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Coding Information

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**Title:** EPA 07 MaxxFORCE® DT/9/10 LT EGR Cooler Flushing Procedure

**Applies To:** EPA 07 MaxxFORCE® DT/9/10

## CHANGE LOG

01/15/2019 - Changed acceptable temperature range for service tool.  
 01/09/2018 - New Article Owner  
 03/05/2015 - Initial Article Release

## QUICK LINKS

<a href="#">Description</a>	<a href="#">Symptoms</a>	<a href="#">Tools</a>	<a href="#">Parts</a>
<a href="#">Diagnostics</a>	<a href="#">Repair Procedure</a>	<a href="#">Warranty</a>	

## DESCRIPTION

This document provides the steps necessary to clean the Low Temperature (LT) Exhaust Gas Recirculation (EGR) Cooler.

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## SYMPTOMS

EGR Cooler Plugging

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## **SPECIAL TOOLS**

<b>Tool Description</b>	<b>Tool Number</b>	<b>Comments</b>	<b>Instructions</b>
Cleaning Management System	12-353-01A		
LT EGR Cooler Flushing Adapters	12-856-07		

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## **SERVICE PARTS INFORMATION**

<b>Kit Description</b>	<b>Part Number</b>	<b>Quantity Required</b>	<b>Notes</b>
Fluid, EGR Cleaning	3015979C1	1	

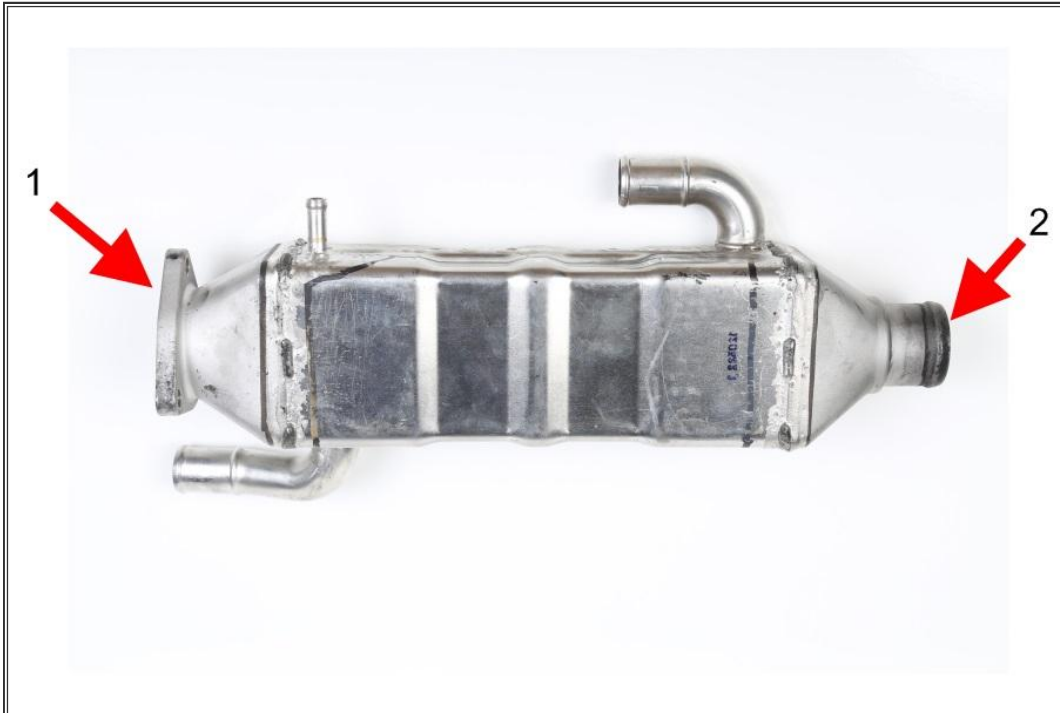
## **DIAGNOSTIC STEPS**

All diagnostics should be completed before performing this procedure.

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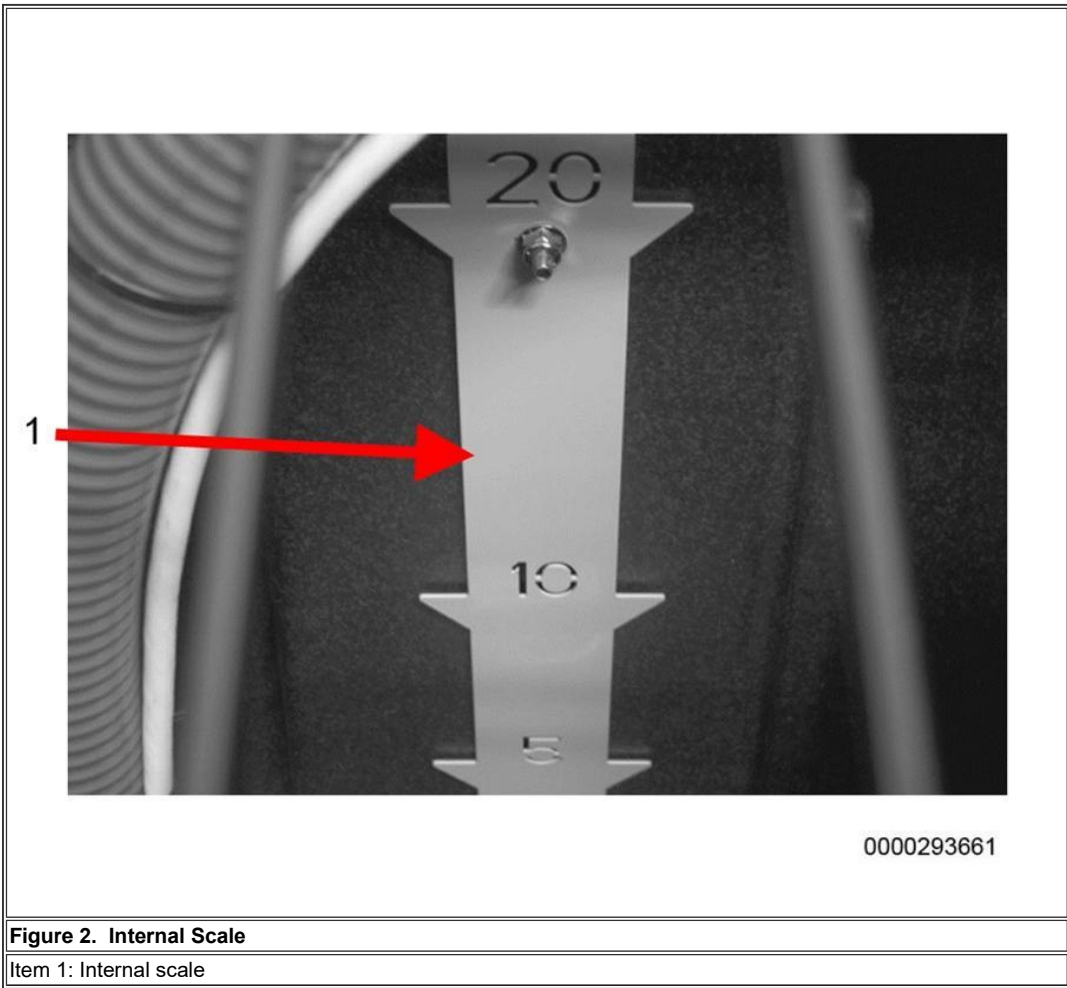
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**REPAIR STEP(s)**



**Figure 1. LT EGR Cooler**

- Item 1: Inlet
- Item 2: Outlet




**Figure 2. Internal Scale**

Item 1: Internal scale

**NOTE**

There is an Internal Scale inside the Cleaning Management System (12-353-01A) that is pre-measured to 5, 10, and 20 Gallons for ease of use.

 <b>WARNING:</b>	<p>To prevent property damage, personal injury, and / or death, park vehicle on hard flat surface, turn engine off, set parking brake, and install wheel chocks to prevent vehicle from moving in both directions.</p>
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 <b>WARNING:</b>	<p>To prevent personal injury and / or death, always wear safe eye protection when performing vehicle maintenance.</p>
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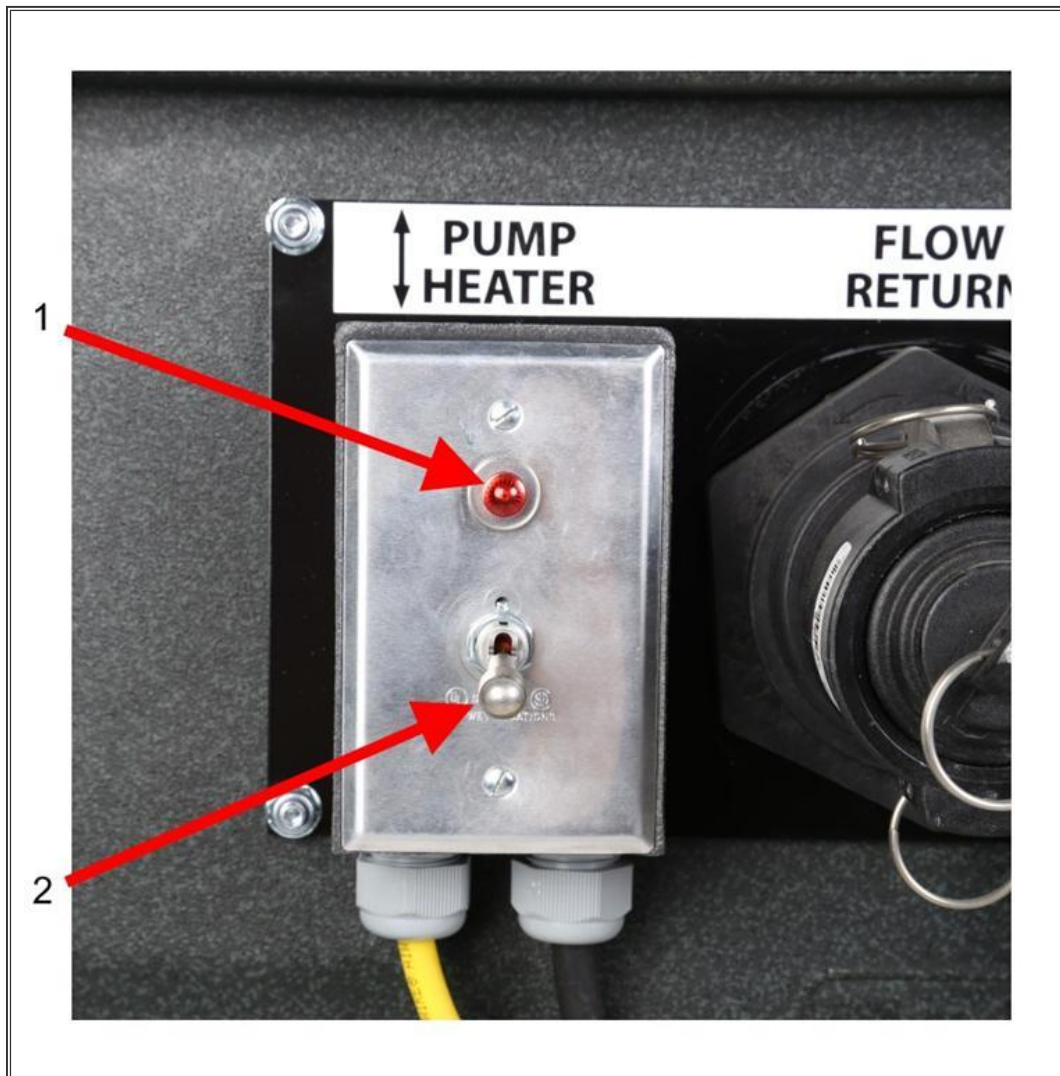
## INSTALLATION

1. Bring vehicle into shop and park on flat surface.
2. Shift transmission into Park or Neutral, set parking brake, and install wheel chocks.
3. Unlatch and open hood.
4. If necessary, clean and / or empty Cleaning Management System (12-353-01A) reservoir.
5. Inspect and clean filter sock (12-353-01-10); replace if needed.

### CAUTION

To prevent property damage, do not activate HEATER switch with Cleaning Management System (12-353-01A) reservoir empty.

6. Add 2.5 gallons (9.5 L) of EGR cleaning fluid and 7.5 gallons (28.4 L) of clean tap water to Cleaning Management System (12-353-01A) reservoir.
7. Plug-in the Cleaning Management System to a safe outlet.

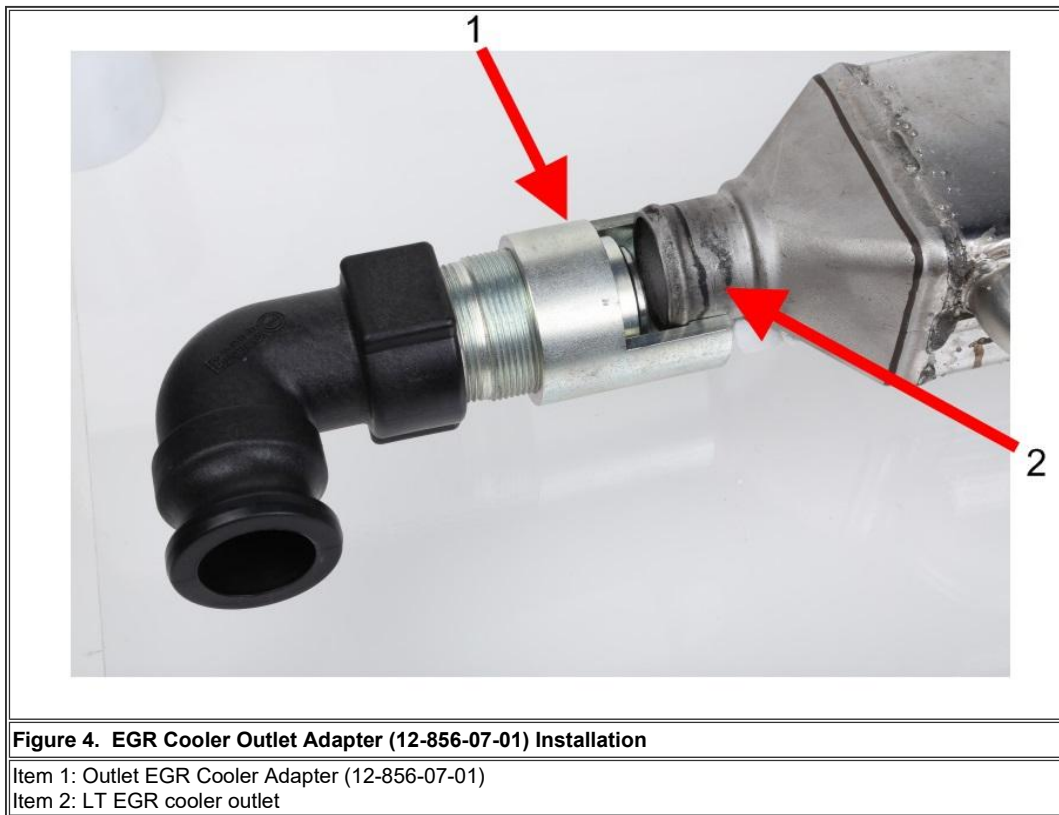


**Figure 3. HEATER Switch**

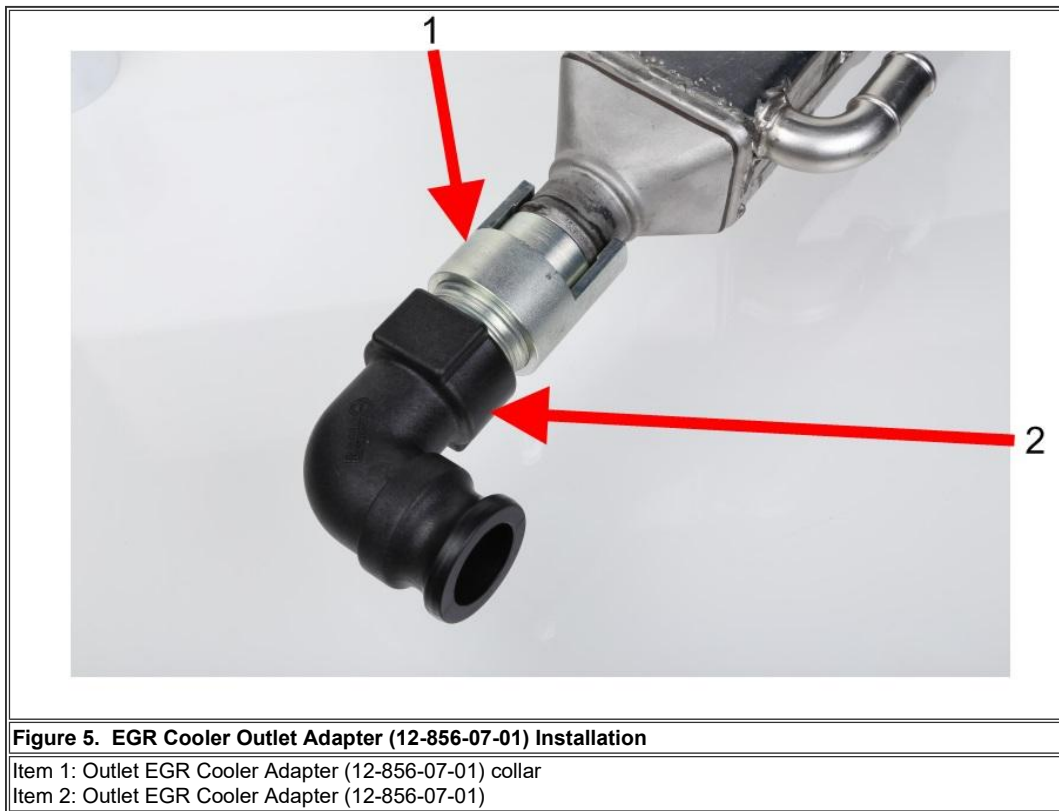
Item 1: Heater light  
Item 2: HEATER

8. Activate PUMP / HEATER switch to HEATER (down position) (**Figure 3**, Item 2) before disassembling vehicle and allow temperature to reach approximately 100-120°F (38-49°C) before cleaning the EGR Cooler. Ensure light (**Figure 3**, Item 1) below HEATER switch is illuminated.

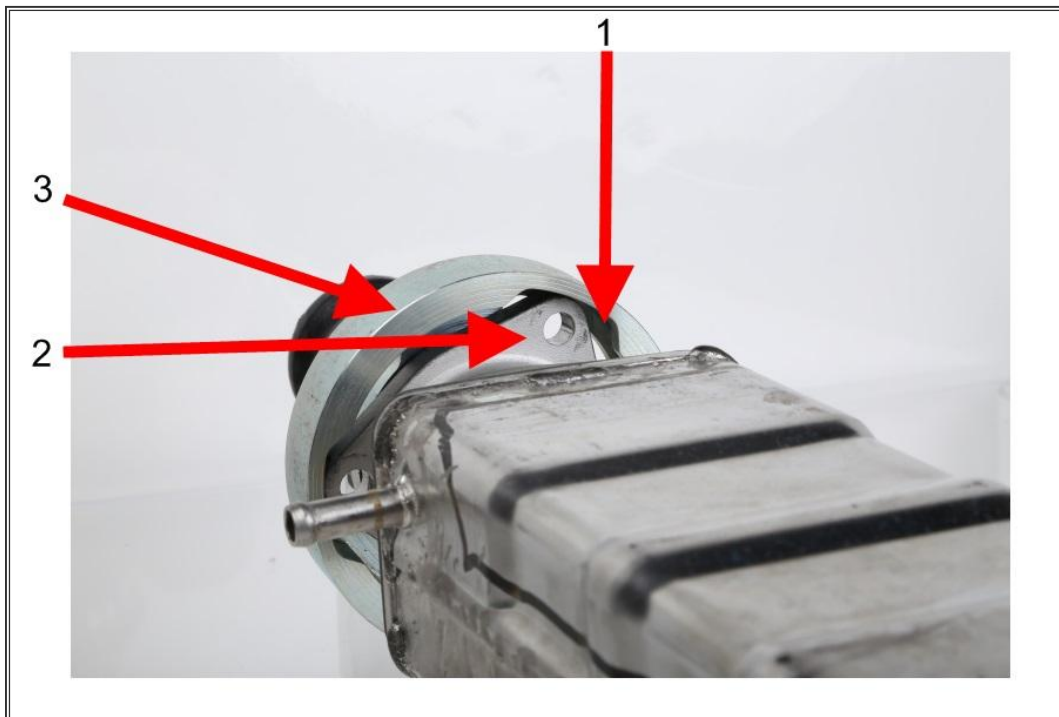
9. Remove Low-Temperature EGR Cooler from vehicle. Refer to [Engine Service Manual, EGES-335-2](#).



10. Slide Outlet EGR Cooler Adapter (12-856-07-01) (Figure 4, Item 1) over LT EGR cooler outlet (Figure 4, Item 2).



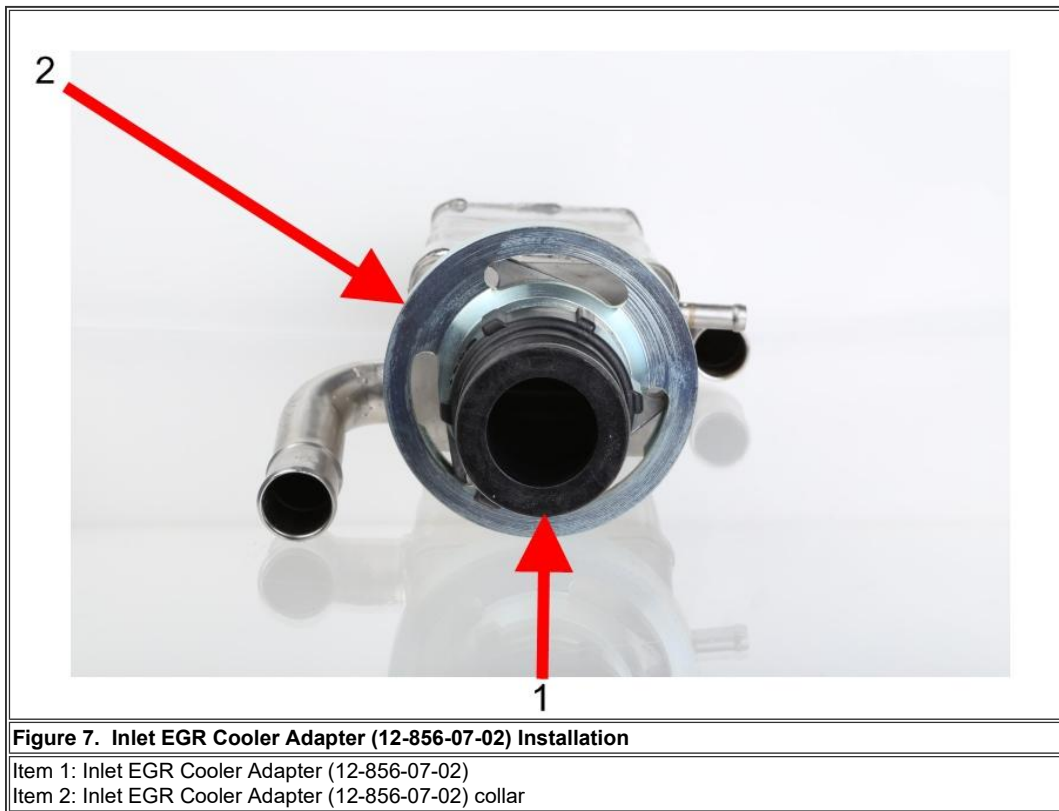
11. Hold Outlet EGR Cooler Adapter (12-856-07-01) collar (**Figure 5**, Item 1) while tightening Outlet EGR Cooler Adapter (**Figure 5**, Item 2) turning clockwise until adapter is secure.



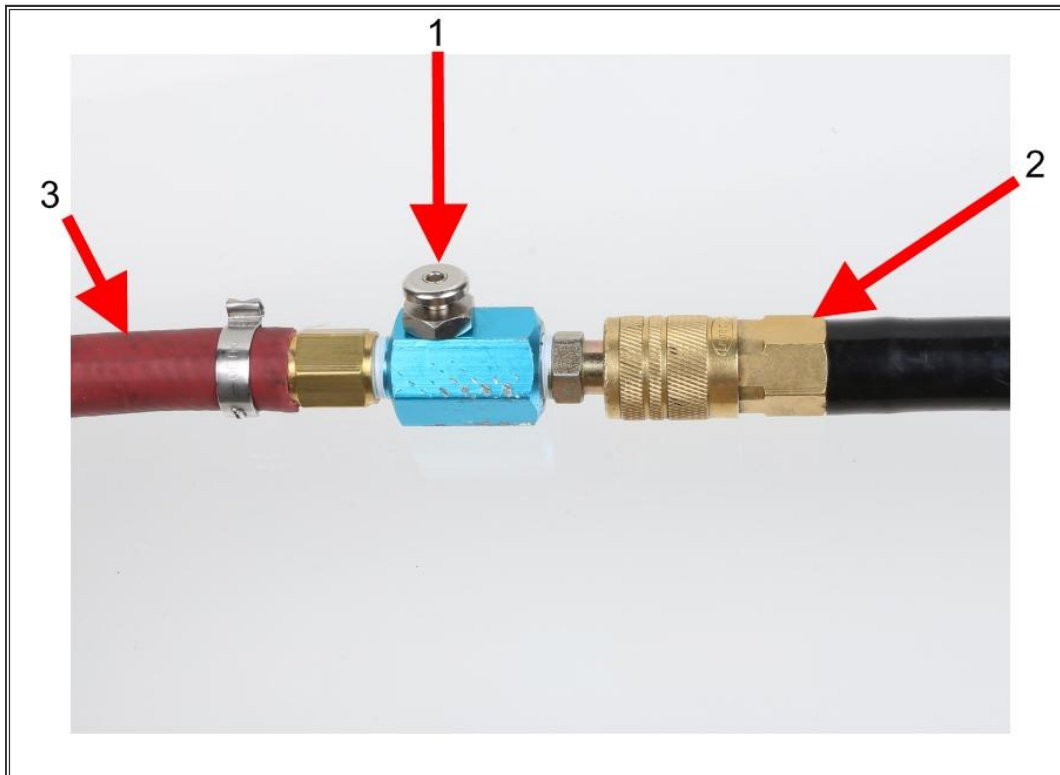
**Figure 6. Inlet EGR Cooler Adapter (12-856-07-02) Installation**

- Item 1: Inlet EGR Cooler Adapter (12-856-07-02) recess
- Item 2: LT EGR cooler inlet / flange tab
- Item 3: Inlet EGR Cooler Adapter (12-856-07-02) collar

12. Install LT EGR cooler inlet (**Figure 6**, Item 3) into Inlet EGR Cooler Adapter (12-856-07-02) recess (**Figure 6**, Item 1), and turn Inlet EGR Cooler Adapter collar (**Figure 6**, Item 1) clockwise until flange tabs (**Figure 6**, Item 3) are secure.



13. Hold Inlet EGR Cooler Adapter (12-856-07-02) collar (**Figure 7**, Item 2) and turn Inlet EGR Cooler Adapter (**Figure 7**, Item 1) clockwise until Inlet EGR Cooler Adapter is secure.



**Figure 8. Shop Air**

Item 1: Push button valve

Item 2: Shop air source

Item 3: Air Injector Coupling (12-856-07-03)

14. Connect shop air source (**Figure 8**, Item 2) (approximately 100 PSI [690 kPa]) to Air Injector Coupling (12-856-07-03) (**Figure 8**, Item 1).



**Figure 9. Cleaning Management System (12-353-01A) Hook-Up**

Item 1: FLOW RETURN hose (12-353-01-03)

Item 2: Inlet EGR Cooler Adapter (12-856-07-02)

Item 3: Outlet EGR Cooler Adapter (12-856-07-01)

Item 4: Air Injector Coupling (12-856-07-03)

Item 5: FLOW FROM PUMP hose (12-353-01-02)

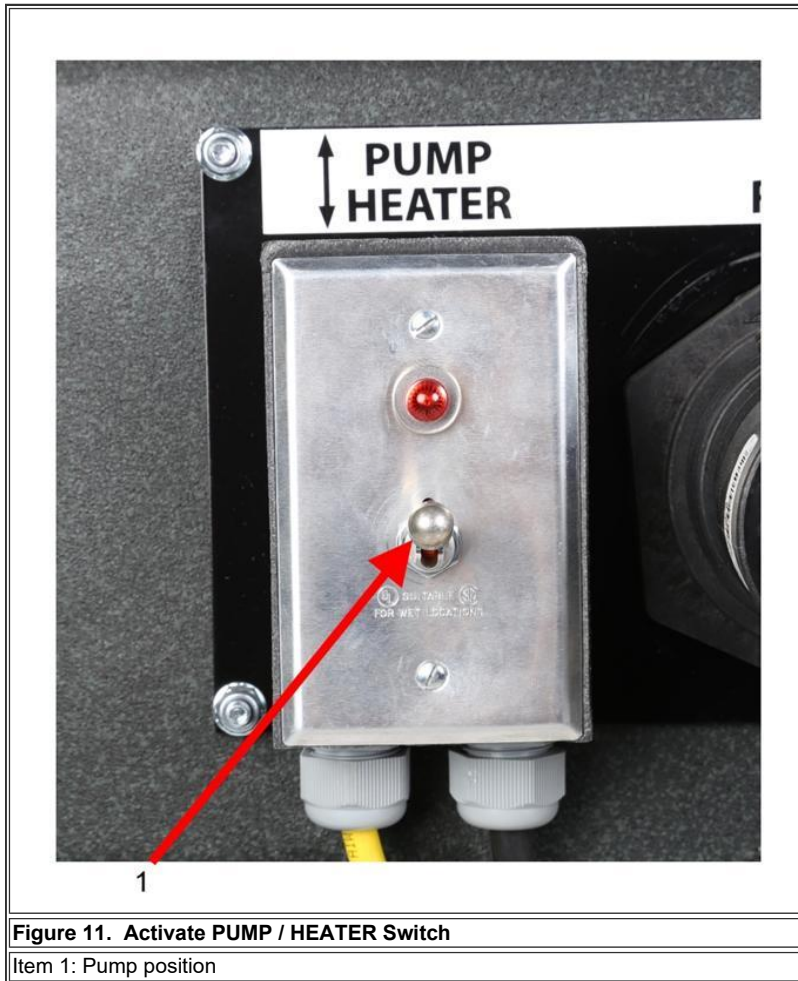
Item 6: FLOW FROM PUMP connection on Cleaning Management System (12-353-01A)

Item 7: FLOW RETURN connection on Cleaning Management System (12-353-01A)

15. Connect Air Injector Coupling (12-856-07-03) (**Figure 9**, Item 4) to Outlet EGR Cooler Adapter (12-856-07-01) (**Figure 9**, Item 3).
16. Connect FLOW FROM PUMP hose (12-353-01-02) (**Figure 9**, Item 5) to FLOW FROM PUMP connection on Cleaning Management System (12-353-01A) (**Figure 9**, Item 6).
17. Connect FLOW FROM PUMP hose (12-353-01-02) (**Figure 9**, Item 5) to Outlet EGR Cooler Adapter (12-856-07-01) (**Figure 9**, Item 3).
18. Connect FLOW RETURN hose (12-353-01-03) (**Figure 9**, Item 1) to FLOW RETURN connection on Cleaning Management System (12-353-01A) (**Figure 9**, Item 7).
19. Connect FLOW RETURN hose (12-353-01-03) (**Figure 9**, Item 1) to Inlet EGR Cooler Adapter (12-856-07-02) (**Figure 9**, Item 2).



20. Set timer (**Figure 10**, Item 1) on Cleaning Management System (12-353-01A) to 10 minutes.

**CLEANING PROCEDURE****WARNING**

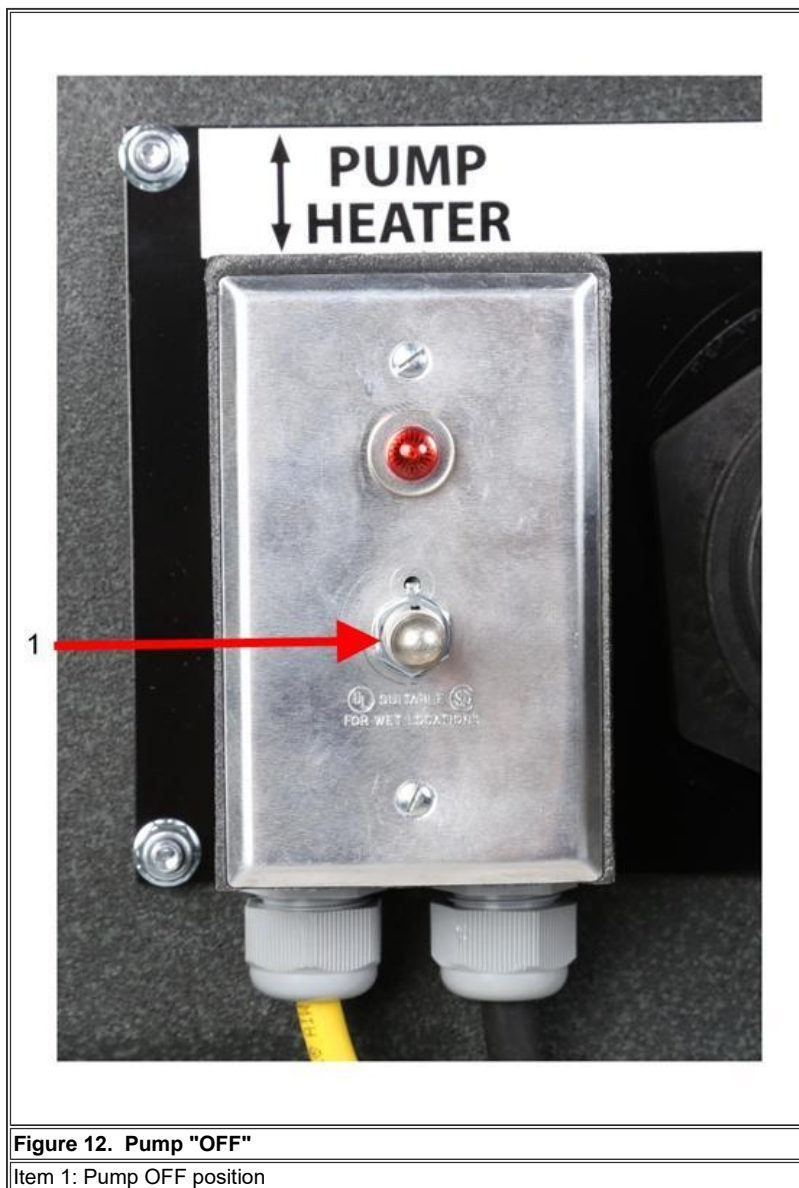
To prevent damage, personal injury, and / or death, make sure all hose connections are secure before activating pump.

1. Activate PUMP / HEATER switch to PUMP (up position) (Figure 11, Item 1) and start timer (Figure 11, Item 1) .

**CAUTION**

To prevent property damage, make sure to introduce only specified amount of air bursts. Too much air introduced into system could cause excessive foaming, which will overflow reservoir.

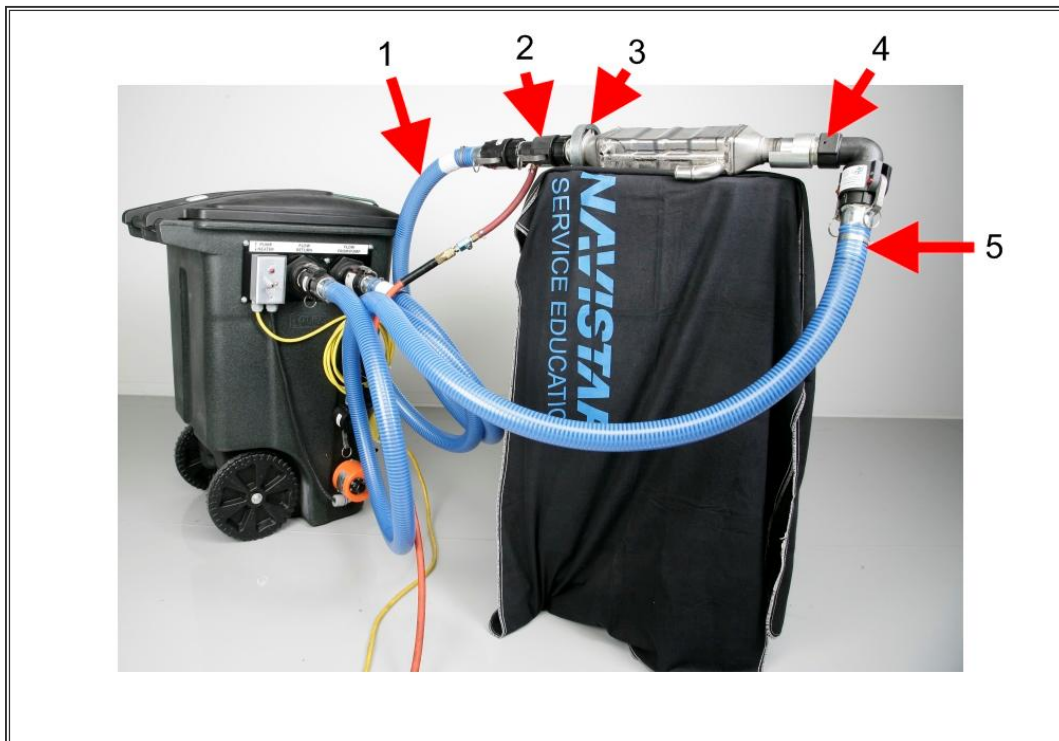
2. At 4- and 9-minute marks, introduce eight bursts of air at intervals of 1 second ON and 2 seconds OFF by pressing push button valve on the Air Injector Coupling (12-856-07-03) (Figure 8, Item 1).



**Figure 12. Pump "OFF"**

Item 1: Pump OFF position

3. After 10 minutes has expired, turn OFF PUMP (middle or neutral position) (**Figure 12**, Item 1), and using push button valve (**Figure 8**, Item 1), purge some of the cleaning solution from hoses back to reservoir to minimize spillage.
4. Disconnect FLOW FROM PUMP hose (12-353-01-02) (**Figure 9**, Item 5) from Outlet EGR Cooler Adapter (12-856-07-01) (**Figure 9**, Item 3).
5. Disconnect FLOW RETURN hose (12-353-01-03) (**Figure 9**, Item 1) from Inlet EGR Cooler Adapter (12-856-07-02) (**Figure 9**, Item 2).



**Figure 13. Forward Flush**

- Item 1: FLOW FROM PUMP hose (12-353-01-02)
- Item 2: Air Injector Coupling (12-856-07-03)
- Item 3: Inlet EGR Cooler Adapter (12-856-07-02)
- Item 4: Outlet EGR Cooler Adapter (12-856-07-01)
- Item 5: FLOW RETURN hose (12-353-01-03)

6. Connect FLOW RETURN hose (12-353-01-03) (**Figure 13**, Item 5) onto Outlet EGR Cooler Adapter (12-856-07-01) (**Figure 13**, Item 4).
7. Connect FLOW FROM PUMP hose (12-353-01-02) (**Figure 13**, Item 1) onto Inlet EGR Cooler Adapter (12-856-07-02) (**Figure 13**, Item 3).

**WARNING**

To prevent property damage, personal injury, and / or death, FLOW RETURN hose (12-353-01-03) must be properly secured prior to turning pump ON when evacuating Cleaning Management System (12-353-01A) reservoir due to high volume of fluid exiting FLOW RETURN hose.

8. Set and start timer (**Figure 10**, Item 1) on Cleaning Management System (12-353-01A) for 10 minutes, then active PUMP / Heater Switch to PUMP (**Figure 11**, Item 1).

**CAUTION**

To prevent property damage, make sure to introduce only specified amount of air bursts. Too much air introduced into system could cause excessive foaming, which will overflow reservoir.

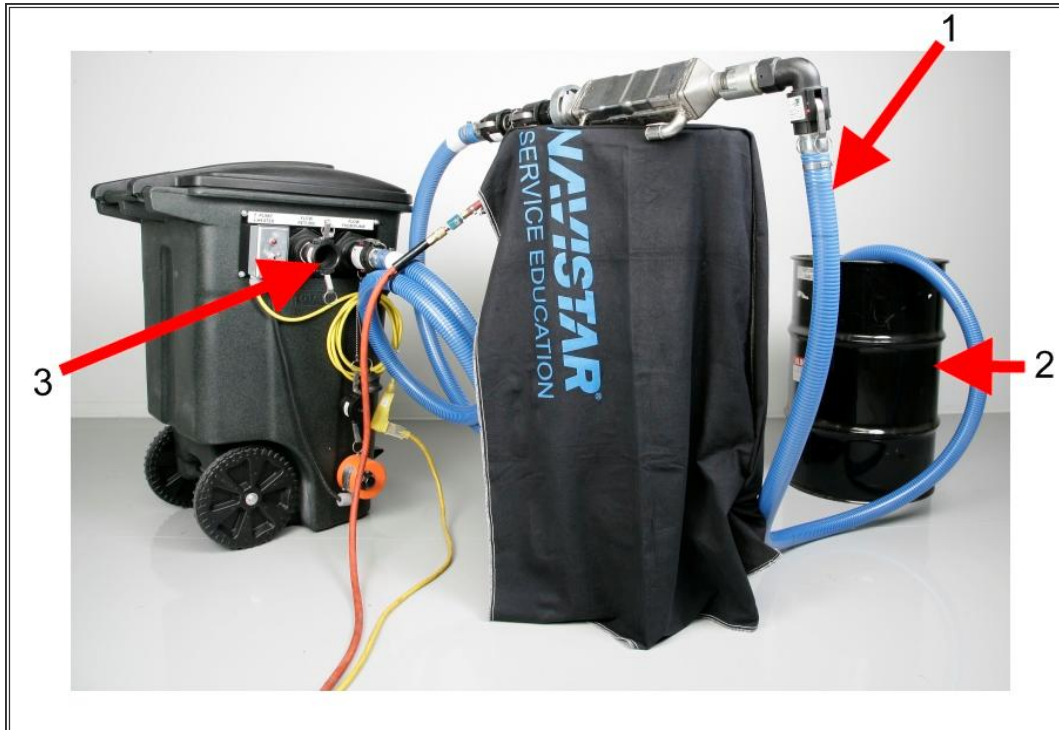
9. At 4- and 9-minute marks, introduce eight bursts of air at intervals of 1 second ON and 2 seconds OFF by pressing push button valve (**Figure 8**, Item 1) on Air Injector Coupling (12-856-07-03).
10. After 10 minutes has expired, turn PUMP OFF (**Figure 12**, Item 1), and using push button valve (**Figure 8**, Item 1), purge some of the cleaning solution from hoses back to reservoir to minimize spillage.

## FLUSHING PROCEDURE

### NOTE

Make sure PUMP / HEATER switch is in OFF position.

1. Disconnect shop air from Air Injector Coupling (12-856-07-03) and press and hold push button valve (**Figure 8**, Item 1) to relieve any pressure in system.



**Figure 14. Draining Cleaning Management System (12-353-01A)**

Item 1: FLOW RETURN hose (12-353-01-03)

Item 2: Suitable container

Item 3: FLOW RETURN connection on Cleaning Management System (12-353-01A)

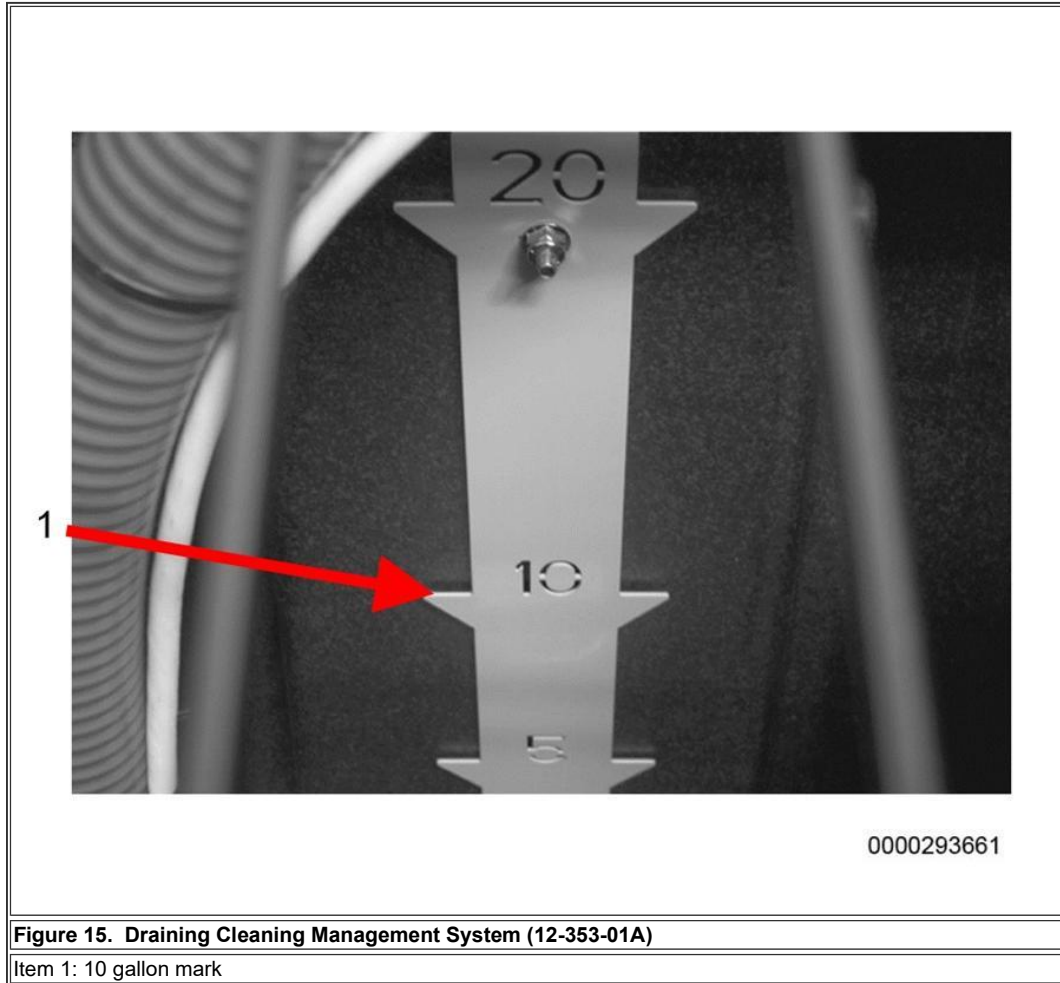
### WARNING

To prevent property damage, personal injury, and / or death, FLOW RETURN hose (12-353-01-03) must be properly secure prior to turning pump ON when evacuating Cleaning Management System (12-353-01A) reservoir due to high volume of fluid exiting FLOW RETURN hose.

### NOTE

Consult your local and state authorities for disposal procedures. Make sure to follow all applicable regulations before draining and / or disposing of any EGR cleaning solution. Make sure to follow all applicable regulations before draining any solution. Properly secure FLOW RETURN hose (12-353-01-03) to a suitable disposal container.

2. Disconnect FLOW RETURN hose (12-353-01-03) (**Figure 14**, Item 1) from Cleaning Management System connection (12-353-01A) (**Figure 14**, Item 3) and place end of FLOW RETURN hose into a suitable container (**Figure 14**, Item 2).
3. Activate PUMP / HEATER switch to PUMP (**Figure 11**, Item 1) and remove as much of used cleaning solution as possible.
4. Tip Cleaning Management System (12-353-01A) onto its front face, using tip-plate and then clean reservoir by spraying it with clean water. Make sure that all cleaning solution is drained from reservoir.



5. Turn Cleaning Management System (12-353-01A) upright and fill reservoir with clean tap water to 10 Gallon Mark (**Figure 15**, Item 1) on internal scale; this water will be used to flush remaining contaminants from LT EGR Cooler.



**Figure 16. Reverse Flush**

- Item 1: FLOW RETURN hose (12-353-01-03)
- Item 2: Inlet EGR Cooler Adapter (12-856-07-02)
- Item 3: Outlet EGR Cooler Adapter (12-856-07-01)
- Item 4: FLOW FROM PUMP hose (12-353-01-02)
- Item 5: FLOW FROM PUMP connection on Cleaning Management System
- Item 6: FLOW RETURN connection on Cleaning Management System

6. Connect FLOW FROM PUMP hose (12-353-01-02) (**Figure 16**, Item 5) and FLOW RETURN hose (12-353-01-03) (**Figure 16**, Item 6) to appropriate Cleaning Management System (12-353-01A) connections.
7. Connect FLOW FROM PUMP hose (12-353-01-02) (**Figure 16**, Item 4) to Outlet EGR Cooler Adapter (12-856-07-01) (**Figure 16**, Item 3) and connect FLOW RETURN hose (12-353-01-03) (**Figure 16**, Item 1) to Inlet EGR Cooler Adapter (12-856-07-02) (**Figure 16**, Item 2).
8. Set and start timer on CMS for 10 minutes, position PUMP / HEATER switch on Cleaning Management System (12-353-01A) to PUMP (**Figure 11**, Item 1), and perform 10-minute rinse with hot tap water (cold water is sufficient if hot tap water is not available).
9. Position PUMP / HEATER switch on Cleaning Management System (12-353-01A) to OFF (**Figure 12**, Item 1).



**Figure 17. Draining Cleaning Management System (12-353-01A)**

- Item 1: FLOW RETURN connection on Cleaning Management System (12-353-01A)  
 Item 2: FLOW FROM PUMP hose (12-353-01-02)  
 Item 3: FLOW RETURN hose (12-353-01-03)  
 Item 4: Suitable drain

**WARNING**

To prevent property damage, personal injury, and / or death, FLOW RETURN hose (12-353-01-03) must be properly secured prior to turning on PUMP when evacuating Cleaning Management System (12-353-01A) reservoir due to high fluid exiting FLOW RETURN hose.

**NOTE**

Consult your local and state authorities for disposal procedures. Make sure to follow all applicable regulations before draining and / or disposing of any EGR cleaning solution. Make sure to follow all applicable regulations before draining any solution. Properly secure FLOW RETURN hose (12-353-01-03) to a suitable disposal container.

10. Disconnect FLOW RETURN hose (12-353-01-03) (Figure 17, Item 1) from FLOW RETURN connection on Cleaning Management System (12-353-01A) (Figure 17, Item 4) and place end of FLOW RETURN hose into a suitable container (Figure 17, Item 3).
11. Position PUMP / HEATER switch on Cleaning Management System (12-353-01A) to PUMP (Figure 11, Item 1) until Cleaning Management System reservoir is empty.
12. Position PUMP / HEATER switch on Cleaning Management System (12-353-01A) to OFF (Figure 12, Item 1).
13. Disconnect FLOW FROM PUMP hose (12-353-01-02) from Cleaning Management System (12-353-01A).
14. Tip Cleaning Management System (12-353-01A) onto its front face, using tip-plate, and then clean reservoir by spraying it with clean water. Make sure that all cleaning solution is drained from reservoir.
15. Turn Cleaning Management System (12-353-01A) upright and fill reservoir with clean tap water to 10 Gallon mark on internal scale; this water will be used to flush remaining contaminants from LT EGR Cooler.



**Figure 18. Forward Flush**

- Item 1: FLOW FROM PUMP hose (12-353-01-02)
- Item 2: Inlet EGR Cooler Adapter (12-856-07-02)
- Item 3: Outlet EGR Cooler Adapter (12-856-07-01)
- Item 4: FLOW RETURN hose (12-353-01-03)
- Item 5: FLOW FROM PUMP connection on Cleaning Management System (12-353-01A)
- Item 6: FLOW RETURN connection on Cleaning Management System (12-353-01A)

16. Connect FLOW FROM PUMP hose (12-353-01-02) (**Figure 18**, Item 5) and FLOW RETURN hose (12-353-01-03) (**Figure 18**, Item 6) to appropriate Cleaning Management System (12-353-01A) connections.

17. Connect FLOW FROM PUMP hose (12-353-01-02) (**Figure 18**, Item 1) to Inlet EGR Cooler Adapter (12-856-07-02) (**Figure 18**, Item 2) and FLOW RETURN hose (12-353-01-03) (**Figure 18**, Item 4) to Outlet EGR Cooler Adapter (12-856-07-01) (**Figure 18**, Item 3).

18. Set and start timer on Cleaning Management System (12-353-01A) for 10 minutes, position PUMP / HEATER switch on Cleaning Management System to PUMP (**Figure 11**, Item 1), and perform 10-minute rinse with hot tap water (cold water is sufficient if hot tap water is not available).

19. Position PUMP / HEATER switch on Cleaning Management System (12-353-01A) to OFF (**Figure 12**, Item 1).



**Figure 19. Draining Cleaning Management System (12-353-01A)**

Item 1: FLOW FROM PUMP hose (12-353-01-02)

Item 2: FLOW RETURN hose (12-353-01-03)

Item 3: Suitable container

Item 4: FLOW RETURN connection on Cleaning Management System (12-353-01A)

**WARNING**

To prevent property damage, personal injury, and / or death, FLOW RETURN hose (12-353-01-03) must be properly secured prior to turning on PUMP when evacuating Cleaning Management System (12-353-01A) reservoir due to high fluid exiting FLOW RETURN hose.

**NOTE**

Consult your local and state authorities for disposal procedures. Make sure to follow all applicable regulations before draining and / or disposing of any EGR cleaning solution. Make sure to follow all applicable regulations before draining any solution. Properly secure FLOW RETURN hose (12-353-01-03) to a suitable disposal container.

20. Disconnect FLOW RETURN hose (12-353-01-03) (Figure 19, Item 1) from FLOW RETURN connection on Cleaning Management System (12-353-01A) (Figure 19, Item 3) and place end of FLOW RETURN hose into a suitable container (Figure 19, Item 2).

21. Position PUMP / HEATER switch on Cleaning Management System (12-353-01A) to PUMP (Figure 11, Item 1) until Cleaning Management System reservoir is empty.

22. Position PUMP / HEATER switch on Cleaning Management System (12-353-01A) to OFF (Figure 12, Item 1).

23. Disconnect FLOW RETURN (12-353-01-03) and FLOW FROM PUMP (12-353-01-02) hoses from Cleaning Management System (12-353-01A).



**Figure 20. Air Blower**

Item 1: FLOW FROM PUMP hose (12-353-01-02)

Item 2: FLOW RETURN hose (12-353-01-03)

Item 3: Suitable container

Item 4: Power Supply

Item 5: Air Blower (12-353-01-07)

24. Connect the FLOW FROM PUMP hose (**Figure 20**, Item 1) to Air Blower (12-353-01-07) (**Figure 20**, Item 5).
25. Connect power supply (**Figure 20**, Item 4) to Air Blower (12-353-01-07) (**Figure 20**, Item 5).
26. Run air blower (12-353-01-7) (**Figure 20**, Item 5) through inlet of EGR cooler at maximum speed until no water is coming from outlet of EGR cooler.
27. Remove power supply from air blower, FLOW FROM PUMP hose from air blower and Inlet EGR Cooler Adapter (12-856-07-02), and FLOW RETURN hose from Outlet EGR Cooler Adapter (12-856-07-01).
28. Remove Inlet EGR Cooler Adapter (12-856-07-02) by holding collar (**Figure 7**, Item 2) then turn Inlet EGR Cooler Adapter (**Figure 7**, Item 1) counter-clockwise until loose and remove from LT EGR cooler inlet.
29. Remove Outlet EGR Cooler Adapter (12-856-07-01) by holding collar (**Figure 5**, Item 1) and turn Outlet EGR Cooler Adapter (**Figure 5**, Item 2) counter-clockwise until loose, then turn and slide Outlet EGR Cooler Adapter off of LT EGR cooler outlet.
30. Install LT EGR cooler into vehicle. Refer to [Engine Service Manual, EGES-335-2](#).
31. Close and latch hood.
32. Remove wheel chocks.

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## **WARRANTY INFORMATION**

### **Warranty Claim Coding:**

<b>Group:</b>	<a href="#">12000 - Description</a>
<b>Noun:</b>	<a href="#">892 - Description</a>

### **Standard Repair Time(s):**

-

SRTs are subject to change without notice, the time posted on the SRT homepage are correct and should be used.

<u>Step</u>	<u>Description</u>	<u>Chassis</u>	<u>Engine</u>	<u>SRT</u>	<u>Hours</u>
ALL	<a href="#">LT EGR Cooler Cleaning</a>	ALL	<a href="#">EPA 07 MaxxForce DT/9/10</a>	<a href="#">EPA 07 MaxxForce DT/9/10</a>	
9	<a href="#">LT EGR Cooler Removal / Installation</a>	CE	<a href="#">EPA 07 MaxxForce DT/9/10</a>	<a href="#">G12-6892K-12</a>	<a href="#">Low-Temperature EGR Cooler Removal &amp; Installation (SRTs)</a>
9	<a href="#">LT EGR Cooler Removal / Installation</a>	3200	<a href="#">EPA 07 MaxxForce DT/9/10</a>	<a href="#">Z12-6892K-12</a>	
9	<a href="#">LT EGR Cooler Removal / Installation</a>	4300	<a href="#">EPA 07 MaxxForce DT/9/10</a>	<a href="#">K12-6892K-12</a>	
9	<a href="#">LT EGR Cooler Removal / Installation</a>	4400	<a href="#">EPA 07 MaxxForce DT/9/10</a>	<a href="#">L12-6892K-12</a>	
9	<a href="#">LT EGR Cooler Removal / Installation</a>	7300 / 7400 / 7500	<a href="#">EPA 07 MaxxForce DT/9/10</a>	<a href="#">M12-6892K-12</a>	
9	<a href="#">LT EGR Cooler Removal / Installation</a>	8500	<a href="#">EPA 07 MaxxForce DT/9/10</a>	<a href="#">P12-6892K-12</a>	
9	<a href="#">LT EGR Cooler Removal / Installation</a>	RE Bus	<a href="#">EPA 07 MaxxForce DT/9/10</a>	<a href="#">I12-6892K-12</a>	

[High-Pressure CAC Removal & Installation \(SRTs\)](#)

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