

# PowerTRONIC Quick Shifter Installation Manual

<b>Document Version</b>	1	<b>Release Date</b>	28 June 2019
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<b>Application information</b>	<b>Generic</b>
Vehicle	<b>Not Applicable</b>
Model	<b>Not Applicable</b>
Year of manufacture	<b>Not Applicable</b>

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 may cause burns/cuts. Proceed with extreme caution or wait until the bike has cooled down. Always wear safety gloves.
- When the installation is complete, make sure to secure the wiring loom away from the movable parts or components which tends to heat up during the normal operation of the vehicle at any chance.
- PowerTRONIC is intended for motorsport use on a closed course, please check with your local laws before using this product. Race Dynamics / PowerTRONIC is not liable for consequences arising out of using the product.
- After any updates/changes on the R-Tune software, click "Send" to update the values on the ECU.
- Quickshift maybe referred to as QS in this document.

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## Tools Required

- Socket kit
- Cutters/Wire Strippers

## Warning

- ❑ Ensure the gearbox and shift linkages are in good condition, slack in the mechanisms, excessive wear and tear, improper tightening torque, etc. may cause faulty/unpredictable triggers of the quickshifter which may result in dangerous riding conditions.
- ❑ It is advisable to turn off the quickshifter in the lower RPMs.
- ❑ Shift down sequence will induce higher sensor readings than shift up, when calibrating ensure the shift up sequence is used.
- ❑ For the same amount of force applied on the lever, the output of sensor is also dependent on the speed of the shift movement, quicker movements of the shift lever results in higher sensor values and vice versa.

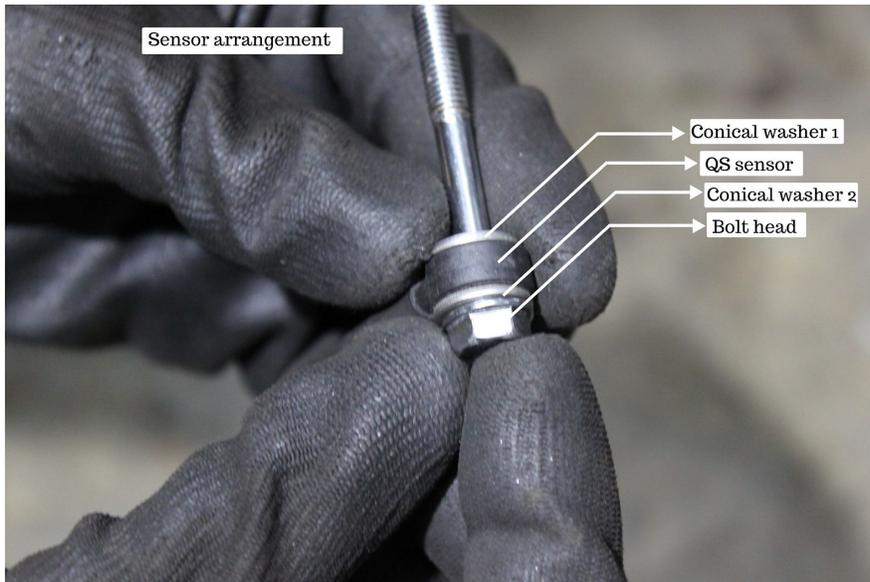
## Description

- ❑ The quickshifter sensor is installed on the shift lever, and senses the gear shift movement of the gear shift lever/pedal, and momentarily cuts power to the engine to enable quick, seamless clutchless shifts.
- ❑ Installation and calibration of quickshifters on PowerTRONIC series of ECUs applicable from
  1. Hardware: All variants of PTB-1A2, PTB-2A2, PTB-3A2, PTB-4A2, some variants of PTBA1CY1 [certain models only, mail us your serial number to verify]
  2. Firmware: F3F.x.xx and upwards
  3. PowerTRONIC R-tune: Version 3.0.3.9 and upwards

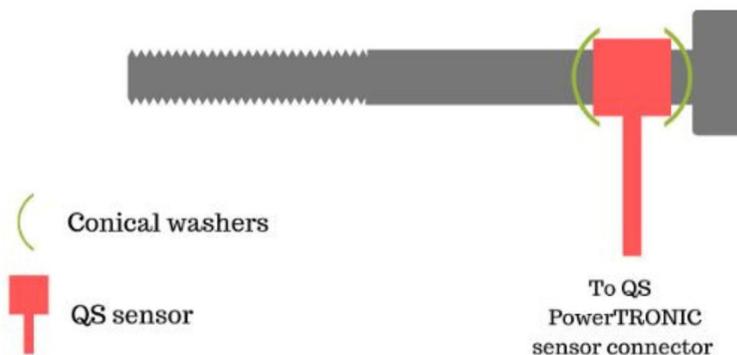
## Quickshifter – Instructions and Installation

### Instructions

- 1) The quick shift kit consists of (a) **Sensor with connector** (b) **Bolt** (c) **Conical washers**.
- 2) Remove the bolt from the original gear shift mechanism.
- 3) Install the supplied quickshifter, in the following order as shown in the image. **(Use a spacer if needed between bolt head and conical washer 2)**



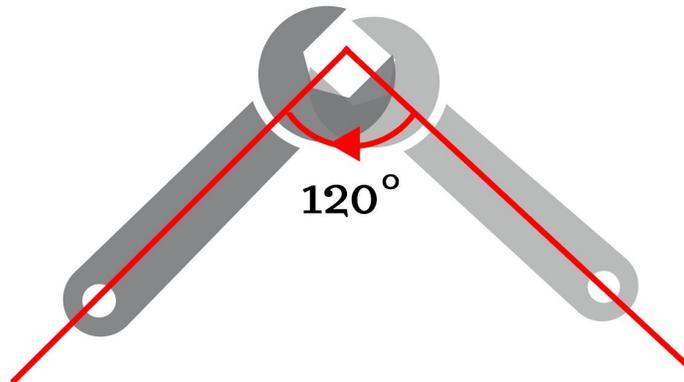
**Refer the schematic diagram before installing the QS sensor on the bike.**



- 4) Tighten the bolt 5 to 6 Nm, or as specified in the original owner's manual or workshop manual (Max torque to be less than or equal to 6Nm)

Or

Tighten the bolt by  $(\frac{2}{3})^{\text{rd}}$  of a full rotation of wrench from the point of feeling resistance for the first time. The maximum degree of rotation is limited to 240 degrees. Refer image below.



**Rotate the wrench by 120° from the point of first resistance and do this twice (total 240°)**

**Warning: DO NOT overtighten the sensor**

- 5) Connect the PowerTRONIC Quick shifter connector to sensor connector and tie it with the frame.

**Note: Do not lock the zip ties completely. Use them as a guide for sensor wire.**

- 6) Connect the R-Tune software to the PowerTRONIC ECU, available at

<https://powertronicecu.com/downloads/> [Refer R-Tune installation manual and connecting to ECU document].

## A. Calibration– Quick shifter sensor

1. Sit on the bike like how you would normally do, place your leg on the shift lever.

1.1. Set the following on PowerTRONIC R-Tune (or use the base map provided for the quickshifter), and click “Send”.

	Parameter	Value to set	Description
1	Quickshift activation	Positive trigger	Defines the sensor output type.
2	Quickshift sensor trigger	50	The value from the quick shift sensor above which the ecu initiates the QS action.
3	Quickshift TPS %	0	The TPS % opening above which the QS function is activated.
4	Quickshift Sleep (ms)	500	The time in milliseconds, for which the input from the sensor is ignored each time a successful QS function is run. It is essential to have a minimum of 200 ms to prevent false triggers.
5	Quickshift RPM v cut (ms)	First two fields set 0 and next 8 set 100	To control the cut times based on RPM, 0 means QS function disabled for that RPM range.

**\*Note:**

“Quickshift Sensor Trigger Active” area on the tab lights up when Sensor value is higher than “Quick Shift Sensor Trigger”, this only indicates the shift action has been recognized, and does not mean the QS function is activated.

Once the QS satisfies the previous step, if the throttle opening % is higher than “Quickshift TPS %” AND “quickshift RPM v cut time” is a value more than 0 for that RPM, then the QS function will activate and cut power for the number of milliseconds as on “Quickshift RPM v cut time”. The “Quickshift spark cut active” on R-tune will light up to indicate the same.

A value of 0 on the “QuickshiftRPM v cut” means the QS function is inhibited for that RPM region.

2. Turn on the ignition key, but do not start the engine.

3. Click on "Reset Max val"

4. Move the shift lever like shifting up a gear, like going from 1<sup>st</sup> to 2<sup>nd</sup>, or 2<sup>nd</sup> to 3<sup>rd</sup>, etc. (Do not shift down a gear, in case you have already done that, click on "reset max val" again), using as much force as you normally use. Observe the "Max sensor value", and enter a value about 80% of this value in the "QuickShift Sensor Trigger" field, and click "Send". The idea is to use a sensor trigger value slightly less than the max recorded. You can repeat this step of clearing the max value and testing your shift force, to ensure the ECU senses your normal operating force.

5. Again, shift up as you normally would, and ensure the "Quickshift Sensor trigger active" lights up momentarily when you upshift. If it does not, repeat Step 4. This step identifies your normal usage pattern and will initiate a shift sequence.

6. Now set "Quickshift TPS %" to your preference, this field specifies a TPS % above which the Quickshift function is activated. Note: for any change that is done on the R-Tune software, you will have to click "send" to update the ECU of these changes.

6.1. To enable quick shift at all times, set "Quickshift TPS %" to 0

6.2. To enable quickshift above a specified TPS %, enter the said value in "Quickshift TPS%" field, you may have to ensure the TPS calibration is done, if in doubt, do a "Auto calibrate" for TPS.

## **B. Calibration – usage**

1. Test the bike on road or on dyno, holding full throttle (or throttle % above the “Quickshift TPS %”) and while not pressing the clutch AND not letting go of throttle, shift up a gear. If there is noticeable cut in power whenever you shift up, the sensor calibration is okay. If there is no cut whatsoever, then you may have to redo the above step (Calibration – sensor) and set the “Quickshift TPS %”

2. To adjust the cut time, lookup the “Quickshift RPM v Cut time (ms)”. This field allows for different cut times based on engine RPMs. If the value set is 0 it means Quickshift function is disabled in that region. If the value is too small the gears will not shift well, have false neutrals or may not shift at all. If the value is too high, the gear will shift but will have an unnecessary delay before the power comes back on. To start with all the fields can be set to 100ms or more. Test and adjust the values based on RPMs for the best cut for your riding style. Typically lower RPMs need higher cut times and higher RPMs need lower cut times. These values may vary based on (not limited to)

2.1. Vehicle condition and age

2.2. Vehicle type

2.3. Shift linkage slack

2.4. Gearbox wear and tear

2.5. Riding style

### C. Troubleshooting

	<b>Problem</b>	<b>Reason</b>	<b>Solution</b>
1	QS does not trigger, the "Sensor value" on R- Tune isn't changing when gears are shifted up/down	Sensor not connected or Sensor or harness failure	Connect sensor and check
2	QS does not trigger, but the "sensor value" changes when the gears are shifted up/down.  "quickshift sensor trigger active" does not light up.	Quickshift sensor trigger Incorrect. Gear lever movement too slow, sensor unable to meet threshold value	Repeat steps A and B mentioned above Gear changes have to be quicker. Quicker shift with same force will yield higher sensor output
3	QS does not trigger, but the "sensor value" changes when the gears are shifted up/down.  "Quickshift sensor trigger active" lights up but "Quickshift spark cut active" does not light up.	Quickshift TPS % Or Quickshift RPM vs cut time incorrectly set	Repeat steps A and B mentioned above
4	QS works, but there are many cuts within a short time, or just after a gear shift has occurred.	Sleep time is too low	Increase quickshift sleep time 5 ms
5	QS works (power cuts), but the gears are not shifting, or gears going into false neutrals.	Cut time for that RPM region too low	Increase cut time for that region
6	QS works (power cuts), but takes a lot of time for the power to get back.	Cut time for that RPM too high	Lower cut time for that region
7	QS cuts randomly when using, especially in lower RPM.	Quickshift TPS % Or Quickshift RPM v cut time Incorrectly set.	Repeat steps A and B mentioned above.