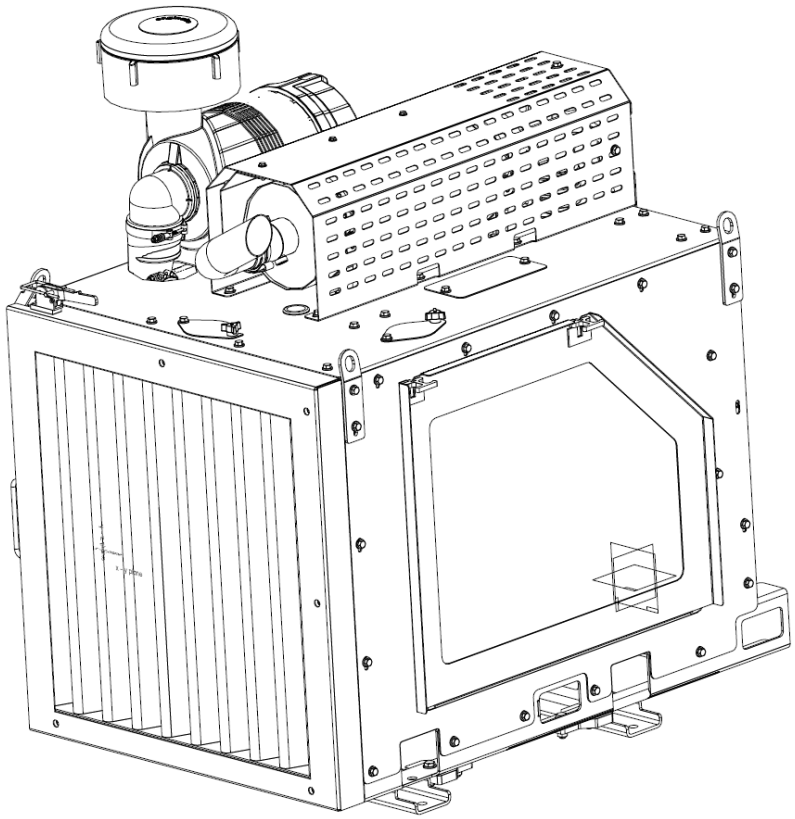
Morbark
Ford 6.2 Engine
Post Production Modification
(PPM-103)



MORBARK	**Note**: Make sure you read and understand these instructions before performing the procedure. If you are confused or uncertain about the contents of this document, contact your local dealer or Morbark directly at 800-255-8839.	Publish Date:	03/29/2022
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Overview

This document describes the steps required to identify what modifications are required to your specific machine to remedy any instances of engine overheating and include the following:

- Replace current radiator (debris) screen with Assembly #40888-451S
- ECM replace or update
- Replace rear and top engine enclosure panels if thermal insulation is present.
- Adjust exhaust tube "Y-Pipe" for clearance to firewall (Note: Replace U bolt clamps with Morbark PN: 29323-598 as required)
- Purge cooling system to remove any trapped air
- Replace radiator fan if existing fan exhausts air from engine assembly instead of "pulling" air INTO engine assembly.
- Inspect for faulty Catalytic Converter; replace as necessary.

Affected Machines

NOTE: Some of these modifications may have been previously completed. Please carefully inspect components prior to replacement.

- Any of these models that use the Ford 6.2L engine: EB 1821 (Pre Ser# 26469), EB 1922 (Pre Ser# 52783), EB 2131

Verify and Obtain Parts from this List

Note: Not all of these parts will be required to upgrade your machine. Inspect your machine and create a checklist of all parts that need to be ordered for your machine.

Place an "X" if associated item(s) apply		Assy/Part No.	Description:	Qty:
	Order if existing panel HAS thermal insulation.	40780-451	Rear Panel	1
	Order if existing panel HAS thermal insulation.	30501-451	Top Panel	1
	Order if existing exhaust clamps are "U Bolt" type	29323-598	Clamp, Exhaust	3
	Order if existing fan is configured to pull air AWAY from engine instead of INTO engine assembly (see Note 1)	29119-013	Fan, Puller	1
	Order if Debris Screen has 1/8" dia holes	40888-451S	Debris Screen, Hinged	1
	Order to assist with radiator air purge.	29119-061	Gates Hose	1
	Order if Catalytic Converter is faulty	29119-006	Catalytic Converter	1

Note 1: Refer to Appendix at back for fan identification photos.

Contact Morbark Service at 800-255-8839 if you have ANY questions or need clarification.

Safety

Dangers, Warnings and Cautions

⚠ DANGER

A Danger explains hazards that <u>will</u> result in personal injury or death.

⚠ WARNING

A Warning explains hazards that <u>might</u> result in personal injury or death.

⚠ CAUTION

A Caution explains hazards that could cause damage to equipment and/or machinery.

Personal Protective Equipment (PPE)

For your safety, always adhere to the following guidelines when performing this procedure:

- Always wear personal protective equipment (hard hat, safety goggles/weld mask, work/weld gloves, hearing protection, etc.) when working on this equipment.
- Know and avoid pinch/ crush points.
- Clean all oil spills, and debris around work area to reduce the risk of slips, trips and falls.
- If lifting or leveraging equipment and/or assemblies always make sure all ramps, hoists, lift straps/chains, jacks, jack stands, etc., are rated and approved for the weights being carried/lifted.

Note – Radiator Care

Please **DO NOT** use high pressure sprayer to clean radiator. Using a pressure washer to clean the radiator could result in impacted debris in-between radiator fins. Impaction can cause loss of airflow, and subsequent exacerbated overheating. Use compressed air to clean debris from radiator.

Engine Modification Procedure

1) See Figure 1. Remove the Debris Screen (1), Access Panel (2), Engine Air Intake Assembly (3), Exhaust Heat Shield (4), Muffler Assembly (5), Rear Panel (6) and the hardware used to hold the Radiator Cover Plate sides and Engine Lifting Lugs (highlighted in red circles) on both sides of engine (7) in the order as numbered and set aside.

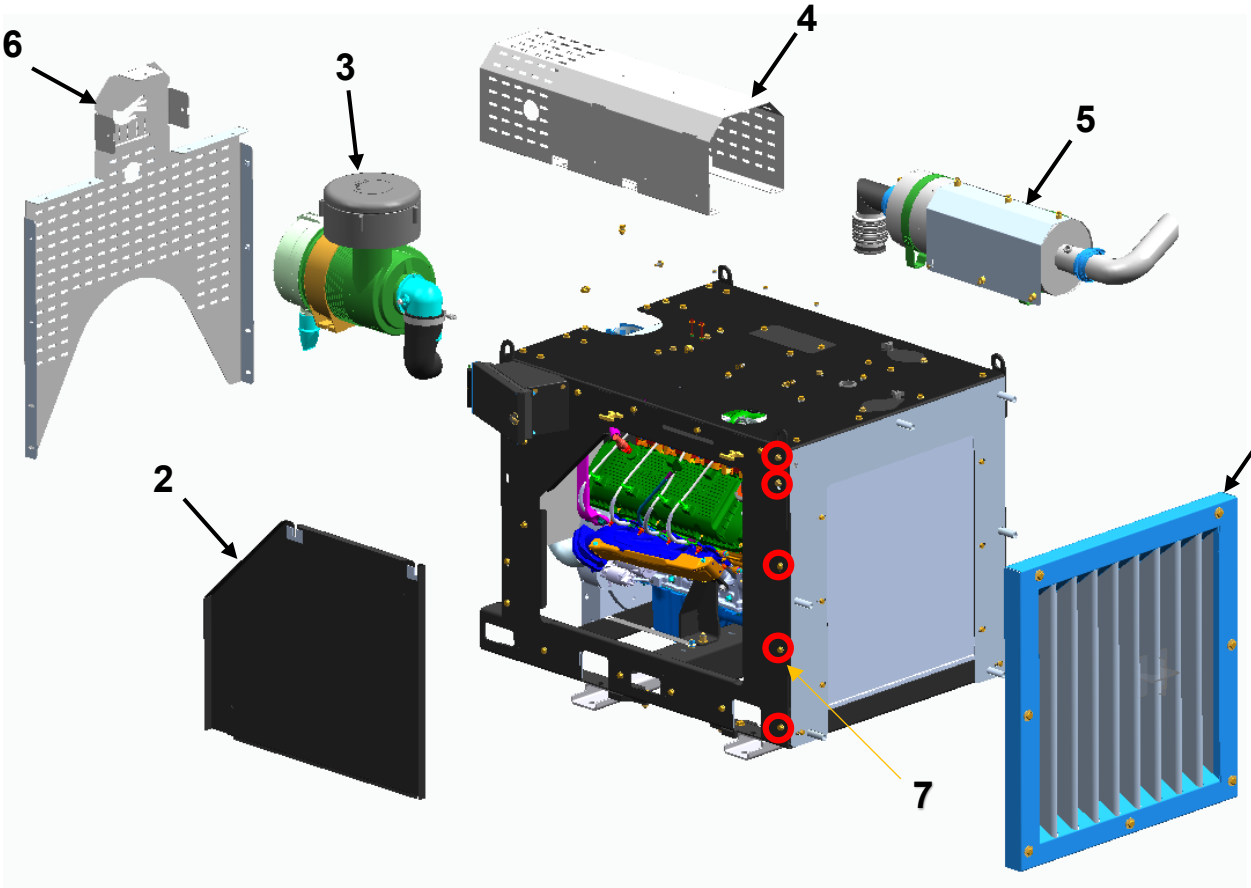


Figure 1

2) See Figure 2. Remove Exhaust Pipe (1), Engine Enclosure Top (2) and Chimney Weldment (3) in the order as numbered and set aside.

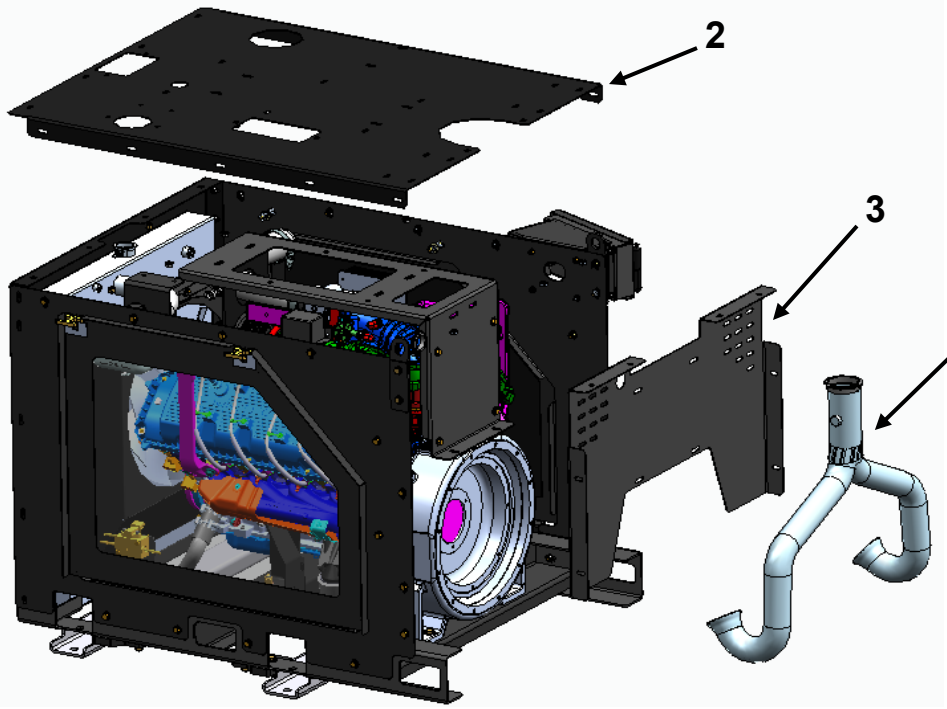


Figure 2

3) See Figure 3. Assemble new Chimney Weldment (1), Engine Enclosure Top (2) and existing Exhaust Pipe (3) in the order as numbered using existing hardware. **Note: See Figure 4 (next page) for exhaust pipe details before installing**.

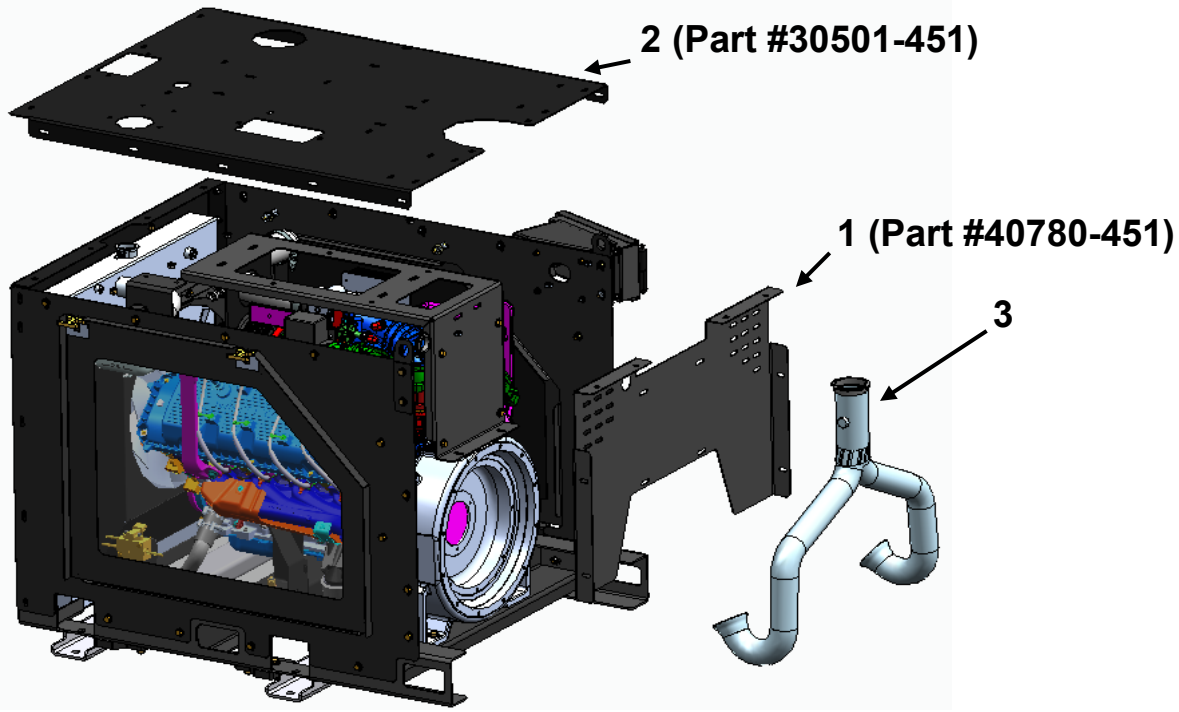
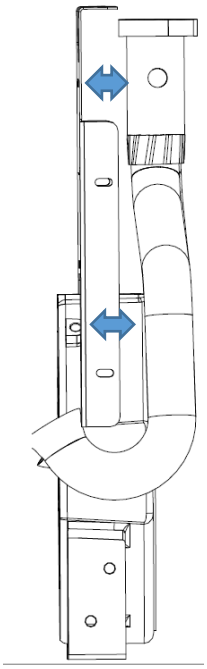


Figure 3

NOTES:

- When changing the fans, adjust the exhaust Y-pipe so it is straight up and down. This component was clamped to the firewall but this allowed too much heat to pass through the firewall.
- Loosen the exhaust manifold joints and pull the pipe back away from the fire wall and re-torque.
- The Catalyst assembly can be adjusted forward and back to allow better fitment of the 90 degree exhaust elbow. Here are some pictures of what it should look like.
- Also remind anyone running a Ford 6.2 liter to only use **5w-30 motor oil**. Using a thicker oil with a higher winter weight (10w, 15w) in the winter may cause timing chain damage.
- Double check that all wiring harnesses are tied back away from any heat sources like the exhaust manifolds.



NOTE: Do NOT reuse U bolt clamps when re-installing Y-pipe.

Make sure pipe is aligned so that there is even clearance between pipe and chimney weldment as shown.

Use 3” band clamp. Make sure elbow is fully seated and there are no leaks at slots.

Figure 4

4) See Figure 5. Re-install Rear Panel using existing hardware.

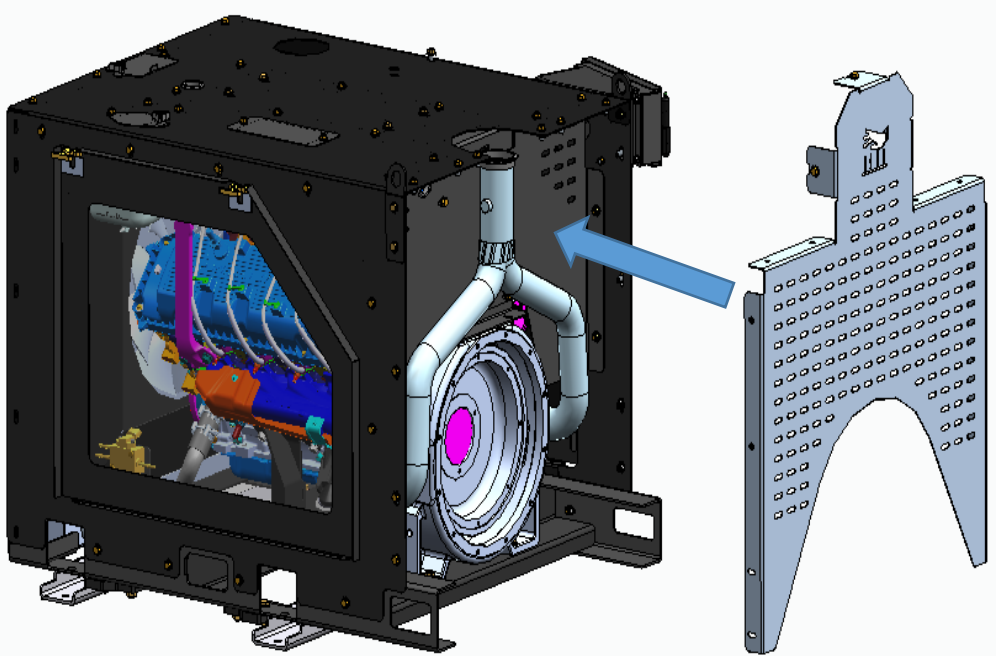


Figure 5

5) See Figure 6. Re-install Muffler Assembly, Access Panel, and Engine Air Intake Assembly using existing hardware.

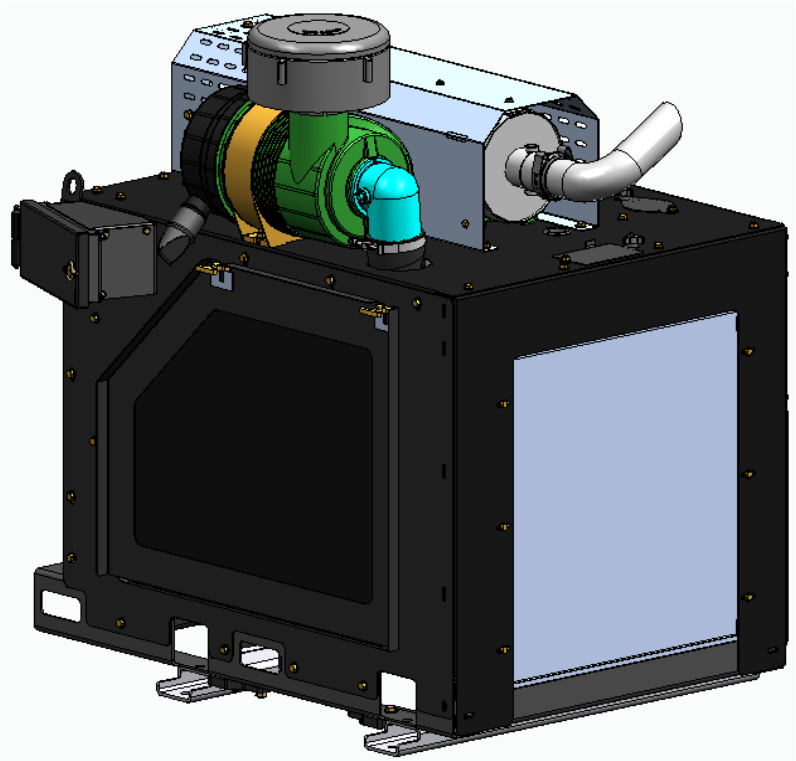


Figure 6

6) See Figure 7. Install new side plates using provided hardware.

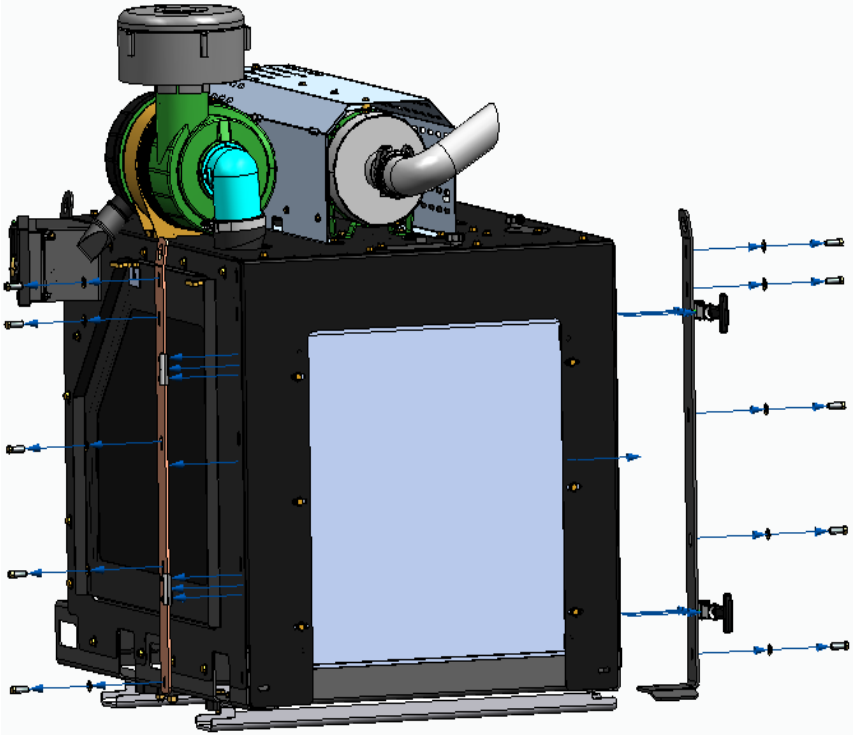


Figure 7

7) See Figure 8. Install new debris screen by sliding it onto hinges and fastening with rubber latches.

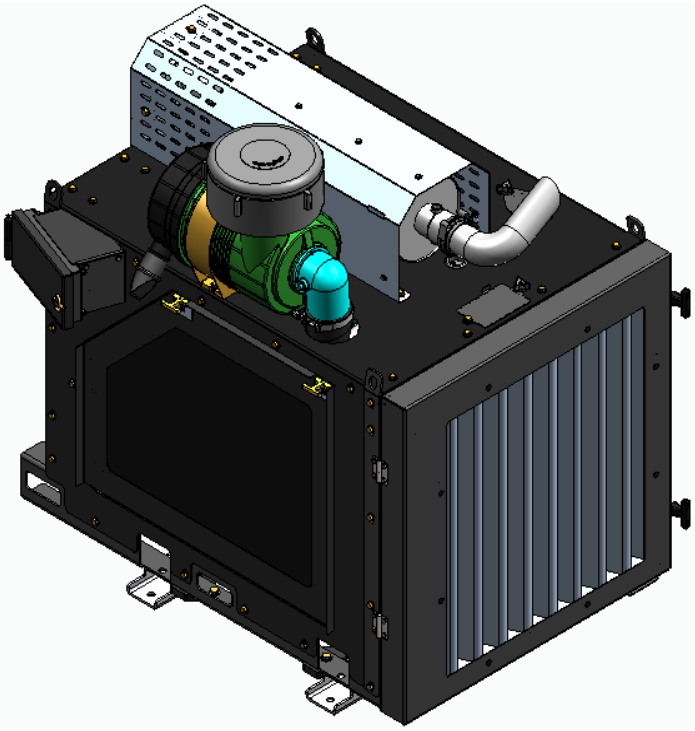


Figure 8

Update or Replace ECM

To update existing ECM contact Art Wicks EDI Service Manager (art@edi-dist.com). This will protect the engine from overheating.

NOTE: Verify calibration prior to updating as all machines may not be affected.

- Calibration: 5380R35D_GAS_TSC1_1200-3200

Or, to replace ECM do the following:

1) See Figure 7. Remove screws.

2) Disconnect wire harnesses.

3) Remove ECM.

4) Install new ECM in reverse.

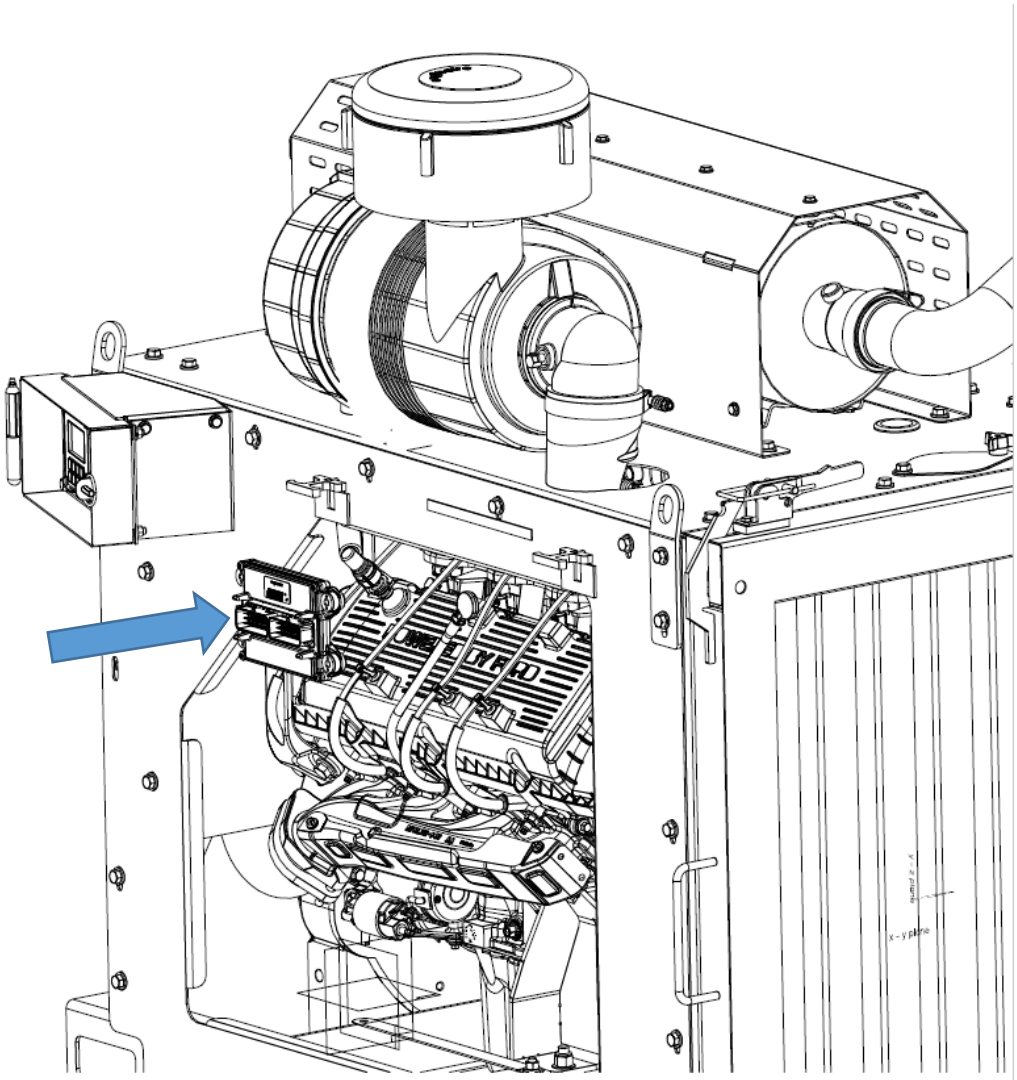


Figure 7

Purging Air from Radiator Coolant

Note: You can drain and vacuum fill the system or use the following procedure, which would require a spill-free funnel. (See links below)

Cooling system purge:

https://www.lislecorp.com/specialty-tools/spill-free-funnel-606Lisle 24680 Spill-Free Funnel [IMPROVED]

1) Install Gates hose (29119-061) on the inlet and outlet of the water pump. Remove side panel of engine enclosure. Openings of both hoses should be visible slightly above and behind the header of the 6.2L Ford engine (See Figure 8).

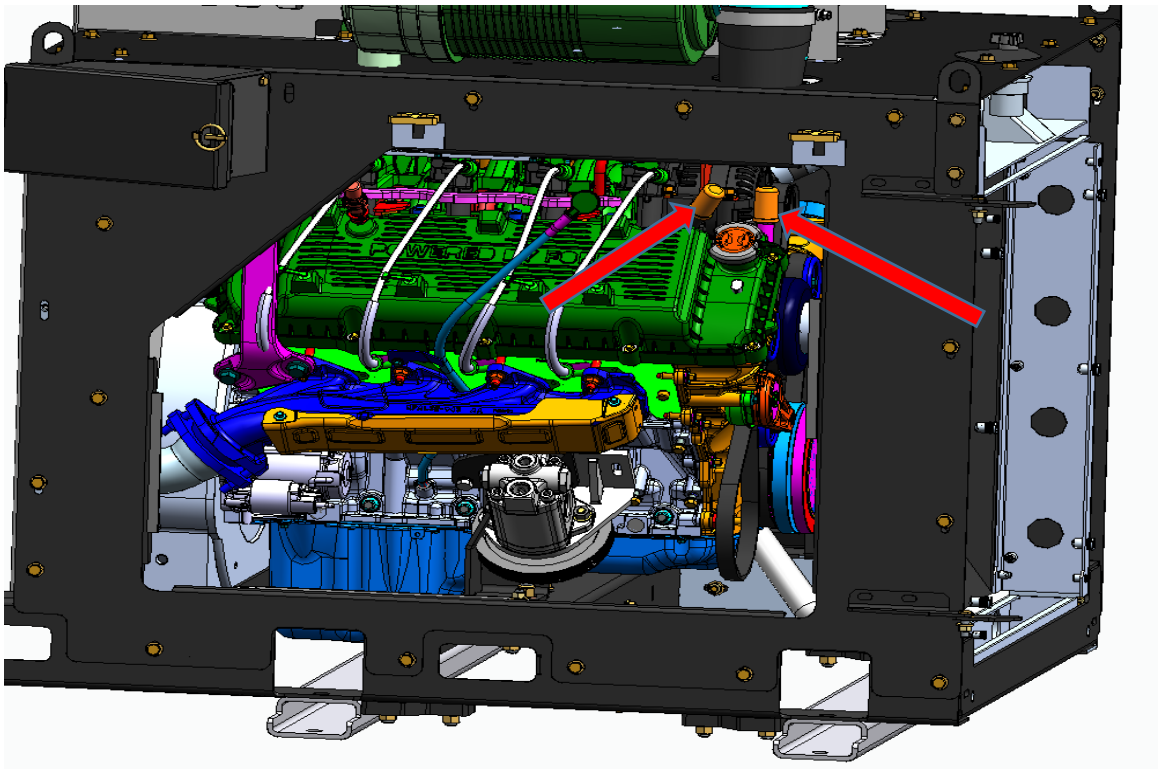


Figure 8

2) Using correct adaptor insert funnel into radiator.

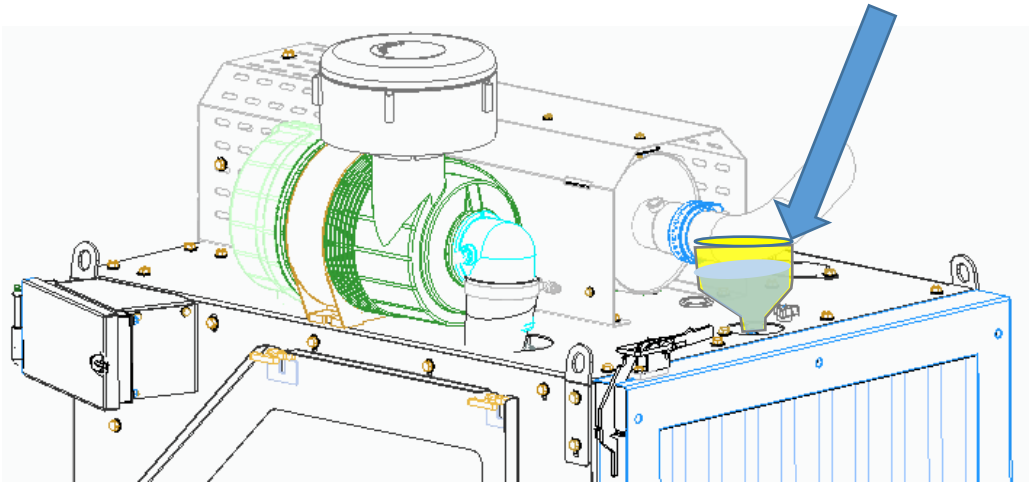


Figure 9

3) Add fluid coolant (**USE**: **Peak Cool 50/50 Pre-diluted Extended Life anti-freeze and coolant, 150,000 mile protection, or equivalent that meets or exceeds WSS-M97B51-A1, ASTM D3306**). NOTE: Make sure the funnel is no more than one-third full to avoid overflow when engine heats up.

4) Start engine. Let engine idle until engine temperature reaches 205°F. Trapped air will escape through funnel.

Figure 10

5) Shut down the engine and let cool.

6) Repeat Steps 3 and 4 up to four times to cycle air out.

7) Squeeze radiator hose then insert the stopper. Remove funnel and install radiator cap.

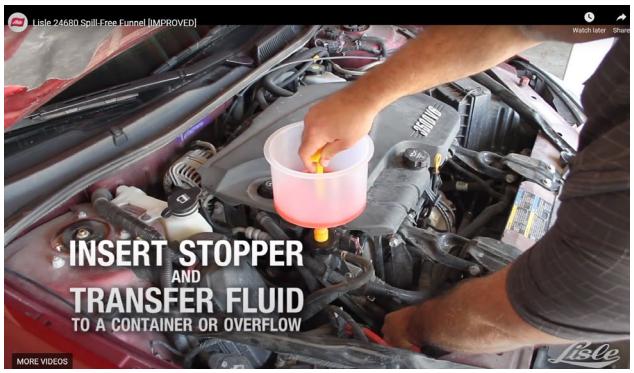


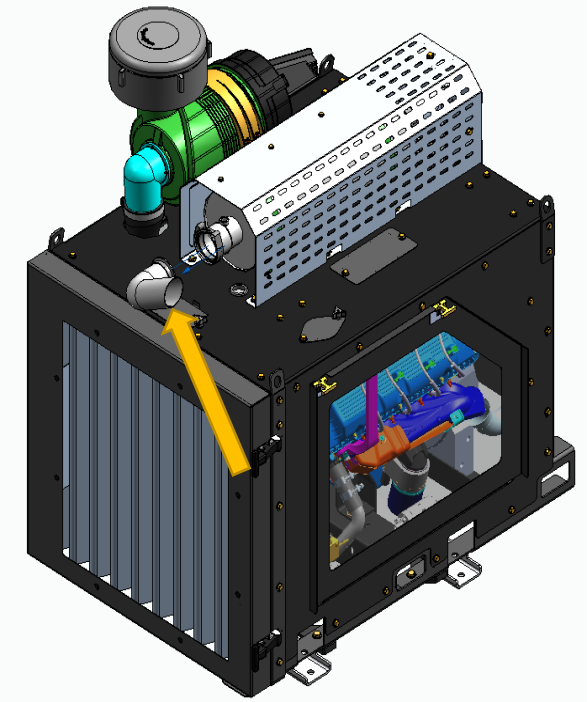
Figure 11

8) Transfer remaining coolant to reservoir.

Figure 12

Inspecting Catalytic Converter

1) Remove exhaust pipe from Catalytic Converter.



2) See figure below. Use a tape measure to see if Catalytic Converter substrate has shifted; the measurement should be no LESS than 11 inches, and NO MORE than 12 inches. <u>If the substrate is outside of these defined limits it must be replaced.</u>

CORRECT Catalyst Depth

INCORRECT Catalyst Depth

3) As well as measuring depth, checking the serial number of the Catalytic Converter can be used to deduce whether the Catalyst substrate may be at risk of shifting in the future. Etched onto the label along the outer skin of the main housing is the Serial Number of each unit. Post Serial Number 415501 Units are less likely to shift during use. Pre-Serial Number 415501 are more likely to shift and should be replaced.

Appendix - Fan Identification/Verification

Wrong fan – Arrow points to <u>right</u>.

Replace with correct fan

Correct fan – Arrow points to <u>left</u>.