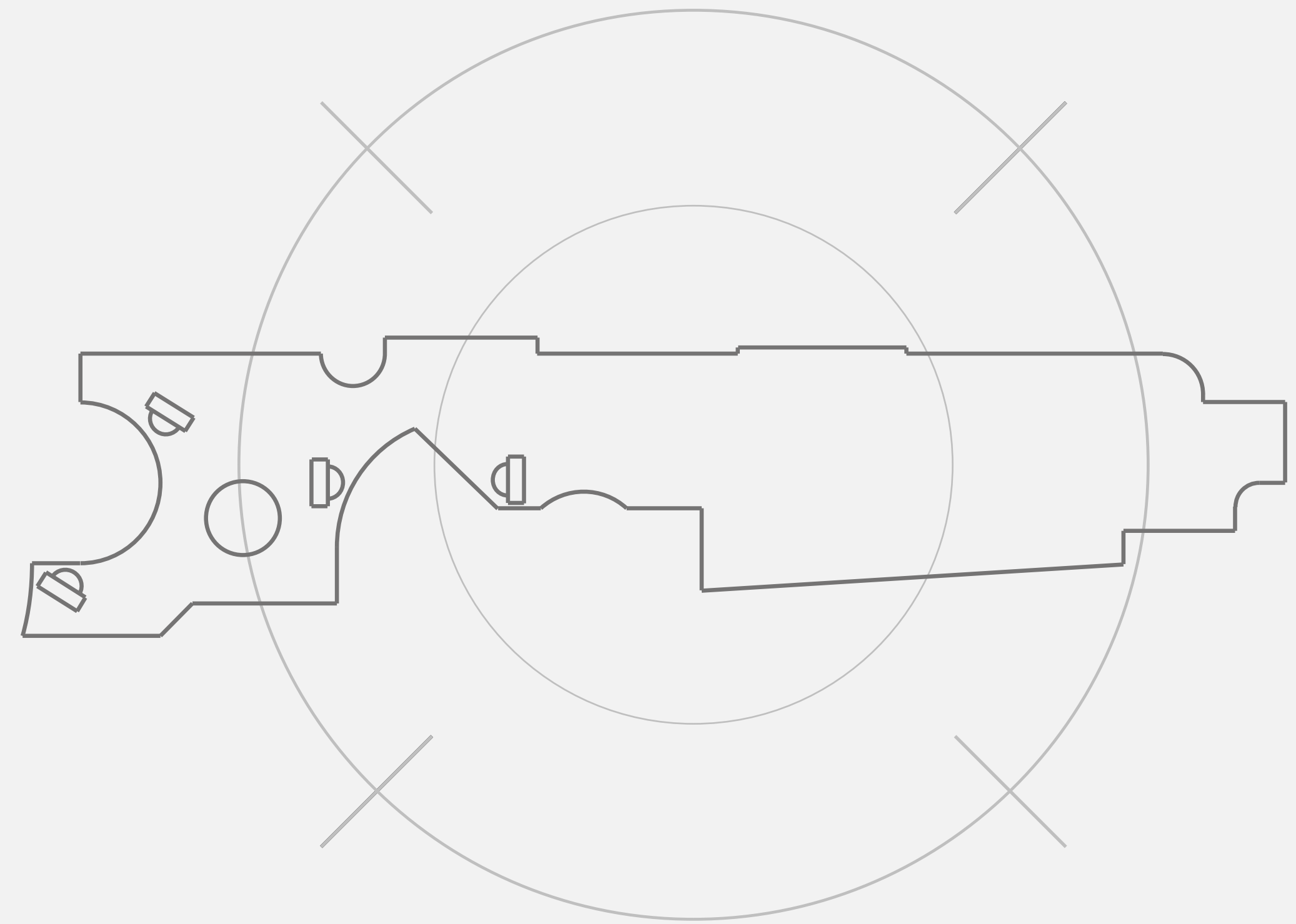


# Arm-**V** Desire **V3**

**MANUAL**



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INSTALLATION OF  
DESIRE V3 INTO  
GEARBOX

---

NEW FUNCTION

---

WARRANTY

---

**Arm-V**  
**Desire V3**

# IMPORTANT TO KNOW

---

1. Desire V3 has its own power consumption unlike the classic contact group. Always disconnect the battery after use. Prolonged storage with the battery connected will lead to its complete discharge
2. Desire V3 features built-in short-circuit protection and does not require the installation of additional fuses.
3. Desire has a water-resistant coating and maintains its functionality in conditions of minor moisture exposure (such as splashes in weather conditions or condensation), but full immersion in water does not guarantee its functionality.
4. The stickers applied to the Desire V3 board are necessary as dielectric material between the gearbox and the board, do not remove them.

## DESIRE V3 CHECK

---

## INSTALLATION OF DESIRE V3 INTO GEARBOX

---

## NEW FUNCTION

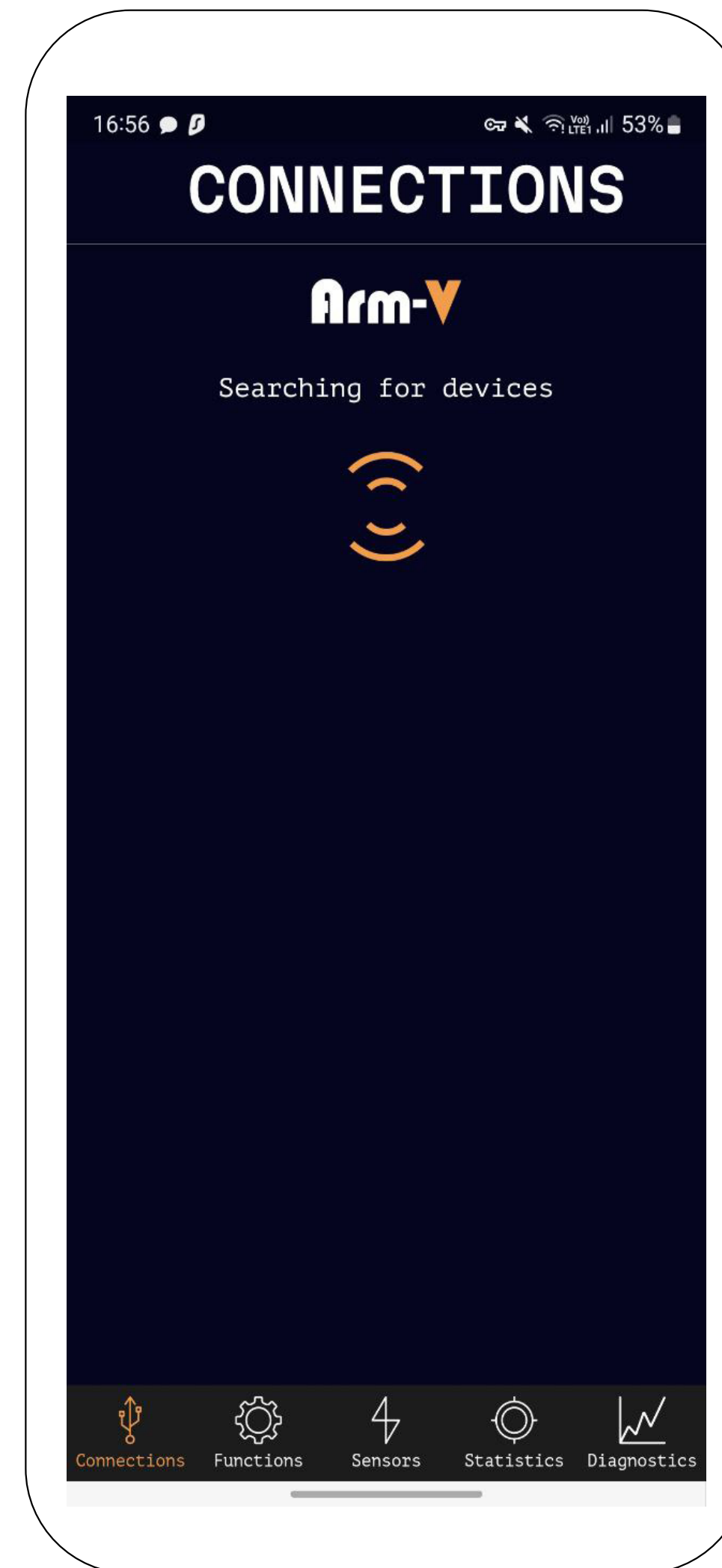
---

## WARRANTY

---



Before beginning the installation, let's learn how Desire works and ensure that it is functional. Download the 'Arm-V' app from [Google Play](https://play.google.com/store/apps/details?id=com.arm.v) or the [arm-v.ru](http://arm-v.ru) website and launch it.



# DESIRE V3 CHECK

## INSTALLATION OF DESIRE V3 INTO GEARBOX

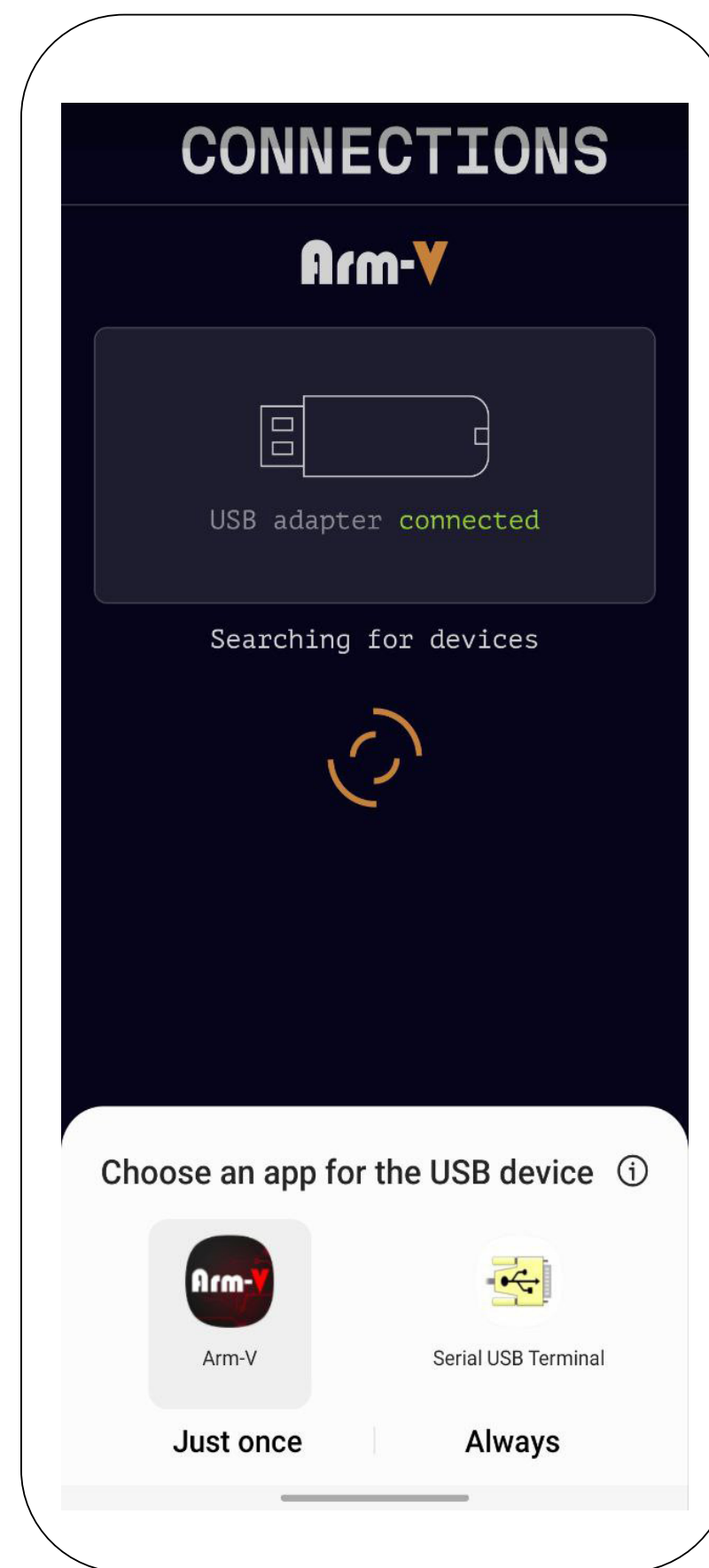
## NEW FUNCTION

## WARRANTY



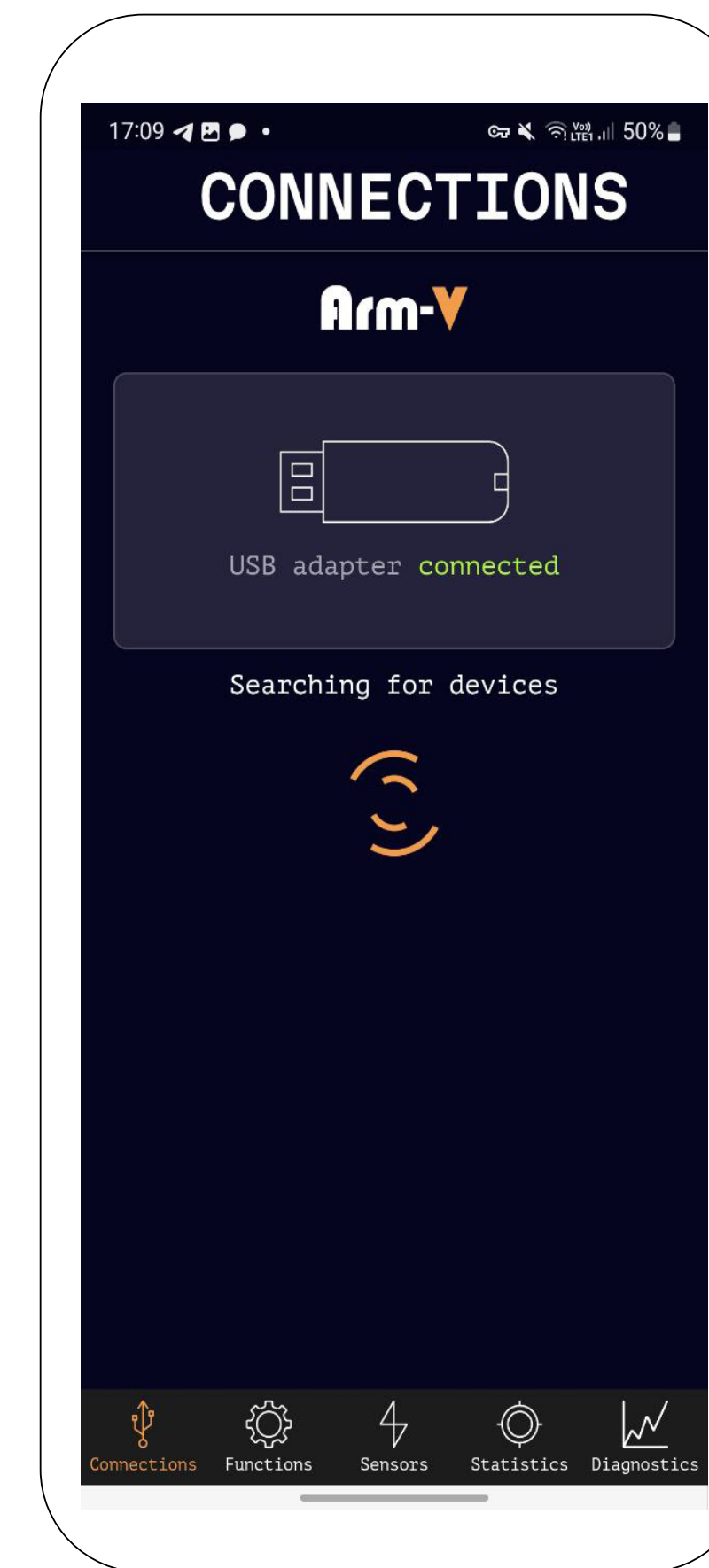
# 2

Connect the Arm-V USB adapter to your smartphone. When connecting, the smartphone will request permission; you need to allow the Arm-V application to use the Arm-V USB adapter at all times.



# 3

You should see in the program that the Arm-V USB adapter is connected.



DESIRE V3  
CHECK

INSTALLATION OF  
DESIRE V3 INTO  
GEARBOX

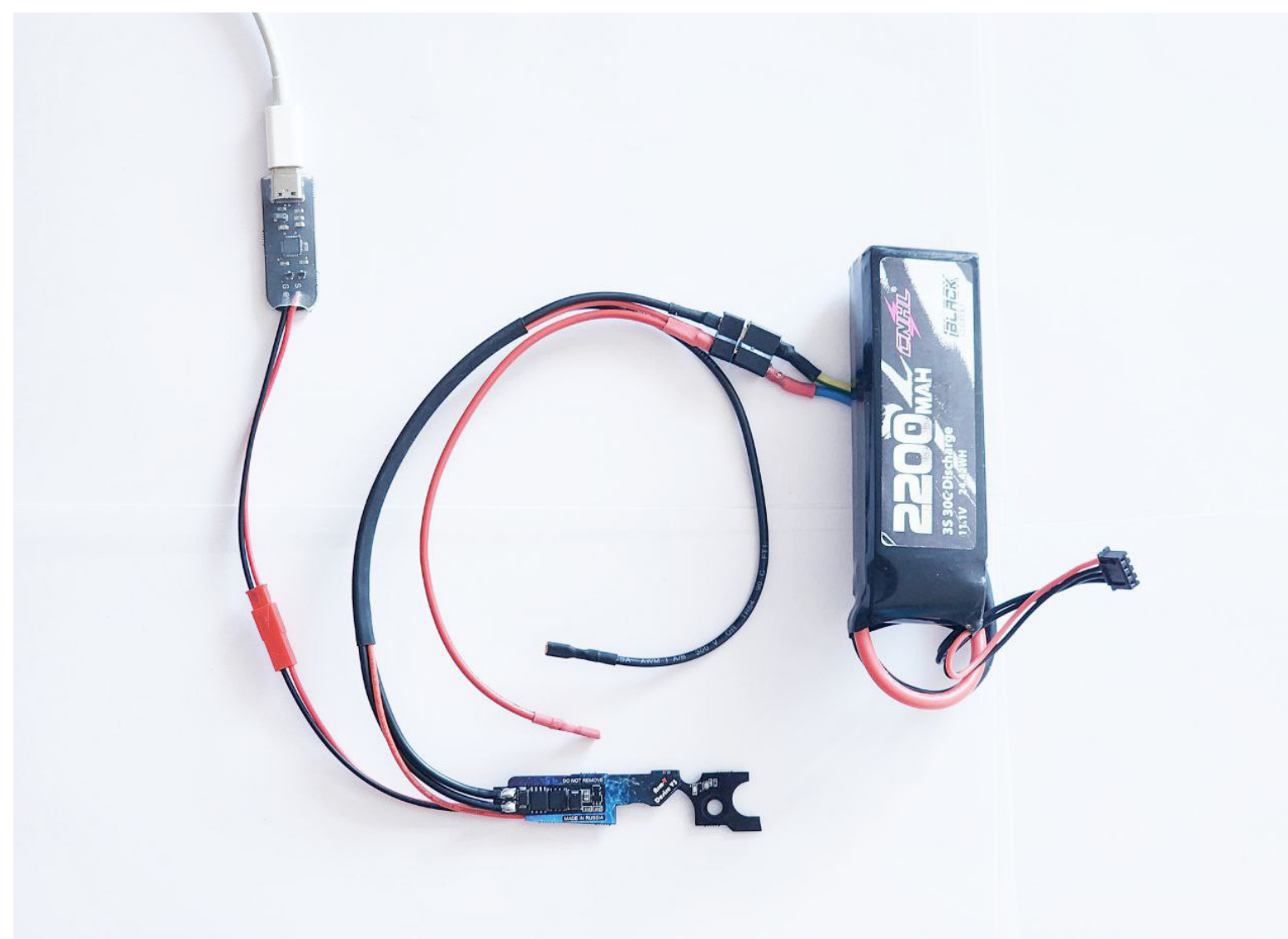
NEW FUNCTION

WARRANTY



4

Take out Desire V3 from the box and place it on a non-metallic surface (such as a sheet of paper), connect it to any battery from 7V to 14V, and connect it to the Arm-V USB adapter.



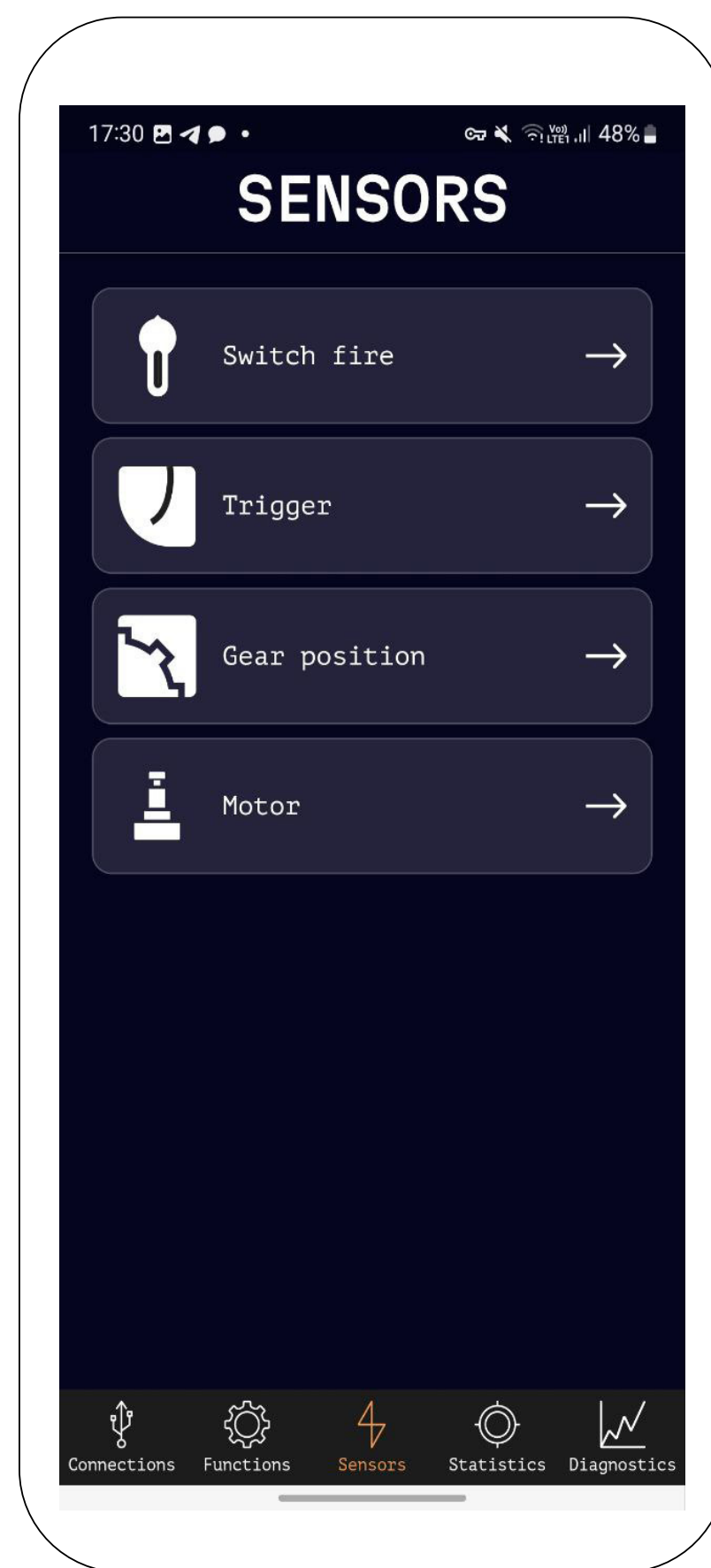
5

Information about the connected device will appear in the application. If the application suggests updating the device, press the 'Update' button. The update process takes less than 1 minute.



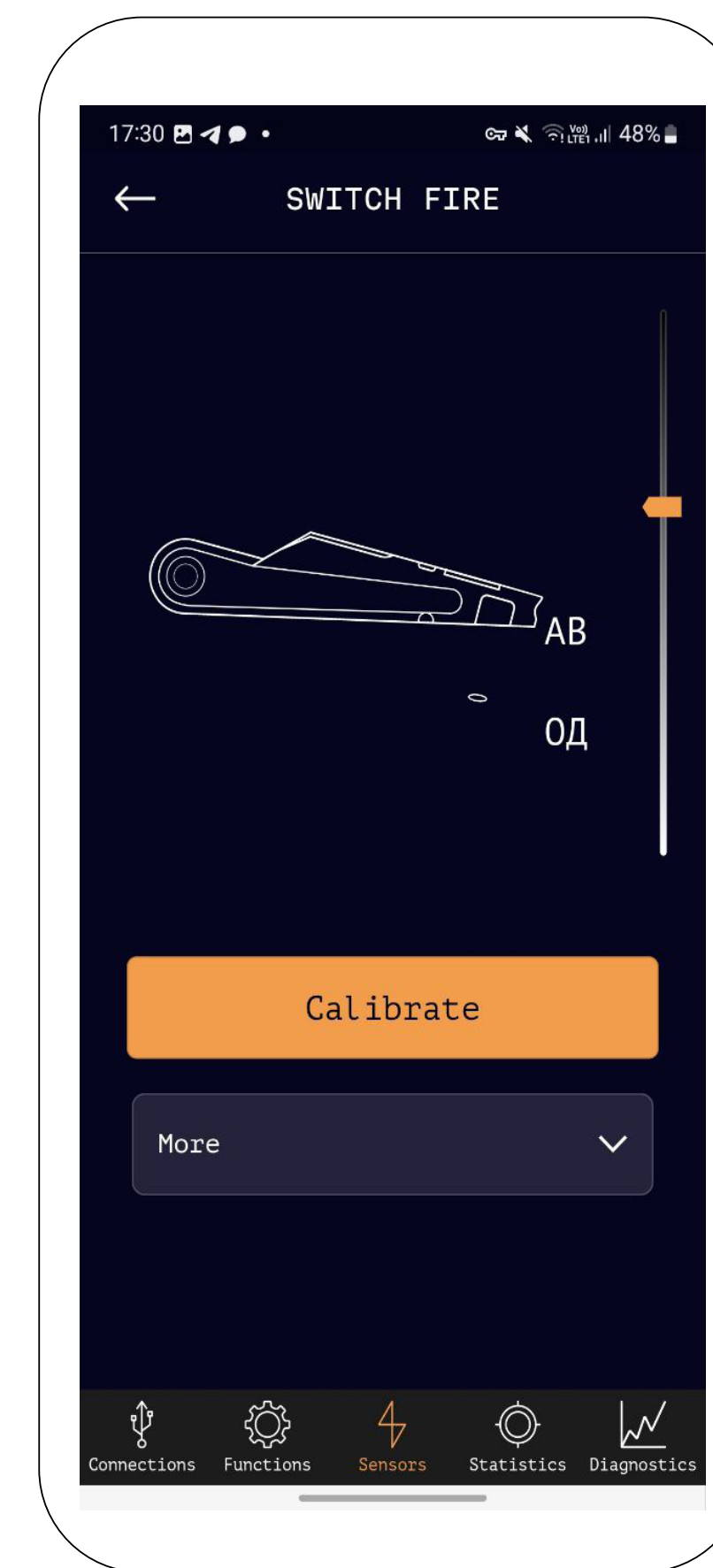
6

Go to the sensors  
screen...



7

...and open the Switch  
fire.



DESIRE V3  
CHECK

---

INSTALLATION OF  
DESIRE V3 INTO  
GEARBOX

---

NEW FUNCTION

---

WARRANTY

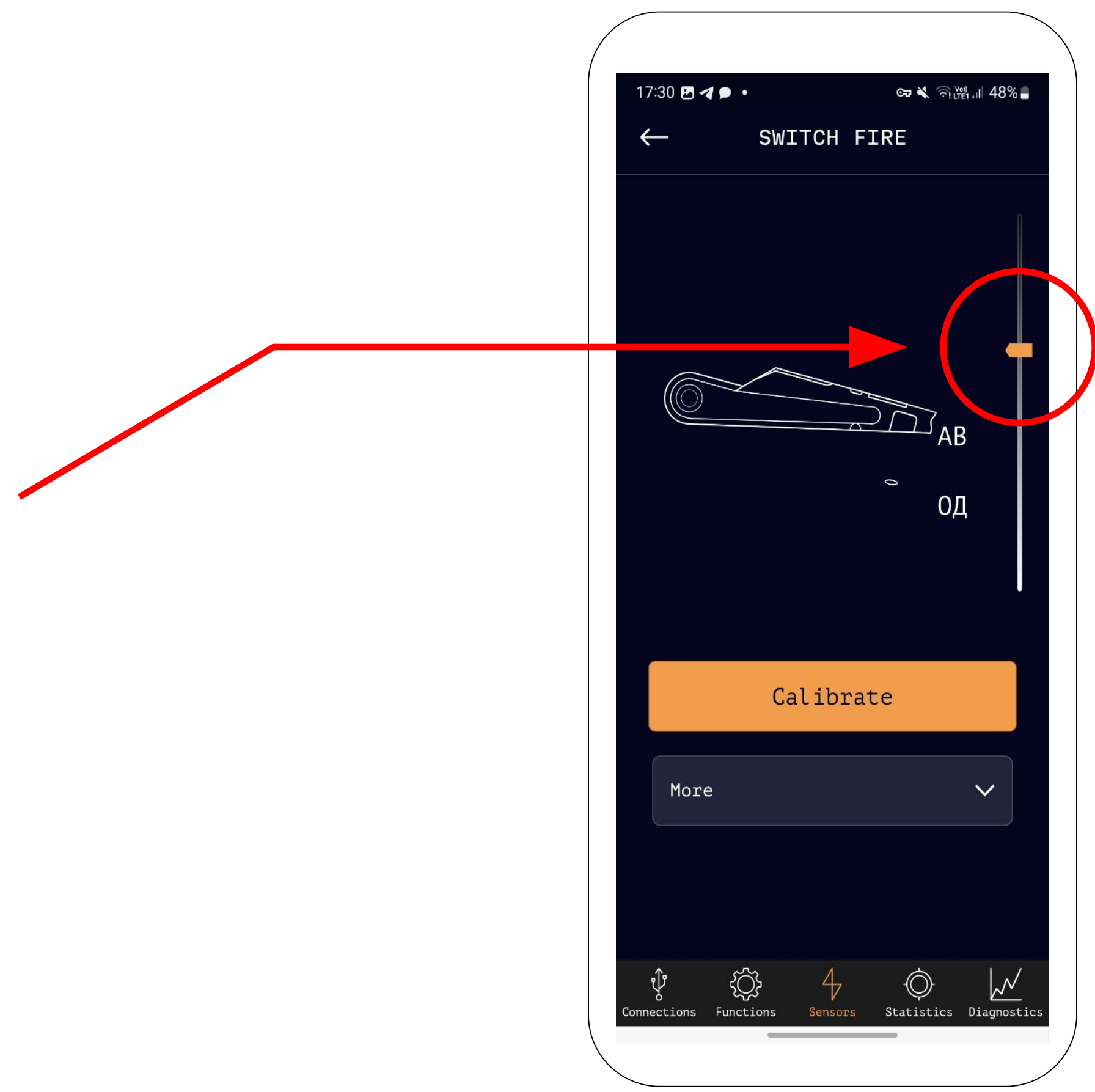
---



# 8

The location of the fire mode switch sensor is shown in the photograph, and its principle of operation involves measuring the intensity of reflected light.

The sensor readings are displayed on a scale in the program.





DESIRE V3  
CHECK

INSTALLATION OF  
DESIRE V3 INTO  
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NEW FUNCTION

WARRANTY



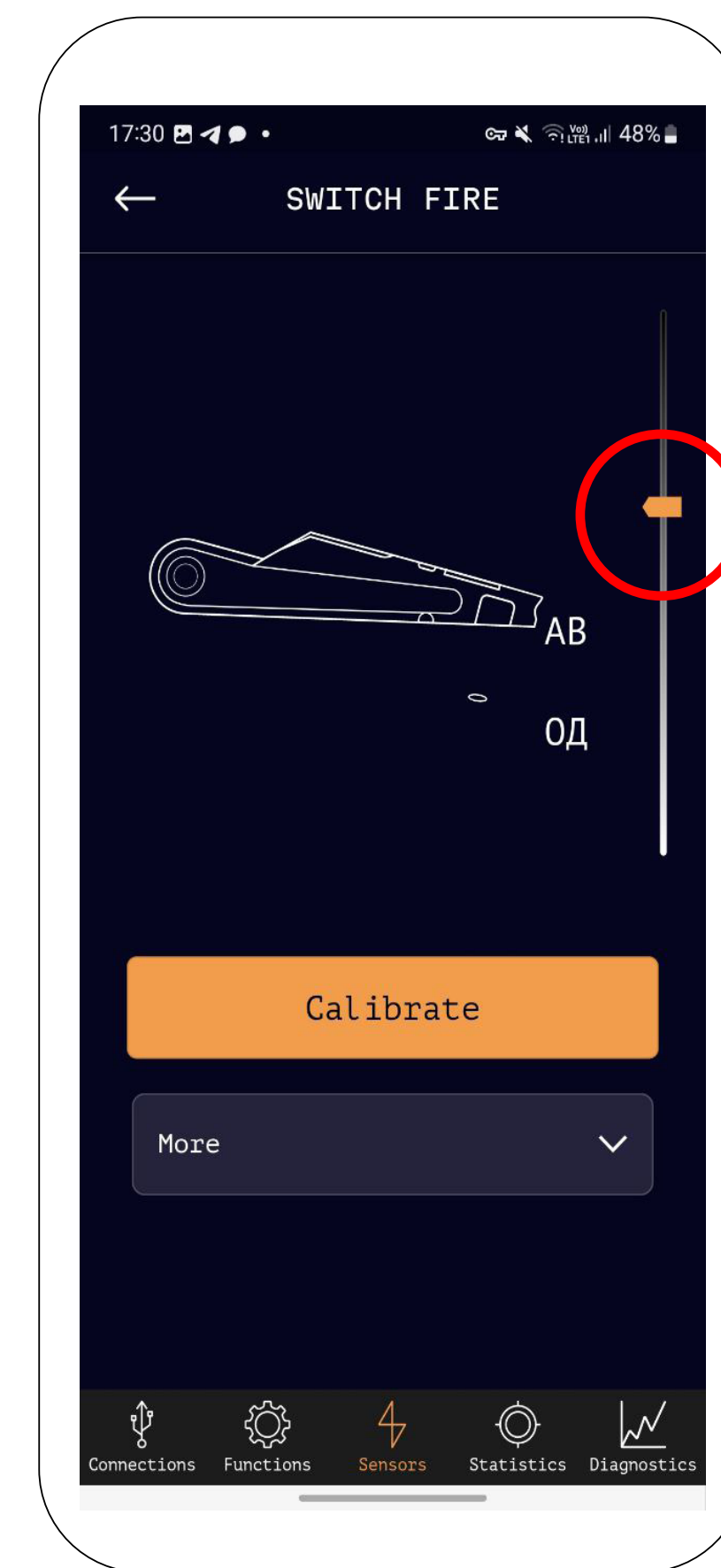
9

Cover the area where the external light sensor is located. If you place a black sheet of paper over the sensor...



10

...you will see the sensor readings rise to the upper end, into the 'black' range.



DESIRE V3  
CHECK

INSTALLATION OF  
DESIRE V3 INTO  
GEARBOX

NEW FUNCTION

WARRANTY



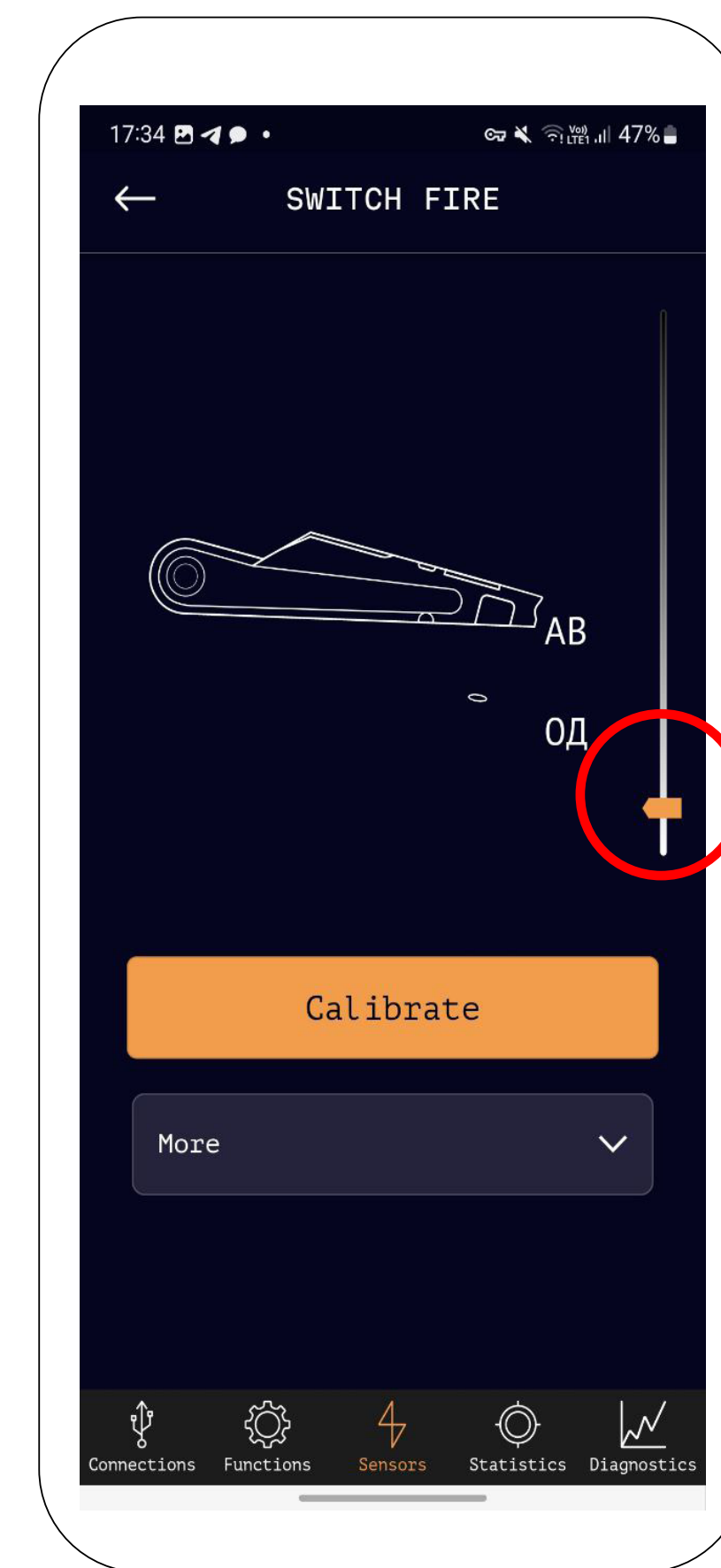
11

If you place a white sheet of paper over the sensor...



12

..the readings will drop down, into the 'white' range.



# DESIRE V3 CHECK

## INSTALLATION OF DESIRE V3 INTO GEARBOX

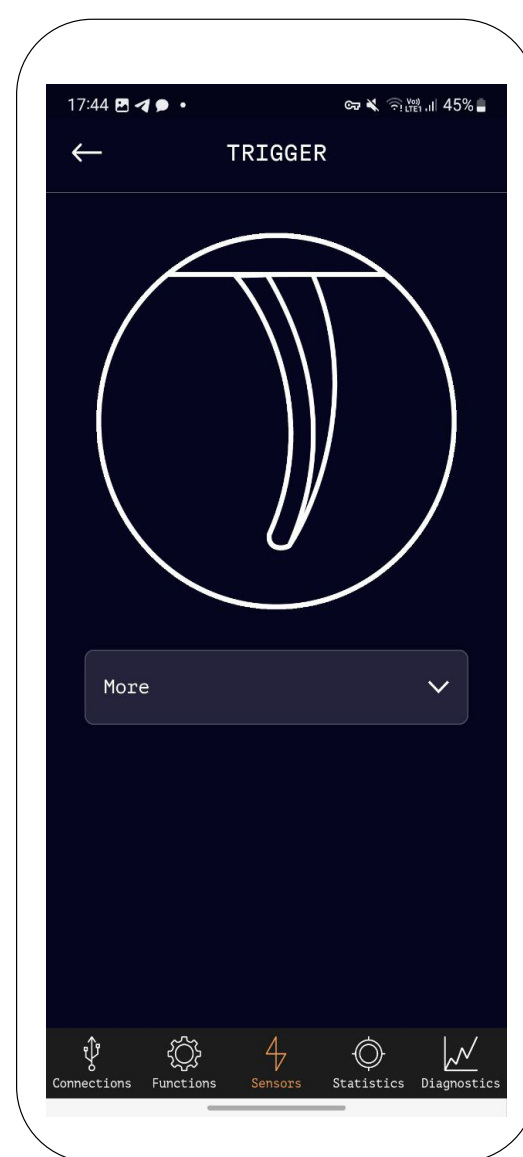
### NEW FUNCTION

### WARRANTY



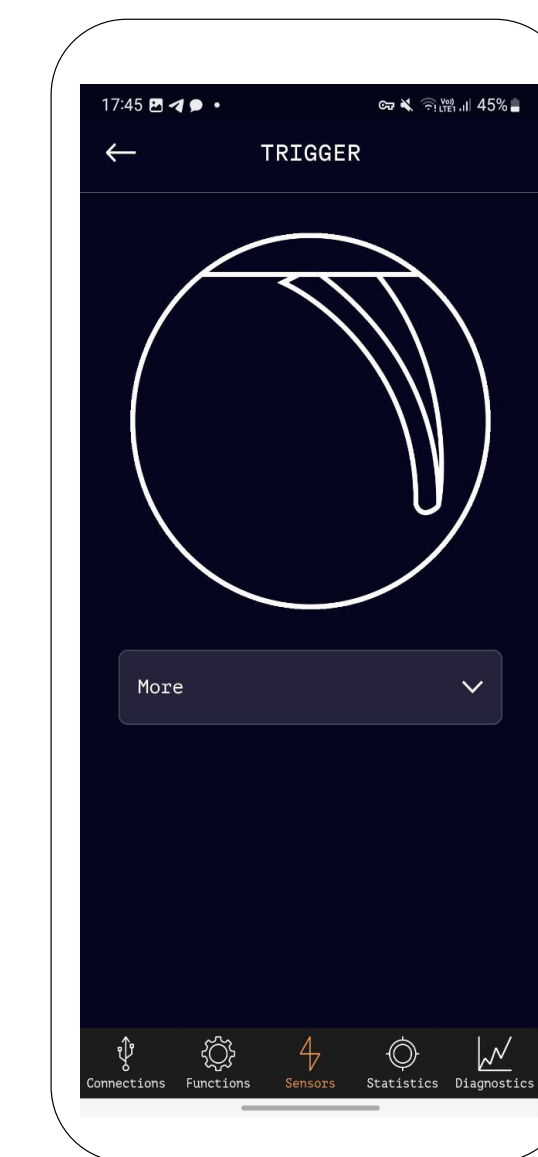
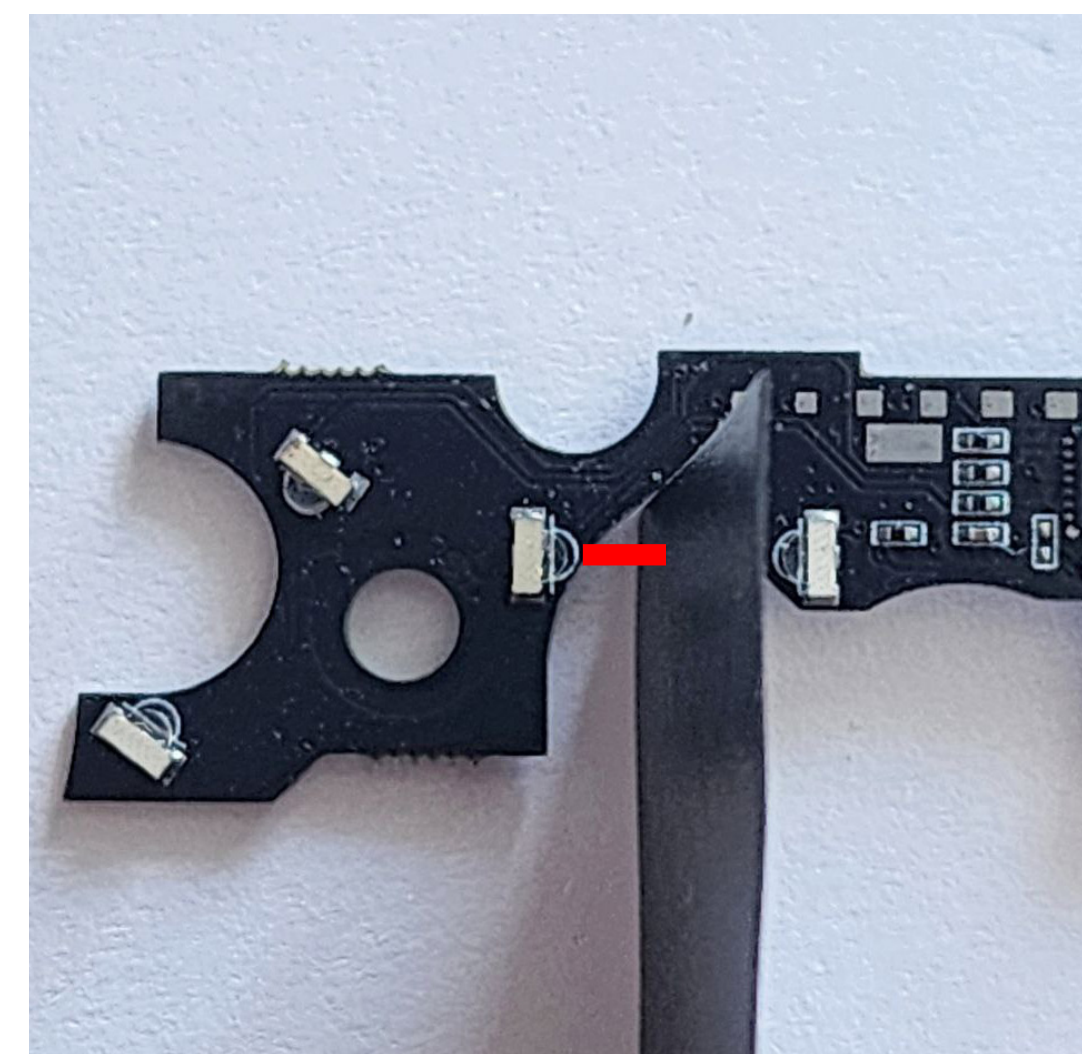
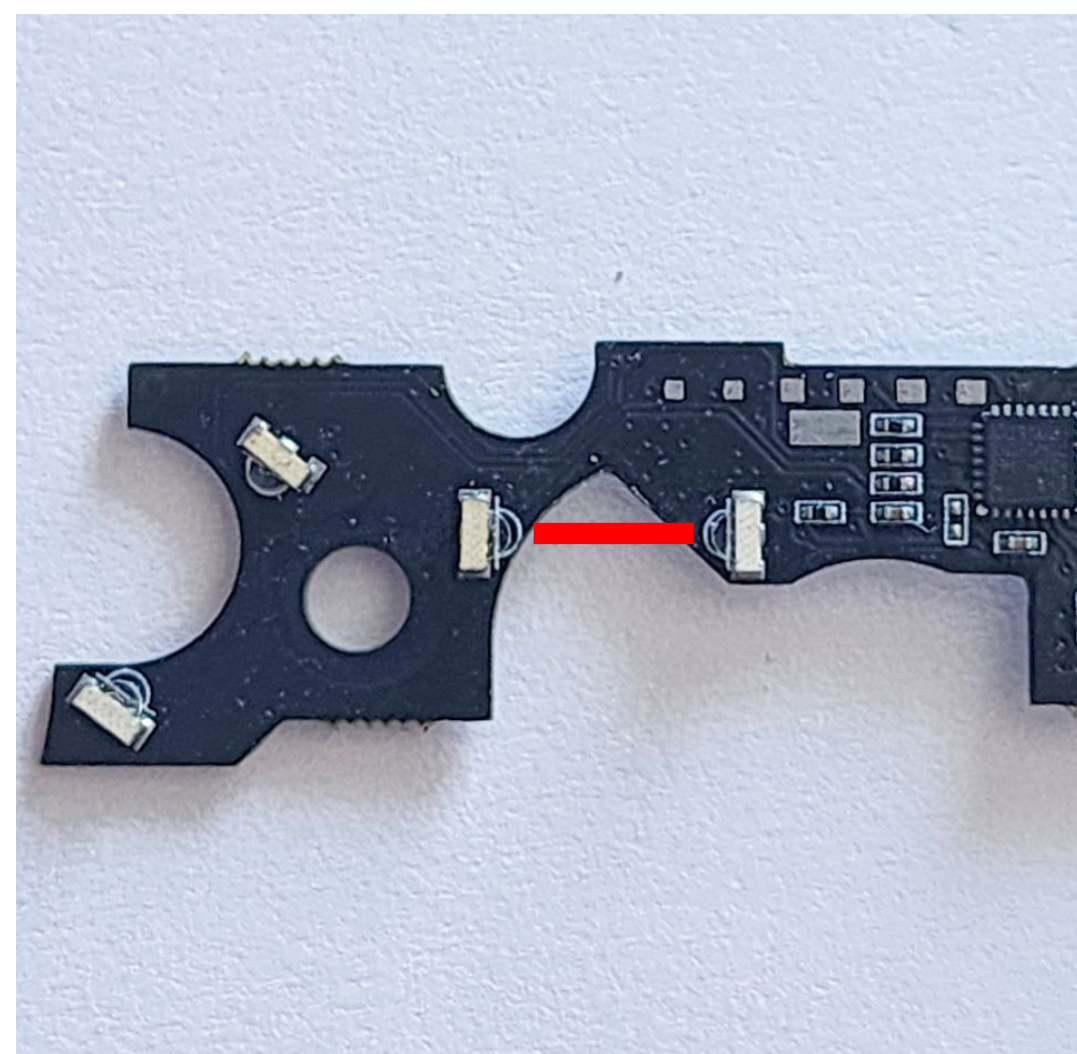
# 13

Go back to the sensors screen and select the trigger hook sensor



# 14

The trigger sensor on Desire V3 operates based on a beam interruption principle. That means, between two optical elements on the board, an infrared (IR) beam passes (invisible to the human eye). When the trigger is pressed, this beam is interrupted, which is then detected by Desire V3. During the test, it's necessary to shield the sensor from external light.



# DESIRE V3 CHECK

## INSTALLATION OF DESIRE V3 INTO GEARBOX

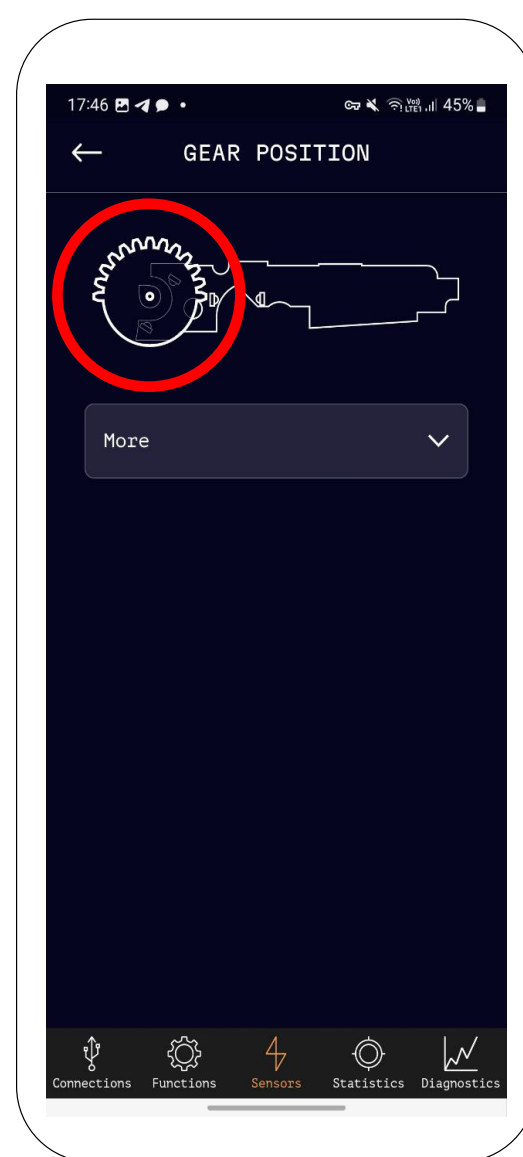
### NEW FUNCTION

### WARRANTY



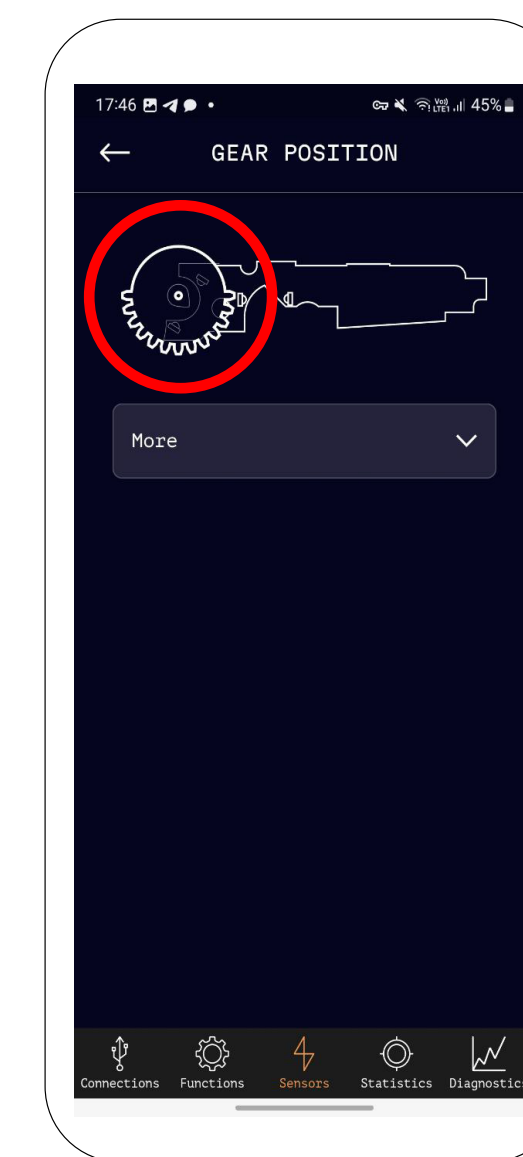
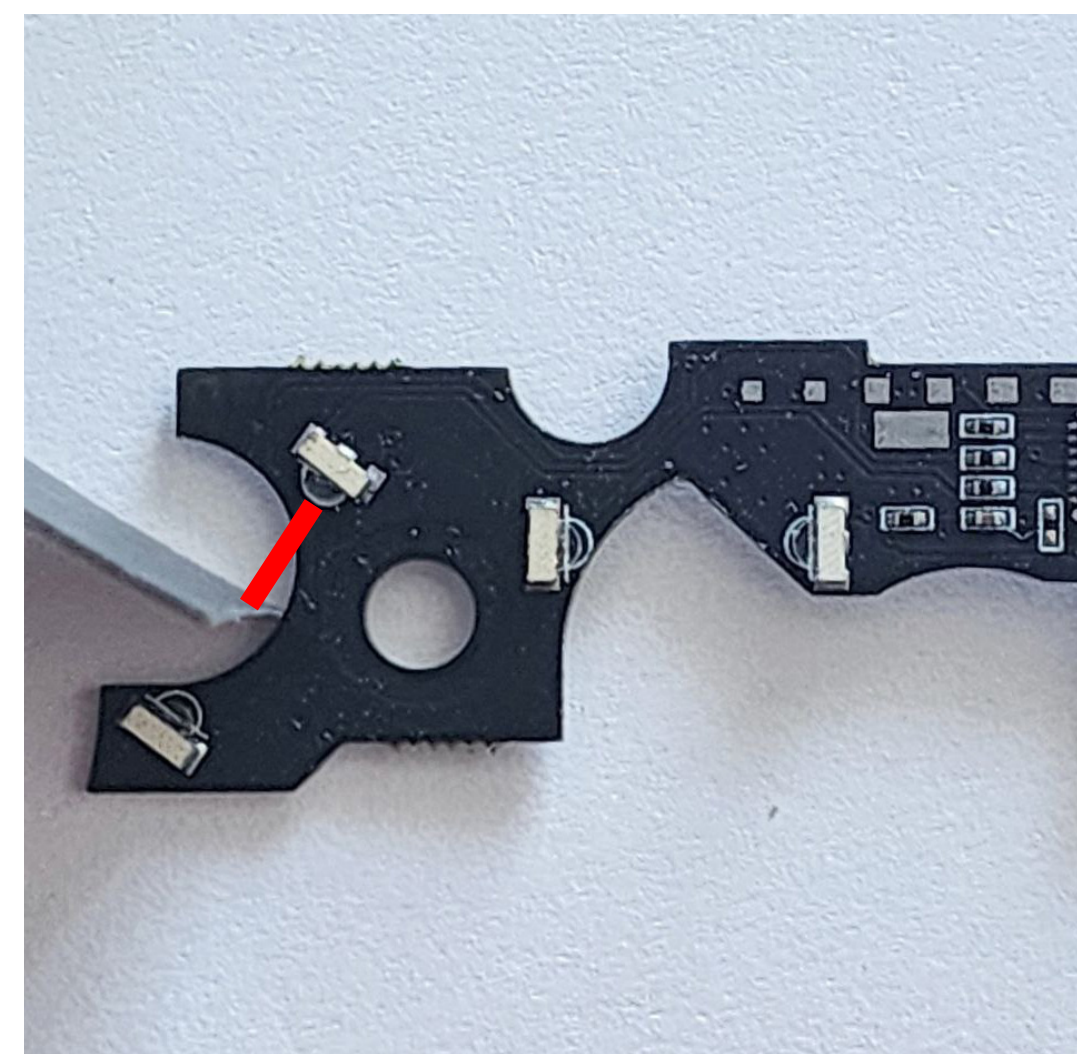
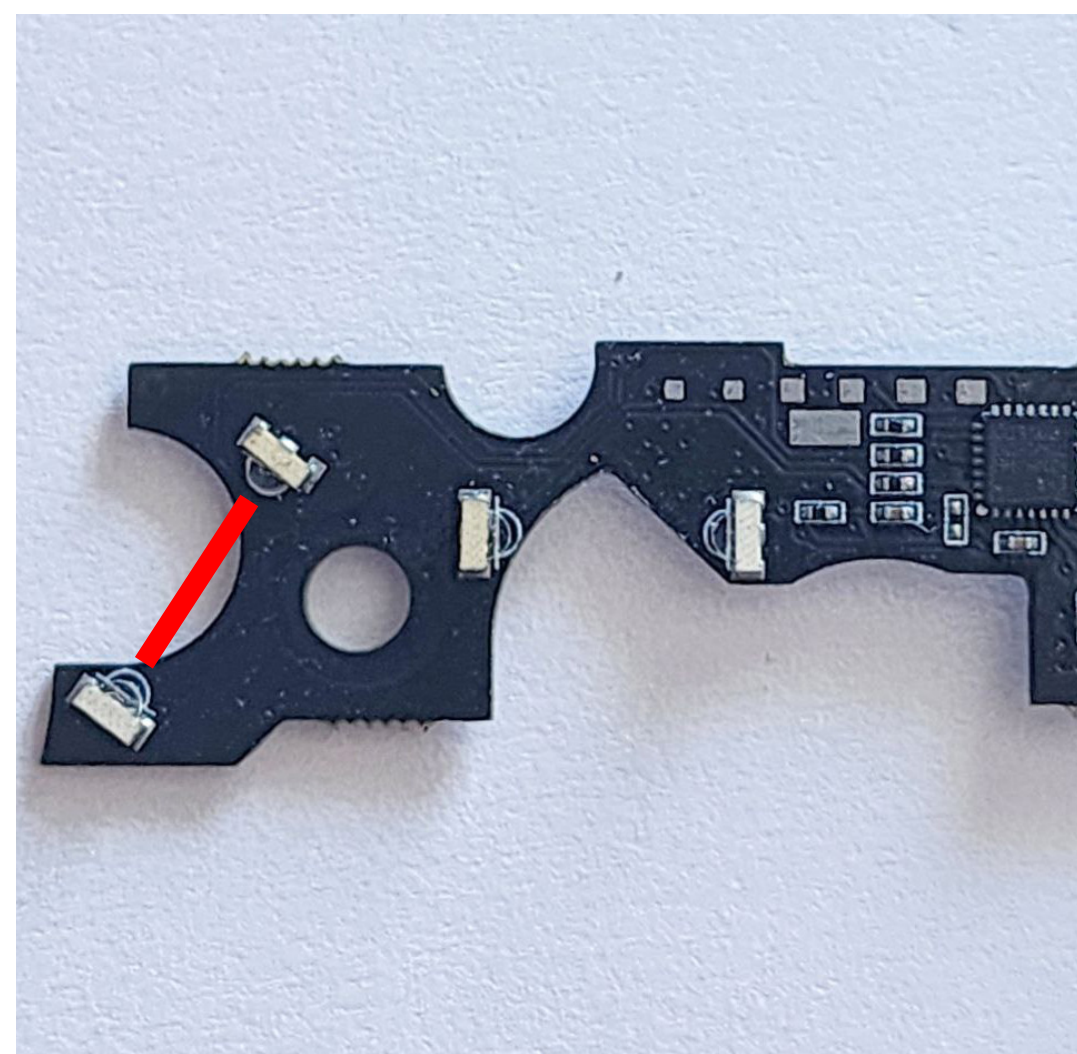
# 15

Go back to the sensors screen and navigate to the gear sensor



# 16

The gear sensor on Desire V3 operates based on a beam interruption principle. This means that between two optical elements on the board, an infrared (IR) beam passes (invisible to the human eye). When the sector gear rotates and the eccentric that previously pressed against the single shot cut-off lever no longer does so, it now interrupts the IR beam, which is then detected by Desire V3. During the test, it's necessary to shield the sensor from external light.



DESIRE V3  
CHECK

INSTALLATION OF  
DESIRE V3 INTO  
GEARBOX

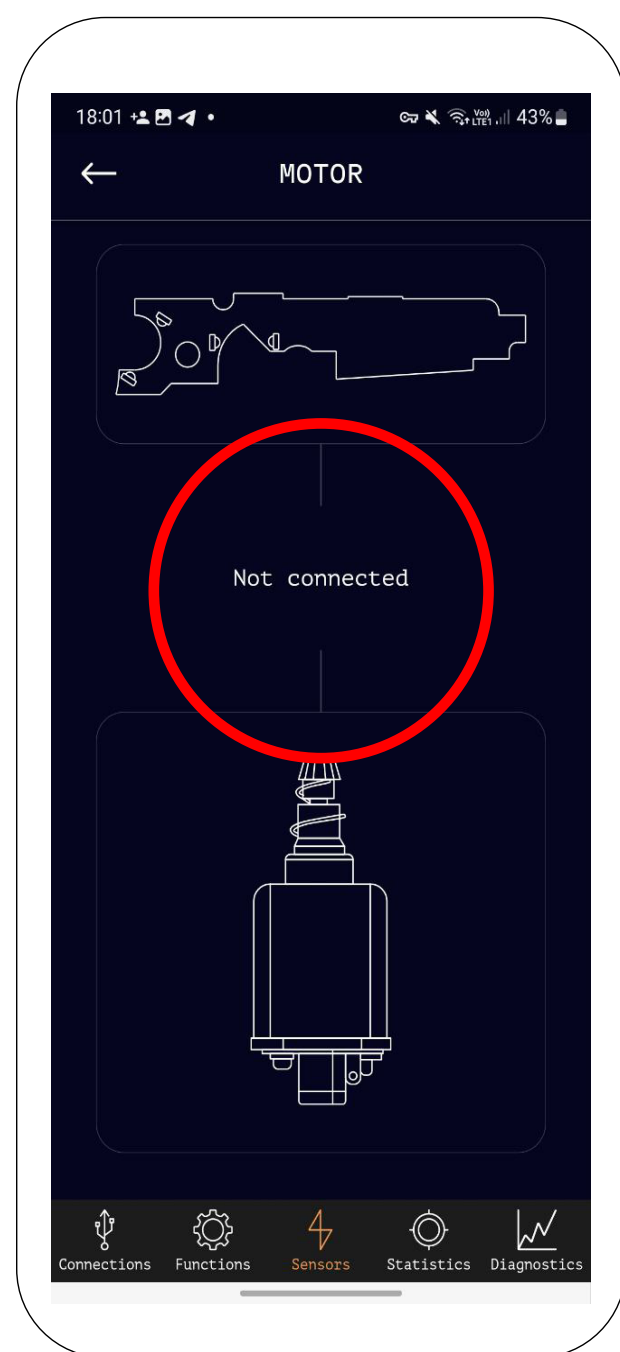
NEW FUNCTION

WARRANTY



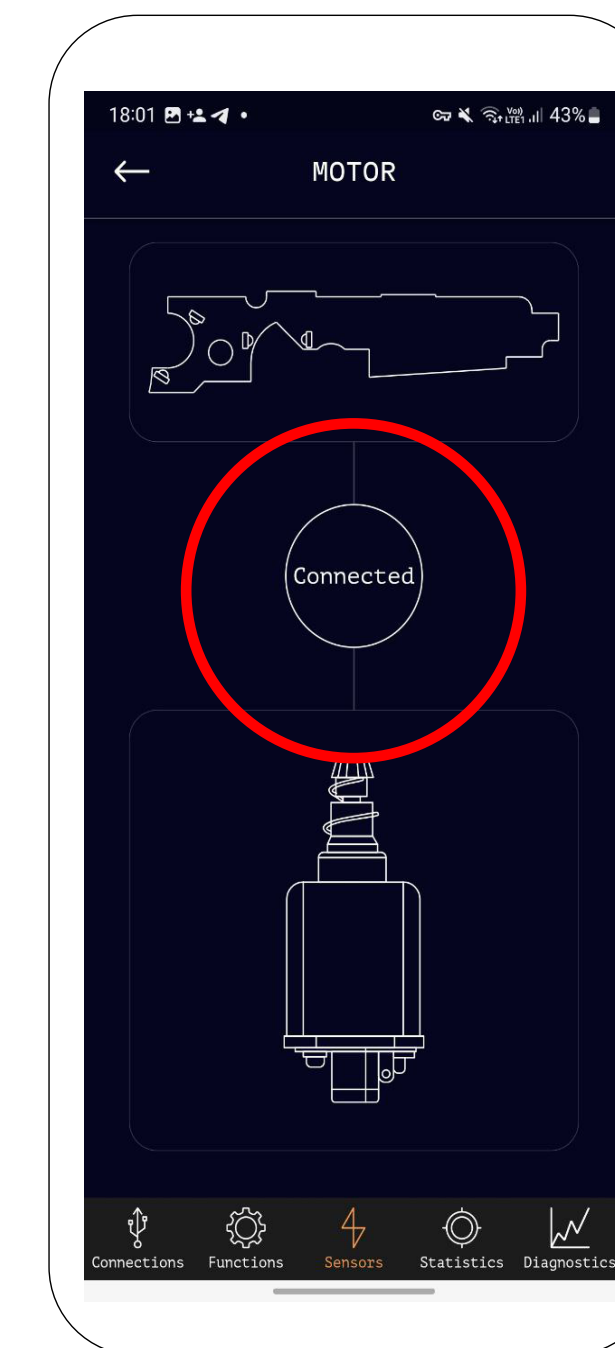
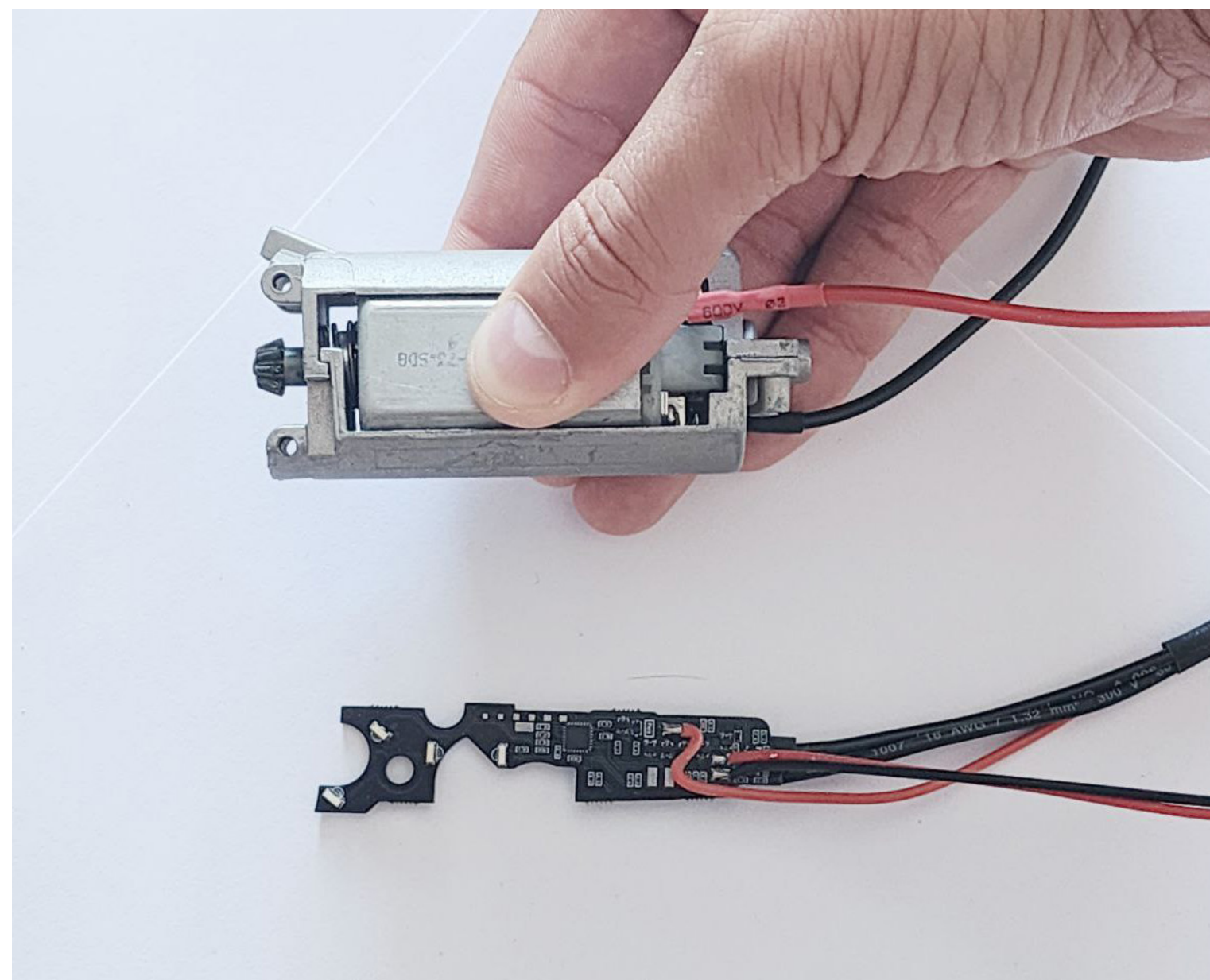
# 17

Go back to the sensors screen and navigate to the motor sensor. It will indicate that the motor is disconnected.



# 18

Connect the motor to Desire V3 and hold it by the casing. The sensor in the application will indicate that the motor is connected.



## DESIRE V3 CHECK

---

### INSTALLATION OF DESIRE V3 INTO GEARBOX

---

### NEW FUNCTION

---

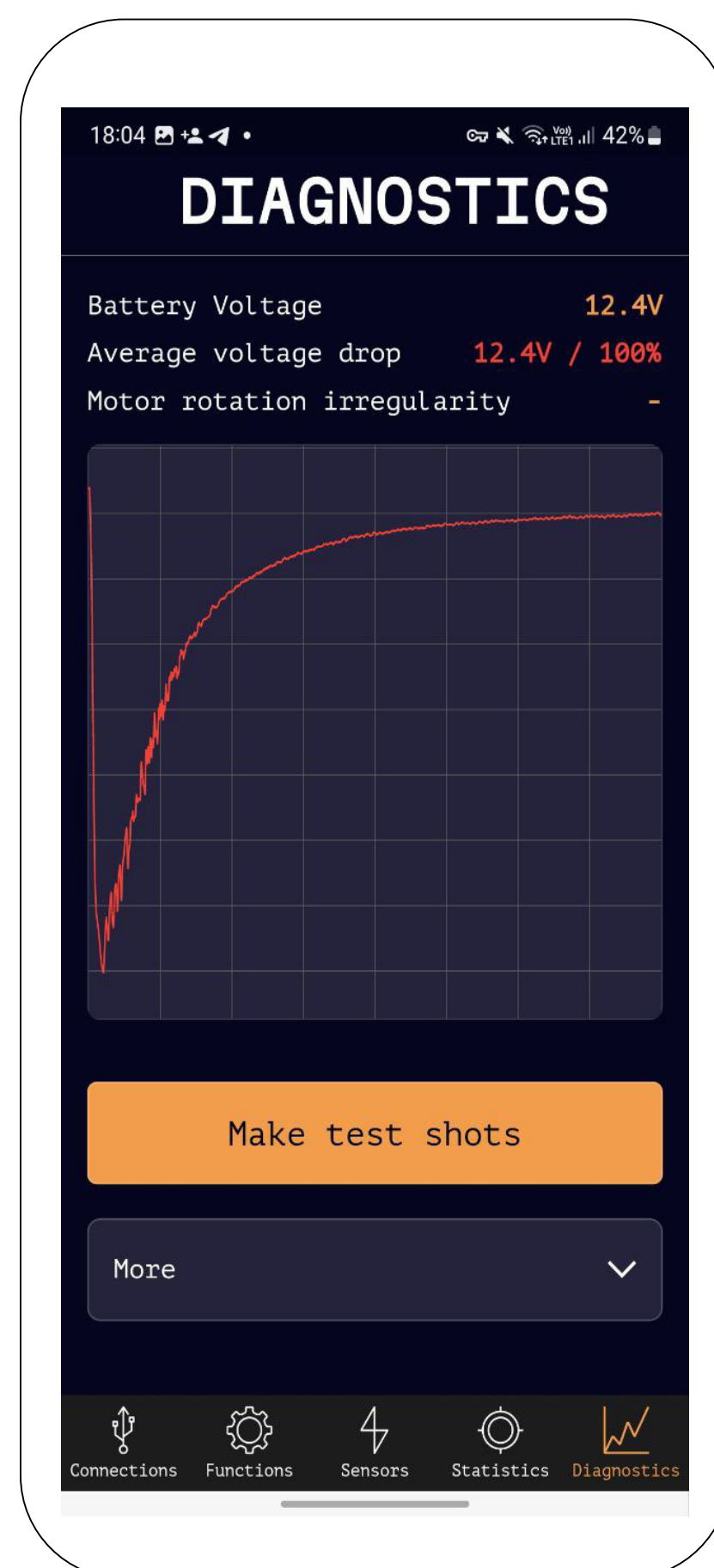
### WARRANTY

---

**Arm-V**  
**Desire V3**

# 19

Navigate to the diagnostics screen and while holding the motor by its casing, press the 'Make test shots' button. The motor will run for just about 1 second, and then a graph similar to the one shown in the image will be generated.



# 20

Disconnect the motor, turn off Desire from the battery, and disconnect the Arm-V USB adapter.

We've understood how all the sensors of Desire V3 work and verified that they function correctly. We also checked the mosfet by starting the motor. Now, we can proceed with installing Desire V3 into the gearbox.

ΠΡΟΒΕΡΚΑ  
DESIRE

---

INSTALLATION OF  
DESIRE V3 INTO  
GEARBOX

---

NEW FUNCTION

---

WARRANTY

---

Arm-V  
Desire V3

## 21

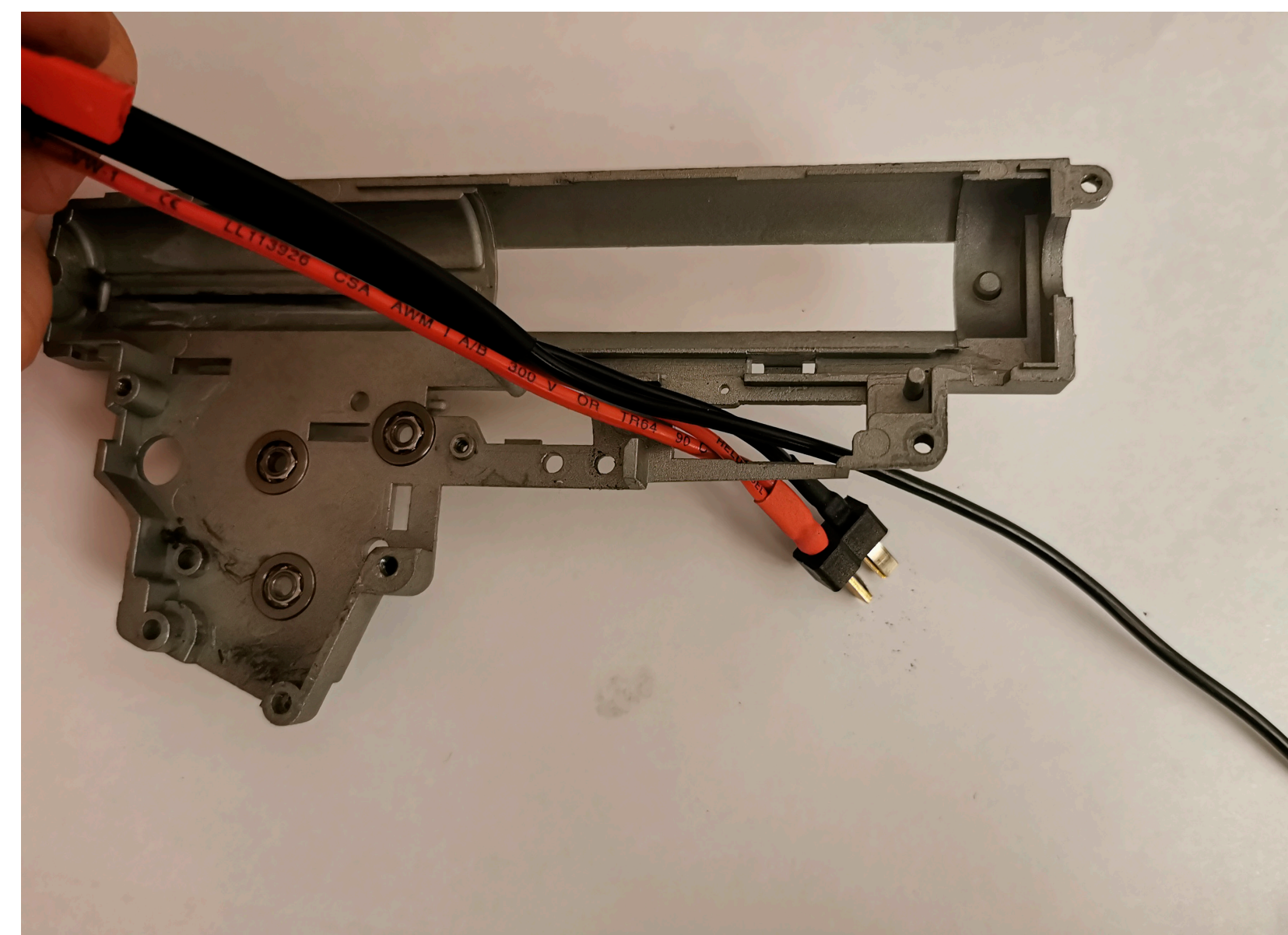
Desire V3 is installed inside the gearbox Version 3. Before installation, you will need to remove the gearbox from your AEG, disassemble it, extract all internal parts, and clean them.



## 22

Thread the wires from Desire V3 from the inside of the gearbox to the outside through the hole intended for the contact group.

«ATTENTION: Do not attempt to install Desire V3 with the battery connected!»



ΠΡΟΒΕΡΚΑ  
DESIRE

INSTALLATION OF  
DESIRE V3 INTO  
GEARBOX

NEW FUNCTION

WARRANTY

Arm-V  
Desire V3

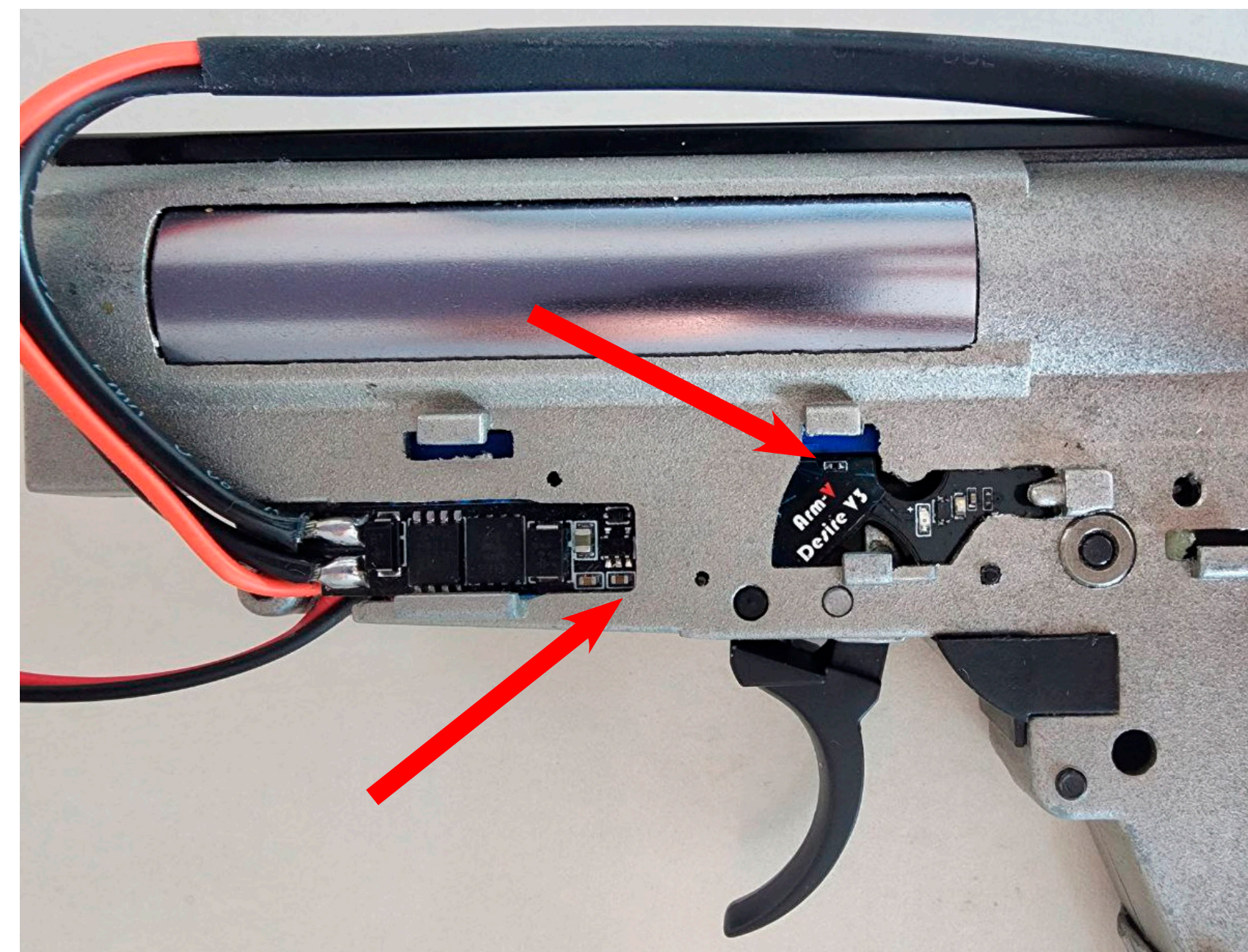
# 23

Attach the board to the gearbox. Make sure nothing is obstructing and the wires are not pinched.



# 24

Ensure that the components on the board do not touch the gearbox wall in the indicated areas.





ΠΡΟΒΕΡΚΑ  
DESIRE

---

INSTALLATION OF  
DESIRE V3 INTO  
GEARBOX

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NEW FUNCTION

---

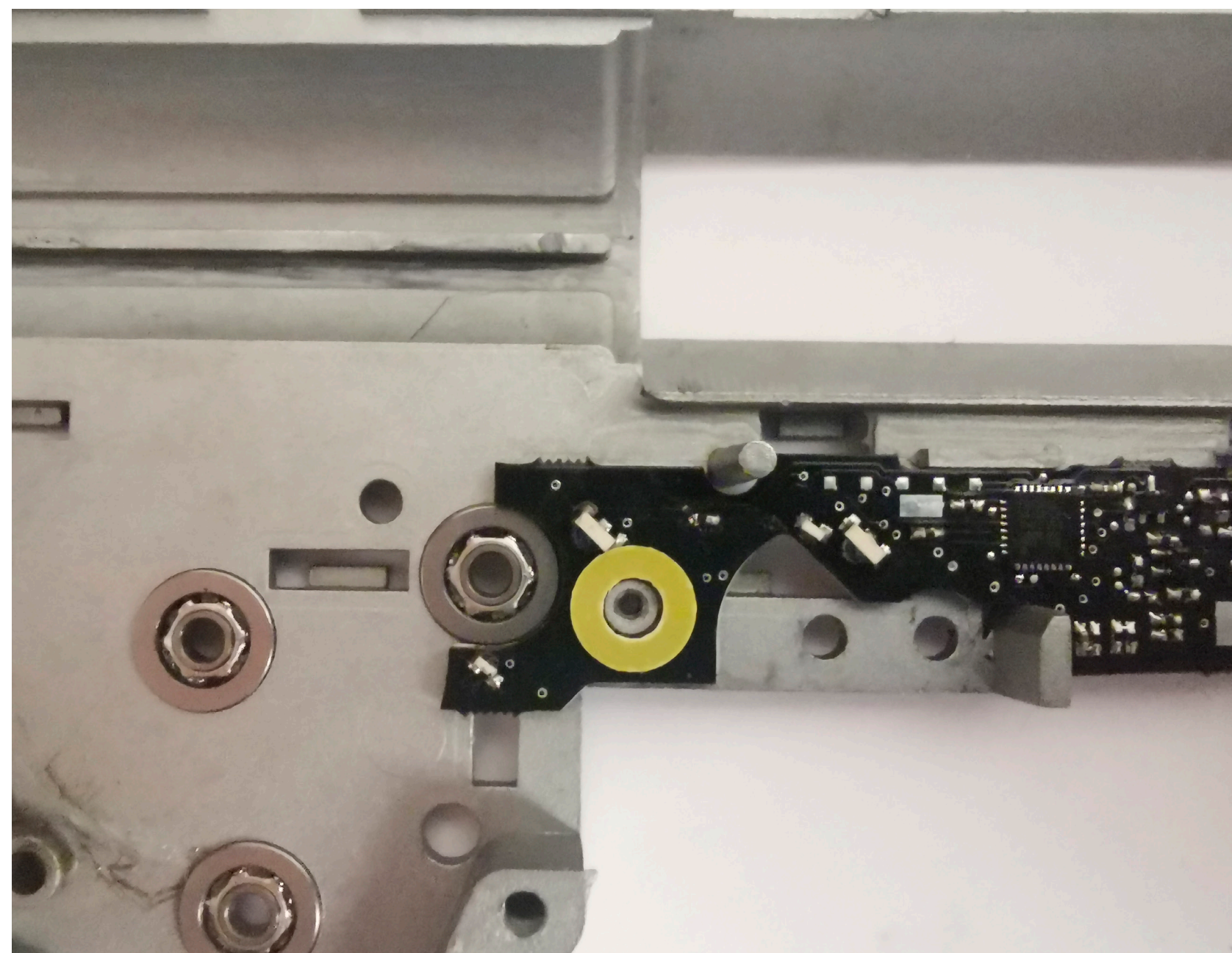
WARRANTY

---

**Arm-V**  
**Desire V3**

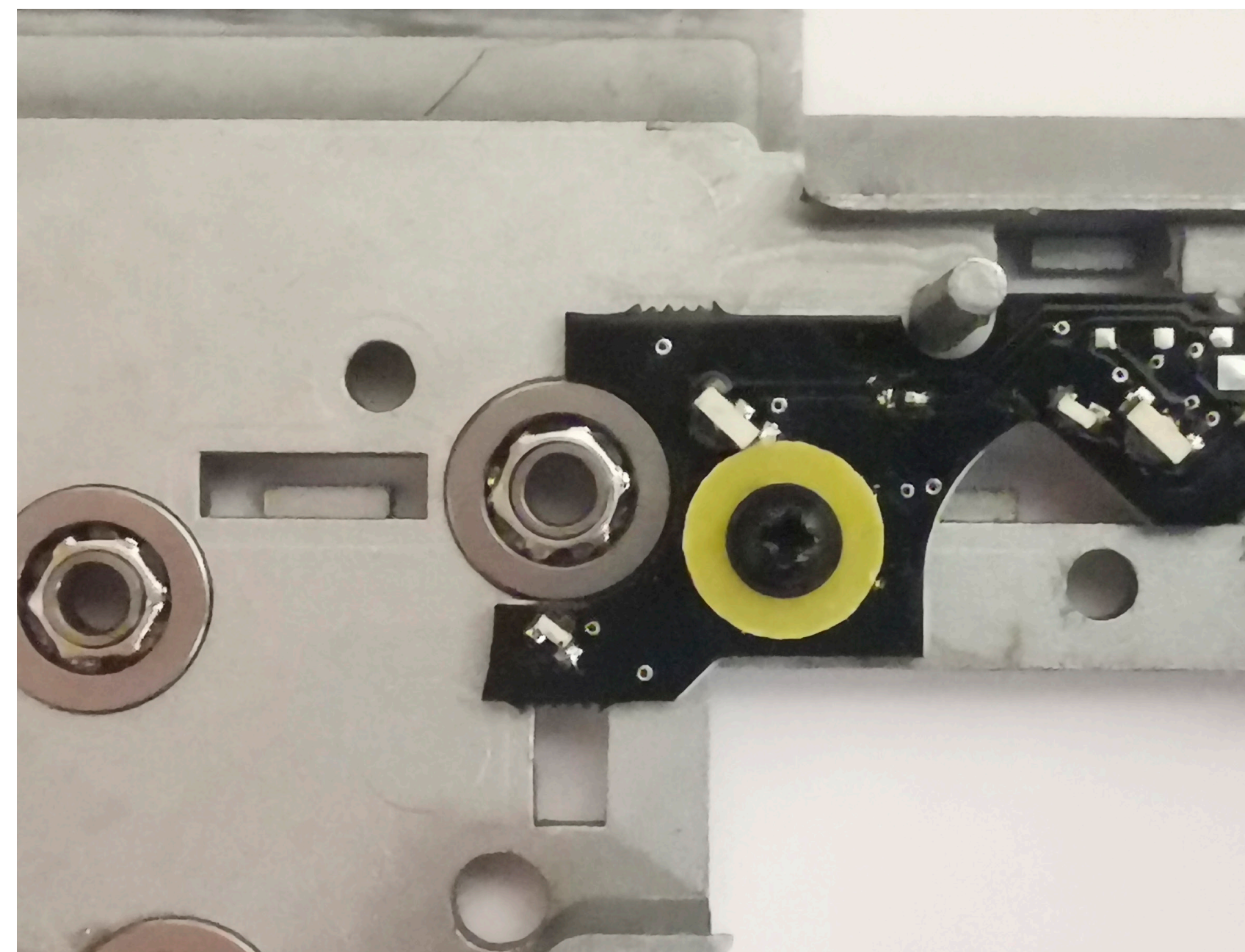
# 25

Install the included insulating washer.



# 26

Secure the board using the contact group mounting screw.



ПРОВЕРКА  
DESIRE

INSTALLATION OF  
DESIRE V3 INTO  
GEARBOX

NEW FUNCTION

WARRANTY

Arm-V  
Desire V3

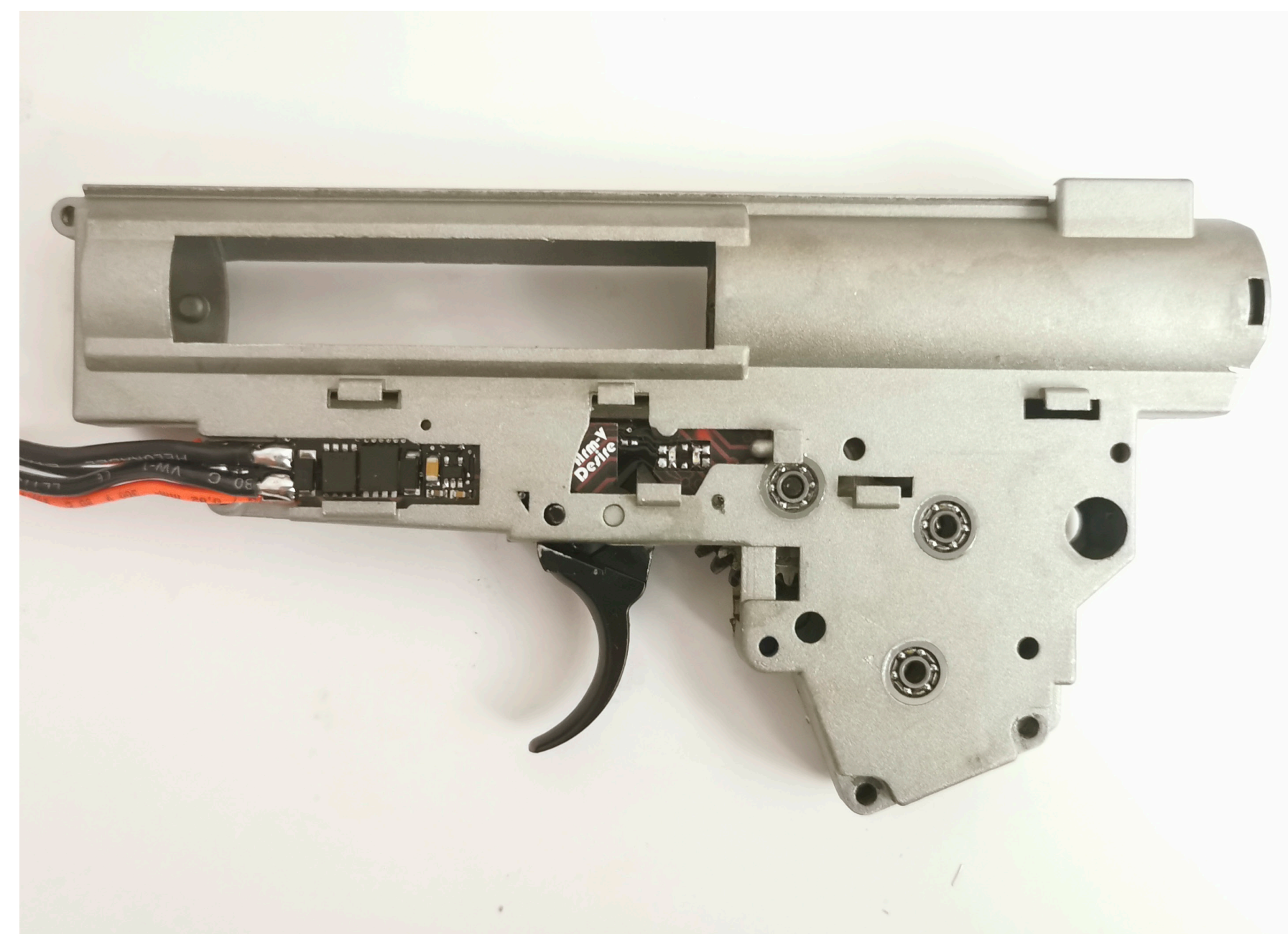
# 27

Install the sector gear and trigger lever into the gearbox.



# 28

Close the gearbox with the second wall and secure it with 2 screws.



ПРОВЕРКА  
DESIRE

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INSTALLATION OF  
DESIRE V3 INTO  
GEARBOX

---

NEW FUNCTION

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WARRANTY

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**Arm-V**  
**Desire V3**

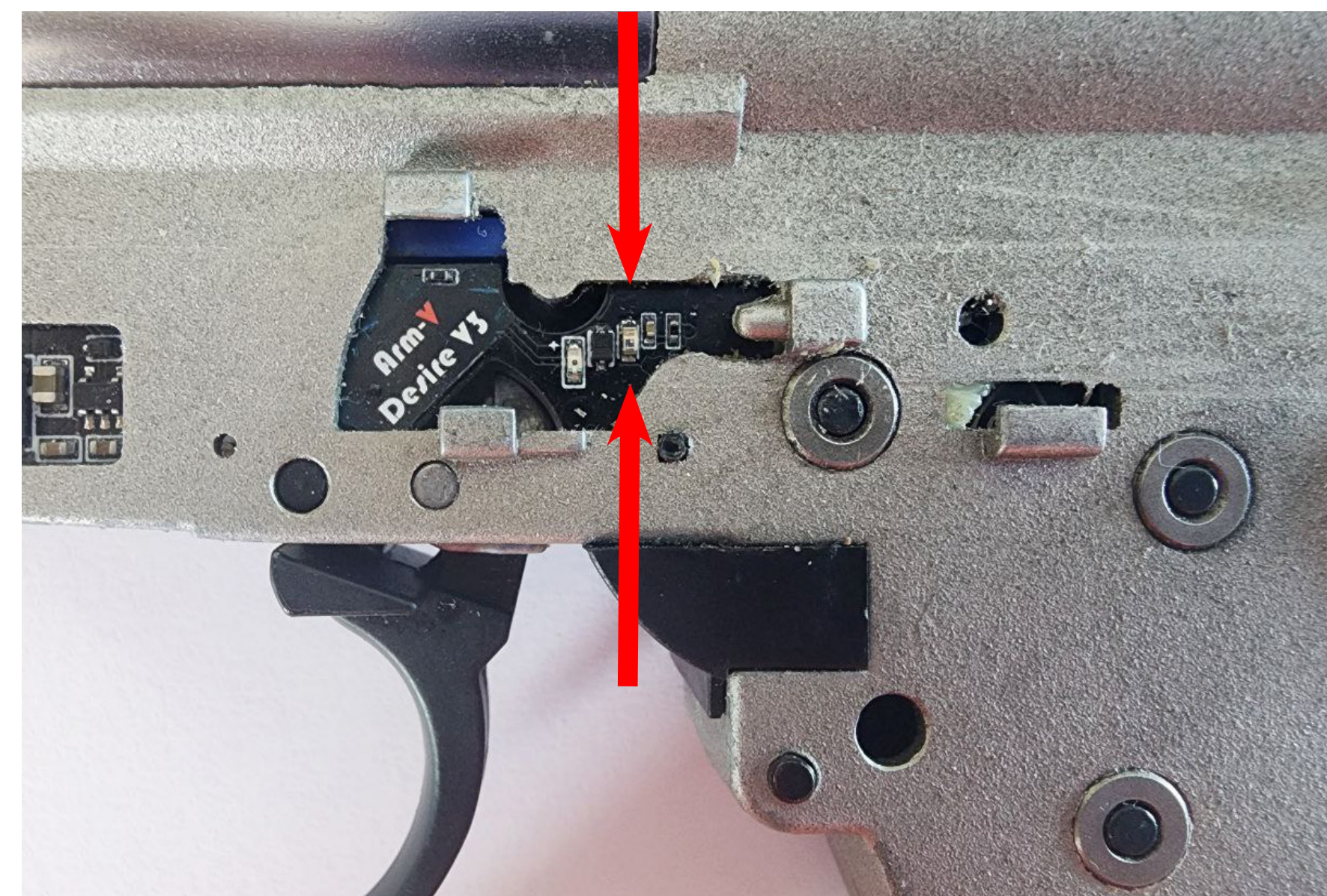
# 29

You need to degrease the selector plate before applying the sticker. Thoroughly clean it with a cleaning agent and let it dry.



# 30

Pay attention to the fire mode switch sensor. The sticker should align flush with the sensor, which is installed at the center.



ПРОБЕРКА  
DESIRE

INSTALLATION OF  
DESIRE V3 INTO  
GEARBOX

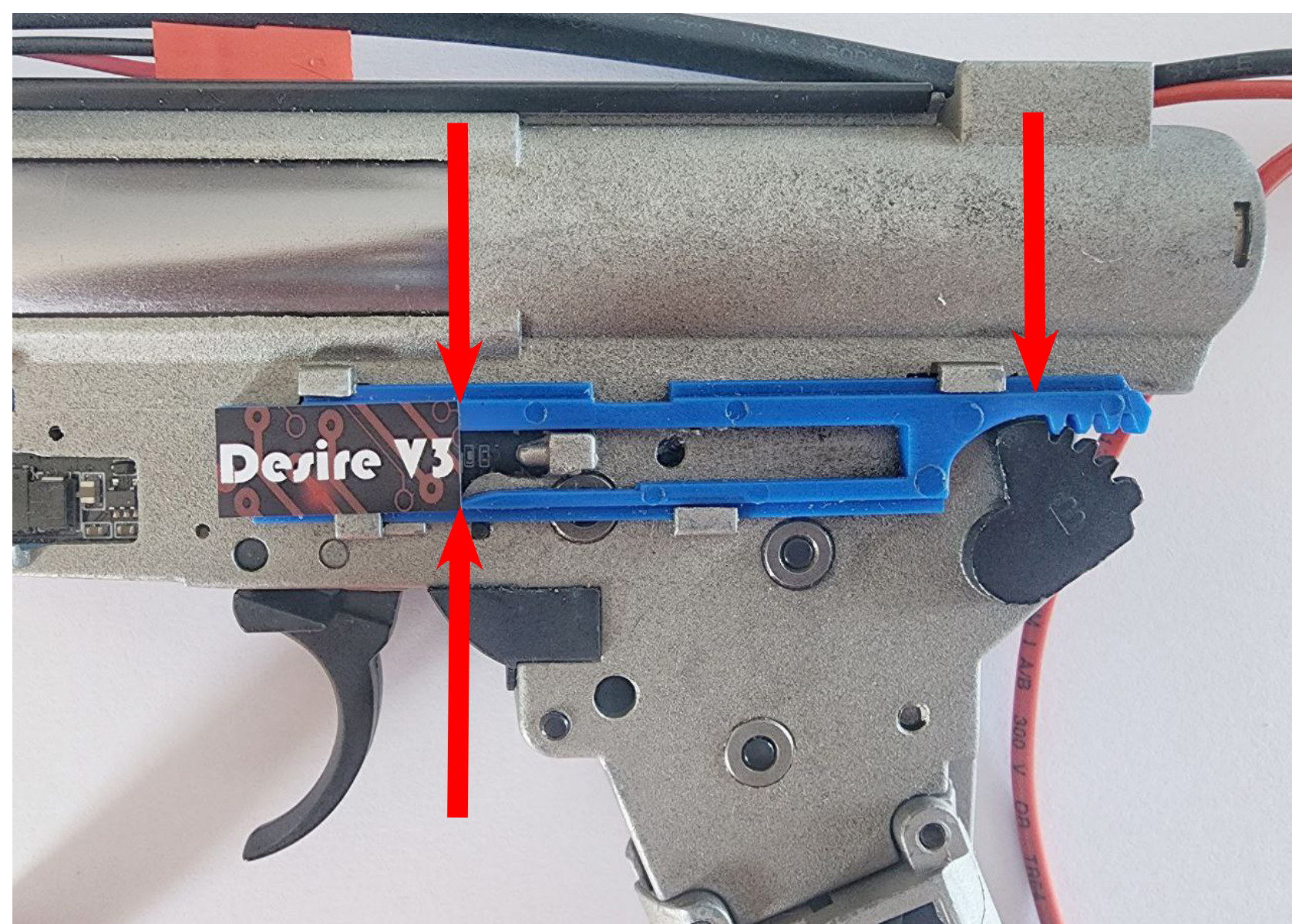
NEW FUNCTION

WARRANTY

Arm-V  
Desire V3

# 31

Install the selector plate and the gear that moves it. Push the plate to the farthest rear position. Apply the sticker.



# 32

Cover the fire mode switch sensor and the hole for the cylinder from external light, for example, with the gearbox shell cover.



ПРОВЕРКА  
DESIRE

---

INSTALLATION OF  
DESIRE V3 INTO  
GEARBOX

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NEW FUNCTION

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WARRANTY

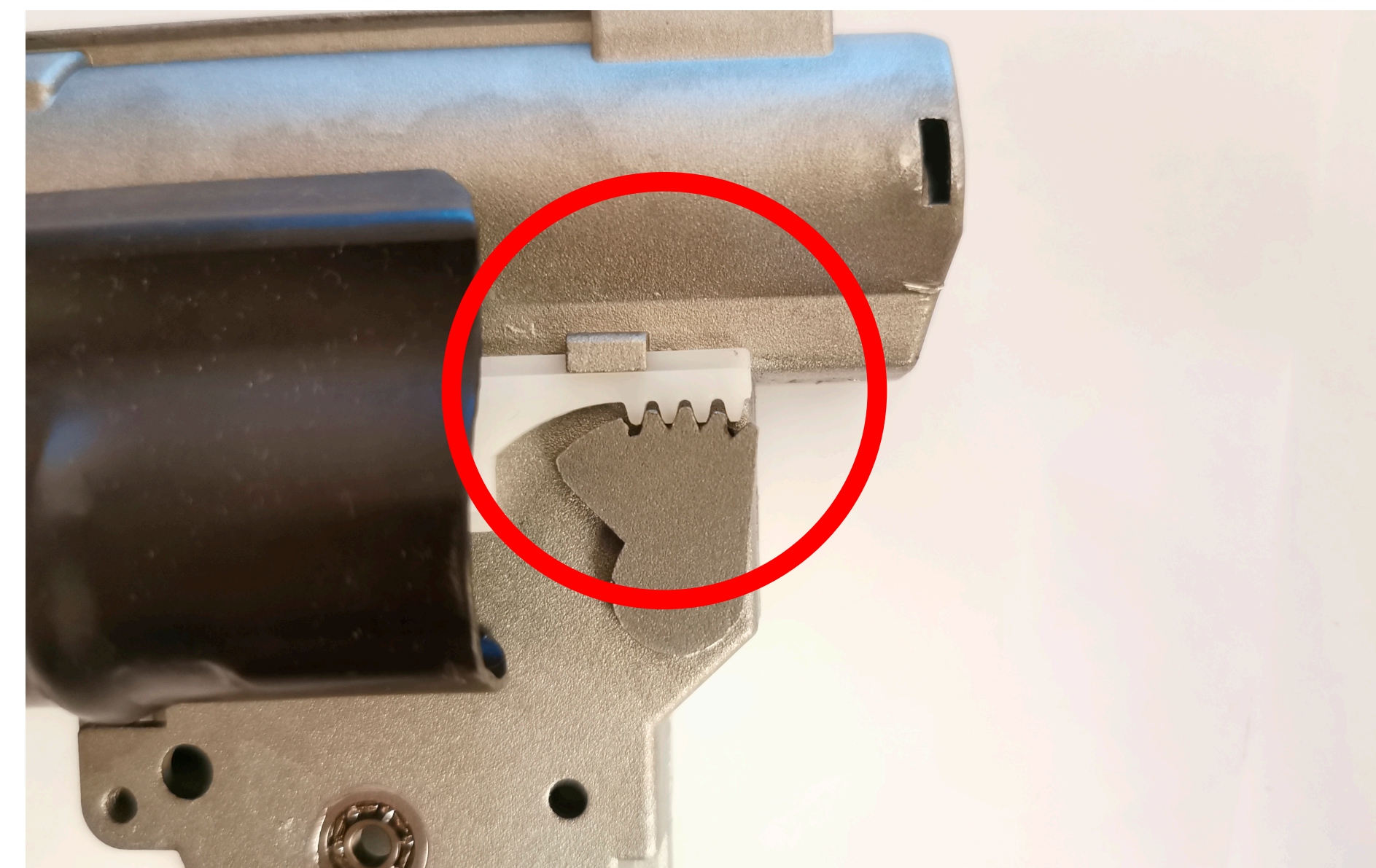
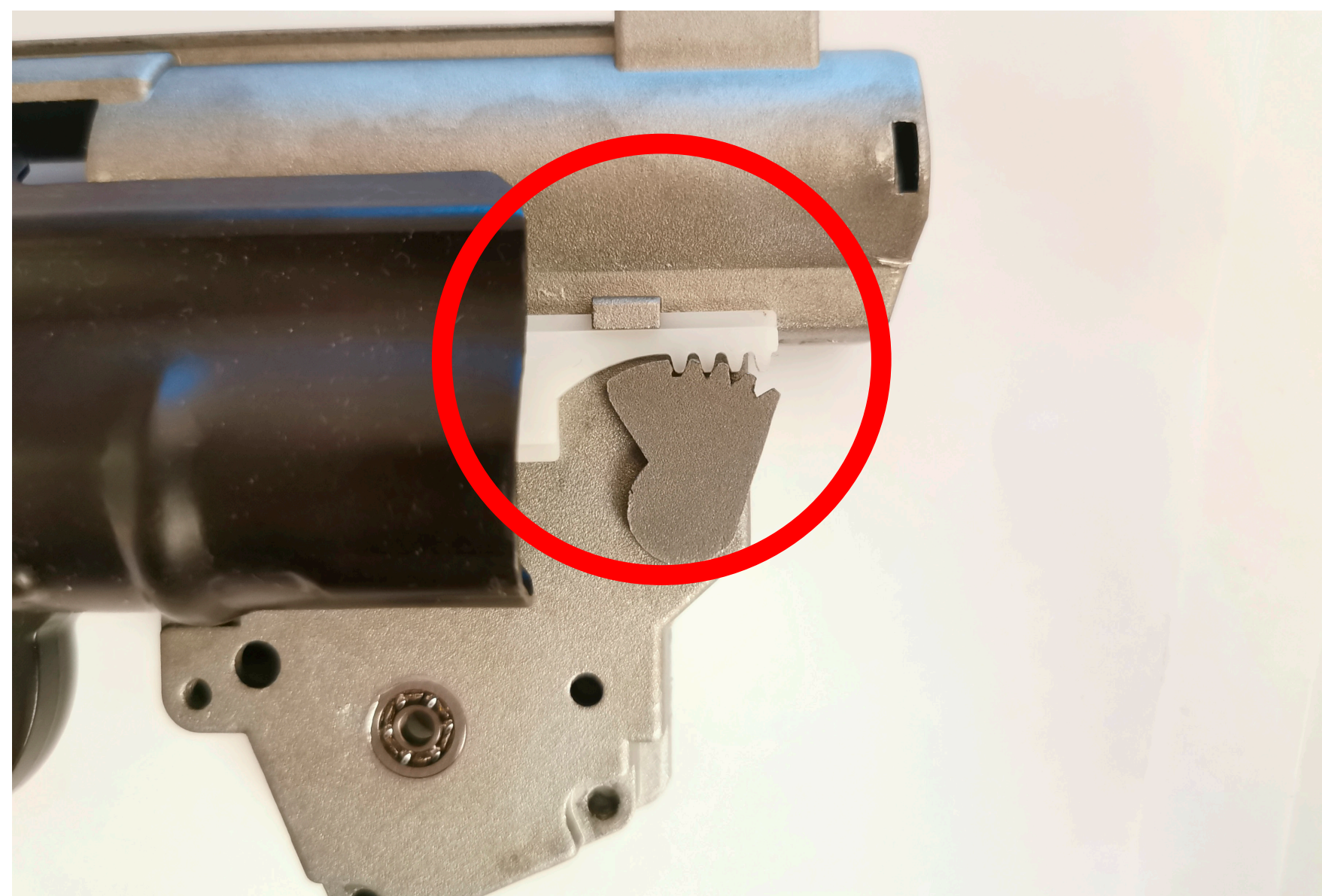
---

Arm-V  
Desire V3

## 33

Connect Desire V3 to the battery and USB adapter. Start the application, go to the sensors screen, and check the operation of all sensors.

Enter to the «Switch fire» and ensure that when the selector plate is in the far right position, the sensor readings are at the bottom of the scale. If you place the plate in the middle position, aligning the 'flag-gear' with the edge of the gearbox, the sensor readings should be no lower than 1/3 of the entire range.



ПРОВЕРКА  
DESIRE

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INSTALLATION OF  
DESIRE V3 INTO  
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NEW FUNCTION

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WARRANTY

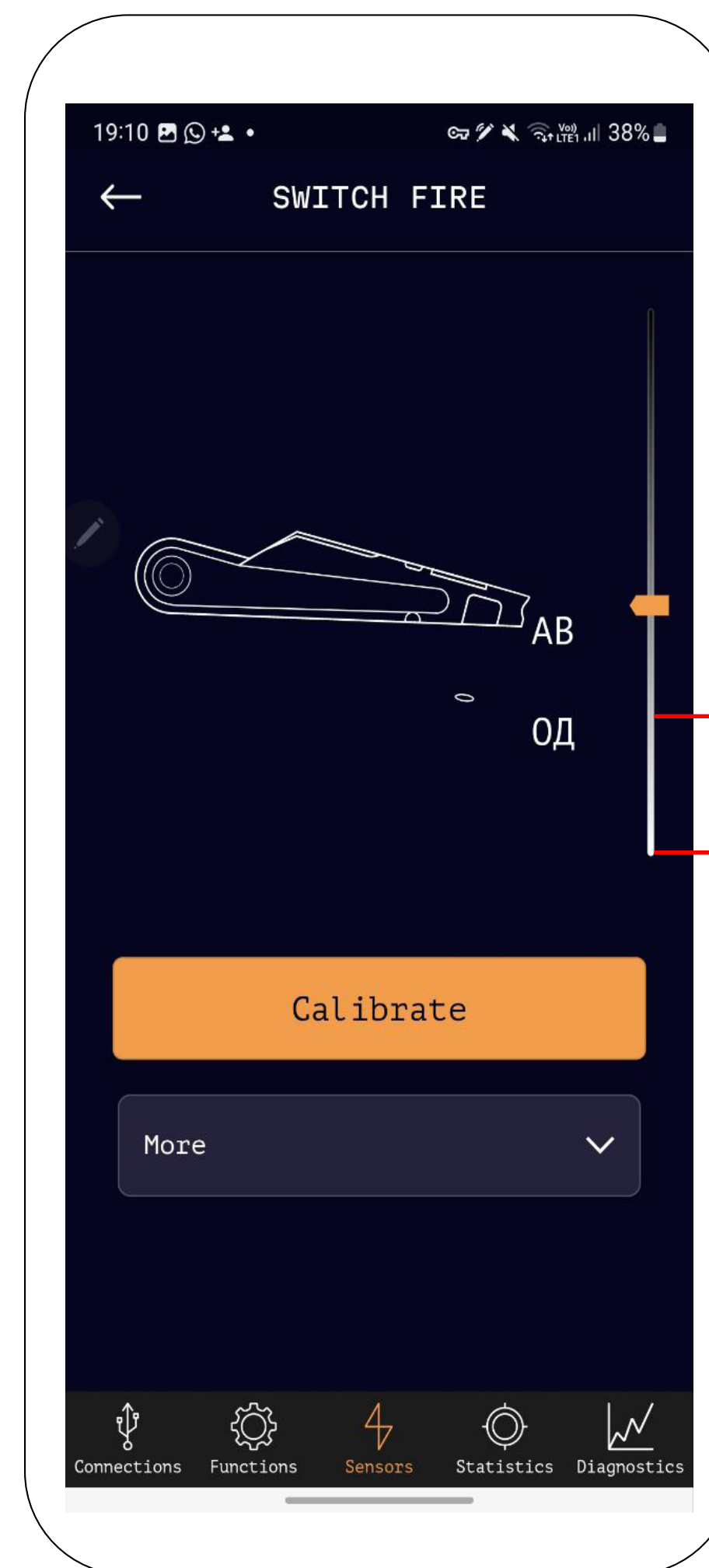
---

Arm-V  
Desire V3

# 34

If the readings are too low in the middle position but rise when you shift the plate to the left, you need to move the sticker to the left.

If the readings do not change, reduce unwanted reflection from the gearbox ends or selector plate using a black marker or paint.



The minimum required range of readings for proper and stable sensor operation.

ПРОВЕРКА  
DESIRE

INSTALLATION OF  
DESIRE V3 INTO  
GEARBOX

NEW FUNCTION

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Arm-V  
Desire V3

# 35

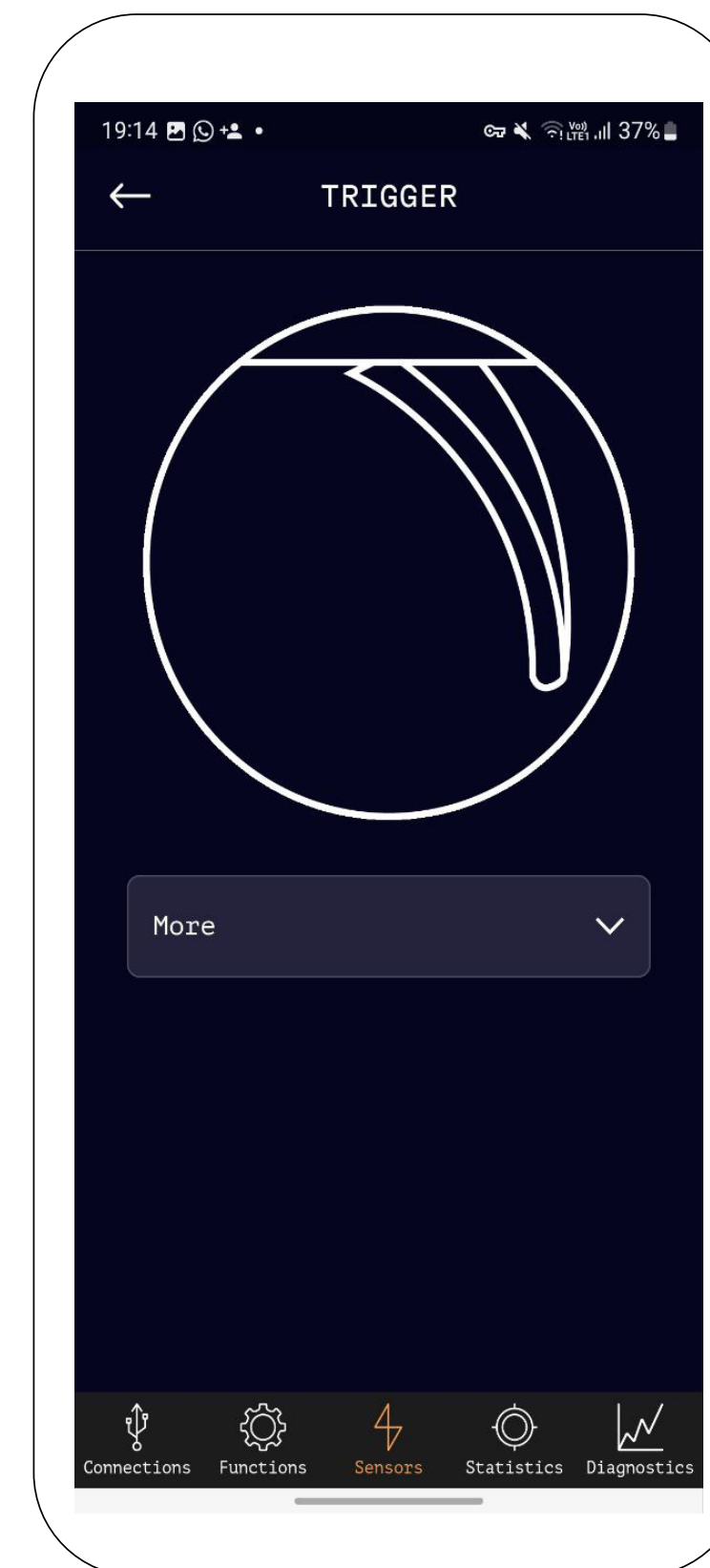
Go back to the sensors screen and navigate to the trigger sensor.

Press the trigger lever...



# 36

...and make sure that it's reflected in the program.



ПРОВЕРКА  
DESIRE

---

INSTALLATION OF  
DESIRE V3 INTO  
GEARBOX

---

NEW FUNCTION

---

WARRANTY

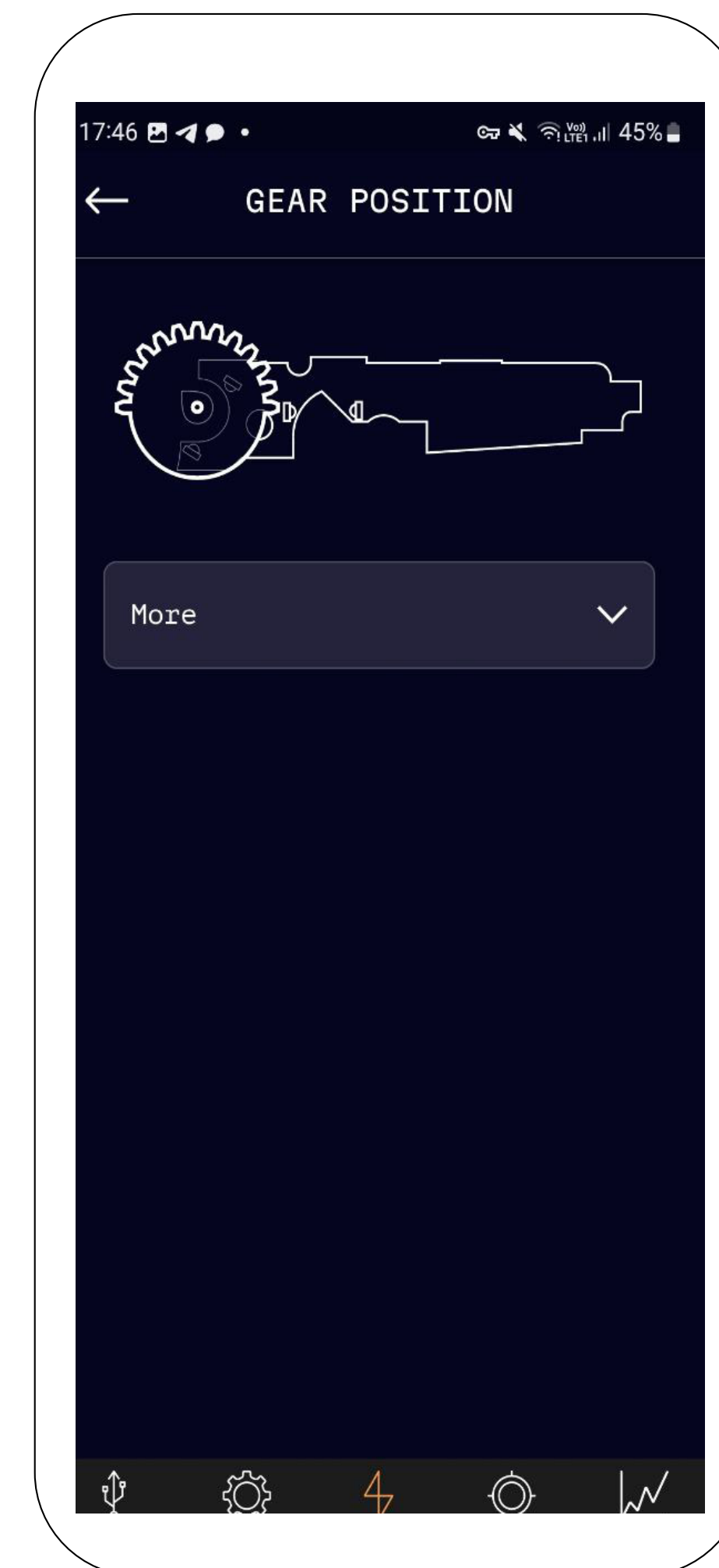
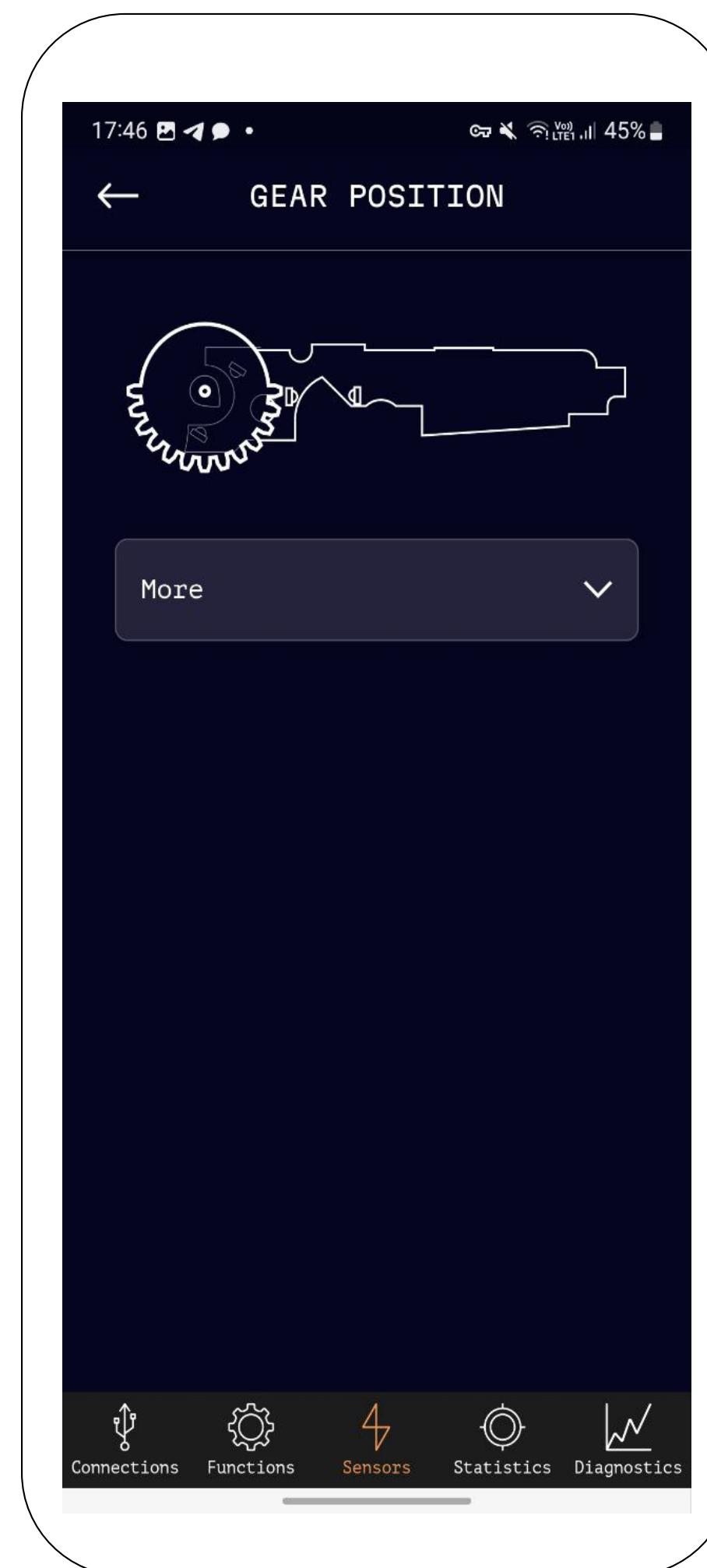
---

Arm-V  
Desire V3

# 37

Go back to the sensors screen and navigate to the «Gear position».

Rotate the sector gear through the cylinder window and ensure that the sensor registers in the program (the sensor might have only 2 positions, it won't display smooth rotation).





ПРОБЕРКА  
DESIRE

INSTALLATION OF  
DESIRE V3 INTO  
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NEW FUNCTION

WARRANTY

Arm-V  
Desire V3

# 38

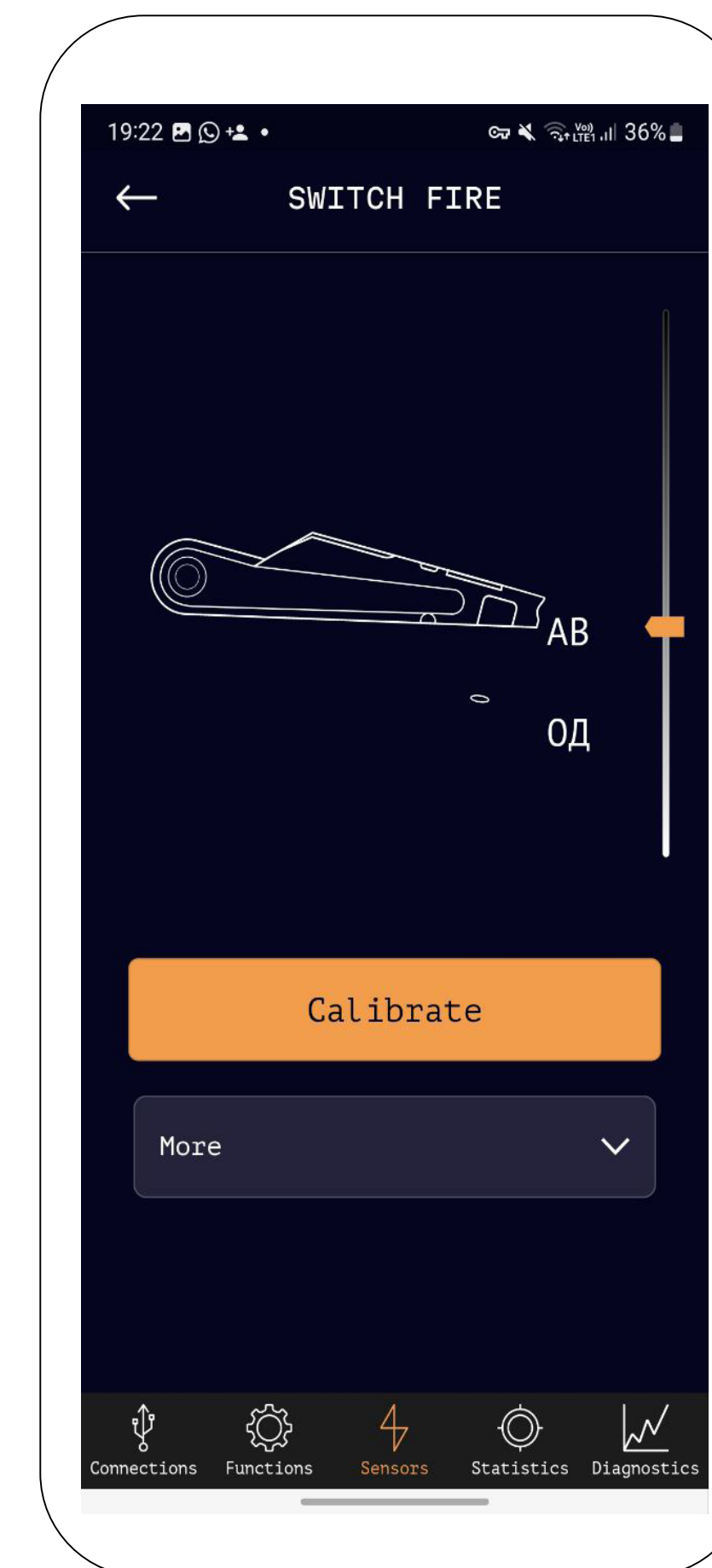
Next, assemble the gearbox by installing all the remaining parts except for the contact group, the single-fire cut-off lever, and its spring. They won't be needed anymore.



# 39

After fully assembling the gearbox, connect it to your smartphone, go to the sensors screen, and enter the «Switch fire.»

Press the 'Calibrate' button.



ПРОВЕРКА  
DESIRE

INSTALLATION OF  
DESIRE V3 INTO  
GEARBOX

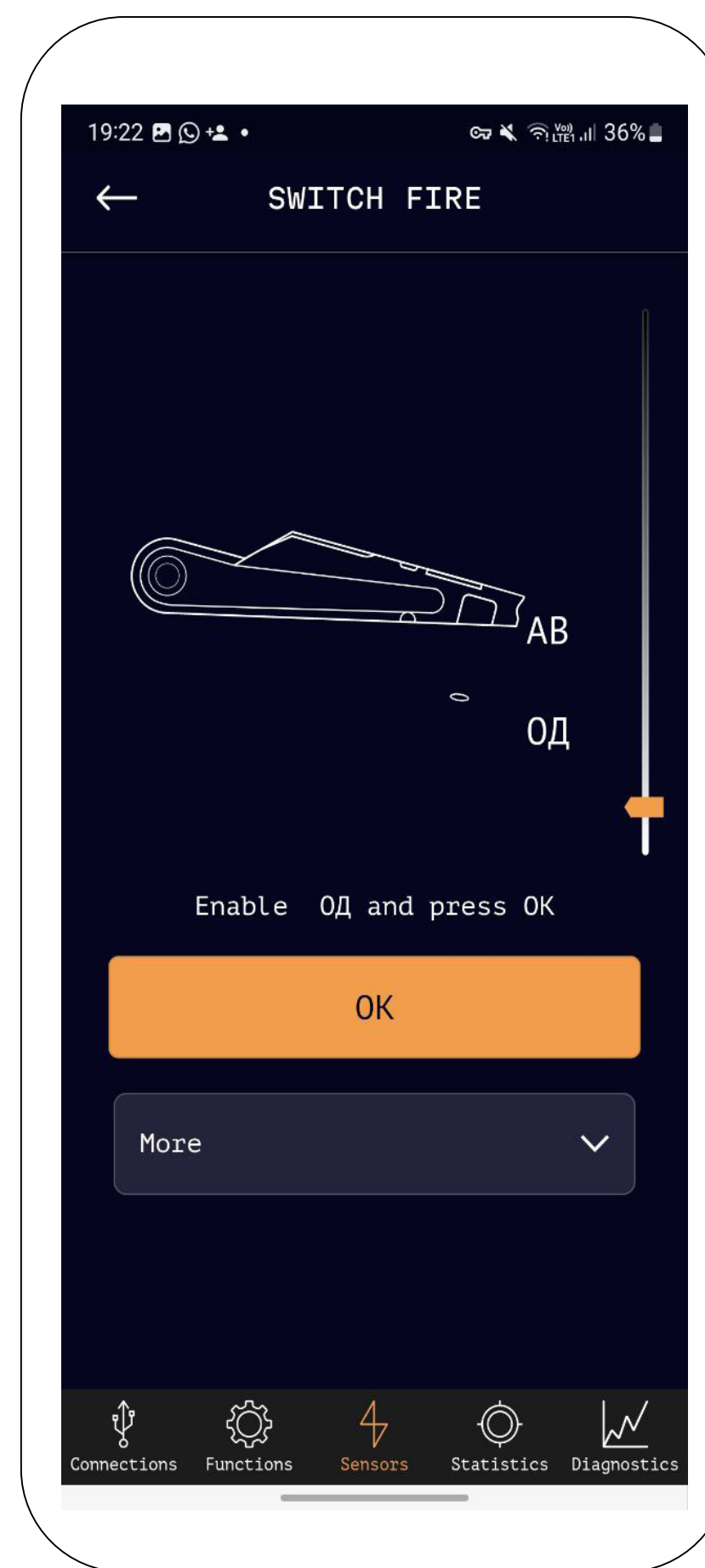
NEW FUNCTION

WARRANTY

Arm-V  
Desire V3

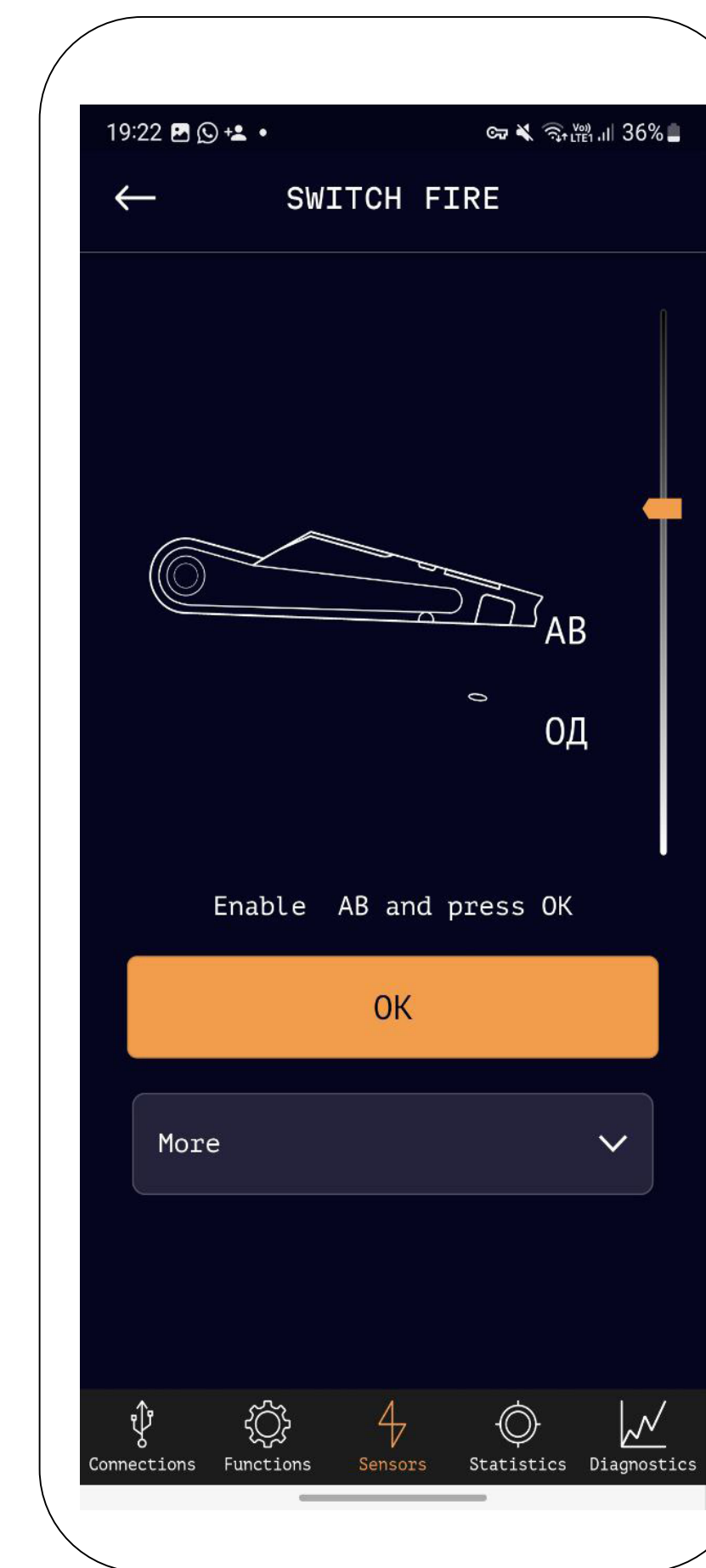
40

Switch the gearbox to single-fire mode and press 'OK'.



41

Switch the gearbox to full-auto mode and press 'OK'.



ПРОВЕРКА  
DESIRE

---

INSTALLATION OF  
DESIRE V3 INTO  
GEARBOX

---

NEW FUNCTION

---

WARRANTY

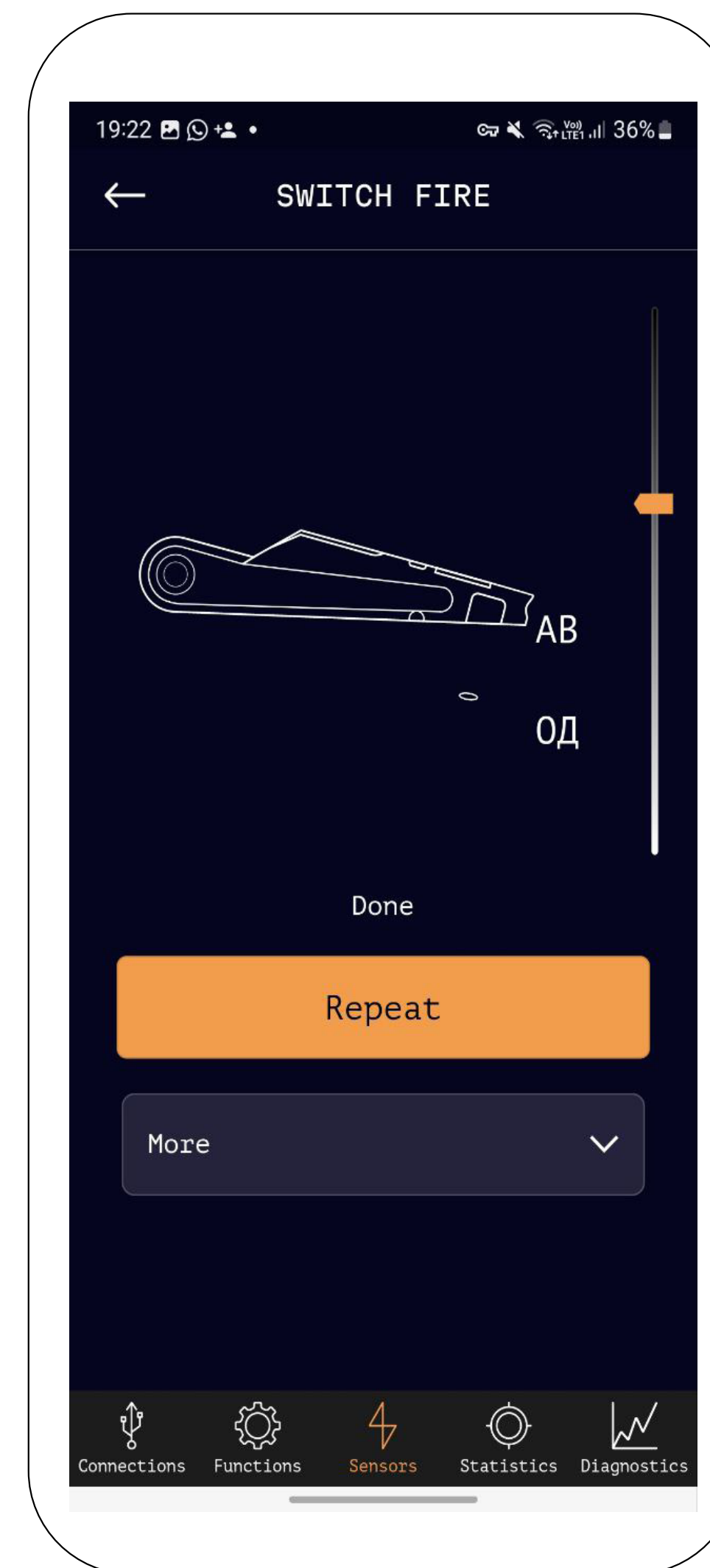
---

**Arm-V**  
**Desire V3**

# 42

Calibration is complete, the fire modes in the program should now switch just like on your gearbox.

The safety mode won't be displayed in the program; it's mechanical.



ПРОВЕРКА  
DESIRE

---

INSTALLATION OF  
DESIRE V3 INTO  
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---

NEW FUNCTION

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WARRANTY

---

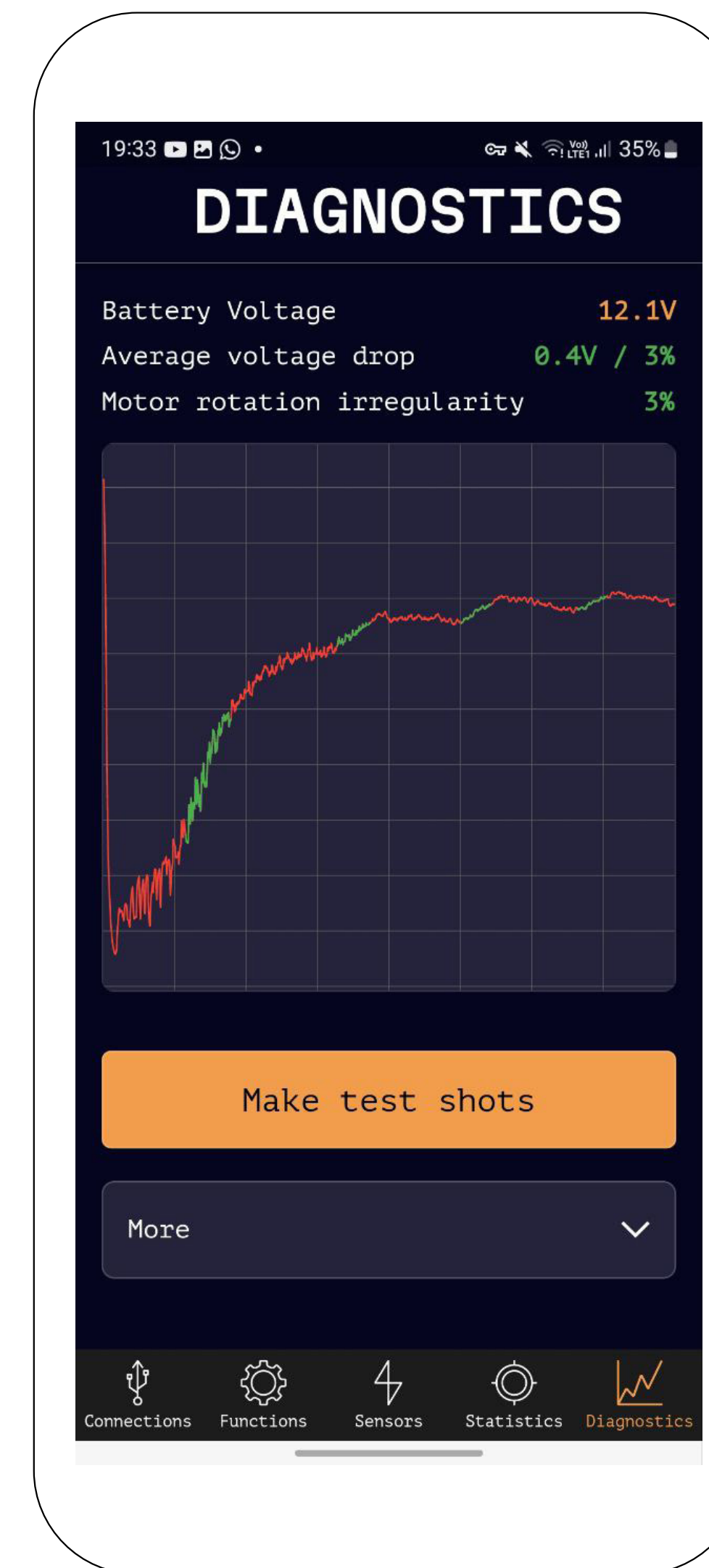
Arm-V  
Desire V3

## 43

Navigate to the diagnostics screen and press the 'Make test shots' button. A graph will be generated.

This graph represents the voltage of your battery during motor operation. When the spring is being compressed, the load increases, causing the voltage to drop. After the shot, the load on the motor decreases, and the voltage will rise again. Changes in load should be smooth. If you see significant jumps on the graph, it's recommended to check the positions of your gears and motor.

The green segments on the graph represent the moments when the gear sensor activates. They should resemble the example provided.



ПРОВЕРКА  
DESIRE

---

INSTALLATION OF  
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NEW FUNCTION

---

WARRANTY

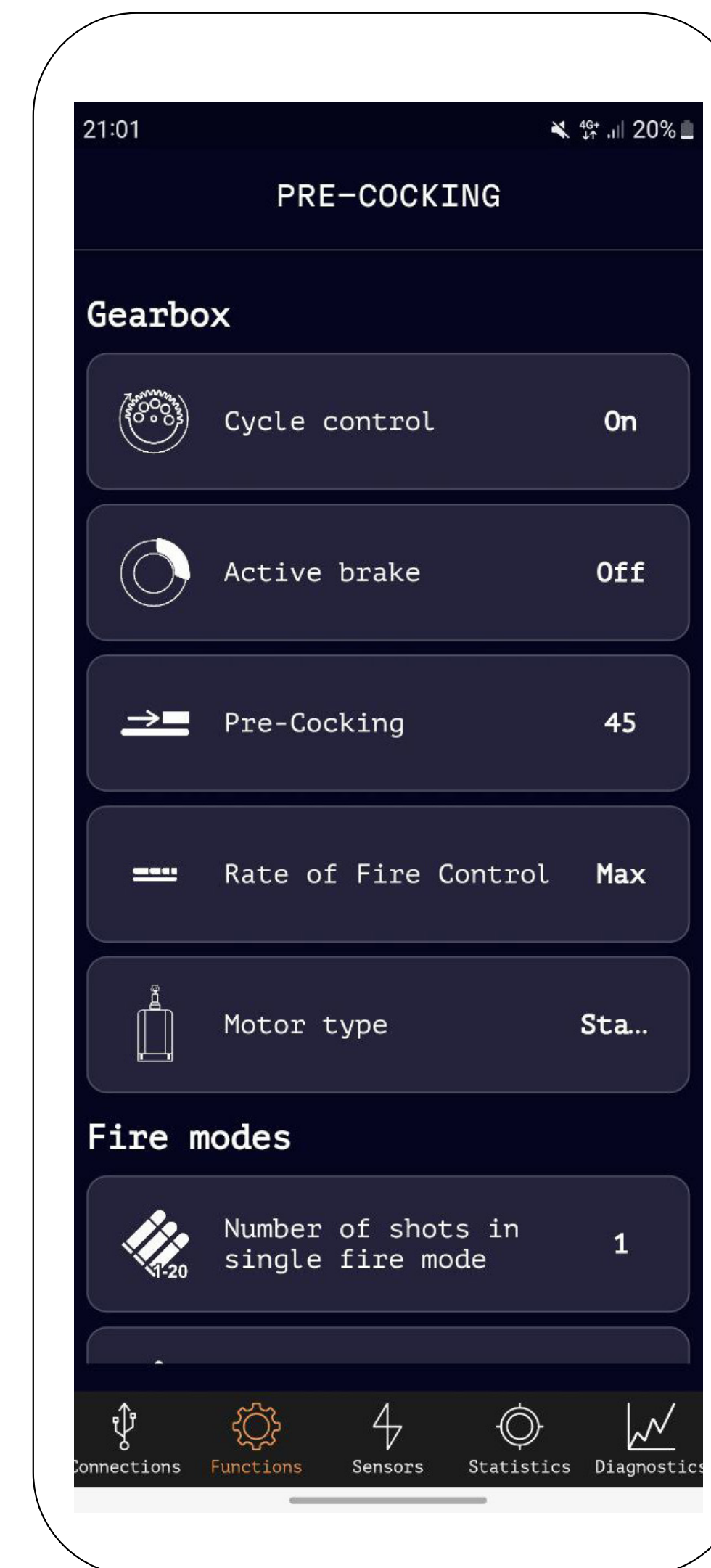
---

Arm-V  
Desire V3

# 44

After the gearbox is fully assembled and tested, you can proceed to configure the new features that have been added to your gearbox. The first few functions are aimed at optimizing the gearbox performance by minimizing the delay between trigger pull and shot, as well as ensuring maximum stability. For visual guidance, follow these steps:

Open the 'Functions' screen.



ПРОВЕРКА  
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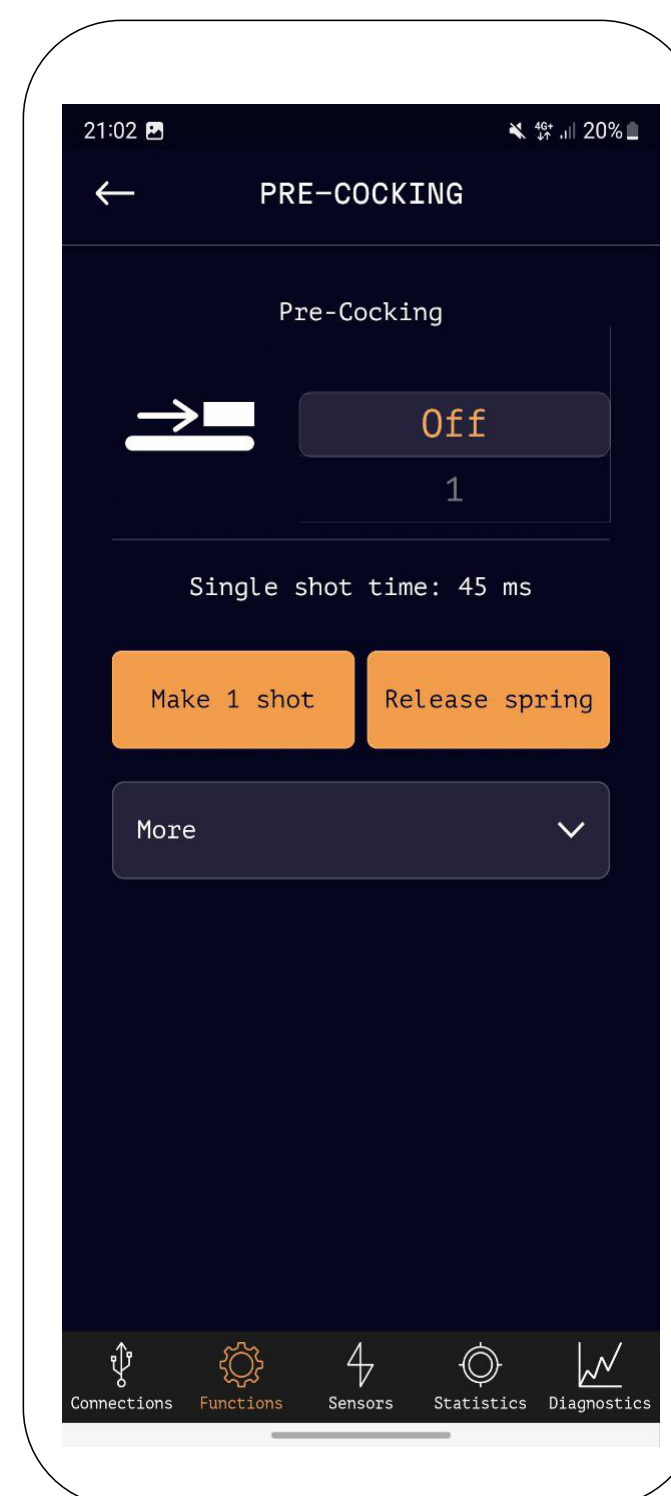
Arm-V  
Desire V3

## 45

Navigate to the 'Pre-cocking' screen and set it to 'Off'.

Press the 'Make 1 shot' button several times and observe the delay time for the first shot.

Because motor inertia is variable (the number of rotations it makes after voltage is removed), the delay time for the first shot will differ significantly from shot to shot.

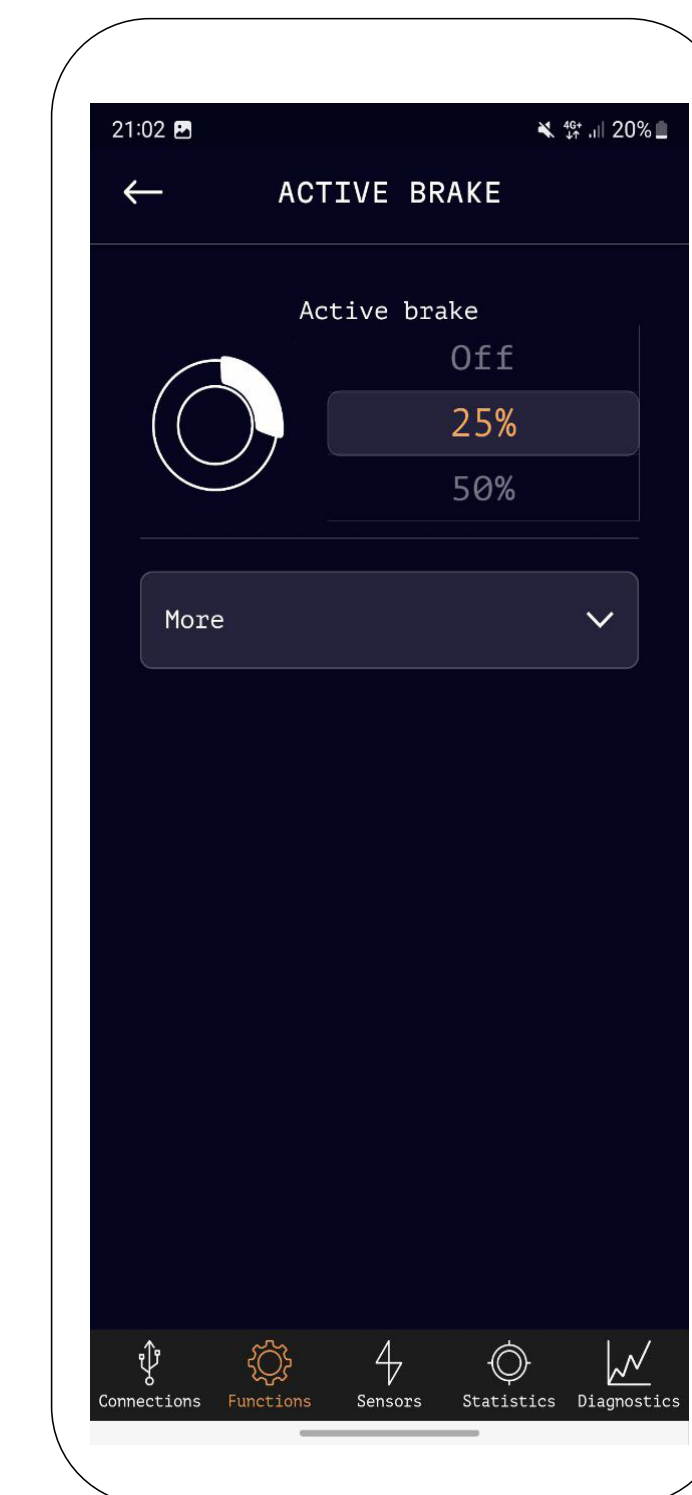


## 46

Now, go back to the 'Functions' screen and enter the 'Active Brake' setting. Enable it at 25%.

This function eliminates motor inertia. If you experienced more than 1 shot in the previous step, you might want to set a higher value for the active brake, but keep in mind that active brake adds heat to the motor.

If your playing style involves around 300-400 single shots in 2 minutes, it's better to disable the active brake.



ПРОБЕРКА  
DESIRE

INSTALLATION OF  
DESIRE V3 INTO  
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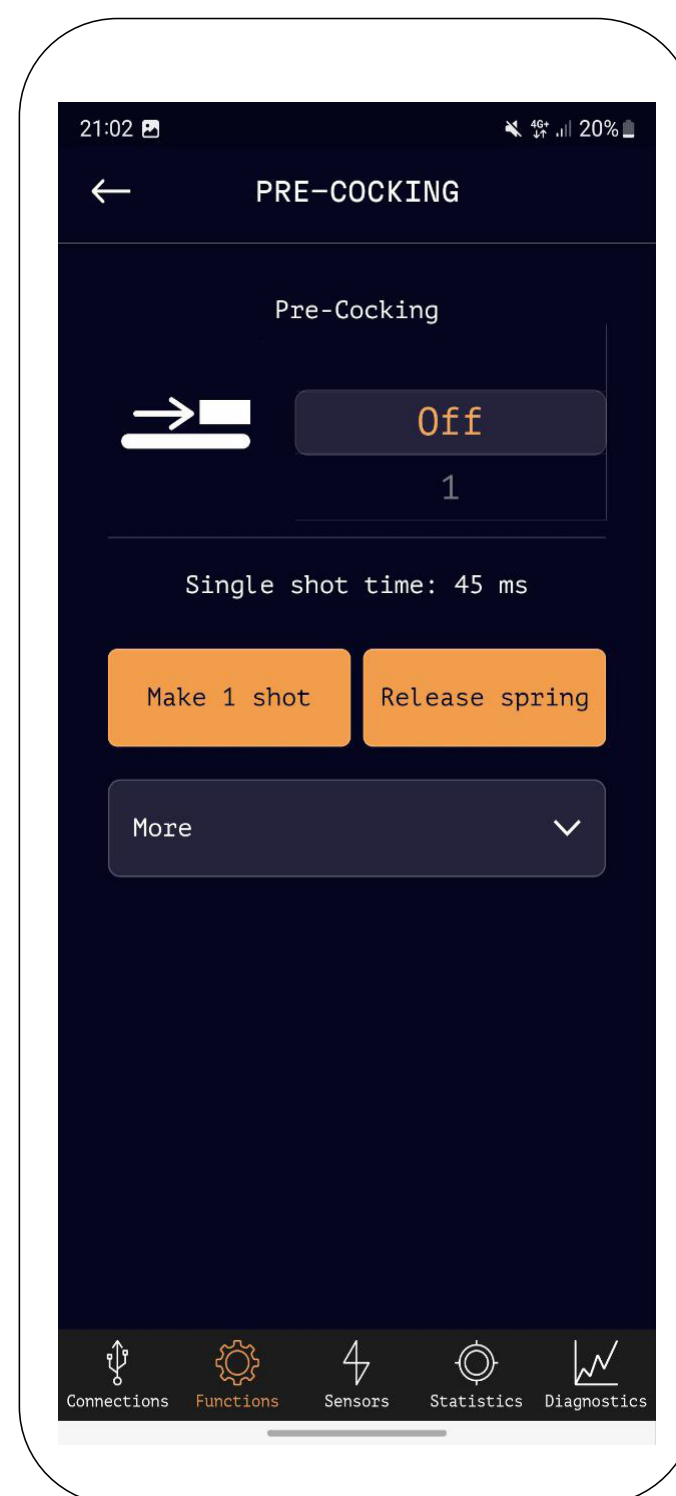
NEW FUNCTION

WARRANTY

Arm-V  
Desire V3

# 47

Go back to the 'Pre-cocking' settings and once again press the 'Make 1 shot' button several times. Observe the delay time for the first shot. It has increased but should now be stable.

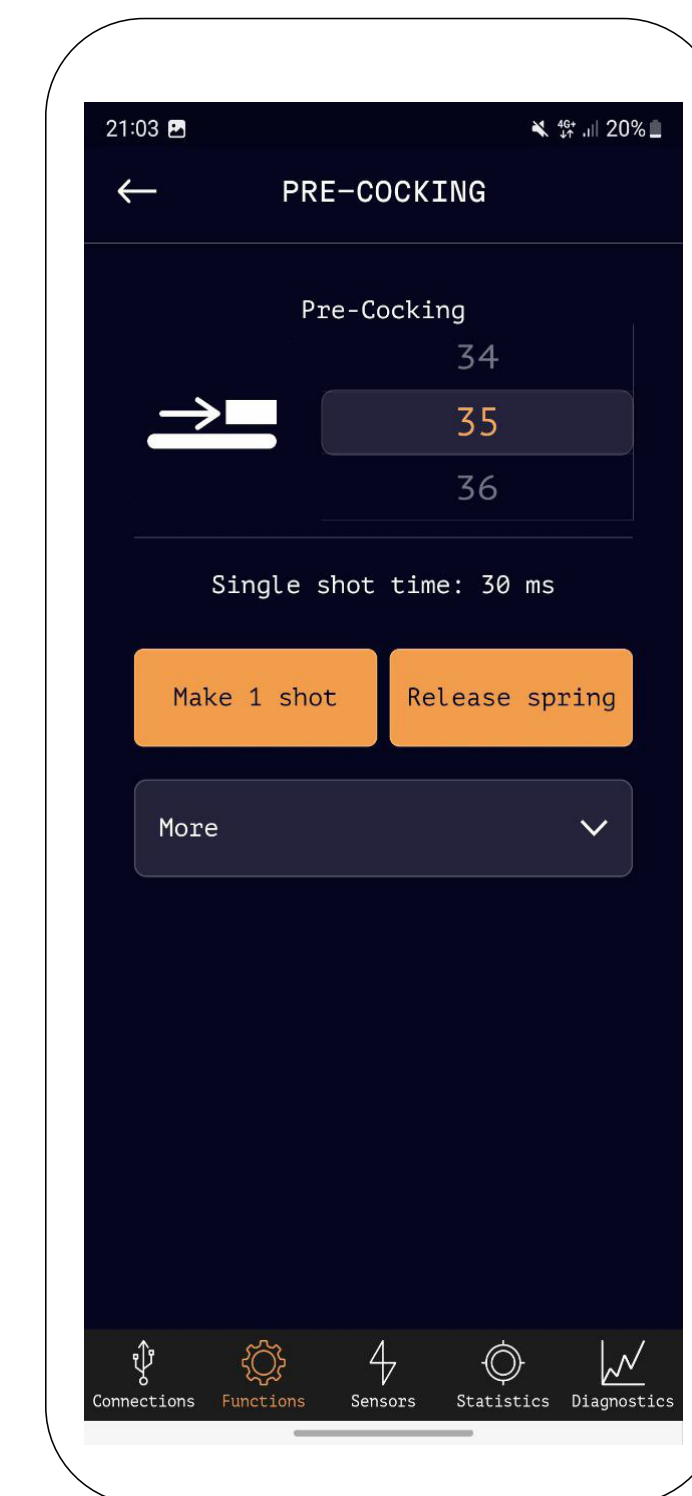


# 48

Now gradually increase the pre-cocking value and test by pressing the 'Make 1 shot' button. Observe how the delay time for the first shot decreases.

If the precocking value becomes too high, you might experience double shots. Desire V3 will automatically reduce the precocking value with each shot until single shots are achieved.

If you were getting double shots at the beginning when active brake was off, you don't need to enable precocking.



ПРОВЕРКА  
DESIRE

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INSTALLATION OF  
DESIRE V3 INTO  
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NEW FUNCTION

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Arm-V  
Desire V3

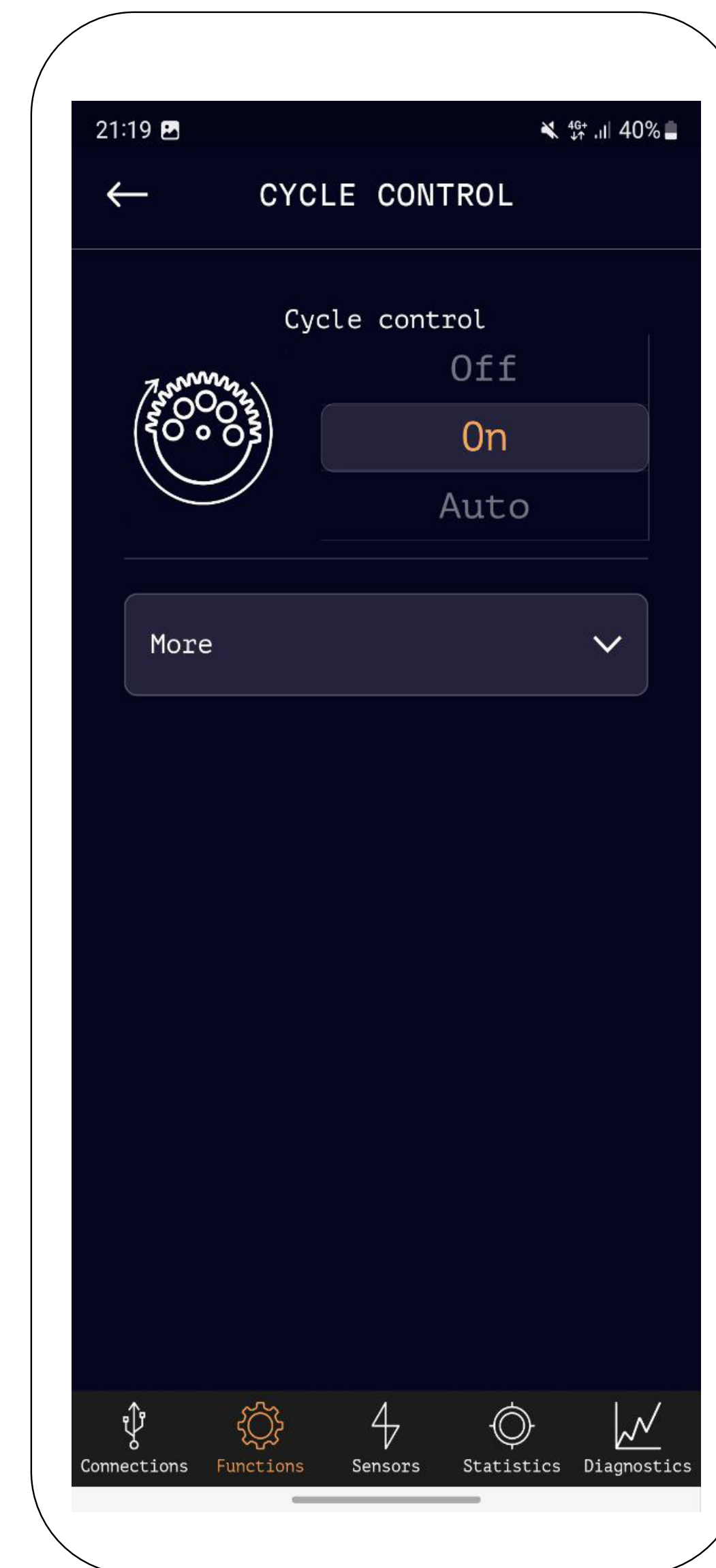
## 49

Once you understand the purpose of active brake and pre-cocking, you can proceed to configuring the Cycle Control function.

If Cycle Control is turned off, the motor will stop immediately after releasing the trigger, resulting in an arbitrary firing cycle state.

If Cycle Control is turned on, after releasing the trigger, Desire V3 will complete the firing cycle and stop the piston exactly at the desired position. If in single-fire mode there are more than one shot due to motor inertia, Desire V3 will automatically reduce the precocking value and then increase the active brake power to achieve stable single shots.

If Cycle Control is set to Auto, Desire V3 will adjust the active brake and precocking settings on each trigger pull to achieve the fastest response time. In this case, there might be a few double shots in the first 5 shots after turning on the system.





ΠΡΟΒΕΡΚΑ  
DESIRE

INSTALLATION OF  
DESIRE V3 INTO  
GEARBOX

NEW FUNCTION

WARRANTY

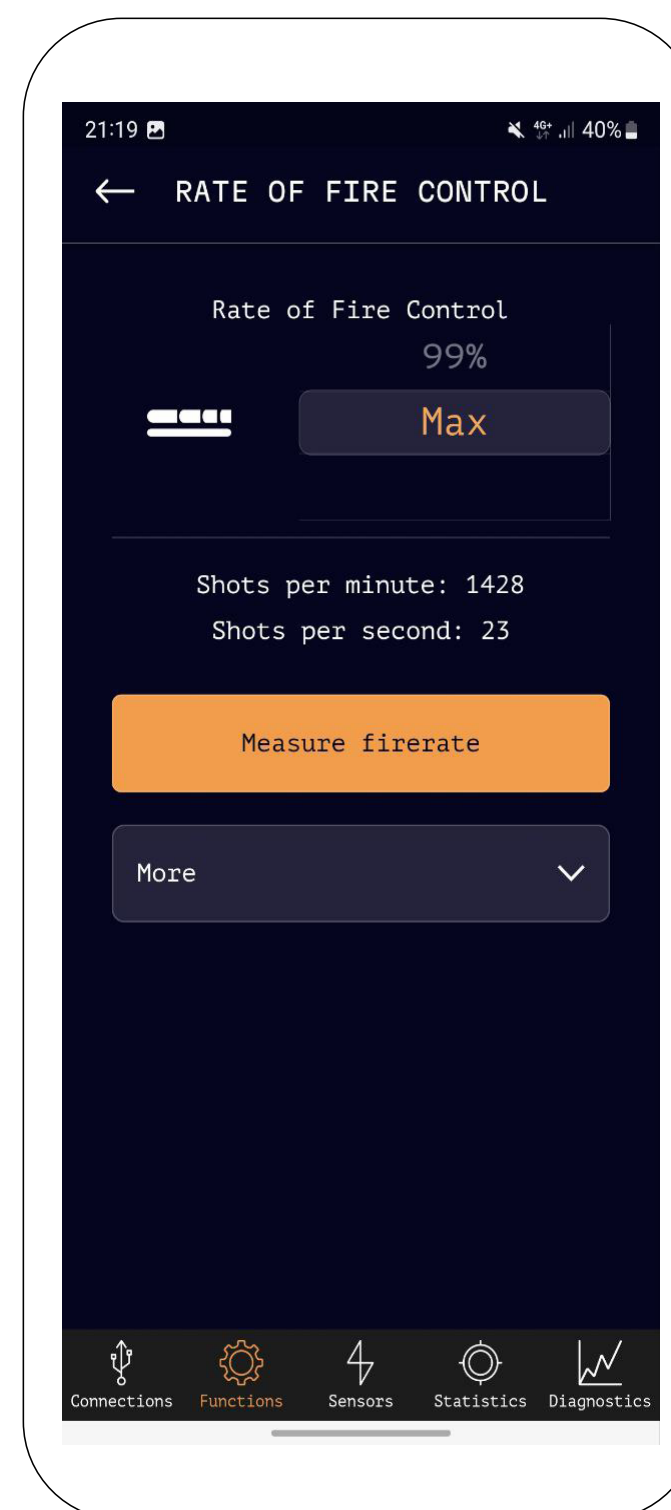
Arm-V  
Desire V3

## 50

The last function that affects gearbox performance is Rate of Fire Control.

The maximum rate of fire is determined by the mechanics of your gearbox. By pressing the 'Measure Firerate' button, the gearbox will perform 10 shots and provide you with the results. If this value is higher than what you need, you can lower it.

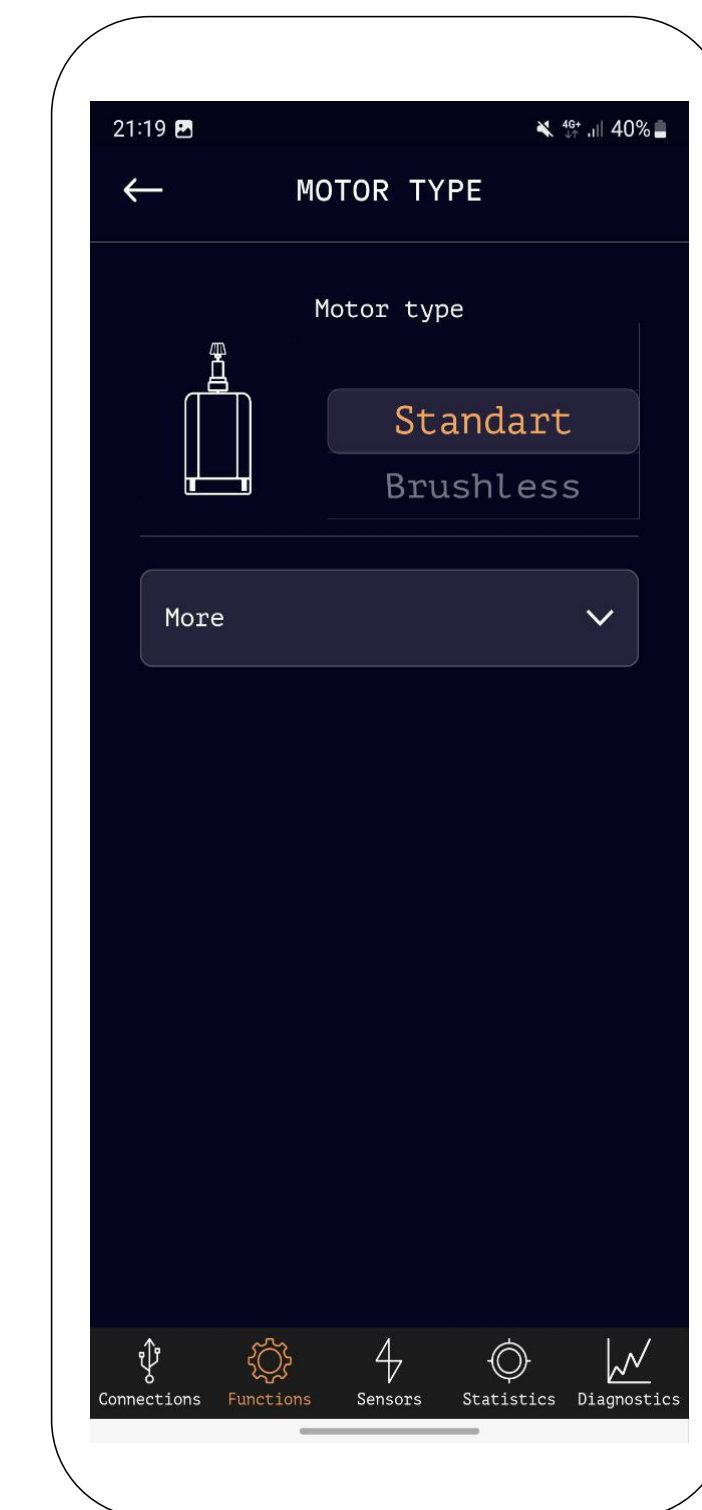
It's not recommended to use this function with high-speed motors due to their inherent overload and increased heating.



## 51

If you are using a brushless motor, you must select this motor type in the corresponding function.

This will disable certain Desire functions that are not supported by the motor's own electronics.



ПРОВЕРКА  
DESIRE

INSTALLATION OF  
DESIRE V3 INTO  
GEARBOX

NEW FUNCTION

WARRANTY

Arm-V  
Desire V3

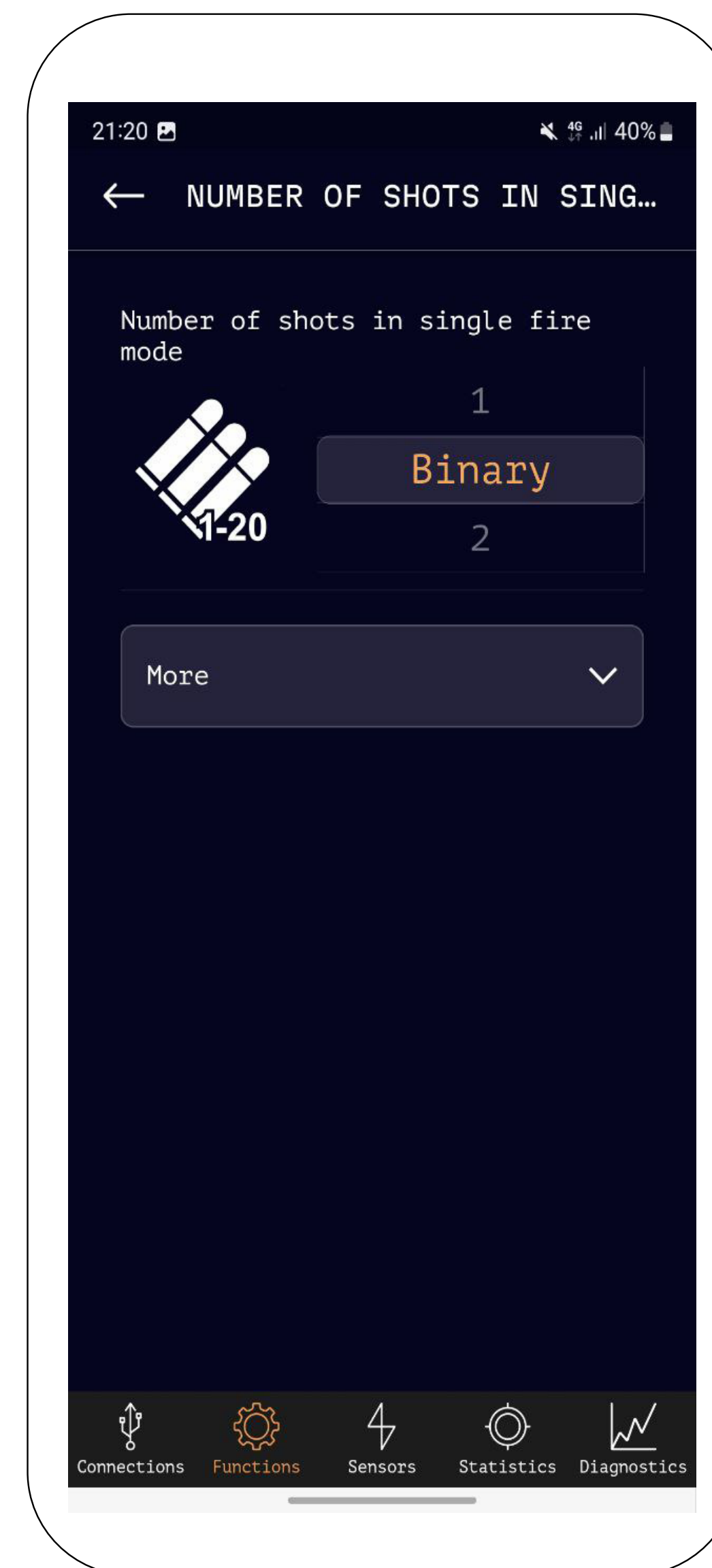
## 52

The next functions control the firing modes.

Previously, your gearbox had the safety mode, single-fire mode, and full-auto mode. Now you can replace any of them with a short burst, completely disable burst mode, or limit it to just one shot. You can also set up two burst values and switch between them by holding the trigger for a few seconds after the cutoff is triggered.

You can activate Burst mode and set, for example, a value of 3. Go to the sensors screen, open the fire mode switch sensor, switch the fire mode switch from single-fire to full-auto and back quickly. Instead of single-fire mode, Burst mode will activate.

The Binary value means that the gearbox will fire one shot upon pressing the trigger and another shot upon releasing it, effectively doubling your perceived rate of fire.



ПРОВЕРКА  
DESIRE

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INSTALLATION OF  
DESIRE V3 INTO  
GEARBOX

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NEW FUNCTION

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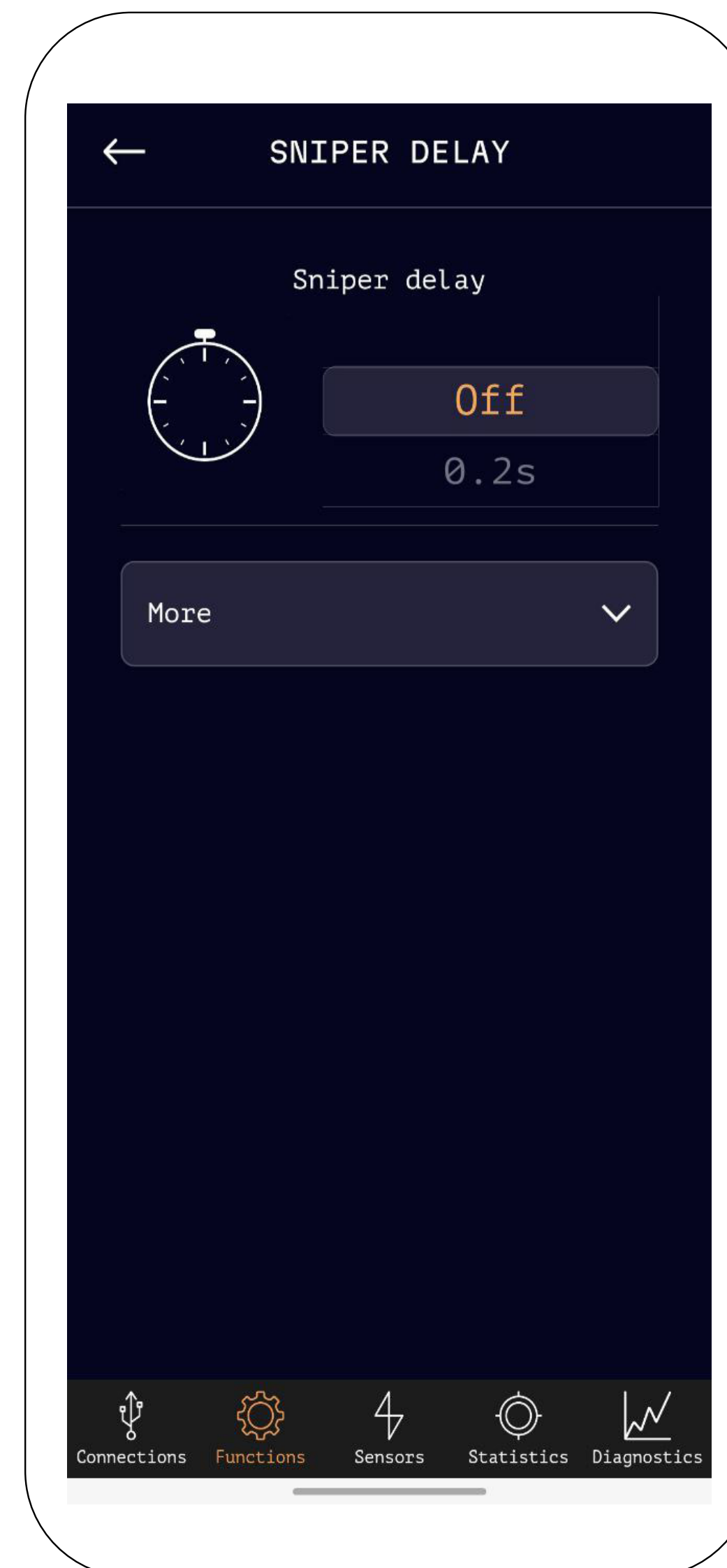
WARRANTY

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Arm-V  
Desire V3

# 53

Sniper delay is necessary for artificially reducing the maximum rate of fire with single shots, simulating manual bolt action on rifles. This function is often required to meet regulations in certain games where high muzzle velocity is present.



ПРОВЕРКА  
DESIRE

INSTALLATION OF  
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NEW FUNCTION

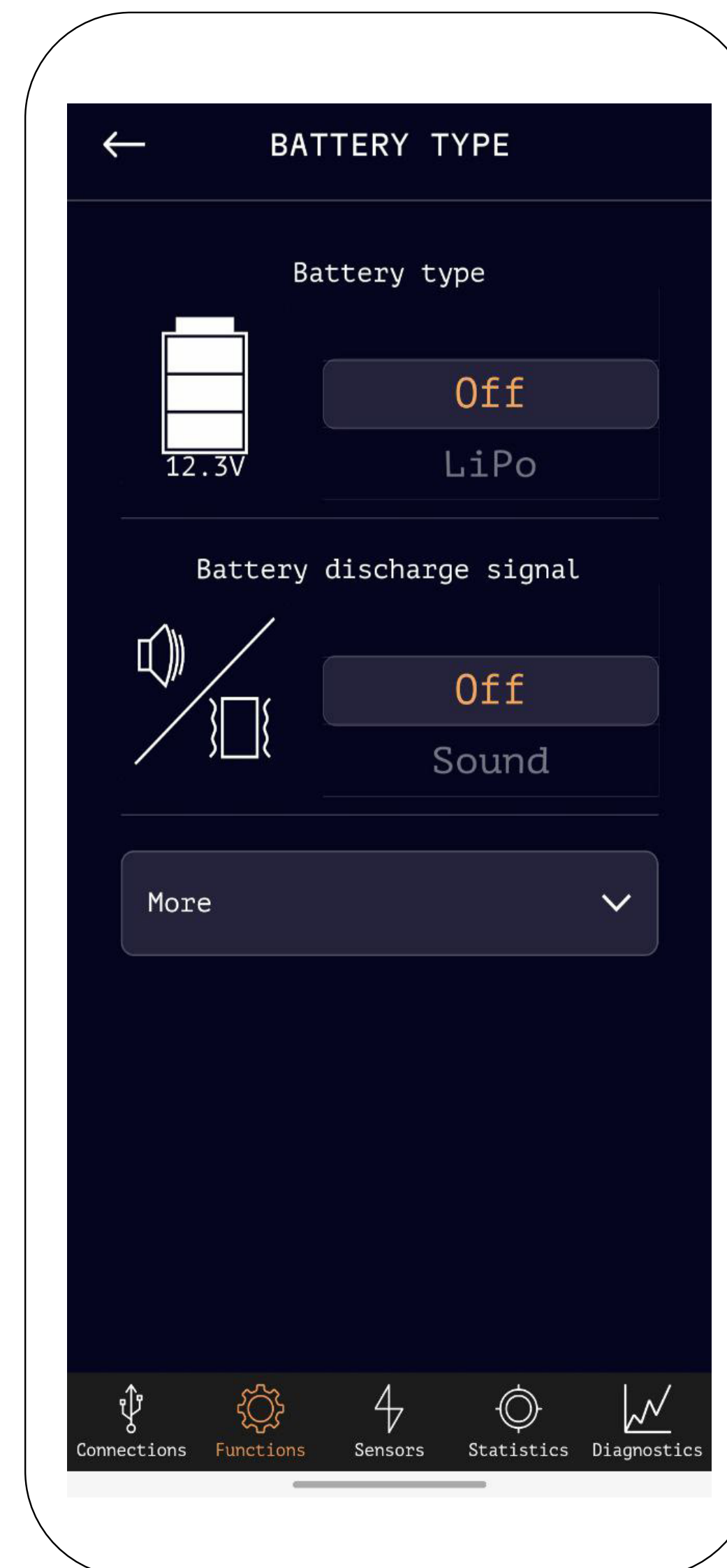
WARRANTY

Arm-V  
Desire V3

# 54

Choose the battery type so that Desire can monitor its charge, provide warnings when the charge level is nearing critical, and prevent firing when the charge becomes critically low to avoid battery degradation.

Please note that this function doesn't negate Desire's own power consumption. Remember to disconnect Desire from the battery after use to prevent complete battery discharge.



ПРОВЕРКА  
DESIRE

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INSTALLATION OF  
DESIRE V3 INTO  
GEARBOX

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NEW FUNCTION

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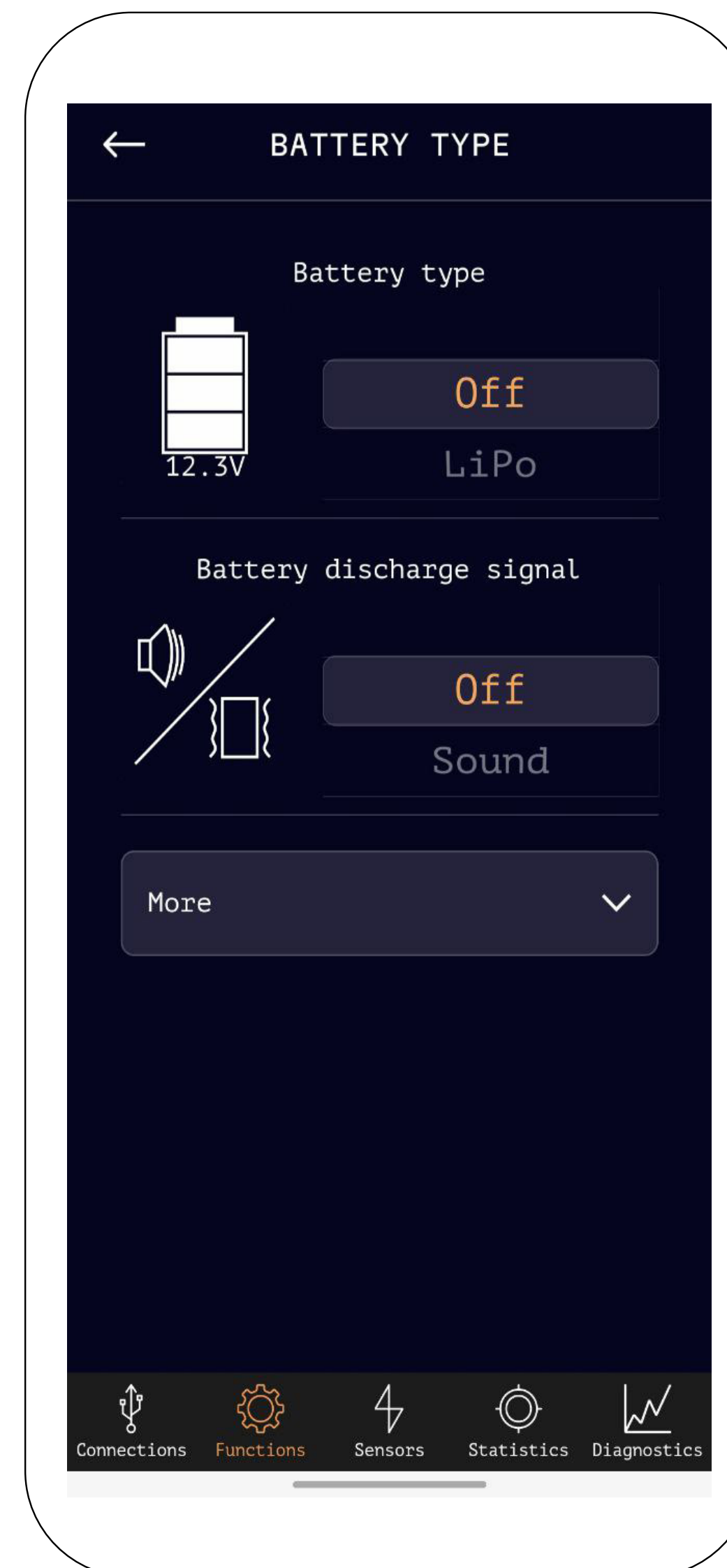
WARRANTY

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Arm-V  
Desire V3

# 55

Select the battery type so that Desire can monitor its charge, warn you when the charge level approaches critical, and prevent firing when the charge becomes critically low, preventing battery degradation. Please note that this function doesn't negate Desire's own power consumption. Remember to disconnect it from the battery after use to prevent complete battery discharge.



ПРОВЕРКА  
DESIRE

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INSTALLATION OF  
DESIRE V3 INTO  
GEARBOX

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NEW FUNCTION

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WARRANTY

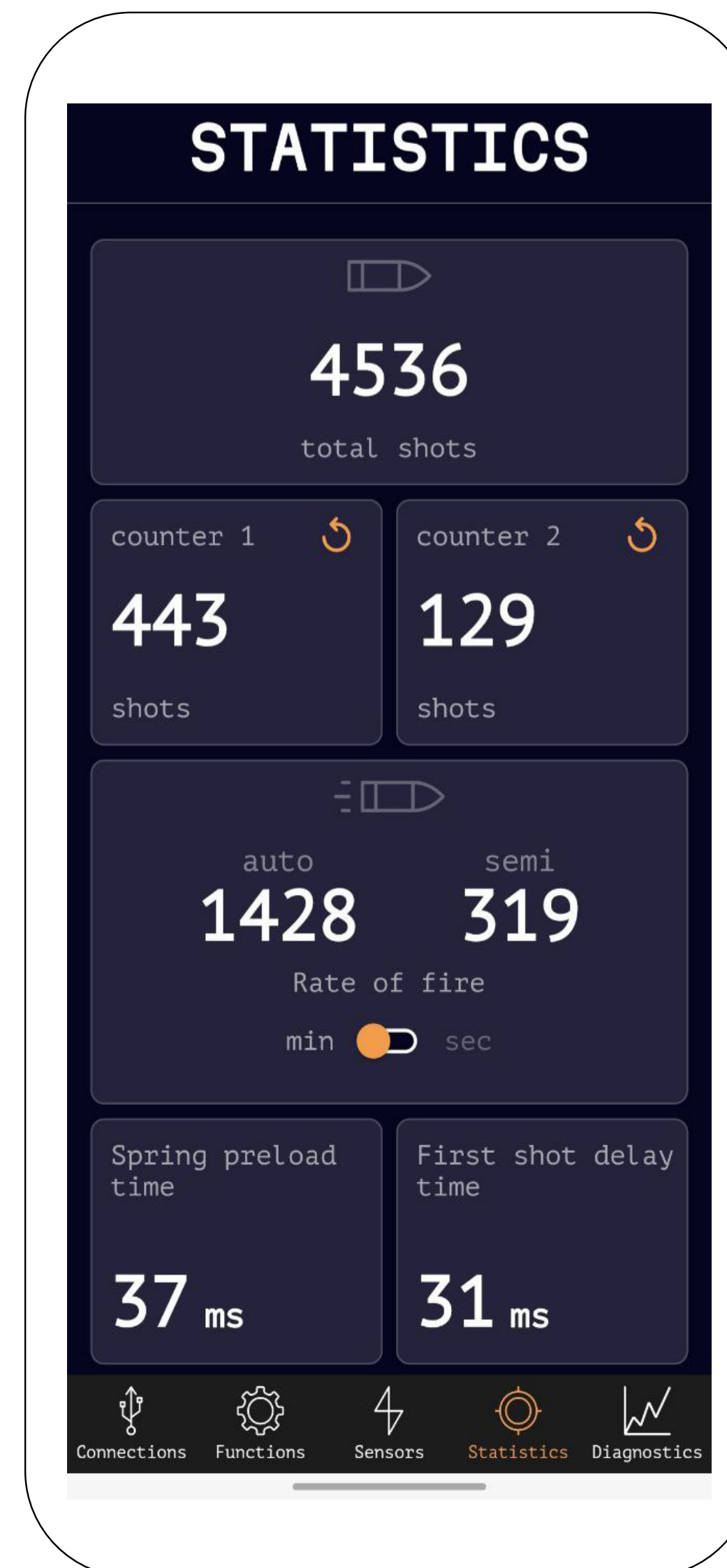
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Arm-V  
Desire V3

# 56

On the statistics screen, you will find 3 shot counters.

The first one is cumulative and cannot be reset. You can reset the readings of the next two, for instance, at the beginning of a season and before each game.



ПРОВЕРКА  
DESIRE

INSTALLATION OF  
DESIRE V3 INTO  
GEARBOX

NEW FUNCTION

WARRANTY

Arm-V  
Desire V3

## 57

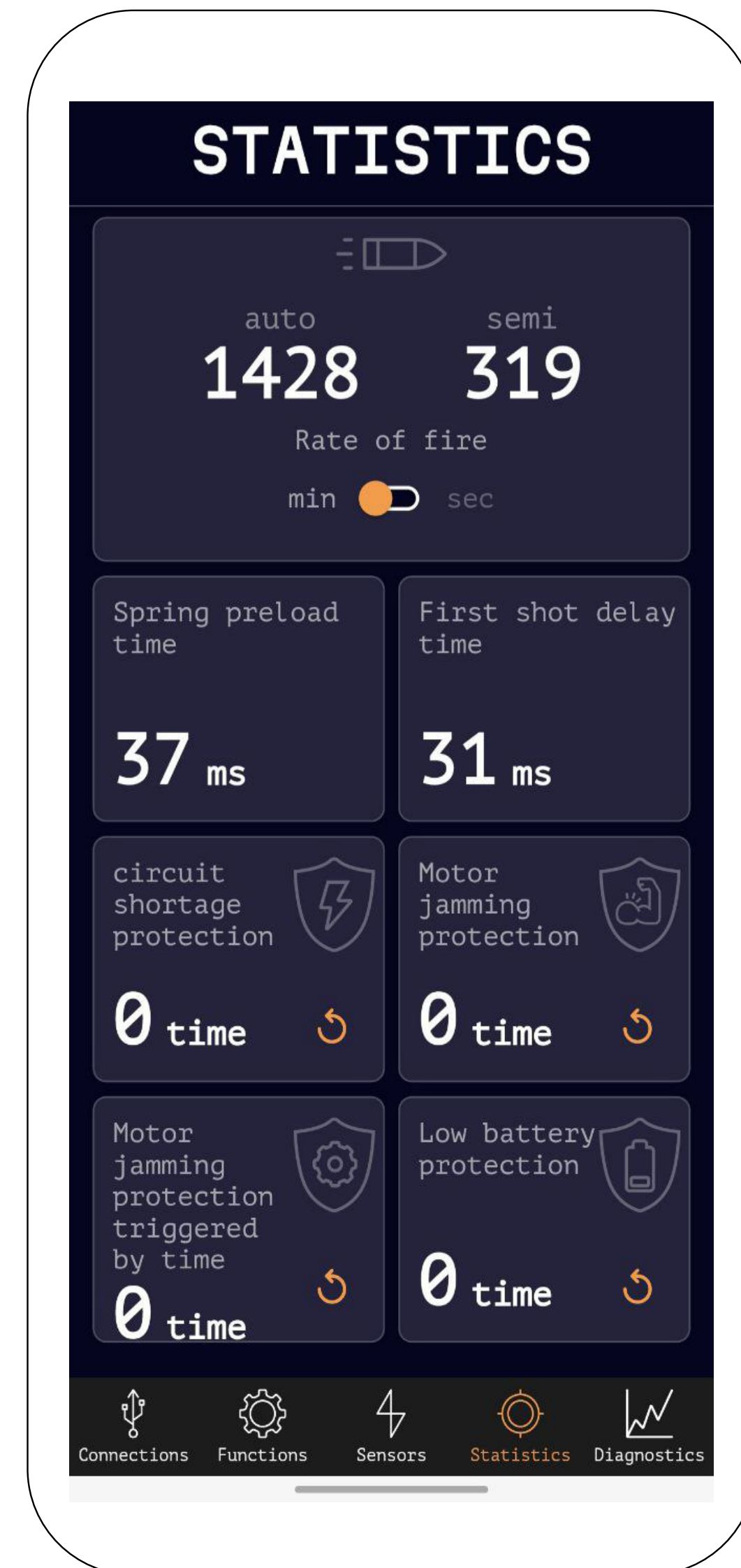
Next, in the statistics section, you will find information about the rate of fire. You can measure it both in automatic firing mode by making a burst longer than 10 shots, and in single-shot mode by firing more than 5 single shots. After the rate of fire, you will see values for pre-cocking spring, first-shot delay time, and 4 protection counters:

Short-circuit protection replaces the fuse. It triggers when the current exceeds 200A. The protection is analog and cannot be disabled.

Motor jamming protection monitors whether the motor starts rotating. If the load on the motor does not decrease during the time required for the gearbox to complete a full cycle, the motor will be turned off to prevent overheating of the motor and battery.

Time-based motor jamming protection monitors whether the gears are rotating. If, within the time required for about  $\pm 3$  shots, the gear sensor does not detect any gear rotation, the motor will be turned off.

Low battery protection triggers when attempting to fire with a critically low battery level (only if the battery type is selected).



ПРОВЕРКА  
DESIRE

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INSTALLATION OF  
DESIRE V3 INTO  
GEARBOX

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NEW FUNCTION

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WARRANTY

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**Arm-V**  
**Desire V3**

## 58

If less than 2 weeks have passed since the purchase and a defect was discovered during the product inspection before installation into the gearbox (i.e., the product is new and shows no signs of installation), you can contact the store where the product was purchased for a replacement.

If the defect arises within 12 months from the purchase date (with a receipt) or within 12 months from the manufacturing date (without a receipt), you can contact Arm-V for warranty repair. Contact information is provided on the [arm-v.ru](http://arm-v.ru) website.