MAXXFORCE

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Class Course Code: SD1207
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EGR Cooler Alignment Tool
Training Program
Study Guide

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INTRODUCTION

Welcome to the Navistar training course for the 2010 MaxxForce 11 and 13 EGR Cooler Alignment Tool. This course will introduce you to the EGR Cooler Alignment Tool, the Update Template for the EGR Cooler Alignment Tool, the procedure to modify the EGR Cooler Alignment Tool, and the procedure that must be followed when performing a partial replacement of the EGR Cooler Assembly.

Objectives

Upon completion of this program, you will be able to: Define the purpose of the EGR Cooler Alignment Tool, identify the EGR Cooler Alignment Tool and Update Template, modify the EGR Cooler Alignment Tool for use with all cooler castings, and correctly complete a partial EGR Cooler replacement.

- *Define the Purpose of the EGR Cooler Alignment Tool*
- *Identify EGR Cooler Alignment Tool and Update Template*
- *Modify EGR Cooler Alignment Tool to Accommodate All EGR Cooler Castings*
- *Complete a Partial EGR Cooler Replacement*

Modules

This course consists of the following four modules: Purpose of the Tool, Tool Identification, Tool Modification, and Partial EGR Cooler Replacement.

1. *Purpose of the Tool*
2. *Tool Identification*
3. *Tool Modification*
4. *Partial EGR Cooler Replacement*

NOTES

MODULE 1: PURPOSE OF THE TOOL

Background

Correct alignment of the EGR Cooler Assembly is necessary for proper operation of the Cooler; and to prevent internal coolant leaks, which may cause excessive wear, or even catastrophic engine failure. While improper alignment is not an issue if the entire EGR Cooler Assembly is replaced as a unit, replacing the unit as a whole is not necessary to complete most repairs. Instead, the technician must diagnose all issues related to the EGR Cooler Assembly and identify a failure within either the High or Low Temperature EGR Cooler.

MODULE 1: PURPOSE OF THE TOOL

PURPOSE OF THE TOOL

If a failure is identified within either the High or Low Temperature EGR Cooler, that cooler must be replaced. The EGR Cooler Alignment Tool is required when reassembling the EGR Cooler Assembly after replacement of either the High Temperature, or Low Temperature, EGR Coolers.

When used correctly, EGR Cooler Alignment Tool will ensure a complete seal between the coolant and exhaust gas passages of the High Temperature and Low Temperature EGR Coolers. The procedure for setup and operation of the tool will be described in detail in the following modules of this program.

Aligns the two halves of the EGR Cooler Assembly during partial EGR Cooler replacement.

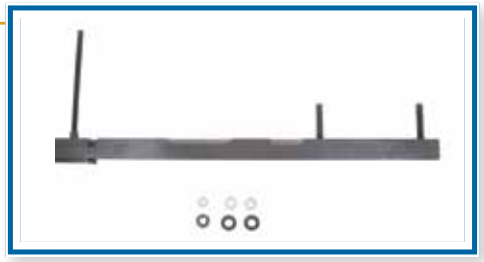
NOTES

MODULE 2: TOOL IDENTIFICATION

EGR Cooler Alignment Tool

Performing a partial replacement of the EGR Cooler Assembly means either the High or Low Temperature EGR Cooler is being replaced; not the entire assembly. When performing this service on a 2010 MaxxForce 11 or MaxxForce 13, the EGR Cooler Alignment Tool, shown here, must be used.

The part number for the alignment tool is 12-892-01A, which includes the EGR Cooler Alignment Tool, a three-eighths dash 16 nut, a three-eighths SAE flat washer, two seven-sixteenths dash 14 nuts, and two seven-sixteenths flat washers, with an instruction sheet.

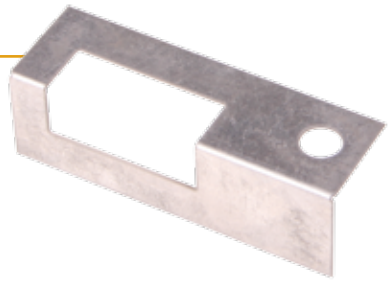


Old Version of Alignment Tool

Shown here is a comparison between the newest version of the EGR Cooler Alignment Tool, and the previous version. While the old version is suitable for use with most EGR Coolers, it is missing a machined indentation, which is a provision for certain High Temperature EGR Coolers.

Update Template

The Update Template provides a quick and easy way to correctly modify older versions of the EGR Alignment Tool. This modification is needed for the Alignment Tool to accept some High Temperature EGR Coolers that have an enlarged casting.



NOTES

MODULE 3: TOOL MODIFICATION

Tool List

The following information will describe the procedure for modifying an old version of the EGR Cooler Alignment Tool to accommodate the full range of EGR Cooler housings.

To complete the modification, you will need the EGR Cooler Alignment Tool Update Template, a bench grinder or Handheld Angle Grinder, and a seven-sixteenths box end wrench.

- *EGR Cooler Alignment Tool Update Template*
- *Bench Grinder or Handheld Angle Grinder*
- *7/16 Boxed-end Wrench*
- *Metal File*

Install Template

The first step in the process is installation of the Update Template onto the EGR Cooler Alignment Tool. The template should be installed on the middle stud with the cut-out section located between the beveled edge of the tool and the middle stud.

Install the seven-sixteenths washer and nut on the middle stud and tighten the nut so that the template is held in place over the tool.

WARNING

ALWAYS EXERCISE CAUTION, AND WEAR PROPER HAND AND EYE SAFETY EQUIPMENT, WHEN OPERATING AIR TOOLS, POWER TOOLS, AND GRINDING WHEELS.

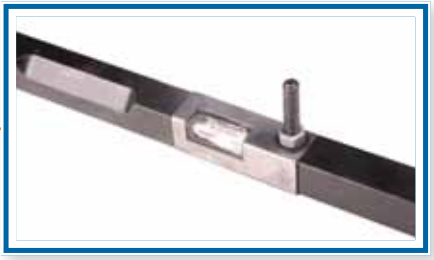
Always exercise caution, and wear proper hand and eye safety equipment, when operating air tools, power tools, and grinding wheels.

Bevel Tool Edge

With the Update Template installed on the EGR Cooler Alignment Tool, mount the Tool horizontally in a vice so that the cut-out of the Update Template is easily accessible. Use a grinding wheel to slowly remove material from the Alignment Tool, making sure to stay within the edges of the cut-out on the template.

Bevel Tool Edge (continued)

Continue removing material from the Alignment Tool until the new beveled area is nearly flat and at a 45 degree angle.



MODULE 3: TOOL MODIFICATION

Test Fit

After the section has been sufficiently ground down, remove the template from the Alignment Tool. If a High Temperature EGR Cooler with the enlarged casting is available, test fit the cooler on the Alignment Tool. Repeat the modification procedure until all fitment issues are resolved.

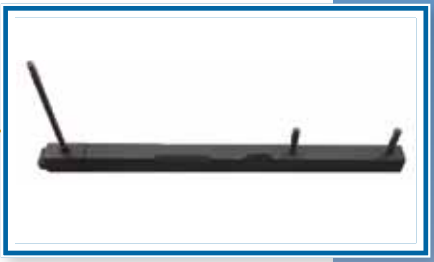
File Tool

Use a metal file to remove any sharp edges and to give the Alignment Tool a smooth finish.

Paint Exposed Metal

When no further modification to the Alignment Tool is required, clean and dry the exposed area, and apply a rust preventative paint.

This completes the Tool Modification process.



NOTES

MODULE 4: PARTIAL EGR COOLER REPLACEMENT

EGR Cooler Assembly Removal

Prior to performing a partial replacement of the EGR Cooler, the EGR Cooler Assembly must be removed from the engine. Refer to the "Exhaust Gas Recirculation (EGR) System" section of the EGES-465 Engine Service Manual for the correct removal procedure.

Tool Setup

Once removed from the engine, the EGR Cooler Assembly can be installed on the EGR Cooler Alignment Tool.

First, mount the EGR Cooler Alignment Tool in a vise. In order for the Alignment Tool to work properly, the notches in the tool must be outside of the vise jaws, with the studs pointing upwards, and the top edge of the tool above the vise jaws.

Be sure the vise is securely attached to the bench to keep the EGR Cooler Alignment Tool and EGR Cooler Assembly from falling.

WARNING

BE SURE THE VISE IS SECURELY ATTACHED TO THE BENCH TO KEEP THE EGR COOLER ALIGNMENT TOOL AND EGR COOLER ASSEMBLY FROM FALLING.

Mount EGR Cooler Assembly

Mount and secure the EGR Cooler Assembly to the EGR Cooler Alignment Tool. The High-Temperature Cooler should be secured to the two shorter mounting studs, and the Low-Temperature Cooler to the longer mounting stud.

1. High-Temperature EGR Cooler Mounting Stud

2. Low-Temperature EGR Cooler Mounting Stud

3. EGR Cooler Alignment Tool

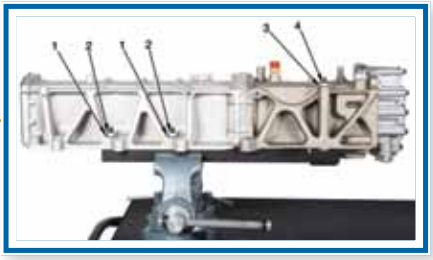
MODULE 4: PARTIAL EGR COOLER REPLACEMENT

Secure EGR Cooler Assembly

With the Cooler in place, install two seven-sixteenths SAE flat washers and two seven-sixteenths by fourteen nuts onto the two High-Temp Cooler mounting studs.

Also install a three-eighths flat washer and three-eighths by sixteen nut onto the Low-Temp Cooler mounting stud. Torque the nuts to 30 pound-feet, or 41 newton-meters.

1. 7/16 SAE flat washer
2. 7/16-14 nut
3. 3/8 SAE flat washer
4. 3/8-16 nut



CAUTION

DO NOT REMOVE THE MID-PLATE FROM THE HIGH TEMPERATURE EGR COOLER. DISTURBING THE SEALING SURFACES MAY CAUSE A LEAK BETWEEN THE EXHAUST GAS AND COOLANT PASSAGES OF THE COOLER.

Separate Cooler Halves

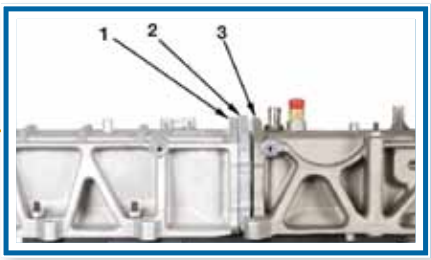
With the EGR Cooler Assembly securely mounted to the Alignment Tool, remove and discard the nine M8 by 50 hex socket screws that fasten the High and Low Temperature Cooler housings to the Mid-plate.

Once the hex socket screws have been removed, the leaking cooler can be separated and removed from the Alignment Tool.

For the purpose of this training program, we will remove the Low Temperature EGR Cooler.

Do not remove the mid-plate from the High Temperature EGR Cooler. Disturbing the sealing surfaces may cause a leak between the exhaust gas and coolant passages of the Cooler.

1. High-Temperature EGR Cooler
2. Mid-plate
3. Low Temperature EGR Cooler



MODULE 4: PARTIAL EGR COOLER REPLACEMENT

Clean Mating Surfaces

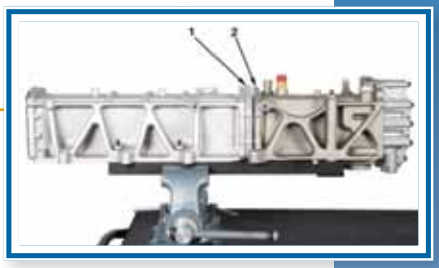
With the failed Low-Temperature EGR Cooler removed from the Alignment Tool, clean the mating surfaces of the Mid-plate and replacement Low-Temperature Cooler.

Install Replacement Cooler

Then, loosen, but do not remove, the nuts fastening the High-Temperature Cooler to the EGR Cooler Alignment Tool.

Position the replacement Low-Temp Cooler and fastening hardware over the appropriate mounting stud of the Alignment Tool and tighten all fasteners hand-tight.

1. Mid-plate
2. Replacement Low-Temperature EGR Cooler.

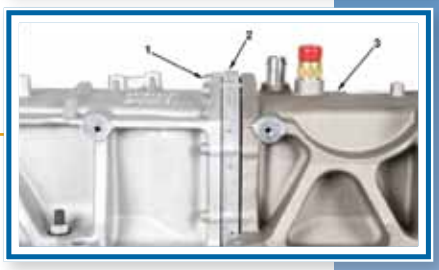


Fasten Cooler Halves

With both Cooler halves secured to the Alignment Tool, slide the Low Temperature EGR Cooler into position contacting the Mid-plate. The Low Temperature EGR Cooler seal must be flush against the Mid-plate surface.

While making sure to maintain proper alignment, reinstall all EGR Cooler Assembly brackets using nine new M8 by 50 hex socket screws tightened finger tight.

1. M8 x 50 Hex Socket Screws
2. Mid-plate
3. Low Temperature EGR Cooler



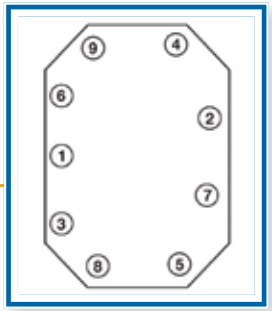
Torque EGR Cooler Assembly Fasteners

After tightening the EGR Cooler Alignment Tool Fasteners to 30 foot pounds, or 41 newton meters, the EGR Cooler halves can be secured.

The torque sequence shown in the image at right must be completed in two stages. During the first stage, torque the hex socket screws, in sequence starting with number one, to 15 foot pounds, or 20 newton meters.

Torque in Two Stages:
First Sequence:
- ***15 lbf·ft or***
- ***(20 N·m)***

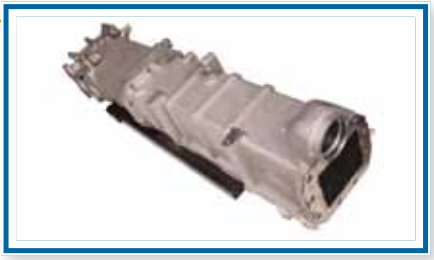
Second Sequence:
- ***23 lbf·ft or***
- ***(31 N·m)***



After completing the first stage, torque the screws again, following the same sequence, to 23 foot pounds, or 31 newton meters.

MODULE 4: PARTIAL EGR COOLER REPLACEMENT

Reassemble the Vehicle



The EGR Cooler Alignment procedure is now complete. Remove the fastening hardware and EGR Cooler Assembly from the Alignment Tool.

Assemble the engine according to the installation procedure in the “Exhaust Gas Recirculation (EGR) System” section of the EGES-465 Engine Service Manual and verify proper operation of the vehicle.

MODULE 4: PARTIAL EGR COOLER REPLACEMENT

CONCLUSION:

This concludes the Navistar Training Course for the 2010 MaxxForce 11 and 13 EGR Cooler Alignment Tool. Thank you for your participation.

