



OWNERS MANUAL

# 160 ULTIMATE KIT

V2014/1

**MSX125 / GROM125**



## INTRODUCTION

Part Nr.: 12103-K26-590AU

Thank you, and congratulations on your purchase of the all-new YUMINASHI 160 Ultimate Light Bore kit for the Honda Grom/MSX125.

This manual will provide you with some background information, instructions on how to install the kit, and explain how to achieve the best performance from our new Grom/MSX 160 Ultimate Kit.

**Please read this manual very carefully before use!...**

## RECOMMEND OCTANE RATINGS



Recommend octane rating for Japan -  
Europe - Australia & Thailand  
**91 - 95 OCTANE**



Recommend octane rating for the U.S.A. & Canada  
**87 - 91 OCTANE (Regular - Premium)**

\*\*Please note: If you use a much higher octane ratio than recommended your engine may not perform optimally. This is due to slower flame propagation. Ensure you are using 87 octane in the US/Canada, or 91 octane in other countries and that it is a good quality fuel. If your hear a knocking noise coming from the engine try a fuel with a slightly higher octane rating!...

## EXHAUST!



Ensure when you install your new Yuminashi 160 Ultimate Kit, the outside diameter of your header isn't larger than 1 inch (25.4mm). **Optimal inside diameter is between 21.5 – 21.8mm (0846 – 0.858 inch).**

If the exhaust header diameter is larger than 1 inch you will not get full power output from the 160cc kit and will result in a loss of top speed and reduced acceleration characteristics.

**If you have an IXIL exhaust, you certainly need to check the inner diameter of your header at the cylinder head side.**



During testing IXIL exhaust systems with the correct outside diameter of 1 inch, but with a very thick weld on the inside diameter which caused the opening to be too small for the 160cc kit.

We recommend **removing the excess material inside the header** in order to achieve the recommended inside diameter of (.846 to .858 inch).



## REINFORCED CLUTCH SPRINGS (6Pcs/Set)



Your 160 Ultimate set includes reinforced clutch springs meant to replace the 6 stock Honda springs in order to prevent clutch slippage caused by increased HP and torque.

The reinforced clutch spring rates were carefully chosen with daily driving in mind to provide enough pressure to avoid clutch slippage, but not so stiff as to cause hand fatigue.

\*\* The springs come in 2 colors.

The 3 blue springs are stiffer and the red lighter. If clutch feel is too stiff when installed together simply remove the red and replace them with the stock springs. Keep in mind that the the blue springs need to be installed on the 3 bolts from the clutch.



The 4th gear and final-drive sprocket combination plays a very crucial role in the performance outcome of your new 160 Ultimate Light Bore kit.

## RECOMMENDED SPROCKET SETUP

This kit has been optimized for a 15/34T sprocket combination with the stock 4th gear 26/24 (0.92 ratio).

With the ECU in “RPM limited touring mode” (*please check page 5. for the ECU modes*) Speeds of up to 130Km/h (80.78Mph) may be attained under perfect road and weather conditions without any head wind.

Top speed is based upon a rider weighing 80Kg (176.4) or less. Your top speed will vary based upon rider’s weight and proper exhaust header diameter.

If your weight exceeds 80Kg (176.4 Pounds) a sprocket combination of 14/32T as a mid-point may produce more desirable acceleration characteristics. Another option is a 34T or 35T rear if more torque and acceleration is desired. We don’t recommend using 14T front sprocket in combination with your stock 34T rear sprocket if you want to be able to reach a top speed of 130Km/h (80.78Mph).

Ultimately the sprocket combination one chooses will be a matter of personal taste.

**Keep in mind that as soon as you are changing the stock gear sprockets, or final-drive sprockets, your genuine MSX/GROM125 speedometer won’t be able anymore to show you the accurate speed!**



-Changing the 4th gear sprocket combination will give you a very pleasant and much longer first, second and third gear where you make it your engine a lot easier to gain top speed each and every time, and this in both, the limited RPM Touring mode and in the open RPM Racing mode.

\*\*Use the table on the next page as a comparison in top speed (*in Touring mode*) in order to assist you in choosing which front and rear sprocket combination will work best for you.

## YUMINASHI 160 ULTIMATE - SPROCKET & GEAR TABLE

**\*\* Results may vary depending upon tire circumference**

BRAND & GEAR SET NAME	PART NUMBER GEAR SET	RATIO GEAR 1	TOP SPEED G1 TOURING MODE	RATIO GEAR 2	TOP SPEED G2 TOURING MODE	RATIO GEAR 3	TOP SPEED G3 TOURING MODE	RATIO GEAR 4	TOP SPEED G4 TOURING MODE	WITH RECOMMEND FRONT SPROCKET	WITH RECOMMEND REAR SPROCKET
HONDA LARGE OVERDRIVE	STOCK	2,5	48,78Km/h 30,31Mph	1,55	78,69Km/h 48,90Mph	1,15	106,05Km/h 65,90Mph	0,92	132,13Km/h 82,11Mph	15	34
YUMINASHI SHORT OVERDRIVE	23471-K26-025	2,5	50,26Km/h 31,23Mph	1,55	81,07Km/h 50,38Mph	1,15	109,27Km/h 67,90Mph	0,96	130,89Km/h 81,34Mph	15	33
YUMINASHI SPORTS GEAR	23471-K26-025B	2,5	52,04Km/h 32,34Mph	1,55	83,93Km/h 52,15Mph	1,15	113,12Km/h 70,29Mph	1,00	130,09Km/h 80,84Mph	16	34
TAKEGAWA CROSS MISSION	02-04-0292	2,5	56,96Km/h 35,39Mph	1,63	87,29Km/h 54,24Mph	1,23	116,04Km/h 72,11Mph	1,083	131,46Km/h 81,69Mph	17	33



## STAND-ALONE DUAL MAP ECU UNIT (PROGRAMMABLE) WITH OVERHEATING CONTROL

Yuminashi R&D began from scratch with our Ultimate Light Bore series kit. The goals were to offer an entirely blue printed cylinder kit, to be able to increase the power of the kit, and to simplify tuning by eliminating guess work. The ECU, camshaft, valves, springs, injector and all other parts have been optimized to work together as one set. As a result it eliminates the need for the customer to figure out ignition timing and AFR ratios by themselves. The result is the risk of engine damage caused by improper setup or incompatible parts is greatly reduced.

Yuminashi takes durability and reliability very serious, and that's the reason why we as a first company in the world include a standalone ECU system with overheat protection built in. We did this to protect your investment and to provide our customers with satisfying results in regards to performance.

The benefit of our new stand-alone ECU system is not only to be able to control the fueling accurately, but to eliminate conflicts with the stock ECU like have been seen in the past with some piggy back systems where engine damage could be the result.

The Overheating Control feature built in to our stand-alone ECU system monitors your engine temperature under all conditions. This system in your ECU is programmed to "give your engine a break" when it is being over stressed by reducing the ignition timing and by adjusting the Air Fuel Ratio. This is done to avoid engine damage, even if you are an extremely aggressive rider and are in Racing mode.

If your engine begins to run hot, the rider will feel it because your engine will temporarily have less power. The ECU has been programmed this way, but will return to normal once soon as the engine temperature has come down. If this occurs often, we recommend installation of an oil cooler. This is a great feature for anyone living in areas that have hot climates.



Installing our Stand-alone ECU system is very easy and is simply plug&play. Just remove the stock unit and plug the new ECU into the harness. The new ECU is programmed and optimized to be used in combination with the 8-hole Big Bore fuel injector that comes included with the kit.

Our stand-alone ECU is a dual-mode system which gives the rider the ability to choose between two different modes/maps.

#### Mode #1: Touring mode

This mode is the most economical mode and may be used for “daily driving”. In this mode engine RPM is limited to 10,500 RPM. This is the default mode which the unit will be in from the factory.

#### Mode #2: Racing mode

Racing mode increases the engine RPM limiter to 12,000RPM. In order to switch to Racing mode the included jumper plug needs to be installed.

\*\*Both modes can be separately adjusted or programmed by your official Yuminashi dealer.

### 8-HOLES BIG BORE INJECTOR

YFS



The 8-Hole Big Bore injector included in the kit has been matched to provide the optimal flow rate for use with the 160cc cylinder kit and has proven to be the perfect match in conjunction with **the stock Honda Grom/MSX125 throttle body.**

The benefit of this larger flow injector is it allows us to maintain a duty cycle that does not push the limits of the stock 125cc injector. This ensures that throughout the RPM range the AF ratio never leans out and causes engine damage. It promotes better fuel atomization, results in smoother throttle response and better overall performance.

Because everything has been optimized for the stock head it **is not necessary to modify the port diameter on the intake runner or exhaust manifold side. If they are modified reduced performance will result** due to decreased gas velocities.

The injector and ECU are blue printed to be used in combination with the stock GROM/MSX125 air filter. If you are using the stock air filter we advise removing the small metal bracket inside the air filter box and removing the restrictor tube inside the stock air filter.

## SX290 8.2 HIGH-LIFT CAMSHAFT



## NEW HIGH-LIFT VALVES



## PROGRESSIVE DOUBLE VALVE SPRINGS

Yuminashi R&D has developed the all new SX290 8.2 high-lift camshaft to be used in conjunction with the 160 Ultimate kit. In order to achieve the best performance possible with your stock ports, manifold and throttle body, we have not only increased the valve timing duration, but also the lift. This makes Yuminashi camshaft the first in the world with a lift of 8.2mm (0.3228 inch).

\*\* Measurements are referring to the intake valve lift, not the intake valve lobe height of the camshaft.

In order to make such high lift possible with the stock 125cc head without causing the valve retainers to hit the valve guides and seals new valves had to be developed as well which are included in the 160cc Ultimate kit.



**Warning: Never install the SX290 8.2 camshaft with the stock Honda valves.**

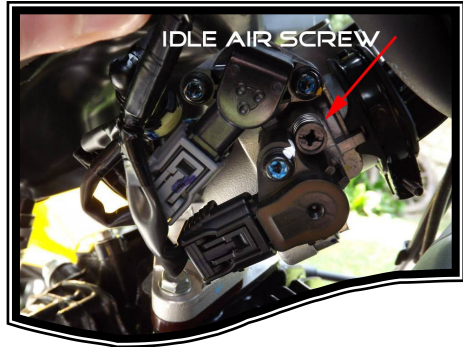
These valve train components are designed to work together and therefore should not be used separately.

**Valve clearance must be set to .05mm intake and .08mm exhaust.**

The double progressive valve springs should be installed to prevent valve float in Racing mode.



## ENGINE RUNNING ON IDLE



Upon starting your Grom/MSX125 for the first time after installation of the 160 Ultimate Kit there is a good likelihood the engine will idle either too high or too low. From the factory the idle air screw has been adjusted for the 125cc engine and not 160cc with a high lift cam.

Setting the idle speed is simple. In the picture the location of the Idle air screw is indicated.

Turning the screw clockwise will cause the engine to run richer (reduced airflow). Turning the screw counterclockwise will cause the engine to run leaner (increased airflow). Adjust the screw until the desired Idle is achieved (~1600RPM).

The picture is of a European model MSX125 which has an Intake Air Control Valve (IACV). The Thai MSX125, Japanese and US Grom models will not have an IACV, however the idle air screw is located in the same position and operates in the same fashion.

If this instruction pamphlet has been read you should have enough information to install the kit. If additional assistance is required please contact your official Yuminashi dealer.

If you would like to see step by step installation steps for a big bore kit installation, then we recommend you to take a visit at [www.inveniamperformance.com](http://www.inveniamperformance.com)

Thank you for purchasing this Yuminashi product. We wish you a lot of fun with your new 160 Ultimate Set!

[WWW.YUMINASHI.COM](http://WWW.YUMINASHI.COM)