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F2 F430 Install Guide

The AeroMotions Edge

The F2 Dynamic Wing was tuned in the 180mph rolling-road Windsheer Wind tunnel. The F2 wing comes with a plug and play tune that will balance your car when using the AeroMotions front splitter, and factory F430 Challenge ride height settings. Please contact Aeromotions for more information.

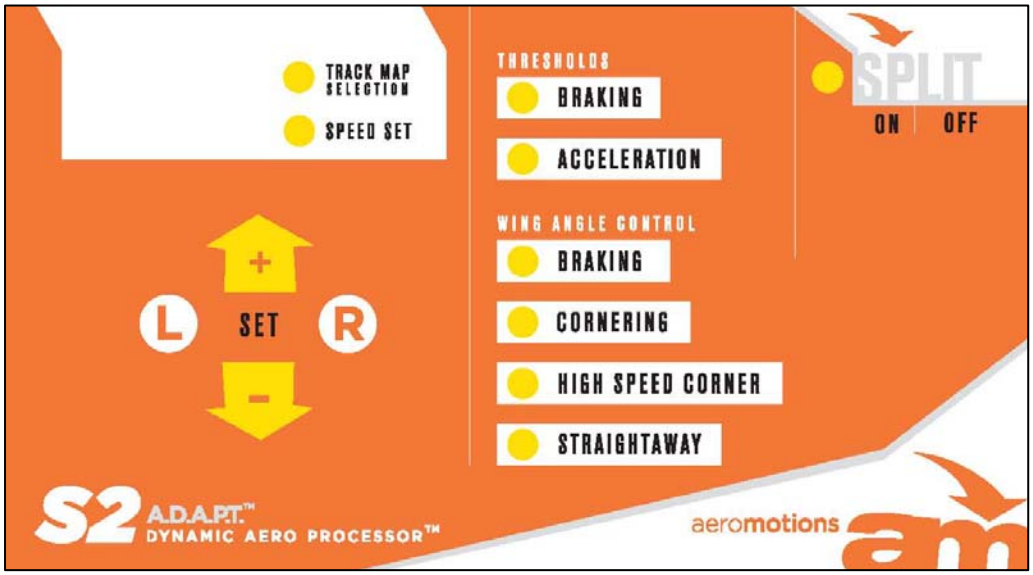
All race cars are different. Make sure to test and appropriately tune your F2 Dynamic Wing to account for any variations in your car from the stock F430 Challenge car. Any changes could drastically effect the performance of your aero package.

Quick Start Guide

AeroMotions recommends professional installation of the F2 Dynamic Wing. If the wing was professionally installed, here's what you need to know to use it. The wing has three angles: Braking, cornering, and straightaway.

1. The Braking angle is high downforce and high drag for maximum stopping power.
2. The Cornering angle should be set to provide the level of downforce needed to balance the car at the traction limit in a turn. The correct angle is dependent on car setup, and should be adjusted using the toggle switch on the Dynamic Module. Toggle the switch up to increase downforce in a corner, or down to reduce downforce.
3. Straightaway is set for low drag. You can increase this angle if you want more stability at high speed.

1. Wiring



Connections on the S2 Computer Controller

Power Cable

- The Dynamic Module requires 10Amp switched power.
- +12V should be applied to the red wire.
- The Black wire is ground.

Data Cable (3 wire connector)

- VSS
  - The Blue wire connects to the vehicle VSS wire.
  - A CAN adapter is available for the factory ECU on the EVO X.
  - For a stand alone ECU, the output signal should be:
    - A square wave (OC)
    - 0-5V or 0-12V
    - Default pulses per mile is 3,600
  - **A sine-wave output from a hall effect sensor will not work.**
- Data Logging
  - The Brown wire can be connected to a Data Logger. The wing position is output as an analog voltage from 0-5V.
- Ground
  - The black wire is an extra ground wire. It can be left disconnected.

Power Pod Connectors

- The Left and Right Wing Cables should be securely plugged in to the corresponding left and right receptacles on the controller. For example, the left power pod plugs into the left connector.

2. Setting the VSS

Set the DIP switches 6,7,8 on the Dynamic Module to calibrate the VSS for your car and engine management system. 0 is off, 1 is on. The Pulse Per Mile (PPM) can also be programmed into a standalone engine management system to provide speed information to the wing.

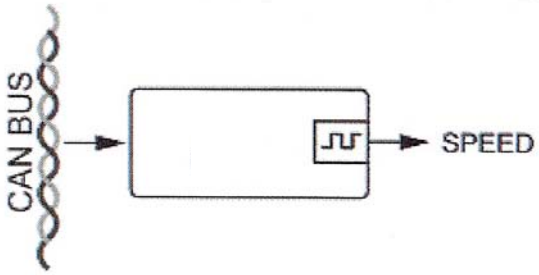
DIP 6	DIP 7	DIP 8	PPM	Application
0	**0**	**0**	**3,600**	**Can Adapter (F430 ECU)**
1	0	0	4,000	Corvette (C5 / C6), Camero, Supra
0	1	0	8,000	R35 GTR
0	0	1	36,000	Porsche 997
1	1	0	2,000	
1	0	1	10,000	

3. CAN Adapter (Factory ECU)

Color	I/O	Function
Black	I	Ground
Red	I	Power +12V regulated ignition controlled supply
Yellow	I	CAN High
Blue	I	CAN Low
Orange	O	Speed Pulse Output 12V

Connecting the CAN Adapter

- **CAN wires are behind the speedometer in the EVO X.**
  - **Pink is CAN low**
  - **Green is CAN High**
- **Connect the Orange output wire to the Blue VSS wire in the Aeromotions Wing.**



The CAN Adapter has built-in diagnostic LEDs to indicate CAN Bus status and speed pulse output to aid the installation process. After power-up:

- Stage 1: Both LEDs light for approx 1 second
- Stage 2: Green LED on while the CB-1 listens for CAN Bus data
- Stage 3: Red LED indicates CAN has been detected. CB-1 now detecting vehicle type
- Stage 4: Once vehicle type is determined the Green LED should pulse when vehicle is driven. Red LED should stay on.

Please note: If LEDs do not follow the above sequence it is still advisable to drive the vehicle to see if a speed pulse signal is still actually being produced by the CB-1. It is possible that some vehicles will perform in a different manner.

General Installation Notes

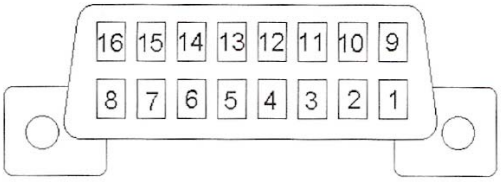
The CAN Bus uses two wires for data transmission. One is called CAN_HIGH and the other called CAN_LOW (sometimes marked as CAN+ and CAN- respectively). All connections should be made with an **insulated solder joint**. Do not cut the CAN Bus wires.

IMPORTANT NOTICE: All connections are for guidance only and to the best of our knowledge. We cannot be held responsible for changes made by the vehicle manufacturer. The CAN Bus system is growing in use by American and European vehicle manufacturers. Unfortunately, they do not conform to anyone standard or wiring concept. Colors can vary as well as location and layout of ECU's. In addition, a vehicle can have more than one CAN Bus system, with potentially only one set carrying the speed pulse data. It is also advisable to disconnect the CAN I SCP interface before any diagnostic work is carried out on the vehicle. This will prevent any possible damage to the interface and also allow any diagnostic work to be carried out successfully.

1. Since manufacturers continually change the pin configuration of the plugs, it is advisable to pick up Pos and Neg for powering the interface from an alternative supply, preferably a good ignition controlled regulated supply. A good earth is essential.

2. The CAN Bus interface has such high internal impedance that it cannot affect the vehicle operation.

3. Connect the CAN High and CAN Low wires before powering up the CB1 interface, so removing any possibility of shorting. While the power wires can be extended, it is *not* advisable to extend the CAN High and Low leads. If there is a need to extend the signal lead (Orange), please ensure that it is run to its destination *avoiding* being close to equipment that might give off pulses which could be picked up by this wire, such as ignition or heater fans, etc.



OBD II Plug

4. Mounting

F430 Mounting
The preferred F430 mounting is behind the driver's seat, on the shelf that provides access to the electronics.

Flat and Level.
The control box should be mounted to a flat, level surface in the car. This will ensure the G's read by the control box are the same as those recorded by data acquisition systems. The box can be mounted with the buttons facing up, or with the buttons facing down. The computer will compensate for the inversion of the accelerometer.

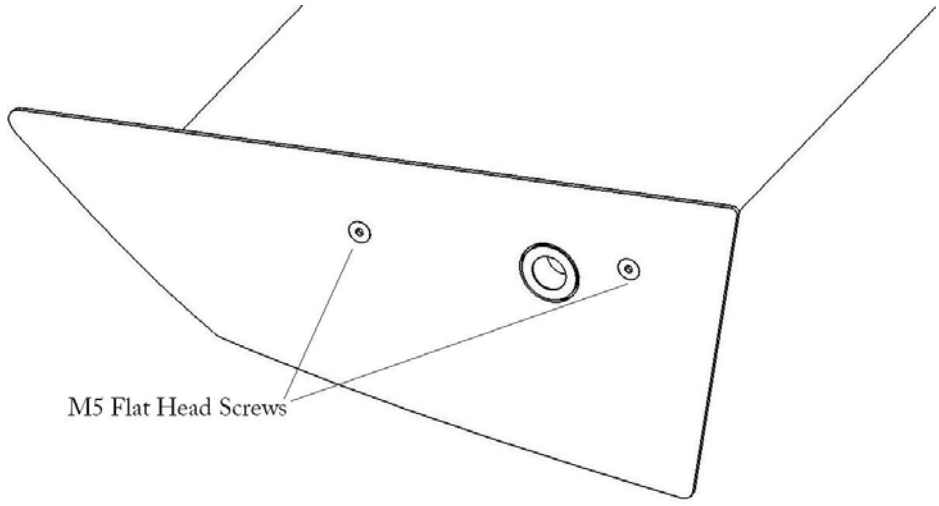
Up Arrow Facing Forward.
There are two arrows on the control box. The up arrow (+) should face forward.

Exposed to the Air.
Mount the box so that the vent fans are unobstructed. Do not enclose the controller in a compartment less than one cubic foot, as overheating might occur. Trunk temperature should not exceed 150F. Ventilation should be added if necessary.

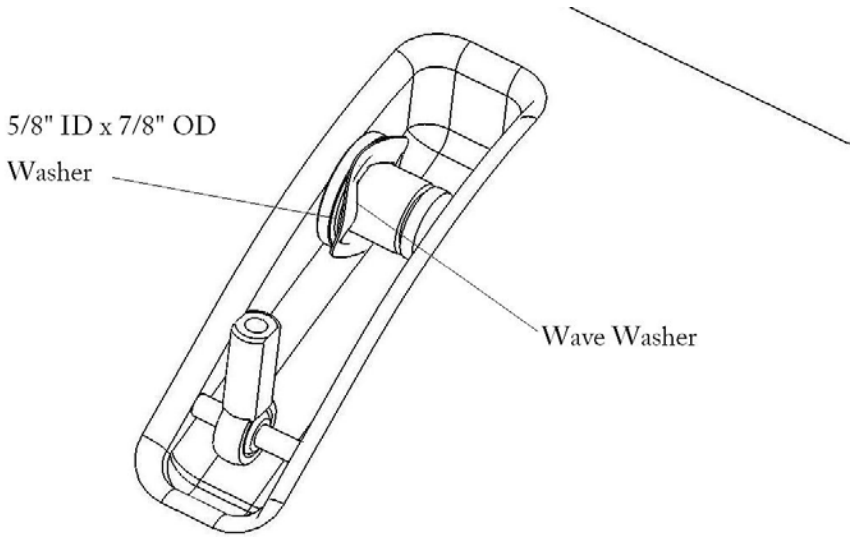
5. Assembling the Wing

The following steps describe how to assemble the wing prior to mounting it to the car.

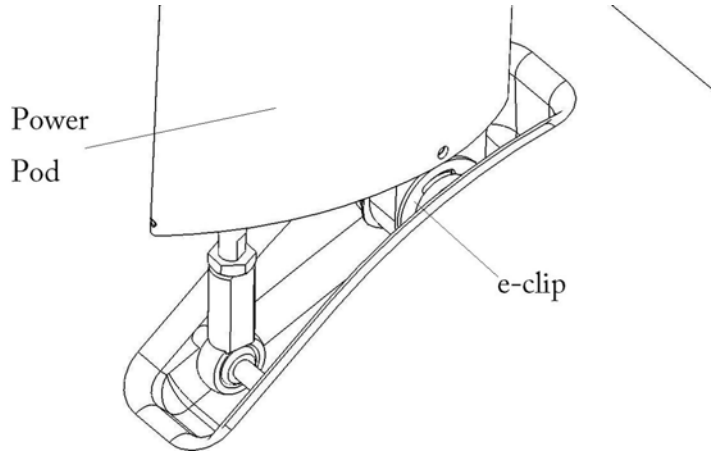
1. Attach the Center Plate to the inside of the Driver's Side Wing Half using the two Flat Head M5 Screws (Max Torque 4 N-m).



2. Insert the Main Pivot Shaft through one wing half.
3. Place one 5/8" ID x 7/8" OD washer on the Main Pivot Shaft where it protrudes into the rectangular recess in the wing (Pivot Box).
4. Place one wave washer on shaft inside the Pivot Box.



5. Slide the power pod onto shaft inside Pivot Box.
   NOTE: The base of the power pods are angled to match the deck lid curvature. The left and right side pods are different angles.
6. Insert 5/8" E-Clip into retaining ring groove on Main Pivot Shaft



7. Place one 5/8" ID x 1" OD washer on the Main Pivot Shaft where it protrudes out the center end of the wing half. This washer goes between the two wing halves.
8. Place the other Wing Half on the Main Pivot Shaft.
9. Place one 5/8" ID x 7/8" OD washer on the Main Pivot Shaft where it protrudes into the Pivot Box on the second Wing Half.
10. Place one wave washer on shaft inside the Pivot Box.
11. Slide the power pod onto shaft inside Pivot Box.
    Insert 5/8" E-Clip into retaining ring groove on Main Pivot Shaft.
    NOTE: The power pods will have to be pushed together to get the second E-Clip in place. **NOTE: The wing halves should rotate smoothly.**
12. Mount the wing using the supplied M6 studs (Max Torque 5 N-m).
13. Tighten the M6 (or M5 depending on model) bolts on the top of the Power Pods to secure the wing.
14. After the wing is securely mounted, **check that each wing half pivots freely**, with minimal friction or binding. Failing to do this will **Void Warranty and may cause an unsafe operating condition.** Mounting the wing with excessive shaft binding interferes with the correct operation of the wing.
15. After checking wing articulation, Screw the stainless steel Push Rods on each Power Pod into the rod end in each wing half. Thread the pushrod **all the way** down to the jam nut. It is OK to rotate the Push Rods using a wrench on the flats, do not over tighten.
16. Attach the End Plates using the M5 screws (Max Torque 4 N-m).

6. Mounting The F2

Fit

The power pods for the F2 are CNC machined to match the contour of the F430 deck lid. Each side has a curved base plate that mounts on the underside of the deck lid to securely clamp the sheet metal skin of the lid.

The wing mounting pitch is 500mm. The front and middle studs are positioned to reside on either side of the bar that reinforces the deck lid. The mounting holes should not require cutting of the reinforcing bar that runs through the lid.

The deck lid should be sandwiched between the upper mounting foot (shown below) and the curved aluminum plate shown on the bottom picture.

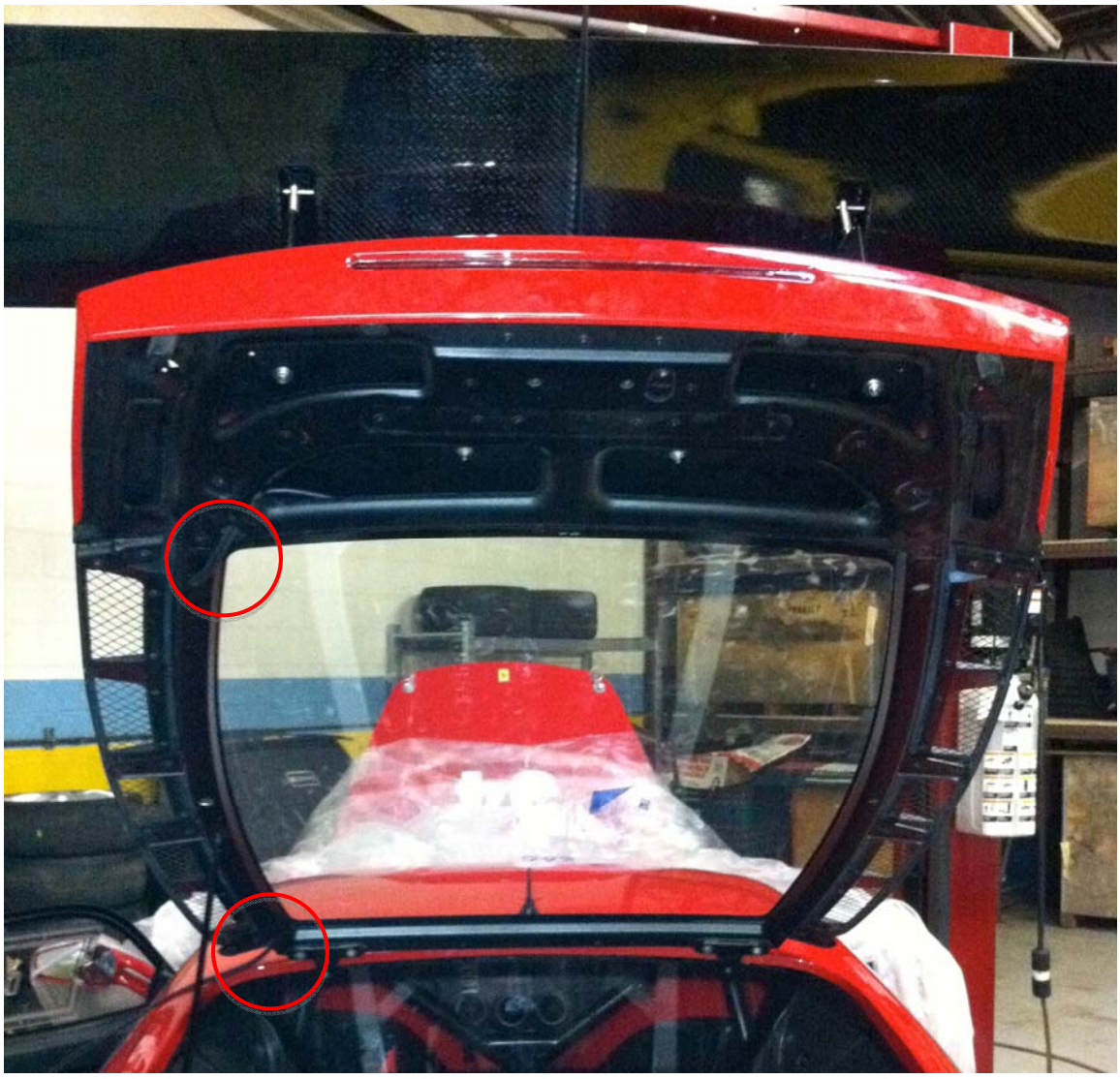
Mounting Foot

Curved under plate

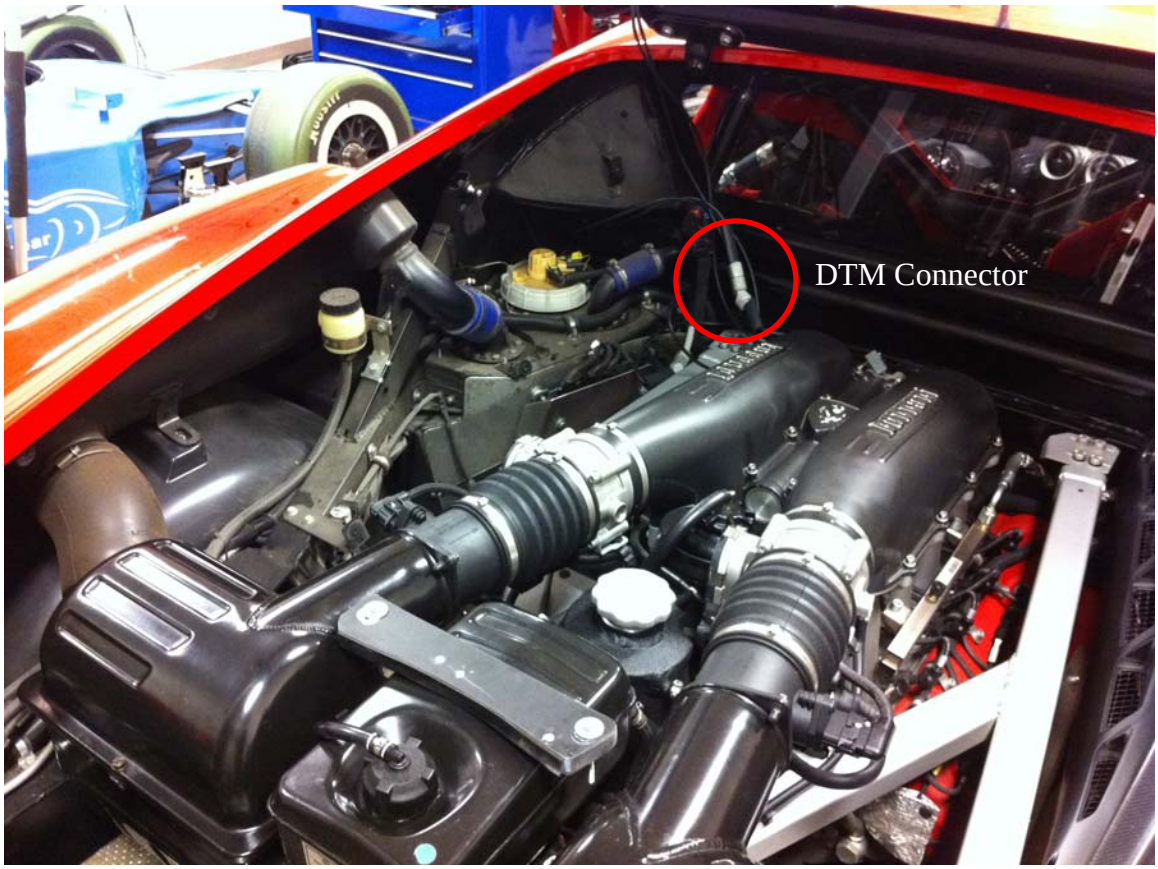
Wiring

The wires for the F2 wing can be run through the driver side of the deck lid. The cable length is sized long to allow a plurality of mounting locations. The preferred mounting method is to add a DTM connector (provided) to enable the rear deck lid to be removed with the wing attached.

The cables should be cut to place the connector in a suitable location. The 54 car placed the connectors under the carbon fiber cover on the driver side, behind the firewall. Cutting the cable allows a smaller hole to be drilled in the deck lid – preserving more of the structure – and allows the cable to be fished through the reinforcing U shaped bar that runs through the deck lid. See pictures below.




DTM Connector



The following pin out is recommended for the DTM connector.

Pin	Wire Color	Function
1	White	Supply V
2	Black	Ground
3	Blue	Signal
4	Shield	Ground
5	Grey	Ground
6	Brown	Supply V

User Manual: Dynamic Wing F2

1. Dynamic Wing F2

The F2 Dynamic Wings come with a plug and play tune developed in the 180mph rolling road wind tunnel. The controller will automatically provide ample downforce in corners, more when you brake, and lower drag on the straightaway. The correct track map should be selected to balance the front aero on your F430.

The wing is programmed with angles tuned for your car.

- **B**raking Angle
  - The wing moves to this high downforce, high drag angle during braking.
- **M**aneuvering Angle (Low Speed Cornering)
  - This is the default wing angle. The wing at this position when the car is standing still, or cornering. Increasing or decreasing this angle will change the car's balance in corners.
- High Speed Maneuvering Angle (High Speed Cornering)
  - This angle allows a different maneuvering angle to be set for high speeds.
- **S**traightaway Angle
  - The wing moves to this low drag angle when it detects the car is on a straightaway.

Note, each racecar setup is unique. Dynamic Wings are programmed to work with the stock upper surfaces of the car. Any aerodynamic modification to the car, such as roof scoops or vortex generators, can change the airflow and necessitate adjustment to the tune.

2. Using the Optional Remote

Holding down a button will move the Dynamic Wing to that angle:

- B (Braking)
- M (Maneuvering Low Speed)
- MS (Maneuvering High Speed)
- S (Straightaway)

Note: when parked, holding M will not cause the wing to move; this is the default position when the car is at rest.

While holding the wing angle button, push the up or down arrow keys to change the angle of both wing halves. Holding the arrow key will cause the wing to move up or down until the arrow key is released. The computer will store this new angle when you let go of the angle button (B,M,S, MS).

NOTE: Angle adjustments are very fine near the highest and lowest angles of attack.

Remote Programmer

3. Pre-Flight Check

When the power is turned ON, the wing performs a startup check. The wing will move to each of the programmed angles. Watch to ensure the wing moves smoothly, and freely. The wing will skip this check if the car starts to drive.

4. Basic Controller Operation

Track Maps

The stock tune is stored in track map 1. Holding down the "Track Map" button and pressing the "UP" or "DOWN" button cycles through ten different maps. The selected map is indicated on the 10 Segment LED by a single lit LED. Track Map "0" (all LED's flash as a block) locks out the wing at the Cornering angle. The wing will function as a static wing.

Split

Pressing the "Split" button toggles the split ON and OFF. When the "Split" is ON, the wing halves will move independently to aid weight transfer in cornering, and the "Split ON" LED will light up.

5. Advanced Controller Operation

Adjusting The Wing Angles

The wing angles are set by holding down any of the four "Wing Angle" buttons and adjusting the "UP" and "DOWN" buttons.

The "Left Set" and "Right Set" LED's indicate which wing halves will be moved. This can be toggled by pressing the "Left Set" or "Right Set" buttons. If both lights are on, both wing halves will move when holding a wing angle button, and pressing the UP or DOWN arrows. If only the right light is on, pressing the UP or DOWN arrow will only move the right side.

Cornering Angle

Turn the wing on. After the pre flight check, the wing will be in the Cornering angle. Pressing and holding the Cornering angle will allow you to adjust the angle. *Note: since this is the default angle, pressing this button will not cause the wing to move.*

Trim both wing halves to the correct angle. To move the Right wing half (passenger side) only, toggle the right LED on (Click "R"). Holding the Low Speed Cornering button down, press the UP or DOWN arrow to adjust the Right wing half.

Trimming Wing Angles

Trim each of the other wing angles by holding the given button. The wing will move to the set angle when the button is held down. The angles can only be adjusted when the corresponding button is held down. Releasing the button will cause the wing to return to the Cornering Angle.

Braking Threshold

Holding down the "Braking Threshold" button allows the deceleration value that causes the wing to move to "Braking Angle" to be adjusted using the "Up" and "Down" buttons. The "Braking Threshold" value is displayed on the 10 Segment LED where each lit LED is $1/10^{th}$ of a G.

Acceleration Threshold

Holding down the "Acceleration Threshold" button allows the acceleration value that causes the wing to move to the "Straightaway" angle to be adjusted using the "UP" and "DOWN" buttons. The "Acceleration Threshold" value is displayed on the 10 Segment LED where each lit LED is $1/10^{th}$ of a G.

Speed Set

Checking the VSS Pulse and Scaling
Holding down the "Speed Set" button puts the controller in Speed Setup mode. Speed Set mode is used to check that the controller is getting an accurate speed reading from the Vehicle Speed Sensor (VSS)

While holding the Speed Set Button, The 10 segment LED will flash with each pulse from the VSS as the car is driven forward. This is best observed at low speeds. After verifying the pulses at low speed, the 10 Segment LED can be used to verify the accuracy of the scaling. Above 50 mph, the LED's on the 10 Segment LED will light to indicate the vehicle speed. Each LED represents 10 mph over 50 mph. One lit LED indicates 60mph. Two lit LED's is 70mph, and 5 lit LED's would shows 100mph.

Setting the Speed Threshold
The speed threshold determines when the wing reduces angle for high speed straightaways. To adjust the speed threshold, hold down the "Speed Set" button and the "Straightaway" button and adjust the "Straightaway Speed Threshold" using the "UP" and "DOWN" buttons. The "Straightaway Speed Threshold" will be displayed on the 10 Segment LED as described above: each lit LED represents 10 mph over 50 mph.

Show Mode:

Hold the down arrow when powering the computer (car) on.

6. Legal Notice

PROFESSIONAL INSTALLATION IS HIGHLY RECOMMENDED and products are understood by consumer to be OFF-ROAD USE ONLY upon purchase. RACING IS INHERENTLY DANGEROUS. The consumer assumes responsibility and all liability associated with operating an aeromotions wing upon purchase. CHECK ALL EQUIPMENT before racing. Car setup is unique. The consumer is responsible for ensuring the correct setup, tuning, and working of the Dynamic Wing with their vehicle setup.