

# Shell Eco-Marathon

By

Moneer Al-Jawad, Abdul Alshodokhi, Jericho Alves, John Gamble, Nikolaus Glassy, Benjamin Kurtz, and Travis Moore

Team 14

## Vehicle Operation Manual Document



Department of Mechanical Engineering  
Northern Arizona University  
Flagstaff, AZ 86011

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## **Section 1: Engine General Information and Maintenance**

### Engine Specifications

The engine used in the vehicle is a Honda GY6 139-QMB 49cc single cylinder engine. For more detailed information, please refer to a Honda GY6 repair manual, which can be easily obtained, for free, online.

### Accessing the Engine

To access the engine while the fairing is on, undo the 2 bolts located on the rear of the car and lift up on the rear hood.

### Checking the Oil Level

Once the rear hood is raised, the engine dipstick is located on the right side of the engine. Follow standard oil level checking procedures like you would for a car or motorcycle.

### Changing the Oil

The engine oil drain plug is located on the underside of the engine. Elevate the car securely using jack stands, undo the bolt and drain the oil into an appropriate container. Refill the oil level from the hole used for the dipstick.

### Changing the Spark Plugs

With the rear hood raised, the spark plug is located on the right side of the engine. Follow standard spark plug removal procedures like you would on a car or motorcycle.

## **Section 2: Pre-Start Up Procedure**

### Filling the Fuel Tank

Remove the two bolts located on the hood at the rear of the vehicle. Lift hood. Remove hose clamp just above gas cap. Unscrew gas cap and fill fuel tank with gasoline using a funnel until gas reaches blue 250 mL line at the top of the fuel tank. Re-assemble fuel system.

### Pressurizing the Air Bottle

**IMPORTANT: SHUT PRESSURE CONNECTION VALVE TO FUEL TANK BEFORE PRESSURIZING FUEL PRESSURE BOTTLE.** Fill fuel pressure bottle just under 60 psi. If 60 psi is reached, the pressure release valve will depressurize air tank. If so, refill fuel pressure bottle. Open pressure valve connection to fuel tank to **NO MORE THAN 50 psi.**

### Setting the Correct Fuel Pressure

The gas tank should be pressurized to around 3 bar. Use the valve to adjust pressure into the tank until it reaches 3 bar. DO NOT GO HIGHER THAN 3 BAR OR THE GAS TANK MAY SHATTER.

## **Section 3: Operating the Vehicle**

### Start motor

With fuel pressurized, enter vehicle, turn on external power and internal power. Connect safety harness and shut door. Press and hold starter button in periods of 5 seconds with 2 seconds rest until vehicle is operational. Let engine warm up for 15 minutes before driving.

### Steering wheel

The steering wheel in the cockpit of the vehicle contains the starter motor, kill switch, horn, front braking system, rear braking system, throttle, and bike computer. The on top of the left hand lever controls the starter motor, the button on the right hand lever controls the kill switch. The lower middle button controls the horn. The right hand lever controls the throttle, the left hand lever controls the front brakes, and the top hand lever controls the rear brakes. Figure 1 shows the layout of the steering wheel. To release the steering wheel, pull hard upward on the key ring on the top of the steering wheel.



**Figure 1: Steering Assembly**

### Bike computer

The bike computer provides information on average speed, maximum speed, trip time, trip distance, overall distance (odometer), and time. To reset the computer for the trip, press and hold the mode button. The computer starts once the vehicle starts moving again. After 30 minutes of inactivity, the computer will be in a sleep mode and display only the time. For advanced questions, contact a bicycle specialty shop.

### Driving Style

To conserve fuel, cycle the motor on/off during driving times. Open the throttle until the computer displays 20 mph. Kill the engine and coast until the computer reads 5 mph. Start the motor again and repeat. Only apply brakes in case of an emergency to minimize energy losses.

## **Section 4: Advanced Information**

### Connecting a Computer to the ECU and Tuning

The ECU uses a serial cable to connect to a laptop. Start by turning off all power to the vehicle, then connect the serial cable to the computer. Open the provided ProCAL tuning software and then turn the power on to the vehicle. Follow the instructions for using the ProCAL software with the provided instruction manual for information on parameter information, data logging, and tuning information.