



## MaxG Ignition Timing Bracket, 1.8L Miata Motors

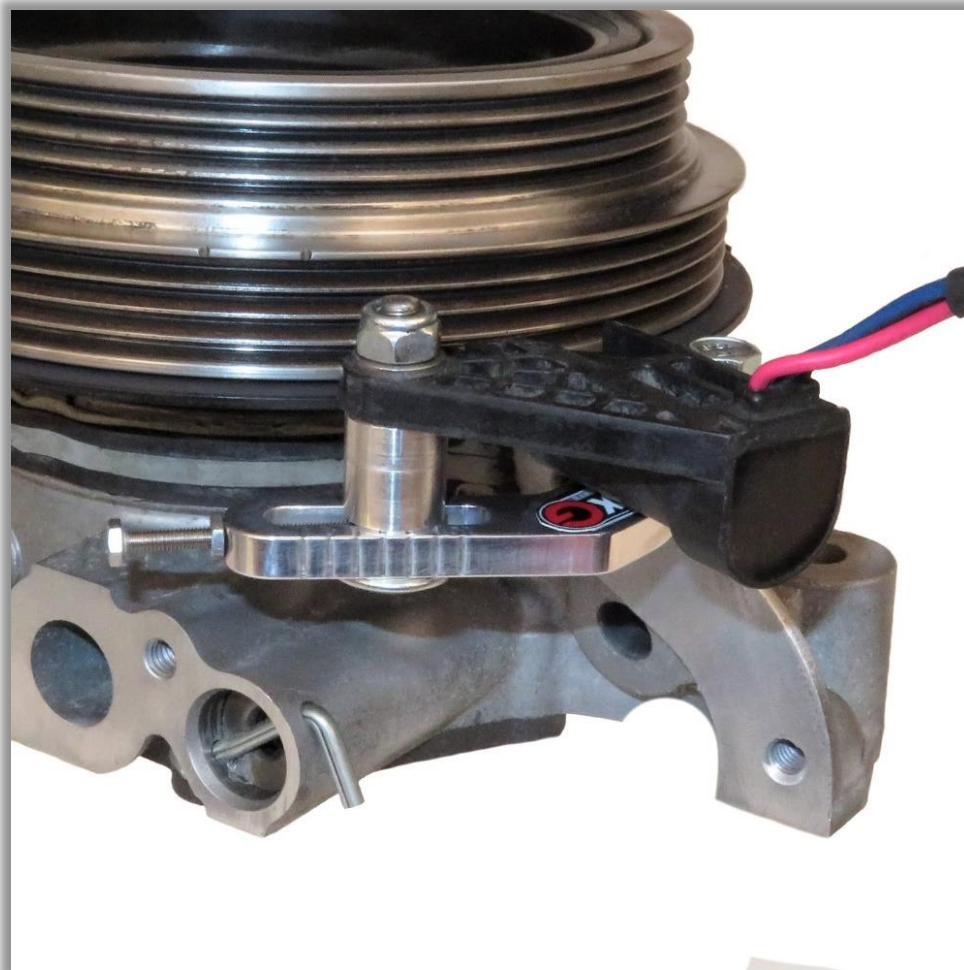
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## Tools Required

- 4mm or 5/32” combination wrench – to tighten the timing screw lock nut
- 10mm socket and short extension or a 10mm deep socket – to remove the stock sensor and install the new bracket and sensor
- 10mm combination wrench
- 21mm open end or combination wrench - turning the crank shaft
- Saw or grinder - to trim the sensor
- A few inches of wire - to make a jumper 18- to 14-gauge wire will work fine
- Magic marker - to mark the timing marks on the pulley
- Inductive timing light – to set the timing
- .020”-.059” thickness/feeler gauge - to set the sensor air gap

## Two Approaches to Replacing the Timing Sensor

1. One is to lift the front of the car and place it on jack stands, remove the splash pan and access the sensor from below. A lot of work will also be done from the top.
2. The second is to approach the sensor from the top of the engine. These instructions are for approaching from the top of the engine. Lifting the car is not required.

## Preparation for Installation

1. Disconnect the negative terminal of the battery
2. Engage the parking brake
3. Put the transmission in neutral
4. Let the engine cool
5. Place the car on jack stands (safely) and remove the splash pan to access the sensor from below

## Getting to the Sensor

1. Remove the stock sensor by unplugging it from the wiring harness – see figure 1

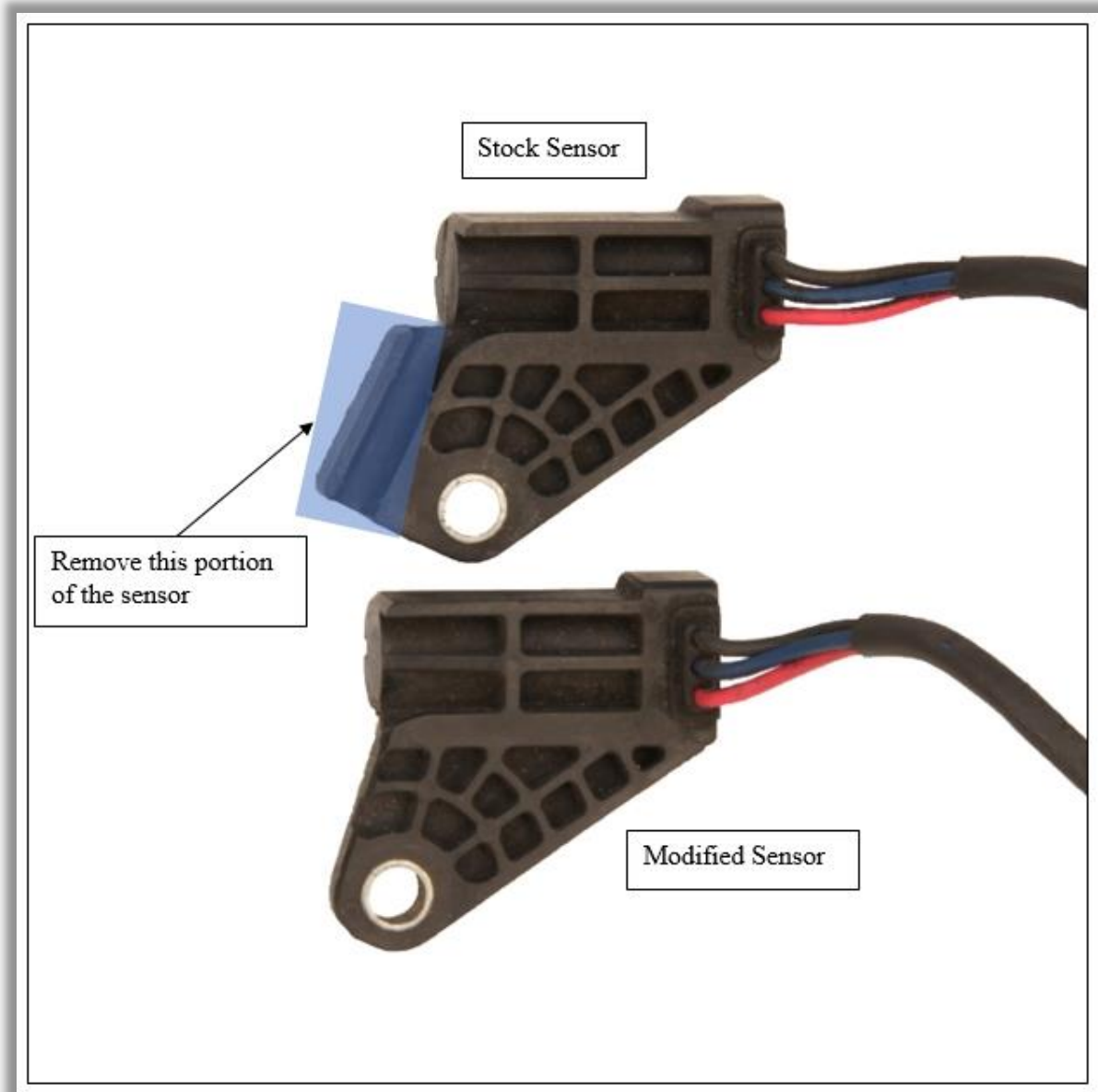


*Figure 1*

2. Remove the intermediate bracket or unsnap the wire retainer
3. Remove sensor – keep the mounting bolt as it will be used to install the new timing bracket.

## Modifying the Stock Sensor

- Remove the portion of the stock sensor as shown in figure 2

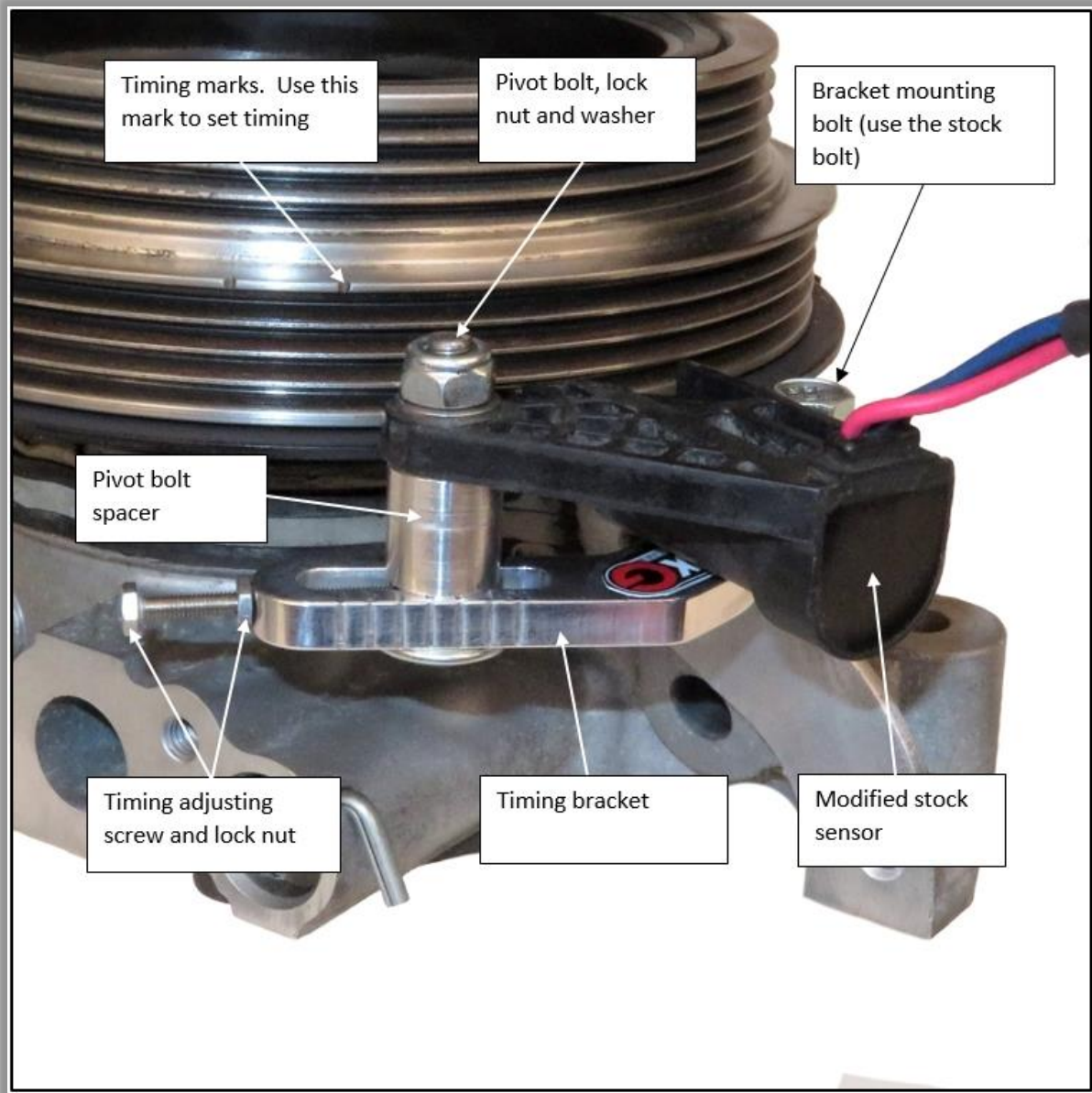


*Figure 2*



## Assemble the Timing Bracket

1. Place the components on the bracket as shown in figure 3

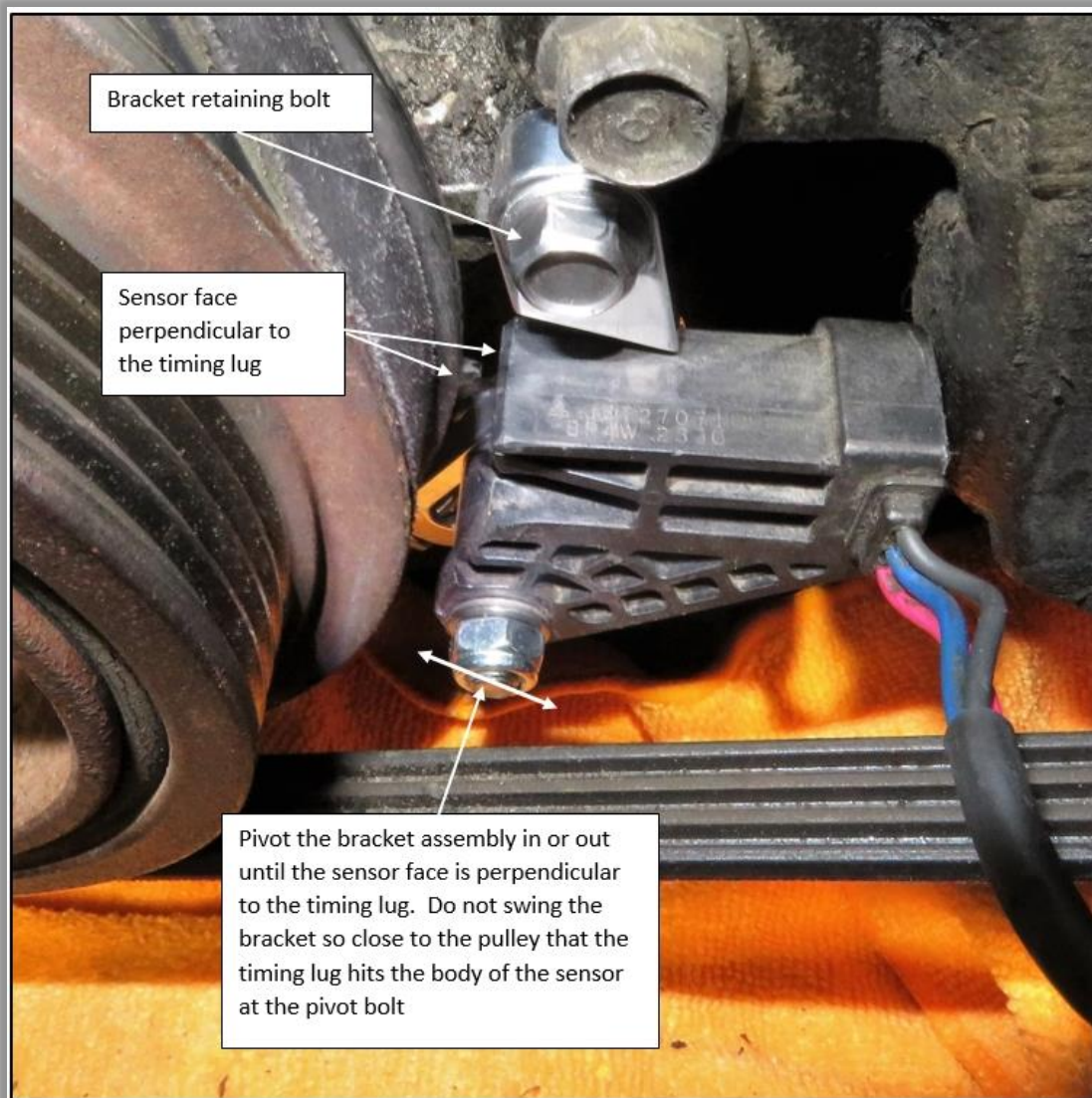


*Figure 3*

2. Adjust the timing screw so that it positions the midpoint of the round spacer on the desired timing degree mark. The “0” mark is the stock timing position (10 degrees BTDC). Each mark is 2 degrees. 2.2 turns of the adjusting screw changes the timing 1 degree. The initial timing setting may not be exactly as desired. Adjust as required.
3. Lightly tighten the pivot bolt nut. You should be able to move the sensor with little effort.

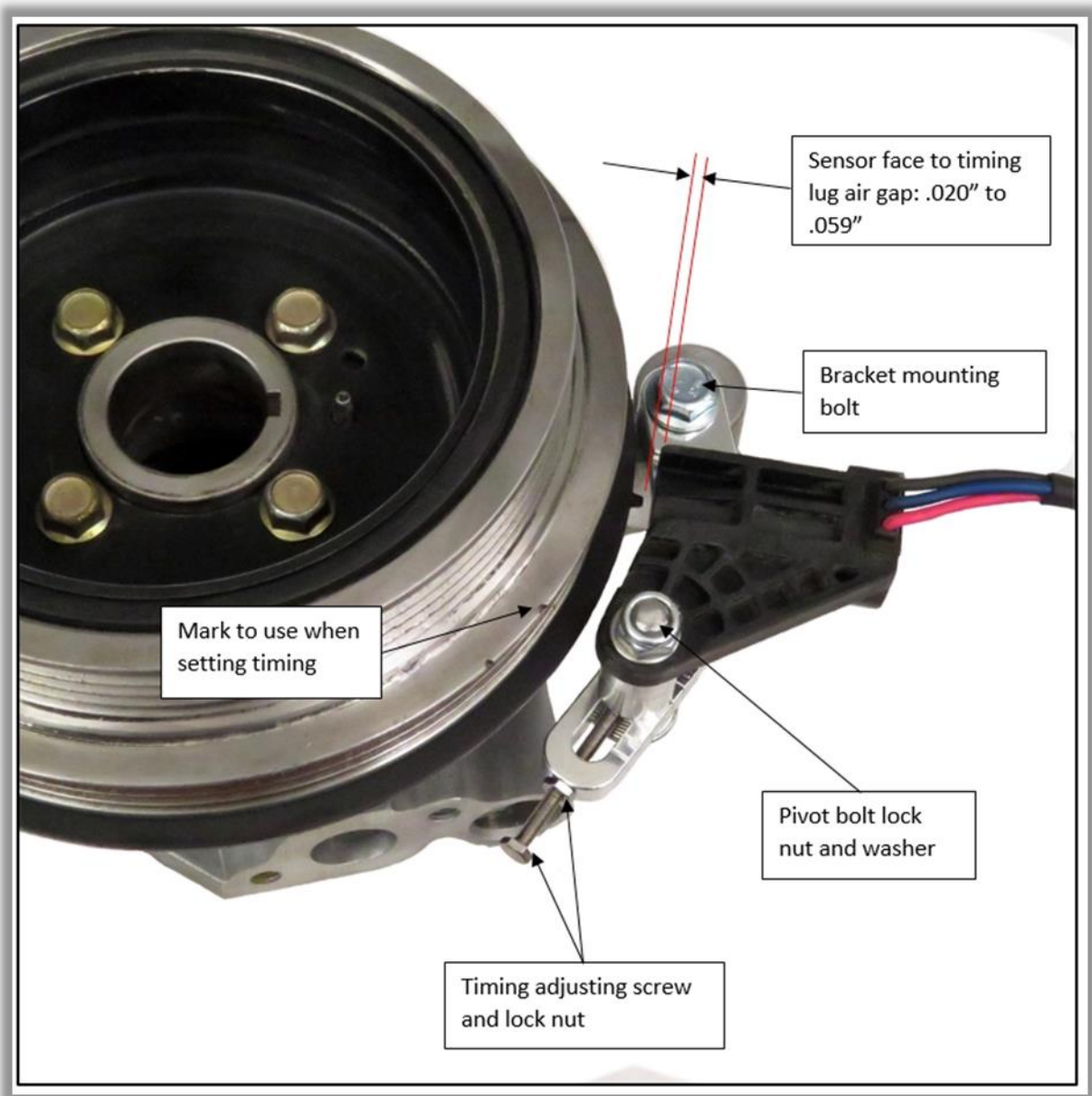
## Installing the Timing Bracket Assembly on the Engine

- Using the stock bolt install the bracket assembly to the same mounting point used by the stock sensor.
- When setting the sensor position, you will need to turn the crank using a 21mm wrench. This is to position the timing lug relative to the air gap you are setting. Be sure the car is in neutral before you turn the crank. It does not take a great deal of force to turn the crank (turn slowly to let compression bleed down). If there is a lot of resistance the car is probably in gear.
- Swing the bracket toward or away from the belt pulley. Watch the orientation of the face of the sensor and the timing lug. The face of the sensor needs to be perpendicular to the timing lug. This allows the timing lug gap to be set properly. When the face of the sensor is properly oriented to the lug tighten the bracket mounting bolt. See figure 4



*Figure 4*

Set the air gap between the timing sensor and the timing lug. The air gap specification is: 0.5-1.5mm {0.020-0.059"} as shown in figure 5



*Figure 5*

- Tighten the pivot bolt lock nut and recheck the air gap. Adjust as required.
- Reinstall the sensor wiring and plug in the sensor.



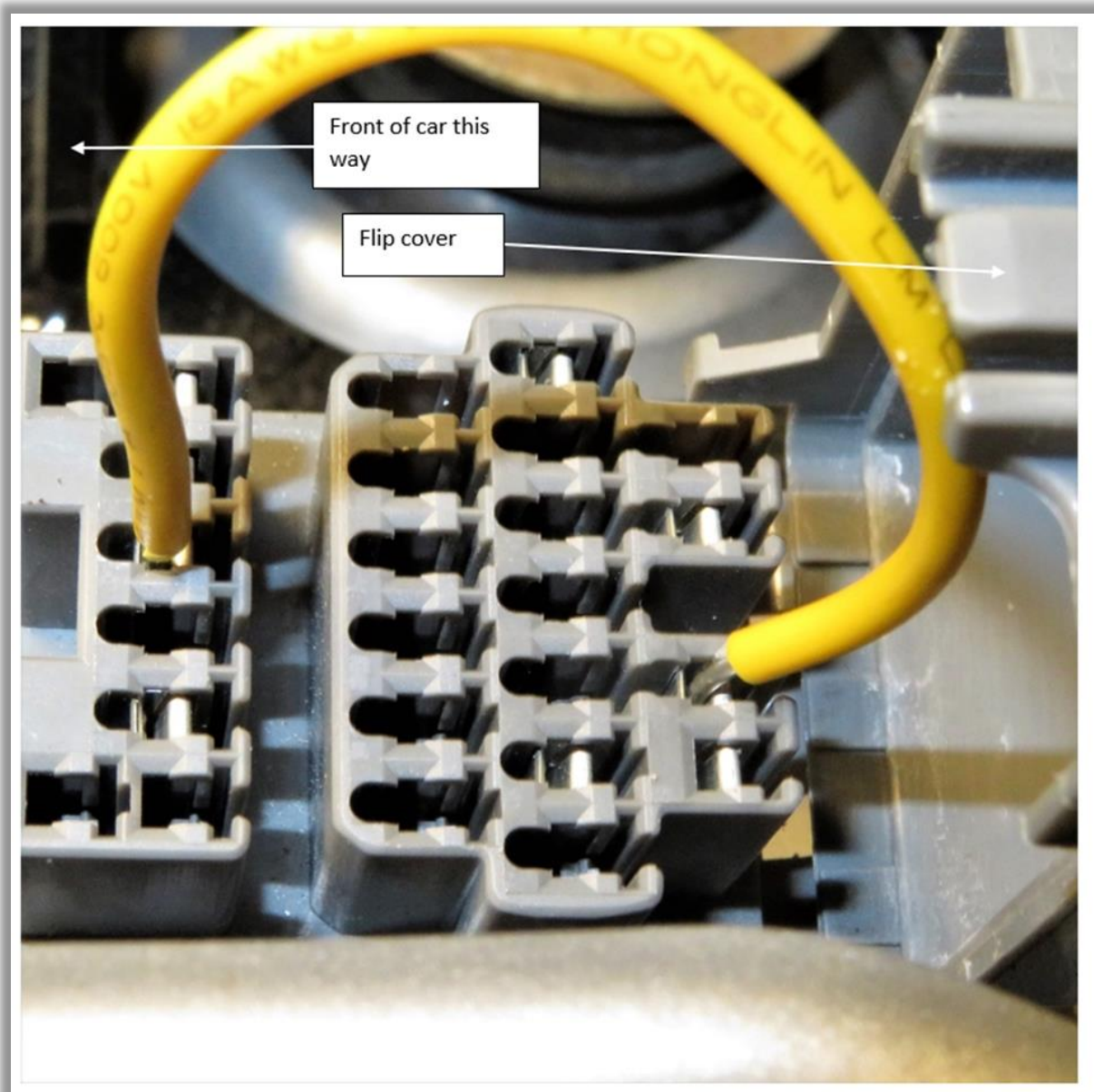
## Setting the Timing

- Each mark on the timing bracket is 2 degrees of timing. Turning the timing adjusting screw 2.2 turns will change the timing 1 degree. Turning the timing adjusting screw counterclockwise advances the timing and clockwise retards the timing.
- Start the engine and let it reach operating temperature. The idle should be about 850 rpm. If the idle is out of spec refer to this article for setting instructions: <https://www.miata.net/garage/ignition.html>
- Once the idle speed is OK turn off all electrical loads.
- Install a jumper between the GRD and TEN connections in the Diagnostics Port. This jumper is necessary to prevent the ECU from correcting the Timing. See figures 6 and 7 for port and terminal locations.



*Figure 6*





*Figure 7*

- With the engine off attach a timing light to the plug wire for cylinder 1 (plug closest to the front of the car).
- Start the car and observe the timing.
- Using the timing adjustment screw to position the timing sensor, move the sensor the desired amount to achieve the desired timing. For example, if 1 degree of advance is desired, turn the timing adjusting screw in (clockwise) 2.2 turns.
- Once the timing is set, reinstall the A/C belt and drivers side radiator.

## Timing Tips

Generally, the motor responds very well to four degrees more advance than stock (14 degrees total).

Exercise some caution regarding engine knock. Although the engine is equipped with a knock sensor that retards the ignition when the vibrations of a knock event are felt, the range of retard available may not be adequate to eliminate all knock.

The sound of knock is a light pinging sound from the motor when under, or very near, full throttle. Knock can damage a motor. If you hear such a sound, lift off of full throttle immediately.

Gasoline octane is a measure of a fuel's knock resistance. The higher-octane fuels allow greater ignition advance before the onset of knock. Therefore, the full throttle power is influenced by the octane rating of the fuel.

The "crisper" throttle response offered by the additional ignition advance is not affected by fuel octane, as the initial motion of the throttle and the knock event occur at different times.

The small benefit to fuel economy is also unrelated to fuel octane.

Take it for a drive and verify the results.

Please contact us at [info@maxgms.com](mailto:info@maxgms.com) or give us a call at 830-438-2890 if you require further assistance.