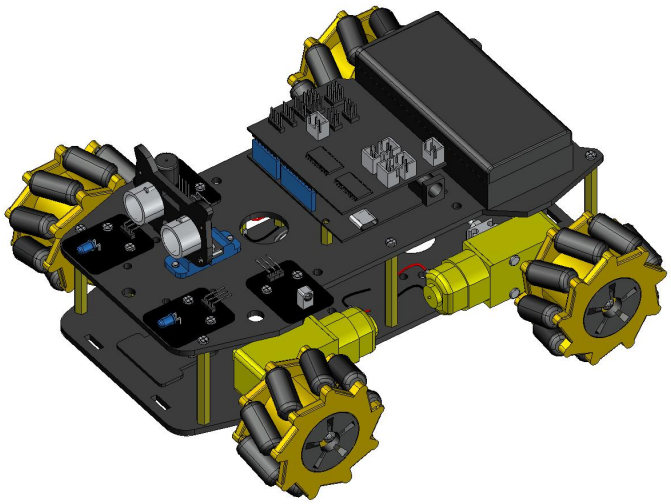
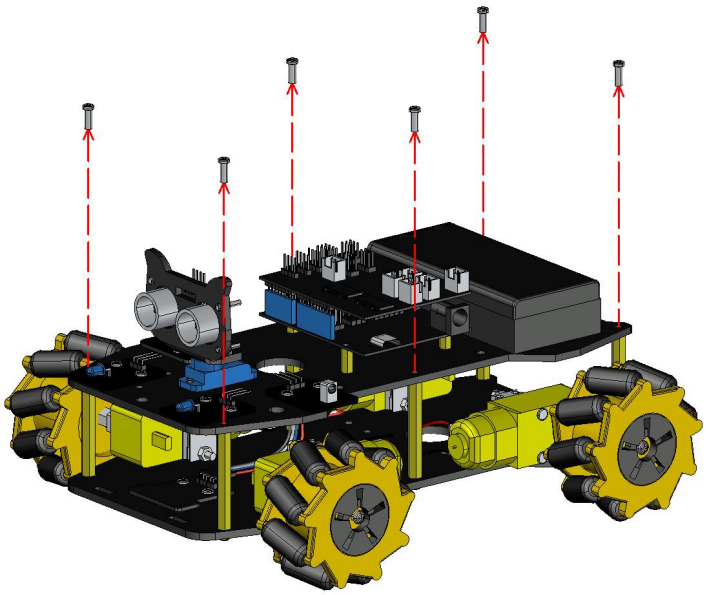
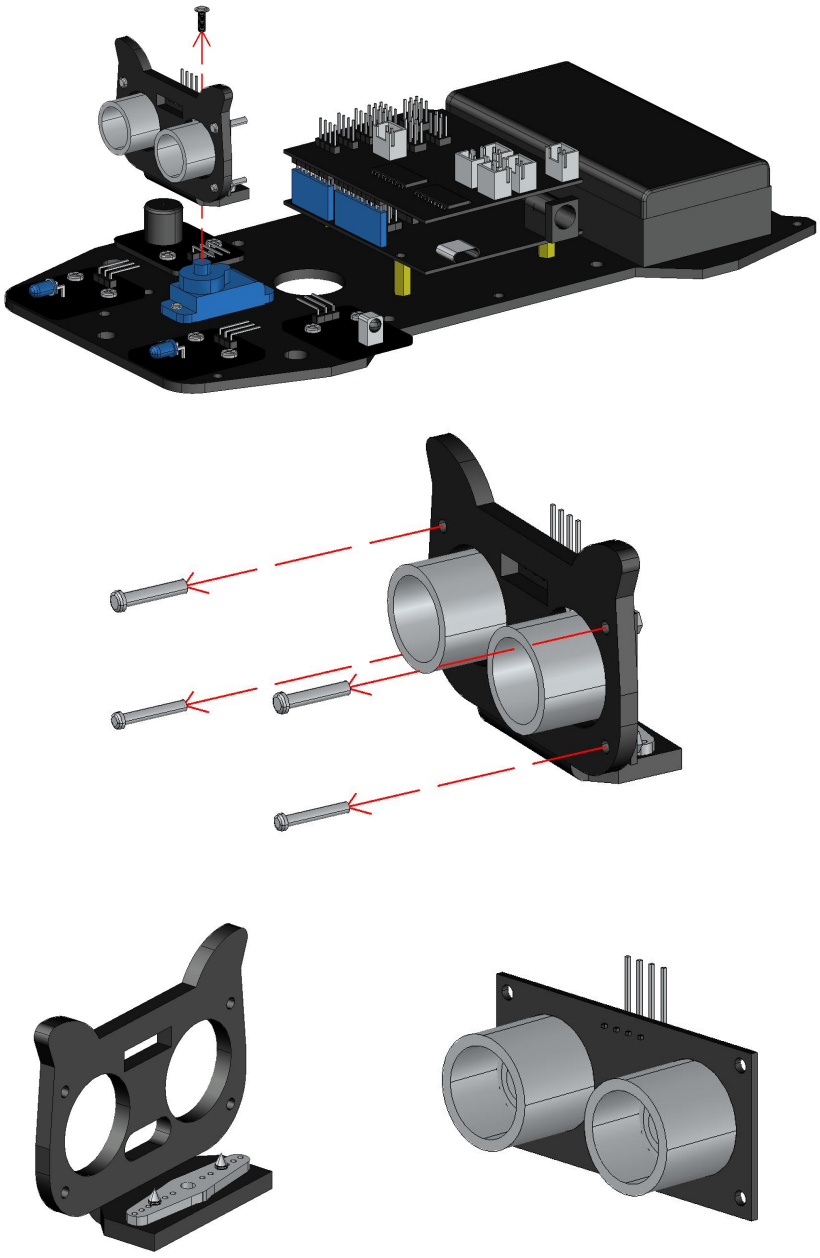
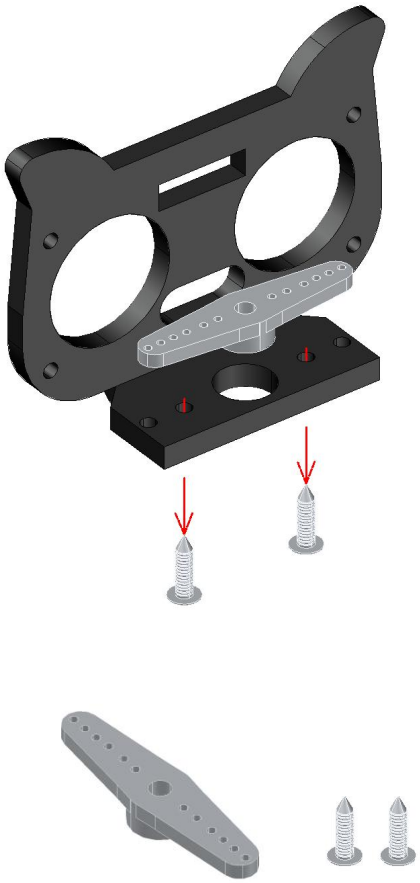
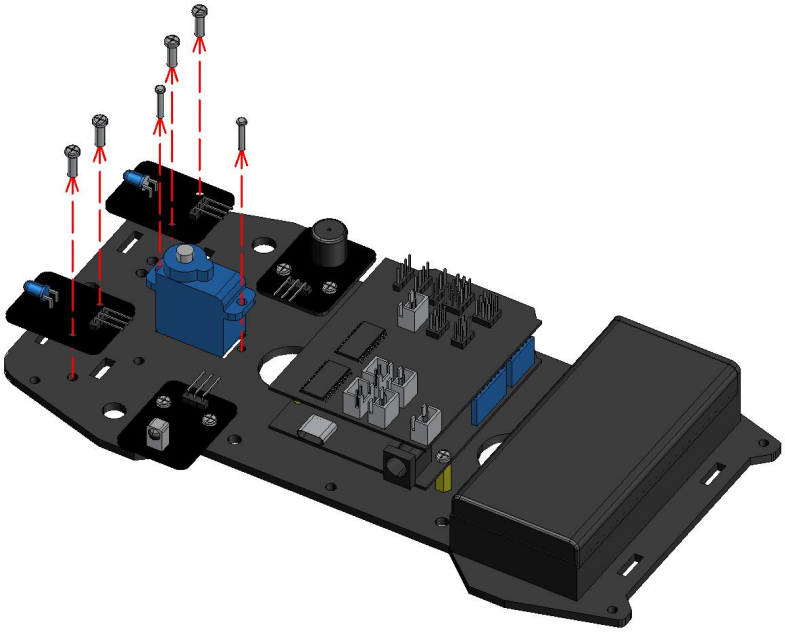
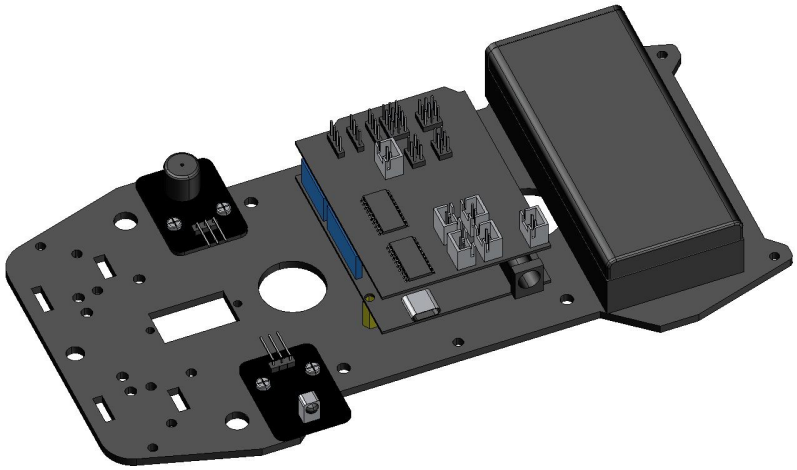
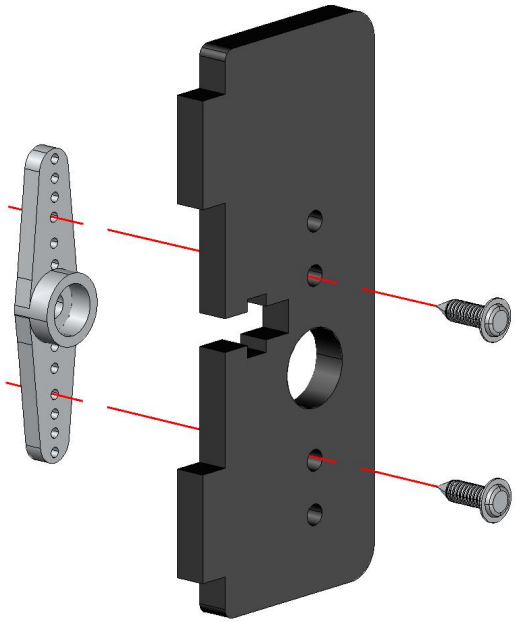
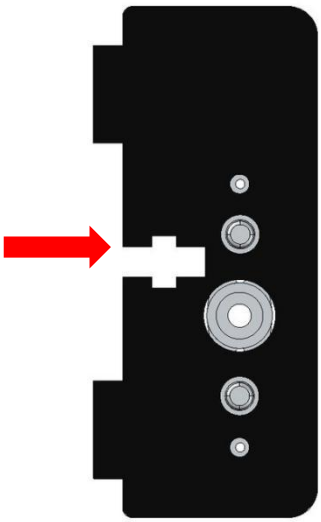
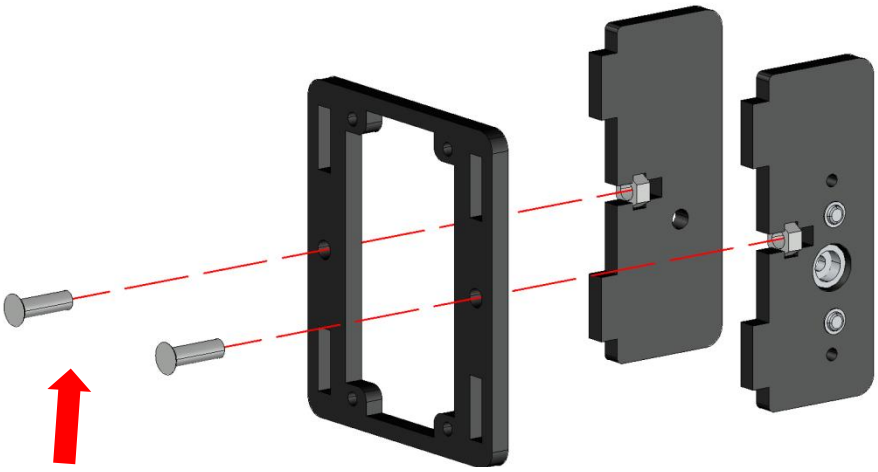
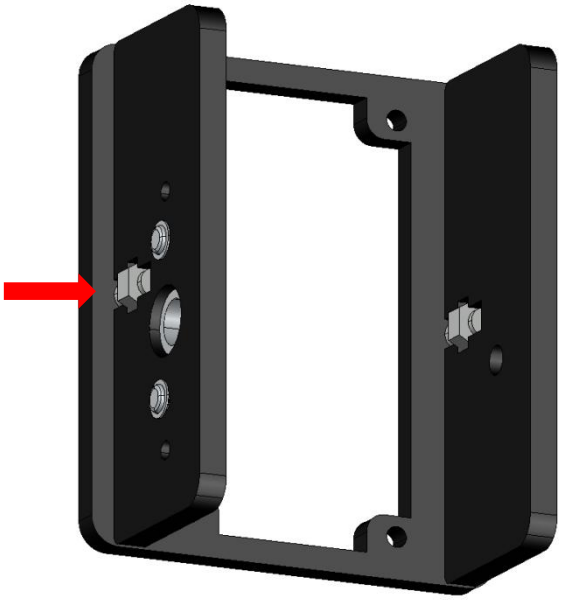
Step 1 Separate the upper and lower chassis of the trolley	
Part Lists	A complete car*1
Splicing Diagram	 
Notes	Remove the six M3*10mm round head screws from the upper chassis, and use scissors to cut the zip ties on the Dupont wires. To avoid complicated wiring, the upper chassis does not need to be completely removed.

Step 2 Take out the ultrasonic sensor	
Part Lists	The upper chassis of the car
Splicing Diagram	
Notes	1.First loosen the screws of the steering wheel and take out the ultrasonic acrylic structure; 2.Loosen the four M2*10mm round head cross screws of the ultrasonic sensor, and finally unplug the DuPont wire on it.

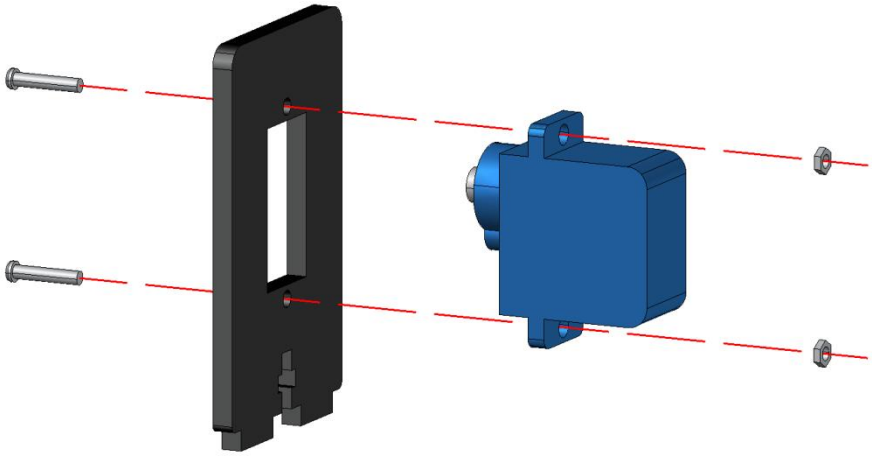
Step 3 Take out the single-arm servo horn and screws.	
Part Lists	Ultrasonic acrylic structure
Splicing Diagram	
Notes	Take out the single-sided servo horn and two M1.4*5mm large round flat head self-tapping screws for later use.

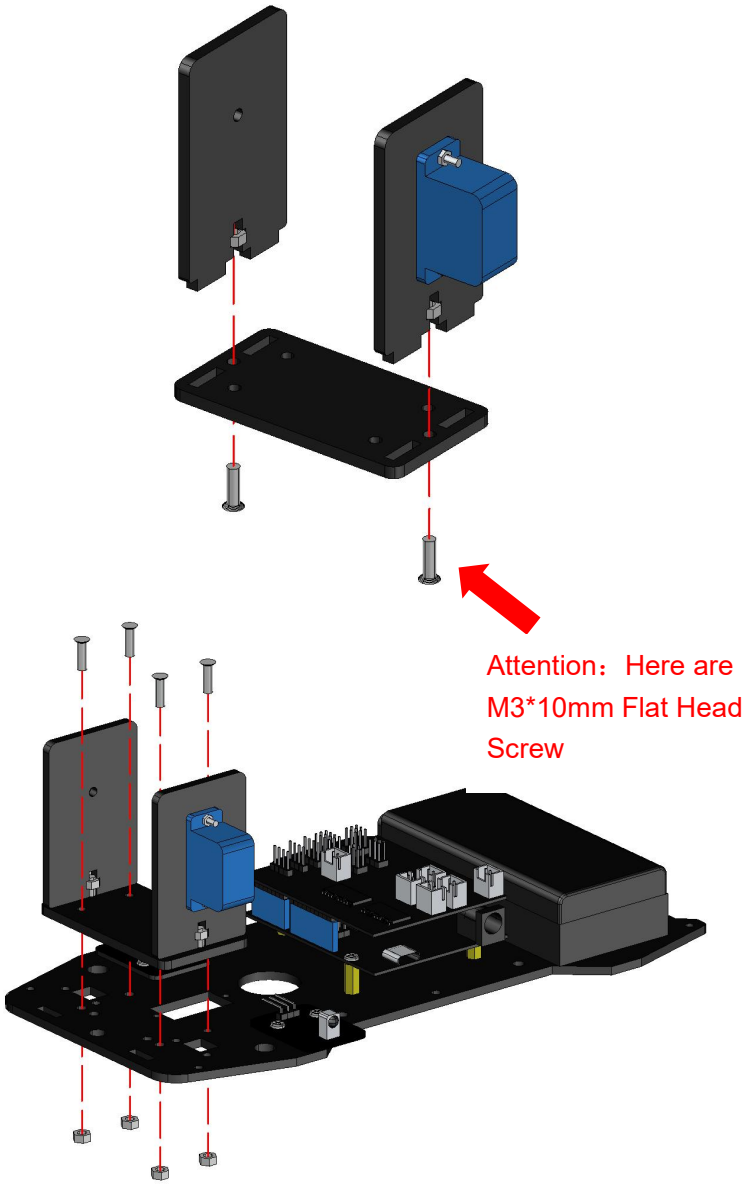
Step 4 Take out the LED module and servo module	
Part Lists	The upper chassis of the car
Splicing Diagram	 
Notes	Loosen the screws of the LED and servo, take out the LED and servo module, and unplug the DuPont cable connecting them from the motherboard.

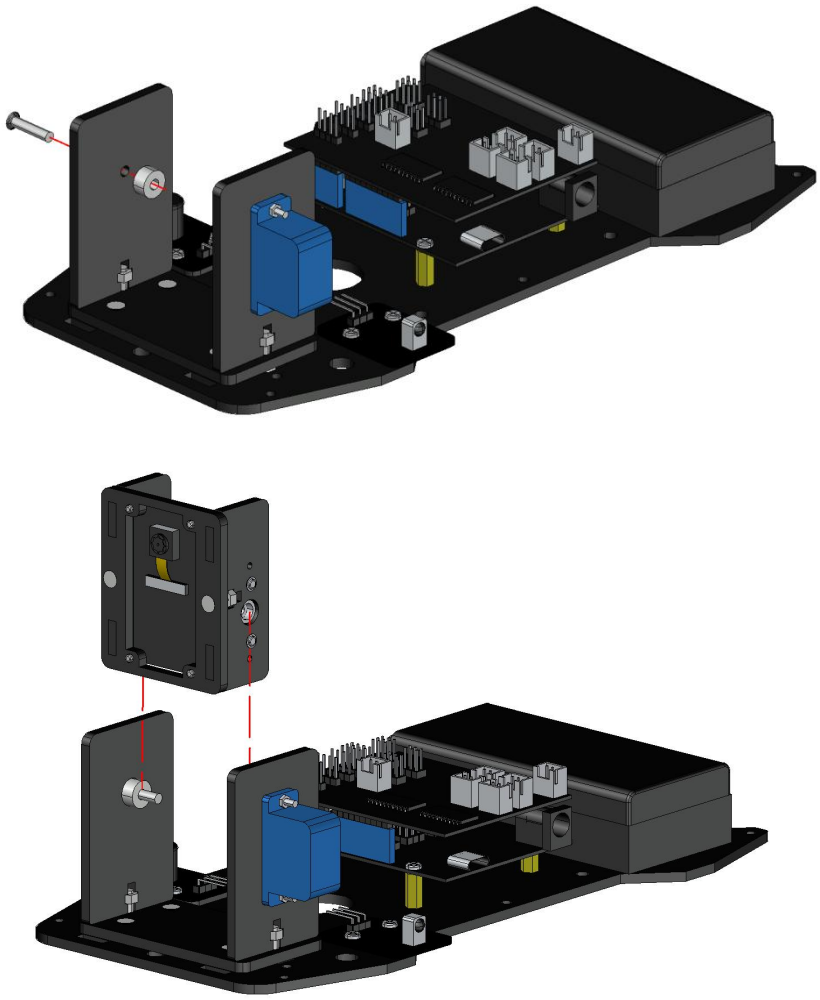
Step 5 Install the camera module structure group（1）			
Part Lists	single-sided servo horn*1	M1.4*5mm Large Round Flat Head Tapping Screws*2	single-sided servo horn acrylic fixed plate*1
Splicing Diagram	  Attention：Please ensure that after installation, this notch is positioned at the upper left of the rudder plate.		
Notes	1.This step requires tearing off all the film on the acrylic; 2.The single rudder plate and M1.4*5mm large round flat head self-tapping screws should be taken from Step 3.		

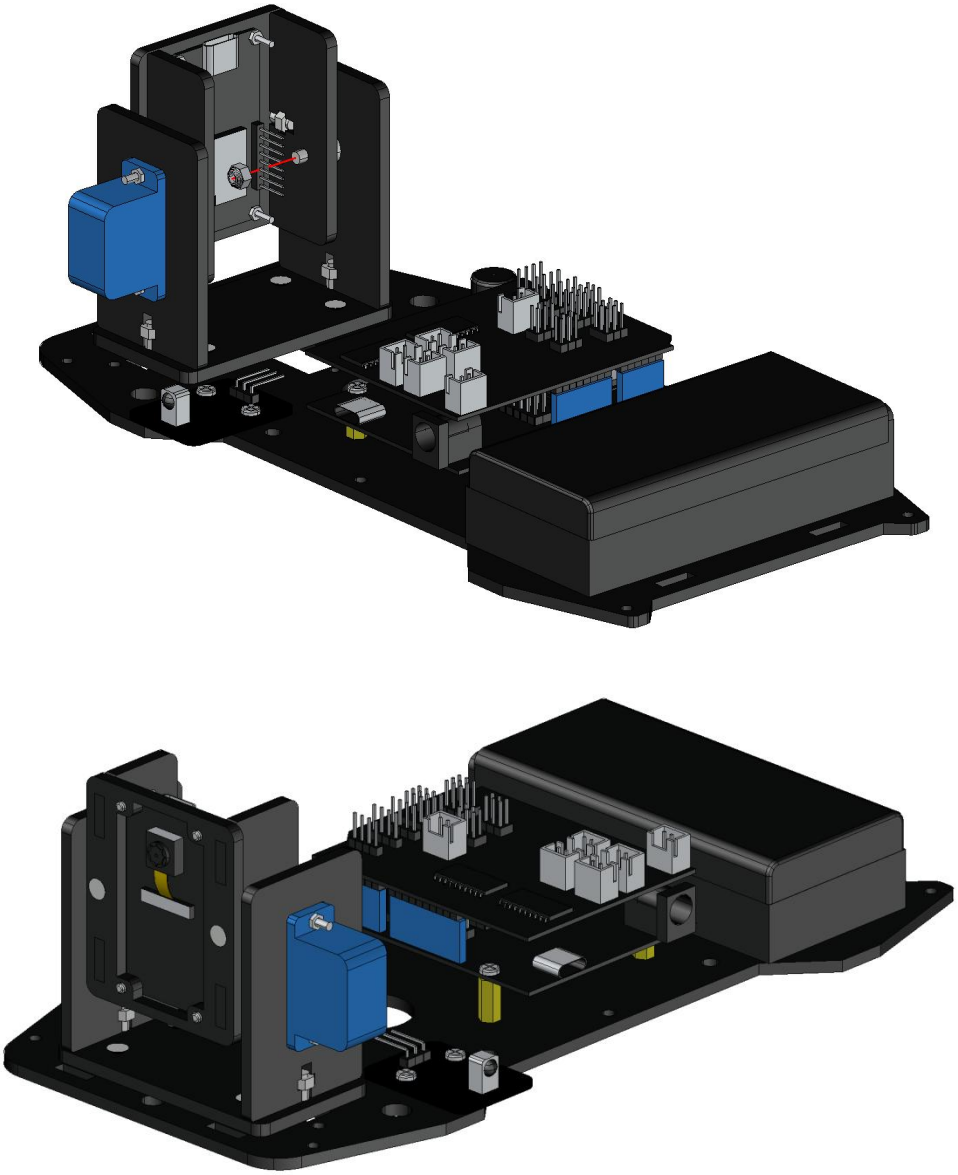
<table>
<tr><td colspan="4">Step 6 Install the camera module structure group （2）</td></tr>
<tr><td rowspan="2">Part Lists</td><td>M3*8mm Flat Head screw*2</td><td>Nylon lock nut acrylic fixing plate*1</td><td>M3 nut*2</td></tr>
<tr><td>Assembled single-sided servo horn acrylic fixed plate</td><td>Camera acrylic fixed plate*1</td><td></td></tr>
<tr><td>Splicing Diagram</td><td colspan="3"> 
Attention：Here are M3*10mm countersunk screws.
Attention：When installing the screws here, you can use your left and right hands to hold the screw first, then tighten it.
  </td></tr>
</table>

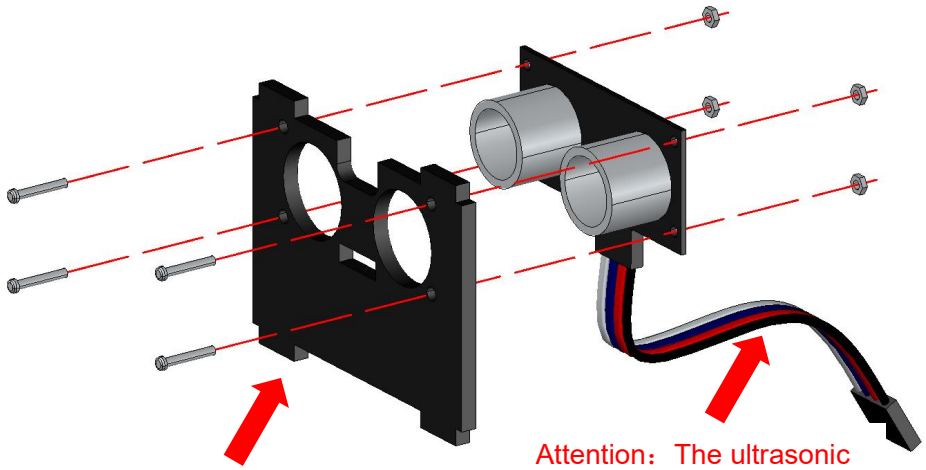
<table>
<tr><th colspan="4">Step 7 Install the camera module structure group（3）</th></tr>
<tr><td rowspan="2">Part Lists</td><td>Assembled Camera acrylic fixed plate</td><td>Camera module*1</td><td>M2*8mm Round Head Screw*4</td></tr>
<tr><td>M2Nickel-Plated Nut*4</td><td></td><td></td></tr>
<tr><td>Splicing Diagram</td><td colspan="3"> 
Attention：The M2 screws should be installed from the front in this direction.</td></tr>
</table>

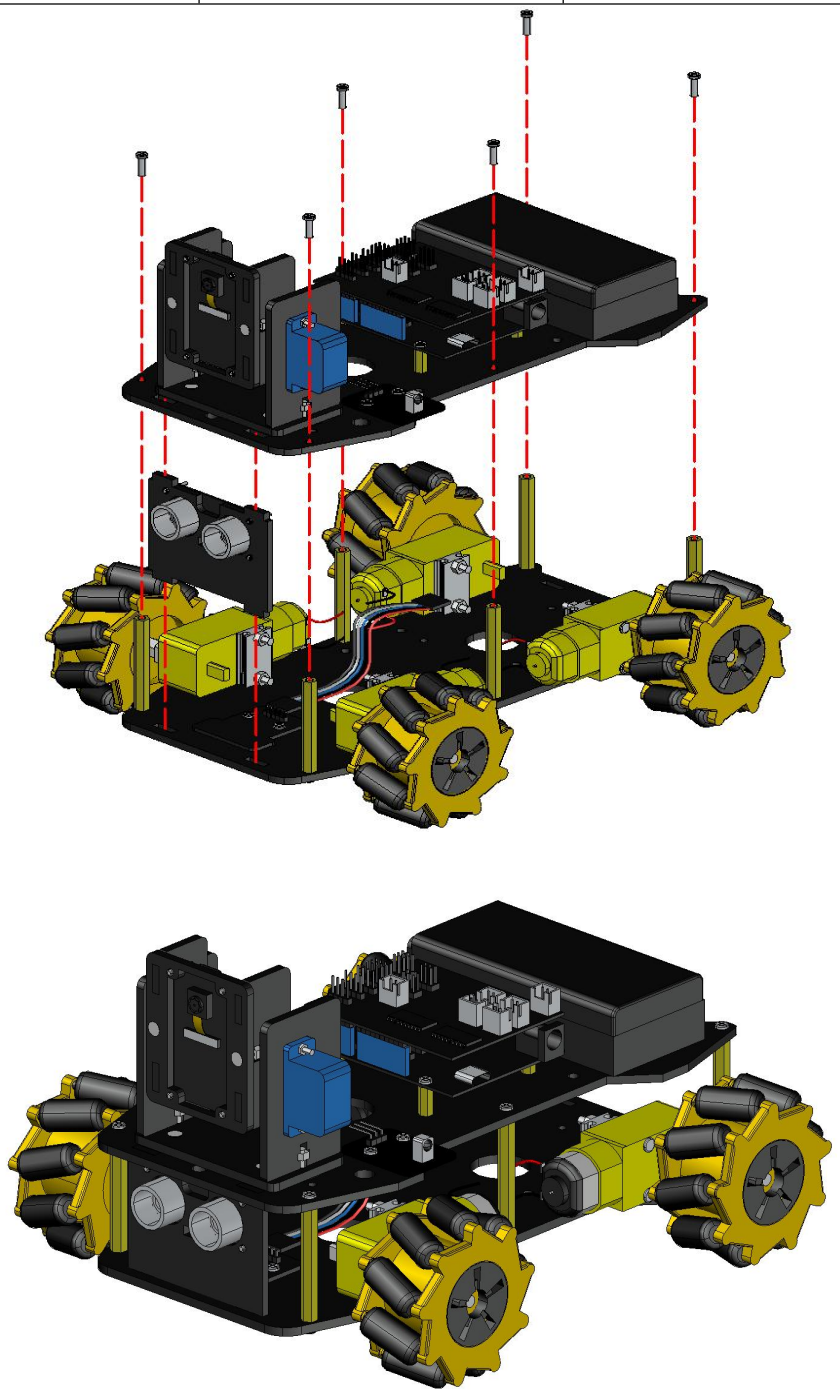
<table>
<tr><td colspan="4">Step 8 Install the camera module structure group （4）</td></tr>
<tr><td rowspan="2">Part Lists</td><td>SG90 Servo Module*1</td><td>Servo acrylic fixed plate*1</td><td>M2 Nickel-Plated Nut*2</td></tr>
<tr><td>M2*10mm Round Head Screw*2</td><td></td><td></td></tr>
<tr><td>Splicing Diagram</td><td colspan="3">  </td></tr>
<tr><td>Notes</td><td colspan="3">Servo module, M2*10mm round head screws, and M2 nickel-plated nuts are removed in Step 4. Pay attention to the direction of the servo motor shaft.</td></tr>
</table>

Step 9 Install the camera module structure group（5）			
Part Lists	M3*10mm Flat Head screw*2	Square acrylic support plate*1	M3 nut*6
	Bottom acrylic fixing plate*1	Installed steering gear acrylic fixing plate	M3*10mm Round Head Screw*4
Splicing Diagram			

Step 10 Install the camera module structure group (6)		
Part Lists	M3*14mm Flat Head screw*1	White ABS isolation column*1
Splicing Diagram		
Notes	First, insert the M3*14mm Flat Head screw partially into the standoffs. Then place the assembled camera structure into position, ensuring the straight servo arm is aligned with the servo motor. The center of the straight servo arm does not need a screw. After aligning the holes, fully insert the screws through the round holes of the anti-loosening nut acrylic mounting plate.	

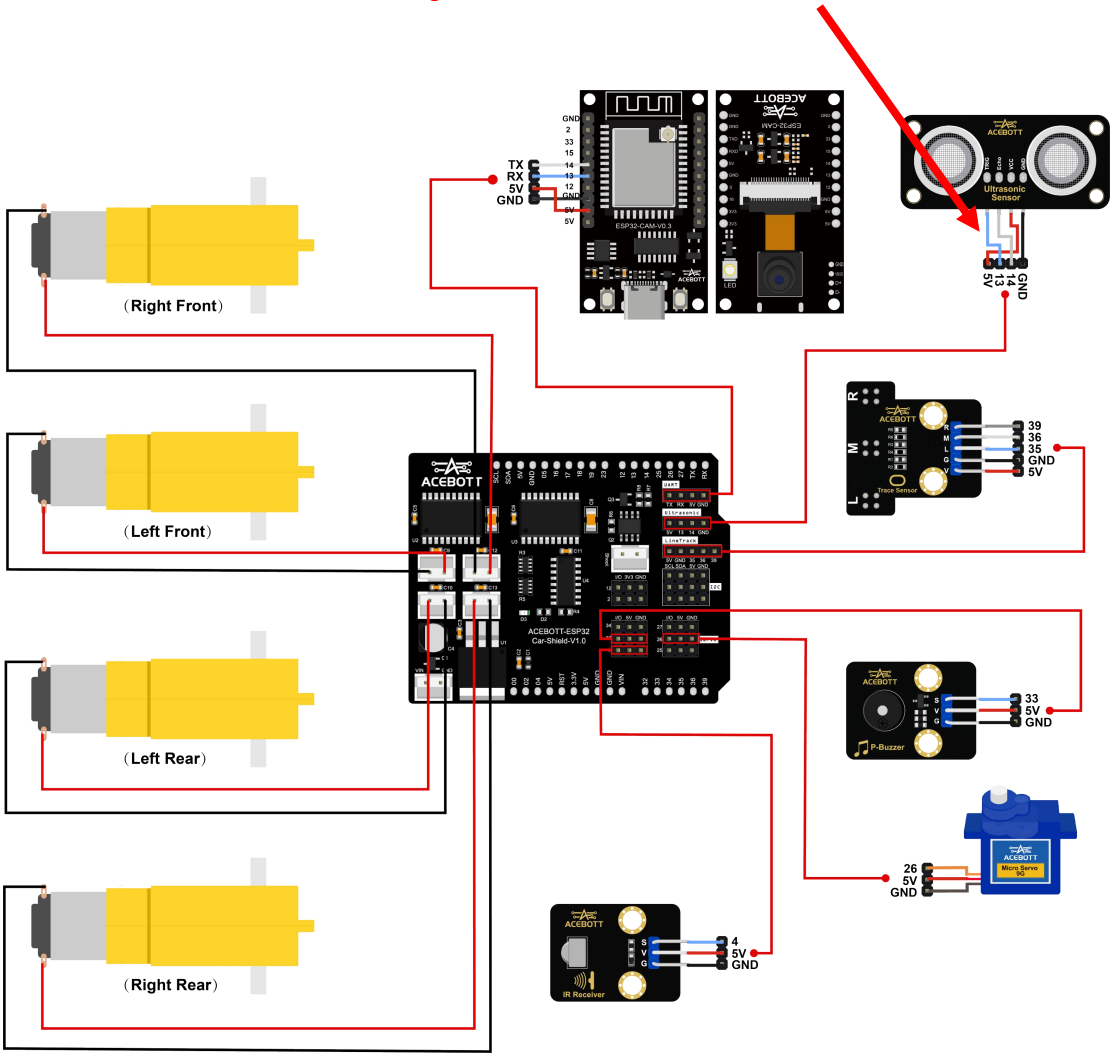
Step 11 Install the camera module structure group（7）	
Part Lists	M3 Nickel-Plated Lock Nut*1
Splicing Diagram	

<table>
<tr><td colspan="4">Step 12 Install ultrasonic sensor structure</td></tr>
<tr><td rowspan="2">Part Lists</td><td>ultrasonic sensor acrylic fixed plate*1</td><td>ultrasonic sensor*1</td><td>M2*10mm Round Head Screw*4</td></tr>
<tr><td>M2 Nickel-Plated Nut*4</td><td></td><td></td></tr>
<tr><td>Splicing Diagram</td><td colspan="3"> 
</td></tr>
<tr><td>Notes</td><td colspan="3">The ultrasonic sensor, M2*10mm Round Head Screws and M2 Nickel-Plated Nuts were removed using Step 2.</td></tr>
</table>

Step 13 Assemble the complete car body			
Part Lists	Assembled upper chassis	Assembled lower chassis	M3*10mm Round Head Screw*6
Splicing Diagram			
Notes	Pass the connection cable of the upper module on the lower chassis through the round hole on the upper chassis.		

Step 14 Wiring

Attention: Please use a 4P cable with one end as an open wire and the other end as a bundled wire to connect the ultrasonic sensor. Connect the open-wire end to the ultrasonic sensor according to the color coding shown in the diagram, and connect the bundled-wire end to the **Ultrasonic** interface on the control board, ensuring the **black wire** is connected to **GND**.



1.The colors of the DuPont wires are blue, red, and black. The blue wire connects to the S pin, the red wire connects to the V pin, and the black wire connects to the G pin.

2.The servo wires are different from standard DuPont wires. The red wire connects to the V pin, the brown wire connects to the G pin, and the yellow wire connects to the S pin.

3.For the ultrasonic sensor wires, the red wire connects to the V pin, the white wire connects to the ECHO pin, the blue wire connects to the TRIG pin, and the black wire connects to the GND pin.

4.For the line tracking sensor wires, the red wire connects to the 5V pin, the black wire connects to the GND pin, the blue wire connects to the L pin, the white wire connects to the M pin, and the gray wire connects to the R pin.

5.Pin 14 of the camera module is connected to the TX pin of the esp32 controller board, and pin 13 is connected to the RX pin of the esp32 controller board.

6.Please make sure to strictly follow the wiring instructions when connecting the module to the ESP32 controller board. Incorrect wiring may cause a short circuit and damage the ESP32 controller board.