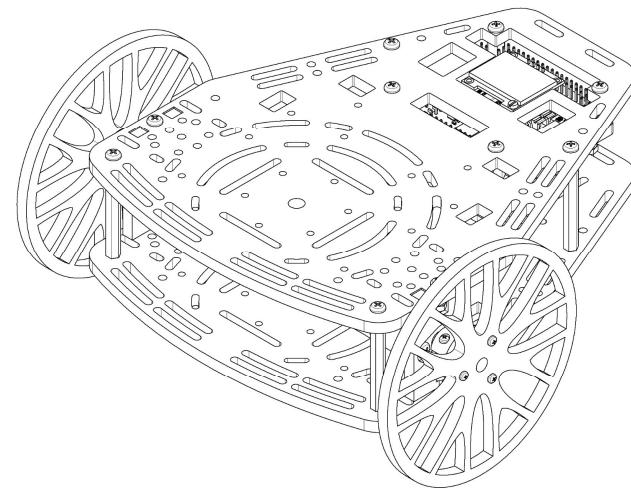


# Puzzlebot

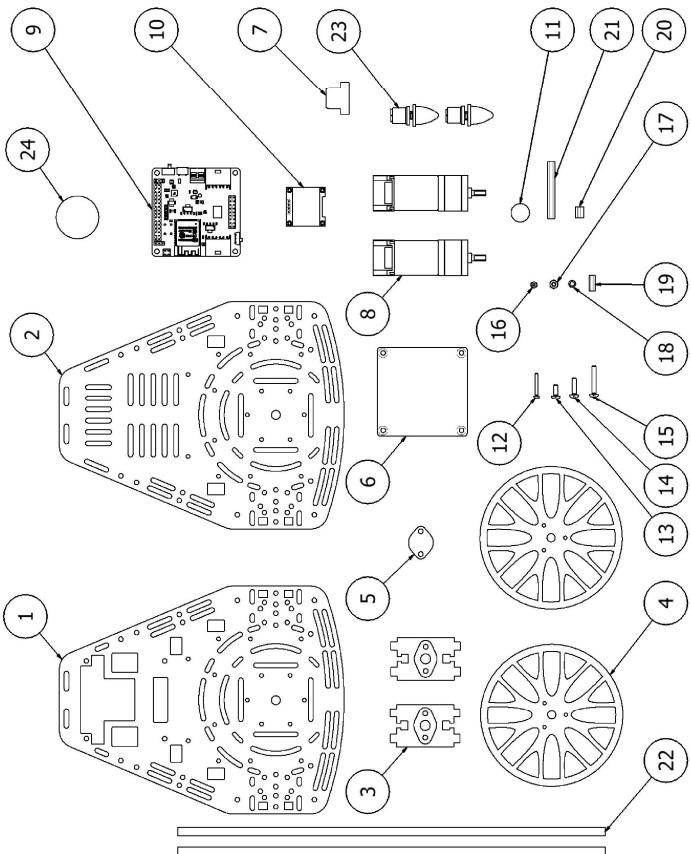
---

## Assembly Manual



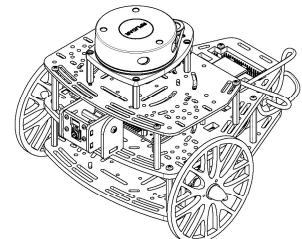
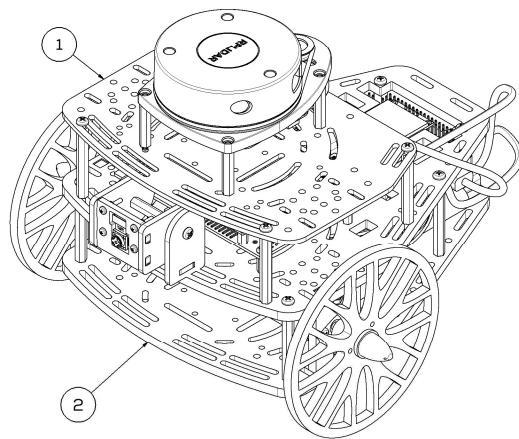
Robotics for everyone  
{Learn, Create, Innovate};

PARTS LIST		DESCRIPTION
ITEM	QTY	
1	1	Top Base
2	1	Bottom Base
3	2	Motor Holder
4	2	Wheel 100 mm diam.
5	1	Caster Wheel Expander
6	1	PCB Base
7	1	Caster Ball Holder
8	2	25D Metal Gear DC Motor Brushed
9	1	Hackerboard
10	1	0.96" OLED Display
11	1	Caster Ball
12	1	M2x16 mm Nylon Pozi Pan Head Screw
13	8	M3x8 mm Pozi Pan Head Screw
14	16	M3x12 mm Pozi Pan Head Screw
15	2	M3x20 mm Pozi Pan Head Screw
16	1	M2 Hex Nylon Nut
17	6	M3 Hex Nut
18	4	5x2 mm Nylon Spacer
19	1	11 mm Round Nylon Spacer
20	4	M3x8 mm Hex Standoff
21	4	M3x40 mm Hex Standoff
22	0.7 m	Adhesive Sponge
23	2	Bullet Adapter
24	4	Velcro Coins (Hook and Loop)



Puzz|ebot

PARTS LIST		DESCRIPTION
ITEM	QTY	
1	1	Top Base-LiDAR Base Assembly
2	1	NVIDIA-Camera Assembly

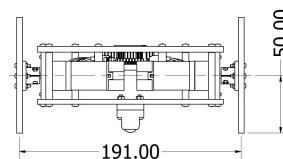
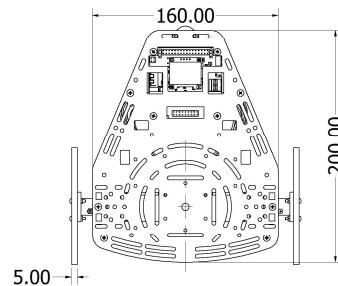


Puzzlebot LiDAR Edition

#### Instructions:

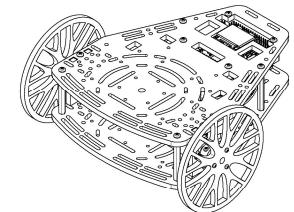
- 1.- Connecte the RPLIDAR A1 using the included serial port adapter to the NVIDIA Jetson Nano.

25 Puzzlebot LiDAR Edition

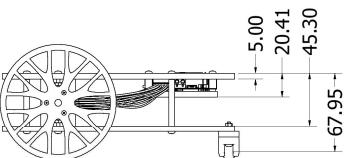


Material: 5mm Acrylic, PLA  
Weight: 600 g (Approximate)

Puzz|ebot



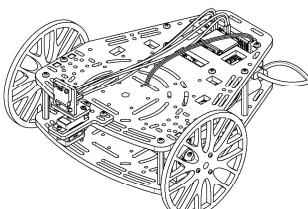
Puzzlebot V 1.5.3



26 General dimensions

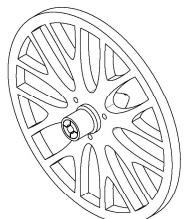
Puzz|ebot

PARTS LIST		
ITEM	QTY	DESCRIPTION
1	1	TOF Laser Mount
2	1	Puzzlebot Hacker Edition
3	4	Connection Wire

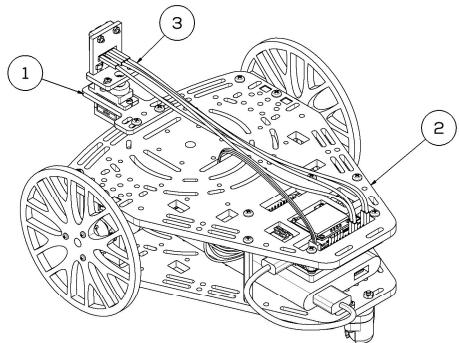


Puzzlebot Laser Edition

PARTS LIST	
ITEM	DESCRIPTION
1	Bullet Coupler
2	Bullet Coupler Cap
3	Bullet Coupler Nut
4	Wheel 100 mm. diam.
5	Rubber Tape



Wheel Coupler Assembly

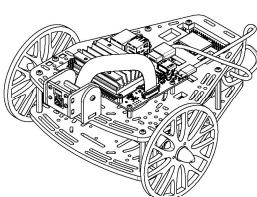


#### Instructions:

- 1.- Connect the TOF Laser Sensor to the Hackerboard, using the wires included.

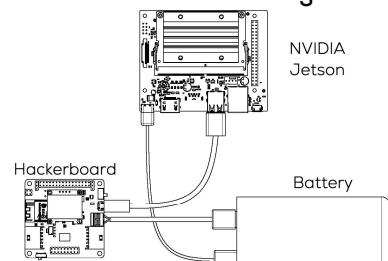
## 23 Servo/TOF Sensor - Wiring

PARTS LIST		
ITEM	QTY	DESCRIPTION
1	1	Top Base-Camera Assembly
2	1	Camera Flat Cable
3	1	Top Base-Jetson Assembly
4	1	USB - Micro USB Cable
5	1	USB Energy Cable
6	1	Battery Cable USB (Not Included)

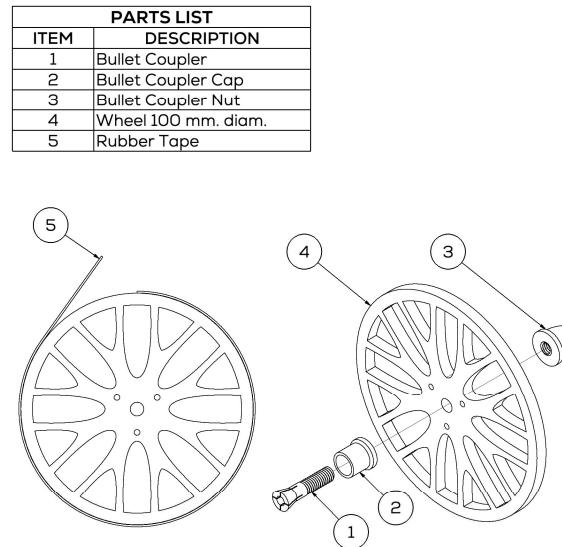


Puzzlebot Jetson Edition

#### Electrical Connection Diagram



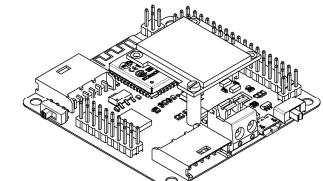
## 24 Puzzlebot NVIDIA/Camera - Assembly



## 1

PARTS LIST	
ITEM	DESCRIPTION
1	Hackerboard
2	0.96" OLED Display
3	11 mm. Round Nylon Spacer
4	M2 Hex Nylon Nut
5	M2x16 mm Nylon Pozi Pan Head Screw

Puzzlebot



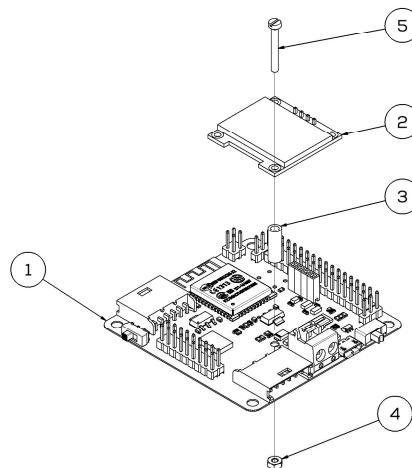
Hackerboard Assembly

- 1.- Insert the screen headers into the Hackerboard female headers.
- 2.- Insert the screw inside the Nylon spacer as shown in the figure.
- 3.- Use the screwdriver to properly tighten the screw and the nut to the Hackerboard.

Figure 19 provides more details of the Hackerboard.

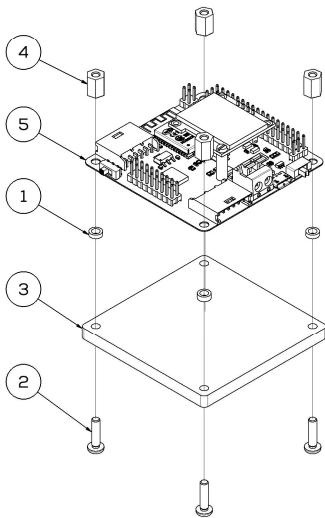
**Warning:** Do not use excessive force.

## 2

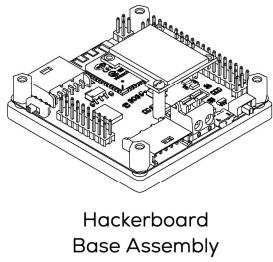


Puzzlebot

PARTS LIST	
ITEM	DESCRIPTION
1	5x2 mm. Nylon Spacer
2	M3x12 mm. Pozi Pan Head Screw
3	PCB Base
4	M3x8 mm Hex Standoff
5	Hackerboard Assembly



3



Hackerboard  
Base Assembly

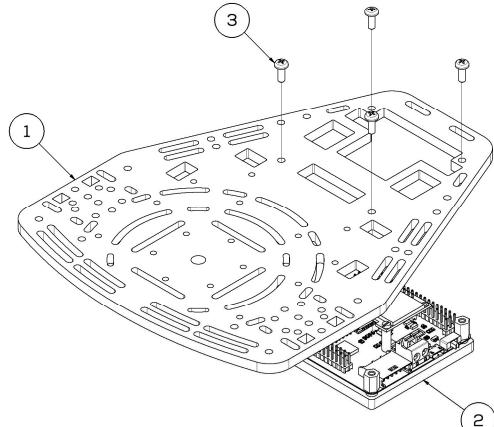
#### Instructions:

- Place the 4 Nylon spacers and Nylon Hex Standoffs as shown in the figure.
- Use the screwdriver to properly tighten the screws to the Hex Standoffs.

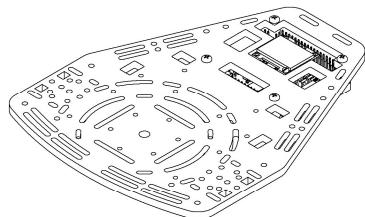
**Warning:** Do not use excessive force.



PARTS LIST	
ITEM	DESCRIPTION
1	Top Base
2	Hackerboard Base Assembly
3	M3x8 mm. Pozi Pan Head Screw



4



Top Base / PCB Base  
Assembly

#### Instructions:

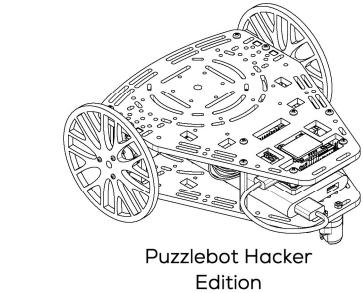
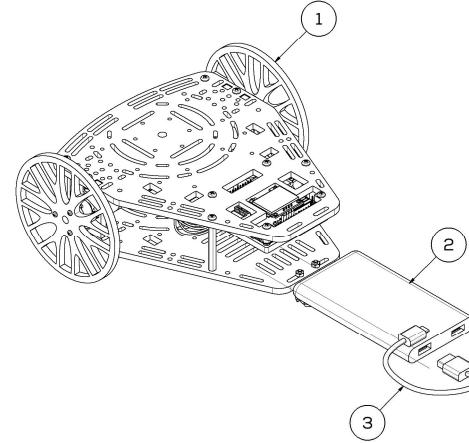
- Use the screwdriver to properly tighten the screws and nuts to the PCB.

**Warning:** Do not use excessive force.

**Note:** For attaching different sensors, actuators or computing units, go to [Figure 10](#) before continuing the assembly.



PARTS LIST		
ITEM	QTY	DESCRIPTION
1	1	Puzzlebot Hacker Edition
2	1	Powerbank
3	1	USB Micro USB Cable

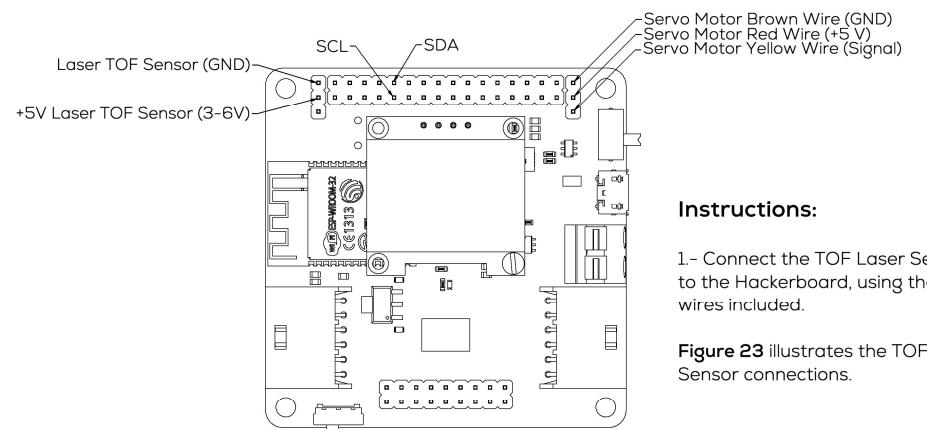


#### Instructions:

- Use the provided USB cable to connect the battery to the Hackerboard.
- Use the provided Velcro coins to keep the battery in place.

**Recommended Battery:**  
Powerbank, 10,000 mAh  
5 V, 3 A (15 W). Powerbank Not Included.

## 21 Battery Connection Diagram



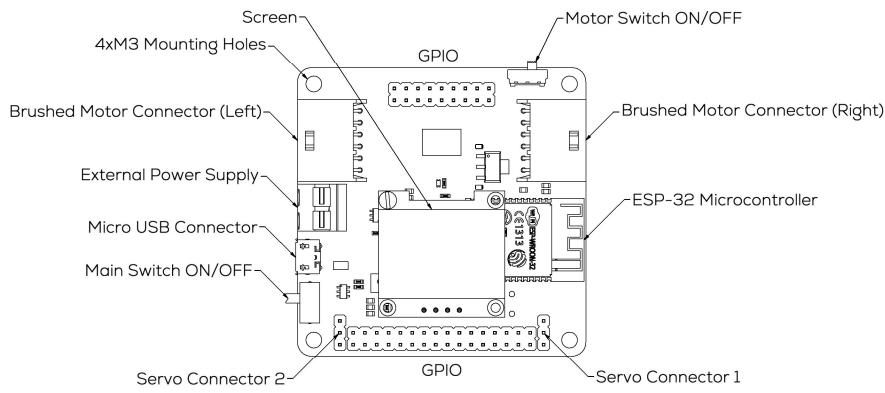
#### Instructions:

- Connect the TOF Laser Sensor to the Hackerboard, using the wires included.

[Figure 23](#) illustrates the TOF Sensor connections.

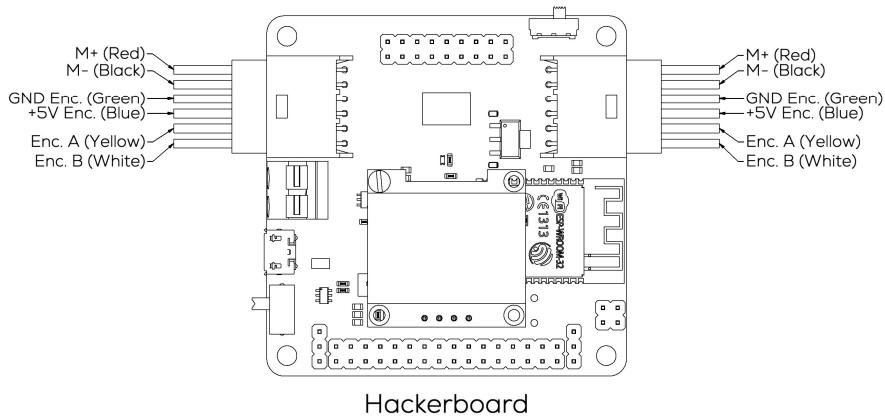
## 22 Servo/TOF Sensor - PCB Connections





19 Hackerboard

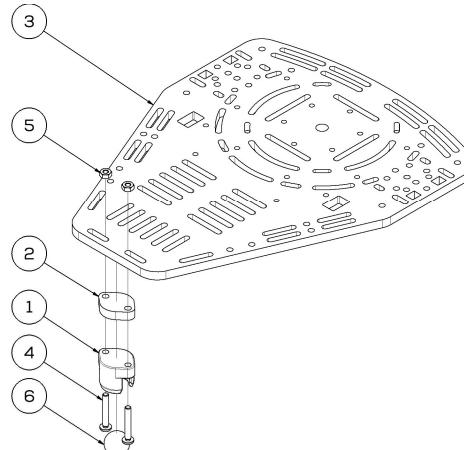
Puzzlebot



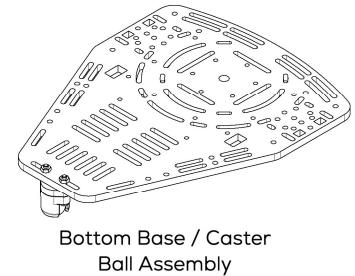
20 Motor Connection Diagram

Puzzlebot

PARTS LIST	
ITEM	DESCRIPTION
1	Caster Ball Holder
2	Caster Wheel Expander
3	Bottom Base
4	M3x20 mm. Pozi Pan Head Screw
5	M3 Hex Nut
6	Caster Ball



5



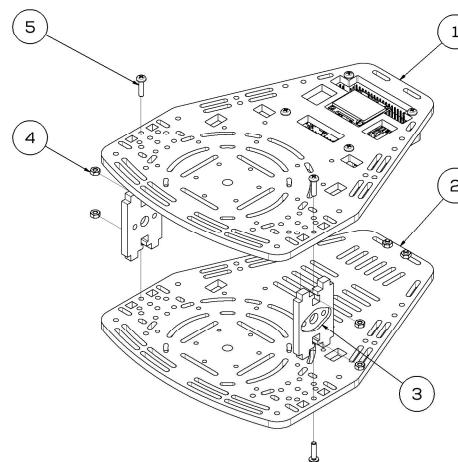
#### Instructions:

- 1.- Use the screwdriver to properly tighten the screws and nuts as shown.
- 2.- Manually press the caster ball (metal ball) into the holder.

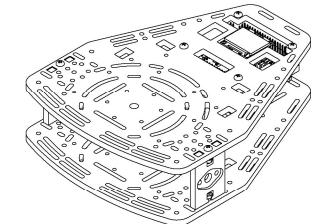
**Warning:** Do not use excessive force.

Puzzlebot

PARTS LIST	
ITEM	DESCRIPTION
1	Top Base / PCB Base Assembly
2	Bottom Base / Caster Ball Assembly
3	Motor Holder
4	M3 Hex Nut
5	M3x12 mm. Pozi Pan Head Screw



6



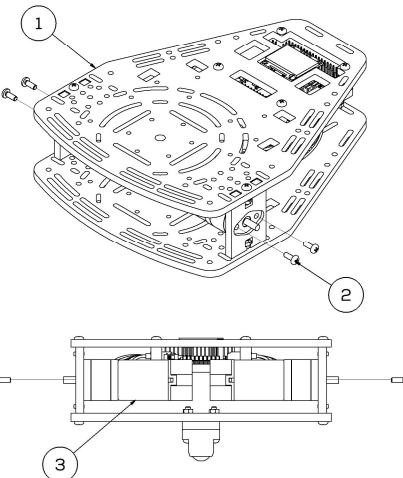
#### Instructions:

- 1.- Use one hand to hold the nut and the screwdriver to properly tighten the screws as shown.

**Warning:** Do not use excessive force.

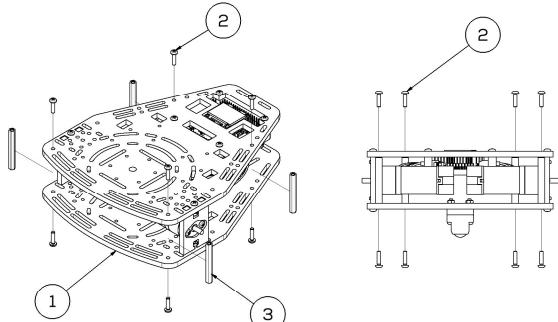
Puzzlebot

PARTS LIST	
ITEM	DESCRIPTION
1	Motor Holder Assembly
2	M3x8 mm Pozi Pan Head Screw
3	25D DC Motor

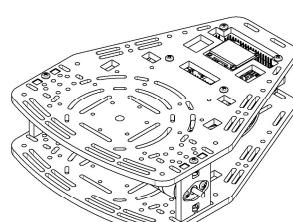


7

PARTS LIST	
ITEM	DESCRIPTION
1	Motor Assembly
2	M3x12 mm Pozi Pan Head Screw
3	M3x40 mm Hex Standoff



8



Motor Assembly

#### Instructions:

- 1.- Use one hand to hold the motors and the screwdriver to properly tighten the screws as shown.

2.- **Figure 20** shows the motor connections to the Hackerboard.

**Warning:** Do not use excessive force.



Top / Bottom Base Assembly

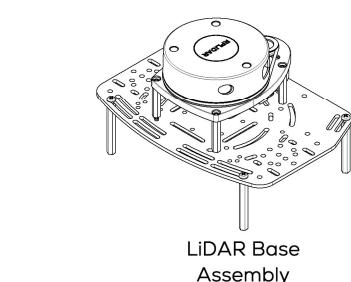
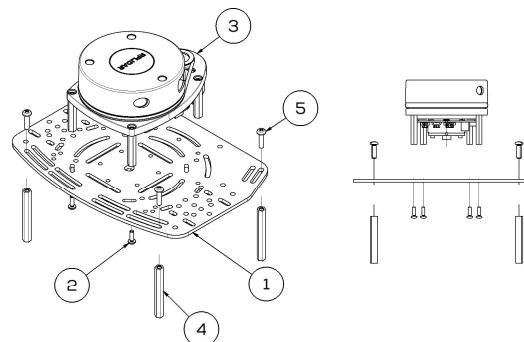
#### Instructions:

- 1.- Use the screwdriver to properly tighten the screws and standoffs as shown.

**Warning:** Do not use excessive force.



PARTS LIST		
ITEM	QTY	DESCRIPTION
1	1	LiDAR Acrylic Base
2	4	M2.5x8 mm Pozi Pan Head Screw
3	1	RPLIDAR AIM8 kit
4	4	M3, 40 mm Hex Standoff
5	4	M3x12 mm Pozi Pan Head Screw



LiDAR Base Assembly

#### Instructions:

- 1.- Use the screwdriver to properly tighten the screws and nuts as shown in the figure.

**Figure 18** shows mounting to the Puzzlebot.

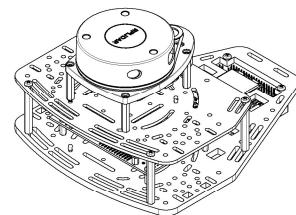
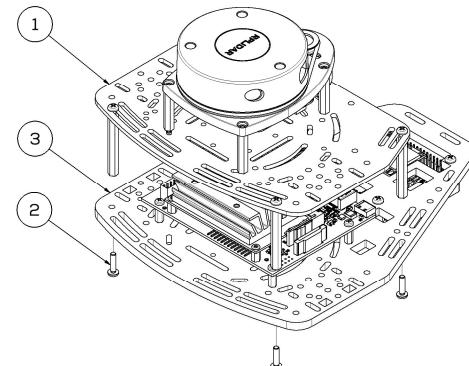
**Note:** The components required for this assembly are provided separately.

**Warning:** Do not use excessive force.



17 LiDAR Base Assembly

PARTS LIST		
ITEM	QTY	DESCRIPTION
1	1	LiDAR Base Assembly
2	4	M3 x 12 mm Pozi Pan Head Screw
3	1	Top Base - Jetson Assembly



Top Base-LiDAR Base Assembly

#### Instructions:

- 1.- Use the screwdriver to properly tighten the screws and nuts as shown in the figure.

**Figure 25** shows the connections to the Puzzlebot.

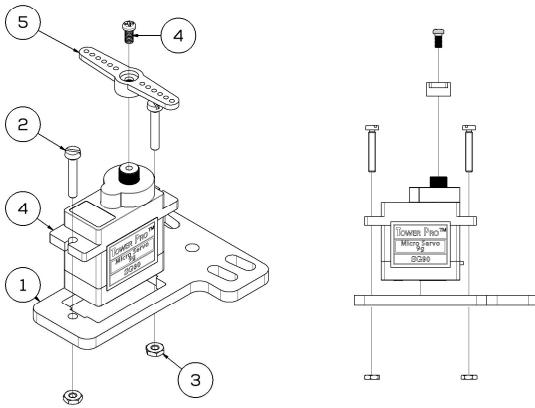
**Note:** The components required for this assembly are provided separately.

**Warning:** Do not use excessive force.



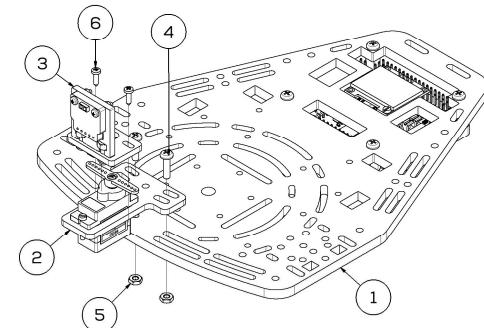
18 LiDAR Mount

PARTS LIST		
ITEM	QTY	DESCRIPTION
1	1	Servo Motor Holder
2	2	M2x10 mm Pozi Pan Head Screw
3	2	M2 Nut
4	1	Servo Motor 9g
5	1	Servo Motor Mount
6	1	Mounting Screw (Included Servo Motor)

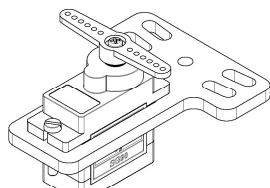


15 Servo Motor Mount

PARTS LIST		
ITEM	QTY	DESCRIPTION
1	1	Top Base / PCB Base Assembly
2	1	Servo Motor Holder Assembly
3	1	Laser Holder Assembly
4	2	M3x12 mm Pozi Pan Head Screw
5	2	M3 Hex Nut
6	2	Self Tapping Screws (Included in Servo Motor)



16 TOF Laser Mount



Servo Motor Assembly

#### Instructions:

- 1.- Use the screwdriver to properly tighten the screws and nuts as shown in the figure.

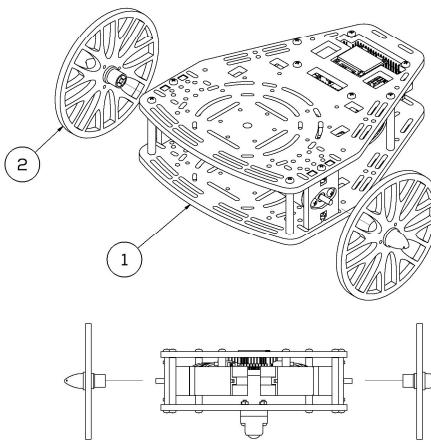
**Figure 16** shows the mounting to the Puzzlebot.

**Note:** The components required for this assembly are provided separately.

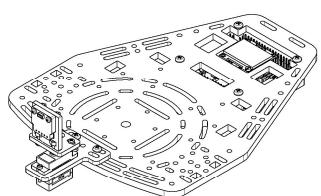
**Warning:** Do not use excessive force.



PARTS LIST	
ITEM	DESCRIPTION
1	Top / Bottom Base Assembly
2	Wheel Coupler Assembly



9



Top Base-Laser Holder Assembly

#### Instructions:

- 1.- Use the screwdriver to properly tighten the screws and nuts as shown in the figure.

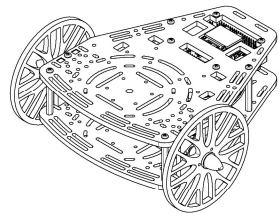
**Figures 22-23**, shows the connections to the Hackerboard.

**Note:** The components required for this assembly are provided separately.

**Warning:** Do not use excessive force.



10



Puzzlebot Hacker Edition

#### Instructions:

- 1.- Insert the Wheel Couple Assembly into the motor shaft.
- 2.- Tighten the motor coupler by hand to the motor shaft and fix the wheels to the motors.

**Figures 20 and 21** shows the electrical connection of the robot.

**Warning:** Do not use excessive force.



## Puzzlebot

### Add-Ons

#### Jetson Edition

Figures 11, 24

#### Camera Assembly

Figures 12 - 13, 24

#### Laser Assembly

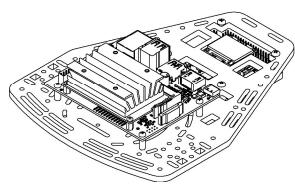
Figures 14 - 16, 22 - 23

#### LiDAR Assembly

Figures 17 - 18, 24 - 25



PARTS LIST		
ITEM	QTY	DESCRIPTION
1	1	Top Base / PCB Base Assembly
2	1	NVIDIA Jetson Nano™ 2GB Devkit
3	4	M2.5x10 mm. Hex Standoff
4	8	M2.5x8 mm. Screw



Top Base-Jetson Assembly

#### Instructions:

1.- Use the screwdriver to properly tighten the screw to the standoffs as shown in the figure.

**Figure 24** shows the electrical connections to the Puzzlebot.

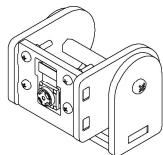
**Note:** The components required for this assembly are provided separately.

**Warning:** Do not use excessive force.



## 11 Puzzlebot Jetson Edition

PARTS LIST		
ITEM	QTY	DESCRIPTION
1	2	Side Mount
2	2	Camera Side Holder
3	1	Frontal Camera Holder
4	1	Inferior Camera Mount
5	1	Bottom Mount
6	1	RPi Camera V2.0
7	4	M2 Hex Nut
8	4	M2x12 mm Pozi Pan Head Screw
9	2	M3x12 mm Pozi Pan Head Screw
10	1	M3x30 mm Hex Standoff



Camera Holder Assembly

#### Instructions:

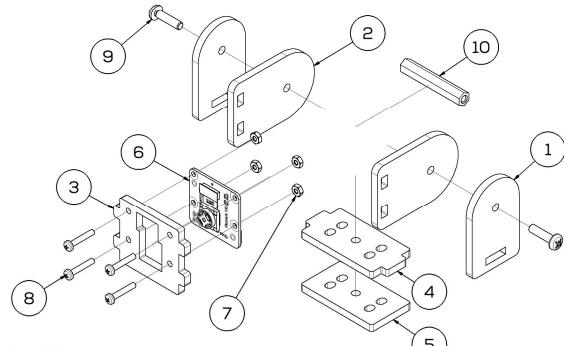
1.- Use the screwdriver to properly tighten the screws and nuts as shown in the figure.

2.- The 'Bottom Mount' is used to mount the Camera Holder to the Puzzle-Bot as shown in **Figure 13**.

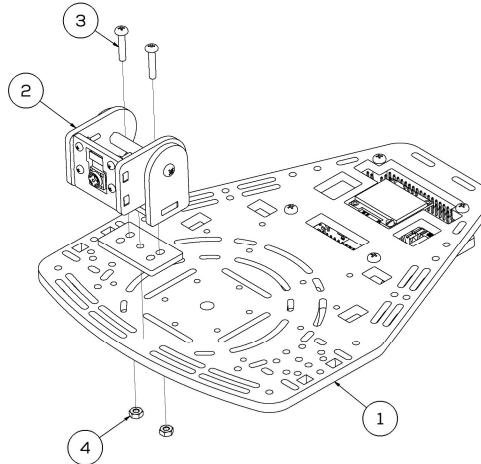
**Note:** The components required for this assembly are provided separately.

**Warning:** Do not use excessive force.

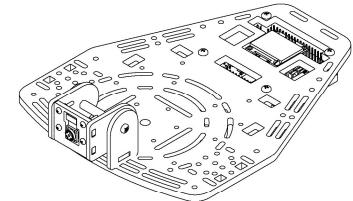
## 12 Camera Holder



PARTS LIST		
ITEM	QTY	DESCRIPTION
1	1	Top Base / PCB Base Assembly
2	1	Camera Holder Assembly
3	2	M3x16 mm Pozi Pan Head Screw
4	2	M3 Hex Nut



## 13 Camera Mount



Top Base-Camera Assembly

#### Instructions:

1.- Use the screwdriver to properly tighten the screws and nuts as shown in the figure.

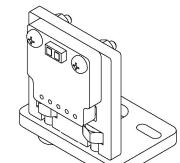
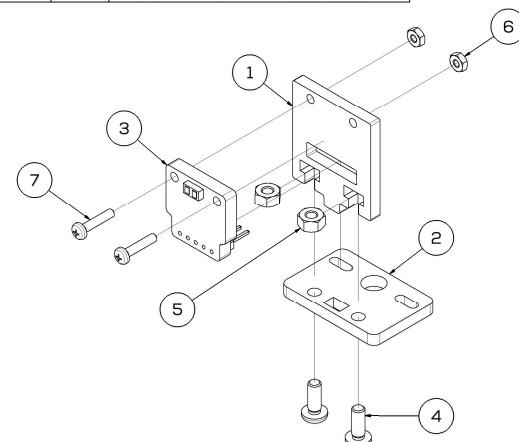
**Figure 24** shows the connections to the Puzzlebot.

**Note:** The components required for this assembly are provided separately.

**Warning:** Do not use excessive force.



PARTS LIST		
ITEM	QTY	DESCRIPTION
1	1	Laser Sensor Holder
2	1	Laser Sensor Mount
3	1	VL53L1X TOF Laser Sensor
4	2	M3x8 mm Pozi Pan Head Screw
5	2	M3 Hex Nut
6	2	M2 Hex Nut
7	2	M2x10 mm Pozi Pan Head Screw



Laser Holder Assembly

#### Instructions:

1.- Use the screwdriver to properly tighten the screws and nuts as shown in the figure.

**Figure 16** shows the mounting to the Puzzlebot.

**Note:** The components required for this assembly are provided separately.

**Warning:** Do not use excessive force.



## 14 Laser Mount