FuelX Autotune - Bear 650 2024-2025 (Eu5/Eu5+)

Document Version	1	**Release Date**	13 October 2025

Application information	**FuelX**
Vehicle	**Royal Enfield**
Model	**Bear 650**
Year of manufacture	**2024-2025**

Note:

- Read through all instructions before installation and use.
- Ensure that the bike is switched off and the key is out of the ignition before proceeding with the installation.
- Some parts of the bikes might be hot/sharp and cause burns/cuts. Proceed with extreme caution or wait until the bike has cooled down. Always wear safety gloves.
- When the installation is complete, ensure to secure the wiring loom away from the movable parts or components that tend to heat up during the normal operation of the vehicle at any time.
- FuelX is intended for motorsport use on a closed course. Please check with your local laws before using this product. Race Dynamics is not liable for consequences arising from using the product.
- The steps demonstrated in the manual are for one cylinder. For multi-cylinder vehicles, the steps have to be replicated for the other cylinders.

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for Indian specification vehicles, the FuelX module will have a sticker indicating it.

⚠ FOR INDIAN SPECIFICATION BIKES ONLY

The warranty/support will not be provided for international users with Indian specification FuelX purchased from unauthorized re-sellers.

1. FuelX

FuelX is an electronic, plug-in, fuel-injection optimizer for modern engines. It either enriches or decreases the AFR in all operating regions according to the rider's requirement. It autotunes the engine to the best operational parameters, constantly monitoring, learning, and adapting to the engine condition, wear and tear, riding style, add-ons (such as air filter and/or exhaust), etc as well as the environmental conditions such as temperature, humidity, altitude, etc. always ensuring the engine performs in the safest and most optimal zones.

The **FuelX kit contains the following items**

- FuelX Module
- Wiring Harness
- Handlebar map switch (Pro and Pro+ versions only)
- Zip ties
- Decals
- Quick start guide and Warranty card

Image 1.1

2. FuelX Variants:

FuelX Pro+

The FuelX Pro+ variant has 10 maps that can be changed depending on the preference of rider. For the Pro+ version, the FuelX contains an additional connector (Refer to Image 2.3) for the Handlebar Map switch (Refer to Image 2.2).

Image 2.1

Image 2.2

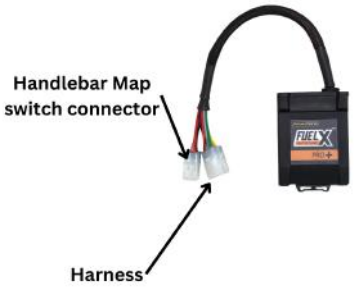


Image 2.3

FuelX Pro

The FuelX Pro variant has 10 maps that can be changed depending on the preference of rider. For the Pro version, the FuelX contains an additional connector (Refer to Image 2.6) for the Handlebar Map switch (Refer to Image 2.5)

Image 2.4

Image 2.5

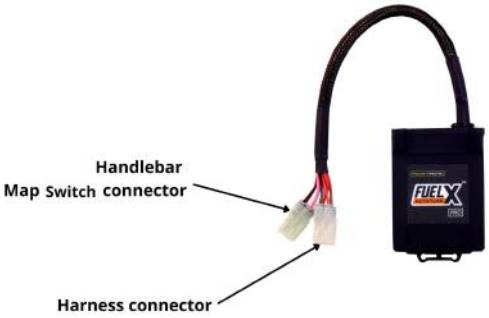


Image 2.6

FuelX Lite

The FuelX Lite variant has a single autotune map and only one connector for the harness.

Image 2.7

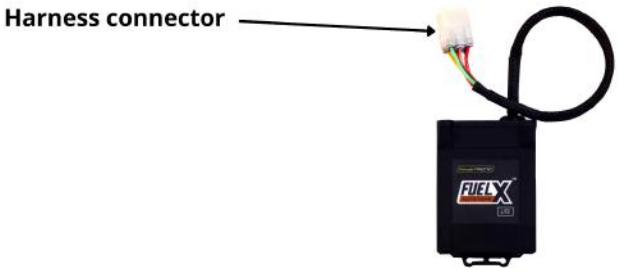


Image 2.7

3. FuelX Harness Connectors

The harness contains

- The Lambda connector (O_2)
- FuelX connector
- Ground/battery negative connector.

Image 3.1

The type and number of connectors may vary depending on the vehicle, year of manufacture, and the number of cylinders. Examples of different types of Lambda sensor connectors are shown below.

Image 3.2

The FuelX is connected between the Lambda sensor connector and the ECU. The male connector of FuelX is connected to the female of the Lambda sensor and vice versa.

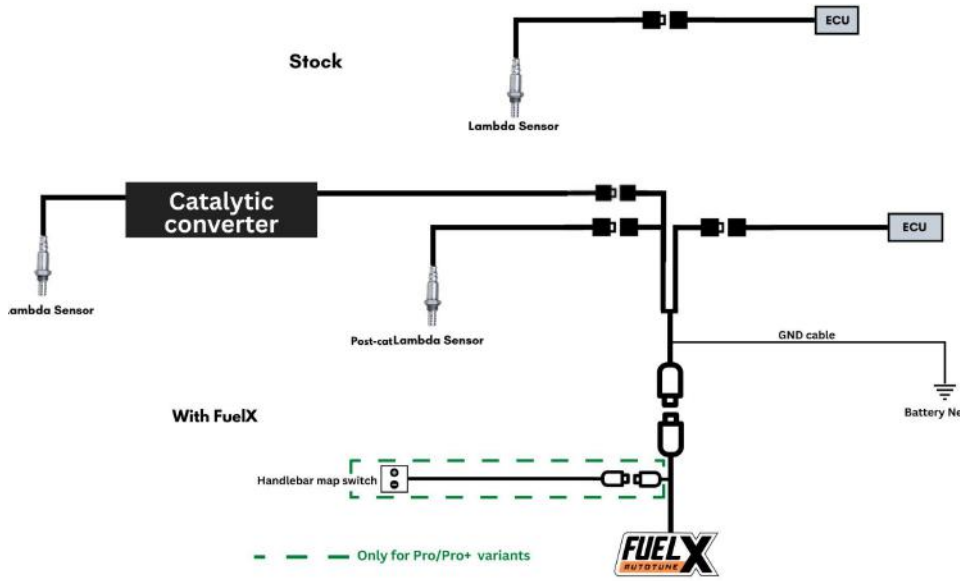


Image 3.3

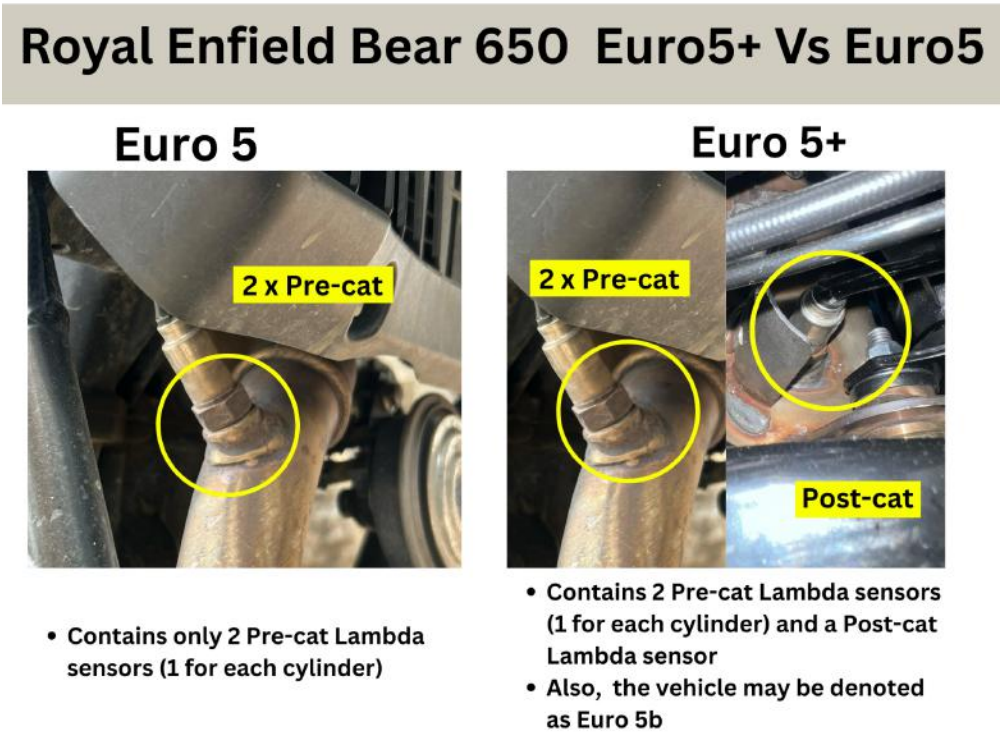


Image 3.4

4. Installation procedure

4.1 Removing panels and fairing

Park the bike using the centre stand on a level surface (Or a paddock stand).

Image 1

Locate the position of the Lambda sensor connectors.

Image 2

4.1.1 Unlock and detach the right-side panel. Refer to **Image 3**.

Image 3

4.1.2 Gently detach the panel after unlocking it. Refer to **Image 4**.

Image 4

4.1.3 Gently detach the panel after unlocking it. Refer to **Image 5.**

Image 5

4.1.4 Locate and pull the knob to unlock the seat lock. Refer to **Image 6**.

Image 6

4.1.5 **Image 7** shows how the seat is unlocked.

Image 7

4.1.6 Detach the seat carefully. Refer to **Image 8**.

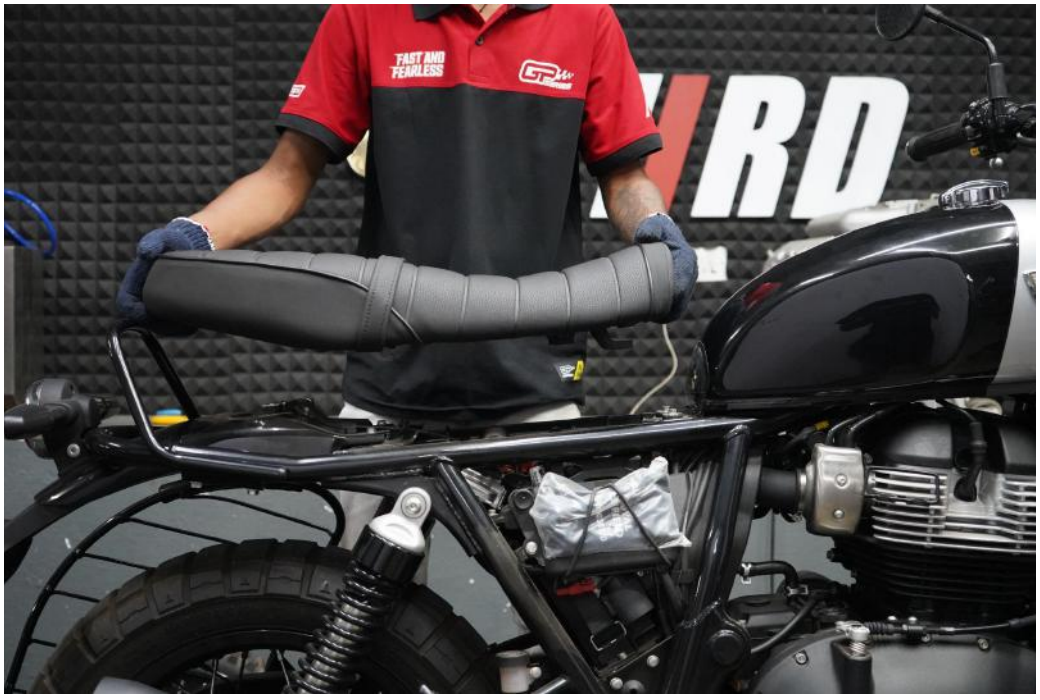


Image 8

4.1.7 Locate and remove the tank bolts using a 10mm hexagonal T socket. Refer to **Image 9** and **Image 10**

Image 9

Image 10

4.1.8 After removing the bolts, gently lift the rear end of the tank a little. Refer to **Image 11**.

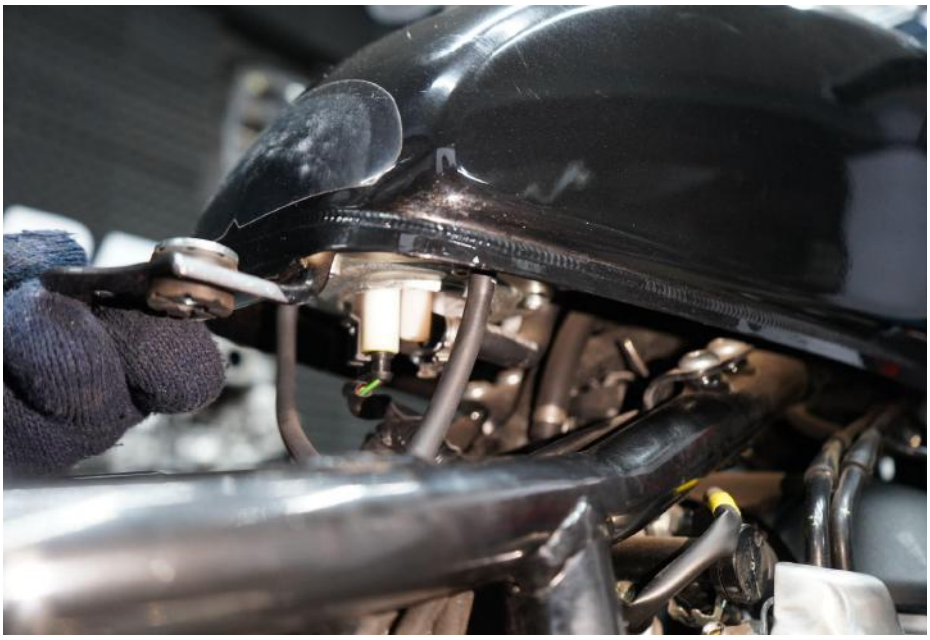


Image 11

4.1.9 Disconnect the vacuum hose 1 carefully. Refer to **Image 12**.

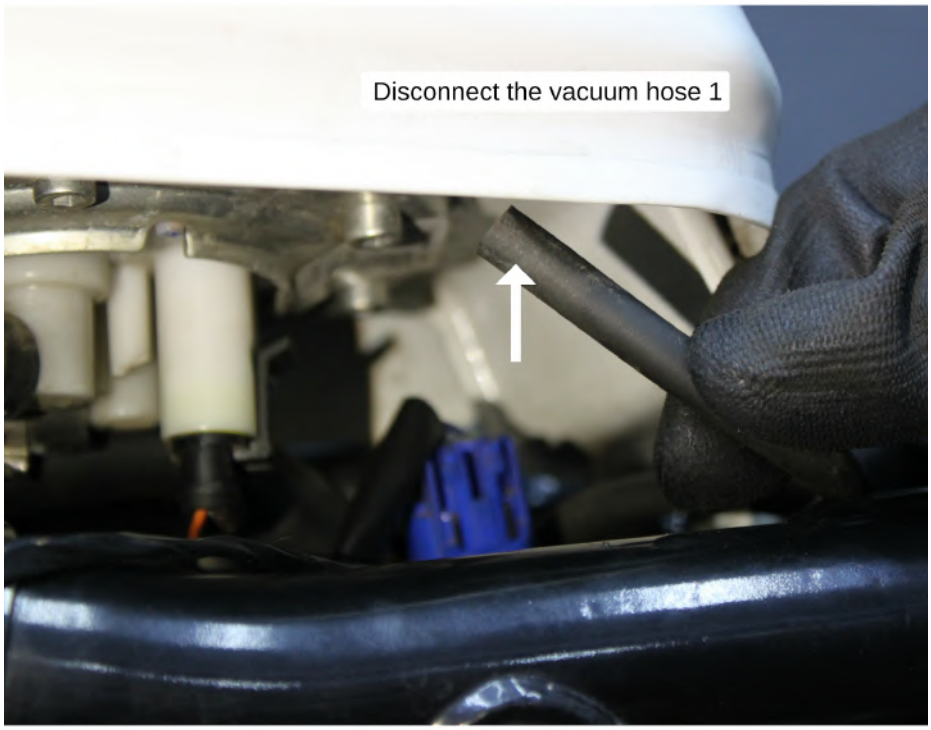


Image 12

4.1.10 Disconnect the vacuum hose 2 carefully. Refer to **Image 13**

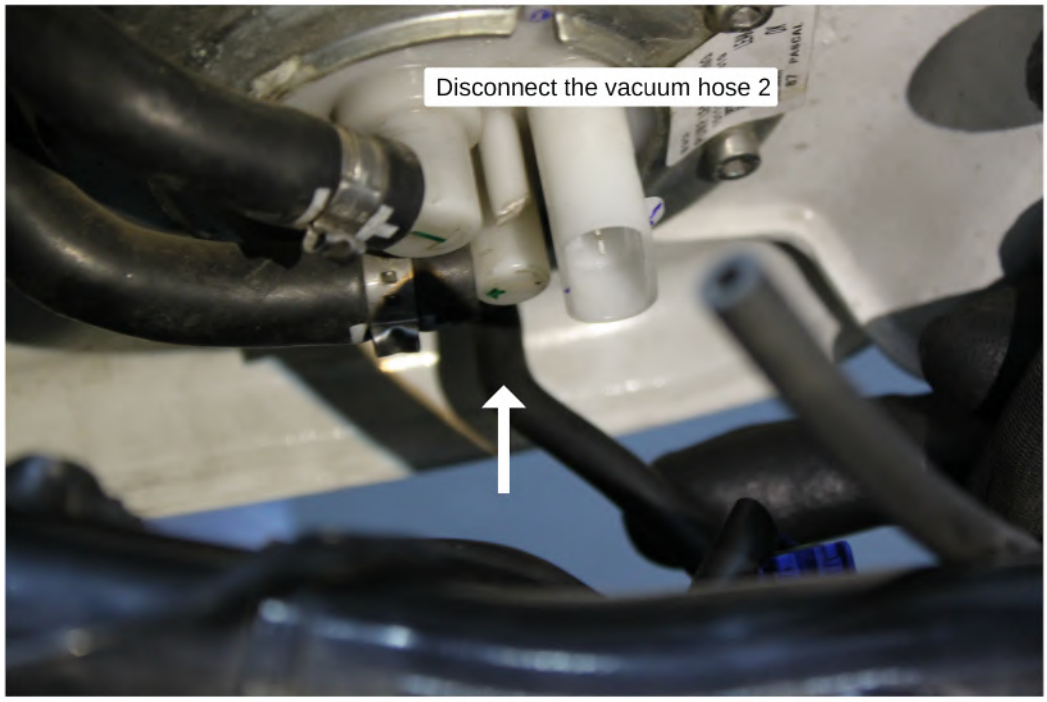


Image 13

4.1.11 Disconnect the fuel pump connector carefully. Refer to **Image 14**.

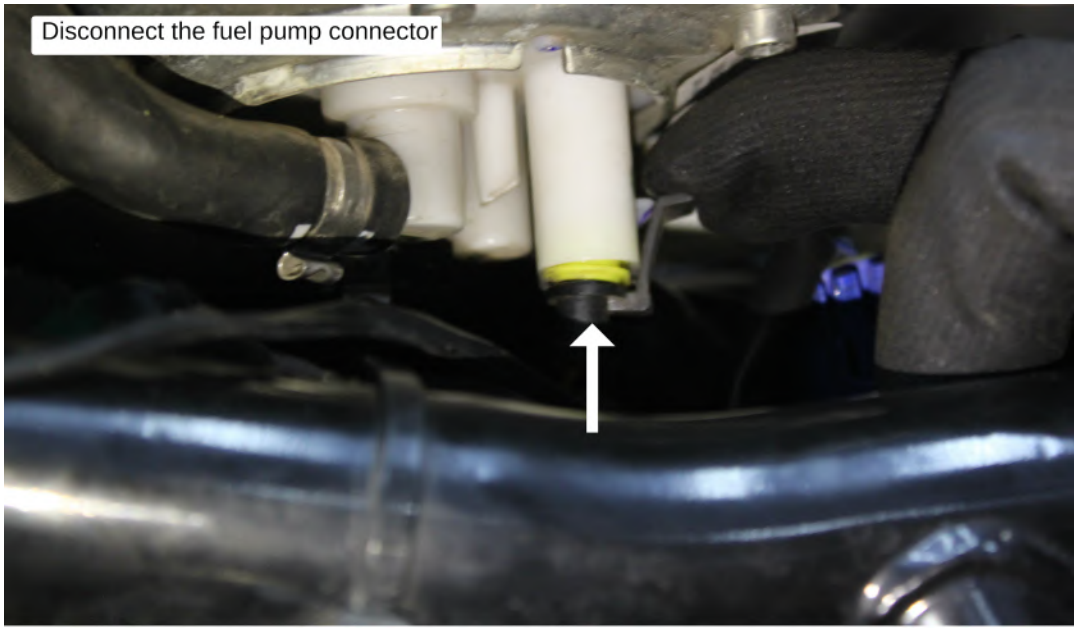


Image 14

4.1.12 Identify and disconnect the fuel gauge connector. Refer to **Image 15**

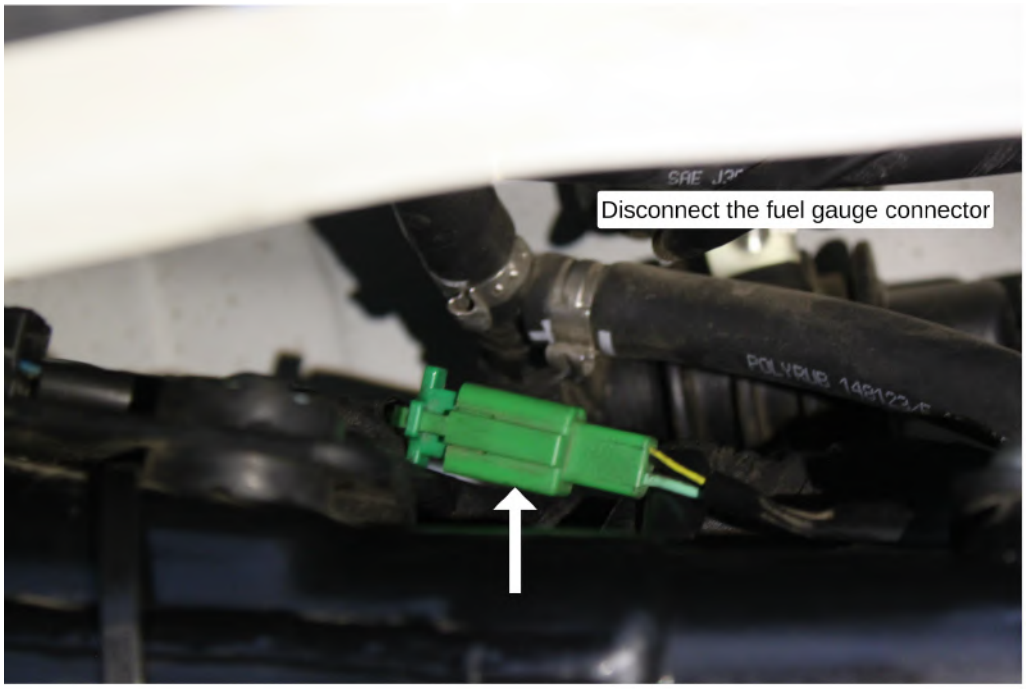


Image 15

4.1.13 Locate and carefully disconnect the fuel line. Refer to **Image 16**

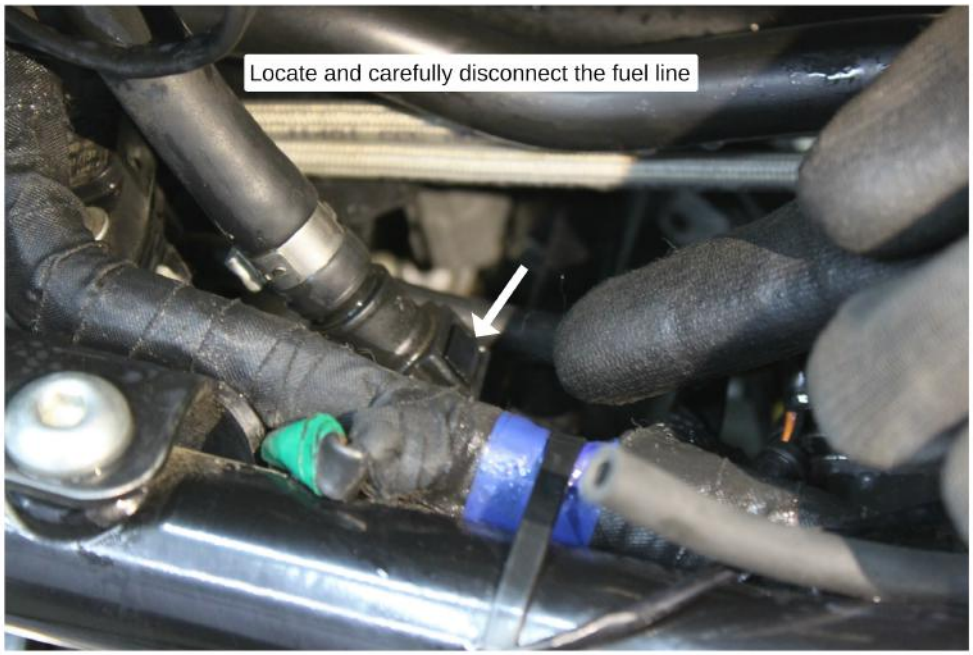


Image 16

4.1.14 Gently lift the tank from the tank seating after disconnecting the connections. Refer to **Image 17**.

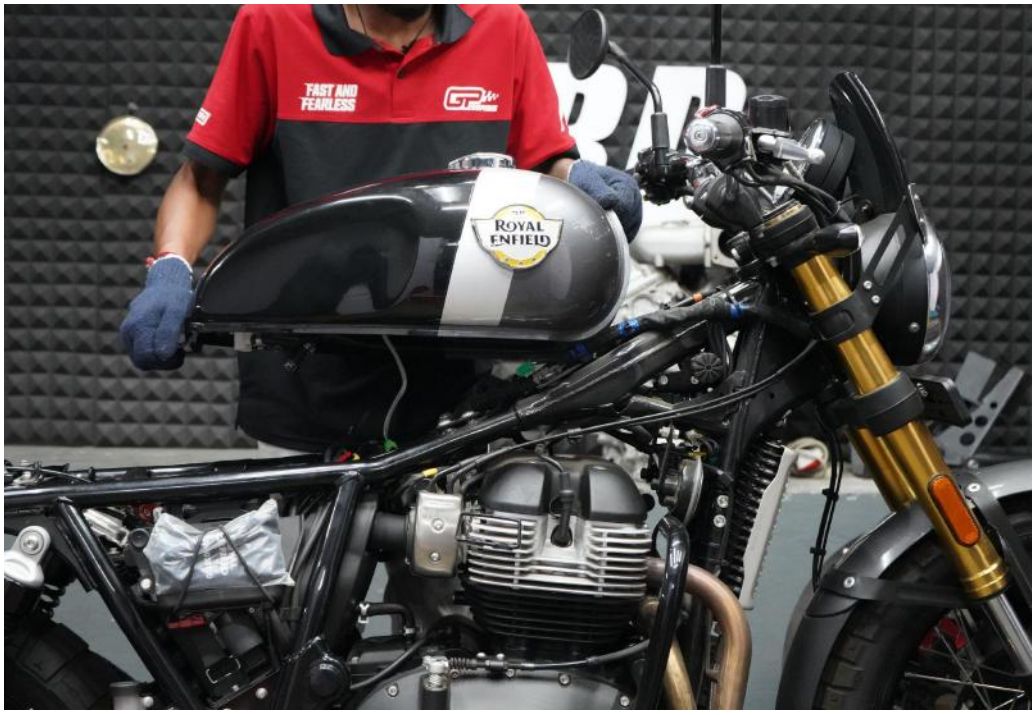


Image 17

4.1.15 Locate the side panel mounting bolt. Refer to **Image 18**.

Image 18

4.1.16 Unscrew the mounting bolt and detach the side panel. Refer to **Image 19**.

Image 19

Routing the harness

4.1.17 Route the FuelX Pre-cat male and female connectors as shown in the image. Refer to **Image 20**

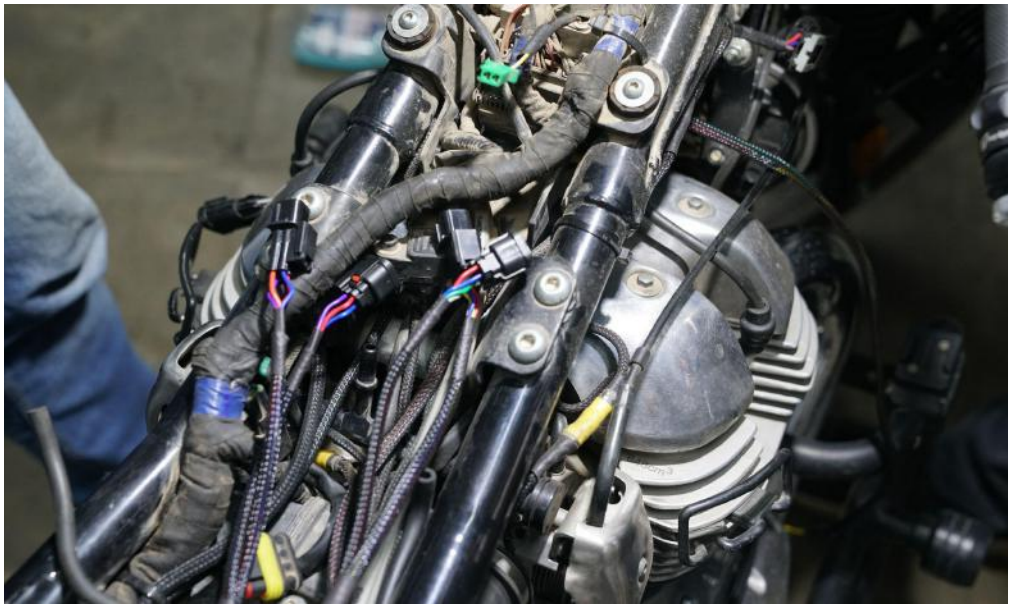


Image 20

4.1.18 Route the FuelX harness under the frame. Refer to **Image 21**

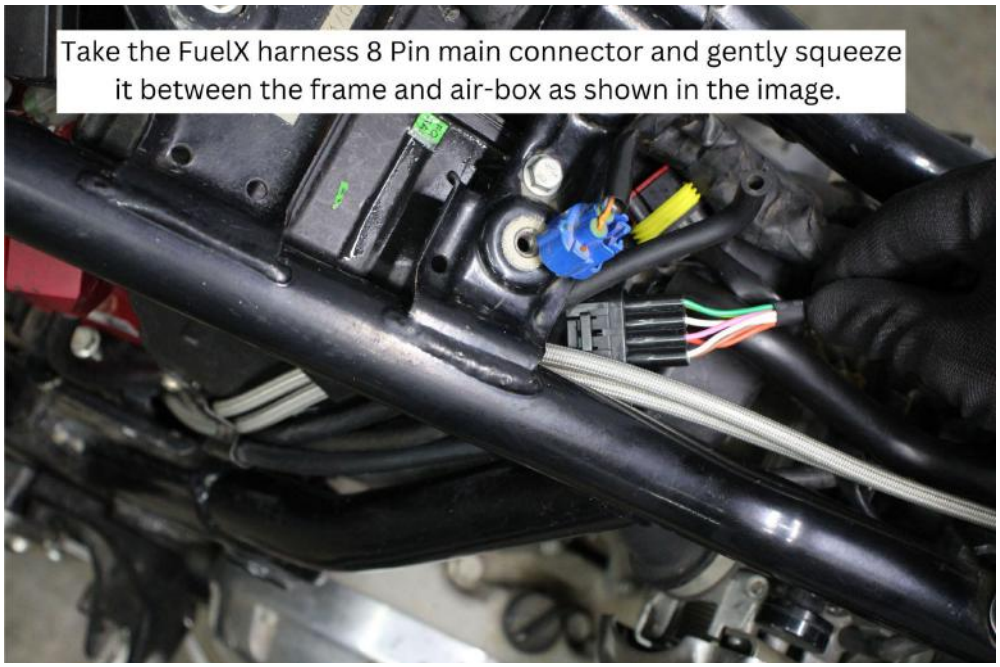


Image 21

4.1.19 Route the FuelX harness under the frame. Refer to **Image 22**

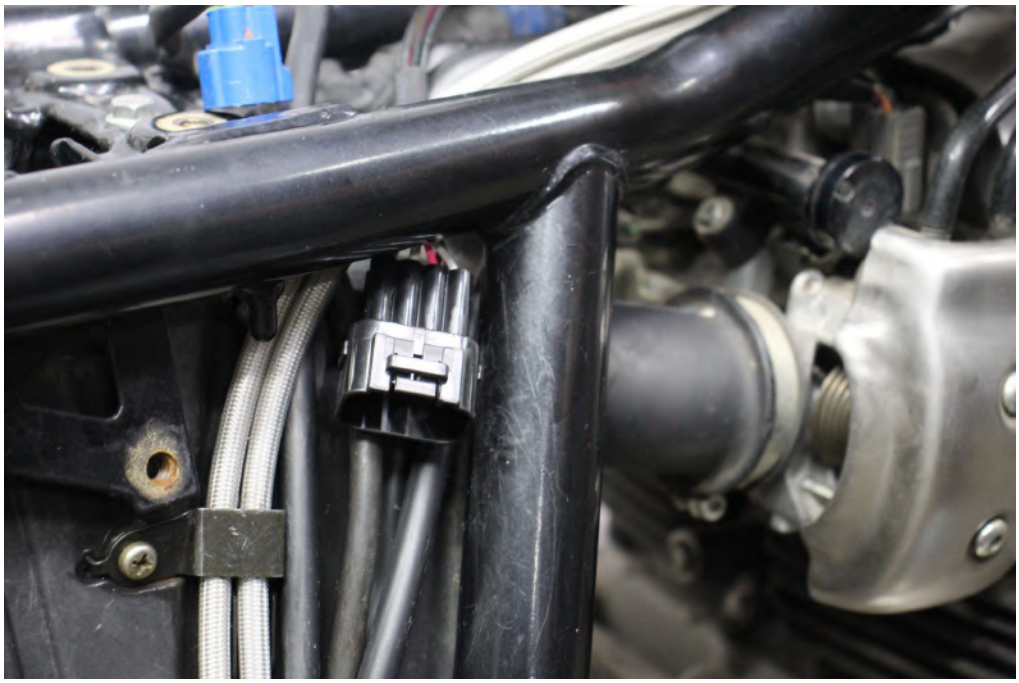


Image 22

4.1.20 Route the FuelX harness behind the frame. Refer to **Image 23**

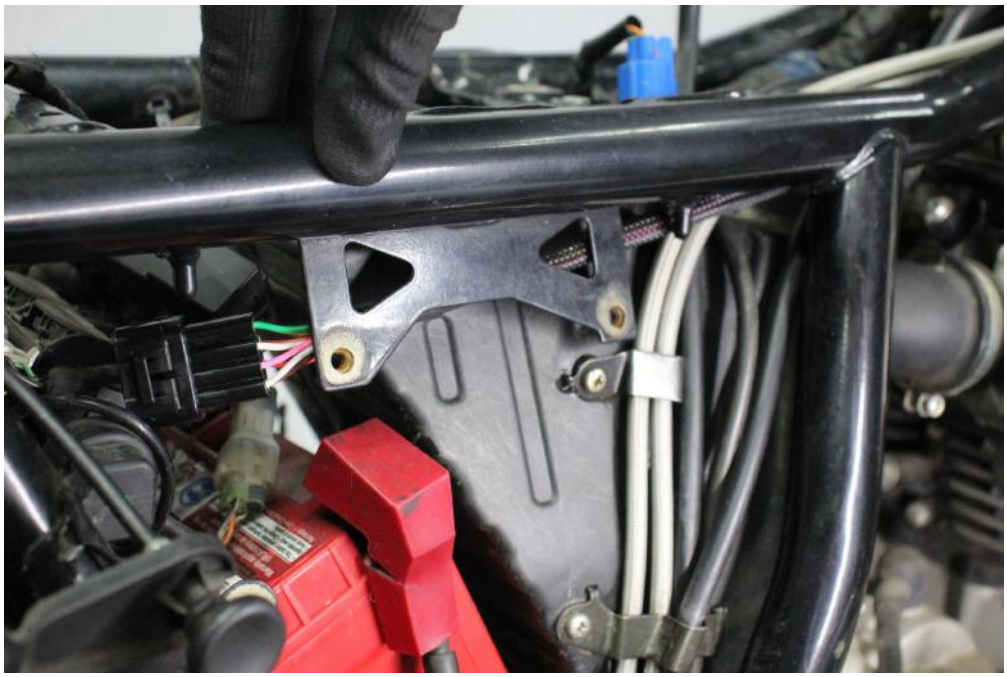


Image 23

4.1.21 Route the FuelX male and female connectors as shown in the image. Refer to **Image 24**

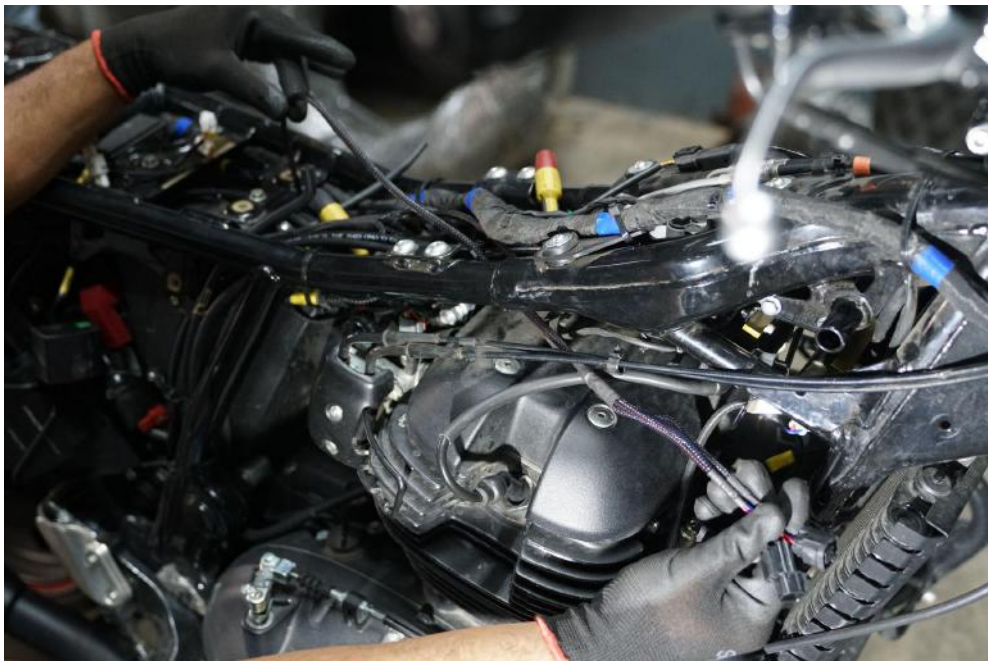


Image 24

Pre-cat Lambda sensor connectors

4.1.22 Refer to **Image 25** to locate the Lambda sensor and Lambda Sensor Connector

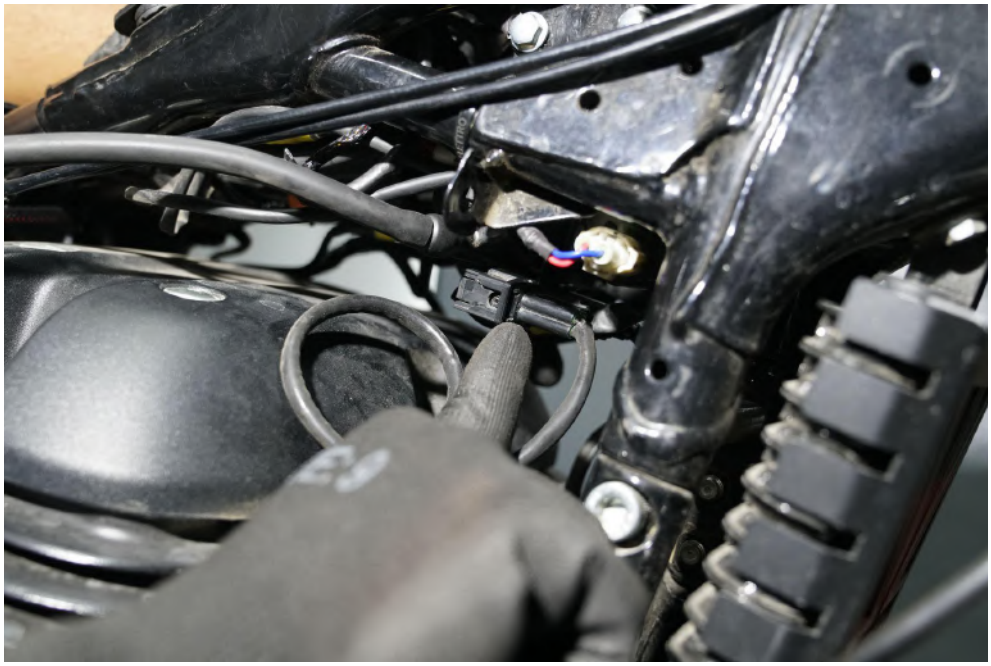


Image 25

4.1.23 Slide the connector back from the lock. Refer to **Image 26**

Image 26

4.1.24 Disconnect the male and female connectors. Refer to **Image 27**.

Image 27

4.1.25 Connect the FuelX male connector to the Stock female Lambda connector. Refer to **Image 28**

Image 28

4.1.26 Connect the FuelX female connector to the Stock male Lambda connector. Refer to **Image 29**

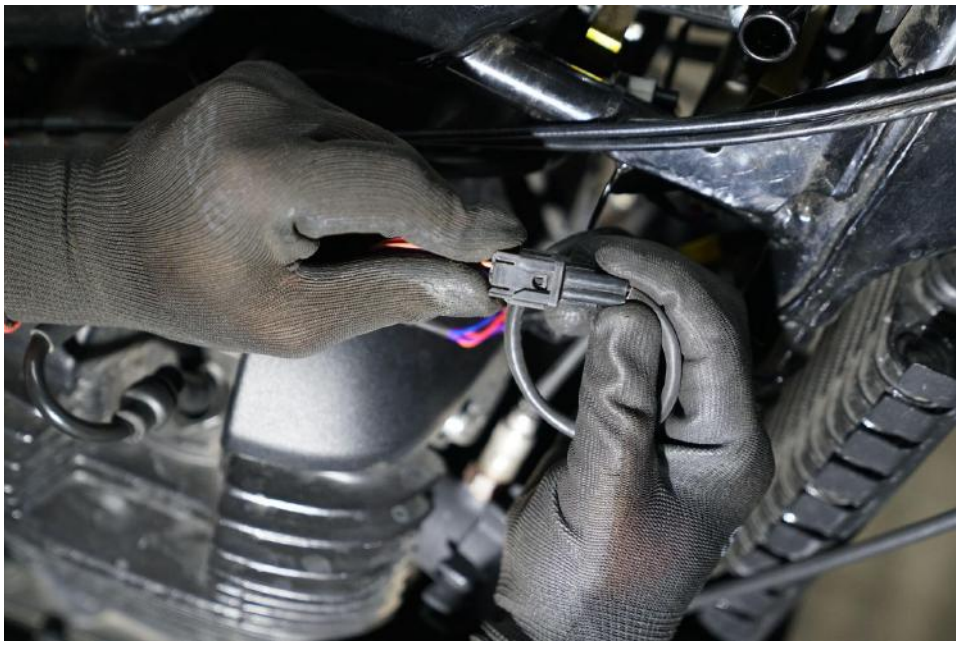


Image 29

4.1.27 Slide the connector back to the lock. Refer to **Image 30**. Repeat the processes on the other side also.

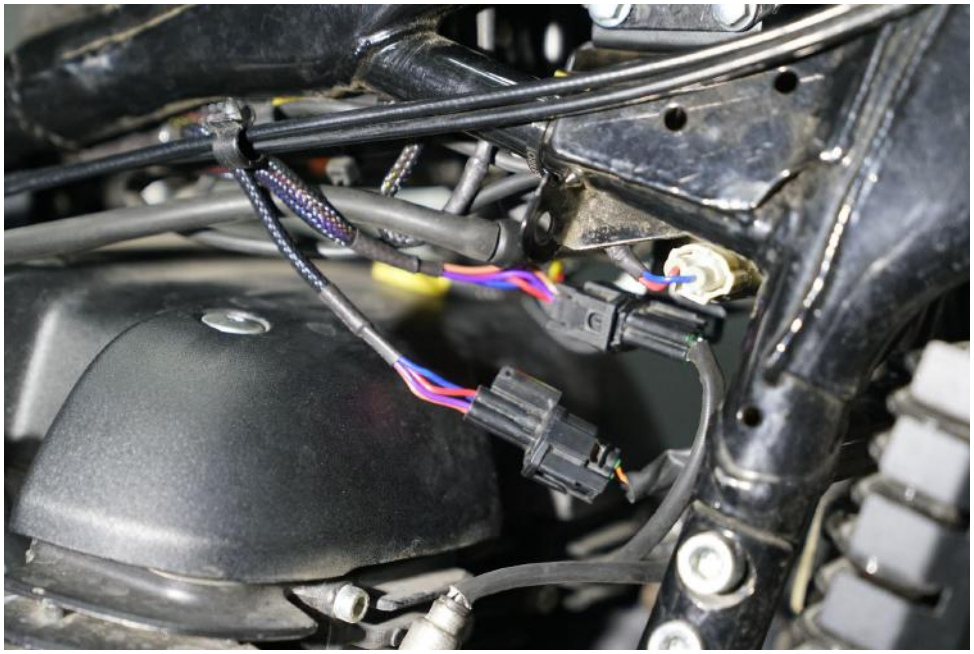


Image 30

Skip the Post-cat Lambda sensor connector installation steps if your vehicle is an EU5 variant

Post-cat Lambda sensor connectors *(For Euro 5+ Models) - Refer to the following steps if your vehicle is a Euro 5+ model.*

4.1.28 Locate the Post-cat lambda sensor connector. (Trace the sensor line to find the Lambda sensor connector) and disconnect them. Refer to **Image 31**

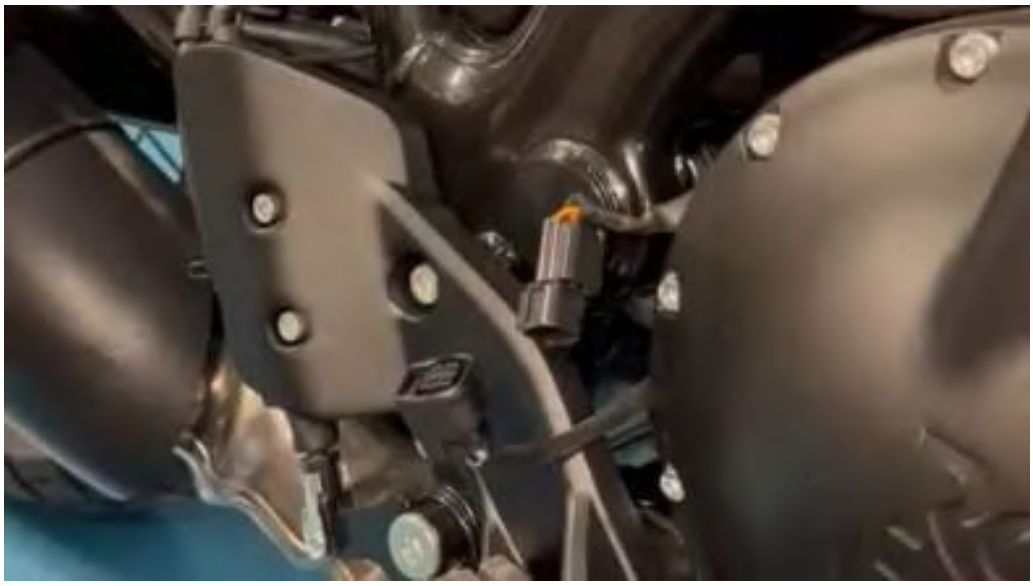


Image 31

4.1.29 Connect the FuelX Post-cat female connector to the stock post-cat male sensor connector. Refer to **Image 32**.

Image 32

4.1.30 Connect the FuelX Post-cat male connector to the stock post-cat female sensor connector. Refer to **Image 33**

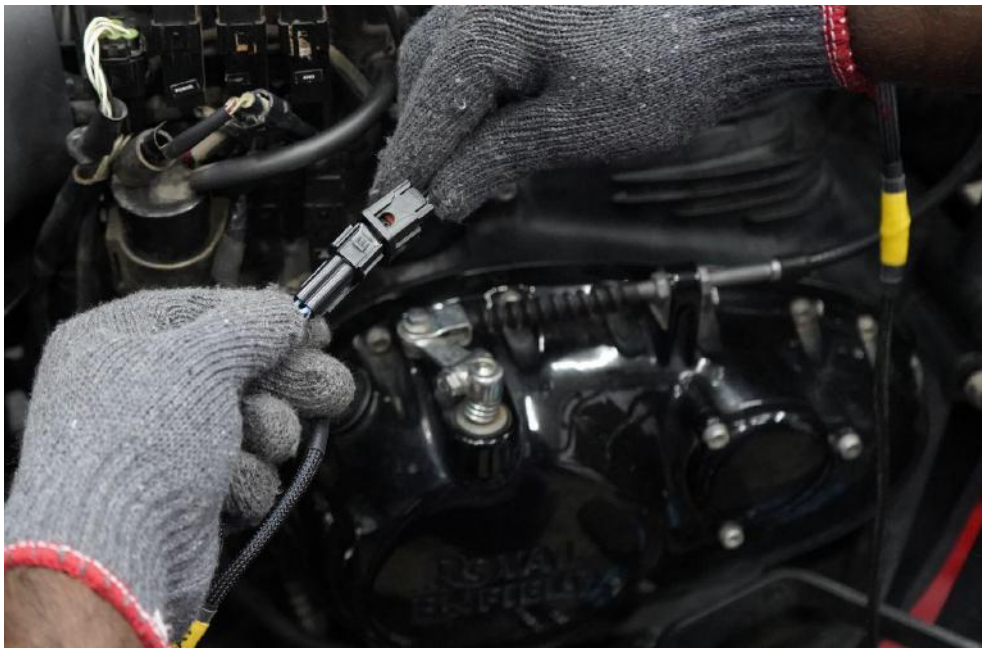


Image 33

4.1.31 Refer to **Image 34** for the completed view.

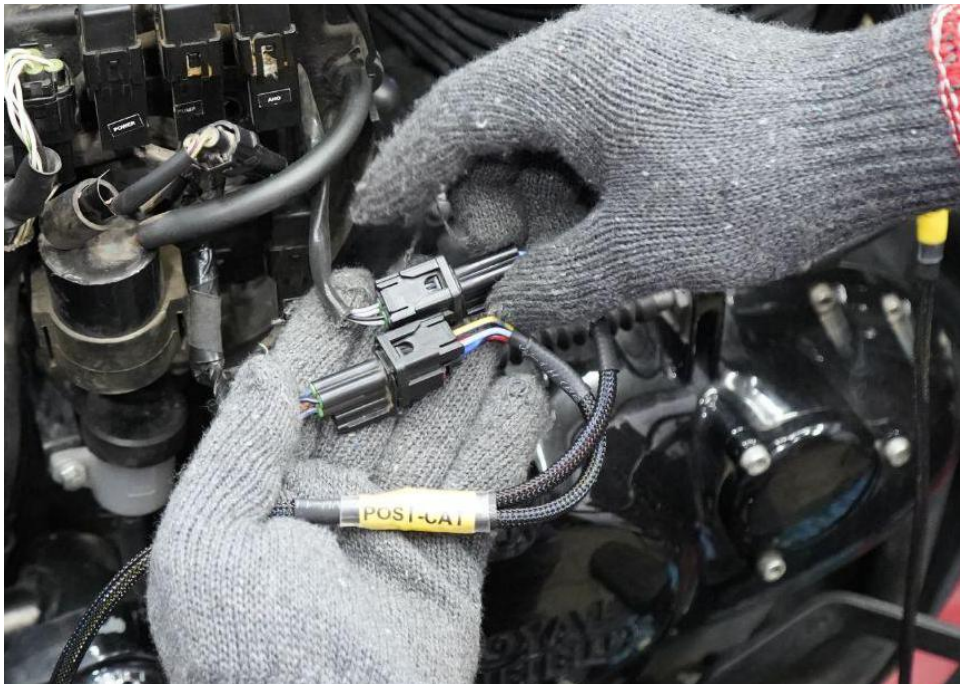


Image 34

4.1.32 Unscrew the battery negative terminal using a Phillips head screwdriver. Refer to **Image 35**

Image 35

4.1.33 Connect the FuelX ground terminal connector to the **battery negative terminal**. Refer **to Image 36**

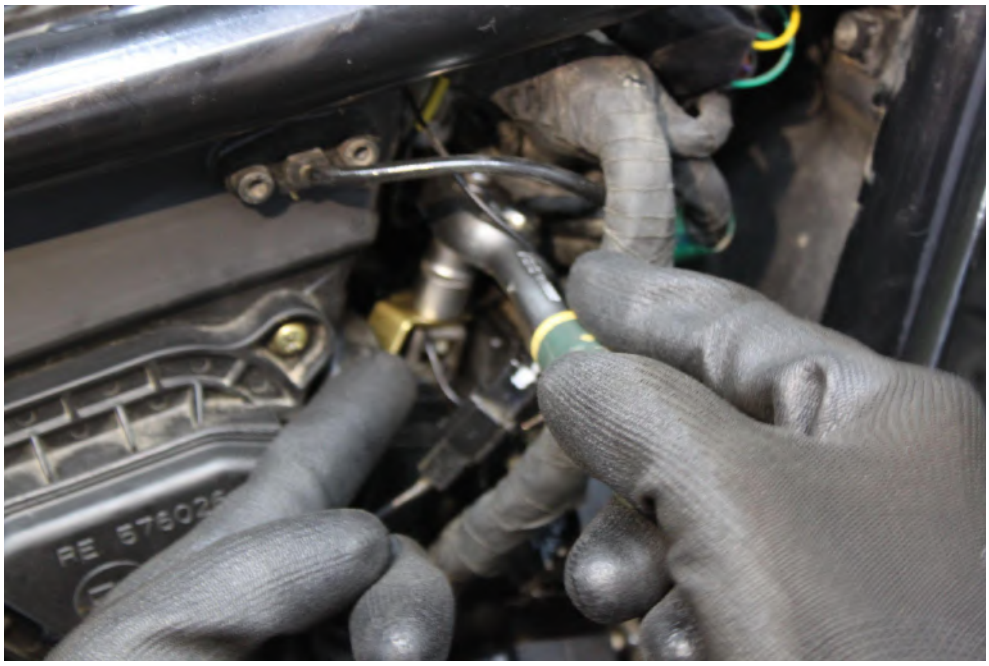


Image 36

4.1.34 For the Handlebar map switch installation, start from the front end. Refer to **Image 37**

Image 37

4.1.35 Route the connector end of the handlebar map switch as shown in the image. Refer to **Image 38**

Image 38

4.1.36 Route the handlebar map switch cable to the rear end of the vehicle. Refer to **Image 39**

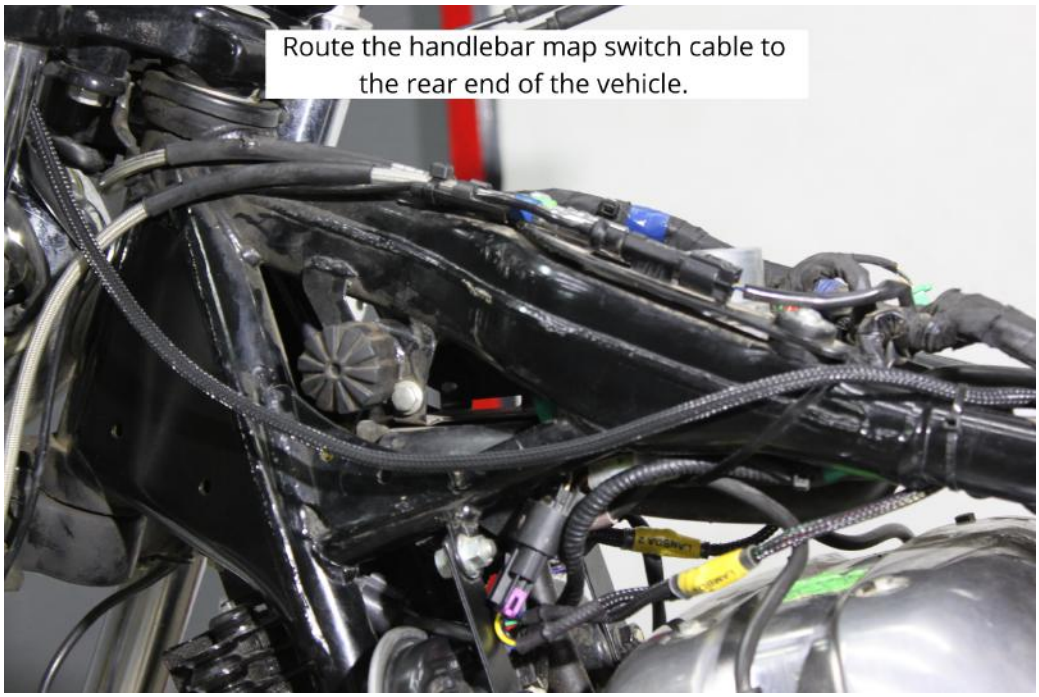


Image 39

4.1.37 Attach the handlebar switch to a suitable position. Refer to **Image 40**

Image 40

4.1.38 Using a 2.5 mm Allen key, tighten the bolts. Refer to **Image 41**

Image 41

4.1.39 Place the FuelX securely under the seat. Refer to **Image 42**

Image 42

4.1.40 Connect the FuelX to the harness. Refer to **Image 43**

Image 43

4.1.41 Connect the handlebar map switch connector to the FuelX connector. Refer to **Image 44**

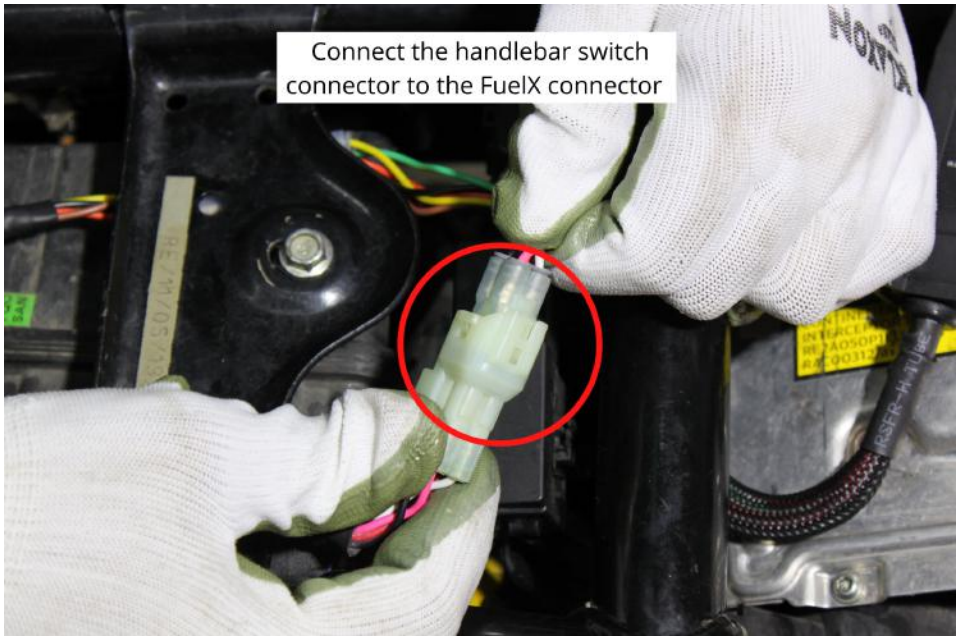


Image 44

4.1.42 Using the provided nylon tags, secure the FuelX and the harness by attaching them to the frame. Refer to **Image 45**

Image 45

5. FuelX Configurations and Settings

For Pro versions, maps on the FuelX can be changed according to the preference of customer. By just pressing the +/- button on the Handlebar map switch. The **Green LED** on the FuelX Handlebar map switch will help the customer know which map is active. Ie, the number of blinks on the handlebar switch indicates the number of maps.

Map No	Map Description
1	LEAN (Less Fuel)
2	
3	STOCK
4	
5	
6	
7	
8	
9	
10	RICH (More Fuel)

Image 5.1

The rider can choose the map according to the fuel enrichment he wants.

The first two maps are lean maps.

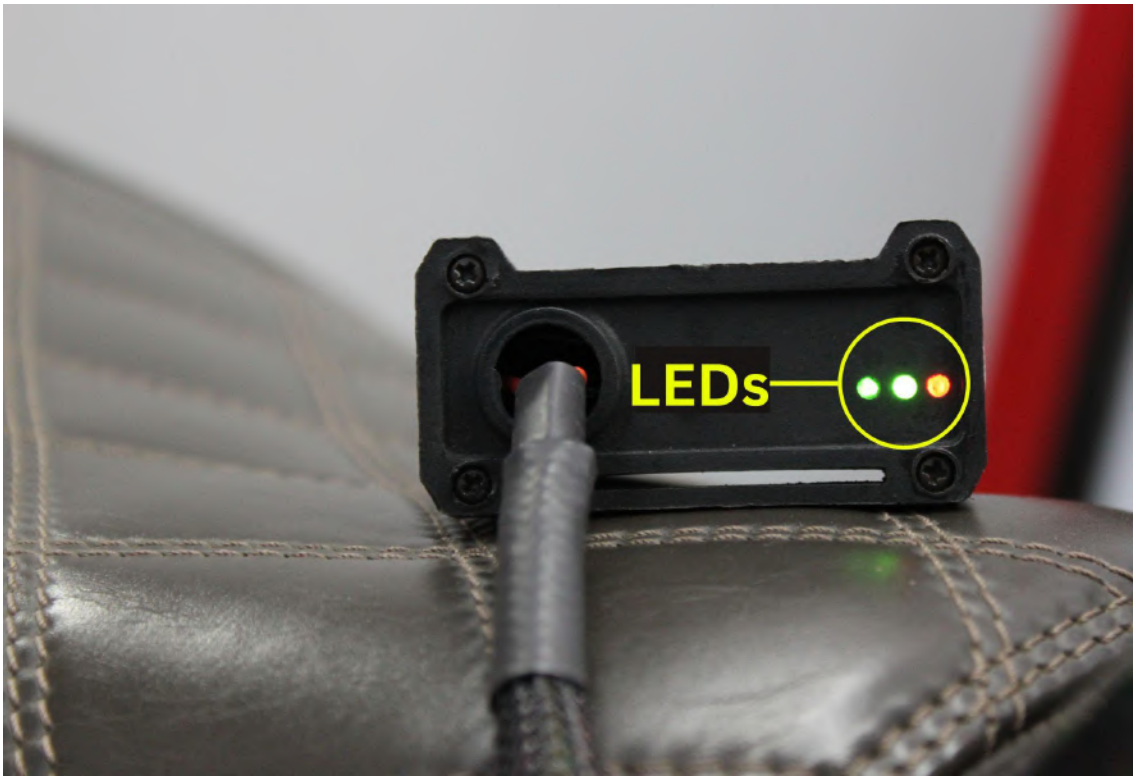
Map 3 runs with stock AFR set by the OEM manufacturer.

Maps 4 from 10 make the AFR richer as the numbers go higher.

For Lite versions, a single autotune map is provided for adjusting the AFR for the best operational parameters.

6. FuelX LEDs

FuelX has LEDs on the module to indicate the operation.



The blinking of the Red LED indicates that the Map on the FuelX is being activated. The Red LED starts blinking after the key and the kill switch are on.

The blinking of the Green LEDs during the idling of the engine indicates that the FuelX is working in sync with the OEM ECU.

The working of both Green and Red LEDs indicates that FuelX is functioning as intended.