

E290: EPA2021 PACCAR MX Fuel Injector Cleaning Procedure

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Number

E290

Subject

EPA2021 PACCAR MX Engine Fuel Injector Cleaning Procedure

Date

3/31/2022

Revision

11/20/2023: Updated procedures and SRT time to include Fuel Filter replacement during cleaning process. Removed in-tank additive references.

06/28/2023: Updated procedures to include high-pressure tests of injector pipes during injector replacement. Updated bulletin and warranty descriptions to clarify procedures and documentation requirements.

04/03/2023: Bulletin updated to clarify bulletin flow with RMI. Removed fuel filter element replacement steps in procedures. Added second cleaning cycle if necessary. Removed in-tank additive information. Added quick claim for repairs on or after 04/03/2023. Added references to E300.

01/27/2023: Updated part number for Diesel Kleen additive.

01/04/2023: Revised in-tank fuel additives in Procedures section.

12/16/2022: Removed John Deere additive from the recommended list.

09/26/2022: Updated Procedures diagram for before/after cleaning comparison of Unbalance Detection test results.

08/11/2022: Added in-tank cleaner information in the Procedure section.

07/22/2022: Removed Fleetguard Diesel Fuel Injector Cleaner option from in-tank additive table.

06/15/2022: Edited parts and tool tables. Added in-tank additive recommendation.

06/03/2022: Adjusted cleaning solutions. DSG 4+ is now available from PPD for US use. John Deere is no longer listed as an alternate.

05/23/2022: Adjusted preferred order of cleaning solutions: DSG 4+ is now preferred while John Deere is an alternate.

05/16/2022: Removed "disconnect aftertreatment system" step in procedures. Updated SRT codes and parts lists.

04/28/2022: Removed Stanadyne cleaning solution. Stanadyne #43566 is not to be used as a cleaner for this procedure.

04/22/2022: Added secondary tool kit part number. Adjusted preference for cleaning fluids. Removed mileage

limit for affected chassis.

04/13/2022: Updated the Parts section to include an alternative fuel system cleaning tool kit.

04/07/2022: Updated contact information for DSG ordering.

04/04/2022: Updated parts section and procedures document.

Condition

Chassis affected may experience one or more of the following DTCs or symptoms;

- Engine Knock
- P3300
- P0300
- P0301, P0302, P0303, P0304, P0305, P0306
- P1263, P1266, P1269, P1272, P1275, P1278
- P0263, P0266, P0269, P0272, P0275, P0278

Chassis Affected

All Model Year 2021 and later Model 389, 520, 567, 579, and 579 MLU chassis equipped with EPA2021 compliant PACCAR MX-11 and MX-13 engines.

Action

Fix-As-Fail

If a customer comes into your dealership and demonstrates the condition above, refer to RMI for troubleshooting procedures for specific fault codes. Complete the procedures attached below for injector cleaning.

Troubleshooting, admin time, and verification steps are NOT included in the cleaning Quick Claims. Use the editable Quick Claim (E290A) or file a separate claim for additional time and materials.

1. Check SIR for “complete” next to **E290A**. The vehicle SIR is also available in .pdf format under “Attachments” in Service Management. If “complete” shows next to **E290A**, the cleaning has been previously performed. See warranty section for filing instructions on vehicles that require additional cleaning.

2. If **E290A** does not appear in SIR, check the "Asset Service History" under the "Asset Profile" in Service Management to ensure another dealer has not recently completed the repair.


3. When completing this cleaning, make sure to manually enter **E290A** in a *new operation line* in Service Management when starting repairs to ensure the repair is tracked properly.

Warranty

Through Base Warranty or any applicable active Extended Warranty, Peterbilt will pay for parts at dealer net plus

applicable mark-up and labor:


CAMPAIGN AND SRT CODES Repairs completed from 04/01/2023 to 11/20/2023			
Quick Claim Code	SRT Code	Labor Hours	Use
E290A1	B23-04A	1.1	Repairs completed from 4/01/2023 to 11/20/2023 – Cleaning performed ONCE.
E290A2	B23-04B	1.9	Repairs completed from 4/01/2023 to 11/20/2023 – Cleaning performed TWICE in same service event.
E290A3	Editable	Editable	Repairs completed from 4/01/2023 to 11/20/2023 – Includes 2 cleanings according to the attached procedures AND injector replacement (ONLY unbalanced injectors on MX-11 or MX-13) in the same service event. Injector replacement may only be claimed ONCE.

<p align="center">CAMPAIGN AND SRT CODES</p> <p align="center">Repairs completed from 04/01/2023 to 11/20/2023</p>			
Quick Claim Code	SRT Code	Labor Hours	Use
			<p align="center"> NOTE</p> <p>This is a long-form editable claim that must include 3 test results from DAVIE4. Include all associated labor and parts for injector replacement per RMI.</p>
E290A4	B23-04C	1.0	Repairs completed from 4/01/2023 to 11/20/2023 – Cleaning performed ONCE – Only applies to MY2023 chassis with NA31 RC1 software – See Procedures for details.
E290A5	B23-04D	1.6	Repairs completed from 4/01/2023 to 11/20/2023 – Cleaning performed

CAMPAIGN AND SRT CODES Repairs completed from 04/01/2023 to 11/20/2023			
Quick Claim Code	SRT Code	Labor Hours	Use
			TWICE in same service event. – Only applies to MY2023 chassis with NA31 RC1 software – See Procedures for details.
E290B1	B23-04A	1.1	Subsequent claim for secondary cleaning completed from 4/01/2023 to 11/20/2023 on vehicles with E290A “Complete” – cleaning performed ONCE in second service event
E290B2	B23-04B	1.9	Subsequent claim for secondary cleaning completed from 4/01/2023 to 11/20/2023 on vehicles with E290A “Complete” – cleaning performed TWICE in second service event.
E290B3	Editable	Editable	Subsequent

CAMPAIGN AND SRT CODES


**Repairs completed from
04/01/2023 to 11/20/2023**

Quick Claim Code	SRT Code	Labor Hours	Use
			<p>claim for secondary cleaning on vehicles with E290A "Complete" - Repairs completed from 4/01/2023 to 11/20/2023 – Includes 2 cleanings according to the attached procedures AND injector replacement (ONLY unbalanced injectors on MX-11 or MX-13) in the same service event. Injector replacement may only be claimed ONCE.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p style="text-align: center;"> NOTE</p> <p>This is a long-form editable claim that must include 3 test results from DAVIE4. Include all associated</p> </div>

CAMPAIGN AND SRT CODES Repairs completed from 04/01/2023 to 11/20/2023			
Quick Claim Code	SRT Code	Labor Hours	Use
			labor and parts for injector replacement per RMI.
E290B4	B23-04C	1.0	Subsequent claim for secondary cleaning completed from 4/01/2023 to 11/20/2023 on vehicles with E290A "Complete" – Cleaning performed ONCE in second service event .– Only applies to MY2023 chassis with NA31 RC1 software – See Procedures for details.
E290B5	B23-04D	1.6	Subsequent claim for secondary cleaning completed from 4/01/2023 to 11/20/2023 on vehicles with E290A "Complete" – Cleaning performed


CAMPAIGN AND SRT CODES Repairs completed from 04/01/2023 to 11/20/2023			
Quick Claim Code	SRT Code	Labor Hours	Use
			TWICE in second service event – Only applies to MY2023 chassis with NA31 RC1 software – See Procedures for details.

CAMPAIGN AND SRT CODES Repairs completed ON or AFTER 11/20/2023			
Quick Claim Code	SRT Code	Labor Hours	Use
E290C1	B23-04E	1.4	Repairs completed ON or AFTER 11/20/2023 – Cleaning performed ONCE.
E290C2	B23-04F	2.2	Repairs completed ON or AFTER 11/20/2023 – Cleaning performed TWICE in same service event.
E290C3	Editable	Editable	Repairs completed ON or AFTER 11/20/2023 –

<p align="center">CAMPAIGN AND SRT CODES</p> <p align="center">Repairs completed ON or AFTER 11/20/2023</p>			
Quick Claim Code	SRT Code	Labor Hours	Use
			<p>Includes 2 cleanings according to the attached procedures AND injector replacement (ONLY unbalanced injectors on MX-11 or MX-13) in the same service event. Injector replacement may only be claimed ONCE.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p align="center"> NOTE</p> <p>This is a long-form editable claim that must include 3 test results from DAVIE4. Include all associated labor and parts for injector replacement per RMI.</p> </div>
E290C4	B23-04G	1.3	Repairs completed ON or AFTER

<p align="center">CAMPAIGN AND SRT CODES</p> <p align="center">Repairs completed ON or AFTER 11/20/2023</p>			
Quick Claim Code	SRT Code	Labor Hours	Use
			11/20/2023 – Cleaning performed ONCE – Only applies to MY2023 chassis with NA31 RC1 software – See Procedures for details.
E290C5	B23-04H	1.9	Repairs completed ON or AFTER 11/20/2023 – Cleaning performed TWICE in same service event. – Only applies to MY2023 chassis with NA31 RC1 software – See Procedures for details.
E290D1	B23-04E	1.4	Subsequent claim for secondary cleaning completed ON or AFTER 11/20/2023 on vehicles with E290A “Complete” – cleaning performed ONCE in second service event

CAMPAIGN AND SRT CODES Repairs completed ON or AFTER 11/20/2023			
Quick Claim Code	SRT Code	Labor Hours	Use
E290D2	B23-04F	2.2	Subsequent claim for secondary cleaning completed ON or AFTER 11/20/2023 on vehicles with E290A "Complete" – cleaning performed TWICE in second service event.
E290D3	Editable	Editable	Subsequent claim for secondary cleaning on vehicles with E290A "Complete" - Repairs completed ON or AFTER 11/20/2023 – Includes 2 cleanings according to the attached procedures AND injector replacement (ONLY unbalanced injectors on MX-11 or MX-13) in the same service event. Injector replacement may only be claimed

CAMPAIGN AND SRT CODES Repairs completed ON or AFTER 11/20/2023			
Quick Claim Code	SRT Code	Labor Hours	Use
			ONCE. <div style="border: 1px solid black; padding: 5px; margin: 5px 0;">  <p>NOTE</p> </div> <p>This is a long-form editable claim that must include 3 test results from DAVIE4. Include all associated labor and parts for injector replacement per RMI.</p>
E290D4	B23-04G	1.3	Subsequent claim for secondary cleaning completed ON or AFTER 11/20/2023 on vehicles with E290A "Complete" – Cleaning performed ONCE in second service event.– Only applies to MY2023 chassis with NA31 RC1 software –

CAMPAIGN AND SRT CODES Repairs completed ON or AFTER 11/20/2023			
Quick Claim Code	SRT Code	Labor Hours	Use
			See Procedures for details.
E290D5	B23-04H	1.9	Subsequent claim for secondary cleaning completed ON or AFTER 11/20/2023 on vehicles with E290A "Complete" – Cleaning performed TWICE in second service event – Only applies to MY2023 chassis with NA31 RC1 software – See Procedures for details.

For repairs completed from 4/01/2023 through 11/20/2023:

- **1.1 hours** labor to perform the attached cleaning procedure ONCE in the same service event – according to the attached procedure and verify the injector calibration. Use appropriate quick claim code from the table above. This quick claim does NOT include filter element replacement.
- **1.9 hours** labor to perform the attached cleaning procedure TWICE in the same service event – according to the attached procedure and verify the injector calibration. Use appropriate quick claim code from the table above. This quick claim does NOT include filter element replacement.
- **1.0 hours** labor to perform the attached cleaning procedure ONCE in the same service event - according to the attached procedure on MY2023 chassis with NA31 RC1 software. Use appropriate quick claim code from the table above. This quick claim does NOT include filter element replacement.
- **1.6 hours** labor to perform the attached cleaning procedure TWICE in the same service event - according to

the attached procedure on MY2023 chassis with NA31 RC1 software. Use appropriate quick claim code from the table above. This quick claim does NOT include filter element replacement.

- Parts and labor to replace unbalanced injectors after 2 cleanings per RMI procedures on MX-13 or MX-11 engine. File a claim for actual parts and labor required for unbalanced injector replacement on the individual chassis per RMI. See parts section for necessary replacement parts. **This is an additional long-form editable claim that must include 3 test results from DAVIE4 – Use quick claim E290A3 or E290B3 as appropriate.**
- If the vehicle has previously completed E290A and requires another cleaning in a second service event, file a claim using the appropriate quick claim code from the tables above in the Campaign Code Field – **E290B1, E290B2, E290B3, E290B4, or E290B5** as appropriate.

For repairs completed ON or AFTER 11/20/2023:

- **1.4 hours** labor to perform the attached cleaning procedure ONCE in the same service event – according to the attached procedure and verify the injector calibration. Use appropriate quick claim code from the table above.
- **2.2 hours** labor to perform the attached cleaning procedure TWICE in the same service event – according to the attached procedure and verify the injector calibration. Use appropriate quick claim code from the table above.
- **1.3 hours** labor to perform the attached cleaning procedure ONCE in the same service event - according to the attached procedure on MY2023 chassis with NA31 RC1 software. Use appropriate quick claim code from the table above.
- **1.9 hours** labor to perform the attached cleaning procedure TWICE in the same service event - according to the attached procedure on MY2023 chassis with NA31 RC1 software. Use appropriate quick claim code from the table above.
- Parts and labor to replace unbalanced injectors after 2 cleanings per RMI procedures on MX-13 or MX-11 engine. File a claim for actual parts and labor required for unbalanced injector replacement on the individual chassis per RMI. See parts section for necessary replacement parts. **This is an additional long-form editable claim that must include 3 test results from DAVIE4 – Use quick claim E290C3 or E290D3 as appropriate.**
- If the vehicle has previously completed E290A and requires another cleaning in a second service event, file a claim using the appropriate quick claim code from the tables above in the Campaign Code Field – **E290D1, E290D2, E290D3, E290D4, or E290D5** as appropriate.



NOTE

If the vehicle previously had injectors replaced under this bulletin and is found to have unbalanced injectors **after 2 cleanings** during a

subsequent service event, do the following:

1. Replace **ONLY** the unbalanced injector(s).
2. File an additional long form claim for the replaced injector(s) and labor per RMI.



NOTE

If using **PACCAR FX9 Fuel System Cleaner (2281100PE)**, please select E290A (editable) and enter as a "Non-PACCAR Part with cost incurred."

- For extraordinary circumstances, please use code **E290A** (during vehicle's first visit to the dealer for E290) or **E290B** (during a vehicles second visit to the dealer for E290). Add from "Recommended Repairs", then select the gear icon to edit Parts/Labor/Misc.
- File the claim within 7 days in accordance with the Warranty Policy.
- If injectors are replaced, return take-off parts to Borg-Warner as specified in the warranty Return Authorization (RA). Ensure that the actual take-off part numbers are included on the RA and match the causal part listed on the engine warranty claim.
- Peterbilt dealers may perform E290A repairs on Kenworth chassis, but Quick Claims do not apply. For

Kenworth chassis repairs, use the long claim input form.

PRWS CLAIM CODING			
Campaign Code:	E290A	Campaign Type:	Field Repair
Claim Category:	Engine	Repair Type:	Fix-As-Fail
Customer Concern Code:	202	Causal Code:	64
Corrective Action Code:	02	Responsibility Code:	MXSTD
Failure Location:	044-002-002	Causal Part:	2272926 for cleaning only. For injector replacement, use actual part number of injector removed.
Supplier Code:	N/A	SRT Code:	<p>B23-04A (1.1 hrs) Injector cleaning procedure (1x) on or after 04/03/2023 (without filter element replacement)</p> <p>B23-04B (1.9 hrs) Injector cleaning procedure (2x) on or after 04/03/2023 (without filter element replacement)</p> <p>B23-04C (1.0 hrs.) Injector cleaning procedure (1x) on or after 04/03/2023</p>

(without filter element replacement) on MY2023 with NA31 RC1 software.

B23-04D**(1.6 hrs.)**

Injector cleaning procedure (2X) on or after 04/03/2023 (without filter element replacement) on MY2023 with NA31 RC1 software.

B23-04E**(1.4 hrs)**

Bulletin E290. Fuel system cleaning one (1) time EPA21 MX11/MX13 per bulletin procedure. Cleaning process was completed on or after 11/20/2023.

B23-04F**(2.2 hrs)**

Bulletin E290. Fuel system cleaning two (2) times EPA21 MX11/MX13 per bulletin procedure. Cleaning process was completed

		<p>on or after 11/20/2023.</p> <p>B23-04G (1.3 hrs) Bulletin E290. Fuel system cleaning one (1) time MY23 (NA31 RC1 Software) EPA21 MX11/MX13 per bulletin procedure. Cleaning process was completed on or after 11/20/2023.</p> <p>B23-04H (1.9 hrs) Bulletin E290. Fuel system cleaning two (2) times MY23 (NA31 RC1 Software) EPA21 MX11/MX13 per bulletin procedure. Cleaning process was completed on or after 11/20/2023.</p>
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Parts

Tools and parts are available from PACCAR parts.

Tool kits are not reimbursable through this bulletin.

Repair parts are only authorized per dates indicated.

TOOLS		
Quantity	Part Number	Description
1	2281101	Fuel System Cleaning

TOOLS		
Quantity	Part Number	Description
		Tool Kit
OR		
1	1961366-1CH	Fuel System Cleaning Tool Kit
<p>Only one of the above tool kits is necessary. Tool Kits listed above do NOT include 5L container. A locally sourced container will be needed.</p>		
1	Locally Sourced	5L container or clean bucket. Available through Dynalon or Amazon

REPAIR PARTS (Fuel System Cleaning)		
Quantity	Part Number	Description
1 jug (5qt)	DK5P	DSG 4+ Super Clean #DK32
5L	2281100PE	Tunap FX9 (Sold in 5 Liter container - 5L required for 1 cleaning per attached procedure)
1	2272926	Filter Set

**NOTE**

Parts below are used ONLY if injector replacement is required according to the attached procedures. File a separate long form claim using the appropriate code in the Campaign field.

**NOTE**

When returning removed injectors to the supplier, ensure that the CAUSAL PART number in the claim matches the actual part number of the injector(s) removed. Part number can be found on the injector data plate.

Use actual part numbers on Return Authorization and engine warranty claim documents.

INJECTOR REPLACEMENT PARTS - MX-13		
Quantity	Part Number	Description
As Needed	2394548PEX	Injector
2	1858035	Usit Ring
As Needed	1313120	Flange Bolt, 10.9 (Injector hold-down bolt)
1	2105834	Valve Cover Gasket - MX-13
As Needed	2138144	Gasket, Oil Fill Pipe
1	2253166	O-ring (Fuel Filtration Module Mounting)
1	2253167	Sealing Ring (Fuel Filtration Module Mounting)
As Needed	F37-1022- 100	Dryer- Receiver with Dye
As Needed	2127551	Sealing Ring Injector
As Needed	EC3501 (US)/ EC7501 (Canada)	Coolant
(Max 1lb)	D14858530	Refrigerant, R134a
As Needed	Source Locally	Cable Ties
As Needed	Source Locally	Contact Cleaner

INJECTOR REPLACEMENT PARTS - MX-13

Quantity	Part Number	Description
As Needed	Source Locally	Loctite (As specified in RMI)
(Max 1oz)	LM1020	A/C Oil

INJECTOR REPLACEMENT PARTS - MX-11		
Quantity	Part Number	Description
As needed	2394547PEX	Injector
As needed	1313120	Flange Bolt, 10.9 (Injector hold-down bolt)
As needed	2127551	Sealing ring, injector
1	1900010	Valve Cover Gasket - MX-11
As Needed	1917012	Flange gasket (inlet manifold)
As Needed	1876805	O-ring (EGR pipe to venturi)
As Needed	2015102	O-ring (non-return valve)
As Needed	2004292	O-ring (injector leak pipe)
As Needed	EC3501 (US) / EC7501 (Canada)	Coolant
As Needed	Source Locally	Cable Ties
As Needed	Source Locally	Contact Cleaner
As Needed	Source Locally	Loctite (As specified in RMI)

Background

The diagnostic codes and injector problems may be caused by carboxylate clogging of injector internal ports. This cleaning procedure should clean the deposits, but it is not a permanent fix. If the problem returns, switching fuel sources may reduce the formation of deposits.


Procedure

Please follow your dealership's safety procedures and precautions to ensure the vehicle can be safely repaired and maintained.

Read all steps before beginning.


Please ensure you are using the latest version of the attached procedure. Discard any printed versions you may have and refer to the bulletin link below each time.

This procedure is in addition to other diagnostic and troubleshooting steps as specified in RMI or other service documentation and repair direction from field service or the Vehicle Support Center.

 NOTE
See Warranty section above for claim filing instructions and attachment requirements.

1. RMI will refer you to this procedure for any active fault codes listed above.
2. Complete the attached cleaning procedure.

[E290 Fuel Injector Cleaning Procedure 11/20/23](#)

 NOTE
On MY2023 vehicles, check component group 1020 . If software number is 2397180 , the vehicle has NA31 RC1 software. Do not perform injector calibration on these vehicles. See Software Change Notice RC1 for Model Year 2023 for more information.

Links

[E290 Fuel Injector Cleaning Procedure 11/20/23](#)