

2013 PACCAR MX-13

Diagnostic Service Manual EPA2013

(P062A to P1223)



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P062A

P062A	
Code number	P062A
Fault code description	Common rail pump unit control-Too short at a certain rail pressure
	"Pressure below lowest allowable pressure at commanded pressure."
Fault code information	1 trip MIL
	3 drive cycle recovery
	Readiness group – None
	Freeze frame type - Fuel
Description of component(s)	Common rail pump units 1 and 2 supply fuel to the common rail.
	1. Outlet port 2. Solenoid connector 3. Sealing ring fuel supply gallery - outside 4. Sealing ring fuel supply gallery - fuel return gallery 5. Sealing ring fuel return gallery - crankcase 6. Spring 7. Roller lifter 8. Common rail pump unit cam 9. Fuel return port 10. Fuel supply port Operation The internal plunger is actuated via a roller lifter on the camshaft. Each pump has three pump events every two crankshaft revolutions. Fuel from the fuel gallery can enter the pump plunger area via an internal valve.
	Fuel from the fuel gallery can enter the pump plunger area via an internal valve.
	A pump event starts when the plunger travels up, the PCI ECU activates the solenoid
<u> </u>	briefly, and the internal valve closes the opening to the fuel gallery. The internal valve



is kept closed hydraulically, and the fuel is pumped to the rail via a check valve in the outlet bore of the pump unit.

The pump event stops when the roller lifter passes the top of the camshaft lobe, causing the plunger to travel downward again. Due to this, the pressure above the plunger decreases and the internal valve opens the opening to the fuel gallery. The check valve in the outlet bore closes and prevents fuel from flowing back from the rail to the plunger area.

Control

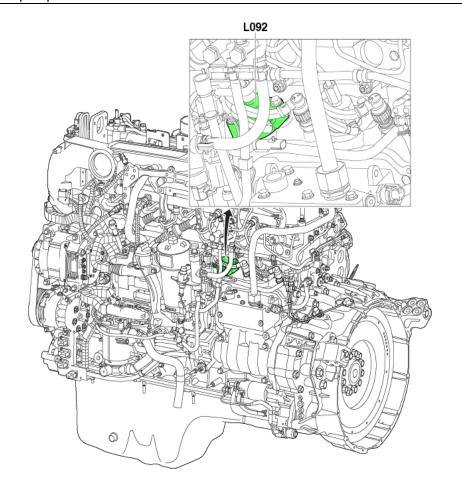
The amount of fuel pumped to the rail depends on the duration of the pump event. The earlier the solenoid is activated by the PCI ECU in the up stroke of the pump plunger, the more (mg/stroke) fuel is pumped to the rail.

Effect on the system:

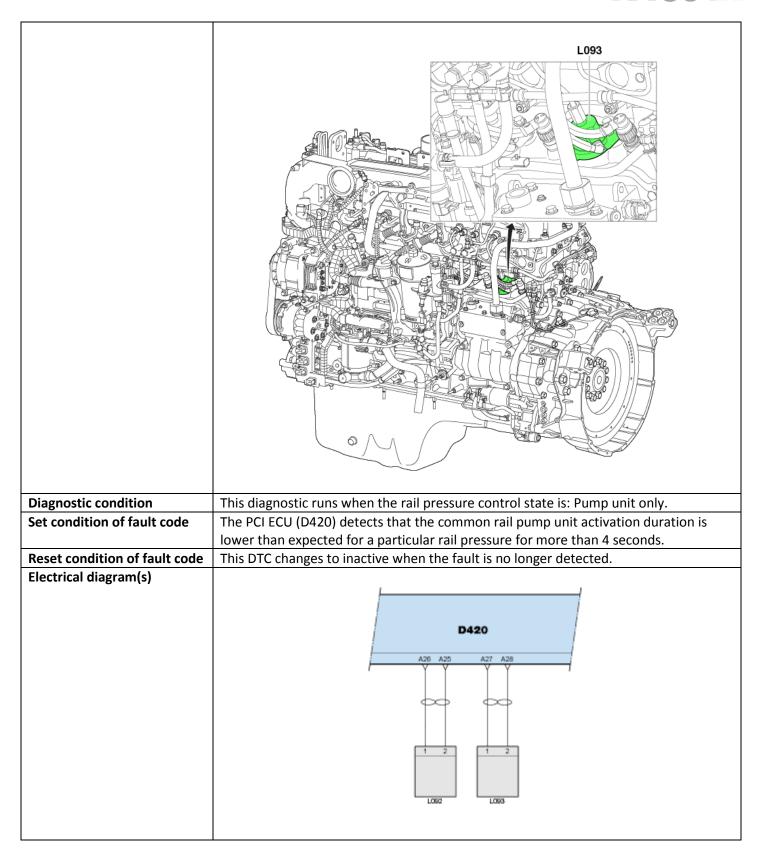
• Rail pressure control.

The rail pressure is closed-loop controlled. A comparison is made between the actual rail pressure and rail pressure demands determined by the ECU. The rail pressure is adjusted by pumping more or less fuel to the rail with the common rail pump

Location of component(s)









Technical data	D420 L092 L093 Function A25 2 Signal low, common rail pump unit 1 A26 1 Signal high, common rail pump unit 1 A27 1 Signal high, common rail pump unit 2 A28 2 Signal low, common rail pump unit 2 Component check, common rail pump unit 1 (L092) Preparation • Key off the ignition • Disconnect connector L092 • Measure on component connector L092 Pin Pin (+ probe) (- probe) Value Condition 1 2 ± 0.67 Ω Resistance value at 20°C [68°F]
Possible causes	maximum 0.94 Ω Resistance value at 120°C [248°F] Component check, common rail pump unit 2 (L093) Preparation • Key off the ignition • Disconnect connector L093 • Measure on component connector L093 Pin Pin (+ probe) (- probe) Value Condition 1 2 ± 0.67 Ω Resistance value at 20°C [68°F] maximum 0.94 Ω Resistance value at 120°C [248°F] • common rail pressure sensor deviation • common rail pump unit failure
Additional information	 The common rail pump units (L092 and L093) supply fuel to the common rail. The amount of fuel pumped to the rail (rail pressure) depends on the activation duration of the pump event. The common rail pump unit control is closed-loop controlled. A comparison is made between the expected and the actual common rail pump unit activation duration. Engine torque is reduced



Diagnostic Step-by-Step



Perform the troubleshooting steps below using the breakout harness, if necessary, to check electrical components, such as sensors, electrical control units, and harnesses. Back probing is not recommended, as it could damage the harness. The ignition should always be in the OFF position when connecting or disconnecting electrical components in order to reduce the likelihood of damage to electrical components.



- Disconnecting the EAS connectors during the troubleshooting process will result in multiple errors.
- For specific electrical component information and pinout locations, always refer to the technical data.
- It is necessary to exit the fault code menu in DAVIE and run the diagnostic test again to identify a change in errors.
- Remember that the truck's operational or mechanical issues may be the root cause of both active and inactive fault codes. Refer to the 'possible causes' section.

Step 1 Step ID 062A-a SRT

Visually inspect the associated component connections and wiring for any of the following:

- Signs of fuel leaks
- Fuel component parts not installed correctly
- Bent or broken fuel lines
- Electrical connections are not secure

Was there evidence of any of the above?

- No: Continue to the next step in the troubleshooting process.
- Yes: Clean, adjust, repair, or replace affected components for any issues identified.

Use DAVIE to re-check for the presence of active faults.

- If this related fault is no longer active, then this issue has been resolved.
- If this related fault is still active, continue to the next step in the troubleshooting process.

Step 2 Step ID 062A-b SRT

DAVIE Direct: Monitor EGR and related temperature sensors

Use DAVIE to monitor the following temperatures:

- EGR Temperature
- Ambient Temperature
- Intercooler Temperature
- Before Turbine Temperature
- Coolant Temperature

Idle the engine for a minimum of 10 minutes to allow temperatures to stabilize. While monitoring, temperature values from sensor to sensor should not vary more than $\pm 30^{\circ}F$.

Do any monitored values vary by more than ±30°F?

- No: Continue to the next step in the troubleshooting process.
- Yes: Clean adjust, repair or replace affected components for any issues identified.

Use DAVIE to re-check for the presence of active faults.

If this related fault is no longer active, then this issue has been resolved.



If this related fault is still active, continue to the next step in the troubleshooting process. Step 3 Step ID 062A-c SRT **DAVIE Direct Test: Pressure Control Valve** Run the prescribed DAVIE Direct test to determine if the high pressure valve is working correctly. Does the test fail to complete or result in a failed state? No: Continue to the next step in the troubleshooting process. Yes: Make the appropriate repairs or component replacements. Use DAVIE to re-check for the presence of active faults. If this related fault is no longer active, then this issue has been resolved. If this related fault is still active, continue to the next step in the troubleshooting process. Step ID 062A-d SRT Step 4 Replace: Electronic Unit pump Replace the faulty Electronic Unit Pump. Use DAVIE to re-check for the presence of active faults. If this related fault is no longer active, then this issue has been resolved. If this related fault is still active, continue to the next step in the troubleshooting process Step 5 Step ID 062A-e SRT For further assistance in diagnosing this issue or for confirmation prior to the replacement of suspect components, contact the Engine Support Call Center at 1-800-477-0251. To validate repair, drive the vehicle until the coolant temperature is at least 70°C **Verification Drive Cycle** [158°F]. Once the minimum target temperature has been reached, proceed at a minimum speed of 80 km/h [50 mph] in the highest gear possible with the engine speed between 1100 and 1500 rpm and set the cruise control. This test is best performed with a loaded vehicle/trailer, but if load is unavailable, turn as many engine power consumers on to produce engine load. Perform this test for roughly 5 to 8 km [3 to 5 miles] or in 3 separate 1.5 km [1 mile] increments if a steady 5 to 8 km [3 to 5 miles] is unachievable. Use a flat road, if possible. Back to Index



P062B

Code number	P062B
Fault code description	Internal ECU injector power generation-Voltage too high
Fault code information	1 trip MIL
	3 drive cycle recovery
	Readiness group – None
	Freeze frame type – Comprehensive
Description of component(s)	Not Applicable
Location of component(s)	Not Applicable
Diagnostic condition	This diagnostic runs Continuously when the ignition is on.
Set condition of fault code	The internal ECU injector power supply voltage is too high.
Reset condition of fault code	This DTC changes to inactive when the fault is no longer detected.
Electrical diagram(s)	Not Applicable
Technical data	Not Applicable
Possible causes	Clear the fault with DAVIE. If the fault reoccurs after ignition on, replace the ECU.
Additional information	Numerous OBD monitors will not run anymore.
	Humidity calculation and correction switched off.
Diagnostic Step-by-Step	Perform the troubleshooting steps below using the breakout harness, if
	necessary, to check electrical components, such as sensors, electrical control
	units, and harnesses. Back probing is not recommended, as it could damage
	the harness. The ignition should always be in the OFF position when
	connecting or disconnecting electrical components in order to reduce the
	likelihood of damage to electrical components.
	Disconnecting the EAS connectors during the troubleshooting Trace and will requisit in resulting agrees.
	process will result in multiple errors.
	 For specific electrical component information and pinout locations, always refer to the technical data.
	It is necessary to exit the fault code menu in DAVIE and run the
	diagnostic test again to identify a change in errors.
	 Remember that the truck's operational or mechanical issues may be
	the root cause of both active and inactive fault codes. Refer to the
	'possible causes' section.
	possible eduses sectioni
	Step 1 Step ID 062B-a SRT
	Visual inspection - Visually inspect all applicable connectors and harnesses for
	corrosion, damage, and rubbing during each step of the diagnostic procedure.
	Proceed to step 2.
	Step 2 Step ID 062B-b SRT
	Verify that there are no other fault codes in DAVIE.
	If no other codes exist, proceed to step 3
	If there are other fault codes, correct them before proceeding.
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	Step 3 Step ID 062B-c SRT
	With key OFF, disconnect the engine harness from the PCI. Verify that there is 12-
	volt battery power and that grounds are good.
	If 12 V is present - Proceed to step 4.
	If there is a problem – Refer to Rapido for repair.
	1 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2



	Step 4	Step ID 062B-d	SRT
	Turn the key ON, and verify	that there is 12-volt ignition	power to the PCI:
	If 12 V is present - I	Proceed to step 5.	
	 If there is a probler 	n – Refer to Rapido for repai	r.
	Step 5	Step ID 062B-e	SRT
	Possible PCI failure – Conta replacement of the PCI.	ct the Engine Support Center	r for further instructions on
Verification Drive Cycle	To validate repair, with DAVI engine and let it idle to verif	•	
			Back to Index



P062D

Code number	P062D
Fault code description	Internal ECU injector power generation – Voltage too low
Fault code information	1 trip MIL
rault code illiorillation	3 drive cycle recovery
	Readiness group – None
	Freeze frame type - Comprehensive
Description of component(s)	This information not required since this is an internal PCI issue
Location of component(s)	This information not required since this is an internal PCI issue
Diagnostic condition	This diagnostic runs continuously when the ignition is on.
Set condition of fault code	The internal ECU injector power supply voltage is too low.
Reset condition of fault code	This DTC changes to inactive when the fault is no longer detected.
Electrical diagram(s)	This information not required since this is an internal PCI issue
Technical data	This information not required since this is an internal PCI issue
Possible causes	Clear the fault with DAVIE. If the fault reoccurs after ignition on, replace the ECU.
Additional information	Numerous OBD monitors will not run anymore.
	Humidity calculation and correction switched off.
Diagnostic Step-by-Step	Perform the troubleshooting steps below using the breakout harness, if
Diagnostic Step 27 Step	necessary, to check electrical components, such as sensors, electrical
	control units, and harnesses. Back probing is not recommended, as it could
	damage the harness. The ignition should always be in the OFF position
	when connecting or disconnecting electrical components in order to reduce
	the likelihood of damage to electrical components.
	Disconnecting the EAS connectors during the troubleshooting
	process will result in multiple errors.
	For specific electrical component information and pinout locations,
	always refer to the technical data.
	It is necessary to exit the fault code menu in DAVIE and run the
	diagnostic test again to identify a change in errors.
	 Remember that the truck's operational or mechanical issues may be
	the root cause of both active and inactive fault codes. Refer to the
	'possible causes' section.
	Step 1 Step ID 062D-a SRT
	Visual Inspection
	Visually inspect the associated component connections and wiring for any of the
	following:
	Loose, bent or broken connector
	Bent, broken, corroded, or pushed back pins
	Moisture or dirt inside the connector
	Damage to the wire harness or insulation
	ECU connections are damaged or disconnected
	Batteries are not okay, contacts are not secure
	- Butteries are not onay, contacts are not secure
	Was there evidence of any of the above?
	No: Continue to step 2 in the troubleshooting process.
	Yes: Clean, adjust, repair, or replace affected components for any issues identified. Present to stop 3.
	identified. Proceed to step 3
	Use DAVIE to re-check for the presence of active faults.



- If this related fault is no longer active, then this issue has been resolved.
- If this related fault is still active, continue to the next step in the troubleshooting process.

Step 2 Step ID 062D-b SRT

Electrical Checks (D420)

For all electrical checks and diagrams, refer to the Engine Service Rapido electrical schematic viewer (ESV) for detailed schematics, connector pin locations, and corresponding signal values.

- Enter the Engine number
- Select the ESV icon
- Click the Search button
- Select the "Component Code" within the Electrical Diagram Search pop-up window
- In the component code box select D420 then Search.

Follow ESV through to find any electrical related problems.

Based on the fault message provided, confirm that the following electrical values are within specified ranges or limits:

Ensure that the ignition key/switch has been set to OFF before disconnecting related cables.

- Supply and signal voltages.
- Cable continuity (no opens or shorts).

Are measured electrical values outside of expected range or limits?

- No: Continue to the next step in the troubleshooting process.
- Yes: Make the appropriate repairs or component replacements. Proceed to Step 3

Use DAVIE to re-check for the presence of active faults.

- If this related fault is no longer active, then this issue has been resolved.
- If this related fault is still active, continue to the next step in the troubleshooting process.

Step 3 Step ID 062D-c SRT

Replace: Engine Controller Unit (ECU)

Replace the identified faulty component.

Contact the PACCAR Engine Support Call Center to confirm replacement of the ECU.

Use DAVIE to re-check for the presence of active faults.

- If this related fault is no longer active, then this issue has been resolved.
- If this related fault is still active, continue to the next step in the troubleshooting process.

Step 4 Step ID 062D-d SRT

Contact the PACCAR Engine Support Call Center

• For further assistance in diagnosing this issue or for confirmation prior to the replacement of suspect components, contact the PACCAR Engine Support Call Center at 1-800-477-0251.

Verification Drive Cycle

To validate repair, with the brakes set, turn the key to the ON position with the engine off, and allow 10 seconds for the system to initialize and run diagnostics.



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Code number	P0640
Fault code description	Grid heater relay - Voltage too high or short circuit to supply
Fault code information	3 drive cycle recovery
	Readiness group – None
	Freeze frame type – Comprehensive
Description of component(s)	For further assistance: Contact the PACCAR Engine Support Call Center 1-800-477-0251 Please contact the Engine Support Center
Location of component(s)	
Diagnostic condition	
Set condition of fault code	
Reset condition of fault code	
Electrical diagram(s)	
Technical data	
Possible causes	
Additional information	
Diagnostic Step-by-Step	Please refer to chassis wiring information.
Verification Drive Cycle	N/A
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Code number	P0650
Fault code description	Malfunction Indicator Lamp (MIL) - Current too low or open circuit on ECU D420 pin
	B23
Fault code information	3 drive cycle recovery
	Readiness group – None
	Freeze frame type – Comprehensive
Description of component(s)	For further assistance: Contact the PACCAR Engine Support Call Center 1-800-477-0251
	Please contact the Engine Support Center
Location of component(s)	
Diagnostic condition	
Set condition of fault code	
Reset condition of fault code	
Electrical diagram(s)	
Technical data	
Possible causes	
Additional information	
Diagnostic Step-by-Step	Please refer to chassis wiring information.
Verification Drive Cycle	N/A
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Code number	P0666
Fault code description	Internal ECU temperature – Data erratic, intermittent, or incorrect at ignition on
Fault code information	1 trip MIL
	3 drive cycle recovery
	Readiness group – None
	Freeze frame type - Comprehensive
Description of component(s)	
	 Temperature sensor ECU atmospheric pressure sensor The PCI ECU has an internal atmospheric pressure sensor in the housing. Air can enter the ECU housing via the air vent (1). Effect on the system: Reduces the maximum engine torque when driving at high altitudes (low air pressure). ECU temperature sensor The PCI ECU has an internal temperature sensor on the printed circuit board. Effect on the system: Monitors the temperature of the electronic control unit. Injector codes Every fuel injector is calibrated during production to compensate for any production tolerances. An injector calibration code is present on the housing and connector of the injector. These injector codes must be (re)programmed with DAVIE if one or more injectors have been replaced or fitted in another position, or if the PCI ECU is replaced. Not programming or incorrectly programmed injector codes can result in reduced



	engine performance or a warning to the driver.
Location of component(s)	D420
	D420
Diagnostic condition	This diagnostic runs:
	 when the ignition has been keyed off continuously for at least 8 hours; difference between the coolant temperature and ambient temperature is less than 15°C [59°F] ambient temperature is more than -20°C [-4°F]
Set condition of fault code	The PCI ECU (D420) detects that the measured internal ECU temperature differs by more than 3°C [37°F] from the average of other temperature sensors on the engine for more than 5 seconds (after the ignition has been keyed off for at least 8 hours).
Reset condition of fault code	 The 8-hour ignition off diagnostics consists of three separate steps: The vehicle ignition may NOT be switched on or engine started for 8-10 consecutive hours (ideal situation would be overnight). Once the 8 to 10 consecutive hours have been reached, key on the ignition (NO engine start) and wait for 10 seconds to allow the system to power up and the diagnostics to run. Start the engine and let it idle for 2 minutes. This DTC changes to inactive when the fault is no longer detected.
Electrical diagram(s)	This information not required since this is an internal PCI issue
Technical data	This information not required since this is an internal PCI issue
Possible causes	Faulty ECU
Additional information	For this diagnostic, the internal PCI ECU temperature sensor reading is compared with an average of other temperature sensors on the engine after the ignition has been switched off for at least 8 hours.



Diagnostic Step-by-Step



Perform the troubleshooting steps below using the breakout harness, if necessary, to check electrical components, such as sensors, electrical control units, and harnesses. Back probing is not recommended, as it could damage the harness. The ignition should always be in the OFF position when connecting or disconnecting electrical components in order to reduce the likelihood of damage to electrical components.



- Disconnecting the EAS connectors during the troubleshooting process will result in multiple errors.
- For specific electrical component information and pinout locations, always refer to the technical data.
- It is necessary to exit the fault code menu in DAVIE and run the diagnostic test again to identify a change in errors.
- Remember that the truck's operational or mechanical issues may be the root cause of both active and inactive fault codes. Refer to the 'possible causes' section.

Step 1	Step ID 0666a	SRT

Visual Inspection

Visually inspect the associated component connections and wiring for any of the following:

- Loose, bent or broken connector
- Bent, broken, corroded, or pushed back pins
- Moisture or dirt inside the connector
- Damage to the wire harness or insulation
- ECU connections are damaged or disconnected
- Batteries are not okay, contacts are not secure

Was there evidence of any of the above?

- No: Continue to the step 2 in the troubleshooting process.
- Yes: Clean, adjust, repair, or replace affected components for any issues identified. Proceed to step 3

Use DAVIE to re-check for the presence of active faults.

- If this related fault is no longer active, then this issue has been resolved.
- If this related fault is still active, continue to the next step in the troubleshooting process.

Step 2 Step ID 0666b

Electrical Checks (D420)

For all electrical checks and diagrams, refer to the Engine Service Rapido electrical schematic viewer (ESV) for detailed schematics, connector pin locations, and corresponding signal values.

- Enter the Engine number
- Select the ESV icon
- Click the Search button
- Select the "Component Code" within the Electrical Diagram Search pop-up window
- In the component code box select D420 then Search.



Follow ESV through to find any electrical related problems. Based on the fault message provided, confirm that the following electrical values are within specified ranges or limits: Ensure that the ignition key/switch has been set to OFF before disconnecting related cables. Supply and signal voltages. Cable continuity (no opens or shorts). Are measured electrical values outside of expected range or limits? No: Continue to the next step in the troubleshooting process. Yes: Make the appropriate repairs or component replacements. Use DAVIE to re-check for the presence of active faults. If this related fault is no longer active, then this issue has been resolved. If this related fault is still active, continue to the next step in the troubleshooting process. Step 3 Step ID 0666c SRT Replace: Engine Controller Unit (ECU) Replace the identified faulty component. Contact the PACCAR Engine Support Call Center to confirm replacement of the ECU. Use DAVIE to re-check for the presence of active faults. If this related fault is no longer active, then this issue has been resolved. If this related fault is still active, continue to the next step in the troubleshooting process. Step ID 0666d SRT Step 4 Contact the PACCAR Engine Support Call Center For further assistance in diagnosing this issue or for confirmation prior to the replacement of suspect components, contact the PACCAR Engine Support Call Center at 1-800-477-0251. **Verification Drive Cycle** To validate repair, with the brakes set, turn the key to the ON position with the engine off, and allow 10 seconds for the system to initialize and run diagnostics. Back to Index



Code number	P0668				
Fault code description	Internal ECU temperature – Internal error				
Fault code information	For further assistance: Contact the PACCAR Engine Support Call Center 1-800-477-0251 Please Contact the Engine Support Center				
Description of component(s)					
Location of component(s)					
Diagnostic condition					
Set condition of fault code					
Reset condition of fault code					
Electrical diagram(s)					
Technical data					
Possible causes					
Additional information					
Diagnostic Step-by-Step					
Verification Drive Cycle					
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Code number	P0669			
Fault code description	Internal ECU temperature – Internal error			
Fault code information	For further assistance: Contact the PACCAR Engine Support Call Center 1-800-477-0251 Please Contact the Engine Support Center			
Description of component(s)				
Location of component(s)				
Diagnostic condition				
Set condition of fault code				
Reset condition of fault code				
Electrical diagram(s)				
Technical data				
Possible causes				
Additional information				
Diagnostic Step-by-Step				
Verification Drive Cycle				
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Code number	P0691			
Fault code description	Electronic controlled fan - Voltage too low or short circuit to ground on ECU D420 pin			
	C74			
Fault code information	3 drive cycle recovery			
	Readiness group – None			
	Freeze frame type – Comprehensive			
Description of component(s)				
	For further assistance: Contact the PACCAR Engine Support Call Center 1-800-477-0251			
	Please contact the Engine Support Center			
Location of component(s)				
Diagnostic condition				
Set condition of fault code				
Reset condition of fault code				
Electrical diagram(s)				
Technical data				
Possible causes				
Additional information				
Diagnostic Step-by-Step	Please refer to chassis wiring information.			
Verification Drive Cycle	N/A			
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Code number	P0692			
Fault code description	Electronic controlled fan - Voltage too high or short circuit to supply on ECU D420 pin			
	C74			
Fault code information	3 drive cycle recovery			
	Readiness group – None			
	Freeze frame type – Comprehensive			
Description of component(s)	For further assistance: Contact the PACCAR Engine Support Call Center 1-800-477-0251 Please contact the Engine Support Center			
Location of component(s)				
Diagnostic condition				
Set condition of fault code				
Reset condition of fault code				
Electrical diagram(s)				
Technical data				
Possible causes				
Additional information				
Diagnostic Step-by-Step	Please refer to chassis wiring information.			
Verification Drive Cycle	N/A			
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Code number	P0698					
Fault code description	ECU PCI 5V sensor supply – Voltage too low or short circuit to ground					
Fault code information	1 trip MIL					
	3 drive cycle recovery					
	Readiness group – None					
	Freeze frame type - Comprehensive					
Description of component(s)	This information not required since this is an internal PCI issue					
Location of component(s)	This information not required since this is an internal PCI issue					
Diagnostic condition	This diagnostic runs continuously when the ignition is on.					
Set condition of fault code	The internal ECU reference sensor power supply voltage is too low.					
Reset condition of fault code	This DTC changes to inactive when the fault is no longer detected.					
Electrical diagram(s)	This information not required since this is an internal PCI issue					
Technical data	This information not required since this is an internal PCI issue					
Possible causes	Broken reference sensor, internally in ECU.					
Additional information	Numerous OBD monitors will not run anymore.					
	Engine torque is reduced.					
Diagnostic Step-by-Step						
Verification Drive Cycle						
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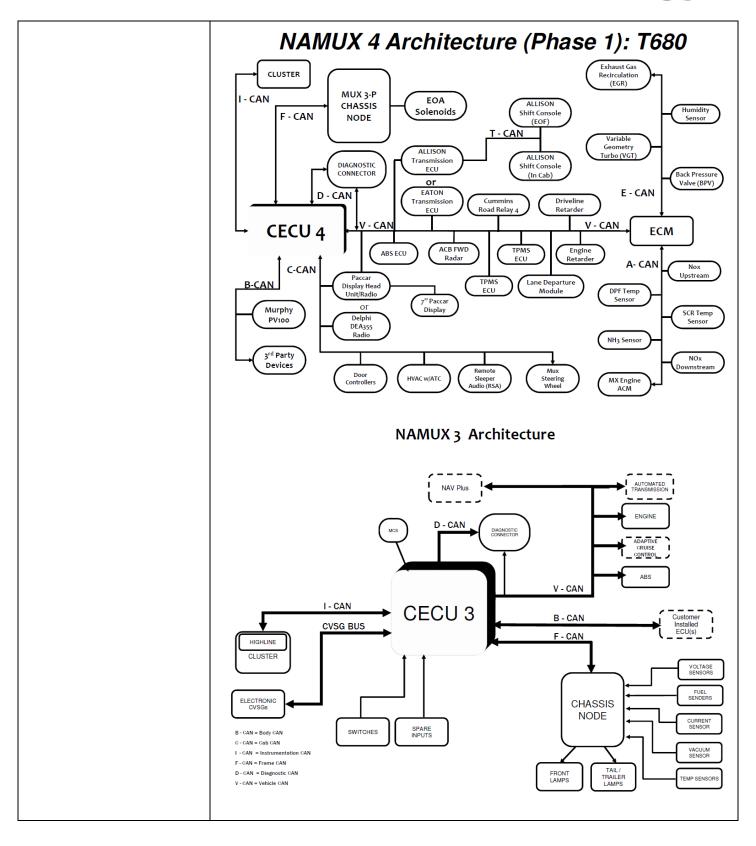


Code number	P0699				
Fault code description	ECU PCI 5V sensor supply – Voltage too high or short circuit to supply				
Fault code information	1 trip MIL				
	3 drive cycle recovery				
	Readiness group – None				
	Freeze frame type - Comprehensive				
Description of component(s)	This information not required since this is an internal PCI issue				
Location of component(s)	This information not required since this is an internal PCI issue				
Diagnostic condition	This diagnostic runs continuously when the ignition is on.				
Set condition of fault code	The internal ECU reference sensor power supply voltage is too high.				
Reset condition of fault code	This DTC changes to inactive when the fault is no longer detected.				
Electrical diagram(s)	This information not required since this is an internal PCI issue				
Technical data	This information not required since this is an internal PCI issue				
Possible causes	Broken reference sensor, internally in ECU.				
Additional information	Numerous OBD monitors will not run anymore.				
	Engine torque is reduced.				
Diagnostic Step-by-Step	This information not required since this is an internal PCI issue				
Verification Drive Cycle					
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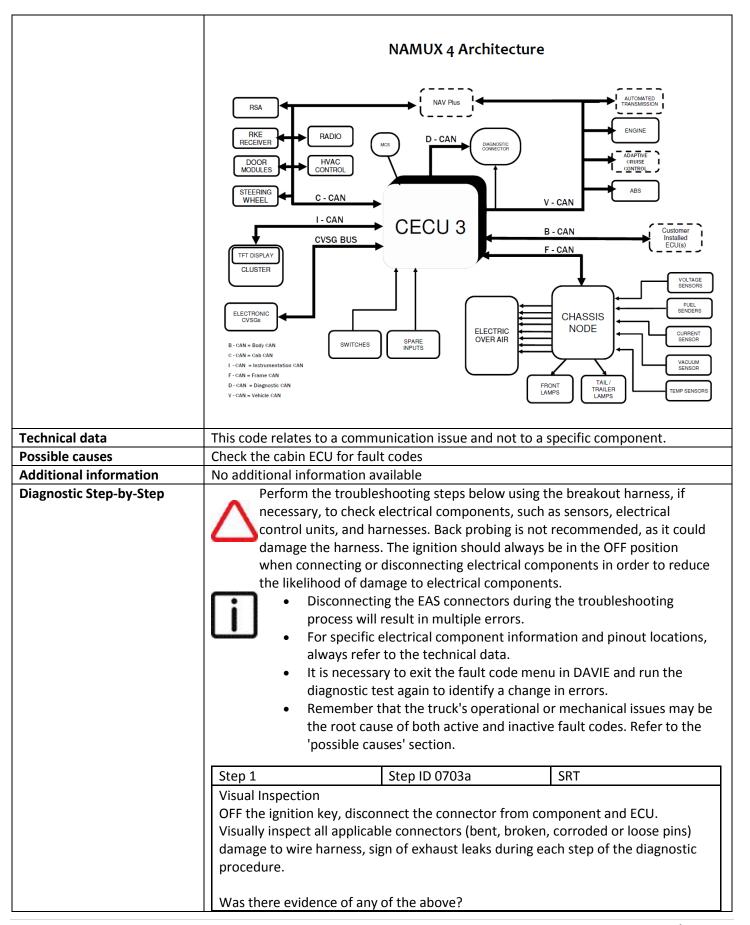


Code number	P0703				
Fault code description	CAN communication - Message (EBC1) out of range - EBS brake switch from brake				
	system				
Fault code information	3 drive cycle recovery				
	Readiness group – None				
	Freeze frame type – Generic				
Description of component(s)	This code relates to a communication issue and not to a specific component.				
Location of component(s)	This code relates to a communication issue and not to a specific component.				
Diagnostic condition	This diagnostic runs continuously when the ignition is on.				
Set condition of fault code					
Reset condition of fault code	This DTC changes to inactive as soon as the error is no longer detected.				
Electrical diagram(s)					
	NAMUX 3 Architecture: 2010 B-Cab FIREWALL Aftertreatment CAN STEERING WHEEL MCS DIAGNOSTIC CONNECTOR PACCAR DISPISY CVSG BUS CVSG BUS Frame CAN Vehicle CAN CHASSIS NODE SPARE INPUTS FRAME INPUTS FRAME INPUTS FRAME INPUTS FRAME INPUTS FRAME INPUTS FRAME INPUTS Aftertreatment CAN LAUTO COMMENT CONNECTOR Vehicle CAN TAIL/ TEMP SENSORS SPARE INPUTS FRAME INPU				











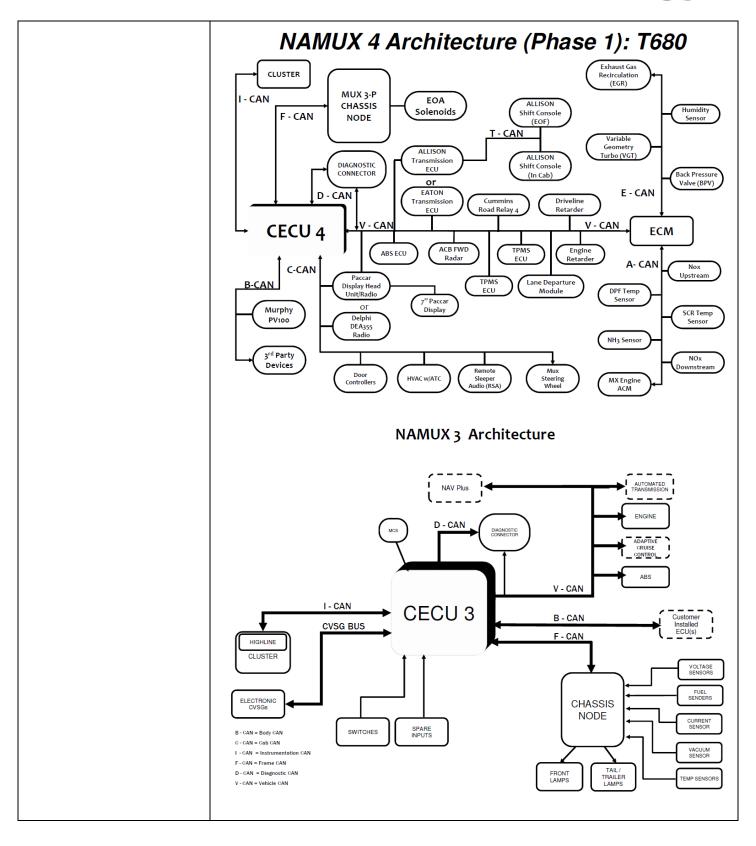
	No: Procee	d to stop 2			
	 No: Proceed to step 2. Yes: Make the appropriate repairs or component replacements. 				
	Use DAVIE to re-check for the presence of active faults. • If this related fault is no longer active, then this issue has been resolved.				
	If this related fault is still active, Proceed to step 2				
	and related radic is still delive, i rocced to step 2				
	Step 2	Step ID 0703b	SRT		
	Data check	•			
	Lookup the				
	Perform th	e checking data test of the spe	ecific component		
	Is test pass?				
	No: Procee	d to step 3			
	Yes : Proce	ed to step4			
	Step 3	Step ID 0703c	SRT		
	Repair or replace c	omponent			
	Repair or re	eplace the component, also ch	eck for electrical connection and		
	wiring harness.				
	Reconnect	the connector			
	ON the ign	ition key			
	Use DAVIE to re-ch	eck for the presence of active	faults:		
	Is DTC fault	active: Proceed to step 4			
	Is DTC fault inactive: Issue resolved. Clear inactive fault.				
	Step 4	Step ID 0703d	SRT		
	For further assistar	nce in diagnosing this issue or f	for confirmation prior to the		
	replacement of sus	pect components, contact the	Engine Support Call Center at		
	1-800-477-0251.				
Verification Drive Cycle	To verify the repair:				
Verification Brive eyele	With the brakes set, turn the key to the ON position with the engine off, and allow 10				
	seconds for the system to initialize and run diagnostics.				
	With the brakes set, start the engine and allow it to run at idle for 2 minutes.				
	Back to Index				
			<u>Buck to muck</u>		



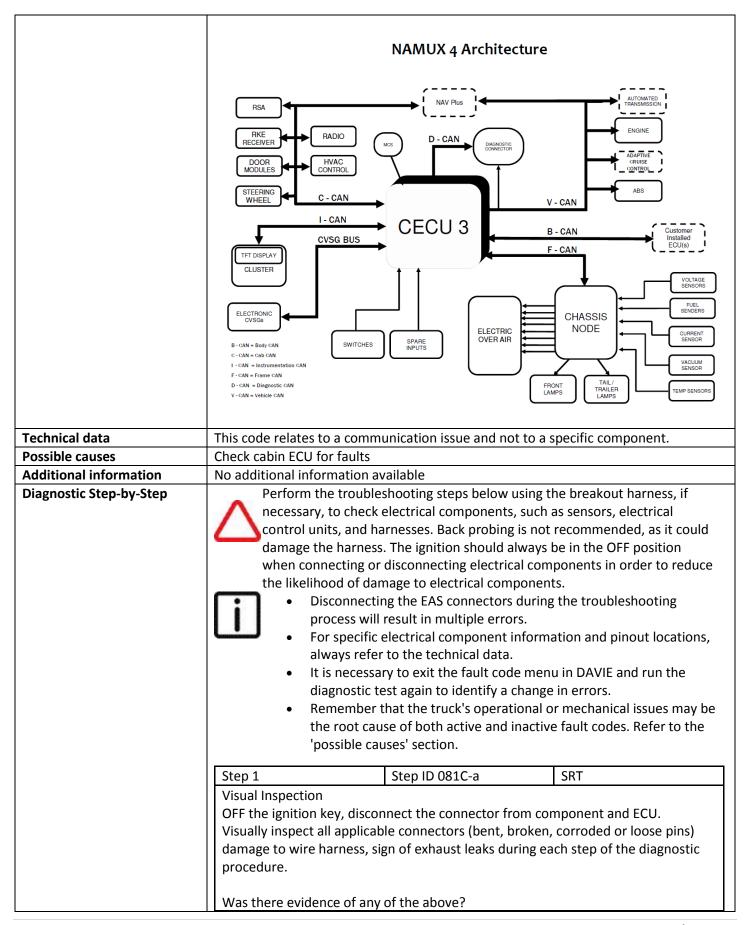
P081C

Code number	P081C				
Fault code description	CAN communication - message (CCVS_VIC) out of range - park brake switch from				
	vehicle controller.				
Fault code information	3 drive cycle recovery				
	Readiness group – None				
	Freeze frame type – Generic				
Description of component(s)	This code relates to a communication issue and not to a specific component.				
Location of component(s)	This code relates to a communication issue and not to a specific component.				
Diagnostic condition	This diagnostic runs continuously when the ignition is on.				
Set condition of fault code					
Reset condition of fault code	This DTC changes to inactive as soon as the error is no longer detected.				
Electrical diagram(s)					
	NAMUX 3 Architecture: 2010 B-Cab FIREWALL Aftertreatment CAN PACCAR DIAGNOSTIC CONNECTOR PACCAR DISPLAY FORM CONTECTOR CONTECTOR FIREWALL AGTO TRANSMISSION FIREWALL AGTO TRANSMISSION FIREWALL AGTO TRANSMISSION FIREWALL AGTO TRANSMISSION FIREWALL FORM FIREWALL AGTO TRANSMISSION FIREWALL FORM FIREWALL FRONT TABLE TA				









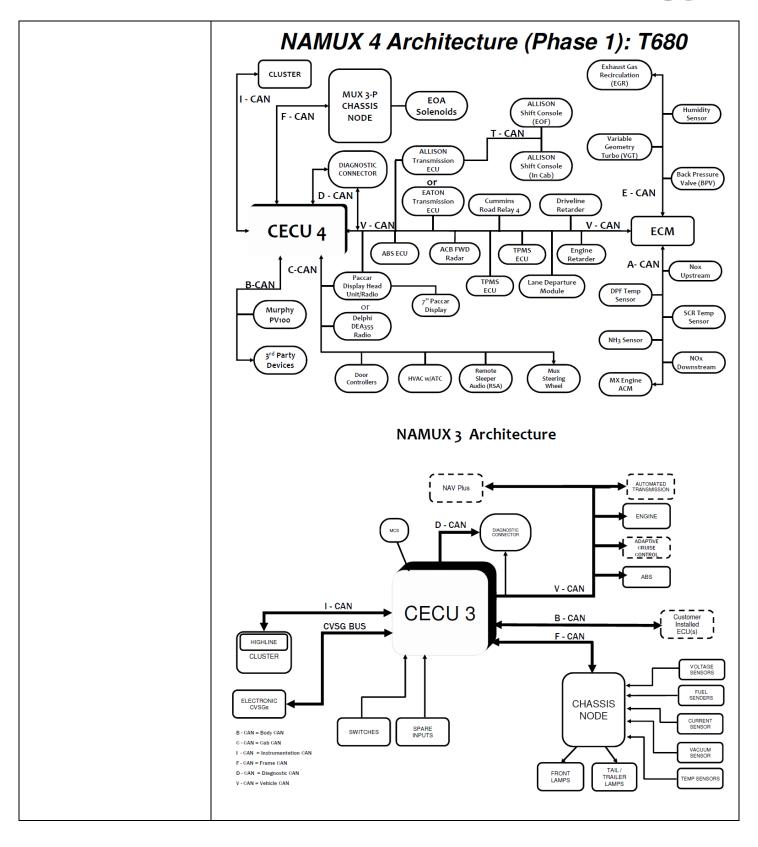


	No: Proceed to step 2.			
	 Yes: Make the appropriate repairs or component replacements. 			
	Tes. Wake	the appropriate repairs or com	ponent replacements.	
	 Use DAVIE to re-check for the presence of active faults. If this related fault is no longer active, then this issue has been resolved. 			
	If this related fault is still active, Proceed to step 2			
		- It this related radic is still delive, i rocced to step 2		
	Step 2	Step ID 081C-b	SRT	
	Data check		1	
	Lookup the technical data of the specific system			
	Perform th	e checking data test of the spec	cific component	
	Is test pass?			
	No: Procee	ed to step 3		
	Yes : Proce	ed to step4		
	Step 3	Step ID 081C-c	SRT	
	Repair or replace of	omponent		
	Repair or r	eplace the component, also che	eck for electrical connection and	
	wiring harness.			
	Reconnect the connector			
	ON the ign			
		eck for the presence of active f	aults:	
		t active: Proceed to step 4		
	Is DTC faul	Is DTC fault inactive: Issue resolved. Clear inactive fault.		
	Step 4	Step ID 081C-d	SRT	
	For further assistance in diagnosing this issue or for confirmation prior to the replacement of suspect components, contact the Engine Support Call Center at			
	1-800-477-0251.			
Verification Drive Cycle	To verify the repair:			
	With the brakes set, turn the key to the ON position with the engine off, and allow 10 seconds for the system to initialize and run diagnostics.			
	With the brakes set, start the engine and allow it to run at idle for 2 minutes.			
	Back to Index			

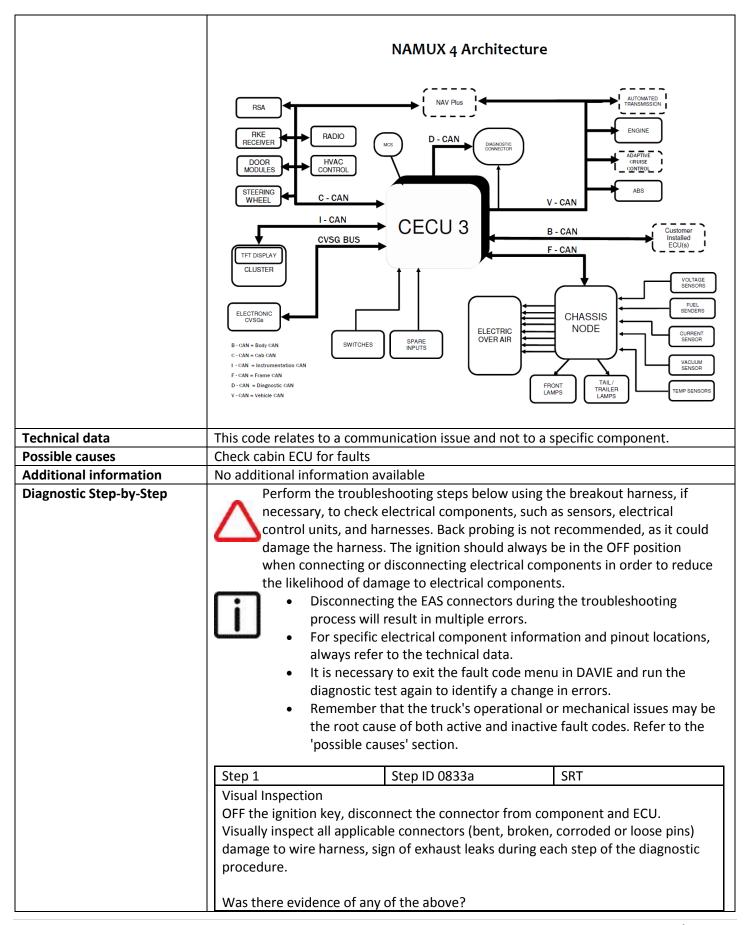


_	T				
Code number	P0833				
Fault code description	CAN communication - Message (CCVS) out of range - Clutch switch from vehicle				
	controller				
Fault code information	3 drive cycle recovery				
	Readiness group – None				
	Freeze frame type – Generic				
Description of component(s)	This code relates to a communication issue and not to a specific component.				
Location of component(s)	This code relates to a communication issue and not to a specific component.				
Diagnostic condition	This diagnostic runs continuously when the ignition is on.				
Set condition of fault code					
Reset condition of fault code	This DTC changes to inactive as soon as the error is no longer detected.				
Electrical diagram(s)					
	NAMUX 3 Architecture: 2010 B-Cab				
	FIREWALL Aftertreatment CAN				
	Diagnostic CAN				
	STEERING WHEEL TRANSMISSION, ENGINE				
	MCS ABS ABS ABS CRUISE CRUISE				
	DIAGNOSTIC CONNECTOR				
	PACCAR LI Engine CAN				
	Display				
	Instrumentation CAN CECU 3				
	CVSG BUS VOLTAGE SENSORS				
	FUEL CLASSES				
	ELECTRONIC SENDERS SENDERS				
	CVSG's CURRENT SENSOR				
	SWITCHES Frame CAN CHASSIS PRESSURE SENSORS				
	SPARE INPUTS VACUUM SENSOR				
	FRONT TAIL TEMP				
	FIREWALL LAMPS TRAILER LAMPS				







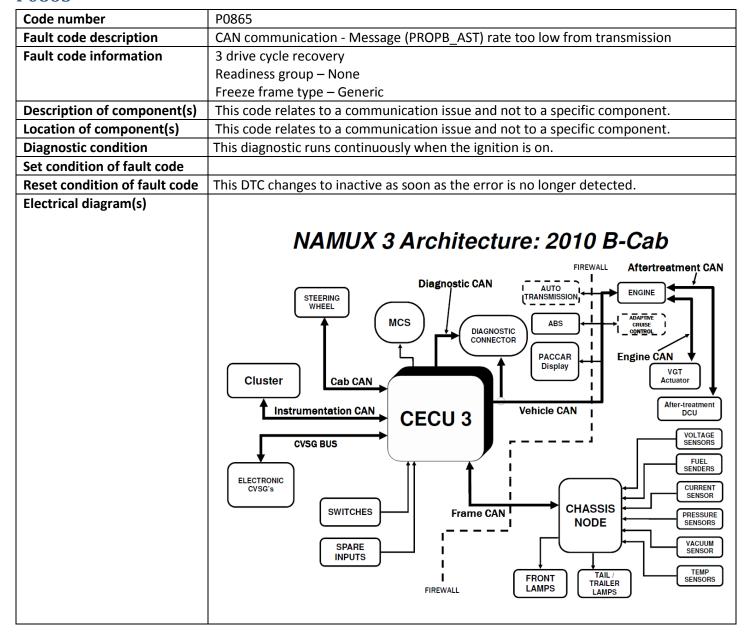




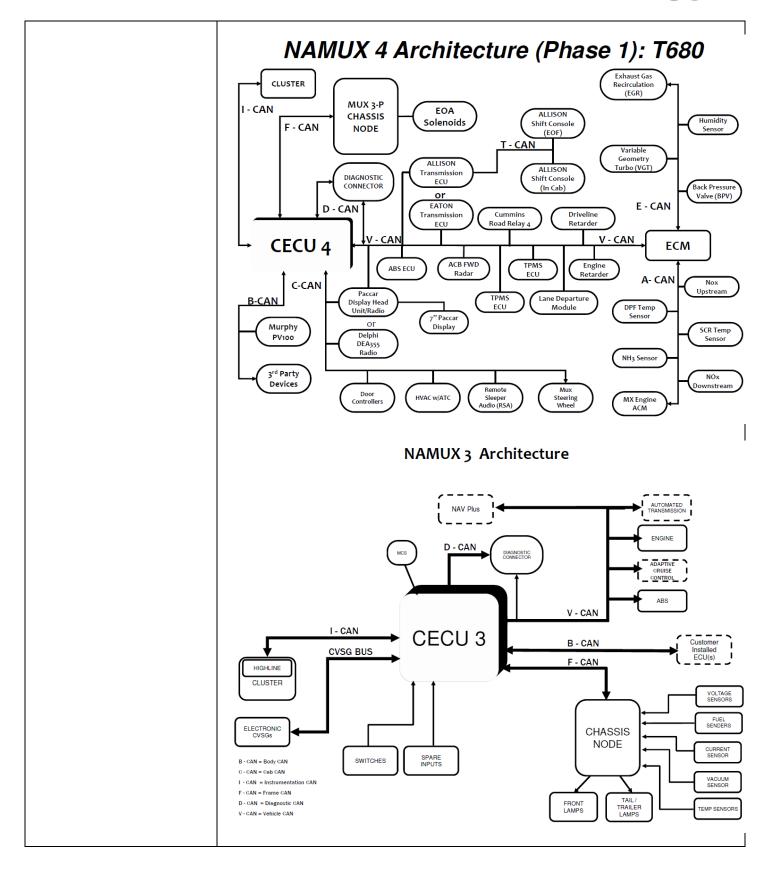
		1	I		
	No: Proceed to step 2.				
	Yes: Make the appropriate repairs or component replacements.				
	 Use DAVIE to re-check for the presence of active faults. If this related fault is no longer active, then this issue has been resolved. 				
	If this related fault is still active, Proceed to step 2				
	- II tilis related radit is still active, Proceed to step 2				
	Step 2	Step ID 0833b	SRT		
	Data check				
	Lookup the	Lookup the technical data of the specific system			
	Perform th	e checking data test of the spe	ecific component		
	Is test pass?				
	No: Procee	ed to step 3			
	Yes : Proce	ed to step4			
	Step 3	Step ID 0833c	SRT		
	Repair or replace of	omponent			
	Repair or r	Repair or replace the component, also check for electrical connection and			
	wiring harness.				
	Reconnect the connector				
	 ON the ign 	ition key			
	Use DAVIE to re-ch	eck for the presence of active	faults:		
	Is DTC faul	t active: Proceed to step 4			
	Is DTC faul	Is DTC fault inactive: Issue resolved. Clear inactive fault.			
	Step 4	Step ID 0833d	SRT		
	For further assistar	nce in diagnosing this issue or f	or confirmation prior to the		
	replacement of sus	spect components, contact the	Engine Support Call Center at		
	1-800-477-0251.				
Verification Drive Cycle	To verify the repair:		<u> </u>		
	With the brakes set, turn the key to the ON position with the engine off, and allow 10				
	seconds for the system to initialize and run diagnostics.				
	With the brakes set, start the engine and allow it to run at idle for 2 minutes.				
	Back to Index				



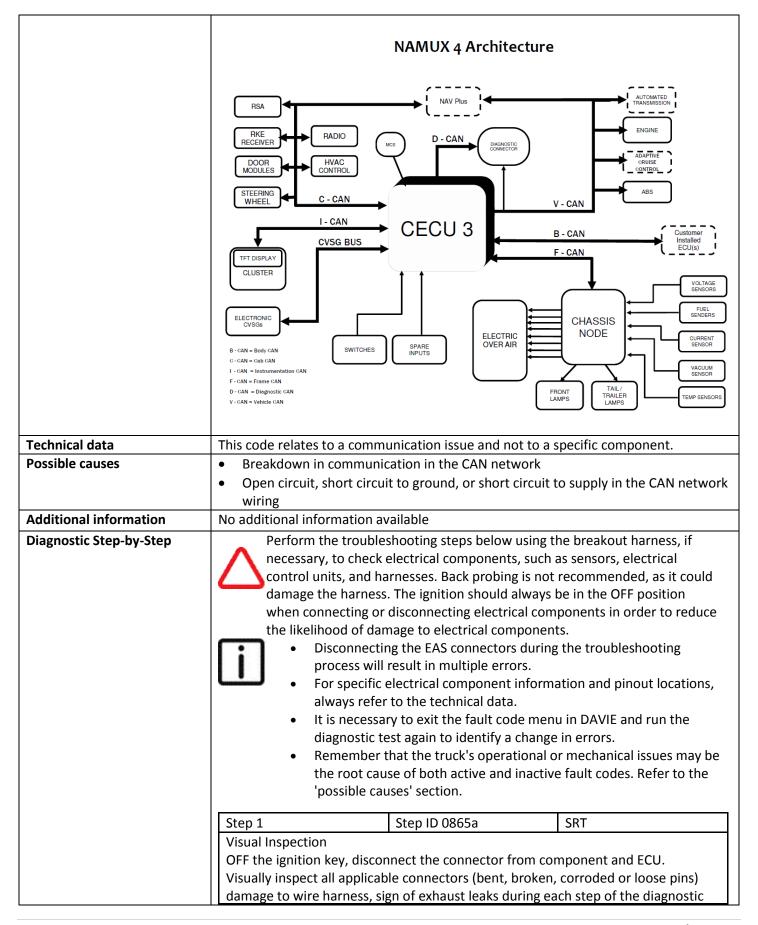
P0865













	procedure.				
	Was there evidence of any of the above?				
	No: Proceed to step 2.				
	Yes: Make the appropriate repairs or component replacements.				
	 Use DAVIE to re-check for the presence of active faults. If this related fault is no longer active, then this issue has been resolved. 				
	If this related fault is still active, Proceed to step 2				
	Step 2 Step ID 0865b SRT				
	Data check				
	 Lookup the technical data of the specific system 				
	 Perform the checking data test of the specific component 				
	Is test pass?				
	No: Proceed to step 3				
	Yes : Proceed to step4				
	Step 3 Step ID 0865c SRT				
	Repair or replace component				
	 Repair or replace the component, also check for electrical connection and wiring harness. Reconnect the connector ON the ignition key Use DAVIE to re-check for the presence of active faults: 				
	Is DTC fault active: Proceed to step 4				
	Is DTC fault inactive: Issue resolved. Clear inactive fault.				
	Step 4 Step ID 0865d SRT For further assistance in diagnosing this issue or for confirmation prior to the replacement of suspect components, contact the Engine Support Call Center at 1-800-477-0251.				
Varification Drive Cycle					
Verification Drive Cycle	 With the brakes set, turn the key to the ON position with the engine off, and allow 10 seconds for the system to initialize and run diagnostics. 				
	With the brakes set, start the engine and allow it to run at idle for 2 minutes.				
	Back to Index				



P101E

Code number	P101E
Fault code description	BPV actuator position - Unable to reach target
Fault code information	1 trip MIL
	3 drive cycle recovery
	Readiness group - None
	Freeze frame type - Exhaust gas
Description of	Back pressure valve (BPV) actuator (L096)
component(s)	The BPV actuator consists of an actuator and a BPV valve.
	The main task of the BPV valve is to create back pressure in the engine exhaust system and control exhaust gas mass flow.
	1 Lever 2 Spring 3 Butterfly valve 4 BPV actuator
	 ECU Electromotor The electromotor rotates the output shaft via internal gears. Output shaft The butterfly valve is moved via a lever by rotating the output shaft. Electromotor position sensor The position of the electromotor is monitored. Output shaft position sensor The position of the output shaft is monitored. Temperature sensor



Control

The BPV actuator is a smart actuator that communicates with the PCI ECU via E-CAN. The actuator ECU is controlled by the PCI ECU but has its own diagnostics on the following actuator inputs and outputs:

- Power supply voltage
- Electromotor position
- Electromotor current
- Output shaft position
- ECU printed circuit board temperature
- ECU hardware and software

After the ignition is keyed on, the valve position is 100% until the actuator is controlled by the PCI ECU.

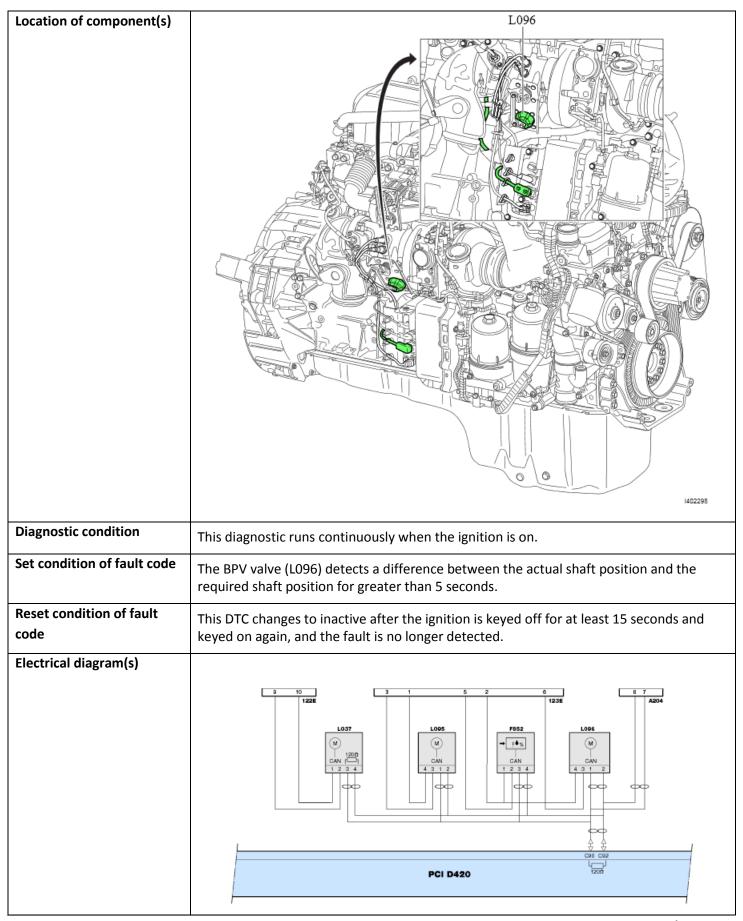
Unpowered and fail-safe position

The unpowered and fail-safe positions of the valve are controlled by a spring and are fully open (100%). If a failure is detected the BPV valve moves to the fail-safe position, if possible.

Effect on the system:

- Creating heat in the exhaust system to heat up the EAS system.
 A lower opening percentage results in a higher back pressure and more heat.
- Decreasing the exhaust gas flow in the exhaust system to heat up the EAS system.
 - A lower opening percentage results in a lower exhaust gas flow in the exhaust system and more heat.
- Altering the pressure drop across the turbine rotor for VTG turbo control.
- Creating back pressure to create EGR gas flow.
- Creating back pressure to create engine braking.







122E 12-pin interface connector

123E 7-pin interface connector

A204 electronic fan interface connector

D420 PCI ECU

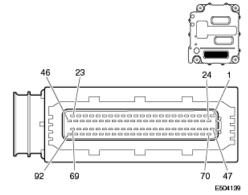
F852 humidity sensor

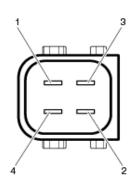
L037 VTG turbocharger actuator

L095 EGR valve module

L096 BPV valve

D420	L096	Function
C90	1	E-CAN high
C92	2	E-CAN low
	3	Ground
	4	Power supply after ignition





E504124

Wiring harness connector D420.C front view

Wiring harness connector L096 front view



Handle connectors and pins with care and use matching measuring probes.

Technical data

Component check, BPV valve (L096)

This type of component cannot be checked with a multimeter or oscilloscope. Perform the following to assess the component:

- Monitor/test the component with DAVIE
- Perform the wiring check

Wiring check, BPV valve (L096)

Preparation

- Key off the ignition
- Disconnect connector L096



	• Mea	sure on the	front side	of wiring	harness connector L096
	Pin (+ probe)	Pin (- probe)	Value	Additio	onal information
	4	3	Ubat	Ignition	n keyed on
	1	2	± 60 Ω	•	Ignition keyed off Ground cable from the battery disconnected DAVIE Vehicle Communication Interface (VCI) disconnected
Possible causes		uator lever a			nism.
Additional information	The posi	tion of the a	ctuator sh	aft, and	therefore the position of the BPV valve, is osed and 100% is fully open.
					the BPV valve is fully open (100% position).
Diagnostic Step-by-Step	i	disconnecting to the comp This trouble and ground in multiple this process Rapido for this necess ECUs, are this DTC	onents. Deleshooting and to the PC et errors. Delectrical coedure as a ror the most essary to use and then run	procedure Cl are fund Cl connect mponent in eference c up-to-date e DAVIE to the Quick as a resul	n the OFF position when connecting or nents to reduce the likelihood of damage is based on the assumption that supply power ctioning properly. tors during the troubleshooting process will result information and pin out locations are provided in only. Always refer to the technical data sections in changes. It clear all current DTCs from the PCI and EAS-3 Check to identify a change in DTC status. It of multiple failure modes. For proper fault mooting steps in the sequence provided.
	Step 1 Conf	irm DTC Sta			
	Action 1. Key	y the ignition	n off for at	least 15	seconds, then key it on again.
	Is P101E active?				
	Yes				No



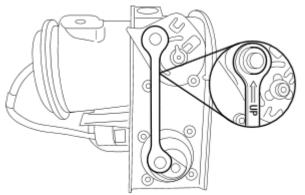
	Refer to step 3A to clear all current codes and run the corresponding repair verification cycles and rechecks, to determine if this DTC was an intermittent or random occurrence.
Go to step 2A	If this DTC is still present, go to step 2A

Step 2 Backpressure Valve (L096) Checks

Step 2A Visual inspection, connection rod installation, BPV valve (L096)

Action

- 1. Key off the ignition
- 2. Visually check that the connection rod of the BPV valve mechanism is installed correctly. The arrow must point upward.



1403009

BPV connection rod installation

3. Visually check that the connection rod of the BPV valve mechanism is not damaged.



140226

Example of a bent lever and connection rod



Is the BPV valve connection rod damaged or installed incorrectly?		
Yes	No	
Correct the installed connection rod or replace if damaged. Refer to step 3A to perform the corresponding repair verification cycles and rechecks.		
If this DTC is still present, go to step 2B	Go to step 2B	

Step 2B Check the free movement of the BPV mechanism



Always set the ignition switch to OFF when working on the BPV mechanism. The valve mechanism can move when the ignition is keyed on, and touching the mechanism can result in physical injury.

Action

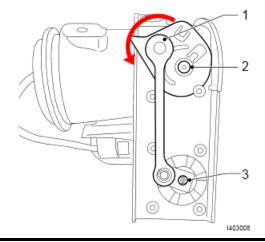
- 1. Set the ignition switch to OFF.
- 2. Check for free movement of the BPV mechanism by moving the connection rod (1) by hand.



Caution: Do not use a tool to move the backpressure valve mechanism.

Movement of the backpressure valve mechanism requires the application of some force because of the presence of a return spring. During the movement, check that:

- The resistance of the mechanism to move is uniform over the full travel path of the connection rod (1), and
- The actuator shaft (3) and valve shaft (2) rotate over the full travel path of the connection rod (1).





Backpressure valve mechanism movement		
Does the BPV mechanism move freely throu	ghout its full range?	
Yes	No	
	Correct any issues found, or replace the BPV (L096) if the valve mechanism does not move freely over the full travel path of the connection rod. Refer to step 3A to perform the corresponding repair verification cycles and rechecks.	
Go to step 2C	If this DTC is still present, go to step 2C	

Step 2C Visual inspection, blockage, BPV valve (L096)



Always set the ignition switch to OFF when working on the BPV valve mechanism. The valve mechanism can move when the ignition is keyed on, and touching the mechanism can result in physical injury.

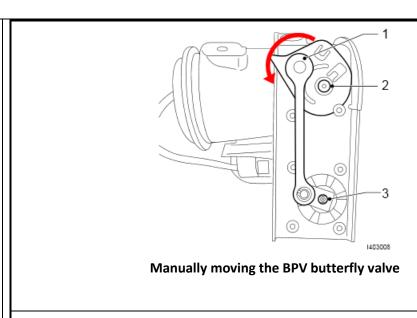
Action

- 1. Set the ignition switch to OFF.
- 2. Loosen the exhaust pipe between the turbocharger and flexible pipe as outlined in the maintenance procedure, "replace back pressure valve assembly" (job ID 66144).
- 3. Check if there is an internal blockage or excessive soot accumulation around the butterfly valve and housing. Open the valve by moving the connection rod (1).



Caution: Do not use a tool to move the backpressure valve mechanism.





Was any internal blockage found within the BPV valve?

Yes	No
Correct any issues found, or replace the BPV if it was found to be damaged. Refer to step 3A to perform the corresponding repair verification cycles and rechecks.	A malfunctioning BPV valve has been detected. Replace the BPV valve. Refer to step 3A to perform the corresponding repair verification cycles and rechecks.
Go to step 2D	If this DTC is still present after performing all steps in the procedure, contact the PACCAR Engine Support Center for further assistance.

Step 2D Exchange BPV valve

Action

- 1. Key off the ignition.
- 2. Disconnect the BPV valve connector from the engine wiring harness connector.
- 3. If available, connect another BPV without installing it.
- 4. Set the ignition switch to ON, and use DAVIE to view any current DTCs.

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Yes	No
	A malfunctioning BPV valve has been
	detected. Replace the BPV valve.



	Refer to step 3A to perform the corresponding repair verification cycles and rechecks.
If all steps have been completed and this DTC is still present, contact the PACCAR Engine Support Center for further assistance.	

Step 3 Repair Verification

Step 3A Repair verification cycles

Perform these repair verification cycles following any corrective actions taken, to enable related OBD monitors to reach a readiness state associated with the DTC or system being investigated.



Before beginning these repair verification cycles, use the DAVIE Diagnostics, Quick Check function to "Clear all" current DTCs from the PCI and EAS-3 ECUs.

Action

1. Start-up

With the brakes set, start the engine and allow it to run at idle for 2 minutes.

Were the identified repair verification cycles able to be completed?

Yes	No
	Investigate and correct any issues preventing these repair verification cycles from being completed, then rerun. For additional assistance, contact the PACCAR Engine Support Center.
Go to step 3B	Go to step 3B

Step 3B DAVIE Diagnostics, Quick Check, OBD Readiness Monitors

Action

Use DAVIE Diagnostics to perform a Quick Check for current DTCs to determine whether the actions taken have cleared this DTC.

- 1. Confirm that the corresponding OBD Monitor Readiness Status value is displayed as "Ready."
 - A status of Ready indicates that the corresponding OBD monitor has run successfully and the problem has been resolved—no further action. If the displayed status is "Not ready," continue to action step 2.
- 2. View the DTC overview display, and confirm that P101E has been cleared.



Is the related OBD Monitor Readiness Status set to "Ready." Or, has P101E been cleared?		
Yes	No	
Problem resolved. No further actions.	Continue with the next step in this troubleshooting procedure. If all steps have been completed and this DTC is still present: • continue to operate the truck to extend the run time, allowing the corresponding OBD monitor sufficient time to complete • or, return to step 3A and perform this repair verification again. If this issue is still present after extending or re-running the repair verification, contact the PACCAR Engine Support Center for further assistance.	
	Support Center ng this issue or for confirmation prior to the nts, contact the PACCAR Engine Support Call	
	Back to Index	



P101F

Code number	P101F		
Fault code description	BPV actuator current – Data valid but too high		
Fault code information	1 trip MIL		
	3 drive cycle recovery		
	Readiness group - None		
	Freeze frame type - Comprehensive		
Description of component(s)	The BPV actuator consists of an actuator and a BPV valve.		
	The main task of the BPV valve is to create back pressure in the engine exhaust		
	system and control exhaust gas mass flow.		
	• Lever		
	Spring		
	Butterfly valve		
	BPV actuator		
	br v actuator		
	The main components of the BPV actuator are:		
	• ECU		
	Electromotor		
	The electromotor rotates the output shaft via internal gears. The electromotor rotates the output shaft via internal gears.		
	• output shaft		
	The butterfly is moved via a lever by rotating the output shaft		
	electromotor position sensor		
	The position of the electromotor is monitored.		
	 output shaft position sensor 		
	The position of the output shaft is monitored.		
	temperature sensor		
	The temperature of the printed circuit board of the ECU is monitored.		
	Control		
	The BPV actuator is a smart actuator that communicates with the PCI ECU via E-CAN. The actuator ECU is controlled by the PCI ECU but has its own diagnostics on the following actuator inputs and outputs:		
	power supply voltage		
	electromotor position		
	electromotor current		
	output shaft position		
	ECU printed circuit board temperature		
	ECU hardware and software		
	LCO flatuwate and software		
	After the ignition is keyed on, the valve position is 100% until the actuator is		
	controlled by the PCI ECU.		
	Unpowered and fail-safe position		
	The unpowered and fail-safe positions of the valve are controlled by a spring and are		
	fully open (100%). If a failure is detected the BPV valve moves to the fail-safe position,		
	if possible.		
	Effect on the system:		
	 Creating heat in the exhaust system to heat up the EAS system. 		



	 A lower opening percentage results in a higher back pressure and more heat. Decreasing the exhaust gas flow in the exhaust system to heat up the EAS system. A lower opening percentage results in a lower exhaust gas flow in the exhaust system and more heat. Altering the pressure drop across the turbine rotor for VTG turbo control. Creating back pressure to create EGR gas flow. Creating back pressure to create engine braking. 	
Location of component(s)	L096	
Diagnostic condition	This diagnostic tune continuously when the ignition is on	
Diagnostic condition	This diagnostic runs continuously when the ignition is on.	
Set condition of fault code	The BPV actuator (L020) detects that the measured actuator current is greater than a	
	temperature-dependent value for more than 6 seconds.	
Reset condition of fault code	This DTC changes to inactive as soon as the error is no longer detected.	



Electrical diagram(s) PCI D420 23 Wiring harness connector D420.C front view Wiring harness connector L096 front view 12-pin interface connector 122E 7-pin interface connector 123E A204 electronic fan interface connector D420 **PCI ECU** F852 humidity sensor L037 VTG turbocharger actuator L095 EGR valve module



	L096 BPV valve		
	LO96 BPV Valve		
	D420 L096 Function		
	C90 1 E-CAN high		
	C92 2 E-CAN low		
	3 Ground		
	4 Power supply after ignition		
Technical data	Component & wiring check, BPV valve (L096)		
	Preparation		
	Key off the ignition.		
	Disconnect connector L096		
	 Measure on the front side of wiring harness connector L096 		
	Pin Pin		
	(+ probe) (- probe)		
	Value Additional information		
	4 3 Ubat ignition keyed on		
	1 2 $\pm 60 \Omega$ • Ignition keyed off		
	Ground cable from the battery		
	disconnected		
	Vehicle Communication Interface (VCI)		
	of DAVIE disconnected		
Possible causes	Sticking or blocked BPV valve or mechanism.		
	High friction of the BPV valve bearings or mechanism in combination with a high		
Additional information	actuator temperature.		
Additional information	The actuator motor torque is reduced with this fault active. Under certain		
	circumstances this can result in the actuator not being able to reach the target		
	position and P101E becoming active also.		
Diagnostic Stop by Stop	 Engine torque is reduced with this fault active. Perform the troubleshooting steps below using the breakout harness, if 		
Diagnostic Step-by-Step	necessary, to check electrical components, such as sensors, electrical control		
	units, and harnesses. Back probing is not recommended, as it could damage		
	the harness. The ignition should always be in the OFF position when		
	connecting or disconnecting electrical components to reduce the likelihood		
	of damage to electrical components		
	This troubleshooting tree is based on the assumption that supply		
	power and ground to the PCI are functioning properly.		
	Disconnecting the PCI connectors during the troubleshooting process		
	will result in multiple errors. • For specific electrical component information and pinout locations,		
	always refer to the technical data in Rapido.		
	 It is necessary to exit the 'active errors' screen in DAVIE and run the diagnostic test again to identify changes in errors. 		
	Remember that the truck's operational or mechanical issues may be		
	the root cause of both active and inactive codes. Refer to the 'possible		
	causes' section in Rapido.		
	Step 1 Step ID 101Fa SRT		
	Visually inspect all applicable connectors (bent, broken, corroded or loose pins)		
	and harnesses for corrosion, damage, and rubbing during each step of the		



	diagnostic procedure. Pr	diagnostic procedure. Proceed to step 2.			
	Step 2	Step ID 101Fb	SRT		
	Electrical Checks (L020)	•			
	Ensure that the ignition	Ensure that the ignition key/switch has been set to OFF before disconnecting			
	related cables.				
	 Supply and sign 	Supply and signal voltages.			
	Cable continuit	cy (no opens or shorts).			
	Are measured electrica	I values outside of expecte	ed range or limits?		
	No: Continue t	o the next step 3 in the tro	ubleshooting process.		
	Yes: Make the	Yes: Make the appropriate repairs or component replacements.			
		Use DAVIE to re-check for the presence of active faults.			
			en this issue has been resolved.		
		ault is still active, continue	to the next step 3 in the		
	troubleshootin	troubleshooting process.			
	GLAND ADALE				
	Step 3	Step ID 101Fc	SRT		
	Replace: BPV Actuator	acted in the proceeding stor	ns an internal problem has most		
	1 1 · · · · · · · · · · · · · · · · · ·	If no problems were detected in the preceding steps, an internal problem has most			
		likely occurred with the BPV Actuator.			
	1 1 -	Replace the identified faulty component. Use DAVIE to re-check for the presence of active faults.			
		 If this related fault is no longer active, then this issue has been resolved. If this related fault is still active, continue to the next step 4 in the 			
	troubleshooting process.				
	Step 4 Step ID 101Fd SRT				
	Contact the PACCAR Engine Support Call Center				
	1 1	For further assistance in diagnosing this issue or for confirmation prior to the			
		replacement of suspect components, contact the PACCAR Engine Support Call			
	Center at 1-800-477-0251.				
Verification Drive Cycle	To validate repair, with th	ne brakes set, turn the key	to the ON position with the		
			nitialize and run diagnostics.		
	Back to Index				



P1020

Code number	P1020		
Fault code description	BPV actuator – Internal error		
Fault code information	1 trip MIL 3 drive cycle recovery Readiness group – None Freeze frame type - Comprehensive		
Description of component(s)	Back pressure valve (BPV) actuator (L096)		
	The BPV actuator consists of an actuator and a BPV valve. The main task of the BPV valve is to create back pressure in the engine exhaust system and control exhaust gas mass flow. 5 Lever 6 Spring 7 Butterfly valve 8 BPV actuator		
	 ECU Electromotor The electromotor rotates the output shaft via internal gears. Output shaft The butterfly is moved via a lever by rotating the output shaft. Electromotor position sensor The position of the electromotor is monitored. Output shaft position sensor The position of the output shaft is monitored. Temperature sensor The temperature of the ECU printed circuit board is monitored. 		



Control

The BPV actuator is a smart actuator that communicates with the PCI ECU via E-CAN. The actuator ECU is controlled by the PCI ECU but has its own diagnostics on the following actuator inputs and outputs:

- Power supply voltage
- Electromotor position
- Electromotor current
- Output shaft position
- ECU printed circuit board temperature
- ECU hardware and software

After the ignition is switched on, the valve position is 100% until the actuator is controlled by the PCI ECU.

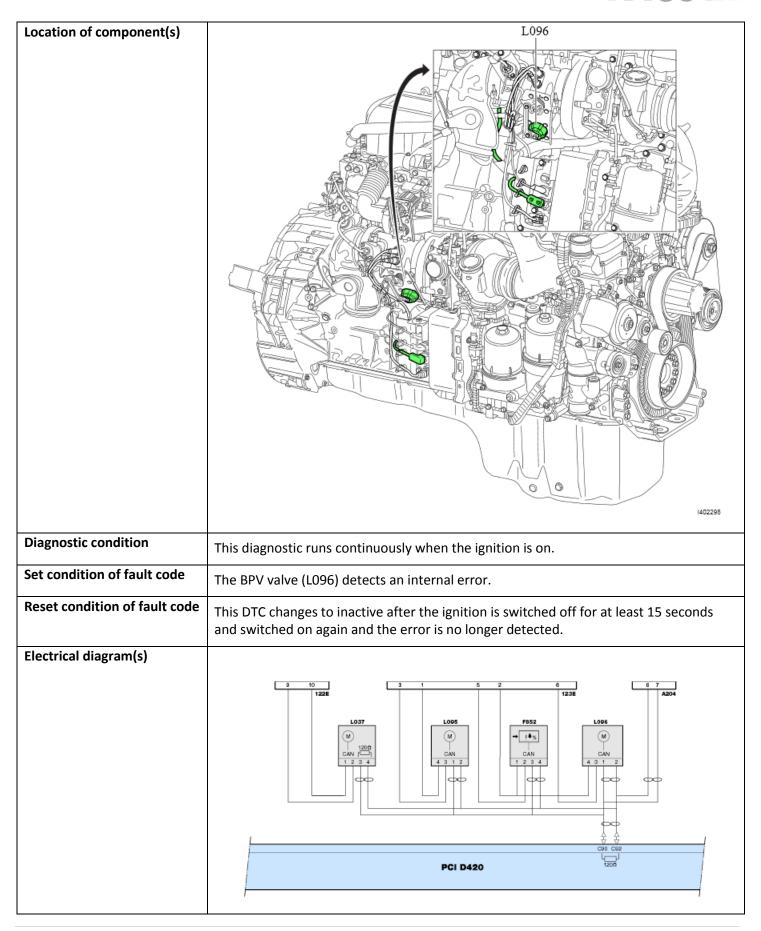
Unpowered and fail-safe position

The unpowered and fail-safe positions of the valve are controlled by a spring and are fully open (100%). If a failure is detected the BPV valve moves to the fail-safe position, if possible.

Effect on the system:

- Creating heat in the exhaust system to heat up the EAS system.
 A lower opening percentage results in a higher back pressure and more heat.
- Decreasing the exhaust gas flow in the exhaust system to heat up the EAS system.
 - A lower opening percentage results in a lower exhaust gas flow in the exhaust system and more heat.
- Altering the pressure drop across the turbine rotor for VTG turbo control.
- Creating back pressure to create EGR gas flow.







122E 12-pin interface connector

123E 7-pin interface connector

A204 electronic fan interface connector

D420 PCI ECU

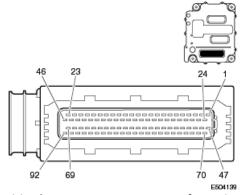
F852 humidity sensor

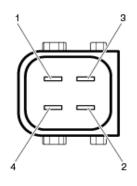
L037 VTG turbocharger actuator

L095 EGR valve module

L096 BPV valve

D420	L096	Function	
C90	1	E-CAN high	
C92	2	E-CAN low	
	3	Ground	
	4	Power supply after ignition	





E504124

Wiring harness connector D420.C front view

Wiring harness connector L096 front view



Handle connectors and pins with care and use matching measuring probes.

Technical data

Component check, BPV valve (L096)

This type of component cannot be checked with a multimeter or oscilloscope. Perform the following to assess the component:

- Monitor/test the component with DAVIE
- Perform the wiring check

Wiring check, BPV valve (L096)

Preparation

- Switch off the ignition
- Disconnect connector L096
- Measure on the front side of wiring harness connector L096



	Pin	Pin	Value	Additional information
	(+ probe)	(- probe)		
	4	3	Ubat	Ignition switched on
	1	2	± 60 Ω	 Ignition switched off Ground cable from the battery disconnected DAVIE Vehicle Communication Interface (VCI) disconnected
Possible causes	Faulty BPV va	alve actuato	r.	
Additional information			s switched off	with this fault active. fault active.
Diagnostic Step-by-Step	·	lisconnectin o the compo	g electrical co onents.	be in the OFF position when connecting or mponents to reduce the likelihood of damage
				rocedure is based on the assumption that nd to the PCI are functioning properly.
	•		ecting the PCI o t in multiple e	connectors during the troubleshooting process rrors.
	•	provided	in this proced	oonent information and pin out locations are lure as a reference only. Always refer to the in Rapido for the most up-to-date changes.
	•		•	AVIE to clear all current DTCs from the PCI and un the Quick Check to identify a change in DTC
	•		ation, complet	a result of multiple failure modes. For proper te all troubleshooting steps in the sequence
	Step 1 Inves	tigate Relat	ed DTCs	
		_		notice of any other active or inactive DTCs. One n the cause of this DTC.
	Step 1A Inv	vestigate rel	ated DTCs	
	Action			
	Use DAVIE Diagnostics to perform a Quick Check for current DTCs.			
	Are these or other related DTCs active? P101E; P1022; P1024; P1025; P1026			
	PIC)1E; P1UZZ; I	1024; P1025;	F1020



Yes	No
Go to the troubleshooting information for these DTCs before continuing with this procedure.	
	Go to step 1B

Step 1B Confirm DTC active state

Action

1. Power-up/Electrical

With the brakes set, switch on the ignition with the engine off, and allow 10 seconds for the system to initialize and run diagnostics.

Is P1020 active?

Yes	No
	Refer to step 3A to clear all current DTCs and run the corresponding repair verification cycles and rechecks to determine if this DTC was an intermittent or random occurrence.
Go to step 2A	If this DTC is still present, go to step 2A

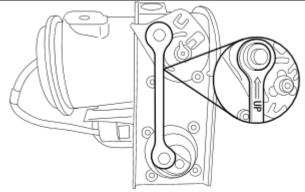
Step 2 Back Pressure Valve (L096) Checks

Step 2A Visual inspection, connection rod installation, BPV valve (L096)

Action

- 1. Switch off the ignition.
- 2. Visually check that the connection rod of the BPV valve mechanism is installed correctly. The arrow must point upward.





1403009

BPV connection rod installation

3. Visually check that the connection rod of the BPV valve mechanism is not damaged.



1402265

Example of a bent lever and connection rod

Is the BPV valve connection rod damaged or installed incorrectly?

Yes	No
Correct the installed connection rod or replace if damaged. Refer to step 3A to perform the corresponding repair verification cycles and rechecks.	
If this DTC is still present, go to step 2B	Go to step 2B

Step 2B Check the free movement of the BPV mechanism



Always switch off the ignition when working on the BPV mechanism. The valve mechanism can move when the ignition is switched on and touching the mechanism can result in physical injury.



Action

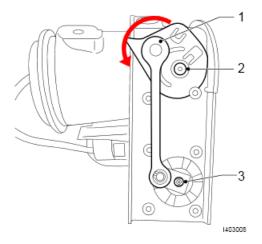
- 1. Switch off the ignition.
- 2. Check for free movement of the BPV mechanism by moving the connection rod (1) by hand.



Caution: Do not use a tool to move the back pressure valve mechanism.

Movement of the back pressure valve mechanism requires the application of some force because of the presence of a return spring. During the movement, check that:

- The resistance of the mechanism to move is uniform over the full travel path of the connection rod (1), and
- The actuator shaft (3) and valve shaft (2) rotate over the full travel path of the connection rod (1).



Back pressure valve mechanism movement

Does the BPV mechanism move freely throughout its full range?

Yes	No
	Correct any issues found if the valve mechanism does not move freely over the full travel path of the connection rod. Refer to step 3A to perform the corresponding repair verification cycles and rechecks.
Go to step 2C	If this DTC is still present, go to step 2C



Step 2C Visual inspection, blockage, BPV valve (L096)



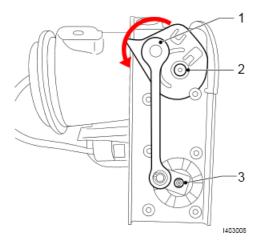
Always switch off the ignition when working on the BPV valve mechanism. The valve mechanism can move when the ignition is switched on and touching the mechanism can result in physical injury.

Action

- 1. Switch off the ignition.
- 2. Loosen the exhaust pipe between the BPV valve and flexible pipe as outlined in the maintenance procedure, "replace assembly back pressure valve (aftertreatment, eng.)", job code J 1435 264406 001 033.
- 3. Check if there is an internal blockage or excessive soot accumulation around the butterfly valve and housing. Open the valve by moving the connection rod (1).



Caution: Do not use a tool to move the back pressure valve mechanism.



Manually moving the BPV butterfly valve

Was any internal blockage found within the BPV valve?

Yes

No

Correct any issues found or replace the BPV if it was found to be damaged.
Refer to step 3A to perform the corresponding repair verification cycles and rechecks.

If this DTC is still present, go to step 2D

Go to step 2D



Step 2D Replace BPV valve (L096)

Action

- 1. Switch off the ignition.
- 2. Disconnect the BPV valve connector from the engine wiring harness connector.
- 3. If available, connect another BPV without installing it.
- 4. Switch on the ignition, and use DAVIE to view any current DTCs.

Is P1020 active?

Yes	No
	A malfunctioning BPV valve has been detected. Contact the PACCAR Engine Support Center for further assistance in diagnosing this issue and replacement of the BPV valve. Refer to step 3A to perform the corresponding repair verification cycles and rechecks.
If all steps have been completed and this DTC is still present, contact the PACCAR Engine Support Center for further assistance.	

Step 3 Repair Verification

Step 3A Repair verification cycles

Perform these repair verification cycles following any corrective actions taken to enable related OBD monitors to reach a readiness state associated with the DTC or system being investigated.



Before beginning these repair verification cycles, use the DAVIE Diagnostics, Quick Check function to "Clear all" current DTCs from the PCI and EAS-3 ECUs.

Action

1. Power-up/Electrical

With the brakes set, switch on the ignition with the engine off, and allow 10 seconds for the system to initialize and run diagnostics.

Were the identified repair verification cycles able to be completed?



Yes	No
	Investigate and correct any issues preventing these repair verification cycles from being completed, then rerun. For additional assistance, contact the PACCAR Engine Support Center.
Go to step 3B	

Step 3B DAVIE Diagnostics, Quick Check, OBD Readiness Monitors

Action

Use DAVIE Diagnostics to perform a Quick Check for current DTCs to determine whether the actions taken have cleared this DTC.

1. Confirm that the corresponding OBD Monitor Readiness Status value is displayed as "Ready."

A status of Ready indicates that the corresponding OBD monitor has run successfully and the problem has been resolved—no further action.

If the displayed status is "Not ready," continue to action step 2.

2. View the DTC overview display and confirm that P1020 has been cleared.

Is the related OBD Monitor Readiness Status set to "Ready." Or, has P1020 been cleared?

Yes	No
Problem resolved. No further actions.	Continue with the next step in this troubleshooting procedure.
	If all steps have been completed and this DTC is still present:
	 continue to operate the truck to extend the run time, allowing the corresponding OBD monitor sufficient time to complete
	 or, return to step 3A and perform this repair verification again.
	If this issue is still present after extending or re-running the repair verification, contact the PACCAR Engine Support Center for further assistance.



İ	Contacting the PACCAR Engine Support Call Center For further assistance in diagnosing this issue or for confirmation prior to the replacement of suspect components, contact the PACCAR Engine Support Call Center.
	Back to Index



P1021

Code number	P1021	
Fault code description	BPV actuator – CAN communication error	
Fault code information	1 trip MIL	
	3 drive cycle recovery	
	Readiness group – None	
	Freeze frame type – Comprehensive	
Description of component(s)	Back pressure valve (BPV) actuator (L096)	
	The BPV actuator consists of an actuator and a BPV valve.	
	The main task of the BPV valve is to create back pressure in the engine exhaust system	
	and control exhaust gas mass flow.	
	9 Lever 10 Spring 11 Butterfly valve 12 BPV actuator	
	 ECU Electromotor The electromotor rotates the output shaft via internal gears. Output shaft The butterfly valve is moved via a lever by rotating the output shaft. Electromotor position sensor The position of the electromotor is monitored. 	
	 Output shaft position sensor The position of the output shaft is monitored. Temperature sensor The temperature of the ECU printed circuit board is monitored 	



Control

The BPV actuator is a smart actuator that communicates with the PCI ECU via E-CAN. The actuator ECU is controlled by the PCI ECU but has its own diagnostics on the following actuator inputs and outputs:

- Power supply voltage
- Electromotor position
- Electromotor current
- Output shaft position
- ECU printed circuit board temperature
- ECU hardware and software

After the ignition is keyed on, the valve position is 100% until the actuator is controlled by the PCI ECU.

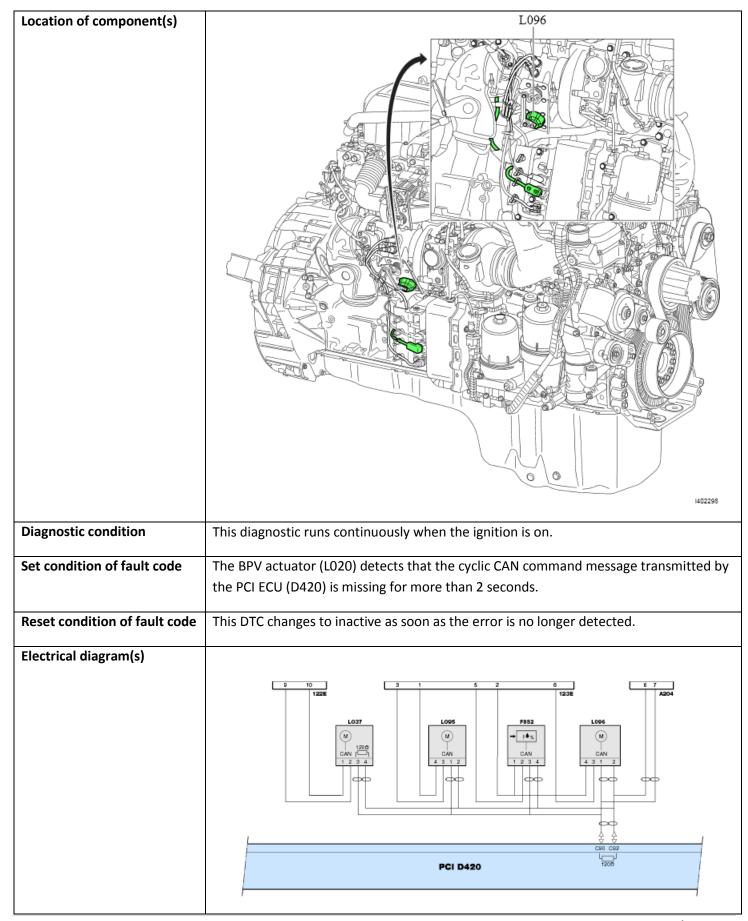
Unpowered and fail-safe position

The unpowered and fail-safe positions of the valve are controlled by a spring and are fully open (100%). If a failure is detected the BPV valve moves to the fail-safe position, if possible.

Effect on the system:

- Creating heat in the exhaust system to heat up the EAS system.
 A lower opening percentage results in a higher back pressure and more heat.
- Decreasing the exhaust gas flow in the exhaust system to heat up the EAS system.
 - A lower opening percentage results in a lower exhaust gas flow in the exhaust system and more heat.
- Altering the pressure drop across the turbine rotor for VTG turbo control.
- Creating back pressure to create EGR gas flow.
- Creating back pressure to create engine braking.







122E 12-pin interface connector

123E 7-pin interface connector

A204 electronic fan interface connector

D420 PCI ECU

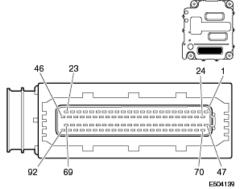
F852 humidity sensor

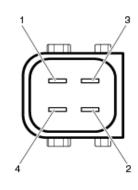
L037 VTG turbocharger actuator

L095 EGR valve module

L096 BPV valve

D420	L096	Function
C90	1	E-CAN high
C92	2	E-CAN low
	3	Ground
	4	Power supply after ignition





iew \

Wiring harness connector D420.C front view

Wiring harness connector L096 front view



Handle connectors and pins with care and use matching measuring probes.

Technical data

Component check, BPV valve (L096)

This type of component cannot be checked with a multimeter or oscilloscope. Perform the following to assess the component:

- Monitor/test the component with DAVIE
- Perform the wiring check

E504124



Wiring check, BPV valve (L096) **Preparation** Key off the ignition Disconnect connector L096 Measure on the front side of wiring harness connector L096 Pin Pin Value **Additional information** (+ probe) (- probe) 3 Ubat Ignition keyed on 1 2 ~ 60 Ω Ignition keyed off Ground cable from the battery disconnected **DAVIE Vehicle Communication** Interface (VCI) disconnected **Possible causes** CAN wiring, see "General troubleshooting - CAN" Additional information The BPV actuator (L020) is controlled by a cyclic CAN command message transmitted by the PCI ECU (D420) in which the operating mode and the target position are demanded. There is still CAN communication between the BPV actuator and PCI ECU with this fault active. The actuator motor is switched off and the BPV valve is fully opened (100%) position) with this fault active. Engine torque is reduced with this fault active. **Diagnostic Step-by-Step** This DTC can be set as a result of multiple failure modes. All steps of the troubleshooting tree must be completed. Step 1. Perform a key-cycle Step 1.A Perform a key-cycle Action 2. Key the ignition off for at least 15 seconds, then key it on again. Is DTC P1021 active? No Yes **Go to** Error! Reference source not found. Go to 5.A



Step 2. Visual inspection, BPV valve

Step 2.A Visual inspection, BPV valve connections and wiring

Action

- 5. Key off the ignition.
- 6. Visually inspect the connections and wiring for any of the following:
 - Damaged or loose connectors
 - Bent, broken, corroded, or loose connector pins
 - Moisture or dirt in the connections
 - Damage to the wire harness or insulation
 - ECU connections are damaged or disconnected

Is there evidence of any of the above?

Yes

No

Correct any issues found.

Go to 3.A

Go to 5.A

Step 3. Electrical Checks, BPV valve

Step 3.A Check the BPV valve CAN connection and power supply

Action

- 1. Monitor the vehicle power supply during engine startup and operation.
- 2. Check the actuator CAN connection and power supply according to "Checking data, BPV valve (L096)".

Are the CAN connection and power supply values within the specifications?

Yes	No
	Repair or replace components and/or wiring as necessary.
Go to 4.A	Go to 5.A



Step 4. Try another BPV valve Step 4.A Try another BPV valve **Action** 3. Key off the ignition. 4. Disconnect the BPV valve connector from the engine wiring harness connector. 5. If available, connect another BPV valve without installing it. Is P1021 active? Yes No A malfunctioning BPV valve has been detected. Replace the BPV valve. Malfunctioning of the originally installed actuator can be confirmed if DTC P1021 becomes active again when it is reconnected to the engine wiring harness connector. For further assistance in diagnosing this Go to 5.A issue or for confirmation prior to the replacement of suspect components, contact the PACCAR Engine Support Call Center at 1-800-477-0251.

Step 5. Reset the DTCs

Step 5.A Reset the DTCs		
Action		
1. Reset the DTCs		
2. Troubleshooting active DTCs		
DTCs reset?		
Yes	No	
	Return to troubleshooting steps.	



	Repair complete	Go to 1.A
Verification Drive Cycle Perform these repair verification cycles following any corrective actions to confirm that this fault is no longer active. Before beginning these repair verification cycles, use the DAVIE Quick function to clear all current DTCs from the PCI and EAS-3 ECUs.		ctive. air verification cycles, use the DAVIE Quick Check
	Start-up With the brakes set, start the engine	e and allow it to run at idle for 2 minutes.
		Back to Index



P1022

Code number	P1022	
Fault code description	BPV actuator – Internal short circuit detected	
Fault code information	1 trip MIL	
	3 drive cycle recovery	
	Readiness group – None	
	Freeze frame type - Comprehensive	
Description of	Back pressure valve (BPV) actuator (L096)	
component(s)	The BPV actuator consists of an actuator and a BPV valve.	
	The main task of the BPV valve is to create back pressure in the engine exhaust system and	
	control exhaust gas mass flow.	
	13 Lever 14 Spring 15 Butterfly valve 16 BPV actuator	
	 ECU Electromotor The electromotor rotates the output shaft via internal gears. Output shaft The butterfly valve is moved via a lever by rotating the output shaft. Electromotor position sensor The position of the electromotor is monitored. Output shaft position sensor The position of the output shaft is monitored. Temperature sensor The temperature of the ECU printed circuit board is monitored 	



Control

The BPV actuator is a smart actuator that communicates with the PCI ECU via E-CAN. The actuator ECU is controlled by the PCI ECU but has its own diagnostics on the following actuator inputs and outputs:

- Power supply voltage
- Electromotor position
- Electromotor current
- Output shaft position
- ECU printed circuit board temperature
- ECU hardware and software

After the ignition is keyed on, the valve position is 100% until the actuator is controlled by the PCI ECU.

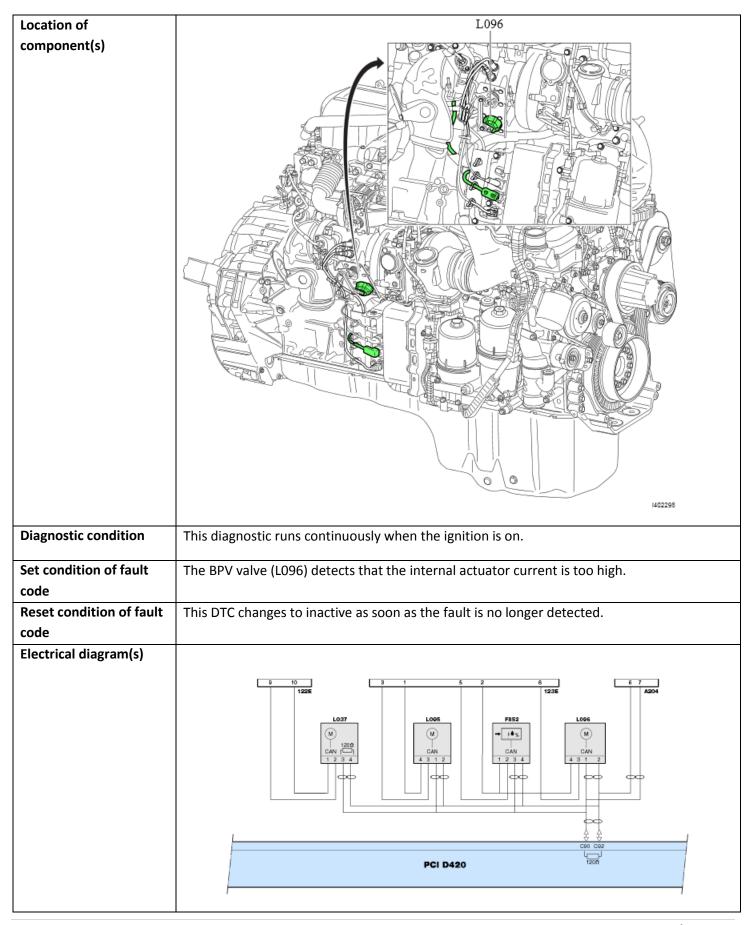
Unpowered and fail-safe position

The unpowered and fail-safe positions of the valve are controlled by a spring and are fully open (100%). If a failure is detected the BPV valve moves to the fail-safe position, if possible.

Effect on the system:

- Creating heat in the exhaust system to heat up the EAS system.
 A lower opening percentage results in a higher back pressure and more heat.
- Decreasing the exhaust gas flow in the exhaust system to heat up the EAS system.
 A lower opening percentage results in a lower exhaust gas flow in the exhaust system and more heat.
- Altering the pressure drop across the turbine rotor for VTG turbo control.
- Creating back pressure to create EGR gas flow.
- Creating back pressure to create engine braking.







122E 12-pin interface connector

123E 7-pin interface connector

A204 electronic fan interface connector

D420 PCI ECU

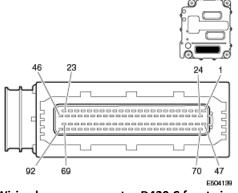
F852 humidity sensor

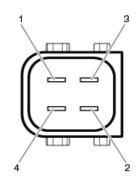
L037 VTG turbocharger actuator

L095 EGR valve module

L096 BPV valve

D420	L096	Function	
C90	1	E-CAN high	
C92	2	E-CAN low	
	3	Ground	
	4	Power supply after ignition	





E504124

Wiring harness connector D420.C front view

Wiring harness connector L096 front view



Handle connectors and pins with care and use matching measuring probes.

Technical data

Component check, BPV valve (L096)

This type of component cannot be checked with a multimeter or oscilloscope. Perform the following to assess the component:

- Monitor/test the component with DAVIE
- Perform the wiring check



Wiring check, BPV valve (L096)

Preparation

- Key off the ignition
- Disconnect connector L096
- Measure on the front side of wiring harness connector L096

Pin (+ probe)	Pin (- probe)	Value	Additional information
4	3	Ubat	Ignition keyed on
1	2	~ 60 Ω	 Ignition keyed off Ground cable from the battery disconnected DAVIE Vehicle Communication Interface (VCI) disconnected

Possible causes

- High friction or sticking BPV valve bearings or mechanism.
- Blocked BPV valve.

Additional information

- The actuator current is monitored.
- The actuator motor is switched off and the BPV valve is fully opened (100% position) with this fault active.
- Engine torque is reduced after 10 hours of engine operation.

Diagnostic Step-by-Step



This DTC can be set as a result of multiple failure modes. All steps of the troubleshooting tree must be completed.

Step 1. Perform a key-cycle

Step 1. A Perform a key-cycle

Action

3. Key the ignition off for at least 15 seconds, then key it on again.

Is DTC P1022 active?

Yes	No
Go to 2.A	Step 2.B



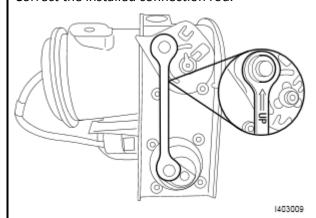
Step 2. Check the BPV valve

Step 2. A Visual inspection, BPV valve mechanism

Action

- 4. Key off the ignition
- 5. Visually check that the connection rod of the BPV valve mechanism is installed correctly. The arrow must point upward.

Correct the installed connection rod.



Is the BPV valve mechanism free of damage?

Yes	No
Go to 2.B	Go to 4.A



Step 2.B Visual inspection, BPV valve mechanism

Action

- 1. Key off the ignition
- 2. Visually check that the connection rod of the BPV valve mechanism is free of damage.

Correct valve mechanism



1402210

Example of a bent lever and connection rod



1402265

Is the BPV valve mechanism free of damage?

Yes	No
Go to 2.C	Go to 4.A



Step 2.C Check the free movement of the BPV valve mechanism



The valve mechanism can move when the ignition is keyed on. Touching the mechanican result in physical injury.

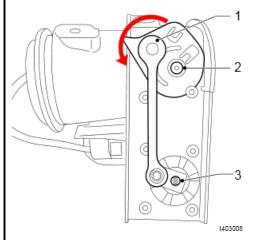
Always key off the ignition when working on the BPV valve mechanism

Action

- 3. Key off the ignition
- 4. Check the free movement of the valve mechanism by moving the connection rod (1) by hand.

The movement requires some force because of the presence of a return spring. Check during the movement that:

- The resistance of the mechanism to move is uniform over the full travel path of the connection rod (1), and
- The actuator shaft (3) and valve shaft (2) rotate over the full travel path of the connection rod (1).





Do not use a tool to move the mechanism.

Does the BPV valve mechanism move freely?		
Yes		No
Go to 3.A		Go to 2.D



Step 2.D Check for blockage in the BPV valve housing

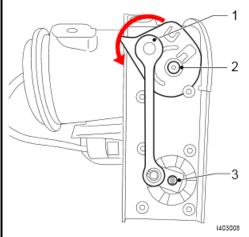


The valve mechanism can move when the ignition is keyed on. Touching the mechanican result in physical injury.

- Always key off the ignition when working on the BPV valve mechanism.
- Maintain a safe distance if the valve is monitored with the ignition keyed on.

Action

- 4. Key off the ignition
- 5. Loosen the exhaust pipe between the turbocharger and flexible pipe according to the job, Replace back pressure valve assembly.
- 6. Check if there is an internal blockage or excessive soot accumulation around the butterfly valve and housing. Open the valve by moving the connection rod (1).





Do not use a tool to move the mechanism.

Was any blockage found?

Yes		No
	Remove blockage/clean the internal valve housing.	A malfunctioning BPV valve has been detected. Replace the BPV
2.	Monitor the BPV valve position with DAVIE, to check that the cleaning was effective.	valve.
3.	Install the exhaust pipe between the turbocharger and flexible pipe according to the job, Replace back pressure valve assembly.	
Go to 4	l.A	Go to 4.A



Step 3. Try another BPV valve

Step 3. A Try another BPV valve Action 7. Key off the ignition. 8. Disconnect the BPV valve connector from the engine wiring harness connector. 9. If available, connect another BPV valve without installing it. Is P1022 active? No Yes A malfunctioning BPV valve has been detected. Replace the BPV valve. Malfunctioning of the originally installed actuator can be confirmed if DTC P1022 becomes active again when it is reconnected to the engine wiring harness connector. For further assistance in diagnosing this Go to 4.A issue or for confirmation prior to the replacement of suspect components, contact the PACCAR Engine Support Call Center at 1-800-477-0251.

Step 4. Reset the DTCs

Step 4.A Reset the DTCs		
Action		
Reset the DTCs		
If DTCs are still present, troubleshoot the active DTCs.		
DTCs reset?		
Yes No		
Return to troubleshooting steps.		
Repair complete	Go to 1.A	



Verification Drive Cycle	Perform these repair verification cycles following any corrective actions taken, to confirm that this fault is no longer active.		
	Before beginning these repair verification cycles, use the DAVIE Quick Check function to clear all current DTCs from the PCI and EAS-3 ECUs.		
	Start-up		
	With the brakes set, start the engine and allow it to run at idle for 2 minutes.		
	Back to Index		



P1023

Code number	P1023	
Fault code description	BPV actuator temperature - Data valid but too high	
Pault code information Description of component(s)	1 trip MIL 3 drive cycle recovery Readiness group – None Freeze frame type – Exhaust gas Back pressure valve (BPV) actuator (L096) The BPV actuator consists of an actuator and a BPV valve. The main task of the BPV valve is to create back pressure in the engine exhaust system and control exhaust gas mass flow. 17 Lever 18 Spring 19 Butterfly valve 20 BPV actuator	
	 ECU Electromotor The electromotor rotates the output shaft via internal gears. Output shaft The butterfly valve is moved via a lever by rotating the output shaft. Electromotor position sensor The position of the electromotor is monitored. Output shaft position sensor The position of the output shaft is monitored. Temperature sensor 	



The temperature of the ECU printed circuit board is monitored

Control

The BPV actuator is a smart actuator that communicates with the PCI ECU via E-CAN. The actuator ECU is controlled by the PCI ECU but has its own diagnostics on the following actuator inputs and outputs:

- Power supply voltage
- Electromotor position
- Electromotor current
- Output shaft position
- ECU printed circuit board temperature
- ECU hardware and software

After the ignition is keyed on, the valve position is 100% until the actuator is controlled by the PCI ECU.

Unpowered and fail-safe position

The unpowered and fail-safe positions of the valve are controlled by a spring and are fully open (100%). If a failure is detected the BPV valve moves to the fail-safe position, if possible.

Effect on the system:

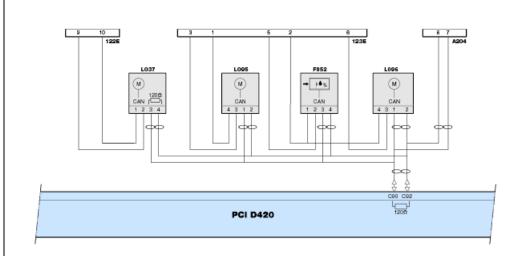
- Creating heat in the exhaust system to heat up the EAS system.
 A lower opening percentage results in a higher back pressure and more heat.
- Decreasing the exhaust gas flow in the exhaust system to heat up the EAS system.
 - A lower opening percentage results in a lower exhaust gas flow in the exhaust system and more heat.
- Altering the pressure drop across the turbine rotor for VTG turbo control.
- Creating back pressure to create EGR gas flow.
- Creating back pressure to create engine braking.



Location of component(s)	L096	
	M02238	
Diagnostic condition	This diagnostic runs continuously when the ignition is on.	
Set conditions	The BPV valve (L096) detects that the temperature of the actuator is greater than	
	142°C for more than 30 seconds.	
Reset conditions	This DTC changes to inactive after the ignition is keyed off for at least 15 seconds and keyed on again, and the fault is no longer detected.	



Electrical diagram(s)



122E 12-pin interface connector

123E 7-pin interface connector

A204 electronic fan interface connector

D420 PCI ECU

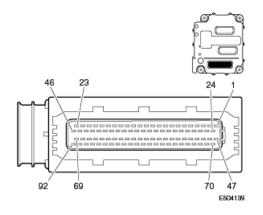
F852 humidity sensor

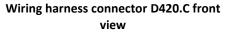
L037 VTG turbocharger actuator

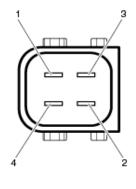
L095 EGR valve module

L096 BPV valve

D420	L096	Function
C90	1	E-CAN high
C92	2	E-CAN low
	3	Ground
	4	Power supply after ignition







E504124

Wiring harness connector L096 front view



	Handle connectors and pins with care and use matching measuring probes.					
Technical data	Component check, BPV valve (L096) This type of component cannot be checked with a multimeter or oscilloscope. Perform the following to assess the component: • Monitor/test the component with DAVIE • Perform the wiring check Wiring check, BPV valve (L096) Preparation • Key off the ignition • Disconnect connector L096 • Measure on the front side of wiring harness connector L096					
	Pin	Pin	Value	Additional information		
	(+ probe) 4	(- probe) 3	Ubat	Ignition keyed on		
	1	2	~ 60 Ω	 Ignition keyed off Ground cable from the battery disconnected DAVIE Vehicle Communication Inter (VCI) disconnected 		
Possible causes	• The	ignition is ke	eyed on shortly	after a hot engine shutdown.		
	 Malfunctioning cooling system Check the engine cooling system for: 					
	Low coolant levelAir in cooling system					
			cooling pipes t	o the actuator		
Additional information	 The temperature is measured on the (printed circuit board) of the actuator. The actuator motor is switched off and the BPV valve is fully opened (100%) 					
	position) with this fault active.					



	Engine torque is reduce	ed with this fault active.			
Diagnostic Step-by-Step	This DTC can be set as a result of multiple failure modes. All steps of the troubleshooting tree must be completed.				
	Step 1. Perform a key cycle				
	Step 1. A Perform a key-cycle				
	Action				
	4. Key the ignition off for at least 15 seconds, then key it on again.				
	Is DTC P1023 active?				
	Yes	No			
	Go to 3.A	Step 2.A			
	Step 2. A Check for an active P1023 Action 1. Operate the engine at normal operating temperature. Is DTC P1023 active?				
	Yes	No			
	Go to 3.A	Step 5.A			
	Step 3. Check the cooling system				
	Step 3. A Check the coolant level of the vehicle cooling system				
	Action				
	Check the coolant level				
	Is the coolant level correct?	Is the coolant level correct?			
	Yes	No			
		Refill the coolant level			



Go to 3.B	Step 2.A			
Step 3. B Inspect the actuator cooling circuit				
Action				
 Check the coolant supply and return pipes of the BPV actuator according to the maintenance job, <u>Check/clean all coolant pipes</u>. 				
Does the actuator cooling work sufficiently?				
Yes No				
	Clean/replace the contaminated or damaged coolant pipe.			
Go to 4.A	Step 2.A			

Step 4. Try another BPV valve

Step 4. A Try another BPV valve		
Action 10. Key off the ignition. 11. Disconnect the BPV valve connector from the engine wiring harness connector. 12. If available, connect another BPV valve without installing it.		
Is P1023 active?		
Yes	No	
	A malfunctioning BPV valve has been detected. Replace the BPV valve. Malfunctioning of the origina P1022 becomes active again value.	
For further assistance in diagnosing this issue or for confirmation prior to the replacement of suspect components, contact the PACCAR Engine Support Call	Go to 4.A	



		1
	Center at 1-800-477-0251.	
	Step 5. Reset the DTCs	
	Step 5. Reset the Dres	
	Step 5.A Reset the DTCs	
	Action	
	Reset the DTCs	
	If DTCs are still present, troubleshoot the	active DTCs.
	DTCs reset?	
	Yes	No
		Return to troubleshooting st
	Repair complete	Go to 1.A
Verification Drive Cycle	Perform these repair verification cycles followi	ng any corrective actions taken, to
	confirm that this fault is no longer active.	
	Before beginning these repair verificati DTCs from the PCI and EAS-3 ECUs.	on cycles, use the DAVIE Quick Check funct
	Start-up	
	With the brakes set, start the engine and allow	it to run at idle for 2 minutes.
		Back to Index



P1024

Code number	P1024		
Fault code description	BPV actuator power supply – Incorrect		
rault code description	BPV actuator power supply – incorrect		
Fault code information	1 trip MIL		
	3 drive cycle recovery		
	Readiness group – None		
	Freeze frame type – Comprehensive		
Description of	Back pressure valve (BPV) actuator (L096)		
component(s)	The BPV actuator consists of an actuator and a BPV valve.		
	The main task of the BPV valve is to create back pressure in the engine exhaust system		
	and control exhaust gas mass flow.		
	21 Lever 22 Spring 23 Butterfly valve 24 BPV actuator		
	The main components of the BPV actuator are:		
	 ECU Electromotor The electromotor rotates the output shaft via internal gears. Output shaft The butterfly valve is moved via a lever by rotating the output shaft. Electromotor position sensor The position of the electromotor is monitored. Output shaft position sensor The position of the output shaft is monitored. Temperature sensor 		



The temperature of the ECU printed circuit board is monitored

Control

The BPV actuator is a smart actuator that communicates with the PCI ECU via E-CAN. The actuator ECU is controlled by the PCI ECU but has its own diagnostics on the following actuator inputs and outputs:

- Power supply voltage
- Electromotor position
- Electromotor current
- Output shaft position
- ECU printed circuit board temperature
- ECU hardware and software

After the ignition is keyed on, the valve position is 100% until the actuator is controlled by the PCI ECU.

Unpowered and fail-safe position

The unpowered and fail-safe positions of the valve are controlled by a spring and are fully open (100%). If a failure is detected the BPV valve moves to the fail-safe position, if possible.

Effect on the system:

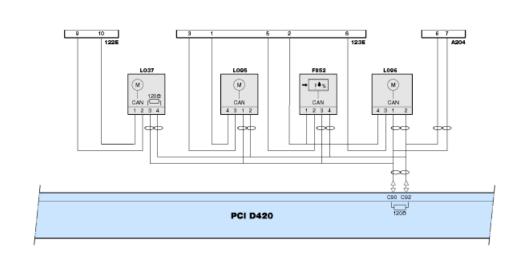
- Creating heat in the exhaust system to heat up the EAS system.
 A lower opening percentage results in a higher back pressure and more heat.
- Decreasing the exhaust gas flow in the exhaust system to heat up the EAS system.
 - A lower opening percentage results in a lower exhaust gas flow in the exhaust system and more heat.
- Altering the pressure drop across the turbine rotor for VTG turbo control.
- Creating back pressure to create EGR gas flow.
- Creating back pressure to create engine braking.



Location of component(s)	L096
	M22298
Diagnostic condition	This diagnostic runs continuously when the ignition is on.
Set condition of fault code	The BPV actuator (L096) detects that the actuator power supply is less than 7.5 V or more than 35 V.
Reset condition of fault code	This DTC changes to inactive when the actuator power supply is between 8.5 V and 34 V.



Electrical diagram(s)



122E 12-pin interface connector

123E 7-pin interface connector

A204 electronic fan interface connector

D420 PCI ECU

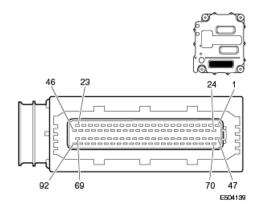
F852 humidity sensor

L037 VTG turbocharger actuator

L095 EGR valve module

L096 BPV valve

D420	L096	Function
C90	1	E-CAN high
C92	2	E-CAN low
	3	Ground
	4	Power supply after ignition



4 2

E504124

Wiring harness connector D420.C front view

Wiring harness connector L096 front view



	i Ha	andle conne	ctors and pins wi	th care and use matching measuring probes.
Technical data	Component check, BPV valve (L096)			
	This type of	componen		ecked with a multimeter or oscilloscope. Perform
		nitor/test th orm the wi	ne component v	with DAVIE
	Wiring check	k, BPV valv	e (L096)	
	 Key off the ignition Disconnect connector L096 Measure on the front side of wiring harness connector L096 			
	Pin (+ probe)	Pin (- probe)	Value	Additional information
	4	3	Ubat	Ignition keyed on
	1	2	~ 60 Ω	 Ignition keyed off Ground cable from the battery disconnected DAVIE Vehicle Communication Interface (VCI) disconnected
Possible causes Additional information	Malf The actu	function in lator powe	r supply is cont	supply system (battery or alternator or wiring).
	with this	DTC active	<u>.</u>	f and the BPV valve is fully open (100% position) hours of engine operation.



Diagnostic Step-by-Step

•	19
•	

This DTC can be set as a result of multiple failure modes. All steps of the troubleshooting tree must be completed.

Step 1. Perform a key cycle

Step 1. A Perform a key-cycle Action 5. Key the ignition off for at least 15 seconds, then key it on again. Is DTC P1024 active? Yes No Go to 2.A Step 5.A

Step 2. Electrical checks, BPV valve

Step 2.A Visual inspection, BPV valve connections and wiring

Action

- 1. Key the ignition off.
- 2. Visually inspect the connections and wiring for any of the following:
 - Damaged or loose connectors
 - Bent, broken, corroded, or loose connector pins
 - Moisture or dirt in the connections
 - Damage to the wire harness or insulation
 - ECU connections are damaged or disconnected

Yes No

Correct any issues found

Go to 4.A Go to 2.B



Action 1. Monitor the vehicle power supply during engine startup and operation. 2. Check the actuator power supply according to, "Checking data, BPV valve (L096)." Is the power supply within the specifications? Yes No Repair or replace components and/or wiring as necessary. Go to 3.A Go to 4.A

Step 3. Try another BPV valve

Step 4. A Try another BPV valve		
Action		
13. Key off the ignition.		
Disconnect the BPV valve connector.	or from the engine wiring harness	
15. If available, connect another BPV v	valve without installing it.	
Is P1024 active?		
Yes	No	
	A malfunctioning BPV valve has been detected. Replace the BPV valve. Malfunctioning of the originally installed actuator can be confirmed if DTC P1024 becomes active again when it is reconnected to the engine wiring harness connector.	



confirm that this fault is no longer active. Before beginning these repair verification cycles, use the DAVIE Quick Check funct DTCs from the PCI and EAS-3 ECUs. Start-up With the brakes set, start the engine and allow it to run at idle for 2 minutes.			
Step 4.A Reset the DTCs Action Reset the DTCs If DTCs are still present, troubleshoot the active DTCs. DTCs reset? Yes No Return to troubleshooting steps. Repair complete Go to 1.A Verification Drive Cycle Perform these repair verification cycles following any corrective actions taken, to confirm that this fault is no longer active. Before beginning these repair verification cycles, use the DAVIE Quick Check funct DTCs from the PCI and EAS-3 ECUs. Start-up With the brakes set, start the engine and allow it to run at idle for 2 minutes.		issue or for confirmation prior to the replacement of suspect components, contact the PACCAR Engine Support Call	Go to 4.A
Action Reset the DTCs If DTCs are still present, troubleshoot the active DTCs. DTCs reset? Yes No Return to troubleshooting steps. Repair complete Go to 1.A Verification Drive Cycle Perform these repair verification cycles following any corrective actions taken, to confirm that this fault is no longer active. Before beginning these repair verification cycles, use the DAVIE Quick Check funct DTCs from the PCI and EAS-3 ECUs. Start-up With the brakes set, start the engine and allow it to run at idle for 2 minutes.		Step 4. Reset the DTCs	
Reset the DTCs If DTCs are still present, troubleshoot the active DTCs. DTCs reset? Yes No Return to troubleshooting steps. Repair complete Go to 1.A Verification Drive Cycle Perform these repair verification cycles following any corrective actions taken, to confirm that this fault is no longer active. Before beginning these repair verification cycles, use the DAVIE Quick Check funct DTCs from the PCI and EAS-3 ECUs. Start-up With the brakes set, start the engine and allow it to run at idle for 2 minutes.		Step 4.A Reset the DTCs	
If DTCs are still present, troubleshoot the active DTCs. DTCs reset? Yes No Return to troubleshooting steps. Repair complete Go to 1.A Verification Drive Cycle Perform these repair verification cycles following any corrective actions taken, to confirm that this fault is no longer active. Before beginning these repair verification cycles, use the DAVIE Quick Check funct DTCs from the PCI and EAS-3 ECUs. Start-up With the brakes set, start the engine and allow it to run at idle for 2 minutes.		Action	
Perform these repair verification cycles following any corrective actions taken, to confirm that this fault is no longer active. Before beginning these repair verification cycles, use the DAVIE Quick Check funct DTCs from the PCI and EAS-3 ECUs. Start-up With the brakes set, start the engine and allow it to run at idle for 2 minutes.		Reset the DTCs	
Yes		If DTCs are still present, troubleshoot	the active DTCs.
Repair complete Go to 1.A Verification Drive Cycle Perform these repair verification cycles following any corrective actions taken, to confirm that this fault is no longer active. Before beginning these repair verification cycles, use the DAVIE Quick Check funct DTCs from the PCI and EAS-3 ECUs. Start-up With the brakes set, start the engine and allow it to run at idle for 2 minutes.		DTCs reset?	
Repair complete Perform these repair verification cycles following any corrective actions taken, to confirm that this fault is no longer active. Before beginning these repair verification cycles, use the DAVIE Quick Check funct DTCs from the PCI and EAS-3 ECUs. Start-up With the brakes set, start the engine and allow it to run at idle for 2 minutes.		Yes	No
Verification Drive Cycle Perform these repair verification cycles following any corrective actions taken, to confirm that this fault is no longer active. Before beginning these repair verification cycles, use the DAVIE Quick Check funct DTCs from the PCI and EAS-3 ECUs. Start-up With the brakes set, start the engine and allow it to run at idle for 2 minutes.			Return to troubleshooting steps.
confirm that this fault is no longer active. Before beginning these repair verification cycles, use the DAVIE Quick Check funct DTCs from the PCI and EAS-3 ECUs. Start-up With the brakes set, start the engine and allow it to run at idle for 2 minutes.		Repair complete	Go to 1.A
confirm that this fault is no longer active. Before beginning these repair verification cycles, use the DAVIE Quick Check funct DTCs from the PCI and EAS-3 ECUs. Start-up With the brakes set, start the engine and allow it to run at idle for 2 minutes.			
Start-up With the brakes set, start the engine and allow it to run at idle for 2 minutes.	Verification Drive Cycle		owing any corrective actions taken, to
With the brakes set, start the engine and allow it to run at idle for 2 minutes.			
			low it to run at idle for 2 minutes.
Rack to Ind			Back to Index



P1025

Code number	P1025		
Fault code description	BPV actuator position - Malfunction on sensor		
Fault code information Description of component(s)	1 trip MIL 3 drive cycle recovery Readiness group – None Freeze frame type – Comprehensive Back pressure valve (BPV) actuator (L096)		
Description of component(s)	The BPV actuator consists of an actuator and a BPV valve. The main task of the BPV valve is to create back pressure in the engine exhaust system and control exhaust gas mass flow. 25 Lever 26 Spring 27 Butterfly valve 28 BPV actuator		
	The main components of the BPV actuator are:		
	 ECU Electromotor The electromotor rotates the output shaft via internal gears. Output shaft The butterfly valve is moved via a lever by rotating the output shaft. Electromotor position sensor The position of the electromotor is monitored. Output shaft position sensor The position of the output shaft is monitored. Temperature sensor 		



The temperature of the ECU printed circuit board is monitored

Control

The BPV actuator is a smart actuator that communicates with the PCI ECU via E-CAN. The actuator ECU is controlled by the PCI ECU but has its own diagnostics on the following actuator inputs and outputs:

- Power supply voltage
- Electromotor position
- Electromotor current
- Output shaft position
- ECU printed circuit board temperature
- ECU hardware and software

After the ignition is keyed on, the valve position is 100% until the actuator is controlled by the PCI ECU.

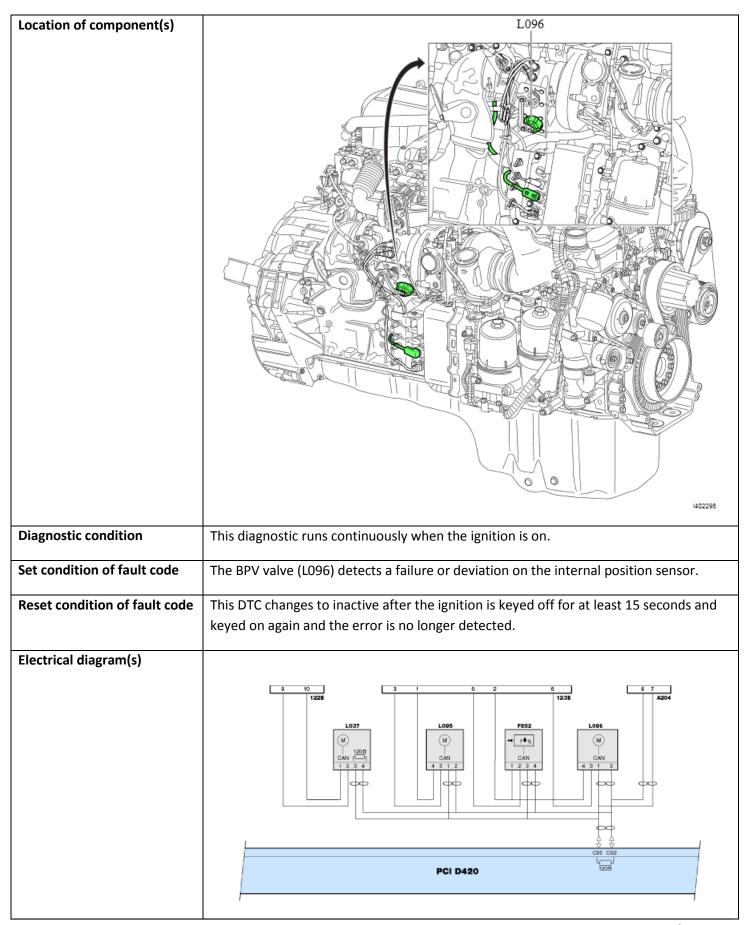
Unpowered and fail-safe position

The unpowered and fail-safe positions of the valve are controlled by a spring and are fully open (100%). If a failure is detected the BPV valve moves to the fail-safe position, if possible.

Effect on the system:

- Creating heat in the exhaust system to heat up the EAS system.
 A lower opening percentage results in a higher back pressure and more heat.
- Decreasing the exhaust gas flow in the exhaust system to heat up the EAS system.
 - A lower opening percentage results in a lower exhaust gas flow in the exhaust system and more heat.
- Altering the pressure drop across the turbine rotor for VTG turbo control.
- Creating back pressure to create EGR gas flow.
- Creating back pressure to create engine braking.







122E 12-pin interface connector

123E 7-pin interface connector

A204 electronic fan interface connector

D420 PCI ECU

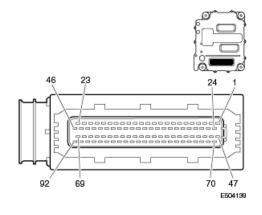
F852 humidity sensor

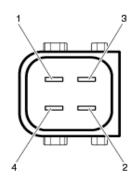
L037 VTG turbocharger actuator

L095 EGR valve module

L096 BPV valve

D420	L096	Function
C90	1	E-CAN high
C92	2	E-CAN low
	3	Ground
	4	Power supply after ignition





E504124

Wiring harness connector D420.C front view

Wiring harness connector L096 front view



Handle connectors and pins with care and use matching measuring probes.

Technical data

Component check, BPV valve (L096)

This type of component cannot be checked with a multimeter or oscilloscope. Perform the following to assess the component:

- Monitor/test the component with DAVIE
- Perform the wiring check



Wiring check, BPV valve (L096) Preparation Key off the ignition Disconnect connector L096 Measure on the front side of wiring harness connector L096 **Additional information** Pin Pin Value (- probe) (+ probe) 4 3 Ubat Ignition keyed on 2 $\sim 60 \Omega$ Ignition keyed off Ground cable from the battery disconnected **DAVIE Vehicle Communication** Interface (VCI) disconnected **Possible causes** Bent actuator lever and/or connection rod. Incorrectly installed connection rod. **Additional information** The position of the BPV valve is monitored by a shaft position sensor in the actuator. The actuator motor is switched off and the BPV valve is fully opened (100% position) with this DTC active. Engine torque is reduced with this DTC active. **Diagnostic Step-by-Step** This DTC can be set as a result of multiple failure modes. All steps of the troubleshooting tree must be completed. Step 1. Perform a key cycle Step 1. A Perform a key-cycle Action 6. Key the ignition off for at least 15 seconds, then key it on again. Is DTC P1025 active? Yes No Go to 2.A Step 2.B



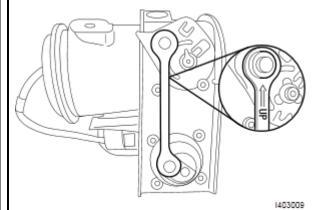
Step 2. Check the BPV valve

Step 2. A Visual inspection, BPV valve mechanism

Action

- 6. Key off the ignition
- 7. Visually check that the connection rod of the BPV valve mechanism is installed correctly. The arrow must point upward.

Correct the installed connection rod.



Is the BPV valve mechanism free of damage?

Yes	No
Go to 2.B	Go to 4.A



Step 2.B Visual inspection, BPV valve mechanism

Action

- 3. Key off the ignition
- 4. Visually check that the connection rod of the BPV valve mechanism is free of damage.

Correct valve mechanism



1402210

Example of a bent lever and connection rod



140226

Is the BPV valve mechanism free of damage?

Yes	No
Go to 2.C	Go to 4.A



Step 2.C Check the free movement of the BPV valve mechanism



The valve mechanism can move when the ignition is keyed on. Touching the mechan result in physical injury.

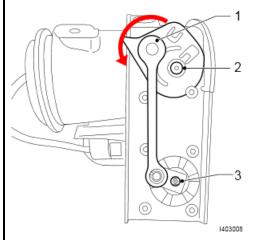
Always key off the ignition when working on the BPV valve mechanism

Action

- 5. Key off the ignition
- 6. Check the free movement of the valve mechanism by moving the connection rod (1) by hand.

The movement requires some force because of the presence of a return spring. Check during the movement that:

- The resistance of the mechanism to move is uniform over the full travel path of the connection rod (1), and
- The actuator shaft (3) and valve shaft (2) rotate over the full travel path of the connection rod (1).



Do not use a tool to move the mechanism.

Does the BPV valve mechanism move freely?	
Yes	No
Go to 3.A	Go to 2.D



Step 2.D Check for blockage in the BPV valve housing

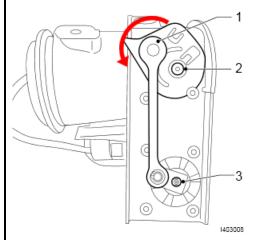


The valve mechanism can move when the ignition is keyed on. Touching the mechan result in physical injury.

- Always key off the ignition when working on the BPV valve mechanism.
- Maintain a safe distance if the valve is monitored with the ignitiφη keyed

Action

- 7. Key off the ignition
- 8. Loosen the exhaust pipe between the turbocharger and flexible pipe according to the job, Replace back pressure valve assembly.
- 9. Check if there is an internal blockage or excessive soot accumulation around the butterfly valve and housing. Open the valve by moving the connection rod (1).



i

Do not use a tool to move the mechanism.

Was any blockage found?

Yes	No	
Remove blockage/clean the internal valve housing.	A malfunctioning BPV valve has been detected. Replace the BPV valve.	
5. Monitor the BPV valve position	detected. Replace the Br v valve.	
with DAVIE, to check that the		
cleaning was effective.		
6. Install the exhaust pipe between		
the turbocharger and flexible		
pipe according to the job,		
Replace back pressure valve		
<u>assembly</u> .		
Go to 4.A	Go to 4.A	



Step 3. Try another BPV valve Step 4. A Try another BPV valve Action 16. Key off the ignition. 17. Disconnect the BPV valve connector from the engine wiring harness connector. 18. If available, connect another BPV valve without installing it. Is P1024 active? Yes No A malfunctioning BPV valve has been detected. Replace the BPV valve. Malfunctioning of the originally installed actuator can be confirmed if DTC P1024 becomes active again when it is reconnected to the engine wiring harness connector. For further assistance in diagnosing this Go to 4.A issue or for confirmation prior to the replacement of suspect components, contact the PACCAR Engine Support Call Center at 1-800-477-0251.

Step 4. Reset the DTCs

Step	4.A	Reset	the	DTCs
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Action

Reset the DTCs

If DTCs are still present, troubleshoot the active DTCs.

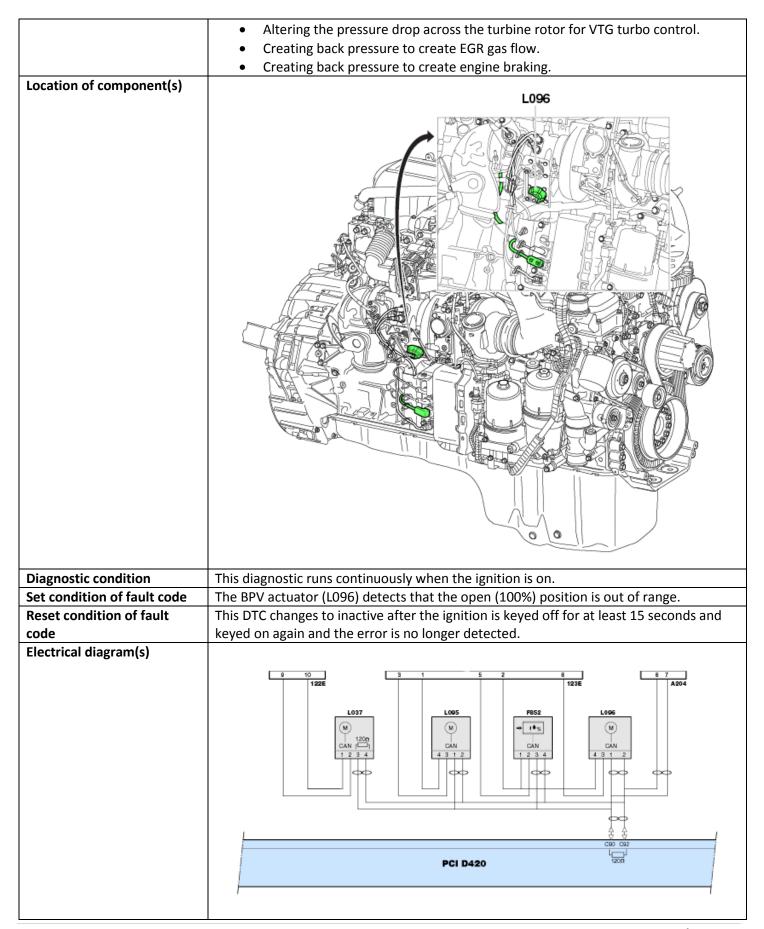


	DTCs reset?	
	Yes	No
		Return to troubleshooting steps.
	Repair complete	Go to 1.A
Verification Drive Cycle	Perform these repair verification cycles following any corrective acconfirm that this fault is no longer active. Before beginning these repair verification cycles, use the DAVIE function to clear all current DTCs from the PCI and EAS-3 ECU	
	Start-up With the brakes set, start the engin	e and allow it to run at idle for 2 minutes.
		Back to Index

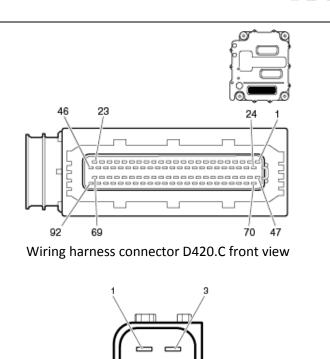


11020	-
Code number	P1026
Fault code description	BPV actuator - Out of calibration
Fault code information	1 trip MIL
	3 drive cycle recovery
	Readiness group – None
	Freeze frame type - Comprehensive
Description of component(s)	The BPV actuator consists of an actuator and a BPV valve.
,	The main task of the BPV valve is to create back pressure in the engine exhaust system
	and control exhaust gas mass flow.
	The main components of the BPV actuator are:
	• ECU
	Electromotor
	• output shaft
	The butterfly is moved via a lever by rotating the output shaft
	electromotor position sensor
	The position of the electromotor is monitored.
	output shaft position sensor
	The position of the output shaft is monitored.
	temperature sensor
	The temperature of the printed circuit board of the ECU is monitored.
	Control
	The BPV actuator is a smart actuator that communicates with the PCI ECU via E-CAN.
	The actuator ECU is controlled by the PCI ECU but has its own diagnostics on the
	following actuator inputs and outputs:
	power supply voltage
	electromotor position
	electromotor current
	output shaft position
	ECU printed circuit board temperature CCU beard as a self-self-self-self-self-self-self-self-
	ECU hardware and software
	After the ignition is keyed on, the valve position is 100% until the actuator is controlled
	by the PCI ECU.
	Unpowered and fail-safe position
	The unpowered and fail-safe positions of the valve are controlled by a spring and are
	fully open (100%). If a failure is detected the BPV valve moves to the fail-safe position, if
	possible.
	Effect on the system:
	Creating heat in the exhaust system to heat up the EAS system.
	 A lower opening percentage results in a higher back pressure and more heat.
	 Decreasing the exhaust gas flow in the exhaust system to heat up the EAS
	system. A lower opening percentage results in a lower exhaust gas flow in the exhaust
	A lower opening percentage results in a lower exhaust gas flow in the exhaust
	system and more heat.









Wiring harness connector L096 front view

122 E 12-pin i	interface	connector
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¹²³E 7-pin interface connector

A204 electronic fan interface connector

D420 PCI ECU

F852 humidity sensor

L037 VTG turbocharger actuator

L095 EGR valve module

L096 BPV valve

D420	L096	Function
C90	1	E-CAN high
C92	2	E-CAN low
	3	Ground
	4	Power supply after ignition

Technical data

Component & wiring check, BPV valve (L096)

Preparation

- Key off the ignition.
- Disconnect connector L096
- Measure on the front side of wiring harness connector L096

Pin (+ probe)	Pin (- probe)	Value	Additional information
4	3	Ubat	Ignition keyed on
1	2	± 60 Ω	 Ignition keyed off



	 Ground cable from battery disconnected Vehicle Communication Interface (VCI) of DAVIE disconnected 		
Possible causes			
Additional information	 The open (100%) position of the BPV valve is checked by the actuator and compared with an ex-factory stored value. The actuator motor is switched off and the BPV valve is fully opened (100% position) with this DTC active. Engine torque is reduced with this DTC active. 		
Diagnostic Step-by-Step	Perform the troubleshooting steps below using the breakout harness, if necessary, to check electrical components, such as sensors, electrical control units, and harnesses. Back probing is not recommended, as it could damage the harness. The ignition should always be in the OFF position when connecting or disconnecting electrical components in order to reduce the likelihood of damage to electrical components. • Disconnecting the EAS connectors during the troubleshooting process will result in multiple errors. • For specific electrical component information and pinout locations, always refer to the technical data. • It is necessary to exit the fault code menu in DAVIE and run the diagnostic test again to identify a change in errors. • Remember that the truck's operational or mechanical issues may be the root cause of both active and inactive fault codes. Refer to the 'possible causes' section.		
	Step 1 Step ID 1026a SRT		
	Visually inspect all applicable connectors (bent, broken, corroded or loose pins) and harnesses for corrosion, damage, and rubbing during each step of the diagnostic procedure. Proceed to step 2.		
	Ston 10 1036h		
	Step 2 Step ID 1026b SRT ECU Information Use the DAVIE Direct selection, "ECU Information" to display ECU S/W information. Compare this information with current configuration information available through Engine Rapido, or by contacting the PACCAR Engine Support Call Center. Is the installed ECU software incorrect? • No: Continue to the next step in the troubleshooting process. • Yes: Make the appropriate updates or component replacements. Contact the PACCAR Engine Support Call Center for authorization and assistance in replacing the ECU or updating the corresponding software. Use DAVIE to re-check for the presence of active faults. • If this related fault is no longer active, then this issue has been resolved. • If this related fault is still active, proceed to step 3 Step 3 Step ID 1026c SRT DAVIE Direct Monitor: BPV Use DAVIE to select and monitor BPV Position and BPV Actuator to determine if		
	replacing the ECU or updating the corresponding so Use DAVIE to re-check for the presence of active faults. If this related fault is no longer active, then this issu If this related fault is still active, proceed to step 3 Step 3 Step 3 Step ID 1026c SR DAVIE Direct Monitor: BPV		



	Do the monitore	d values appear incorrect?		
	No: Cont	inue to the next step in the trou	oleshooting process.	
	Yes: Clean adjust, repair or replace affected components for any issues identified.			
	Use DAVIE to re-	check for the presence of active	faults.	
	 If this related fault is no longer active, then this issue has been resolved. If this related fault is still active, proceed to step 4 			
		· · ·	·	
	Step 4	Step ID 1026d	SRT	
	Replace: BPV Act	uator		
	If no problems w	ere detected in the preceding st	eps, an internal problem has mo	st
	likely occurred w	ith the BPV Actuator.		
	Replace the iden	tified faulty component.		
	Use DAVIE to re-	check for the presence of active	faults.	
	 If this related fault is no longer active, then this issue has been resolved. 			
	If this related fault is still active, proceed to step 5			
	Step 5	Step ID 1026e	SRT	
	For further assistance in diagnosing this issue or for confirmation prior to the			
	replacement of suspect components, contact the PACCAR Engine Support Call Center at 1-800-477-0251.			
Verification Drive Cycle	To validate repair, with the brakes set, turn the key to the ON position with the engine off, and allow 10 seconds for the system to initialize and run diagnostics			
			Back to	Index



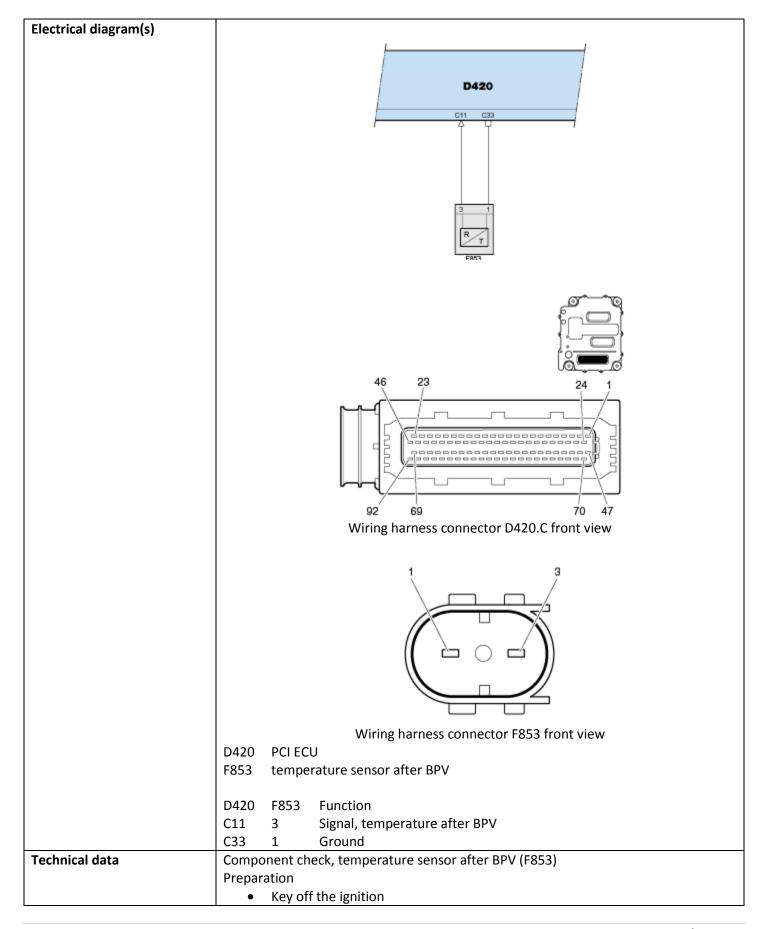
Code number	P1029	
Fault code description	BPV Position sensor fault	
Fault code information	1 trip MIL	
	3 drive cycle recovery	
	Readiness group – None	
	Freeze frame type – Comprehensive	
Description of component(s)	For further assistance: Contact the PACCAR Engine Support Call Center 1-800-477-0251 Please Contact the Engine Support Center	
Location of component(s)		
Diagnostic condition		
Set condition of fault code		
Reset condition of fault code		
Electrical diagram(s)		
Technical data		
Possible causes		
Additional information		
Diagnostic Step-by-Step		·
Verification Drive Cycle		
		Back to Index



P102A

Code number	P102A
Fault code description	Temperature after BPV - Voltage too high or short circuit to supply on ECU D420 pin
	C11
Fault code information	1 trip MIL
	3 drive cycle recovery
	Readiness group – None
	Freeze frame type - Generic
Description of component(s)	The exhaust gas temperature after BPV is measured after the back pressure valve (BPV).
	 Effect on the system: Calculates the NOx composition for correction of the NOx emissions by the engine Higher measured temperature after BPV results in a higher calculated NO2 emission by the engine. Calculate temperature before turbine Higher measured temperature after BPV results in higher calculated exhaust gas temperature before the turbine.
Location of component(s)	F853
Diagnostic condition	Diagnostic condition information is not available.
Set condition of fault code	When Sensor output voltage is greater than 4.343V.
Reset condition of fault code	This fault code will change to inactive immediately after the diagnostic







	Disconnect connector F853	
	 Measure on component connector F853 	
	Pin Pin	
	(+ probe) (- probe) Value Additional information	
	1 3 197.6–204.6 Ω Resistance value at 0°C [34°F]	
	217.1–224.15 Ω Resistance value at 25°C [77°F]	
	349.5–356.1 Ω Resistance value at 200°C [392°F]	
	622.5–634.1 Ω Resistance value at 600°C [1112°F]	
	022.5 05 1.112 Resistance value at 000 c [1112 1]	
	Component & circuit check, ECU (D420)	
	Preparation Koy off the ignition	
	Key off the ignition. Property of 5052	
	Disconnect connector F853	
	Measure on the front side of wiring harness connector F853	
	Pin Pin	
	(+ probe) (- probe) Value Additional information	
	3 1 5V Ignition keyed on	
Possible causes	No possible causes available.	
Additional information	No additional information available.	
Diagnostic Step-by-Step	Perform the troubleshooting steps below using the breakout harness, if	
	necessary, to check electrical components, such as sensors, electrical control	
	units, and harnesses. Back probing is not recommended, as it could damage	
	the harness. The ignition should always be in the OFF position when	
	connecting or disconnecting electrical components to reduce the likelihood	
	of damage to electrical components	
	This troubleshooting tree is based on the assumption that supply	
	power and ground to the PCI are functioning properly.	
	Disconnecting the PCI connectors during the troubleshooting process will provide in moultiple armore.	
	will result in multiple errors.	
	For specific electrical component information and pinout locations,	
	always refer to the technical data in Rapido.	
	It is necessary to exit the 'active errors' screen in DAVIE and run the	
	diagnostic test again to identify changes in errors.	
	 Remember that the truck's operational or mechanical issues may be 	
	the root cause of both active and inactive codes. Refer to the 'possible	
	causes' section in Rapido.	
	Step 1 Step ID 102Aa SRT	
	Visually inspect all applicable connectors (bent, broken, corroded or loose pins)	
	and harnesses for corrosion, damage, and rubbing during each step of the	
	diagnostic procedure. Proceed to step 2.	
	Step 2 Step ID 102Ab SRT	
	Electrical Checks	
	Ensure that the ignition key/switch has been set to OFF before disconnecting	
	related cables.	
	Based on the fault message provided, confirm that the following electrical values	
	are within specified ranges or limits:	
	Supply and signal voltages (12V).	
	Cable continuity (no opens or shorts).	



	Are measured ele	ectrical values outside of expected	d range or limits?
	Yes - Pro	ceed to step 3	
	No - Pro	ceed to step 4	
	Step 3	Step ID 102Ac	SRT
	Repair or replace presence of activ	After BPV Temperature sensor a e faults.	nd use DAVIE to re-check for the
	Fault inactive – issue resolve		
	Fault active - Proceed to step 4		
	Step 4	Step ID 102Ad	SRT
	For further assist	ance in diagnosing this issue or fo	or confirmation prior to the
	replacement of suspect components, contact the PACCAR Engine Support Call		
	Center at 1-800-4	177-0251.	
Verification Drive Cycle	• •	with the brakes set, start the eng	gine and allow it to run at idle for 2
	minutes.		
			Back to Index



P102B

Code number	P102B
Fault code description	Temperature after BPV - Voltage too low or short circuit to ground on ECU D420 pin
	C11
Fault code information	For further assistance: Contact the PACCAR Engine Support Call Center 1-800-477-0251 Please Contact the Engine Support Center
Description of component(s)	
Location of component(s)	
Diagnostic condition	
Set condition of fault code	
Reset condition of fault code	
Electrical diagram(s)	
Technical data	
Possible causes	
Additional information	
Diagnostic Step-by-Step	
Verification Drive Cycle	
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P102C

Code number	P102C
Fault code description	Broken Turbine fault
Fault code information	For further assistance: Contact the PACCAR Engine Support Call Center 1-800-477-0251 Please Contact the Engine Support Center
Description of component(s)	
Location of component(s)	
Diagnostic condition	
Set condition of fault code	
Reset condition of fault code	
Electrical diagram(s)	
Technical data	
Possible causes	
Additional information	
Diagnostic Step-by-Step	
Verification Drive Cycle	
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P102D

Code number	P102D
Fault code description	AMF CAN sensor burn off timeout fault
Fault code information	For further assistance: Contact the PACCAR Engine Support Call Center 1-800-477-0251 Please Contact the Engine Support Center
Description of component(s)	
Location of component(s)	
Diagnostic condition	
Set condition of fault code	
Reset condition of fault code	
Electrical diagram(s)	
Technical data	
Possible causes	
Additional information	
Diagnostic Step-by-Step	
Verification Drive Cycle	
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P102E

Code number	P102E
Fault code description	AMF PCB temperature out of range at power up
Fault code information	For further assistance: Contact the PACCAR Engine Support Call Center 1-800-477-0251 Please Contact the Engine Support Center
Description of component(s)	
Location of component(s)	
Diagnostic condition	
Set condition of fault code	
Reset condition of fault code	
Electrical diagram(s)	
Technical data	
Possible causes	
Additional information	
Diagnostic Step-by-Step	
Verification Drive Cycle	
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P102F

Code number	P102F
Fault code description	BPV actuator temperature – Data erratic , intermittent or incorrect at ignition on
Fault code information	2 trip MIL
radic code illiorination	3 drive cycle recovery
	Readiness group – None
	Freeze frame type - Generic
Description of component(s)	The BPV actuator consists of an actuator and a BPV valve.
Description of component(s)	
	The main task of the BPV valve is to create back pressure in the engine exhaust
	system and control exhaust gas mass flow.
	• Lever
	• Spring
	Butterfly valve
	BPV actuator
	The main components of the BPV actuator are:
	• ECU
	Electromotor
	The electromotor rotates the output shaft via internal gears.
	output shaft
	The butterfly is moved via a lever by rotating the output shaft
	electromotor position sensor
	The position of the electromotor is monitored.
	output shaft position sensor
	 The position of the output shaft is monitored.
	temperature sensor
	- temperature sensor
	The temperature of the printed circuit board of the ECU is monitored.
	Control
	The BPV actuator is a smart actuator that communicates with the PCI ECU via E-CAN. The actuator ECU is controlled by the PCI ECU but has its own diagnostics on the
	following actuator inputs and outputs:
	power supply voltage
	electromotor position
	electromotor current
	output shaft position
	ECU printed circuit board temperature
	ECU hardware and software
	After the ignition is keyed on, the valve position is 100% until the actuator is
	controlled by the PCI ECU.
	Unpowered and fail-safe position
	The unpowered and fail-safe positions of the valve are controlled by a spring and are
	fully open (100%). If a failure is detected the BPV valve moves to the fail-safe position, if possible.
	Effect on the system:
	Creating heat in the exhaust system to heat up the EAS system.



	 A lower opening percentage results in a higher back pressure and more heat. Decreasing the exhaust gas flow in the exhaust system to heat up the EAS system. A lower opening percentage results in a lower exhaust gas flow in the exhaust system and more heat. Altering the pressure drop across the turbine rotor for VTG turbo control. Creating back pressure to create EGR gas flow. Creating back pressure to create engine braking.
Location of component(s)	L096
Diagnostic condition	 This diagnostic runs: when the ignition is switched on (NO engine start), and; the difference between the coolant temperature and ambient temperature is less than 15°C [59°F], and;
Set condition of fault code	ambient temperature is more than -20°C [-4°F] The PCI ECU (D420) detects that the actuator temperature from the BPV actuator
	(L096) differs by more than 3°C [37°F] from the average of other temperature sensors on the engine for more than 5 seconds (after the ignition has been keyed off for at least 8 hours).
Reset condition of fault code	The 8-hour ignition off diagnostics consists of three separate steps:
	 The vehicle ignition may NOT be switched on or engine started for 8-10 consecutive hours (ideal situation would be overnight). Once the 8 to 10 consecutive hours have been reached, key on the ignition



(NO engine start) and wait for 10 seconds to allow the system to power up and the diagnostics to run. Start the engine and let it idle for 2 minutes. This DTC changes to inactive when the fault is no longer detected. Electrical diagram(s) 10% PCI D420 46 23 _____ 69 Wiring harness connector D420.C front view Wiring harness connector L096 front view 122E 12-pin interface connector 123E 7-pin interface connector electronic fan interface connector A204 **PCI ECU** D420



	FOED IN WITH AND ADDRESS OF THE PARTY OF THE		
	F852 humidity sensor		
	L037 VTG turbocharger actuator		
	L095 EGR valve module		
	L096 BPV valve		
	D420 L096 Function		
	C90 1 E-CAN high		
	C92 2 E-CAN low		
	3 Ground		
	4 Power supply after ignition		
Technical data	Component & wiring check, BPV valve (L096)		
	Preparation		
	Key off the ignition.		
	Disconnect connector L096		
	Measure on the front side of wiring harness connector L096		
	Pin Pin		
	(+ probe) (- probe)		
	Value Additional information		
	4 3 Ubat ignition keyed on		
	1 2 $\pm 60 \Omega$ • Ignition keyed off		
	Ground cable from the battery		
	disconnected		
	Vehicle Communication Interface (VCI)		
	of DAVIE disconnected		
Possible causes	Faulty BPV actuator (L096)		
Additional information	· · · · · · · · · · · · · · · · · · ·		
Additional information	The BPV actuator is a smart actuator that communicates with the PCI ECU via E- CAN The actuator ECU is controlled by the PCI ECU but has its own diagnostics.		
	CAN. The actuator ECU is controlled by the PCI ECU but has its own diagnostics.		
	The temperature is measured on the (printed circuit board) of the actuator. For this diagnostic, the received actuator temperature from the BBV actuator.		
	For this diagnostic, the received actuator temperature from the BPV actuator (1020) is compared with an average of other temperature conserve on the engine.		
	(L020) is compared with an average of other temperature sensors on the engine		
Discounting to the Charles	after the ignition has been keyed off for at least 8 hours.		
Diagnostic Step-by-Step	Perform the troubleshooting steps below using the breakout harness, if		
	necessary, to check electrical components, such as sensors, electrical control		
	units, and harnesses. Back probing is not recommended, as it could damage		
	the harness. The ignition should always be in the OFF position when		
	connecting or disconnecting electrical components in order to reduce the		
	likelihood of damage to electrical components.		
	Disconnecting the EAS connectors during the troubleshooting		
	process will result in multiple errors.		
	For specific electrical component information and pinout locations,		
	always refer to the technical data.		
	It is necessary to exit the fault code menu in DAVIE and run the		
	diagnostic test again to identify a change in errors.		
	 Remember that the truck's operational or mechanical issues may be 		
	the root cause of both active and inactive fault codes. Refer to the		
	'possible causes' section.		
	Step 1 Step ID 102F-a SRT		
1	Visually inspect all applicable connectors (bent, broken, corroded or loose pins)		
	and harnesses for corrosion, damage, and rubbing during each step of the		



	diagnostic procedure. Proceed to step 2.		
	GLAND GRAND GRAND		
	Step 2 Step ID 102F-b SRT		
	Electrical Checks		
	Ensure that the ignition key/switch has been set to OFF before disconnecting		
	related cables.		
	Based on the fault message provided, confirm that the following electrical values		
	are within specified ranges or limits:		
	Supply and signal voltages (12V).		
	Cable continuity (no opens or shorts).		
	Are measured electrical values outside of expected range or limits?		
	Yes - Proceed to step 3		
	No - Proceed to step 4		
	Step 3 Step ID 102F-c SRT		
	Replace: BPV Actuator		
	If no problems were detected in the preceding steps, an internal problem has most		
	likely occurred with the BPV Actuator.		
	Replace the identified faulty component.		
	Use DAVIE to re-check for the presence of active faults.		
	 If this related fault is no longer active, then this issue has been resolved. 		
	 If this related fault is still active, continue to the next step in the 		
	troubleshooting process.		
	Step 4 Step ID 102F-d SRT		
	For further assistance in diagnosing this issue or for confirmation prior to the replacement of suspect components, contact the Engine Support Call Center at 1-800-477-0251.		
Verification Drive Cycle	To validate repair, with the brakes set, turn the key to the ON position with the engine off, and allow 10 seconds for the system to initialize and run diagnostics		
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1 1050			
Code number	P1030		
Fault code description	EGR Temperature-Data erratic, intermittent or incorrect at ignition on.		
Fault code information	2 trip MIL		
	3 drive cycle recovery		
	Readiness group – None		
	Freeze frame type - Generic		
Description of component(s)	The EGR gas flow temperature is measured after the EGR cooler.		
	Effect on the system:		
	Corrects EGR gas flow calculation (the temperature is an indication of the gas		
	density)		
	Closes the EGR valve when the EGR temperature is too high		
	Monitors EGR cooler performance		
Location of common aut/a	Wionitors Law cooler periormance		
Location of component(s)	F740		
	F749		
Diagnostic condition	This diagnostic runs:		
Diagnostic condition			
	when the ignition has been keyed off continuously for at least 8 hours;		
	difference between the coolant temperature and ambient temperature is less		
	than 15°C [59°F]		
	 ambient temperature is more than -20°C [-4°F] 		
Set condition of fault code	The PCI ECU (D420) detects that the measured EGR temperature sensor differs by		
	more than 3°C [37°F] from the average of other temperature sensor readings on/off		
	the engine for more than 5 seconds (after the ignition has been keyed off for at least		
	8 hours).		
Reset condition of fault code	The 8-hour ignition off diagnostics consists of three separate steps:		



The vehicle ignition may NOT be switched on or engine started for 8-10 consecutive hours (ideal situation would be overnight). Once the 8 to 10 consecutive hours have been reached, key on the ignition (NO engine start) and wait for 10 seconds to allow the system to power up and the diagnostics to run. Start the engine and let it idle for 2 minutes. This DTC changes to inactive when the fault is no longer detected. Electrical diagram(s) D420 23 ______ Wiring harness connector D420.A front view 2 Wiring harness connector F749 front view



	D420 F749	Functio	n	
	C9 1 Signal, EGR temperature			
	C31 2	Ground	· ·	
Technical data	Component check, EGR temperature sensor (F749)			
	Preparation			
	Key off the ignition			
	Disconnect connector F749			
			nponent connecto	or F749
	Pin	Pin	mporterit comicate	
	(+probe)	(-probe)	Value	Additional information
	1	2	97.7–100.3 Ω	Resistance value at 0°C [32°F]
			107.4–108.2 Ω	Resistance value at 20°C [68°F]
			137.5–139.1 Ω	Resistance value at 100°C [212°F]
			167.3–169.7 Ω	Resistance value at 180°C [356°F]
			192.5–195.5 Ω	Resistance value at 250°C [482°F]
			132.3 133.3 12	Nesistance value at 250 e [402 1]
	Component &	& circuit ch	eck, ECU (D420)	
	Preparation		, , ,	
	Key c	off the ignit	tion	
	• Disco	nnect con	nector F749	
	• Meas	sure on the	front side of wiri	ng harness connector F749
	Pin	Pin		
	(+probe)	(-probe)	Value	Additional information
	1	2	5V	Ignition keyed on
Possible causes	EGR tempera	ture senso	r deviation	
Additional information	For this diagr	ostic, the I	EGR temperature	sensor (F749) reading is compared with an
	average of ot	her tempe	rature sensors on	the engine after the ignition has been keyed
	off for at least 8 hours.			
Diagnostic Step-by-Step	Perfo	rm the tro	ubleshooting step	s below using the breakout harness, if
	<i>M</i> •	•		nponents, such as sensors, electrical
		•		k probing is not recommended, as it could
		•	•	should always be in the OFF position
			-	g electrical components to reduce the
	likelihood of damage to electrical components			
			_	based on the assumption that supply
	power and ground to the PCI are functioning properly.			
	•		~	ectors during the troubleshooting process
			in multiple errors	
	•		-	onent information and pinout locations,
			fer to the technica	tive errors' screen in DAVIE and run the
	_			ntify changes in errors.
	•	_	_	operational or mechanical issues may be
				e and inactive codes. Refer to the 'possible
			ction in Rapido.	e and mactive codes. Never to the possible
	Step 1		Step ID 1030	Oa SRT
	<u> </u>	ction - Visi		ssociated component connections and
	wiring for a			,
	_		ose connectors	
		U		



- Bent, broken, corroded or loose connector pins
- Moisture or dirt in the connections
- Damage to the wire harness or insulation
- ECU connections damaged or disconnected
- Batteries are not okay, contacts are not tight
- Signs of exhaust or coolant leaks on the EGR
- Improper coolant level
- Broken or missing clamps on any air component part

Was there evidence of any of the above?

- No: Continue to the next step in the troubleshooting process.
- Yes: Clean, adjust, repair, or replace affected components for any issues identified.

Use DAVIE to re-check for the presence of active faults.

- If this related fault is no longer active, then this issue has been resolved.
- If this related fault is still active, continue to the next step in the troubleshooting process.

Step 2	Step ID 1030b	SRT

DAVIE Direct: Monitor EGR and related temperature sensors

Use DAVIE to monitor the following temperatures:

- EGR Temperature
- Ambient Temperature
- Intercooler Temperature
- Before Turbine Temperature
- Coolant Temperature

Idle the engine for a minimum of 10 minutes to allow temperatures to stabilize. While monitoring, temperature values from sensor to sensor should not vary more

than ±30°F.

Do any monitored values vary by more than ±30°F?

- No: Continue to the next step in the troubleshooting process.
- Yes: Clean adjust, repair or replace affected components for any issues identified.

Use DAVIE to re-check for the presence of active faults.

- If this related fault is no longer active, then this issue has been resolved.
- If this related fault is still active, continue to the next step in the troubleshooting process.

Step 3	Step ID 1030c	SRT
Step 5	300 15 10300	J

Ancillary Test: Air Side Pressure Test

Perform the prescribed testing to identify any potential leaks in the system.

Does the test fail to complete or result in a failed state?

- No: Continue to the next step in the troubleshooting process.
- Yes: Make the appropriate repairs or component replacements.

Use DAVIE to re-check for the presence of active faults.

- If this related fault is no longer active, then this issue has been resolved.
- If this related fault is still active, continue to the next step in the troubleshooting process.



	Step 4	Step ID 1030d	SRT		
	Replace: EGR Temperature sensor				
	Replace the identified smart sensor.				
	Use DAVIE to re-check for	Use DAVIE to re-check for the presence of active faults.			
	If this related fault is no longer active, then this issue has been resolved.				
	If this related fault is still active, continue to the next step in the				
	troubleshooting pr	ocess.			
			_		
	Step 5	Step ID 1030e	SRT		
	Contact the PACCAR Engine Support Call Center For further assistance in diagnosing this issue or for confirmation prior to the replacement of suspect components, contact the PACCAR Engine Support Call				
	Center at 1-800-477-0251.				
Verification Drive Cycle	To validate repair, with the	brakes set, turn the key to th	e ON position with the		
	engine off, and allow 10 seconds for the system to initialize and run diagnostics.				
			Back to Index		



Code number	P1032		
Fault code description	Vehicle speed - Data erratic, intermittent, or incorrect at ignition on		
Fault code description			
rault code information	3 drive cycle recovery		
	Readiness group – None		
Description of the second of the	Freeze frame type – Generic		
Description of component(s)	Not required		
Location of component(s)	Not required		
Diagnostic condition	This diagnostic runs once after the ignition is on.		
Set condition of fault code	The PCI ECU (D420) detects that the measured vehicle speed is unlikely when the		
	ignition is keyed on.		
Reset condition of fault code	This DTC changes to inactive when the fault is no longer detected. To validate the		
	repair, key off the ignition for at least 15 seconds, key it on again, then monitor		
	vehicle speed signal with DAVIE at vehicle standstill.		
Electrical diagram(s)	Not required		
Technical data	Not required		
Possible causes	Faulty vehicle speed signal		
Additional information	No additional information found.		
Diagnostic Step-by-Step	Perform the troubleshooting steps below using the breakout harness, if		
	necessary, to check electrical components, such as sensors, electrical control units, and harnesses. Back probing is not recommended, as it could damage the harness. The ignition should always be in the OFF position when connecting or disconnecting electrical components to reduce the likelihood of damage to electrical components This troubleshooting tree is based on the assumption that supply power and ground to the PCI are functioning properly. Disconnecting the PCI connectors during the troubleshooting process will result in multiple errors. For specific electrical component information and pinout locations, always refer to the technical data in Rapido. It is necessary to exit the 'active errors' screen in DAVIE and run the diagnostic test again to identify changes in errors. Remember that the truck's operational or mechanical issues may be the root cause of both active and inactive codes. Refer to the 'possible causes' section in Rapido.		
	Step 1 Step ID 1032a SRT		
	Clear the fault codes		
	Clear the fault codes.		
	Turn the key switch ON.		
	Is fault code P1032 inactive?		
	Yes – Repair complete		
	No –Proceed to step 2		
	Step 2 Step ID 1032b SRT		
	For further assistance in diagnosing this issue or for confirmation prior to the		
	replacement of suspect components, contact the Engine Support Call Center at		
	1-800-477-0251.		
Verification Drive Cycle	To verify the repair:		



With the brakes set, turn the key to the ON position with the engine off, and allow 10 seconds for the system to initialize and run diagnostics.
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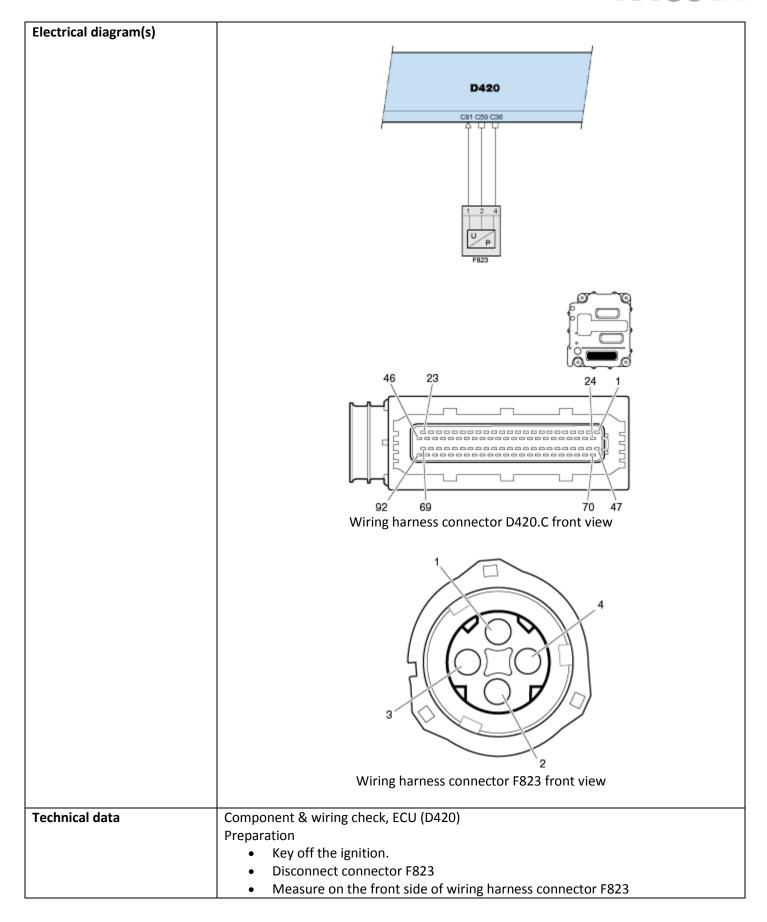


Code number	P1039
Fault code description	Pressure after BPV – Data valid but too high
Fault code information	2 trip MIL
	3 drive cycle recovery
	Readiness group – None
	Freeze frame type - Generic
Description of component(s)	Description, Pressure Sensor After BPV (F823)
	The exhaust gas pressure after the BPV valve is measured by the sensor (1) via a steel tube (2).
	Effect on the system:
	 Correction of the NOx sensor before the catalyst signal. A higher measured exhaust gas pressure after the BPV valve results in lower calculated NOx emissions by the engine.
012 DACCAR MY Diagnostic So	



	 Calculates the exhaust gas temperature before the turbine Lower measured exhaust gas pressure after the BPV valve results in higher calculated exhaust gas temperature before the turbine.
Location of component(s)	F823
Diagnostic condition	 The diagnostic runs if all the conditions mentioned in this chapter are met. The air pressure sensor after BPV is fitted. EGR and BPV are controlled normally. No faults present on the pressure sensor after BPV, ambient pressure sensor, pressure sensor before turbine. Exhaust gas flow rate > 250 g/s. Time since engine start > 60 seconds.
Set condition of fault code	The DTC is set if the pressure after BPV corrected for the ambient pressure is higher than the threshold which is based on the exhaust gas mass flow.
Reset condition of fault code	This DTC changes to inactive when the fault is no longer detected.







	Pin Pin		
	(+ probe) (- probe) Value Additional information		
	2 4 5V Ignition keyed on		
Possible causes	None		
Additional information			
	Part of the component check for OBD functionality.		
Diagnostic Step-by-Step	Perform the troubleshooting steps below using the breakout harness, if necessary, to check electrical components, such as sensors, electrical control units, and harnesses. Back probing is not recommended, as it could damage the harness. The ignition should always be in the OFF position when connecting or disconnecting electrical components to reduce the likelihood of damage to electrical components • This troubleshooting tree is based on the assumption that supply power and ground to the PCI are functioning properly. • Disconnecting the PCI connectors during the troubleshooting process will result in multiple errors. • For specific electrical component information and pinout locations, always refer to the technical data in Rapido. • It is necessary to exit the 'active errors' screen in DAVIE and run the diagnostic test again to identify changes in errors. • Remember that the truck's operational or mechanical issues may be the root cause of both active and inactive codes. Refer to the 'possible causes' section in Rapido.		
	Step 1 Step ID 1039a SRT Visually inspect all applicable connectors (bent, broken, corroded or loose pins) and harnesses for corrosion, damage, and rubbing during each step of the		
	diagnostic procedure. Proceed to step 2.		
	Standard Sp. 18.4020h		
	Step 2 Step ID 1039b SRT		
	Electrical Checks Ensure that the ignition key/switch has been set to OFF before disconnecting related cables. Based on the fault message provided, confirm that the following electrical values are within specified ranges or limits: • Supply and signal voltages (12V). • Cable continuity (no opens or shorts). Are measured electrical values outside of expected range or limits? • Yes - Proceed to step 3 • No - Proceed to step 4		
	Step 3 Step ID 1039c SRT		
	Visual inspection: DOC Inlet Remove the DOC inlet and visually inspect for any of the following: • Signs of damage • Soot plugging; 50% or more of the cells in the catalyst being plugged Was there evidence of any of the above? • No: Continue to the Step 4 in the troubleshooting process.		
	 Yes: Clean, adjust, repair, or replace affected components for any issues identified. Proceed to step 5 		



If soot plugging was found, perform a manual cleaning of the DPF or perform a stationary regeneration.

Use DAVIE to re-check for the presence of active faults.

- If this related fault is no longer active, then this issue has been resolved.
- If this related fault is still active, continue to the next step in the troubleshooting process.

Step 4 Step ID 1039d SRT

Visual inspection: After BPV Pressure sensor

Remove the After BPV Pressure sensor and visually inspect the senor tip for any of the following:

- Signs of damage
- Excessive build-up on the sensor tip

Was there evidence of any of the above?

- No: Continue to the next step in the troubleshooting process.
- Yes: Clean, adjust, repair, or replace affected components for any issues identified. Proceed to step 5

If soot plugging was found, perform a manual cleaning of the DPF or perform a stationary regeneration.

Use DAVIE to re-check for the presence of active faults.

- If this related fault is no longer active, then this issue has been resolved.
- If this related fault is still active, continue to the next step in the troubleshooting process.

Step 5 Step ID 1039e SRT

Replace the identified component.

Use DAVIE to re-check for the presence of active faults.

- If this related fault is no longer active, then this issue has been resolved.
- If this related fault is still active, continue to the next step in the troubleshooting process.

Step 6 Step ID 1039f SRT

Contact the PACCAR Engine Support Call Center

For further assistance in diagnosing this issue or for confirmation prior to the replacement of suspect components, contact the PACCAR Engine Support Call Center at 1-800-477-0251.

Verification Drive Cycle

To validate repair:

This cycle is best performed on a level grade road (least amount of incline possible) and under load using a trailer. If a loaded trailer is unavailable, produce engine load by turning the A/C and fan to ON.

With the System Initiation cycle complete, proceed to a road with a minimum speed limit of 50 mph, then get to the highest gear possible with the engine speed between 1100-1500 rpm, and set the cruise control. Run this cycle for roughly 3 to 5 miles or in three separate 1-mile increments if a steady 3 to 5 miles is unachievable.

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P103C

Code number	P103C		
Fault code description	EGR control – unable to reach target		
Fault code information	2 trip MIL		
	3 drive cycle recovery		
	Readiness group – None		
	Freeze frame type - Generic		
Description of component(s)			
Description of component(s)			
	0% 100% Butterfly valve EGR valve actuator Lever Spring		
	The EGR module consists of an actuator and an EGR valve. The main task of the EGR valve is to control the EGR flow to the inlet manifold. The EGR position does not necessarily indicate the amount of EGR flow to the inlet manifold. The amount of EGR gas fed back mainly depends on the pressure difference between the pressure before turbine and the boost pressure, in combination with the EGR valve position The main components of the EGR valve actuator are: ECU Electromotor The electromotor rotates the output shaft via internal gears. output shaft The butterfly is moved via a lever by rotating the output shaft electromotor position sensor The position of the electromotor is monitored. output shaft position sensor		



The position of the output shaft is monitored.

• temperature sensor

The temperature of the printed circuit board of the ECU is monitored.

Contro

The EGR valve actuator is a smart actuator that communicates with the PCI ECU via E-CAN. The actuator ECU is controlled by the PCI ECU but has its own diagnostics on the following actuator inputs and outputs:

- power supply voltage
- electromotor position
- electromotor current
- output shaft position
- ECU printed circuit board temperature
- ECU hardware and software

After the ignition is keyed on, the valve position is 0% until the PCI ECU commands the actuator.

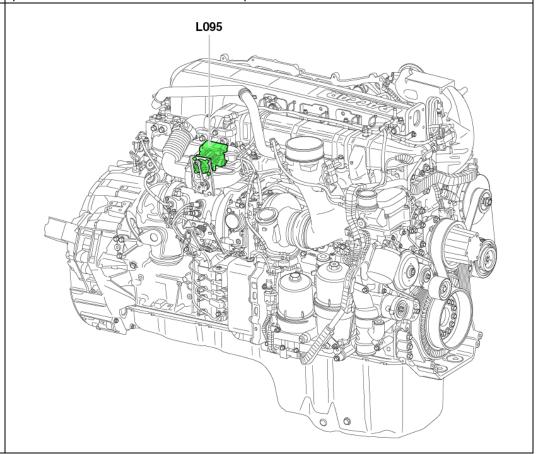
Unpowered and fail-safe position

The unpowered and the fail-safe positions of the valve are controlled by a spring and are fully closed (0%). If a failure is detected the EGR valve moves to the fail-safe position, if possible.

Effect on the system:

Controlling the EGR gas flow to the inlet manifold. A higher opening percentage results in a higher amount of EGR flow at the same pressure difference between the pressure before turbine and the boost pressure

Location of component(s)





Diagnostic condition	This diagnostic runs:			
Diagnostic condition	This diagnostic runs: • when the engine is running at a steady load, and:			
	 when the engine is running at a steady load, and; coolant temperature is above 50°C [122°F] The PCI ECU (D420) detects that the demanded NOx conversion is limited by the EGR 			
Set condition of fault code	The PCI ECU (D420) detects that the demanded NOx conversion is limited by the EGR			
See condition or iddit code	system limits for more than 300 seconds.			
Reset condition of fault code	This DTC changes to inactive when the fault is no longer detected. To validate the			
neset condition of fault code	repair, drive the vehicle until the coolant temperature is at least 70°C [158°F]. Once			
	the minimum target temperature has been reached, perform several low to higher			
	speed accelerations with moderate engine load. Also perform high-load to low-load			
	transitions. This activity should be conducted within the range of 15 km/h [10 mph] to			
	65 km/h [40 mph] for no more than 5 to 8 km [3 to 5 miles].			
Electrical diagram(s)	, La manifest and manages and the control of the co			
	9 10 3 1 5 2 6 6 7 122E 123E A204			
	L095 M 1200 GAN GAN 1 2 3 4 4 3 1 2 CAN 1 2 3 4 4 3 1 2			
	PCI D420			
	92 69 70 47 Wiring harness connector D420.C front view			
	4 2			
	Wiring harness connector L095 front view			



	4225 42 11 11 11 11 11 11				
	122E 12-pin interface connector				
	123E 7-pin interface connector				
	A204 electronic fan interface connector				
	D420 PCI ECU				
	F852 humidity sensor				
	L037 VTG turbocharger actuator				
	L095 EGR valve module				
	L096 BPV valve				
	D420 L095 Function				
	C90 1 E-CAN high				
	C92 2 E-CAN low				
	3 Ground				
	4 Power supply after ignition				
Technical data	Component & wiring check, EGR valve module (L095)				
	Preparation				
	Key off the ignition.				
	Disconnect connector L095				
	 Measure on the front side of wiring harness connector L095 				
	Pin Pin				
	(+ probe) (- probe) Value Additional information				
	3 4 Ubat ignition keyed on				
	1 2 $\pm 60 \Omega$ 1. Ignition keyed off				
	2. Ground cable from the battery disconnected				
	3. Vehicle Communication Interface (VCI) of				
	DAVIE disconnected				
Possible causes	Leaking EGR system				
	Clogged EGR system				
	Clogged EGR pressure difference sensor venturi				
	NOx before catalyst sensor deviation.				
Additional information	The engine NOx emission is, among others, controlled by varying the EGR flow toward				
Diagnostic Stop by Stop	the inlet manifold of the engine.				
Diagnostic Step-by-Step	Perform the troubleshooting steps below using the breakout harness, if				
	necessary, to check electrical components, such as sensors, electrical				
	control units, and harnesses. Back probing is not recommended, as it could				
	damage the harness. The ignition should always be in the OFF position				
	when connecting or disconnecting electrical components to reduce the				
	likelihood of damage to electrical components				
	This troubleshooting tree is based on the assumption that supply				
	power and ground to the PCI are functioning properly.				
	Disconnecting the PCI connectors during the troubleshooting process will provide in growth				
	will result in multiple errors.				
	For specific electrical component information and pinout locations, always refer to the technical data in Panido.				
	always refer to the technical data in Rapido.				
	It is necessary to exit the 'active errors' screen in DAVIE and run the diagnostic test again to identify changes in errors.				
	 diagnostic test again to identify changes in errors. Remember that the truck's operational or mechanical issues may be 				
	the root cause of both active and inactive codes. Refer to the 'possible				
	the root cause of both active and mactive codes. Refer to the possible				



causes' section in Rapido.

Step 1 Step ID 103C-a SRT

Visually inspect all applicable connectors (bent, broken, corroded or loose pins) and harnesses for corrosion, damage, and rubbing during each step of the diagnostic procedure. Proceed to step 2.

Step 2 Step ID 103C-b SRT

Check for any Internal or external exhaust leakage in the EGR system. Is leakage present?

• Yes: - Replace the identified component.

Use DAVIE to re-check for the presence of active faults.

- If this related fault is no longer active, then this issue has been resolved.
- If this related fault is still active, Proceed to step 3
- No: Proceed to step 3

Step 3 Step ID 103C-c SRT

Check for clogged/restrictions in the lines connected to the EGR pressure differential sensor.

• Yes: - Clean the clogged/restrictions in the lines.

Use DAVIE to re-check for the presence of active faults.

- If this related fault is no longer active, then this issue has been resolved.
- If this related fault is still active, Proceed to step 4
- No: Proceed to step 4

Step 4 Step ID 103C-d SRT

Check for Clogged EGR system or in the EGR cooler.

Is EGR system or EGR cooler is clogged?

• Yes: - Clean the EGR cooler.

Use DAVIE to re-check for the presence of active faults.

- If this related fault is no longer active, then this issue has been resolved.
- If this related fault is still active, Proceed to step 5
- No: Proceed to step 5

Step 5 Step ID 103C-e SRT

Check NOx Sensor, Before Catalyst

Replace the identified component.

Use DAVIE to re-check for the presence of active faults.

- If this related fault is no longer active, then this issue has been resolved.
- If this related fault is still active, Proceed to step 6

Step 6 Step ID 103C-f SRT

For further assistance in diagnosing this issue or for confirmation prior to the replacement of suspect components, contact the PACCAR Engine Support Call Center at 1-800-477-0251.



Verification Drive Cycle	To validate the repair: Drive the vehicle on a level grade road (least amount of incline possible) and under load using a trailer. If a loaded trailer is unavailable, produce engine load by turning the A/C and fan to ON. With the System Initiation cycle complete, proceed to a road with a minimum speed limit of 50 mph, then get to the highest gear possible with the engine speed between 1100-1500 rpm, and set the cruise control. Run this cycle for roughly 3 to 5 miles or in three separate 1-mile increments if a steady 3 to 5 miles is unachievable.
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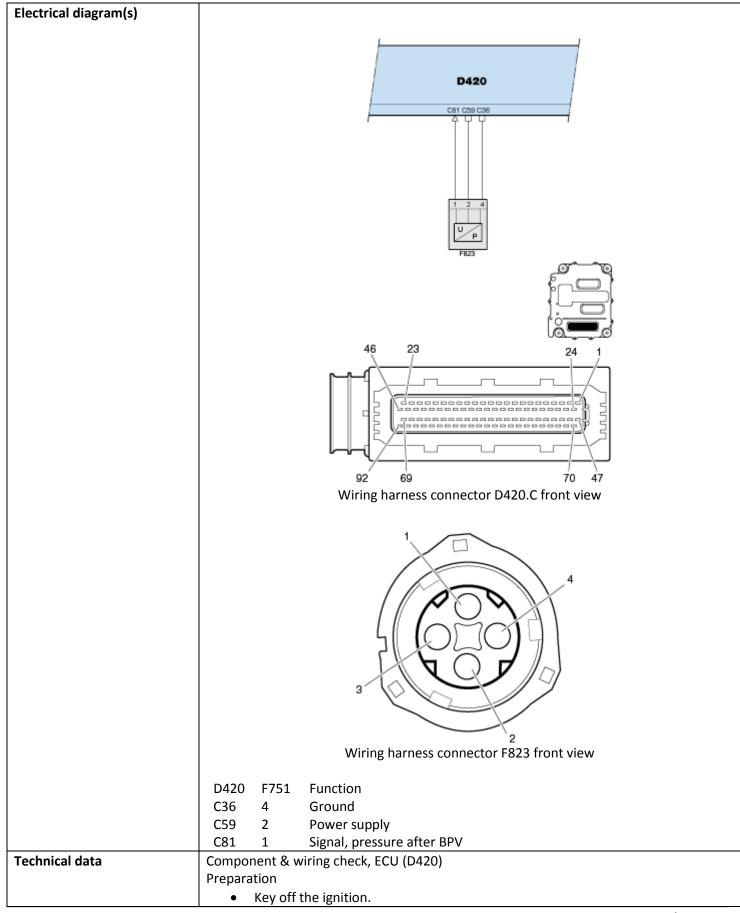
P1040

Code number	P1040		
Fault code description	Pressure after BPV - Data valid but too low		
Fault code information	2 trip MIL		
	3 drive cycle recovery		
	Readiness group – None		
	Freeze frame type - Generic		
Description of component(s)	The exhaust gas pressure after the BPV valve is measured by the sensor (1) via a stee		
bescription of component(s)	tube (2).		
	tube (2).		
	2		
	E Do Con-Hand		
	Effect on the system:		
	Correction of the NOx sensor before the catalyst signal		
	 A higher measured exhaust gas pressure after the BPV valve results in lower 		
	calculated NOx emissions by the engine.		
	 Calculates the exhaust gas temperature before the turbine 		
	Lower measured exhaust gas pressure after the BPV valve results in higher calculated		
	exhaust gas temperature before the turbine.		



Location of component(s)	
	F823
Diagnostic condition	 The diagnostic runs if all the conditions mentioned in this chapter are met. The air pressure sensor after BPV is fitted.
	EGR and BPV are controlled normally.
	No faults present on the pressure sensor after BPV, ambient pressure sensor, pressure sensor before turbing.
	 pressure sensor before turbine. Exhaust gas flow rate > 250 g/s.
	 Exhaust gas now rate > 250 g/s. Time since engine start > 60 seconds.
Set condition of fault code	The DTC is set if the pressure after BPV corrected for the ambient pressure is lower
	than the threshold which is based on the exhaust gas mass flow.
Reset condition of fault code	This DTC changes to inactive when the fault is no longer detected.
neset condition of fault code	This DTC changes to mactive when the fault is no longer detected.







	Disconnect connector F823					
	Measure on the front side of wiring harness connector F823					
	Pin Pin					
	(+ probe) (- probe) Value Additional information					
	2 4 5V Ignition keyed on					
Possible causes	Leaking pressure sensor after BPV system					
	Faulty pressure sensor after BPV					
	 NOx before catalyst s 	ensor deviation.				
Additional information	Part of the component ch	eck for OBD functionality	/.			
Diagnostic Step-by-Step	Perform the troubleshooting steps below using the breakout harness, if					
	necessary, to check electrical components, such as sensors, electrical control					
	units, and harnes	units, and harnesses. Back probing is not recommended, as it could damage				
	the harness. The	gnition should always be	e in the OFF position when			
	connecting or dis	connecting electrical con	ponents to reduce the likelihood			
	of damage to elec	ctrical components				
	• This trouble	shooting tree is based or	n the assumption that supply			
	power and a	ground to the PCI are fur	ctioning properly.			
	• Disconnecti	ng the PCI connectors du	ring the troubleshooting process			
	will result ir	multiple errors.				
	 For specific 	electrical component inf	ormation and pinout locations,			
	always refe	to the technical data in	Rapido.			
	 It is necessar 	ry to exit the 'active erro	ors' screen in DAVIE and run the			
	diagnostic test again to identify changes in errors. Remember that the truck's operational or mechanical issues may be the root cause of both active and inactive codes. Refer to the 'possible'					
	causes' section in Rapido.					
	Step 1 Step 1040a SRT					
	Visually inspect all applicable connectors (bent, broken, corroded or loose pins)					
	and harnesses for corrosion, damage, and rubbing during each step of the					
	diagnostic procedure. Pr	oceed to step 2.				
	Step 2	Step 1040b	SRT			
	Turn the key switch ON	and use the DAVIE to Che	eck for Fault Codes present on			
	system.					
	Is other fault codes are a	active?				
	 Yes – Proceed with the appropriate fault code resolution No – Proceed to step 3 					
	Step 3 Step 1040c SRT					
	Check for any leakage in	the BPV system.				
	Is leakage present?					
	1 I	e identified component.				
	Use DAVIE to re-check for the presence of active faults.					
		d fault is no longer active	e, then this issue has been			
	resolved. • If this related fault is still active, Proceed to step 4					
	No: - Proceed to step 4					
	Step 4	Step 1040d	SRT			



	Repair or replace the BPV Position Actuator.					
	Use DAVIE to re-check for the presence of active faults.					
	If this related fault is no longer active, then this issue has been resolved.					
	If this rel					
	Step 5	Step 5 Step ID 1040e SRT				
	Check NOx Senso	Check NOx Sensor, Before Catalyst				
	Replace the iden	Replace the identified component.				
		Use DAVIE to re-check for the presence of active faults.				
		If this related fault is no longer active, then this issue has been resolved.				
	If this rel	lated fault is still active, Proceed	to step 6			
	Step 6	Step 1040f	SRT			
		CAR Engine Support Call Center				
	For further assistance in diagnosing this issue or for confirmation prior to the					
	replacement of suspect components, contact the PACCAR Engine Support Call					
	Center at 1-800-477-0251.					
Verification Drive Cycle	To validate the repair, drive the vehicle until the coolant temperature is at least 70°C					
	[158°F]. Once the minimum target temperature has been reached, proceed at a					
	minimum speed of 80 km/h [50 mph] in the highest gear possible with the engine speed					
	between 1100 and 1500 rpm and set the cruise control. This test is best performed with					
	a loaded vehicle/trailer, but if load is unavailable, turn as many engine power					
	consumers on to produce engine load. Perform this test for roughly 5 to 8 km [3 to 5					
	miles] or in 3 separate 1.5 km [1 mile] increments if a steady 5 to 8 km [3 to 5 miles] is					
	unachievable. Use a flat road, if possible.					
	Back to Index					



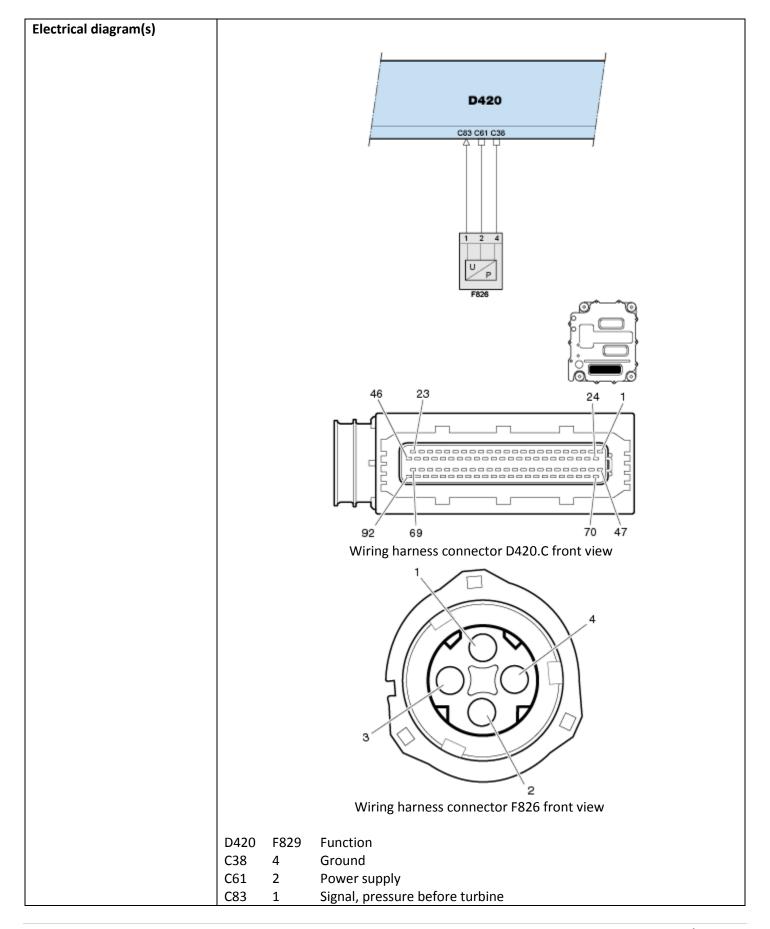
P1042

Code number	P1042			
Fault code description	VTG turbocharger control – Unable to reach target			
Fault code information	2 trip MIL			
	3 drive cycle recovery			
	Readiness group – None			
	Freeze frame type - Generic			
Description of component(s)				
	The exhaust gas pressure before the turbine is measured with sensor (1) via a steel tube (2) before the EGR valve. Effect on the system: Control of the VTG turbo charger Control of the EGR flow			
	Control of the EGR flow Control of the BPV valve			
	Control of the Bry Valve Control of the engine brake			
	Calculates the exhaust gas temperature before the turbine			
	Lower measured exhaust gas pressure before turbine results in higher			
	calculated exhaust gas temperature before the turbine			
	calculated exhaust gas temperature before the turbine			



Location of component(s)				
	F826			
Diagnostic condition	This diagnostic runs:			
	 engine speed is between 1050 and 1850 rpm, and 			
	the engine mode is SCR high efficiency or standard.			
Set condition of fault code	The PCI ECU (D420) detects that the VTG turbocharger control is limited by the The PCI ECU (D420) detects that the VTG turbocharger control is limited by the The PCI ECU (D420) detects that the VTG turbocharger control is limited by the The PCI ECU (D420) detects that the VTG turbocharger control is limited by the			
Reset condition of fault code	 exhaust gas pressure before turbine for more than 300 seconds. This DTC changes to inactive when the fault is no longer detected. To validate the 			
reset condition of fault code	 This DTC changes to inactive when the fault is no longer detected. To validate the repair, drive the vehicle until the coolant temperature is at least 70°C [158°F]. Once the minimum target temperature has been reached, proceed at a minimum speed of 80 km/h [50 mph] in the highest gear possible with the engine speed between 1100 and 1500 rpm and set the cruise control. This test is best performed with a loaded vehicle/trailer, but if load is unavailable, turn as many engine power consumers on to produce engine load. Perform this test for roughly 5 to 8 km [3 to 5 miles] or in 3 separate 1.5 km [1 mile] increments if a steady 5 to 8 km [3 to 5 miles] is unachievable. Use a flat road, if possible. 			







Technical data	Pin Pin				
	(+probe) (-probe) Value Additional information				
	2 4 5V Ignition keyed on				
Possible causes	Leaking exhaust system				
	Leaking pressure sensor before turbine tube				
	Pressure sensor before turbine deviation				
Additional information	The VTG turbocharger control depends, among other factors, on the exhaust gas				
	pressure before turbine.				
	The VTG turbocharger is controlled by the VTG turbocharger actuator (L037).				
	The exhaust gas pressure before turbine is measured by the pressure sensor				
	before turbine (F826).				
Diagnostic Step-by-Step	Perform the troubleshooting steps below using the breakout harness, if				
	necessary, to check electrical components, such as sensors, electrical control				
	units, and harnesses. Back probing is not recommended, as it could damage				
	the harness. The ignition should always be in the OFF position when				
	connecting or disconnecting electrical components in order to reduce the				
	likelihood of damage to electrical components.				
	Disconnecting the EAS connectors during the troubleshooting				
	process will result in multiple errors.				
	For specific electrical component information and pinout locations,				
	always refer to the technical data.				
	It is necessary to exit the fault code menu in DAVIE and run the				
	 diagnostic test again to identify a change in errors. Remember that the truck's operational or mechanical issues may be the root cause of both active and inactive fault codes. Refer to the 				
	'possible causes' section.				
	Step 1 Step 1042a SRT				
	Visually inspect all applicable connectors (bent, broken, corroded or loose pins)				
	and harnesses for corrosion, damage, and rubbing during each step of the				
	diagnostic procedure. Proceed to step 2.				
	Chan 2 Chan 1042h CDT				
	Step 2 Step 1042b SRT				
	Visual Inspection: Pressure sensor before turbo (P3)				
	Visually inspect the identified component for any of the following:				
	Damaged or blockage 1. If evidence for above is not found then proceed with Step 3 2. If evidence of above is found then:				
	Clean, adjust, repair, or replace affected components for any issues				
	identified.				
	Use DAVIE to re-check for the presence of active faults.				
	 If this related fault is no longer active, then this issue has been resolved. 				
	If this related fault is still active, continue to the Step 3				
	Step 3 Step 1042c SRT				
	Ancillary Test: Air Side Pressure Perform the prescribed test to determine if there are any leaks in the air system. Test failed to complete or result in a failed state 1. If the above test fails to complete then proceed with Step 4				



	2. If the above test clears then:				
	Make the appropriate repairs or component replacements.				
	Use DAVIE to re-check for the presence of active faults.				
	If this related fault is no longer active, then this issue has been resolved.				
	• If this related fault is still active, continue to the Step 4.				
	aa carea radic is still active, contained to the step in				
	Step 4 Step 1042d SRT				
	Replace: Pressure sensor before turbo (P3)				
	Replace the identified faulty component.				
	2. Use DAVI	IE to check for the presence of a	active faults.		
	If this related fault is no longer active, then this issue has been resolved.				
	• If this	related fault is still active, conti	nue to the Step 5.		
	Step 5	Step 1042e	SRT		
	Contact the PACC	CAR Engine Support Call Center			
	For further assistance in diagnosing this issue or for confirmation prior to the				
	replacement of suspect components, contact the PACCAR Engine Support Call				
	Center at 1-800-477-0251.				
Verification Drive Cycle	To validate repair:				
	This cycle is best performed on a level grade road (least amount of incline possible)				
	and under load using a trailer. If a loaded trailer is unavailable, produce engine load				
	by turning the A/C and fan to ON.				
	With the System Initiation cycle complete, proceed to a road with a minimum speed				
	limit of 50 mph, then get to the highest gear possible with the engine speed between				
	1100-1500 rpm, and set the cruise control. Run this cycle for roughly 3 to 5 miles or in				
	three separate 1-mile increments if a steady 3 to 5 miles is unachievable.				
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P104B

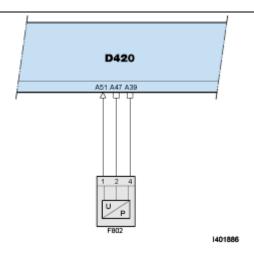
Code number	P104B	
Fault code description	Boost pressure – Data valid but too high	
Fault code information	2 trip MIL 3 drive cycle recovery Readiness group – None Freeze frame type - Crankcase	
Description of component(s)	The boost pressure is measured in the inlet manifold, near cylinder 1. Effect on the system	
	 Determines the smoke limit A higher measured boost pressure increase results in higher torque for the same smoke level 	
	 Determines soot emissions A higher measured boost pressure results in lower calculated soot emission by the engine. 	
	 Determines NOx emissions A higher measured boost pressure results in higher calculated NOx emission by the engine. 	
	 Calculates exhaust gas mass flow used for DEF dosing estimation by the EAS-3 system. A higher measured boost pressure results in higher calculated exhaust gas mass flow. 	
	 Calculates the temperature after the compressor (VTG turbo charger) A higher measured boost pressure results in higher calculated temperature after the compressor. 	
	 Calculates the temperature before the turbine. A higher measured boost pressure results in lower calculated exhaust gas temperature before the turbine. 	



Location of component(s)	F802
	MASSER Z
Diagnostic condition	 This diagnostic runs: When the engine is running at a steady load, and; When coolant temperature is above 50°C [122°F], and; When ambient temperature is between -15 and 40°C [5 and 104°F], and; The engine mode is SCR high efficiency or standard.
Set condition of fault code	The PCI ECU (D420) detects that the measured boost pressure is more than 0.5 bar [7.3 psi] higher than the expected boost pressure for more than 50 seconds.
Reset condition of fault	This DTC changes to inactive when the fault is no longer detected.
code	
	To validate the repair, drive the vehicle until the coolant temperature is at least 70°C [158°F]. Once the minimum target temperature has been reached, proceed at a
	minimum speed of 80 km/h [50 mph] in the highest gear possible with the engine speed
	between 1100 and 1500 rpm and set the cruise control. This test is best performed with
	a loaded vehicle/trailer, but if load is unavailable, turn as many engine power consumers
	on to produce engine load. Perform this test for roughly 5 to 8 km [3 to 5 miles] or in 3 separate 1.5 km [1 mile] increments if a steady 5 to 8 km [3 to 5 miles] is unachievable.
	Use a flat road, if possible.
	ose a nacroad, ii possible.



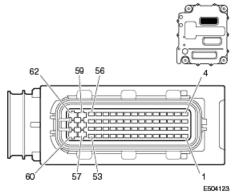
Electrical diagram(s)

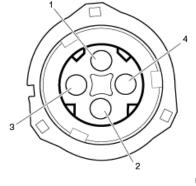


D420 PCI ECU

F802 Boost pressure sensor

D420	F802	Function
A39	4	Ground
A47	2	Power supply
A51	1	Signal, boost pressure





Wiring harness connector D420.A front view

Wiring harness connector F802 front view



Handle connectors and pins with care and use matching measuring probes.

Technical data

Component check, boost pressure sensor (F802)

This type of component cannot be checked with a multimeter or oscilloscope. Perform



	the following to assess the component:			
	 Monitor/test the component with DAVIE Perform the wiring check 			
	Component & wiring check, ECU (D420)			
	Preparation			
	• Disco		nector F802	ring harness connector F802
	Pin (+ probe)	Pin (- probe)	Value	Additional information
		4	5V	Ignition keyed on
Possible causes		ssure sens rger failure	or deviation	
Additional information				npared with an expected boost pressure. he boost pressure sensor (F802).
Diagnostic Step-by-Step	Step 1. Investigate Related Trouble Codes			
	Before troubleshooting this code, take notice of any other active or inactive trouble codes. One or multiple other codes could have been the cause for this code.			
	Step 1.A Investigate related trouble codes			
	Action			
	Use DAVIE Diagnostics to perform a Quick Check for current trouble codes.			
	Are these or any other related codes active?			
	P0107; P0108Any turbocharger related codes			
	Yes			No
	Refer to the troubleshooting information for these codes before continuing with this procedure.			
				Go to step 2.A



Step 2. Intake Manifold (Boost) Pressure Sensor (F802) Checks

Step 2. A Visual inspection, connections and wiring, boost pressure sensor (F802)

Action

- 1. Visually inspect the associated component connections and wiring for any of the following:
 - Damaged or loose connectors
 - Bent, broken, corroded or loose connector pins
 - Moisture or dirt in the connections
 - Damage to the wire harness or insulation
 - The correct parts are not installed
 - ECU connections are damaged or disconnected
 - Batteries not fully charged or contacts are not tight
 - Boost pressure sensor (F802) damaged or not installed correctly

Was there evidence of any of the above?		
Yes	No	
Correct any issues found. If the boost pressure sensor (F802) is found to be damaged or broken, replace it.		
Refer to Step 3.A to perform the corresponding repair verification cycles and rechecks.		
If this code is still present, go to Step 2.B	Go to step 2.B	

Action 1. Perform the steps outlined in the procedure, "pressure testing (intake/exhaust elem.)," job ID 84123, to determine whether there are any leaks in the intake air system. Was there evidence of a leak in the air system? Yes No Correct any issues found.



Refer to step 3.A to perform the corresponding repair verification cycles and rechecks.	
If this code is still present, go to step 2.C.	Go to step 2.C

Step 2.C DAVIE Monitor, inlet air pressure in inlet manifold

Action

- 1. Connect DAVIE.
- 2. Start the truck, and allow it to run at idle.
- 3. Use DAVIE to monitor the inlet air pressure in the inlet manifold:
 - a. Confirm that the air pressure sensor supply voltage is within the referenced range.
 - b. Compare the monitored signal values for inlet air pressure in inlet manifold (relative) to the ambient pressure. With the engine running at idle, the inlet manifold pressure should be slightly above the ambient pressure.
- 4. Turn on A/C and fan to ON, to create a load on the engine.
- 5. Increase the engine RPMs, and then use DAVIE to confirm there is a corresponding increase in the intake air pressure in the inlet manifold. The expected increase can be as much as two to three times the ambient pressure, depending on actual engine loads and turbocharger operation.

Are monitored values within expected range at idle and higher engine RPMs?

Yes	No
	Replace the boost pressure sensor (F802).
	Refer to Step 3.A to perform the corresponding repair verification cycles and rechecks.
If all steps have been completed and this trouble code is still present, contact the PACCAR Engine Support Center for further assistance.	If all steps have been completed and this trouble code is still present, contact the PACCAR Engine Support Center for further assistance.



Step 3. Repair Verification

Step 3.A Repair verification cycles

Perform these repair verification cycles following any corrective actions taken, to enable related OBD monitors to reach a readiness state associated with the trouble code or system being investigated.



Before beginning these repair verification cycles, use the DAVIE Diagnostics, Quick Check function to clear all current DTCs from the PCI and EAS-3 ECUs.

Action

1. Steady State

This cycle is best performed on a level grade road (least amount of incline possible) and under load using a trailer. If a loaded trailer is unavailable, produce engine load by turning the A/C and fan to ON.

With the System Initiation cycle complete, proceed to a road with a minimum speed limit of 50 mph, then get to the highest gear possible with the engine speed between 1100-1500 rpm, and set the cruise control. Run this cycle for roughly 3 to 5 miles or in three separate 1-mile increments if a steady 3 to 5 miles is unachievable.

Were the identified repair verification cycles able to be completed?

Yes	No
	Investigate and correct any issues preventing these repair verification cycles from being completed, then re-run. For additional assistance, contact the PACCAR Engine Support Center.
Go to step 3.B	Go to step 3.B

Step 3.B DAVIE Diagnostics, Quick Check

Action

1. Use DAVIE Diagnostics to perform a Quick Check for current trouble codes to determine whether the actions taken have cleared this trouble code.

H	las	P104B	been c	leared?
---	-----	-------	--------	---------

Yes	No
Problem resolved. No further actions.	Continue with the next step in this troubleshooting procedure. If all steps have been completed and this trouble code is still present, contact the PACCAR Engine Support Center for further



	assistance.
i	Contacting the PACCAR Engine Support Center For further assistance in diagnosing this issue or for confirmation prior to the replacement of suspect components, contact the PACCAR Engine Support Call Center.
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P104C

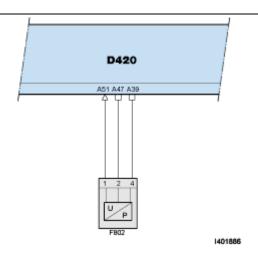
Code number	P104C	
Fault code description	Boost pressure – Data valid but too low	
Fault code information	2 trip MIL 3 drive cycle recovery Readiness group – None Freeze frame type - Crankcase	
Description of component(s)	The boost pressure is measured in the inlet manifold, near cylinder 1. Effect on the system	
	 Determines the smoke limit A higher measured boost pressure increase results in higher torque for the same smoke level 	
	 Determines soot emissions A higher measured boost pressure results in lower calculated soot emission by the engine. 	
	 Determines NOx emissions A higher measured boost pressure results in higher calculated NOx emission by the engine. 	
	 Calculates exhaust gas mass flow used for DEF dosing estimation by the EAS-3 system. A higher measured boost pressure results in higher calculated exhaust gas mass flow. 	
	 Calculates the temperature after the compressor (VTG turbo charger) A higher measured boost pressure results in higher calculated temperature after the compressor. 	
	 Calculates the temperature before the turbine. A higher measured boost pressure results in lower calculated exhaust gas temperature before the turbine. 	



Location of component(s)	F802		
Diagnostic condition	This diagnostic runs:		
	 When the engine is running at a steady load, and; When coolant temperature is above 50°C [122°F], and; When ambient temperature is between -15 and 40°C [5 and 104°F], and; The engine mode is SCR high efficiency or standard. 		
Set condition of fault code	The PCI ECU (D420) detects that the measured boost pressure is more than 0.5 bar [7.3 psi] lower than the expected boost pressure for more than 50 seconds.		
Reset condition of fault	This DTC changes to inactive when the fault is no longer detected.		
code	To validate the repair, drive the vehicle until the coolant temperature is at least 70°C [158°F]. Once the minimum target temperature has been reached, proceed at a minimum speed of 80 km/h [50 mph] in the highest gear possible with the engine speed between 1100 and 1500 rpm and set the cruise control. This test is best performed with a loaded vehicle/trailer, but if load is unavailable, turn as many engine power consumers on to produce engine load. Perform this test for roughly 5 to 8 km [3 to 5 miles] or in 3 separate 1.5 km [1 mile] increments if a steady 5 to 8 km [3 to 5 miles] is unachievable. Use a flat road, if possible.		



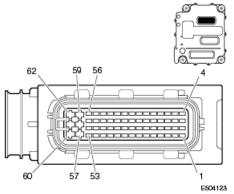
Electrical diagram(s)

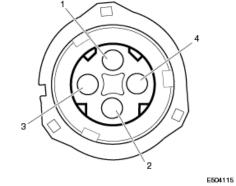


D420 PCI ECU

F802 Boost pressure sensor

D420	F802	Function	
A39	4	Ground	
A47	2	Power supply	
A51	1	Signal, boost pressure	





Wiring harness connector D420.A front view

Wiring harness connector F802 front view



Handle connectors and pins with care and use matching measuring probes.



Technical data	Component check, boost pressure sensor (F802)			
	This type of component cannot be checked with a multimeter or oscilloscope. Perform the following to assess the component:			
	 Monitor/test the component with DAVIE Perform the wiring check 			
	Component & wiring check, ECU (D420)			
	Preparation			
	 Key off the ignition Disconnect connector F802 Measure on the front side of wiring harness connector F802 			
	Pin (+ probe)	Pin (- probe)	Value	Additional information
	2	4	5V	Ignition keyed on
Possible causes	_	inlet air sys		
		ressure sens narger failur	sor deviation e	
Additional information			•	mpared with an expected boost pressure. the boost pressure sensor (F802).
Diagnostic Step-by-Step	The ignition should always be in the OFF position when connecting or disconnecting electrical components to reduce the likelihood of damage to the components.			
	i ·		leshooting proced the PMCI are fund	lure is based on the assumption that supply power and ctioning properly.
	٠.	Disconned in multiple		nnectors during the troubleshooting process will result
		this proce		nt information and pin out locations are provided in ce only. Always refer to the technical data sections in ate changes.
	•			E to clear all current trouble codes from the PCI and the Quick Check to identify a change in fault status.
	•	This DTC isolation, of	can be set as a re complete all troubl	esult of multiple failure modes. For proper fault leshooting steps in the sequence provided.



Step 1. Investigate Related Trouble Codes Before troubleshooting this code, take notice of any other active or inactive trouble codes. One or multiple other codes could have been the cause for this code. Step 1.A Investigate related trouble codes Action 1. Use DAVIE Diagnostics to perform a Quick Check for current trouble codes. Are these or any other related codes active? P0107; P0108 Any turbocharger related codes Yes No Refer to the troubleshooting information for these codes before continuing with this procedure. Go to step 2.A Step 2. Intake Manifold (Boost) Pressure Sensor (F802) Checks Step 2. A Visual inspection, connections and wiring, boost pressure sensor (F802) Action 1. Visually inspect the associated component connections and wiring for any of the following: Damaged or loose connectors Bent, broken, corroded or loose connector pins Moisture or dirt in the connections Damage to the wire harness or insulation The correct parts are not installed

ECU connections are damaged or disconnected

Was there evidence of any of the above?

Batteries not fully charged or contacts are not tight

Boost pressure sensor (F802) damaged or not installed correctly

No

Yes



Correct any issues found. If the boost pressure sensor (F802) is found to be damaged or broken, replace it.	
Refer to Step 3.A to perform the corresponding repair verification cycles and rechecks.	
If this code is still present, go to Step 2.B	Go to step 2.B

Step 2.B Pressure testing, intake and exhaust elements

Action

1. Perform the steps outlined in the procedure, "pressure testing (intake/exhaust elem.)," job ID 84123, to determine whether there are any leaks in the intake air system.

Was there evidence of a leak in the air system?

Yes	No
Correct any issues found.	
Refer to step 3.A to perform the corresponding repair verification cycles and rechecks.	
If this code is still present, go to step 2.C.	Go to step 2.C



Step 2.C DAVIE Monitor, inlet air pressure in inlet manifold

Action

- 1. Connect DAVIE.
- 2. Start the truck, and allow it to run at idle.
- 3. Use DAVIE to monitor the inlet air pressure in the inlet manifold:
 - a. Confirm that the air pressure sensor supply voltage is within the referenced range.
 - b. Compare the monitored signal values for inlet air pressure in inlet manifold (relative) to the ambient pressure. With the engine running at idle, the inlet manifold pressure should be slightly above the ambient pressure.
- 4. Turn on A/C and fan to ON, to create a load on the engine.
- Increase the engine RPMs, and then use DAVIE to confirm there is a corresponding increase in the intake air pressure in the inlet manifold.
 The expected increase can be as much as two to three times the ambient pressure, depending on actual engine loads and turbocharger operation.

Are monitored values within expected range at idle and higher engine RPMs?

Yes	No
	Replace the boost pressure sensor (F802).
	Refer to Step 3.A to perform the corresponding repair verification cycles and rechecks.
If all steps have been completed and this trouble code is still present, contact the	If all steps have been completed and this trouble code is still present,
PACCAR Engine Support Center for	contact the PACCAR Engine Support
further assistance.	Center for further assistance.

Step 3. Repair Verification

Step 3.A Repair verification cycles

Perform these repair verification cycles following any corrective actions taken, to enable related OBD monitors to reach a readiness state associated with the trouble code or system being investigated.



Before beginning these repair verification cycles, use the DAVIE Diagnostics, Quick Check function to clear all current DTCs from the PCI and EAS-3 ECUs.



Action

1. Steady State

This cycle is best performed on a level grade road (least amount of incline possible) and under load using a trailer. If a loaded trailer is unavailable, produce engine load by turning the A/C and fan to ON.

With the System Initiation cycle complete, proceed to a road with a minimum speed limit of 50 mph, then get to the highest gear possible with the engine speed between 1100-1500 rpm, and set the cruise control. Run this cycle for roughly 3 to 5 miles or in three separate 1-mile increments if a steady 3 to 5 miles is unachievable.

Were the identified repair verification cycles able to be completed?

Yes	No
	Investigate and correct any issues preventing these repair verification cycles from being completed, then re-run. For additional assistance, contact the PACCAR Engine Support Center.
Go to step 3.B	Go to step 3.B

Step 3.B DAVIE Diagnostics, Quick Check

Action

1. Use DAVIE Diagnostics to perform a Quick Check for current trouble codes to determine whether the actions taken have cleared this trouble code.

Has P104C been cleared?

Yes	No
Problem resolved. No further actions.	Continue with the next step in this troubleshooting procedure. If all steps have been completed and this trouble code is still present, contact the PACCAR Engine Support Center for further assistance.



i	Contacting the PACCAR Engine Support Center For further assistance in diagnosing this issue or for confirmation prior to the replacement of suspect components, contact the PACCAR Engine Support Call Center.
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P104D

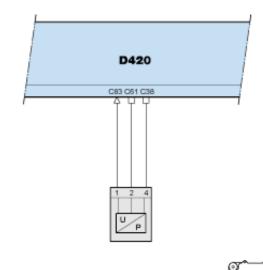
Code number	P104D
Fault code description	Pressure before turbine – Data valid but too high
Fault code information	2 trip MIL
	3 drive cycle recovery
	Readiness group - None
	Freeze frame type - Generic
Description of component(s)	
	The exhaust gas pressure before the turbine is measured with sensor (1) via a steel tube (2) before the EGR valve.
	Effect on the system:

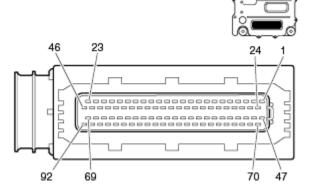


Location of component(s)	F826	
Diagnostic condition	This diagnostic runs: • engine speed 1000 and 1700 rpm, and;	
	 when the engine is running at a steady load, and; 	
	when coolant temperature is above 50°C [122°F], and; The engine mode is SCR high efficiency or standard or protection.	
	The engine mode is SCR high efficiency or standard or protection.	
Set condition of fault code	The PCI ECU (D420) detects that the measured pressure before turbine is higher than	
Reset condition of fault code	the expected pressure before turbine for more than 50 seconds. This DTC changes to inactive when the fault is no longer detected. To validate the	
neset condition of fault code	repair, drive the vehicle until the coolant temperature is at least 70°C [158°F]. Once	
	the minimum target temperature has been reached, proceed at a minimum speed of	
	80 km/h [50 mph] in the highest gear possible with the engine speed between 1100	
	and 1500 rpm and set the cruise control. This test is best performed with a loaded	
	vehicle/trailer, but if load is unavailable, turn as many engine power consumers on to	
	produce engine load. Perform this test for roughly 5 to 8 km [3 to 5 miles] or in 3 separate 1.5 km [1 mile] increments if a steady 5 to 8 km [3 to 5 miles] is	
	unachievable. Use a flat road, if possible.	

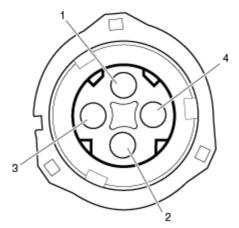


Electrical diagram(s)





Wiring harness connector D420.C front view



Wiring harness connector F826 front view

D420	F829	Function
C38	4	Ground
C61	2	Power supply
C83	1	Signal, pressure before turbine



Restricted pressure sensor before turbine tube Pressure sensor before turbine deviation The measured pressure before turbine is compared with an expected pressur before turbine. The pressure before turbine is measured by the pressure sensor before turbine (F826). Perform the troubleshooting steps below using the breakout harness, if necessary, to check electrical components, such as sensors, electrical cont units, and harnesses. Back probing is not recommended, as it could damage the harness. The ignition should always be in the OFF position when connecting or disconnecting electrical components in order to reduce the likelihood of damage to electrical components in order to reduce the likelihood of damage to electrical components in order to reduce the likelihood of damage to electrical component information and pinout locations always refer to the technical data. • Disconnecting the EAS connectors during the troubleshooting process will result in multiple errors. • For specific electrical component information and pinout locations always refer to the technical data. • It is necessary to exit the fault code menu in DAVIE and run the diagnostic test again to identify a change in errors. • Remember that the truck's operational or mechanical issues may be the root cause of both active and inactive fault codes. Refer to the 'possible causes' section. Step 1 Step 104Da SRT Visually inspect all applicable connectors (bent, broken, corroded or loose pins) and harnesses for corrosion, damage, and rubbing during each step of the diagnostic procedure. Proceed to step 2.
before turbine. The pressure before turbine is measured by the pressure sensor before turbin (F826). Perform the troubleshooting steps below using the breakout harness, if necessary, to check electrical components, such as sensors, electrical coun units, and harnesses. Back probing is not recommended, as it could damage the harness. The ignition should always be in the OFF position when connecting or disconnecting electrical components in order to reduce the likelihood of damage to electrical components. Disconnecting the EAS connectors during the troubleshooting process will result in multiple errors. For specific electrical component information and pinout locations always refer to the technical data. It is necessary to exit the fault code menu in DAVIE and run the diagnostic test again to identify a change in errors. Remember that the truck's operational or mechanical issues may be the root cause of both active and inactive fault codes. Refer to the possible causes' section. Step 1 Step 104Da SRT Visually inspect all applicable connectors (bent, broken, corroded or loose pins) and harnesses for corrosion, damage, and rubbing during each step of the diagnostic procedure. Proceed to step 2.
necessary, to check electrical components, such as sensors, electrical contunits, and harnesses. Back probing is not recommended, as it could damage the harness. The ignition should always be in the OFF position when connecting or disconnecting electrical components in order to reduce the likelihood of damage to electrical components. • Disconnecting the EAS connectors during the troubleshooting process will result in multiple errors. • For specific electrical component information and pinout locations always refer to the technical data. • It is necessary to exit the fault code menu in DAVIE and run the diagnostic test again to identify a change in errors. • Remember that the truck's operational or mechanical issues may lead the root cause of both active and inactive fault codes. Refer to the 'possible causes' section. Step 1 Step 104Da SRT Visually inspect all applicable connectors (bent, broken, corroded or loose pins) and harnesses for corrosion, damage, and rubbing during each step of the diagnostic procedure. Proceed to step 2.
Visually inspect all applicable connectors (bent, broken, corroded or loose pins) and harnesses for corrosion, damage, and rubbing during each step of the diagnostic procedure. Proceed to step 2. Step 2 Step 104Db SRT
Visually inspect all applicable connectors (bent, broken, corroded or loose pins) and harnesses for corrosion, damage, and rubbing during each step of the diagnostic procedure. Proceed to step 2. Step 2 Step 104Db SRT
Allchigty rest. All side riessure
Perform the prescribed test to determine if there are any leaks in the air system. Does the test fail to complete or result in a failed state? No: Continue to the next step3 in the troubleshooting process. Yes: Make the appropriate repairs or component replacements. Use DAVIE to re-check for the presence of active faults. If this related fault is no longer active, then this issue has been resolved. If this related fault is still active, continue to the next step in the troubleshooting process.
Step 3 Step 104Dc SRT



DAVIE Direct Monitor: Before Turbine Pressure Use DAVIE to monitor the Before Turbine Pressure, to determine if the Before **Turbine Pressure** Sensor (P3) is reading correctly. Does the monitored value appear incorrect? No: Continue to the next step4 in the troubleshooting process. Yes: Clean adjust, repair or replace affected components for any issues identified. Use DAVIE to re-check for the presence of active faults. If this related fault is no longer active, then this issue has been resolved. If this related fault is still active, continue to the next step in the troubleshooting process. Step 104Dd SRT Step 4 Visual Inspection: Pressure Sensor Before Turbo (P3) Visually inspect the identified component for any of the following: Damaged or blockage Was there evidence of any of the above? No: Continue to the next step5 in the troubleshooting process. Yes: Clean, adjust, repair, or replace affected components for any issues identified. Use DAVIE to re-check for the presence of active faults. If this related fault is no longer active, then this issue has been resolved. If this related fault is still active, continue to the next step in the troubleshooting process. Step 5 Step 104De SRT Replace: Pressure sensor before turbo (P3) Replace the identified faulty component. Use DAVIE to check for the presence of active faults. If this related fault is no longer active, then this issue has been resolved. If this related fault is still active, continue to the next step in the troubleshooting process. Step 6 Step 104Df SRT Contact the PACCAR Engine Support Call Center For further assistance in diagnosing this issue or for confirmation prior to the replacement of suspect components, contact the PACCAR Engine Support Call Center at 1-800-477-0251. **Verification Drive Cycle** To validate repair: This cycle is best performed on a level grade road (least amount of incline possible) an under load using a trailer. If a loaded trailer is unavailable, produce engine load by turi the A/C and fan to ON. With the System Initiation cycle complete, proceed to a road with a minimum speed li of 50 mph, then get to the highest gear possible with the engine speed between 1100-1500 rpm, and set the cruise control. Run this cycle for roughly 3 to 5 miles or in three

separate 1-mile increments if a steady 3 to 5 miles is unachievable.



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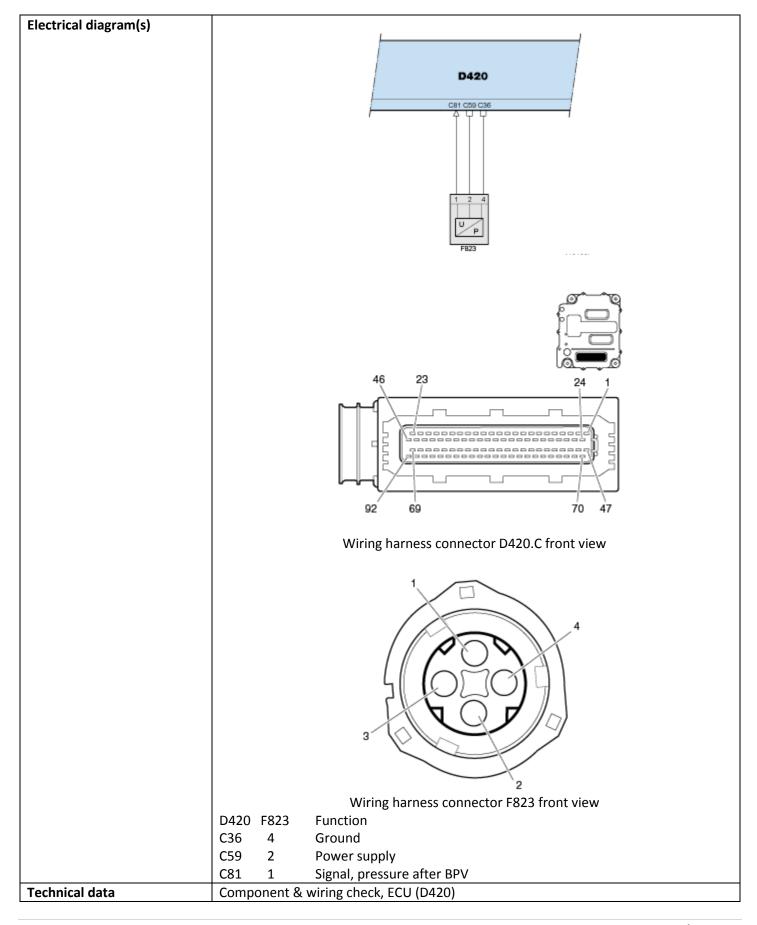
P1050

Code number	P1050
Fault code description	Pressure after BPV – Data erratic, intermittent, or incorrect
Fault code information	2 trip MIL
	3 drive cycle recovery
	Readiness group - None
	Freeze frame type - Generic
Description of component(s)	
	The exhaust gas pressure after the BPV valve is measured by the sensor (1) via a steel tube (2).
	Effect on the system:
	Correction of the NOx sensor before the catalyst signal
	A higher measured exhaust gas pressure after the BPV valve results in lower
	calculated NOx emissions by the engine.
	Calculates the exhaust gas temperature before the turbine Lower measured exhaust gas prossure after the RRV value results in higher.
	Lower measured exhaust gas pressure after the BPV valve results in higher calculated exhaust gas temperature before the turbine.



Location of component(s)		
Location of component(s)	F823	
Diagnostic condition	This diagnostic runs:	
	engine speed is between 1000 and 1700 rpm, and;	
	 engine is running at a steady load, and; coolant temperature is above 50°C [122°F], and; 	
	 coolant temperature is above 50°C [122°F], and; the engine mode is SCR high efficiency or standard. 	
Cat candition of fault and	- · · · · · · · · · · · · · · · · · · ·	
Set condition of fault code	The PCI ECU (D420) detects that measured pressure after BPV differs too much from the expected pressure after BPV for more than 50 seconds.	
Reset condition of fault code		
	repair, drive the vehicle until the coolant temperature is at least 70°C [158°F]. Once	
	the minimum target temperature has been reached, proceed at a minimum speed of	
	80 km/h [50 mph] in the highest gear possible with the engine speed between 1100	
	and 1500 rpm and set the cruise control. This test is best performed with a loaded vehicle/trailer, but if load is unavailable, turn as many engine power consumers on to	
	produce engine load. Perform this test for roughly 5 to 8 km [3 to 5 miles] or in 3	
	separate 1.5 km [1 mile] increments if a steady 5 to 8 km [3 to 5 miles] is	
	unachievable. Use a flat road, if possible.	







	Preparation		
	Key off the ignition.		
	Disconnect connector F823		
	Measure on the front side of wiring harness connector F823		
	Pin Pin		
	(+probe) (-probe) Value Additional information		
	2 4 5V Ignition keyed on		
Possible causes	Leakage in the exhaust system between engine and DPF filter inlet.		
	Blockage in the exhaust system between engine and DPF filter inlet.		
	Pressure sensor after BPV deviation		
	DPF pressure sensor deviation		
Additional information	The measured pressure after BPV is compared with an expected pressure after		
	BPV. For the calculation of the expected value, the DPF pressure sensor (F837)		
	and ambient pressure are used, among others.		
	The pressure after BPV is measured by the pressure sensor after BPV (F823)		
Diagnostic Step-by-Step	Perform the troubleshooting steps below using the breakout harness, if		
Diagnostic Step by Step	necessary, to check electrical components, such as sensors, electrical control		
	units, and harnesses. Back probing is not recommended, as it could damage		
	the harness. The ignition should always be in the OFF position when		
	connecting or disconnecting electrical components in order to reduce the		
	likelihood of damage to electrical components.		
	Disconnecting the EAS connectors during the troubleshooting		
	process will result in multiple errors.		
	For specific electrical component information and pinout locations, always refer to the technical data.		
	 always refer to the technical data. It is necessary to exit the fault code menu in DAVIE and run the 		
	diagnostic test again to identify a change in errors.		
	Remember that the truck's operational or mechanical issues may be		
	the root cause of both active and inactive fault codes. Refer to the		
	'possible causes' section.		
	possible causes section.		
	Step 1 Step 1050a SRT		
	Visually inspect all applicable connectors (bent, broken, corroded or loose pins)		
	and harnesses for corrosion, damage, and rubbing during each step of the diagnostic procedure. Proceed to step 2.		
	Step 2 Step 1050b SRT		
DAVIE Direct: Monitor related sensors			
	Use DAVIE to monitor and record values for the following: • After BPV Pressure		
	After BPV Pressure After Turbo Pressure		
	BPV Position Actuator		
	Are all recorded values within OEM specifications?		
	No: Continue to the next step3 in the troubleshooting process.		
	Yes: Clean adjust, repair or replace affected components for any issues identified.		
	Use DAVIE to re-check for the presence of active faults.		
	• If this related fault is no longer active, then this issue has been resolved.		



 If this related fault is still active, continue to the next step in the troubleshooting process. Step 3 Step 1050c SRT Visual inspection: After BPV Pressure sensor Remove the After BPV Pressure sensor and visually inspect the senor tip for any of the following: Signs of damage Excessive build-up on the sensor tip Was there evidence of any of the above? No: Continue to the next step 4 in the troubleshooting process. Yes: Clean, adjust, repair, or replace affected components for any issues identified. If soot plugging was found, perform a manual cleaning of the DPF or perform a stationary regeneration. Use DAVIE to re-check for the presence of active faults. If this related fault is no longer active, then this issue has been resolved. If this related fault is still active, continue to the next step in the troubleshooting process. Step 4 Step 1050d SRT Replace: After BPV Pressure sensor Replace the identified component. Use DAVIE to re-check for the presence of active faults. If this related fault is no longer active, then this issue has been resolved. If this related fault is still active, continue to the next step in the troubleshooting process. Step 5 Step 1050e **SRT** Contact the PACCAR Engine Support Call Center For further assistance in diagnosing this issue or for confirmation prior to the replacement of suspect components, contact the PACCAR Engine Support Call Center at 1-800-477-0251. **Verification Drive Cycle** To validate repair: This cycle is best performed on a level grade road (least amount of incline possible) and under load using a trailer. If a loaded trailer is unavailable, produce engine load by turning the A/C and fan to ON. With the System Initiation cycle complete, proceed to a road with a minimum speed limit of 50 mph, then get to the highest gear possible with the engine speed between 1100-1500 rpm, and set the cruise control. Run this cycle for roughly 3 to 5 miles or in three separate 1-mile increments if a steady 3 to 5 miles is unachievable. **Back to Index**



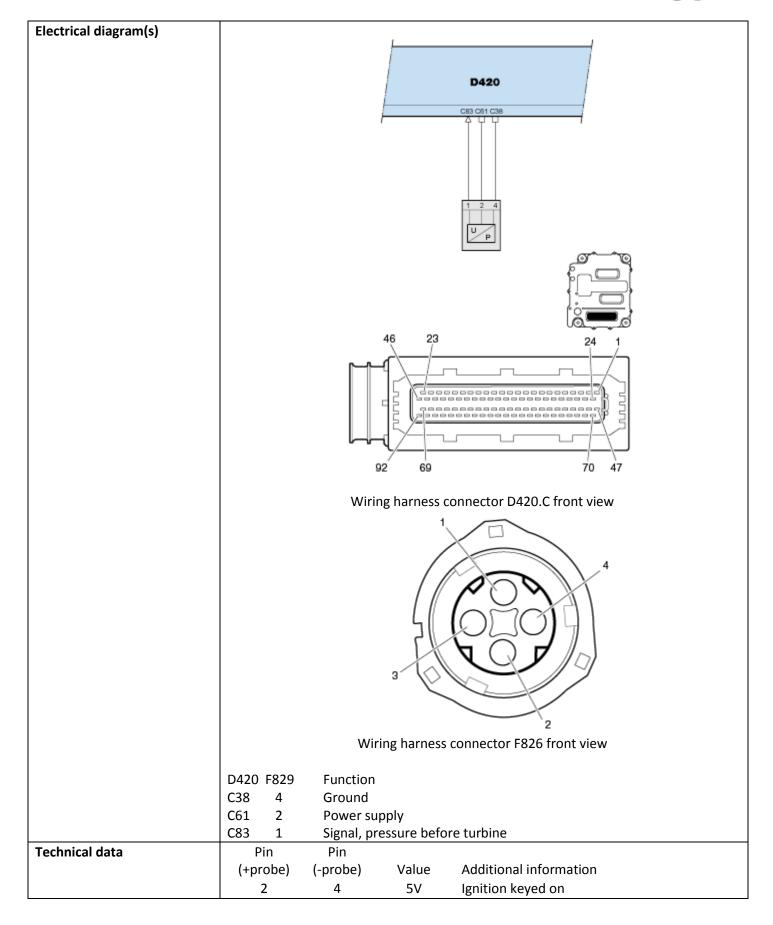
P1057

Code number	P1057
Fault code description	Pressure before turbine – Data valid but too low
Fault code information	2 trip MIL
	3 drive cycle recovery
	Readiness group – None
	Freeze frame type – Generic
Description of component(s)	
	1 2
	The exhaust gas pressure before the turbine is measured with sensor (1) via a steel
	tube (2) before the EGR valve.
	Effect on the system:



Location of company (s)		
Location of component(s)	F826	
	00	
Diagnostic condition	This diagnostic runs:	
	 engine speed is between 1000 and 1700 rpm, and; engine is running at a steady load, and; 	
	 coolant temperature is above 50°C [122°F], and; 	
	 the engine mode is SCR high efficiency or standard or protection. 	
Set condition of fault code	The PCI ECU (D420) detects that measured pressure before turbine is lower than the	
	expected pressure before turbine for more than 50 seconds.	
Reset condition of fault code	This DTC changes to inactive when the fault is no longer detected. To validate the	
	repair, drive the vehicle until the coolant temperature is at least 70°C [158°F]. Once the minimum target temperature has been reached, proceed at a minimum speed of	
	80 km/h [50 mph] in the highest gear possible with the engine speed between 1100	
	and 1500 rpm and set the cruise control. This test is best performed with a loaded	
	vehicle/trailer, but if load is unavailable, turn as many engine power consumers on to	
	produce engine load. Perform this test for roughly 5 to 8 km [3 to 5 miles] or in 3	
	separate 1.5 km [1 mile] increments if a steady 5 to 8 km [3 to 5 miles] is	
	unachievable. Use a flat road, if possible.	







Possible causes	This DTC changes to inactive when the fault is no longer detected. To validate the repair, drive the vehicle until the coolant temperature is at least 70°C [158°F]. Once the minimum target temperature has been reached, proceed at a minimum speed of 80 km/h [50 mph] in the highest gear possible with the engine speed between 1100 and 1500 rpm and set the cruise control. This test is best performed with a loaded vehicle/trailer, but if load is unavailable, turn as many engine power consumers on to produce engine load. Perform this test for roughly 5 to 8 km [3 to 5 miles] or in 3 separate 1.5 km [1 mile] increments if a steady 5 to 8 km [3 to 5 miles] is unachievable. Use a flat road, if possible.	
Additional information	 The measured pressure before turbine is compared with an expected pressure before turbine. The pressure before turbine is measured by the pressure sensor before turbine (F826). 	
Diagnostic Step-by-Step	Perform the troubleshooting steps below using the breakout harness, if necessary, to check electrical components, such as sensors, electrical control units, and harnesses. Back probing is not recommended, as it could damage the harness. The ignition should always be in the OFF position when connecting or disconnecting electrical components in order to reduce the likelihood of damage to electrical components. • Disconnecting the EAS connectors during the troubleshooting process will result in multiple errors. • For specific electrical component information and pinout locations, always refer to the technical data. • It is necessary to exit the fault code menu in DAVIE and run the diagnostic test again to identify a change in errors. • Remember that the truck's operational or mechanical issues may be the root cause of both active and inactive fault codes. Refer to the 'possible causes' section.	
	Step 1Step 1057aSRTVisually inspect all applicable connectors (bent, broken, corroded or loose pins)and harnesses for corrosion, damage, and rubbing during each step of thediagnostic procedure. Proceed to step 2.Step 2Step 1057bSRT	
	Ancillary Test: Air Side Pressure Check - Perform the prescribed test to determine if there are any leaks in the air system. Does the test fail to complete or result in a failed state? • No: Continue to the next step in the troubleshooting process, Proceed to step 3. • Yes: Make the appropriate repairs or component replacements. Use DAVIE to re-check for the presence of active faults. • If this related fault is no longer active, then this issue has been resolved. • If this related fault is still active, continue to the next step in the troubleshooting process. Verify if code is cleared using Verification Drive Cycle procedure.	
	Step 3 Step 1057c SRT DAVIE Direct Monitor: Before Turbine Pressure - Use DAVIE to monitor the Before	



Turbine Pressure, to determine if the Before Turbine Pressure

Sensor (P3) is reading correctly. Check if the monitored value appears incorrect?

- No: Continue to the next step 4 in the troubleshooting process.
- Yes: Clean adjust, repair or replace affected components for any issues identified.

Use DAVIE to re-check for the presence of active faults.

- If this related fault is no longer active, then this issue has been resolved.
- If this related fault is still active, continue to the next step in the troubleshooting process.

Verify if code is cleared using Verification Drive Cycle procedure.

Step 4 Step 1057d SRT

Visual Inspection: Pressure Sensor Before Turbo (P3)

Visually inspect the identified component for any Damaged or blockage

Was there evidence of any of the Damaged or blockage?

- No: Continue to the next step 5 in the troubleshooting process.
- Yes: Clean, adjust, repair, or replace affected components for any issues identified.

Use DAVIE to re-check for the presence of active faults.

- If this related fault is no longer active, then this issue has been resolved.
- If this related fault is still active, continue to the next step in the troubleshooting process.

Verify if code is cleared using Verification Drive Cycle procedure.

Step 5 Step 1057e SRT

Replace: Pressure sensor before turbo (P3)

Replace the identified faulty component.

Use DAVIE to re-check for the presence of active faults.

- If this related fault is no longer active, then this issue has been resolved.
- If this related fault is still active, continue to the next step in the troubleshooting process.

Verify if code is cleared using Verification Drive Cycle procedure.

Step 6 Step 1057f SRT

Contact the PACCAR Engine Support Call Center

For further assistance in diagnosing this issue or for confirmation prior to the replacement of suspect components, contact the PACCAR Engine Support Call Center at 1-800-477-0251.

Verification Drive Cycle

To validate repair:

This cycle is best performed on a level grade road (least amount of incline possible) and under load using a trailer. If a loaded trailer is unavailable, produce engine load by turning the A/C and fan to ON.

With the System Initiation cycle complete, proceed to a road with a minimum speed limit of 50 mph, then get to the highest gear possible with the engine speed between 1100-1500 rpm, and set the cruise control. Run this cycle for roughly 3 to 5 miles or in three separate 1-mile increments if a steady 3 to 5 miles is unachievable.

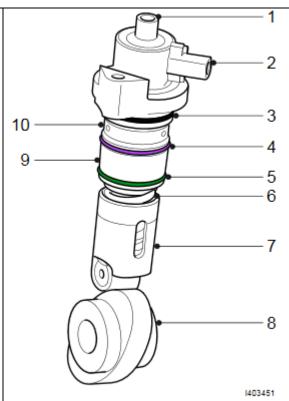
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P1086

1 1000	Tavaaa	
Code number	P1086	
Fault code description	Engine rail pressure rise – Too slow	
Fault code information	1 trip MIL	
	3 drive cycle recovery	
	Readiness group – None	
	Freeze frame type – Fuel	
Description of component(s)	Common rail pressure sensor (F854)	
	The rail pressure is measured in the common rail.	
	The rail pressure sensor is part of the common rail and is not	
	interchangeable as a separate part.	
	Effect on the system:	
	Effect on the system: • Feedback on the rail pressure control	
	Feedback on the rail pressure control.	
	The rail pressure is closed-loop controlled. A comparison is made between	
	the rail pressure demands determined by the ECU and the rail pressure	
	feedback measured by the common rail pressure sensor.	
	Description, common rail pump unit 1 and 2 (L092, L093)	
	Common rail pump units 1 and 2 supply fuel to the common rail.	
	4	
	1	
	2	
	3	
	10 —	
	4	
	9——	
	5	
	6	
	7	
	(6)	
	8	
	1400204	
	1402301	





- 1 Outlet port
- 2 Solenoid connector
- 3 Sealing ring fuel supply gallery outside
- 4 Sealing ring fuel supply gallery fuel return gallery
- 5 Sealing ring fuel return gallery crankcase
- 6 Spring
- 7 Roller lifter
- 8 Common rail pump unit cam
- 9 Fuel return port
- 10 Fuel supply port

Operation

The internal plunger is actuated via a roller lifter on the camshaft. Each pump has three pumping events for every two crankshaft revolutions.

Fuel from the fuel gallery can enter the pumping plunger area via an internal valve. A pumping event starts when the plunger travels up, the PCI ECU activates the solenoid briefly and the internal valve closes the opening to the fuel gallery. The internal valve is kept closed hydraulically, and the fuel is pumped to the rail via a check valve in the outlet bore of the pump unit.

The pumping event stops when the roller lifter passes the top of the camshaft lobe, causing the plunger to travel downwards again. Due to this, the pressure above the plunger decreases and the internal valve opens the opening to the fuel gallery. The check valve in the outlet bore closes and prevents fuel from flowing back from the rail to the plunger area.

Control

The amount of fuel pumped to the rail depends on the duration of the pumping



event (pump delivery percentage). The earlier the solenoid is activated by the PCI ECU in the up stroke of the pumping plunger the more fuel (mg/stroke) is pumped to the rail.

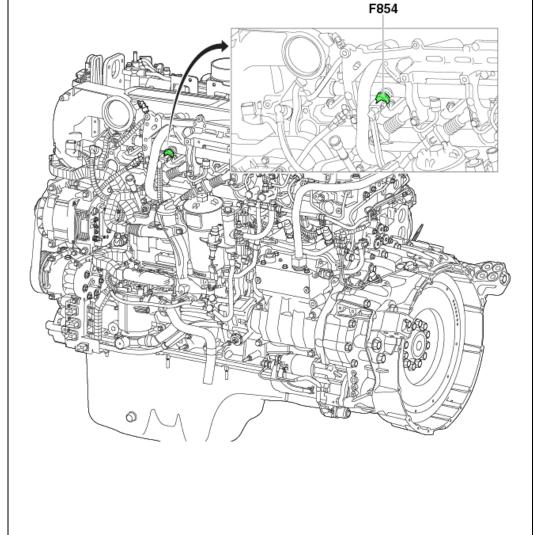
Effect on the system:

Rail pressure control.

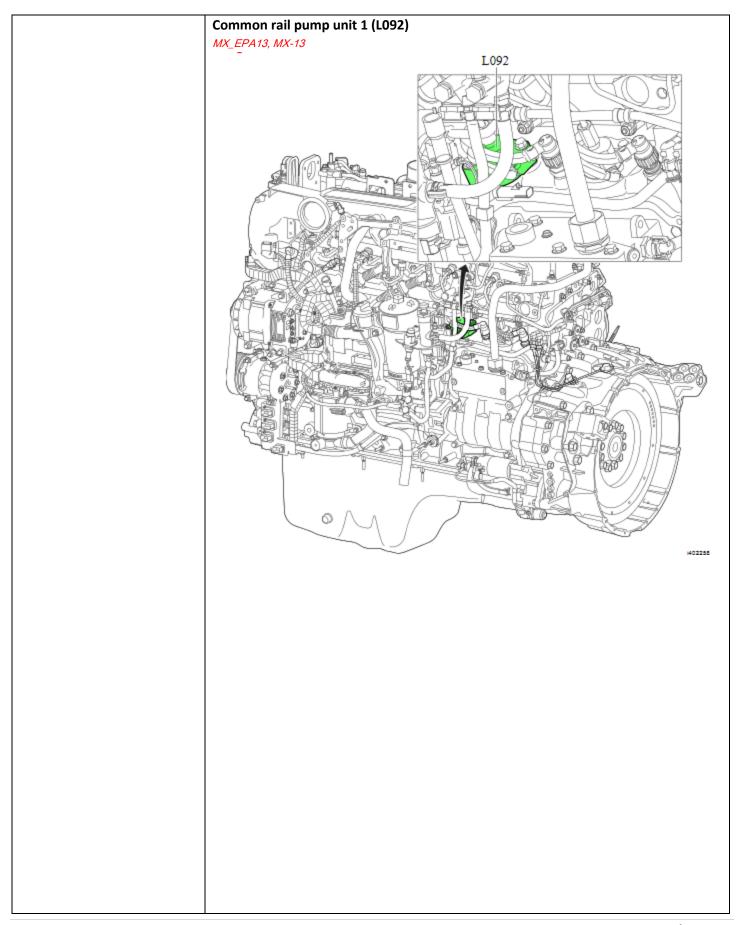
The rail pressure is closed-loop controlled. A comparison is made between the actual rail pressure and rail pressure demands determined by the ECU. The rail pressure is adjusted by pumping more or less fuel to the rail with the common rail pump units.

Location of component(s)

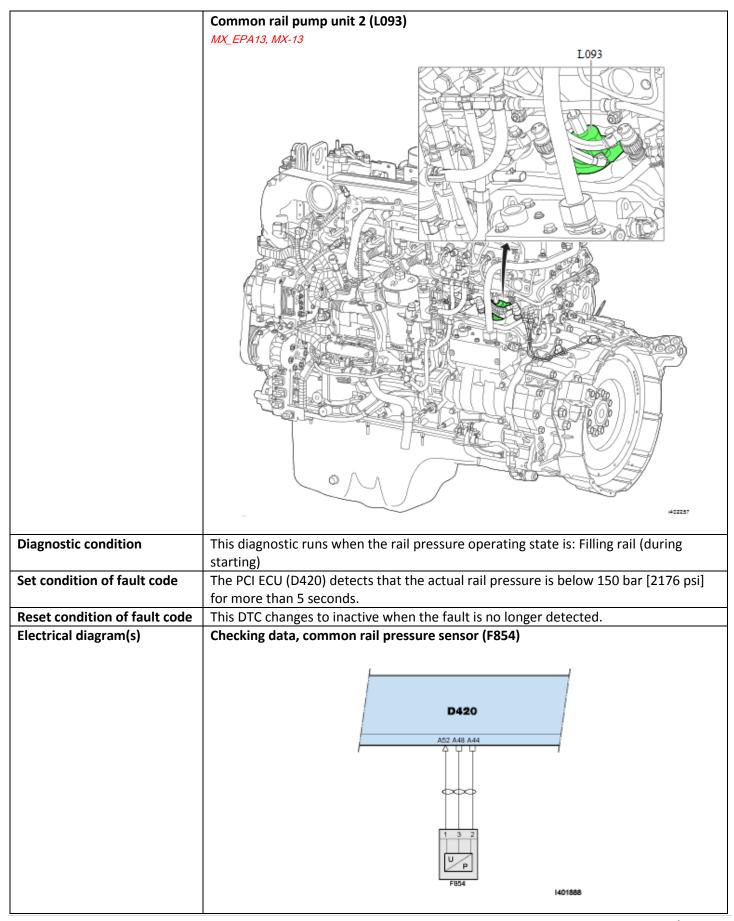
Common rail pressure sensor (F854)









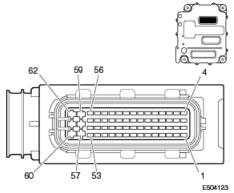


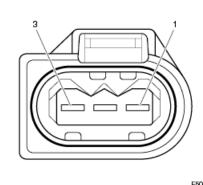


D420 PCI ECU

F854 engine rail pressure sensor

D420	F854	Function	
A44	2	Ground	
A48	3	Power supply	
A52	1	Signal, common rail pressure	





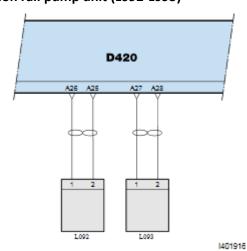
Wiring harness connector D420.A front view

Wiring harness connector F854 front view



Handle connectors and pins with care and use matching measuring probes.

Checking data, common rail pump unit (L092-L093)



D420 PCI ECU

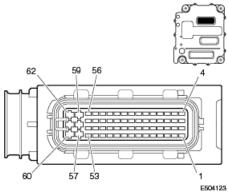
L092 common rail pump unit 1

L093 common rail pump unit 2

D420 L092 L093 Function	
-------------------------	--



A25	2		Signal low, common rail pump unit 1
A26	1		Signal high, common rail pump unit 1
A27		1	Signal high, common rail pump unit 2
A28		2	Signal low, common rail pump unit 2



Wiring harness connector D420.A front view



Handle connectors and pins with care and use matching measuring probes.

Technical data

Component check, common rail pressure sensor (F854)

This type of component cannot be checked with a multimeter/oscilloscope. Perform the following to assess the component:

- Monitor/test the component with DAVIE.
- Perform the wiring check (see below).

Component & wiring check, ECU (D420)

Preparation

- Key off the ignition.
- Disconnect connector F854
- Measure on the front side of wiring harness connector F854

Pin (+ probe)	Pin (- probe)	Value	Additional information
3	2	5V	Ignition keyed on

Component check, common rail pump unit 1 (L092)

Preparation

- Key off the ignition
- Disconnect connector L092



• Measure on component connector L092

Pin (+ probe)	Pin (- probe)	Value	Additional information
1	2	± 0.67 Ω	Resistance value at 20°C [68°F]
		maximum 0.94 Ω	Resistance value at 120°C [248°F]

Component check, common rail pump unit 2 (L093)

Preparation

- Key off the ignition
- Disconnect connector L093
- Measure on component connector L093

Pin (+ probe)	Pin (- probe)	Value	Additional information
1	2	± 0.67 Ω	Resistance value at 20°C [68°F]
		maximum 0.94 Ω	Resistance value at 120°C [248°F]

Possible causes

• Air present in the fuel system.

If the fuel system or parts of it have been emptied during maintenance or repair, this DTC may become active temporarily after the engine is started. If the DTC stays inactive when the engine is running, no further investigation is necessary.

- Fuel gelling at very low ambient temperatures.
- Restriction in the fuel supply or low performance of the fuel lift pump.
- An external or internal leakage on the high-pressure fuel system components.

Additional information



This DTC may be a result of P3834. If P3834 is active or inactive, troubleshoot P3834 first.

- The rail pressure is closed-loop controlled. A comparison is made between the requested and actual rail pressure measured by the common rail pressure sensor.
- The actual rail pressure is measured in the common rail by the common rail pressure sensor (F854)



Diagnostic Step-by-Step



The ignition should always be in the OFF position when connecting or disconnecting electrical components to reduce the likelihood of damage to the components.



- This troubleshooting procedure is based on the assumption that supply power and ground to the PMCI are functioning properly.
- Disconnecting the PMCI connectors during the troubleshooting process will result in multiple errors.
- Specific electrical component information and pin out locations are provided in this procedure as a reference only. Always refer to the technical data sections in Rapido for the most up-to-date changes.
- It is necessary to use DAVIE to clear all current trouble codes from the PCI and EAS-3 ECUs, and then run the Quick Check to identify a change in fault status.
- This DTC can be set as a result of multiple failure modes. For proper fault isolation, complete all troubleshooting steps in the sequence provided.

Step 1. Investigate Related Trouble Codes

Before troubleshooting this code, take notice of any other active or inactive trouble codes. One or multiple other codes could have been the cause for this code.

Action 1. Use DAVIE Diagnostics to perform a Quick Check for current trouble codes. Are these or any other related codes active? P0263, P0266, P0269, P0272, P0275, P0278, P0301, P0302, P0303, P0304, P0305, P0306 Yes No Refer to the troubleshooting information for these codes before continuing with this procedure. Go to step 2.A

Step 2. Fuel System Checks

Step 2.A Visual inspection, connections and wiring, common rail pressure sensor (F854)



Action

- 1. Visually inspect the associated component connections and wiring for any of the following:
 - Fuel gelling (thickening or crystallization of fuel in the fuel filter)
 - Damaged or loose connector
 - Bent, broken, corroded or loose connector pins
 - Moisture or dirt in the connection
 - Damage to the wire harness or insulation
 - Sensor is damaged
 - Signs of external fuel leaks
 - Any damaged, bent, or broken fuel lines
 - Related fuel components not installed correctly

Yes

No

Correct any issues found.
Refer to Step 3.A to perform the corresponding repair verification cycles and rechecks.

If this code is still present, go to step 2.B

Step 2.B Visual inspection, connections and wiring, common rail pump unit 1 and 2 (L092, L093)

Action

- 1. Visually inspect the associated component connections and wiring for any of the following:
 - Damaged or loose connector
 - Bent, broken, corroded or loose connector pins
 - Moisture or dirt in the connection
 - Damage to the wire harness or insulation
 - Sensor is damaged
 - Signs of external fuel leaks
 - Any damaged, bent, or broken fuel lines
 - Related fuel components not installed correctly

Was there evidence of any of the above?

Yes	No
Correct any issues found.	



Refer to Step 3.A to perform the corresponding repair verification cycles and rechecks.	
If this code is still present, go to step 2.C	Go to step 2.C

Step 2.C Rapido Maintenance: Check fuel supply, low pressure (Job ID: 68720)

Action

1. Check the low pressure fuel supply by performing the maintenance procedure, "check fuel system low pressure (Fuel system), job ID 68720."

Do any of the tests result in a failed state based on the criteria provided?

Yes	No
Correct any issues found. Refer to Step 3.A to perform the corresponding repair verification cycles and rechecks.	
If this code is still present, go to step 2.D	Go to step 2.D

Step 2.D Electrical checks, resistance, common rail pump units 1 and 2 (L092 and L093)



Refer to the corresponding Checking Data in Engine Service – Rapido for associated supply and signal voltages, resistance values, and related connector pin test points.

Action

 Check the resistance level as outlined in the corresponding checking data, "Component check, common rail pump unit 1 pump (L092)" and "Component check, common rail pump unit 2 pump (L093)"

Are measured values within expected range?	
Yes No	
	Correct any issues found, or replace the common rail unit pump if measured values indicate an error. Refer to Step 3.A to perform the corresponding repair verification cycles



	and rechecks.
Got to Step 2.E	If this code is still present, go to Step 2.E

Step 2.E Rapido Maintenance: Check Fuel System High Pressure (Job ID: M038143)

Action

1. Check the high pressure valve process associated with this procedure, refer to the job "Check Fuel System High Pressure (Fuel system), Job ID 73760."

Do any of the tests result in a failed state based on the criteria provided?

Yes	No
Correct any issues found. Refer to Step 3.A to perform the corresponding repair verification cycles and rechecks.	
	If all steps have been completed and this trouble code is still present, contact the PACCAR Engine Support Center for further assistance.

Step 3. Repair Verification

Step 3.A Repair verification cycles

Perform these repair verification cycles following any corrective actions taken, to enable related OBD monitors to reach a readiness state associated with the trouble code or system being investigated.



 Before beginning these repair verification cycles, use the DAVIE Diagnostics, Quick Check function to clear all current DTCs from the PCI and EAS-3 ECUs.

Action

- 1. If the fuel system has been serviced, perform the following steps:
 - a. Bleed the fuel system associated with this procedure, refer to the job "Bleed (fuel system), Job ID 67132."
 - b. Operate the engine for 2 minutes to clear entrained air.
 - c. Clear the DTCs.
- 2. Start-up

With the brakes set, start the engine and allow it to run at idle for 2 minutes.



Yes	No
	Investigate and correct any issues preventing these repair verification cycles from being completed, then rerun. For additional assistance, contact the PACCAR Engine Support Center.
Go to Step 3.B	Go to Step 3.B
<u>-</u>	form a Quick Check for current trouble
codes to determine whether t	'na actione takan hawa ciaarad thie trollnie
code.	the actions taken have cleared this trouble
code.	the actions taken have cleared this trouble
code. Has P1086 been cleared?	the actions taken have cleared this trouble

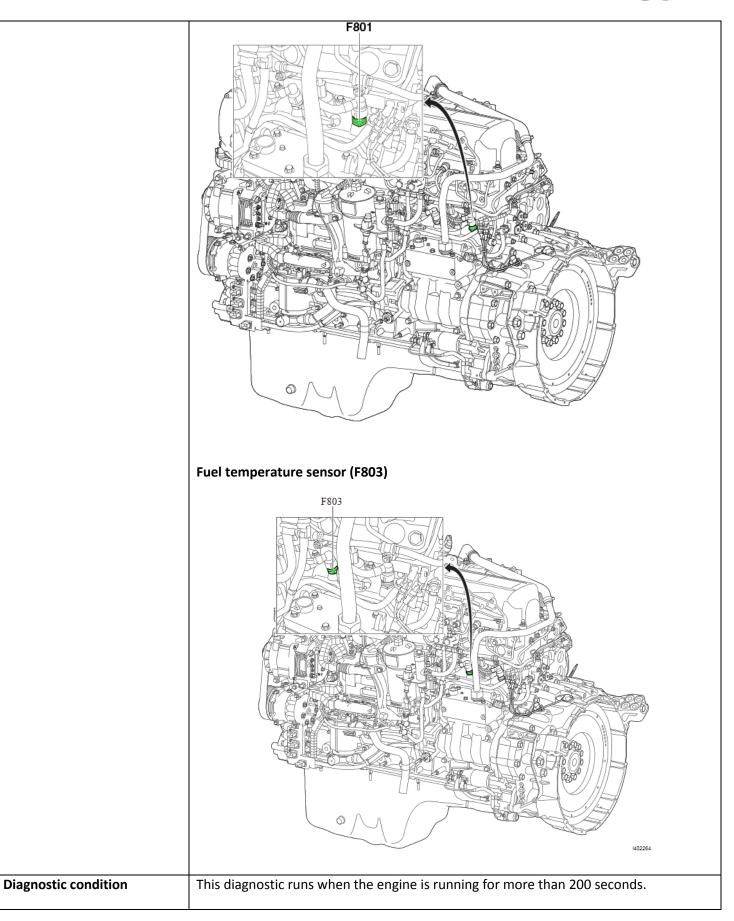
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P1087

Code number	P1087	
Fault code description	Fuel pressure - Data valid but too low, moderately severe	
Fault code information	1 trip MIL 3 drive cycle recovery Readiness group – None Freeze frame type – Fuel	
Description of component(s)	Fuel pressure sensor (F801) The low-pressure fuel pressure is measured at the end of the low-pressure fuel supply gallery. Effect on the system: • Limitation of the engine torque when the fuel pressure is too low.	
	Fuel temperature sensor (F803) The fuel temperature is measured in the low-pressure fuel supply gallery between the common rail pump units.	
	Effect on the system: preventing automatic fuel module water draining activation when the fuel temperature is very low (the water present may be frozen). limitation of the engine torque when the fuel temperature is too high.	
Location of component(s)	Fuel pressure sensor (F801)	



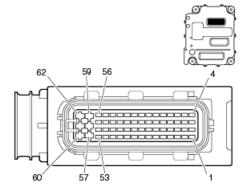


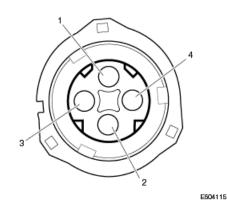


Set condition of fault code	The PCI ECU (D420) detects that the fuel pressure is too low (gray area of the graph)				
	for more than 50 seconds.				
	P = Fuel pressure in bar; rpm = engine speed				
	P _{21,8} 14,5 7,3 0 0 350 700 1050 1400 1750 2100 2450 rpm P = Fuel pressure in psi; rpm = engine speed				
Reset condition of fault code	This DTC changes to inactive when the fault is no longer detected.				
Electrical diagram(s)	Checking data, fuel pressure sensor (F801)				
	A38 A50 A46				
	1401884				
	D420 F801 Function				
	A38 4 Ground				
	A50 1 Signal, fuel pressure				



A46 2 Power supply





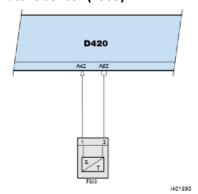
Wiring harness connector D420.A front view

Wiring harness connector F801 front view



Handle connectors and pins with care and use matching measuring probes.

Checking data, fuel temperature sensor (F803)

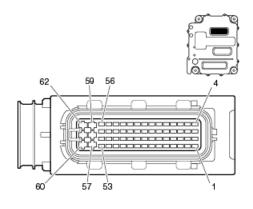


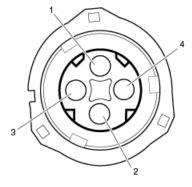
D420 PCI ECU

F803 fuel temperature sensor

D420	F803	Function
A42	1	Signal, fuel pressure
A60	3	Ground







E504115

Wiring harness connector D420.A front view

Wiring harness connector F801 front view



Handle connectors and pins with care and use matching measuring probes.

Technical data

Component and wiring check, fuel pressure sensor (F801)

Component check, fuel pressure sensor (F801)

This type of component cannot be checked with a multimeter or oscilloscope. Perform the following to assess the component:

- Monitor/test the component with DAVIE
- Perform the wiring check

Component & wiring check, ECU (D420)

Preparation

- Switch off the ignition.
- Disconnect connector F801.
- Measure on the front side of wiring harness connector F801.

Pin	Pin	Value	Additional information
(+ probe)	(- probe)		
2	4	5V	Ignition keyed on

Component check, fuel temperature sensor (F803)

Preparation

- Switch off the ignition.
- Disconnect connector F803.
- Measure on component connector F803.



	Pin	Pin	Valu	9	Additional information	
	(+ probe)	(- probe)				
	1	3	5633–6120 Ω		Resistance value at 0°C [34°F]	
			2411–2573 Ω		Resistance value at 20°C [68°F]	
			1128–1213 Ω		Resistance value at 40°C [104°F]	
			568–619 Ω		Resistance value at 60°C [140°F]	
			306–337 Ω		Resistance value at 80°C [176°F]	
			176–196 ()	Resistance value at 100°C [212°F]	
	Component & wiring check, ECU (D420) Preparation • Switch off the ignition. • Disconnect connector F803.					
	• Mea	sure on the	front side of	wiring h	narness connector F803.	
	Pin	Pin	Value	Additi	onal information	
	(+ probe)	(- probe)				
	1	3	5V	Ignitic	n switched on	
Additional information	 Faulty fuel pressure control valve Restriction in the fuel supply or low performance of the fuel lift pump. 					
Additional information	The low-pre	ssure fuel pr	essure is me	asured l	by the fuel pressure sensor (F801).	
Diagnostic Step-by-Step	The ignition should always be in the OFF position when connecting or disconnecting electrical components to reduce the likelihood of damage to the components. This troubleshooting procedure is based on the assumption that supply power and ground to the PCI are functioning properly. Disconnecting the PCI connectors during the troubleshooting process will result in multiple errors.					
	 Specific electrical component information and pin out locations are provided in this procedure as a reference only. Always refer to the technical data sections in Rapido for the most up-to-date changes. 					
	 It is necessary to use DAVIE to clear all current DTCs from the PCI and EAS-3 ECUs, and then run the Quick Check to identify a change in fault status. 					
		 This DTC can be set as a result of multiple failure modes. For proper fault isolation, complete all troubleshooting steps in the sequence provided. 				



Step 1 Investigate Related DTCs

Before troubleshooting this DTC, take notice of any other active or inactive DTCs. One or multiple other DTCs could have been the cause for this DTC.

Step 1A Investigate related DTCs			
Action			
Use DAVIE Diagnostics to perform a	1. Use DAVIE Diagnostics to perform a Quick Check for current DTCs.		
Are these or any other related DTCs active?			
P2541; P2542	P2541; P2542		
Yes	No		
Refer to the troubleshooting information for these DTCs before continuing with this procedure.			
	Go to step 2A		

Step 2 Fuel System, Low Pressure Checks

Step 2A Visual inspection, connections and wiring, fuel pressure (F801) and fuel temperature (F803) sensors

Action

- 1. Visually inspect the associated component connections and wiring for any of the following:
 - Damaged or loose connectors
 - Bent, broken, corroded, or loose connector pins
 - Moisture or dirt in the connections
 - Damage to the wire harness or insulation
 - The correct parts are not installed
 - ECU connections are damaged or disconnected
 - Battery not fully charged or contacts not tight
 - Fuel pressure sensor (F801) broken or not installed correctly
 - Fuel temperature sensor (F803) broken or not installed correctly

Yes No

Correct any issues found.
Refer to step 3A to perform the



corresponding repair verification cycles and rechecks.	
If this DTC is still present, go to step 2B	Go to step 2B

Step 2B DAVIE Monitor, fuel pressure

Action

- 1. Ensure the ignition switch has been set to off.
- 2. Disconnect and remove the fuel temperature sensor (F803).
- 3. Install a pressure gauge at the fuel temperature sensor (F803) port.
- 4. Set the ignition switch to on.
- 5. Note the fuel pressure readings at 650 rpm and at 2100 rpm.
- 6. Use DAVIE to monitor the fuel pressure values at the same engine speeds.
- 7. Compare the monitored pressure values.

The expected results should be within the following pressure ranges:

Engine speed	Fuel pressure
650 rpm	108 to 122 psi
2100 rpm	128 to 142 psi

Are the compared fuel pressure values within the expected range?

Yes

No

Possible obstruction or leakage in the fuel supply.

Go to step 2C

Go to step 2C

Step 2C Visual inspection, low pressure circuit

Action

1. Inspect the low pressure side of the fuel system for any of the following:



	*For additional information related to some of these check points, see "replace fuel filter element (Fuel system), job ID 66433."		
 Low fuel level in fuel tank Fuel filter is damaged or needs replacement* Air in fuel system* Fuel leaks Damaged or kinked fuel lines Dirt or debris in the priming pump sieve (E073) Damage to the fuel lift pump o-ring Fuel system is not primed* Fuel control valve located at the left-rear of the engine block is open Damage to the power steering pump o-ring A damaged o-ring on the power steering pump could lead to an overheating condition for the power steering pump, which can be 			
transmitted via thermal condu Did these checks identify any failing condit	· · ·		
Yes	No		
 If the fuel lift pump o-ring has failed, change the o-ring and inspect the fuel pump integrity. If the fuel lift pump is failing, replace it. If the power steering pump oring is damaged, replace the oring. Refer to step 3A to perform the corresponding repair verification cycles and rechecks. 			
If all steps have been completed and this DTC is still present, contact the PACCAR Engine Support Center for further assistance. If all steps have been completed and this DTC is still present, contact the PACCAR Engine Support Center for further assistance.			

Step 3 Repair Verification



Step 3A Repair verification cycles

Perform these repair verification cycles following any corrective actions taken, to enable related OBD monitors to reach a readiness state associated with the trouble code or system being investigated.



Before beginning these repair verification cycles, use the DAVIE Diagnostics, Quick Check function to clear all current DTCs from the PCI and EAS-3 ECUs.

Action

1. Start-up

With the brakes set, start the engine and allow it to run at idle for 2 minutes.

Were the identified repair verification cycles able to be completed?

Yes	No
	Investigate and correct any issues preventing these repair verification cycles from being completed, then rerun. For additional assistance, contact the PACCAR Engine Support Center.
Go to step 3B	Go to step 3B

Step 3B DAVIE Diagnostics, Quick Check, OBD Readiness Monitors

Action

Use DAVIE Diagnostics to perform a Quick Check for current DTCs to determine whether the actions taken have cleared this DTC.

- 1. Confirm that the corresponding OBD Monitor Readiness Status value is displayed as "Ready."
 - A status of Ready indicates that the corresponding OBD monitor has run successfully and the problem has been resolved—no further action.
 - If the displayed status is "Not ready," continue to action step 2.
- 2. View the DTC overview display, and confirm that P1087 has been cleared.

Is the related OBD Monitor Readiness Status set to "Ready." Or, has P1087 been cleared?

Yes	No



Problem resolved. No further actions.	Continue with the next step in this troubleshooting procedure. If all steps have been completed and this DTC is still present: • continue to operate the truck to extend the run time, allowing the corresponding OBD monitor sufficient time to complete • or, return to step 3A and perform this repair verification again. If this issue is still present after extending or re-running the repair verification, contact the PACCAR Engine Support Center for further assistance.
	Back to Index

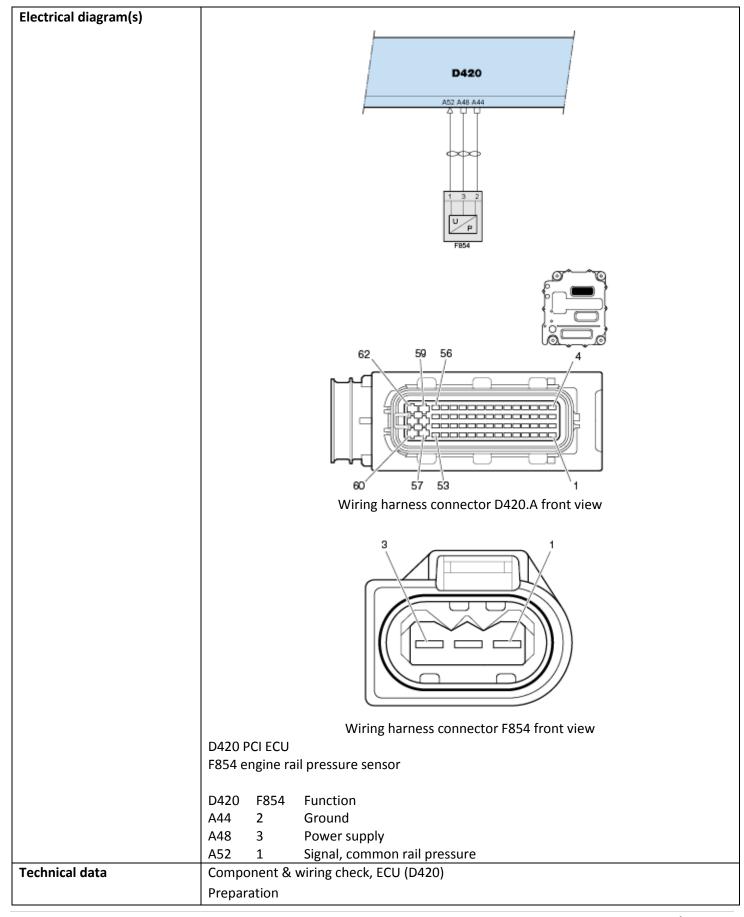


Code number	P1088		
Fault code description	Engine rail pressure - Data valid but too high		
Fault code information	For further assistance: Contact the PACCAR Engine Support Call Center 1-800-477-0251 Please contact Engine support center		
Description of component(s)			
Location of component(s)			
Diagnostic condition	This diagnostic runs when the rail pressure operating state is: Release valve only		
Set condition of fault code	The PCI ECU (D420) detects that the measured rail pressure is more than 2840 bar [41191 psi].		
Reset condition of fault code	This DTC changes to inactive when the fault is no longer detected.		
Electrical diagram(s)			
Technical data			
Possible causes	 Common rail pressure release valve failure (stuck in the closed position) Multiple injectors stuck in the closed position. 		
Additional information	 This DTC becomes active in combination with other fuel system related DTCs. Troubleshoot these faults first. The rail pressure is measured in the common rail by the common rail pressure sensor (F854). 		
	When this DTC is active:		
	o the engine torque is reduced		
	o the engine runs in protection mode		
	o the engine runs in rail pressure control state: Release valve only		
	o the maximum rail pressure is limited to 1300 bar		
Diagnostic Step-by-Step			
Verification Drive Cycle			
	Back to Index		



Codo numbos	D1000		
Code number	P1089		
Fault code description	Engine rail pressure - Data valid but too high		
Fault code information	1 trip MIL		
	3 drive cycle recovery		
	Readiness group – None		
	Freeze frame type - Fuel		
Description of component(s)	The rail pressure is measured in the common rail.		
	The rail pressure sensor is part of the common rail and is not interchangeable as a		
	separate part.		
	Effect on the system:		
	Feedback on the rail pressure control.		
	The rail pressure is closed-loop controlled. A comparison is made between the rail		
	pressure demands determined by the ECU and the rail pressure feedback measured by		
	the common rail pressure sensor.		
Location of component(s)			
	F854		
Diagnostic condition	This diagnostic runs when the rail pressure operating state is: Pump unit only or Rail		
	discharge		
Set condition of fault code	The PCI ECU (D420) detects that the measured rail pressure is more than 2840 bar		
	[41191 psi].		
Reset condition of fault	This DTC changes to inactive when the fault is no longer detected. To validate the		
code	repair, drive the vehicle until the coolant temperature is at least 70°C [158°F] in normal		
	driving conditions. This activity can be best conducted with a loaded vehicle/trailer.		
	driving conditions. This activity can be best conducted with a loaded vehicle/trailer.		







	W Williams and a			
	Key off the ignition. Disconnect connector FSE4			
	Disconnect connector F854 Massure on the front side of wiring harness connector F854			
	Measure on the front side of wiring harness connector F854 Big. Big. Big. Big. Big. Big. Big. Big.			
	Pin Pin Value Additional information (+ probe)			
	3 2 5V Ignition keyed on			
Possible causes	No possible causes information available.			
Additional information	 The rail pressure is measured in the common rail by the common rail pressure sensor (F854). Engine torque is reduced. 			
Diagnostic Step-by-Step	Perform the troubleshooting steps below using the breakout harness, if necessary, to check electrical components, such as sensors, electrical control units, and harnesses. Back probing is not recommended, as it could damage the harness. The ignition should always be in the OFF position when connecting or disconnecting electrical components in order to reduce the likelihood of damage to electrical components. • Disconnecting the EAS connectors during the troubleshooting process will result in multiple errors. • For specific electrical component information and pinout locations, always refer to the technical data. • It is necessary to exit the fault code menu in DAVIE and run the diagnostic test again to identify a change in errors. • Remember that the truck's operational or mechanical issues may be the root cause of both active and inactive fault codes. Refer to the			
	'possible causes' section.			
	Step 1 Step ID 1089a SRT Visually inspect all applicable connectors (bent, broken, corroded or loose pins) and harnesses for corrosion, damage, and rubbing during each step of the diagnostic procedure. Proceed to step 2			
	Step 2 Step ID 1089b SRT			
	DAVIE Direct Test: High Pressure Fuel Pump Unit test Run the prescribed DAVIE Direct test to determine if the electronic unit pumps ar working correctly. Does the test fail to complete or result in a failed state? No: Proceed to step4 Yes: Proceed to step 3			
	Step 3 Step ID 1089c SRT			
	Repairs or component replacements appropriate component and use DAVIE to recheck for the presence of active faults. • Fault inactive – issue resolve • Fault active - Proceed to step 4			
	Step 4 Step ID 1089d SRT			
	DAVIE Direct Test: Pressure Control Valve Run the prescribed DAVIE Direct test to determine if the high pressure valve is working correctly.			
	Does the test fail to complete or result in a failed state?			



No: Proceed to step 6 Yes: Proceed to step 5 Step ID 1089e SRT Step 5 Repairs or component replacements appropriate component and use DAVIE to recheck for the presence of active faults. Fault inactive - issue resolve Fault active - Proceed to step 6 Step ID 1089f SRT Step 6 Replace: Electronic Unit pump Replace the faulty Electronic Unit Pump. Use DAVIE to re-check for the presence of active faults. Fault inactive – issue resolve If this related fault is still active, proceed to step 7 Step 7 Step ID 1089g SRT Replace: High Pressure Valve (Common Rail) Replace the Common Rail assembly, which includes the High Pressure Valve. NOTE: The entire Common Rail must be replaced. The High Pressure Valve is a non-serviceable part and cannot be replaced or repaired separately. Contact the PACCAR Engine Support Call Center to confirm replacement of the Common Rail assembly. Use DAVIE to re-check for the presence of active faults. Fault inactive – issue resolve • If this related fault is still active, proceed to step 8 Step ID 1089h SRT Step 8 For further assistance in diagnosing this issue or for confirmation prior to the replacement of suspect components, contact the PACCAR Engine Support Call Center at 1-800-477-0251. **Verification Drive Cycle** To validate repair, with the brakes set, start the engine and allow it to run at idle for 2 minutes. **Back to Index**



Code number	P1090		
Fault code description	Detects when rail pressure goes over threshold (APV) in the absence of rail pressure		
	sensor fault		
Fault code information	For further assistance: Contact the PACCAR Engine Support Call Center 1-800-477-0251 Please Contact the Engine Support Center		
Description of component(s)			
Location of component(s)			
Diagnostic condition			
Set condition of fault code			
Reset condition of fault code			
Electrical diagram(s)			
Technical data			
Possible causes			
Additional information			
Diagnostic Step-by-Step			
Verification Drive Cycle			
	Back to Index		



Code number	P1091		
Fault code description	Engine rail pressure control - Data erratic, intermittent, or incorrect		
Fault code information	1 trip MIL		
	3 drive cycle recovery		
	Readiness group – Fuel system		
	Freeze frame type – Generic		
Description of	The rail pressure is measured in the common rail.		
component(s)	The rail pressure sensor is part of the common rail and is not interchangeable as a		
•	separate part.		
	Effect on the system:		
	Feedback on the rail pressure control.		
	The rail pressure is closed-loop controlled. A comparison is made between the rail		
	pressure demands determined by the ECU and the rail pressure feedback measured		
	by the common rail pressure sensor.		
Location of component(s)	,		
:	F854		
Diagnostic condition	This diagnostic runs:		
•	during fuel injection cutoff event, and;		
	 engine speed is between 1200 and 1600 rpm, and; 		
	 rail pressure operating state is: Release valve, and: 		
	 rail pressure operating state is: Release valve, and; this test is carried out after 30 minutes of engine running time when the 		



	evaluation is made.		
Set condition of fault code	The PCI ECU (D420) detects that the controlled common rail pressure release valve		
	current differs too much from the expected current.		
Reset condition of fault	This DTC changes to inactive when the fault is no longer detected.		
code	This 2 to shariges to macric when the radic is no foliger detected.		
Electrical diagram(s)	D420 A52 A48 A44		
	1 3 2 U P F854		
	Wiring harness connector D420.A front view		
	Wiring harness connector F854 front view D420 PCI ECU F854 engine rail pressure sensor		
	D420 F854 Function		



	A44 2 Ground			
	A48 3 Power supply			
	A52 1 Signal, common rail pressure			
Technical data	Component & wiring check, ECU (D420)			
recimical data	Preparation			
	Key off the ignition.			
	-			
	Disconnect connector F854 Measure on the front side of wiring barness connector F854			
	Measure on the front side of wiring harness connector F854 Pin			
	(+ probe) (- probe)	Value	Additional information	
	3 2	5V	Ignition keyed on	
Possible causes	Common rail pump unit fai	lure		
	Common rail pressure release valve failure			
	 Common rail pressure sens 	or deviation		
Additional information	For this diagnostic, the high-pro	essure fuel system	components are checked using an	
	autonomous test. During this to	est, the rail pressur	e is controlled by the common rail	
	pressure release valve (L094) d	uring a fuel cutoff of	event. The PCI ECU controls the	
	•		ep the rail pressure at 1500 bar. This	
	is compared with the common			
Diagnostic Step-by-Step		- '	using the breakout harness, if	
		·	s, such as sensors, electrical control	
			recommended, as it could damage	
	the harness. The ignition should always be in the OFF position when			
	connecting or disconnecting electrical components to reduce the likelihood			
	of damage to electrical components			
	This troubleshooting tree is based on the assumption that supply Assumption of the tree of the property			
	power and ground to the PCI are functioning properly.			
	Disconnecting the PCI connectors during the troubleshooting process			
	will result in mult	•		
	-	•	formation and pinout locations,	
	always refer to the technical data in Rapido.			
	It is necessary to exit the 'active errors' screen in DAVIE and run the diagnostic test again to identify changes in errors.			
	 diagnostic test again to identify changes in errors. Remember that the truck's operational or mechanical issues may be 			
	the root cause of both active and inactive codes. Refer to the 'possible			
	causes' section in Rapido.			
	Step 1 Step ID 1091a SRT			
	Visually inspect all applicable connectors (bent, broken, corroded or loose pins)			
	and harnesses for corrosion, damage, and rubbing during each step of the			
	diagnostic procedure. Proceed to step 2.			
	Step 2 Step ID 1091b SRT			
	Run DAVIE Direct test (Pressure Control Valve) to determine if the high pressure			
	valve is working correctly.			
	Does the test fail to complete or result in a failed state?			
	No: Proceed to step 3			
	Yes: Make the appropriate repairs or component replacements.			
		_		
	Use DAVIE to re-check for the presence of active faults.			



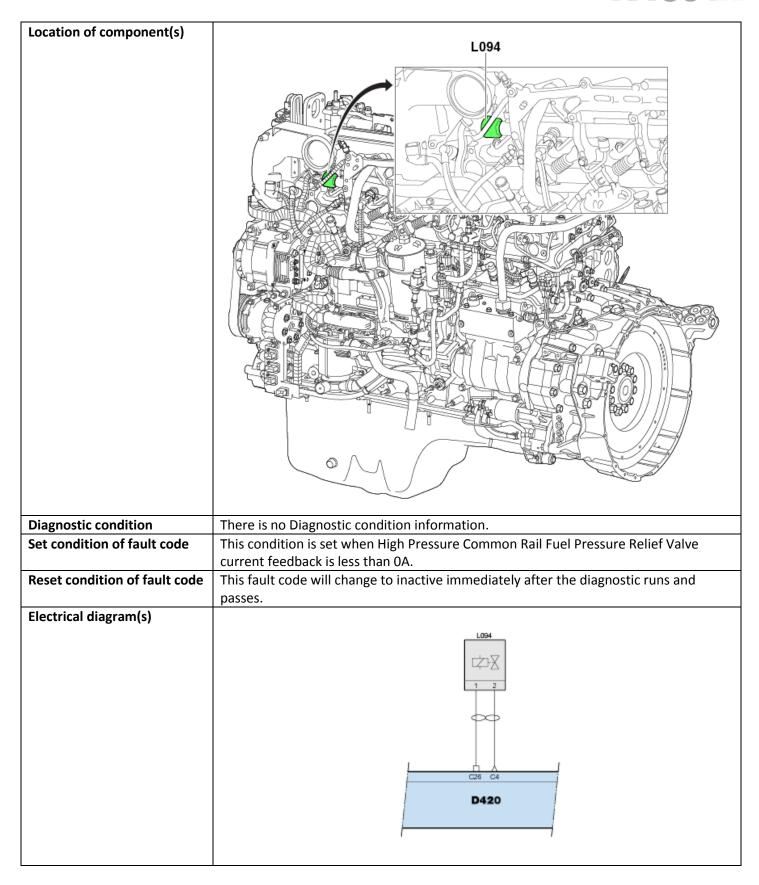
	Fault inactive – issue resolved				
	Fault active - Proceed to step 3				
	Step 3 Step ID 1091c SRT				
	Repair or replace High Pressure Valve (Common Rail) and use DAVIE to re-check				
	for the presence of active faults.				
	Fault inactive – issue resolved				
	Fault active - Proceed to step 4				
	Step 4 Step ID 1091d SRT				
		nce in diagnosing this issue or fo			
	replacement of suspect components, contact the PACCAR Engine Support Call				
	Center at 1-800-477-0251.				
Verification Drive Cycle	To validate repair:				
	This cycle is best performed on a level grade road (least amount of incline possible)				
	and under load using a trailer. If a loaded trailer is unavailable, produce engine load by turning the A/C and fan to ON. With the System Initiation cycle complete, proceed to a road with a minimum speed limit of 50 mph, then get to the highest gear possible with the engine speed between 1100-1500 rpm, and set the cruise control. Run this cycle for roughly 3 to 5 miles or in				
	three separate 1-mile increments if a steady 3 to 5 miles is unachievable.				
	Back to Index				



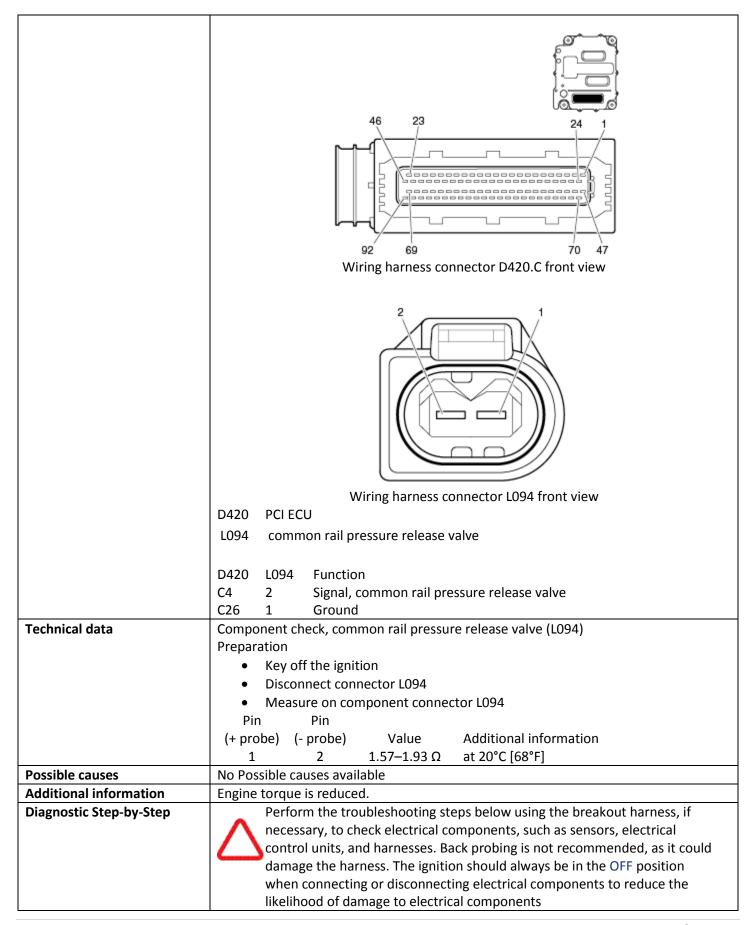
P109C

Code number	P109C
Fault code description	Common rail pressure release valve - Current too low or open circuit on ECU D420 pin
	C4
Fault code information	1 trip MIL
	3 drive cycle recovery
	Readiness group – None
	Freeze frame type - Fuel
Description of component(s)	The common rail pressure release valve is used to control the rail pressure during a malfunction in the rail pressure control situation. Secondly, it has a pressure-limiting valve so that the rail pressure does not exceed 3250 ± 300 bar [47138 ± 4351 psi] in emergency situations (e.g., loss of rail pressure control). The common rail pressure release valve is part of the common rail and is not interchangeable as a separate part.
	Control During normal rail pressure control, the valve is controlled (duty cycle) to keep it closed. The current to keep the valve closed varies and depends on the required rail pressure. If it is not electronically controlled (e.g., faulty valve or wiring), the valve is normally closed and opens at approximately 320 ± 70 bar [4641 ± 1015 psi]. The opening pressure can vary depending on engine speed, fuel temperature, and other factors. If the valve opens, the fuel is dumped into the supply pipe of the fuel module. Learning function The current to control the common rail pressure release valve is determined by the PCI ECU and is stored in its memory. If a common rail pressure release valve is changed, the stored value in the PCI ECU must be reset with DAVIE. Effect of output signal on the system: • controlling the rail pressure in case the normal rail pressure control is lost (for example, a failure on high-pressure fuel system components is detected).

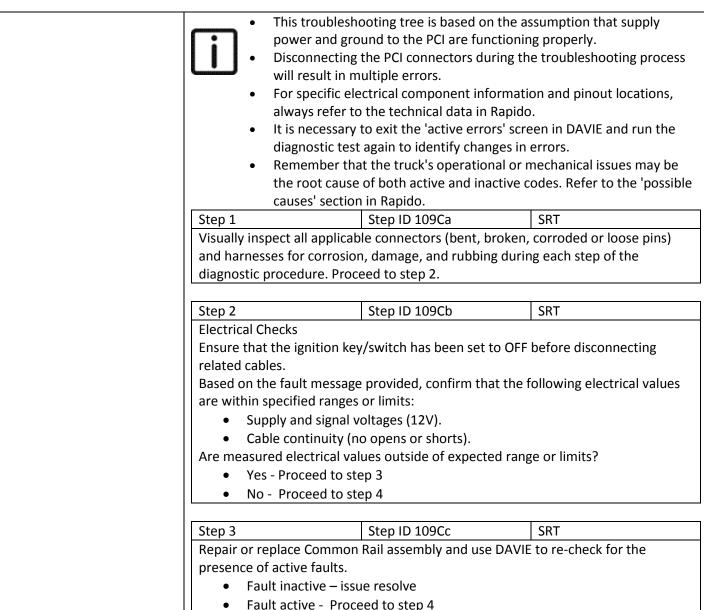












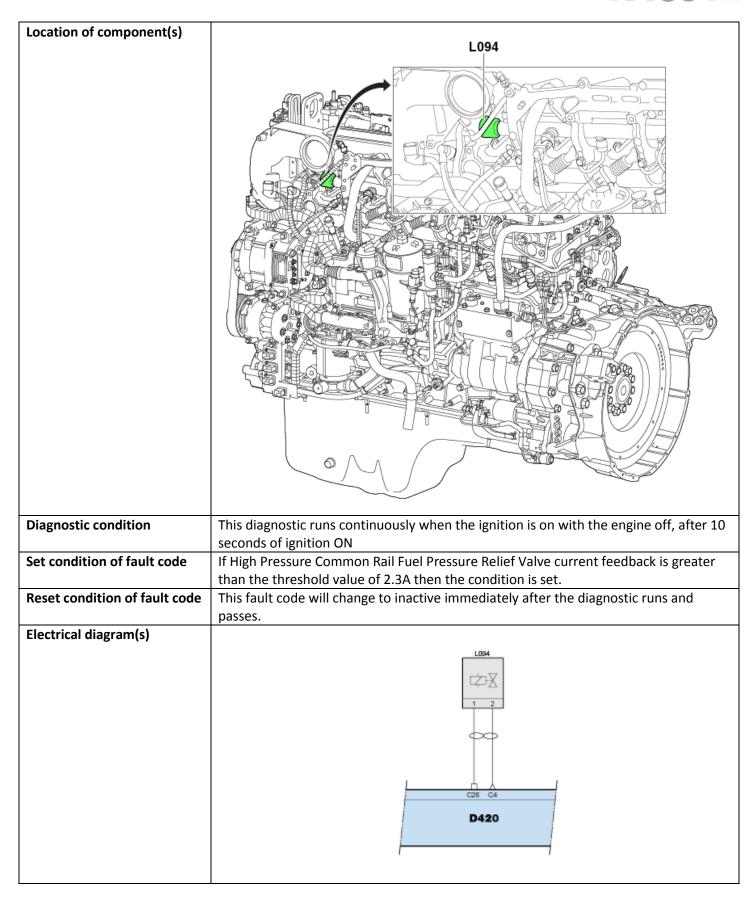
	Step 3	Step ID 109Cc	SRT		
	Repair or replace Common Rail assembly and use DAVIE to re-check for the				
	presence of active faults.				
	 Fault inactive – issu 	ue resolve			
	Fault active - Proce	eed to step 4			
	Step 4	Step ID 109Cd	SRT		
	For further assistance in dia	agnosing this issue or for con	firmation prior to the		
	replacement of suspect components, contact the PACCAR Engine Support Call				
	Center at 1-800-477-0251.				
Verification Drive Cycle	To validate repair, with the brakes set, start the engine and allow it to run at idle for 2				
	minutes.				
	Back to Index				
	Buok to mack				



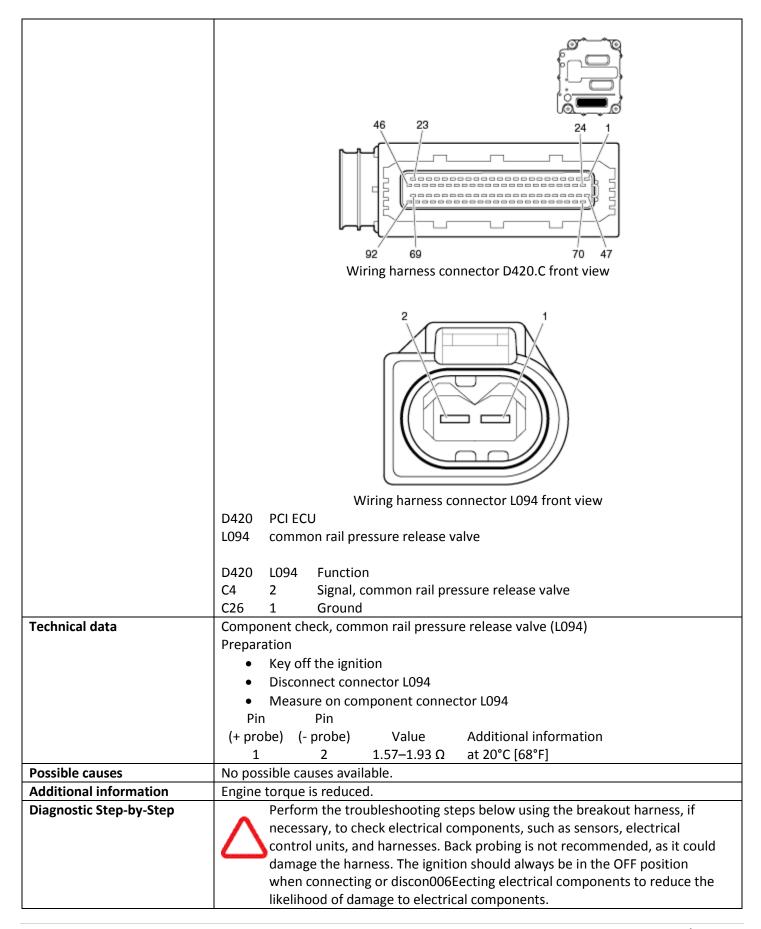
P109D

Code number	P109D
Fault code description	Common rail pressure release valve - Current too high on ECU D420 pin C4
Fault code information	1 trip MIL
	3 drive cycle recovery
	Readiness group – None
	Freeze frame type - Fuel
Description of component(s)	The common rail pressure release valve is used to control the rail pressure during a malfunction in the rail pressure control situation. Secondly, it has a pressure-limiting valve so that the rail pressure does not exceed 3250 ± 300 bar $[47138 \pm 4351 \text{ psi}]$ in emergency situations (e.g., loss of rail pressure control). The common rail pressure release valve is part of the common rail and is not interchangeable as a separate part.
	Control During normal rail pressure control, the valve is controlled (duty cycle) to keep it closed. The current to keep the valve closed varies and depends on the required rail pressure. If it is not electronically controlled (e.g., faulty valve or wiring), the valve is normally closed and opens at approximately 320 ± 70 bar [4641 ± 1015 psi]. The opening pressure can vary depending on engine speed, fuel temperature, and other factors. If the valve opens, the fuel is dumped into the supply pipe of the fuel module.
	Learning function The current to control the common rail pressure release valve is determined by the PCI ECU and is stored in its memory. If a common rail pressure release valve is changed, the stored value in the PCI ECU must be reset with DAVIE.
	 Effect of output signal on the system: Controlling the rail pressure in case the normal rail pressure control is lost (for example, a failure on high-pressure fuel system components is detected). Limits the maximum rail pressure in emergency situations













- This troubleshooting tree is based on the assumption that supply power and ground to the PCI are functioning properly.
- Disconnecting the PCI connectors during the troubleshooting process will result in multiple errors.
- For specific electrical component information and pin out locations, always refer to the technical data in Rapido.
- It is necessary to exit the 'active errors' screen in DAVIE and run the diagnostic test again to identify changes in errors.
- Remember that the truck's operational or mechanical issues may be the root cause of both active and inactive codes. Refer to the 'possible causes' section in Rapid.

Step 1	Step ID 109Da	SRT
Jicp 1	Step ID 103Da	

Visually inspect all applicable connectors (bent, broken, corroded or loose pins) and harnesses for corrosion, damage, and rubbing during each step of the diagnostic procedure. Proceed to step 2.

C+an 3	Step ID 109Db	SRT
Step 2	1 2160 10 10900	1.581

Electrical Checks

Ensure that the ignition key/switch has been set to OFF before disconnecting related cables.

Based on the fault message provided, confirm that the following electrical values are within specified ranges or limits:

- Supply and signal voltages.
- Cable continuity (no opens or shorts).

Are measured electrical values outside of expected range or limits?

- Yes Proceed to step 3
- No Proceed to step 4

Step 3 Step ID 109Dc SRT

Repair or replace appropriate component and use DAVIE to re-check for the presence of active faults.

- Fault inactive issue resolved
- Fault active Proceed to step 4

Step 4	Step ID 109Dd	SRT
Jicp +	July 103Da	2111

Replace: High Pressure Valve (Common Rail)

Contact the PACCAR Engine Support Call Center to confirm replacement of the Common Rail assembly.

Replace the Common Rail assembly, which includes the High Pressure Valve. Use DAVIE to re-check for the presence of active faults.

- Fault inactive issue resolve
- Fault active Proceed to step 5

Step 5	Step ID 109De	SRT
Jicp J	Step ID 103De	2111

Contact the PACCAR Engine Support Call Center:

For further assistance in diagnosing this issue or for confirmation prior to the replacement of suspect components, contact the PACCAR Engine Support Call Center at 1-800-477-0251.



Verification Drive Cycle	To validate repair, with the brakes set, turn the key to the ON position with the engine off, and allow 10 seconds for the system to initialize and run diagnostics.
	Back to Index

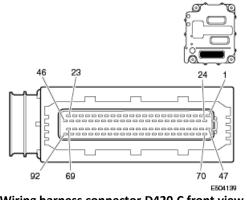


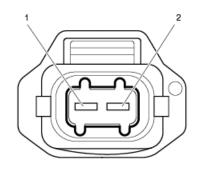
F 1110	
Code number	P1110
Fault code description	Intercooler efficiency - Too low
Fault code information	2 trip MIL
radic code illiorillation	3 drive cycle recovery
	Readiness group – Boost
	Freeze frame type – Boost
Description of component(s)	The intercooler outlet temperature is measured before the EGR mixer.
	Effect on the system
	Monitors intercooler performance
Location of component(s)	F750
	MOZZAB
Diagnostic condition	This diagnostic runs:
	150 seconds after an engine start, and;
	engine is running at steady speed and load, and;
	• coolant temperature is above 65°C [149°F], and;
	I have a second of the second



	• vehi	cle speed is	s more than 25 km/h [15.5 mph]	
Set condition of fault code	The PCI ECU (D420) detects that cooling capacity of the intercooler is too low for more than 40 seconds.			
Reset condition of fault code	This DTC	changes to i	nactive when the fault is no longer detected.	
	[158°F]. O minimum speed bet performed power cou to 5 miles	once the mir speed of 80 ween 1100 d with a loan nsumers on or in 3 sep	r, drive the vehicle until the coolant temperature is at least 70°C nimum target temperature has been reached, proceed at a 0 km/h [50 mph] in the highest gear possible with the engine and 1500 rpm and set the cruise control. This test is best ded vehicle/trailer, but if load is unavailable, turn as many engine to produce engine load. Perform this test for roughly 5 to 8 km [3 parate 1.5 km [1 mile] increments if a steady 5 to 8 km [3 to 5 e. Use a flat road, if possible.	
Electrical diagram(s)			D420 C17 C40 R T F750 1401892	
	D420 PCI	ECU		
	F750 Inte	rcooler tem	nperature sensor	
	D420	F750	Function	
	C17	1	Signal, intercooler temperature	
	C31	2	Ground	







Wiring harness connector D420.C front view

Wiring harness connector F750 front view



Handle connectors and pins with care and use matching measuring probes.

Technical data

Component check, intercooler temperature sensor (F750)

Preparation

- Key off the ignition
- Disconnect connector F750
- Measure on the component connector F750

Pin	Pin	Value	Additional information
(+ probe)	(- probe)		
1	2	5248–5732 Ω	Resistance value at 0°C [32°F]
		2334–2505 Ω	Resistance value at 20°C [68°F]
		1133–1198 Ω	Resistance value at 40°C [104°F]
		593–619 Ω	Resistance value at 60°C [140°F]
		331–341 Ω	Resistance value at 80°C [176°F]
		195–199 Ω	Resistance value at 100°C [212°F]

Component & circuit check, ECU (D420)

Preparation

Key off the ignition



	• Disco	onnect conn	ector F750			
	Pin (+ probe)	Pin (- probe)	Value	Additional information		
	1	2	5V	Ignition keyed on		
Possible causes	 Fan not v Intercoo Ambient Coolant EGR tem Pre-com Boost (ir Ambient Boost aii Use of a 	 Fan not working correctly Intercooler temperature sensor deviation Ambient air temperature sensor deviation Coolant temperature sensor deviation EGR temperature sensor deviation Pre-compressor air temperature sensor deviation Boost (intake manifold) air temperature sensor deviation Ambient air pressure sensor deviation Boost air pressure sensor deviation Use of a winterfront at temperatures above 40°F (4°C) Use of an aftermarket winterfront that has excessive airflow restriction through 				
Additional information		The cooling efficiency of the intercooler is monitored.				
	1. The calculates after 2. The tempera	calculated temperature before the intercooler with the measured temperature after the intercooler.				
Diagnostic Step-by-Step	di:	_	electrical comp	in the OFF position when connecting or onents to reduce the likelihood of damage to		





- This troubleshooting procedure is based on the assumption that supply power and ground to the PMCI are functioning properly.
- Disconnecting the PMCI connectors during the troubleshooting process will result in multiple errors.
- Specific electrical component information and pin out locations are provided in this procedure as a reference only. Always refer to the technical data sections in Rapido for the most up-to-date changes.
- It is necessary to use DAVIE to clear all current trouble codes from the PCI and EAS-3 ECUs, and then run the Quick Check to identify a change in fault status.
- This DTC can be set as a result of multiple failure modes. For proper fault isolation, complete all troubleshooting steps in the sequence provided.

Step 1. Investigate Related Trouble Codes

Before troubleshooting this code, take notice of any other active or inactive trouble codes. One or multiple other codes could have been the cause for this code.

Step 1.A Investigate related trouble codes			
1. Use DAVIE Diagnostics to per	rform	a Quick Check for current trouble codes.	
Are these or any other related codes	active	e?	
Ambient air temp sensor	P00	72; P0073; P009A	
Coolant temperature sensor	P01	P0115; P0117; P0118; P1115; P2181; P2183	
Post-intercooler air temperature sensor	P0095; P0097; P0098; P0127; P1127		
EGR (venturi) temperature sensor	P040B; P040C; P040D, or related EGR codes		
Pre-compressor air temperature sensor	P2199; U1071		
Boost air temperature sensor	P01	10; P0112; P0113; P1128; P1573	
Ambient air pressure sensor P222		26; P2228; P2229	
Boost air pressure sensor	P0069; P0107; P0108; P104B; P104C		
Yes		No	
Refer to the troubleshooting information these codes before continuing withis procedure.			
		Go to step 2.A	



Step 2. Intercooler (F750) Checks

Step 2. A Visual inspection, intercooler (F750)

Action

- 1. Visually inspect the intercooler (charge air cooler) and associated components for any of the following:
 - Loose or broken clamps on the air system
 - Dirt or debris build-up (blockage) at the front of the intercooler
 - Air system parts are removed or damaged
 - Hump hoses are folded over or have holes
 - Damage to or incorrect installation of any of the following sensors:
 - Coolant temperature sensor (F566)
 - o Post-intercooler temperature sensor (F750)
 - o Pre-compressor air (after BPV) temperature sensor (F853)
 - o EGR (venturi) temperature sensor (F749)
 - Boost air temperature sensor (F804)
 - o Boost air pressure sensor (F802)

Was there evidence of any of the above?	
Yes	No
Correct any issues found. If a sensor is	
found to be damaged or broken, replace	
it.	
Refer to Step 3.A to perform the	
corresponding repair verification cycles	
and rechecks.	
If this code is still present, go to Step	Go to step 2.B
2.B.	

Step 2.B DAVIE monitor, intercooler temperature and related sensors Action 1. Use DAVIE to select and monitor the following temperature and pressure values for comparison: Coolant temperature (turbo control) Post-intercooler air temperature(turbo control) Pre-compressor air temperature(turbo control) EGR temperature (EGR control) Boost air pressure (turbo control) For initial temperature readings, monitor with the ignition key to ON and the engine to OFF. Start the engine and allow it to idle for a minimum of 10 minutes to allow the temperature sensors to stabilize. While monitoring, no temperature should vary by a value of more than 50°F for a period of more than 5 seconds. Do any monitored values vary by more than 50°F (24°C) for more than 5 seconds? No Yes Correct any issues found, or replace the related sensor if measured values indicate a sensor error. Refer to Step 3.A to perform the corresponding repair verification cycles and rechecks. If this code is still present, go to step 2.C. Go to step 2.C

Step 2.C Pressure testing, intake and exhaust elements

Action

1. Perform the steps outlined in the procedure, "pressure testing (intake/exhaust elem.)," job ID 84123, to determine whether there are any leaks in the intake air system.

Was there evidence of a leak in the air system?

Yes No



Correct any issues found.	
Refer to Step 3.A to perform the	
corresponding repair verification cycles	
and rechecks.	
If all steps have been completed and	If all steps have been completed and
this trouble code is still present, contact	this trouble code is still present, contact
the PACCAR Engine Support Center for	the PACCAR Engine Support Center for
further assistance.	further assistance.

Step 3. Repair Verification

Step 3.A Repair verification cycles

Perform these repair verification cycles following any corrective actions taken, to enable related OBD monitors to reach a readiness state associated with the trouble code or system being investigated.



Before beginning these repair verification cycles, use the DAVIE Diagnostics, Quick Check function to clear all current DTCs from the PCI and EAS-3 ECUs.

Action

1. Steady State

This cycle is best performed on a level grade road (least amount of incline possible) and under load using a trailer. If a loaded trailer is unavailable, produce engine load by turning the A/C and fan to ON.

With the System Initiation cycle complete, proceed to a road with a minimum speed limit of 50 mph, then get to the highest gear possible with the engine speed between 1100-1500 rpm, and set the cruise control. Run this cycle for roughly 3 to 5 miles or in three separate 1-mile increments if a steady 3 to 5 miles is unachievable.

Were the identified repair verification cycles able to be completed?

Yes	No
	Investigate and correct any issues preventing these repair verification cycles from being completed, then rerun. For additional assistance, contact the PACCAR Engine Support Center.
Go to step 3.B	Go to step 3.B



Action 1. Use DAVIE Diagnostics to perform a Quick Check for current trouble codes determine whether the actions taken have cleared this trouble code. Has P1110 been cleared? Yes No Problem resolved. No further actions. Continue with the next step in this troubleshooting procedure. If all steps have been completed and this trouble code is still present, contact the PACCA Engine Support Center for further assistance. Contacting the PACCAR Engine Support Center For further assistance in diagnosing this issue or for confirmation prior to the replacement of suspect components, contact the PACCAR Engine Support Call Center.		ck
determine whether the actions taken have cleared this trouble code. Has P1110 been cleared? Yes No Problem resolved. No further actions. Continue with the next step in this troubleshooting procedure. If all steps have been completed and this trouble code is still present, contact the PACCA Engine Support Center for further assistance. Contacting the PACCAR Engine Support Center For further assistance in diagnosing this issue or for confirmation prior to the replacement of suspect components, contact the PACCAR Engine Support Call	Action	
Yes Problem resolved. No further actions. Continue with the next step in this troubleshooting procedure. If all steps have been completed and this trouble code is still present, contact the PACCA Engine Support Center for further assistance. Contacting the PACCAR Engine Support Center For further assistance in diagnosing this issue or for confirmation prior to the replacement of suspect components, contact the PACCAR Engine Support Call	, <u> </u>	
Problem resolved. No further actions. Continue with the next step in this troubleshooting procedure. If all steps have been completed and this trouble code is still present, contact the PACCA Engine Support Center for further assistance. Contacting the PACCAR Engine Support Center For further assistance in diagnosing this issue or for confirmation prior to the replacement of suspect components, contact the PACCAR Engine Support Call	Has P1110 been cleared?	
troubleshooting procedure. If all steps have been completed and this trouble code is still present, contact the PACCA Engine Support Center for further assistance. Contacting the PACCAR Engine Support Center For further assistance in diagnosing this issue or for confirmation prior to the replacement of suspect components, contact the PACCAR Engine Support Call	Yes	No
For further assistance in diagnosing this issue or for confirmation prior to the replacement of suspect components, contact the PACCAR Engine Support Call	Problem resolved. No further actions.	troubleshooting procedure. If all steps have been completed and this trouble code is still present, contact the PACCAI Engine Support Center for further
	Contacting the PACCAR Engine St	assistance. upport Center g this issue or for confirmation prior to the



Code number	P1115
Fault code description	Coolant temperature - Data valid but too high, moderately severe
Fault code information	1 trip MIL
	3 drive cycle recovery
	Readiness group – None
	Freeze frame type – Cooling
Description of component(s)	The coolant temperature is measured in the coolant return gallery at the right rear end of the cylinder block. Effect on the system: Calculates the quantity of fuel to inject and the injection timing Displays the coolant temperature to the driver Displays warnings to the driver concerning high coolant temperature Limits the engine torque when the coolant temperature is too high Limits the maximum engine speed when the engine is cold Enables condition for severity of (OBD) diagnostic checks
	Fast idle speed control
	Cold start aid
Location of component(s)	F566
Diagnostic condition	This diagnostic runs continuously when the ignition is keyed on and when the engine is running.
Set condition of fault code	The PCI ECU (D420) detects that the measured coolant temperature is more than 110°C [230°F] for more than 10 seconds.
Reset condition of fault code	This DTC changes to inactive when the fault is no longer detected. To validate the
	repair, drive the vehicle until the coolant temperature is at least 70°C [158°F]. Once the minimum target temperature has been reached, perform several low to higher



	speed accelerations with moderate engine load. Also perform high-load to low-load transitions. This activity should be conducted within the range of 15 km/h [10 mph] to
	65 km/h [40 mph] for no more than 5 to 8 km [3 to 5 miles].
Electrical diagram(s)	D420 A58 A61 P556 62 59 56 A58 A61
	Wiring harness connector D420.A front view
	Wiring harness connector F566 front view
	D420 PCI ECU
	F566 coolant temperature sensor
	D420 F556 Function A58 1 Signal, coolant temperature A61 2 Ground
Technical data	Component check, coolant temperature sensor (F566)
	PreparationKey off the ignition
	▼ Key off the ignition



	Disconnect connector	⁻ F566	
	Measure on component connector F566		
	Pin Pin		
	(+ probe) (- probe)	Value	Additional information
	1 2	14936–15961 Ω	Resistance value at -20°C [-4°F]
		5727–6056 Ω	Resistance value at 0°C [32°F]
		2439-2557 Ω	Resistance value at 20°C [68°F]
		1151–1197 Ω	Resistance value at 40°C [104°F]
		585-604 Ω	Resistance value at 60°C [140°F]
		318–327 Ω	Resistance value at 80°C [176°F]
		185–188 Ω	Resistance value at 100°C [212°F]
		111–114 Ω	Resistance value at 120°C [248°F]
	Component & circuit ched	ck, ECU (D420)	. ,
	Preparation	, , ,	
	Key off the ignition		
	Disconnect connector	⁻ F566	
	 Measure on the front 	side of wiring harne	ss connector F566
	Pin Pin		
	(+ probe) (- probe)	Value	Additional information
	1 2	5V	Ignition keyed on
Possible causes	 Coolant level too low 		
	 Contaminated radiate 		
	Faulty engine cooling	fan	
	Blocked thermostat		
	Coolant temperature		
Additional information	The engine coolant temperature is monitored by the coolant temperature sensor (F566).		
Diagnostic Step-by-Step	Perform the troubleshooting steps below using the breakout harness, if		
Tragitation of the property of			ents, such as sensors, electrical control
		·	not recommended, as it could damage
	the harness. The ignition should always be in the OFF position when		
	connecting or disconnecting electrical components in order to reduce the		
	likelihood of damage to electrical components.		
	Disconnecting the EAS connectors during the troubleshooting		
	 process will result in multiple errors. For specific electrical component information and pinout locations, always refer to the technical data. It is necessary to exit the fault code many in DAVIE and run the 		
	It is necessary to exit the fault code menu in DAVIE and run the diagnostic test again to identify a change in errors		
	 diagnostic test again to identify a change in errors. Remember that the truck's operational or mechanical issues may be 		
	the root cause of both active and inactive fault codes. Refer to the		
	'possible	causes' section.	
	Step 1	Step ID 1115a	SRT
	Visually inspect all applic	cable connectors (be	nt, broken, corroded or loose pins)
	and harnesses for corros	sion, damage, and ru	bbing during each step of the
	diagnostic procedure. Pr	roceed to step 2.	
		T	
	Step 2	Step ID 1115b	SRT



Ancillary Test: Coolant Leak

Perform the prescribed testing to determine correct operation of the associated engine or aftertreatment system.

Does the test fail to complete or result in a failed state?

- No Proceed to step 4
- Yes Proceed to Step 3

Step 3 Step ID 1115c

SRT

Repairs or component replacements appropriate component and use DAVIE to recheck for the presence of active faults.

- Fault inactive issue resolved
- Fault active Proceed to step 4

Step 4 Step ID 1115d SRT

Remove and inspect the thermostat to verify it is not stuck in the open or closed position.

Was the thermostat stuck in the open or closed position?

- No Proceed to step 6
- Yes Proceed to step 5

Step 5 Step ID 1115e SRT

Repairs or component replacements appropriate component and use DAVIE to recheck for the presence of active faults.

- Fault inactive issue resolved
- Fault active Proceed to step 6

Step 6 Step ID 1115f SRT

Replace the identified faulty Coolant temperature sensor and use DAVIE to recheck for the presence of active faults.

- Fault inactive issue resolved
- Fault active Proceed to step 7

Step 7 Step ID 1115g SRT

For further assistance in diagnosing this issue or for confirmation prior to the replacement of suspect components, contact the Engine Support Call Center at 1-800-477-0251.

Verification Drive Cycle

To validate repair:

This cycle is best performed on a level grade road (least amount of incline possible) and under load using a trailer. If a loaded trailer is unavailable, produce engine load by turning the A/C and fan to ON.

With the System Initiation cycle complete, proceed to a road with a minimum speed limit of 50 mph, then get to the highest gear possible with the engine speed between 1100-1500 rpm, and set the cruise control. Run this cycle for roughly 3 to 5 miles or in three separate 1-mile increments if a steady 3 to 5 miles is unachievable.

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Code number	P1122
Fault code description	Sticking cruise fault
Fault code information	For further assistance: Contact the PACCAR Engine Support Call Center 1-800-477-0251 Please Contact the Engine Support Center
Description of component(s)	
Location of component(s)	
Diagnostic condition	
Set condition of fault code	
Reset condition of fault code	
Electrical diagram(s)	
Technical data	
Possible causes	
Additional information	
Diagnostic Step-by-Step	
Verification Drive Cycle	
	Back to Index



Code number	P1127
Fault code description	Intercooler temperature - Data valid but too high, moderately severe
Fault code information	1 trip MIL 3 drive cycle recovery Readiness group – None Freeze frame type – Boost
Description of component(s)	The intercooler outlet temperature is measured before the EGR mixer.
	Effect on the system
	Monitors intercooler performance
Location of component(s)	
	F750
Diagnostic condition	This diagnostic runs 300 seconds after the engine is started.
Set condition of fault code	The PCI ECU (D420) detects that the intercooler outlet temperature is more than 95°C



Reset condition of fault code Electrical diagram(s) D420 D420 PCI ECU F750 Intercooler temperature sensor D420 F750 Function C17 1 Signal, intercooler temperature C31 2 Ground
D420 PCI ECU F750 Intercooler temperature sensor D420 F750 Function
D420 PCI ECU F750 Intercooler temperature sensor D420 F750 Function
D420 F750 Function C17 1 Signal, intercooler temperature C31 2 Ground
C17 1 Signal, intercooler temperature C31 2 Ground
C31 2 Ground
Wiring harness connector D420.C front view Wiring harness connector F750 front view
Handle connectors and pins with care and use matching measuring probes.
Technical data Component check, intercooler temperature sensor (F750)
Preparation
 Key off the ignition Disconnect connector F750



	Measure on the component connector F750			
	Pin (+ probe)	Pin (- probe)	Value	Additional information
	1	2	5248–5732 Ω	Resistance value at 0°C [32°F]
			2334–2505 Ω	Resistance value at 20°C [68°F]
			1133–1198 Ω	Resistance value at 40°C [104°F]
			593–619 Ω	Resistance value at 60°C [140°F]
			331–341 Ω	Resistance value at 80°C [176°F]
			195–199 Ω	Resistance value at 100°C [212°F]
	Component & circuit check, ECU (D420) Preparation • Key off the ignition • Disconnect connector F750 • Measure on the front side of wiring harness connector F750			
	Pin (+ probe)			
	1	2	5V	Ignition keyed on
Possible causes	 Restricted air flow through the intercooler/radiator Faulty engine cooling fan Intercooler temperature sensor deviation 			
Additional information	The intercooler outlet temperature is measured before the EGR mixer by the intercooler temperature sensor (F750).			
Diagnostic Step-by-Step	The ignition should always be in the OFF position when connecting or disconnecting electrical components to reduce the likelihood of damage to the components. This troubleshooting procedure is based on the assumption that supply power and ground to the PCI are functioning properly. Disconnecting the PCI connectors during the troubleshooting process will result in multiple errors. Specific electrical component information and pin out locations are provided in this procedure as a reference only. Always refer to the technical data sections in Rapido for the most up-to-date changes. It is necessary to use DAVIE to clear all current DTCs from the PCI and EAS-3			



ECUs, and then run the Quick Check to identify a change in DTC status.

This DTC can be set as a result of multiple failure modes. For proper fault isolation, complete all troubleshooting steps in the sequence provided.

Step 1 Investigate Related DTCs

Before troubleshooting this DTC, take notice of any other active or inactive DTCs. One or multiple other DTCs could have been the cause for this DTC.

Step 1A Investigate related DTCs			
Action			
Use DAVIE Diagnostics to perform a Quick Check for current DTCs.			
Are these or any other related DTC	s active?		
Ambient air temp sensor	P0072; P0073; F	2009A	
Coolant temperature sensor	P0115; P0117; F	P0118; P1115; P2181; P2183	
Post-intercooler air temperature sensor	P0095; P0097; F	20098; P0127	
EGR (venturi) temperature sensor	P040B; P040C; F	P040D, or related EGR DTCs	
Pre-compressor air temperature sensor	P2199; U1071		
Boost air temperature sensor	P0110; P0112; F	P0113; P1128; P1573	
Yes		No	
Refer to the troubleshooting information for these DTCs before continuing with this procedure.			
		Go to step 2A	

Step 2 Intercooler (F750) Checks

Step 2A Visual inspection, intercooler (F750)

Action

- 1. Visually inspect the intercooler (charge air cooler) and associated components for any of the following:
 - Loose or broken clamps on the air system
 - Dirt or debris build-up (blockage) at the front of the intercooler
 - Air system parts are removed or damaged



- Hump hoses are folded over or have holes
- Damage to or incorrect installation of the Coolant temperature sensor (F566)
- Damage to or incorrect installation of the Post-intercooler temperature sensor (F750)
- Damage to or incorrect installation of the Pre-compressor air (after BPV) temperature sensor (F853)
- Damage to or incorrect installation of the EGR (venturi) temperature sensor (F749)
- Damage to or incorrect installation of the Boost air temperature sensor (F804)
- Damage to or incorrect installation of the Boost air pressure sensor (F802)

Was there evidence of any of the above?

Yes	No
Correct any issues found. If a sensor is found to be damaged or broken, replace it. Refer to step 3A to perform the corresponding repair verification cycles and rechecks.	
If this DTC is still present, go to step 2B	step 2B

Step 2B Electrical checks, resistance, intercooler temperature sensor (F750)



Refer to the corresponding checking data for associated supply and signal voltages, resistance values, and related connector pin test points.

Action

1. Confirm the sensor resistance values as outlined in the corresponding checking data, "Component check, intercooler temperature sensor (F750).

Are measured values within expected range?

Yes	No
	Correct any issues found, or replace the intercooler temperature sensor (F750) if measured values indicate a sensor error. Refer to step 3A to perform the corresponding repair verification cycles and rechecks.



Go to step 2C	If this DTC is still present, go to step 2C

Step 2C Electrical checks, supply voltage, intercooler temperature sensor (F750)



Refer to the corresponding checking data for associated supply and signal voltages, resistance values, and related connector pin test points.

Action

1. Confirm the sensor supply voltage as outlined in the corresponding checking data, "Component check, intercooler temperature sensor (F750).

Are measured values within expected range?

Yes	No
	Correct any issues found. Refer to step 3A to perform the corresponding repair verification cycles and rechecks.
Go to step 2D	If this DTC is still present, go to step 2D

Step 2D DAVIE monitor, intercooler temperature and related sensors

Action

- 1. Use DAVIE to select and monitor the following temperature and pressure values for comparison:
 - Coolant temperature (turbo control)
 - Post-intercooler air temperature(turbo control)
 - Pre-compressor air temperature(turbo control)
 - EGR temperature (EGR control)
 - Boost air pressure (turbo control)

For initial temperature readings, monitor with the ignition key to ON and the engine to OFF.

Start the engine and allow it to idle for a minimum of 10 minutes to allow the temperature sensors to stabilize.

While monitoring, no temperature should vary by a value of more than 50°F for a period of more than 5 seconds.

Do any monitored values vary by more than 50°F (24°C) for more than 5 seconds?

Yes No



Correct any issues found, or replace the related sensor if measured values indicate a sensor error. Refer to step 3A to perform the corresponding repair verification cycles and rechecks.	
If this DTC is still present, go to step 2E	Go to step 2E

Step 2E Special test, intake/exhaust leak

Action

1. Perform this test using the Intake/Exhaust Leak Test Kit (#1903034) to determine whether there are any leaks in the intake air system.

Was there evidence of a leak in the air system?

Yes	No
Correct any issues found. Refer to step 3A to perform the corresponding repair verification cycles and rechecks.	
If all steps have been completed and this DTC is still present, contact the PACCAR Engine Support Center for further assistance.	If all steps have been completed and this DTC is still present, contact the PACCAR Engine Support Center for further assistance.

Step 3 Repair Verification

Step 3A Repair verification cycles

Perform these repair verification cycles following any corrective actions taken, to enable related OBD monitors to reach a readiness state associated with the DTC or system being investigated.



Before beginning these repair verification cycles, use the DAVIE Diagnostics, Quick Check function to clear all current DTCs from the PCI and EAS-3 ECUs.

Action

1. Steady State

This cycle is best performed on a level grade road (least amount of incline possible) and under load using a trailer. If a loaded trailer is unavailable, produce engine load by turning the A/C and fan to ON. With the System Initiation cycle complete, proceed to a road with a minimum speed limit of 50 mph, then get to the highest gear possible with the engine speed between 1100-1500 rpm, and set the cruise control. Run



•	oughly 3 to 5 miles or in three separate 1-mile increments if niles is unachievable.
Were the identified re	pair verification cycles able to be completed?
Yes	No
	Investigate and correct any issues preventing these repair verification cycl from being completed, then re-run. For additional assistance, contact the PACCAR Engine Support Center.
Go to step 3B	Go to step 3B

Step 3B DAVIE Diagnostics, Quick Check		
Action		
 Use DAVIE Diagnostics to perform a Quick Check for current DTCs to determine whether the actions taken have cleared this DTC. 		
Has P1127 been cleared?		
Yes	No	
Problem resolved. No further actions.	Continue with the next step in this troubleshooting procedure. If all steps have been completed and this DTC is still present, contact the PACCAR Engine Support Center for further assistance.	



Contacting the PACCAR Engine Support Center

For further assistance in diagnosing this issue or for confirmation prior to the replacement of suspect components, contact the PACCAR Engine Support Call Center.

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Code number	P1128
Fault code description	Air temp too high.
Fault code information	For further assistance: Contact the PACCAR Engine Support Call Center 1-800-477-0251 Please Contact the Engine Support Center
Description of component(s)	
Location of component(s)	
Diagnostic condition	
Set condition of fault code	
Reset condition of fault code	
Electrical diagram(s)	
Technical data	
Possible causes	
Additional information	
Diagnostic Step-by-Step	
Verification Drive Cycle	
	Back to Index



P1133	I
Code number	P1133
Fault code description	Lambda sensor heater – Voltage too high or short circuit to supply on ECU D420 pin C46
Fault code information	1 trip MIL
	3 drive cycle recovery
	Readiness group – None
	Freeze frame type – Exhaust gas
Description of component(s)	The lambda sensor measures the oxygen concentration in the exhaust gases after the BPV valve.
	Air/fuel ratio
	The PCI ECU uses the measured oxygen concentration in the exhaust to determine
	the air/fuel ratio of the combustion process.
	Typical air/fuel ratios are 18 to 45. A high value indicates a high oxygen concentration
	measured by the lambda sensor. Sensor heater
	The sensor has an integrated heater to maintain a sensor operating temperature of
	approximately 750°C [1382°F]. The PCI ECU controls the heater.
	Sensor heating control
	The first stage starts when the ignition is keyed on.
	The sensor is heated to a value at which any condensate evaporates from the
	sensor.
	The second stage starts after the 'dew point' is reached.
	The sensor is heated to its operating temperature of approximately 750°C



	 [1382°F]. The PCI ECU determines the 'dew point' by calculating how much energy (heat by burning fuel in the engine) is pumped through the exhaust. If the 'dew point' is not/no longer reached, the sensor temperature stays at/drops to the standby temperature, similar to the first stage heating. Effect on the system Determines the air/fuel ratio of the combustion process Controls the smoke limit; where the measured exhaust gas oxygen concentration is compared with a target value for smoke limitation. A higher measured oxygen concentration results in lower calculated soot formation by the engine. Controls NOx emissions; determines whether the target Exhaust Gas Recirculation is being achieved to control NOx emissions. A higher measured oxygen concentration results in higher calculated NOx formation by the engine. Controls regeneration of the diesel particulate filter (DPF). The soot particles in the DDF are librared by the engine and the processor of the diesel particulate filter (DPF). The soot particles in the DDF are librared by the engine and the processor of the diesel particulate filter (DPF).
Location of component(s)	in the DPF are 'burned' using the oxygen present in the exhaust gas.
Location of component(s)	F834
Diagnostic condition	Need to consider all active/inactive faults: one or multiple faults may have triggered this fault
	 when the engine speed is between 950 and 2000 rpm, and; when the engine is running at a steady load, and; when coolant temperature is above 50°C [122°F], and; the engine mode is SCR high efficiency or standard or protection;



0.1 11.1 00 11.1	The lambda sensor (F834) is in the operating mode. The lambda sensor (F834) is in the operating mode.
Set condition of fault code	This diagnostic starts five minutes after the engine starts. The diagnostic runs continuously.
Reset condition of fault code	This fault code will change to inactive immediately after the diagnostic runs and
	passes.
Electrical diagram(s)	2 123E F834
	46 23 24 1
	92 69 70 47 E504139
	Wiring harness connector D420.C front view
	1 5 5 6 Wiring harness connector F834 front view



	D420 F024 F
	D420 F834 Function
	C21 5 Trimming resistor
	C22 2 Ground, sensor element
	C23 6 Signal, nernst sensor
	C45 1 Signal, pump cell current
	C46 3 Ground, heater element
	4 Power supply, heater element
Technical data	Component check, lambda sensor (F834) Preparation
	Key the ignition off
	Disconnect connector F834
	Measure on component connector F834
	Pin Pin
	(+ probe) (- probe) Value Additional information
	4 3 2.4–4.0 Ω Heater element resistance at 20°C [68°C]
	Component & circuit check, ECU (D420) Preparation
	Key the ignition off
	Disconnect connector F834
	Measure on the front side of wiring harness connector F834
	Pin Pin Pin
	(+ probe) (- probe) Value Additional information
	4 Ground Ubat Heater element power supply with ignition keyed on
Possible causes	Faulty wiring
	Faulty connector
	Faulty sensor
Additional information	No additional information available.
Diagnostic Step-by-Step	Perform the troubleshooting steps below using the breakout harness, if
. , .	necessary, to check electrical components, such as sensors, electrical
	control units, and harnesses. Back probing is not recommended, as it could
	damage the harness. The ignition should always be in the OFF position
	when connecting or disconnecting electrical components in order to
	reduce the likelihood of damage to electrical components.
	Disconnecting the EAS connectors during the troubleshooting
	process will result in multiple errors.
	For specific electrical component information and pinout locations,
	always refer to the technical data.
	It is necessary to exit the fault code menu in DAVIE and run the
	diagnostic test again to identify a change in errors.
	Remember that the truck's operational or mechanical issues may
	be the root cause of both active and inactive fault codes. Refer to
	the 'possible causes' section.
	Step 1 Step ID 1133a SRT
	Visually inspect all applicable connectors (bent, broken, corroded or loose pins)
	and harnesses for corrosion, damage, and rubbing during each step of the
	diagnostic procedure. Proceed to step 2.
	diagnostic procedure. Froceed to step 2.



Step 2 Step ID 1133b SRT With the key OFF, disconnect the lambda sensor. Turn the key ON and navigate through DAVIE to read errors: If fault is inactive – Proceed to step 3. If fault is active - Proceed to step 4. Step 3 Step ID 1133c **SRT** With key OFF, disconnect the harness from the lambda sensor. Turn the key on and measure the voltage between a battery ground and the supply terminal of the lambda sensor circuit on the engine harness: If the voltage is acceptable – Replace the lambda sensor and reconnect the harness and verify the fault as per verification drive cycle. If the voltage is not acceptable - Proceed to step 4 Step ID 1133d Step 4 **SRT** With key OFF, disconnect the engine harness from the PCI. Turn the key ON and navigate through DAVIE to read errors: If fault is inactive – Replace the engine harness and verify the fault as per verification drive cycle. If fault is active – Proceed to step 5. Step ID 1133e **SRT** Step 5 For further assistance in diagnosing this issue or for confirmation prior to the replacement of suspect components, contact the PACCAR Engine Support Call Center at 1-800-477-0251. **Verification Drive Cycle** To validate repair, drive the vehicle at a minimum speed of 80 km/h [50 mph] in the highest gear possible with the engine speed between 1100 and 1500 rpm and set the cruise control. This test is best performed with a loaded vehicle/trailer, but if load is unavailable, turn as many engine power consumers on to produce engine load. Perform this test for roughly 5 to 8 km [3 to 5 miles] or in 3 separate 1.5 km [1 mile] increments if a steady 5 to 8 km [3 to 5 miles] is unachievable. Use a flat road, if possible. **Back to Index**



Code number	P1134
Fault code description	Lambda sensor heater – Voltage too low or short circuit to ground on ECU D420 pin C46
Fault code information	1 trip MIL 3 drive cycle recovery Readiness group – None Freeze frame type – Exhaust gas
Description of component(s)	The lambda sensor measures the oxygen concentration in the exhaust gases after the BPV valve.
	Dr v valve.
	Air/fuel ratio The PCI ECU uses the measured oxygen concentration in the exhaust to determine
	the air/fuel ratio of the combustion process. Typical air/fuel ratios are 18 to 45. A high value indicates a high oxygen concentration measured by the lambda sensor. Sensor heater
	The sensor has an integrated heater to maintain a sensor operating temperature of approximately 750°C [1382°F]. The PCI ECU controls the heater. Sensor heating control The first stage starts when the ignition is keyed on
	 The first stage starts when the ignition is keyed on. The sensor is heated to a value at which any condensate evaporates from the sensor.
	 The second stage starts after the 'dew point' is reached. The sensor is heated to its operating temperature of approximately 750°C



[1382°F]. The PCI ECU determines the 'dew point' by calculating how much energy (heat by burning fuel in the engine) is pumped through the exhaust. If the 'dew point' is not/no longer reached, the sensor temperature stays at/drops to the standby temperature, similar to the first stage heating. Effect on the system Determines the air/fuel ratio of the combustion process Controls the smoke limit; where the measured exhaust gas oxygen concentration is compared with a target value for smoke limitation. A higher measured oxygen concentration results in lower calculated soot formation by the engine. Controls NOx emissions; determines whether the target Exhaust Gas Recirculation is being achieved to control NOx emissions. A higher measured oxygen concentration results in higher calculated NOx formation by the engine. Controls regeneration of the diesel particulate filter (DPF). The soot particles in the DPF are 'burned' using the oxygen present in the exhaust gas. Location of component(s) F834 Need to consider all active/inactive faults: one or multiple faults may have triggered **Diagnostic condition** this fault when the engine speed is between 950 and 2000 rpm, and; when the engine is running at a steady load, and; when coolant temperature is above 50°C [122°F], and; the engine mode is SCR high efficiency or standard or protection;

the lambda sensor (F834) is in the operating mode.



Set condition of fault code	This diagnostic starts five minutes after the engine starts. The diagnostic runs
	continuously
Reset condition of fault code	This fault code will change to inactive immediately after the diagnostic runs and
Electrical diagram(s)	passes.
Electrical diagram(s)	2 F834 123E F834 4 1 5 2 6 3 C45 C21 C22 C23 C46 D420
	46 23 24 1
	Wiring harness connector D420.C front view
	1 5 6 Wiring harness connector F834 front view
	D420 F834 Function
	C21 5 Trimming resistor



	C22 2 Ground, sensor element
	C23 6 Signal, nernst sensor
	C45 1 Signal, pump cell current
	C46 3 Ground, heater element
	4 Power supply, heater element
Technical data	Component check, lambda sensor (F834)
	Preparation
	Key the ignition off
	 Disconnect connector F834
	 Measure on component connector F834
	Pin Pin Value Additional information
	(+ probe) (- probe) Value Additional information
	4 3 2.4–4.0 Ω Heater element resistance at 20°C [68°C]
	Component & circuit check, ECU (D420) Preparation
	Key the ignition off
	Disconnect connector F834
	 Measure on the front side of wiring harness connector F834
	Pin Pin
	(+ probe) (- probe) Value Additional information
	4 Ground Ubat Heater element power supply with ignition keyed on
Possible causes	Faulty wiring
	Faulty connector
	Faulty sensor
Additional information	No additional information available.
Diagnostic Step-by-Step	Perform the troubleshooting steps below using the breakout harness, if
, , , , , , , , , , , , , , , , , , ,	necessary, to check electrical components, such as sensors, electrical
	control units, and harnesses. Back probing is not recommended, as it could
	damage the harness. The ignition should always be in the OFF position
	when connecting or disconnecting electrical components in order to
	reduce the likelihood of damage to electrical components.
	Disconnecting the EAS connectors during the troubleshooting
	process will result in multiple errors.
	For specific electrical component information and pinout locations,
	always refer to the technical data.
	It is necessary to exit the fault code menu in DAVIE and run the
	diagnostic test again to identify a change in errors.
	 Remember that the truck's operational or mechanical issues may
	be the root cause of both active and inactive fault codes. Refer to
	the 'possible causes' section.
	Step 1 Step ID 1134a SRT
	Visually inspect all applicable connectors (bent, broken, corroded or loose pins)
	and harnesses for corrosion, damage, and rubbing during each step of the
	diagnostic procedure. Proceed to step 2.



Step ID 1134b SRT Step 2 With the key OFF, disconnect the lambda sensor. Turn the key ON and navigate through DAVIE to read errors: If fault is inactive – Proceed to step 3. If fault is active – Proceed to step 4. Step 3 Step ID 1134c SRT With key OFF, disconnect the harness from the lambda sensor. Turn the key on and measure the voltage between a battery ground and the supply terminal of the lambda sensor circuit on the engine harness: If the voltage is acceptable – Replace the lambda sensor and reconnect the harness and verify the fault as per verification drive cycle. If the voltage is not acceptable - Proceed to step 4 Step 4 Step ID 1134d SRT With key OFF, disconnect the engine harness from the PCI. Turn the key ON and navigate through DAVIE to read errors: If fault is inactive – Replace the engine harness and verify the fault as per verification drive cycle. If fault is active – Proceed to step 5. SRT Step 5 Step ID 1134e For further assistance in diagnosing this issue or for confirmation prior to the replacement of suspect components, contact the Engine Support Call Center at 1-800-477-0251. **Verification Drive Cycle** To validate the repair: Drive the vehicle at a minimum speed of 80 km/h [50 mph] in the highest gear possible with the engine speed between 1100 and 1500 rpm and set the cruise control. This test is best performed with a loaded vehicle/trailer, but if load is unavailable, turn as many engine power consumers on to produce engine load. Perform this test for roughly 5 to 8 km [3 to 5 miles] or in 3 separate 1.5 km [1 mile] increments if a steady 5 to 8 km [3 to 5 miles] is unachievable. Use a flat road, if possible. Back to Index



Code number	P1135
Fault code description	Lambda sensor heater – Voltage too low or short circuit to supply on ECU D420 pin
	C46
Fault code information	1 trip MIL
	3 drive cycle recovery
	Readiness group – None
	Freeze frame type – Exhaust gas
Description of component(s)	The lambda sensor measures the oxygen concentration in the exhaust gases after the
	BPV valve.
	Air/fuel ratio
	The PCI ECU uses the measured oxygen concentration in the exhaust to determine
	the air/fuel ratio of the combustion process.
	Typical air/fuel ratios are 18 to 45. A high value indicates a high oxygen concentration
	measured by the lambda sensor.
	Sensor heater
	The sensor has an integrated heater to maintain a sensor operating temperature of
	approximately 750°C [1382°F]. The PCI ECU controls the heater. Sensor heating control
	The first stage starts when the ignition is keyed on.
	The sensor is heated to a value at which any condensate evaporates from the
	sensor.
	 The second stage starts after the 'dew point' is reached.
	The sensor is heated to its operating temperature of approximately 750°C



[1382°F]. The PCI ECU determines the 'dew point' by calculating how much energy (heat by burning fuel in the engine) is pumped through the exhaust. If the 'dew point' is not/no longer reached, the sensor temperature stays at/drops to the standby temperature, similar to the first stage heating. Effect on the system Determines the air/fuel ratio of the combustion process Controls the smoke limit; where the measured exhaust gas oxygen concentration is compared with a target value for smoke limitation. A higher measured oxygen concentration results in lower calculated soot formation by the engine. Controls NOx emissions; determines whether the target Exhaust Gas Recirculation is being achieved to control NOx emissions. A higher measured oxygen concentration results in higher calculated NOx formation by the engine. Controls regeneration of the diesel particulate filter (DPF). The soot particles in the DPF are 'burned' using the oxygen present in the exhaust gas. Location of component(s) F834 Need to consider all active/inactive faults: one or multiple faults may have triggered **Diagnostic condition** this fault

- when the engine speed is between 950 and 2000 rpm, and;
- when the engine is running at a steady load, and;
- when coolant temperature is above 50°C [122°F], and;
- the engine mode is SCR high efficiency or standard or protection;
- the lambda sensor (F834) is in the operating mode.



Set condition of fault code	This diagnostic starts five minutes after the engine starts. The diagnostic runs
Reset condition of fault code	continuously This fault code will change to inactive immediately after the diagnostic runs and
	passes.
Electrical diagram(s)	2
	46 23 24 1
	Wiring harness connector D420.C front view
	Wiring harness connector F834 front view
	D420 F834 Function C21 5 Trimming resistor



	C22 2 Crownd concert clament
	C22 2 Ground, sensor element
	C23 6 Signal, nernst sensor
	C45 1 Signal, pump cell current
	C46 3 Ground, heater element
	4 Power supply, heater element
Technical data	Component check, lambda sensor (F834)
	Preparation
	Key the ignition off
	Disconnect connector F834
	Measure on component connector F834
	Pin Pin Value Additional information
	(+ probe) (- probe)
	4 3 2.4–4.0 Ω Heater element resistance at 20°C [68°C]
	Component & circuit check, ECU (D420) Preparation
	Key the ignition off
	Disconnect connector F834
	Measure on the front side of wiring harness connector F834
	Pin Pin
	(+ probe) (- probe) Value Additional information
	4 Ground Ubat Heater element power supply with ignition keyed on
Possible causes	Faulty wiring
	Faulty connector
	Faulty sensor
Additional information	No additional information available.
Diagnostic Step-by-Step	Perform the troubleshooting steps below using the breakout harness, if
	necessary, to check electrical components, such as sensors, electrical
	control units, and harnesses. Back probing is not recommended, as it could
	damage the harness. The ignition should always be in the OFF position
	when connecting or disconnecting electrical components to reduce the
	likelihood of damage to electrical components
	This troubleshooting tree is based on the assumption that supply
	power and ground to the PCI are functioning properly.
	Disconnecting the PCI connectors during the troubleshooting process
	will result in multiple errors.
	 For specific electrical component information and pinout locations,
	always refer to the technical data in Rapido.
	 It is necessary to exit the 'active errors' screen in DAVIE and run the
	diagnostic test again to identify changes in errors.
	Remember that the truck's operational or mechanical issues may be
	the root cause of both active and inactive codes. Refer to the 'possible
	causes' section in Rapido.
	Step 1 Step ID 1135a SRT
	Visually inspect all applicable connectors (bent, broken, corroded or loose pins) and
	harnesses for corrosion, damage, and rubbing during each step of the diagnostic
	procedure. Proceed to step 2.



Step 2 Step ID 1135b **SRT** With the key OFF, disconnect the lambda sensor. Turn the key ON and navigate through DAVIE to read errors: If fault is inactive – Proceed to step 3. If fault is active – Proceed to step 4. Step 3 Step ID 1135c **SRT** With key OFF, disconnect the harness from the lambda sensor. Turn the key on and measure the voltage between a battery ground and the supply terminal of the lambda sensor circuit on the engine harness: If the voltage is acceptable – Replace the lambda sensor and reconnect the harness and verify the fault as per verification drive cycle. If the voltage is not acceptable – Proceed to step 4 Step ID 1135d **SRT** Step 4 With key OFF, disconnect the engine harness from the PCI. Turn the key ON and navigate through DAVIE to read errors: If fault is inactive – Replace the engine harness and verify the fault as per verification drive cycle. If fault is active – Proceed to step 5. **SRT** Step 5 Step ID 1135e Contact the PACCAR Engine Support Call Center For further assistance in diagnosing this issue or for confirmation prior to the replacement of suspect components, contact the PACCAR Engine Support Call Center at 1-800-477-0251. **Verification Drive Cycle** To validate the repair: Drive the vehicle at a minimum speed of 80 km/h [50 mph] in the highest gear possible with the engine speed between 1100 and 1500 rpm and set the cruise control. This test is best performed with a loaded vehicle/trailer, but if load is unavailable, turn as many engine power consumers on to produce engine load. Perform this test for roughly 5 to 8 km [3 to 5 miles] or in 3 separate 1.5 km [1 mile] increments if a steady 5 to 8 km [3 to 5 miles] is unachievable. Use a flat road, if possible. Back to Index



Code number	P1136
Fault code description	Lambda sensor heater – Voltage too low or short circuit to ground on ECU D420 pin C46
Fault code information	1 trip MIL
	3 drive cycle recovery
	Readiness group – None
	Freeze frame type – Exhaust gas
Description of component(s)	The lambda sensor measures the oxygen concentration in the exhaust gases after the BPV valve.
	BPV valve.
	Air/fuel ratio
	The PCI ECU uses the measured oxygen concentration in the exhaust to determine
	the air/fuel ratio of the combustion process. Typical air/fuel ratios are 18 to 45. A high value indicates a high oxygen concentration
	measured by the lambda sensor.
	Sensor heater
	The sensor has an integrated heater to maintain a sensor operating temperature of
	approximately 750°C [1382°F]. The PCI ECU controls the heater.
	Sensor heating control
	The first stage starts when the ignition is keyed on.
	The sensor is heated to a value at which any condensate evaporates from the
	sensor.
	The second stage starts after the 'dew point' is reached.
	The sensor is heated to its operating temperature of approximately 750°C



Location of component(s)	 [1382°F]. The PCI ECU determines the 'dew point' by calculating how much energy (heat by burning fuel in the engine) is pumped through the exhaust. If the 'dew point' is not/no longer reached, the sensor temperature stays at/drops to the standby temperature, similar to the first stage heating. Effect on the system Determines the air/fuel ratio of the combustion process Controls the smoke limit; where the measured exhaust gas oxygen concentration is compared with a target value for smoke limitation. A higher measured oxygen concentration results in lower calculated soot formation by the engine. Controls NOx emissions; determines whether the target Exhaust Gas Recirculation is being achieved to control NOx emissions. A higher measured oxygen concentration results in higher calculated NOx formation by the engine. Controls regeneration of the diesel particulate filter (DPF). The soot particles in the DPF are 'burned' using the oxygen present in the exhaust gas.
	F834
Diagnostic condition	The diagnostic runs after the engine run 5 min and Lambda value is more the 1.3
Set condition of fault code	This diagnostic starts five minutes after the engine starts. The diagnostic runs
	continuously.
Reset condition of fault code	This fault code will change to inactive immediately after the diagnostic runs and passes.



Electrical diagram(s) F834 C45 C21 C22 C23 C46 D420 23 46 24 7------70 92 69 47 E504139 Wiring harness connector D420.C front view Wiring harness connector F834 front view D420 F834 **Function** C21 5 Trimming resistor C22 2 Ground, sensor element C23 6 Signal, nernst sensor C45 1 Signal, pump cell current C46 3 Ground, heater element



	4	Power supply	y, heater e	lemer	t
Technical data	•	Component check, lambda sensor (F834)			
	Preparation				
	 Key th 	e ignition off			
	 Discor 	nect connecto	r F834		
		ire on compon	ent conne	ctor F	334
	Pin (+ probe)	Pin (- probe)	Value		Additional information
	4	3	2.4–4.0	Ω	Heater element resistance at 20°C [68°C]
	Component & Preparation	circuit check, E	ECU (D420)	
	 Key th 	e ignition off			
	• Discor	nect connecto	r F834		
			t side of w	iring h	arness connector F834
	Pin (+ probe)	Pin (- probe)	Value	Addi	tional information
	4	Ground	Ubat		er element power supply with on keyed on
Possible causes	Faulty	wiring			
	Faulty	connector			
	Faulty	sensor			
Additional information	No Additional	information av	ailable		
Diagnostic Step-by-Step	necess contro could position	sary, to check end units, and had damage the had not when connecting the disconnecting process will refer specific end to cations, alwords.	electrical c rnesses. B rness. The cting or di ood of dan g the EAS result in m electrical c vays refer y to exit tl	ompolack present in a general connection with the connection to the connection to the connection co	nent information and pinout technical data. t code menu in DAVIE and run the
	•	Remember t	hat the trual	ıck's o oth act	ify a change in errors. perational or mechanical issues may ive and inactive fault codes. Refer to
	Step 1	Remember to be the root of	hat the tru ause of bo causes' se	ick's ooth act	perational or mechanical issues may
	and harnesse	Remember to be the root of the 'possible ect all applicable	step ID 1 e connect, damage,	oth act ection. 136a ors (be	perational or mechanical issues may ive and inactive fault codes. Refer to
	Visually inspe and harnesse diagnostic pr	Remember to be the root of the 'possible ect all applicables for corrosion	Step ID 1 e connect , damage,	oth act ection. 136a ors (be and re	perational or mechanical issues may ive and inactive fault codes. Refer to SRT ent, broken, corroded or loose pins) ubbing during each step of the
	Visually insperand harnessed diagnostic pro-	Remember to be the 'possible the 'possible ect all applicables for corrosion ocedure. Procedure. Pr	Step ID 1 le connect , damage, eed to step Step ID 2 ct the lam	oth act ection. 136a ors (be and re o 2.	perational or mechanical issues may ive and inactive fault codes. Refer to SRT ent, broken, corroded or loose pins)
	Visually insperand harnesse diagnostic pro-	Remember to be the root of the 'possible ect all applicables s for corrosion ocedure. Proce	Step ID 1 e connect , damage, eed to step Step ID 2 ct the lam	oth action. 136a ors (be and record) 136b bda se	SRT ent, broken, corroded or loose pins) ubbing during each step of the SRT SRT and inactive fault codes. Refer to



	If fault is ac	tive – Proceed to step 4.	
	Step 3	Step ID 1136c	SRT
	11		mbda sensor. Turn the key on and
	_	e between a battery ground ar	nd the supply terminal of the
		iit on the engine harness:	
			ambda sensor and reconnect the
		d verify the fault as per verifica	-
	If the voltage	ge is not acceptable – Proceed	to step 4
	Chair A	Chara ID 442Cd	CDT
	Step 4	Step ID 1136d	SRT
		nnect the engine harness from	i the PCI. Turn the key ON and
	navigate through D		enace and varify the fault as nor
	verification	•	rness and verify the fault as per
		tive – Proceed to step 5.	
	I I I I I I I I I I I I I I I I I I I	tive – Proceed to step 3.	
	Step 5	Step ID 1136e	SRT
		R Engine Support Call Center	
		ce in diagnosing this issue or fo	or confirmation prior to the
		pect components, contact the	-
	Center at 1-800-477	•	
Verification Drive Cycle	To validate repair:		
	This cycle is best per	formed on a level grade road (I	east amount of incline possible)
	and under load using	; a trailer. If a loaded trailer is ι	ınavailable, produce engine load
	by turning the A/C ar		
	-		to a road with a minimum speed
	-		le with the engine speed between
	•		cycle for roughly 3 to 5 miles or in
	three separate 1-mile	e increments if a steady 3 to 5	miles is unachievable.
			Back to Index



P1137	,
Code number	P1137
Fault code description	Lambda sensor heater power supply - Incorrect
Fault code information	1 trip MIL
	3 drive cycle recovery
	Readiness group – None
	Freeze frame type – Exhaust gas
Description of component(s)	The lambda sensor measures the oxygen concentration in the exhaust gases after the BPV valve.
	Dr v valve.
	Air/fuel ratio
	The PCI ECU uses the measured oxygen concentration in the exhaust to determine
	the air/fuel ratio of the combustion process.
	Typical air/fuel ratios are 18 to 45. A high value indicates a high oxygen concentration measured by the lambda sensor.
	Sensor heater
	The sensor has an integrated heater to maintain a sensor operating temperature of
	approximately 750°C [1382°F]. The PCI ECU controls the heater.
	Sensor heating control
	The first stage starts when the ignition is keyed on.
	The sensor is heated to a value at which any condensate evaporates from the
	sensor.
	 The second stage starts after the 'dew point' is reached.
	The sensor is heated to its operating temperature of approximately 750°C
	[1382°F]. The PCI ECU determines the 'dew point' by calculating how much



Location of component(s)	energy (heat by burning fuel in the engine) is pumped through the exhaust. If the 'dew point' is not/no longer reached, the sensor temperature stays at/drops to the standby temperature, similar to the first stage heating. Effect on the system • Determines the air/fuel ratio of the combustion process • Controls the smoke limit; where the measured exhaust gas oxygen concentration is compared with a target value for smoke limitation. A higher measured oxygen concentration results in lower calculated soot formation by the engine. • Controls NOx emissions; determines whether the target Exhaust Gas Recirculation is being achieved to control NOx emissions. A higher measured oxygen concentration results in higher calculated NOx formation by the engine. • Controls regeneration of the diesel particulate filter (DPF). The soot particles in the DPF are 'burned' using the oxygen present in the exhaust gas.
Set condition of fault code	The PCI ECU (D420) detects that the power supply to control the lambda sensor
	heater is less than 9V for more than 5 seconds.
Reset condition of fault code	This DTC changes to inactive when the fault is no longer detected. To validate the
The state of the s	repair:
	Key the ignition off for at least 15 seconds, then key it on again. Then start
	the engine and let it idle for 2 minutes, and;



Drive the vehicle until the coolant temperature is at least 70°C [158°F]. Once the minimum target temperature has been reached, proceed at a minimum speed of 80 km/h [50 mph] in the highest gear possible with the engine speed between 1100 and 1500 rpm and set the cruise control. This test is best performed with a loaded vehicle/trailer, but if load is unavailable, turn as many engine power consumers on to produce engine load. Perform this test for roughly 5 to 8 km [3 to 5 miles] or in 3 separate 1.5 km [1 mile] increments if a steady 5 to 8 km [3 to 5 miles] is unachievable. Use a flat road, if possible. Electrical diagram(s) C45 C21 C22 C23 C46 D420 46 23 24 ------92 69 70 47 E504139 Wiring harness connector D420.C front view



Technical data	Wiring harness connector F834 front view D420 F834 Function C21 5 Trimming resistor C22 2 Ground, sensor element C33 6 Signal, pump cell current C46 3 Ground, heater element 4 Power supply, heater element Component check, lambda sensor (F834) Preparation • Key the ignition off • Disconnect connector F834 • Measure on component connector F834 Pin Pin Value Additional information (+ probe) (- probe) 4 3 2.4–4.0 \(\Omega\$ Heater element resistance at 20°C [68°C] Component & circuit check, ECU (D420) Preparation • Key the ignition off • Disconnect connector F834 • Measure on the front side of wiring harness connector F834 Pin Pin Pin Value Additional information • Key the ignition off • Disconnect connector F834 • Measure on the front side of wiring harness connector F834 Pin Pin Value Additional information
	(+ probe) (- probe) Value Additional information 4 Ground Libat Heater element power supply with
Possible causes	ignition keyed on • Power supply to the PCI ECU.
	Check the PCI power supply.
Additional information	The PCI ECU uses the oxygen concentration in the exhaust, measured by the lambda sensor (F834), to determine the air/fuel ratio of the combustion process. The sensor has an integrated heater to maintain a sensor operating temperature of approximately 750°C [1382°F].



Diagnostic Step-by-Step



Perform the troubleshooting steps below using the breakout harness, if necessary, to check electrical components, such as sensors, electrical control units, and harnesses. Back probing is not recommended, as it could damage the harness. The ignition should always be in the OFF position when connecting or disconnecting electrical components in order to reduce the likelihood of damage to electrical components.



- Disconnecting the EAS connectors during the troubleshooting process will result in multiple errors.
- For specific electrical component information and pinout locations, always refer to the technical data.
- It is necessary to exit the fault code menu in DAVIE and run the diagnostic test again to identify a change in errors.
- Remember that the truck's operational or mechanical issues may be the root cause of both active and inactive fault codes. Refer to the 'possible causes' section.

Step 1	Step ID 1137a	SRT

Visually inspect all applicable connectors (bent, broken, corroded or loose pins) and harnesses for corrosion, damage, and rubbing during each step of the diagnostic procedure. Proceed to step 2.

Step 2	Step ID 1137b	SRT
Jicp Z	Step ID 11376	J111

Electrical Checks

Ensure that the ignition key/switch has been set to OFF before disconnecting related cables.

Based on the fault message provided, confirm that the following electrical values are within specified ranges or limits:

- Supply and signal voltages (12V).
- Cable continuity (no opens or shorts).

Are measured electrical values outside of expected range or limits?

- Yes Proceed to step 3
- No Proceed to step 4

C: 0	C: 15 4407	SRT
Step 3	Step ID 1137c	1 (1)
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Repair or replace appropriate component and use DAVIE to re-check for the presence of active faults.

- Fault inactive issue resolved
- Fault active Proceed to step 4

C1 4	Step ID 1137d	SRT
Step 4		

Replace Lambda sensor and use DAVIE to re-check for the presence of active faults.

- Fault inactive issue resolved
- Fault active Proceed to step 5

C. =	6. 15.4407	CDT
Step 5	Step ID 1137e	l SRT
JIEDJ	I DIED ID TTD/E	1 2111

For further assistance in diagnosing this issue or for confirmation prior to the replacement of suspect components, contact the Engine Support Call Center at 1-800-477-0251.



Verification Drive Cycle	 Key the ignition off for at least 15 seconds, then key it on again. Then start the engine and let it idle for 2 minutes, and; Drive the vehicle until the coolant temperature is at least 70°C [158°F]. Once the minimum target temperature has been reached, proceed at a minimum speed of 80 km/h [50 mph] in the highest gear possible with the engine speed between 1100 and 1500 rpm and set the cruise control. This test is best performed with a loaded vehicle/trailer, but if load is unavailable, turn as many engine power consumers on to produce engine load. Perform this test for roughly 5 to 8 km [3 to 5 miles] or in 3 separate 1.5 km [1 mile] increments if a steady 5 to 8 km [3 to 5 miles] is unachievable. Use a flat road, if possible.
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P1138	
Code number	P1138
Fault code description	Lambda Sensor heater – Voltage too low or short circuit to ground on ECU D420 pin C46
Fault code information	1 trip MIL
	3 drive cycle recovery
	Readiness group – None
	Freeze frame type – Exhaust gas
Description of component(s)	The lambda sensor measures the oxygen concentration in the exhaust gases after the BPV valve.
	Brv valve.
	Air/fuel ratio
	The PCI ECU uses the measured oxygen concentration in the exhaust to determine
	the air/fuel ratio of the combustion process.
	Typical air/fuel ratios are 18 to 45. A high value indicates a high oxygen concentration
	measured by the lambda sensor.
	Sensor heater The conserves an integrated heater to maintain a conserve aperating temperature of
	The sensor has an integrated heater to maintain a sensor operating temperature of
	approximately 750°C [1382°F]. The PCI ECU controls the heater.
	Sensor heating control
	The first stage starts when the ignition is keyed on. The senser is bested to a value at which any condensate evenerates from the
	The sensor is heated to a value at which any condensate evaporates from the
	sensor. The second stage starts after the 'dow point' is reached
	The second stage starts after the 'dew point' is reached. The sensor is heated to its operating temperature of approximately 750°C. The second stage starts after the 'dew point' is reached.
	The sensor is heated to its operating temperature of approximately 750°C



[1382°F]. The PCI ECU determines the 'dew point' by calculating how much energy (heat by burning fuel in the engine) is pumped through the exhaust. If the 'dew point' is not/no longer reached, the sensor temperature stays at/drops to the standby temperature, similar to the first stage heating. Effect on the system Determines the air/fuel ratio of the combustion process Controls the smoke limit; where the measured exhaust gas oxygen concentration is compared with a target value for smoke limitation. A higher measured oxygen concentration results in lower calculated soot formation by the engine. Controls NOx emissions; determines whether the target Exhaust Gas Recirculation is being achieved to control NOx emissions. A higher measured oxygen concentration results in higher calculated NOx formation by the engine. Controls regeneration of the diesel particulate filter (DPF). The soot particles in the DPF are 'burned' using the oxygen present in the exhaust gas. Location of component(s) F834 Need to consider all active/inactive faults: one or multiple faults may have triggered **Diagnostic condition** this fault when the engine speed is between 950 and 2000 rpm, and;

when the engine is running at a steady load, and; when coolant temperature is above 50°C [122°F], and;

the lambda sensor (F834) is in the operating mode.

the engine mode is SCR high efficiency or standard or protection;



Set condition of fault code	The PCI-2 ECU detects that the time it takes to control the temperature is too long.
Reset condition of fault code	This fault code will change to inactive immediately after the diagnostic runs and passes.
Electrical diagram(s)	2 123E F834 4 1 5 2 8 3 C45 C21 C22 C23 C46 D420
	46 23 24 1 92 69 70 47
	Wiring harness connector D420.C front view
	Wiring harness connector F834 front view
	D420 F834 Function C21 5 Trimming resistor



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	procedure. Proceed	to step 2.	
	Step 2	Step ID 1138b	SRT
	With the key OFF, d	isconnect the lambda sensor. T	urn the key ON and navigate
	through DAVIE to re	ad errors:	
	If fault is ina	active – Proceed to step 3.	
	If fault is act	tive – Proceed to step 4.	
	Step 3	Step ID 1138c	SRT
			nbda sensor. Turn the key on and
	_	e between a battery ground an	d the supply terminal of the
	 lambda sensor circuit on the engine harness: If the voltage is acceptable – Replace the lambda sensor and reconnect the 		
	harness and verify the fault as per verification drive cycle.		-
	If the voltage is not acceptable – Proceed to step 4		to step 4
	C1 4	CL ID . 4420 -l	COT
	Step 4	Step ID 1138d	SRT
	 With key OFF, disconnect the engine harness from the PCI. Turn the key ON and navigate through DAVIE to read errors: If fault is inactive – Replace the engine harness and verify the fault as per verification drive cycle. If fault is active – Proceed to step 5. 		
	• II lault is act	ive – Proceed to step 5.	
	Step 5	Step ID 1138e	SRT
		R Engine Support Call Center	SNI
		ce in diagnosing this issue or fo	er confirmation prior to the
		pect components, contact the F	
	Center at 1-800-477	•	Accan Engine Support can
Verification Drive Cycle	To validate the repair		
7	•	minimum speed of 80 km/h [5	60 mphl in the highest gear
		ine speed between 1100 and 1	, -
		est performed with a loaded ve	•
		nany engine power consumers	
	Perform this test for	roughly 5 to 8 km [3 to 5 miles]	or in 3 separate 1.5 km [1 mile]
	increments if a stead	y 5 to 8 km [3 to 5 miles] is una	achievable. Use a flat road, if
	possible.		
			Back to Index



Code number	P1139
Fault code description	Lambda heater calibration test fault
Fault code information	For further assistance: Contact the PACCAR Engine Support Call Center 1-800-477-0251 Please Contact the Engine Support Center
Description of component(s)	
Location of component(s)	
Diagnostic condition	
Set condition of fault code	
Reset condition of fault code	
Electrical diagram(s)	
Technical data	
Possible causes	
Additional information	
Diagnostic Step-by-Step	
Verification Drive Cycle	
	Back to Index



P113A

P113A	,	
Code number	P113A	
Fault code description	Lambda sensor temperature – Unable to reach target temperature	
Fault code information	1 trip MIL	
	3 drive cycle recovery	
	Readiness group - EGS heater	
	Freeze frame type - Exhaust gas	
Description of component(s)	The lambda sensor measures the oxygen concentration in the exhaust gases after the BPV valve.	
	DI V VOIVE.	
	Air/fuel ratio The PCI ECU uses the measured oxygen concentration in the exhaust to determine	
	the air/fuel ratio of the combustion process. Typical air/fuel ratios are 18 to 45. A high value indicates a high oxygen concentration	
	measured by the lambda sensor.	
	Sensor heater	
	The sensor has an integrated heater to maintain a sensor operating temperature of	
	approximately 750°C [1382°F]. The PCI ECU controls the heater.	
	Sensor heating control	
	The first stage starts when the ignition is keyed on.	
	The sensor is heated to a value at which any condensate evaporates from the	
	sensor.	
	The second stage starts after the 'dew point' is reached.	
	The sensor is heated to its operating temperature of approximately 750°C	
	[1382°F]. The PCI ECU determines the 'dew point' by calculating how much	



Location of component(s)	energy (heat by burning fuel in the engine) is pumped through the exhaust. If the 'dew point' is not/no longer reached, the sensor temperature stays at/drops to the standby temperature, similar to the first stage heating. Effect on the system • Determines the air/fuel ratio of the combustion process • Controls the smoke limit; where the measured exhaust gas oxygen concentration is compared with a target value for smoke limitation. A higher measured oxygen concentration results in lower calculated soot formation by the engine. • Controls NOx emissions; determines whether the target Exhaust Gas Recirculation is being achieved to control NOx emissions. A higher measured oxygen concentration results in higher calculated NOx formation by the engine. • Controls regeneration of the diesel particulate filter (DPF). The soot particles in the DPF are 'burned' using the oxygen present in the exhaust gas.
Diagnostic condition	This diagnostic runs when the lambda sensor (F834) is in the operating mode.
Set condition of fault code	The PCI ECU (D420) detects that the temperature of the lambda sensor:
	is not within the expected values within 25 seconds, or; a second a section requirement value.
	exceeds a safe maximum value
Reset condition of fault code	This DTC changes to inactive when the fault is no longer detected. To validate the
	repair:
	Key the ignition off for at least 15 seconds, then key it on again. Then start



the engine and let it idle for 2 minutes, and; Drive the vehicle until the coolant temperature is at least 70°C [158°F]. Once the minimum target temperature has been reached, proceed at a minimum speed of 80 km/h [50 mph] in the highest gear possible with the engine speed between 1100 and 1500 rpm and set the cruise control. This test is best performed with a loaded vehicle/trailer, but if load is unavailable, turn as many engine power consumers on to produce engine load. Perform this test for roughly 5 to 8 km [3 to 5 miles] or in 3 separate 1.5 km [1 mile] increments if a steady 5 to 8 km [3 to 5 miles] is unachievable. Use a flat road, if possible. Electrical diagram(s) 123E F834 C45 C21 C22 C23 C46 D420 46 23 _____ 70 47 92 69 E504139 Wiring harness connector D420.C front view



Technical data	Wiring harness connector F834 front view D420 F834 Function C21 5 Trimming resistor C22 2 Ground, sensor element C23 6 Signal, nernst sensor C45 1 Signal, pump cell current C46 3 Ground, heater element 4 Power supply, heater element Component check, lambda sensor (F834) Preparation		
	Key the ignition off		
	Disconnect connector F834		
	Measure on component connector F834		
	Pin Pin Value Additional information		
	(+ probe) (- probe) Heater element resistance		
	4 3 2.4–4.0 Ω at 20°C [68°C]		
	Component & circuit check, ECU (D420) Preparation		
	Key the ignition off		
	Disconnect connector F834		
	Measure on the front side of wiring harness connector F834		
	Pin Pin Value Additional information (+ probe)		
	4 Ground Ubat Heater element power supply with ignition keyed on		
Possible causes	Faulty lambda sensor		
Additional information	The PCI ECU uses the oxygen concentration in the exhaust, measured by the lambda		
	sensor (F834), to determine the air/fuel ratio of the combustion process. The sensor		
	has an integrated heater to maintain a sensor operating temperature of approximately		
Diagnostic Step-by-Step	Perform the troubleshooting steps below using the breakout harness, if necessary, to check electrical components, such as sensors, electrical control units, and harnesses. Back probing is not recommended, as it could damage the harness. The ignition should always be in the OFF position when connecting or disconnecting electrical components to reduce the likelihood of damage to electrical components		





- This troubleshooting tree is based on the assumption that supply power and ground to the PCI are functioning properly.
- Disconnecting the PCI connectors during the troubleshooting process will result in multiple errors.
- For specific electrical component information and pinout locations, always refer to the technical data in Rapido.
- It is necessary to exit the 'active errors' screen in DAVIE and run the diagnostic test again to identify changes in errors.
- Remember that the truck's operational or mechanical issues may be the root cause of both active and inactive codes. Refer to the 'possible causes' section in Rapido.

Step 1 Step ID 113A-a

SRT

Test Drive to Confirm Fault

Perform the following pre-check steps to confirm this fault before continuing troubleshooting:

- Use DAVIE to clear the existing active faults
- Take the truck for a 30 minute test drive

Use DAVIE to re-check for the presence of active faults.

- If this related fault is no longer active, then this issue has been resolved.
- If this related fault is still active, continue to the next step in the troubleshooting process.

Step 2

Step ID 113A-b

SRT

Visually inspect all applicable connectors (bent, broken, corroded or loose pins) and harnesses for corrosion, damage, and rubbing during each step of the diagnostic procedure. Proceed to step 3.

Step 3

Step ID 113A-c

SRT

Replace Lambda sensor and use DAVIE to re-check for the presence of active faults.

- Fault inactive issue resolved
- Fault active Proceed to step 4

Step 4

Step ID 113A-d

SRT

For further assistance in diagnosing this issue or for confirmation prior to the replacement of suspect components, contact the PACCAR Engine Support Call Center at 1-800-477-0251.

Verification Drive Cycle

To validate repair:

This cycle is best performed on a level grade road (least amount of incline possible) and under load using a trailer. If a loaded trailer is unavailable, produce engine load by turning the A/C and fan to ON. With the System Initiation cycle complete, proceed to a road with a minimum speed limit of 50 mph, then get to the highest gear possible with the engine speed between 1100-1500 rpm, and set the cruise control. Run this cycle for roughly 3 to 5 miles or in three separate 1-mile increments if a steady 3 to 5 miles is unachievable.

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P113B

P113B	
Code number	P113B
Fault code description	Lambda sensor controller - Incorrect
Fault code information	1 trip MIL
1	3 drive cycle recovery
1	Readiness group - EGS heater
!	Freeze frame type - Exhaust gas
Description of component(s)	The lambda sensor measures the oxygen concentration in the exhaust gases after the
	BPV valve.
!	Air/fuel ratio The PCI ECU uses the measured oxygen concentration in the exhaust to determine
	the air/fuel ratio of the combustion process.
	Typical air/fuel ratios are 18 to 45. A high value indicates a high oxygen concentration
	measured by the lambda sensor.
	Sensor heater
	The sensor has an integrated heater to maintain a sensor operating temperature of
	approximately 750°C [1382°F]. The PCI ECU controls the heater.
	Sensor heating control
	The first stage starts when the ignition is keyed on. The stage starts when the ignition is keyed on. The stage starts when the ignition is keyed on.
	The sensor is heated to a value at which any condensate evaporates from the
	sensor. The second stage starts after the 'dow point' is reached
	The second stage starts after the 'dew point' is reached. The sensor is heated to its operating temperature of approximately 750°C. The sensor is heated to its operating temperature of approximately 750°C.
	The sensor is heated to its operating temperature of approximately 750°C [1382°F]. The PCI ECU determines the 'dew point' by calculating how much



Location of component(s) Diagnostic condition	energy (heat by burning fuel in the engine) is pumped through the exhaust. If the 'dew point' is not/no longer reached, the sensor temperature stays at/drops to the standby temperature, similar to the first stage heating. Effect on the system • Determines the air/fuel ratio of the combustion process • Controls the smoke limit; where the measured exhaust gas oxygen concentration is compared with a target value for smoke limitation. A higher measured oxygen concentration results in lower calculated soot formation by the engine. • Controls NOx emissions; determines whether the target Exhaust Gas Recirculation is being achieved to control NOx emissions. A higher measured oxygen concentration results in higher calculated NOx formation by the engine. • Controls regeneration of the diesel particulate filter (DPF). The soot particles in the DPF are 'burned' using the oxygen present in the exhaust gas.
Set condition of fault code	The PCI ECU (D420) detects that the lambda sensor heater controller inside the PCI
	ECU is malfunctioning.
Reset condition of fault code	This DTC changes to inactive when the fault is no longer detected. To validate the
Reset condition of fault code	
	repair:
	 Key the ignition off for at least 15 seconds, then key it on again. Then start
	the engine and let it idle for 2 minutes, and;



Drive the vehicle until the coolant temperature is at least 70°C [158°F]. Once the minimum target temperature has been reached, proceed at a minimum speed of 80 km/h [50 mph] in the highest gear possible with the engine speed between 1100 and 1500 rpm and set the cruise control. This test is best performed with a loaded vehicle/trailer, but if load is unavailable, turn as many engine power consumers on to produce engine load. Perform this test for roughly 5 to 8 km [3 to 5 miles] or in 3 separate 1.5 km [1 mile] increments if a steady 5 to 8 km [3 to 5 miles] is unachievable. Use a flat road, if possible. Electrical diagram(s) C45 C21 C22 C23 C46 D420 46 23 24 ------92 69 70 47 E504139 Wiring harness connector D420.C front view



Technical data	Wiring harness connector F834 front view D420 F834 Function C21 5 Trimming resistor C22 2 Ground, sensor element C23 6 Signal, nernst sensor C45 1 Signal, pump cell current C46 3 Ground, heater element 4 Power supply, heater element Cmponent check, lambda sensor (F834) Preparation • Key the ignition off • Disconnect connector F834 • Measure on component connector F834 Pin Pin Value Additional information (- probe) Heater element resistance at 20°C [68°C] Component & circuit check, ECU (D420) Preparation • Key the ignition off • Disconnect connector F834 • Measure on the front side of wiring harness connector F834 Pin Pin Value Additional information (+ probe) (- probe) Value Additional information
Dec. Marie	4 Ground Ubat Heater element power supply with ignition keyed on
Possible causes	 Faulty lambda sensor ECU connections are damaged or disconnected
Additional information	• The PCI ECU uses the oxygen concentration in the exhaust, measured by the lambda sensor (F834), to determine the air/fuel ratio of the combustion process. The sensor has an integrated heater to maintain a sensor operating temperature of approximately 750°C [1382°F].



Perform the troubleshooting steps below using the breakout harness, if **Diagnostic Step-by-Step** necessary, to check electrical components, such as sensors, electrical control units, and harnesses. Back probing is not recommended, as it could damage the harness. The ignition should always be in the OFF position when connecting or disconnecting electrical components to reduce the likelihood of damage to electrical components This troubleshooting tree is based on the assumption that supply power and ground to the PCI are functioning properly. Disconnecting the PCI connectors during the troubleshooting process will result in multiple errors. For specific electrical component information and pinout locations, always refer to the technical data in Rapido. It is necessary to exit the 'active errors' screen in DAVIE and run the diagnostic test again to identify changes in errors. Remember that the truck's operational or mechanical issues may be the root cause of both active and inactive codes. Refer to the 'possible causes' section in Rapido. Step ID 113B-a **SRT** Step 1 Test Drive to Confirm Fault Perform the following pre-check steps to confirm this fault before continuing troubleshooting: Use DAVIE to clear the existing active faults Take the truck for a 30 minute test drive Use DAVIE to re-check for the presence of active faults. If this related fault is no longer active, then this issue has been resolved. If this related fault is still active, continue to the next step in the troubleshooting process. Step 2 Step ID 113B-b **SRT** Visually inspect all applicable connectors (bent, broken, corroded or loose pins) and harnesses for corrosion, damage, and rubbing during each step of the diagnostic procedure. Proceed to step 3. Step ID 113B-c **SRT** Step 3 Replace Lambda sensor and use DAVIE to re-check for the presence of active faults.

- Fault inactive issue resolved
- Fault active Proceed to step 4

Step 4	Step ID 113B-d	SRT	
For further assistance in diagnosing this issue or for confirmation prior to the			
replacement of suspect components, contact the PACCAR Engine Support Call			
Center at 1-800-477-0251.			

Verification Drive Cycle

To validate repair:

This cycle is best performed on a level grade road (least amount of incline possible) and under load using a trailer. If a loaded trailer is unavailable, produce engine load by turning the A/C and fan to ON. With the System Initiation cycle complete, proceed to a road with a minimum speed limit of 50 mph, then get to the highest gear possible with the engine speed between 1100-1500 rpm, and set the cruise control. Run this



cycle for roughly 3 to 5 miles or in three separate 1-mile increments if a steady 3 to 5 miles is unachievable.
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Code number	P1158	
Fault code description	Wheel speed, front axle, left - Data erratic, intermittent or incorrect	
Fault code information	1 trip MIL 3 drive cycle recovery Readiness group – None Freeze frame type - Comprehensive	
Description of component(s)	The wheel speed sensor is a type of tachometer, consisting of a toothed ring and electrical pickup. It is a sender device used for reading the speed of a vehicle's wheel rotation.	
Location of component(s)	 The type of axle determines the sensor mounting location: Steering axle sensors are typically installed in the steering knuckle or in a bolted-on bracket. Drive axle sensors are typically mounted on a block, attached to the axle housing or in a bolted-on bracket. 	
Diagnostic condition	This diagnostic runs continuously when the ignition is on.	
Set condition of fault code	The ECU detects that the speed of the left-front axle wheel speed sensor is > 160 km/h [99 mph].	
Reset condition of fault code	This DTC changes to inactive when a normal wheel speed is detected.	
Electrical diagram(s)	Refer to the OEM technical data for additional information.	
Technical data	Refer to the OEM technical data for additional information.	
Possible causes	Wheel speed sensor defect.	
Additional information	The vehicle was driven excessively fast or the wheel speed sensor is malfunctioning.	
Diagnostic Step-by-Step	The ignition should always be in the OFF position when connecting or disconnecting electrical components to reduce the likelihood of damage to the components. This troubleshooting procedure is based on the assumption that supply power and ground to the PCI are functioning properly. Disconnecting the PCI connectors during the troubleshooting process will result in multiple errors. Specific electrical component information and pin out locations are provided in this procedure as a reference only. Always refer to the technical data sections in Rapido for the most up-to-date changes. It is necessary to use DAVIE to clear all current DTCs from the PCI and EAS-3 ECUs, and then run the Quick Check to identify a change in fault status.	
	 This DTC can be set as a result of multiple failure modes. For proper fault isolation, complete all troubleshooting steps in the sequence provided. 	



Step 1 Wheel Speed Sensor Checks

Step 1A Visual inspection, connections and wiring, wheel speed sensor, front axle left

Action

- 1. Visually inspect the associated component connections and wiring for any of the following:
 - Damaged or loose connectors
 - Bent, broken, corroded or loose connector pins
 - Moisture or dirt in the connections
 - Damage to the wire harness or insulation
 - ECU connections are damaged or disconnected
 - Batteries not fully charged, contacts are not tight
 - The related sensor is not installed correctly or it is damaged
 - The installed wheel and tire size is incorrect

Was there evidence of any of the above?

Yes	No
Correct any issues found. If the wheel speed sensor is found to be damaged or broken, replace it. Refer to step 3A to perform the corresponding repair verification cycles and rechecks.	
If this DTC is still present, go to step 2A	Go to step 2A

Step 2 OEM Troubleshooting

Step 2A OEM troubleshooting

Refer to the OEM technical data for related troubleshooting information.

Yes

No

Correct any issues found. If the wheel speed sensor is found to be damaged or broken, replace it.

Refer to step 3A to perform the



corresponding repair verification cycles and rechecks.	
If all steps have been completed and this DTC is still present, contact the PACCAR Engine Support Center for further assistance.	

Step 3 Repair Verification

Step 3A Repair verification cycles

Perform these repair verification cycles following any corrective actions taken, to enable related OBD monitors to reach a readiness state associated with the DTC or system being investigated.



Before beginning these repair verification cycles, use the DAVIE Diagnostics, Quick Check function to "Clear all" current DTCs from the PCI and EAS-3 ECUs.

Action

1. Overrun

With the System Initiation cycle complete, proceed to a road with minimum speed limit of 50 mph.

While remaining within the legally posted speed limit, get the truck in the highest gear possible with the engine speed at a minimum of 1800 rpm. Once the target engine speed has been reached, leave the truck in gear and release the accelerator pedal, allowing the truck to coast until the engine speed has reached 900 rpm. Perform this cycle 4 times.

- For Eaton Ultrashift transmissions, idle drop can only go to 1000 rpm
- For Alison Autoshift transmission, this test will not be able to be conducted

Were the identified repair verification cycles able to be completed?

Yes	No
	Investigate and correct any issues preventing these repair verification cycles from being completed, then re-run. For additional assistance, contact the PACCAR Engine Support Center.
Go to step 3B	



	Step 3B DAVIE Diagnostics, Quick Check, OBD Readiness Monitors	
	Action Use DAVIE Diagnostics to perform a Quick Check for current DTCs to determine whether the actions taken have cleared this DTC. 1. Confirm that the corresponding OBD Monitor Readiness Status value is displayed as "Ready." A status of Ready indicates that the corresponding OBD monitor has run successfully and the problem has been resolved—no further action. If the displayed status is "Not ready," continue to action step 2. 2. View the DTC overview display, and confirm that P1158 has been cleared.	
	Is the related OBD Monitor Readiness Status set to "Ready." Or, has P1158 been cleared?	
	Yes	No
	Problem resolved. No further actions.	Continue with the next step in this troubleshooting procedure. If all steps have been completed and this DTC is still present: • continue to operate the truck to extend the run time, allowing the corresponding OBD monitor sufficient time to complete • or, return to step 3A and perform this repair verification again. If this issue is still present after extending or re-running the repair verification, contact the PACCAR Engine Support Center for further assistance.
		Support Center ing this issue or for confirmation prior to the ents, contact the PACCAR Engine Support Call
		Back to Index



Code number	P1159	
Fault code description	Wheel speed , front axle , right – Data erratic , intermittent or incorrect	
Fault code information	1 trip MIL 3 drive cycle recovery Readiness group – None Freeze frame type - Comprehensive	
Description of component(s)	The wheel speed sensor is a type of tachometer, consisting of a toothed ring and electrical pickup. It is a sender device used for reading the speed of a vehicle's wheel rotation.	
Location of component(s)	The type of axle determines the sensor mounting location:	
	 Steering axle sensors are typically installed in the steering knuckle or in a bolted-on bracket. Drive axle sensors are typically mounted on a block, attached to the axle housing or in a bolted-on bracket. 	
Diagnostic condition	This diagnostic runs continuously when the ignition is on.	
Set condition of fault code	The ECU detects that the speed of the right-front axle wheel speed sensor is > 160 km/h [99 mph].	
Reset condition of fault code	This DTC changes to inactive when a normal wheel speed is detected.	
Electrical diagram(s)	Refer to the OEM technical data for additional information.	
Technical data	Refer to the OEM technical data for additional information.	
Possible causes	Wheel speed sensor defect.	
Additional information	The vehicle was driven excessively fast or the wheel speed sensor is malfunctioning.	
Diagnostic Step-by-Step	The ignition should always be in the OFF position when connecting or disconnecting electrical components to reduce the likelihood of damage to the components.	
	 This troubleshooting procedure is based on the assumption that supply power and ground to the PCI are functioning properly. 	
	 Disconnecting the PCI connectors during the troubleshooting process will result in multiple errors. 	
	 Specific electrical component information and pin out locations are provided in this procedure as a reference only. Always refer to the technical data sections in Rapido for the most up-to-date changes. 	
	 It is necessary to use DAVIE to clear all current DTCs from the PCI and EAS-3 ECUs, and then run the Quick Check to identify a change in fault status. 	
	 This DTC can be set as a result of multiple failure modes. For proper fault 	



isolation, complete all troubleshooting steps in the sequence provided.

Step 1 Wheel Speed Sensor Checks

Step 1A Visual inspection, connections and wiring, wheel speed sensor, front axle, right

Action

- 1. Visually inspect the associated component connections and wiring for any of the following:
 - Damaged or loose connectors
 - Bent, broken, corroded or loose connector pins
 - Moisture or dirt in the connections
 - Damage to the wire harness or insulation
 - ECU connections are damaged or disconnected
 - Batteries not fully charged, contacts are not tight
 - The related sensor is not installed correctly or it is damaged
 - The installed wheel and tire size is incorrect

Yes No

Correct any issues found. If the wheel speed sensor is found to be damaged or broken, replace it.
Refer to step 3A to perform the corresponding repair verification cycles and rechecks.

If this DTC is still present, go to step 2A

Go to step 2A

Step 2 OEM Troubleshooting

Step 2A OEM troubleshooting		
Action		
1. Refer to the OEM technical data for related troubleshooting information.		
Was an issue identified using the OEM troubleshooting?		
Yes	No	
Correct any issues found. If the wheel speed sensor is found to be damaged or	Contact the PACCAR Engine Support Center for further assistance in	



broken, replace it. Refer to step 3A to perform the corresponding repair verification cycles and rechecks.	diagnosing this issue.
If all steps have been completed and this DTC is still present, contact the PACCAR Engine Support Center for further assistance.	

Step 3 Repair Verification

Step 3A Repair verification cycles

Perform these repair verification cycles following any corrective actions taken, to enable related OBD monitors to reach a readiness state associated with the DTC or system being investigated.



Before beginning these repair verification cycles, use the DAVIE Diagnostics, Quick Check function to "Clear all" current DTCs from the PCI and EAS-3 ECUs.

Action

1. Overrun

With the System Initiation cycle complete, proceed to a road with minimum speed limit of 50 mph.

While remaining within the legally posted speed limit, get the truck in the highest gear possible with the engine speed at a minimum of 1800 rpm. Once the target engine speed has been reached, leave the truck in gear and release the accelerator pedal, allowing the truck to coast until the engine speed has reached 900 rpm. Perform this cycle 4 times.

- For Eaton Ultrashift transmissions, idle drop can only go to 1000 rpm
- For Alison Autoshift transmission, this test will not be able to be conducted

Were the identified repair verification cycles able to be completed?	
Yes	No
	Investigate and correct any issues preventing these repair verification cycles from being completed, then rerun. For additional assistance, contact the PACCAR Engine Support Center.
Go to step 3B	



Action	
Use DAVIE Diagnostics to perform a Qu whether the actions taken have cleare	ick Check for current DTCs to determine I this DTC.
displayed as "Ready." A status of Ready indicates tha successfully and the problem h	t the corresponding OBD monitor has run as been resolved—no further action. eady," continue to action step 2.
2. View the DTC overview display	, and confirm that P1159 has been cleared.
Is the related OBD Monitor Readiness : cleared?	Status set to "Ready." Or, has P1159 been
Yes	No
Problem resolved. No further actions.	Continue with the next step in this troubleshooting procedure. If all steps have been completed and this DTC is still present: • continue to operate the truck to extend the run time, allowing the corresponding OBD monitor sufficient time to complete • or, return to step 3A and perform this repair verification again. If this issue is still present after extending or re-running the repair verification, contact the PACCAR Engine Support Center for further assistance.
	e Support Center sing this issue or for confirmation prior to the nents, contact the PACCAR Engine Support Call



Code number	P1160	
Fault code description	Wheel speed, rear axle, left – Data erratic, intermittent or incorrect	
Fault code information	1 trip MIL 3 drive cycle recovery Readiness group – None Freeze frame type - Comprehensive	
Description of component(s)	The wheel speed sensor is a type of tachometer, consisting of a toothed ring and electrical pickup. It is a sender device used for reading the speed of a vehicle's wheel rotation.	
Location of component(s)	 The type of axle determines the sensor mounting location: Steering axle sensors are typically installed in the steering knuckle or in a bolted-on bracket. Drive axle sensors are typically mounted on a block, attached to the axle housing or in a bolted-on bracket. 	
Diagnostic condition	This diagnostic runs continuously when the ignition is on.	
Set condition of fault code	The ECU detects that the speed of the left-rear axle wheel speed sensor is > 160 km/h [99 mph].	
Reset condition of fault code	This DTC changes to inactive when a normal wheel speed is detected.	
Electrical diagram(s)	Refer to the OEM technical data for additional information.	
Technical data	Refer to the OEM technical data for additional information.	
Possible causes	Wheel speed sensor defect.	
Additional information	The vehicle was driven excessively fast or the wheel speed sensor is malfunctioning.	
Diagnostic Step-by-Step	The ignition should always be in the OFF position when connecting or disconnecting electrical components to reduce the likelihood of damage to the components. This troubleshooting procedure is based on the assumption that supply power and ground to the PCI are functioning properly. Disconnecting the PCI connectors during the troubleshooting process will result in multiple errors. Specific electrical component information and pin out locations are provided in this procedure as a reference only. Always refer to the technical data sections in Rapido for the most up-to-date changes. It is necessary to use DAVIE to clear all current DTCs from the PCI and EAS-3 ECUs, and then run the Quick Check to identify a change in fault status. This DTC can be set as a result of multiple failure modes. For proper fault	



isolation, complete all troubleshooting steps in the sequence provided.

Step 1 Wheel Speed Sensor Checks

Step 1A Visual inspection, connections and wiring, wheel speed sensor, rear axle, left

Action

- 1. Visually inspect the associated component connections and wiring for any of the following:
 - Damaged or loose connectors
 - Bent, broken, corroded or loose connector pins
 - Moisture or dirt in the connections
 - Damage to the wire harness or insulation
 - ECU connections are damaged or disconnected
 - Batteries not fully charged, contacts are not tight
 - The related sensor is not installed correctly or it is damaged
 - The installed wheel and tire size is incorrect

Was there evidence of any of the above?	
Yes	No
Correct any issues found. If the wheel speed sensor is found to be damaged or broken, replace it. Refer to step 3A to perform the corresponding repair verification cycles and rechecks.	
If this DTC is still present, go to step 2A	Go to step 2A

Step 2 OEM Troubleshooting

Step 2A OEM troubleshooting	
Action 1. Refer to the OEM technical data for related troubleshooting information.	
Was an issue identified using the OEM troubleshooting? Yes No	



Correct any issues found. If the wheel speed sensor is found to be damaged or broken, replace it. Refer to step 3A to perform the corresponding repair verification cycles and rechecks.		Contact the PACCAR Engine Support Center for further assistance in diagnosing this issue.	
	If all steps have been completed and this DTC is still present, contact the PACCAR Engine Support Center for further assistance.		

Step 3 Repair Verification

Step 3A Repair verification cycles

Perform these repair verification cycles following any corrective actions taken, to enable related OBD monitors to reach a readiness state associated with the DTC or system being investigated.



Before beginning these repair verification cycles, use the DAVIE Diagnostics, Quick Check function to "Clear all" current DTCs from the PCI and EAS-3 ECUs.

Action

1. Overrun

With the System Initiation cycle complete, proceed to a road with minimum speed limit of 50 mph.

While remaining within the legally posted speed limit, get the truck in the highest gear possible with the engine speed at a minimum of 1800 rpm. Once the target engine speed has been reached, leave the truck in gear and release the accelerator pedal, allowing the truck to coast until the engine speed has reached 900 rpm. Perform this cycle 4 times.

- For Eaton Ultrashift transmissions, idle drop can only go to 1000 rpm
- For Alison Autoshift transmission, this test will not be able to be conducted

Yes

No

Investigate and correct any issues preventing these repair



		verification cycles from being completed, then re-run. For additional assistance, contact the PACCAR Engine Support Center.
G	o to step 3B	
	rep 3B DAVIE Diagnostics, Quick Che	ck, OBD Readiness Monitors
Us		ick Check for current DTCs to determine I this DTC.
	 Confirm that the corresponding displayed as "Ready." 	g OBD Monitor Readiness Status value is
	•	t the corresponding OBD monitor has run as been resolved—no further action.
	If the displayed status is "Not re	eady," continue to action step 2.
	2. View the DTC overview display,	and confirm that P1160 has been cleared.
	the related OBD Monitor Readiness Seared?	tatus set to "Ready." Or, has P1160 been
Ye	es	No



Problem resolved. No further actions.	Continue with the next step in this troubleshooting procedure. If all steps have been completed and this DTC is still present: • continue to operate the truck to extend the run time, allowing the corresponding OBD monitor sufficient time to complete • or, return to step 3A and perform this repair verification again. If this issue is still present after extending or re-running the repair verification, contact the PACCAR Engine Support Center for further assistance.
	Support Center Sing this issue or for confirmation prior to the ents, contact the PACCAR Engine Support Call Back to Index



Code number	P1161	
Fault code description	Wheel speed, rear axle, right – Data erratic, intermittent or incorrect	
Fault code information	1 trip MIL 3 drive cycle recovery Readiness group – None Freeze frame type - Comprehensive	
Description of component(s)	The wheel speed sensor is a type of tachometer, consisting of a toothed ring and electrical pickup. It is a sender device used for reading the speed of a vehicle's wheel rotation.	
Location of component(s)	 The type of axle determines the sensor mounting location: Steering axle sensors are typically installed in the steering knuckle or in a bolted-on bracket. Drive axle sensors are typically mounted on a block, attached to the axle housing or in a bolted-on bracket. 	
Diagnostic condition	This diagnostic runs continuously when the ignition is on.	
Set condition of fault code	The ECU detects that the speed of the right-rear axle wheel speed sensor is > 160 km/h [99 mph].	
Reset condition of fault code	This DTC changes to inactive when a normal wheel speed is detected.	
Electrical diagram(s)	Refer to the OEM technical data for additional information.	
Technical data	Refer to the OEM technical data for additional information.	
Possible causes	Wheel speed sensor defect.	
Additional information	The vehicle was driven excessively fast or the wheel speed sensor is malfunctioning.	
Diagnostic Step-by-Step	The ignition should always be in the OFF position when connecting or disconnecting electrical components to reduce the likelihood of damage to the components. This troubleshooting procedure is based on the assumption that supply power and ground to the PCI are functioning properly. Disconnecting the PCI connectors during the troubleshooting process will result in multiple errors. Specific electrical component information and pin out locations are provided in this procedure as a reference only. Always refer to the technical data sections in Rapido for the most up-to-date changes. It is necessary to use DAVIE to clear all current DTCs from the PCI and EAS-3 ECUs, and then run the Quick Check to identify a change in fault status. This DTC can be set as a result of multiple failure modes. For proper fault	



isolation, complete all troubleshooting steps in the sequence provided.

Step 1 Wheel Speed Sensor Checks

Step 1A Visual inspection, connections and wiring, wheel speed sensor, rear axle, right

Action

- 1. Visually inspect the associated component connections and wiring for any of the following:
 - Damaged or loose connectors
 - Bent, broken, corroded or loose connector pins
 - Moisture or dirt in the connections
 - Damage to the wire harness or insulation
 - ECU connections are damaged or disconnected
 - Batteries not fully charged, contacts are not tight
 - The related sensor is not installed correctly or it is damaged
 - The installed wheel and tire size is incorrect

Was there evidence of any of the above?	
Yes	No
Correct any issues found. If the wheel speed sensor is found to be damaged or broken, replace it. Refer to step 3A to perform the corresponding repair verification cycles and rechecks.	
If this DTC is still present, go to step 2A	Go to step 2A

Step 2 OEM Troubleshooting

Step 2A OEM troubleshooting		
Action 1. Refer to the OEM technical data for related troubleshooting information.		
Was an issue identified using the OEM troubleshooting?		
Yes	No	



Correct any issues found. If the wheel speed sensor is found to be damaged or broken, replace it. Refer to step 3A to perform the corresponding repair verification cycles and rechecks.	Contact the PACCAR Engine Support Center for further assistance in diagnosing this issue.
If all steps have been completed and this DTC is still present, contact the PACCAR Engine Support Center for further assistance.	

Step 3 Repair Verification

Step 3A Repair verification cycles

Perform these repair verification cycles following any corrective actions taken, to enable related OBD monitors to reach a readiness state associated with the DTC or system being investigated.



Before beginning these repair verification cycles, use the DAVIE Diagnostics, Quick Check function to "Clear all" current DTCs from the PCI and EAS-3 ECUs.

Action

1. Overrun

With the System Initiation cycle complete, proceed to a road with minimum speed limit of 50 mph.

While remaining within the legally posted speed limit, get the truck in the highest gear possible with the engine speed at a minimum of 1800 rpm. Once the target engine speed has been reached, leave the truck in gear and release the accelerator pedal, allowing the truck to coast until the engine speed has reached 900 rpm. Perform this cycle 4 times.

- For Eaton Ultrashift transmissions, idle drop can only go to 1000 rpm
- For Alison Autoshift transmission, this test will not be able to be conducted

Yes

No

Investigate and correct any issues preventing these repair verification



	cycles from being completed, then re- run. For additional assistance, contact the PACCAR Engine Support Center.
Go to step 3B	

Action

Use DAVIE Diagnostics to perform a Quick Check for current DTCs to determine whether the actions taken have cleared this DTC.

1. Confirm that the corresponding OBD Monitor Readiness Status value is displayed as "Ready."

A status of Ready indicates that the corresponding OBD monitor has run successfully and the problem has been resolved—no further action.

If the displayed status is "Not ready," continue to action step 2.

2. View the DTC overview display, and confirm that P1161 has been cleared.

Is the related OBD Monitor Readiness Status set to "Ready." Or, has P1161 been cleared?

Yes	No
Problem resolved. No further actions.	Continue with the next step in this troubleshooting procedure. If all steps have been completed and this DTC is still present: • continue to operate the truck to extend the run time, allowing the corresponding OBD monitor sufficient time to complete • or, return to step 3A and perform this repair verification again. If this issue is still present after extending or re-running the repair verification, contact the PACCAR Engine Support Center for further assistance.

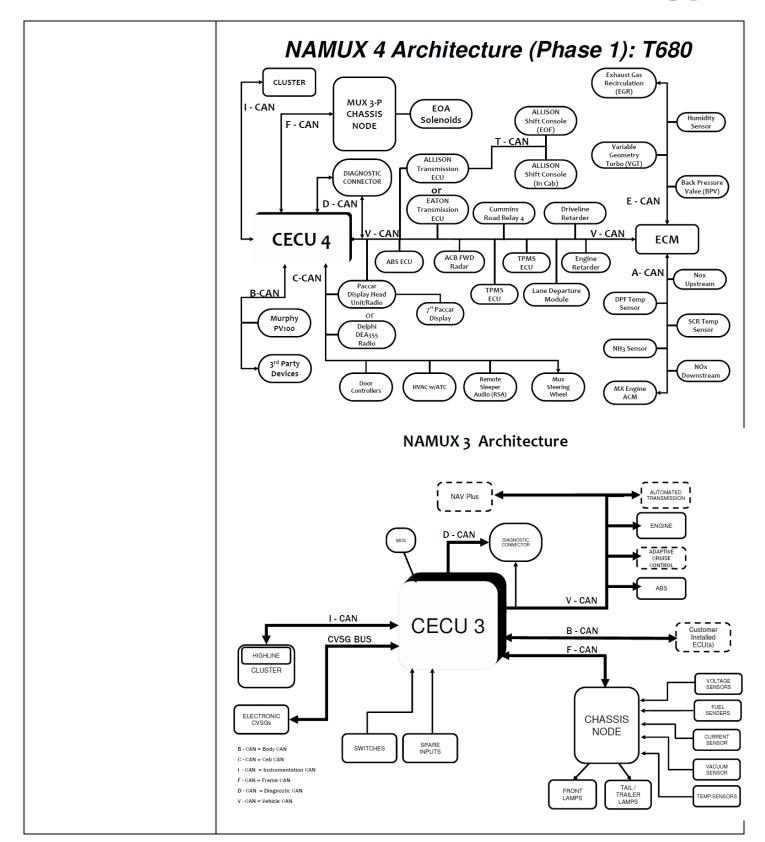


i	Contacting the PACCAR Engine Support Center For further assistance in diagnosing this issue or for confirmation prior to the replacement of suspect components, contact the PACCAR Engine Support Call Center.
	Back to Index

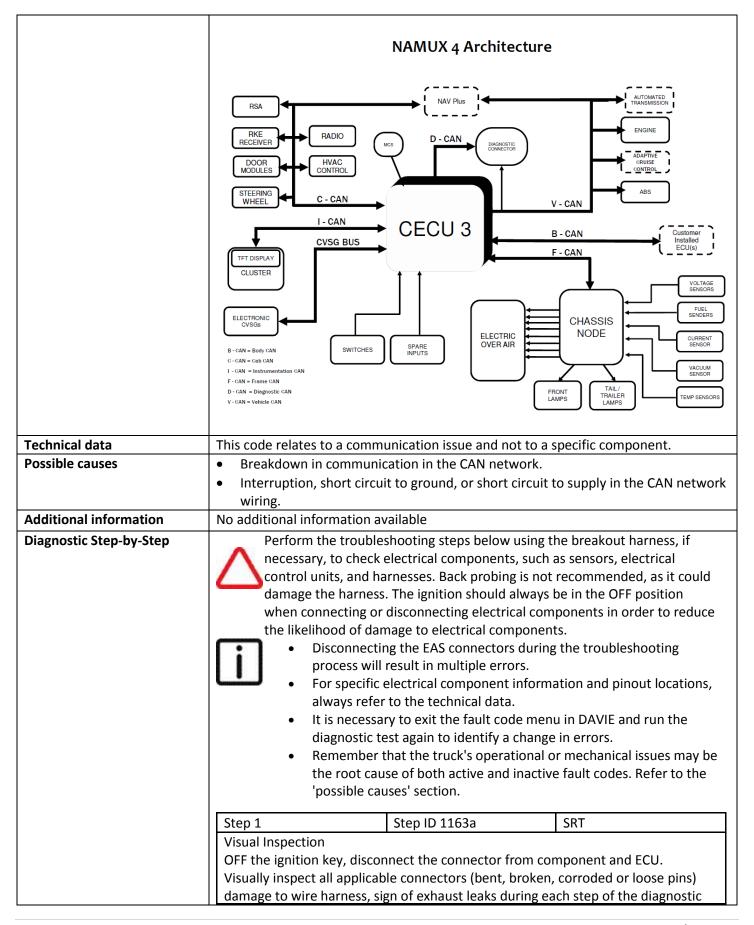


Code number	P1163
Fault code description	CAN communication - Message (TCO1) out of range - vehicle speed from transmission
Fault code information	3 drive cycle recovery
	Readiness group – None
	Freeze frame type – Generic
Description of component(s)	This code relates to a communication issue and not to a specific component.
Location of component(s)	This code relates to a communication issue and not to a specific component.
Diagnostic condition	This diagnostic runs continuously when the ignition is on.
Set condition of fault code	
Reset condition of fault code	This DTC changes to inactive as soon as the error is no longer detected.
Electrical diagram(s)	
	Diagnostic CAN STEERING WHEEL MCS DIAGNOSTIC CONNECTOR PACCAR DISPIBLY Vehicle CAN Vehicle CAN Instrumentation CAN CVSG BUS ELECTRONIC CVSG's SWITCHES Frame CAN FRONT F









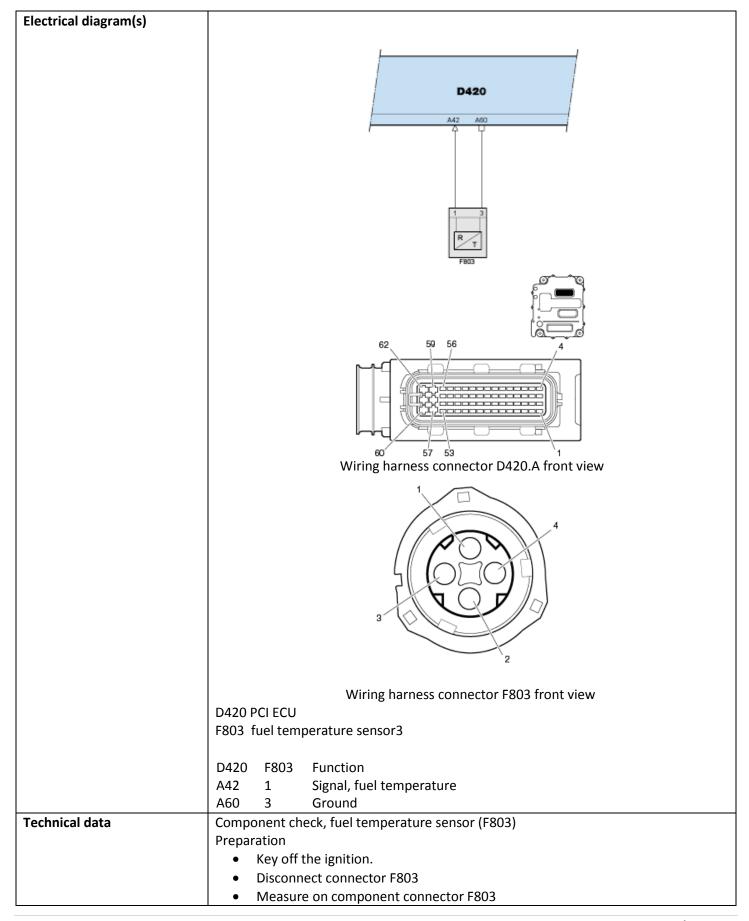


	procedure. Was there evidence of any of the above? No: Proceed to step 2. Yes: Make the appropriate repairs or component replacements. Use DAVIE to re-check for the presence of active faults. If this related fault is no longer active, then this issue has been resolved. If this related fault is still active, Proceed to step 2		
		•	
	wiring harne Reconnect t ON the ignit Use DAVIE to re-che Is DTC fault	place the component, also chess. he connector	
		Step ID 1163d ce in diagnosing this issue or ect components, contact the	SRT for confirmation prior to the Engine Support Call Center at
Verification Drive Cycle	engine off, and allow		ey to the ON position with the to initialize and run diagnostics. to run at idle for 2 minutes. Back to Inde



Code number	P1167		
Fault code description	Fuel temperature - Data valid but too high, least severe		
Fault code information	3 drive cycle recovery		
	Readiness group – None		
	Freeze frame type – Fuel		
Description of component(s)	The fuel temperature is measured in the low-pressure fuel supply gallery between the		
	common rail pump units.		
	Effect on the system:		
	Preventing automatic fuel module water draining activation when the fuel		
	temperature is very low (the water present may be frozen).		
	 Limitation of the engine torque when the fuel temperature is too high. 		
Location of component(s)			
,	F803		
Diagnostic condition	This diagnostic runs continuously when the ignition is on.		
Set condition of fault code	The PCI ECU (D420) detects that the fuel temperature is more than 92°C [198°F] for		
Set condition of fault code	more than 300 seconds.		
Reset condition of fault code	This DTC changes to inactive when the fault is no longer detected. To validate the		
neset condition of fault code	repair, key off the ignition for at least 15 seconds, key on again. Then start the engine		
	and let it idle for more than 300 seconds.		
	and let it fall for more than 500 seconds.		







	Pin Pin (+ probe) Value Additional information		
	1 3 5633–6120 Ω Resistance value at 0°C [34°F]		
	2411–2573 Ω Resistance value at 20°C [68°F]		
	1128–1213 Ω Resistance value at 40°C [104°F]		
	$568-619 \Omega$ Resistance value at 60° C [140°F]		
	$306-337 \Omega$ Resistance value at 80°C [176°F]		
	176–196 Ω Resistance value at 100°C [212°F]		
	170–190 tz Resistance value at 100 C [212 F]		
	Component & wiring check, ECU (D420)		
	PreparationKey off the ignition.		
	Disconnect connector F803		
	 Measure on the front side of wiring harness connector F803 		
	Pin Pin		
	(+ probe) (- probe) Value Additional information		
Possible causes	 1 3 5V Ignition keyed on Restrictions in the fuel to tank return circuit or faulty fuel pressure regulating 		
Possible causes	valve.		
	 Check the fuel pressure according to the prescribed job. 		
	Excessive dumping of fuel from the common rail through common rail pressure		
	release valve (L094).		
Additional information	The low-pressure fuel temperature is measured by the fuel temperature sensor (F803).		
Diagnostic Step-by-Step	Perform the troubleshooting steps below using the breakout harness, if necessary, to check electrical components, such as sensors, electrical control units, and harnesses. Back probing is not recommended, as it could damage the harness. The ignition should always be in the OFF position when connecting or disconnecting electrical components in order to reduce the likelihood of damage to electrical components. • Disconnecting the EAS connectors during the troubleshooting process will result in multiple errors. • For specific electrical component information and pinout locations, always refer to the technical data. • It is necessary to exit the fault code menu in DAVIE and run the diagnostic test again to identify a change in errors. • Remember that the truck's operational or mechanical issues may be the root cause of both active and inactive fault codes. Refer to the 'possible causes' section.		
	Step 1 Step ID 1167a SRT		
	Verify fuel level. Verify that the fuel level is within normal range. Low fuel in a high ambient temperature can cause high fuel temperatures. Is fuel below the normal range and is the ambient temperature high? • Yes – Add fuel. Proceed to step 2.		
	No – Proceed to step 2.		

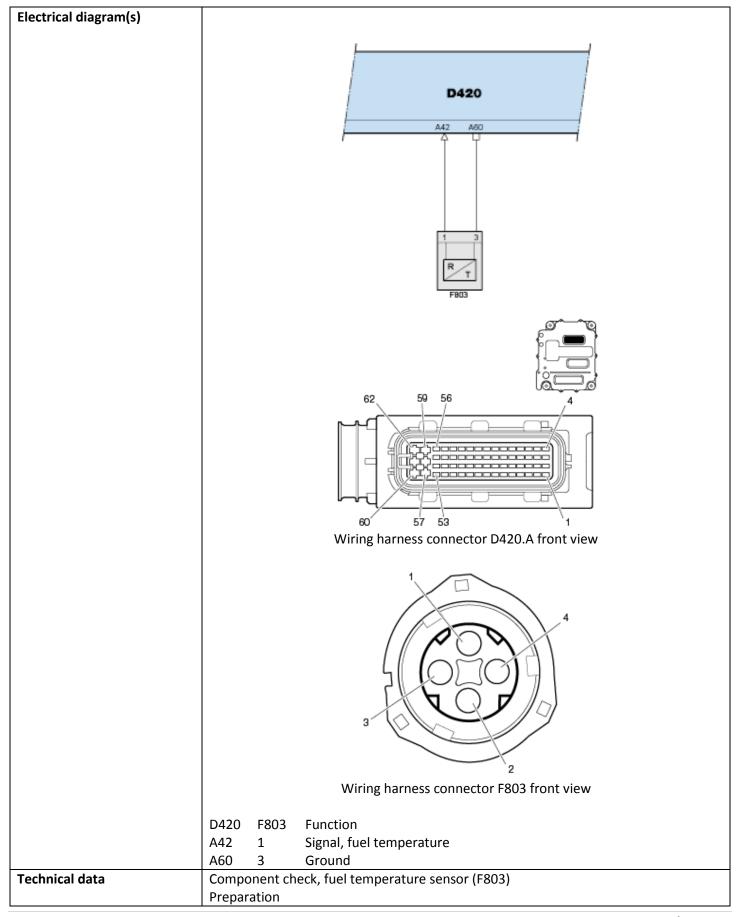


	Step 2	Step ID 1167b	SRT
	Check for fault codes		
	Use DAVIE to find any other active fuel temperature fault codes. Are there other		
	active fuel temperature fau	ult codes?	
	· ·	ne other active fuel temperat	ture fault codes.
	No – Proceed to st	·	
		- I	
	Step 3	Step ID 1167c	SRT
	Validation	•	·
	Turn the key switch ON.		
	Drive the truck un	nder conditions similar to tho	se that caused the fault
	code.		
	Use DAVIE to view the active fault codes.		
	Is P1167 still active?		
	Yes – Contact the Engine Support Center (ESC).		
	No – The repair is of	•	
Verification Drive Cycle	To validate repair, drive the truck under normal conditions until the coolant		
	temperature reaches a minimum of 150°F. This cycle can be conducted with a		
	loaded trailer or bobtail.		
			Deals to July
			Back to Index



Code number	P1168
Fault code description	Fuel temperature - Data valid but too high, moderately severe
Fault code information	1 trip MIL
Taut code information	3 drive cycle recovery
	Readiness group – None
	Freeze frame type - Fuel
Description of component(s)	The fuel temperature is measured in the low-pressure fuel supply gallery between the
Description of component(s)	common rail pump units.
	Effect on the system:
	 preventing automatic fuel module water draining activation when the fuel
	temperature is very low (the water present may be frozen).
	 limitation of the engine torque when the fuel temperature is too high.
Location of component(s)	immediation of the engine torque when the fact temperature is too mgm.
2000tion of component(3)	F803
Diagnostic condition	
Diagnostic condition Set condition of fault code	This diagnostic runs when the engine is running for more than 200 seconds. The PCI ECU (D420) detects that the fuel temperature is more than 95°C [203°F] for
Set condition of fault code	more than 300 seconds.
Reset condition of fault code	
Reset condition of fault code	This DTC changes to inactive when the fault is no longer detected. To validate the
	repair, key off the ignition for at least 15 seconds, key on again. Then start the engine and let it idle for more than 300 seconds.
	מווע ופנ זנ ועופ זטו זווטופ נוזמוז 500 גפנטוועג.







	Key off the ignition.			
	Disconnect connector F803			
	Measure on component connector F803			
	Pin	Pin		
	(+ probe)	(- probe)	Value	Additional information
	1	3	5633–6120 Ω	
	1	3	2411–2573 Ω	
	1	3	1128–1213 Ω	
	1	3	568–619 Ω	Resistance value at 60°C [140°F]
	1	3	306–337 Ω	Resistance value at 80°C [176°F]
	1	3	176–196 Ω	Resistance value at 100°C [212°F]
	Preparation	-	ck, ECU (D420)	
		ff the ignitio		
		nnect conne		
		-	onent connec	tor F803
	Pin	Pin	Value /	Additional information
	(+ probe)	(- probe) 3		gnition
Possible causes				circuit or faulty fuel pressure regulating
1 ossibic causes	valve.	ii iii tile idei	to tank return	circuit of faulty fuel pressure regulating
		fuel pressui	re according to	the prescribed job.
		-	_	ommon rail through the common rail
		release valve		G
Additional information	• The low-p			measured by the fuel temperature sensor
	(F803).Engine torque is reduced with this DTC active.			
Diamentia Stan by Stan	_	-		
Diagnostic Step-by-Step	Perform the troubleshooting steps below using the breakout harness, if necessary, to check electrical components, such as sensors, electrical control units, and harnesses. Back probing is not recommended, as it could damage the harness. The ignition should always be in the OFF position when connecting or disconnecting electrical components in order to reduce the likelihood of damage to electrical components. • Disconnecting the EAS connectors during the troubleshooting process will result in multiple errors. • For specific electrical component information and pinout locations, always refer to the technical data. • It is necessary to exit the fault code menu in DAVIE and run the diagnostic test again to identify a change in errors. • Remember that the truck's operational or mechanical issues may be the root cause of both active and inactive fault codes. Refer to the 'possible causes' section.			
	Step 1 Step ID 1168a SRT Visually inspect all applicable connectors (bent, broken, corroded or loose pins) and harnesses for corrosion, damage, and rubbing during each step of the diagnostic procedure. Proceed to step 2.			



Step 2 Step ID 1168b SRT

Verify that the fuel level is within normal range. Low fuel in a high ambient temperature can cause high fuel temperatures.

Is fuel below the normal range and is the ambient temperature high?

- Yes Add fuel. Proceed to step 3.
- No Proceed to step 3.

Step 3 Step ID 1168c SRT

Does the fuel pressure pass these tests?

- Yes Proceed to step 4.
- No Repair as needed. Proceed to the validation step.

Step 4 Step ID 1168d SRT

Troubleshooting steps

- Drive the truck under conditions similar to those that caused the fault code.
- Stop the truck.
- Use DAVIE to view the fuel temperature.
 - A passing fuel blender temperature is 100 to 125°F.
 - A failing fuel blender temperature is above 160°F.
 - A passing fuel blender bypassed fuel is 80 to 100°F.

Is the fuel blender temperature above 160°F?

- Yes Replace the fuel blender. Proceed to step 4.
- No Contact Engine Support Center (ESC).

Step 5 Step ID 1168e SRT

Troubleshooting steps

- Turn the key switch OFF.
- Disconnect the fuel temperature sensor.
- Inspect the fuel temperature sensor connector/harness interface for:
 - corroded or dirty pins,
 - damaged pins,
 - pushed back or expanded pins,
 - loose connector,
 - moisture in or on the connector,
 - connector shell damage,
 - missing or damaged connector seals and/or
 - wire insulation damage.

Has dirt or damage been found?

- Yes Clean, repair or replace the damaged connection or harness if possible. Proceed to step 5.
- No Proceed to step 5.

Step 6 Step ID 1168f SRT

Troubleshooting steps

- Turn the key switch OFF.
- Disconnect the fuel temperature sensor.



	 Pin the power supply leg. If voltage is 4.8 V to 5.2 V – Pass. Proceed to step 6. If voltage is lower than 4.8 V or higher than 5.2 V – Fail. Repair/replace harness as needed, then retest. Proceed to step 6. Step 7 Step ID 1168g SRT Troubleshooting steps Turn the key switch OFF. Disconnect the fuel sensor. Place a jumper wire between the power supply and harness at the sensor connector. Pin the return leg of the circuit. If voltage is 4.8 V to 5.2 V – Pass. Proceed to step 7. If voltage is lower than 4.8 V or higher than 5.2 V – Fail. Repair/replace harness on signal return leg, as needed, then retest. Proceed to step 7 		an 5.2 V – Fail. Repair/replace to step 6. SRT Oly and harness at the sensor d to step 7. an 5.2 V – Fail. Repair/replace
	Step 8 Step ID 1168h SRT Troubleshooting steps Turn the key switch OFF. Disconnect the fuel temperature sensor. Pin the sensor signal pin to the chassis ground. Does the ohmmeter indicate that there is continuity between the sensor signal pin and the chassis ground? Yes – Repair/replace the grounded portion of the circuit on the return as needed, then retest. Proceed to step 7. No – Proceed to step 8.		
	Step 9 Step ID 1168i SRT Troubleshooting steps Turn the key switch ON. Drive the truck under conditions similar to those that caused the fault code. Use DAVIE to view the active fault codes. Is P1168 still active? Yes – Contact the Engine Support Center (ESC). Proceed to step 10. No – The repair is complete. Step 10 Step ID 1168j SRT For further assistance in diagnosing this issue or for confirmation prior to the replacement of suspect components, contact the Engine Support Call Center at		
Verification Drive Cycle	1-800-477-0251. To verify the repair it to run at idle for		akes set, start the engine and allow Back to Index



Code number	P1180		
Fault code description	Fuel temperature - Data valid but too high, moderately severe		
Fault code information	3 drive cycle recovery		
	Readiness group – None		
	Freeze frame type – Fuel		
Description of component(s)	The fuel temperature is measured in the low-pressure fuel supply gallery between the		
Description of component(s)	common rail pump units.		
	Effect on the system:		
	Preventing automatic fuel module water draining activation when the fuel		
	temperature is very low (the water present may be frozen).		
	 temperature is very low (the water present may be frozen). Limitation of the engine torque when the fuel temperature is too high. 		
Location of component(s)	Elimitation of the engine torque when the fuer temperature is too high.		
Location of component(s)	F803		
Diagnostic condition	This diagnostic runs continuously when the engine is running.		
Set condition of fault code			
	4,0 3,5		
	3,0-		
	P _{2.0} -		
	1,5		
	1,0 - 0,5 -		
	O 350 700 1050 1400 1750 2100 2450		
	rpm		
	P fuel pressure in bar		
	Rpm- Engine speed in rpm		



	P fuel pressure in psi Rpm- Engine speed in rpm The PCI ECU (D420) detects that: • fuel temperature is more than 95°C [203°F], and • fuel pressure is too low (gray area of the graph), and • ambient temperature is more than 45°C [113°F], and • fuel tank level is low
Reset condition of fault code	This DTC changes to inactive when the fault is no longer detected. To validate the repair, key off the ignition for at least 15 seconds, key on again. Then start the engine
Electrical diagram(s)	and operate it at several engine speeds
	D420 A42 A00 FB03
	Wiring harness connector D420.A front view



	W	iring harness con	nector F803 front view	
	D420PCI ECU			
	F803fuel temperature se	ensor3		
	D420 F803 Function	า		
		uel temperature		
	A60 3 Ground	· · · · · · · · · · · · · · · · · · ·		
Technical data	Component check, fuel	temperature sens	sor (F803)	
	Preparation • Key off the ignit	ion		
	Disconnect confidence			
		Measure on component connector F803		
	Pin Pin			
	1 3	5633–6120 Ω	Resistance value at 0°C [34°F]	
		2411–2573 Ω	Resistance value at 20°C [68°F]	
		1128–1213 Ω	Resistance value at 40°C [104°F]	
		568–619 Ω	Resistance value at 60°C [140°F]	
		306–337 Ω	Resistance value at 80°C [176°F]	
		176–196 Ω	Resistance value at 100°C [212°F]	
	Component & wiring check, ECU (D420) Preparation			
	Key off the ignition.			
		Disconnect connector F803		
	Measure on the Pin Pin	Measure on the front side of wiring harness connector F803 Diagonal Picture P		
	(+ probe) (- probe)	\/aluc	onal information	
	1 3	value /taaiti	onal information on keyed on	
Possible causes			high ambient temperatures.	
Additional information			asured by the fuel pressure sensor (F801).	
	• The low-pressure fu (F803).	• The low-pressure fuel temperature is measured by the fuel temperature sensor (F803).		
	 Engine torque is red 	ucea.		



Diagnostic Step-by-Step	Perform the troubleshooting steps below using the breakout harness, if necessary, to check electrical components, such as sensors, electrical control units, and harnesses. Back probing is not recommended, as it could damage the harness. The ignition should always be in the OFF position when connecting or disconnecting electrical components in order to reduce the likelihood of damage to electrical components. • Disconnecting the EAS connectors during the troubleshooting process will result in multiple errors. • For specific electrical component information and pinout locations, always refer to the technical data. • It is necessary to exit the fault code menu in DAVIE and run the diagnostic test again to identify a change in errors. • Remember that the truck's operational or mechanical issues may be the root cause of both active and inactive fault codes. Refer to the 'possible causes' section.
	Step 1 Step ID 1180a SRT Verify fuel level. Verify that the fuel level is within normal range. Low fuel in a high ambient temperature can cause high fuel temperatures. Is fuel below 5% and is the ambient temperature high? • Yes – Add fuel. Proceed to other fault codes. • No – Proceed to other fault codes.
Verification Drive Cycle	To validate repair, drive the truck under normal conditions until the coolant temperature reaches a minimum of 150°F. This cycle can be conducted with a loaded trailer or bobtail. Back to Index



Code number	P1191
Fault code description Fault code information	Fuel filter – Clogged
Fault code information	3 drive cycle recovery
	Readiness group – None
	Freeze frame type – Fuel
Description of component(s)	The fuel filter filters dirt out of the fuel. The fuel enters via connection (1) and is forced through the filter element (2). There is a central tube (3) in the filter element. The filtered fuel flows to the fuel filter holder. There is an orifice in the screw on the fuel filter holder to bleed the air out of the system (filter). Open the screw to bleed air out of the system.
Location of component(s)	Not available/required for this code
Diagnostic condition	This diagnostic runs continuously when the engine is running.
Set condition of fault code	The PCI ECU (D420) detects that:
	• fuel temperature is more than 95°C [203°F] and
	• fuel pressure is too low (gray area of the graph)
	1 - Taci piessaie is too low (Bray area of the Brayn)



	P _{2,0} 1,5 1,0 0,5 0 350 700 1050 1400 1750 2100 2450 rpm		
	P Fuel pressure in bar rpm 58,0 50,8 43,5 36,3 29,0 21,8 14,5 7,3 0 0 350 700 1050 1400 1750 2100 2450 P Fuel pressure in psi		
Reset condition of fault code	rpm Engine speed in rpm This DTC changes to inactive when the fault is no longer detected. To validate the repair, key off the ignition for at least 15 seconds, key on again. Then start the engine		
Electrical diagram(s)	and operate it at several engine speeds. Not available/required for this code		
Technical data	Not available/required for this code Not available/required for this code		
Possible causes	Clogged fuel filter		
Additional information	 The low-pressure fuel pressure is measured by the fuel pressure sensor (F801). The low-pressure fuel temperature is measured by the fuel temperature sensor (F803). 		
Diagnostic Step-by-Step	Perform the troubleshooting steps below using the breakout harness, if necessary, to check electrical components, such as sensors, electrical control units, and harnesses. Back probing is not recommended, as it could damage the harness. The ignition should always be in the OFF position when connecting or disconnecting electrical components to reduce the likelihood of damage to electrical components This troubleshooting tree is based on the assumption that supply power and ground to the PCI are functioning properly.		



	_	ring the troubleshooting process
	esult in multiple errors.	
•	pecific electrical component infors rs refer to the technical data in F	•
•	ecessary to exit the 'active error	·
	ostic test again to identify chang	
_	ember that the truck's operation	
	oot cause of both active and inac	•
'possi	ble causes' section in Rapido.	
Step 1	Step ID 1191a	SRT
•	•	oken, corroded or loose pins) and
	osion, damage, and rubbing dur	
procedure. Procee		and compared to the analysis and
-		
Step 2	Step ID 1191b	SRT
		SRT
Check fuel supply Repair or replace	Step ID 1191b	
Check fuel supply Repair or replace active faults.	Step ID 1191b line for leakage and blockage: the supply line and use DAVIE to	
Check fuel supply Repair or replace active faults. • Fault inac	Step ID 1191b line for leakage and blockage: the supply line and use DAVIE to	
Check fuel supply Repair or replace active faults. • Fault inac	Step ID 1191b line for leakage and blockage: the supply line and use DAVIE to	
Check fuel supply Repair or replace active faults. • Fault inac • Fault activ	Step ID 1191b line for leakage and blockage: the supply line and use DAVIE to	
Check fuel supply Repair or replace active faults. Fault inac Fault activ	Step ID 1191b line for leakage and blockage: the supply line and use DAVIE to tive – issue resolve ve – Proceed to step 3 Step ID 1191c	o re-check for the presence of
Check fuel supply Repair or replace active faults. Fault inac Fault activ Step 3 Replace: Fuel filte	Step ID 1191b line for leakage and blockage: the supply line and use DAVIE to tive – issue resolve ve – Proceed to step 3 Step ID 1191c	o re-check for the presence of
Check fuel supply Repair or replace active faults. Fault inac Fault activ Step 3 Replace: Fuel filte Replace the ident	Step ID 1191b line for leakage and blockage: the supply line and use DAVIE to tive – issue resolve ve – Proceed to step 3 Step ID 1191c	o re-check for the presence of SRT
Check fuel supply Repair or replace active faults. Fault inac Fault activ Step 3 Replace: Fuel filte Replace the ident Use DAVIE to re-c	Step ID 1191b line for leakage and blockage: the supply line and use DAVIE to tive – issue resolve ve – Proceed to step 3 Step ID 1191c r ified faulty component.	o re-check for the presence of SRT
Check fuel supply Repair or replace active faults. Fault inac Fault activ Step 3 Replace: Fuel filte Replace the ident Use DAVIE to re-c Fault inac	Step ID 1191b line for leakage and blockage: the supply line and use DAVIE to tive – issue resolve ve – Proceed to step 3 Step ID 1191c r ified faulty component. heck for the presence of active to	o re-check for the presence of SRT
Check fuel supply Repair or replace active faults.	Step ID 1191b line for leakage and blockage: the supply line and use DAVIE to tive – issue resolve ve – Proceed to step 3 Step ID 1191c or ified faulty component. heck for the presence of active to	o re-check for the presence of SRT

	Fault active – Proceed to step 4		
	Step 4	Step ID 1191d	SRT
	Contact the PACCAR Engine Support Call Center		
		agnosing this issue or for con mponents, contact the PACC	•
Verification Drive Cycle	To validate the repair, key of start the engine and operate	_	seconds, key on again. Then
			Back to Index



Code number	P1194		
Fault code description	Fuel filter - Very clogged		
Fault code information	3 drive cycle recovery		
radic code information	Readiness group – None		
	Freeze frame type – Fuel		
Description of component(s)	Treeze name type Tuei		
Description of component(s)	The fuel filter filters dirt out of the fuel. The fuel enters via connection (1) and is forced through the filter element (2). There is a central tube (3) in the filter element. The filtered fuel flows to the fuel filter holder. There is an orifice in the screw on the fuel filter holder to bleed the air out of the		
	system (filter).		
Leasting of company to the	Open the screw to bleed air out of the system.		
Location of component(s)	Not available/required for this code		
Diagnostic condition	This diagnostic runs continuously when the engine is running.		
Set condition of fault code	The PCI ECU (D420) detects that:		
	• fuel temperature is more than 95°C [203°F], and		
	fuel pressure is too low (gray area of the graph).		



	P 2 1,5 1 0,5 0 0 350 700 1050 1400 1750 2100 2450 rpm			
	P Fuel pressure in bar rpm Engine speed in rpm			
	50.8 43.5 36.3 29.0 21.8 14.5 7.3			
	0 350 700 1050 1400 1750 2100 2450 rpm			
	P Fuel pressure in psi			
	rpm Engine speed in rpm			
Reset condition of fault code	This DTC changes to inactive when the fault is no longer detected. To validate the			
	repair, key off the ignition for at least 15 seconds, key on again. Then start the engine			
	and operate it at several engine speeds.			
Electrical diagram(s) Technical data	Not available/required for this code Not available/required for this code			
Possible causes	Very clogged fuel filter.			
Additional information	 The low-pressure fuel pressure is measured by the fuel pressure sensor (F801). 			
	 The low-pressure fuel temperature is measured by the fuel temperature sensor 			
	(F803).			
	Engine torque is reduced.			
Diagnostic Step-by-Step	Perform the troubleshooting steps below using the breakout harness, if necessary, to check electrical components, such as sensors, electrical control units, and harnesses. Back probing is not recommended, as it could damage the harness. The ignition should always be in the OFF position when connecting or disconnecting electrical components to reduce the likelihood of damage to electrical components • This troubleshooting tree is based on the assumption that supply power and ground to the PCI are functioning properly. • Disconnecting the PCI connectors during the troubleshooting process will result in multiple errors. • For specific electrical component information and pinout locations,			

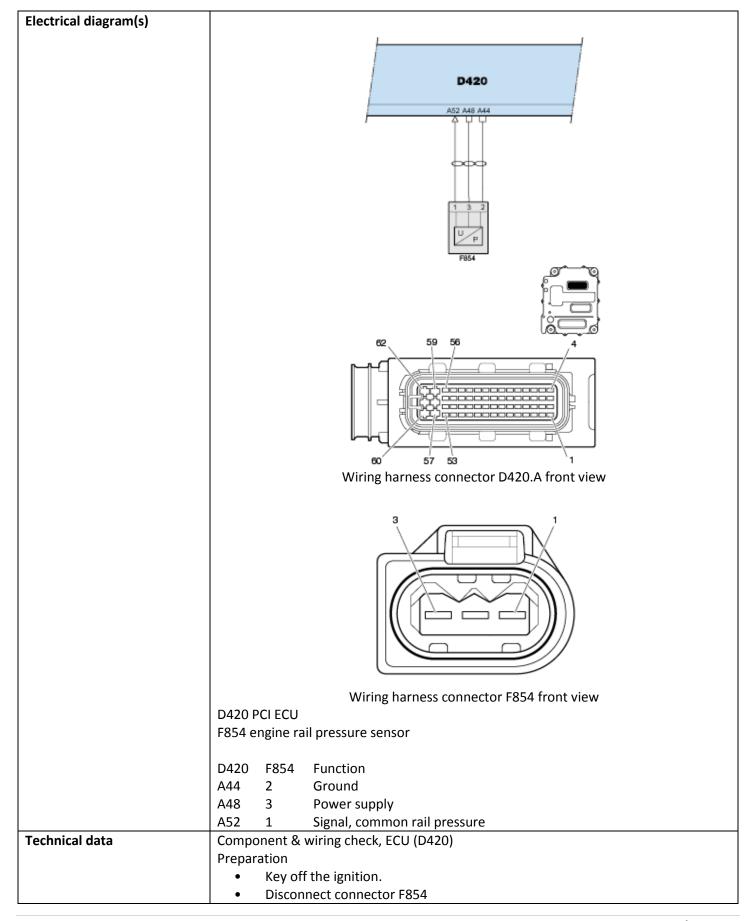


always refer to the technical data in Rapido. It is necessary to exit the 'active errors' screen in DAVIE and run the diagnostic test again to identify changes in errors. Remember that the truck's operational or mechanical issues may be the root cause of both active and inactive codes. Refer to the 'possible causes' section in Rapido. Step ID 1194a SRT Step 1 Visually inspect all applicable connectors (bent, broken, corroded or loose pins) and harnesses for corrosion, damage, and rubbing during each step of the diagnostic procedure. Proceed to step 2. SRT Step 2 Step ID 1194b Check fuel supply line for leakage and blockage: Repair or replace the supply line and use DAVIE to re-check for the presence of active faults. Fault inactive – issue resolve Fault active – Proceed to step 3 Step ID 1194c SRT Step 3 Replace: Fuel filter Replace the identified faulty component. Use DAVIE to re-check for the presence of active faults. Fault inactive – issue resolve Fault active - Proceed to step 4 Step 4 Step ID 1194d SRT Contact the PACCAR Engine Support Call Center For further assistance in diagnosing this issue or for confirmation prior to the replacement of suspect components, contact the PACCAR Engine Support Call Center at 1-800-477-0251. **Verification Drive Cycle** To validate the repair, key off the ignition for at least 15 seconds, key on again. Then start the engine and operate it at several engine speeds. **Back to Index**



Code number	P1195		
Fault code description	Engine rail pressure - Data erratic, intermittent, or incorrect at ignition on		
Fault code information	2 trip MIL		
rault code illiorillation	·		
	3 drive cycle recovery		
	Readiness group – None		
	Freeze frame type - Fuel		
Description of component(s)	The rail pressure is measured in the common rail.		
	The rail pressure sensor is part of the common rail and is not interchangeable as a		
	separate part.		
	Effect on the system:		
	feedback on the rail pressure control.		
	The rail pressure is closed-loop controlled. A comparison is made between the		
	rail pressure demands determined by the ECU and the rail pressure feedback		
	measured by the common rail pressure sensor.		
Location of component(s)	measured by the common rail pressure sensor.		
Location of component(s)	F854		
	1004		
Diagnostic condition	This diagnostic runs whon:		
Diagnostic condition	This diagnostic runs when:		
	engine is not running, and;		
	 the ignition is keyed on after it has been off for more than 200 seconds, and; 		
	fuel temperature is more than 0°C [32°F]		
Set condition of fault code	The PCI ECU (D420) detects that the actual rail pressure is more than 245 bar [3553		
	psi].		
Reset condition of fault code	This DTC changes to inactive when the fault is no longer detected. To validate the		
	repair, drive the vehicle until the coolant temperature is at least 70°C [158°F] in		
	normal driving conditions. This activity can be best conducted with a loaded		
	vehicle/trailer.		
	vernoicy trailer.		







	Pin	Pin			
	(+ probe)	(- probe)	Value	Additional in	
	3	2	5V	Ignition keye	ed on
Possible causes		pressure sense			
Additional information	running. • The rail prosensor (Fa	essure is meas	ured in the		ored when the engine is not the common rail pressure
Diagnostic Step-by-Step	nece cont dama when	ssary, to check rol units, and hage the harnes n connecting of ikelihood of da Disconnect process will For specific always refe It is necess diagnostic Remember be the root	c electrical contains arnesses. But the ignition of the igniti	omponents, such ack probing is not should alwayding electrical componectors durultiple errors. Omponent informical data. The fault code more identify a charactive and interest and interes	ing the troubleshooting rmation and pinout locations, enu in DAVIE and run the
	Step 1		Step ID 11	195a	SRT
	Visually insp	• •	ble connecton, damage,	ors (bent, broke and rubbing du	en, corroded or loose pins) uring each step of the
	Step 2		Step ID 12	195b	SRT
	related cabl Based on th are within s	the ignition kees. e fault messag pecified range: ply and signal of le continuity (red electrical value) - Proceed to si	re provided, s or limits: voltages (12 no opens or alues outside tep 3 tep 4	confirm that th V). shorts). e of expected ra	FF before disconnecting The following electrical values The ange or limits? SRT The sents and use DAVIE to re-



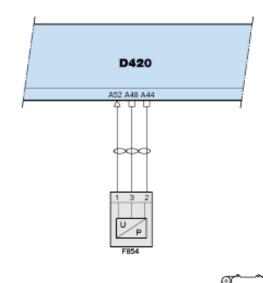
	Step 4	Step ID 1195d	SRT		
	Replace: Common Rail Pressure sensor (Common Rail)				
	Replace the Common Rail assembly, which includes the Common Rail Pressure				
	sensor.				
	NOTE: The entire	NOTE: The entire Common Rail must be replaced. The Common Rail Pressure			
	sensor is a non-se	erviceable part and cannot be re	eplaced or repaired separately.		
	Contact the PACC	CAR Engine Support Call Center	to confirm replacement of the		
	Common Rail asso	•			
	Use DAVIE to re-o	heck for the presence of active	faults.		
	Fault inaction	Fault inactive – issue resolve			
	If this related fault is still active, proceed to step 5				
	Step 5 Step ID 1195e SRT				
	For further assistance in diagnosing this issue or for confirmation prior to the				
	replacement of suspect components, contact the Engine Support Call Center at				
	1-800-477-0251.				
Verification Drive Cycle	To validate repair, with the brakes set, turn the key to the ON position with the				
	engine off, and allo	engine off, and allow 10 seconds for the system to initialize and run diagnostics.			
			Back to Inde	<u>dex</u>	

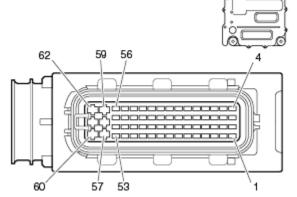


Code number	P1196		
Fault code description	Engine rail pressure - Data erratic, intermittent, or incorrect at ignition on		
Fault code information	2 trip MIL		
rault code illiorillation	•		
	3 drive cycle recovery		
	Readiness group – None		
	Freeze frame type – Fuel		
Description of component(s)	The rail pressure is measured in the common rail.		
Description of component(s)	·		
	The rail pressure sensor is part of the common rail and is not interchangeable as a		
	separate part.		
	Effect on the system:		
	feedback on the rail pressure control.		
	The rail pressure is closed-loop controlled. A comparison is made between the rail		
	pressure demands determined by the ECU and the rail pressure feedback		
	measured by the common rail pressure sensor.		
Location of component(s)			
	F854		
Diagnostic condition	This diagnostic runs when:		
2.38.10300 001141011			
	engine is not running, and; continuous contin		
	 the ignition is keyed on after it has been off for more than 200 seconds, and; 		
	fuel temperature is more than 0°C [32°F]		
Set condition of fault code	The PCI ECU (D420) detects that the actual rail pressure is more than 140 bar [2030		
	psi].		
Docat condition of fault carla			
Reset condition of fault code	This DTC changes to inactive when the fault is no longer detected. To validate the		
	repair, drive the vehicle until the coolant temperature is at least 70°C [158°F] in		
	normal driving conditions. This activity can be best conducted with a loaded		
	vehicle/trailer.		
	To a contract of the contract		

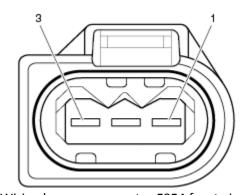


Electrical diagram(s)





Wiring harness connector D420.A front view



Wiring harness connector F854 front view

D420 PCI ECU

F854 engine rail pressure sensor

D420 F854 Function A44 2 Ground A48 3 Power supply



	A52 1 Signal, commo	n rail pressure			
Technical data		Component & wiring check, ECU (D420)			
	Preparation				
	 Key off the ignition. 				
	Disconnect connector F	-854			
		ide of wiring harness con	nector F854		
	Pin Pin				
		Additional information			
	3 2 5V	Ignition keyed on			
Baratti and and		<u> </u>			
Possible causes	Common rail pressure sensor d				
Additional information		ual rail pressure is monito	ored when the engine is not		
	running.				
	The rail pressure is measur	ed in the common rail by	the common rail pressure		
	sensor (F854).				
-	Engine torque is reduced.				
Diagnostic Step-by-Step		ooting steps below using			
		ectrical components, such			
			t recommended, as it could		
	_	he ignition should always			
		· ·	mponents in order to reduce		
	Antidottore.	ge to electrical compone			
		the EAS connectors durir	ng the troubleshooting		
		sult in multiple errors.			
		-	nation and pinout locations,		
	always refer to the technical data.				
	 It is necessary to exit the fault code menu in DAVIE and run the 				
	diagnostic test again to identify a change in errors.				
	 Remember that the truck's operational or mechanical issues may be the root cause of both active and inactive fault codes. Refer to 				
	the 'possible causes' section.				
			1.00		
	1	tep ID 1196a	SRT		
	Visually inspect all applicable connectors (bent, broken, corroded or loose pins)				
	and harnesses for corrosion, damage, and rubbing during each step of the diagnostic procedure. Proceed to step 2.				
		tep ID 1196b	SRT		
	Electrical Checks				
	Ensure that the ignition key/switch has been set to OFF before disconnecting				
	related cables.				
	Based on the fault message provided, confirm that the following electrical values				
	are within specified ranges or limits:				
	Supply and signal voltages (12V).				
	Cable continuity (no c	pens or shorts).			
	Are measured electrical value	s outside of expected ran	nge or limits?		
	Yes - Proceed to step	3			
	No - Proceed to step 4				
	Step 3 S	tep ID 1196c	SRT		
	11 '	•			



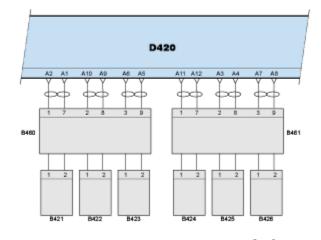
	Repair or replace Common Rail assembly, which includes the Common Rail Pressure sensor, and use DAVIE to re-check for the presence of active faults. • Fault inactive – issue resolve • Fault active - Proceed to step 4 Step 4 Step ID 1196d SRT For further assistance in diagnosing this issue or for confirmation prior to the replacement of suspect components, contact the PACCAR Engine Support Call Center at 1-800-477-0251.		
Verification Drive Cycle	To validate repair, w minutes.	ith the brakes set, start the en	ngine and allow it to run at idle for 2
			Back to Index

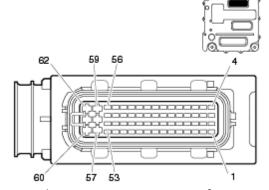


Code number	P1201
Fault code description	Injector solenoid valve cylinder 1 - Current too low or open circuit on ECU D420 pin
	A2
Fault code information	1 trip MIL
	3 drive cycle recovery
	Readiness group – None
	Freeze frame type – Comprehensive
Description of component(s)	The fuel injector injects fuel into the combustion chamber.
	Control
	The amount of fuel injected depends on the duration of the injector solenoid
	activation in combination with the rail pressure. The longer the solenoid is activated
	by the PCI ECU at the same rail pressure, the more fuel is injected.
	Injector codes
	Every fuel injector is calibrated during production to compensate for any production
	tolerances. An injector calibration code is present on the housing and connector of
	the injector. These injector codes must be (re)programmed with DAVIE if one or more
	injectors have been replaced or fitted in another position, or if the PCI ECU is
	replaced.
	Not programming or incorrectly programmed injector codes can result in reduced
	engine performance or a warning to the driver.
Location of component(s)	B421
Diagnostic condition	The diagnostic runs continuously with the ignition on.
Set condition of fault code	This condition will be set if Current in Needle control valve is less than 4.5A.
Reset condition of fault code	This fault code will change to inactive immediately after the diagnostic runs and
	passes.

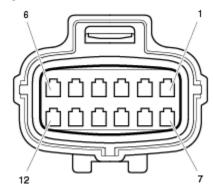


Electrical diagram(s)





Wiring harness connector D420.A front view



Wiring harness connector B460 & B461 front view

B460 connector cylinders 1-3

B461 connector cylinders 4-6

D420 PCI ECU

B421 solenoid valve injector cylinder 1

B422 solenoid valve injector cylinder 2

B423 solenoid valve injector cylinder 3

B424 solenoid valve injector cylinder 4

B425 solenoid valve injector cylinder 5

B426 solenoid valve injector cylinder 6

D420 B460 B421 B422 B423 Function

A1 7 2 Signal low, injector solenoid valve cylinder 1



	A2 1	1		Signal high	n, injector solenoid valve cylinder 1			
	A5 9		2	Signal low	, injector solenoid valve cylinder 3			
	A6 3		1	Signal high	n, injector solenoid valve cylinder 3			
	A9 8		2	Signal low	, injector solenoid valve cylinder 2			
	A10 2		1	Signal high	n, injector solenoid valve cylinder 2			
	D420 B460	B424 B	425 B426	Function				
	A3 2		1	Signal high	n, injector solenoid valve cylinder 5			
	A4 8		2	Signal low	, injector solenoid valve cylinder 5			
	A7 3		1	Signal high	n, injector solenoid valve cylinder 6			
	A8 9		2	Signal low	, injector solenoid valve cylinder 6			
	A11 1	1		Signal high	n, injector solenoid valve cylinder 4			
	A12 7	2		Signal low	, injector solenoid valve cylinder 4			
Technical data	Component c	Component check, injector solenoid valve cylinder 1 (B421)						
	Preparation							
		Services Services						
		Disconnect connector B460Measure on wiring harness connector B460						
	• Meas	ure on wirir Pin	ig narness c	onnector B40	50			
	(+ probe)	(- probe)	Value		Additional information			
	1	7	± 0.67 Ω		Resistance value at 20°C [68°F]			
			maximu		Resistance value at 120°C [248°F]			
	Component check, injector solenoid valve cylinder 2 (B422) Preparation							
	Key off the ignition Research to PAGE							
	Disconnect connector B460 Massure on wiring harpess connector B460							
	 Measure on wiring harness connector B460 Pin Pin 							
	(+ probe)	(- probe)	Value		Additional information			
	2	8	± 0.67 Ω		Resistance value at 20°C [68°F]			
			maximu	n 0.94 Ω	Resistance value at 120°C [248°F]			
	Component check, injector solenoid valve cylinder 3 (B423) Preparation							
	Key off the ignition							
		Disconnect connector B460Measure on wiring harness connector B460						
	Pin	Pin	.0	JCOLOT DA				
	(+ probe)	(- probe)	Value		Additional information			
	3	9	± 0.67 Ω		Resistance value at 20°C [68°F]			
			maximu	m 0.94 Ω	Resistance value at 120°C [248°F]			
	Component check, injector solenoid valve cylinder 4 (B424)							

Preparation



	Key off the ignition Piccompact as PAC1				
	Disconnect connector B461				
	Measure on wiring harness connector B461				
		in			
	(+ probe) (- pr	obe) Value	Additional information		
	1	\pm 0.67 Ω	Resistance value at 20°C [68°F]		
		maximum 0.94 Ω	Resistance value at 120°C [248°F]		
	Component check, injector solenoid valve cylinder 5 (B425) Preparation				
	Key off the ignition				
	Disconnect connector B461				
	Measure on wiring harness connector B461				
	Pin Pin				
		obe) Value	Additional information		
		\pm 0.67 Ω maximum 0.94 Ω	Resistance value at 20°C [68°F]		
	Component check, injector solenoid valve cylinder 6 (B426) Preparation				
	Key off the ignition				
	 Disconnect 	connector B461			
	Measure on	wiring harness connector I	B461		
	Pin Pin				
	(+ probe) (- pr	obe) Value	Additional information		
	3	± 0.67 Ω	Resistance value at 20°C [68°F]		
		maximum 0.94 Ω	Resistance value at 120°C [248°F]		
Possible causes	Faulty sensor				
	Faulty connector				
	Faulty wiring				
Additional information	No additional information available.				
Diagnostic Step-by-Step	Perform the	e troubleshooting steps belo	ow using the breakout harness, if		
	necessary, to check electrical components, such as sensors, electrical control units, and harnesses. Back probing is not recommended, as it could				
	damage the	harness. The ignition shou	ld always be in the OFF position		
	when conne	ecting or disconnecting elec	ctrical components in order to reduce		
	the likelihood of damage to electrical components.				
	• Dise	connecting the EAS connect	tors during the troubleshooting		
	process will result in multiple errors.				
	• For	specific electrical compone	ent information and pinout locations,		
	always refer to the technical data.				
		· · · · · · · · · · · · · · · · · · ·	code menu in DAVIE and run the		
		gnostic test again to identif			
	Remember that the truck's operational or mechanical issues may				
			e and inactive fault codes. Refer to		
	the	'possible causes' section.			



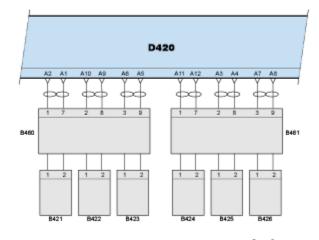
	Step 1	Step ID 1201a	SRT	
	Visually inspect all applicable connectors (bent, broken, corroded or loose pins) and harnesses for corrosion, damage, and rubbing during each step of the diagnostic procedure. Proceed to step 2.			
	Step 2	Step ID 1201b	SRT	
	Electrical Checks Ensure that the ignition key/switch has been set to OFF before disconnecting related cables.			
Based on the fault message provided, confirm that the following electrical value are within specified ranges or limits: • Supply and signal voltages (12V).				
	 Cable continuity (no opens or shorts). Are measured electrical values outside of expected range or limits? Yes - Proceed to step 3 			
	No - Proceed			
	Step 3	Step ID 1201c	SRT	
	Repair or replace 'Solenoid Valve Injector, Cylinder 1' and use DAVIE to re-check for the presence of active faults. • Fault inactive – issue resolved • Fault active - Proceed to step 4			
	Fault active -	Proceed to step 4		
	Step 4	Step ID 1201d	SRT	
	For further assistance in diagnosing this issue or for confirmation prior to the replacement of suspect components, contact the Engine Support Call Center at 1-800-477-0251.			
Verification Drive Cycle	•	·	to the ON position with the initialize and run diagnostics.	
			Back to Index	

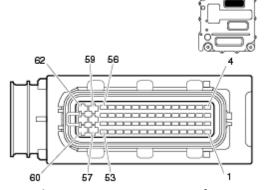


Code number	P1202			
Fault code description	Injector solenoid valve cylinder 1 - Short circuit between ECU D420 pin A1 and A2			
Fault code information	1 trip MIL			
	3 drive cycle recovery			
	Readiness group – None			
	Freeze frame type - Comprehensive			
Description of component(s)	The fuel injector injects fuel into the combustion chamber.			
	Control			
	The amount of fuel injected depends on the duration of the injector solenoid			
	activation in combination with the rail pressure. The longer the solenoid is activated			
	by the PCI ECU at the same rail pressure, the more fuel is injected.			
	Injector codes			
	Injector codes Every fuel injector is calibrated during production to compensate for any production			
	Every fuel injector is calibrated during production to compensate for any production			
	tolerances. An injector calibration code is present on the housing and connector of the injector. These injector codes must be (re)programmed with DAVIE if one or more			
	injectors have been replaced or fitted in another position, or if the PCI ECU is			
	replaced.			
	Not programming or incorrectly programmed injector codes can result in reduced			
	engine performance or a warning to the driver.			
Location of component(s)	engine performance of a training to the arriver			
	B421			
Diagnostic condition	Diagnostic condition is set when Power stage hardware is active			
Set condition of fault code	If High side voltage on the injector (before injection) compared to battery voltage			
	is less than the threshold value 20.00% and greater than the threshold value			
	80.00% then the condition is set			
	If Current passing through the sensor resistor is greater than the threshold value			
	25A then the condition is set			
Reset condition of fault code	This fault code will change to inactive immediately after the diagnostic runs and			
	passes.			

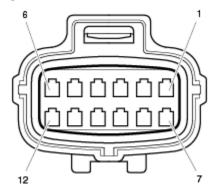


Electrical diagram(s)





Wiring harness connector D420.A front view



Wiring harness connector B460 & B461 front view

B460 connector cylinders 1-3

B461 connector cylinders 4-6

D420 PCI ECU

B421 solenoid valve injector cylinder 1

B422 solenoid valve injector cylinder 2

B423 solenoid valve injector cylinder 3

B424 solenoid valve injector cylinder 4

B425 solenoid valve injector cylinder 5

B426 solenoid valve injector cylinder 6

D420 B460 B421 B422 B423 Function

A1 7 2

Signal low, injector solenoid valve cylinder 1



			r	maximum	0.94 Ω	Resistance value at 120°C [248°F]			
	3	9		± 0.67	7 Ω	Resistance value at 20°C [68°F]			
	(+ probe)	(- probe	e)	Valu	е	Additional information			
	Pin	Pin	-						
		isure on wi			nector B	460			
		onnect con		B460					
	Preparation • Kev	off the igni	tion						
	Component check, injector solenoid valve cylinder 3 (B423)								
	[248°F]								
			r	maximum	0.94 Ω	Resistance value at 120°C			
	2	8		± 0.67	7 Ω	[68°F]			
	(+ probe)	(- probe	2)	Valu		Additional information Resistance value at 20°C			
	Pin	Pin							
	Measure on wiring harness connector B460								
	Disconnect connector B460								
	Preparation • Key off the ignition								
	Component check, injector solenoid valve cylinder 2 (B422)								
		[248°F]							
			r	maximum	0.94 Ω	Resistance value at 120°C			
	1	7		± 0.67		[68°F]			
	(+ probe)	(- probe	=)	Valu		Additional information Resistance value at 20°C			
	Pin	Pin / probe	s)	Valu		Additional information			
	 Measure on wiring harness connector B460 								
		onnect con		B460					
	·	off the igni	tion						
Technical data	Component Preparation	check, inje	ctor so	lenoid val	ve cylind	er 1 (B421)			
	A12 7					w, injector solenoid valve cylinder 4			
	A11 1					gh, injector solenoid valve cylinder 4			
	A8 9				_	w, injector solenoid valve cylinder 6			
	A7 3			1 5	Signal hig	gh, injector solenoid valve cylinder 6			
	A4 8		2	9	Signal lov	w, injector solenoid valve cylinder 5			
	D420 B46 A3 2		B425 1		Function Signal hig	gh, injector solenoid valve cylinder 5			
	D430 D46	50 D424	D 425	D426 I	F #:				
	A10 2			1 9	Signal hig	gh, injector solenoid valve cylinder 2			
	A9 8			2 5	Signal lov	w, injector solenoid valve cylinder 2			
	A6 3		1	9	Signal hig	gh, injector solenoid valve cylinder 3			
	A5 9		2	9	Signal lov	w, injector solenoid valve cylinder 3			



	Preparation Key o Disco Meas	off the ignition onnect connect sure on wiring Pin	harness connector B	461 Additional information Resistance value at 20°C [68°F]
	Preparation • Key o	off the ignition	solenoid valve cylind	ler 5 (B425)
		onnect connect		
		_	harness connector B	461
	Pin	Pin (probo)	Value	Additional information
	(+ probe) 2	(- probe) 8	Value ± 0.67 Ω	
		0	maximum 0.94Ω	
			111axii11aii1 0.54 12	[248°F]
	Preparation Key o Disco Meas	off the ignition onnect connect sure on wiring Pin	harness connector B	461
	(+ probe)	· · · · · ·	Value	
	3	9	± 0.67 Ω	
			maximum 0.94 Ω	Resistance value at 120°C [248°F]
Possible causes	No possible o	auses available	<u>.</u>	
Additional information	No additiona	l information a	vailable.	
Diagnostic Step-by-Step		necessary, to che ontrol units, are ould damage the cosition when conder to reduce Disconnecti process will For specific always referred it is necessary diagnostic to Remember	neck electrical compond harnesses. Back pure he harness. The ignit onnecting or disconrection the likelihood of daring the EAS connectoresult in multiple entertical component to the technical data try to exit the fault corest again to identify at that the truck's oper	t information and pinout locations, ca. ode menu in DAVIE and run the



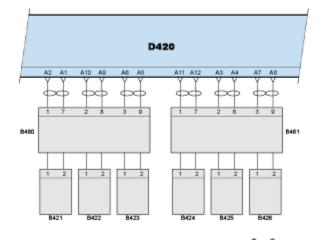
'possible causes' section. Step ID 1202a **SRT** Step 1 Visually inspect all applicable connectors (bent, broken, corroded or loose pins) and harnesses for corrosion, damage, and rubbing during each step of the diagnostic procedure. Proceed to step 2. Step ID 1202b Step 2 SRT **Electrical Checks** Ensure that the ignition key/switch has been set to OFF before disconnecting related cables. Based on the fault message provided, confirm that the following electrical values are within specified ranges or limits: Supply and signal voltages (12V). Cable continuity (no opens or shorts). Are measured electrical values outside of expected range or limits? Yes - Proceed to step 3 No - Proceed to step 4 Step 3 Step ID 1202c **SRT** Repair or replace appropriate component and use DAVIE to re-check for the presence of active faults. Fault inactive - issue resolve Fault active - Proceed to step 4 Step 4 Step ID 1202d Replace the identified faulty component (Solenoid Valve Injector, Cylinder 1) and use DAVIE to re-check for the presence of active faults. Fault inactive - issue resolved Fault active - Proceed to step 5 Step ID 1202e **SRT** Step 5 For further assistance in diagnosing this issue or for confirmation prior to the replacement of suspect components, contact the Engine Support Call Center at 1-800-477-0251. **Verification Drive Cycle** To validate repair, with the brakes set, turn the key to the ON position with the engine off, and allow 10 seconds for the system to initialize and run diagnostics.

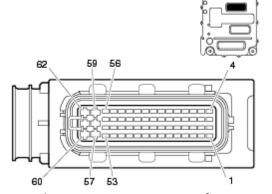
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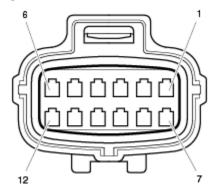
Code number	P1203
Fault code description	Injector solenoid valve cylinder 1 - Voltage too low or short circuit to ground on ECU
-	D420 pin A2
Fault code information	1 trip MIL
	3 drive cycle recovery
	Readiness group – None
	Freeze frame type - Comprehensive
Description of component(s)	The fuel injector injects fuel into the combustion chamber.
	Control
	The amount of fuel injected depends on the duration of the injector solenoid
	activation in combination with the rail pressure. The longer the solenoid is activated
	by the PCI ECU at the same rail pressure, the more fuel is injected.
	Injector codes
	Every fuel injector is calibrated during production to compensate for any production
	tolerances. An injector calibration code is present on the housing and connector of
	the injector. These injector codes must be (re)programmed with DAVIE if one or more
	injectors have been replaced or fitted in another position, or if the PCI ECU is
	replaced.
	Not programming or incorrectly programmed injector codes can result in reduced
	engine performance or a warning to the driver.
Location of component(s)	
	B421
Diagnostic condition	Diagnostic condition is set when Power stage hardware is active
Set condition of fault code	If High side voltage on the injector (before injection) compared to battery voltage
	is less than the threshold value 20.00% then the condition is set.
	If Current through sense resistor on driver bank A is less than the threshold value
	4.50A then the condition is set.
Reset condition of fault code	This fault code will change to inactive immediately after the diagnostic runs and
	passes.
	I ·







Wiring harness connector D420.A front view



Wiring harness connector B460 & B461 front view

B460 connector cylinders 1-3

B461 connector cylinders 4-6

D420 PCI ECU

B421 solenoid valve injector cylinder 1

B422 solenoid valve injector cylinder 2

B423 solenoid valve injector cylinder 3

B424 solenoid valve injector cylinder 4

B425 solenoid valve injector cylinder 5

B426 solenoid valve injector cylinder 6

D420 B460 B421 B422 B423 Function

A1 7 2



							PACCAR
	A2	1	1			Signal hig	gh, injector solenoid valve cylinder 1
	A5	9		2		Signal lov	w, injector solenoid valve cylinder 3
	A6	3		1		Signal hig	gh, injector solenoid valve cylinder 3
	A9	8			2	Signal lov	w, injector solenoid valve cylinder 2
	A10	2			1	Signal hig	gh, injector solenoid valve cylinder 2
	D420	B460	B424	B425	B426	Function	
	A3	2		1		Signal hi	gh, injector solenoid valve cylinder 5
	A4	8		2		Signal lov	w, injector solenoid valve cylinder 5
	A7	3			1	Signal hig	gh, injector solenoid valve cylinder 6
	A8	9			2	Signal lov	w, injector solenoid valve cylinder 6
	A11	1	1			Signal hig	gh, injector solenoid valve cylinder 4
	A12	7	2			Signal lov	w, injector solenoid valve cylinder 4
Technical data	Compo Prepara		eck, inje	ector so	lenoid v	alve cylind	ler 1 (B421)
	•	Key off	the ign	ition			
	•	Discon	nect cor	nnector	B460		
	•			iring ha	rness co	nnector B	460
	Pir		Pin	۵)	\/a	الما	Additional information
	(+ pro	ibe)	(- prob	e)		lue 67 Ω	Additional information Resistance value at 20°C [68°F]
			,	ı	_	m 0.94 Ω	Resistance value at 120°C [248°F]
	Compo	nent ch	eck inie	ector so	lenoid v	alve cylind	ler 2 (B422)

Component check, injector solenoid valve cylinder 2 (B422)

Preparation

- Key off the ignition
- Disconnect connector B460
- Measure on wiring harness connector B460

Pin	Pin		
(+ probe)	(- probe)	Value	Additional information
2	8	± 0.67 Ω	Resistance value at 20°C [68°F]
		maximum 0.94 Ω	Resistance value at 120°C [248°F]

Component check, injector solenoid valve cylinder 3 (B423)

Preparation

- Key off the ignition
- Disconnect connector B460
- Measure on wiring harness connector B460

Pin	Pin		
(+ probe)	(- probe)	Value	Additional information
3	9	± 0.67 Ω	Resistance value at 20°C [68°F]
		maximum $0.94~\Omega$	Resistance value at 120°C [248°F]

Component check, injector solenoid valve cylinder 4 (B424)

Preparation

Key off the ignition



	• Disco	Disconnect connector B461					
	• Mea	sure on wiring	harness connector B	461			
	Pin	Pin					
	(+ probe)	(- probe)	Value	Additional information			
	1	7	± 0.67 Ω	Resistance value at 20°C [68°F]			
	_		maximum 0.94 Ω				
			1110/1111111111111111111111111111111111	nesistance value at 120 G [2 10 1]			
	Component	check, injector	solenoid valve cylind	ler 5 (B425)			
	Preparation			(2.12)			
	•	off the ignition					
	-	onnect connect					
			harness connector B	461			
	Pin	Pin	marriess connector b	401			
	(+ probe)		Value	Additional information			
	2	(- probe) 8	± 0.67 Ω	Resistance value at 20°C [68°F]			
	2	0					
			maximum 0.94 Ω	Resistance value at 120°C [248°F]			
	Component	check, injector	solenoid valve cylind	ler 6 (B426)			
	Preparation						
	Key o	off the ignition					
	• Disco	onnect connect	tor B461				
	• Mea	sure on wiring	harness connector B	461			
	Pin	Pin					
	(+ probe)	(- probe)	Value	Additional information			
	3	9	± 0.67 Ω	Resistance value at 20°C [68°F]			
			maximum $0.94~\Omega$	Resistance value at 120°C [248°F]			
Possible causes	No possible o	causes availabl	e.				
Additional information	No additiona	l information a	available				
Diagnostic Step-by-Step	ned con con pos	cessary, to che ntrol units, and uld damage the sition when co reduce the like • Disconne process w • For specif locations, • It is neces diagnosti • Remembe be the ro	ck electrical componed harnesses. Back prosed harness. The ignition necting or disconned lihood of damage to cting the EAS connectial result in multiple of the electrical componed, always refer to the test again to identificer that the truck's op	ent information and pinout			
	and harnes	ses for corrosic	on, damage, and rubb	SRT s, broken, corroded or loose pins) bing during each step of the			
	diagnostic p	procedure. Pro	ceed to step 2.				

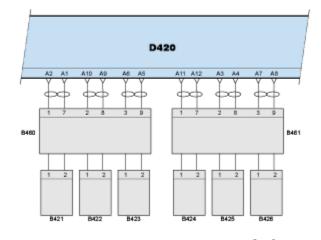


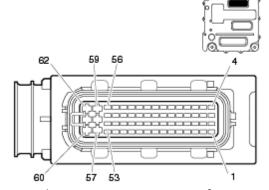
	Step 2	Step ID 1203b	SRT						
	Electrical Checks	CCCP : 2							
	Ensure that the ignition key/switch has been set to OFF before disconnecting related cables.								
		Based on the fault message provided, confirm that the following electrical values							
	are within specified ranges								
	Supply and signal v								
	11 '''	no opens or shorts).							
	11	lues outside of expected rar	nge or limits?						
	Yes - Proceed to st	·							
	No - Proceed to st	•							
		1							
	Step 3	Step ID 1203c	SRT						
	· · · · · · · · · · · · · · · · · · ·	ate component and use DAV	/IE to re-check for the						
	presence of active faults.	•							
	• Fault inactive – iss	ue resolve							
	Fault active - Proc	eed to step 4							
		•							
	Step 4	Step ID 1203d	SRT						
	Replace the identified faul	ty component (Solenoid Valv	ve Injector, Cylinder 1) and						
		the presence of active faults							
	Fault inactive – iss	ue resolve							
	Fault active - Proc	eed to step 5							
		,							
	Step 5	Step ID 1203e	SRT						
	For further assistance in di	agnosing this issue or for co	nfirmation prior to the						
	replacement of suspect components, contact the Engine Support Call Center at								
	1-800-477-0251.								
Verification Drive Cycle	To validate repair, with the	brakes set, turn the key to tl	ne ON position with the						
	engine off, and allow 10 seconds for the system to initialize and run diagnostics.								
			Back to Index						
			<u>back to maex</u>						



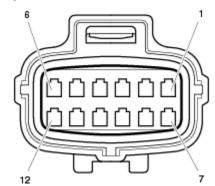
Code number	P1204
Fault code description	Injector solenoid valve cylinder 1 - Voltage too high or short circuit to supply on ECU
	D420 pin A2
Fault code information	1 trip MIL
	3 drive cycle recovery
	Readiness group – None
	Freeze frame type – Comprehensive
Description of component(s)	The fuel injector injects fuel into the combustion chamber.
	Control
	The amount of fuel injected depends on the duration of the injector solenoid
	activation in combination with the rail pressure. The longer the solenoid is activated
	by the PCI ECU at the same rail pressure, the more fuel is injected.
	Injector codes
	Every fuel injector is calibrated during production to compensate for any production
	tolerances. An injector calibration code is present on the housing and connector of
	the injector. These injector codes must be (re)programmed with DAVIE if one or more
	injectors have been replaced or fitted in another position, or if the PCI ECU is
	replaced.
	Not programming or incorrectly programmed injector codes can result in reduced
	engine performance or a warning to the driver.
Location of component(s)	B421
Diagnostic condition	This diagnostic runs whenever the engine is running at idle or higher RPM. This code will set If the voltage on the ground wire for the injector exceeds 9.6 volts during
	when the injector is commanded on while the engine is running.
Set condition of fault code	This condition is set when
	 High side voltage on the injector (before injection) compared to battery
	voltage is higher than 80%
	 Current through sense resistor on driver bank A is more than 25 A
Reset condition of fault code	This fault code will change to inactive immediately after the diagnostic runs and
	passes.







Wiring harness connector D420.A front view



Wiring harness connector B460 & B461 front view

B460 connector cylinders 1-3

B461 connector cylinders 4-6

D420 PCI ECU

B421 solenoid valve injector cylinder 1

B422 solenoid valve injector cylinder 2

B423 solenoid valve injector cylinder 3

B424 solenoid valve injector cylinder 4

B425 solenoid valve injector cylinder 5

B426 solenoid valve injector cylinder 6

D420 B460 B421 B422 B423 Function



							PACCAR
	A2	1	1			Signal	high, injector solenoid valve cylinder 1
	A5	9		2		Signal	low, injector solenoid valve cylinder 3
	A6	3		1		Signal	high, injector solenoid valve cylinder 3
	A9	8			2	Signal	low, injector solenoid valve cylinder 2
	A10	2			1	Signal	high, injector solenoid valve cylinder 2
	D420	B460	B424	B425	B426	Functi	on
	A3	2		1		Signal	high, injector solenoid valve cylinder 5
	A4	8		2		Signal	low, injector solenoid valve cylinder 5
	A7	3			1	Signal	high, injector solenoid valve cylinder 6
	A8	9			2	Signal	low, injector solenoid valve cylinder 6
	A11	1	1			Signal	high, injector solenoid valve cylinder 4
	A12	7	2			Signal	low, injector solenoid valve cylinder 4
Technical data	Compor Prepara		eck, inje	ctor sol	enoid v	alve cyli	nder 1 (B421)
	•	Key off	the ign	ition			
	•	Discon	nect cor	nnector	B460		
		Measu		iring ha	rness co	nnecto	r B460
	Pin	ا (د	Pin	١	Valu	•	Additional information
	(+ prol	Je) (- probe)	Value ± 0.67		Additional information Resistance value at 20°C [68°F]
			,	ma	± 0.07		Resistance value at 120°C [248°F]

Component check, injector solenoid valve cylinder 2 (B422)

Preparation

• Key off the ignition

Disconnect connector B460

Measure on wiring harness connector B460

Pin	Pin		
(+ probe)	(- probe)	Value	Additional information
2	8	± 0.67 Ω	Resistance value at 20°C [68°F]
		maximum 0.94 Ω	Resistance value at 120°C
			[248°F]

Component check, injector solenoid valve cylinder 3 (B423) Preparation

Key off the ignition

• Disconnect connector B460

• Measure on wiring harness connector B460

Pin	Pin		
(+ probe)	(- probe)	Value	Additional information
3	9	± 0.67 Ω	Resistance value at 20°C [68°F]
		maximum 0.94 Ω	Resistance value at 120°C
			[248°F]

Component check, injector solenoid valve cylinder 4 (B424)

Preparation



	 Key off the ignition 						
	Disconnect connector B461						
	Measure on wiring harness connector B461						
	Pin Pin	namess connector b	101				
	(+ probe) (- probe)	Value	Additional information				
	1 7	± 0.67 Ω					
	,	maximum 0.94 Ω					
	Component check, injector solenoid valve cylinder 5 (B425) Preparation • Key off the ignition • Disconnect connector B461 • Measure on wiring harness connector B461 Pin Pin (+ probe) (- probe) Value Additional information 2 8 ± 0.67 Ω Resistance value at 20°C [68°F] maximum 0.94 Ω Resistance value at 120°C [248°F] Component check, injector solenoid valve cylinder 6 (B426) Preparation • Key off the ignition • Disconnect connector B461 • Measure on wiring harness connector B461 Pin Pin						
	$\begin{array}{cccccccccccccccccccccccccccccccccccc$						
Descible source	No possible sauses available		[248°F]				
Possible causes	No possible causes availabl						
Additional information	No additional information a		de la companya de la				
Diagnostic Step-by-Step	necessary, to che control units, and could damage the position when control units are could damage the position when control units, and could damage the position when control units are control units, and could damage the position of the position of the could damage the position of the position of the could damage the position of the position	eck electrical compored harnesses. Back proper harness. The ignition on ecting or disconnication the likelihood of dame ecting the EAS connessific electrical compores, always refer to the essary to exit the faultic test again to identic that the truck's opportunity of the existing existing the existing exist	nent information and pinout technical data. technical data. t code menu in DAVIE and run the ify a change in errors. perational or mechanical issues may ive and inactive fault codes. Refer to				
	Step 1	Step ID 1204a	SRT				

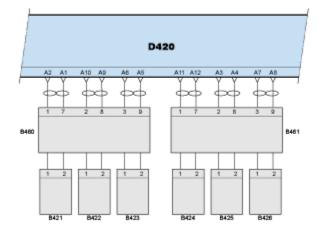


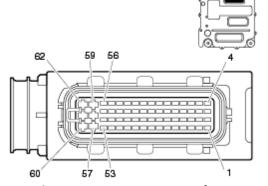
	Visually inspect all a	oplicable connectors (bent, I	broken, corroded or loose pins)						
		rrosion, damage, and rubbir	• •						
		diagnostic procedure. Proceed to step 2.							
	Step 2	Step 2 Step ID 1204b SRT							
	Electrical Checks	<u>.</u>	·						
	Ensure that the ignit	ion key/switch has been set	to OFF before disconnecting						
	related cables.								
		<u> </u>	at the following electrical values						
	are within specified	•							
		ignal voltages (12V).							
		uity (no opens or shorts).							
		ical values outside of expect	ted range or limits?						
	Yes - Procee	•							
	No - Procee	d to step 4							
	Cton 2	Cton ID 1204c	SRT						
	Step 3	Step ID 1204c							
			e component 'Solenoid Valve or the presence of active faults.						
		e – issue resolve	or the presence of active faults.						
		- Proceed to step 4							
	• Tault active	1 Toceed to step 4							
	Step 4 Step ID 1204d SRT								
		e in diagnosing this issue or	for confirmation prior to the						
	replacement of susp	replacement of suspect components, contact the Engine Support Call Center at 1-800-477-0251.							
	1-800-477-0251.								
Verification Drive Cycle	• •	·	ey to the ON position with the						
	engine off, and allow	10 seconds for the system to	o initialize and run diagnostics.						
			Back to Inde						



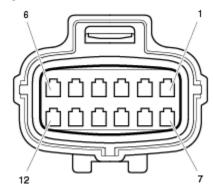
Code number	P1205
Fault code description	Injector solenoid valve cylinder 5 - Current too low or open circuit on ECU D420 pin
	A4
Fault code information	1 trip MIL
	3 drive cycle recovery
	Readiness group – None
	Freeze frame type – Comprehensive
Description of component(s)	The fuel injector injects fuel into the combustion chamber. Control
	The amount of fuel injected depends on the duration of the injector solenoid
	activation in combination with the rail pressure. The longer the solenoid is activated
	by the PCI ECU at the same rail pressure, the more fuel is injected.
	Injector codes
	Every fuel injector is calibrated during production to compensate for any production
	tolerances. An injector calibration code is present on the housing and connector of
	the injector. These injector codes must be (re)programmed with DAVIE if one or more
	injectors have been replaced or fitted in another position, or if the PCI ECU is
	replaced.
	Not programming or incorrectly programmed injector codes can result in reduced engine performance or a warning to the driver.
Location of component(s)	engine performance of a warriing to the arriver.
Location of component(s)	B425
Location of component(s)	
	B425
Diagnostic condition	This diagnostic runs when power stage hardware is active.
Diagnostic condition Set condition of fault code	This diagnostic runs when power stage hardware is active. This condition is set when current in Needle control valve is less than 4.5 A.
Diagnostic condition	This diagnostic runs when power stage hardware is active.







Wiring harness connector D420.A front view



Wiring harness connector B460 & B461 front view

B460 connector cylinders 1-3

B461 connector cylinders 4-6

D420 PCI ECU

B421 solenoid valve injector cylinder 1

B422 solenoid valve injector cylinder 2

B423 solenoid valve injector cylinder 3

B424 solenoid valve injector cylinder 4

B425 solenoid valve injector cylinder 5

B426 solenoid valve injector cylinder 6

D420 B460 B421 B422 B423 Function

A1 7 2



	A2	1	1			Signal hig	gh, injector solenoid valve cylinder 1
	A5	9		2		Signal lov	w, injector solenoid valve cylinder 3
	A6	3		1		Signal hig	gh, injector solenoid valve cylinder 3
	A9	8			2	Signal lov	v, injector solenoid valve cylinder 2
	A10	2			1	Signal hig	gh, injector solenoid valve cylinder 2
	D420	B460	B424	B425	B426	Function	
	A3	2		1			gh, injector solenoid valve cylinder 5
	A4	8		2		_	w, injector solenoid valve cylinder 5
	A7	3			1	-	gh, injector solenoid valve cylinder 6
	A8	9			2	_	v, injector solenoid valve cylinder 6
	A11	1	1			-	gh, injector solenoid valve cylinder 4
	A12	7	2				v, injector solenoid valve cylinder 4
Technical data	-		eck, inje	ctor sc	olenoid va	alve cylind	er 1 (B421)
	Prepara		the igni	ition			
		•	nect cor		r B/160		
	•					nnector B	460
	Pin		Pin				
	(+ pro	be)	(- probe	e) \	/alue		Additional information
	1		7		0.67 Ω		Resistance value at 20°C [68°F]
				r	naximum	ι 0.94 Ω	Resistance value at 120°C [248°F]
	Compo		eck, inje	ctor sc	olenoid va	alve cylind	er 2 (B422)
	•		the igni	ition			
	•	•	nect cor		r B460		
	•	Measu	re on wi	ring ha	arness co	nnector B	460
	Pin		Pin				
	(+ pro	be)	(- probe	•	/alue - 0.67 Ω		Additional information Resistance value at 20°C [68°F]
	2		8		naximum	0.94.0	Resistance value at 120°C
				•	naximan	10.54 12	[248°F]
			eck, inje	ctor sc	olenoid va	alve cylind	er 3 (B423)
	Prepara		the igni	ition			
		•	nect cor		r B460		
	•					nnector B	460
	Pin		Pin	<i>3</i>	- 32 20		
	(+ pro	be)	(- probe	e) \	/alue		Additional information
	3		9		0.67 Ω		Resistance value at 20°C [68°F]
				r	naximum	0.94 Ω	Resistance value at 120°C [248°F]

Component check, injector solenoid valve cylinder 4 (B424)



	Duna annatina						
	Preparation • Key off the ignition						
	Key off the ignition Disconnect compactor PAC1						
	Disconnect connector B461 Management of the B464						
		-	g harness connector B	3461			
	Pin	Pin	Malica	Additional information			
		(- probe) –	Value	Additional information			
	1	7	± 0.67 Ω	Resistance value at 20°C [68°F]			
			maximum 0.94 Ω				
				[248°F]			
	Component c	heck, injecto	r solenoid valve cylind	der 5 (B425)			
	•	ff the ignition	า				
	•	nnect connec					
	Meas	ure on wiring	g harness connector B	3461			
	Pin	Pin	,				
	(+ probe)	(- probe)	Value	Additional information			
	2	8	± 0.67 Ω	Resistance value at 20°C [68°F]			
			maximum 0.94 Ω	Resistance value at 120°C			
				[248°F]			
		heck, injecto	r solenoid valve cylind	der 6 (B426)			
	Preparation						
	•	ff the ignition					
		nnect connec					
		_	g harness connector B	3461			
	Pin	Pin					
		(- probe)		Additional information			
	3	9	± 0.67 Ω	• •			
			maximum 0.94 Ω	Resistance value at 120°C [248°F]			
Possible causes	No possible c						
Additional information	No additional						
Diagnostic Step-by-Step			- ·	elow using the breakout harness,			
		•	· ·	ponents, such as sensors,			
	Commence of the Commence of th			es. Back probing is not			
			_	ne harness. The ignition should			
		•	•	connecting or disconnecting			
		-		duce the likelihood of damage to			
		•		octors during the troublesheeting			
			•	-			
	<u> </u>	•	·				
		-		-			
			· · · · · · · · · · · · · · · · · · ·				
		7	-	, -			
				•			
		-					
	i ele	 For spe location It is ned the diag Remem may be 	necting the EAS conne will result in multiple cific electrical compo ns, always refer to the cessary to exit the fau gnostic test again to in ther that the truck's o	nent information and pinout e technical data. It code menu in DAVIE and run dentify a change in errors. perational or mechanical issues th active and inactive fault codes.			

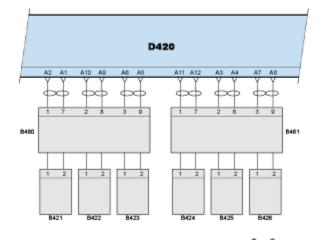


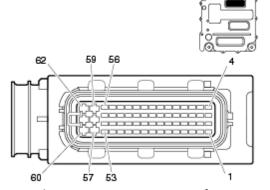
	Step 1	Step ID 1205a	SRT							
	Visually inspect all applicable	e connectors (bent, broker	n, corroded or loose pins)							
	and harnesses for corrosion,	, damage, and rubbing dur	ing each step of the							
	diagnostic procedure. Proce	ed to step 2.								
	Step 2	Step ID 1205b	SRT							
	Electrical Checks									
	Ensure that the ignition key,	switch has been set to OF	F before disconnecting							
	related cables.									
	Based on the fault message	provided, confirm that the	following electrical values							
	are within specified ranges of	or limits:								
	 Supply and signal vo 	oltages (12V).								
	Cable continuity (no	opens or shorts).								
	Are measured electrical valu	Are measured electrical values outside of expected range or limits?								
	Yes - Proceed to step	p 3								
	No - Proceed to ste	p 4								
	Step 3	Step ID 1205c	SRT							
	Repairs or component replacements appropriate component 'Solenoid Valve									
	Injector, Cylinder 5' and use DAVIE to re-check for the presence of active faults.									
	Fault inactive – issue resolve									
	Fault active - Procee	ed to step 4								
	Step 4	Step ID 1205d	SRT							
	For further assistance in diagnosing this issue or for confirmation prior to the									
	replacement of suspect com	ponents, contact the Engi	ne Support Call Center at							
	1-800-477-0251.									
Verification Drive Cycle	To validate repair, with the bi		•							
	engine off, and allow 10 seconds for the system to initialize and run diagnostics.									
			Back to Ind							
			<u> </u>							



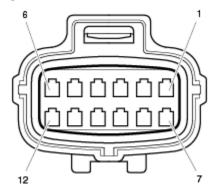
Code number	P1206
Fault code description	Injector solenoid valve cylinder 5-Short circuit between ECU D420 pin A3 and A4.
Fault code information	1 trip MIL
	3 drive cycle recovery
	Readiness group – None
	Freeze frame type - Comprehensive
Description of component(s)	The fuel injector injects fuel into the combustion chamber.
	Control
	The amount of fuel injected depends on the duration of the injector solenoid
	activation in combination with the rail pressure. The longer the solenoid is activated
	by the PCI ECU at the same rail pressure, the more fuel is injected.
	Injector codes
	Every fuel injector is calibrated during production to compensate for any production
	tolerances. An injector calibration code is present on the housing and connector of
	the injector. These injector codes must be (re)programmed with DAVIE if one or more
	injectors have been replaced or fitted in another position, or if the PCI ECU is
	replaced. Not programming or incorrectly programmed injector codes can result in reduced
	engine performance or a warning to the driver.
Location of component(s)	engine performance of a warning to the univer.
Location of component(s)	
	B425
Diagnostic condition	This diagnostic runs when power stage hardware is active.
Set condition of fault code	High side voltage on the injector (before injection) compared to battery voltage is
	less than 20% and greater than 80.00% of threshold value
	Current passing through sense resistor is greater than 25.00A of the threshold
	value
Reset condition of fault code	This fault code will change to inactive immediately after the diagnostic runs and
	passes.







Wiring harness connector D420.A front view



Wiring harness connector B460 & B461 front view

B460 connector cylinders 1-3

B461 connector cylinders 4-6

D420 PCI ECU

B421 solenoid valve injector cylinder 1

B422 solenoid valve injector cylinder 2

B423 solenoid valve injector cylinder 3

B424 solenoid valve injector cylinder 4

B425 solenoid valve injector cylinder 5

B426 solenoid valve injector cylinder 6

D420 B460 B421 B422 B423 Function

A1 7 2



	A2 1	1		Signal high, injector solenoid valve cylinder 1			
	A5 9	2	2	Signal low, injector solenoid valve cylinder 3			
	A6 3	-	1	Signal high, injector solenoid valve cylinder 3			
	A9 8		2	Signal low, injector solenoid valve cylinder 2			
	A10 2		1	Signal high, injector solenoid valve cylinder 2			
	D420 B460) B424 B4	25 B426	Function			
	A3 2		1	Signal high, injector solenoid valve cylinder 5			
	A4 8	2	2	Signal low, injector solenoid valve cylinder 5			
	A7 3		1	Signal high, injector solenoid valve cylinder 6			
	A8 9		2	Signal low, injector solenoid valve cylinder 6			
	A11 1	1		Signal high, injector solenoid valve cylinder 4			
	A12 7	2		Signal low, injector solenoid valve cylinder 4			
Technical data			r solenoid v	valve cylinder 5 (B425)			
recinical data	Preparation	ricek, irijector	Joieriola (valve cylinaer 3 (B+23)			
	•	ff the ignitior	1				
	• Disco	nnect connec	tor B461				
		_	g harness co	onnector B461			
	Pin	Pin		A Live Live on			
	(+ probe)	(- probe)	Value	Additional information			
	2	8	± 0.67 Ω	Resistance value at 20°C [68°F] m 0.94 Ω Resistance value at 120°C [248°F]			
Possible cause	No possible ca	aucoc availah		Nesistance value at 120 C [248 T]			
Additional information	No additional						
Diagnostic Step-by-Step	neces contr dama when	ssary, to checol units, and age the harned connecting of the likelihood Disconnecting of the process where the specifical ways refult is necessed in the content of the con	ck electrical harnesses. The ign or disconner	steps below using the breakout harness, if I components, such as sensors, electrical Back probing is not recommended, as it could ition should always be in the OFF position ecting electrical components in order to tage to electrical components. As connectors during the troubleshooting multiple errors. I component information and pinout locations, echnical data. It the fault code menu in DAVIE and run the to identify a change in errors. I truck's operational or mechanical issues may both active and inactive fault codes. Refer to section.			
	Step 1	11	Step ID				
				ctors (bent, broken, corroded or loose pins)			
		and harnesses for corrosion, damage, and rubbing during each step of the diagnostic procedure. Proceed to step 2.					
	Step 2		Step ID				
	Follow ESV t	hrough to fin	d any elect	trical related problems			

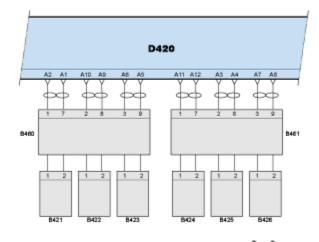


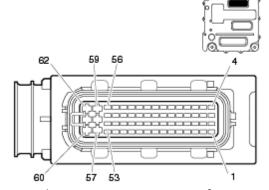
Based on the fault message provided, confirm that the following electrical values are within specified ranges or limits: Ensure that the ignition key/switch has been set to OFF before disconnecting related cables. Supply and signal voltages. • Cable continuity (no opens or shorts). Are measured electrical values outside of expected range or limits? No: Issue resolved. Yes: Make the appropriate repairs or component replacements. Proceed Use DAVIE to re-check for the presence of active faults. If this related fault is no longer active, then this issue has been resolved. If this related fault is still active, continue to the Step 4 in the troubleshooting process. Step 3 Step ID 1206c SRT Replace: Solenoid Valve Injector, Cylinder 5 Replace the identified faulty component. Use DAVIE to re-check for the presence of active faults. If this related fault is no longer active, then this issue has been resolved. If this related fault is still active, continue to Step 4 in the troubleshooting process Step 4 Step ID 1206d SRT Contact the PACCAR Engine Support Call Center For further assistance in diagnosing this issue or for confirmation prior to the replacement of suspect components, contact the PACCAR Engine Support Call Center at 1-800-477-0251. **Verification Drive Cycle** To validate repair, with the brakes set, turn the key to the ON position with the engine off, and allow 10 seconds for the system to initialize and run diagnostics. **Back to Index**



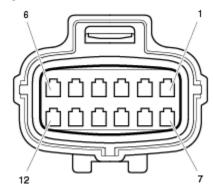
Code number	P1207
Fault code description	Injector solenoid valve cylinder 5-Voltage too low or short circuit to ground on ECU
•	D420 pin A4.
Fault code information	1 trip MIL
	3 drive cycle recovery
	Readiness group – None
	Freeze frame type - Comprehensive
Description of component(s)	The fuel injector injects fuel into the combustion chamber.
	Control
	The amount of fuel injected depends on the duration of the injector solenoid
	activation in combination with the rail pressure. The longer the solenoid is activated
	by the PCI ECU at the same rail pressure, the more fuel is injected.
	Injector codes
	Every fuel injector is calibrated during production to compensate for any production
	tolerances. An injector calibration code is present on the housing and connector of
	the injector. These injector codes must be (re)programmed with DAVIE if one or more
	injectors have been replaced or fitted in another position, or if the PCI ECU is
	replaced.
	Not programming or incorrectly programmed injector codes can result in reduced
	engine performance or a warning to the driver.
Location of component(s)	engine performance of a warning to the differ.
Location of component(s)	
	B425
Diagnostic condition	This diagnostic runs when power stage hardware is active.
Set condition of fault code	High side voltage on the injector (before injection) compared to battery voltage is
	less than 20.00% of threshold value
	 Current through sense resistor on driver bank B is less than 4.5A of the threshold
	value
Reset condition of fault code	This fault code will change to inactive immediately after the diagnostic runs and
neset condition of fault code	passes.
	pubbeb.







Wiring harness connector D420.A front view



Wiring harness connector B460 & B461 front view

B460 connector cylinders 1-3

B461 connector cylinders 4-6

D420 PCI ECU

B421 solenoid valve injector cylinder 1

B422 solenoid valve injector cylinder 2

B423 solenoid valve injector cylinder 3

B424 solenoid valve injector cylinder 4

B425 solenoid valve injector cylinder 5

B426 solenoid valve injector cylinder 6

D420 B460 B421 B422 B423 Function

A1 7 2



A5 9 2 Signal low, injector solenoid valve cylinder 3 A6 3 1 Signal high, injector solenoid valve cylinder 2 A10 2 1 Signal high, injector solenoid valve cylinder 2 A10 2 1 Signal high, injector solenoid valve cylinder 2 D420 B460 B424 B425 B426 Function A3 2 1 Signal high, injector solenoid valve cylinder 5 A4 8 2 Signal high, injector solenoid valve cylinder 5 A7 3 1 Signal high, injector solenoid valve cylinder 5 A8 9 2 Signal low, injector solenoid valve cylinder 6 A8 9 2 Signal high, injector solenoid valve cylinder 6 A11 1 1 1 Signal high, injector solenoid valve cylinder 6 A11 1 1 Signal high, injector solenoid valve cylinder 6 A11 1 Signal high, injector solenoid valve cylinder 6 A11 1 Signal high, injector solenoid valve cylinder 6 A11 1 Signal high, injector solenoid valve cylinder 6 A11 1 Signal high, injector solenoid valve cylinder 6 A11 1 Signal high, injector solenoid valve cylinder 6 A11 1 Signal high, injector solenoid valve cylinder 6 A11 1 Material high, injector solenoid valve cylinder 5 A11 Signal high, injector solenoid valve cylinder 6 A8 9 Signal low, injector solenoid valve cylinder 6 A11 1 Signal high, injector solenoid valve cylinder 6 A8 9 Signal low, injector solenoid valve cylinder 6 A8 9 Signal high, injector solenoid valve cylinder 6 A8 9 Signal low, injector solenoid valve cylinder 6 A8 9 Signal high, injector solenoid valve cylinder 6 A8 9 Signal low, injector solenoid valve cylinder 5 A11 Signal high, injector solenoid valve cylinder 5 A12 Signal low, injector sole		A2	1	1			Signal high	, injector solenoid valve cylinder 1
A6 3 1 Signal high, injector solenoid valve cylinder 3 A9 8 2 Signal low, injector solenoid valve cylinder 2 A10 2 1 Signal high, injector solenoid valve cylinder 2 D420 B460 B424 B425 B426 Function A3 2 1 Signal high, injector solenoid valve cylinder 5 A4 8 2 Signal low, injector solenoid valve cylinder 5 A7 3 1 Signal high, injector solenoid valve cylinder 6 A8 9 2 Signal low, injector solenoid valve cylinder 6 A11 1 1 Signal high, injector solenoid valve cylinder 6 A11 1 1 Signal high, injector solenoid valve cylinder 6 A12 7 2 Signal low, injector solenoid valve cylinder 4 A12 7 2 Signal low, injector solenoid valve cylinder 4 A12 7 1 Signal high, injector solenoid valve cylinder 4 A12 7 2 Signal low, injector solenoid valve cylinder 4 A12 7 2 Signal low, injector solenoid valve cylinder 4 A12 7 2 Signal low, injector solenoid valve cylinder 5 A11 1 1 A12 Signal high, injector solenoid valve cylinder 4 A12 7 2 Signal low, injector solenoid valve cylinder 4 A12 7 2 Signal low, injector solenoid valve cylinder 4 A12 7 2 Signal low, injector solenoid valve cylinder 4 A12 7 2 Signal low, injector solenoid valve cylinder 4 A13 A14 A15				_	2			•
A9 8 2 Signal low, injector solenoid valve cylinder 2 A10 2 1 Signal high, injector solenoid valve cylinder 2 D420 B460 B424 B425 B426 Function A3 2 1 Signal high, injector solenoid valve cylinder 5 A4 8 2 Signal low, injector solenoid valve cylinder 6 A8 9 2 Signal low, injector solenoid valve cylinder 6 A8 9 2 Signal low, injector solenoid valve cylinder 6 A11 1 1 Signal high, injector solenoid valve cylinder 6 A11 1 1 Signal low, injector solenoid valve cylinder 7 A12 7 2 Signal low, injector solenoid valve cylinder 4 A12 7 2 Signal low, injector solenoid valve cylinder 4 A12 7 2 Signal low, injector solenoid valve cylinder 4 A12 7 2 Signal low, injector solenoid valve cylinder 4 A12 7 2 Signal low, injector solenoid valve cylinder 4 A12 7 2 Signal low, injector solenoid valve cylinder 4 A12 7 2 Signal low, injector solenoid valve cylinder 4 A12 7 2 Signal low, injector solenoid valve cylinder 4 A12 7 2 Signal low, injector solenoid valve cylinder 6 A11 1 1 Signal high, injector solenoid valve cylinder 6 A11 1 1 Signal high, injector solenoid valve cylinder 6 A12 Signal low, injector solenoid valve cylinder 6 A13 Signal ligh, injector solenoid valve cylinder 6 A14								•
A10 2 1 Signal high, injector solenoid valve cylinder 2 D420 B460 B424 B425 B426 Function A3 2 1 Signal high, injector solenoid valve cylinder 5 A4 8 2 Signal low, injector solenoid valve cylinder 5 A7 3 1 Signal high, injector solenoid valve cylinder 6 A8 9 2 Signal low, injector solenoid valve cylinder 6 A11 1 1 Signal high, injector solenoid valve cylinder 6 A12 7 2 Signal low, injector solenoid valve cylinder 4 A12 7 2 Signal low, injector solenoid valve cylinder 4 A12 7 2 Signal low, injector solenoid valve cylinder 4 A12 7 2 Signal low, injector solenoid valve cylinder 4 A12 Preparation • Key off the ignition • Disconnect connector B461 • Measure on wring harness connector B461 • Pin Pin (+ probe) (- probe) Value Additional information 2 8 ± 0.67 Ω Resistance value at 20°C [68°F] maximum 0.94 Ω Resistance value at 120°C [248°F] Possible causes Additional information Diagnostic Step-by-Step Perform the troubleshooting steps below using the breakout harness, if necessary, to check electrical components, such as sensors, electrical control units, and harnesses. Back probing is not recommended, as it could damage the harness. The ignition should always be in the OFF position when connecting or disconnecting electrical components in order to reduce the likelihood of damage to electrical components in order to reduce the likelihood of damage to electrical components in order to reduce the likelihood of damage to electrical components in order to reduce the likelihood of damage to electrical components in order to reduce the likelihood of damage to electrical components in order to reduce the likelihood of damage to electrical components in order to reduce the likelihood of damage to electrical components in order to reduce the likelihood of damage to electrical components in order to reduce the likelihood of damage to electrical components in order to reduce the likelihood of damage to electrical components in order to reduce the likelihood of damage to electrical components in order to reduce the likeliho					1	_	-	•
D420 B460 B424 B425 B426 Function A3 2 1 Signal high, injector solenoid valve cylinder 5 A4 8 2 Signal how, injector solenoid valve cylinder 6 A8 9 2 Signal high, injector solenoid valve cylinder 6 A11 1 1 Signal high, injector solenoid valve cylinder 6 A11 1 1 Signal high, injector solenoid valve cylinder 6 A11 1 1 Signal high, injector solenoid valve cylinder 4 A12 7 2 Signal low, injector solenoid valve cylinder 6 A12 1								•
A3 2 1 Signal high, injector solenoid valve cylinder 5 A4 8 2 Signal low, injector solenoid valve cylinder 6 A7 3 1 Signal high, injector solenoid valve cylinder 6 A8 9 2 Signal low, injector solenoid valve cylinder 6 A11 1 1 Signal high, injector solenoid valve cylinder 6 A11 1 1 Signal high, injector solenoid valve cylinder 4 A12 7 2 Signal low, injector solenoid valve cylinder 4 A12 7 2 Signal low, injector solenoid valve cylinder 4 A12 7 2 Signal low, injector solenoid valve cylinder 4 A12 7 2 Signal low, injector solenoid valve cylinder 4 A12 7 2 Signal low, injector solenoid valve cylinder 4 A12 7 2 Signal low, injector solenoid valve cylinder 4 A12 7 2 Signal low, injector solenoid valve cylinder 4 A12 7 2 Signal low, injector solenoid valve cylinder 5 Key off the ignition • Key off the ignition • Disconnect connector B461 • Measure on wiring harness connector B461 Pin Pin (+ probe) (- probe) Value Additional information 2 8 ± 0.67 Ω Resistance value at 20°C [68°F] maximum 0.94 Ω Resistance value at 120°C [248°F] Possible causes Additional information available. Perform the troubleshooting steps below using the breakout harness, if necessary, to check electrical components, such as sensors, electrical control units, and harnesses. Back probing is not recommended, as it could damage the harness. The ignition should always be in the OFF position when connecting or disconnecting electrical components in order to reduce the likelihood of damage to electrical components • Disconnecting the EAS connectors during the troubleshooting process will result in multiple errors. • For specific electrical component information and pinout locations, always refer to the technical data. • It is necessary to exit the fault code menu in DAVIE and run the diagnostic test again to identify a change in errors. • Remember that the truck's operational or mechanical issues may be the root cause of both active and inactive fault codes. Refer to the 'possible causes' section.		A10	2			1	Signal high	, injector solenoid valve cylinder 2
A4 8 2 Signal low, injector solenoid valve cylinder 5 A7 3 1 Signal high, injector solenoid valve cylinder 6 A8 9 2 Signal low, injector solenoid valve cylinder 6 A11 1 1 Signal high, injector solenoid valve cylinder 4 A12 7 2 Signal low, injector solenoid valve cylinder 4 A12 7 2 Signal low, injector solenoid valve cylinder 4 A12 7 2 Signal low, injector solenoid valve cylinder 4 A12 7 2 Signal low, injector solenoid valve cylinder 4 A12 7 2 Signal low, injector solenoid valve cylinder 4 A12 7 2 Signal low, injector solenoid valve cylinder 4 A12 7 2 Signal low, injector solenoid valve cylinder 4 A12 7 2 Signal low, injector solenoid valve cylinder 4 A12 7 2 Signal low, injector solenoid valve cylinder 4 A12 7 2 Signal low, injector solenoid valve cylinder 5 Preparation • Key off the ignition • Low of the ignition • Disconnect connector B461 • Measure on wiring harness connector B461 Pin Pin Pin Pin (+ probe) (- probe) Value Additional information 2 8 ± 0.67 Ω Resistance value at 20°C [68°F] maximum 0.94 Ω Resistance value at 120°C [248°F] Possible causes Additional information available. No additional information available. Perform the troubleshooting steps below using the breakout harness, if necessary, to check electrical components, such as sensors, electrical control units, and harnesses. Back probing is not recommended, as it could damage the harness. The ignition should always be in the OFF position when connecting or disconnecting electrical components in order to reduce the likelihood of damage to electrical components in order to reduce the likelihood of damage to electrical components in order to reduce the likelihood of damage to electrical components in order to reduce the likelihood of damage to electrical components. • Disconnecting the EAS connectors during the troubleshooting process will result in multiple errors. • For specific electrical component information and pinout locations, always refer to the technical data. • It is necessary to exit the fault code menu in DAVIE and run the d		D420	B460	B424	B425	B426	Function	
A7 3 1 Signal high, injector solenoid valve cylinder 6 A8 9 2 Signal low, injector solenoid valve cylinder 6 A11 1 1 1 Signal high, injector solenoid valve cylinder 4 A12 7 2 Signal low, injector solenoid valve cylinder 4 A12 7 2 Signal low, injector solenoid valve cylinder 4 A12 7 2 Signal low, injector solenoid valve cylinder 5 Preparation • Key off the ignition • Disconnect connector B461 • Measure on wiring harness connector B461 Pin Pin (+ probe) (- probe) Value Additional information 2 8 ± 0.67 Ω Resistance value at 20°C [68°F] maximum 0.94 Ω Resistance value at 120°C [248°F] Possible causes Additional information Diagnostic Step-by-Step No possible causes available. Perform the troubleshooting steps below using the breakout harness, if necessary, to check electrical components, such as sensors, electrical control units, and harnesses. Back probing is not recommended, as it could damage the harness. The ignition should always be in the OFF position when connecting or disconnecting electrical components. • Disconnecting the EAS connectors during the troubleshooting process will result in multiple errors. • For specific electrical components in order to reduce the likelihood of damage to electrical components. • Li is necessary to exit the fault code menu in DAVIE and run the diagnostic test again to identify a change in errors. • Remember that the truck's operational or mechanical issues may be the root cause of both active and inactive fault codes. Refer to the 'possible causes' section. Step 1 Step ID 1207a SRT Visually inspect all applicable connectors (bent, broken, corroded or loose pins) and harnesses for corrosion, damage, and rubbing during each step of the diagnostic procedure. Proceed to step 2.		А3	2		1		Signal high	, injector solenoid valve cylinder 5
A8 9 2 Signal low, injector solenoid valve cylinder 6 A11 1 1 1 Signal high, injector solenoid valve cylinder 4 A12 7 2 Signal low, injector solenoid valve cylinder 4 A12 7 2 Signal low, injector solenoid valve cylinder 4 Component check, injector solenoid valve cylinder 5 (B425) Preparation • Key off the ignition • Disconnect connector B461 • Measure on wiring harness connector B461 Pin Pin (+ probe) (- probe) Value Additional information 2 8 ± 0.67 Ω Resistance value at 20°C [68°F] maximum 0.94 Ω Resistance value at 120°C [248°F] Possible causes No possible causes available. No additional information available. Perform the troubleshooting steps below using the breakout harness, if necessary, to check electrical components, such as sensors, electrical control units, and harnesses. Back probing is not recommended, as it could damage the harness. The junition should always be in the OFF position when connecting or disconnecting electrical components in order to reduce the likelihood of damage to electrical components in order to reduce the likelihood of damage to electrical components. • Disconnecting the EAS connectors during the troubleshooting process will result in multiple errors. • For specific electrical component information and pinout locations, always refer to the technical data. • It is necessary to exit the fault code menu in DAVIE and run the diagnostic test again to identify a change in errors. • Remember that the truck's operational or mechanical issues may be the root cause of both active and inactive fault codes. Refer to the 'possible causes' section. Step 1 Step ID 1207a SRT Visually inspect all applicable connectors (bent, broken, corroded or loose pins) and harnesses for corrosion, damage, and rubbing during each step of the diagnostic procedure. Proceed to step 2.		A4	8		2		Signal low,	injector solenoid valve cylinder 5
A11 1 1 Signal high, injector solenoid valve cylinder 4 A12 7 2 Signal low, injector solenoid valve cylinder 4 Component check, injector solenoid valve cylinder 5 (B425) Preparation • Key off the ignition • Disconnect connector B461 • Measure on wiring harness connector B461 Pin Pin (+ probe) (- probe) Value Additional information 2 8 ± 0.67 Ω Resistance value at 20°C [68°F] maximum 0.94 Ω Resistance value at 120°C [248°F] Possible causes No possible causes available. No additional information Diagnostic Step-by-Step Perform the troubleshooting steps below using the breakout harness, if necessary, to check electrical components, such as sensors, electrical control units, and harnesses. Back probing is not recommended, as it could damage the harness. The ignition should always be in the OFF position when connecting or disconnecting electrical components in order to reduce the likelihood of damage to electrical components in order to reduce the likelihood of damage to electrical components. • Disconnecting the EAS connectors during the troubleshooting process will result in multiple errors. • For specific electrical component information and pinout locations, always refer to the technical data. • It is necessary to exit the fault code menu in DAVIE and run the diagnostic test again to identify a change in errors. • Remember that the truck's operational or mechanical issues may be the root cause of both active and inactive fault codes. Refer to the 'possible causes' section. Step 1 Step ID 1207a SRT Visually inspect all applicable connectors (bent, broken, corroded or loose pins) and harnesses for corrosion, damage, and rubbing during each step of the diagnostic procedure. Proceed to step 2.		A7	3			1	Signal high	, injector solenoid valve cylinder 6
Technical data Component check, injector solenoid valve cylinder 5 (B425) Preparation • Key off the ignition • Disconnect connector B461 • Measure on wiring harness connector B461 Pin Pin (+ probe) (- probe) Value Additional information 2 8 ± 0.67 Ω Resistance value at 20°C [68°F] maximum 0.94 Ω Resistance value at 120°C [248°F] Possible causes Additional information No additional information available. Perform the troubleshooting steps below using the breakout harness, if necessary, to check electrical components, such as sensors, electrical control units, and harnesses. Back probing is not recommended, as it could damage the harness. The ignition should always be in the OFF position when connecting or disconnecting electrical components in order to reduce the likelihood of damage to electrical components. • Disconnecting the EAS connectors during the troubleshooting process will result in multiple errors. • For specific electrical component information and pinout locations, always refer to the technical data. • It is necessary to exit the fault code menu in DAVIE and run the diagnostic test again to identify a change in errors. • Remember that the truck's operational or mechanical issues may be the root cause of both active and inactive fault codes. Refer to the 'possible causes' section. Step 1 Step ID 1207a SRT Visually inspect all applicable connectors (bent, broken, corroded or loose pins) and harnesses for corrosion, damage, and rubbing during each step of the diagnostic procedure. Proceed to step 2.		A8	9			2	Signal low,	injector solenoid valve cylinder 6
Technical data Component check, injector solenoid valve cylinder 5 (B425) Preparation • Key off the ignition • Disconnect connector B461 • Measure on wiring harness connector B461 Pin Pin (+ probe) (- probe) Value Additional information 2 8 ± 0.67 Ω Resistance value at 20°C [68°F] maximum 0.94 Ω Resistance value at 120°C [248°F] Possible causes Additional information No additional information available. Perform the troubleshooting steps below using the breakout harness, if necessary, to check electrical components, such as sensors, electrical control units, and harnesses. Back probing is not recommended, as it could damage the harness. The ignition should always be in the OFF position when connecting or disconnecting electrical components in order to reduce the likelihood of damage to electrical components. • Disconnecting the EAS connectors during the troubleshooting process will result in multiple errors. • For specific electrical component information and pinout locations, always refer to the technical data. • It is necessary to exit the fault code menu in DAVIE and run the diagnostic test again to identify a change in errors. • Remember that the truck's operational or mechanical issues may be the root cause of both active and inactive fault codes. Refer to the 'possible causes' section. Step 1 Step ID 1207a SRT Visually inspect all applicable connectors (bent, broken, corroded or loose pins) and harnesses for corrosion, damage, and rubbing during each step of the diagnostic procedure. Proceed to step 2.		A11	1	1			Signal high	, injector solenoid valve cylinder 4
Preparation • Key off the ignition • Disconnect connector B461 • Disconnect connector B461 • Measure on wiring harness connector B461 Pin Pin (+ probe) (- probe) Value Additional information 2 8 ± 0.67 Ω Resistance value at 20°C [68°F] maximum 0.94 Ω Resistance value at 120°C [248°F] Possible causes No possible causes available. No additional information Diagnostic Step-by-Step Perform the troubleshooting steps below using the breakout harness, if necessary, to check electrical components, such as sensors, electrical control units, and harnesses. Back probing is not recommended, as it could damage the harness. The ignition should always be in the OFF position when connecting or disconnecting electrical components in order to reduce the likelihood of damage to electrical components. • Disconnecting the EAS connectors during the troubleshooting process will result in multiple errors. • For specific electrical component information and pinout locations, always refer to the technical data. • It is necessary to exit the fault code menu in DAVIE and run the diagnostic test again to identify a change in errors. • Remember that the truck's operational or mechanical issues may be the root cause of both active and inactive fault codes. Refer to the 'possible causes' section. Step 1 Step ID 1207a SRT Visually inspect all applicable connectors (bent, broken, corroded or loose pins) and harnesses for corrosion, damage, and rubbing during each step of the diagnostic procedure. Proceed to step 2.		A12	7	2				
 Key off the ignition Disconnect connector B461 Measure on wiring harness connector B461 Pin Pin (+ probe) (- probe) Value Additional information 2 8 ± 0.67 Ω Resistance value at 20°C [68°F] maximum 0.94 Ω Resistance value at 120°C [248°F] Possible causes Additional information No additional information available. Perform the troubleshooting steps below using the breakout harness, if necessary, to check electrical components, such as sensors, electrical control units, and harnesses. Back probing is not recommended, as it could damage the harness. The ignition should always be in the OFF position when connecting or disconnecting electrical components in order to reduce the likelihood of damage to electrical components. Disconnecting the EAS connectors during the troubleshooting process will result in multiple errors. For specific electrical component information and pinout locations, always refer to the technical data. It is necessary to exit the fault code menu in DAVIE and run the diagnostic test again to identify a change in errors. Remember that the truck's operational or mechanical issues may be the root cause of both active and inactive fault codes. Refer to the 'possible causes' section. Step 1 Step ID 1207a SRT Visually inspect all applicable connectors (bent, broken, corroded or loose pins) and harnesses for corrosion, damage, and rubbing during each step of the diagnostic procedure. Proceed to step 2. 	Technical data	Compor	nent ch	eck, inje	ctor so	lenoid v	alve cylinde	- 5 (B425)
 Disconnect connector B461 Measure on wiring harness connector B461 Pin		Prepara	tion				-	
Measure on wiring harness connector B461 Pin Pin (+ probe) (- probe) Value Additional information 2 8 ± 0.67 Ω Resistance value at 20°C [68°F] maximum 0.94 Ω Resistance value at 120°C [248°F] Possible causes No possible causes available. No additional information Diagnostic Step-by-Step Perform the troubleshooting steps below using the breakout harness, if necessary, to check electrical components, such as sensors, electrical control units, and harnesses. Back probing is not recommended, as it could damage the harness. The ignition should always be in the OFF position when connecting or disconnecting electrical components in order to reduce the likelihood of damage to electrical components. □ Disconnecting the EAS connectors during the troubleshooting process will result in multiple errors. □ For specific electrical component information and pinout locations, always refer to the technical data. □ It is necessary to exit the fault code menu in DAVIE and run the diagnostic test again to identify a change in errors. □ Remember that the truck's operational or mechanical issues may be the root cause of both active and inactive fault codes. Refer to the 'possible causes' section. Step 1		•		_				
Pin (+ probe) (- probe) Value Additional information 2 8 ± 0.67 Ω Resistance value at 20°C [68°F] maximum 0.94 Ω Resistance value at 120°C [248°F] Possible causes No possible causes available. No additional information Diagnostic Step-by-Step Perform the troubleshooting steps below using the breakout harness, if necessary, to check electrical components, such as sensors, electrical control units, and harnesses. Back probing is not recommended, as it could damage the harness. The ignition should always be in the OFF position when connecting or disconnecting electrical components in order to reduce the likelihood of damage to electrical components. • Disconnecting the EAS connectors during the troubleshooting process will result in multiple errors. • For specific electrical component information and pinout locations, always refer to the technical data. • It is necessary to exit the fault code menu in DAVIE and run the diagnostic test again to identify a change in errors. • Remember that the truck's operational or mechanical issues may be the root cause of both active and inactive fault codes. Refer to the 'possible causes' section. Step 1 Step ID 1207a SRT Visually inspect all applicable connectors (bent, broken, corroded or loose pins) and harnesses for corrosion, damage, and rubbing during each step of the diagnostic procedure. Proceed to step 2.		•						
(+ probe) (- probe) Value Additional information 2 8		• 5.			_	rness co	onnector B46	51
Possible causes No possible causes available. No additional information Diagnostic Step-by-Step Perform the troubleshooting steps below using the breakout harness, if necessary, to check electrical components, such as sensors, electrical control units, and harnesses. Back probing is not recommended, as it could damage the harness. The ignition should always be in the OFF position when connecting or disconnecting electrical components. Disconnecting or disconnectors during the troubleshooting process will result in multiple errors. For specific electrical component information and pinout locations, always refer to the technical data. It is necessary to exit the fault code menu in DAVIE and run the diagnostic test again to identify a change in errors. Remember that the truck's operational or mechanical issues may be the root cause of both active and inactive fault codes. Refer to the 'possible causes' section. Step 1 Step ID 1207a SRT Visually inspect all applicable connectors (bent, broken, corroded or loose pins) and harnesses for corrosion, damage, and rubbing during each step of the diagnostic procedure. Proceed to step 2.						<i>l</i> alua		Additional information
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Visually inspect all applicable connectors (bent, broken, corroded or loose pins) and harnesses for corrosion, damage, and rubbing during each step of the diagnostic procedure. Proceed to step 2.	Diagnostic Step-by-Step	i	necess contro could o positio	ary, to of lunits, a damage n when to reduce proces For splocation It is need to Remermay be	check el and har the har connect e the li anecting s will re ecific el ons, alw ecessary ostic tes mber the	lectrical resses. The cting or kelihood g the EA esult in lectrical vays refer to exit stagain at the toot caus	components Back probing the ignition sh disconnectire d of damage as connectors multiple erro component er to the tech the fault coo to identify a ruck's opera e of both act	s, such as sensors, electrical g is not recommended, as it nould always be in the OFF ag electrical components in to electrical components. So during the troubleshooting ors. Information and pinout nnical data. The menu in DAVIE and run the change in errors. Stional or mechanical issues tive and inactive fault codes.
		Visuall and ha	y inspe	for cor	plicable rosion,	connec	ctors (bent, be, and rubbir	proken, corroded or loose pins)
Step 2 Step ID 1207b SRT		alagno	istic pro	ceaure.	Procee	ea to ste	ep 2.	
		1						

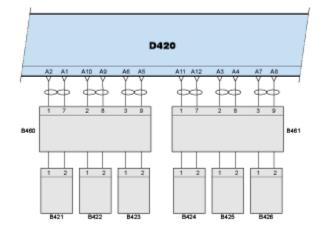


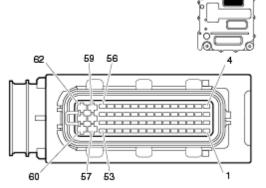
	Follow ESV through	gh to find any electrical related p	problems
	Based on the faul	t message provided, confirm tha	t the following electrical values
	are within specifi	ed ranges or limits:	
	Ensure that the ig	gnition key/switch has been set to	o OFF before disconnecting
	related cables.		
	Supply ar	nd signal voltages.	
	Cable cor	ntinuity (no opens or shorts).	
	Are measured ele	ectrical values outside of expecte	d range or limits?
	No: Issue	resolved.	
	Yes: Make	e the appropriate repairs or com	ponent replacements.
	Use DAVIE to re-o	check for the presence of active f	aults. Proceed to step 3.
	If this relationships	ated fault is no longer active, the	n this issue has been resolved.
	If this relationships	ated fault is still active, continue	to the step 4 in the
	troublesh	nooting process.	
	Step 3	Step ID 1207c	SRT
	11	l Valve Injector, Cylinder 5	
	11 '	ified faulty component.	
	Use DAVIE to re-o	theck for the presence of active f	aults.
		ated fault is no longer active, the	
		ated fault is still active, continue	to the step 4 in the
	troublesh	nooting process	
	Step 4	Step ID 1207d	SRT
		CAR Engine Support Call Center	
		ance in diagnosing this issue or fo	·
		uspect components, contact the	PACCAR Engine Support Call
V. C. L. D. L. C. L.	Center at 1-800-4		La tha ON and the or
Verification Drive Cycle	· · · · · · · · · · · · · · · · · · ·	with the brakes set, turn the key	•
	engine off, and allo	ow 10 seconds for the system to	initialize and run diagnostics.
			Back to Index



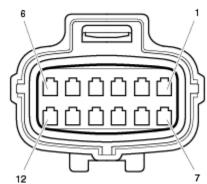
Fault code information Fault code information Fault code information I trip MIL 3 drive cycle recovery Readiness group – None Freeze frame type – Comprehensive Description of component(s) Fault code information Freeze frame type – Comprehensive The fuel injector injects fuel into the combustion chamber. Control The amount of fuel injected depends on the duration of the injector solenoid activation in combination with the rail pressure, The longer the solenoid is activated by the PCI ECU at the same rail pressure, the more fuel is injected. Injector codes Every fuel injector is calibrated during production to compensate for any production tolerances. An injector calibration code is present on the housing and connector of the injector. These injector calibration code is present on the housing and connector of the injectors have been replaced or fitted in another position, or if the PCI ECU is replaced. Not programming or incorrectly programmed injector codes can result in reduced engine performance or a warning to the driver. Location of component(s) Diagnostic condition The diagnostic condition begins when the power stage hardware is active High side voltage on the injector (before injection) compared to battery voltage is greater than 80% of threshold value Current through sense resistor on driver bank B is greater than 25A of threshold value Current through sense resistor on driver bank B is greater than 60% of threshold value This fault code will change to inactive immediately after the diagnostic runs and	Code number	P1208
The diagnostic condition The diagnostic condition of component(s) Diagnostic condition of fault code The diagnostic condition of fault code Plagnostic condition of fault code The diagnostic condition begins when the power stage hardware is active A direct yole recovery Readiness group – None Freeze frame type – Comprehensive The fuel injector injects fuel into the combustion chamber. Control The amount of fuel injected depends on the duration of the injector solenoid activation in combination with the rail pressure. The longer the solenoid is activated by the PCI ECU at the same rail pressure, the more fuel is injected. Injector codes Every fuel injector is callibrated during production to compensate for any production tolerances. An injector codes us present on the housing and connector of the injector. These injector codes must be (re)programmed with DAVIE if one or more injectors have been replaced or fitted in another position, or if the PCI ECU is replaced. Not programming or incorrectly programmed injector codes can result in reduced engine performance or a warning to the driver. B425 B425 Diagnostic condition The diagnostic condition begins when the power stage hardware is active High side voltage on the injector (before injection) compared to battery voltage is greater than 80% of threshold value Current through sense resistor on driver bank B is greater than 25A of threshold value	Fault code description	Injector solenoid valve cylinder 5, Voltage too high or short circuit to supply on ECU
A drive cycle recovery Readiness group – None Freeze frame type – Comprehensive The fuel injector injects fuel into the combustion chamber. Control The amount of fuel injected depends on the duration of the injector solenoid activation in combination with the rail pressure. The longer the solenoid is activated by the PCI ECU at the same rail pressure, the more fuel is injected. Injector codes Every fuel injector is calibrated during production to compensate for any production tolerances. An injector calibration code is present on the housing and connector of the injector. These injector codes must be (re)programmed with DAVIE if one or more injectors have been replaced or fitted in another position, or if the PCI ECU is replaced. Not programming or incorrectly programmed injector codes can result in reduced engine performance or a warning to the driver. Location of component(s) Diagnostic condition The diagnostic condition begins when the power stage hardware is active High side voltage on the injector (before injection) compared to battery voltage is greater than 80% of threshold value Current through sense resistor on driver bank B is greater than 25A of threshold value		D420 pin A4
Readiness group – None Freeze frame type – Comprehensive The fuel injector injects fuel into the combustion chamber. Control The amount of fuel injected depends on the duration of the injector solenoid activation in combination with the rail pressure. The longer the solenoid is activated by the PCI ECU at the same rail pressure, the more fuel is injected. Injector codes Every fuel injector is calibrated during production to compensate for any production tolerances. An injector code is present on the housing and connector of the injectors have been replaced or fitted in another position, or if the PCI ECU is replaced. Not programming or incorrectly programmed injector codes can result in reduced engine performance or a warning to the driver. Location of component(s) Diagnostic condition The diagnostic condition begins when the power stage hardware is active • High side voltage on the injector (before injection) compared to battery voltage is greater than 80% of threshold value • Current through sense resistor on driver bank B is greater than 25A of threshold value	Fault code information	1 trip MIL
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Control The amount of fuel injected depends on the duration of the injector solenoid activation in combination with the rail pressure. The longer the solenoid is activated by the PCI ECU at the same rail pressure, the more fuel is injected. Injector codes Every fuel injector is calibrated during production to compensate for any production to loreances. An injector calibration code is present on the housing and connector of the injector. These injector codes must be (re)programmed with DAVIE if one or more injectors have been replaced or fitted in another position, or if the PCI ECU is replaced. Not programming or incorrectly programmed injector codes can result in reduced engine performance or a warning to the driver. Location of component(s) Diagnostic condition The diagnostic condition begins when the power stage hardware is active High side voltage on the injector (before injection) compared to battery voltage is greater than 80% of threshold value Current through sense resistor on driver bank B is greater than 25A of threshold value		Freeze frame type – Comprehensive
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Every fuel injector is calibrated during production to compensate for any production tolerances. An injector calibration code is present on the housing and connector of the injector. These injector codes must be (re)programmed with DAVIE if one or more injectors have been replaced or fitted in another position, or if the PCI ECU is replaced. Not programming or incorrectly programmed injector codes can result in reduced engine performance or a warning to the driver. Location of component(s) B425 Diagnostic condition The diagnostic condition begins when the power stage hardware is active • High side voltage on the injector (before injection) compared to battery voltage is greater than 80% of threshold value • Current through sense resistor on driver bank B is greater than 25A of threshold value		by the PCI ECU at the same rail pressure, the more fuel is injected.
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Diagnostic condition The diagnostic condition begins when the power stage hardware is active • High side voltage on the injector (before injection) compared to battery voltage is greater than 80% of threshold value • Current through sense resistor on driver bank B is greater than 25A of threshold value		B425
 Set condition of fault code High side voltage on the injector (before injection) compared to battery voltage is greater than 80% of threshold value Current through sense resistor on driver bank B is greater than 25A of threshold value 		
greater than 80% of threshold value • Current through sense resistor on driver bank B is greater than 25A of threshold value	-	The diagnostic condition begins when the power stage hardware is active
Current through sense resistor on driver bank B is greater than 25A of threshold value	Set condition of fault code	
value		
Reset condition of fault code This fault code will change to inactive immediately after the diagnostic runs and		
_ , _ ,	Reset condition of fault code	This fault code will change to inactive immediately after the diagnostic runs and
passes.		







Wiring harness connector D420.A front view



Wiring harness connector B460 & B461 front view

B460 connector cylinders 1-3

B461 connector cylinders 4-6

D420 PCI ECU

B421 solenoid valve injector cylinder 1

B422 solenoid valve injector cylinder 2

B423 solenoid valve injector cylinder 3

B424 solenoid valve injector cylinder 4

B425 solenoid valve injector cylinder 5

B426 solenoid valve injector cylinder 6

D420 B460 B421 B422 B423 Function 2

Α1

7



	A2	1	1			Signal high, inject	or solenoid valve cylinder 1	
	A5	9		2		Signal low, injecto	or solenoid valve cylinder 3	
	A6	3		1		Signal high, inject	or solenoid valve cylinder 3	
	A9	8			2	Signal low, injecto	or solenoid valve cylinder 2	
	A10	2			1	Signal high, inject	or solenoid valve cylinder 2	
	D420	B460	B424	B425	B426	Function		
	А3	2		1		Signal high, inject	or solenoid valve cylinder 5	
	A4	8		2		Signal low, injecto	or solenoid valve cylinder 5	
	A7	3			1	Signal high, inject	or solenoid valve cylinder 6	
	A8	9			2	Signal low, injecto	or solenoid valve cylinder 6	
	A11	1	1			Signal high, inject	or solenoid valve cylinder 4	
	A12	7	2			Signal low, injector	or solenoid valve cylinder 4	
Technical data	Compone	ent che	ck. inie	ctor sol	enoid v	alve cylinder 5 (B42	.5)	
	Preparati		- , , -			,	-,	
	Key o	off the i	gnition)				
	• Disco	nnect o	connec	tor B46	1			
			wiring	harnes	s conne	ctor B461		
		Pin Pin						
	(+ probe	e) (- p	-	Value	_	Additional inf		
	2		8	± 0.67			llue at 20°C [68°F]	
Descible serves	No posih			maxim	num 0.9	4 \(\Omega\) Resistance va	llue at 120°C [248°F]	
Possible causes Additional information	No possik No additi			ion ava	ilahla			
Diagnostic Step-by-Step						stens helow using t	he breakout harness, if	
Diagnostic etch by etch		necessary, to check electrical components, such as sensors, electrical						
		control units, and harnesses. Back probing is not recommended, as it could						
	damage the harness. The ignition should always be in the OFF position when connecting or disconnecting electrical components in order to reduce the likelihood of damage to electrical components.							
	رث					_		
	 Disconnecting the EAS connectors during the troubleshooting process will result in multiple errors. For specific electrical component information and pinout 							
		locations, always refer to the technical data.						
							u in DAVIE and run the	
		 diagnostic test again to identify a change in errors. Remember that the truck's operational or mechanical issues may be the root cause of both active and inactive fault codes. Refer to the 'possible causes' section. 						
			tile þt	JJJINIE (Lauses	occion.		
	Step 1				Step ID	1208a	SRT	
		inspect	t all ap				corroded or loose pins)	
		and harnesses for corrosion, damage, and rubbing during each step of the						
	diagnos	diagnostic procedure. Proceed to step 2.						
							T	
	Step 2			9	Step ID	1208b	SRT	



Electrical Checks (B425) For all electrical checks and diagrams, refer to the Engine Service Rapido electrical schematic viewer (ESV) for detailed schematics, connector pin locations, and corresponding signal values. Enter the Engine number Select the ESV icon Click the Search button Select the "Component Code" within the Electrical Diagram Search pop-up window In the component code box select B425 then Search. Follow ESV through to find any electrical related problems Based on the fault message provided, confirm that the following electrical values are within specified ranges or limits: Supply and signal voltages. Cable continuity (no opens or shorts). Are measured electrical values outside of expected range or limits? No: Issue resolved Yes: Make the appropriate repairs or component replacements. Proceed to step 3 Use DAVIE to re-check for the presence of active faults. If this related fault is no longer active, then this issue has been resolved. If this related fault is still active, continue to the step 4 in the troubleshooting process. Step 3 Step ID 1208c SRT Replace: Solenoid Valve Injector, Cylinder 5 Replace the identified faulty component. Use DAVIE to re-check for the presence of active faults. If this related fault is no longer active, then this issue has been resolved. If this related fault is still active, continue to Step 4 in the troubleshooting process Step 4 Step ID 1208d SRT Contact the PACCAR Engine Support Call Center For further assistance in diagnosing this issue or for confirmation prior to the replacement of suspect components, contact the PACCAR Engine Support Call Center at 1-800-477-0251. To validate repair, with the brakes set, turn the key to the ON position with the **Verification Drive Cycle**

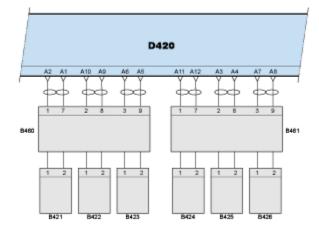
engine off, and allow 10 seconds for the system to initialize and run diagnostics.

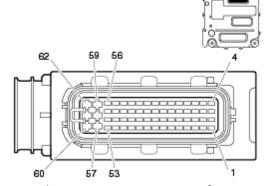
Back to Index



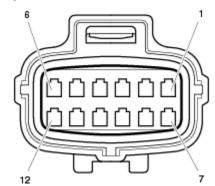
Code number	P1209				
Fault code description	Injector solenoid valve cylinder 3, Current too low or open circuit on ECU D420 pin A5				
Fault code information	1 trip MIL				
	3 drive cycle recovery				
	Readiness group – None				
	Freeze frame type – Comprehensive				
Description of component(s)	The fuel injector injects fuel into the combustion chamber. Control				
	The amount of fuel injected depends on the duration of the injector solenoid				
	activation in combination with the rail pressure. The longer the solenoid is activated				
	by the PCI ECU at the same rail pressure, the more fuel is injected.				
	Injector codes				
	Every fuel injector is calibrated during production to compensate for any production				
	tolerances. An injector calibration code is present on the housing and connector of				
	the injector. These injector codes must be (re)programmed with DAVIE if one or more				
	injectors have been replaced or fitted in another position, or if the PCI ECU is				
	replaced.				
	Not programming or incorrectly programmed injector codes can result in reduced				
	engine performance or a warning to the driver.				
Location of component(s)					
	B423				
Diagnostic condition	The diagnostic condition begins when the power stage hardware is active.				
Set condition of fault code	Current in Needle control valve is less than 4.50A of the threshold value.				
Reset condition of fault code	This fault code will change to inactive immediately after the diagnostic runs and				
	passes.				







Wiring harness connector D420.A front view



Wiring harness connector B460 & B461 front view

B460 connector cylinders 1-3

B461 connector cylinders 4-6

D420 PCI ECU

B421 solenoid valve injector cylinder 1

B422 solenoid valve injector cylinder 2

B423 solenoid valve injector cylinder 3

B424 solenoid valve injector cylinder 4

B425 solenoid valve injector cylinder 5

B426 solenoid valve injector cylinder 6

D420 B460 B421 B422 B423 Function

A1 7 2



	A2 1	1			Signal high, injector solenoid valve cylinder 1	
	A5 9	_	2		Signal low, injector solenoid valve cylinder 3	
					,	
	A6 3		1	2	Signal high, injector solenoid valve cylinder 3	
	A9 8			2	Signal low, injector solenoid valve cylinder 2	
	A10 2			1	Signal high, injector solenoid valve cylinder 2	
	D420 B46 A3 2	0 B424	B425 1	B426	Function Signal high, injector solenoid valve cylinder 5	
	A4 8		2		Signal low, injector solenoid valve cylinder 5	
	A7 3			1	Signal high, injector solenoid valve cylinder 6	
	A8 9			2	Signal low, injector solenoid valve cylinder 6	
	A11 1	1			Signal high, injector solenoid valve cylinder 4	
	A12 7	2			Signal low, injector solenoid valve cylinder 4	
Technical data	Preparation					
	•	off the ign	ition			
	• Disco	nnect co	nnector	B460		
	• Mea	sure on w	iring ha	rness co	onnector B460	
	Pin	Pin				
	(+ probe)	(- probe	•	Value	Additional information	
	3 9 $\pm 0.67 \Omega$ Resistance value at 20°C [68°F]					
			maxır	num 0.9	94 Ω Resistance value at 120°C [248°F]	
Possible causes Additional information	No possible o		tion ava	ilabla		
Diagnostic Step-by-Step	Perform the troubleshooting steps below using the breakout harness, if necessary, to check electrical components, such as sensors, electrical control units, and harnesses. Back probing is not recommended, as it could damage the harness. The ignition should always be in the OFF position when connecting or disconnecting electrical components in order to reduce the likelihood of damage to electrical components. • Disconnecting the EAS connectors during the troubleshooting process will result in multiple errors. • For specific electrical component information and pinout locations, always refer to the technical data. • It is necessary to exit the fault code menu in DAVIE and run the diagnostic test again to identify a change in errors. • Remember that the truck's operational or mechanical issues may be the root cause of both active and inactive fault codes. Refer to the 'possible causes' section.					
	1 1	ses for co	oplicable rrosion, e. Procee	damage	etors (bent, broken, corroded or loose pins) e, and rubbing during each step of the ep 2.	
	Electrical Ch	necks (B4	23)			



For all electrical checks and diagrams, refer to the Engine Service Rapido electrical schematic viewer (ESV) for detailed schematics, connector pin locations, and corresponding signal values. Enter the Engine number Select the ESV icon Click the Search button Select the "Component Code" within the Electrical Diagram Search pop-up window In the component code box select B425 then Search. Follow ESV through to find any electrical related problems Based on the fault message provided, confirm that the following electrical values are within specified ranges or limits: Supply and signal voltages. Cable continuity (no opens or shorts). Are measured electrical values outside of expected range or limits? No: Issue Resolved. • Yes: Make the appropriate repairs or component replacements. Proceed to step 3 Use DAVIE to re-check for the presence of active faults. If this related fault is no longer active, then this issue has been resolved. If this related fault is still active, continue to Step 4 in the troubleshooting process. SRT Step 3 Step ID 1209c Replace: Solenoid Valve Injector, Cylinder 3 Replace the identified faulty component. Use DAVIE to re-check for the presence of active faults. If this related fault is no longer active, then this issue has been resolved. If this related fault is still active, continue to the Step 4 in the troubleshooting process Step 4 Step ID 1209d SRT Contact the PACCAR Engine Support Call Center For further assistance in diagnosing this issue or for confirmation prior to the replacement of suspect components, contact the PACCAR Engine Support Call Center at 1-800-477-0251. To validate repair, with the brakes set, turn the key to the ON position with the **Verification Drive Cycle**

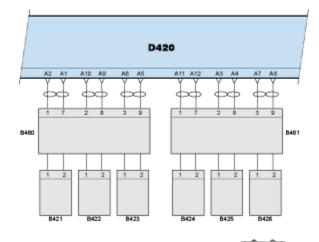
engine off, and allow 10 seconds for the system to initialize and run diagnostics.

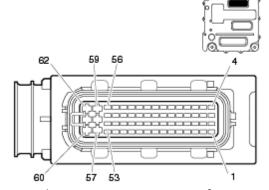
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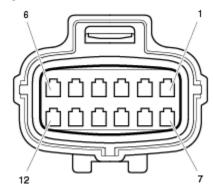
Code number	P1210			
Fault code description	Injector solenoid valve cylinder 3 – Short circuit between ECU D420 pin A6 and A5			
Fault code information	1 trip MIL			
	3 drive cycle recovery			
	Readiness group – None			
	Freeze frame type – Comprehensive			
Description of component(s)	The fuel injector injects fuel into the combustion chamber.			
	Control			
	The amount of fuel injected depends on the duration of the injector solenoid			
	activation in combination with the rail pressure. The longer the solenoid is activated			
	by the PCI ECU at the same rail pressure, the more fuel is injected.			
	by the Fer Lee at the same ran pressare, the more racins injected.			
	Injector codes			
	Every fuel injector is calibrated during production to compensate for any production			
	tolerances. An injector calibration code is present on the housing and connector of			
	the injector. These injector codes must be (re)programmed with DAVIE if one or more			
	injectors have been replaced or fitted in another position, or if the PCI ECU is			
	replaced.			
	Not programming or incorrectly programmed injector codes can result in reduced			
	engine performance or a warning to the driver.			
Location of component(s)	8 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4			
,	B423			
Diagnostic condition	This diagnostic runs whenever the engine is running at idle or higher RPM.			
Set condition of fault code	This code will set If the voltage on the ground wire for the injector below 2.4 volts or			
	exceeds 9.6 volts during when the injector is commanded on while the engine is			
	running.			
Reset condition of fault code	This fault code will change to inactive immediately after the diagnostic runs and			
nesce condition of fault code	passes.			
1	passes.			







Wiring harness connector D420.A front view



Wiring harness connector B460 & B461 front view

B460 connector cylinders 1-3

B461 connector cylinders 4-6

D420 PCI ECU

B421 solenoid valve injector cylinder 1

B422 solenoid valve injector cylinder 2

B423 solenoid valve injector cylinder 3

B424 solenoid valve injector cylinder 4

B425 solenoid valve injector cylinder 5

B426 solenoid valve injector cylinder 6

D420 B460 B421 B422 B423 Function
A1 7 2 Signal low, injector solenoid valve



	1							
						cylinder 1		
	A2	1	1			Signal high, injector solenoid valve		
						cylinder 1		
	A5	9		2		Signal low, injector solenoid valve		
						cylinder 3		
	A6	3		1		Signal high, injector solenoid valve		
						cylinder 3		
	A9	8			2	Signal low, injector solenoid valve cylinder 2		
	A10	2			1	Signal high, injector solenoid valve cylinder 2		
	D420	B460	B424	B425	B426	Function		
	A3	2		1		Signal high, injector solenoid valve cylinder 5		
	A4	8		2		Signal low, injector solenoid valve cylinder 5		
	A7	3			1	Signal high, injector solenoid valve cylinder 6		
	A8	9			2	Signal low, injector solenoid valve cylinder		
	A11	1	1			Signal high, injector solenoid valve cylinder		
	A12	7	2			Signal low, injector solenoid valve cylinder		
Technical data	Compo	nent ch	eck, inje	ctor sc	olenoid v	ralve cylinder 1 (B421)		
	Prepara		, ,			, , , ,		
	•		the ign	ition				
	•	-	nect cor		r B460			
	•	Measu	re on wi	iring ha	arness co	onnector B460		
	Pir		Pin					
	(+ pro		(- prob	e) \	/alue	Additional information		
	1	,	` · 7		± 0.67 Ω			
						n 0.94 Ω Resistance value at 120°C [248°F]		
	Component check, injector solenoid valve cylinder 2 (B422) Preparation							
	•	Key off	the ign	ition				
	•	Discon	nect cor	necto	r B460			
	•	Measu	re on wi	iring ha	arness co	onnector B460		
	Pir		Pin	-				
	(+ pro	be)	(- prob	e) \	/alue	Additional information		
	2		8	₫	± 0.67 Ω	Resistance value at 20°C [68°F]		
				r	maximun	n 0.94 Ω Resistance value at 120°C [248°F]		
			eck, inje	ctor so	olenoid v	alve cylinder 3 (B423)		
	Preparation • Key off the ignition							
	_	K AV AH	the ian	ıtı∩n				
	•	-	the ign nect cor		r D460			



	• Meas	7	g harness connector B	3460					
	Pin	Pin							
	(+ probe)	(- probe)	Value	Additional information					
	3	9	± 0.67 Ω	• •					
			maximum 0.94 Ω	Resistance value at 120°C [248°F]					
	Preparation	check, injecto	r solenoid valve cylind	der 4 (B424)					
	· ·	nnect conne							
			g harness connector B	2/61					
	Pin	Pin	3 Harriess confidential L	9401					
		(- probe)	Value	Additional information					
	1	7	\pm 0.67 Ω maximum 0.94 Ω	Resistance value at 20°C [68°F]					
	Preparation	theck, injecto	r solenoid valve cylind	der 5 (B425)					
	• Disco	nnect conne	ctor B461						
	• Meas	sure on wiring	g harness connector B	3461					
	Pin	Pin							
		(- probe)		Additional information					
	2	8	± 0.67 Ω	Resistance value at 20°C [68°F]					
			maximum 0.94 Ω	Resistance value at 120°C [248°F]					
	Component check, injector solenoid valve cylinder 6 (B426) Preparation								
	• Key c	Key off the ignition							
		nnect conne							
	MeasPin	sure on wiring Pin	g harness connector B	3461					
	(+ probe)	(- probe)	Value	Additional information					
	3	9	± 0.67 Ω	Resistance value at 20°C [68°F]					
			maximum 0.94 Ω	Resistance value at 120°C [248°F]					
Possible causes	No possible c								
Additional information	No additiona								
Diagnostic Step-by-Step	nece	ssary, to ched rol units, and	ck electrical compone harnesses. Back prob	ow using the breakout harness, if nts, such as sensors, electrical ping is not recommended, as it could ld always be in the OFF position					
		_	or disconnecting elections and control of the contr	trical components in order to reduce omponents.					





- Disconnecting the EAS connectors during the troubleshooting process will result in multiple errors.
- For specific electrical component information and pinout locations, always refer to the technical data.
- It is necessary to exit the fault code menu in DAVIE and run the diagnostic test again to identify a change in errors.
- Remember that the truck's operational or mechanical issues may be the root cause of both active and inactive fault codes. Refer to the 'possible causes' section.

Step 1

Step ID 1210a

SRT

Visually inspect all applicable connectors (bent, broken, corroded or loose pins) and harnesses for corrosion, damage, and rubbing during each step of the diagnostic procedure. Proceed to step 2.

Step 2

Step ID 1210b

SRT

Electrical Checks

Ensure that the ignition key/switch has been set to OFF before disconnecting related cables.

Based on the fault message provided, confirm that the following electrical values are within specified ranges or limits:

- Supply and signal voltages (12V).
- Cable continuity (no opens or shorts).

Are measured electrical values outside of expected range or limits?

- Yes Proceed to step 3
- No Proceed to step 4

Step 3

Step ID 1210c

SRT

Repair or replace the appropriate component and use DAVIE to re-check for the presence of active faults.

- Fault inactive issue resolved
- Fault active Proceed to step 4

Step 4

Step ID 1210d

SRT

For further assistance in diagnosing this issue or for confirmation prior to the replacement of suspect components, contact the Engine Support Call Center at 1-800-477-0251.

Verification Drive Cycle

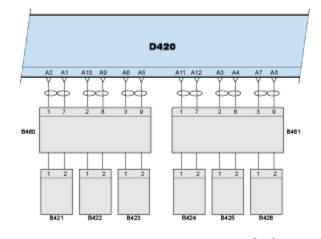
To validate repair, with the brakes set, turn the key to the ON position with the engine off, and allow 10 seconds for the system to initialize and run diagnostics.

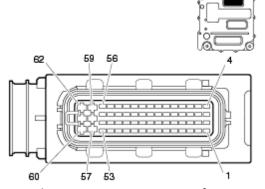
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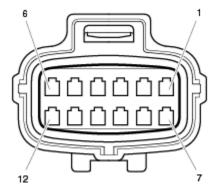
Code number	P1211					
Fault code description	Injector solenoid valve cylinder 3 – Voltage too low or short circuit to ground on ECU					
_	D420 pin A5					
Fault code information	1 trip MIL					
	3 drive cycle recovery					
	Readiness group – None					
	Freeze frame type – Comprehensive					
Description of component(s)	The fuel injector injects fuel into the combustion chamber.					
	Control					
	The amount of fuel injected depends on the duration of the injector solenoid					
	activation in combination with the rail pressure. The longer the solenoid is activated					
	by the PCI ECU at the same rail pressure, the more fuel is injected.					
	Injector codes					
	Every fuel injector is calibrated during production to compensate for any production					
	tolerances. An injector calibration code is present on the housing and connector of					
	the injector. These injector codes must be (re)programmed with DAVIE if one or more					
	injectors have been replaced or fitted in another position, or if the PCI ECU is					
	replaced.					
	Not programming or incorrectly programmed injector codes can result in reduced					
	engine performance or a warning to the driver.					
Location of component(s)						
	B423					
Diagnostic condition	This diagnostic runs whenever the engine is running at idle or higher RPM.					
Set condition of fault code	This code will set If the voltage on the ground wire for the injector below 2.4 volts					
	during when the injector is commanded on while the engine is running.					
Reset condition of fault code	This fault code will change to inactive immediately after the diagnostic runs and					
	passes.					







Wiring harness connector D420.A front view



Wiring harness connector B460 & B461 front view

B460 connector cylinders 1-3

B461 connector cylinders 4-6

D420 PCI ECU

B421 solenoid valve injector cylinder 1

B422 solenoid valve injector cylinder 2

B423 solenoid valve injector cylinder 3

B424 solenoid valve injector cylinder 4

B425 solenoid valve injector cylinder 5

B426 solenoid valve injector cylinder 6

D420 B460 B421 B422 B423 Function 2

Α1 7 Signal low, injector solenoid valve cylinder 1



	A2	1	1			Signal high, injector solenoid valve cylinder 1
	A5	9		2		Signal low, injector solenoid valve cylinder 3
	A6	3		1		Signal high, injector solenoid valve cylinder 3
	A9	8			2	Signal low, injector solenoid valve cylinder 2
	A10	2			1	Signal high, injector solenoid valve cylinder 2
	D420	B460	B424	B425	B426	Function
	А3	2		1		Signal high, injector solenoid valve cylinder 5
	A4	8		2		Signal low, injector solenoid valve cylinder 5
	A7	3			1	Signal high, injector solenoid valve cylinder 6
	A8	9			2	Signal low, injector solenoid valve cylinder 6
	A11	1	1			Signal high, injector solenoid valve cylinder 4
	A12	7	2			Signal low, injector solenoid valve cylinder 4
Technical data				ctor sc	olenoid v	valve cylinder 1 (B421)
Teermeur data	Prepara		con, mje	0.01.50	renora v	raive cylinder I (B 121)
			the igni	tion		
	•	Discon	nect con	necto	r B460	
	•	Measu	re on wi	ring ha	arness co	onnector B460
	Pin		Pin			
	(+ prol	oe)	(- probe	•	/alue	Additional information
	1		7		± 0.67 Ω	
				1	IIdXIIIIUII	n 0.94 Ω Resistance value at 120°C [248°F]
	Compon	ent ch	eck, inje	ctor sc	olenoid v	valve cylinder 2 (B422)
	Prepara					
		•	the igni		D.460	
			nect con			onnector PACO
	Pin	ivieasu	re on wi Pin	ring na	arness cc	onnector B460
	(+ prol	oe)	(- probe	e) \	/alue	Additional information
	2	,	8	•	0.67 Ω	
				r	naximun	m 0.94 Ω Resistance value at 120°C
						[248°F]
	-		eck, inje	ctor sc	olenoid v	valve cylinder 3 (B423)
	Prepara		ali e e			
		•	the igni nect con		r D/160	
						onnector B460
	Pin		Pin	8 110	41 11C33 CC	51111CC101 D-100
	(+ prol	oe)	(- probe	e) \	/alue	Additional information
	3		9		0.67 Ω	Resistance value at 20°C [68°F]
				r	naximun	m 0.94 Ω Resistance value at 120°C
						[248°F]
	Compon	ant ch	ack inic	ctorco	Janoid v	valve cylinder 4 (B424)
	Compon	ieni (iii	cck, iiije	CLUI SC	nenoiu V	valve cylliluel 4 (D424)



	T								
	Preparation								
	Key off the ignition								
	Disconnect connector B461Measure on wiring harness connector B461								
	Pin	Pin							
	(+ probe)	(- probe)	Value	Additional information					
	1	7	± 0.67 Ω	Resistance value at 20°C [68°F]					
			maximum $0.94~\Omega$	Resistance value at 120°C					
				[248°F]					
	Component o	heck, injecto	r solenoid valve cylind	der 5 (B425)					
	 Key o 	ff the ignition	า						
	 Disco 	nnect connec	ctor B461						
	 Meas 	ure on wiring	g harness connector B	3461					
	Pin	Pin	-						
		(- probe)	Value	Additional information					
	2	8	± 0.67 Ω	Resistance value at 20°C [68°F]					
			maximum 0.94 Ω						
				[248°F]					
	Component c	heck. iniecto	r solenoid valve cylind	der 6 (B426)					
	Preparation	, ,	,						
		ff the ignition	า						
	ine, en une ignicien								
	Disconnect connector B461 Massure on wiring barness connector B461								
	Measure on wiring harness connector B461 Pin Pin Pin Pin Pin Pin Pin Pin								
		(- probe)	Value	Additional information					
	3	9		Davista and a st 2000 [C00F]					
	3	9							
			maximum 0.94 Ω	Resistance value at 120°C [248°F]					
Possible causes	No possible c	auses availab	le.						
Additional information	No additional	information	available.						
Diagnostic Step-by-Step	Per	form the trou	ubleshooting steps be	low using the breakout harness, if					
	nec	essary, to che	eck electrical compon	ents, such as sensors, electrical					
	con	trol units, and	d harnesses. Back pro	bbing is not recommended, as it					
	cou	ld damage th	e harness. The ignition	on should always be in the OFF					
	pos	ition when co	onnecting or disconne	ecting electrical components in					
	order to reduce the likelihood of damage to electrical components.								
	$\overline{\Box}$	• Disconne	ecting the EAS connec	ctors during the troubleshooting					
		process	will result in multiple	errors.					
	L.	 For spec 	ific electrical compon	ent information and pinout					
		-	s, always refer to the						
			•	t code menu in DAVIE and run the					
				fy a change in errors.					
		_	_	perational or mechanical issues may					
				ve and inactive fault codes. Refer to					
		the 'poss	sible causes' section.						
		-							

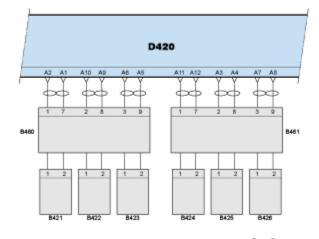


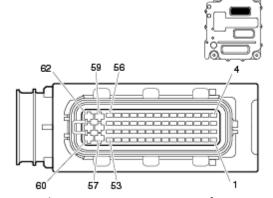
			Back to Index						
Verification Drive Cycle		ith the brakes set, turn the ke	y to the ON position with the initialize and run diagnostics.						
	For further assistance in diagnosing this issue or for confirmation prior replacement of suspect components, contact the Engine Support Call (1-800-477-0251.								
	Step 4	Step ID 1211d	SRT						
	Fault active - Proceed to step 4								
	Fault inactive – issue resolved								
	Repair or replace the appropriate component and use DAVIE to re-check for the presence of active faults.								
	Step 3	Step ID 1211c	SRT						
	No - Proceed to step 4								
	Yes - Proceed to step 3								
	Are measured electrical values outside of expected range or limits?								
	 Supply and signal voltages (12V). Cable continuity (no opens or shorts). 								
	are within specified								
			at the following electrical values						
	related cables.	•							
		ition key/switch has been set	to OFF before disconnecting						
	Electrical Checks	Step ID 1211b	ואכן						
	Step 2 Step ID 1211b SRT								
		'							
	diagnostic procedure. Proceed to step 2.								
	Visually inspect all applicable connectors (bent, broken, corroded or loose pins) and harnesses for corrosion, damage, and rubbing during each step of the								
	Step 1	Step ID 1211a	SRT						



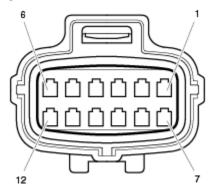
Code number	P1212
Fault code description	Injector solenoid valve cylinder 3 – Voltage too high or short circuit to supply on ECU
-	D420 pin A5
Fault code information	1 trip MIL
	3 drive cycle recovery
	Readiness group – None
	Freeze frame type – Comprehensive
Description of component(s)	The fuel injector injects fuel into the combustion chamber.
	Control
	The amount of fuel injected depends on the duration of the injector solenoid activation
	in combination with the rail pressure. The longer the solenoid is activated by the PCI
	ECU at the same rail pressure, the more fuel is injected.
	Injector codes
	Every fuel injector is calibrated during production to compensate for any production
	tolerances. An injector calibration code is present on the housing and connector of the
	injector. These injector codes must be (re)programmed with DAVIE if one or more
	injectors have been replaced or fitted in another position, or if the PCI ECU is replaced.
	Not programming or incorrectly programmed injector codes can result in reduced
	engine performance or a warning to the driver.
Location of component(s)	
	B423
Diagnostic condition	Diagnostic conditions runs when Power stage hardware is active
Set condition of fault code	High side voltage on the injector (before injection) compared to battery voltage is greater than 80.00% of threshold value
	Current through sense resistor on driver bank A is greater than 25.00% of the threshold value
Reset condition of fault code	This fault code will change to inactive immediately after the diagnostic runs and passes.
The state of the s	and the passes







Wiring harness connector D420.A front view



Wiring harness connector B460 & B461 front view

B460 connector cylinders 1-3

B461 connector cylinders 4-6

D420 PCI ECU

B421 solenoid valve injector cylinder 1

B422 solenoid valve injector cylinder 2

B423 solenoid valve injector cylinder 3

B424 solenoid valve injector cylinder 4

B425 solenoid valve injector cylinder 5

B426 solenoid valve injector cylinder 6

D420 B460 B421 B422 B423 Function

A1 7 2 Signal low, injector solenoid valve cylinder 1



	A2	1	1			Signal high, injector solenoid valve cylinder 1				
	A5	9		2		Signal low, injector solenoid valve cylinder 3				
	A6	3		1		Signal high, injector solenoid valve cylinder 3				
	A9	8			2	Signal low, injector solenoid valve cylinder 2				
	A10	2			1	Signal high, injector solenoid valve cylinder 2				
	D420	B460	B424	B425	B426	Function				
	А3	2		1		Signal high, injector solenoid valve cylinder 5				
	A4	8		2		Signal low, injector solenoid valve cylinder 5				
	A7	3			1	Signal high, injector solenoid valve cylinder 6				
	A8	9			2	Signal low, injector solenoid valve cylinder 6				
	A11	1	1			Signal high, injector solenoid valve cylinder 4				
	A12	7	2			Signal low, injector solenoid valve cylinder 4				
Technical data	Compon	ent ch	eck inie	ctor so	enoid v	alve cylinder 1 (B421)				
rediffical data	Preparat		con, mje	.001 301	crioia v	ave cymiaer I (B 121)				
	•	The state of the s								
	•	Discon	nect cor	ect connector B460						
	• 1	Measure on wiring harness connector B460								
	Pin Pin									
	(+ prob	e) (-	probe)		Value	Additional information				
	1		7		0.67 Ω	Resistance value at 20°C [68°F]				
				maxır	num 0.9	4 Ω Resistance value at 120°C [248°F]				
	Compon	Component check, injector solenoid valve cylinder 2 (B422)								
	•	Preparation								
		•	the ign							
		Disconnect connector B460								
		Measure on wiring harness connector B460								
	Pin (+ prob	۵) (۔	Pin probe)		Value	Additional information				
	2	C) (8		0.67 Ω	Resistance value at 20°C [68°F]				
	_		_		num 0.9					
	Compon	ent ch	eck, inje	ctor so	enoid v	alve cylinder 3 (B423)				
	Preparat									
		•	the ign							
			nect cor							
	•	Measu	re on w	iring ha	rness co	nnector B460				



	Pin	Pin									
	(+ probe)	(- probe)	Value	Additional information							
	3	9	± 0.67 Ω	Resistance value at 20°C [68°F]							
			maximum 0.94 Ω	Resistance value at 120°C [248°F]							
	Component Preparation		ctor solenoid valve	cylinder 4 (B424)							
	• Key	Key off the ignition									
	• Disc	connect con	nector B461								
	• Me	asure on wi	ring harness connec	ctor B461							
	Pin	Pin									
		(- probe)	Value	Additional information							
	1	7	± 0.67 Ω								
			maximum 0.94 Ω	Resistance value at 120°C [248°F]							
	Component of Preparation	Component check, injector solenoid valve cylinder 5 (B425) Preparation									
	Key c	' east									
	• Disco	Disconnect connector B461									
	• Meas	sure on wiri	ing harness connect	or B461							
	Pin	Pin									
	(+ probe)	(- probe)		Additional information							
	2	8	± 0.67 Ω	Resistance value at 20°C [68°F]							
			maximum 0.94 Ω	Resistance value at 120°C [248°F]							
	Component of Preparation	check, injec	tor solenoid valve c	ylinder 6 (B426)							
	• Key o	off the igniti	ion								
		Disconnect connector B461									
	 Measure on wiring harness connector B461 Pin Pin 										
		(- probe)	Value	Additional information							
	3	9	± 0.67 Ω	Resistance value at 20°C [68°F]							
			maximum 0.94 Ω	Resistance value at 120°C [248°F]							
Possible causes	No Possible o	causes avail	able								
Additional information	No additional information available										



Diagnostic Step-by-Step



Perform the troubleshooting steps below using the breakout harness, if necessary, to check electrical components, such as sensors, electrical control units, and harnesses. Back probing is not recommended, as it could damage the harness. The ignition should always be in the OFF position when connecting or disconnecting electrical components in order to reduce the likelihood of damage to electrical components.



- Disconnecting the EAS connectors during the troubleshooting process will result in multiple errors.
- For specific electrical component information and pinout locations, always refer to the technical data.
- It is necessary to exit the fault code menu in DAVIE and run the diagnostic test again to identify a change in errors.
- Remember that the truck's operational or mechanical issues may be the root cause of both active and inactive fault codes. Refer to the 'possible causes' section.

Step 1 Step ID 1212a SRT

Visually inspect all applicable connectors (bent, broken, corroded or loose pins) and harnesses for corrosion, damage, and rubbing during each step of the diagnostic procedure. Proceed to step 2.

Step 2 Step ID 1212b SRT

Electrical Checks

Ensure that the ignition key/switch has been set to OFF before disconnecting related cables.

Based on the fault message provided, confirm that the following electrical values are within specified ranges or limits:

- Supply and signal voltages (12V).
- Cable continuity (no opens or shorts).

Are measured electrical values outside of expected range or limits?

- Yes Proceed to step 3
- No Proceed to step 4

ep 3 Step ID 1212c SRT

Repairs or component replacements appropriate component

"Solenoid Valve Injector, Cylinder 3 and use DAVIE to re-check for the presence of active faults.

- Fault inactive issue resolve
- Fault active Proceed to step 4

Step 4	Step ID 1212d	SRT
Step .	OCCD ID TETEG	J

For further assistance in diagnosing this issue or for confirmation prior to the replacement of suspect components, contact the Engine Support Call Center at 1-800-477-0251.

Verification Drive Cycle

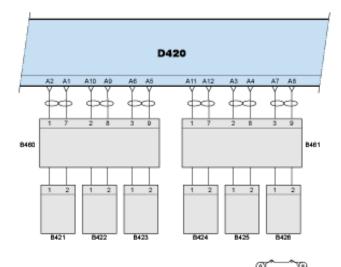
To validate repair, with the brakes set, turn the key to the ON position with the engine off, and allow 10 seconds for the system to initialize and run diagnostics.

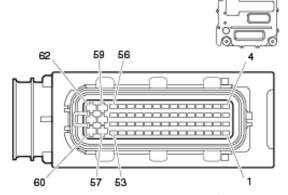
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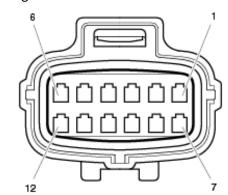
Code number	P1213
Fault code description	Injector solenoid valve cylinder 6 – Current too low or open circuit on ECU D420 pin
	A8
Fault code information	1 trip MIL
	3 drive cycle recovery
	Readiness group – None
	Freeze frame type – Comprehensive
Description of component(s)	The fuel injector injects fuel into the combustion chamber.
	Control
	The amount of fuel injected depends on the duration of the injector solenoid
	activation in combination with the rail pressure. The longer the solenoid is activated
	by the PCI ECU at the same rail pressure, the more fuel is injected.
	Injector codes
	Every fuel injector is calibrated during production to compensate for any production
	tolerances. An injector calibration code is present on the housing and connector of
	the injector. These injector codes must be (re)programmed with DAVIE if one or more
	injectors have been replaced or fitted in another position, or if the PCI ECU is
	replaced.
	Not programming or incorrectly programmed injector codes can result in reduced
	engine performance or a warning to the driver.
Location of component(s)	DAGE
	B426
	1300
Diagnostic condition	Diagnostic conditions runs when Power stage hardware is active
Set condition of fault code	Current in Needle control valve is less than 4.50A of threshold value
Reset condition of fault code	This fault code will change to inactive immediately after the diagnostic runs and
	passes.
1	passes.







Wiring harness connector D420.A front view



Wiring harness connector B460 & B461 front view

B460 connector cylinders 1-3

B461 connector cylinders 4-6

D420 PCI ECU

B421 solenoid valve injector cylinder 1

B422 solenoid valve injector cylinder 2

B423 solenoid valve injector cylinder 3

B424 solenoid valve injector cylinder 4

B425 solenoid valve injector cylinder 5

B426 solenoid valve injector cylinder 6



D420 B400 B424 B422 B422 Function						
D420 B460 B421 B422 B423 Function A1 7 2 Signal low, injector solenoi	id valvo cylindor 1					
	•					
	-					
A5 9 2 Signal low, injector solenoi	•					
A6 3 1 Signal high, injector soleno	·					
A9 8 2 Signal low, injector solenoi	id valve cylinder 2					
A10 2 1 Signal high, injector soleno	oid valve cylinder 2					
D420 D450 D424 D425 D426 5 44114						
D420 B460 B424 B425 B426 Function A3 2 1 Signal high, injector soleno	oid valvo cylindor E					
A3 2 1 Signal high, injector soleno A4 8 2 Signal low, injector solenoi	•					
	·					
A7 3 1 Signal high, injector soleno	·					
A8 9 2 Signal low, injector solenoi	,					
A11 1 Signal high, injector soleno	•					
A12 7 2 Signal low, injector solenoi	id valve cylinder 4					
Technical data Component check, injector solenoid valve cylinder 1 (B421)						
Preparation						
Key off the ignition						
Disconnect connector B460						
 Measure on wiring harness connector B460 Pin Pin 						
(+ probe) (- probe) Value Additional informatio	nn l					
1 7 ± 0.67 Ω Resistance value at 20						
maximum 0.94 Ω Resistance value at 12						
Component check, injector solenoid valve cylinder 2 (B422)						
Preparation						
Key off the ignitionDisconnect connector B460						
Measure on wiring harness connector B460						
Pin Pin						
(+ probe) (- probe) Value Additional information	on					
2 8 ± 0.67 Ω Resistance value at 20	0°C [68°F]					
maximum 0.94 Ω Resistance value at 12	20°C [248°F]					
Companent shock injector colons id value gulinder 3 (D422)						
Component check, injector solenoid valve cylinder 3 (B423) Preparation						
Key off the ignition						
Disconnect connector B460						
Disconnect connector B460						



	Pin	Pin							
	(+ probe)	(- probe)	Value	Additional information					
	3	9	± 0.67 Ω	Resistance value at 20°C [68°F]					
			maximum 0.94 Ω	Resistance value at 120°C [248°F]					
	Component	Component check, injector solenoid valve cylinder 4 (B424)							
	Preparation	Preparation							
	• Key	and the second s							
	• Disc	Disconnect connector B461							
	• Mea	 Measure on wiring harness connector B461 							
	Pin	Pin							
	(+ probe)		Value	Additional information					
	1	7	± 0.67 Ω	Resistance value at 20°C [68°F]					
			maximum 0.94 Ω	Resistance value at 120°C [248°F]					
	-	Component check, injector solenoid valve cylinder 5 (B425)							
	· · · · · ·	Preparation							
		Key off the ignition							
		Disconnect connector B461							
		Pin Pin							
	(+ probe)		Value	Additional information					
	2	8	± 0.67 Ω	Resistance value at 20°C [68°F]					
			maximum 0.94 Ω	Resistance value at 120°C [248°F]					
	· ·	Component check, injector solenoid valve cylinder 6 (B426)							
	·	Preparation Nov off the ignition							
	· · · · · · · · · · · · · · · · · · ·	Key off the ignitionDisconnect connector B461							
				or R461					
	 Measure on wiring harness connector B461 Pin Pin 								
	(+ probe)		Value	Additional information					
	3	9	± 0.67 Ω	Resistance value at 20°C [68°F]					
			maximum 0.94 Ω	Resistance value at 120°C [248°F]					
Possible causes	No possible o	causes avail	able						
Additional information	No additiona	No additional information available							



Diagnostic Step-by-Step



Perform the troubleshooting steps below using the breakout harness, if necessary, to check electrical components, such as sensors, electrical control units, and harnesses. Back probing is not recommended, as it could damage the harness. The ignition should always be in the OFF position when connecting or disconnecting electrical components in order to reduce the likelihood of damage to electrical components.



- Disconnecting the EAS connectors during the troubleshooting process will result in multiple errors.
- For specific electrical component information and pinout locations, always refer to the technical data.
- It is necessary to exit the fault code menu in DAVIE and run the diagnostic test again to identify a change in errors.
- Remember that the truck's operational or mechanical issues may be the root cause of both active and inactive fault codes. Refer to the 'possible causes' section.

Step 3 Step ID 1213c SRT

Visually inspect all applicable connectors (bent, broken, corroded or loose pins) and harnesses for corrosion, damage, and rubbing during each step of the diagnostic procedure. Proceed to step 2.

Step 2 Step ID 1213b SRT

Electrical Checks

Ensure that the ignition key/switch has been set to OFF before disconnecting related cables.

Based on the fault message provided, confirm that the following electrical values are within specified ranges or limits:

- Supply and signal voltages (12V).
- Cable continuity (no opens or shorts).

Are measured electrical values outside of expected range or limits?

- Yes Proceed to step 3
- No Proceed to step 4

Step 3 Step ID 1213c SRT

Repairs or component replacements appropriate component "

Solenoid Valve Injector, Cylinder 6" and use DAVIE to re-check for the presence of active faults.

- Fault inactive issue resolve
- Fault active Proceed to step 4

Step 4	Step ID 1213d	SRT
Jicp T	3(C) 12 1213G	2111

For further assistance in diagnosing this issue or for confirmation prior to the replacement of suspect components, contact the Engine Support Call Center at 1-800-477-0251.

Verification Drive Cycle

To validate repair, with the brakes set, turn the key to the ON position with the engine off, and allow 10 seconds for the system to initialize and run diagnostics.

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Code number	P1214
Fault code description	Injector Solenoid Valve Cylinder 6 – Short circuit between ECU D420 pin A7 and A8
Fault code information	For further assistance: Contact the PACCAR Engine Support Call Center 1-800-477-0251
Description of component(s)	
Location of component(s)	
Diagnostic condition	
Set condition of fault code	
Reset condition of fault code	
Electrical diagram(s)	
Technical data	
Possible causes	
Additional information	
Diagnostic Step-by-Step	
Verification Drive Cycle	
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Code number	P1215
Fault code description	Injector Solenoid Valve Cylinder 6 – Voltage too low or Short circuit to ground on ECU
	D420 pin A8
Fault code information	For further assistance: Contact the PACCAR Engine Support Call Center 1-800-477-0251 Please Contact the Engine Support Center
Description of component(s)	
Location of component(s)	
Diagnostic condition	
Set condition of fault code	
Reset condition of fault code	
Electrical diagram(s)	
Technical data	
Possible causes	
Additional information	
Diagnostic Step-by-Step	
Verification Drive Cycle	
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Code number	P1216
Fault code description	Injector solenoid valve cylinder 6 – Voltage too high or short circuit to supply on ECU
	D420 pin A8
Fault code information	For further assistance: Contact the PACCAR Engine Support Call Center 1-800-477-0251
Description of component(s)	
Location of component(s)	
Diagnostic condition	
Set condition of fault code	
Reset condition of fault code	
Electrical diagram(s)	
Technical data	
Possible causes	
Additional information	
Diagnostic Step-by-Step	
Verification Drive Cycle	
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Code number	P1217
Fault code description	Injector solenoid valve cylinder 2 – Current too low or open circuit on ECU D420 pin A9
Fault code information	Please Contact the Engine Support Center For further assistance: Contact the PACCAR Engine Support Call Center 1-800-477-0251
Description of component(s)	
Location of component(s)	
Diagnostic condition	
Set condition of fault code	
Reset condition of fault code	
Electrical diagram(s)	
Technical data	
Possible causes	
Additional information	
Diagnostic Step-by-Step	
Verification Drive Cycle	
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Code number	P1218
Fault code description	Injector solenoid valve cylinder 2 – Short circuit between ECU D420 pin A10 and A9
Fault code information	
Description of component(s)	For further assistance: Contact the PACCAR Engine Support Call Center 1-800-477-0251 Please contact Engine support center
Location of component(s)	
Diagnostic condition	
Set condition of fault code	
Reset condition of fault code	
Electrical diagram(s)	
Technical data	
Possible causes	
Additional information	
Diagnostic Step-by-Step	
Verification Drive Cycle	
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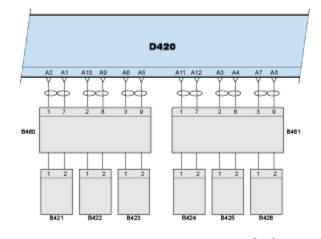


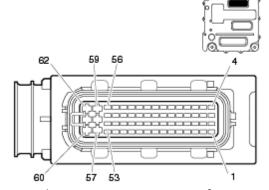
Code number	P1219
Fault code description	Injector solenoid valve cylinder 2 – Voltage too low or short circuit to ground on ECU
•	420 pin A9
Fault code information	
Description of component(s)	For further assistance: Contact the PACCAR Engine Support Call Center 1-800-477-0251 Please contact Engine support center
Location of component(s)	
Diagnostic condition	
Set condition of fault code	
Reset condition of fault code	
Electrical diagram(s)	
Technical data	
Possible causes	
Additional information	
Diagnostic Step-by-Step	
Verification Drive Cycle	
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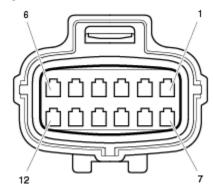
Fault code information 1 trip MIL 3 drive cycle recove Readiness group - Freeze frame type Description of component(s) The fuel injector in Control The amount of fuel	- None
Fault code information 1 trip MIL 3 drive cycle recove Readiness group - Freeze frame type Description of component(s) The fuel injector in Control The amount of fuel	- None e - Comprehensive njects fuel into the combustion chamber. el injected depends on the duration of the injector solenoid
3 drive cycle recove Readiness group - Freeze frame type Description of component(s) The fuel injector in Control The amount of fuel	- None e - Comprehensive njects fuel into the combustion chamber. el injected depends on the duration of the injector solenoid
Readiness group – Freeze frame type Description of component(s) The fuel injector in Control The amount of fue	- None e - Comprehensive njects fuel into the combustion chamber. el injected depends on the duration of the injector solenoid
Description of component(s) The fuel injector in Control The amount of fuel	e - Comprehensive njects fuel into the combustion chamber. el injected depends on the duration of the injector solenoid
Description of component(s) The fuel injector in Control The amount of fuel	e - Comprehensive njects fuel into the combustion chamber. el injected depends on the duration of the injector solenoid
Description of component(s) The fuel injector in Control The amount of fue	njects fuel into the combustion chamber. el injected depends on the duration of the injector solenoid
Control The amount of fue	el injected depends on the duration of the injector solenoid
	· · · · · · · · · · · · · · · · · · ·
	· · · · · · · · · · · · · · · · · · ·
activation in comb	
	the same rail pressure, the more fuel is injected.
Injector codes	ca p. casa. c,cc. c
· ·	r is calibrated during production to compensate for any production
· · · · · · · · · · · · · · · · · · ·	ector calibration code is present on the housing and connector of
-	e injector codes must be (re)programmed with DAVIE if one or more
	en replaced or fitted in another position, or if the PCI ECU is
replaced.	an replaced of fitted in another position, of it the refereous
'	or incorrectly programmed injector codes can result in reduced
	ice or a warning to the driver.
Location of component(s)	ice of a warning to the driver.
Location of component(s)	B422
Diagnostic conditionDiagnostic conditi second.	on is set when Power stage hardware is active in less than one
Set condition of fault code • High side volta	age on the injector (before injection) compared to battery voltage is
greater than t	he threshold value 80.00% then the condition is set.
Current throu	gh sense resistor on driver bank B is greater than the threshold
	then the condition is set.
Reset condition of fault code This fault code wil	Il change to inactive immediately after the diagnostic runs and
passes.	, ,







Wiring harness connector D420.A front view



Wiring harness connector B460 & B461 front view

B460 connector cylinders 1-3

B461 connector cylinders 4-6

D420 PCI ECU

B421 solenoid valve injector cylinder 1

B422 solenoid valve injector cylinder 2

B423 solenoid valve injector cylinder 3

B424 solenoid valve injector cylinder 4

B425 solenoid valve injector cylinder 5

B426 solenoid valve injector cylinder 6

D420 B460 B421 B422 B423 Function

A1 7 2 Signal low, injector solenoid valve cylinder 1



	A2	1	1			Signal hig	gh, injector solenoid valve cylinder 1
	A5	9		2		Signal lov	w, injector solenoid valve cylinder 3
	A6	3		1		Signal his	gh, injector solenoid valve cylinder 3
	A9	8			2	•	w, injector solenoid valve cylinder 2
	A10					_	gh, injector solenoid valve cylinder 2
	AIO	۷			1	Signal III	gri, injector solenola valve cylinder 2
	D420	B460	B424	B425	B426	Function	
	А3	2		1		Signal hig	gh, injector solenoid valve cylinder 5
	A4	8		2		Signal lov	w, injector solenoid valve cylinder 5
	A7	3			1	Signal hig	gh, injector solenoid valve cylinder 6
	A8	9			2	Signal lov	w, injector solenoid valve cylinder 6
	A11	1	1			_	gh, injector solenoid valve cylinder 4
	A12	7	2			•	w, injector solenoid valve cylinder 4
Technical data				ctorco	lonoid v		ler 1 (B421)
recillical data	Preparat		eck, iiije	ctor sc	nenoia v	aive cyllilu	ICI I (D421)
			the ign	ition			
		-	nect cor		r B460		
						nnector B	460
	Pin		Pin	0			
	(+ prob	(+ probe) (- probe) Value			Va	lue	Additional information
	1		7		± 0.6	67 Ω	Resistance value at 20°C [68°F]
					maximuı	m 0.94 Ω	Resistance value at 120°C [248°F]
	Component check, injector solenoid valve cylinder 2 (B422)						
	PreparationKey off the ignition						
	Key off the ignition Disconnect connector B460						
	Measure on wiring harness connector B460						
	Pin	vicasa	Pin	111118 1110	1111033 00	inicctor b	400
	(+ prob	e)	(- prob	e)	Va	lue	Additional information
	2		8		± 0.6	67 Ω	Resistance value at 20°C [68°F]
					maximuı	m 0.94 Ω	Resistance value at 120°C [248°F]
	Component check, injector solenoid valve cylinder 3 (B423)						
	Preparation						
	Key off the ignitionDisconnect connector B460						
	Disconnect connector B460 Measure on wiring harness connector B460						
	Pin	vicasu	Pin	g 110	c33 CU	ATTICCTOL D	
	(+ prob	e)	(- prob	e)	Va	lue	Additional information
	3	-,	9	- 1		67 Ω	Resistance value at 20°C [68°F]
			J			m 0.94 Ω	Resistance value at 120°C [248°F]



	Preparation						
	1	off the ignition					
	-	nnect connec					
				461			
		_	harness connector B	401			
	Pin	Pin	Malina	A deliti and information			
		(- probe)	Value	Additional information			
	1	7	± 0.67 Ω				
			maximum $0.94~\Omega$				
				[248°F]			
	Component of Preparation	check, injector	solenoid valve cylind	er 5 (B425)			
	Key c	off the ignition					
	•	nnect connec					
			harness connector B	461			
	Pin	Pin	Trainiess connector B	.01			
		(- probe)	Value	Additional information			
	2	8	± 0.67 Ω				
	_	Ü	maximum 0.94Ω	· · ·			
			maximam 0.54 22	[248°F]			
	Component check, injector solenoid valve cylinder 6 (B426) Preparation						
	·						
	Key off the ignition Disconnect connector R461						
	Disconnect connector B461Measure on wiring harness connector B461						
	Pin	Sure on wiring Pin	namess connector B	401			
			Value	Additional information			
		(- probe)	Value				
	3	9	± 0.67 Ω	<u>-</u>			
			maximum 0.94 Ω	Resistance value at 120°C [248°F]			
Possible causes			ition available				
Additional information	+	l information a					
Diagnostic Step-by-Step				elow using the breakout			
			•	cal components, such as			
				narnesses. Back probing is not			
		· ·	•	e harness. The ignition should			
		•	•	onnecting or disconnecting			
		-		uce the likelihood of damage to			
	el	ectrical compo					
			ecting the EAS conne	_			
			• .	result in multiple errors.			
	-			nent information and pinout			
			s, always refer to the				
				t code menu in DAVIE and run			
		_	_	dentify a change in errors.			
				perational or mechanical issues			
		-		h active and inactive fault			
		codes. R	Refer to the 'possible	causes' section.			



Step 1 Step ID 1220a SRT

Visually inspect all applicable connectors (bent, broken, corroded or loose pins) and harnesses for corrosion, damage, and rubbing during each step of the diagnostic procedure. Proceed to step 2.

Step 2 Step ID 1220b SRT

Electrical Checks

Ensure that the ignition key/switch has been set to OFF before disconnecting related cables.

Based on the fault message provided, confirm that the following electrical values are within specified ranges or limits:

- Supply and signal voltages (12V).
- Cable continuity (no opens or shorts).

Are measured electrical values outside of expected range or limits?

- Yes Proceed to step 3
- No Proceed to step 4

Step 3 Step ID 1220c SRT

Make the appropriate repairs or component replacements and use DAVIE to recheck for the presence of active faults.

- Fault inactive issue resolve
- Fault active Proceed to step 4

Step 4 Step ID 1220d SRT

Replace: Solenoid Valve Injector, Cylinder 2

Replace the identified faulty component and use DAVIE to re-check for the presence of active faults.

- Fault inactive issue resolve
- Fault active Proceed to step 5

Step 5 Step ID 1220e SRT

For further assistance in diagnosing this issue or for confirmation prior to the replacement of suspect components, contact the Engine Support Call Center at 1-800-477-0251.

Verification Drive Cycle

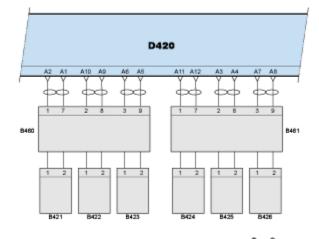
To validate repair, with the brakes set, turn the key to the ON position with the engine off, and allow 10 seconds for the system to initialize and run diagnostics.

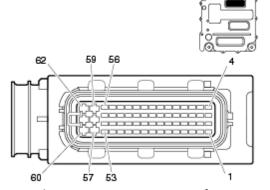
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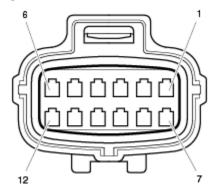
Code number	P1221
Fault code description	Injector solenoid valve cylinder 4 - Current too low or open circuit on ECU D420 pin
	A12
Fault code information	1 trip MIL
	3 drive cycle recovery
	Readiness group – None
	Freeze frame type - Comprehensive
Description of component(s)	The fuel injector injects fuel into the combustion chamber.
	Control
	The amount of fuel injected depends on the duration of the injector solenoid
	activation in combination with the rail pressure. The longer the solenoid is activated
	by the PCI ECU at the same rail pressure, the more fuel is injected.
	Injector codes
	Every fuel injector is calibrated during production to compensate for any production
	tolerances. An injector calibration code is present on the housing and connector of the injector. These injector codes must be (re)programmed with DAVIE if one or more
	injectors have been replaced or fitted in another position, or if the PCI ECU is
	replaced.
	Not programming or incorrectly programmed injector codes can result in reduced
	engine performance or a warning to the driver.
Location of component(s)	engine performance of a warning to the arrect.
	B424
Diagnostic condition	Diagnostic condition is set when Power stage hardware is active in less than one second
Set condition of fault code	Current in Needle control valve is less than 4.50A
Reset condition of fault code	This fault and will about to imputive impundintally often the diagnostic number of
Reset condition of fault code	This fault code will change to inactive immediately after the diagnostic runs and







Wiring harness connector D420.A front view



Wiring harness connector B460 & B461 front view

B460 connector cylinders 1-3

B461 connector cylinders 4-6

D420 PCI ECU

B421 solenoid valve injector cylinder 1

B422 solenoid valve injector cylinder 2

B423 solenoid valve injector cylinder 3

B424 solenoid valve injector cylinder 4

B425 solenoid valve injector cylinder 5

B426 solenoid valve injector cylinder 6

D420 B460 B421 B422 B423 Function

A1 7 2 Signal low, injector solenoid valve cylinder 1



					-2					
	A2 1	1		Signal hi	gh, injector solenoid valve cylinder 1					
	A5 9	2		Signal lo	w, injector solenoid valve cylinder 3					
	A6 3	1		Signal his	gh, injector solenoid valve cylinder 3					
	A9 8	_	2	•	w, injector solenoid valve cylinder 2					
				_	•					
	A10 2		1	Signai ni	gh, injector solenoid valve cylinder 2					
	D420 B46	0 B424 B42	25 B426	Function	1					
	A3 2	1		Signal hig	gh, injector solenoid valve cylinder 5					
	A4 8	2		Signal lo	w, injector solenoid valve cylinder 5					
	A7 3		1	Signal hig	gh, injector solenoid valve cylinder 6					
	A8 9		2	Signal lo	w, injector solenoid valve cylinder 6					
	A11 1	1		_	gh, injector solenoid valve cylinder 4					
	A12 7	2		-	w, injector solenoid valve cylinder 4					
			1							
echnical data	•	check, injector	solenola va	aive cylind	der 1 (B421)					
	Preparation	off the ignition								
	Key off the ignitionDisconnect connector B460									
		Measure on wiring harness connector B460								
		Pin Pin								
	(+ probe)	(- probe)	Val	ue	Additional information					
	1 1	7	± 0.6		Resistance value at 20°C [68°F]					
			maximun	n 0.94 Ω	Resistance value at 120°C [248°F]					
	Component	Component check, injector solenoid valve cylinder 2 (B422)								
		Preparation								
	· ·	· · · · · · · · · · · · · · · · · · ·								
	•	Disconnect connector B460								
	• Mea	Measure on wiring harness connector B460								
	Pin	_								
	(+ probe)	(- probe)	Val	ue	Additional information					
	2	8	± 0.6	57 Ω	Resistance value at 20°C [68°F]					
			maximun	n 0.94 Ω	Resistance value at 120°C [248°F]					
	Component	Component check, injector solenoid valve cylinder 3 (B423)								
	Preparation	Preparation								
	•	Key off the ignition								
		Disconnect connector B460								
		sure on wiring	harness co	nnector B	460					
	Pin	Pin								
	(+ probe)	(- probe)	Val		Additional information					
	3	9	± 0.6		Resistance value at 20°C [68°F]					
			maximun	n 0.94 Ω	Resistance value at 120°C [248°F]					
	Component	check, injector	solenoid va	alve cylino	der 4 (B424)					
	Preparation	-		-						
	• Vou	off the ignition								

• Key off the ignition



	• Disco	nnect connect	tor B461					
	• Mea	sure on wiring	harness connector B	461				
	Pin	Pin						
	(+ probe)	(- probe)	Value	Additional information				
	1	7	± 0.67 Ω	Resistance value at 20°C [68°F]				
			maximum 0.94 Ω	Resistance value at 120°C				
				[248°F]				
	Component of	check, injector	solenoid valve cylind	ler 5 (B425)				
	Preparation	, ,	,	,				
	,	off the ignition						
	-	onnect connect						
			harness connector B	461				
	Pin	Pin						
	(+ probe)		Value	Additional information				
	2	8	± 0.67 Ω					
	_	· ·	maximum 0.94 Ω					
			1110X11110111 0.54 12	Resistance value at 120 e [240 1]				
	Component of Preparation	check, injector	solenoid valve cylind	ler 6 (B426)				
		off the ignition						
	1	_						
	Disconnect connector B461Measure on wiring harness connector B461							
	Pin	Pin	mariness connector b	401				
	(+ probe)		Value	Additional information				
	3	9	± 0.67 Ω	Resistance value at 20°C [68°F]				
		9	maximum 0.94 Ω					
Descible source	No possible s	ausas infarma		Nesistance value at 120 C [246 T]				
Possible causes	•	auses informa						
Additional information		l information a		lanning the breekenst begans if				
Diagnostic Step-by-Step	_			low using the breakout harness, if ents, such as sensors, electrical				
	<i>y</i> •	-						
	control units, and harnesses. Back probing is not recommended, as it could damage the harness. The ignition should always be in the OFF							
	position when connecting or disconnecting electrical components in							
	order to reduce the likelihood of damage to electrical components.							
	Disconnecting the EAS connectors during the troubleshooting							
	process will result in multiple errors.							
	ٺ	•	•	ent information and pinout				
	locations, always refer to the technical data.							
	It is necessary to exit the fault code menu in DAVIE and run the							
	diagnostic test again to identify a change in errors.							
		_	~	erational or mechanical issues				
		may be th	ne root cause of both	active and inactive fault codes.				
	may be the root cause of both active and inactive fault codes. Refer to the 'possible causes' section.							
		Refer to t	the possible causes s	section.				
	Step 1	Refer to t	Step ID 1221a	SRT				
			Step ID 1221a					
	Visually insp	pect all applica	Step ID 1221a ble connectors (bent	SRT				

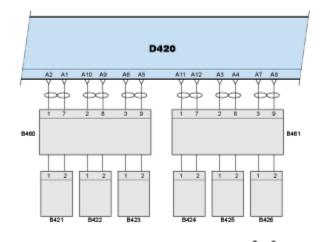


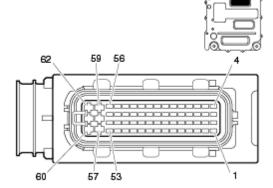
	Step 2	Step ID 1221b	SRT								
	Electrical Checks										
	Ensure that the ignition key/switch has been set to OFF before disconnecting										
	related cables.	related cables.									
		• •	hat the following electrical								
	values are within spec	values are within specified ranges or limits:									
	Supply and sign	nal voltages (12V).									
	Cable continui	ity (no opens or shorts).									
	Are measured electric	al values outside of exped	cted range or limits?								
	Yes - Proceed	to step 3									
	No - Proceed	to step 4									
	Step 3	Step ID 1221c	SRT								
	Make the appropriate	repairs or component re	placements and use DAVIE to re-								
	check for the presence	e of active faults.									
	Fault inactive	– issue resolve									
	 Fault active - 	Proceed to step 4									
	Step 4	Step ID 1221d	SRT								
	Replace: Solenoid Valv	e Injector, Cylinder 4									
	Replace the identified	faulty component and us	se DAVIE to re-check for the								
	presence of active fau	lts.									
	Fault inactive	– issue resolve									
	Fault active -	Proceed to step 5									
	Step 5	Step ID 1221e	SRT								
			r for confirmation prior to the								
	replacement of suspect 1-800-477-0251.	ct components, contact th	ne Engine Support Call Center at								
Verification Drive Cycle	To validate repair, with	the brakes set, turn the k	key to the ON position with the								
	engine off, and allow 10	seconds for the system	to initialize and run diagnostics.								
			Back to Inc								



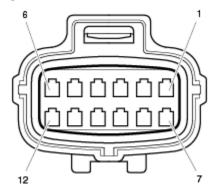
Code number	P1222
Fault code description	Injector solenoid valve cylinder 4– Short circuit between ECU D420 pin A11 and A12
Fault code information	1 trip MIL
	3 drive cycle recovery
	Readiness group – None
	Freeze frame type – Comprehensive
Description of component(s)	The fuel injector injects fuel into the combustion chamber.
	Control
	The amount of fuel injected depends on the duration of the injector solenoid
	activation in combination with the rail pressure. The longer the solenoid is activated
	by the PCI ECU at the same rail pressure, the more fuel is injected.
	Injector codes
	Every fuel injector is calibrated during production to compensate for any production
	tolerances. An injector calibration code is present on the housing and connector of the injector. These injector codes must be (re)programmed with DAVIE if one or more
	injectors have been replaced or fitted in another position, or if the PCI ECU is
	replaced.
	Not programming or incorrectly programmed injector codes can result in reduced
	engine performance or a warning to the driver.
Location of component(s)	anguite performance of a maximing to the annual
	B424
Diagnostic condition	The diagnostic runs when power stage hardware is active
Set condition of fault code	This condition is set when
	High side voltage on the injector (before injection) compared to battery
	voltage is in between 20% to 80% of threshold value
	Current through sense resistor on driver bank A is more than 25 A
Reset condition of fault code	This fault code will change to inactive immediately after the diagnostic runs and
	passes.







Wiring harness connector D420.A front view



Wiring harness connector B460 & B461 front view

B460 connector cylinders 1-3

B461 connector cylinders 4-6

D420 PCI ECU

B421 solenoid valve injector cylinder 1

B422 solenoid valve injector cylinder 2

B423 solenoid valve injector cylinder 3

B424 solenoid valve injector cylinder 4

B425 solenoid valve injector cylinder 5

B426 solenoid valve injector cylinder 6

D420 B460 B421 B422 B423 Function

A1 7 2

Signal low, injector solenoid valve cylinder 1



							PACCAR
	A2	1	1			Signal hig	gh, injector solenoid valve cylinder 1
	A5	9		2		Signal lov	w, injector solenoid valve cylinder 3
	A6	3		1		Signal hig	gh, injector solenoid valve cylinder 3
	A9	8			2	Signal lov	w, injector solenoid valve cylinder 2
	A10	2			1	Signal hi	gh, injector solenoid valve cylinder 2
	D420	B460	B424	B425	B426	Function	
	A3	2		1		Signal hi	gh, injector solenoid valve cylinder 5
	A4	8		2		Signal lov	w, injector solenoid valve cylinder 5
	A7	3			1	Signal hig	gh, injector solenoid valve cylinder 6
	A8	9			2	Signal lov	w, injector solenoid valve cylinder 6
	A11	1	1			Signal hi	gh, injector solenoid valve cylinder 4
	A12	7	2			Signal lov	w, injector solenoid valve cylinder 4
Technical data	Compo Prepara	ation Key off Discon	the ign	ition nnectoi	r B460	alve cylind	ler 1 (B421) 460
	Pir		Pin				
	(+ pro	be)	(- prob	e)		lue	Additional information
	1		7			67 Ω	Resistance value at 20°C [68°F]
					maxımu	m 0.94 Ω	Resistance value at 120°C [248°F]

Component check, injector solenoid valve cylinder 2 (B422)

Preparation

- Key off the ignition
- Disconnect connector B460
- Measure on wiring harness connector B460

Pin	Pin		
(+ probe)	(- probe)	Value	Additional information
2	8	± 0.67 Ω	Resistance value at 20°C [68°F]
		maximum 0.94 Ω	Resistance value at 120°C [248°F]

Component check, injector solenoid valve cylinder 3 (B423) Preparation

- Key off the ignition
- Disconnect connector B460
- Measure on wiring harness connector B460

Pin	Pin		
(+ probe)	(- probe)	Value	Additional information
3	9	± 0.67 Ω	Resistance value at 20°C [68°F]
		maximum 0.94 Ω	Resistance value at 120°C
			[248°F]

Component check, injector solenoid valve cylinder 4 (B424)



	T								
	Preparation								
	-	off the ignition							
	Disconnect connector B461								
	• Mea	sure on wiring	harness connector B	461					
	Pin	Pin							
	(+ probe)	(- probe)	Value	Additional information					
	1	7	± 0.67 Ω	Resistance value at 20°C [68°F]					
			maximum 0.94 Ω	Resistance value at 120°C					
				[248°F]					
				[2101]					
	Component Preparation	check, injector	solenoid valve cylind	er 5 (B425)					
		off the ignition							
		onnect connec							
				4.6.4					
		_	harness connector B	401					
	Pin	Pin (varialisa)		Additional information					
		(- probe)	Value	Additional information					
	2	8	± 0.67 Ω	Resistance value at 20°C [68°F]					
			maximum 0.94 Ω	Resistance value at 120°C [248°F]					
	Component	check, injector	solenoid valve cylind	er 6 (B426)					
	Preparation	Preparation							
	Key 6	off the ignition							
	• Disco	onnect connec	tor B461						
			harness connector B	461					
	Pin	Pin							
	(+ probe)		Value	Additional information					
	3	9	± 0.67 Ω	Resistance value at 20°C [68°F]					
		J		Resistance value at 120°C					
			maximum 0.94 Ω	[248°F]					
Possible causes	<u> </u>	causes availabl							
Additional information		I information a							
Diagnostic Step-by-Step			- ·	ow using the breakout harness,					
	<i>y</i> •	-	-	nents, such as sensors,					
	ele	ctrical control	units, and harnesses.	Back probing is not					
	red	commended, a	s it could damage the	harness. The ignition should					
	always be in the OFF position when connecting or disconnecting								
	ele	ctrical compor	nents in order to redu	ice the likelihood of damage to					
	ele	ctrical compor	nents.						
		 Disconne 	ecting the EAS connec	tors during the troubleshooting					
		process v	will result in multiple o	errors.					
	لت	• For speci	fic electrical compone	ent information and pinout					
		locations	, always refer to the t	echnical data.					
		100010113	, and a joiner to the t						
1			· · · · · · · · · · · · · · · · · · ·	code menu in DAVIE and run					
		• It is neces	ssary to exit the fault						
		 It is neces the diagn 	ssary to exit the fault nostic test again to ide	code menu in DAVIE and run					
		It is necessive the diagramRememb	ssary to exit the fault nostic test again to ide er that the truck's op	code menu in DAVIE and run entify a change in errors.					

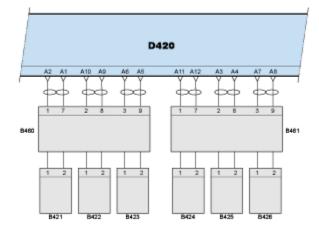


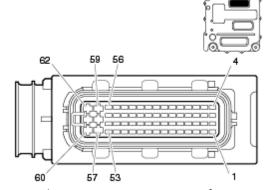
Step 1 Step ID 1222a SRT Visually inspect all applicable connectors (bent, broken, corroded or loose pins) and harnesses for corrosion, damage, and rubbing during each step of the diagnostic procedure. Proceed to step 2. Step 2 Step ID 1222b SRT **Electrical Checks** Ensure that the ignition key/switch has been set to OFF before disconnecting related cables. Based on the fault message provided, confirm that the following electrical values are within specified ranges or limits: Supply and signal voltages (12V). • Cable continuity (no opens or shorts). Are measured electrical values outside of expected range or limits? Yes - Proceed to step 3 No - Proceed to step 4 Step ID 1222c SRT Step 3 Repairs or component replacements appropriate component and use DAVIE to recheck for the presence of active faults. Fault inactive - issue resolve Fault active - Proceed to step 4 Step 4 Step ID 1222d SRT For further assistance in diagnosing this issue or for confirmation prior to the replacement of suspect components, contact the Engine Support Call Center at 1-800-477-0251. **Verification Drive Cycle** To validate repair, with the brakes set, turn the key to the ON position with the engine off, and allow 10 seconds for the system to initialize and run diagnostics. **Back to Index**



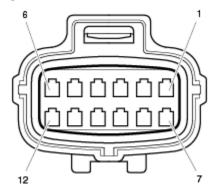
Code number	P1223
Fault code description	Injector solenoid valve cylinder 4– Voltage too low or short circuit to ground on ECU
·	D420 pin A12
Fault code information	1 trip MIL
	3 drive cycle recovery
	Readiness group – None
	Freeze frame type – Comprehensive
Description of component(s)	The fuel injector injects fuel into the combustion chamber.
	Control
	The amount of fuel injected depends on the duration of the injector solenoid
	activation in combination with the rail pressure. The longer the solenoid is activated
	by the PCI ECU at the same rail pressure, the more fuel is injected.
	Injector codes
	Every fuel injector is calibrated during production to compensate for any production
	tolerances. An injector calibration code is present on the housing and connector of
	the injector. These injector codes must be (re)programmed with DAVIE if one or more
	injectors have been replaced or fitted in another position, or if the PCI ECU is
	replaced.
	Not programming or incorrectly programmed injector codes can result in reduced
	engine performance or a warning to the driver.
Location of component(s)	
	B424
	D424
Diagnostic condition	The diagnostic runs when power stage hardware is active
Set condition of fault code	This condition is set when
	High side voltage on the injector (before injection) compared to battery
	voltage is less than 20% of threshold value
	Current through sense resistor on driver bank B is less than 4.5 A
Reset condition of fault code	This fault code will change to inactive immediately after the diagnostic runs and
Reset condition of fault code	







Wiring harness connector D420.A front view



Wiring harness connector B460 & B461 front view

B460 connector cylinders 1-3

B461 connector cylinders 4-6

D420 PCI ECU

B421 solenoid valve injector cylinder 1

B422 solenoid valve injector cylinder 2

B423 solenoid valve injector cylinder 3

B424 solenoid valve injector cylinder 4

B425 solenoid valve injector cylinder 5

B426 solenoid valve injector cylinder 6

D420 B460 B421 B422 B423 Function

A1 7 2 Signal low, injector solenoid valve cylinder 1



	A2	1	1			Signal hig	gh, injector solenoid valve cylinder 1
	A5	9		2		Signal lov	w, injector solenoid valve cylinder 3
	A6	3		1		Signal hig	gh, injector solenoid valve cylinder 3
	A9	8			2	Signal lov	w, injector solenoid valve cylinder 2
	A10	2			1	Signal hig	gh, injector solenoid valve cylinder 2
						0 (,
	D420	B460	B424	B425	B426	Function	
	А3	2		1		Signal hig	gh, injector solenoid valve cylinder 5
	A4	8		2		Signal lov	w, injector solenoid valve cylinder 5
	A7	3			1	Signal hig	gh, injector solenoid valve cylinder 6
	A8	9			2	Signal lov	w, injector solenoid valve cylinder 6
	A11	1	1			Signal hig	gh, injector solenoid valve cylinder 4
	A12	7	2			Signal lov	w, injector solenoid valve cylinder 4
Technical data	Compor	nent che	eck, inje	ctor sc	olenoid v	alve cylind	er 1 (B421)
	Prepara					•	·
	•	Key off	the ign	ition			
			nect cor				
				iring ha	arness co	nnector B	460
	Pin (+ pro		Pin (- prob	۵۱	Va	lue	Additional information
	1	DC)	7	C)		67 Ω	Resistance value at 20°C [68°F]
			•			m 0.94 Ω	Resistance value at 120°C
							[248°F]
	Compor	nent che	eck. inie	ctor sc	olenoid v	alve cylind	er 2 (B422)
	Prepara		, ,			,	,
	•	Key off	the ign	ition			
			nect cor				
				iring ha	arness co	nnector B	460
	Pin (+ pro		Pin (- prob	۵۱	Va	lue	Additional information
	2	DC)	8	C)		67 Ω	Resistance value at 20°C [68°F]
	_		J			m 0.94 Ω	Resistance value at 120°C
							[248°F]
	Compor	nent che	eck. inie	ector sc	olenoid v	alve cylind	er 3 (B423)
	Prepara		,, -				
	•	Key off	the ign	ition			
	•	Discon	nect cor	necto	r B460		
				iring ha	arness co	nnector B	460
	Pin		Pin	٥)	\/-	المام	Additional information
	(+ pro	ue)	(- probe	e)		lue 67 Ω	Additional information Resistance value at 20°C [68°F]
	3		9			m 0.94 Ω	Resistance value at 20 °C [06 F]
					aaiiiiui	0.5 7 32	[248°F]
							- · · · · ·

Component check, injector solenoid valve cylinder 4 (B424)



	T									
	Preparation									
	Key off the ignition									
	Disconnect connector B461Measure on wiring harness connector B461									
	Pin Pin									
	(+ probe)	(- probe)	Value	Additional information						
	1	7	± 0.67 Ω	Resistance value at 20°C [68°F]						
			maximum 0.94 Ω	Resistance value at 120°C						
				[248°F]						
	Preparation		solenoid valve cylind	ler 5 (B425)						
	• Key c	off the ignition								
	• Disco	nnect connec	tor B461							
	• Meas	sure on wiring	harness connector B	461						
	Pin	Pin								
	(+ probe)	(- probe)	Value	Additional information						
	2	8	± 0.67 Ω	Resistance value at 20°C [68°F]						
			maximum 0.94 Ω	Resistance value at 120°C [248°F]						
	Component check, injector solenoid valve cylinder 6 (B426)									
	Preparation									
	Key off the ignition									
	Disconnect connector B461									
	• Meas	sure on wiring	harness connector B	461						
	Pin	Pin								
	(+ probe)	(- probe)	Value	Additional information						
	3	9	± 0.67 Ω	Resistance value at 20°C [68°F]						
			maximum 0.94 Ω	Resistance value at 120°C [248°F]						
Possible causes	No possible c	auses availabl	e.							
Additional information	No additiona	l information a	available.							
Diagnostic Step-by-Step	Per	form the trou	bleshooting steps bel	low using the breakout harness, if						
	nec	essary, to che	ck electrical compon	ents, such as sensors, electrical						
	cor	itrol units, and	l harnesses. Back pro	bing is not recommended, as it						
	cou	ıld damage the	e harness. The ignitio	n should always be in the OFF						
	position when connecting or disconnecting electrical components in									
	-		_	age to electrical components.						
	Disconnecting the EAS connectors during the troubleshooting									
			vill result in multiple	_						
	ئ	•	•	ent information and pinout						
		-	, always refer to the t							
				code menu in DAVIE and run the						
				fy a change in errors.						
		_	_	perational or mechanical issues						
				active and inactive fault codes.						
		Refer to 1	the 'possible causes' s	section.						



	Step 1	Step ID 1223a	SRT						
	Visually inspect all	applicable connectors (bent, b	roken, corroded or loose pins)						
	and harnesses for	corrosion, damage, and rubbin	g during each step of the						
	diagnostic procedu	ure. Proceed to step 2.							
	Step 2	Step ID 1223b	SRT						
	Electrical Checks								
	Ensure that the igr	nition key/switch has been set	to OFF before disconnecting						
	related cables.								
		<u> </u>	at the following electrical values						
	are within specifie	_							
	Supply and signal voltages (12V).								
	Cable continuity (no opens or shorts).								
	Are measured electrical values outside of expected range or limits?								
	Yes - Proceed to step 3								
	No - Proce	eed to step 4							
	Step 3	Step ID 1223c	SRT						
	11 -	Repairs or component replacements appropriate component and use DAVIE to re-							
	check for the presence of active faults.								
	Fault inactive – issue resolve								
	Fault activ	e - Proceed to step 4							
	Step 4	Step ID 1223d	SRT						
	For further assistance in diagnosing this issue or for confirmation prior to the								
	replacement of suspect components, contact the Engine Support Call Center at								
	1-800-477-0251.								
Verification Drive Cycle		with the brakes set, turn the ke	•						
	engine off, and allow	w 10 seconds for the system to	initialize and run diagnostics.						
			Back to Inc						