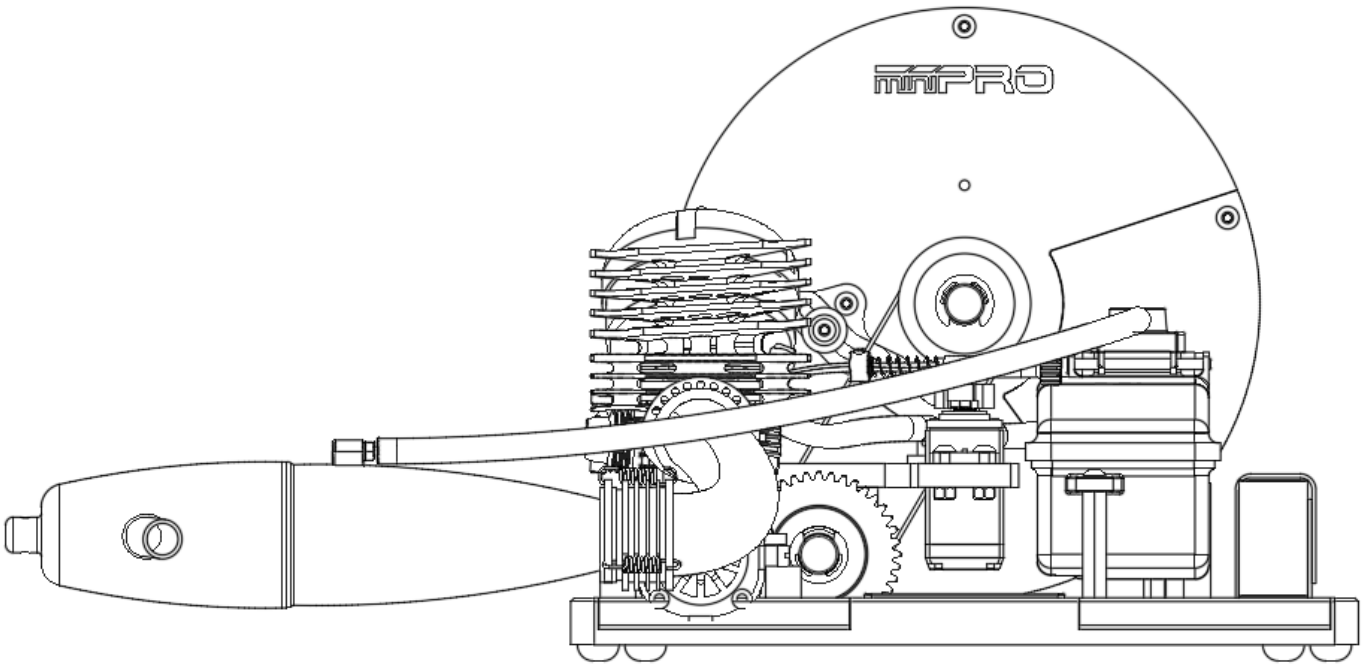
MINIPRO® R/C INERTIA MOTOR DYNO

ASSEMBLY GUIDE

REVISION 1.1



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Email: info@miniprousa.com
Website: www.minipro.com

SAFETY PRECAUTIONS

1. This is not a toy. This product is intended for people aged 18 years and older with previous experience building and operating Radio Control (R/C) equipment.
2. Make sure that dynamometers and motors under test are equipped with appropriate safety guards.
3. Make sure that all electronic products are earth grounded.
4. Do not exceed dynamometer and sensor specifications.

TABLE OF CONTENT

ENGINE DYNO DIAGRAM

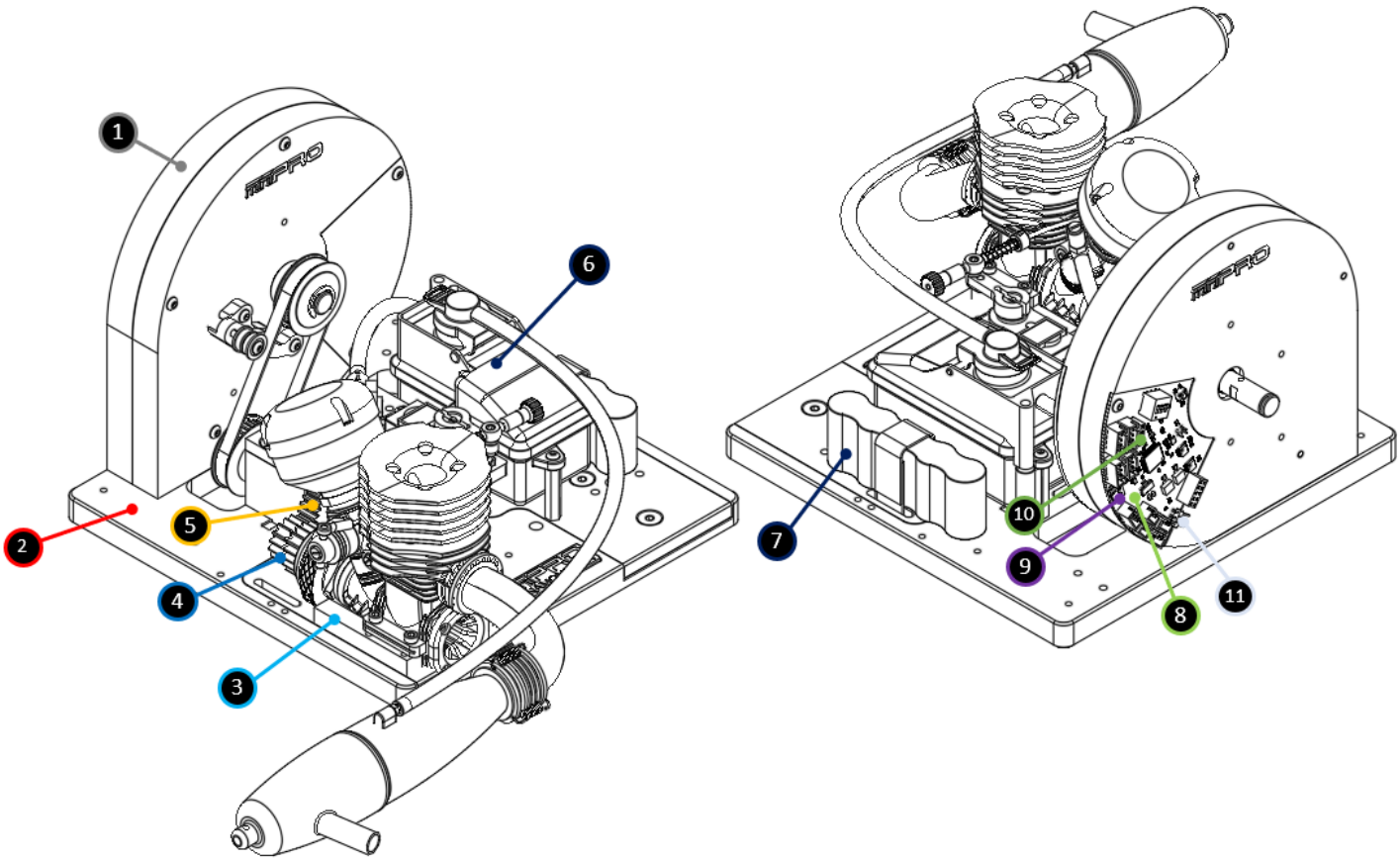
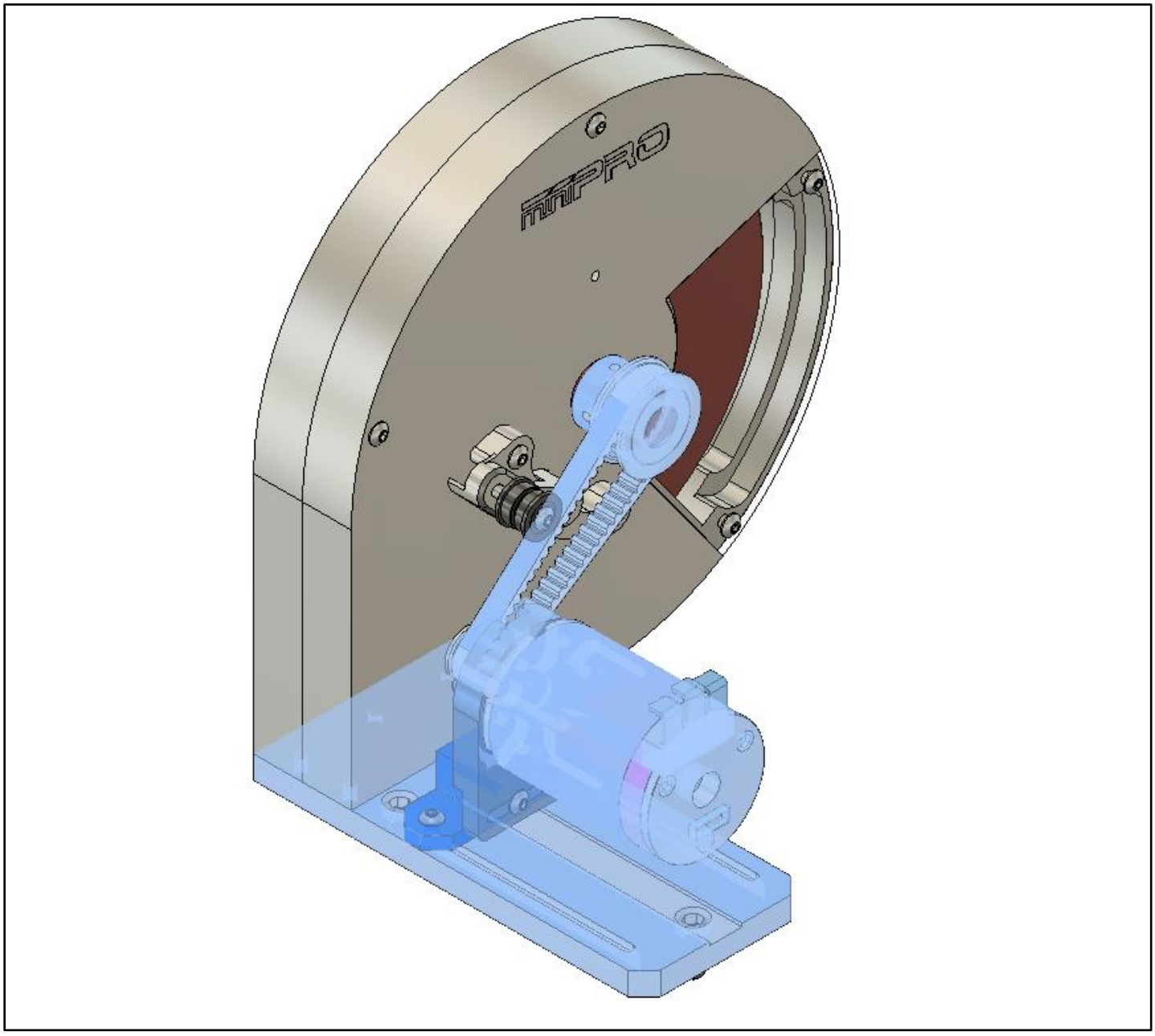


Figure 1: Engine Dyno diagram

ITEM	FUNCTION
1	Flywheel unit.
2	Flywheel base
3	Engine holder
4	Engine Clutch (sold separately)
5	Dyno Gear and transmission assembly
6	Fuel tank
7	Servo Battery (sold separately)
8	Dyno Controller Board V3.0 and later.
9	USB Connection for Windows PC.
10	All Weather Temperature port (sold separately)
11	Servo signal port (Y connection required to power servo)

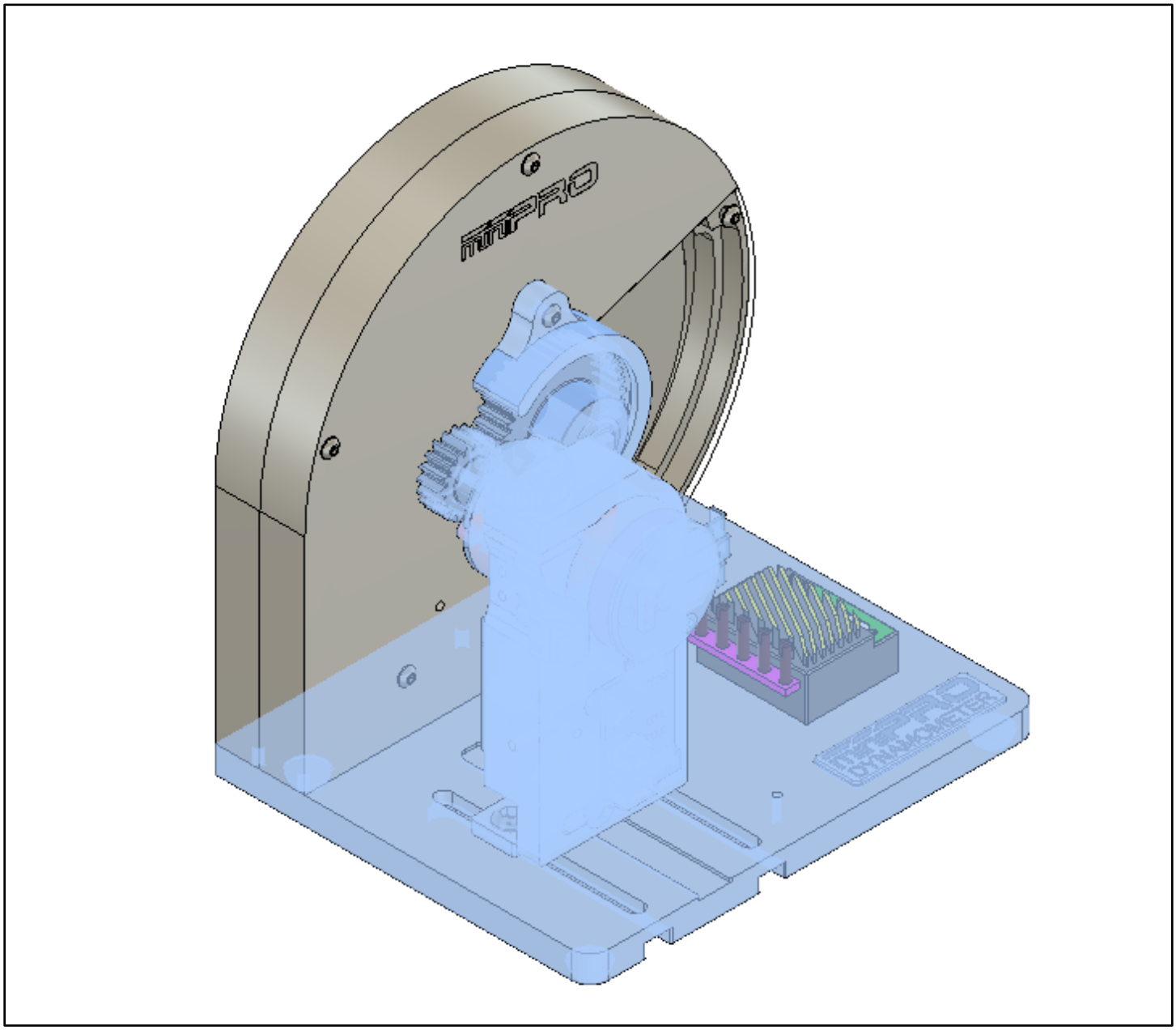
UPGRADE KIT DISSASSEMBLY GUIDE

1a.



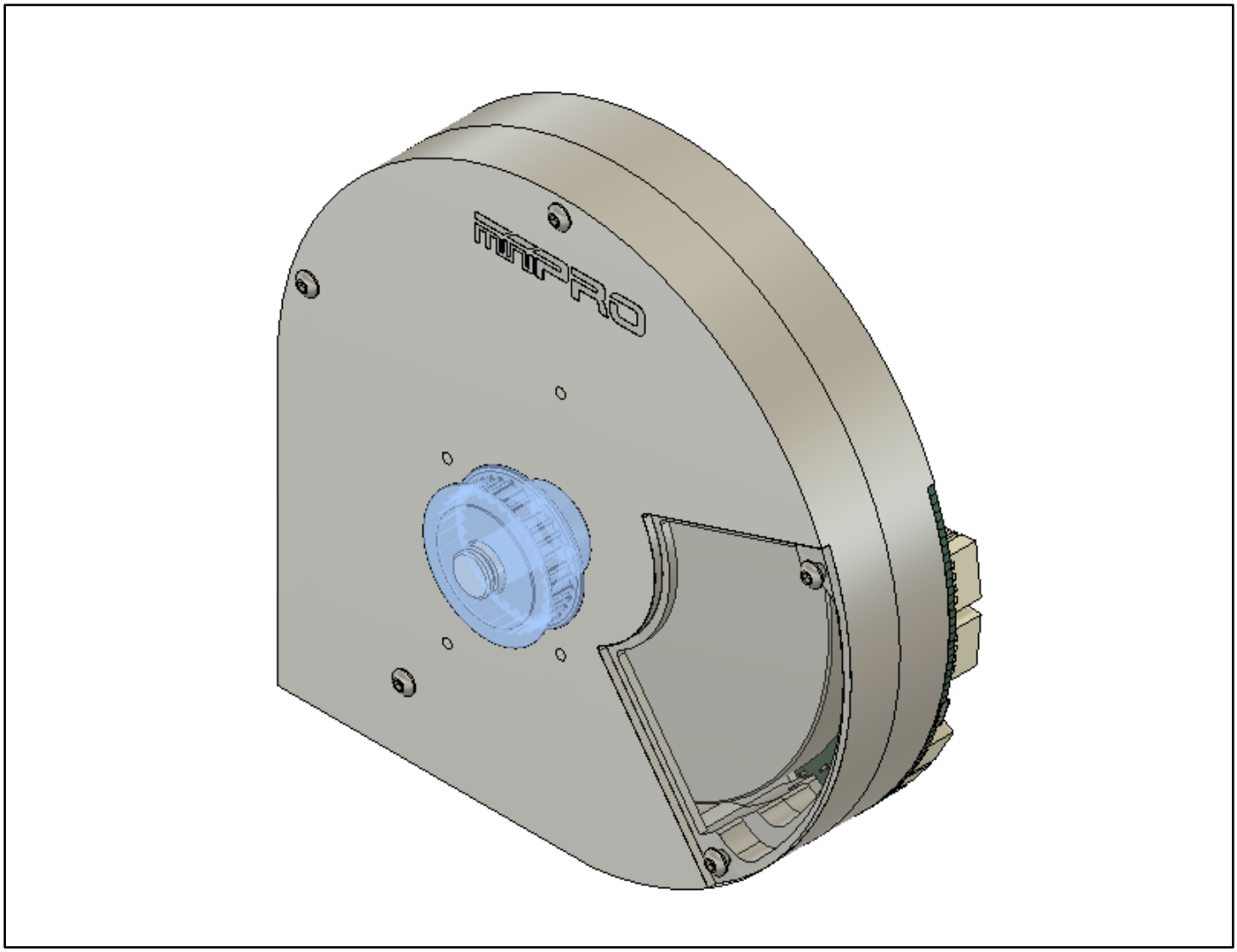
For dynos with belts; remove the flywheel pulley, and base from the flywheel unit.

1b.



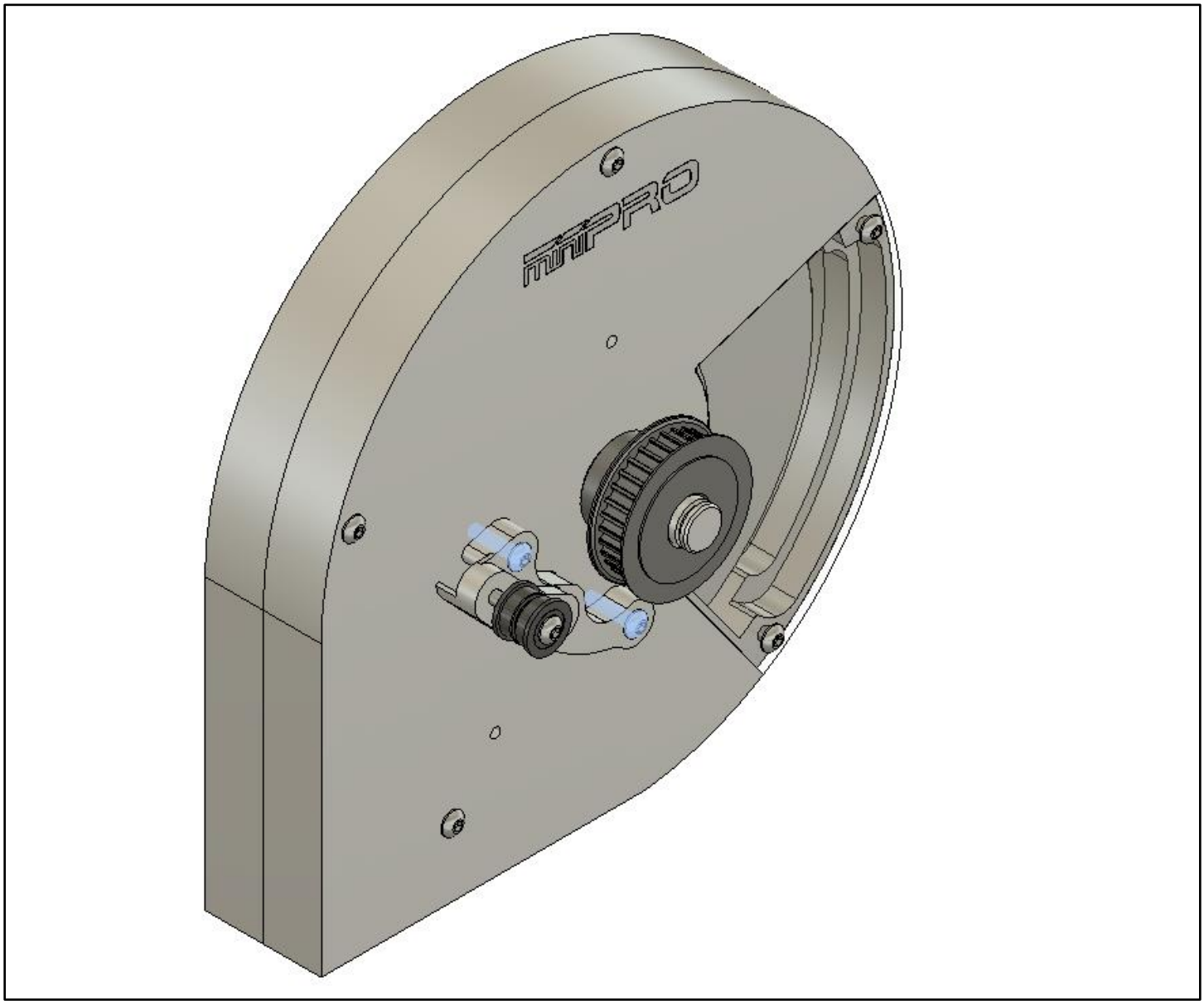
For dynos with pinion and gears; remove the flywheel gear, shield, and base from the flywheel unit.

2.



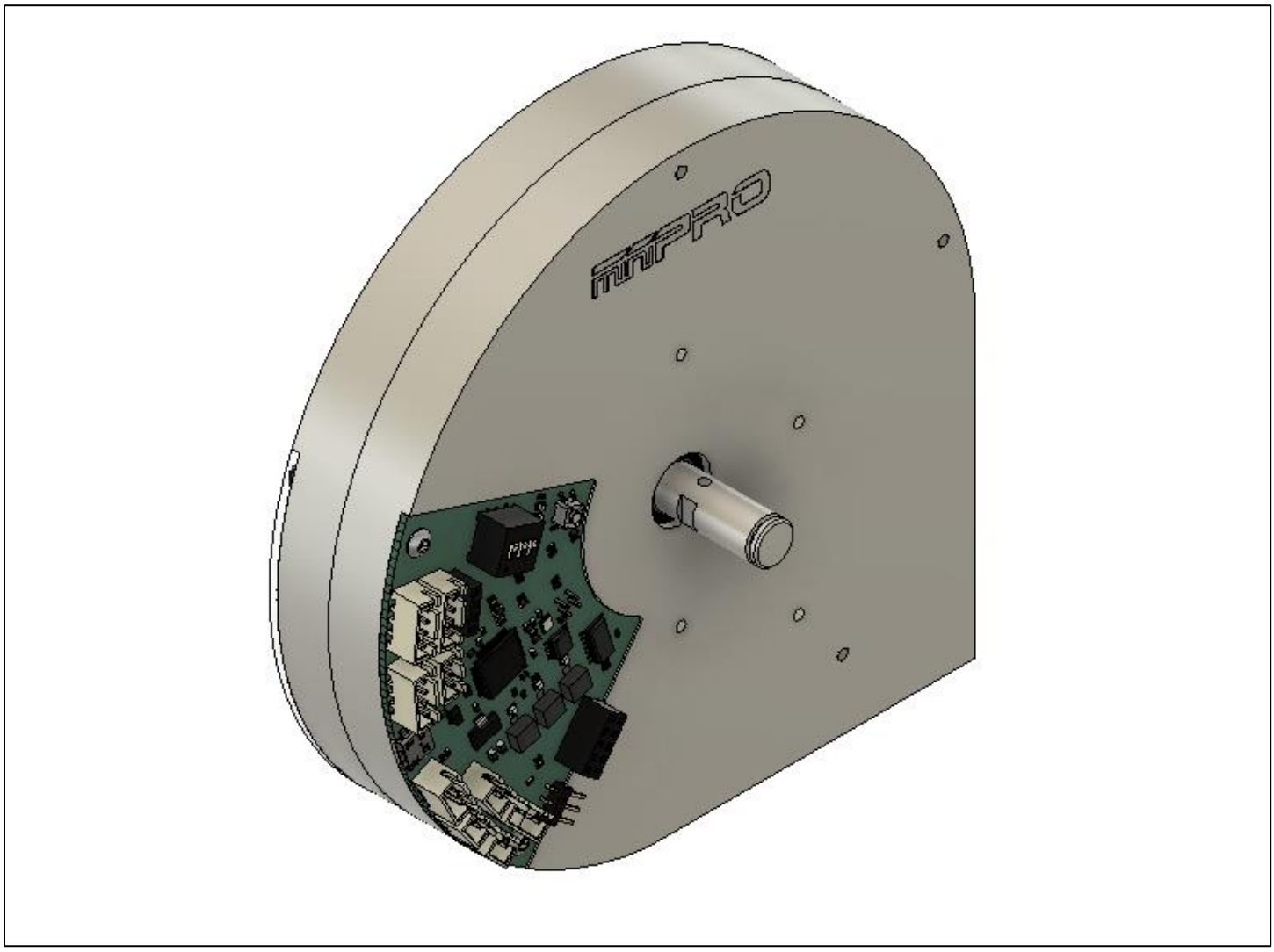
Install GT3 Pulley to the flywheel.

3.



Using a 2.0mm hex tool, install belt tensioner using (2) set screws (only for dynos with pinion/gear setup).

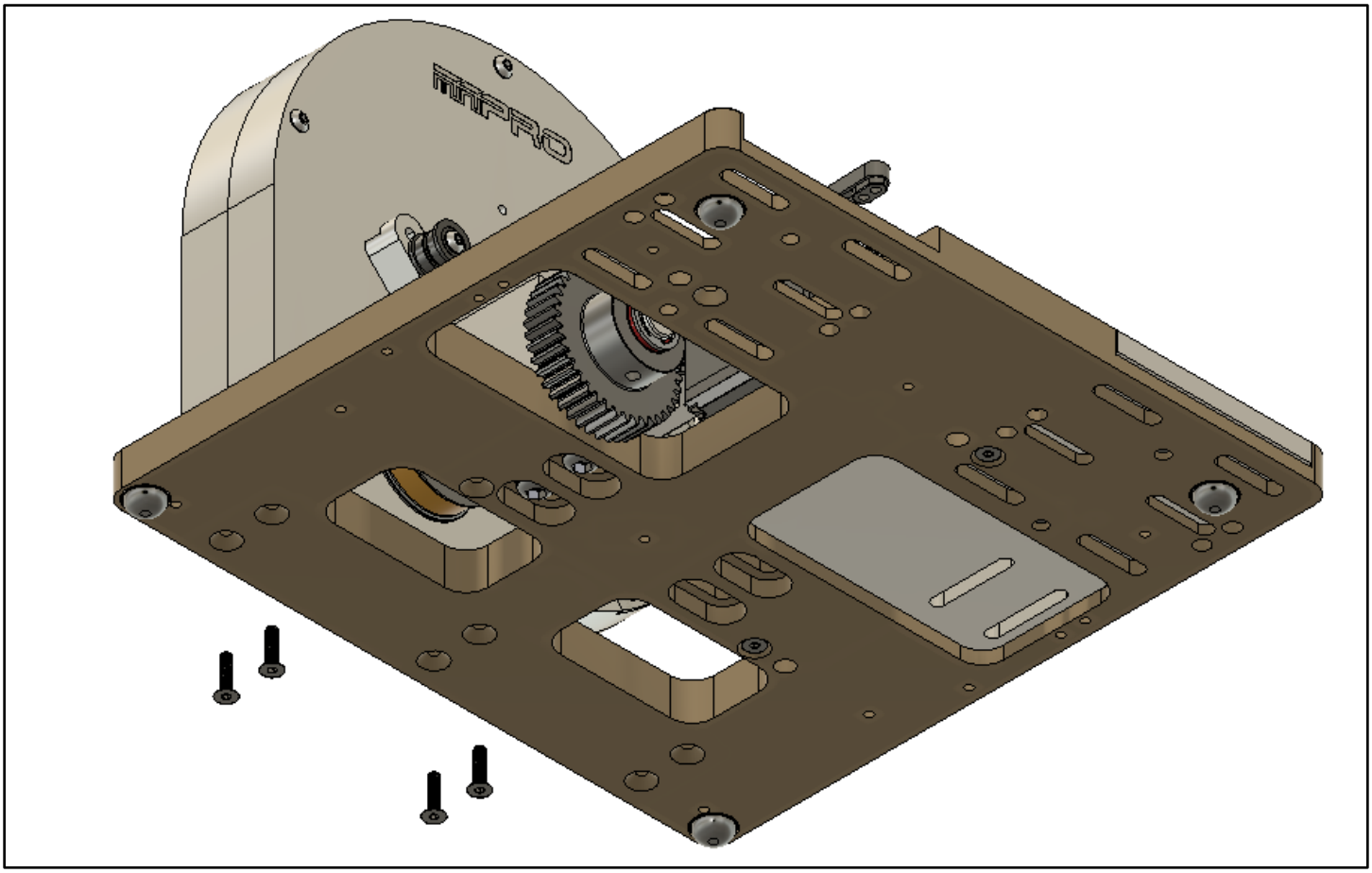
4.



Using a 2.0mm hex tool, remove dyno controller board V2 and install newer controller board. Next, follow the steps for Motor Dyno Assembly.

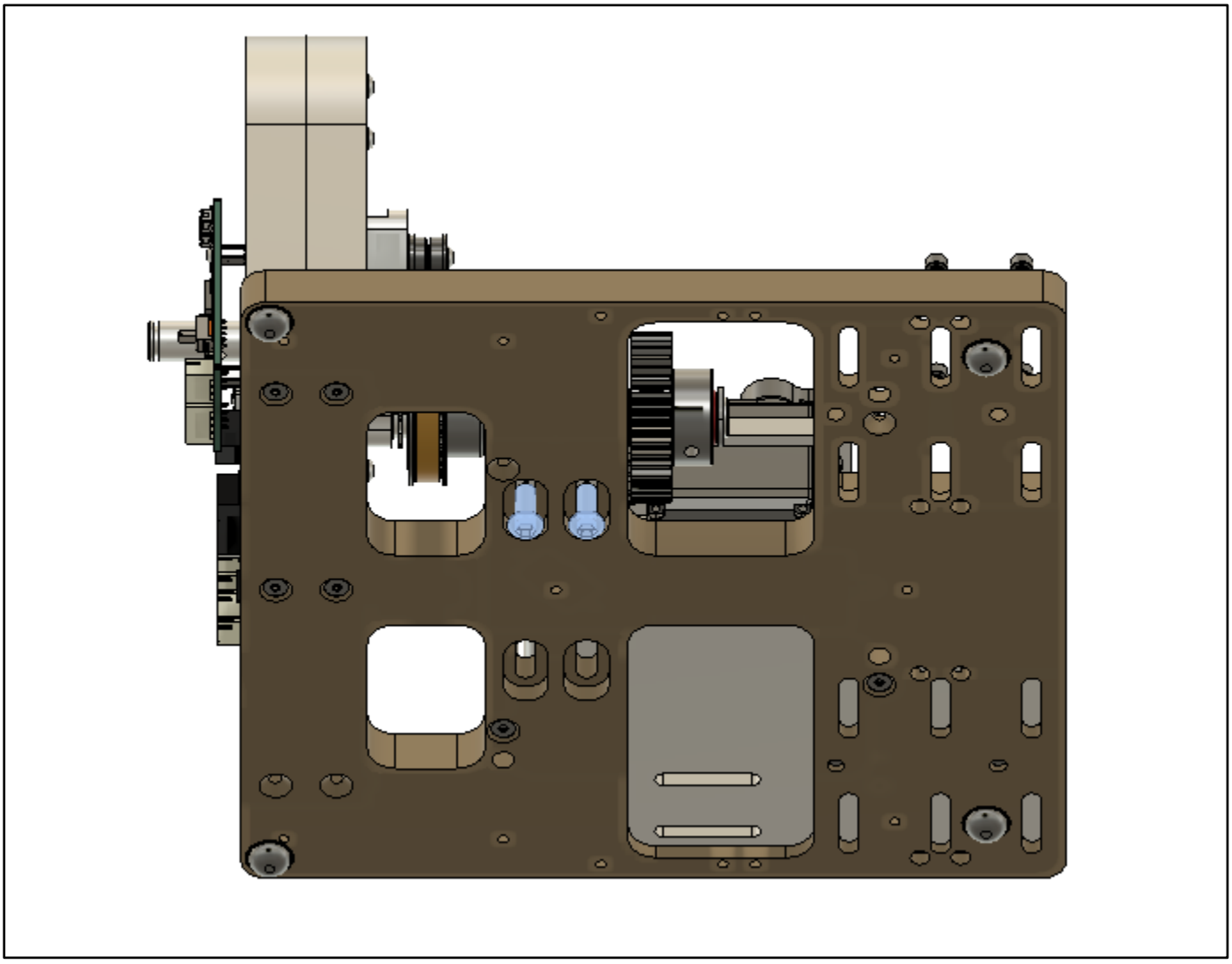
ASSEMBLY GUIDE

1.



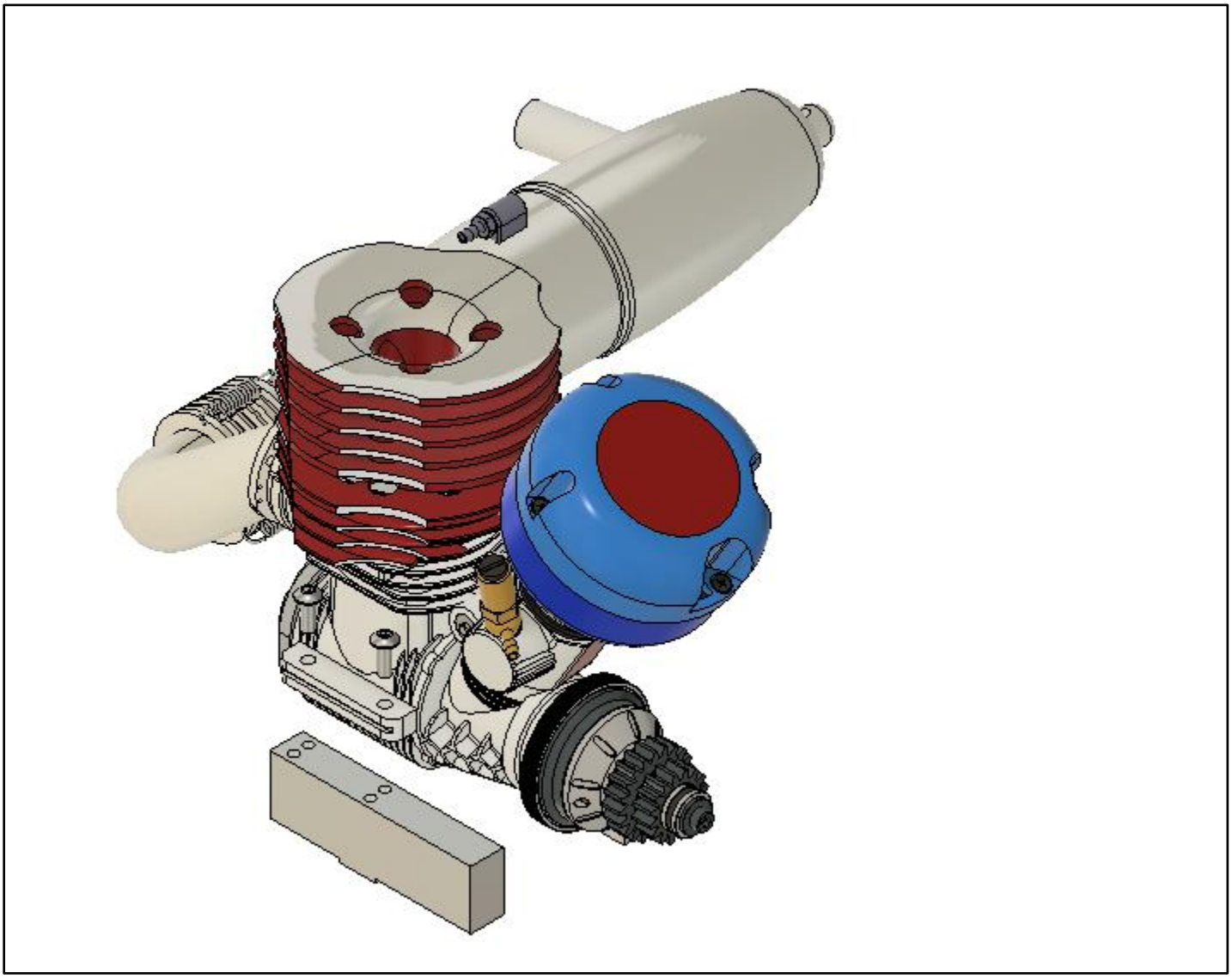
Using a 2.0mm hex tool, install (4) flat head screw(s) underneath the base assembly and flywheel unit.

2.



Using a 3.0mm hex tool, loosen (2) transmission screws and install the belt. Adjust the tension (sllide transmission) and tighten the screws.

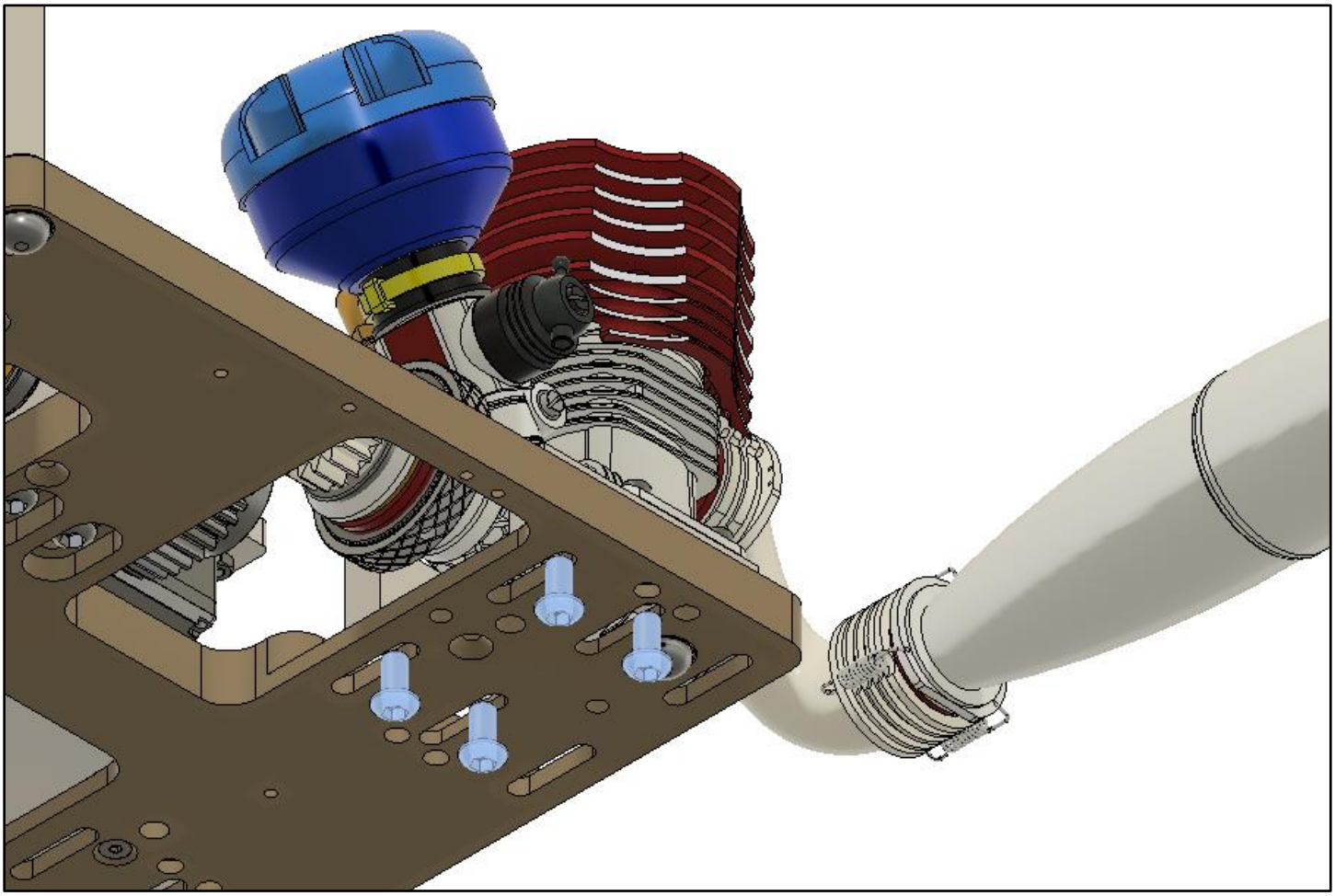
3.



After assembling your test engine (see manufacturers manual), using a 2.0mm hex tool, install (4) head screws to the motor mount.

IMPORTANT: the size of motor mount needs to be compatible with your engine. I.e. a 0.21 engine uses a 0.21 motor mount. test engine is sold seperately.

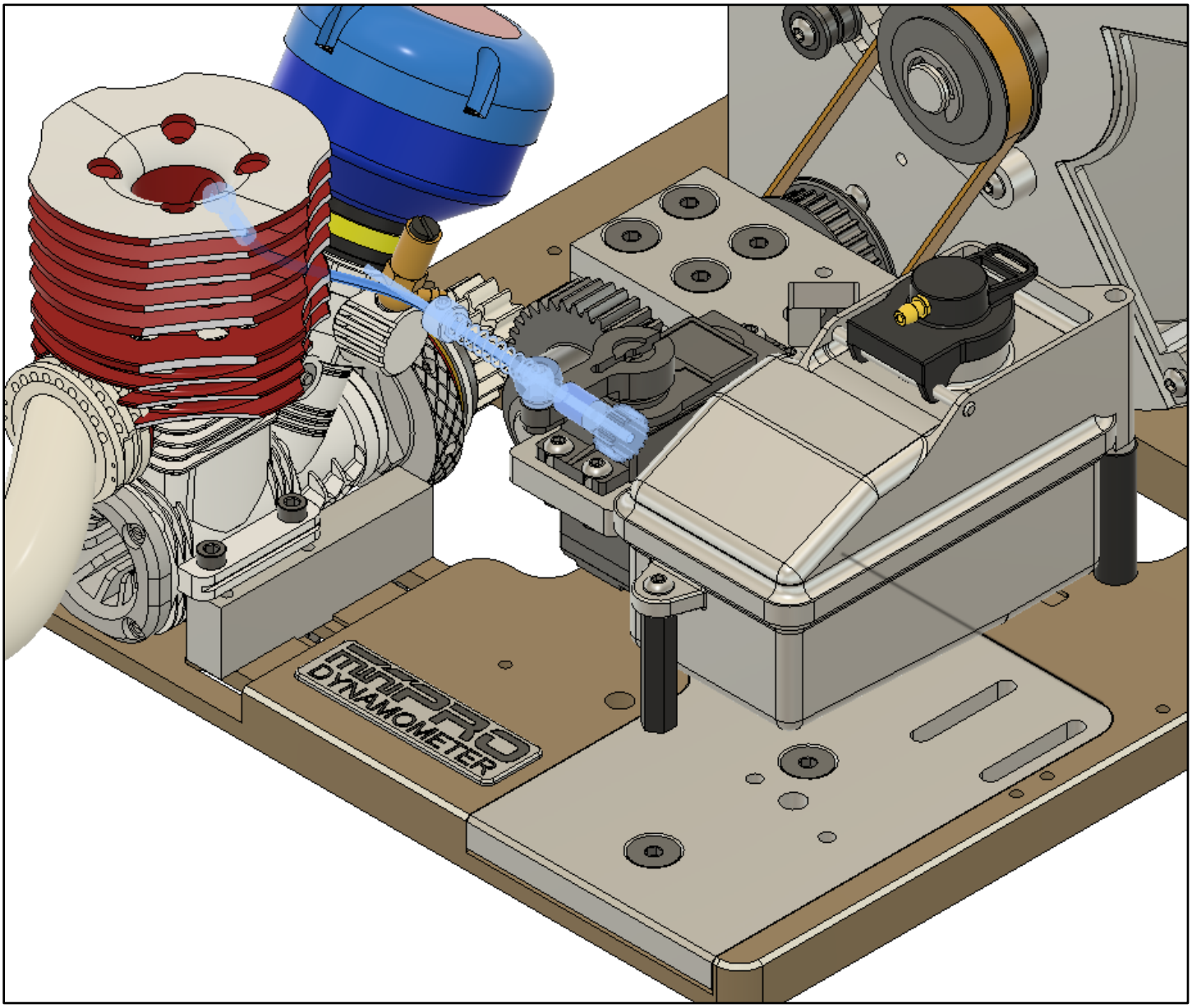
4.



Using a 3.0mm hex tool, install motor holder with (4) round head screw(s). Adjust the cluth and dyno gear overlap and tighten the screws.

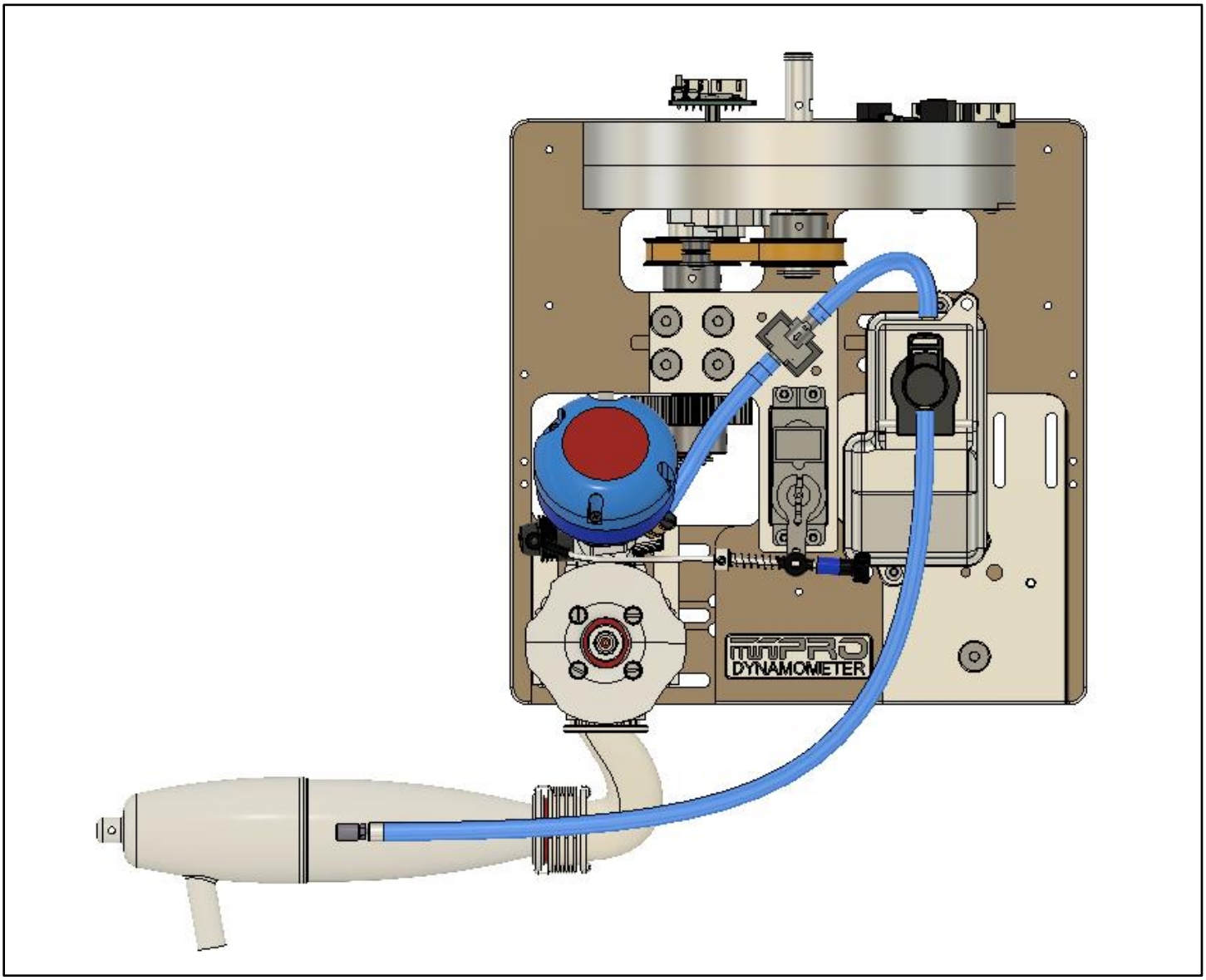
IMPORTANT: It's recommended to constantly check all screws to make sure they are not loosen due to engine vibrations. The use of threadlocker is highly recommended.

5.



Install the servo linkage to your engine. Some bending and cutting might be required due to the uniqueness of the engine and carburator. Unscrew and detach the servo arm once the installation is completed. The throttle would need to be adjusted in the software.

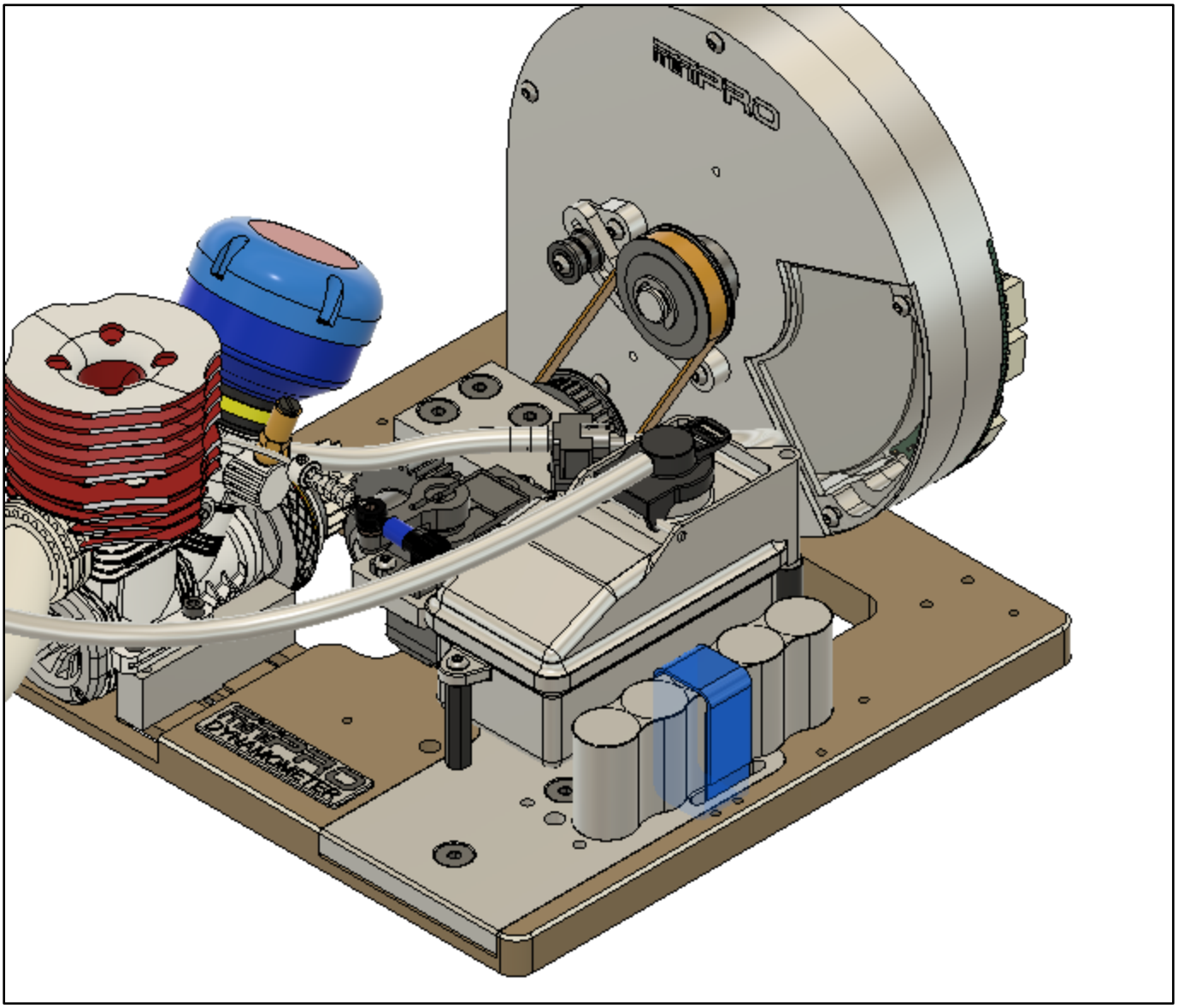
6.



Install your fuel lines. Some cutting might be required. Electronic Speed Control (ESC) to your motor and place it on the dyno's aluminum base. Please refer to the engines and exhaust manufacturer for any recommendations in leght for fuel lines.

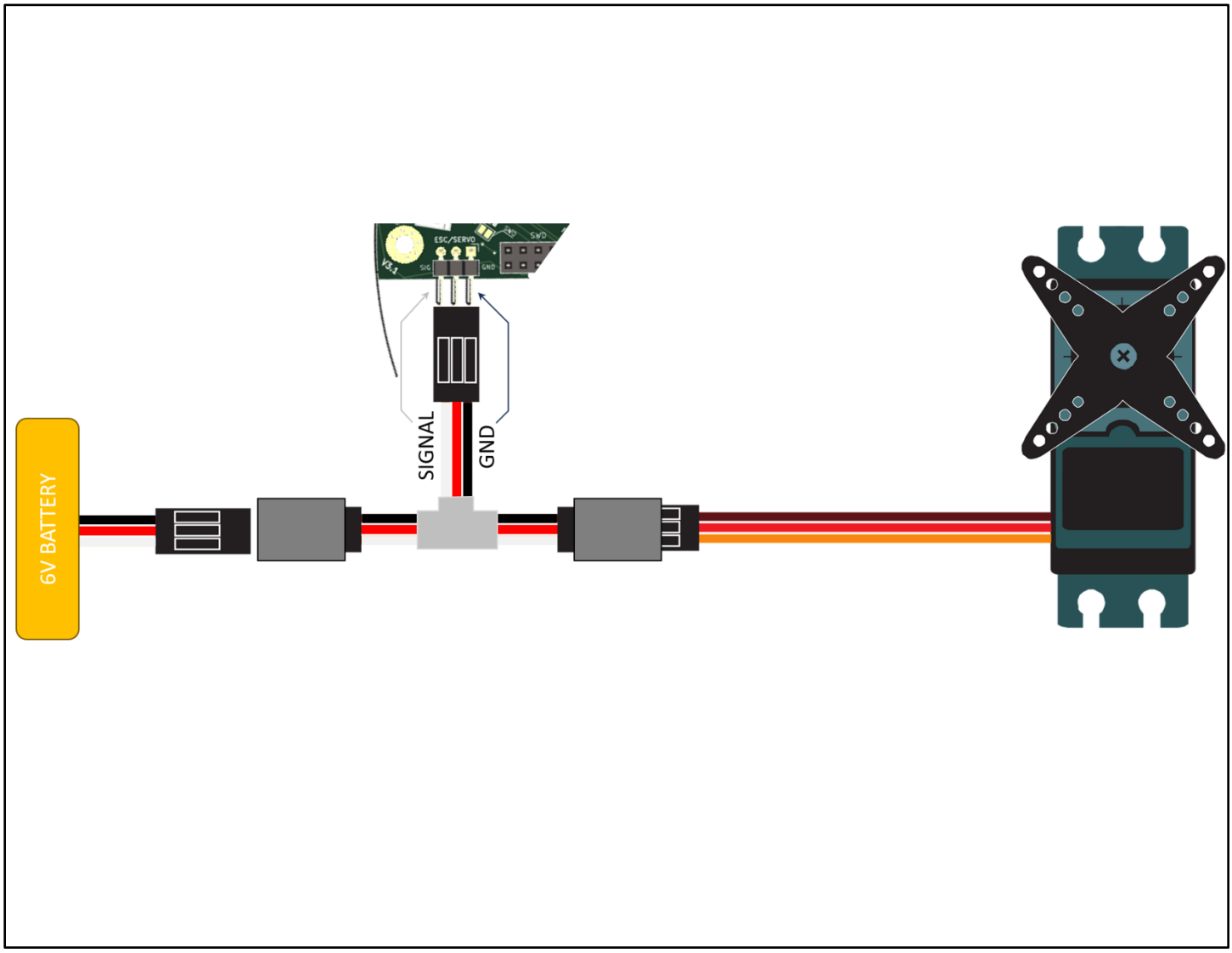
IMPORTANT: Above image shows a flow sensor between fuel tank output and engine input. This sensor is not necesarry for the operation of the dynamometer and is not included.

7.



Install 6V battery with straps. *Battery not included and sold seperately.*

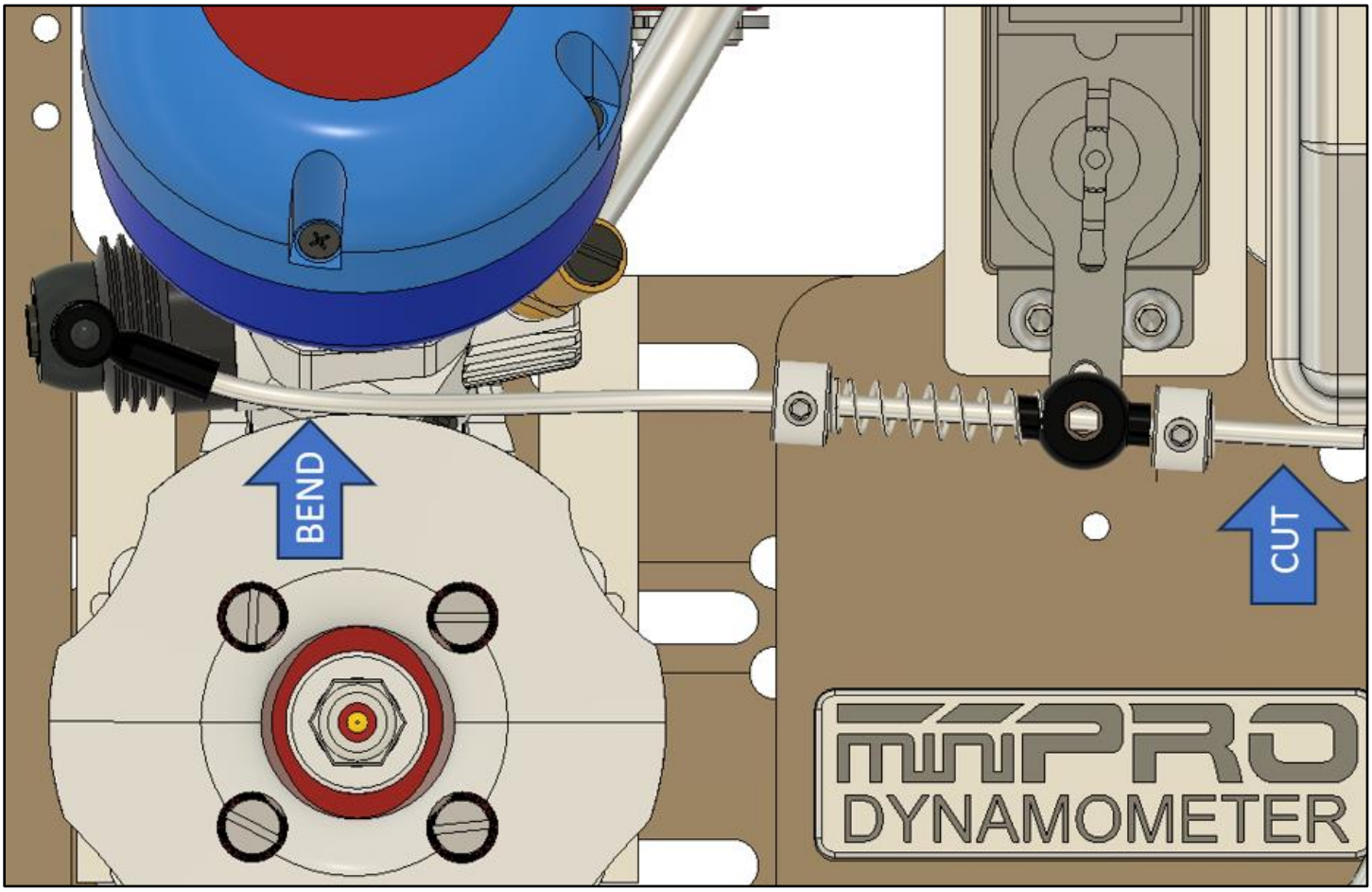
8.



Connect 6V battery, servo to the provided “Y” cable. If you purchased the Throttle license, then, connect the female plug to the back of the dynamometer controller board.

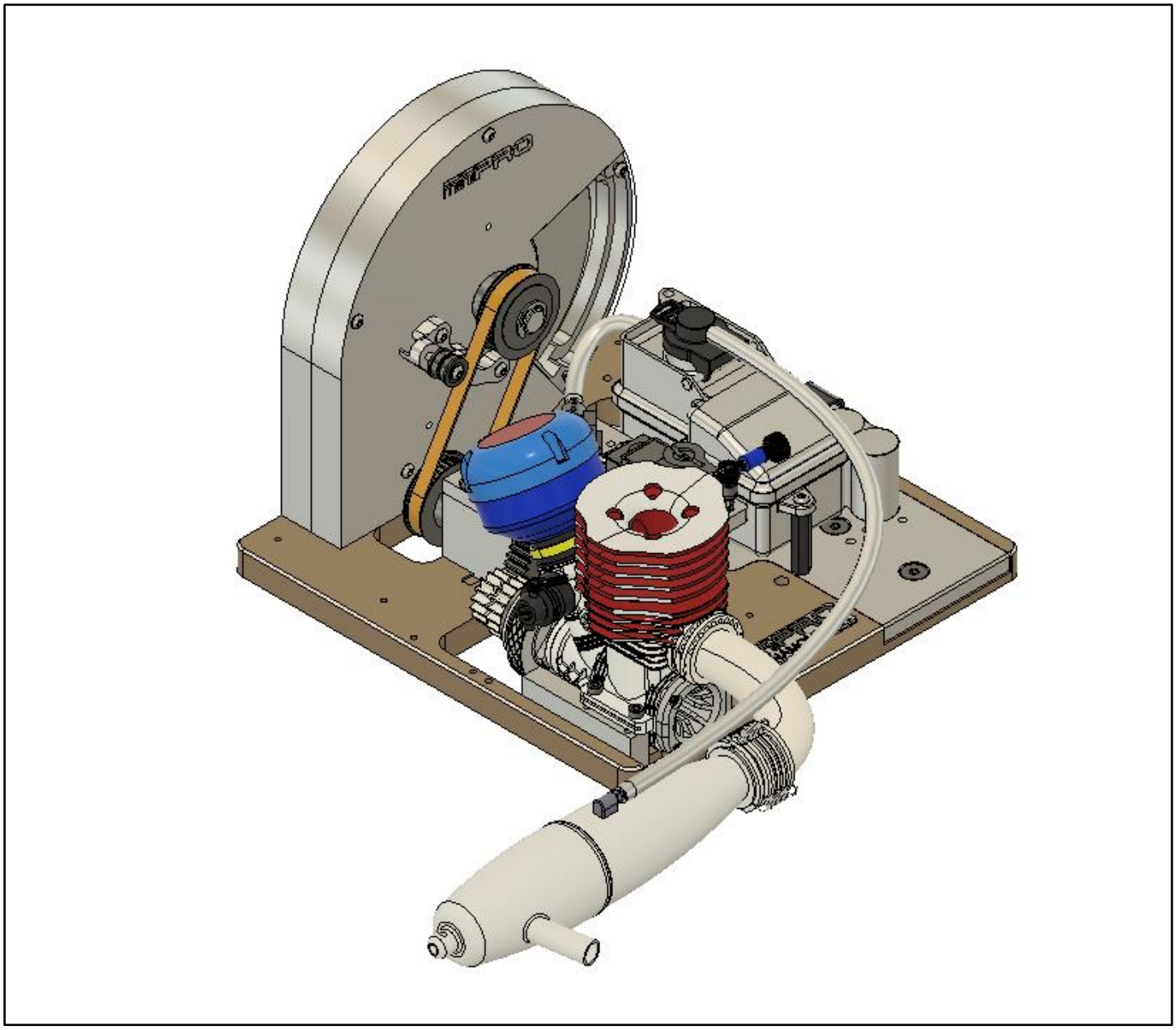
IMPORTANT: If throttle license was not purchased, you must use a radio transmitter to operate the throttle or purchase a license in our website.

9.



Install throttle linkage. Bend linkage to allow smoth throttle movement and cut excess.

10.



Done! The dyno is ready for use.

DYNO BOARD V3.0 - PORTS DIAGRAM

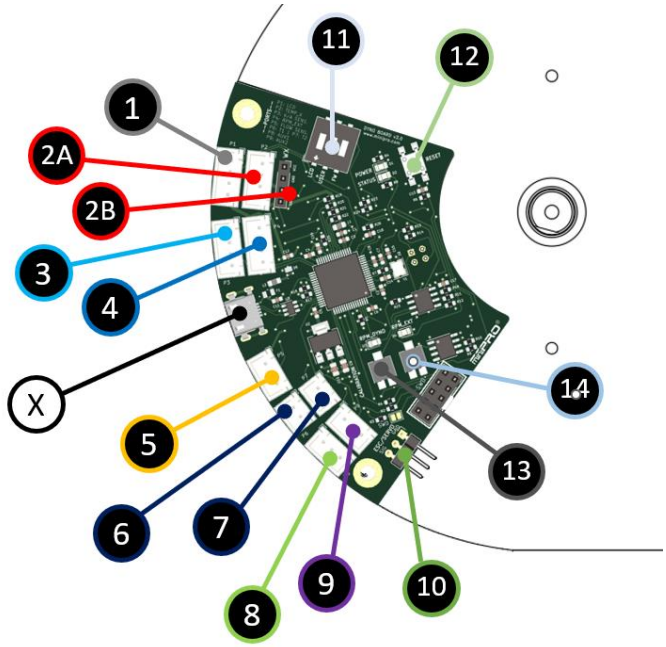


Figure 1: Dyno Controller Board V3.0 Ports Diagram

ITEM	FUNCTION
1	Port #1 used for LCD Screen.
2A	Port #2A used for I.R. Temp. sensor. IMPORTANT: Only one sensor in Port #2 can be used at the time.
2B	Port #2B used for All-Weather Temp. sensor. IMPORTANT: Only one sensor in Port #2 can be used at the time.
3	Port #3 connects to the H1 or A1 Voltage and Current sensor. The Dyno controller board might be equipped with a 3 pin or 4 Pin connector.
4	Port #4 connects to External RPM sensor.
5	Port #5 connects to Flow sensor.
6	Port #6 connects to Motor Loop. Temp. sensor.
7	Port #7 connects to Motor Loop. Temp. sensor.
8	Port #8 is Auxiliary port used for custom sensor designed by MINIPRO.
9	Port #9 is Auxiliary port used for custom sensor designed by MINIPRO.
10	Internal Servo/ESC Throttle Controller port. This feature is not enabled and is subject to license fee.
11	Programable Switches. Pin #1 is to enable LCD Screen; Pin #2 is for custom programing; Pin #3 is for Firmware Update.
12	Reset Button. Only used during Firmware Update
13	Dyno RPM Signal tuning.
14	External RPM Signal tuning.
X	Micro USB Cable connects to a Windows PC.

DYNO BOARD V3.0 – SENSORS WIRING DIAGRAM

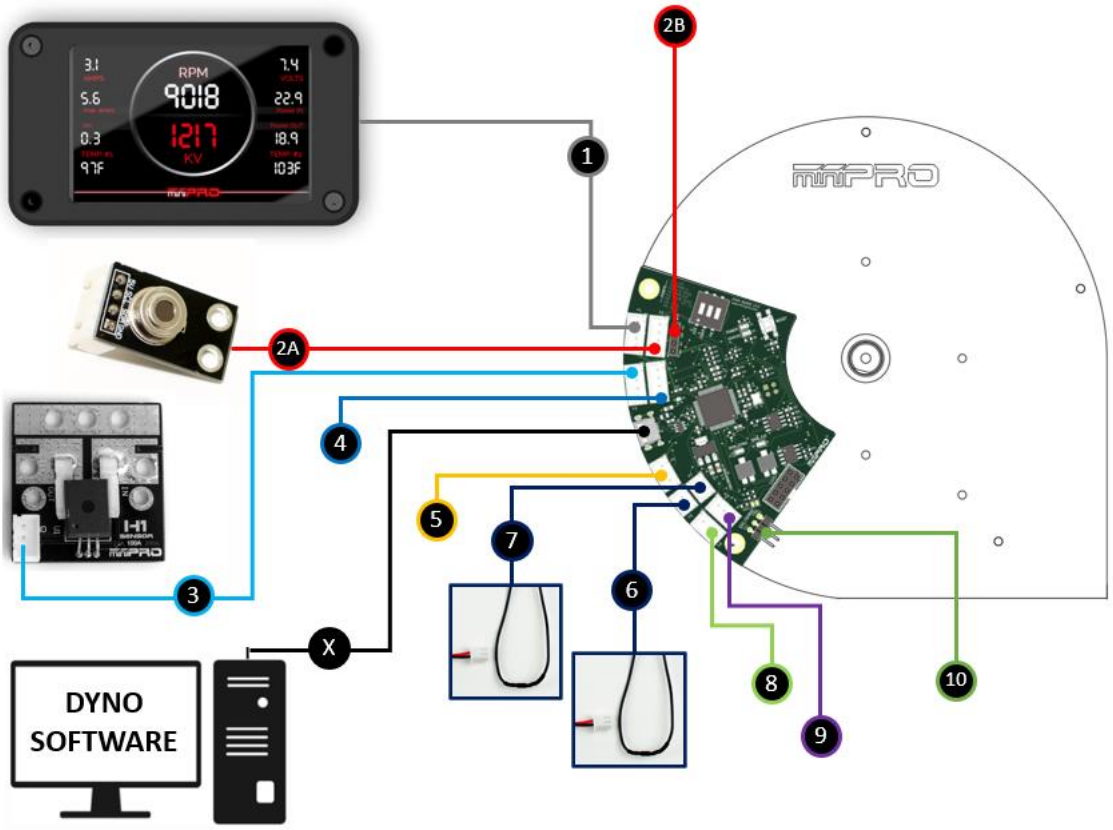


Figure 2: Dyno Controller Board V3.0 – Sensors Connection Diagram

ITEM	FUNCTION
1	Port #1 connects to LCD Screen.
2A	Port #2 connects to I.R. Temp. sensor *or* All-Weather Temp. sensor.
2B	
3	Port #3 connects to the H1 or A1 Voltage and Current sensor. The Dyno controller board might be equipped with a 3 pin or 4 pin connectors.
4	Port #4 connects to External RPM sensor. The Dyno controller board might be equipped with a 3 pin or 4 pin connectors.
5	Port #5 connects to Flow sensor.
6	Port #6 connects to Motor Loop. Temp. sensor.
7	Port #7 connects to Motor Loop. Temp. sensor.
8	Port #8 is Auxiliary port used for custom sensor designed by MINIPRO.
9	Port #9 is Auxiliary port used for custom sensor designed by MINIPRO.
10	Servo or ESC connection. This feature is not enabled and is subject to license fee.
X	Micro USB Cable connects to a Windows PC.

Warranty voided if it's not installed according to Figure 2.

DYNO BOARD V3.1 - PORTS DIAGRAM

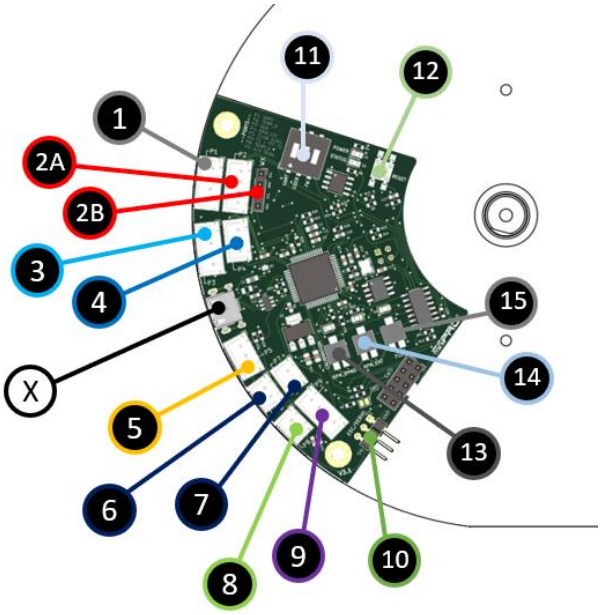


Figure 3: Dyno Controller Board V3.1 Ports Diagram

ITEM	FUNCTION
1	Port #1 used for LCD Screen.
2A	Port #2A used for I.R. Temp. sensor. IMPORTANT: Only one sensor in Port #2 can be used at the time.
2B	Port #2B used for All-Weather Temp. sensor. IMPORTANT: Only one sensor in Port #2 can be used at the time.
3	Port #3 8 is Auxiliary port used for custom sensor designed by MINIPRO.
4	Port #4 connects to External RPM sensor.
5	Port #5 connects to Flow sensor.
6	Port #6 connects to Motor Loop. Temp. sensor.
7	Port #7 connects to Motor Loop. Temp. sensor.
8	Port #8 is Auxiliary port used for custom sensor designed by MINIPRO.
9	Port #9 connects to the H1 or A1 Voltage and Current sensor. The Dyno controller board might be equipped with a 3 pin or 4 Pin connector.
10	Internal Servo/ESC Throttle Controller port. This feature is not enabled and is subject to license fee.
11	Programable Switches. Pin #1 is to enable LCD Screen; Pin #2 is for custom programing; Pin #3 is for Firmware Update.
12	Reset Button. Only used during Firmware Update
13	Dyno RPM Signal tuning.
14	External RPM Signal tuning.
15	Flow Sensor Signal tuning
X	Micro USB Cable connects to a Windows PC.

DYNO BOARD V3.1 – SENSORS WIRING DIAGRAM

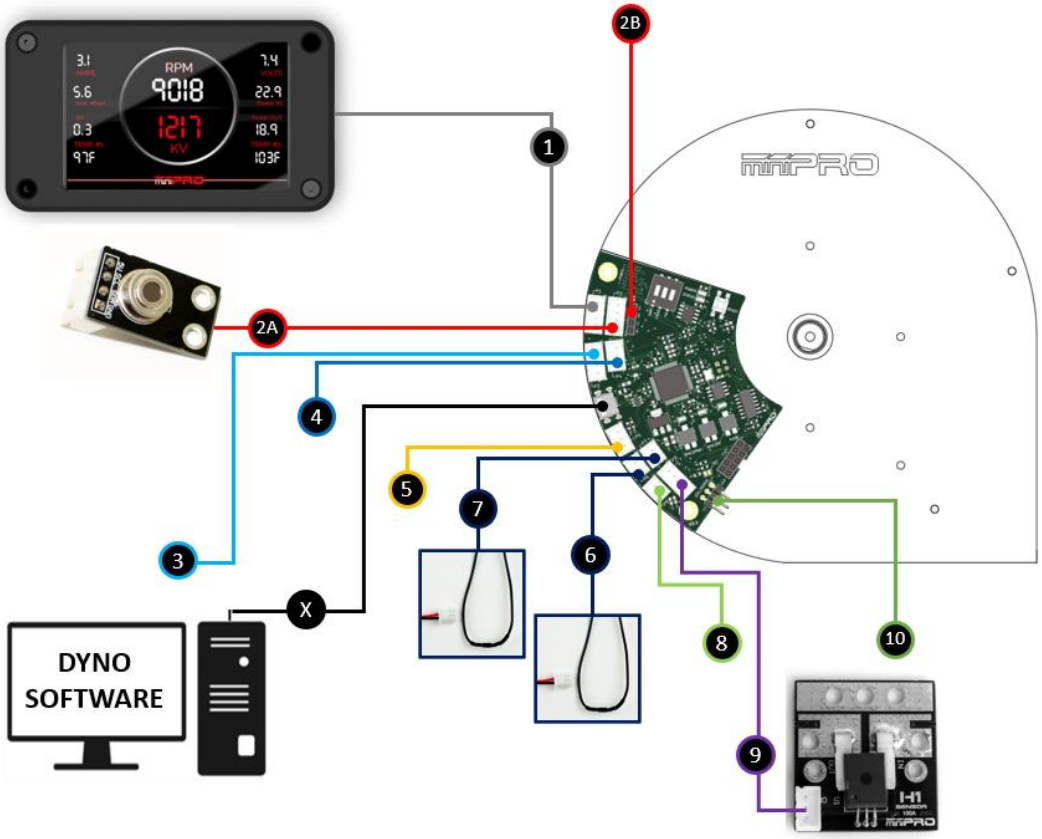


Figure 4: Dyno Controller Board V3.1 – Sensors Connection Diagram

ITEM	FUNCTION
1	Port #1 connects to LCD Screen.
2A	Port #2 connects to I.R. Temp. sensor *or* All-Weather Temp. sensor.
2B	
3	Port #3 is Auxiliary port used for custom sensor designed by MINIPRO.
4	Port #4 connects to External RPM sensor. The Dyno controller board might be equipped with a 3 pin or 4 pin connectors.
5	Port #5 connects to Flow sensor.
6	Port #6 connects to Motor Loop. Temp. sensor.
7	Port #7 connects to Motor Loop. Temp. sensor.
8	Port #8 is Auxiliary port used for custom sensor designed by MINIPRO.
9	Port #9 connects to the H1 or A1 Voltage and Current sensor. The Dyno controller board might be equipped with a 3 pin or 4 pin connectors
10	Servo or ESC connection. This feature is not enabled and is subject to license fee.
X	Micro USB Cable connects to a Windows PC.

Warranty voided if it's not installed according to Figure 4.

SOFTWARE INSTALLATION – V5.0 and later

**** Please refer to the software manual for more information.***

Download the software from the provided link and double click the file to begin the installation.
Press Next >> to continue.

Figure 5: Software Installation Welcome Screen

Add the Name, Organization and Serial Number.
Press Next >> to continue.
NOTE: Only one license can be used per PC. Additional licenses are available for purchase.

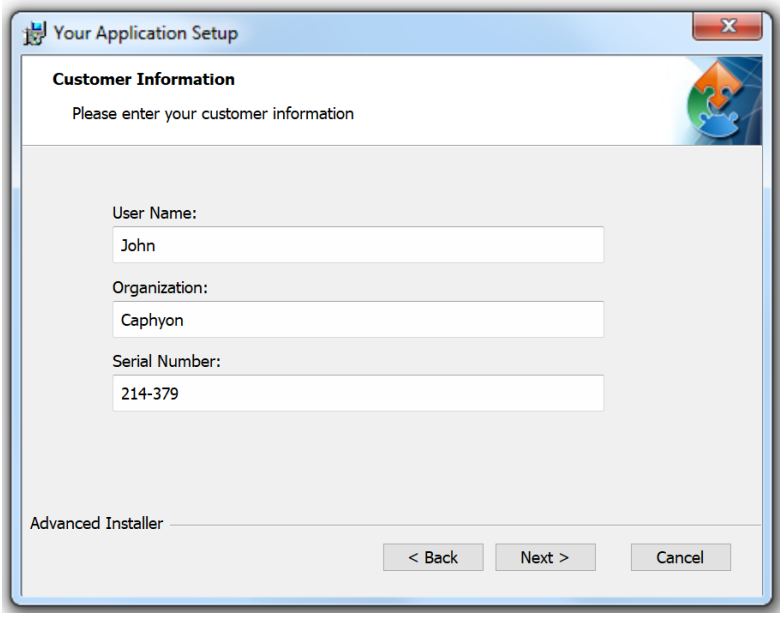


Figure 6: Software License Screen

Select the location where the software will be installed.
Press Next >> to continue.

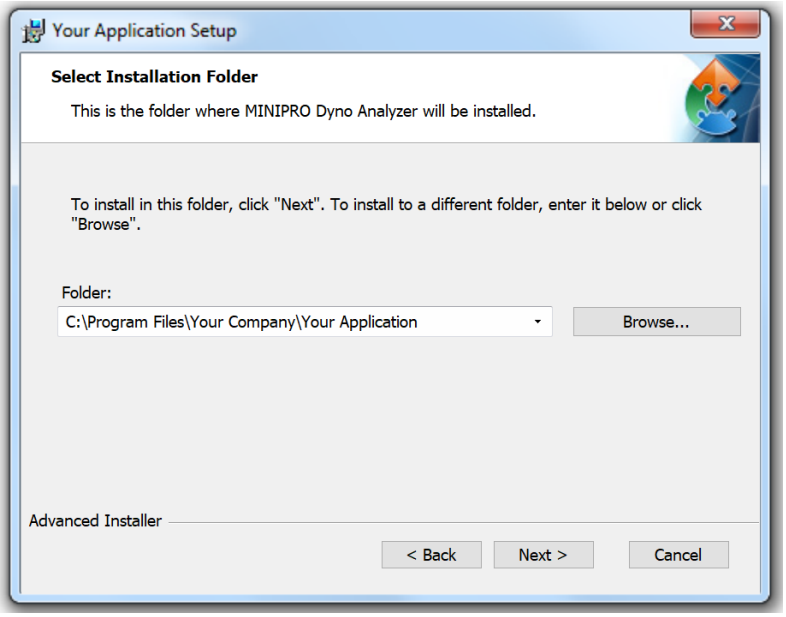


Figure 7: Folder Installation Screen

The software is ready to install.
Press Install to continue.

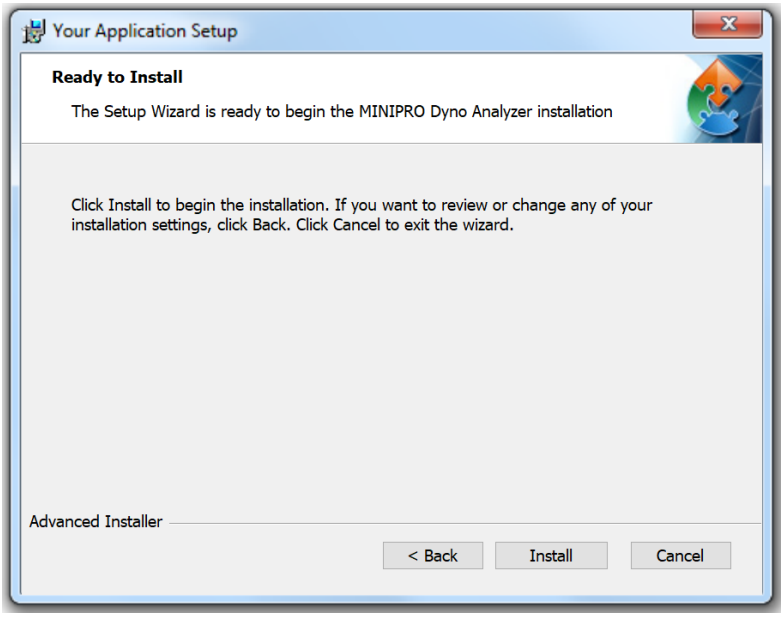


Figure 8: Ready to Install Screen

The software will begin installation. Please wait until the setup finishes. This may take several minutes.

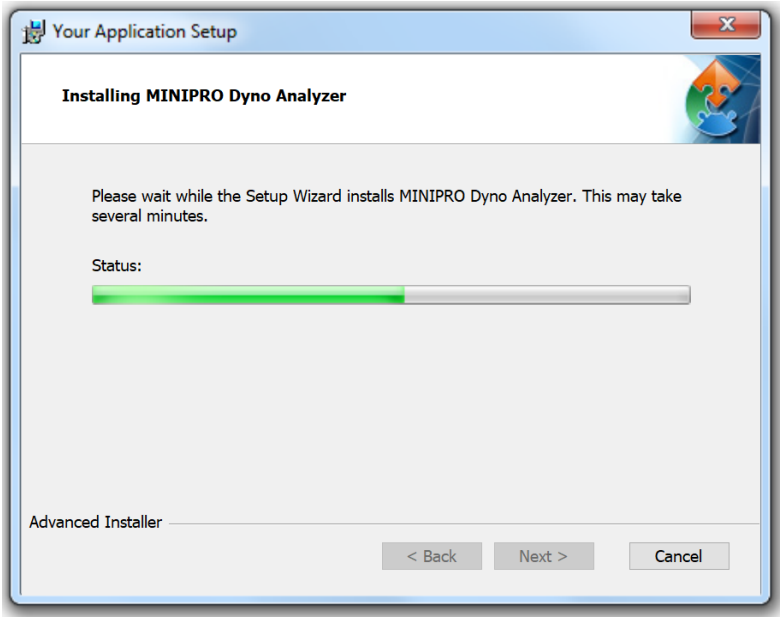


Figure 9: Installation Screen

The software finished installing.
Press Finish to complete the installation.

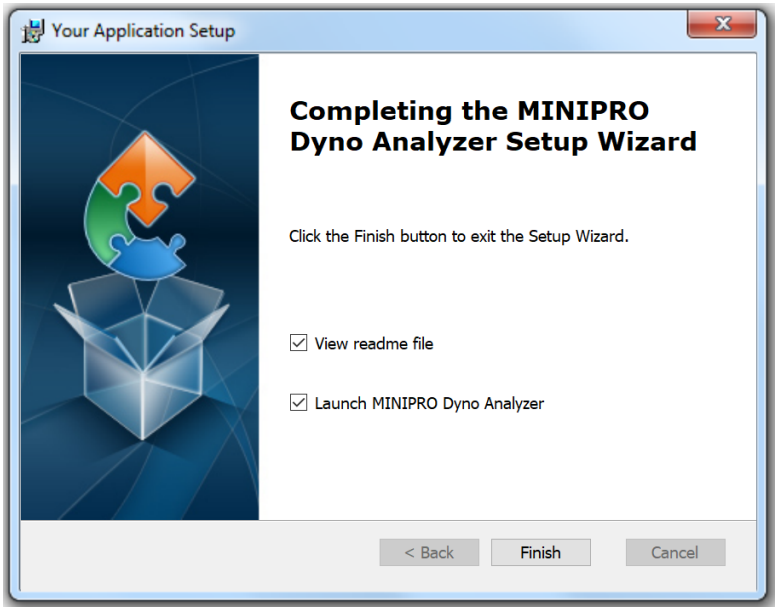


Figure 10: Installation Screen

THROTTLE CALIBRATION WITH SERVO

I/O PORTS - SENSORS:

INSTRUCTIONS:

1. Open the MINIPRO Testing Software and Connect the dynamometer to the program and throttle.
2. Go-to *Configure Hardware -> Throttle Calibration* tab.
3. Connect all necessary sensors.
4. Slide the Full Throttle to ~60% and make sure the engine's carburetor is opening. If is not opening, then check "Reverse PWM Signal." 60% is a good start but you can increase the maximum throttle percentage to your requirements. This is the position the servo will move when throttle is set to 100%.
5. Slide the Full Brake to close to ~50%.
6. Slide the Neutral to ~50%. This is the position the servo will move when throttle is set to 0%.
7. Press the Save Setup button, and your configuration is completed.
8. Go-to *Configure Test* tab and select Enable Servo/ESC Sequence to *Yes*.
9. Go-to *Run Test* tab and move the Throttle slider to confirm your servo and throttle are working.
10. Done!

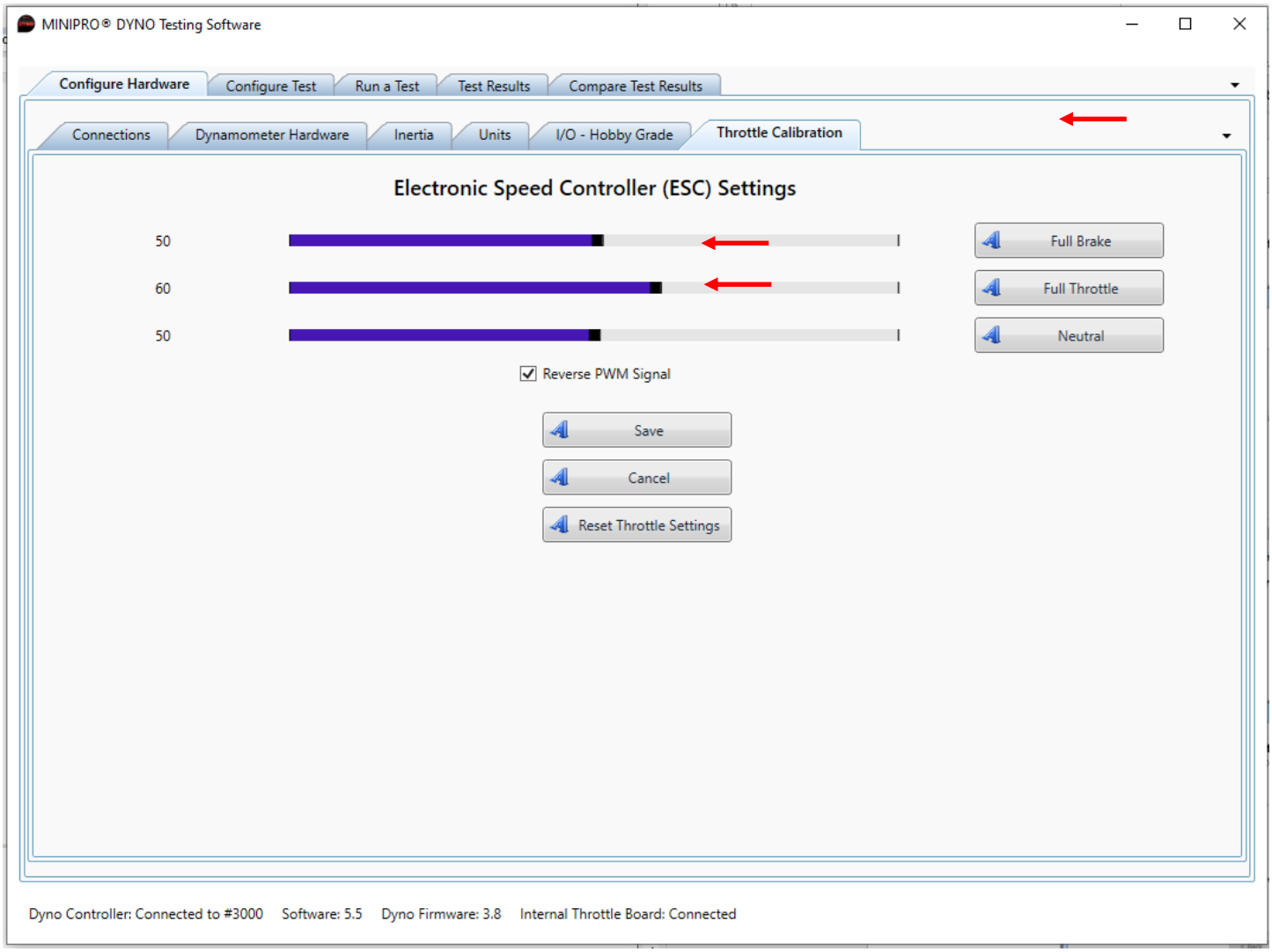


Figure 11: Throttle calibration. This setting only applies if you have the Throttle Controller License.

SOFTWARE CONFIGURATION

I/O PORTS - SENSORS:

INSTRUCTIONS:

11. Open the MINIPRO Testing Software and Connect the dynamometer to the program.
12. Go-to *Configure Hardware -> I/O Hobby Grade* tab.
13. Connect all necessary sensors.
14. Select the installed sensors from the drop-down (i.e. for voltage and current sensor see *Figure 3*).
15. Press the Apply Settings button. If the software cursor stays busy for longer than 1 min; press Apply again.
16. Press the Save Setup button, and your configuration is completed.

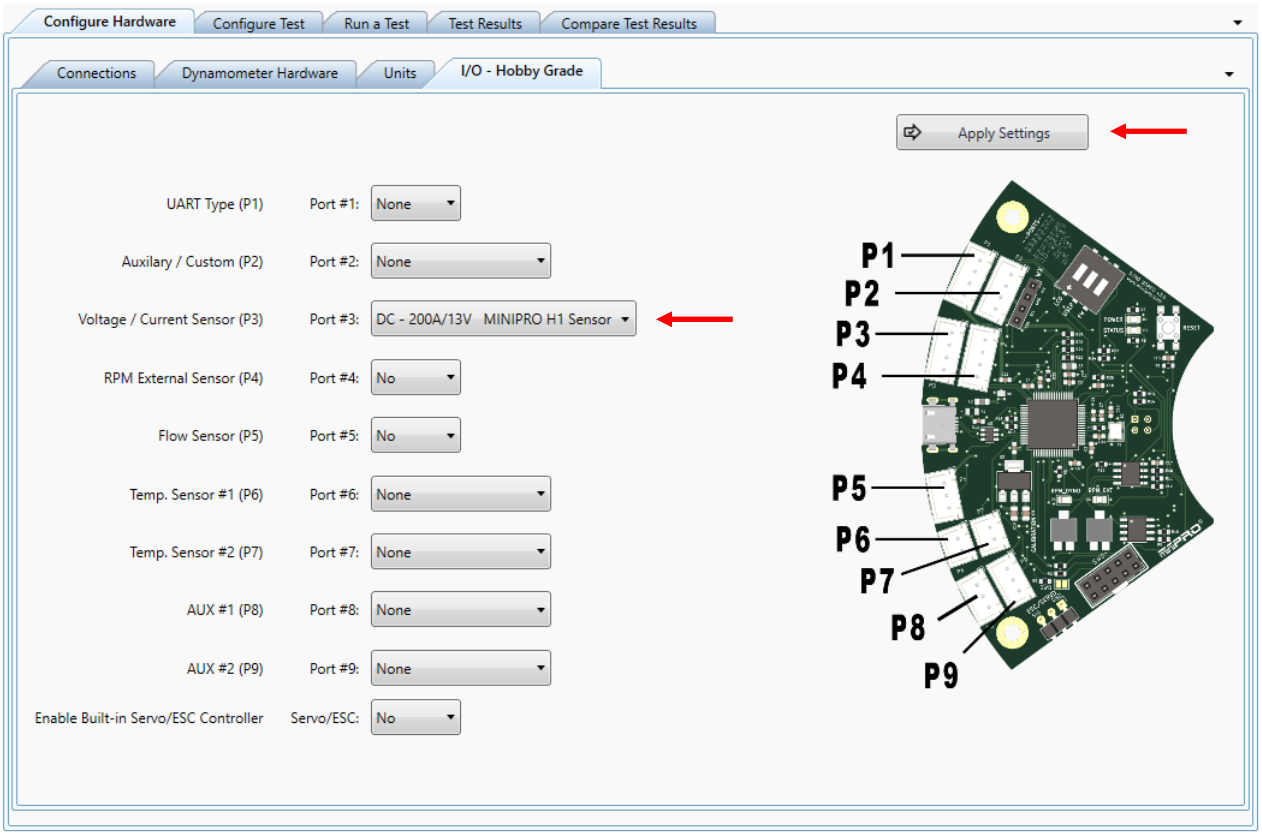


Figure 12: I/O Configuration for V3.X boards