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Coding Information

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Title: **Pre-2007 HPV Wiper Troubleshooting**

Applies To: **All Pre-2007 HPV's**

DESCRIPTION

Note: If the wiper failure occured after an ESC replacement, and it went from an ESC 1, to an ESC 2, then the removal of feature code 595289 and the enabling of feature code 595288 is required. No further diagnosis is required.

The windshield wiper switch has a total of eight positions: off, five intermittent wipe settings, low speed, and high speed. The wiper switch is actually three separate switches. Each of the three switches is connected to an accessory biased ESC digital input. Closing a switch provides a path to ZVR, which pulls the digital input to near 0V. Each of the eight possible wiper switch settings causes a different combination of open and closed switches. The combination of open or closed switches is used by the ESC to determine which switch position the driver has selected. Note that if the wiper switch is disconnected, the inputs will all pull up to accessory voltage level. This will cause the ESC to operate the wiper motor at high speed. Other wiper inputs include ESC ignition and ESC accessory inputs.

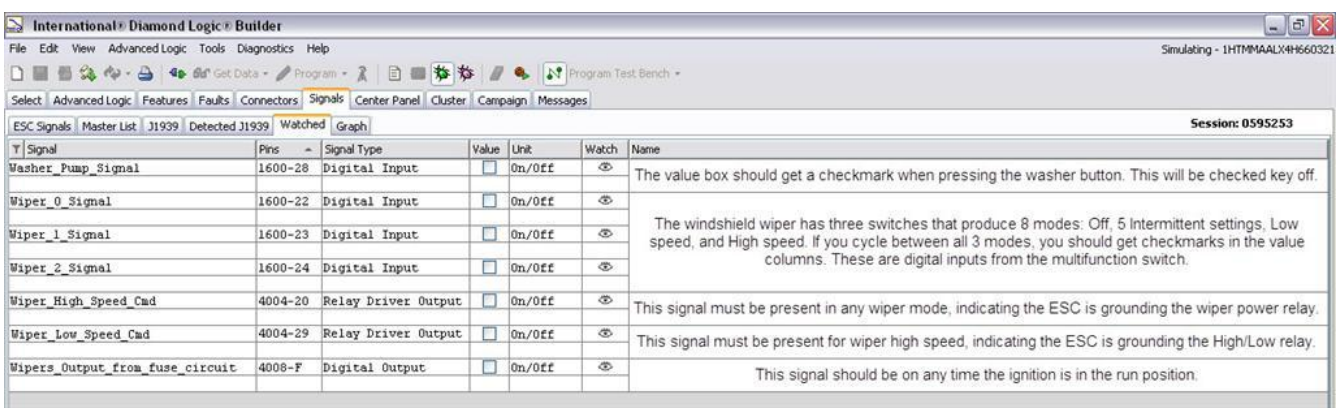
The most common cause of the wipers staying on all the time is that the washer input to the ESC is staying on.

For more information on how this feature works, click here S08293.

SYMPTOMS

- Wipers on Low all the time
- Wipers on High all the time
- Wipers won't come on

SIGNALS TO WATCH



TROUBLESHOOTING

1. The first step is to check and record the DTC's using DLB, not the cluster. For info on doing this properly, see **IK2600036**.

Signal	ESC Pin	SPN	FMI	Byte 8	Byte 7	Description / Circuit Identification	Action

Wipers_Output_from_fuse_circuit	4008-F	611	14	6	1	Wiper Power Under Current	Check for open circuits to the wiper relays.
Wipers_Output_from_fuse_circuit	4008-F	611	14	6	2	Wiper Power Over Current	Check for a short to ground in the circuits to the wiper relays.
Wipers_Output_from_fuse_circuit	4008-F	611	14	6	3	Wiper Power Less than Normal	Check for a short in the circuits to the wiper relays.
Wipers_Output_from_fuse_circuit	4008-F	611	14	6	4	Wiper Power Greater than Normal	Check for excessive resistance or loose terminals in the circuits to the wiper relays.
Wipers_Output_from_fuse_circuit	4008-F	611	14	6	6	Wiper Power has Current Flow when Commanded Off	Check for a short to power in the circuits to the wiper relays.
Wiper_High_Speed_Cmd	4004-20	2033	14	8	1	Wiper Power Relay Output Overloaded	Check for short to power in the circuits between the power relay socket and the ESC. Check relay coil resistance
Wiper_High_Speed_Cmd	4004-20	2033	14	8	2	Wiper Power Relay Ouput Open Circuit	Check for an open in the circuits between the power relay socket and the ESC. Check relay coil resistance
Wiper_High_Speed_Cmd	4004-20	2033	14	8	3	Wiper Power Relay Output Shorted to Ground	Check for short to ground in the circuits between the power relay socket and the ESC. Check relay coil resistance
Wiper_Low_Speed_Cmd	4004-29	2033	14	14	1	Wiper Hi/Low Speed Relay Output Overloaded	Check for short to power in the circuits between the relay socket and the ESC. Check relay coil resistance
Wiper_Low_Speed_Cmd	4004-29	2033	14	14	2	Wiper Hi/Low Speed Relay Output Open Circuit	Check for an open in the circuits between the relay socket and the ESC. Check relay coil resistance
Wiper_Low_Speed_Cmd	4004-29	2033	14	14	3	Wiper Low Speed Relay Output Shorted to Ground	Check for short to ground in the circuits between the relay socket and the ESC. Check relay coil resistance

2. Make sure that you have ignition and accessory voltage to the Body Controller. If you don't have accessory voltage, the wipers won't work. For info on checking this, see **IK0800092**.

3. Hook up with DLB and monitor the Washer_Pump_Signal, Wiper_0_Signal, Wiper_1_Signal, and Wiper_2_Signal. These are the inputs to the ESC from the switch.

- If there is a check mark next to the Washer_Pump_Signal, the ESC thinks that the washer switch is being pushed all the time.

Wiper Switch Position	1600-22	1600-23	1600-24
Off	**No Checkmark**	**No Checkmark**	**No Checkmark**
Intermittent 1	**Checkmark**	**No Checkmark**	**No Checkmark**
Intermittent 2	**No Checkmark**	**Checkmark**	**No Checkmark**
Intermittent 3	**Checkmark**	**Checkmark**	**No Checkmark**
Intermittent 4	**No Checkmark**	**No Checkmark**	**Checkmark**
Intermittent 5	**Checkmark**	**No Checkmark**	**Checkmark**
Low	**No Checkmark**	**Checkmark**	**Checkmark**
High	**Checkmark**	**Checkmark**	**Checkmark**

4. Hook up your break out box to the 1600 connector and measure voltage on pin 28.

- You should have about 10 volts when the washer switch is not being pushed.
- You might have 0v or close to it. This means that you have a short to ground or a bad switch.
- If a short to ground is found, check the Washer pump input circuit

5. Measure voltage on pins 22, 23, and 24 of the 1600 connector through the breakout box.

- These pins are the inputs for the Wiper_0_Signal, Wiper_1_Signal, and Wiper_2_Signal.
- You should have about 0 volts on each of these with the wiper switch turned off. Each of the three switches in the multifunction switch are normally closed. When the switch is moved to another position, the switch will open and the corresponding wire will show the voltage output from the body controller.
- If you have voltage on any of these with the switch turned off, you have an open in that circuit

CIRCUIT DIAGRAMS

- Wiper Output Schematics
- Wiper Input Schematics
- For advanced interactive Circuit Diagrams, click here. This diagram is a good place to see how the system works.
- Electrical System Troubleshooting Guide - Wipers

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