

E290: EPA2021 PACCAR MX Fuel Injector Cleaning Procedure

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Number

E290

Subject

EPA2021 PACCAR MX Fuel Injector Cleaning Procedure

Date

3/31/2022

Revision

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.

03/31/2023: 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 after 04/01/23. Added references to E300.

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

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.

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 aftertreatment disconnect steps in procedures. Updated SRT codes and parts lists.

04/28/2022: Removed Standyne 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.

04/07/2022: 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 T680, T680 NextGen, T800, T880, W900, and W990 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.

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.
4. Print the E300 Driver's Information Packet (attached below) and fill in the warranty end date and mileage information on the first page for the chassis. Refer to E300 for specific limitations of in-tank additive reimbursement.
 - Check the vehicle SIR to determine end date and mileage of any applicable engine warranty. The warranty start date is the vehicle "In Service" date.

Warranty

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

plus applicable mark-up and labor:

Campaign and SRT Codes

Campaign Code	SRT Code	Labor Hours	Use
NONE	B44-FSD	3.1	Repairs completed BEFORE 04/01/23
E290A1	B23-04A	1.1	Repairs completed on or after 04/01/23 – Cleaning performed ONCE
E290A2	B23-04B	1.9	Repairs completed on or after 04/01/23 – Cleaning performed TWICE in same service event.
E290A3	Editable	Editable	Repairs completed on or after 06/28/2023 – Includes 2 cleanings according to the attached procedures AND injector replacement (ONLY unbalanced injectors on MX-13 or MX-11) in the same service event. Injector replacement may only be claimed ONCE.  NOTE 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.
E290A4	B23-04C	1.0	Repairs completed on or after 04/01/23 – Cleaning performed ONCE – Only applies to MY2023 chassis with NA31 RC1 software – See Procedures for details.
E290A5	B23-04D	1.6	Repairs completed on or after 04/01/23 – Cleaning performed 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 on vehicles with E290A “Complete” – Secondary cleaning performed ONCE <i>in second service event</i>
E290B2	B23-04B	1.9	Subsequent claim for secondary cleaning on vehicles with E290A “Complete” – Secondary Subsequent cleaning performed TWICE <i>in second service event</i>
E290B3	Editable	Editable	Subsequent claim for secondary cleaning on vehicles with E290A “Complete” - Repairs completed on or after 06/28/2023 – Includes 2 cleanings according to the attached procedures AND injector replacement (ONLY unbalanced injectors on MX-13 or MX-11) in the same

Campaign Code	SRT Code	Labor Hours	Use
			service event. Injector replacement may only be claimed ONCE.
			 NOTE 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.
E290B4	B23-04C	1.0	Subsequent claim for secondary cleaning on vehicles with E290A "Complete" – Cleaning performed ONCE in <i>second service event</i> – Only applies to MY2023 chassis with NA31 RC1 software – See Procedures for details.
E290B5	B23-04D	1.6	Subsequent claim for secondary cleaning on vehicles with E290A "Complete" – Cleaning performed TWICE in <i>second service event</i> – Only applies to MY2023 chassis with NA31 RC1 software – See Procedures for details.

For repairs completed **before 04/01/23**,

- File a long form claim for applicable repair parts (listed below) and 3.1 hrs labor using SRT code B44-FSD. This claim includes filter element replacement.

For repairs completed **on or after 04/01/23**,

- **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 necessary 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 table above in the Campaign Code Field –

E290B1, E290B2, E290B3, E290B4, or E290B5 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.
- File an additional claim for extraordinary circumstances. A quick claim for standard labor must be filed first.
 - File the claim within 14 days in accordance with Warranty Policy [CA009](#).
 - 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.

Kenworth dealers may perform E290A repairs on Peterbilt chassis, but Quick Claims do not apply. For Peterbilt

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:	Camp (E290A1, A2, A4, A5 & E290B1, B2, B4, B5) CampSupp (E290A3 & E290B3)
Failure Location	044-002-002	Causal Part	2272926 for cleaning only. For injector replacement, use actual removed PNs
Supplier Code	N/A	SRT Code	B44-FSD 3.1 hrs Injector cleaning procedure before 04/01/23 B23-04A 1.1 hrs Injector cleaning procedure (1x)

			as of 04/01/23 (without filter element replacement) B23-04B 1.9 hrs Injector cleaning procedure (2x) as of 04/01/23 (without filter element replacement) B23-04C 1.0 hrs Injector cleaning procedure (1x) as of 04/01/2023 (without filter element replacement) on MY2023 NA31 RC1 Chassis B23-04D 1.6 hrs Injector cleaning procedure (2x) as of 04/01/2023 (without filter element replacement) on MY2023 NA31 RC1 Chassis
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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 for repairs on or before the dates listed.

TOOLS

Quantity	Part Number	Description
1	2281101	Fuel System Cleaning Tool Kit
OR		
1	1961366-1CH	Fuel System Cleaning Tool Kit
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 for US locations.		
1	Locally Sourced	5L container or clean bucket. Available through Dynalox or Amazon

REPAIR PARTS

Quantity	Part Number	Description
1 jug (5qt)	DK5P	DSG 4+ Super Clean #DK32
The following parts only apply to repairs completed before 04/01/23		
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 removed injectors stamped 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

Quantity	Part Number	Description
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
As Needed	2253166	O-ring (Fuel Filtration Module mounting)
As Needed	2253167	Sealing Ring (Fuel Filtration Module mounting)
As Needed	2272926	Fuel Filter Element set
As Needed	F37-1022-100	Dryer-Receiver with Dye
6	2127551	Sealing Ring, Injector
As Needed	EC3501 (US) / EC7501 (Canada)	Coolant
As Needed (1 lb maximum)	D14858530	Refrigerant, R134a
As Needed	Source Locally	Cable Ties
As Needed	Source Locally	Contact Cleaner
As Needed	Source Locally	Loctite 242
As Needed (1 oz maximum)	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-

Quantity	Part Number	11 Description
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	2272926	Fuel filter element set
As Needed	EC3501 (US) / EC7501 (Canada)	Coolant
As Needed	Source Locally	Cable Ties
As Needed	Source Locally	Contact Cleaner
As Needed	Source Locally	Loctite 242

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 Injector Cleaning Procedure](#)



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.

3. Refer to [E300](#) for in-tank additive use and reimbursement of additive cost.
 - A. Print the Driver's information Packet (below)
 - B. Fill in the Chassis number and warranty expiration date/mileage
 - C. Explain to the customer what they need to do and the expiration date/mileage that they need to meet
 - D. Give the Driver's Information Packet with the expiration information filled in to the driver.
 - E. Advise the driver that the log sheet is necessary for in-tank fuel additive reimbursement through [E300](#) through their local dealer.

Links

[E290 Injector Cleaning Procedure](#)

[E300 Driver's Information Packet](#)
