GENERAL MOTORS
SERVICE PARTS
OPERATION
6200 Grand Pointe Drive, Grand Blanc, MI
48439

# LS CIRCLE TRACK IGNITION CONTROLLER

**19355863** Ignition Control for Carbureted LS Series Engines (24x Crankshaft Index/1x Camshaft Index, 58x Crankshaft Index/4x Camshaft Index)

| Parts Included | Quantity |
|---|---|
| Ignition Controller | 1 |
| Main Harness | 1 |
| Sub Harness | 1 |
| Crank / Cam Pigtail 24x/1x | 1 |
| Crank / Cam Pigtail 58x/4x | 1 |
| USB Cable | 1 |
| Mounting Kit | 1 |
| MSDView USB Flash Drive | 1 |

**WARNING:** During installation, disconnect the battery cables. When disconnecting, always remove the Negative cable first and install it last.

## Operation

The 19355863 LS Circle Track Ignition Controller works with 24x/1x and 58x/4x crank/cam configurations. It auto detects the correct configuration based on the crankshaft reluctor wheel pattern, so there is no need to select one. It provides a customizable timing plot that can be programmed via MSDView.

## Software Installation

It is recommended, that you install and run MSDView software while connected to the unit to perform the base settings. The unit can be powered via the USB cable, so this can be done from a desktop or laptop and does not require an external power source.

## Mounting

The Controller is designed to be mounted under the hood or on the bulkhead (front of dash panel). Do not mount the unit near exhaust. Four vibration mounts are supplied to mount the unit. The unit is fully potted, but should not be immersed or subjected to direct spray from a power washer.

Find a suitable location, confirm that all of the wires reach their connections. Mark the mounting hole locations using the unit as a template. Drill the holes with a 3/16" bit.

## Wiring

All of the wiring, except three wires, are routed into factory style connectors to ensure an easy installation. The wire descriptions are listed on the following charts.

**WIRING**

| | |
|---|---|
| BLACK | Ground. Connect to a ground source, such as the engine or battery negative. |
| RED | Connect to a 12 volt switched source or dedicated fused 30A 12 volt source. |

**CAM/CRANK SENSOR - 10 PIN**

| | | |
|---|---|---|
| ORANGE/YELLOW | Pin-1 | Crank Sensor Signal |
| BROWN/WHITE | Pin-2 | Cam Signal |
| ORANGE | Pin-3 | 5 Volt Supply |
| PINK | Pin-4 | 12 Volt Supply |
| BROWN | Pin-6 | Sensor Ground |
| GRAY | Tach | Provides a 12 Volt Square Wave Signal |

**COIL CONNECTOR – EVEN CYLINDERS**

| | | |
|---|---|---|
| BLACK | Pin-A | Engine Ground |
| RED/GREEN | Pin-B | Coil 2 |
| BROWN/GREEN | Pin-C | Coil 4 |
| | Pin-D | Not Used |
| BROWN | Pin-E | Sensor Ground |
| BLUE/WHITE | Pin-F | Coil 6 |
| VIOLET/BLUE | Pin-G | Coil 8 |
| PINK | Pin-H | 12 Volt Supply for Even Cylinder Coils |

**COIL CONNECTOR – ODD CYLINDERS**

| | | |
|---|---|---|
| BLACK | Pin-A | Engine Ground |
| RED | Pin-B | Coil 7 |
| GREEN | Pin-C | Coil 5 |
| | Pin-D | Not Used |
| BROWN | Pin-E | Sensor Ground |
| LIGHT BLUE | Pin-F | Coil 3 |
| VIOLET | Pin-G | Coil 1 |
| PINK | Pin-H | 12 Volt Supply for Odd Cylinder Coils |

| | PIN | FUNCTION | COLOR | |
|---|---|---|---|---|
| 16-Pin Connector | A | NOT USED | | |
| | B | Sensor Ground | BROWN | Connect to Passenger's Side Coil Connector. (Coils 2-4-6-8) |
| | C | Coil 2 | RED/GREEN | |
| | D | Coil 4 | BROWN/GREEN | |
| | E | Coil 6 | BLUE/ WHITE | |
| | F | Coil 8 | VIOLET/BLUE | |
| | G | 12V Supply | PINK | |
| | H | Main 12V Supply | RED | Connect to Relay or dedicated fused 30A switch. |
| | J | Ground | BLACK | Connect to a ground source. |
| | K | 12V Supply | PINK | Connect to Driver's Side Coil Connector. (Coils 1-3-5-7) |
| | L | Coil 7 | RED | |
| | M | Coil 5 | GREEN | |
| | N | Coil 3 | LIGHT BLUE | |
| | P | Coil 1 | VIOLET | |
| | R | Sensor Ground | BROWN | |
| | S | NOT USED | | |

| | PIN | FUNCTION | COLOR | |
|---|---|---|---|---|
| 10-Pin Connector | A | 12V Sensor Power | PINK | |
| | B | Ground | BROWN | Connect to Cam/Crank Pigtail. |
| | C | Cam | BROWN/WHITE | |
| | D | Crank | ORANGE/YELLOW | |
| | E | 5V Sensor Power | ORANGE | |
| | F | Factory Use | BLACK | |
| | G | NOT USED | | |
| | H | NOT USED | PINK | |
| | J | NOT USED | BLUE | |
| | K | Tach | GRAY | Tach Output |

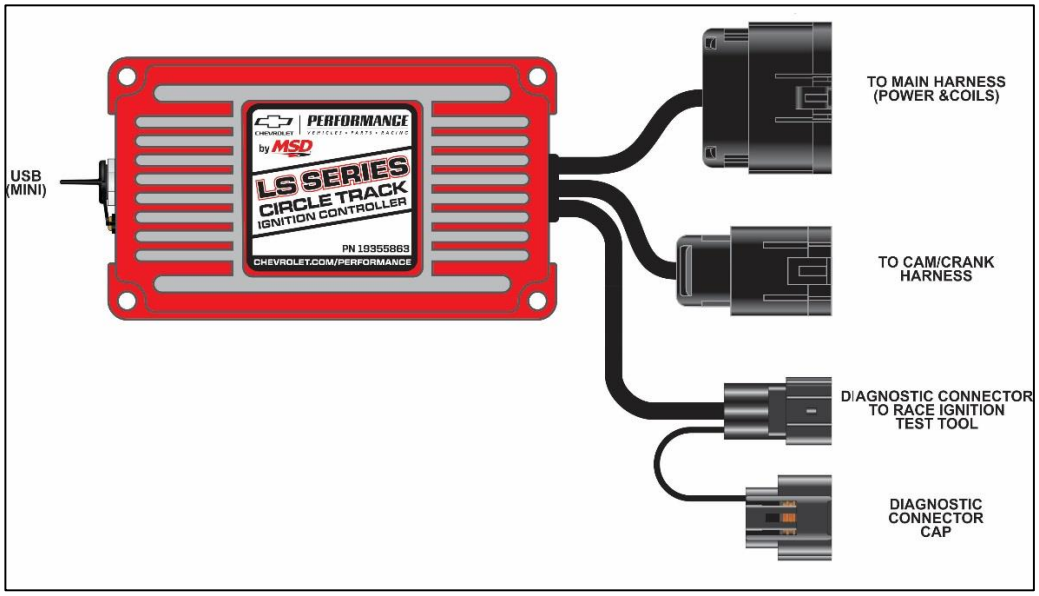


**Figure 1 LS Ignition Controller, PN 19355863**

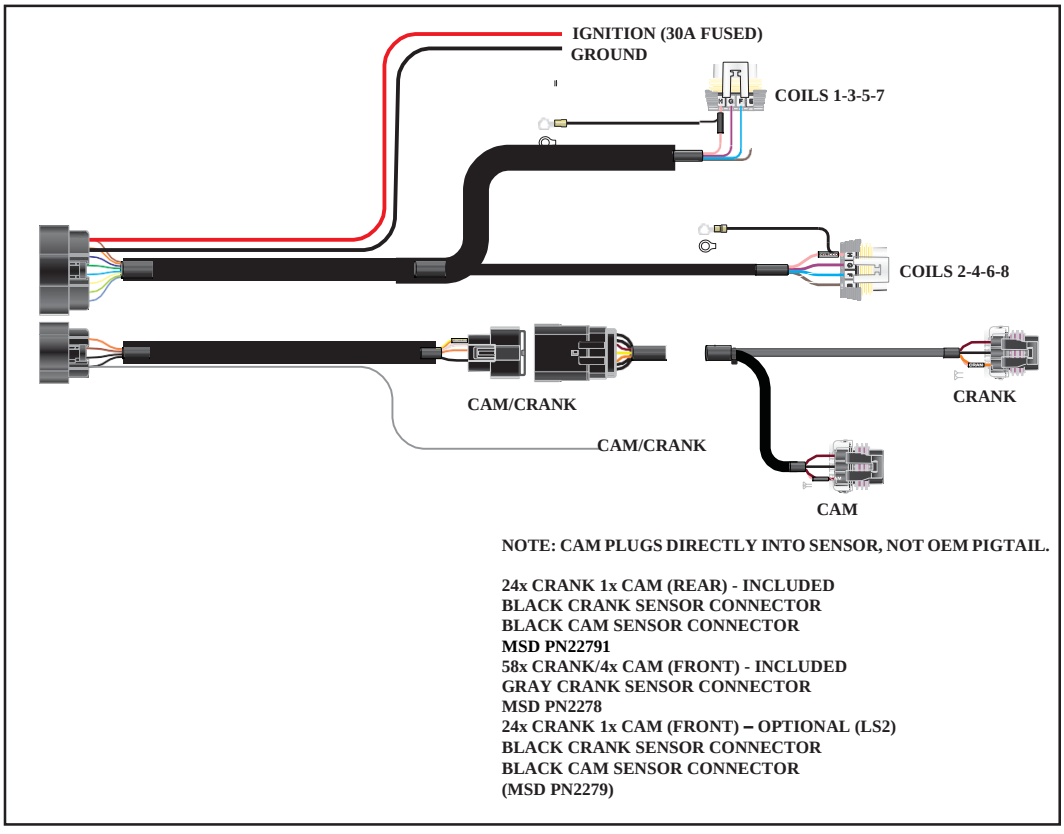


**Figure 2 LS Ignition Controller Harnesses, PN 19355863**

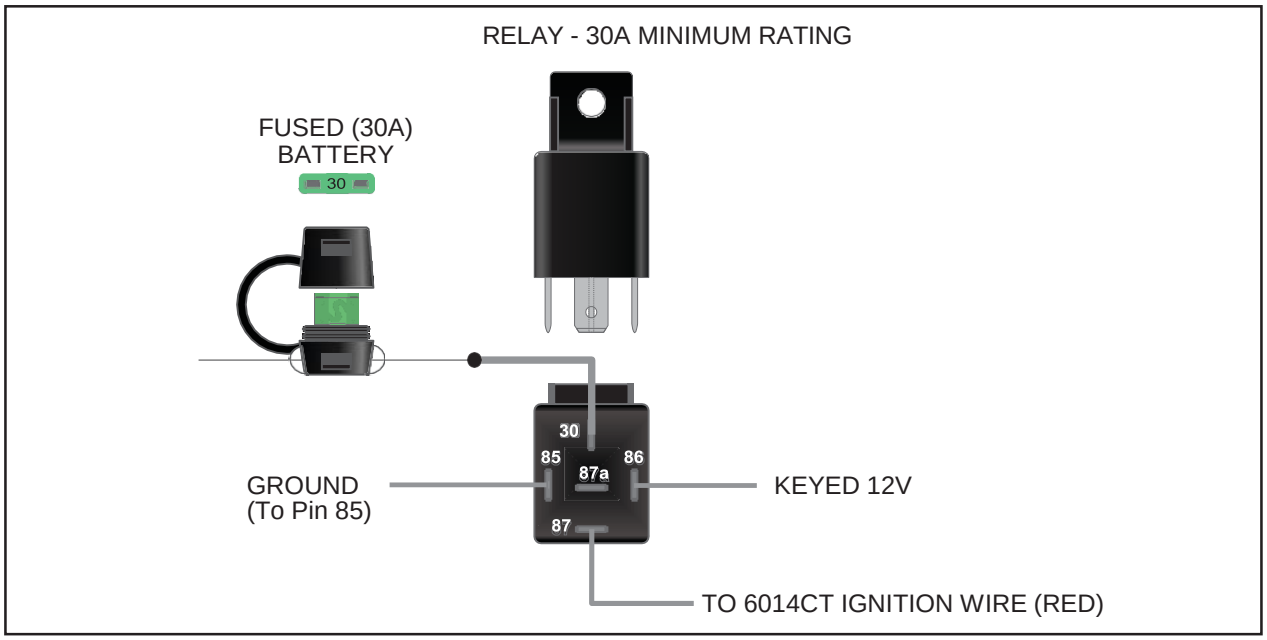


**Figure 3 30A Relay/Fuse Diagram (Relay and Fuse Not Included)**

**RACE IGNITION TECH TOOL**

The Race Ignition Tech Tool, (PN 19355922) was developed to help sanctioning bodies verify the compliance/configuration of the19355863. The Tech Tool communicates with the controller via the Diagnostic Connector.

Products that are compatible with the Tech Tool will have a dedicated tab in the MSDView software named "REGULATED". Any unit can be configured as a MASTER unit, the Tech Tool can then be connected to the MASTER unit and the REGULATED parameters synced to the MASTER configuration in the tool, The Tech Tool with the MASTER configuration can then be used to verify the compliance of units in the field.

**Figure 4 LS Ignition Tech Tool, PN 19355922**

**MSDVIEW**
The MSDView software allows calibration of control parameters such as ignition timing, rev limiter and also live monitoring of the engine. The following information gives a brief explanation of each function or feature in the system and the settings that control them. While using the software, you can mouse over each item for a brief on-screen explanation.

**Note**: Make sure MSDView is installed on the PC prior to connecting the Circle Track LS Ignition Controller.

**PROGRAMMABLE FEATURES AND SETTINGS**
These are basic settings that should be configured the first time the unit is used, but it is not required. A basic setup can be performed on the bench with just the USB cable connected to the device. No external power is required.

**INSTALLATON OF THE MSDVIEW SOFTWARE**

1. Insert the installation Flash Drive into an available USB port.
2. Locate the 'autorun.exe' file on the Flash Drive.
3. Click on "Install MSD View Software." Click 'Yes' when asked 'Do you want the following program to make changes to this computer?'.
4. Click 'Next' in the 'Setup - MSD View' window. Accept the License Agreement and click 'Next'. Choose to accept the desktop icon then click 'Install'. Click 'Finish' to run the application.
5. Connect the LS Controller via USB and wait for it to be listed in the product window.

   It will be listed in the product window. Select the LS Controller by highlighting the line or checking the box and clicking the 'View/Hide' button.

   **Note**: The first time the unit is connected; it may prompt for updates to be installed.

**Saves and Transfers**
Changes made to the Circle Track LS Ignition Controller via MSDView are in real time. You can create and save numerous different files to your PC and load them back into the unit for different applications. The following will go through a general description of the software for the Circle Track LS Ignition Controller.

**Programmable Features and Settings:**
These are basic settings that should be configured the first time the unit is used, but it is not required. A basic setup can be performed on the bench with just the USB cable connected to the device. No external power is required.

**Maximum Rev Limiter:** This is the maximum RPM that the engine can reach before the Rev limiter becomes active.

**Coil Type**: This selects the dwell or charge time of the coils. Choose "Auto" if unsure.

Auto- The controller will automatically match the coil dwell to the crankshaft reluctor wheel used.

LS-1 This sets the dwell time of the LS1/6 coils

LS2/3/7 This sets the dwell time of the LS2/3/7 coils

Truck This sets the dwell time of the early truck coils

**Timing**
Under this tab, you will find the timing plot used to control the spark output. The ignition spark timing is a function of the Engine Speed. The user can modify the plot points, add additional points or remove unnecessary points.

**Regulated**
Under this tab, you will find the settings that can be regulated by sanctioning bodies. When a particular setting is predetermined by a sanctioning body, the appropriate setting should be checked in the 'Regulated' tab. These settings should also match the predetermined values as prescribed by the sanctioning body. This feature allows the use of the Tech Tool to verify compliance.

When the Tech Tool is connected via the Diagnostic Connector it will read the regulated parameters from the unit and compare them to the specified values. A match in of all the SP parameters indicates compliance, while a mismatch indicates noncompliance. Normally, it is the responsibility of the racer to enter the 'Regulated' parameters in accordance with sanctioning body rules.

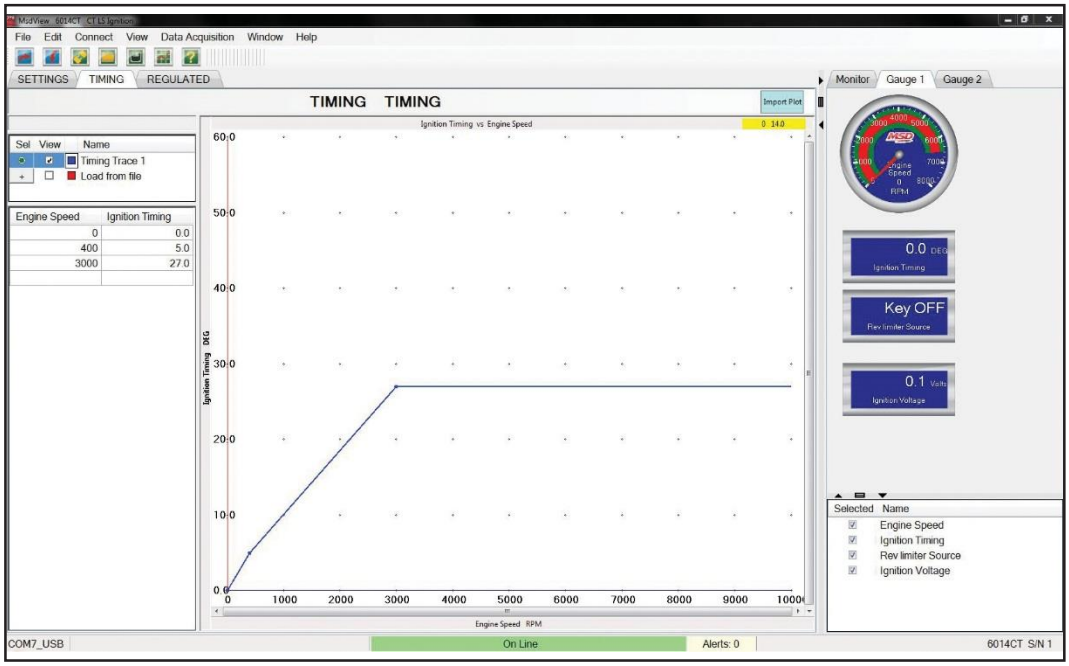


**Figure 5 Custom Timing Table 1**

## MONITORS

| MONITORS | DESCRIPTIONS |
|---|---|
| ENGINE SPEED | Engine speed in RPM |
| IGNITION TIMING | Ignition timing referenced to degrees Before Top Dead Center (BTDC) |
| IGNITION VOLTAGE | This is the voltage being supplied to the unit. This is also the voltage being supplied to the coils - so it is important that it remains over 12V to ensure optimum engine performance. |
| REV LIMITER SOURCE | Indicates which source will be limiting the motor. It will be "Key Off" when connected via USB, or "Maximum" any other time. |

## ALERTS

| FAULTS | Descriptions/Causes |
|---|---|
| BATTERY | Activates if voltage drops below 9V or goes above 18V CAM FAULT RPM is detected, but no cam sensor signal is present |
| CRANK FAULT | Camshaft sensor signal is present, but no engine speed is detected via the crankshaft sensor. |
| EEPROM READ ERROR | EEPROM data corrupted EEPROM WRITE |
| ERROR | Error writing to EEPROM |

GENERAL MOTORS
SERVICE PARTS
OPERATION
6200 Grand Pointe Drive, Grand Blanc, MI
48439

## TECH NOTES