

## Tool Instruction Induction Cleaning System

4328219R4

Tool Number: 12-544-01



0000341081

Figure 1. Induction Cleaning System – 12-544-01.

### Purpose

Essential tools to remove material buildup on intake valves caused by internal coolant leakage. A special Engine Control Module (ECM) was developed to eliminate variations in engine speed and temperature during the cleaning process.

## Application(s)

MaxxForce® 11 and 13 (EPA 10)

MaxxForce® 11 and 13 (EPA 10) with HD-OBD



**GOVERNMENT REGULATION:** Engine fluids (oil, fuel, and coolant) may be a hazard to human health and the environment. Handle all fluids and other contaminated materials (such as filters or rags) in accordance with applicable regulations. Recycle or dispose of engine fluids, filters, and other contaminated materials according to applicable regulations.

**! WARNING:** To prevent personal injury or death, read all safety instructions in the “Safety Information” section of the *Engine Service Manual* or *Engine Diagnostic Manual*.

**! WARNING:** To prevent property damage, personal injury, and / or death, park vehicle on 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, always wear safe eye protection when performing vehicle maintenance.

**! WARNING:** To prevent personal injury or death, install down draft outlet pipe into shop exhaust vent.

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



## Tool Contents

Table 1

Image	Tool Number	Qty	Description
 <p>0000297495</p>	Refer to Serviceable Parts Breakdown at End of Document	1	Pressure Tank Assembly
 <p>0000297493</p>	12-544-01-16	1	Exhaust Outlet Pipe
 <p>0000297494</p>	12-544-01-17	1	Down Draft Outlet Pipe
 <p>0000297492</p>	12-544-01-18	1	Engine Control Module (ECM)
 <p>0000299023</p>	Obtain Locally	As Required	Filter
 <p>0000341141</p>	12-544-01-20	1	Oxygen (O2) Sensor Plug

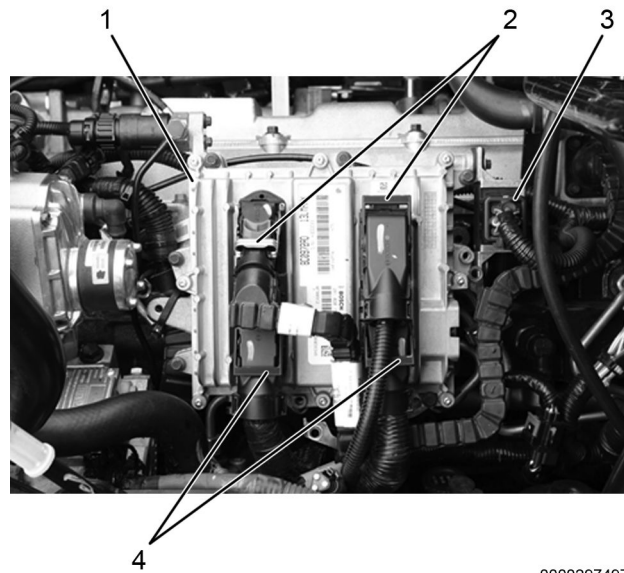
## Tool Contents (cont.)

Table 1. (cont.)

Image	Tool Number	Qty	Description
 <p>0000341121</p>	12-544-01-21	1	Nitrogen Oxide (NOx) Sensor Plug
 <p>0000160075</p>	4328219R4	1	Tool Instruction

## Instructions

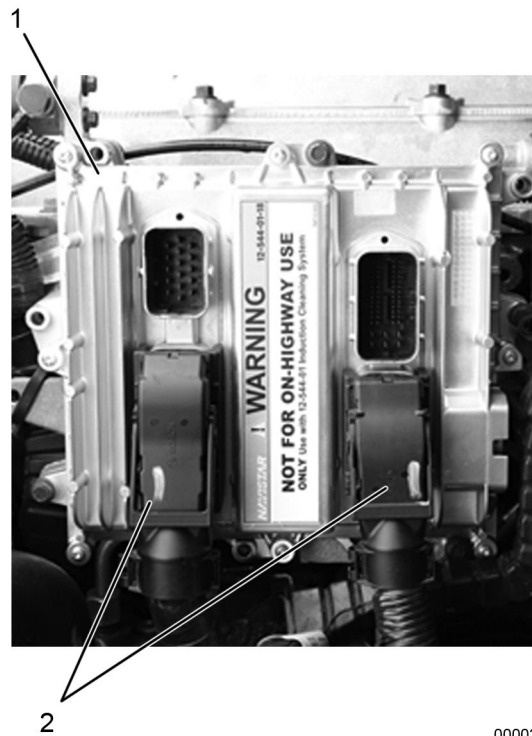
### Installation



**Figure 2. Engine Control Module (ECM) Connectors.**

1. ECM
  2. Upper ECM connector lock (2)
  3. Inlet air heater relay
  4. Lower ECM connector lock (2)
- 
1. Bring vehicle into shop and park on flat surface.
  2. Shift transmission to Park or Neutral, set parking brake, and install wheel chocks.
  3. Unlatch and open hood.
  4. Disconnect / remove negative battery terminal.
  5. Remove air filter housing.
  6. Disengage upper connector locks (Figure 2, Item 2).
  7. Disconnect upper ECM connectors.
  8. Disengage lower connector locks (Figure 2, Item 4).
  9. Disconnect lower ECM connectors.
  10. Disconnect inlet air heater relay (Figure 2, Item 3) next to ECM.
  11. Remove eight bolts securing ECM. Do not discard.
  12. Remove ECM (Figure 2, Item 1) from vehicle. Do not discard.

## Instructions (cont.)



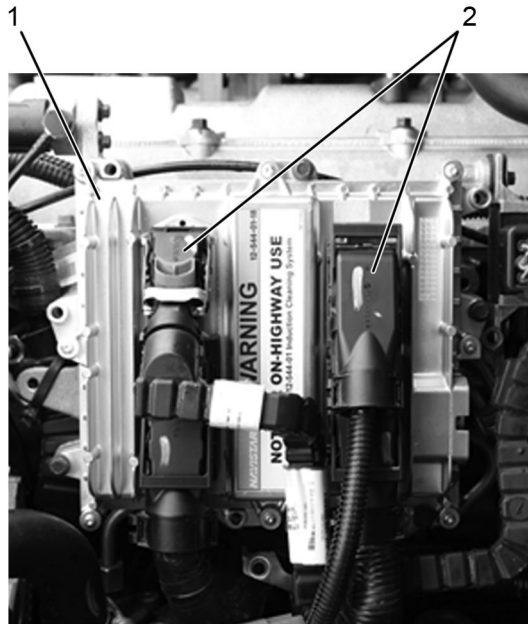
**Figure 3. Induction Cleaning ECM Lower Connectors.**

1. 12-544-01-18 ECM
2. Lower ECM connector (2)

**NOTE: Do not install all ECM bolts; two - four bolts securing ECM will be sufficient for cleaning procedure.**

13. Position and install ECM (Figure 3, Item 1) with two - four previously removed bolts. Using torque wrench, tighten bolts to 10 lb-ft (14 N•m).
14. Connect lower ECM connectors (Figure 3, Item 2), and engage connector locks.

## Instructions (cont.)

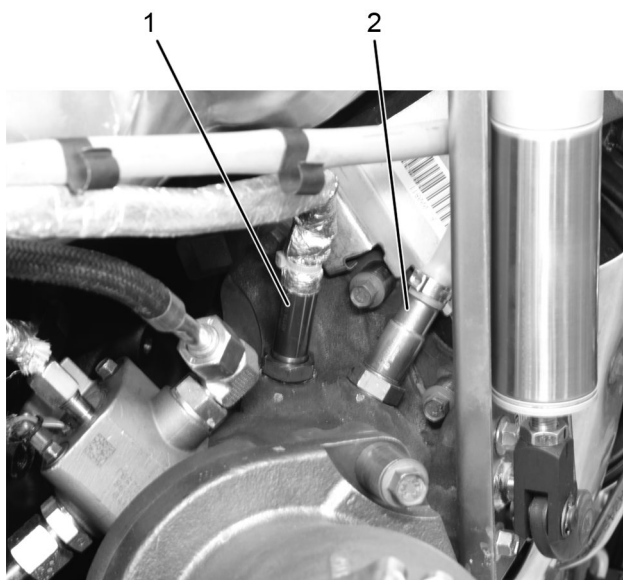


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**Figure 4. Induction Cleaning ECM Upper Connectors.**

1. 12-544-01-18 ECM
  2. Upper ECM connector (2)
- 
15. Connect upper ECM connectors (Figure 4, Item 2) to induction cleaning ECM (Figure 4, Item 1), and engage connector locks.
  16. Install air filter housing.

## Instructions (cont.)



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**Figure 5. NOx and O2 Sensors.**

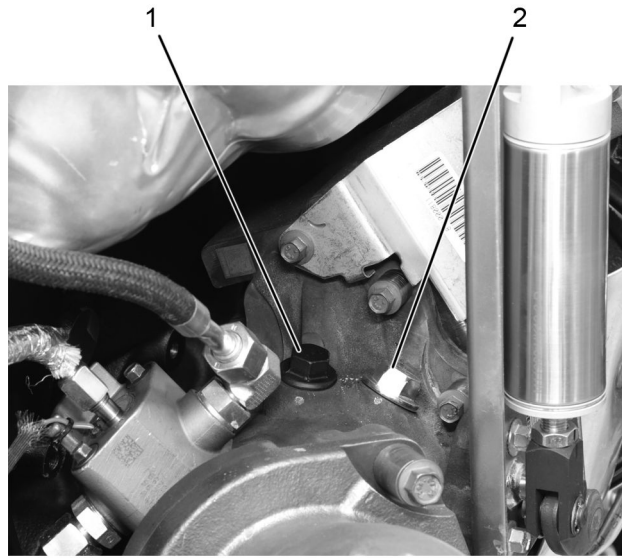
1. NOx sensor
2. O2 sensor

17. If equipped, disconnect and remove NOx sensor (Figure 5, Item 1).

18. Disconnect and remove O2 sensor (Figure 5, Item 2).



## Instructions (cont.)



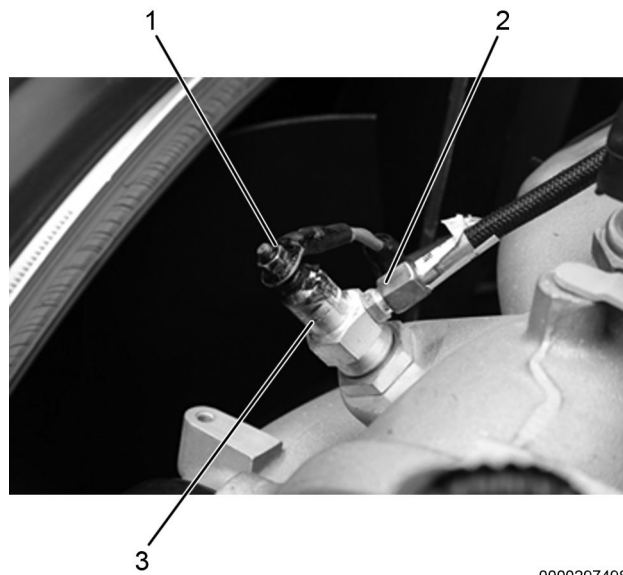
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**Figure 6. NOx and O2 Sensor Plugs.**

1. NOx sensor plug
2. O2 sensor plug

19. Install NOx sensor plug (Figure 6, Item 1). Tighten plug securely.
20. Install O2 sensor plug (Figure 6, Item 2). Tighten plug securely.

## Instructions (cont.)



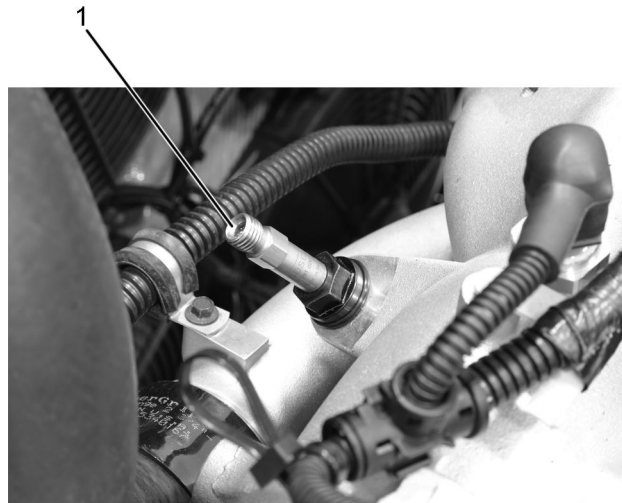
**Figure 7. Inlet Air Heater Fuel Igniter.**

1. Inlet air heater electrical connection
2. Inlet air heater fuel supply line
3. Inlet air heater fuel igniter

**CAUTION: Residual fuel may be present when removing inlet air heater fuel supply line.**

21. Remove inlet air heater fuel supply line (Figure 7, Item 2).
22. Remove inlet air heater electrical connection (Figure 7, Item 1).
23. Remove inlet air heater fuel igniter (Figure 7, Item 3).

## Instructions (cont.)

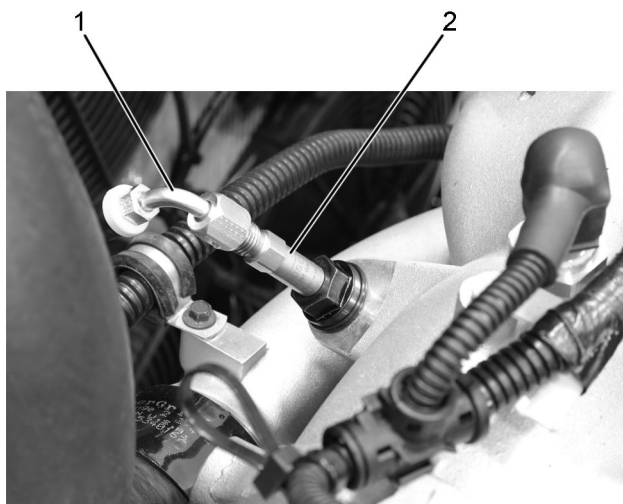


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**Figure 8. Injector Assembly.**

1. Injector assembly
  
24. Remove protective cap, and install kit-supplied 12-544-01-08 Injector Adapter and 12-544-01-07 Injector (Figure 8, Item 1) into inlet air heater fuel igniter port. Hand tighten injector adapter but no more than 10 lb-in (1 N•m).

## Instructions (cont.)

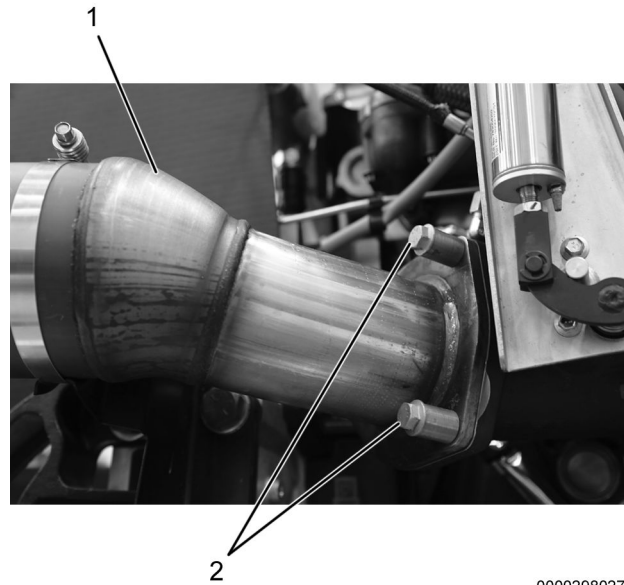


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**Figure 9. Fuel Supply Line.**

1. 12-544-01-05 Induction Cleaner Hose Sub-Assembly
  2. Injector assembly
- 
25. Install induction cleaner hose sub-assembly onto injector (Figure 9, Items 1 and 2).

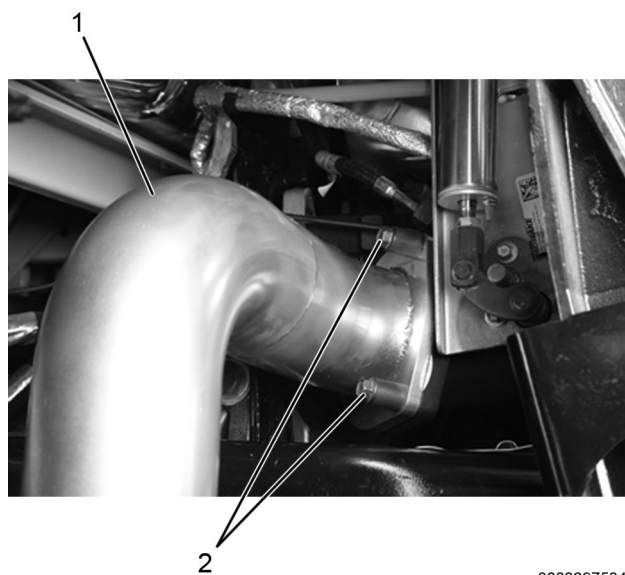
## Instructions (cont.)



**Figure 10. Pre-Diesel Oxidation Catalyst (Pre-DOC) Pipe.**

1. Pre-DOC pipe
  2. Bolt (3) (1 not shown)
- 
26. Remove bolts (Figure 10, Item 2), spacers, and clamp from pre-DOC pipe (Figure 10, Item 1). Do not discard.
  27. Remove pre-DOC pipe from turbocharger outlet.

## Instructions (cont.)



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**Figure 11. Exhaust Outlet Pipe.**

1. 12-544-01-16 Exhaust Outlet Pipe
  2. Bolt (3) (1 not shown)
28. Using previously removed bolts (Figure 11, Item 2), spacers, and gasket, install exhaust outlet pipe (Figure 11, Item 1). Using torque wrench, tighten bolts to 27 lb-ft (36 N•m).

## Instructions (cont.)

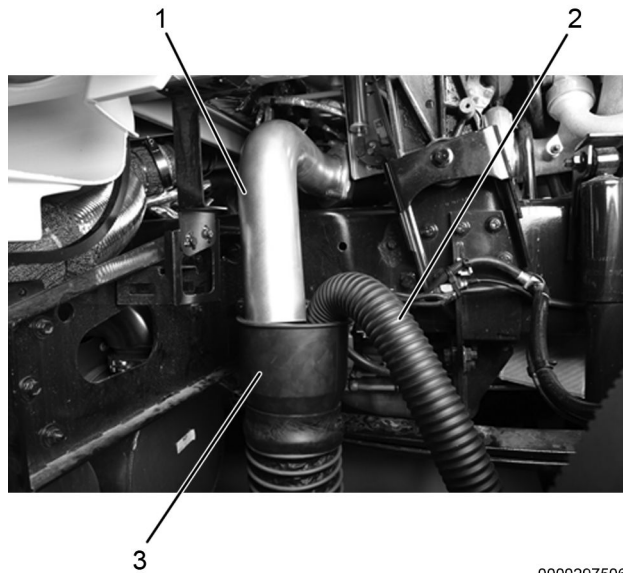


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**Figure 12. Down Draft Outlet Pipe.**

1. 12-544-01-17 Down Draft Outlet Pipe
  
29. Install down draft outlet pipe (Figure 12, Item 1).

## Instructions (cont.)



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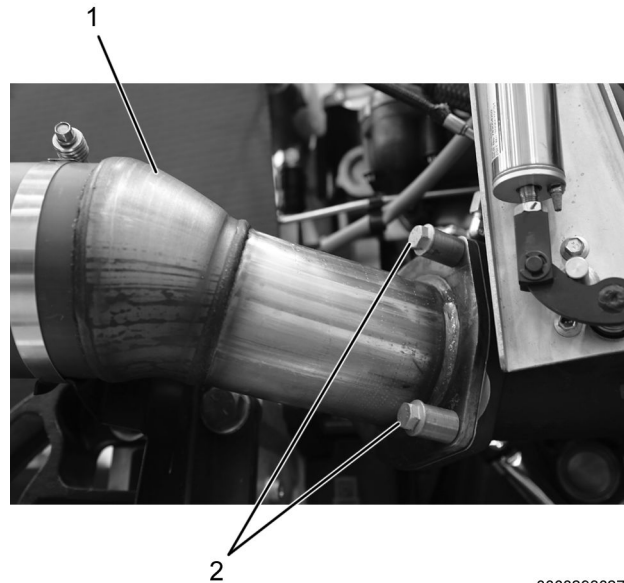
**Figure 13. Exhaust Vent.**

1. 12-544-01-16 Exhaust Outlet Pipe
  2. 12-544-01-17 Down Draft Outlet Pipe
  3. Exhaust vent tube
- 
30. Connect exhaust vent tube (Figure 13, Item 3) to exhaust outlet pipe (Figure 13, Item 1) and down draft outlet pipe (Figure 13, Item 2).
  31. Install negative battery cable.
  32. Perform induction system cleaning test. Refer to appropriate service manual, service bulletin, or equivalent for detailed instruction.



## Instructions (cont.)

### Removal



**Figure 14. Pre-Diesel Oxidation Catalyst (Pre-DOC) Pipe.**

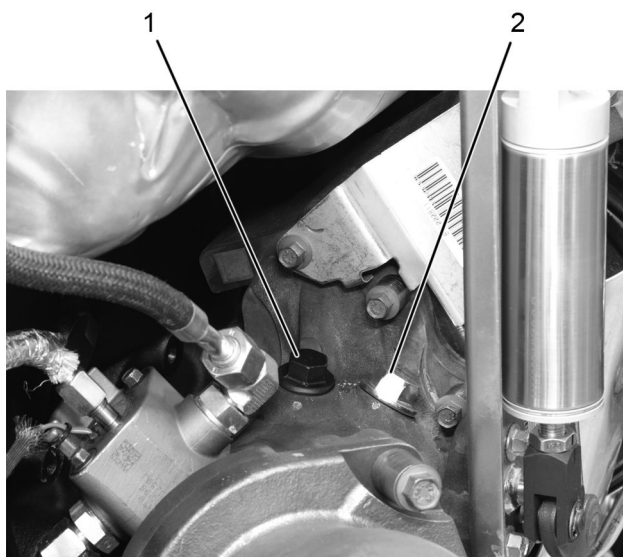
1. Pre-DOC pipe
2. Bolt (3) (1 not shown)

1. Remove negative battery cable.
2. Remove exhaust vent tube (Figure 13, Item 3).
3. Remove down draft outlet pipe (Figure 12, Item 1).
4. Remove exhaust outlet pipe (Figure 11, Item 1). Do not discard spacers, bolts, or gasket.

**NOTE: If necessary, replace gaskets.**

5. Position and install pre-DOC pipe (Figure 14, Item 1) onto turbocharger outlet with gaskets, spacers, and bolts (Figure 14, Item 2). Refer to appropriate service manual, service bulletin, or equivalent for detailed instruction.
6. Position and install clamp to pre-DOC pipe. Refer to appropriate service manual, service bulletin, or equivalent for detailed instruction.

## Instructions (cont.)

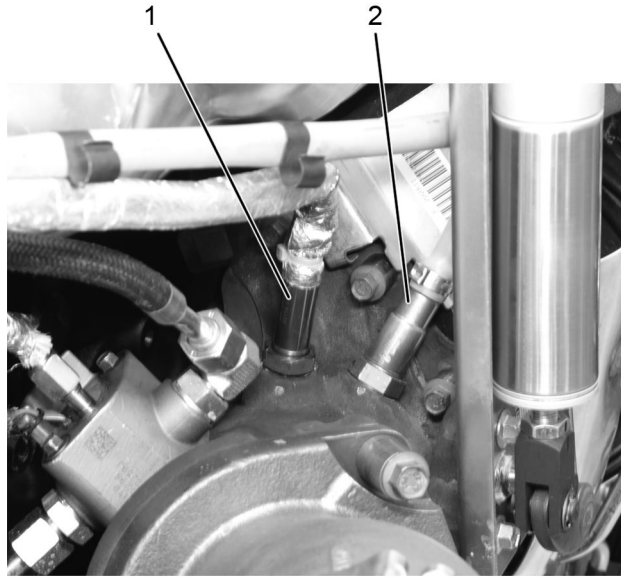


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**Figure 15. NOx and O2 Sensor Plugs.**

1. NOx sensor plug
  2. O2 sensor plug
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7. Remove NOx and O2 sensor plugs (Figure 15, Items 1 and 2).

## Instructions (cont.)

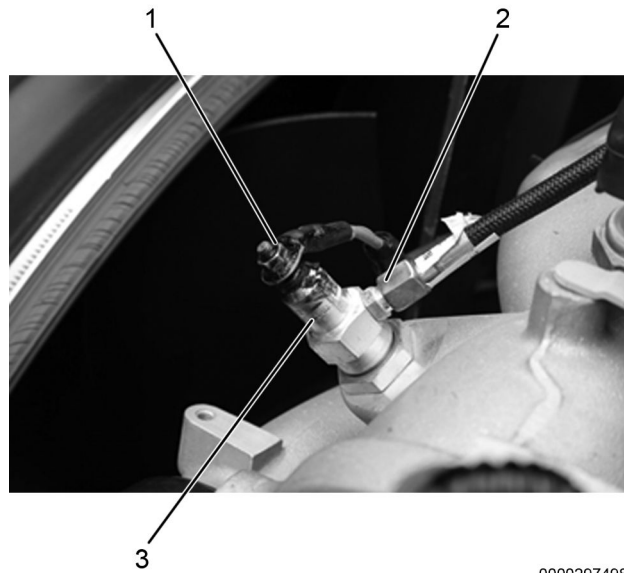


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**Figure 16. NOx and O2 Sensors.**

1. NOx sensor
  2. O2 sensor
- 
8. If equipped, install and connect NOx sensor (Figure 16, Item 1). Refer to appropriate service manual, service bulletin, or equivalent for detailed instruction.
  9. Install and connect O2 sensor (Figure 16, Item 2). Refer to appropriate service manual, service bulletin, or equivalent for detailed instruction.

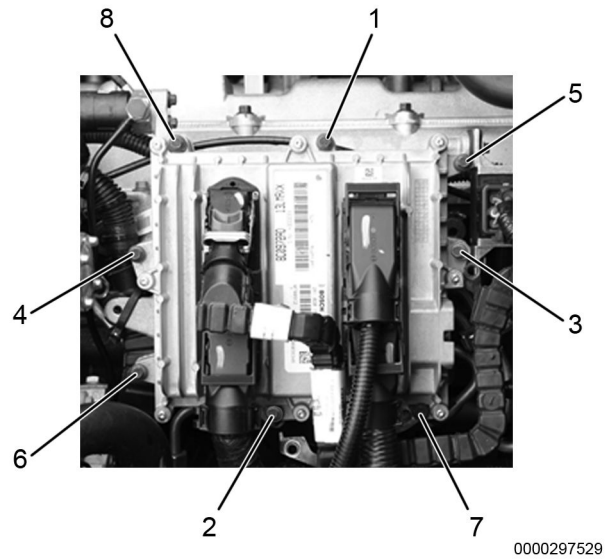
## Instructions (cont.)



**Figure 17. Inlet Air Heater Fuel Igniter.**

1. Inlet air heater electrical connection
  2. Inlet air heater fuel supply line
  3. Inlet air heater fuel igniter
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10. Remove induction cleaner hose sub-assembly and injector assembly (Figure 9, Items 1 and 2) from inlet air heater fuel igniter port.
  11. Install inlet air heater fuel igniter (Figure 17, Item 3). Using torque wrench, tighten to 17 lb-ft (23 N•m).
  12. Install inlet air heater electrical connection (Figure 17, Item 1). Using torque wrench, tighten to 35 lb-in (4 N•m).
  13. Install inlet air heater fuel supply line (Figure 17, Item 2). Using torque wrench, tighten to 132 lb-in (10 N•m).
  14. Remove air filter housing.
  15. Disengage locks and disconnect connectors from kit-supplied induction cleaning ECM (Figures 3 and 4, Items 1 and 2).
  16. Remove kit-supplied induction cleaning ECM. Do not discard bolts.

## Instructions (cont.)



**Figure 18. ECM Torque Sequence.**

17. Install original ECM using eight bolts. Using torque wrench and torque sequence (Figure 18), tighten bolts to 89 lb-in (10 N•m).
  18. Connect inlet air heater relay (Figure 2, Item 3) next to ECM.
  19. Connect ECM connectors and engage locks (Figure 2, Items 2 and 4).
  20. Install air filter housing.
  21. Connect / install negative battery cable.
  22. Close and latch hood.
  23. Remove wheel chocks.
- CAUTION: Flush tank with clean water until no soap residue is evident. Failure to comply may result in a contaminated hose assembly, a restricted injector, and poor overall tool performance.**
24. Rinse tank of all soap residue and refill with at least 1 liter of clean water. Seal and pressurize tank and spray clean water to flush hose and injector. Continue spraying for at least 30 seconds to 1 minute after water is exhausted from air-dry injector.

## SERVICE REPLACEMENT PARTS

Table 2 SERVICE REPLACEMENT PARTS

Image	Replacement Part Number	Description
 <p>0000298022</p>	12-544-01-01	5 Gallon Stainless Pressure Tank
 <p>0000298023</p>	12-544-01-02	Gauge / Air Regulator Assembly
 <p>0000298021</p>	12-544-01-05	Hose Sub-Assembly
 <p>0000298024</p>	12-544-01-06	Air Shutoff Valve
 <p>0000298026</p>	12-544-01-07	Injector
 <p>0000308949</p>	12-544-01-08	Injector Adapter

## Contact Information

If you would like to order additional tools or need replacement parts, please refer to the Navistar Service Tool Catalog. If you have questions, concerns, or feedback, please contact Navistar Service Tool Support Center:

- Submit a Service Tool iKNow case file.
- Phone: 800-365-0088 (toll free).