3. Fuel System MXU 700i

This chapter covers the location and servicing of the fuel system components for the fuel injected KYMCO MXU 700i models.

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General Service Information

- Be sure to relieve the fuel pressure before fuel pump or fuel hose removal.

- Bending or twisting the control cables will affect operation and could cause the cables to stick or bind, resulting in loss of vehicle control.

- Work in a fully ventilated area. Smoking or allowing flames or sparks in the work area or where gasoline is stored can cause a fire or explosion.

- Do not apply carburetor cleaners to the inside of the throttle body.

- Do not snap the throttle valve from fully open to fully close after the throttle cable has been removed; this may cause incorrect idle speed.

- Do not loosen or tighten the painted bolts and screws of the throttle body. This can cause throttle and idle valve synchronization failure.
• Seal the cylinder head intake ports with tape or a clean towel to prevent dirt and debris from entering the intake ports after the throttle body has been removed.

• Do not damage the throttle body. It may cause incorrect throttle and idle valve synchronization.

• When the fuel pump is removed make sure it is stored in a clean area where it cannot fall and be damaged. Also, be sure the fuel pump isn’t resting on the fuel level sensor float arm.

• Always replace the fuel pump seal when the fuel pump is removed.

• The electronic fuel injection system is equipped with the self-diagnostic system. If the Check Engine Lamp “CELP” lights while riding, follow the self-diagnostic procedures to solve the problem.

• A faulty fuel injection problem is often related to poorly connected or corroded connectors. Check those connections before proceeding.

• When disassembling the fuel injection parts, note the location of the O-rings. Replace them with new ones upon reassembly.

• Do not disconnect the battery negative (-) or positive (+) cable while engine is running, it may cause ECU damage.

• Do not disconnect or connect the ECU connector while the ignition switch is in the ON position; it may cause the ECU damage.
TROUBLESHOOTING

Engine fail to start

• Battery voltage too low
• Fuel level too low
• Pinched or clogged fuel hose
• Faulty fuel pump operating system
• Clogged fuel injector
• Faulty spark plug or wrong type
• Clogged Airflow Bypass Valve
• Wet spark plug

Backfiring or misfiring during acceleration

• Ignition system malfunction

Engine stall, hard to start, rough idling

• Intake air leak
• Fuel contaminated/deteriorated
• Pinched or clogged fuel hose
• Idle speed fail to adjust
• Wet spark plug

Poor performance (drive ability) and poor fuel economy

• Pinched or clogged fuel hose
• Faulty injector
SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Removal

Remove the air filter. See the Air Filter Servicing topic for more information.

Squeeze the breather hose clip and slide it back. Free the breather hose from the airbox boot.
Remove the two airbox mounting bolts.

Loosen the throttle body to airbox clamp with a #2 Phillips screwdriver.
Free the airbox from the throttle body. Remove the airbox.

Cover the mouth of the throttle body with a clean shop towel or tape to prevent debris from entering the engine.
Installation

Fit the airbox into place.

Connect the airbox to the throttle body.
Install the bracket and two airbox bolts. Tighten the airbox bolts securely.

Tighten the airbox to throttle body clamps securely with a #2 Phillips screwdriver.
Connect the breather hose to the airbox boot. Secure the hose with the clamp.

Install the air filter. See the Air Filter Servicing topic for more information.
Check Engine Lamp (CELP)

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Display Indicators

Note: The check engine lamp (CELP) will come on for 2 seconds when the key is turned on. It should go off when the engine is started. If it lights after this the system has detected a problem. The vehicle should be immediately diagnosed as to what is causing the light to come on.

The check engine lamp (CELP) is located on the instrument display.
The wrench icon on the display will come on when the key is turned on and go away when the engine has started. If the wrench icon come on the this indicates and EFI system electric part fault and and a failure code is present.

**Failure Code Indicator**

If the ECU connectors, or battery leads are disconnected the stored malfunction codes will be lost.
There are 3 priority levels of the CELP while the engine is running.

**Priority grade 1:** The CELP blinks continuously letting you know this is the most severe condition. The rider must slow and immediately take the vehicle to the dealership service center for evaluation.

**Priority grade 2:** The CELP lights and doesn't blink, but stays on continuously. This shows a component is experiencing trouble or something has gone wrong with a circuit. Evaluate the trouble code to find the source of the problem.

**Priority grade 3:** The CELP blinks once and doesn't come back on. This is a warning. Example - the engine rpm was too high for a short time.

**Without Diagnostic Special Tool**

**SELF-DIAGNOSTIC PROCEDURES**

- Turn key to the ON position.
- The CELP will light for two seconds and then go off.
If the engine has problem, the CELP will blink to show the failure codes.

There’re 22 failure codes for the Synerjet M3C system.

If the vehicle gets multiple failure codes, the CELP will display the lower number code, then progress to the higher number after four seconds. The failure codes will display repeatedly. After the codes cycle four times the codes will clear from the system memory.

**EFI SELF-DIAGNOSIS FAILURE CODES**

The CELP denotes the failure codes. When the indicator lights for one second that is equal to ten. A half second blink is equal to one.

In the example above the first code has two long blinks \((10 \times 2)\) and one short blink \(+1\). This equals 21 blinks.

\[(10 \times 2) + 1 = 21\]

The second code in the example shows three seconds after the first. The second code has two long blinks \((10 \times 2)\) and two short blinks \(+2\). This equals 22 blinks.

\[(10 \times 2) + 2 = 22\]
In this example the failure codes corresponding with 21 and 22 blinks need to be evaluated.

To see the full list of trouble codes see the Diagnostic Trouble Codes (DTCs) topic.

**With Special Tool**

See the Fuel Injection Diagnostic Tool topic.

**Self-Diagnosis Reset Procedure**

After the codes cycle four times the codes will clear from the system memory. Always clear the memory after fixing the problem to prevent the light from showing the next time the vehicle is used.

**TPS/ISC Reset**

Start the engine and let it idle until the engine temperature has reached 85° C (185° F). The ECU will learn the new setting.
Component Location

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Right Side

A. ECU
B. Regulator/Rectifier
C. Gear Position Switch
D. Winch Leads
E. Stator Coil and Ignition Pulse Generator / Crank Position Sensor
A. Roll Sensor (Tip-over Switch)
B. Diagnostic Tool Connector
C. Throttle Body
D. Ignition Coil
E. Spark Plug
F. Water Temperature Sensor
Throttle Body

The following components can be found here.

- Throttle Body
- T-MAP (Manifold Air Pressure)
- Fuel Injector
- Fuel Hose
- TPS (Throttle Position Sensor)
- ISC (Idle Speed Control)
Under The Seat

A. Winch Leads (optional)
B. Battery
C. Relays (see below)
D. Starter Relay
E. Fuse Box
Relays

A. Fan Relay
B. Engine Start Relay
C. Fuel Pump Relay
D. Switched Power Relay
Fuel Pump

The fuel pump is located inside the fuel tank.
Diagnostic Tool

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

OPERATION INSTRUCTIONS

Diagnostic tool Part Number: 3620A-LEB2-E00
CAN Linker Part Number: 3620A-LGC7-E000

This tool has been developed by KYMCO and for KYMCO vehicles only.

The tool software can be updated for new models with a computer via the USB cable.

Please refer to the specifications when servicing this vehicle. See the Specifications topic for more information.
This tool does not have an internal battery. The power for the tool is provided by the vehicle when connected. The vehicle should have a fully charged battery when using the diagnostic tool.

Set the transmission shifter in the P or N position.

Plug the diagnostic tool connector into the CAN Linker as shown.
Remove the front cover to access the diagnostic tool connector. See the Front Cover topic for more information.

Remove the dummy side of the connector.

Set a multimeter to reads voltage (DCV). Measure the voltage as indicated.

<table>
<thead>
<tr>
<th>Terminal (+)</th>
<th>Terminal (-)</th>
<th>Normal</th>
</tr>
</thead>
<tbody>
<tr>
<td>BR/L</td>
<td>G/B</td>
<td>Battery Voltage</td>
</tr>
<tr>
<td>B/L</td>
<td>W/L</td>
<td>Battery Voltage - 1</td>
</tr>
</tbody>
</table>

Connect the CAN Linker to the diagnostic plug.

Turn on the ignition switch to send power to the tool.
The FI tool has three buttons and two lights below the screen. The left button is the up button that will move the selector up. The right button is the down button that moves the selector down. The middle button is ENTER. This will select the item you have chosen. The left light indicated the tool has power, and the right light indicates a Diagnostic Trouble Code (DTC) is present.

The functions of the diagnostic tool include ECU version, model name, data analysis and adjust.

**ECU version**: includes model name, ECU number, identifications number and software version.

**DTC Inspect**: DTC reading, DTC clearing, and troubleshooting.

**Data Analyze**: For ECU’s setting inspection and running condition analysis.

**Adjust**: Not allowed
ECU Version

The four functions will display when the tool is powered on. The model name will show LKM5 for the MXU 700i.
Pressing the enter button on the ECU version will show information on the ECU software and calibration.

Press the down button (right) to return to the first page.

DTC (Diagnostic Trouble Code)

INSPECTION PROCEDURE

Press the down button (right) to move the item selector down to the DTC Inspect item.
Pressing the enter button on the DTC Inspect item will bring up the options shown above. Select the DTC Load option and press the enter button to display the DTC options.

There are three DTC options - Active, Occurred, and History.

Move the selector to the Active option and press enter to display current DTC.
The diagnostic tool will display all current DTC. In the photo above only one code (12) is showing. Select the code number of interest and press enter for more information on that DTC.

In this instance the indicated code is 12 (CELP blinks). This corresponds to the DTC P0230.
Blinks | Failure Codes | Fault description | Priority | Fault management
---|---|---|---|---
12 | P0230 | Fuel pump relay or electric circuit malfunction | 2 | 1. Make sure the relay connector is connected correctly.

2. Check if the ECU sends a signal to relay.

3. Check the fuel pump relay resistance

Consult the DTC table for more information on how to troubleshoot the problem. See the Diagnostic Trouble Codes (DTCs) topic

Up button and select the previous options to return to the original screen.

**DTC Clear Procedure**
Press the down button (right) to move the item selector down to the DTC Inspect item.

Pressing the enter button on the DTC Inspect item will bring up the options shown above. Move the selector down to the Clear DTC option and press enter.
The diagnostic tool will show when the DTC in memory is cleared. Also, the DTC indicator light will be off.

Data Analysis Procedure

When using the data analysis feature for running condition items such as ignition advance, ISC step, etc., make sure the engine temperature has reached 80° C. The engine temperature is displayed on data analysis page 03.

Press the down button (right) to move the item selector down to the DATA Analyze item. Press enter to bring up the DATA Analyze page 01 shown below. Press the down button to continue through the seven DATA Analyze pages.
The 01 page shows engine speed, idle speed set point, and battery voltage.
The 02 page shows TPS position and TPI idle adapted.

Page 03

The 03 page shows engine temperature, air temperature, and intake pressure.
The 04 page shows atmospheric pressure, fuel injection interval, and ignition advance.

Page 05

The 05 page shows rollover voltage.
The 05 page shows the rollover voltage.

Page 06

The 06 page shows the ISC step and ISC learn step.
The 07 page shows the ECU counter.
Fuel Injection Sensors

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

You will need a digital multimeter to inspect the sensors.

Water Temperature Sensor (WTS)

Removal

Remove the left side cover. See the Side Covers topic for more information.

Drain the coolant. See the Coolant topic for more information.

Turn the ignition switch to the OFF position.
The WTS is located on the left side of the cylinder head.

Push in the spring and unplug the WTS sensor connector.

Remove the sensor with a 22 mm wench.
Installation

Thread in the WTS. Tighten the WTS to specification with a deep well 22 mm socket.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>N-m</th>
<th>kgf-m</th>
<th>ft-lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>WTS</td>
<td>12</td>
<td>1.2</td>
<td>8.6</td>
</tr>
</tbody>
</table>

Inspection

Input Voltage

Turn the ignition switch to the OFF position.
Push in the spring and unplug the WTS sensor connector.

Set the multimeter to read voltage (DCV).

Turn the ignition switch to the ON position.

Measure the input voltage on the harness side of the connector.

(WTS Input Voltage: 5 ± 0.1 V)

If the input voltage is out of specifications check the offending wires for a short or open lead.
Resistance

Set the multimeter to ohms of resistance (Ω).

Suspend the sensor and a thermometer in a pot of coolant with string. Make sure the WTS and the thermometer are not touching the pot. Bring the
temperature up to the specification slowly and check the resistance between the sensor terminal and body.

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Standard Resistance (approximate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>60° C (140° F)</td>
<td>703.8 ± 40.9 Ω</td>
</tr>
<tr>
<td>90° C (194° F)</td>
<td>260.7 ± 15.1 Ω</td>
</tr>
<tr>
<td>120° C (248° F)</td>
<td>111.1 ± 7.8 Ω</td>
</tr>
</tbody>
</table>

Manifold Air Temperature Pressure (T-MAP)

To remove and install the sensors on the throttle body see the Throttle Body Components topic.

Input Voltage Inspection

Turn the ignition switch to the OFF position.
Unplug the T-MAP connector.

Set the multimeter to read voltage (DCV).

Turn the ignition switch to ON position.

Measure if the ECU voltage outputs to the MAP between the following terminals of the MAP connector.

<table>
<thead>
<tr>
<th>Terminal</th>
<th>Normal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Violet/Red (+) – Violet/Green (-)</td>
<td>5 V</td>
</tr>
</tbody>
</table>

If the input voltage is out of specifications check the offending wires for a short or open lead.

**Resistance**

Set the multimeter to ohms of resistance (kΩ).
Measure the resistance between the 3 and 4 pins of the T-MAP sensor.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>SPECIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-MAP sensor resistance (20°C)</td>
<td>1613 - 2544 Ω</td>
</tr>
</tbody>
</table>

To replace the T-MAP sensor see the [Throttle Body Components](#) topic.

### Throttle Position Sensor

**Input Voltage Inspection**
Unplug the TPS connector.

Turn the ignition switch to “ON”.

Measure if the ECU voltage outputs to TPS between the following terminals of the TPS connector.

<table>
<thead>
<tr>
<th>Terminal</th>
<th>Normal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Violet/Red (+) – Violet/Green (-)</td>
<td>5 V</td>
</tr>
</tbody>
</table>
Resistance Inspection

Set the multimeter to ohms of resistance (kΩ).

Measure the resistance between the ground (A) and input (C) terminals of the TPS.

<table>
<thead>
<tr>
<th>ID</th>
<th>DESIGNATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>GND</td>
</tr>
<tr>
<td>B</td>
<td>OUTPUT</td>
</tr>
<tr>
<td>C</td>
<td>INPUT</td>
</tr>
</tbody>
</table>

| Throttle Position Sensor (TPS) resistance (at 20°C/68°F) | 3500 - 6500 Ω |
Data Analysis

Bring up data analysis page 02 to see information on the TPS. See the Diagnostic Tool topic for more information.

The TPS voltage should display as indicated in the table per the throttle position.

<table>
<thead>
<tr>
<th>Throttle Position</th>
<th>Opening Angle</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Close</td>
<td>0 %</td>
<td>0.67 ± 0.05 V</td>
</tr>
<tr>
<td>Open</td>
<td>&gt; 90 %</td>
<td>1.8 - 2.3 V</td>
</tr>
</tbody>
</table>

To replace the TPS see the Throttle Body Components topic.

Crankshaft Position Sensor (CKP)

See the ignition pulse generator in the Generator Cover topic.
Roll Sensor / Tip-Over

Removal and Installation

Remove the front fender upper cover. See the Front Fender topic for more information.

The roll sensor is mounted on the frame in front of the steering shaft.
Remove the two roll sensor screws with a #2 Phillips screwdriver.

Unplug the roll sensor and remove it.

Plug in the roll sensor and install it so the UP mark faces up. Tighten the two roll sensor screws securely with a #2 Phillips screwdriver.
**Inspection**

Turn the ignition switch to the OFF position.

Remove the roll sensor screws, but leave the sensor plugged in.

Set the multimeter to read voltage (DCV).

Turn the ignition switch to the ON position.

Measure the voltage of the roll sensor wires with the connector plugged in and the sensor in the regular upright attitude.

<table>
<thead>
<tr>
<th>Terminal</th>
<th>Normal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Violet/Red (+) - Green (-)</td>
<td>5 V (ECU Voltage)</td>
</tr>
<tr>
<td>Black/White (+) - Green (-)</td>
<td>0.4 - 1.4 V</td>
</tr>
</tbody>
</table>
Incline the roll sensor 65 ± 10 degrees to the left or right. Check the voltage.

<table>
<thead>
<tr>
<th>Terminal</th>
<th>Normal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Violet/Red (+) - Green (-)</td>
<td>5 V (ECU Voltage)</td>
</tr>
<tr>
<td>Black/White (+) - Green (-)</td>
<td>0.4 - 1.4 V</td>
</tr>
</tbody>
</table>

If this test is to be repeated the ignition switch must be turned OFF to reset the system.
Fuel Injector

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Warning: Gas is extremely flammable! Do not work around an open flame or a source of sparks.

Removal

<table>
<thead>
<tr>
<th>Component</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seat</td>
<td>Seat</td>
</tr>
<tr>
<td>Side covers</td>
<td>Side Covers</td>
</tr>
<tr>
<td>Fuel tank and shield</td>
<td>Fuel Tank</td>
</tr>
</tbody>
</table>

Loosen the fuel injector hose clamp with a #2 Phillips screwdriver. Disconnect the fuel hose from the fuel injector.
Push in the spring clip and unplug the fuel injector connector.
Disassembly

MXU500i

Remove the two fuel injector mounting bolts with a 10 mm socket.
Remove the fuel injector and pipe from the intake pipe.

Slide off the clip and pull the fuel injector out of its pipe.
The O-rings should be replaced with new items on installation.

**MXU700i**

On the MXU 700i models remove the single bolt with an 8 mm socket.
Remove the fuel injector and pipe from the intake pipe.
Slide off the clip and pull the fuel injector out of its pipe.

The O-rings should be replaced with new items on installation.

**Inspection**

A digital multimeter is needed to test the fuel injector.

Set the multimeter to read ohms of resistance (Ω).
Measure the resistance between the fuel injector terminals

<table>
<thead>
<tr>
<th>ITEM</th>
<th>SPECIFICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel injector resistance (at 20°C/68°F)</td>
<td>10.6 - 15.9 Ω</td>
</tr>
</tbody>
</table>

**Cleaning**

**PROBLEM**

1. Fuel Injector cannot output the fuel.
2. The Injector injection time (ms) is shorter or longer.
   
   Standard: < 1.6 ms. Check this with the FI Tool DATA Analyze page 04. See the Diagnostic Tool topic for more information.

**ANALYSIS**

Injector block (With carbon build up).
SOLUTION

1. Use the specified injector cleaner.
2. Connect the battery as pictured.
3. The injector cleaner with the flash relay.
4. Keeping the fuel injector operating.
5. Wait for 20-30 minutes.
6. Clean the carbons completely from the injector.
Assembly

MXU500i

Install new O-rings to the fuel injector. Apply a light coat of fresh engine oil to the fuel injector O-ring seals.

Install the fuel injector into the pipe. Install the clip to secure the fuel injector.
Install fuel injector and pipe onto the intake pipe. Guide the fuel injector into place, and be sure not to damage the O-ring.

Install the two fuel injector mounting bolts and tighten them securely.
Install the fuel injector into the pipe. Install the clip to secure the fuel injector.
Install fuel injector and pipe onto the intake pipe. Guide the fuel injector into place, and be sure not to damage the O-ring.

Fit the post on the fuel pipe into the slot on the intake manifold. Install the bolt and tighten it securely with an 8 mm socket.
Installation

Plug in the fuel injector connector.
Connect the fuel hose to the fuel injector pipe. Tighten the fuel hose clamp securely with a #2 Phillips screwdriver.

<table>
<thead>
<tr>
<th>Component</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel tank and shield</td>
<td>Fuel Tank</td>
</tr>
<tr>
<td>Side covers</td>
<td>Side Covers</td>
</tr>
<tr>
<td>Seat</td>
<td>Seat</td>
</tr>
</tbody>
</table>
Fuel Pump

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Warning: Gas is extremely flammable! Do not work around an open flame or a source of sparks.

Fuel Line Inspection

Remove the seat. See the Seat topic for more information.

Remove fuel tank cover. See the Fuel Tank topic for more information.

Inspect the fuel line from the fuel pump to the throttle body.
Input Voltage Inspection

Unplug the fuel pump connector.

Set the multimeter to read voltage (DCV).

Touch the multimeter leads to the harness side of the fuel pump connector, with the positive lead touching the orange/red wire terminal and the negative lead touching the green wire terminal.
Turn the ignition switch ON. The battery voltage should show for a few seconds. Replace the fuel pump if it is not functioning and the input voltage is correct.

If the battery voltage is not present check the following:

- Fuse B (10 A)
- Fuel pump relay
- ECU

**Removal**

Turn the ignition switch off.

Remove fuel tank cover. See the [Fuel Tank](#) topic for more information.

Unplug the fuel pump electrical connector.

With the fuel pump connector still unplugged start the engine and allow it to run until it uses the remaining fuel in the line and stalls. Turn off the ignition switch after the engine stalls.
Clean the disconnect fitting and put a rag over it. Push down on the black release and disconnect the fuel fitting from the fuel tank. Place plastic bags over the fuel line ends to keep debris out and prevent damage.

Remove the six fuel pump bolts with a 10 mm socket.
Remove the fuel pump mounting ring.

Note the position of the fuel pump outlet pipe. Mark the fuel tank with the outlet pipe position so the fuel pump can be installed to the correct position.
Carefully lift out the fuel pump. Guide the fuel level float out of the fuel tank with the pump.

Remove the O-ring from the fuel pump. Discard the fuel pump O-ring, and replace it with a new item on assembly.
Inspect the fuel filter and replace it as needed.
Fuel Level Gauge Inspection

Full

Empty
Make sure the fuel level gauge float arm moves smoothly. Using a digital multimeter set to ohms of resistance (Ω). Measure the resistance between the gray wire fuel pump/level gauge connector terminals with the float raised to the positions indicted below.

<table>
<thead>
<tr>
<th>Fuel Level Float Position</th>
<th>Approximate Resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full</td>
<td>101 Ω</td>
</tr>
<tr>
<td>Empty</td>
<td>3 Ω</td>
</tr>
</tbody>
</table>

Replace the fuel pump unit with a new part if the resistance is out of specification.

**Fuel Output Pressure**

Turn the key to the OFF position.

Use a fuel hose clamp to block the flow of fuel to the fuel injector.

Loosen the fuel injector hose clamp with a #2 Phillips screwdriver.
Disconnect the fuel hose from the fuel injector pipe. Connect the fuel pressure gauge to the fuel hose. Remove the fuel hose clamp. Turn the key to the ON position. Check the fuel pressure.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>SPECIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel pump standard pressure</td>
<td>3 Bar or 43 psi</td>
</tr>
</tbody>
</table>

If the fuel pressure is below specification check the fuel line for kinks and clogs. Also, inspect the fuel strainer screen on the fuel pump and the breather hose on the tank.

**Fuel Pump Relay**

Turn the ignition switch to the OFF position.

Remove the seat. See the Seat topic for more information.
The fuel pump relay is located under the seat.

**Continuity Test**

Set the multimeter to read ohms of resistance (Ω).
Check for continuity between the terminals of the relay that match up with the red/blue and orange/red wires.

Jump a 12 V battery to the terminals of the relay that match up with red/yellow and black/red wires.

There should be continuity only when 12 V battery connected. If there is not continuity when the 12 V battery is connected, replace the fuel pump relay.
Installation

Replace the O-ring with new item and apply a small amount of fresh engine oil to the new O-ring.
Carefully insert the fuel pump into the tank. Avoid damaging the fuel pump wires and fuel strainer.

Position the fuel delivery pipe as shown.

Install the fuel pump mounting ring.
Install the six fuel pump bolts. Tighten the bolts evenly and securely with a 10 mm socket.

Connect the fuel hose to the outlet pipe on the fuel pump. Make sure the connector is securely attached to the outlet pipe.
Plug in the fuel pump connector.

fuel tank cover. See the Fuel Tank topic for more information.

Install the seat. See the Seat topic for more information.
Throttle Body Removal and Installation

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

- Turn off the ignition switch during removal/installation.
- Check and confirm if the voltage is over 12V with a voltmeter after replacement.
- Check and confirm if the other connectors are installed correctly after replacement.
- Do not damage the throttle body, it may cause the throttle and idle valve to fail synchronization.
- The throttle body is preset in the KYMCO factory, do not disassemble it incorrectly.
- Do not loosen or tighten the painted bolts and screws for the throttle body. Loosening or tightening them can cause the throttle and idle valve synchronization to fail.
- TPS and ISC have to be reset after the throttle body MAP, TPS, ISC or ECU has been reinstalled.
Removal

Throttle Body

<table>
<thead>
<tr>
<th>Remove these components</th>
<th>Topic</th>
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<tr>
<td>Component</td>
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<tr>
<td>Seat</td>
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<tr>
<td>Side covers</td>
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<tr>
<td>Fuel tank and shield</td>
<td>Fuel Tank</td>
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<tr>
<td>Rear Fender</td>
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<tr>
<td>Airbox</td>
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</tbody>
</table>

Unplug the ISC connector.

Unplug the TPS connector.
Unplug the T-MAP connector.

Loosen the fuel injector hose clamp with a #2 Phillips screwdriver. Disconnect the fuel hose from the fuel injector.
Push in the spring and unplug the fuel injector connector.

Remove the two throttle drum cover screws with a #2 Phillips screwdriver.
Remove the throttle drum cover.

Slide the throttle cable housing out of the throttle body.
Free the throttle cable from the throttle drum.

The throttle body is held to the intake pipe with a clamp.
Loosen the intake pipe clamp with a #2 Phillips screwdriver.

Remove the throttle body from the intake pipe.
Intake Pipe

Remove the two intake pipe bolts that hold the intake pipe to the cylinder head.

Remove the intake pipe from the cylinder head.
Remove the O-ring from the intake

To remove the fuel injector see the Fuel Injector topic for more information.

To disassemble the throttle body see the Throttle Body Components topic for more information.
Installation

Intake Pipe

Install a new intake pipe O-ring. If this O-ring allows an air leak the engine will not run correctly.
Fit the intake pipe onto the cylinder head.

Install the intake pipe and tighten the bolts securely with a 10 mm socket.
Throttle Body

Fit the throttle body into place as shown. Make sure the ridge on the throttle body fits into the gap on the intake pipe fitting.
Tighten the intake pipe throttle body clamp securely with a #2 Phillips screwdriver.

Fit the end of the throttle cable into the throttle drum.

Fit the throttle cable into the throttle body as shown.
Install the throttle drum cover.

Install the two throttle drum cover screws and tighten them securely with a #2 Phillips screwdriver.
Plug in the fuel injector connector.

Connect the fuel hose to the fuel injector pipe. Tighten the fuel hose clamp securely with a #2 Phillips screwdriver.
Plug in the T-MAP connector.

Plug in the TPS connector.
Plug in the ISC connector.

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</table>
Throttle Body Components

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

To remove the throttle body. See the Throttle Body Removal and Installation topic for more information.

To inspect the sensors see the Fuel Injection Sensors topic.
Disassembly

Fuel Injector

To remove the fuel injector see the Fuel Injector topic.

T-MAP Sensor

The T-MAP sensor sits on top of the throttle body.
Remove the T-MAP sensor set plate screw with a #2 Phillips screwdriver.

Remove the T-MAP sensor.
ISC (Idle Speed Control - Air Bypass Valve)

Remove the two ISC screws with a #2 Phillips screwdriver.

Remove the ISC from the throttle body.
Remove the O-ring from the ISC and discard it. Clean the tip of the ISC valve.

**Inspection**

If the engine is hard to start, stops, or idles rough the ISC may be faulty.

Use the data analysis feature of the FI Diagnostic Tool to see information on the ISC. See the [Diagnostic Tool](#) topic for more information.

Start the engine and let it run until the engine temperature reaches 80° C.
The ISC step should be below 65.

**TPS Sensor**

The TPS is located on the throttle shaft opposite the throttle drum.
Remove the TPS sensor with a #2 Phillips screwdriver.

Assembly

The throttle position sensor (TPS) and idle air bypass valve (ISC) have to be reset when the throttle body MAP, TPS, ISC or ECU have been reinstalled.

TPS/ISC Reset

Start the engine and let it idle until the engine temperature has reached 85° C (185° F). The ECU will learn the new setting.

TPS Sensor

Apply oil onto a new O-ring and place it on the TPS.
Install the TPS onto the throttle body so that it returns to the original position.

Install and tighten the screw securely with a #2 Phillips screwdriver.
ISC (Idle Speed Control - Air Bypass Valve)

Apply oil onto a new O-ring and place it on the ISC.

Install the ISC into the throttle body as shown, being careful not to damage the O-ring.
Install the two ISC screws and tighten them securely with a #2 Phillips.

**T-MAP Sensor**
Apply oil onto a new O-ring and place it on the T-MAP sensor.

Install the T-MAP into the throttle body, being careful not to damage the O-ring.

Install the T-MAP sensor screw and tighten it securely with a #2 Phillips.

Install the throttle body. See the Throttle Body Removal and Installation topic for more information.