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 Other Languages: NONE Author: Jonathan Lang
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Coding Information

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Title: 6.6 Engine Replacement Diagnostics and Guidelines

Applies To: CV, International 6.6

CHANGE LOG:

Please refer to the change log text box below for recent changes to this article:

07/09/2024 - Initial Article Release

DESCRIPTION

This document will guide the user through providing the necessary documentation to tech support for a 6.6 engine replacement.

SYMPTOM(s)

Diagnostic Trouble Code(s) & Dashboard Indicator Light(s):

DTC/Light	Description
Low oil pressure warning	Warning message on the dash

Customer Observations or Concerns

- Low oil pressure
- Coolant overflowing from the surge tank while running
- Low power
- Rough running with Smoking, popping noises, or knocking noise
- Metal in the oil
- Engine oil pressure warning
- Malfunction Indicator Light

SPECIAL TOOL(s) / SOFTWARE

Tool Description	Tool Number	Comments	Instructions

Compression Gauge	ZTSE2482A	N/A	N/A
Compression Gauge Adapter	EN-47603	N/A	N/A
Glow Plug Bore Reamer	EN-52074	N/A	N/A
Cylinder Head Leakdown Tester	OTC5609	N/A	N/A
Cylinder Head Leakdown Adapter	J-35667-8	N/A	N/A

[Tools Resource Center](#)

SERVICE PARTS INFORMATION

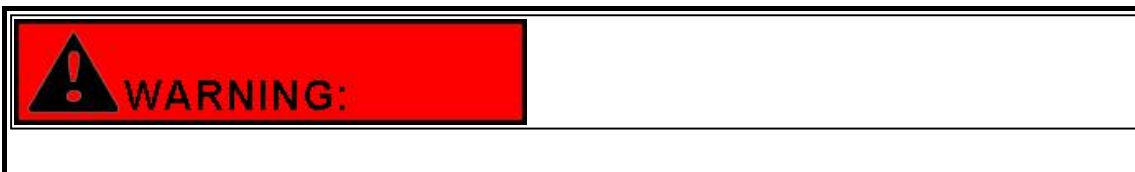
Kit Description	Part Number	Quantity Required	Notes
ENGINE, DIESEL , MY20	7505544C91	1	Model year 20'
ENGINE, DIESEL , GM 12701847	7508724C91	1	Model year 24'
DIESEL ENGINE	7502569C92	1	Model year 18'
6.6L V8 CYLINDER HEAD ASSEMBLY MACHINED	6040718C91	1	Model year 18'
HEAD ASSEMBLY, CYLINDER, COMPLETE WITH VALVES, RIGHT	6042235C91	1	Model year 20'
HEAD ASSEMBLY, CYLINDER, COMPLETE WITH VALVES, LEFT	6042236C91	1	Model year 20'
HEAD ASSEMBLY, CYLINDER, COMPLETE WITH VALVES, RIGHT	6045002C91	1	Model year 24'
HEAD ASSEMBLY, CYLINDER, COMPLETE WITH VALVES, LEFT	6045003C91	1	Model year 24'

DIAGNOSTIC STEP(s)

Possible Causes:

- Lack of maintenance
- Low oil
- Contaminated fuel
- Failed high-pressure fuel pump
- Failed glow plug
- Damaged valves
- Failed roller lifter
- Damaged Camshaft

Step-Based Diagnostics:



To prevent property damage, personal injury, and / or death, keep flames or sparks away from vehicle and do not smoke while servicing the vehicle's batteries. Batteries expel explosive gases.



WARNING:

To prevent property damage, personal injury, and / or death, remove the ground cable from the negative terminal of the battery box before disconnecting any electrical components. Always connect the ground cable last.



WARNING:

To prevent personal injury and / or death, always wear safe eye protection when performing vehicle maintenance.



WARNING:

To prevent property damage, personal injury, and / or death, if the vehicle must be raised, do not work under the vehicle supported only by jacks. Jacks can slip or fall over.



WARNING:

To prevent property damage, personal injury, and / or death, park vehicle on a hard, flat surface, turn the engine off, set the parking brake, and install wheel chocks to prevent the vehicle from moving in either direction.



WARNING:

To prevent personal injury or death, do not overfill the fuel tank. Overfilling the fuel tanks creates a fire hazard.



WARNING:

To prevent personal injury or death, do not smoke in the work area.



WARNING:

To prevent personal injury or death, do not refuel the tank when the engine is running.

CAUTION:

To prevent property damage, clean glow plug bores and surrounding areas prior to removing glow plugs. Cover engine opening to prevent inducing dirt and debris into the engine.

CAUTION:

To prevent property damage, do not allow glow plugs to touch each other or metal engine components.

CAUTION:

To prevent property damage, never use power tools to install threaded components

Step	Action	Decision
1	DIAGNOSTIC: Complete the symptom-based diagnostics for low engine oil pressure light, low power, smoking, or running rough.	Yes. Please complete the 6.6 engine replacement checklist . Please then start a case file with the powertrain team and attach the completed checklist, pictures of your findings, and the oil change records to the case.
	YES/NO QUESTION?	Yes, no resolution. Proceed to step 2.
	Have the appropriate symptom-based diagnostics been completed in the 6.6 manual?	No. Complete the appropriate symptom-based diagnostics in the 6.6 manual.

Step	Action	Decision
2	DIAGNOSTIC: Repair any concerns found in the symptom-based diagnostics.	Yes. End diagnostics.
	YES/NO QUESTION? Did the repairs resolve the concern?	No. Proceed to step 3.

Step	Action	Decision
3	DIAGNOSTIC: Drain the engine oil and capture it in a clean and clear container for inspection.	Metal glitter or debris. Please complete the 6.6 engine replacement checklist . Please then start a case file with the Powertrain team and attach the completed checklist, pictures of your findings, and the oil change records to the case.

<p>YES/NO QUESTION?</p> <p>Was the oil thick or contaminated with metal, fuel, or coolant?</p>	<p>No. Proceed to step 4.</p>
	<p>Fuel or coolant. Please complete the appropriate symptom-based diagnostics in the 6.6 manual. If there is no resolution, please start a case file with the Powertrain team.</p>

Step	Action	Decision
4	<p>DIAGNOSTIC:</p> <p>Remove the glow plugs and inspect for damage.</p>	<p>Yes. Please complete the 6.6 engine replacement checklist. Please then start a case file with the Powertrain team and attach the completed checklist, pictures of your findings, and the oil change records to the case.</p>
	<p>YES/NO QUESTION?</p> <p>Do the glow plugs have any contamination, damage, or missing tips?</p>	<p>No. Proceed to step 5.</p>

Step	Action	Decision
5	<p>DIAGNOSTIC:</p> <p>Compression tests the cylinders using the compression testing instructions in the 6.6 manual.</p>	<p>Yes. Please proceed to step 6.</p>
	<p>YES/NO QUESTION?</p> <p>Do any cylinders have lower than 2,069 KPA (300 PSI) or a difference of greater than 345 KPA (50 PSI) between the suspect cylinder and the average compression of all 8 cylinders?</p>	<p>No. please proceed to step 7.</p>

Step	Action	Decision
6	<p>DIAGNOSTIC:</p> <p>Perform a cylinder leakdown test using the directions in the 6.6 diagnostics manual and regulating shop air to 80 PSI.</p>	<p>Yes, air leak at the intake manifold. Proceed to step 7.</p>
	<p>YES/NO QUESTION?</p> <p>Is there an audible leak and do any cylinders have a leakage of more than 25%?</p>	<p>Yes, air leaks into the exhaust. Proceed to step 7.</p>

Air leaks into the crankcase. Proceed to step 9.

Air bubbles in the cooling system. Proceed to step 9.

Step	Action	Decision
7	DIAGNOSTIC: Remove the valve cover and inspect the rockers and valve stems. YES/NO QUESTION? Are any rockers loose, valve bridges missing, or valve stems damaged?	Yes. Proceed to step 8.
		No. Proceed to step 9.

Step	Action	Decision
8	DIAGNOSTIC: Remove the lifters and inspect the camshaft. YES/NO QUESTION? Does the camshaft or lifter have abnormal wear or damage?	Yes. Please complete the 6.6 engine replacement checklist . Please then start a case file with the Powertrain team and attach the completed checklist, pictures of your findings, and the oil change records to the case.
		No. Please start a case with the powertrain team for further directions.

Step	Action	Decision
9	DIAGNOSTIC: Remove the head and inspect the valve faces and cylinders for damage YES/NO QUESTION? Are the valve faces or cylinders damaged?	Valve damage. Replace the head and necessary components. Retest for the concern after the repairs.
		Cylinder or piston damage. Please complete the 6.6 engine replacement checklist . Please then start a case file with the Powertrain team and attach the completed checklist, pictures of your findings, and the oil change records to the case.
		No. Please start a case with the powertrain team for further assistance.

REPAIR STEP(s)

REMOVAL PROCEDURE:

[Glow plug removal bank 1](#)

[Glow plug removal bank 2](#)

[Valve lifter removal](#)

[Cylinder head removal Passenger's side](#)

[Cylinder head removal Driver's side](#)

[Valve cover removal Passenger's side](#)

[Valve cover removal Driver's side](#)

INSTALLATION PROCEDURE:

[Glow plug installation bank 1](#)

[Glow plug installation bank 2](#)

[Valve lifter installation](#)

[Cylinder head installation Passenger's side](#)

[Cylinder head installation Driver's side](#)

[Valve cover installation Passenger's side](#)

[Valve cover installation Driver's side](#)

WARRANTY INFORMATION

Warranty Claim Coding:

Refer to the [Warranty Coding Manual](#) for Group and Noun Codes.

Standard Repair Time(s):

Refer to the [SRT Manual](#) for Repair Times

OTHER RESOURCES

[Master Service Information Site](#)

[Compression testing steps](#)

[6.6 Engine checklist](#)

[Cylinder leakage test](#)

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