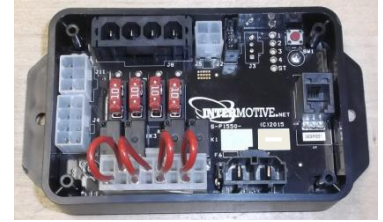


TLC910 Tail Light Controller

2016-2021 Mercedes-Benz Sprinter

Contact InterMotive for additional applications



Introduction

The TLC910 module provides an interface between the OEM tail light signals and aftermarket LED tail light assemblies. The module serves two main purposes.

First, the OEM system provides separate brake and turn signals. These signals must be combined for use with the aftermarket assembly. The TLC reads these signals discretely and/or via CAN. The TLC combines these signals to create left brake/turn and right brake/turn outputs.

Second, the LED tail light assemblies draw significantly less current than the OEM incandescent tail lights. Due to the reduced current draw, the LED assemblies cannot properly interface directly with the OEM system. The TLC monitors the current drawn by the LED assemblies in order to detect tail light malfunction. Once malfunction is detected, the TLC will signal the OEM SAM (Sprinter) module by removing load resistors from the OEM signals. This will trigger fast flash to notify the operator of the malfunction.

Note: The installer must provide all harnessing for the TLC module.

Installation Instructions

Disconnect vehicle battery before proceeding with installation.



WARNING
Disconnect the battery to
prevent setting a check engine
light.

IMPORTANT - READ BEFORE INSTALLATION

It is the installer's responsibility to route and secure all wiring harnesses where they cannot be damaged by sharp objects, mechanical moving parts and high heat sources. Failure to do so could result in damage to the system or vehicle and create possible safety concerns for the operator and passengers.

It is important to avoid placing the module where it could encounter strong magnetic fields from high current cabling connected to motors, solenoids, etc. Also avoid radio frequency energy from antenna's or inverters next to the module. Finally, avoid high voltage spikes in vehicle wiring by always using diode clamped relays when installing upfitter circuits.

TLC910 Module

Determine a suitable location to mount the TLC910 module. InterMotive strongly suggests that the TLC module should be close to the rear of the vehicle near the tail lights. Locate the module in an area away from any external heat sources (engine heat, heater ducts, etc.). An installer supplied mounting enclosure is required. The enclosure shall be water resistant and durable. Do not actually mount the module until all wire harnesses are routed and secure. The last step will be to mount the module.

J4: 8-Pin Input/Output Header

Header J4 contains the TLC's 5 discrete wire inputs and 2 tail light assembly LCO's. All inputs and outputs are active power (12V).

Mating Connector Manufacturer Part #: 39-01-2080

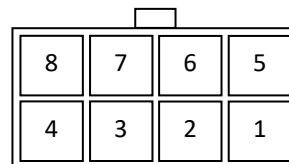
Mating Pin Manufacturer Part #: 39-00-0077 (16AWG), 39-00-0038 (18-24AWG)

The pins on connector J4 are defined as follows:

- Pin #1 - OEM Service Brake Signal Input
- Pin #2 - OEM Marker Signal Input
- Pin #3 - OEM Left Turn Signal Input
- Pin #4 - OEM Right Turn Signal Input
- Pin #5 - OEM Reverse Signal Input
- Pin #6 - N/C
- Pin #7 - Left Brake/Turn Output.
- Pin #8 - Right Brake/Turn Output.



J4: 8 Pin Molex MiniFit Jr



J4 Header Pinout

J6: 2-Pin Power Header

Header J6 contains the TLC's system power and ground connections. When making this connection the appropriate wire gauge must be used to guarantee at least 10V at the TLC module at all times.

Mating Connector Manufacturer Part #: 42816-0212

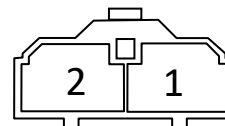
Mating Pin Manufacturer Part #: 42815-0012 (10-12AWG), 42815-0042 (14-16AWG)

The pins on connector J6 are defined as follows:

- Pin #1 - Ground
- Pin #2 - Power



J6: 2 Pin Molex MiniFit Sr



J6 Header Pinout

J7: 16-Pin Relay Configuration Header

The 16 Pin Molex header J7 contains all inputs to the relay contacts.

Mating Connector Manufacturer Part #: 39-01-2160

Mating Pin Manufacturer Part #: 39-00-0077 (16AWG), 39-00-0038 (18-24AWG)

The pins on connector J7 are defined as follows (pins not listed below have no connection):

Pin #2 - Loopback to pin #10.

Pin #4 - Loopback to pin #12.

Pin #10 - Loopback to pin #2.

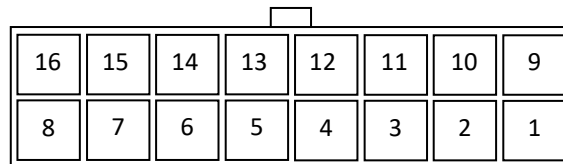
Pin #12 - Loopback to pin #4.

Pin #13 - OEM Left Turn Signal Input

Pin #15 - OEM Right Turn Signal Input



J7: 16 Pin Molex MiniFit Jr



J7 Header Pinout

J8: 4-Pin Relay Output Header

Header J8 contains the 4 TLC fused relay output pins. Each relay output is capable of 10A maximum.

Mating Connector Manufacturer Part #: 44441-2004

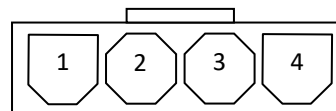
Mating Pin Manufacturer Part #: 43375-0001 (14-16AWG), 43375-2001 (18-20AWG)

The pins on connector J8 are defined as follows:

- Pin #1 - Marker Output
- Pin #2 - Reverse Output
- Pin #3 - Left Turn Signal Load Resistor
- Pin #4 - Right Turn Signal Load Resistor



J8: 4 Pin Molex Sabre



J8 Header Pinout

J11: 6-Pin DLC Header

The 6 Pin Molex MiniFit Jr Header J11 houses the CAN communication pins. These are intended to connect to the Vehicle Interface Module (VIM). This connection is not required for TLC operation. However, making this connection allows the TLC to provide redundancy for tail light operation. If the discrete inputs from the OEM system are lost the module will be able to read the signals via the CAN bus and retain tail light operation.

Note: If the TLC module is operating without the discrete inputs for turn signals then OEM fast flash is triggered to indicate the faulted condition.

Mating Connector Manufacturer Part #: 39-01-2060

Mating Pin Manufacturer Part #: 39-00-0077 (16AWG), 39-00-0038 (18-24AWG)

The pins on connector J11 are defined as follows:

Pin #1 - N/C

Pin #2 - VIM-TLC CAN High

Pin #3 - N/C

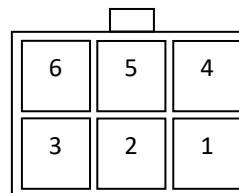
Pin #4 - N/C

Pin #5 - VIM-TLC CAN Low

Pin #6 - N/C



J11: 6 Pin Molex MiniFit Jr



J11 Header Pinout

TLC910 Module Mounting

Ensure all harnesses are properly connected and routed. Mount the TLC910 module inside of installer provided enclosure.

Reconnect vehicle battery

Post Installation / Check List

The following checks must be made after installation of the system, to ensure correct and safe operation. If any of the checks do not pass, do not deliver the vehicle. Recheck all connections per the installation instructions.

1. Turn ignition key on (to "Run").
2. Turn on the left turn signal and verify left tail light assembly flashes with front.
3. With left turn signal on, disconnect an LED assembly from the TLC's left turn signal output.
4. Verify the indicator and remaining turn signal lights fast flash to indicate the issue.
5. Re-connect the LED assembly to the TLC's left turn signal output.
6. Verify the indicator and turn signal lights return to normal flash rate.
7. Turn on the right turn signal and verify right tail light assembly flashes with front.
8. With right turn signal on, disconnect an LED assembly from the TLC's right turn signal output.
9. Verify the indicator and remaining turn signal lights fast flash to indicate the issue.
10. Re-connect the LED assembly to the TLC's right turn signal output.
11. Verify the indicator and turn signal lights return to normal flash rate.
12. With both turn signals off, apply the service brake and verify both tail lights turn on solid.
13. Turn on the emergency flashers and verify both tail lights flash appropriately.
14. Turn on headlights and verify marker lights turn on.
15. Shift to reverse and verify reverse lights turn on.

DO NOT PUT VEHICLE IN SERVICE IF IT DOES NOT PASS ALL OF THE ABOVE TESTS

Contact InterMotive at 530-823-1048 for technical assistance

Configuration

The TLC module must be configured to operate with specific tail light LED assemblies. Various LED assemblies will have different current draws. The current draw of a specific LED assembly will vary with battery voltage and ambient temperature. InterMotive must characterize the LED assembly used and create a TLC configuration that allows proper operation.

A previously created configuration may be specified at the time of order. The module will be programmed with the specified configuration before shipment.

Fast Flash Conditions

The TLC910 module provides an interface between the OEM tail light signals and aftermarket LED tail light assemblies. The TLC module will operate without any direct interaction from the vehicle operator. The TLC interacts with the driver by triggering OEM fast flash on the left and/or the right turn signals. When the TLC module is installed the OEM fast flash will occur in multiple scenarios.

The first scenario is failure of LED's in the tail light assembly or loss of connection between the TLC and the tail light assembly. In this case, the TLC has detected the reduced current draw of the LED assembly. Replace LED assembly or repair harnessing to resolve the fault.

The second scenario is loss of the discrete input for a turn signal. In this case, the module will detect the fault if the input is not switching but the CAN data indicates that the turn signal is on. Repair the wiring for the associated OEM turn signal input to resolve the fault.

The third and final scenario is due to a short on the TLC brake/turn output. This can occur if the wire between the TLC and the tail light assembly is pinched or the insulation is worn through and the wire is shorted to chassis ground. In this case, the TLC will detect an overcurrent fault on the associated output. Repair harnessing to resolve the fault.

A technician can determine the cause of the fast flash by using diagnostic page 4. See diagnostics details on page 7 of this document.

Diagnostics

Diagnostic mode is entered by pressing the test button on the module. The module provides diagnostic LEDs which illuminate according to the following table. There are multiple pages of diagnostics and the page can be determined by the Status LED. Pressing the test button will cycle through the different pages.



	LED1	LED2	LED3	LED4	STATUS LED
DIAG OFF	Marker Output	Reverse Output	Left Brake/Turn Output (J4-7)	Right Brake/Turn Output (J4-8)	OFF
PAGE 1	CAN Traffic	Hazards CAN	SB CAN	SB Input (J4-1)	Flash Pattern 1-1
PAGE 2	Left Turn CAN	Left Turn Input (J4-3)	Right Turn CAN	Right Turn Input (J4-4)	Flash Pattern 2-2
PAGE 3	Reverse CAN	Reverse Input (J4-5)	Marker CAN	Marker Input (J4-2)	Flash Pattern 3-3
PAGE 4	Left Turn Signal Fast Flash Active	Left Turn Signal Fast Flash Cause*	Right Turn Signal Fast Flash Active	Right Turn Signal Fast Flash Cause*	Flash Pattern 4-4
PAGE 5	Intermotive Internal Use				Flash Pattern 5-5
PAGE 6	Intermotive Internal Use				Flash Pattern 6-6
PAGE 7	Intermotive Internal Use				Flash Pattern 7-7
PAGE 8	Intermotive Internal Use				Flash Pattern 8-8

* LED function for fast flash cause is defined as follows:

LED Off: Low Current Fault Threshold Detected

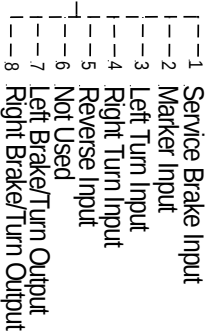
LED On: Loss of Turn Signal Input from OEM System

LED Flashing: Overcurrent Fault On Output

1 ●
2 ●
3 ●
4 ●
ST ●

SW1

110



If the TLC910 fails any step in the Post Installation Test, review the installation instructions and check all connections.

If necessary, call InterMotive Technical Support at (530) 823-1048.