NAVISTAR®

Diesel Particulate Filter Cleaning

Study Guide

Course Code: 8249

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NOTE

THE INFORMATION PROVIDED WITHIN THIS COURSE IS FOR TRAINING PURPOSES ONLY. ALWAYS CONSULT THE LATEST SERVICE, DIAGNOSTIC, AND TOOL INFORMATION, LOCATED ON NAVISTAR'S SERVICE PORTAL, PRIOR TO PERFORMING SERVICE ON NAVISTAR ENGINES, VEHICLES, AND EQUIPMENT.

Introduction

Welcome to the Navistar training course for Diesel Particulate Filter Cleaning. The purpose of this course is to guide you through the cleaning procedure of a plugged Diesel Particulate Filter.

If you have questions or concerns regarding this program, please contact Navistar Service Education by submitting a case file (Dealer Personnel); or by calling 1-800-365-0088.

Over time, it is possible for the Diesel Particulate Filter (DPF) or Diesel Oxidation Catalyst (DOC) to become plugged with soot or ash. When this occurs the component must be removed and cleaned or exchanged. This requires special handling techniques and cleaning equipment.

Inspection Form

NOTE

All DPFs are tracked and identified with a specific serial number. If a replacement DPF is installed, you must record the serial numbers of both the original and the replacement on the warranty report and in Service Portal.

DPF Inspection Form

Use the Diesel Particulate Filter Inspection/Cleaning form found in iKNow article IK1201132, Titled: Navistar Diesel Particulate Filter Cleaning Service Procedure, to record the required information found on the vehicle as well as on the DPF itself. Fill in the Date, Serial Number, Part Number, Customer Information, Mileage, Vin Number, Hours of operation, and Engine Type on the DPF Inspection/Cleaning form.

Snap Acceleration Test

Before removing the DPF conduct a Snap Acceleration Test on the vehicle. Record the findings of the test on the Diesel Particulate Filter Inspection/Cleaning form. Details on conducting the Snap Acceleration Test can be found in the Aftertreatment Symptom-Based Diagnostic and Inspection Manual.

Indexing

NOTE

Before removing a DPF to be cleaned and reinstalled, the components must be indexed and marked to show the direction of exhaust flow. This ensures proper installation after the filter has been cleaned.

Index the DPF

To index and mark the direction of flow on the DPF, place a permanent index mark on all components to show how they should line up and draw an arrow showing the direction of flow. This important function will ensure that the diesel particular filter is properly reinstalled.

CAUTION

Do not attempt to clean the DPF or DOC with a pressure washer or compressed air. Failure to comply will result in damage to the DPF or DOC.

CAUTION

The ash contained within the DPF or DOC is considered a hazardous waste. Disposal should be in accordance with all local laws and regulations. Refer to www.epa.gov for more information.

WARNING

To prevent property damage, personal injury, and / or death, before working on the exhaust system components, allow sufficient time for cool down. During regeneration, exhaust gas temperature could reach 1500°F (800°C), and exhaust system surface temperature could exceed 1300°F (700°C), which is hot enough to ignite or melt common materials, and to burn skin. The exhaust and exhaust components can remain hot after the vehicle has stopped moving.

Visual Inspection

In order to visually inspect or clean the DPF it must be removed from the vehicle. Use the DOC and DPF Reuse Guidelines to determine the condition of the DOC and DPF, these guidelines can be found in the Aftertreatment Symptom-Based Diagnostic and Inspection Manual. The DOC and DPF Reuse Guidelines include photographs to help identify the condition of the components.

CAUTION

To prevent property damage, personal injury, and / or death, use a suitable device for support and removal of the DPF. The DPF is heavy and contains a ceramic "brick" that is sensitive to shocks and impacts.

Using the DOC and DPF Reuse Guidelines, determine whether the DPF can be cleaned and reused "marked Green Tag" or if it must be replaced "marked Red Tag". If the DPF or DOC is determined to have fuel, oil, or coolant contamination refer to the appropriate engine diagnostic manual for diagnostic procedures to repair the cause of contamination before replacing the DPF or DOC.

Component Identification

Cleaning System

The DPF cleaning system is made up of four components. The "Trap Tester", "Trap Blaster", "Trap Burner", and the "Soot Sucker".

Trap Tester

The "Trap Tester" is used to measure the level of restriction in the DPF. The "Trap Tester" is equipped with a magnahelic gauge used to record the flow restriction through the DPF being tested.

NOTE

Navistar® does not recommend or authorize cleaning of the DOC utilizing the "Air Knife" function, as this will cause the fins to bend.

Trap Blaster

The "Trap Blaster" uses compressed air to clean the DPF in an automated process. During the cleaning process the "Trap Blaster" blows air into the clean side of the DPF to push the trapped ash out of the dirty side of the DPF. The lower spear pulses air over the dirty side of the DPF to break up any soot and ash stuck to the filter's surface.

Trap Burner

The "Trap Burner" is an industrial kiln used to convert soot caught in the DPF to ash. The "Trap Burner" bakes the DPF at a high temperature for an extended period of time to bake heavy soot deposits and convert them to ash in the same way as a regeneration would.

Soot Sucker

The "Soot Sucker" is a soot and fume recovery system. The unit has two filters inside, one is a paper cartridge style filter and the other is a HEPA panel filter. The "Soot Sucker" pulses air in to the filters to disrupt the soot collected on the filters, the soot then falls to the collection container at the bottom of the unit. The "Soot Sucker" is used to during the DPF cleaning process to pull soot and ash out of the "Trap Blaster".

Pneumatic Cleaning Process

Setup

To start the cleaning process set the DPF on the stack of adapter rings. You will use the ring the DPF is sitting on and the ring that just fits around the outside of the DPF flange.

Adapter Rings

Once you have identified the correct adaptor rings, install only the smaller into the Trap Blaster.

Measure lower spear height

Now use a straight edge to measure the height of the lower spear. Also measure the distance from the DPF flange to the substrate. Determine if the lower spear is within 1/2 to 3/4 of an inch of the substrate. If the lower Spear is not at the proper height you may have to either cut the existing spear to length or replace it with a longer tube.

Adjust Lower Spear Travel

Set the Lower Spear "Engage" knob to the "Move Only" position to move the lower spear, then use the left and right "Position" knobs to adjust the travel limits of the lower spear. Adjust the "Position" knobs until the lower spear lightly touches the sides of the adapter rings. Then move the "Engage" knob back to the off position.

DPF Setup

Set the DPF in to the "Trap Blaster" with the flow arrow pointing up. Be sure to center the DPF in the adapter rings.

Adjust Upper Spear

Next set the height of the upper spear by turning the "Height" knob to the down position until the spear is approximately 1/2 to 3/4 of an inch away from the substrate of the filter. Now set the side to side travel of the upper spear by moving the Upper Spear "Engage" knob to the "move only" position. Adjust the side limit of the spear by turning the Upper Spear "Position" knobs. Adjust the upper spear so that it lightly touches the side flanges of the DPF. When this is complete turn the Upper Spear "Engage" knob back to the "Off" position.

Cone Style DPF cleaning tips

When cleaning a cone style DPF a straight spear will not reach the entire surface of the filter. In this situation a bent nozzle will be necessary. Use a bent nozzle to clean the outside edges of the DPF then a straight nozzle to clean the center.

Start Soot Sucker

Turn on the "Soot Sucker" by pressing the "Start" button and turning the "Motor" and "Pulse" knobs to the "On" positions.

Begin Cleaning the DPF

Start the "Trap Blaster" by moving the "Rotate" knob to the "Full Air" position, and the upper and lower "Engage" knobs to the "Air blast" position.

Finish Cleaning the DPF

Once the DPF has been cleaned turn off the "Trap Blaster" and "Soot Sucker "and remove the DPF.

Thermal Cleaning Process

Setup

In order to thermally clean a DPF start by lowering the DPF in to the "Trap Burner". Ensure the DPF sits securely on the filter rack, then close and secure the lid. Start the "Soot Sucker". Next press p1 on the key pad of the "Trap Burner", then press the start button. The display will then prompt to press 1 if there is oil or fluids in the DPF or to press 2 if there is no oil or fluids present. Once a selection is made the "Trap Burner" will display a three digit code. Enter this code using key pad on the "Trap Burner" then press enter. Finally press the start button. After the "Trap Burner" has completed its process the display will read complete. The unit will need approximately 12 hours to fully heat and cool the filter safely.

CAUTION

To prevent property damage, during cleaning or inspection, do not use a grinder or abrasive air tool to remove residual gasket material.

After Cleaning

Once the DPF has been successfully cleaned thoroughly clean the mating surfaces. The gaskets, nuts, and bolts used in the engine aftertreatment system are special and it is recommended that they be replaced when reinstalling exhaust aftertreatment components. Reinstall the DPF and DOC in the vehicle, then connect the batteries and check for any exhaust leaks. Perform a DPF reset procedure if applicable and retest its operation.

More Info

For more information on DPF cleaning or reuse guidelines refer to the appropriate service manual.

CONCLUSION

You have now completed the Navistar training course for Diesel Particulate Filter Cleaning.

Thank you for your participation.

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