



# Preliminary Information

## PIT5434D Diagnostic Tips - Front Heated Seats (RPO KB6)

### Models

Brand:	Model:	Model Years:	VIN:		Engine:	Transmissions:
			from	to		
Cadillac	Escalade Models	2015 - 2020	All	All	All	All
Chevrolet	Silverado 1500	2014	All	All	All	All
Chevrolet	Silverado	2015	All	All	All	All
Chevrolet	Suburban	2015 - 2016	All	All	All	All
Chevrolet	Tahoe	2015 - 2016	All	All	All	All
GMC	Sierra 1500	2014	All	All	All	All
GMC	Sierra	2015	All	All	All	All
GMC	Yukon Models	2015 - 2016	All	All	All	All

### With Heated and Cool seats (RPO KB6)

#### Supersession Statement

This PI was superseded to update the Model Years. Please discard PIT5434C.

The following diagnosis might be helpful if the vehicle exhibits the symptom(s) described in this PI.

### Condition / Concern

**Note: This document is only to provide additional tips when diagnosing a front heated seat concern and is not meant to be a diagnostic flow chart or replace SI. Always, perform and refer to SI for the latest diagnostic information and procedures.**

Some customers, with trucks equipped with heated and cooled seats (RPO KB6), may comment on any of the following front heated seat concerns:

- Condition 1: A front heated seat (driver, passenger, back and/or cushion) is inoperative
- Condition 2: The front heated seats do not operate when the truck is remote started and/or when first started in the morning during a cold start
- Condition 3: The front heated seats do not heat up like their previous vehicle

### Recommendations / Instructions

#### 1 Condition 1: A front heated seat (back and/or cushion) is inoperative

- 1.1 In general, the front heated seats can be viewed as four independent seat heaters that include a Heating Element and Blower. Diagnosis each affected seat heater individually. Example, if the owner's complaint is the driver's heated seat (back and cushion) are inoperative, diagnosis the driver's seat back separate from the driver's seat cushion.
- 1.2 Each blower has 4 circuits: Power, Ground, Control (from BCM) and Heating Element Supply Power.

**1.3** Three of the four blower circuits (blower Power, Ground and Control (from BCM) circuits) can easily be checked by starting the engine and turn on the cooled seat. When the cooled seats are turned on the blower in each seat back and cushion will turn on. Listen carefully when the cooled seats are turned on for the blowers to turn on. This is the quickest and easiest way to verify if each of the blowers have good power (circuits 5140 or 6140), ground (circuits 1150 or 1250) and control (from BCM) circuits (circuits 5906 or 5908). These circuits are the same circuits needed to operate the heated seat. If any of the blowers do not turn on, these circuits will need to be tested at the blower.

**1.4** The fourth blower circuit, heating element supply power, (circuits 2432, 2077, 2481, or 2479) can be tested to determine if the blower is supplying power to the heating element. Disconnect the affected heating element and connect a voltmeter across the heating element supply power and ground circuit. These are male terminals and the connector will either need to be back probed or use test probe J35616-65B. Start the engine and turn on the heated seat, the blower will supply B+ on the element supply power circuit for 1-2 seconds. Because the heating element is disconnected the blower senses a fault, which is why the power is only present for 1-2 seconds.

**Tip-** Depending on the voltmeter's update rate, it may not be able to detect/display the 1-2 seconds B+ turn on from the blower. The meter may need to be set to a min/max setting for it to detect/display the B+ supply from the blower. In most cases, a test light maybe used in place of a voltmeter and it should briefly illuminate after pressing the heated seat switch, test light dependent.

**1.5** With the heated seat element disconnected, use an ohmmeter to measure the resistance of the heating element. The heating element resistance should be approximately 5 - 7.5 ohms. Do NOT condemn the heating element just because the resistance is not within the approximate resistance spec. Some common sense should be used if the resistance is close to the spec, performing step 1.6 will help determine if the heating element should be condemned. The resistance spec listed is approximate because of a couple different reasons: 1. The heating element resistance can change with temperature. 2. The heating element is not a single resistive wire design like used on previous GM vehicles. It is more like a rear window defroster grid. Just like a rear window defroster grid, if only one grid line is damage, only that part of the grid will not heat, but the rest of the grid will operate. The only difference is the seat blower monitors the amperage and can detect high and/or low current issues and turn off the heated seat element if out of range.

**Tip-** When measuring the resistance of the heating element, the connector terminals are very small terminal and can be damage. When checking the resistance, the connector should either be back probed or use test probe J35616-64B.

**1.6** If all of the above steps check ok or the heating element resistance is close to the approximate spec, reconnect all disconnected connectors. Connect a voltmeter across the affected heated seat element connectors supply power and ground circuits (back probing the connector). To make sure you have a correct connection back probing, switch the meter to ohms and check the resistance of the heating element. The resistance should be close to the same resistance as seen in step 1.5. Switch the meter back to voltage and start the engine. While monitoring the voltmeter, turn the heated seats on high. The blower, duty cycles the heating element supply power on and off from 0 volts to Battery voltage. If the voltmeter is measuring slightly lower than battery voltage, this indicates the heated seat is ON and operating (no fault present please review steps 2 and 3 for additional help). If you only measure a quick 1-2 seconds B+ turn on from the blower (like in step 1.4) then the blower has detected a fault with the heating element or circuits/terminals. In most cases, the main concern is with the heating element itself.

**Tip-** A new heating element can easily be plugged in, without installing it into the seat, and then be felt to make sure it is heating up. Do this before completely installing the heating element into the seat.

**Additional test:** If the voltmeter can measure duty cycle, an additional test can be performed to indicate the blower is cycling the heating element on correctly. With the voltmeter still connected in the same manner as step 1.6 switch the meter to measure duty cycle. This test will only work if the meter was measuring voltage when the heated seats

were turned on. With the heated seats on High, the duty cycle should measure 90% duty cycle (90% on and 10% off), which is why when measuring voltage the voltmeter measured slightly lower than battery voltage (90% on time). If the heated seat is switched to Med it would measure 40% duty cycle (40% on and 60% off) and low is 10% duty cycle (10% on and 90% off). If you are getting these values the heated seats is working correctly at this time.

**NOTE: When checking the duty cycle be sure to understand if the meter being used is measuring on time or off time. Also, make sure the meter leads are connected in the correct polarity.**

**2 Condition 2: The front heated seats do not operate when the truck is remote started and/or when first started in the morning during a cold start.**

**2.1 If the concern is only during a remote start event please review these tips:**

- The heated seats will only turn on if the ambient temperature is below 50 deg F (10 degs C).
- The heated seat feature needs to also be turned on in the Radio's "Settings" menu before they will operate during a remote start. See the latest version of [PIT5240](#) for additional information.
- During a remote start, the heated seat indicators will remain off, even when the seats are active, this is normal.
- When the ignition is turned on from a remote start, the heated seats will turn off. The customer must reactivate the heated seats if they desire the seat heater to be active, this is normal.
- When a heated seat is unoccupied, like during a remote start, the heat transfer between the heating element and the seat surface is significantly less compared to when the seat is occupied. This is normal and if an unoccupied seat is felt during a remote start it may not feel as if the heated seats are operating. When the seat is occupied, the seat surface is compressed closer to the heating element providing greater transfer. A quick test is to have the customer/dealer sit in the seat and perform a cold remote start, like first thing in the morning. Allow the vehicle to run for several minutes and feel if the seat is operating.
- If a remote start is performed within 2 hrs. of shutting the engine off, the heated seats may not turn on, depending on how long the engine was running on the previous ignition cycle. This is due to the outside temperature sensor being inaccurate because of the heat generated by the engine radiator. If testing for an inoperative heated seat during an RVS event, allow the vehicle to sit outside in ambient temperatures below 50 deg F (10 degs C) with the ignition off for more than 2 hours.

**2.2 In general, if there is a valid complaint that the "Heated Seats do not operate during the first cold start or first cold remote start" it could be caused by the heated seat element resistance being too low and out of specification when cold. The heated seat element can be warmed up, changing its resistance, by either the person sitting in the seat or because of the interior warming up, this change can bring the resistance into spec and the heated seat could become operational. The best way to test for this is to perform the following testing. The testing should be performed during the first cold start in the morning at the same outside temperature the customer states the issue happens. Allow the vehicle to sit outside overnight, and the day before have the heated seat element connectors accessible so testing can be done first thing without delay. Do NOT sit in the seat you are testing. Before turning the ignition on or starting the truck perform the resistance test at each affected heating element as outlined in step 1.5, and document on RO. Next, perform the test outlined in step 1.6. When measuring the voltage and duty cycles if they indicate the heated seat is on, either the condition has not been duplicated or review the information in step 3. If only the quick 1-2 second B+ turn on power is measured, then the blower detected a fault with the heating element or circuits. In some cases, you may measure a very low voltage and duty cycle approximately 5% (5% on and 95% off). This could be cause by the blower detecting a**

slight fault, but still trying to turn on the heating element. Regardless, the blower motor is detecting a fault with the heating element or circuits and it needs to be repaired. In either case, the most common issue is with the heating element itself and it will need to be replaced.

**Tip-** A new heating element can easily be plugged in, without installing it into the seat, and then be felt to make sure it is heating up. Do this before completely installing the heating element into the seat.

**3 Condition 3: The front heated seats do not heat up like our previous vehicle.**

**3.1** Some owners may comment the heated seats do not get as hot as their previous vehicle or they may claim they are inoperative. If the above testing has been performed and it has been proven the heated seats are operating, please review the following tip:

**3.2** This heated seat system utilizes a self-regulating heating element system, which is different from the non-regulated heating element systems with seat temperature sensors previously used on GM vehicles. In the self-regulating type of system, temperature feedback to a control module (blower) is not required for temperature regulation. The heating element material itself regulates the surface temperature based on the effective voltage/duty cycle applied to the heating element. This new way of regulating the heating elements could be why some owner's notice a difference between their previous vehicle.

Please follow this diagnostic or repair process thoroughly and complete each step. If the condition exhibited is resolved without completing every step, the remaining steps do not need to be performed.

