

2022 CHEVROLET CORVETTE SERVICE MANUAL

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Wiper/Washer System Description and Operation

Windshield Wiper Operation

The windshield wipers system allows the driver to clear the vehicle's windshield using a discrete switch or through an automatic rain sensing system. The windshield wiper system functions through a primary control, but also allows redundant high speed-only operation in the event of a system fault. The wiper system uses the S82 Windshield Wiper/Washer Switch as the primary means of driver control. The S82 Windshield Wiper/Washer Switch is a discrete input to the K9 Body Control Module. The K9 Body Control Module communicates with the M75 Windshield Wiper Motor via LIN to control wiper activation. The K9 Body Control Module communicates with the K219 Lighting Control Module over CAN, which controls B+ to the M75 Windshield Wiper Motor during operation.

Low Speed Wiper Operation

The K9 Body Control Module interprets the ignition being switch to ON and the K9 Body Control Module responds by sending a CAN message to the K219 Lighting Control Module to supply B+ to the M75 Windshield Wiper Motor. The K219 Lighting Control Module controls the KR12B Windshield Wiper Relay by providing voltage to the coil side of the relay. This energizes the relay, closing the relay's high current switch, which supplies B+ to the M75 Windshield Wiper Motor. With the S82 Windshield Wiper/Washer Switch in the low speed position, the discrete signal circuit to the K9 Body Control Module is pulled down through two resistors in a resistor ladder to a low reference provided by the K9 Body Control Module. The K9 Body Control Module interprets this specific voltage pull-down as a request for wiper activation. The K9 Body Control Module communicates with the M75 Windshield Wiper Motor via LIN, requesting consistent low speed wiping operation.

Intermittent Wiper Operation

The K9 Body Control Module interprets the ignition being switched to ON and the K9 Body Control Module responds by sending a CAN message to the K219 Lighting Control Module to supply B+ to the M75 Windshield Wiper Motor. The K219 Lighting Control Module controls the KR12B Windshield Wiper Relay by providing voltage to the coil side of the relay. This energizes the relay, closing the relay's high current switch, which supplies B+ to the M75 Windshield Wiper Motor. With the S82 Windshield Wiper/Washer Switch in the intermittent position, the discrete signal circuit to the K9 Body Control Module is pulled down through a number of resistors within a resistor ladder to a low reference provided by the K9 Body Control Module. The number of resistors the signal travels through is dependent on the intermittent selection made on the S82 Windshield Wiper/Washer Switch. The K9 Body Control Module interprets this range of voltage pull-down as a request for intermittent wiper activation, with each pull-down voltage value equating an intermittent sensitivity level. The K9 Body Control Module communicates with the M75 Windshield Wiper Motor via LIN.

High Speed Wiper Operation

The K9 Body Control Module interprets the ignition being switched to ON and the K9 Body Control Module responds by sending a CAN message to the K219 Lighting Control Module to supply B+ to the M75 Windshield Wiper Motor. The K219 Lighting Control Module controls the KR12B Windshield Wiper Relay by providing voltage to the coil side of the relay. This energizes the relay, closing the relay's high current switch, which supplies B+ to the M75 Windshield Wiper Motor. With the S82 Windshield Wiper/Washer Switch in the high speed position, the discrete signal circuit to the K9 Body Control Module is pulled down through two resistors in a resistor ladder to a low reference provided by the K9 Body Control Module. The K9 Body Control Module interprets this specific voltage pull-down as a request for wiper activation. In addition to this pull-down signal, a second switch in the S82 Windshield Wiper/Washer Switch is also pulled down to low reference. This signal is a discrete input to the K219 Lighting Control Module and M75 Windshield Wiper Motor. The K9 Body Control Module communicates with the M75 Windshield Wiper Motor via LIN, requesting wiping operation. As noted earlier, the second switch in the S82 Windshield Wiper/Washer Switch also pulls-down a signal circuit from the M75 Windshield Wiper Motor. This discrete signal indicates to the M75 Windshield Wiper Motor that high speed wiper operation has been selected. This secondary discrete circuit provides a redundant means of high speed wiper operation should a circuit fault occur on the signal circuit between the S82 Windshield Wiper/Washer Switch and K9 Body Control Module or CAN communication be interrupted between the K9 Body Control Module and K219 Lighting Control Module.

Mist (Single Wipe) Operation

The K9 Body Control Module interprets the ignition being switched to ON and the K9 Body Control Module responds by sending a CAN message to the K219 Lighting Control Module to supply B+ to the M75 Windshield Wiper Motor. The K219 Lighting Control Module controls the KR12B Windshield Wiper Relay by providing voltage to the coil side of the relay. This energizes the relay, closing the relay's high current switch, which supplies B+ to the M75 Windshield Wiper Motor. The mist (single wipe) position is a momentary switch position that will

return the S82 Windshield Wiper/Washer Switch to the off position as soon as the switch is released. With the S82 Windshield Wiper/Washer Switch in the mist (single wipe) position, the discrete signal circuit to the K9 Body Control Module is pulled down through two resistors in a resistor ladder to a low reference provided by the K9 Body Control Module. The K9 Body Control Module interprets this specific voltage pull-down as a request for wiper activation. The K9 Body Control Module communicates with the M75 Windshield Wiper Motor via LIN, requesting consistent low speed wiping operation as long as the S82 Windshield Wiper/Washer Switch is held in the mist (single wipe) position. If the mist (single wipe) position is only briefly selected, the K9 Body Control Module will request only a single wipe.

Wiper Park Operation

With the S82 Windshield Wiper/Washer Switch in the off position, the discrete signal circuit to the K9 Body Control Module is pulled down through one resistor in a resistor ladder to a low reference provided by the K9 Body Control Module. The K9 Body Control Module interprets this specific voltage pull-down as a request to stop wiper activation. The K9 Body Control Module communicates with the M75 Windshield Wiper Motor via LIN, requesting wiper operation stop. The M75 Windshield Wiper Motor will park the windshield wipers in their lowest position.

The windshield wiper system consists of the following electrical components:

- S82 Windshield Wiper/Washer Switch
- K9 Body Control Module
- K219 Exterior Lighting Control Module
- KR12B Windshield Wiper Relay
- M75 Windshield Wiper Motor

Windshield Wiper Components

S82 Windshield Wiper/Washer Switch

The S82 Windshield Wiper/Washer Switch is the primary input to the K9 Body Control Module for the driver to control windshield wiper operation. The S82 Windshield Wiper/Washer Switch also provides discrete input to the K219 Lighting Control Module and M75 Windshield Wiper Motor during high speed wiper operation.

The S82 Windshield Wiper/Washer Switch contains three individual internal switch. One switch changes between mist (single wipe), off, intermittent, low speed, and high speed selection. The second switch changes with differing intermittent sensitivity selection. The third switch is only active when high speed wiper operation is selected. A resistor ladder is also used to determine switch selection and intermittent sensitivity selection. The high speed switch does not utilize the resistor ladder.

The K9 Body Control Module provides the S82 Windshield Wiper/Washer Switch with ground through a single low reference circuit and monitors the switch position through a single signal circuit. Voltage is applied by the K9 Body Control Module to this signal circuit and voltage drop is monitored to determine switch selection. This voltage drop will vary depending on the number of resistors in the resistor ladder, which changes depending on switch position. In the off position, current flows through a single resistor. In the mist (single wipe), low speed, and high speed position, current flows through two resistors. In the intermittent position, current flows through three or more resistors, depending on the intermittent sensitivity selected.

The S82 Windshield Wiper/Washer Switch provides a discrete switch input to the K219 Lighting Control Module and M75 Windshield Wiper Motor during high speed wiper operation. The K219 Lighting Control Module and M75 Windshield Wiper Motor monitor high speed wiper request on a single, shared signal circuit. Voltage is applied by the K219 Lighting Control Module and M75 Windshield Wiper Motor to this signal circuit and voltage drop is monitored to determine switch selection. When high speed operation is selected, the signal circuit is pulled to ground (low reference). The K219 Lighting Control Module will respond by powering the M75 Windshield Wiper Motor. The M75 Windshield Wiper Motor will respond by enabling high speed wiping. This second signal circuit provides discrete operation of high speed wipers should any circuit fault occur between the S82 Windshield Wiper/Washer Switch and K9 Body Control Module or if there communication fault on LIN or CAN circuits.

K9 Body Control Module

The K9 Body Control Module responds to input requests from the S82 Windshield Wiper/Washer Switch. The K9 Body Control Module provides a constant ground for the S82 Windshield Wiper/Washer Switch and monitors a signal circuit to determine the requested windshield wiper position.

The K9 Body Control Module communicates with the M75 Windshield Wiper Motor via LIN.

K219 Lighting Control Module

When the ignition is turned on the K219 Lighting Control Module controls B+ to the M75 Windshield Wiper Motor through the KR12B Windshield Wiper Relay. When wiper high speed operation is requested a discrete high speed signal is sent from the K219 Lighting Control

Module to the M75 Windshield Wiper Motor. A CAN message is also sent from the K219 Lighting Control Module to the K9 Body Control Module that the high speed operation is active.

In case of communication failure, the system will default to low speed wiper operation, controlled by the K219 Lighting Control Module through the discrete signal.

KR12B Windshield Wiper Relay

The KR12B Windshield Wiper Relay supplies B+ to the M75 Windshield Wiper Motor and is controlled by the K219 Lighting Control Module. The coil side of the relay receives a constant chassis ground and the switch side receives a constant B+. When the ignition is switched to ON, the K219 Lighting Control Module will provide voltage to the coil side of the relay. This will energize the relay, closing the high current contact, and supply B+ to the M75 Windshield Wiper Motor, enabling wiper operation.

M75 Windshield Wiper Motor

The M75 Windshield Wiper Motor communicates with the K9 Body Control Module via LIN and responds to requests to turn the windshield wipers on and off, as well as to vary the wiper speed. The M75 Windshield Wiper Motor receives a constant chassis ground. B+ is controlled by the KR12B Windshield Wiper Relay. In operation, the M75 Windshield Wiper Motor monitors LIN messages to determine the requested wiper selection is requested. The M75 Windshield Wiper Motor also monitors voltage on a discrete signal circuit to determine high speed wiper requests.

The M75 Windshield Wiper Motor includes a DC motor and an internal position switch to indicate the wiper park position. When wiper operation is requested, the DC motor spins. The spinning motor is directed to a wiping motion through the windshield wiper transmission. When wiper operation is no longer required, the M75 Windshield Wiper Motor will continue spinning until the internal position switch indicates it is in the park position.

Windshield Washer Operation

The windshield washer system allows the driver to clean the vehicle's windshield using a discrete switch. The washer system uses the S82 Windshield Wiper/Washer Switch as the primary means of driver control. The S82 Windshield Wiper/Washer Switch is a discrete input to the K9 Body Control Module. The K9 Body Control Module communicates with the K219 Lighting Control Module over CAN to control G24 Windshield Washer Pump activation. The K9 Body Control Module also communicates with the K219 Lighting Control Module to control B+ to the M75 Windshield Wiper Motor during operation.

The windshield wiper system consists of the following electrical components:

- S82 Windshield Wiper/Washer Switch
- K9 Body Control Module
- K219 Lighting Control Module
- KR12B Windshield Wiper Relay
- KR11 Windshield Washer Pump Relay
- G24 Windshield Washer Pump
- M75 Windshield Wiper Motor
- B118B Windshield Washer Fluid Level Switch

Windshield Washer Components

S82 Windshield Wiper/Washer Switch

The S82 Windshield Wiper/Washer Switch is the primary input to the K9 Body Control Module for the driver to control windshield washer operation.

The K9 Body Control Module provides the S82 Windshield Wiper/Washer Switch with ground through a single low reference circuit and monitors the switch position through a single signal circuit. Voltage is applied by the K9 Body Control Module to this signal circuit and voltage drop is monitored to determine switch selection. The S82 Windshield Wiper/Washer Switch contains an internal switch dedicated to windshield washer operation. When the switch is closed, the signal circuit is pulled to ground, indicating washer operation is requested.

K9 Body Control Module

The K9 Body Control Module responds to input requests from the S82 Windshield Wiper/Washer Switch. The K9 Body Control Module provides a constant ground for the S82 Windshield Wiper/Washer Switch and monitors a signal circuit to determine the requested windshield wiper position.

When washer operation is requested, the K9 Body Control Module will send a CAN message to the K219 Exterior Lighting Control Module to enable the G24 Windshield Washer Pump, as well as supply B+ to the M75 Windshield Wiper Motor. The K9 Body Control Module communicates with the M75 Windshield Wiper Motor via LIN. When washers are requested, the K9 Body Control Module will request low speed wiper activation from the M75 Windshield Wiper Motor.

K219 Lighting Control Module

The K219 Lighting Control Module controls B+ to the G24 Windshield Washer Pump. When washer operation is requested from a CAN message from the K9 Body Control Module, the K219 Lighting Control Module will apply voltage via a high side driver to the KR11 Windshield Washer Pump Relay. The K219 Lighting Control Module also controls B+ to the M75 Windshield Wiper Motor. When washer operation is requested, the K219 Lighting Control Module will apply voltage via a high side driver to the KR12B Windshield Wiper Relay.

The K219 Lighting Control Module also monitors the B118B Windshield Washer Fluid Level Switch through a discrete signal circuit.

KR12B Windshield Wiper Relay

The KR12B Windshield Wiper Relay supplies B+ to the M75 Windshield Wiper Motor and is controlled by the K219 Lighting Control Module. The coil side of the relay receives a constant chassis ground and the switch side receives a constant B+. When wiper operation is requested, the K219 Lighting Control Module will provide voltage to the coil side of the relay. This will energize the relay, closing the high current contact, and supply B+ to the M75 Windshield Wiper Motor, enabling wiper operation.

KR11 Windshield Washer Pump Relay

The KR11 Windshield Washer Pump Relay supplies B+ to the G24 Windshield Washer Pump and is controlled by the K219 Lighting Control Module. The coil side of the relay receives a constant chassis ground and the switch side receives a constant B+. When wiper operation is requested, the K219 Lighting Control Module will provide voltage to the coil side of the relay. This will energize the relay, closing the high current contact, and supply B+ to the G24 Windshield Washer Pump, enabling washer pump operation.

G24 Windshield Washer Pump

The G24 Windshield Washer Pump receives a constant chassis ground. B+ is controlled by the KR11 Windshield Washer Pump Relay. With voltage applied, a DC motor spins, connecting and pressurizing washer fluid from the washer fluid reservoir. The pressurized washer fluid is deposited on the windshield through a series of lines and nozzles.

M75 Windshield Wiper Motor

The M75 Windshield Wiper Motor communicates with the K9 Body Control Module via LIN and responds to requests to turn the windshield wipers on and off. The M75 Windshield Wiper Motor receives a constant chassis ground. B+ is controlled by the KR12B Windshield Wiper Relay. In operation, the M75 Windshield Wiper Motor monitors LIN messages to determine when washer operation is requested. The M75 Windshield Wiper Motor will wiper at low speed when washer operation is requested.

The M75 Windshield Wiper Motor includes a DC motor and an internal position switch to indicate the wiper park position. When washer operation is requested, the DC motor spins. The spinning motor is directed to a wiping motion through the windshield wiper transmission. When wiper operation is no longer required, the M75 Windshield Wiper Motor will continue spinning until the internal position switch indicates it is in the park position.

B118B Windshield Washer Fluid Level Switch

The B118B Windshield Washer Fluid Level Switch receives a constant chassis ground. A signal circuit is monitored by the K219 Lighting Control Module. The K219 Exterior Lighting Control Module applies voltage to the signal circuit. When the B118B Windshield Washer Fluid Level Switch is closed, voltage on the signal circuit is pulled to ground, indicating fluid in the washer fluid reservoir.