

Doctors of Intelligence & Technology

Installation for TS300 (or SR10)



2017-11-23

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Introduction

This user manual is used for the installation of TS100 generated by SZdoit, together with the motor connection with the development board. Specially, the installation is very similar to the other T series tank chassis from SZdoit, excluding the shock suspension. Therefore, the installation is very convenient.

1. Installation for Driving wheel (two wheels for one TS300)

a) Material for one driving wheel:

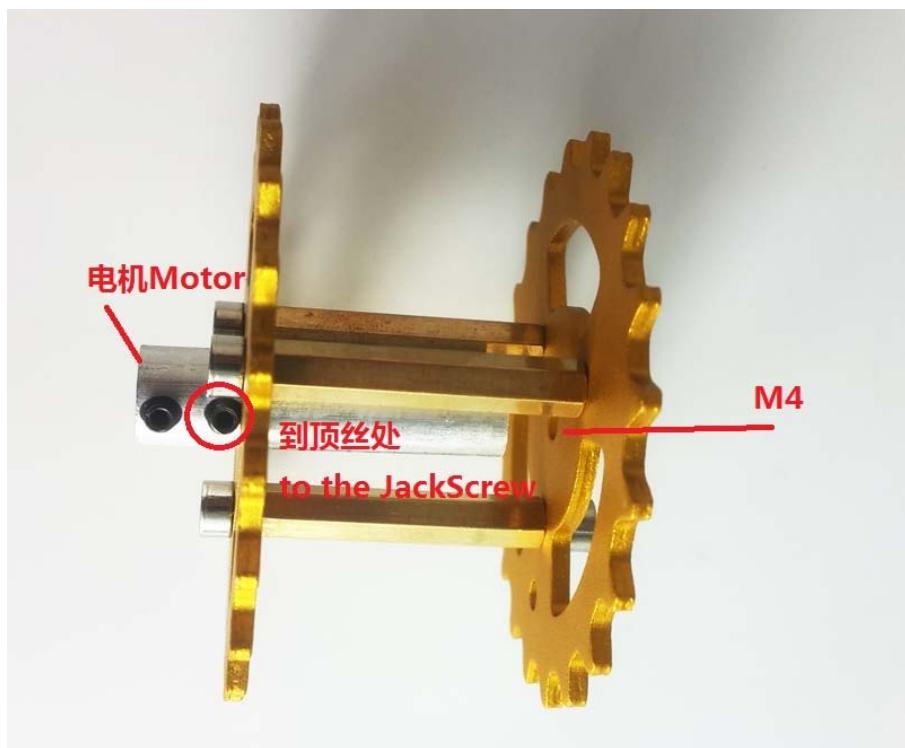
- 1) Wheel piece: 2pcs
- 2) Aluminum alloy coupling: 1pcs (with 3 types for the different motors: $\Phi 4$ 、 $\Phi 5$ 、 $\Phi 6$ mm, the default size is $\Phi 4$ mm)
- 3) 17mm copper pillar: 3pcs
- 4) M3*8 screw: 6pcs
- 5) M4*10: 1pcs
- 6) Jackscrew: 2pcs



- b) Firstly, put jackscrew to aluminum alloy coupling, and let copper pillar to wheel pieces



- c) After install the two wheel pieces together, and then let the coupling pu through the wheel piece with big hole firstly. Note: (1) let the location hole align with each other; (2) the wheel piece with small hole is connected to M4 screw, and the other is connected to motor.



2. Installation for bearing wheel (one TS300 needs 10pcs bearing wheel)

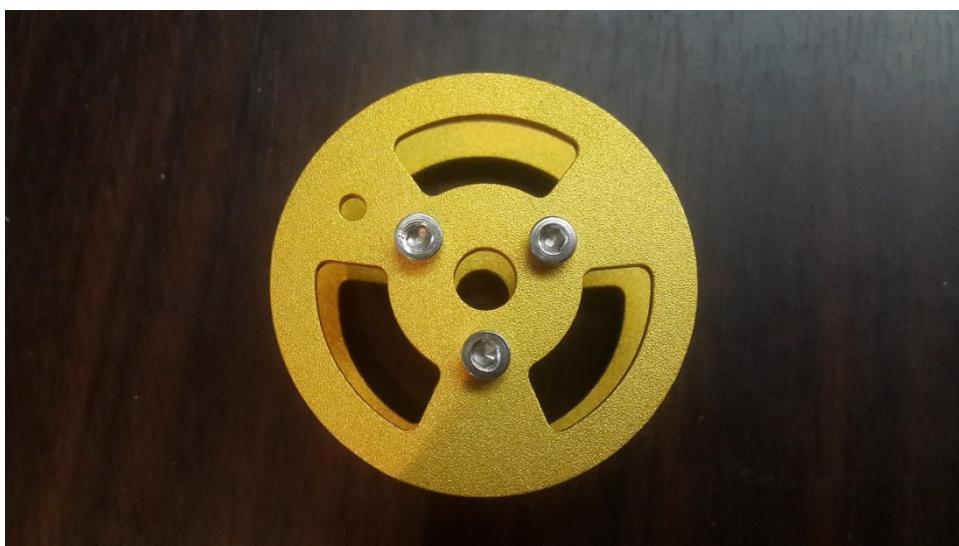
- a) material for one bearing wheel:
- 1) 17mm copper pillar: 3pcs
 - 2) M3*8 screw: 6pcs
 - 3) stainless steel connector: 1pcs
 - 4) M2 screw: 1pcs
 - 5) cup bearing: 2pcs
 - 6) wheel piece: 2pcs (note: when install the wheel, please let the location hole is aligned with each other)



- d) Install the copper pillar to the 2pcs wheel pieces
Firstly, install 3pcs copper pillar to one wheel piece



- e) Then, let another pcs wheel piece to install the pillar to it. Note that, please let the location is aligned with each other.



- f) Let one cup bearing through the stainless steel



- g) Then install one wheel piece to install the stainless steel with cup bearing, and later install another wheel piece. Use a M2 screw to fix the outside wheel piece.



Some notation when install the bearing wheel

- 1) Align the wheel pieces;
- 2) After installation the bearing wheel. Let the bearing wheel turn to test whether it is smooth. If not, then loose the M2 screw.

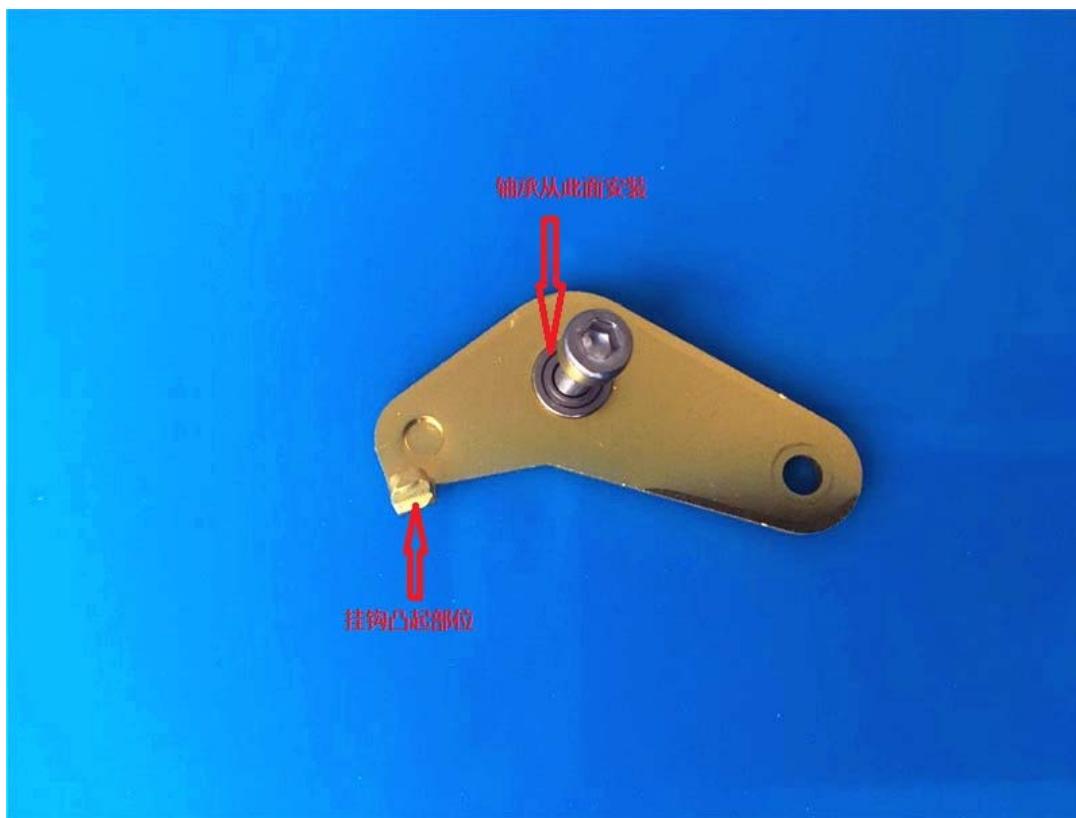
3. Install the shock suspension (the total is 8pcs, including left and right 4pcs)

- a) Materials when install a shock suspension:

- 1) installed bearing wheel: 1pcs
- 2) shock suspension bracket: 1pcs
- 3) cup bearing: 1pcs
- 4) M4*8 screw: 2pcs
- 5) M4 screw nut: 1pcs
- 6) spring: 1pcs



b) Firstly, put the cup bearing into the centre hole of the shock suspension bracket. Importantly, the hook must on the top surface.



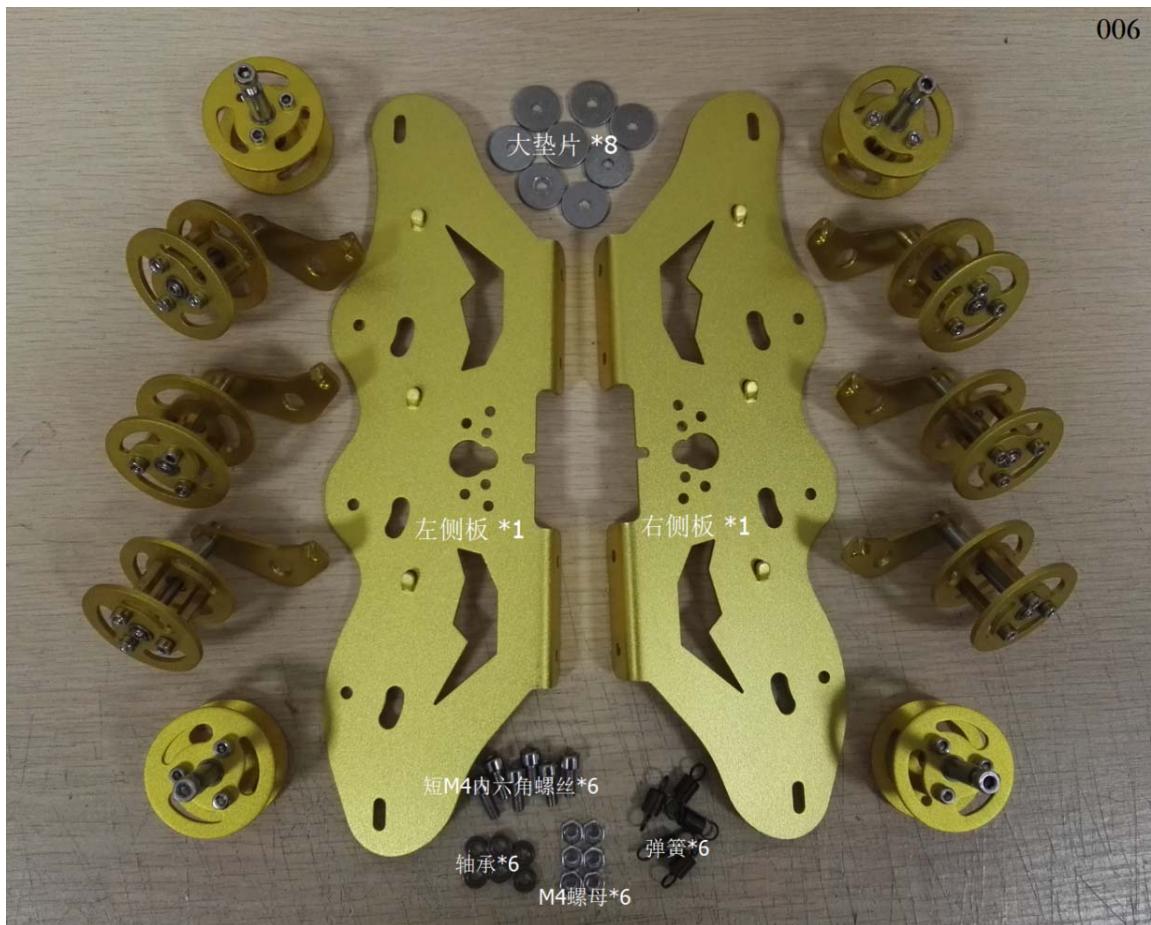
c) Use M4*8 screw to connect the bearing wheel and the shock suspension bracket.



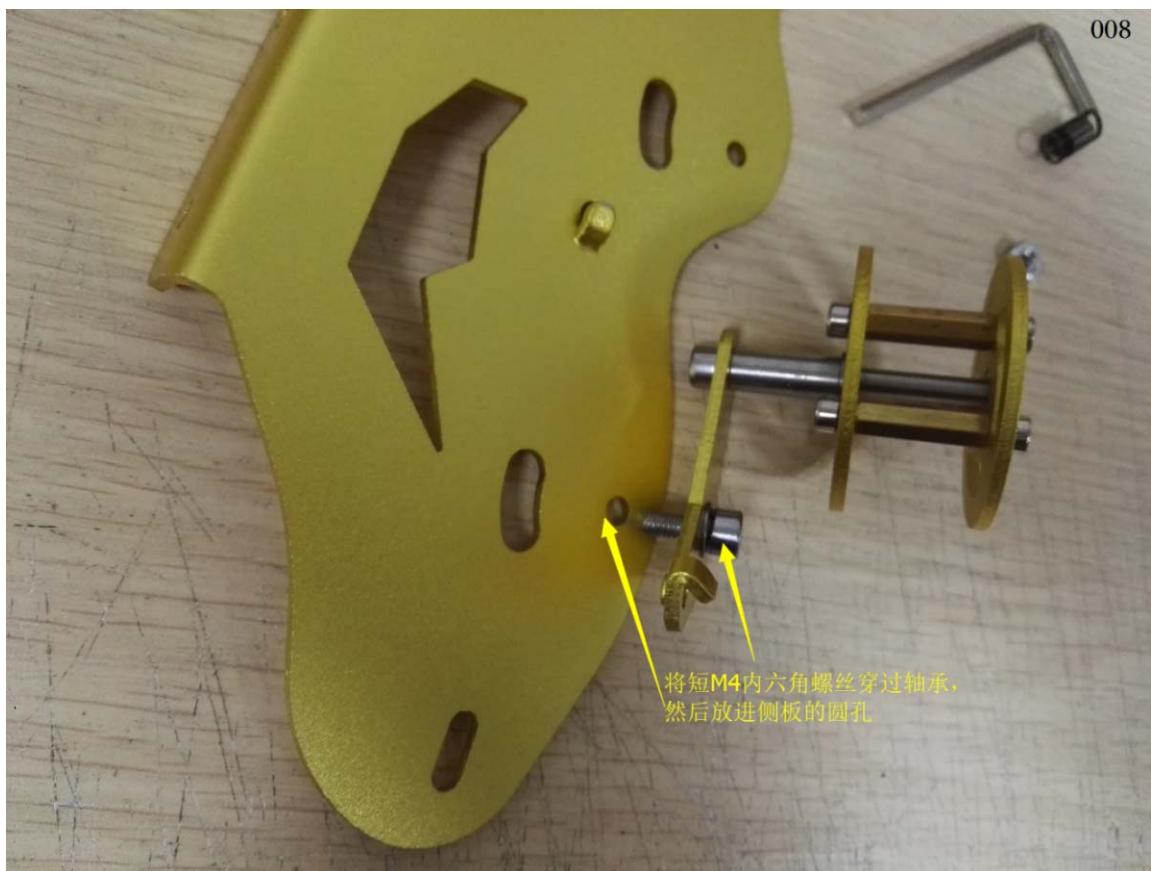
d) Then, use M4*8 screw and nut to fix on the side plate, shown in the following picture



006



008





Importantly, you must the direction of the bearing wheels are the same, shown in the following picture



010

用弹簧将悬挂件和侧板的勾牵拉住



011

左右侧板都装上带悬挂件的承重轮





014

将短M4内六角螺丝穿过侧板一端的条形孔，再次放上垫片



015

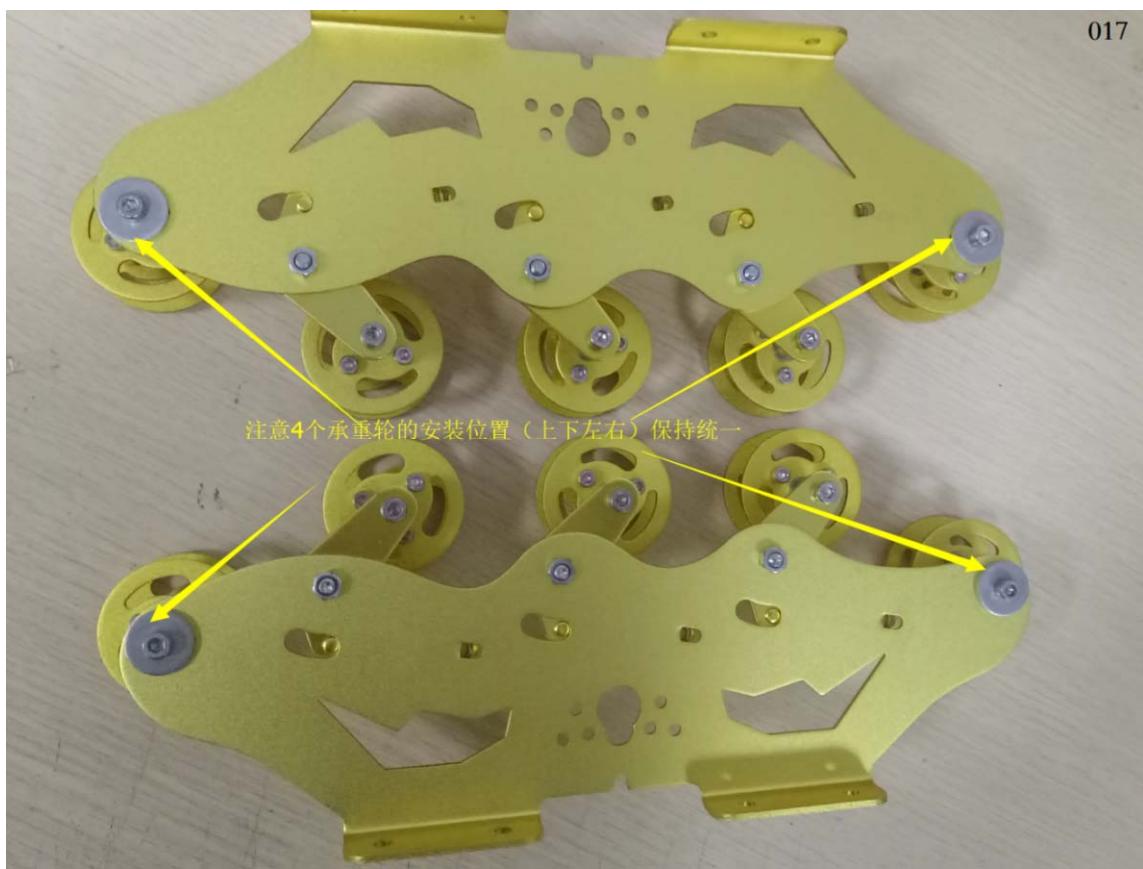
将承重轮固定到该短M4内六角螺丝上



016



017



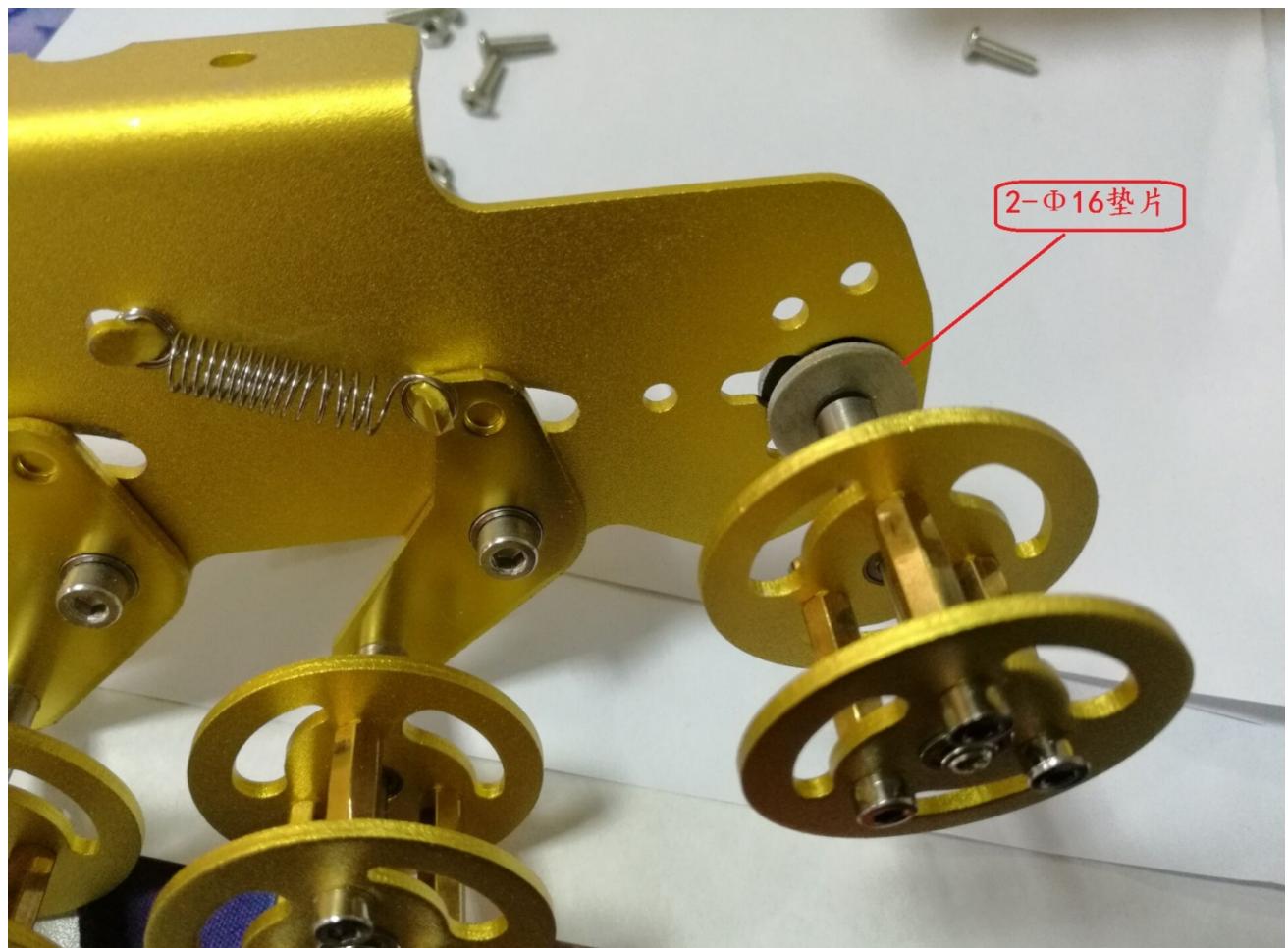
4. Installation a bearing wheel to the side plate (left and right)

The wheel can adjust the length of track.

a) Material when install a bearing wheel

- 1) bearing wheel: 1pcs
- 2) 16mm gasket: 2pcs
- 3) M4 screw: 1pcs

b) Leave enough space to adjust the track when install this bearing wheel to the side plate

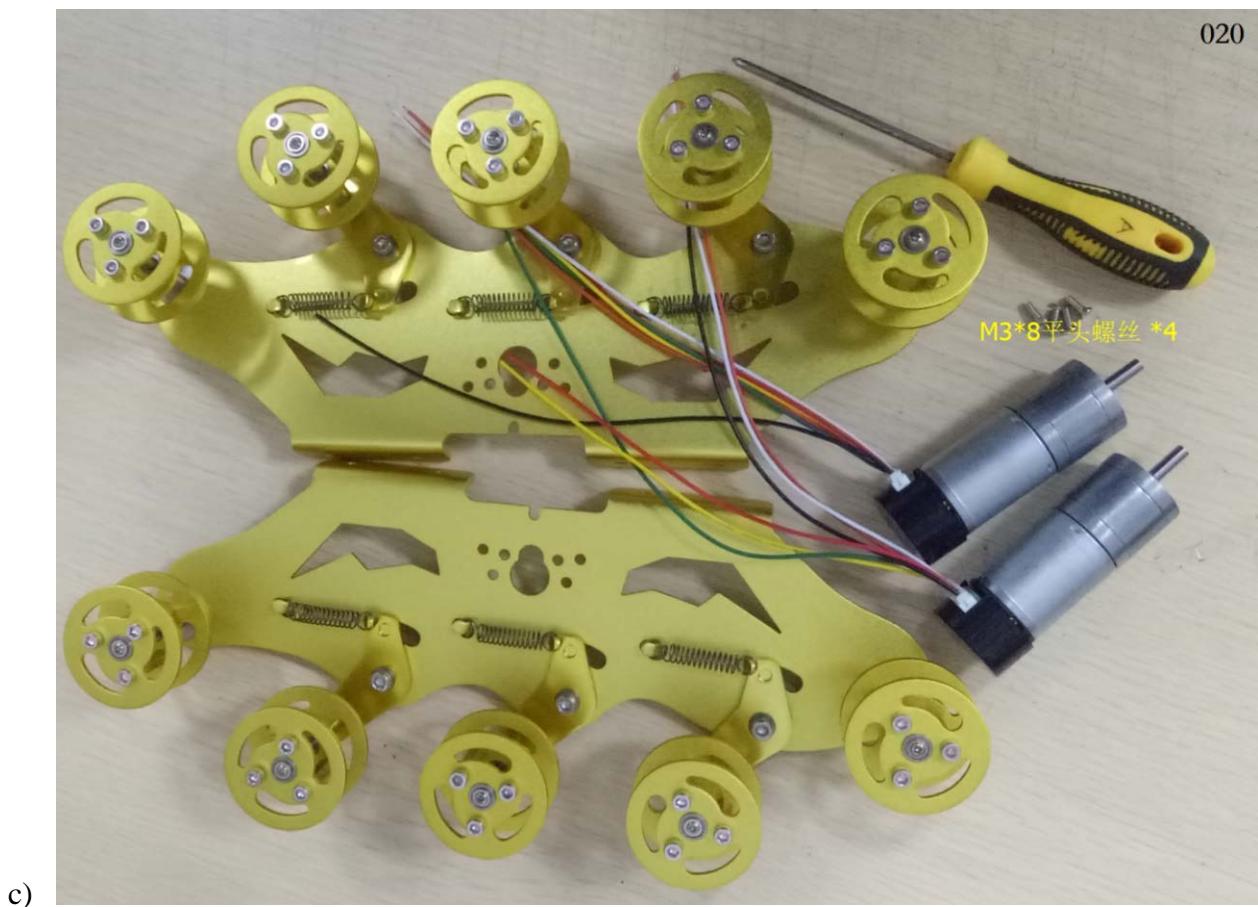


5. Summary

a) materials

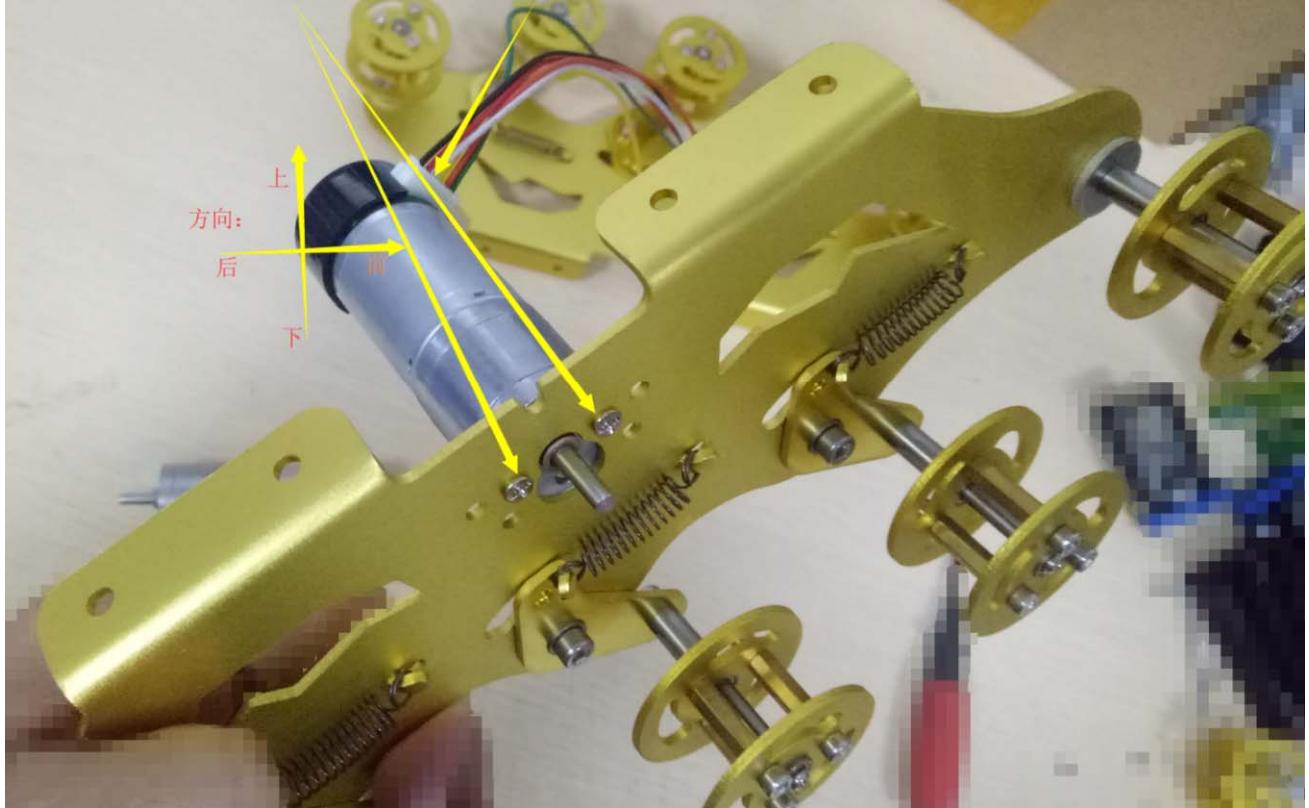
- 1) metal panel: 1pcs
- 2) left and right installed side plate with bearing wheel
- 3) installed driving wheel: 2pcs
- 4) motor: 2pcs
- 5) track: 2pcs
- 6) M3*12 screw: 8pcs
- 7) M3 nut: 8pcs
- 8) M3*10 screw: 4pcs

b) Install the motor with m3*10 screw.

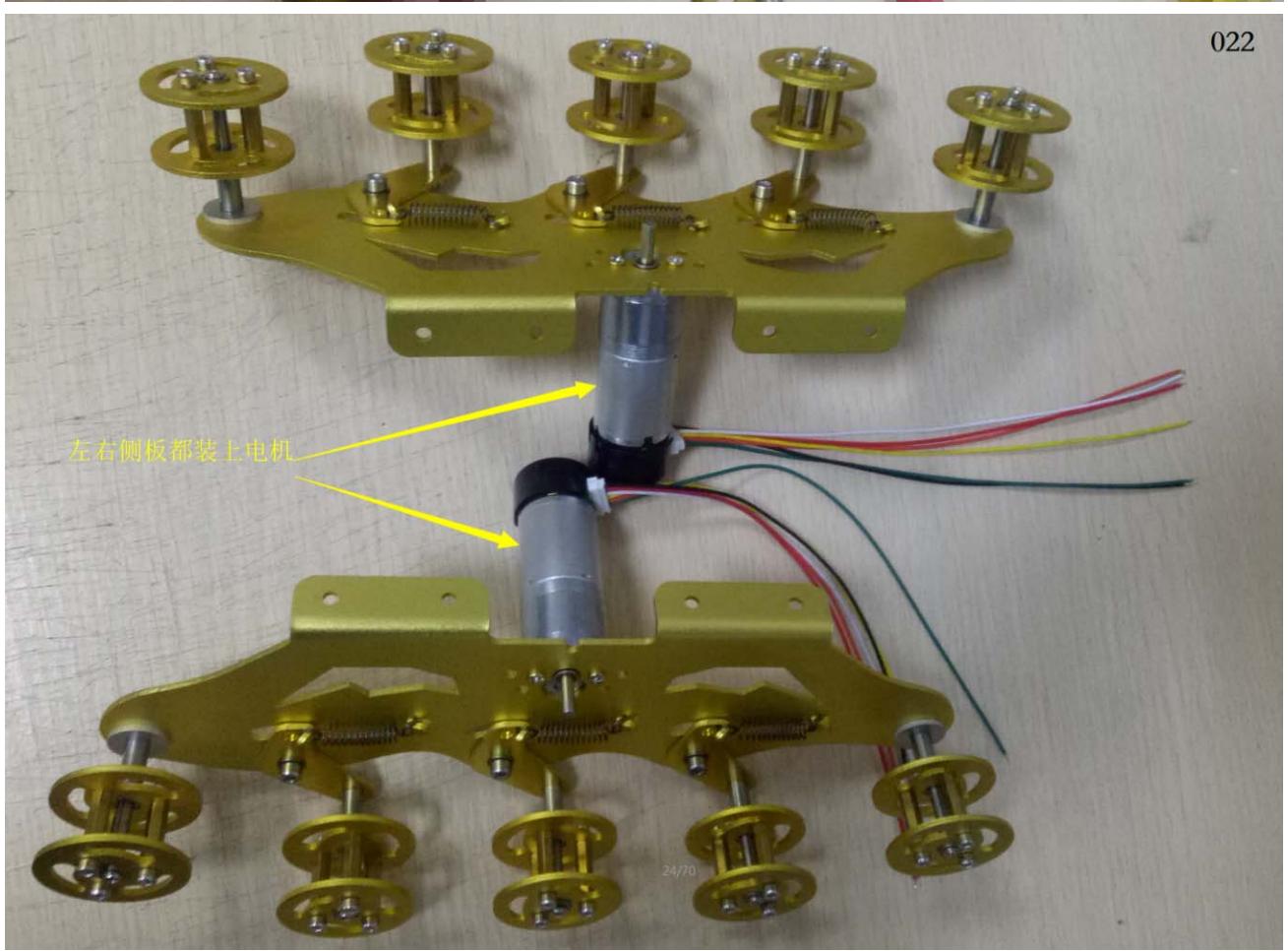


021

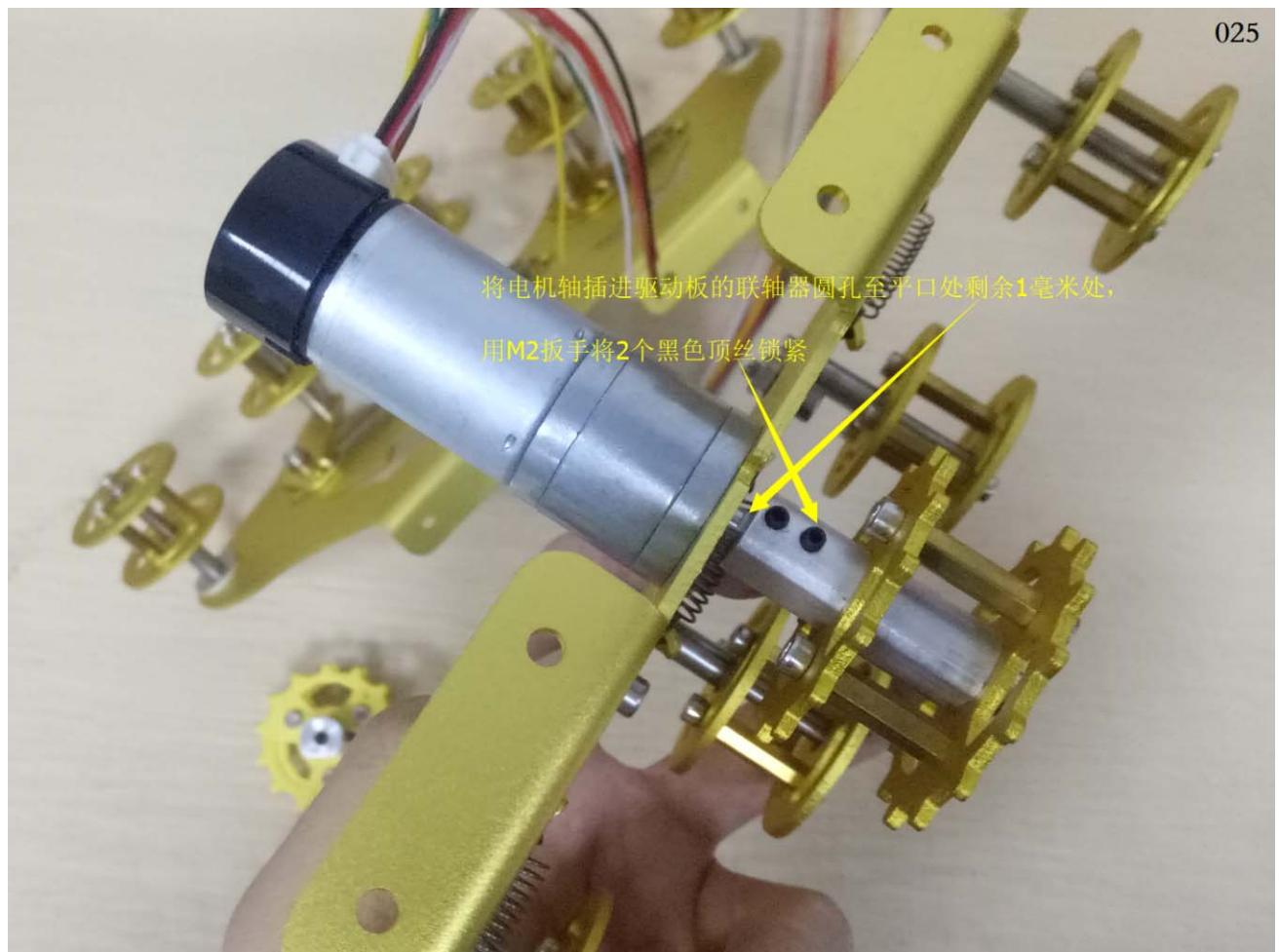
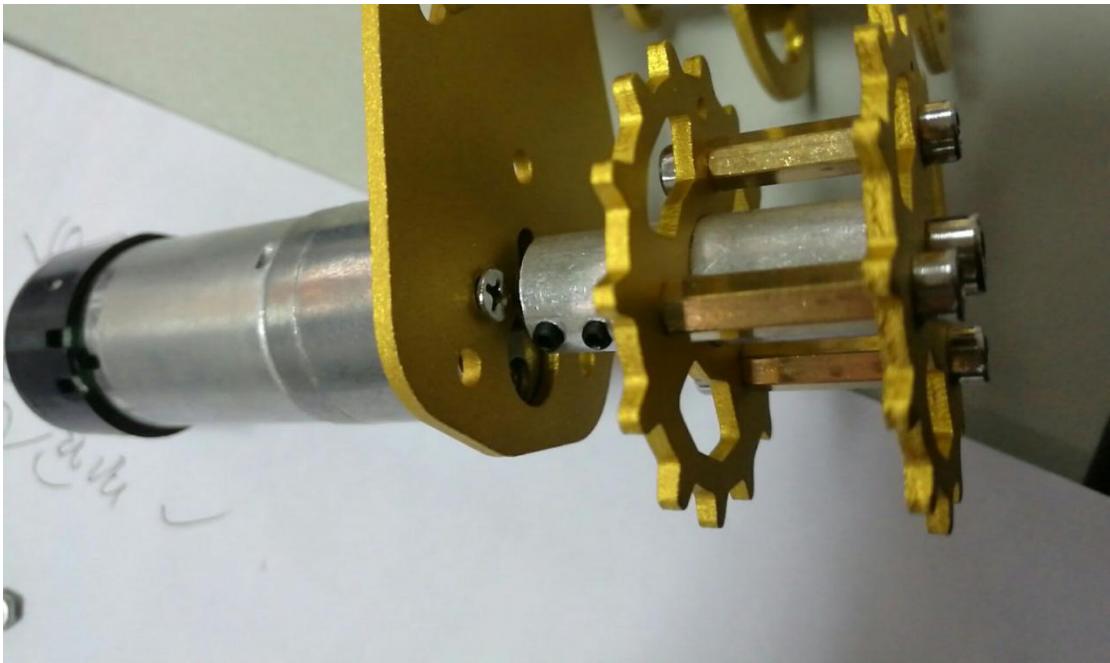
用2个M3*8平头螺丝将电机固定到侧板上，注意让电机线端朝上

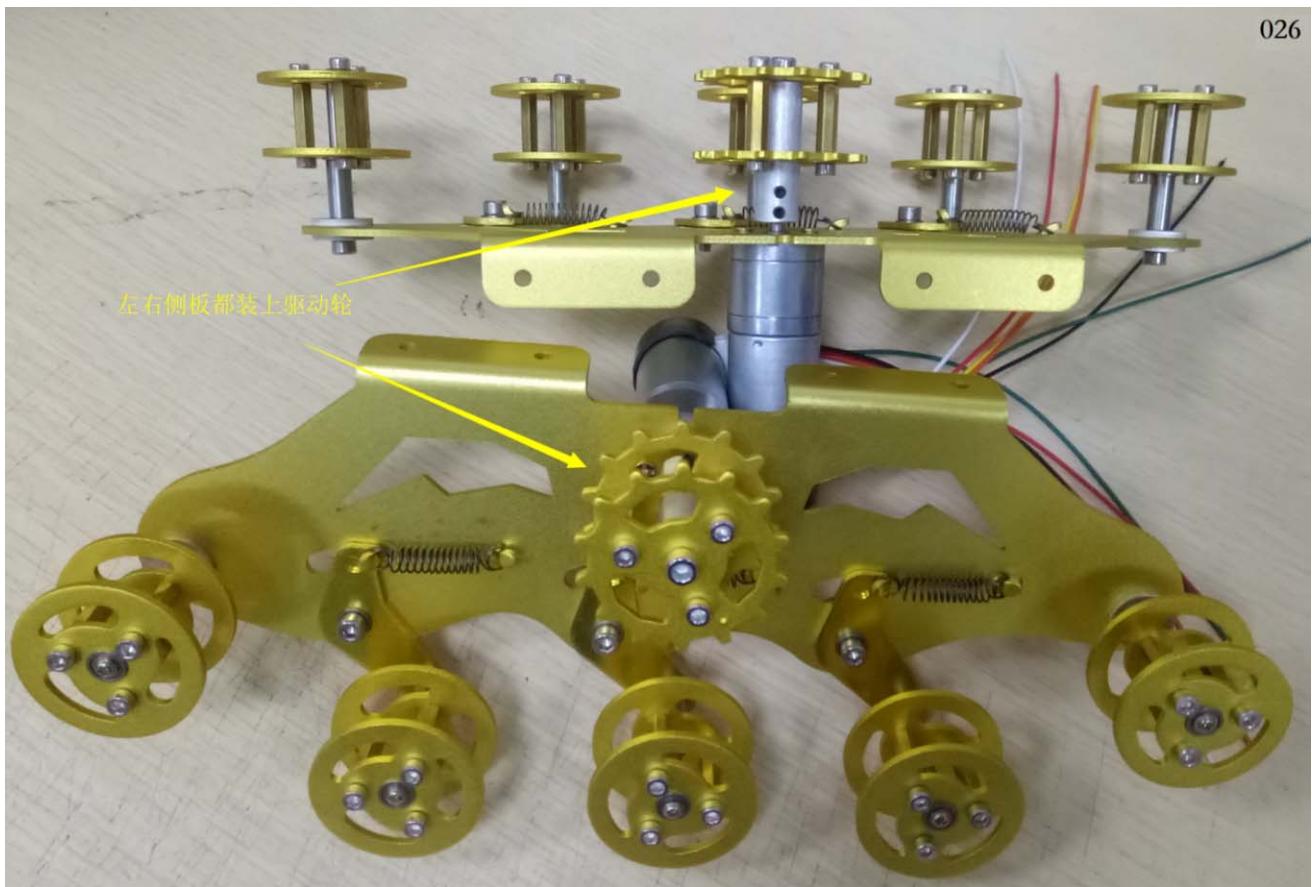


022



d) Install the driving wheel and connect the motor

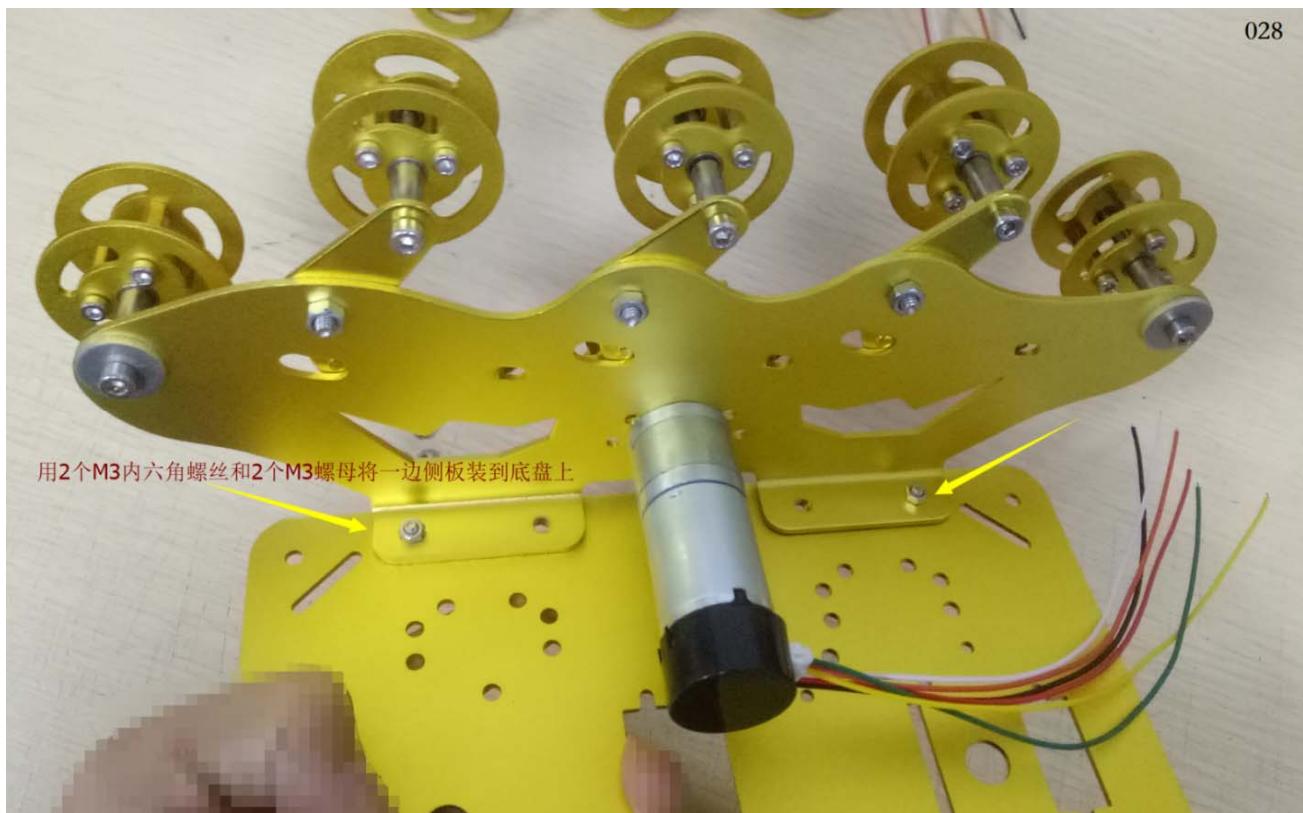




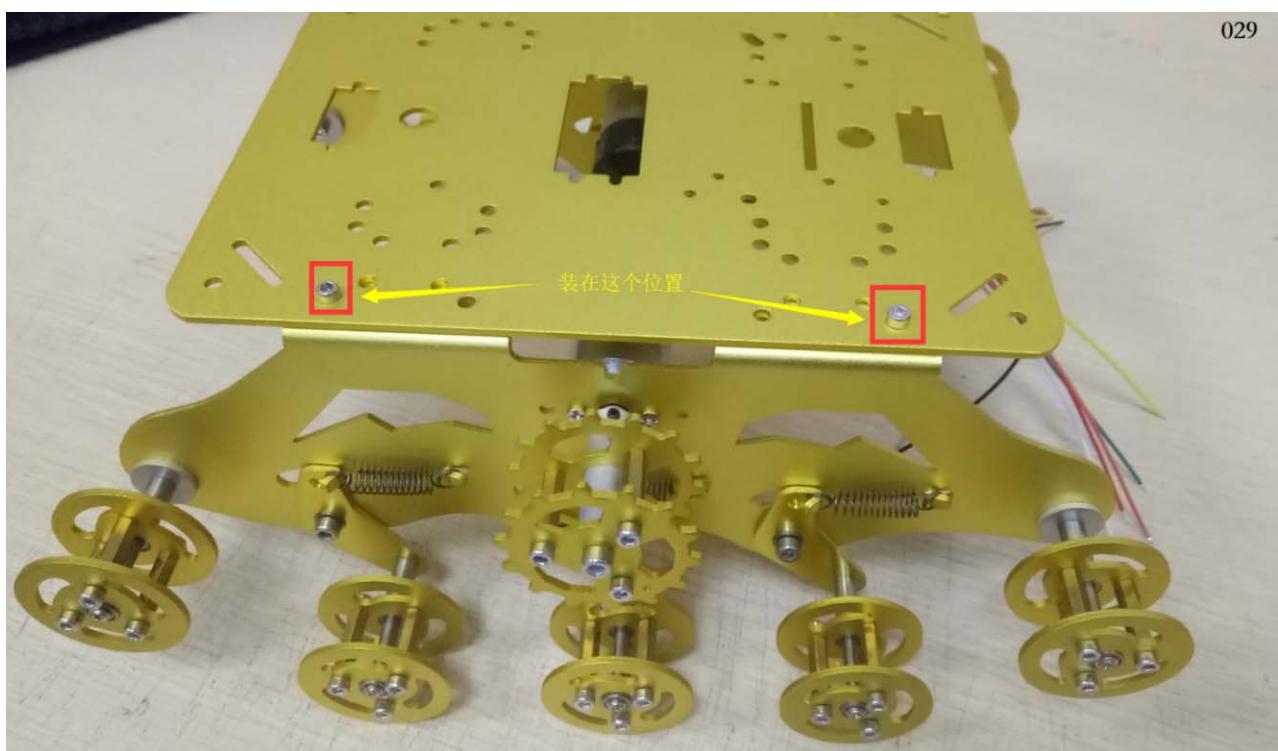
e) Install the metal panel



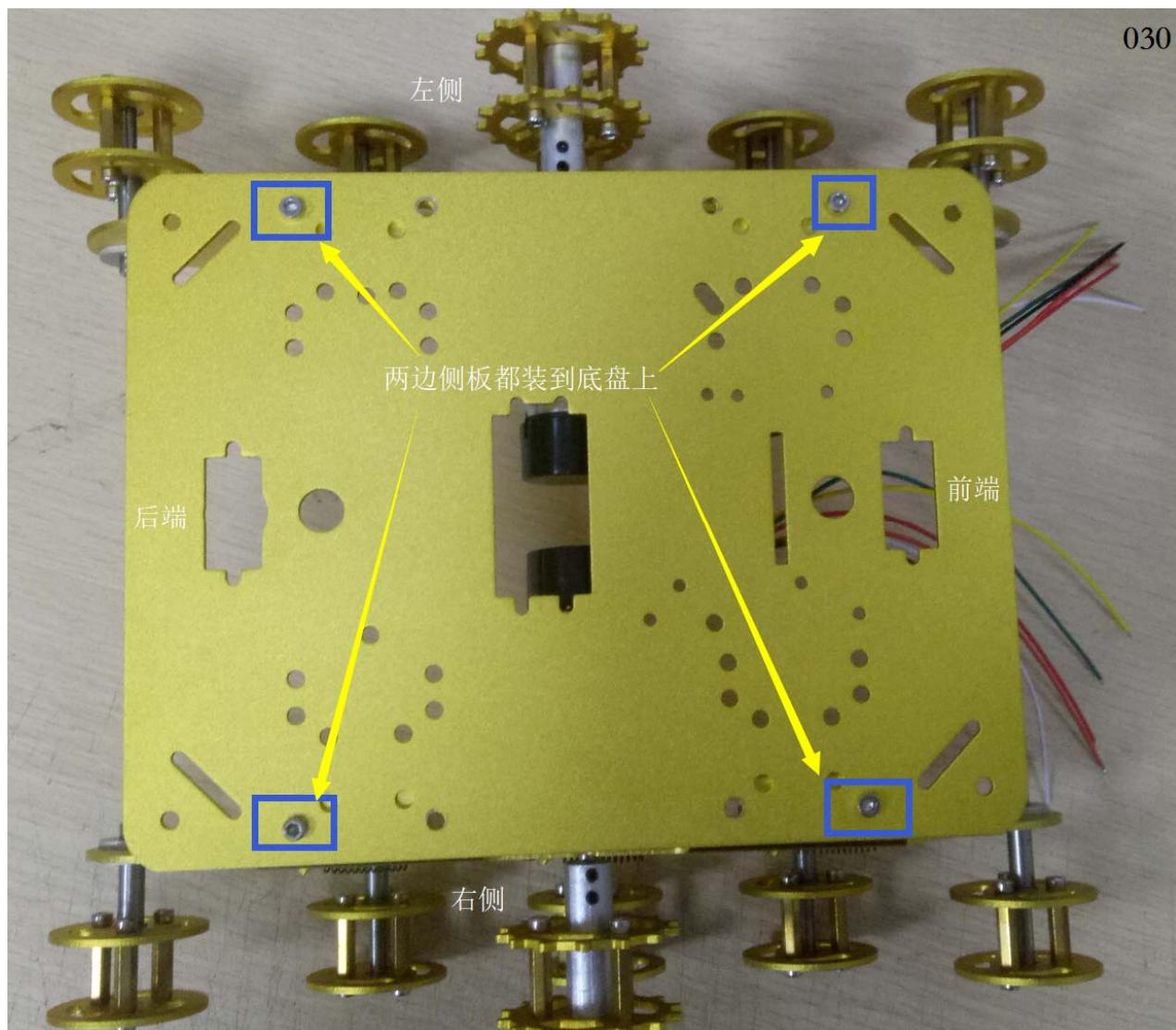
028



029



030

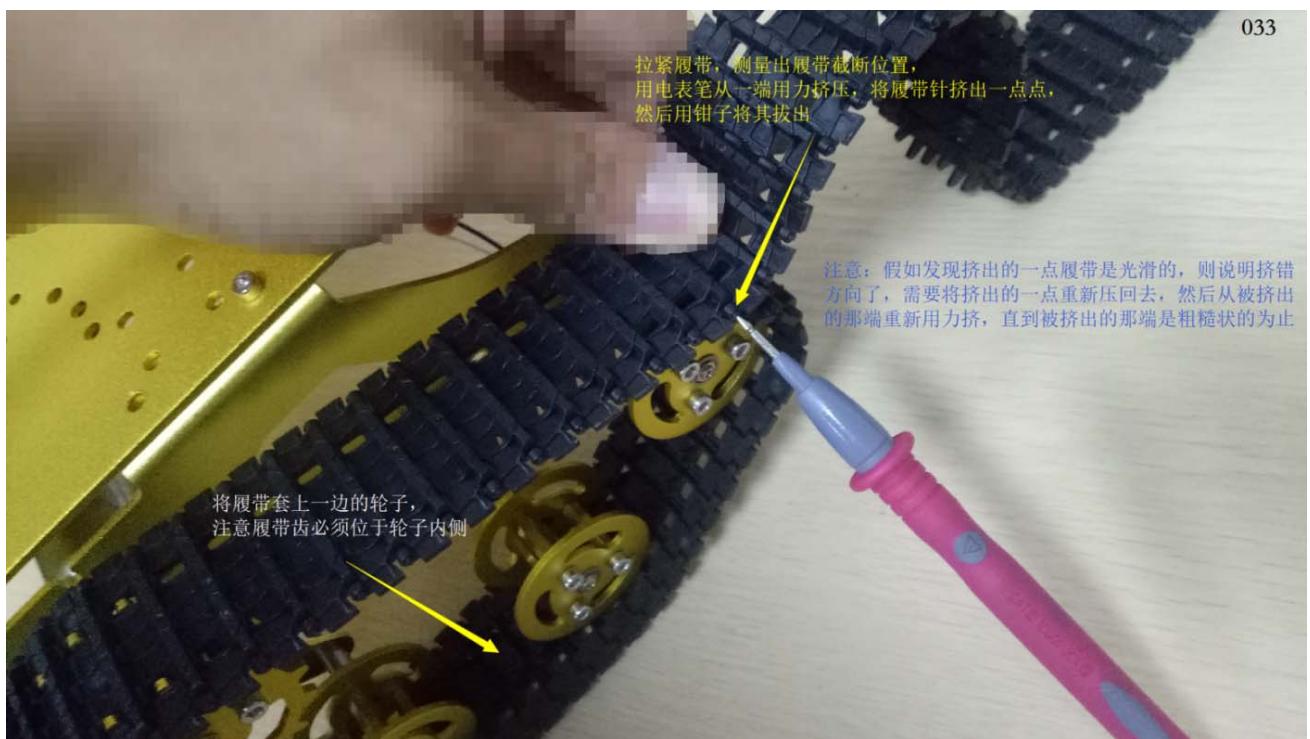


- f) Adjust the length of the track and install it to the car chassis. Note, the track can be changed at random length.

032

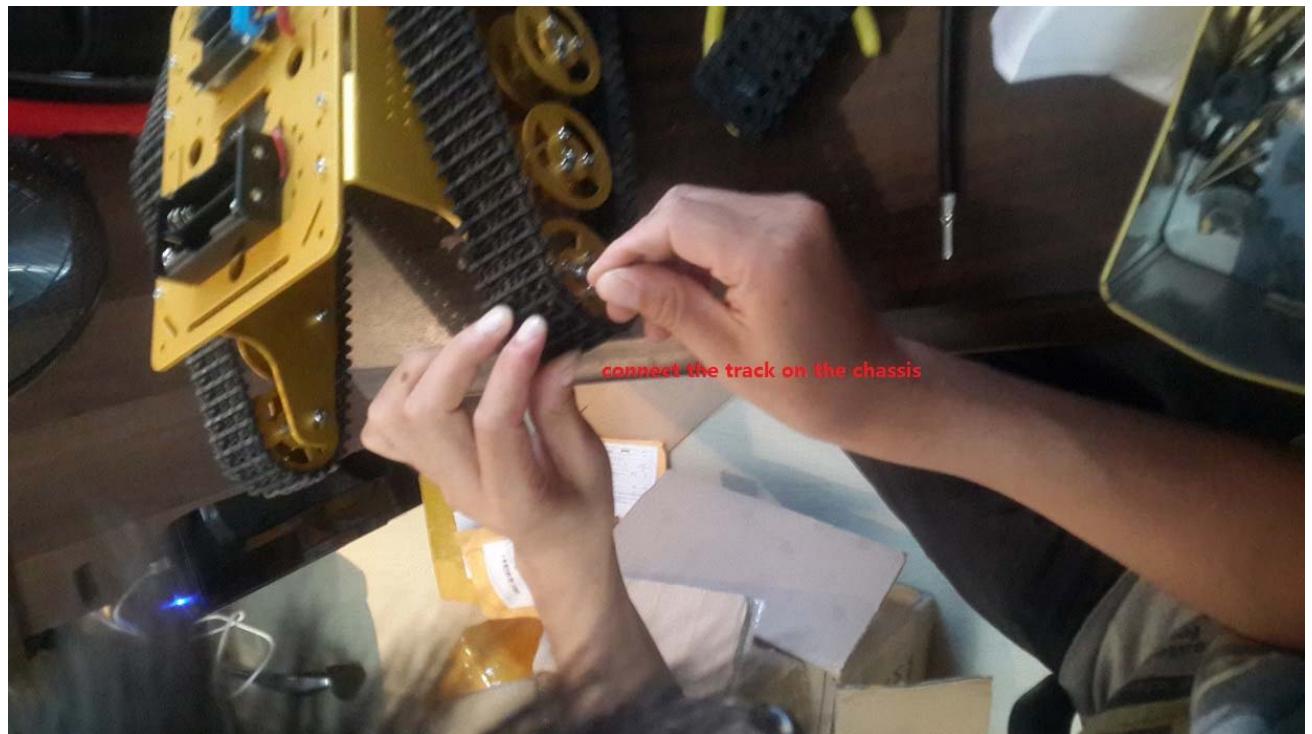


033



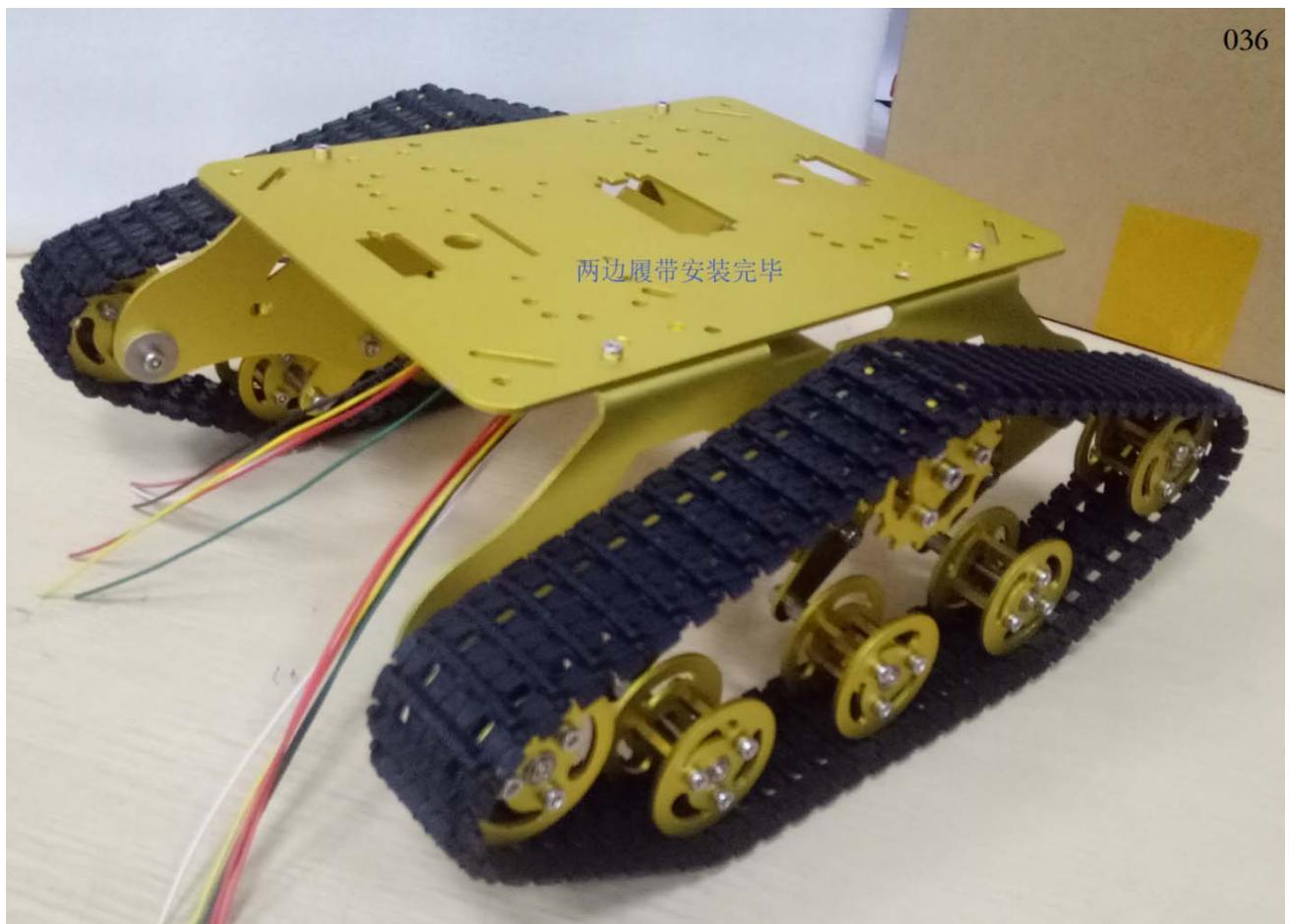


g) Install the track to the wheel. **Note, the length can be changed randomly.**



h) The complete TS100 after installation





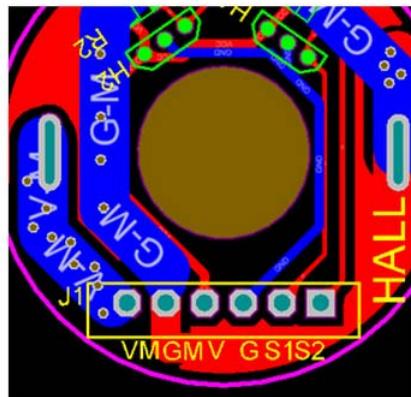
Some notations

- 1) Align the location hole when install the wheels;
- 2) Track can be changed randomly;
- 3) Note the screw models when installs the car;
- 4) M2 doesn't fix to tight when install the bearing wheel;
- 5) by adjust the location of the end of bearing wheel, can adjust the track;
- 6) the same direction is necessary when install the shock suspension;

6. Connection for the motor



This motor has Hall sensor, which can be used to measure the speed. If we face the shaft of the motor, the interface is VM (power for motor), GM(GND for motor); V(power for Hall sensor), G (GND for Hall sensor) ; S1(signal from the first sensor), S2 (signal from the 2nd sensor) 。



**其中，VM、GM为电机接线，V、G为传感器
供电线，S1，S2为传感器信号输出线。**

Gear Motor
User Manual-SR04

A. Specifications:

- Name: 25mm gear motor
- Output speed: $150 \pm 10\%$ rpm
- No-load Current: 200mA (Max)
- Stall current: 4500mA (max)
- Stall torque: 9.5kgNaN
- Rated speed: $100 \pm 10\%$ rpm
- Rated torque: 3000gNaN
- Rated Current: 1200mA (Max)
- Noise: 56dB
- Working voltage: 9V
- Outside Shaft Length: 14.5mm
- Shaft End Play: 0.05-0.50mm
- Screw Size: M3.0
- Dia. Of Shaft phi4mm, D3.5
- Encoder: 2 pulses/circle

B. Illustration for the motor connection

VM:Power for motor
GM:GND for Motor
V:Power for Hall Sensor
G:GND for Hall Sensor
S1:Singal from the 1st Hall Sensor
S2:Singal from the 2nd Hall Sensor

C. Product Parameters:

产品型号：GM25-370-24140-75-14.5D10			
1. 标准使用条件 (Standard Operating Conditions)			
NO.	项目(Item)	规 格(Specification)	检 验方法 (Test Method)
1.1	额定电压 (Rated Voltage)	DC 9.0V	电压表 (Multimeter)
1.2	速比 (Gear Ratio)	1/75	
1.3	马达转向 (Rotation)	CW	手感 (Handle)
1.4	电机位置 (Motor Position)	检测时水平 (All position in horizontal)	手感 (Handle)
1.5	检测时的温度范围 Temperature	0 Degree - 30 Degree Celsius	温度计 (Thermometer)
1.6	检测时的湿度范围 Humidity	30% ~ 95%	湿度计 (Hygroscope)
2. 电机性能 (Performance Of Motors)			
NO.	项 目(Item)	规 格(Specification)	检 验方法 (Test Method)
2.1	空载转速 (No-load Speed)	$11500 \pm 10\%$ rpm	转速表 (Flash Speed Indicator)
2.2	空载电流 (No-load Current)	180mA(Max)	电流表 (DC Power Supply)
2.3	堵转电流 (Stall Current)	4500mA(Max)	电流表 (DC Power Supply)
2.4	堵转力矩 (Stall Torque)	160g.cm	扭力计 (Torque Measure)
3. 整机性能 (Performance of Gear motors)			
NO.	项 目(Item)	规 格(Specification)	检 验方法 (Test Method)
3.1	输出转速 (Output Speed)	$150 \pm 10\%$ rpm	转速表 (Flash Speed Indicator)
3.2	空载电流 (No-load Current)	200mA(Max)	电流表 (DC Power Supply)
3.3	堵转电流 (Stall Current)	4500mA(Max)	电流表 (DC Power Supply)
3.4	堵转力矩 (Stall Torque)	9.5kg.cm	扭力计 (Torque Measure)
3.5	负载力矩 (Rated Torque)	3000g.cm	扭力计 (Torque Measure)
3.6	负载电流 (Rated Current)	1200mA(Max)	电流表 (DC Power Supply)
3.7	负载转速 (Rated Speed)	$100 \pm 10\%$ rpm	转速表 (Flash Speed Indicator)
3.8	噪音 30CM (Noise)	56dB	分贝仪 (Digital Sound Level Meter)
4. 基本尺寸 (The Dimension)			
NO.	项 目(Item)	规 格(Specification)	检 验方法 (Test Method)
4.1	轴伸尺寸 (The Outside Shaft Length)	14.5mm	卡尺 (Vernier Calipers)
4.2	轴向间隙 (Shaft End Play)	0.05-0.50mm	游标 (Frock)
4.3	螺孔 (Screw Size)	M3.0	游标 (Frock)
4.4	出轴直径 (Dia.of shaft)	$\phi 4\text{mm}$ D3.5	卡尺 (Vernier Calipers)
4.5	外形安装尺寸 (Outline Mounting Dimension)	Refer to the Outline Drawing	游标和卡尺 Calipe

If you use our controller kit, you can get it from the smartarduino.com, and the connection is shown in the following.

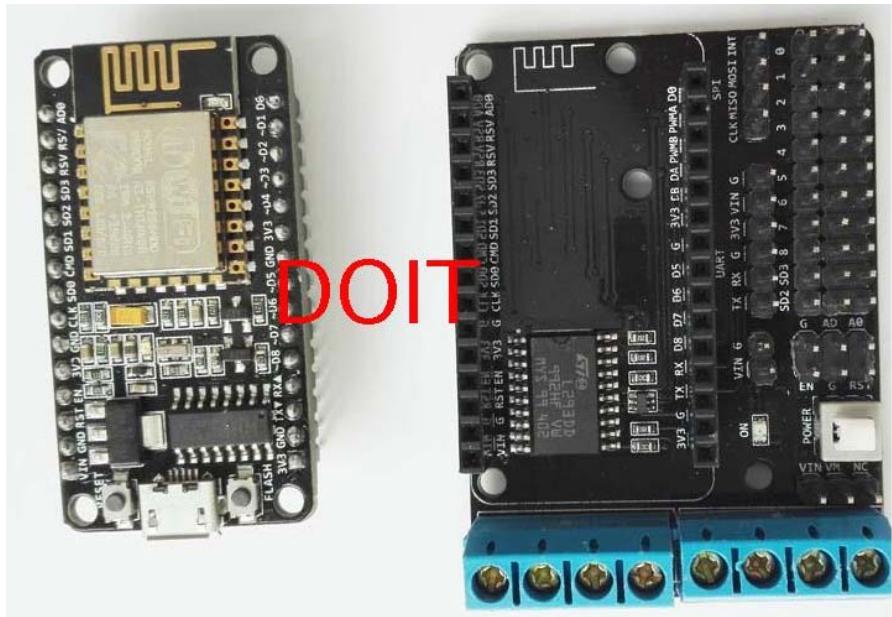
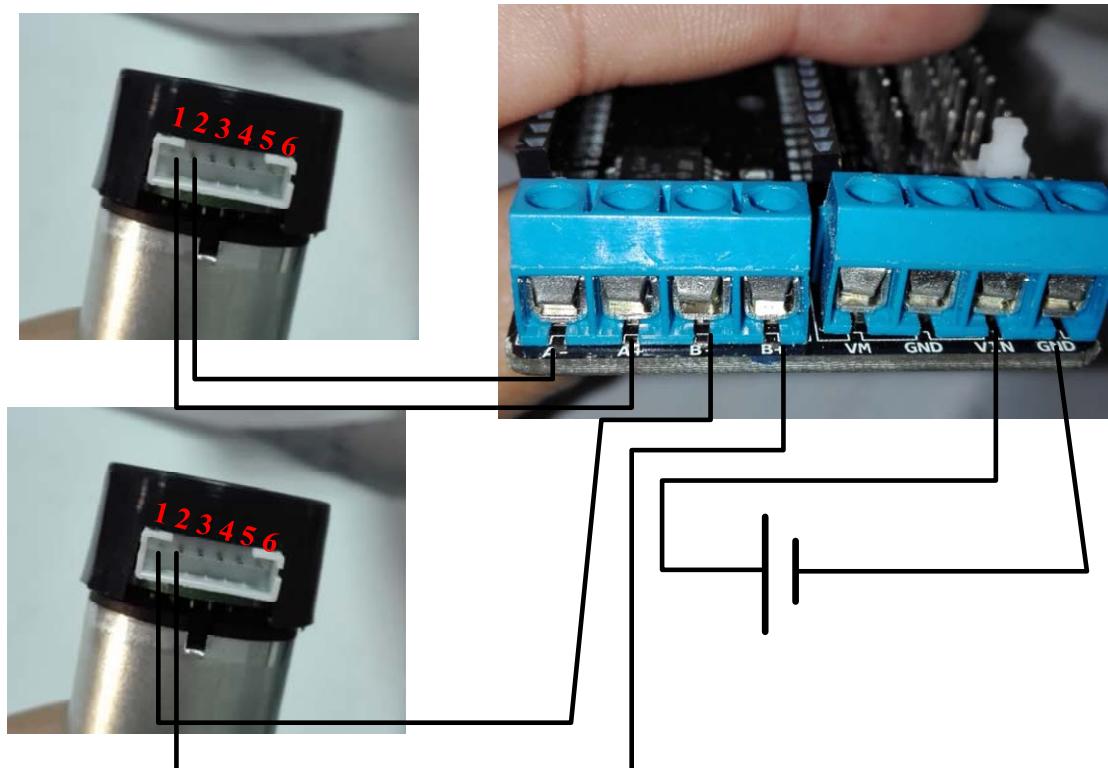


图 doit 公司的 NodeMCU 套件。



Connection



图 2 驱实物连接

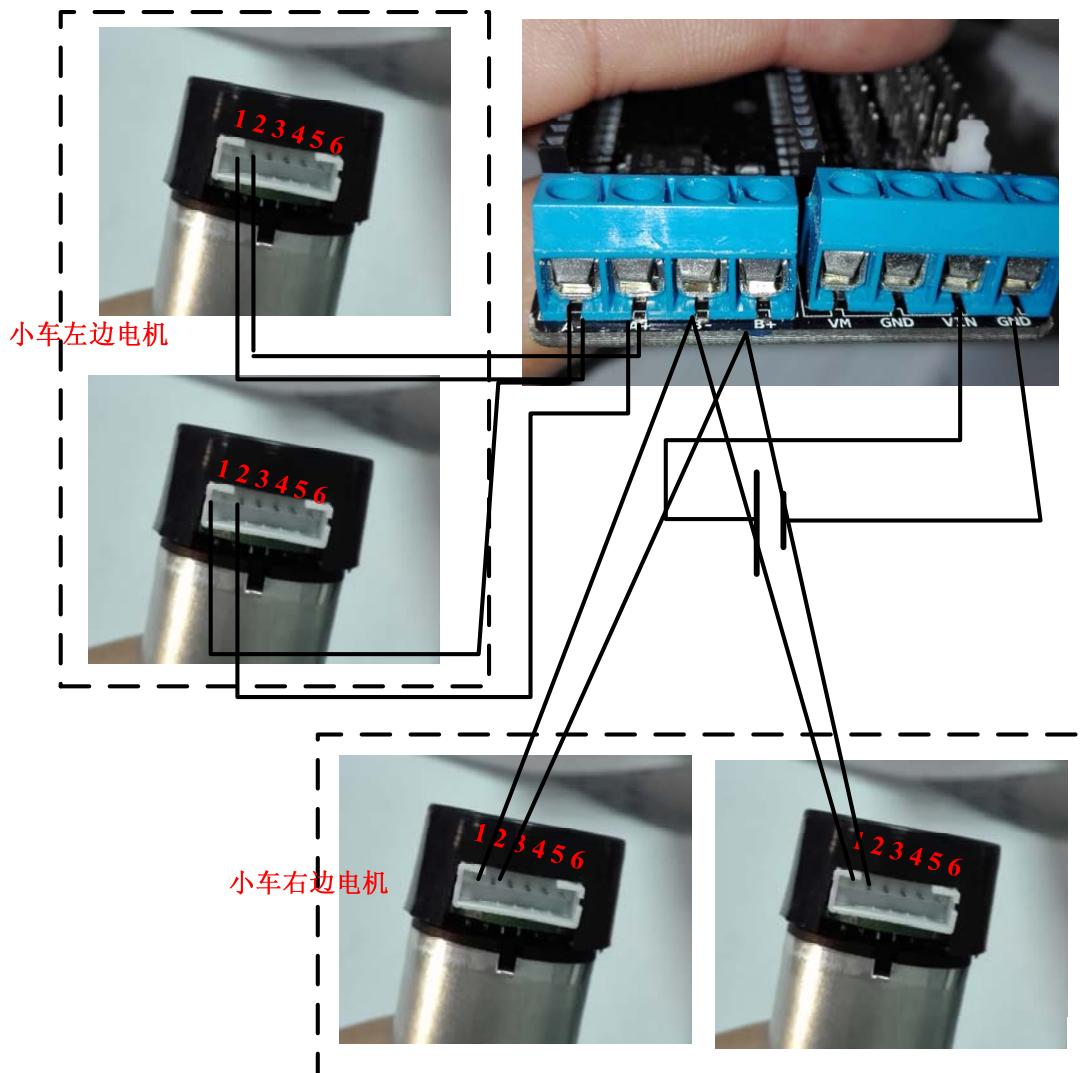


图 4 驱连接示意图

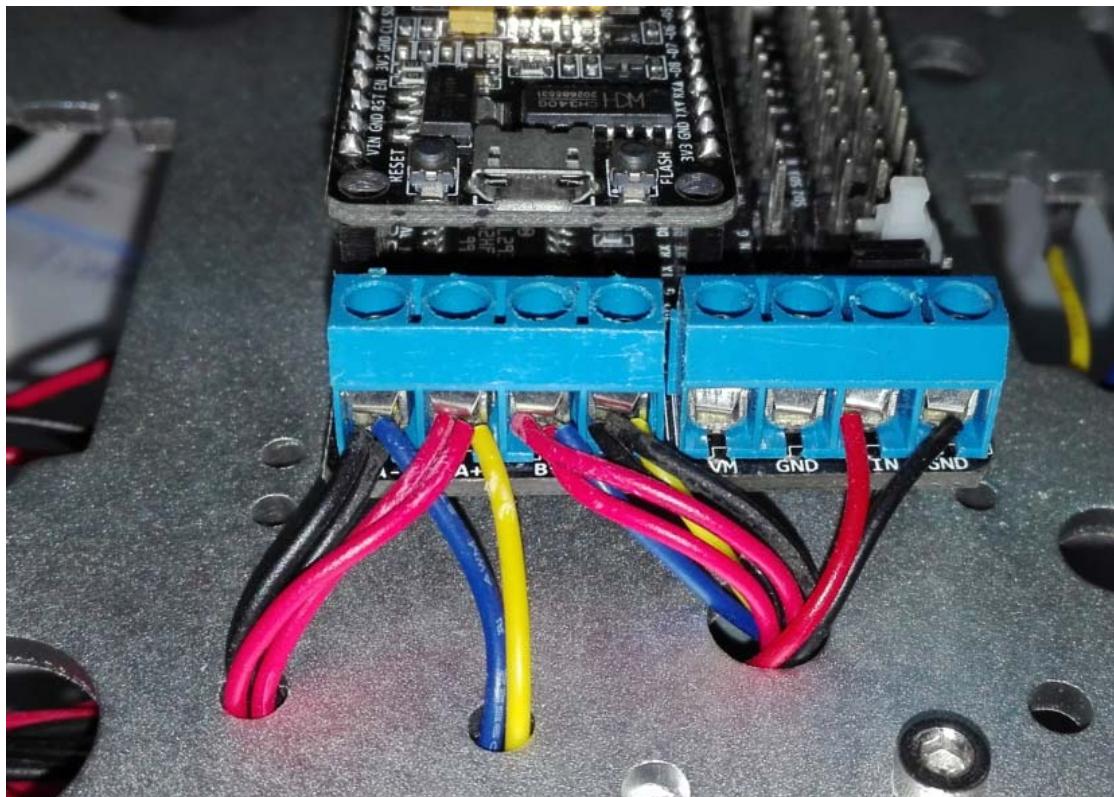


图 4 驱连接实物图

More information, please visit the wiki: wiki.doit.am.