

❖ IMAGE



❖ INTRODUCTION

Nowadays, engines of motorcycles and cars are equipped Programmed Fuel Injection technology (PGM-FI), it replaced for previous mechanical control systems. This system provide many advantages compared to previous generation of engine performance, fuel consumption optimize, smart, convenient, safe for users and exhaust pollution decrease, environment protection.

Beside above advantages, there are still many defects, which in fact have not been resolved as below:

- PGM-FI system only works perfectly when it is very new, after short time (about one year) engine technical parameters has not reached standard. Example: engine fuel consumption is more than old carburetor system and it creates more pollution emissions.
- The cost for repair and replacement is more expensive after a few years of operation.
- Especially, Electronic control technique in motorcycle/ car repair is complex. It requires repairer must have high technical qualifications. Besides, electronic control modules (ECU) has integrated designed and do not allow adjust parameters due to deviation of components in ECU.
- Some designs and software programming inside ECUs still have many errors that have not fixed and it created many difficulties for technician.

AFO-3S model supports anti-theft function by secret code without using "magnetic card", consuming power form battery. The vehicle can only start engine when the owner enter the security code by holding/releasing brake and opening/closing throttle.

AFO-3 – The abbreviation of an electronic accessory will be adding on the new generation motorcycle and car that used Programmed Fuel Injection technology (PGM-FI). It allow user adjust optimally fuel injection system to standard value of engine. **AFO-3** is researched and manufactured by DTDAuto Technology Team, Institute of Physics, Vietnam Academy of Science and Technology. With **AFO-3** all above troubles will be solving intelligently, automatically or can be adjust optimally by technicians to makes vehicle run better and less environment pollution.

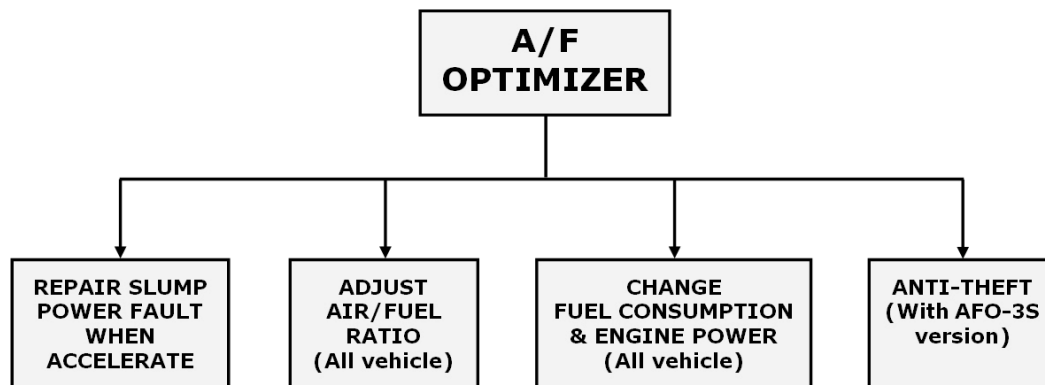
❖ **FEATURES**

- The device is designed with intelligent microcontroller technology, it like as a secondary ECU that optimize A/F ratio according to the actual load status of engine
- Only optimize A/F ratio to repair slum power when accelerate without changing fuel injection quantity at the other loading conditions, so do not rich fuel when operating in the normal load mode.
- Can adjust A/F ratio depending on user's demand
- Keep the original wiring harness, no need to cut wiring during installation
- Quick installation time and simple operation with dedicated wire clamp
- Update, upgrading the next software versions via internet
- Equipment is stable, watertight and low energy consumption
- Especially: AFO-3S supports the anti-theft function for motorbike *(if vehicle is starting, user turns off the engine but no more than 10 minutes then turn on the ignition key or vehicle shutdown due to Idling Stop mode, AFO-3S will recognize that this is still the owner and no require entering security code)*
- Equipment can be installed for all types of FI motorcycles and cars using electronic fuel injection system with AFO-3 1, 2, 4 and 6 channels

❖ **OPTIONAL VERSION**

| No. | VERSION | TYPE | OPTIONS |
|-----|---------|--|---|
| 1 | AFO-3 | VERSION WITHOUT ANTI-THEFT FUNCTION | |
| | | 1 | Injector connector SH125i/150i or similar types |
| | | 2 | Injector connector AIR BLADE 125 FI or similar types |
| | | 3 | Injector connector LEAD 110 FI or similar types |
| 2 | AFO-3S | VERSION WITH ANTI-THEFT FUNCTION | |
| | | 1 | Injector connector of SH125i/150i or similar types |
| | | 2 | Injector connector of AIR BLADE 125 FI or similar types |
| | | 3 | Injector connector of LEAD 110 FI or similar types |

❖ **FUNCTION**



1. AUTO REPAIR SLUMP POWER FAULT WHEN ACCELERATE FOR PGM-FI HONDA

2. CALIBRATE A/F RATIO FOR PGM-FI MOTORBIKE/ SCOOTER

Proactively calibrate Air/Fuel ratio to recover faults related to fuel rich/lean caused by ECM fault as more fuel consumption, weak engine, Idling Stop ... that need not replace a new ECM

3. CHANGE FUEL CONSUMPTION AND ENGINE POWER OF PGM-FI VEHICLE IN CASE OF YOU HAVE SPECIAL DEMANDS

- Proactively adjust the less fuel consumption in case of users are old people that only need fuel economy consumption and needn't quick response engine power.
- Proactively adjust rich fuel than normal design of vehicle in case of user is young people that want quick acceleration engine, "strong engine".

4. ANTI-THEFT SYSTEM

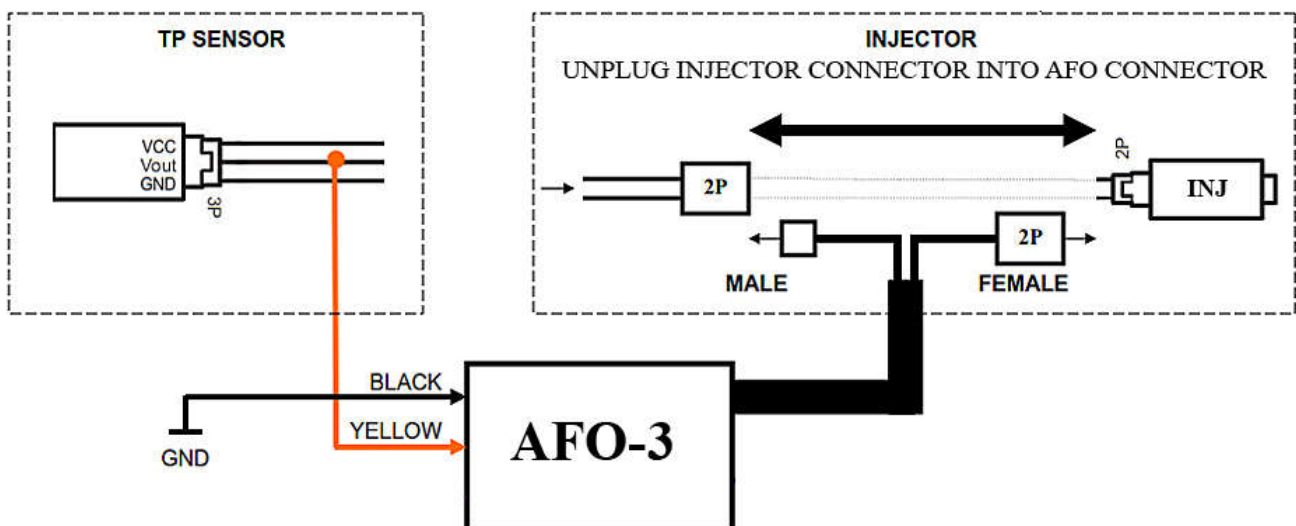
Only the owner of the vehicle knows security code can start engine. This is the extra function of AFO-3S kit.

❖ **INSTALLATION INSTRUCTION**

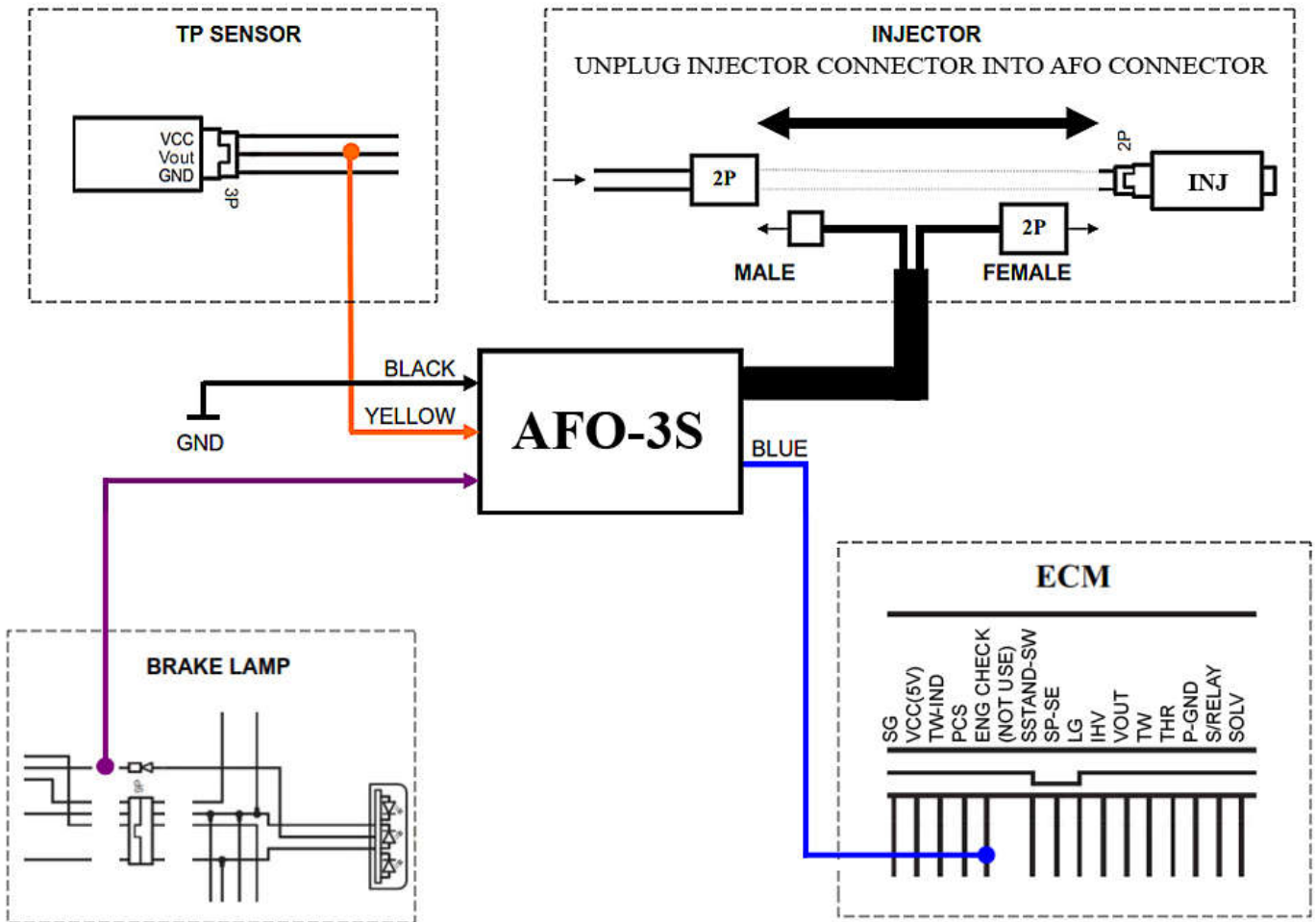
1. ELECTRICAL WIRING DIAGRAM FOR AFO-3 & AFO-3S

- Step 1: Turn off ignition key
- Step 2: Remove out the seat, storage box then connect exactly circuit as below image:

ELECTRICAL WIRING DIAGRAM FOR AFO-3



ELECTRICAL WIRING DIAGRAM FOR AFO-3S



2. NOTES IN AFO INSTALLATION FOR PGM-FI HONDA

Connector of HONDA injectors have 02 types are common and special connector (*reverse connector*), about 90% are common type, only 10% are reverse type.

To determine type for connector, you must plug-in AFO connector to vehicle connector same as the image below. Look at wiring color type:

- If wire color of connector are same side then that is common connector type.



☞ **This case, don't need to change anything in the installation**


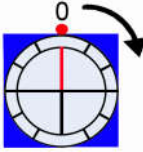


- If wire color of connector are reverse then that is special connector type (*reverse connector*). Look at the image below:



🔑 **This case, you must invert wires of injector connector on motorbike firstly**

| STEPS REVERT WIRES OF INJECTOR CONNECTOR ON MOTORBIKE | |
|---|--|
| Injector connector on motorbike before revert | |
| Use clamp to remove metal latch (1) and wires of injector connector (2) on motorcycle | |
| - Revert pink/blue wire and black/white wire then plug in them into connector (3) - Plug metal latch (4) | |
| Injector connector on motorbike after inverted wires | |

3. CALIBRATION

| MODE | POSITION OF ADJUSTMENT SCREW | DESCRIPTION |
|---------------------------------|---|---|
| MODE 1 (Default mode) | Zero position (0 point)  | Auto repair weak power fault when cool start and slump accelerator |
| MODE 2 | From 0 point to on the right (increasing direction)  | Increase air/fuel ratio and up engine power |
| MODE 3 | From 0 point to first bar on the left (decreasing direction)  | Only perform anti theft function without adjustment and optimum air/fuel ratio |
| MODE 4 | From first bar on the left decreasing direction to left  | Decrease air/fuel ratio, down engine power but it will be down fuel consumption |

4. AUTO REPAIR SLUMP POWER WHEN ACCELERATE FOR HONDA PGM-FI

- **Step 1:** Turn off ignition key
- **Step 2:** Remove out of the seat, storage box then connect exactly circuit as electrical wiring diagram.
- **Step 3:** Turn the adjustment screw to the zero position if not (Zero point)

5. ADJUST A/F RATIO FOR PGM-FI MOTORBIKE/ SCOOTER

- **Step 1:** Connect exactly circuit as electrical wiring diagram
- **Step 2:** Connect MOTOSCAN to vehicle to check current A/F ratio
- **Step 3:** Adjust
 - + **If rich A/F ratio:** Turn the adjustment screw to the left (*anti-clockwise*) begin position 1, 2, 3, 4 or 5 bars to decrease A/F ratio to standard A/F value is 14,7/1.
 - + **If lean A/F ratio:** Turn the adjustment screw to the right (*clockwise*)

begin position 0, 1, 2, 3, 4 or 5 bars to increase A/F ratio to standard A/F value is 14,7/1 or more.

- Step 4: Reconnect MOTOSCAN to motorbike/ Scooter to check result of A/F ratio and ACM SFSTRIM after you adjusted and checked vehicle operating.

6. CHANGE FUEL CONSUMPTION AND ENGINE POWER OF PGM-FI VEHICLE IN CASE OF YOU HAVE SPECIAL DEMANDS

- **Step 1:** Connect exactly circuit as electrical wiring diagram

- **Step 2:** Connect MOTOSCAN to vehicle to check current A/F ratio

- **Step 3:**

+ **Adjust fuel economy:** Turn the adjustment screw to the left (anti-clockwise) begin position 1, 2, 3, 4 or 5 bars to decrease fuel to initial default value.

+ **Adjust to increase engine power:** Turn the adjustment screw to the right (clockwise) begin position 0, 1, 2... or 5 bars to increase engine power to initial default value.

NOTES:

- Fuel economy can makes weaker engine

- Engine power increasing can consume more fuel

- Each adjust value, you must wait for 10 seconds for update ECM to new value -

Step 4: Reconnect MOTOSCAN to motorcycle to check A/F ratio, ECM SFSTRIM then check engine power after adjusting.

7. INSTALL FOR ANTI-THEFT FUNCTION

- This function supports for AFO-3S

- Connect exactly circuit as electrical wiring diagram

(Notes: Do not need to use violet wire and blue wire for AFO-3 without support ANTI-THEFT)

❖ APPLICATION

- Used for almost motorcycles and cars that used electronic injection technical special functions

- Support special functions for HONDA PGM-FI is not equiped MAP sensor as AIR BLADE 125, LEAD 125, VISION 125...

❖ SPECIFICATION

- Installation time: about 20 to 30 minutes for 1 vehicle

- Low cost, direct installation on the vehicle

- Reliability operating, stability, quality and durability

- Dimension: 70 x 45 x 15 mm

- Weight: 100g

- Current consumption: 5mA to 10mA

- Operating voltage: 12V






- water resist, light impact and temperature < 100C

- Firmware version: 3.0

- Free update Firmware (If there is release)

- Warranty 01 year

❖ PACKAGE

| No. | QUANTITY | DESCRIPTION | IMAGE |
|-----|----------|----------------------|--|
| 1 | 01 | Electronic converter |  |
| 2 | 03 | Signal wire clamp |  |
| 3 | 04 | Plastic cable tie |  |
| 4 | 01 | User manual |  |
| 5 | 01 | Cover box |  |

DTDAUTO VIETNAM Co., Ltd

Add1: No.D1, 93 Alley, Cau Giay st., Hanoi, Vietnam

Add2: Floor 3, Building A25, Institute of Physics / Institute of Science and Technology of Vietnam, No. 18 Hoang Quoc Viet, Hanoi, Vietnam

Phone: +84 19002228, +84 913555416

Email: dtdauto@gmail.com

Web: www.dtdauto.com ; www.cartools.com.vn ; www.cartraining.com.vn