

**6068 PowerTech™ OEM
Diesel Engines
Below 130kW (174 hp)
(Interim Tier 4/Stage III
B platform)**

COMPONENT TECHNICAL MANUAL

**6.8 L OEM Diesel Engines Below
130kW (174 hp) — Interim Tier
4/Stage III B platform**

CTM104619 23FEB17 (ENGLISH)

John Deere Power Systems

Worldwide Edition
PRINTED IN U.S.A.

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Prevent Acid Burns

Sulfuric acid in battery electrolyte is poisonous. It is strong enough to burn skin, eat holes in clothing, and cause blindness if splashed into eyes.

Avoid the hazard by:

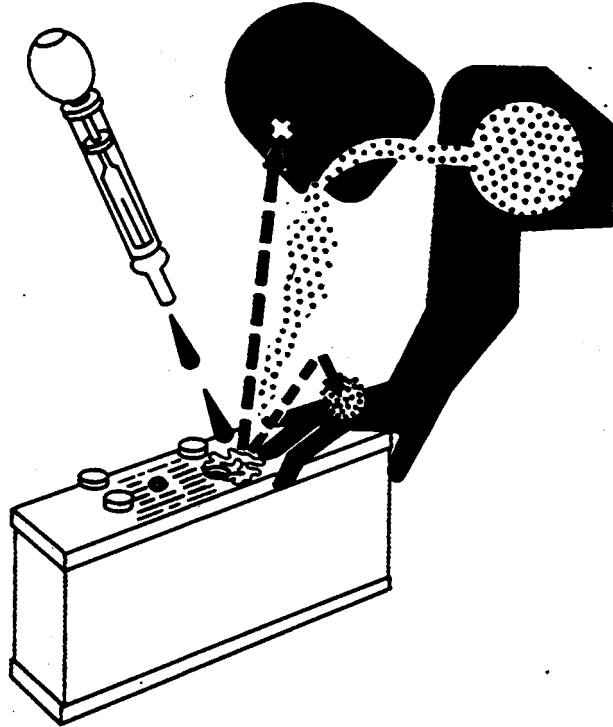
1. Filling batteries in a well-ventilated area.
2. Wearing eye protection and rubber gloves.
3. Avoiding breathing fumes when electrolyte is added.
4. Avoiding spilling or dripping electrolyte.
5. Use proper jump start procedure.

If you spill acid on yourself:

1. Flush your skin with water.
2. Apply baking soda or lime to help neutralize the acid.
3. Flush your eyes with water for 15—30 minutes. Get medical attention immediately.

If acid is swallowed:

1. Do not induce vomiting.
2. Drink large amounts of water or milk, but do not exceed 2 L (2 quarts).
3. Get medical attention immediately.



TS203 —UN—23AUG88

DX,POISON -19-21APR93-1/1

Prevent Battery Explosions

Keep sparks, lighted matches, and open flame away from the top of battery. Battery gas can explode.

Never check battery charge by placing a metal object across the posts. Use a volt-meter or hydrometer.

Do not charge a frozen battery; it may explode. Warm battery to 16°C (60°F).



TS204 —UN—15APR13

DX,SPARKS -19-03MAR93-1/1

Diesel Engine Coolant (engine with wet sleeve cylinder liners)

Preferred Coolants

The following pre-mix engine coolants are preferred:

- John Deere COOL-GARD™II
- John Deere COOL-GARD II PG

COOL-GARD II pre-mix coolant is available in several concentrations with different freeze protection limits as shown in the following table.

COOL-GARD II pre-mix	Freeze Protection Limit
COOL-GARD II 20/80	-9 °C (16 °F)
COOL-GARD II 30/70	-16 °C (3 °F)
COOL-GARD II 50/50	-37 °C (-34 °F)
COOL-GARD II 55/45	-45 °C (-49 °F)
COOL-GARD II PG 60/40	-49 °C (-56 °F)
COOL-GARD II 60/40	-52 °C (-62 °F)

Not all COOL-GARD II pre-mix products are available in all countries.

Use COOL-GARD II PG when a non-toxic coolant formulation is required.

Additional Recommended Coolants

The following engine coolant is also recommended:

- John Deere COOL-GARD II Concentrate in a 40—60% mixture of concentrate with quality water.

IMPORTANT: When mixing coolant concentrate with water, do not use less than 40% or greater than 60% concentration of coolant. Less than 40% gives inadequate additives for corrosion protection. Greater than 60% can result in coolant gelation and cooling system problems.

Other Coolants

Other ethylene glycol or propylene glycol base coolants may be used if they meet the following specification:

- Pre-mix coolant meeting ASTM D6210 requirements

COOL-GARD is a trademark of Deere & Company

- Coolant concentrate meeting ASTM D6210 requirements in a 40—60% mixture of concentrate with quality water

If coolant meeting one of these specifications is unavailable, use a coolant concentrate or pre-mix coolant that has a minimum of the following chemical and physical properties:

- Provides cylinder liner cavitation protection according to either the John Deere Cavitation Test Method or a fleet study run at or above 60% load capacity
- Is formulated with a nitrite-free additive package
- Protects the cooling system metals (cast iron, aluminum alloys, and copper alloys such as brass) from corrosion

Water Quality

Water quality is important to the performance of the cooling system. Distilled, deionized, or demineralized water is recommended for mixing with ethylene glycol and propylene glycol base engine coolant concentrate.

Coolant Drain Intervals

Drain and flush the cooling system and refill with fresh coolant at the indicated interval, which varies with the coolant used.

When COOL-GARD II or COOL-GARD II PG is used, the drain interval is 6 years or 6000 hours of operation.

If a coolant other than COOL-GARD II or COOL-GARD II PG is used, reduce the drain interval to 2 years or 2000 hours of operation.

IMPORTANT: Do not use cooling system sealing additives or antifreeze that contains sealing additives.

Do not mix ethylene glycol and propylene glycol base coolants.

Do not use coolants that contain nitrites.

DX,COOL3 -19-15MAY13-1/1

Safety Precautions

Only qualified service technicians, familiar with this equipment, can use the engine repair stand.

To maintain shear strength specifications, alloy steel Class 10.9 or SAE Grade 8 or higher cap screws must be used to mount adapters and engine to repair stand. Tighten cap screws to specifications given.

For full thread engagement, be certain that tapped holes in adapters and engine blocks are clean and not damaged. A thread length engagement equal to 1-1/2 screw diameters minimum is required to maintain strength requirements.

To avoid structural or personal injury, do not exceed the maximum capacity rating of 2722 kg (6000 lb.). Maximum capacity is determined with the center of the engine located not more than 330 mm (13 in.) from the mounting hub surface of the engine stand.

The center of balance of an engine must be located within 51 mm (2 in.) of the engine stand rotating shaft. Engine

center of balance is located a few millimeters above the crankshaft.

To prevent possible personal injury due to engine slippage, recheck to make sure that engine is solidly mounted before releasing support from engine lifting device.

Do not position any part of the body under a load being lifted or suspended. Accidental slippage can result in personal injury.

Use the lifting jack when it is necessary to lift the engine for rotation. When working on the engine, the jack must be at its lowest position to keep the center of gravity and the possibility of tipping low.

To prevent possible personal injury due to sudden engine movement, lower the engine by operating jack release valve slowly. Do not unscrew release valve knob more than two turns from its closed position.

PU00210,00000C4 -19-02SEP10-1/1

Glow Plug — Removal

Special Tools:

- None

Consumables:

- None

NOTE: For clarity purpose, exhaust manifold and EGR are removed from the pictures.

NOTE: Thermostat housing may need to be removed to access the cylinder number 1 glow plug.

In some applications, removing only thermostat cover would be sufficient to access the cylinder number 1 glow plug.

1. If necessary, perform Thermostat Housing — Removal.

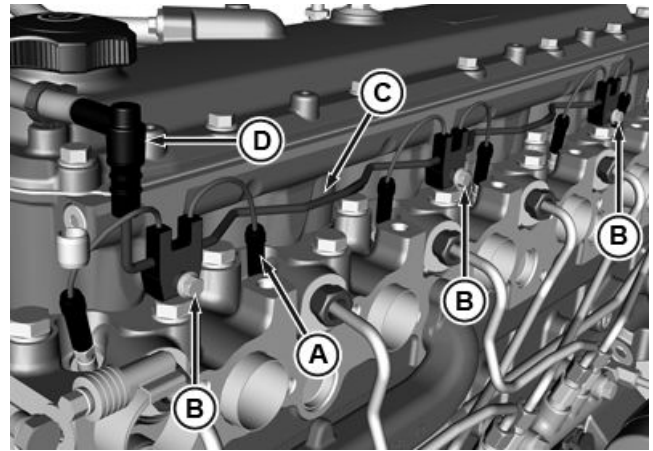
Special Tools:

- None

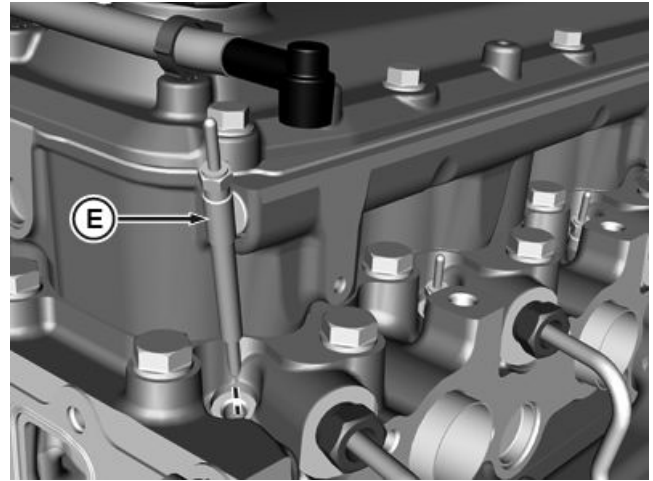
2. Disconnect the connectors (A) from the glow plug terminals.
3. Loosen the mounting screws (B) and uninstall the glow plug bus bar (C) from the rocker arm shaft carrier.
4. Disconnect the bus bar from the wiring harness (D).
5. Loosen and remove all glow plugs (E) from cylinder head.

A—Connectors (6)
B—Glow Plug Bus Bar
Mounting Screw (3)
C—Glow Plug Bus Bar

D—Wiring Harness
E—Glow Plug (6)



Glow Plugs Connectors Removal



Glow Plugs Removal

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RG18398 —UN—25JUN10

RG18399 —UN—25JUN10

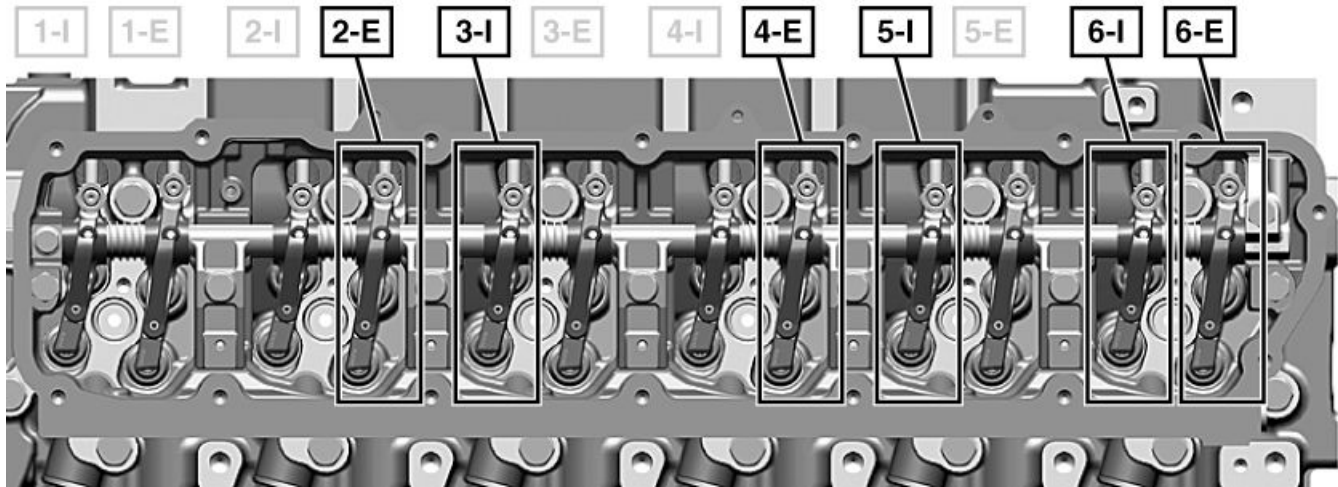
Glow Plug Bore — Cleaning and Inspection

Look for any burr or foreign particles trapped inside the glow plug bore with the help of torch light.

Clean glow plug bores with a plastic brush before repair

NOTE: A few drops of light oil or kerosene will help clean the bores.

PU00210,0000367 -19-06MAR11-1/1



Valve Lift Measurement— #6 TDC

RG18329 —UN—16APR10

8. Lock engine at TDC No. 6 compression stroke.
9. Set rocker arm-to-valve bridge clearance to 0.0 mm (0.0 in) for No. 2, 4, and 6 exhaust and No. 3, 5, and 6 intake valves.
10. Repeat steps 4—7.

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Valve — Measurement

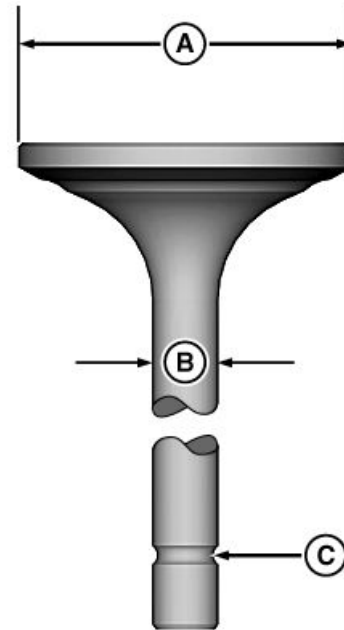
Special Tools:
Valve Inspection Tool

Consumables:
• None

1. Thoroughly clean and inspect valves to help determine if they can be restored to a serviceable condition. Replace valves that are burned, cracked, eroded, or chipped.
2. Inspect valve keeper groove (C) on valve stem for damage. Also inspect stems for signs of scuffing, which may indicate insufficient valve guide-to-valve stem clearance. Replace if defects are evident.
3. Measure valve head diameter (A). Compare valve stem diameter (B) with guide inner diameter to determine clearance, as outlined later in this group.

Specification

Intake Valve	
Stem—Diameter.....	6.987—7.013 mm (0.2750—0.2761 in.)
Exhaust Valve	
Stem—Diameter.....	6.974—7.000 mm (0.2745—0.2756 in.)
Intake Valve	
Head—Diameter.....	36.37—36.63 mm (1.432—1.442 in.)
Exhaust Valve	
Head—Diameter.....	35.37—35.63 mm (1.392—1.402 in.)



Measuring Valves

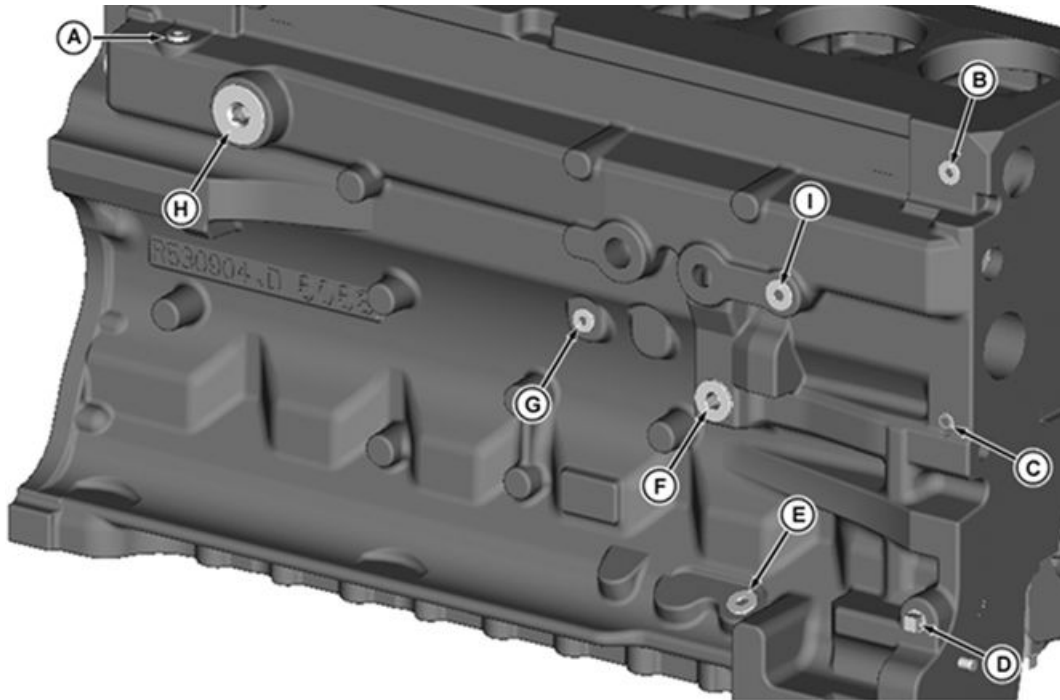
A—Valve Head Diameter
B—Valve Stem Diameter

C—Valve Keeper Groove

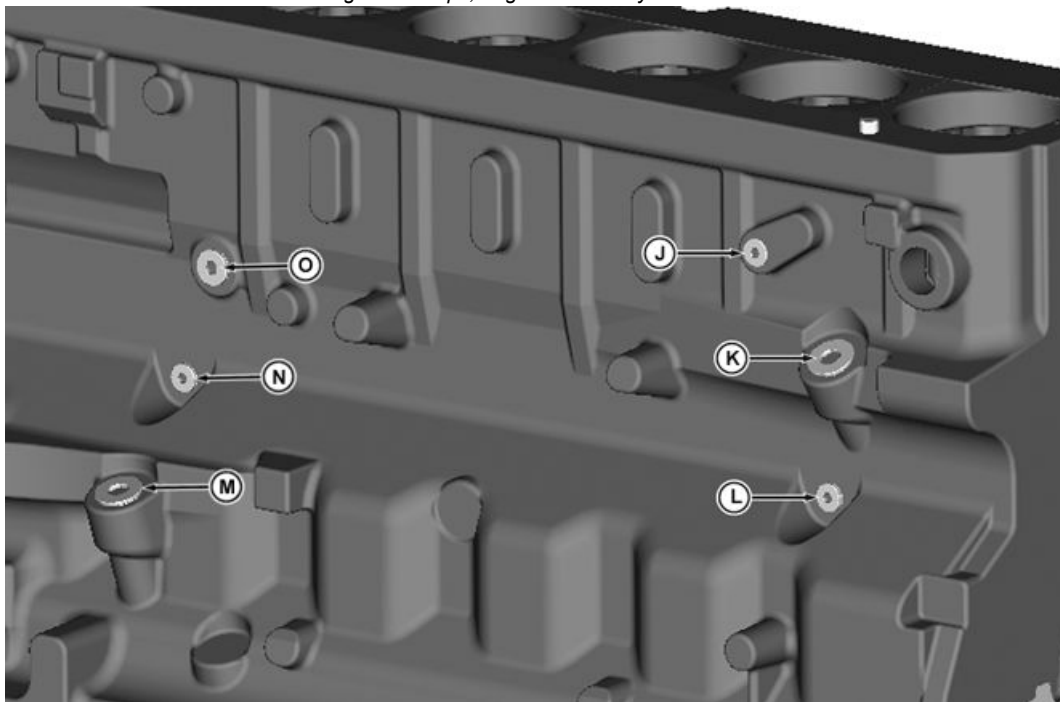
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Plugs and Caps, Right Side of Cylinder Block



Plugs and Caps, Left Side of Cylinder Block

- | | | | |
|------------------|------------------|------------------|------------------|
| A—M14 x 1.5 Plug | F—M27 x 2 Plug | J—M14 x 1.5 Plug | O—M18 x 1.5 Plug |
| B—M14 x 1.5 Plug | G—M14 x 1.5 Plug | K—M37 x 2 Plug | P—M27 x 2 Plug |
| C—1/4"-18 Plug | H—15/8"-12 Plug | L—M14 x 1.5 Plug | |
| D—3/8"-18 Plug | I—M18 x 1.5 Plug | M—M27 x 2 Plug | |
| E—M18 x 1.5 Plug | | N—M14 x 1.5 Plug | |

9. Coat all pipe plug threads, except for those pipe plugs with a nylon patch, with LOCTITE® 572 or Hylomar™ 5059. Install plugs and tighten to specification.

Continued on next page

MK41968,0000039 -19-04MAR11-3/5

Piston Pin and Bushing — Inspection

1. Carefully clamp the piston pin—installed in the connecting rod, in a soft-jawed vise.
2. Rotate connecting rod back and forth several times to make sure connecting rod moves freely on piston pin.
3. Remove and re-insert pin from either side of connecting rod bushing.

If pin is free on one end, but tight on the other, the bushing bore could be tapered (A).

If pin enters freely from both sides, but is tight in the center, bushing bore may be bell-mouthed (B).

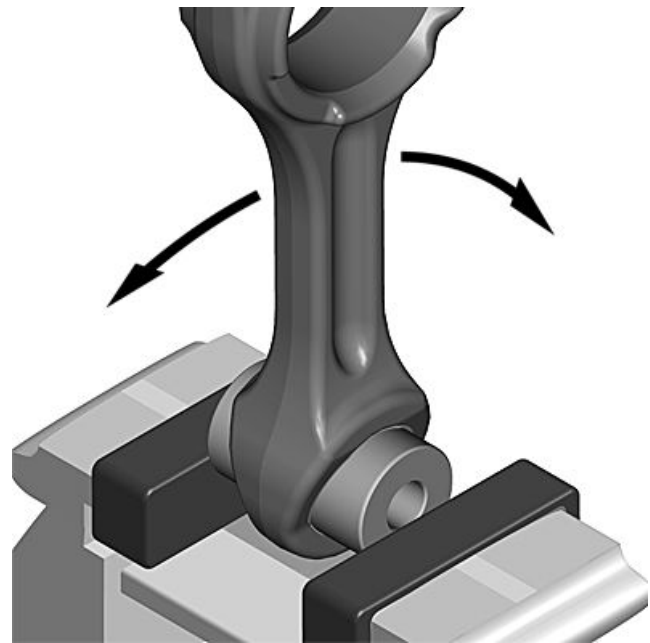
4. Measure I.D. of pin bushing and O.D. of piston pin. Compare measurements with specifications.

Specification

Piston Pin—OD.....	41.271—41.277 mm (1.624—1.625 in.)
Pin Bushing—ID.....	41.3—41.326 mm (1.6259—1.6270 in.)
Connecting Rod	
Pin-to-Bushing—Oil	
Clearance.....	0.016—0.036 mm (0.0006—0.0014 in.)
Bushing Wear Limit	0.050 mm (0.001 in.)

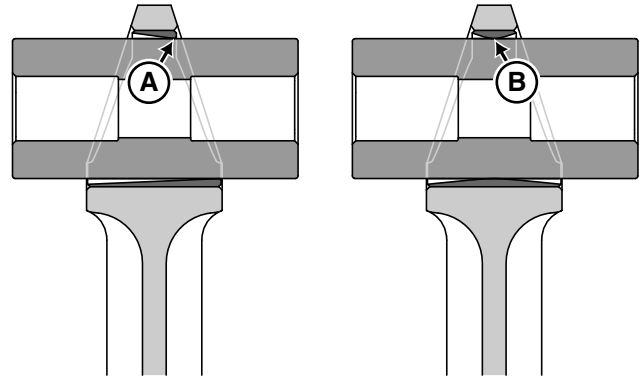
A—Tapered Bore

B—Bell-mouthed Bore



RG16881 —UN—23MAR09

Piston Pin to Rod Fit Check



Bushing Bore Wear Points

RG18647 —UN—11AUG10

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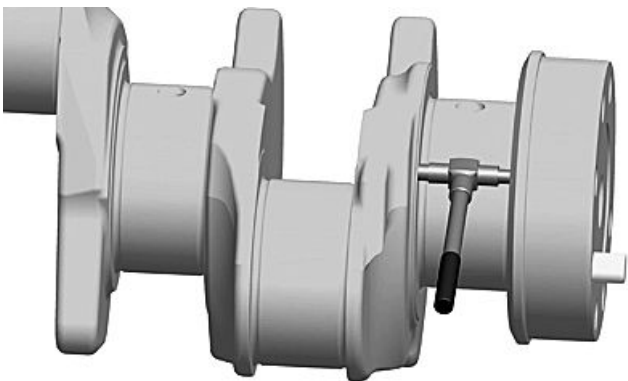
Crankshaft Thrust Bearing — Inspection

NOTE: Oversized bearings were available for some early engines. If crankshaft has been previously reconditioned, thrust journal width may not be within specifications. However, oil (side) clearance must be within specification.

- 1. Measure and record crankshaft main thrust journal width.

If crankshaft thrust journal width is not within specifications, install a new crankshaft.
- 2. Measure and record width of main thrust bearing. Oil (side) clearance between thrust bearing and thrust journal must be within specifications.

Specification	
Crankshaft Main Thrust Bearing Journal (New)—Width.....	38.952—39.028 mm (1.5335—1.5365 in.)
Crankshaft Main Thrust Bearing—Overall Width.....	38.79—38.87 mm (1.527—1.530 in.)



Measure Main Bearing Width



Measure Thrust Bearing Width



Assembled Thrust Bearing

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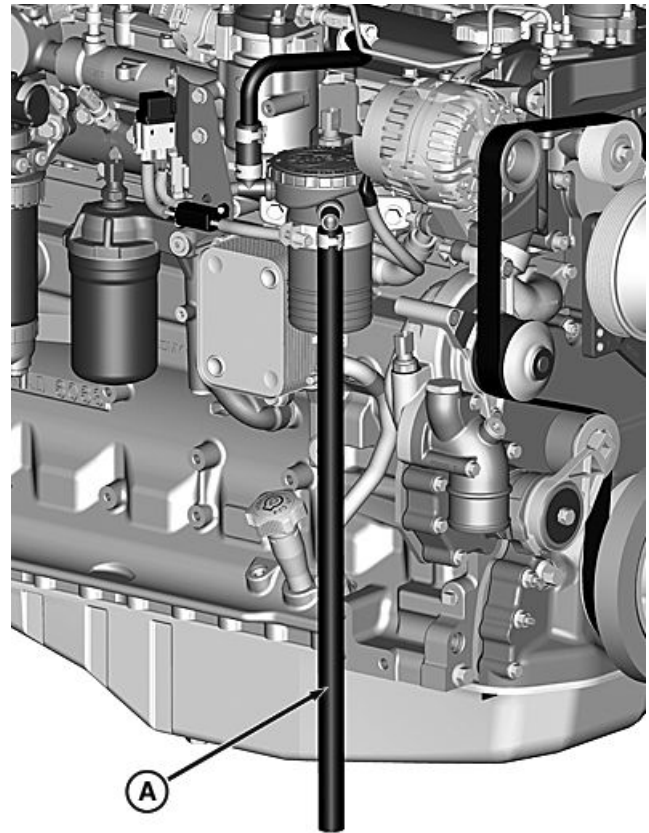
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RG18929—UN—09AUG10

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2. If necessary, remove hose clamp from vent hose (A). Remove hose from OCV, inspect for damage.

A—Vent Hose



OCV Vent System

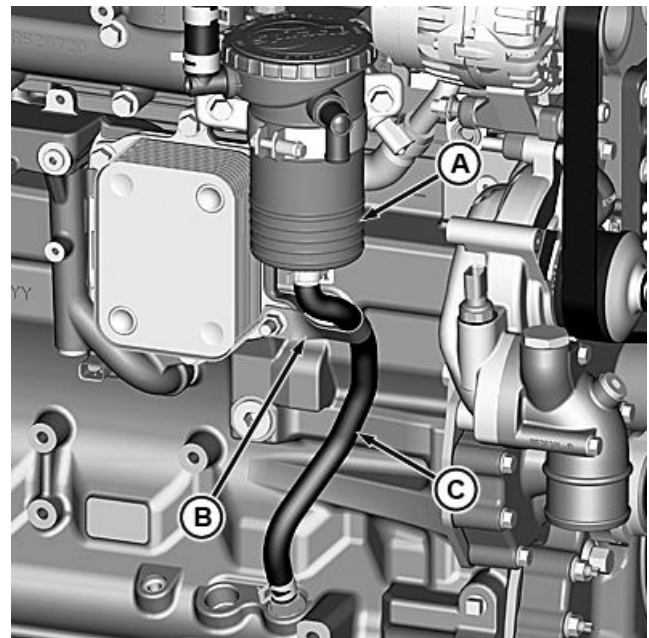
RG20315 —UN—28APR11

BK34394,0001B53 -19-23NOV12-2/4

3. Loosen and remove cap screw securing P-clamp (B) to lower OCV oil drain hose (C).
4. Remove hose clamps from OCV oil drain hose (C). Remove OCV oil drain tube (C) , inspect for damage.
5. Loosen and remove 2 cap screws from intake manifold and OCV filter housing (A).
6. Remove OCV filter housing and set aside.

A—OCV Filter Housing
B—P-clamp

C—OCV Oil Drain Tube



OCV removal

RG18643 —UN—04JUN10

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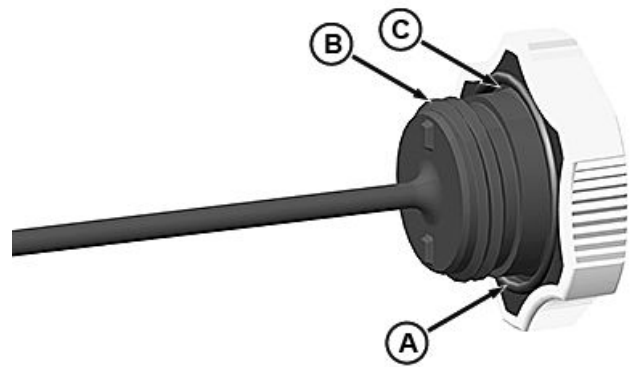
Dipstick Tube and Dipstick — Inspection

If oil is leaking from dipstick assembly, perform the following inspection.

1. Inspect O-ring (A) at the base of the dipstick cap for damage. If damage is found, replace dipstick tube.
2. Inspect threads (B) of dipstick cap. If damage is found, replace dipstick cap.
3. Inspect sealing surface (C) between dipstick tube and dipstick cap. If damage is found, replace dipstick cap.

If oil continues to leak from dipstick cap, replace dipstick tube.

4. Inspect dipstick tube for damage. If damage is found, replace dipstick tube.
5. Perform Dipstick Tube and Dipstick — Installation in Section 02, Group 060.



A—O-Ring
B—Threads

C—Sealing Surface

RG24851 —UN—09DEC13

ZE59858,00002DE -19-09DEC13-1/1

Dipstick Tube and Dipstick — Installation

Special Tools:

- JDG965 — Dipstick Tube Driver

Consumable Material:

- ® 609 or Hylomar 760 retaining compound

1. Coat the bottom outside diameter of the dipstick tube with LOCTITE® 609 or Hylomar 760 retaining compound.

IMPORTANT: Do not reuse dipstick tube if damaged during disassembly.

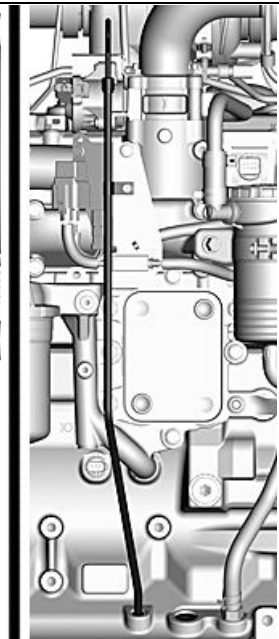
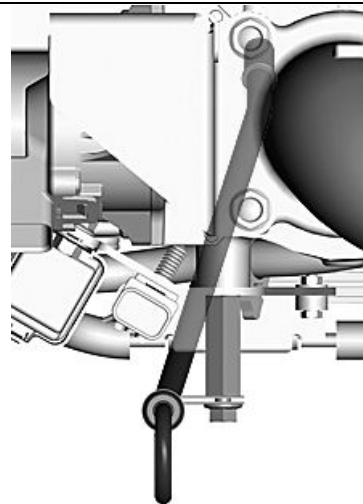
2. Install the dipstick tube into the right side of the cylinder block with the first bend oriented at the 7:00 position (as seen from above on the right side of the engine) until the shoulder of the tube bottoms out on the spot-face of the cylinder block. The final location of the dipstick tube is determined by the stud and p-clamp in the steps to follow. Wipe off any excess retaining compound.

3. Install stud into the glow plug relay bracket and air intake manifold.

Specification

Stud into relay bracket
and air intake—Torque..... 35 N·m (26 lb·ft)

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LOCTITE is a registered trademark of Loctite Corp.



Dipstick Tube Position

RG18801 —UN—15JUL10

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NG13347,00000F9 -19-09FEB16-1/2

Belt — Wear Check

1. Check belt for cracks, fraying, or stretched-out areas. Replace if necessary.
2. Reset belt tension as necessary.
See Belt Tensioner — Spring Tension Check in this group.
3. Visually inspect belt tensioner assembly.

4. Verify that correct spacer is installed between tensioner mount and timing gear cover, to ensure there is no abnormal side wear of belt.
5. Check mounting brackets, alternator, belt tensioner, idler pulley, etc. and the belt length. Replace belt as needed. For more information, refer operator's manual.

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Belt Tensioner — Installation

1. Belt Tensioner — Installation

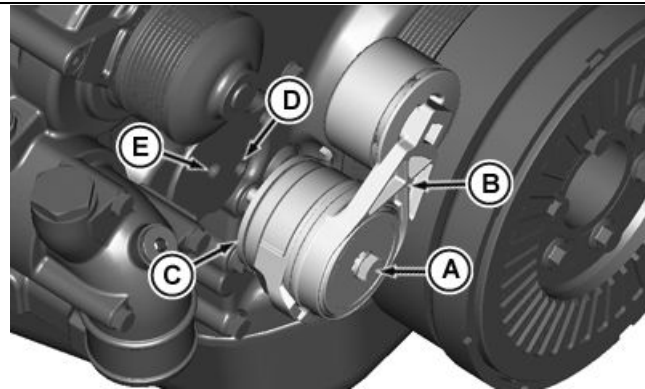
IMPORTANT: Verify that correct spacer is installed between tensioner mount and timing gear cover, to prevent abnormal side wear of belt.

- a. With help of locating hole (D), install belt tensioner (B) along with spacer (C).
- b. Install cap screw (A) with washer in the locating hole (E) and tighten to specification.

Specification

Belt Tensioner Cap
Screw—Torque..... 50 N•m (36.88 lb-ft)

2. Install fan belt.
3. Perform Fan (Fixed Speed Fan) — Inspection and Installation or Fan (Variable Speed Fan) — Inspection and Installation.



Belt Tensioner Installation

A—Cap Screw
B—Belt Tensioner
C—Spacer

D—Locating Hole
E—Mounting Hole

RG18872 —UN—28JUL10

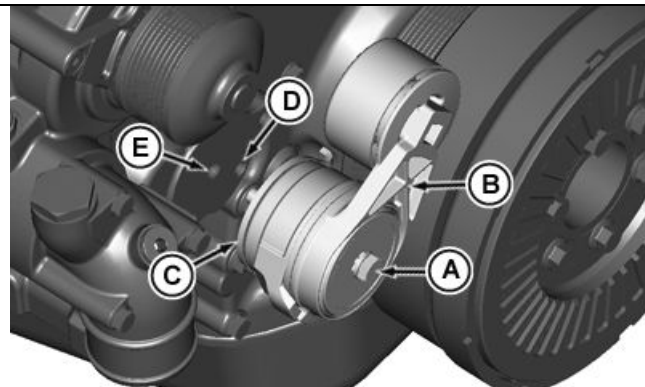
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Belt Tensioner — Removal

1. Perform Fan (Fixed Speed Fan) — Removal or Fan (Variable Speed Fan) — Removal.
2. Remove fan belt.
3. **Belt Tensioner Removal**
 - a. Remove cap screw (A) with washer.
 - b. Remove Belt Tensioner (B) along with spacer (C).

A—Cap Screw
B—Belt Tensioner
C—Spacer

D—Locating Hole
E—Mounting Hole



Belt Tensioner Removal

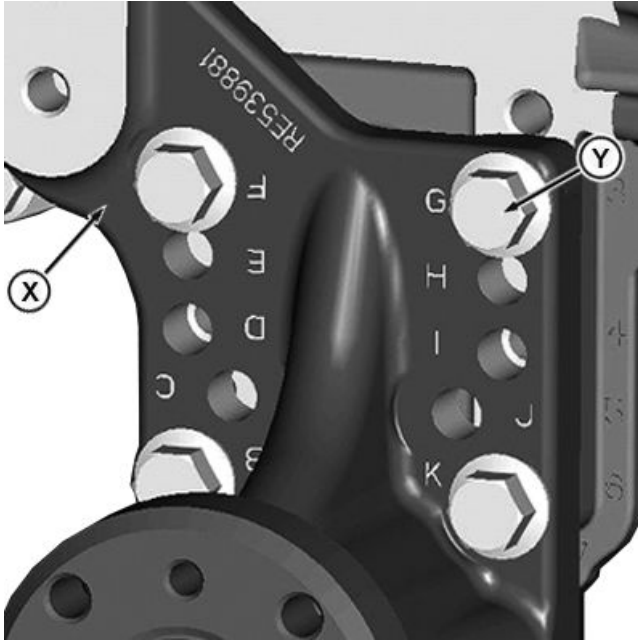
RG18872 —UN—28JUL10

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Fan Drive Assembly — Removal

1. Perform Fan (Fixed Speed Fan) — Removal or Fan (Variable Speed Fan) — Removal
2. Remove fan belt, if not removed.
3. Remove the four cap screws and the fan drive assembly.

NOTE: Depending on option or application, the configuration might look different.



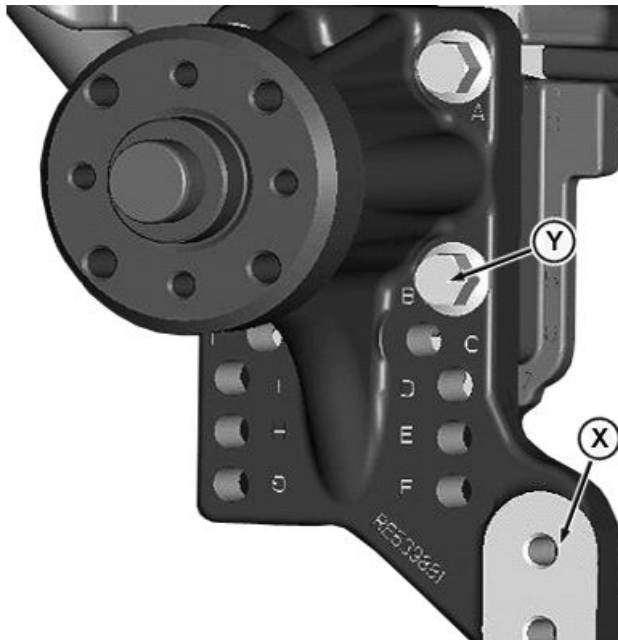
RG18874 —UN—29JUL10

Option 2349 (258 mm fan height)



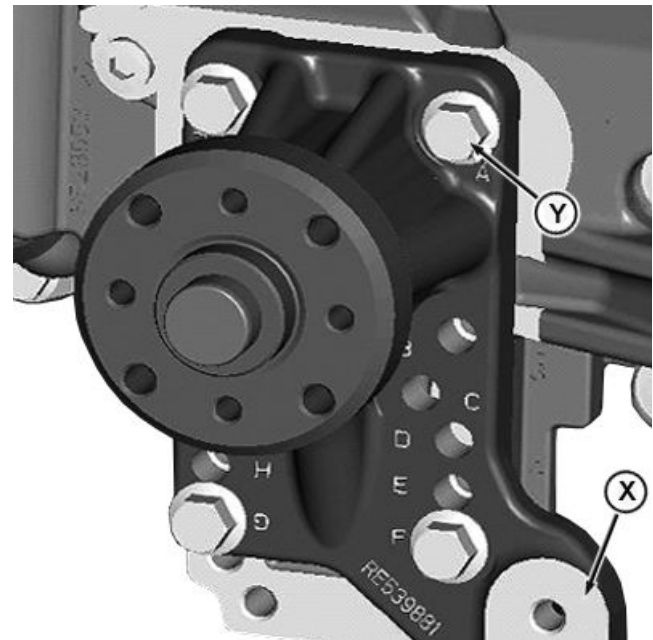
RG18879 —UN—29JUL10

Option 2356 (290 mm Fan Height)



RG18880 —UN—29JUL10

Option 2357 (338 mm Fan Height)



RG18881 —UN—29JUL10

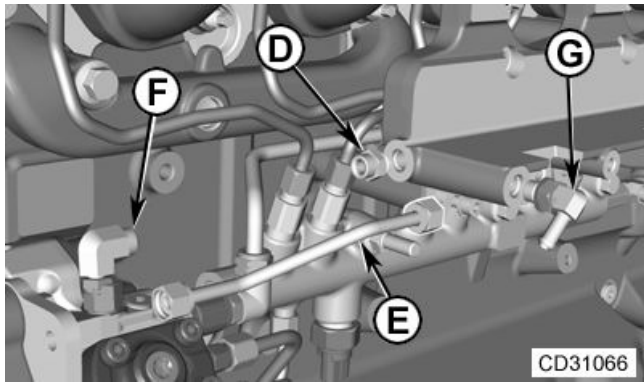
Option 2358 (402 mm Fan Height)

X—Idler Pulley Arm

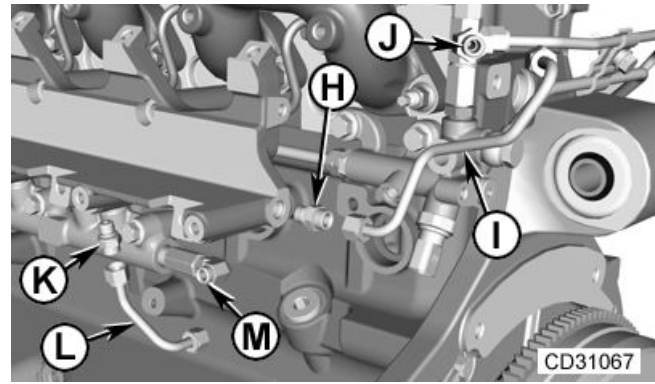
Y—4 Cap Screws (M10 x 30)

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MK41968,000002B -19-27APR15-1/3



CD31066 —UN—25NOV09



CD31067 —UN—25NOV09

Install Fuel Lines at Front End

- D—Straight Fitting
E—Fuel Line
F—High-pressure Fuel Pump
G—Elbow Fitting
H—Straight Fitting
I—Fuel Line

- J—Fuel Manifold
K—Straight Fitting
L—Fuel Line
M—Elbow Fitting

2. Install fitting (D) into bracket. Tighten to specification.

Specification

Fitting-to-bracket
—Torque..... 23 N·m (204 lb.-in.)

3. Install fuel line (E) between EGR cooler bracket and high-pressure fuel pump fitting (F). Tighten to specification.

Specification

Fuel line (both ends)—Torque..... 13 N·m (115 lb.-in.)

4. Install elbow fitting (G) into bracket. Orient fitting in proper direction then tighten nut to specification.

Specification

Elbow fitting-to-bracket—Torque..... 24 N·m (212 lb.-in.)

5. Install fitting (H) into bracket. Tighten to specification.

Specification

Fitting-to-bracket
—Torque..... 23 N·m (204 lb.-in.)

6. Install fuel line (I) between EGR cooler bracket and fuel manifold (J). Tighten to specification.

Specification

Fuel line (both ends)—Torque..... 13 N·m (115 lb.-in.)

7. Install fitting (K) into bracket. Tighten to specification.

Specification

Fitting-to-bracket
—Torque..... 23 N·m (204 lb.-in.)

8. Install fuel line (L) between EGR cooler bracket and elbow fitting (M). Tighten to specification.

Specification

Fuel line (both ends)—Torque..... 13 N·m (115 lb.-in.)

9. Tighten Allen screws (B) and cap screws (C) to specification.

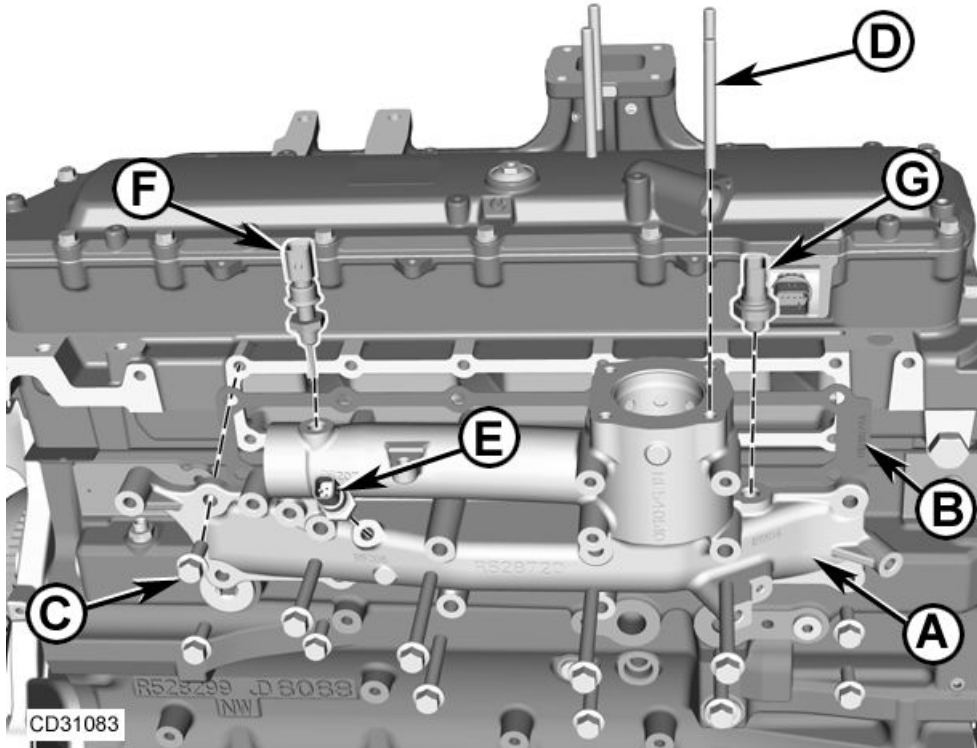
EGR cooler bracket-to-engine—Specification

Allen screws—Torque..... 50 N·m (37 lb.-ft.)
Cap screws—Torque..... 70 N·m (52 lb.-ft.)

Continued on next page

VP98307,00000A8 -19-04MAR15-2/5

Intake Manifold — Installation



Install Intake Manifold

A—Intake Manifold
B—Gasket
C—Cap Screws (12)

D—Studs
E—Manifold Air Temperature
(MAT) Sensor

F—EGR Temperature Sensor
G—Manifold Air Pressure (MAP)
Sensor

Consumables:

- Intake Manifold Gasket

1. Install intake manifold (A) with a new gasket (B).
2. Install cap screws (C) and tighten to specification.

Specification

Intake manifold-to-engine—Torque..... 73 N·m (54 lb.-ft.)

3. If necessary, install studs (D). Tighten until stud bottoms.
4. If removed, install manifold air temperature sensor (E). Tighten to specification.

Specification

Manifold air temperature sensor—Torque..... 17 N·m (12 lb.-ft.)

5. If removed, install EGR temperature sensor (F). Tighten to specification.

Specification

EGR temperature sensor—Torque..... 30 N·m (22 lb.-ft.)

6. If removed, install manifold air pressure sensor (G). Tighten to specification.

Specification

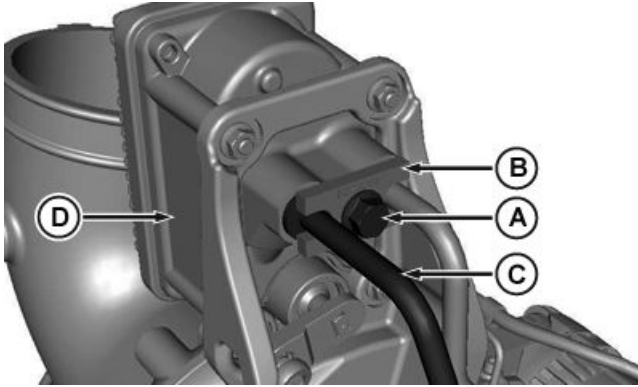
Manifold air pressure sensor—Torque..... 18 N·m (13 lb.-ft.)

7. Perform EGR Flow Venturi Assembly — Installation.
8. Perform Air Throttle Actuator (PVX) — Installation.
9. Reconnect wiring harness.

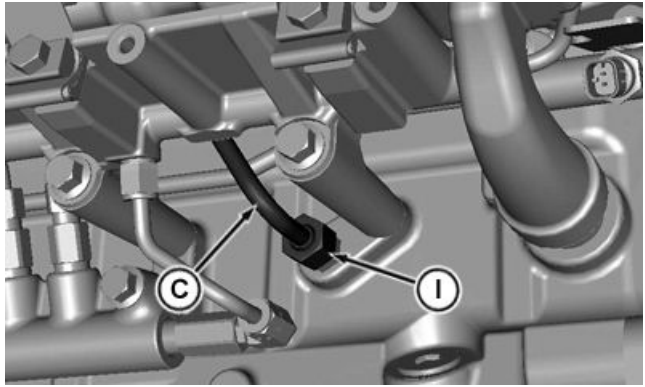
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CD31083 —UN—09DEC09

VGT Actuator Coolant Supply Line — Removal



Remove Coolant Supply Line from Actuator



Remove Coolant Supply Line from Cylinder Block

- | | |
|-----------------------|-------------------------------------|
| A—Cap Screw | D—Actuator |
| B—Clamp | I— Actuator Coolant Supply Line Nut |
| C—Coolant Supply Line | |

1. Let engine to cool down then drain coolant.
2. Remove cap screw (A) and clamp (B) holding the coolant supply line (C) to actuator (D).
3. Loosen nut (I) and disconnect coolant supply line (C) from cylinder block.

CD03523,00002F1 -19-25APR11-1/1

11.

NOTE: For applications other than OEM, refer to operator's manual for proper servicing, hourly replacement intervals, and filter locations.

Thoroughly clean filter header (C) and surrounding area to prevent dirt and debris from entering fuel system.

12. Unscrew and remove fuel filter element (A).

13. Place new filter packing (B) on filter element.

14. Apply a thin film of fuel on packing (B).

15. Screw filter element (A) into fuel filter header (C) and tighten to specification.

Specification

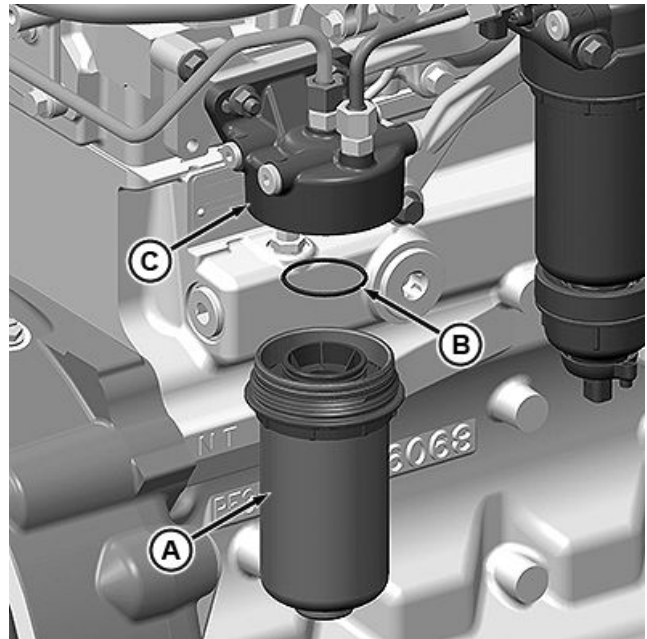
Secondary Fuel Filter

Water Separator

Bowl-to-Filter

Header—Torque.....11.5—17 N·m (102—150 lb.-in.)

NOTE: To prime the fuel system before starting engine, turn ignition key to ON for 60 seconds.



Replace Secondary Fuel Filter Element

A—Secondary Fuel Filter
Element
B—Fuel Filter Packing

C—Secondary Fuel Filter
Header

RG28529 —UN—08JUL16

PU00210,00003B6 -19-11JUL16-4/4

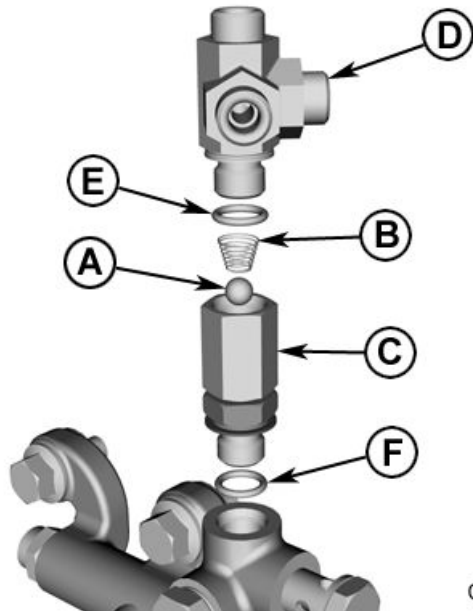
Return Fuel Manifold Assembly — Installation

Special Tools:

- None

Consumables:

- None



CD31161

Assemble check valve

A—Ball
B—Spring
C—Air Bleed Orifice Body
D—Return Fuel Manifold
E—O-Ring

F—O-Ring
G—Electronic Injector Return Line
H—Fuel Return Line (between Return Fuel Manifold and EGR Cooler Bracket Fuel Gallery)

I— EGR Cooler Bracket Return Gallery
J— Air Bleed Orifice Nut
K—Supply Fuel Manifold

1. If required, install ball (A) and spring (B) into check valve body (C). Then install return fuel manifold (D) with new O-ring (E). Tighten to specification.

Specification

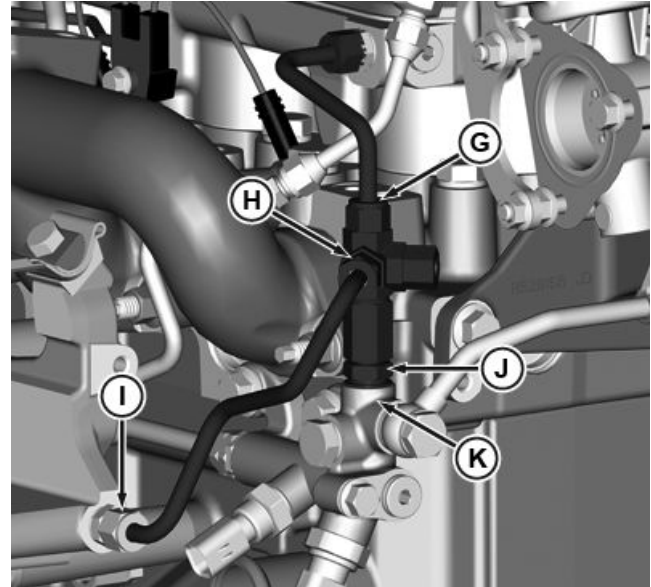
Special Fitting-to-Air Bleed Orifice Body—Torque..... 23 N•m (16.96 lb-ft)

2. Install check valve assembly with new O-ring (F) onto fuel manifold (K). Do not tighten at this stage.

3. Reconnect electronic injector return line (G) from fuel gallery inside the rocker arm shaft carrier (injector leak-off). Tighten nut to specification.

Specification

Fuel Return Line between Return Manifold Fitting And EGR Cooler Bracket Fuel Gallery—Torque..... 13 N•m (9.58 lb-ft)



CD31161 —UN—31MAR10

Install Check Valve Assembly

RG19832 —UN—28DEC10

4. Reconnect fuel return line (H) between check valve and EGR cooler bracket return gallery (I). Tighten nut to specification.

Specification

Fuel Return Line between Check Valve and EGR Cooler Bracket Fuel Gallery—Torque..... 13 N•m (9.59 lb-ft.)

5. Tighten check valve nut (J) to specification.

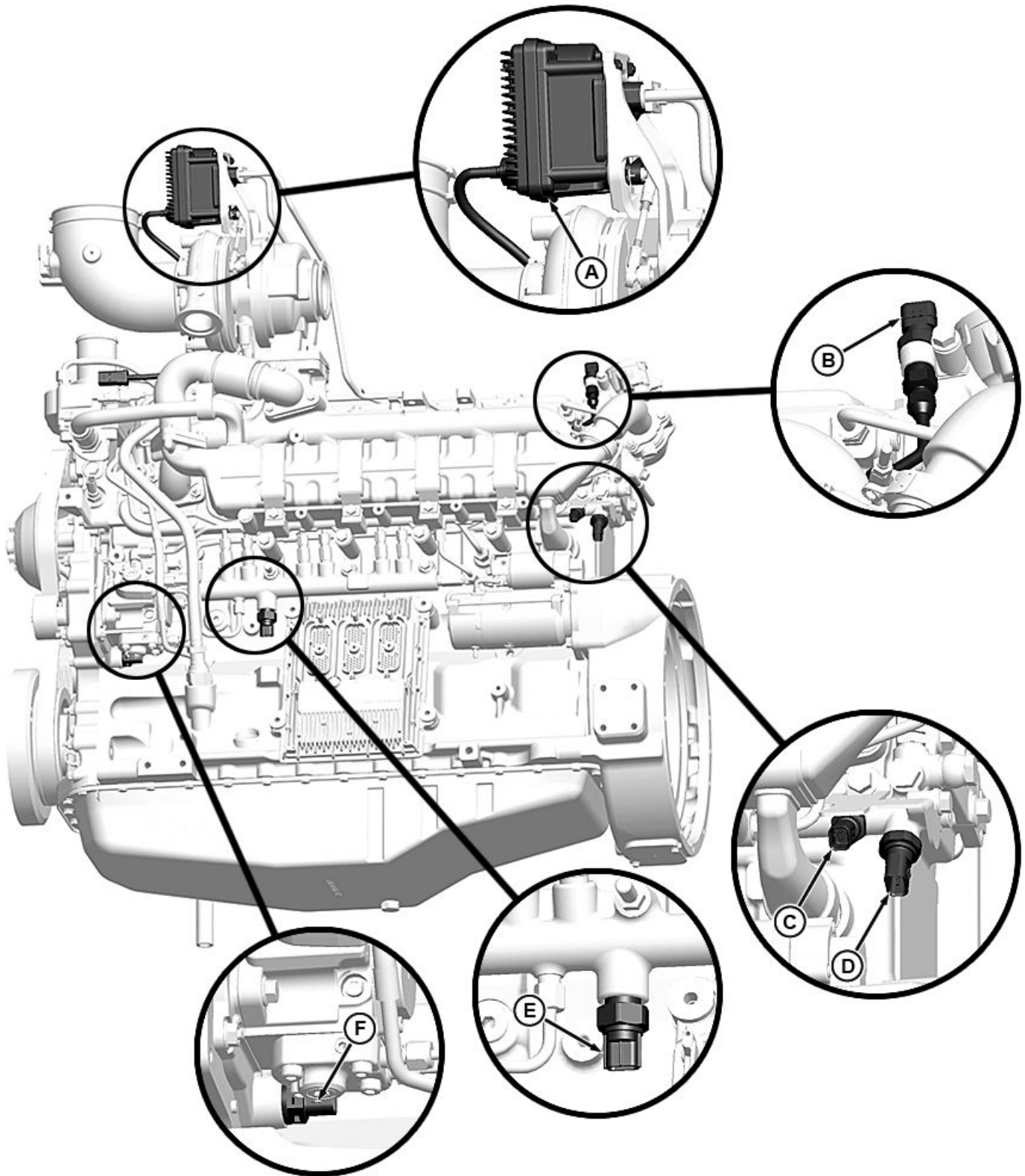
Specification

Air Bleed Orifice Nut-to-Fuel Manifold—Torque..... 23 N•m (16.96 lb-ft)

NOTE: To prime the fuel system before starting engine, turn ignition key to ON for 60 seconds.

CD03523,00002EC -19-04JAN11-1/1

Component Location Diagram 4



Component Location Diagram 4

- | | | |
|------------------------------------|-------------------------------------|-----------------------------|
| A—VGT Actuator | C—Fuel Temperature Sensor | E—Fuel Rail Pressure Sensor |
| B—Exhaust Manifold Pressure Sensor | D—Low-Pressure Fuel Pressure Sensor | F—Camshaft Position Sensor |

RG19595 —UN—20OCT10

Continued on next page

PU00210,000038A -19-13JAN11-1/2

Intake Manifold Air Temperature (MAT) Sensor — Installation

1. If the manifold air temperature sensor (A) is reused, check O-ring (B) for good condition. If damaged, replace it.

IMPORTANT: Torque tool must engage fully on the hexagonal steel body of the sensor to avoid damage of the plastic connector.

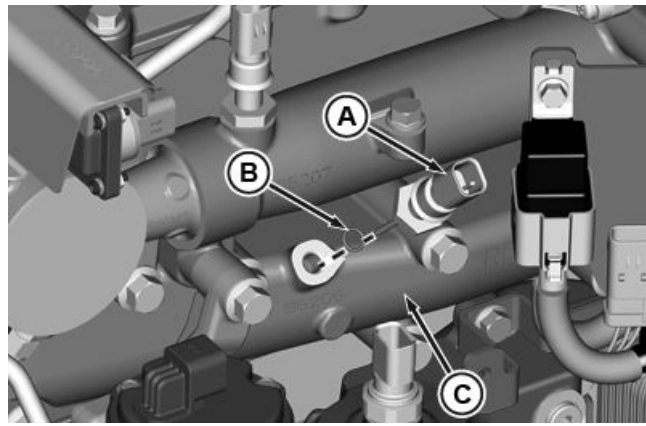
2. Install sensor onto the intake manifold (C). Tighten it to specification:

Specification

Manifold Air Temperature

Sensor—Torque..... 17 N•m (12 lb-ft)

3. Reconnect wiring harness connector to sensor.



Manifold Air Temperature Sensor Installation

A—Manifold Air Temperature Sensor
B—O-Ring
C—Intake Manifold

RG18843 —UN—22JUL10

PU00210,00003B0 -19-01DEC10-1/1

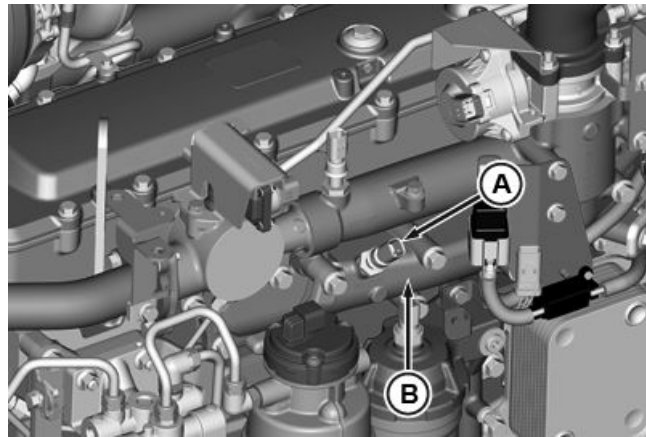
Intake Manifold Air Temperature (MAT) Sensor — Removal

NOTE: For more information on this sensor, see B5206 - Manifold Air Temperature (MAT) Sensor in Section 03, Group 140.

1. Disconnect wiring harness connector from manifold air temperature sensor (A).

IMPORTANT: Torque tool must engage fully on the hexagonal steel body of the sensor to avoid damage of the plastic connector.

2. Remove sensor from the intake manifold (B).



Manifold Air Temperature Sensor Removal

A—Manifold Air Temperature Sensor
B—Intake Manifold

RG18844 —UN—22JUL10

PU00210,00003AF -19-01DEC10-1/1

Connectors

Connectors provide electrical conductivity between two devices. Connectors typically consist of an outer shell, terminals, and perhaps a seal and locking device. Connectors come in many shapes and sizes. The differences being the number and type of terminals, voltage and current ratings, and environmental characteristics. Connectors join together as pairs, one called the receptacle and the other called the plug.

For a connector to function properly, the terminals have to be kept clean and free of any foreign debris. Over time, moisture, dirt, and other contaminants can cause the terminals of the connector to erode and not make a good electrical connection. It is important that the seals around the connector pairs are functional when reconnecting the connector.

Certain precautions are required when working with connectors.

- Do not pull on wires to disconnect a connector.
- Observe the locking mechanism of the connector when disconnecting and reconnecting a connector.
- Do not force connectors into each other when reconnecting.
- Make sure the connector is free of dirt or grease.
- Make sure the connector is dry of any moisture before reconnecting.
- Do not probe through the wire insulation or through the back of the connector to make measurements.

- Look for bent or damaged terminals before reconnecting connectors.
- If corrosion exists on any terminals, replace the terminal and mating terminal.
- Always use Flex Probe Kit, [JDG10466](#) when making measurements on a connector terminal.

NOTE: For more information on terminals, see [Terminal Test](#) in Section 04, Group 155.

NOTE: For connector and sensor locations, see the applicable component location diagram in **Electrical Engine Control Repair and Adjustment** Section 02, Group 110.

NOTE: For wiring diagrams of connectors and harnesses, see the applicable wiring diagram in **Diagnostic Specifications** Section 06, Group 210.

IMPORTANT: Do not use items such as paper clips or wires for inserting into connector terminals when making measurements. Damage can occur to the connector or terminal.

IMPORTANT: If a connector is not being used, apply the proper dust cap to protect it from foreign debris.

BL90236,0000192 -19-17FEB14-1/1

Installation of Repair Wire Assembly (RWA)

NOTE: There are two types of installation procedures:

- Method 1—RWA is the same gauge as the wire being repaired
- Method 2—RWA is a different gauge than the wire being repaired

Install Repair Wire Assembly (RWA)—Method 1

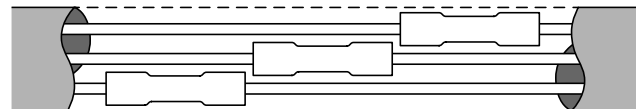
1. See your machine parts catalog for the correct RWA for the connector to be repaired.

IMPORTANT: Ensure that there is adequate room for the splice in the area of the harness where the repair will be installed.

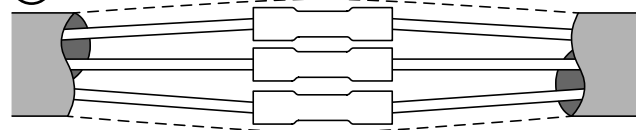
2. Ensure the area of the harness where the splice will be installed is clean. Cut the wire on the harness and the RWA to the desired length.

IMPORTANT: If multiple RWAs are being used make sure to stagger the splices (A) so that they do not over lap each other (B).

(A) CORRECT



(B) INCORRECT



A—Correct

B—Incorrect

RG20576—UN—17JUN11

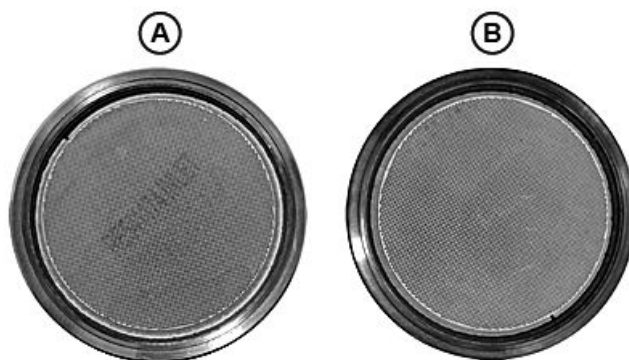
Continued on next page

DX,RWA -19-01DEC14-1/8

Inspect Diesel Particulate Filter (DPF) and Diesel Oxidation Catalyst (DOC)

Appearance - Clean diesel particulate filter.

Action - New filter ready for use.



Clean DPF

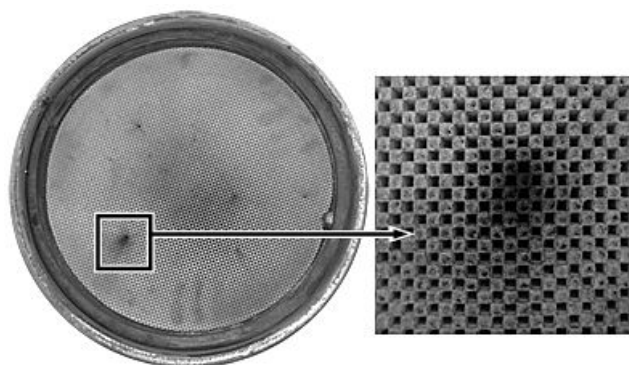
RG17895—UN—04NOV09

RE38635,000009E -19-28APR15-2/11

Appearance - With soot in the DPF, air flowing onto inlet face produces “black holes” on the outlet face. With no soot in the part, it is still possible to see a pulse of ash come out of the outlet face. Attached graphics show the appearance of a leaking channel.

Cause - A leaking channel from the inlet face to the outlet face.

Action - The DPF needs to be replaced if localized damage is present as shown in the graphic. If only a single channel is damaged, a total of 15 locations need to be present on the outlet face to replace the DPF. After replacement, perform DPF Calibration and a Service Regeneration.



Indication of Soot Present due to damaged channels on the DPF outlet

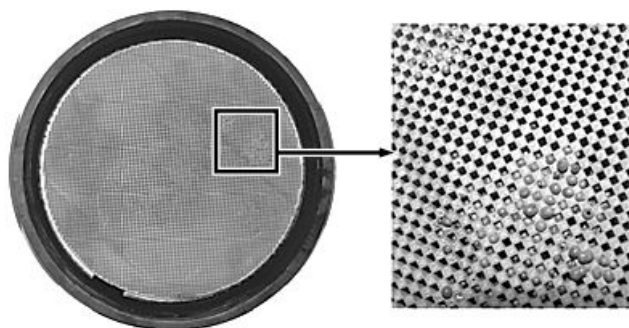
RG17896—UN—04NOV09

RE38635,000009E -19-28APR15-3/11

Appearance - This graphic indicates a melted area on the outlet face.

Cause - Excessive temperature.

Action - The DPF needs to be replaced if localized damage is present as shown in the graphic. After replacement, perform DPF Calibration and a Service Regeneration.



Melted area on the Outlet Face

RG17898—UN—04NOV09

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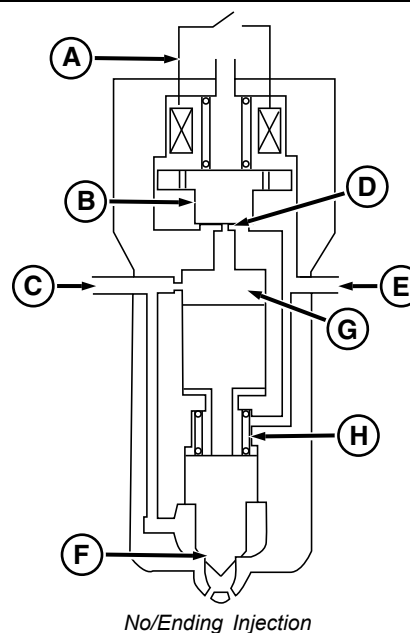
RE38635,000009E -19-28APR15-4/11

EI - Ending Injection

Injection ends when the current is removed from the TWV (A). The solenoid valve (B) closes causing fuel to fill the control chamber (G). The valve spring and the hydraulic force from the fuel in the control chamber cause the hydraulic piston to push the needle down and close the nozzle. At this time the injection is complete.

A—Two-Way Valve (TWV)
B—Solenoid Valve
C—Fuel Inlet
D—Orifice Seat

E—Fuel Leakoff
F—Nozzle
G—Control Chamber
H—Valve Spring



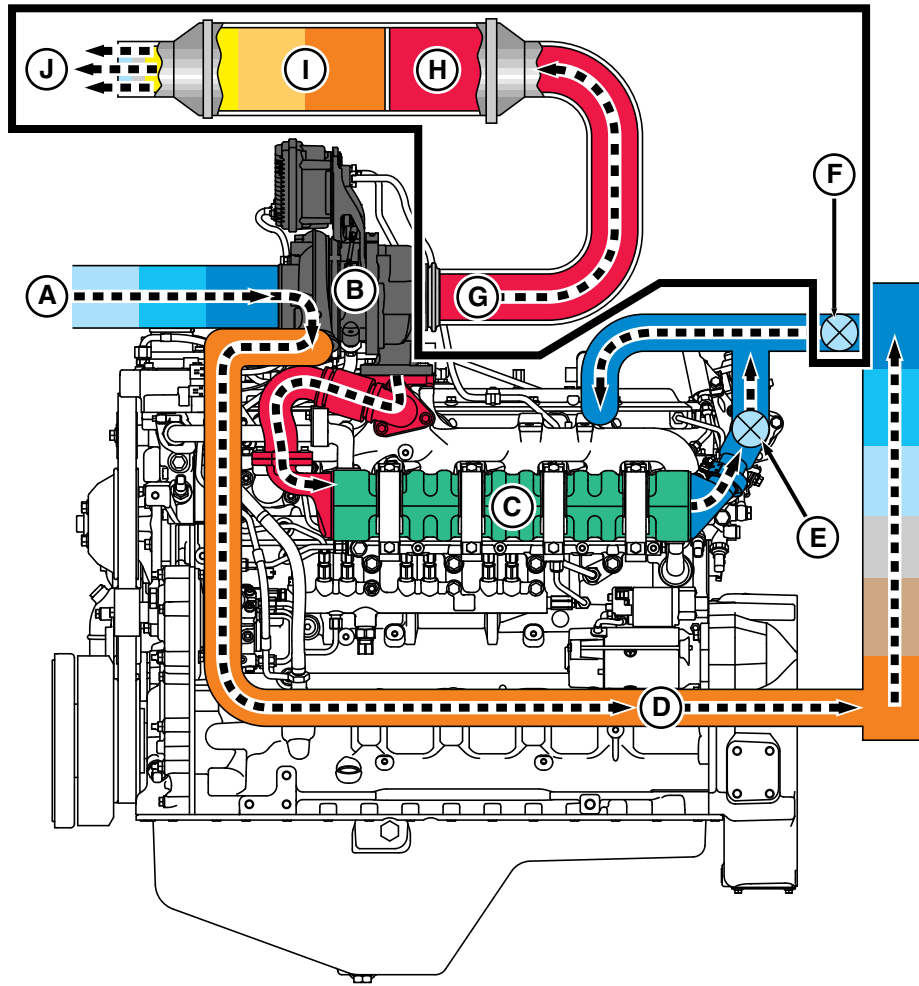
RG11556A—UN—16FEB01

BK34394,0000E1D -19-17NOV10-3/3

Passive Regeneration

The DPF is regenerated during normal engine operation under moderate to heavy load when the exhaust

temperatures are high. No in-cylinder fuel dosing occurs during these ideal conditions, and no operator input is required.



Air Flow Diagram

A—Inlet Air
B—VGT Turbocharger
C—EGR Cooler

D—Compressed Air from
Turbocharger
E—EGR Valve

F—Air Throttle Actuator
G—Exhaust Gas
H—DOC

I—DPF
J—Exhaust Gas Outlet

Continued on next page

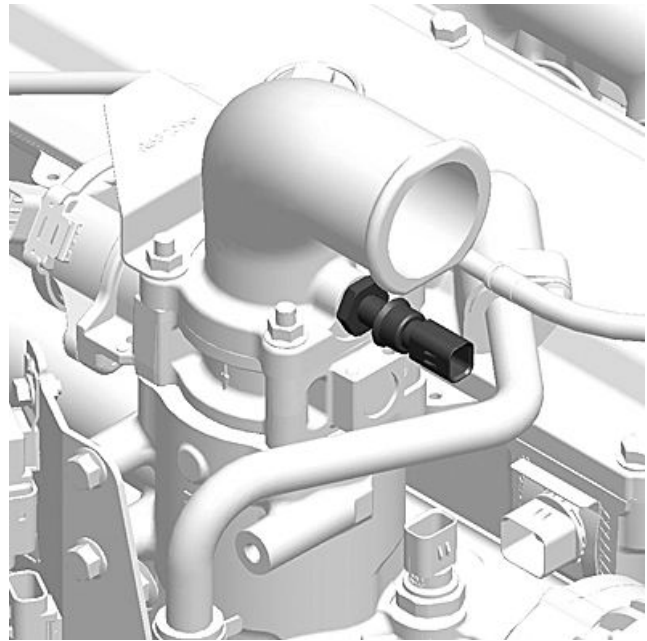
BK34394,0000DFB -19-29JUL11-2/4

RG19666 —UN—18NOV10

The ECU uses this sensor to measure the temperature of the charge air cooler outlet air entering the intake manifold. The ECU then compares the temperatures of the recirculated exhaust gas, charge air cooler outlet air, and the mixed air in the intake manifold to determine if proper cooling and mixing has occurred. If the temperature is not correct, the ECU adjusts the signal going to the EGR valve to compensate the mixture accordingly. The ECU also uses this sensor for engine protection purposes.

For more information on how temperature sensors operate, see [Measuring Temperature](#) in Section 03, Group 140.

For more information on engine protection and derate programs, see [Engine Derate and Shutdown Protection](#) in Section 03, Group 140.



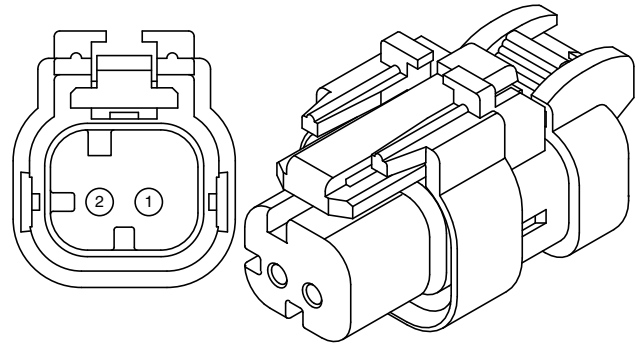
B5205 Image

RG19539—UN—12OCT10

BK34394,000040D -19-15DEC10-3/3

B5206 - Manifold Air Temperature (MAT) Sensor

Component Information			
Pin	Description	Circuit Number	Wire Color
1	Signal	5456	Blue
2	Return	5774	Yellow



2-Pin Connector

RG16634—UN—27AUG13

Continued on next page

BK34394,000040E -19-18OCT10-1/2

Digital Throttle

2-state, 3-state, and ramp throttles use switches to send speed control commands to the ECU and are classified as digital throttles.

2-State

The switch uses two different resistors to change the voltage returned to the ECU. The ECU uses an internal conversion table to convert the voltage to a specific engine speed. When the switch is in the minimum throttle position, the current is routed through a 390 ohm resistor. Fast idle position uses a 3000 ohm resistor.

3-State

The switch has three positions: minimum throttle, maximum throttle, and fast idle. The fast idle (no-load) position speed is set in the ECU according to the needs of the application. In the maximum or minimum throttle positions, engine speed can be set within a range programmed into the ECU or by bump switches. The switch uses three different resistors to change the voltage returned to the ECU. When the switch is in the minimum throttle position, current is routed through a 390 ohm resistor. The maximum throttle position uses a 1300 ohm resistor and the fast idle position uses a 3000 ohm resistor.

Ramp

The digital ramp throttle operates between minimum throttle and fast idle and uses a 3-position ramp throttle switch. If the switch is held in the increase throttle position, the engine speed ramps up in small increments. If the switch is held in the decrease throttle position, the engine speed ramps down. As long as this switch is held in a momentary position, the engine continues to ramp up or down until the maximum high or low throttle speed setting is reached. When released, the switch returns to the center hold throttle position.

This is a 3-position, spring-loaded-to-center switch. The increase speed position uses a 3000 ohm resistor. The

decrease speed position uses a 390 ohm resistor, and the hold position uses a 1300 ohm resistor. The ramp throttle settings are reset to the factory settings when the key is turned off and back on. The ramp rate selection is a trim option and sets the rate of change for engine speed increases or decreases. There are four ramp rate options available.

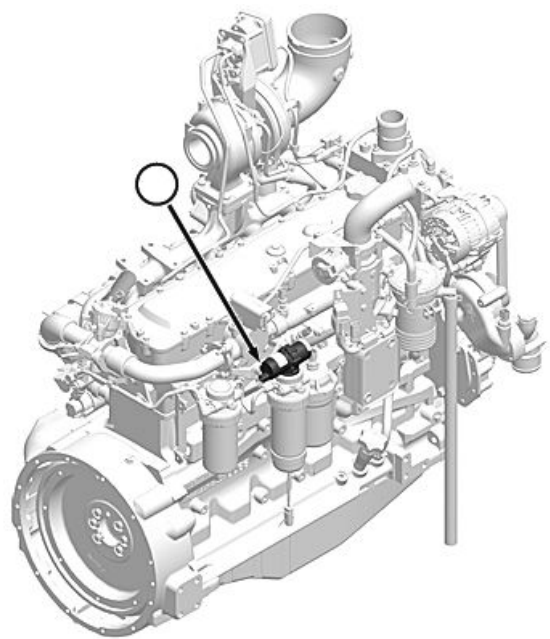
- **3 second exponential:** Engine speed starts to increase/decrease at a slow rate and will accelerate/decelerate at an increasingly faster rate the longer the switch is held. The engine throttle setting goes from 0% to 100% throttle in 3—5 seconds.
- **5 Second Linear:** Engine speed increases/decreases at a constant rate. With this setting the engine throttle setting goes from 0% to 100% throttle in 5 seconds.
- **7 Second Linear:** Engine speed increases/decreases at a constant rate. With this setting the engine throttle setting goes from 0% to 100% throttle in 7 seconds.
- **9 Second Linear:** Engine speed increases/decreases at a constant rate. With this setting the engine throttle setting goes from 0% to 100% throttle in 9 seconds.
- **Custom Linear:** Engine speed increases/decreases at a rate set by the operator. With this setting the engine throttle setting goes from 0% to 100% throttle at a rate from 5 through 30 seconds determined by the operator. Ramp steps or bumps are minor increases or decreases, in the engine speed setting. When the ramp throttle switch is momentarily held in the Increase Throttle or Decrease Throttle positions, the engine speed increases/decreases a selected percentage of the throttle range. The actual engine rpm speed change for each setting varies.

Four ramp step rates are available:

- 0.4% of throttle range
- 0.8% of throttle range
- 1.6% of throttle range
- 2.8% of throttle range

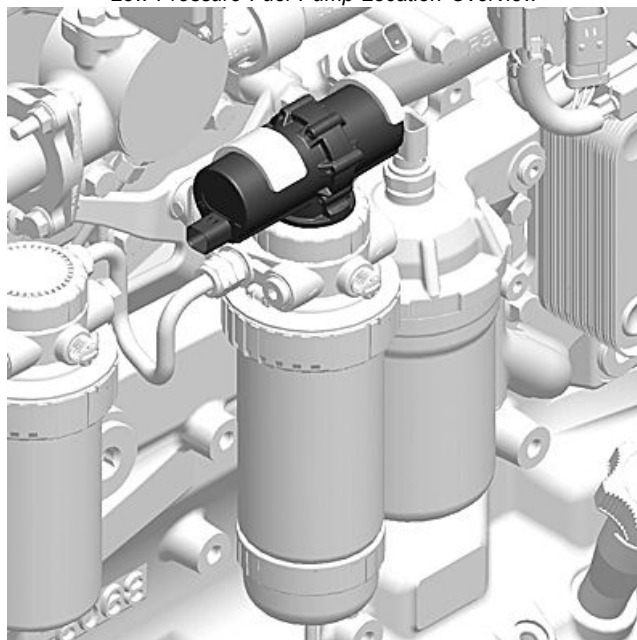
RG40049,00002E8 -19-01OCT10-1/1

For additional low-pressure fuel pump information, see [Low-Pressure Fuel Pump Operation](#) in Section 03, Group 130.



RG19552—UN—12OCT10

Low-Pressure Fuel Pump Location Overview



RG19553—UN—12OCT10

Y5004 Image

BK34394,0000459 -19-15DEC10-2/2

Page	Page
002069.14 — Incorrect CAN Message Received From Source Address 69 04-164-29	002076.14 — Incorrect CAN Message Received From Source Address 76 04-164-32
002069.19 — Communication Error with Source Address 69 04-164-30	002076.19 — Communication Error with Source Address 76 04-164-33
002070.09 — No CAN Message Received From Source Address 70 04-164-30	002077.09 — No CAN Message Received From Source Address 77 04-164-33
002070.14 — Incorrect CAN Message Received From Source Address 70 04-164-30	002077.14 — Incorrect CAN Message Received From Source Address 77 04-164-33
002070.19 — Communication Error with Source Address 70 04-164-30	002077.19 — Communication Error with Source Address 77 04-164-33
002071.09 — No CAN Message Received From Source Address 71 04-164-30	002078.09 — No CAN Message Received From Source Address 78 04-164-33
002071.14 — Incorrect CAN Message Received From Source Address 71 04-164-30	002078.14 — Incorrect CAN Message Received From Source Address 78 04-164-33
002071.19 — Communication Error with Source Address 71 04-164-30	002078.19 — Communication Error with Source Address 78 04-164-33
002072.09 — No CAN Message Received From Source Address 72 04-164-31	002079.09 — No CAN Message Received From Source Address 79 04-164-34
002072.14 — Incorrect CAN Message Received From Source Address 72 04-164-31	002079.14 — Incorrect CAN Message Received From Source Address 79 04-164-34
002072.19 — Communication Error with Source Address 72 04-164-31	002079.19 — Communication Error with Source Address 79 04-164-34
002073.09 — No CAN Message Received From Source Address 73 04-164-31	002080.09 — No CAN Message Received From Source Address 80 04-164-34
002073.14 — Incorrect CAN Message Received From Source Address 73 04-164-31	002080.14 — Incorrect CAN Message Received From Source Address 80 04-164-34
002073.19 — Communication Error with Source Address 73 04-164-31	002080.19 — Communication Error with Source Address 80 04-164-34
002074.09 — No CAN Message Received From Source Address 74 04-164-31	002081.09 — No CAN Message Received From Source Address 81 04-164-34
002074.14 — Incorrect CAN Message Received From Source Address 74 04-164-32	002081.14 — Incorrect CAN Message Received From Source Address 81 04-164-35
002074.19 — Communication Error with Source Address 74 04-164-32	002081.19 — Communication Error with Source Address 81 04-164-35
002075.09 — No CAN Message Received From Source Address 75 04-164-32	002082.09 — No CAN Message Received From Source Address 82 04-164-35
002075.14 — Incorrect CAN Message Received From Source Address 75 04-164-32	002082.14 — Incorrect CAN Message Received From Source Address 82 04-164-35
002075.19 — Communication Error with Source Address 75 04-164-32	002082.19 — Communication Error with Source Address 82 04-164-35
002076.09 — No CAN Message Received From Source Address 76 04-164-32	002083.09 — No CAN Message Received From Source Address 83 04-164-35

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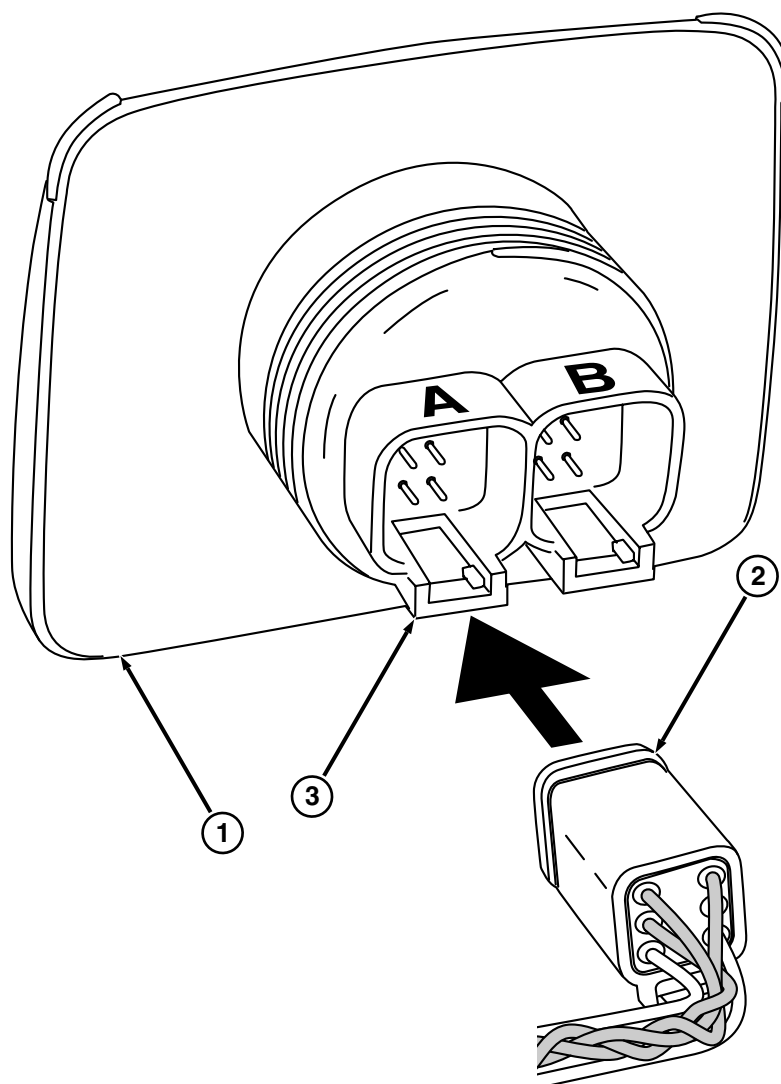
Diagnostic Procedure**Additional References:**

None

NOTE: The wiring diagrams provided are for a typical John Deere supplied OEM harness. Wire number, colors, and jumper connectors do not apply to all applications.

For connector repair or complete wiring information:

- see [Connector Repair Information Table](#)
- see [6.8L Wiring Diagram 10](#) located in Section 06, Group 210.



Rear of Powerview

- 1—Rear of Powerview
 2—Wiring harness connector with CAN wiring
 3—Left Side Connector (A)

IMPORTANT: Terminal damage occurs if anything other than the specified flex probe from **JDG10466 Flex Probe Kit** is used.

Flex probes:

Powerview

- [JDG10460](#) — Female — Yellow/Purple
- [JDG10461](#) — Male — Yellow/Purple

Continued on next page

BK34394,0000DD3 -19-28FEB11-2/11

8 Verify Voltages to ECU and Ignition

1. Connect Diagnostic Test Box :
 - A to A5503 connector female socket 7 (+).
 - B to A5503 connector female socket 44 (-).
 2. Set S1 to position 1 on Diagnostic Test Box.
 3. Connect multimeter to Diagnostic Test Box.
 4. Ignition ON, Engine OFF
 5. Press and hold S3 on Diagnostic Test Box.
 6. Monitor voltage on multimeter.
- Is voltage measurement within +/- 0.75 V of battery voltage?

YES: [GO TO 9](#)

NO: Repair open or high resistance in wiring harness or ignition switch. Verify engine starts. In Service ADVISOR, perform Harness Diagnostic Mode Test. Perform [Exhaust Condition Check](#)

BK34394,0000DD7 -19-27APR15-10/20

9 Perform Harness Diagnostic Mode Test

In Service ADVISOR, perform Harness Diagnostic Mode Test.

Are there any active DTCs?

YES: Discontinue this test and perform test for the active DTCs.

NO: [GO TO 10](#)

BK34394,0000DD7 -19-27APR15-11/20

10 Cranking Speed Check

1. Remove DOC inlet pipe.
 2. Perform [Engine Cranking Speed Check](#) in Section 04, Group 155.
- Does test pass?

YES: [GO TO 11](#)

NO: Repair problem. Verify engine starts. Perform [Exhaust Condition Check](#)

BK34394,0000DD7 -19-27APR15-12/20

11 Abnormal Engine Noise Check

1. DOC inlet pipe still removed.
2. Ignition ON, engine cranking.
3. Listen for abnormal engine noise. If a noise is heard, see [Abnormal Engine Noise](#) in Section 4 Group 150.

Any problems found?

YES: Repair problem. Verify engine starts. Perform [Exhaust Condition Check](#)

NO: [GO TO 12](#)

Continued on next page

BK34394,0000DD7 -19-27APR15-13/20

2 Excessive Crankcase Pressure Check

Check for excessive crankcase pressure. See [Crankcase Pressure \(Blow-By\) Test](#) in Section 4, Group 155.

Were any problems found?

YES: Excessive fumes or dripping oil observed; appears to be caused by boost pressure. Check the turbocharger, repair or replace as needed. See [Turbocharger — Failure Analysis](#) in Section 02, Group 080.

YES: Excessive fumes or dripping oil observed; does NOT appear to be caused by boost pressure. Excessive blow-by, not caused by boost pressure is most likely caused by faulty piston rings/cylinder liners not providing an adequate combustion seal. Perform a compression test to verify this is the case. See [Mechanical Compression Test](#) in Section 04, Group 155.

NO: [GO TO 3](#)

BK34394,0000DE7 -19-25JAN16-4/5

3 Pistons, Rings, Cylinder Liners Check

The most likely cause of the excessive oil consumption is one of the following failures in the pistons, rings, and/or cylinder liners or in the valve guides. Check the most likely item as needed.

- Oil control rings worn or broken
- Scored cylinder liners or pistons
- Piston ring grooves excessively worn
- Piston rings sticking in ring grooves
- Insufficient piston ring tension
- Piston ring gaps not staggered
- Cylinder liners glazed (insufficient load during engine break-in)
- Worn valve guides or stems

Were any problems found?

YES: Repair problem as necessary. Perform [Exhaust Condition Check](#)

NO: Contact DTAC for support.

BK34394,0000DE7 -19-25JAN16-5/5

CAN Message Not Received

The ECU did not receive a CAN message from another control unit.

When DTC is Displayed:

When the ECU does not receive a CAN message from another control unit.

Related Information:

NOTE: The last three digits of the SPN you just came from correlate to the Source Address of the control unit in question.

Additional references:

Application technical manual, which lists all controllers on the application.

For connector repair or ECU wiring information:

- see [Connector Repair Information Table](#)
- see [6.8L Engine Schematic 2](#)
- see [6.8L Wiring Diagram 6](#)

located in Section 06, Group 210.

To determine which control unit has stopped sending messages to the ECU, use the following procedure:

IMPORTANT: You MUST look at the application technical manual to see how many controllers are on the application and what their source addresses are.

1. Ignition ON, Engine OFF.

2. Connect Service ADVISOR, see [Connecting to Service ADVISOR](#) in Section 04, Group 160.
3. Using Service ADVISOR, go to the Readings menu and select Get Controllers.
4. Service ADVISOR should now be displaying a list of control units communicating on your application.
5. From the list supplied by the application technical manual, determine which controller is no longer communicating.

IMPORTANT: If the control unit source address is not listed, it is not communicating on the communication bus.

Were you able to identify the control unit that is not communicating?

Yes: Look for an open or short connection of the CAN wiring between the ECU and the other controller. Repair problem. Perform [Verification Procedure](#).

No, all control units are communicating: While performing the [Wiggle Test](#), close displayed list, repeat step 3 and watch for a new controller to be displayed. If a new controller is displayed look for an intermittent connection of the CAN wiring between the ECU and the other controller or corrosion at the connectors. Repair problem. Perform [Verification Procedure](#).

BK34394,0000EBF -19-02AUG11-1/1

3 Mechanical Pressure Check

1. Ignition OFF, Engine OFF.
2. Disconnect fuel line from secondary fuel outlet to supply fuel manifold.
3. Install 0—103 kPa (0—1.03 bar) (0—15 psi) gauge between secondary fuel outlet and supply fuel manifold using [JT05470](#) Universal Pressure Test Kit.
4. Ignition ON, Engine OFF.
5. Monitor mechanical pressure gauge reading.

Is pressure 41—62 kPa (0.4—0.62 bar) (6—9 psi)?

YES: [GO TO 4](#)

NO: Pressure is less than 85 kPa (0.9 bar) (12 psi).
[GO TO 5](#)

NO: Pressure is greater than 140 kPa (1.4 bar) (20 psi). Replace primary fuel filter header. Perform [Verification Procedure](#).

BK34394,0001B59 -19-25MAY16-6/21

4 Check Fuel Pressure

With gauge still attached, in Service ADVISOR, monitor Low-Pressure Fuel — Actual Pressure.

Is mechanical gauge reading and Low-Pressure Fuel — Actual Pressure readings within 15 kPa (0.2 bar) (2.2 psi) of each other?

YES: [GO TO 18](#)

NO: Gauge reads less.
[GO TO 16](#)

NO: Gauge reads higher.
[GO TO 7](#)

BK34394,0001B59 -19-25MAY16-7/21

5 Visual Leak check

1. Ignition OFF, Engine OFF.
2. Check for loose, broken, or cracked fuel line fitting at top of fuel filter head.

Were any problems found?

YES: Repair problem.
Perform [Verification Procedure](#).

NO: [GO TO 6](#)

BK34394,0001B59 -19-25MAY16-8/21

6 Check for Air in Fuel

Perform [Air in Fuel Check](#) in Section 04, Group 155.

Were any problems found?

YES: Repair problem.
Perform [Verification Procedure](#).

NO: Replace Low-Pressure Fuel Pump.
Perform [Verification Procedure](#).

BK34394,0001B59 -19-25MAY16-9/21

7 Terminal Check

1. Ignition OFF, Engine OFF.
2. Disconnect low-pressure fuel pressure sensor connector B5107.
3. Perform [Terminal Test](#) on sensor and B5107 connector.

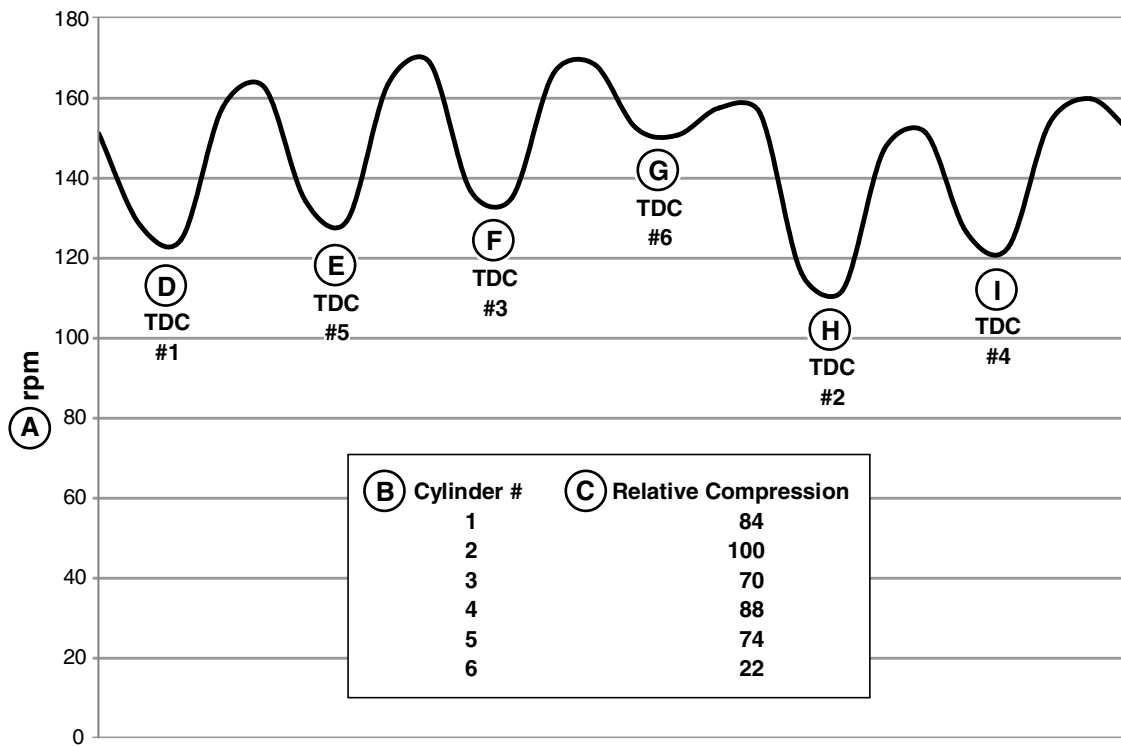
Were any problems found?

YES: Repair problem.
Perform [Verification Procedure](#).

NO: [GO TO 8](#)

Continued on next page

BK34394,0001B59 -19-25MAY16-10/21



RG16708 —UN—15JAN09

Figure 2
Cranking Speed and Typical Cylinder Electronic Compression Test Results When One Cylinder has Low Compression (Cylinder #6).

A—rpm
B—Cylinder Number
C—Relative Compression
D—Top Dead Center (TDC) #1
E—Top Dead Center (TDC) #5
F—Top Dead Center (TDC) #3
G—Top Dead Center (TDC) #6
H—Top Dead Center (TDC) #2
I—Top Dead Center (TDC) #4

There are a couple of hints from the compression test results shown in Figure 2 that indicate there is likely a compression problem with cylinder #6. First, cylinder #6 is indicating the lowest relative compression value which is substantially less than the other cylinders. Second, the next cylinder in the firing order, #2, has the highest relative compression. However, the decrease in crankshaft speed after top dead center of #6 due to the lack of help from the compressed air in the cylinder makes it difficult to determine if there is also a problem with the other cylinders. Note that the test results for some cylinders are lower than 80% due to low compression in cylinder

#6, even though there is likely no compression problem in these cylinders. However, if the engine is partially disassembled to repair the low compression problem with #6, then the other cylinders should also be inspected.

The compression test can also be used to diagnose problems such as a damaged cylinder head gasket causing a compression leak between adjacent cylinders. This would likely result in two adjacent cylinders also having low compression as shown in Figure 3. Again, the other cylinders in the firing order would be affected by the two cylinders with low compression.

Continued on next page

RX24524,0000159 -19-13FEB17-3/4

Diagnostic Test Box — Using

Diagnostic Test Box — Functionality

The JDG10273 Diagnostic Test Box is designed to aid the technician in troubleshooting electronically controlled engine systems. The tool must be used according to the CTM instructions:

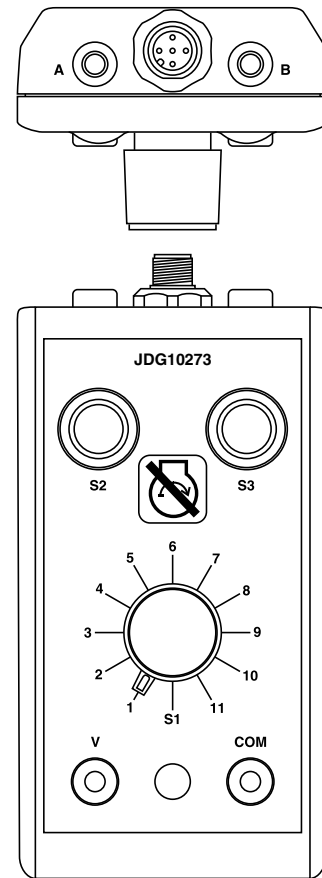
- Service ADVISOR
- JT07306 — Digital Multimeter
- JDG10466 — Flex Probe Kit
- J-35616-20 — Test Leads
- JDG10273P1 — Extension Cable, 15 ft Component Tester
- JDG10273P2 — Power Cable

The Diagnostic Test Box is used to find some of the following wiring harness problems:

- Open wires
- Shorted wires
- Series resistance
- Parallel resistance

Functional components of the Diagnostic Test Box are:

- Power connector and power harness provide connection to the machine battery terminals.
- LED indicates that power is applied correctly to Diagnostic Test Box.
- Test lead inputs A and B provide connection to the harness.
- Test lead inputs V and COM provide connection to the Digital Multimeter.
- Switch S1 is used to create a voltage divider circuit as specified within the CTM diagnostic procedure.
- Switch S2 is used to provide an alternate ground path as specified within the CTM diagnostic procedure.
- Switch S3 is used to provide a load on a circuit as specified within the CTM diagnostic procedure.



JDG10273 - Diagnostic Test Box

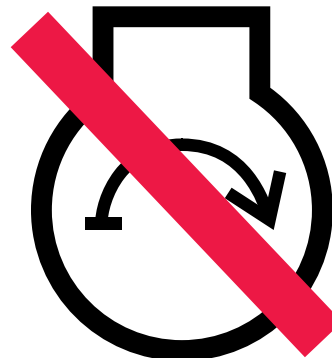
RG17892 —UN—15FEB10

BK34394,00001F1 -19-27APR15-1/6

Before Connecting Diagnostic Test Box

IMPORTANT: RUNNING ENGINE WITH DIAGNOSTIC TEST BOX CONNECTED COULD CAUSE SEVERE ENGINE DAMAGE

- Key OFF, Engine OFF when connecting or disconnecting Diagnostic Test Box.
- Follow all safety warnings of the machine manufacturer.



Do Not Run Engine

Continued on next page

BK34394,00001F1 -19-27APR15-2/6

RG17193 —UN—26MAY09

Diagnostic Instructions and Information

002187.14	Incorrect CAN Message received From Source Address 187	179
002187.19	Communication Error with Source Address 187	179
002188.09	No CAN Message Received From Source Address 188	179
002188.14	Incorrect CAN Message received From Source Address 188	179
002188.19	Communication Error with Source Address 188	179
002189.09	No CAN Message Received From Source Address 189	179
002189.14	Incorrect CAN Message received From Source Address 189	179
002189.19	Communication Error with Source Address 189	179
002190.09	No CAN Message Received From Source Address 190	179
002190.14	Incorrect CAN Message received From Source Address 190	179
002190.19	Communication Error with Source Address 190	179
002191.09	No CAN Message Received From Source Address 191	179
002191.14	Incorrect CAN Message received From Source Address 191	179
002191.19	Communication Error with Source Address 191	179
002192.09	No CAN Message Received From Source Address 192	179
002192.14	Incorrect CAN Message received From Source Address 192	179
002192.19	Communication Error with Source Address 192	179
002193.09	No CAN Message Received From Source Address 193	179
002193.14	Incorrect CAN Message received From Source Address 193	179
002193.19	Communication Error with Source Address 193	179
002194.09	No CAN Message Received From Source Address 194	179
002194.14	Incorrect CAN Message received From Source Address 194	179
002194.19	Communication Error with Source Address 194	179
002195.09	No CAN Message Received From Source Address 195	179
002195.14	Incorrect CAN Message received From Source Address 195	179
002195.19	Communication Error with Source Address 195	179
002196.09	No CAN Message Received From Source Address 196	179
002196.14	Incorrect CAN Message received From Source Address 196	179
002196.19	Communication Error with Source Address 196	179
002197.09	No CAN Message Received From Source Address 197	179
002197.14	Incorrect CAN Message received From Source Address 197	179
002197.19	Communication Error with Source Address 197	179
002198.09	No CAN Message Received From Source Address 198	179
002198.14	Incorrect CAN Message received From Source Address 198	179
002198.19	Communication Error with Source Address 198	179
002199.09	No CAN Message Received From Source Address 199	179
002199.14	Incorrect CAN Message received From Source Address 199	179
002199.19	Communication Error with Source Address 199	179
002200.09	No CAN Message Received From Source Address 200	179
002200.14	Incorrect CAN Message received From Source Address 200	179
002200.19	Communication Error with Source Address 200	179
002201.09	No CAN Message Received From Source Address 201	179
002201.14	Incorrect CAN Message received From Source Address 201	179
002201.19	Communication Error with Source Address 201	179
002202.09	No CAN Message Received From Source Address 202	179
002202.14	Incorrect CAN Message received From Source Address 202	179
002202.19	Communication Error with Source Address 202	179
002203.09	No CAN Message Received From Source Address 203	179
002203.14	Incorrect CAN Message received From Source Address 203	179
002203.19	Communication Error with Source Address 203	179
002204.09	No CAN Message Received From Source Address 204	179
002204.14	Incorrect CAN Message received From Source Address 204	179
002204.19	Communication Error with Source Address 204	179

Continued on next page

DN22556,0000165 -19-29JUL11-6/11

Engine Control Unit (ECU) — Donating this Engine's ECU to be Used Elsewhere

NOTE: An Internet connection is needed.

Electronic components on this engine have specific settings for optimum performance and to maintain emissions compliance. To maintain these settings, when any of the electronic components or an engine are replaced, the ECU needs to be reprogrammed with the correct settings for that component. This is done by downloading the applicable calibration in Service ADVISOR.

NOTE: If at anytime during this procedure any errors appear that prevent the payload from being downloaded, contact DTAC.

1. Connect to the internet.
2. In Service ADVISOR, select "Program" from the Menu Bar.
3. Select "Download Payloads" from the drop-down list.
4. On the John Deere Custom Performance web page that comes up, click on the "Serial Number Search" tab.
5. Type in the engine serial number you are downloading the payload for.
6. Verify the information you typed in.
7. If the information is correct click the "Submit" button.
8. Verify the information displayed is correct.
9. If the information is not for the engine, click on the "Search Again" button and repeat steps 5 - 9.
10. If the information is correct click the "Download Selected" button.
11. Another window pops up titled "Download Controller Options".
12. Select "Donating This Engines' ECU to be Used Elsewhere".
13. Select "Submit" button.
14. A window will popup and tell you if the file was downloaded successfully.
15. Click "OK".
16. In Service ADVISOR, Select "Program" from the menu bar.
17. Select "Program Controller" from the drop-down list.
18. Highlight proper payload file.
19. Select "Program Controller".
20. An ECU Trimmable Options page may appear.
21. Configure Trimmable Options page if applicable.
22. Select "Program..." if applicable.
23. Connect "CURRENT ECU" from donor engine so that parameters can be preserved.
24. Click "OK".
25. A window will popup and tell you that the ECU programmed successfully.
26. Click on the "Tools" tab at the top of the screen.
27. Select "Connect to Deere Network" so the return file can be sent.
28. Perform Engine Control Unit (ECU) — Replacing Current ECU with Another ECU in Section 04, Group 160.

RE42287,0001FFF -19-09AUG16-1/1

4 Install New ECU

1. Ignition OFF, Engine OFF.

2. Perform Engine Control Unit (ECU) — Replacing Current ECU with Another ECU.

IMPORTANT: The current ECU is the donor ECU and the “Enter ECU part number and ECU serial number of ECU to be programmed” is the new ECU.

3. Install new ECU programmed with identical software that was in the removed ECU.

4. Download the payload for the donor engine and reprogram and reinstall the donor ECU.

5. Ignition ON, Engine OFF.

6. Operate engine under conditions that set the DTC.

Is DTC that sent you here active?

YES: Contact DTAC for support.

NO: Problem resolved.

RE42287,0002035 -19-09MAR16-6/6

Flex probes:

Sensor

- JDG10460 — Female — Yellow/Purple
- JDG10461 — Male — Yellow/Purple

ECU

- JDG10460 — Female — Yellow/Purple
- JDG10461 — Male — Yellow/Purple

Tools:

- JDG10273 — Diagnostic Test Box
- JT07306 — Digital Multimeter
- J-35616-20 — Test Leads

RE42287,00000D0 -19-28FEB11-3/14

1 Read DTCs and Store Snapshot Information

1. Connect Service ADVISOR, see [Connecting to Service ADVISOR](#) in Section 04, Group 160.

NOTE: When DTCs are cleared Snapshot information for ALL DTCs is cleared.

2. Ignition ON, Engine OFF.
3. If any DTCs have snapshot capture or snapshot recording information, save the information. For instructions on saving and using snapshot information, see [Snapshot Instructions](#) in Section 04, Group 160.
4. In Service ADVISOR, perform Control Unit Information and Overview test.
5. Refresh Codes.

Is DTC 000028.03 active?

YES: [GO TO 2](#)

NO: [GO TO 7](#)

RE42287,00000D0 -19-28FEB11-4/14

2 Terminal Check

1. Ignition OFF, Engine OFF.
2. Disconnect digital throttle sensor connector R5003.
3. Perform [Terminal Test](#) on sensor and R5003 connector.

Were any problems found?

YES: Repair problem.
Perform [Verification Procedure](#).

NO: [GO TO 3](#)

RE42287,00000D0 -19-28FEB11-5/14

3 Circuit Check

1. Connect Diagnostic Test Box :
 - A to R5003 connector female socket B (+).
 - B to R5003 connector female socket A (-).
2. Set S1 to position 8 on Diagnostic Test Box.
3. Connect multimeter to Diagnostic Test Box.
4. Ignition ON, Engine OFF.
5. Monitor voltage on multimeter.
6. Perform [Wiggle Test](#).

Does voltage remain between 2.3 and 2.7 V?

YES: [GO TO 4](#)

NO: Voltage greater than 2.7 V. [GO TO Short to Voltage Procedure](#).

NO: Voltage less than 2.3 V. [GO TO 6](#)

Continued on next page

RE42287,00000D0 -19-28FEB11-6/14

6 Open or High Resistance Circuit Check

1. Press and hold both S2 and S3 buttons on Diagnostic Test Box.

2. Monitor voltage on multimeter.

Does voltage now remain between 4.8 and 5.2 V?

YES: Repair open or high resistance in return wire. Perform [Verification Procedure](#).

NO: Repair open or high resistance in supply wire. Perform [Verification Procedure](#).

RE42287,00000D4 -19-28FEB11-9/19

7 Signal Circuit Check

1. Ignition OFF, Engine OFF.

2. Connect Diagnostic Test Box :

- A to R5001 connector female socket C (+).
- B to R5001 connector female socket B (-).

3. Set S1 to position 9 on Diagnostic Test Box.

4. Connect multimeter to Diagnostic Test Box.

5. Ignition ON, Engine OFF.

6. Monitor voltage on multimeter.

7. Perform [Wiggle Test](#).

Is voltage between 2.3 and 2.7 V?

YES: [GO TO 8](#)

NO: [GO TO 10](#)

RE42287,00000D4 -19-28FEB11-10/19

8 Software Check

In Service ADVISOR, monitor Secondary Analog Throttle Input Voltage.

Is voltage between 2.3 and 2.7 V?

YES: Replace sensor. Perform [Verification Procedure](#).

NO: [GO TO 9](#)

RE42287,00000D4 -19-28FEB11-11/19

9 Reprogram ECU

1. Ignition OFF, Engine OFF.

2. Disconnect Diagnostic Test Box.

3. Reconnect all connectors and components.

4. Reprogram ECU. For more information, see [Engine Control Unit \(ECU\) — Reprogramming Instructions](#) in Section 04, Group 160.

5. Ignition ON, Engine OFF.

6. Refresh codes.

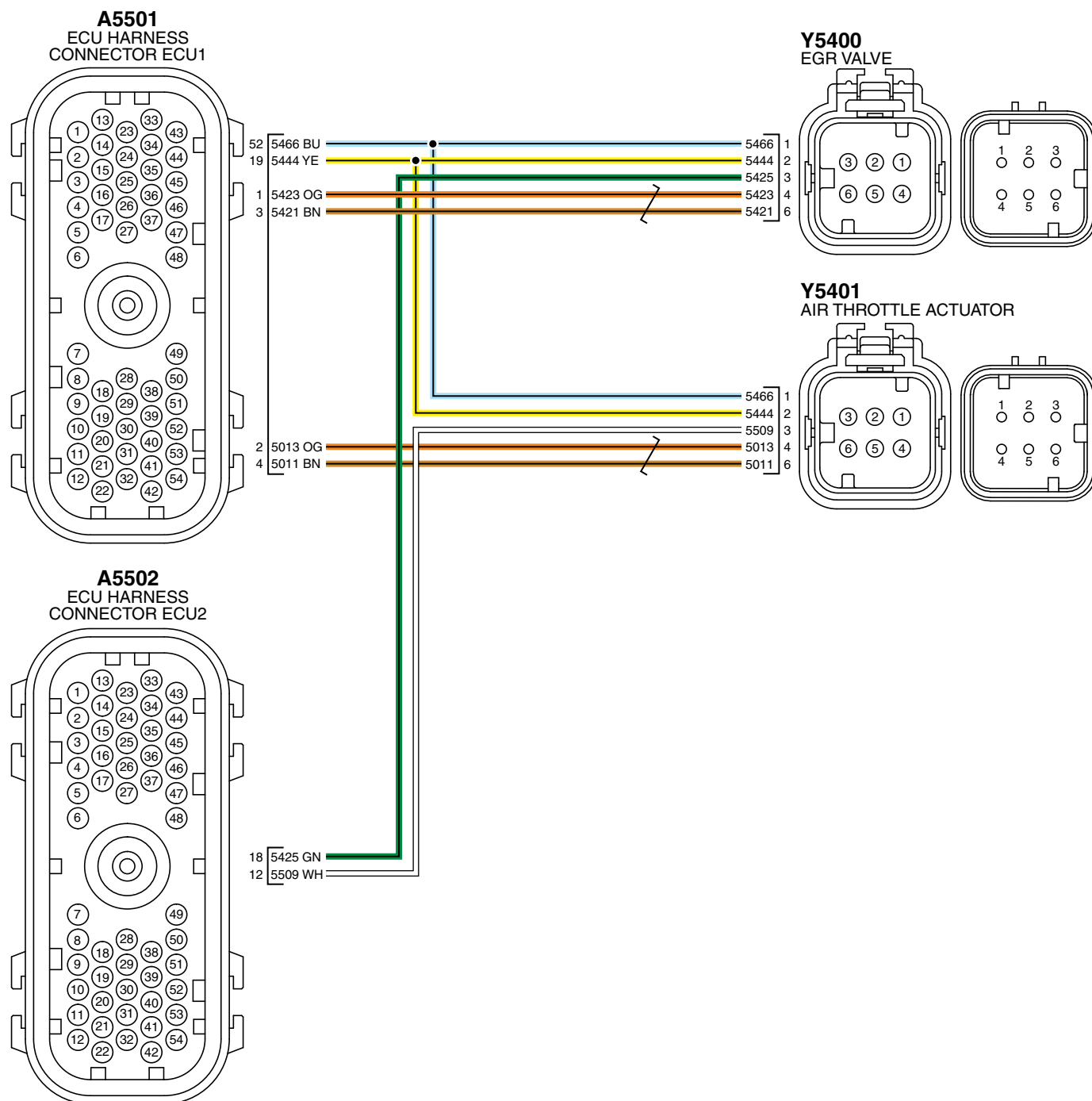
Is DTC 000029.04 active?

YES: [GO TO 15](#)

NO: Perform [Verification Procedure](#).

Continued on next page

RE42287,00000D4 -19-28FEB11-12/19



Air Throttle Actuator and EGR Valve Wiring Diagram

A5501—52—Supply
A5501—19—Return
A5501—2—Air Throttle Actuator PWM Drive #1
A5501—4—Air Throttle Actuator PWM Drive #2
A5501—3—EGR Valve PWM Drive #1
A5501—1—EGR Valve PWM Drive #2
A5502—12—Air Throttle Actuator Position Signal
A5502—18—EGR Valve Position Signal

IMPORTANT: Terminal damage occurs if anything other than the specified flex probe from JDG10466 Flex Probe Kit is used.

Flex probe:

Sensor

- JDG10460 — Female — Yellow/Purple

- JDG10461 — Male — Yellow/Purple

Continued on next page

RE42287,00002B9 - 19-27APR15-3/6

4 Signal Circuit Check

1. Connect Diagnostic Test Box :
 - A to B5107 connector female socket 3 (+).
 - B to B5107 connector female socket 2 (-).
2. Set S1 to position 9 on Diagnostic Test Box.
3. Connect multimeter to Diagnostic Test Box.
4. Ignition ON, Engine OFF.
5. Monitor voltage on multimeter.
6. Perform Wiggle Test.

NOTE: A negative voltage is less than 2.3 V.

Does voltage remain between 2.3 and 2.7 V?

YES: GO TO 8

NO: Voltage greater than 2.7 V. GO TO Short to Voltage Procedure.

NO: Voltage less than 2.3 V. GO TO 5

RE42287,00003A6 -19-27APR15-7/15

5 Open Circuit Check

Press and hold S2 on Diagnostic Test Box while performing Wiggle Test.

Does voltage remain between 2.3 and 2.7 V?

YES: Repair open in return wire. Perform Verification Procedure.

NO: GO TO 6

RE42287,00003A6 -19-27APR15-8/15

6 Terminal Check

1. Ignition OFF, Engine OFF.
2. Disconnect ECU connector A5501.
3. Perform Terminal Test on A5501 connector female sockets 54, 18, and 41. And corresponding ECU male pins.

Were any problems found?

YES: Repair problem. Perform Verification Procedure.

NO: GO TO 7

RE42287,00003A6 -19-27APR15-9/15

7 Continuity Check

1. Measure the resistance between A5501 connector female socket 18 and B5107 connector female socket 2.
2. Measure the resistance between A5501 connector female socket 41 and B5107 connector female socket 3.

Are both resistance measurements less than 5 ohms?

YES: GO TO Problem Not Found Procedure.

NO: Repair mispin. Perform Verification Procedure.

RE42287,00003A6 -19-27APR15-10/15

8 Software Check

In Service ADVISOR monitor Low-Pressure Fuel Input Voltage.

Is voltage between 2.3 and 2.7 V?

YES: Replace sensor. Perform Verification Procedure.

NO: GO TO 9

Continued on next page

RE42287,00003A6 -19-27APR15-11/15

ECU

- JDG10460 — Female — Yellow/Purple
- JDG10461 — Male — Yellow/Purple

Tools:

- JDG10273 — Diagnostic Test Box
- JT07306 — Digital Multimeter
- J-35616-20 — Test Leads

RE42287,00003AB -19-27APR15-3/19

1 Read DTCs and Store Snapshot Information

1. Connect Service ADVISOR, see [Connecting to Service ADVISOR](#) in Section 04, Group 160.

NOTE: When DTCs are cleared, Snapshot information for ALL DTCs is cleared.

2. Ignition ON, Engine OFF for three minutes.
3. If any DTCs have snapshot capture or snapshot recording information, save the information. For instructions on saving and using snapshot information, see [Snapshot Instructions](#) in Section 04, Group 160.
4. In Service ADVISOR, perform Control Unit Information and Overview test.
5. Refresh Codes.

Is DTC 000097.00 or 000097.16 active?

YES: [GO TO 2](#)

NO: [GO TO 14](#)

RE42287,00003AB -19-27APR15-4/19

2 Water in Fuel Check

1. Ignition OFF, Engine OFF.
2. Drain water from fuel filter water separator bowl.
3. Disconnect low-pressure fuel pump connector Y5501.
4. Ignition ON, Engine OFF.
5. In Service ADVISOR, monitor Water In Fuel Input Voltage.

Is voltage below 4 V?

YES: [GO TO 3](#)

NO: [GO TO 12](#)

RE42287,00003AB -19-27APR15-5/19

3 Terminal Check

1. Ignition OFF, Engine OFF.
2. Disconnect water-in-fuel sensor connector B5600.
3. Perform [Terminal Test](#) on sensor and B5600 connector.

Were any problems found?

YES: Repair problem.
Perform [Verification Procedure](#).

NO: [GO TO 4](#)

Continued on next page

RE42287,00003AB -19-27APR15-6/19

**000100.02 — Engine Oil Pressure is not Zero
with Engine Stopped**

*The engine oil pressure signal is not at zero
with the engine stopped.*

Continued on next page

BK34394,0000E46 -19-27APR15-1/13

**000101.00 — Engine Crankcase Pressure
Extremely High**

The crankcase pressure signal is extremely high.

Continued on next page

BK34394,0000E4A -19-17AUG11-1/14

Diagnostic Procedure**Troubleshooting Sequence:****005125.03****000102.03****When DTC is Displayed:**

When the ignition is on, and the fault is active.

Related Information:

The manifold air pressure sensor signal voltage to the ECU corresponds to a pressure higher than what is physically possible for the manifold air pressure sensor.

Alarm Level:

Warning

Control Unit Response:

The ECU tries to maintain proper operating conditions.

The ECU uses a default value for manifold air pressure.

Additional references:

For sensor location see B5104 - Manifold Air Pressure (MAP) Sensor in Section 03, Group 140.

For more pressure sensor information, see Measuring Pressure in Section 03, Group 140.

For more information on how to use Diagnostic Test Box, see Diagnostic Test Box — Using in Section 04, Group 160.

For more information on the Control Unit Information and Overview test, see Control Unit Information and Overview Test in Section 04, Group 160.

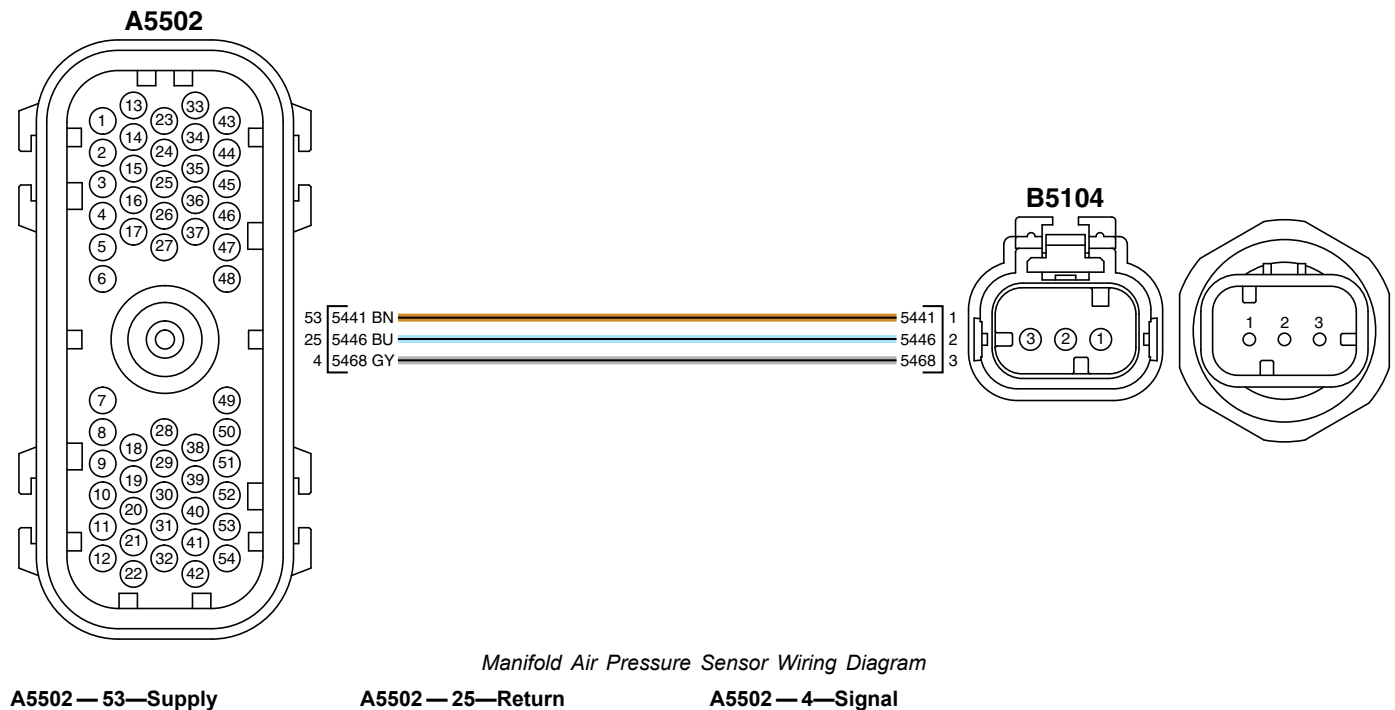
NOTE: The wiring diagrams provided are for a typical John Deere supplied OEM harness. Wire number, colors, and jumper connectors do not apply to all applications.

For connector repair or complete wiring information:

- see Connector Repair Information Table

- see 6.8L Wiring Diagram 2

located in Section 06, Group 210.



RG16751 — UN—22DEC09

IMPORTANT: Terminal damage occurs if anything other than the specified flex probe from **JDG10466 Flex Probe Kit** is used.

Continued on next page

RE42287,00000E9 -19-28FEB11-2/15

Diagnostic Procedure

Troubleshooting Sequence:

002629.04

000103.05

000103.00

000103.02

When DTC is Displayed:

When the ignition is on and the engine is running.

Related Information:

This DTC may be caused by electrical noise interfering with the signal coming from the VGT speed sensor to the ECU. This DTC may also be caused by a problem with the VGT speed sensor or wiring.

Alarm Level:

Warning

Control Unit Response:

The ECU tries to maintain proper operating conditions and use the ECU calculated VGT speed for maintaining engine parameters.

Additional References:

For more VGT speed sensor information, see [B5300 - VGT Speed Sensor](#) in Section 03, Group 140.

For more information on speed sensors, see [Measuring Speed](#) in Section 03, Group 140.

For more information on the VGT Learn Value Reset Test, see [VGT or Exhaust Throttle — Learn Value Reset Instructions](#) in Section 04, Group 160.

For more information on the Control Unit Information and Overview test, see [Control Unit Information and Overview Test](#) in Section 04, Group 160.

For more information on the Harness Diagnostic Mode Test, see [Harness Diagnostic Mode Test](#) in Section 04, Group 160.

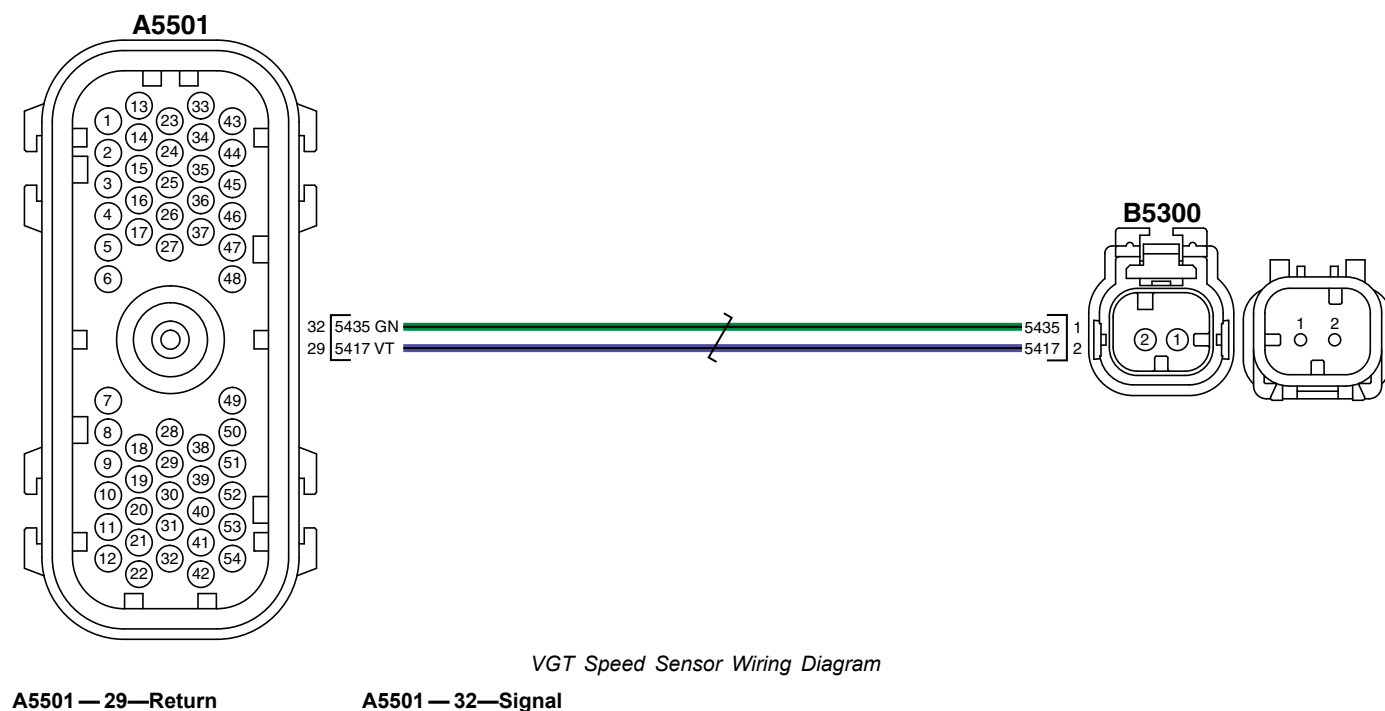
NOTE: The wiring diagrams provided are for a typical John Deere supplied OEM harness. Wire number, colors, and jumper connectors do not apply to all applications.

For connector repair or complete wiring information:

- see [Connector Repair Information Table](#)

- see [6.8L Wiring Diagram 1](#)

located in Section 06, Group 210.



RG17733 — UN—06MAY10

Continued on next page

RE42287,00000ED -19-27APR15-2/14

Diagnostic Procedure**Troubleshooting Sequence:****000105.03****000105.04****When DTC is Displayed:**

When the ignition is on, and the fault is active.

Related Information:

The manifold air temperature sensor signal voltage to the ECU corresponds to a temperature lower than what is physically possible for the manifold air temperature sensor.

Alarm Level:

Warning

Control Unit Response:

The ECU tries to maintain proper operating conditions.

The ECU uses a default value for manifold air temperature.

Additional References:

For sensor location see B5206 - Manifold Air Temperature (MAT) Sensor in Section 03, Group 140.

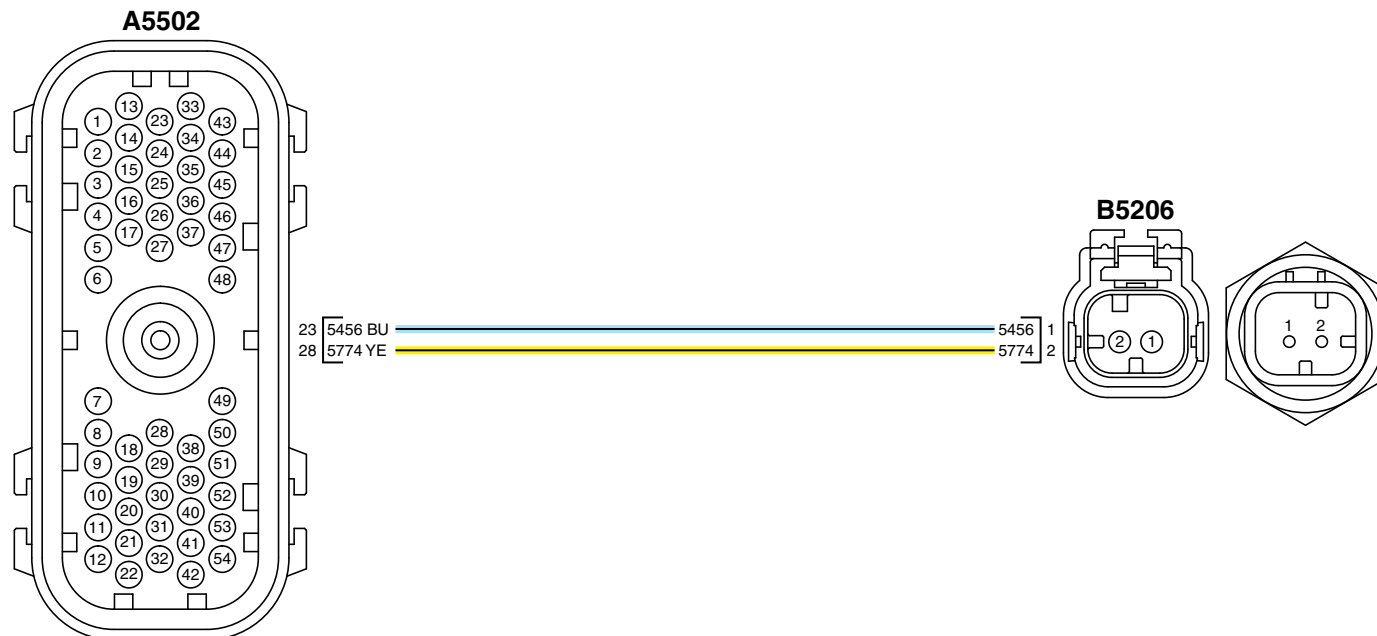
For more temperature sensor information, see Measuring Temperature in Section 03, Group 140.For more information on how to use Diagnostic Test Box, see Diagnostic Test Box — Using in Section 04, Group 160.For more information on the Control Unit Information and Overview test, see Control Unit Information and Overview Test in Section 04, Group 160.

NOTE: The wiring diagrams provided are for a typical John Deere supplied OEM harness. Wire number, colors, and interconnects do not apply to all applications.

For connector repair or complete wiring information:

- see Connector Repair Information Table- see 6.8L Wiring Diagram 2

located in Section 06, Group 210.



Manifold Air Temperature Sensor Wiring Diagram

A5502—23—Signal**A5502—28—Return**

IMPORTANT: Terminal damage occurs if anything other than the specified flex probe from JDG10466 Flex Probe Kit is used.

Continued on next page

RE42287,00000F1 -19-28FEB11-2/15

4 Signal Circuit Check

1. Connect Diagnostic Test Box :
 - A to B5108 connector female socket 3 (+).
 - B to B5108 connector female socket 2 (-).
2. Set S1 to position 9 on Diagnostic Test Box.
3. Connect multimeter to Diagnostic Test Box.
4. Ignition ON, Engine OFF.
5. Monitor voltage on multimeter.
6. Perform Wiggle Test.

NOTE: A negative voltage is less than 2.3 V.

Does voltage remain between 2.3 and 2.7 V?

YES: GO TO 8

NO: Voltage greater than 2.7 V. GO TO Short to Voltage Procedure.

NO: Voltage less than 2.3 V. GO TO 5

BK34394,0000E4F -19-27APR15-7/15

5 Open Circuit Check

Press and hold S2 on Diagnostic Test Box while performing Wiggle Test.

Does voltage remain between 2.3 and 2.7 V?

YES: Repair open in return wire. Perform Verification Procedure.

NO: GO TO 6

BK34394,0000E4F -19-27APR15-8/15

6 Terminal Check

1. Ignition OFF, Engine OFF.
2. Disconnect ECU connector A5502.
3. Perform Terminal Test on A5502 connector female sockets 41, 31, and 42. And corresponding ECU male pins.

Were any problems found?

YES: Repair problem. Perform Verification Procedure.

NO: GO TO 7

BK34394,0000E4F -19-27APR15-9/15

7 Continuity Check

1. Measure the resistance between A5502 connector female socket 31 and B5108 connector female socket 2.
2. Measure the resistance between A5502 connector female socket 42 and B5108 connector female socket 3.

Are both resistance measurements less than 5 ohms?

YES: GO TO Problem Not Found Procedure.

NO: Repair mis-pin. Perform Verification Procedure.

BK34394,0000E4F -19-27APR15-10/15

8 Software Check

In Service ADVISOR, monitor Engine Coolant Pressure Input Voltage.

Is voltage between 2.3 and 2.7 V?

YES: Replace sensor. Perform Verification Procedure.

NO: GO TO 9

BK34394,0000E4F -19-27APR15-11/15

Continued on next page

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**000110.04 — Engine Coolant Temperature
Signal Out of Range Low**

*The engine coolant temperature signal is lower than
the sensor low voltage specification.*

Continued on next page

BK34394,0000E56 -19-27APR15-1/15

IMPORTANT: If application is not using a John Deere engine coolant surge tank and sensors, probe carefully since correct Flex Probes cannot be specified.

Flex probes:

Switches

- JDG10458 — Female — Blue/Green
- JDG10459 — Male — Blue/Green

ECU

- JDG10460 — Female — Yellow/Purple
- JDG10461 — Male — Yellow/Purple

Tools:

- JDG10273 — Diagnostic Test Box
- JT07306 — Digital Multimeter
- J-35616-20 — Test Leads

BK34394,0000E5C -19-23AUG16-3/17

1 ECU Software Update Check

1. Connect Service ADVISOR, see [Connecting to Service ADVISOR](#) in Section 04, Group 160.

NOTE: When DTCs are cleared Snapshot information for ALL DTCs is cleared.

2. Ignition ON, Engine OFF.

NOTE: The ignition must be ON for 90 seconds to allow the DTC to set if it is active.

3. If any DTCs have snapshot capture or snapshot recording information, save the information. For instructions on saving and using snapshot information, see [Snapshot Instructions](#) in Section 04, Group 160.
4. Search Custom Performance for ECU software updates.

Is a new version of software available?

YES: Reprogram ECU with newest software. Perform [Verification Procedure](#)

NO: [GO TO 2](#)

BK34394,0000E5C -19-23AUG16-4/17

2 Verify Problem

1. In Service ADVISOR, perform Control Unit Information and Overview test.

2. Refresh codes.

Is DTC 000111.17 active?

YES: [GO TO 3](#)

NO: [GO TO 12](#)

BK34394,0000E5C -19-23AUG16-5/17

3 Coolant Level Check

1. Ignition OFF, Engine OFF.

2. Check coolant level in surge tank for correct coolant level.

Is coolant level in the normal range?

YES: [GO TO 4](#)

NO: Fill to proper level. Perform [Verification Procedure](#).

BK34394,0000E5C -19-23AUG16-6/17

4 Verify OEM Parts

Verify that surge tank and level switches are John Deere OEM parts.

Are surge tank and switches John Deere OEM parts?

YES: [GO TO 5](#)

NO: See your application technical manual for diagnostics of the engine coolant level sensors.

Continued on next page

BK34394,0000E5C -19-23AUG16-7/17

**000157.16 — Fuel Rail Pressure Signal
Moderately High**

The fuel rail pressure signal is moderately high.

Continued on next page

RE42287,00003B2 - 19-27APR15-1/4

Tools:

- JT07306 — Digital Multimeter
- J-35616-20 – Test Leads

RE42287,00000DE -19-28FEB11-3/6

1 Read DTCs and Store Snapshot Information

1. Connect Service ADVISOR, see Connecting to Service ADVISOR in Section 04, Group 160.

NOTE: When DTCs are cleared, Snapshot Information for ALL DTCs is cleared.

2. Ignition ON, Engine OFF.
3. If any DTCs have snapshot capture or snapshot recording information, save the information. For instructions on saving and using snapshot information, see Snapshot Instructions in Section 04, Group 160.
4. In Service ADVISOR, perform Control Unit Information and Overview test.
5. Check battery state of charge.
6. Ignition ON, engine running.
7. Check charging system for proper operation.

Were any problems found?

YES: Repair problem.
Perform Verification Procedure.

NO: GO TO 2

RE42287,00000DE -19-28FEB11-4/6

2 Voltage Check

1. Ignition ON, engine running
2. In Service ADVISOR, monitor Unswitched Battery Voltage.
3. Using multimeter, measure battery voltage at the battery.

Is voltage reading in Service ADVISOR within 0.6 V of multimeter reading?

YES: GO TO Problem Not Found Procedure.

NO: GO TO 3

RE42287,00000DE -19-28FEB11-5/6

3 Reprogram ECU

1. Reprogram ECU. For more information, see Engine Control Unit (ECU) — Reprogramming Instructions in Section 04, Group 160.
2. Ignition ON, Engine OFF.
3. In Service ADVISOR, monitor Unswitched Battery Voltage.
4. Using multimeter, measure battery voltage at the battery.

Is voltage reading in Service ADVISOR within 0.6 V of multimeter reading?

YES: Perform Verification Procedure.

NO: Replace ECU.
Perform Verification Procedure.

RE42287,00000DE -19-28FEB11-6/6

000190.16 — Engine Speed Moderately High

The engine speed is moderately higher than expected.

Diagnostic Procedure**When DTC is Displayed:**

When the engine is running and the error is active.

Related Information:

The ECU detected that engine speed has exceeded the maximum speed allowed.

Alarm Level:

Warning

Control Unit Response:

The ECU stops fuel flow to the high-pressure common-rail (HPCR), by turning off the suction control valve on the high-pressure fuel pump.

For troubleshooting procedure see [000190.00 – Engine Speed Extremely High](#).

BK34394,0000E0A -19-04MAY11-1/1

000412.15 — EGR Temperature Signal Slightly High

The EGR temperature signal is slightly higher than expected.

Diagnostic Procedure**When DTC is Displayed:**

When the engine is running and the error is active.

Related Information:

The EGR temperature signal is slightly higher than expected at the operating conditions that set the DTC.

The engine must be running for a minimum of 3 minutes for DTC to become active.

Alarm Level:

Warning

Control Unit Response:

The ECU derates the engine.

For troubleshooting procedure see [000412.00 – EGR Temperature Signal Extremely High](#).

RE42287,00000FA -19-23NOV10-1/1

000612.04 — Injector Drive #2 Shorted to Ground

The ECU detected a short to ground on injector drive #2 circuit.

Continued on next page

RE42287,00003BC -19-09MAY11-1/16

Flex probes:

Sensor

- JDG10460 — Female — Yellow/Purple
- JDG10461 — Male — Yellow/Purple

ECU

- JDG10460 — Female — Yellow/Purple
- JDG10461 — Male — Yellow/Purple

Tools:

- JDG10273 — Diagnostic Test Box
- JT07306 — Digital Multimeter
- J-35616-20 — Test Leads

BK34394,0000E0D -19-27APR15-3/18

1 Read DTCs and Store Snapshot Information

1. Connect Service ADVISOR, see [Connecting to Service ADVISOR](#) in Section 04, Group 160.

NOTE: When DTCs are cleared Snapshot information for ALL DTCs is cleared.

2. Ignition ON, Engine OFF.
3. If any DTCs have snapshot capture or snapshot recording information, save the information. For instructions on saving and using snapshot information, see [Snapshot Instructions](#) in Section 04, Group 160.
4. In Service ADVISOR, perform [Control Unit Information and Overview Test](#).
5. Refresh Codes.
6. Wait 60 seconds.

Is DTC 000636.06 active?

YES: [GO TO 2](#)

NO: [GO TO 10](#)

BK34394,0000E0D -19-27APR15-4/18

2 Terminal Check

1. Ignition OFF, Engine OFF.
2. Disconnect camshaft position sensor connector B5302.
3. Perform [Terminal Test](#) on sensor and B5302 connector.

Were any problems found?

YES: Repair problem.
Perform [Verification Procedure](#).

NO: [GO TO 3](#)

BK34394,0000E0D -19-27APR15-5/18

3 Circuit Check

1. Connect Diagnostic Test Box:
 - A to B5302 connector female sockets 2 (+).
 - B to B5302 connector female sockets 1 (-).
2. Set S1 to position 9 on Diagnostic Test Box.
3. Connect multimeter to Diagnostic Test Box.
4. Ignition ON, Engine OFF.
5. Monitor voltage on multimeter.

NOTE: Every 30 seconds the voltage on the meter changes for an instant. Disregard this change.

6. Perform [Wiggle Test](#).

Does voltage consistently read 1.3 V to 1.8 V?

YES: [GO TO 4](#)

NO: [GO TO 5](#)

Continued on next page

BK34394,0000E0D -19-27APR15-6/18

Flex probes:

Sensor

- JDG10460 — Female — Yellow/Purple
- JDG10461 — Male — Yellow/Purple

ECU

- JDG10460 — Female — Yellow/Purple
- JDG10461 — Male — Yellow/Purple

Tools:

- JDG10273 — Diagnostic Test Box
- JT07306 — Digital Multimeter
- J-35616-20 — Test Leads

BK34394,0000E11 -19-04MAY11-3/6

1 Read DTCs and Store Snapshot Information

1. Connect Service ADVISOR, see [Connecting to Service ADVISOR](#) in Section 04, Group 160.

NOTE: When DTCs are cleared, Snapshot information for ALL DTCs is cleared.

2. Ignition ON, Engine OFF.
3. If any DTCs have snapshot capture or snapshot recording information, save the information. For instructions on saving and using snapshot information, see [Snapshot Instructions](#) in Section 04, Group 160.
4. In Service ADVISOR, perform [Control Unit Information and Overview Test](#).
5. Ignition OFF, Engine OFF.
6. Disconnect crankshaft position sensor connector B5301.
7. Perform [Terminal Test](#) on sensor and B5301 connector.

Were any problems found?

YES: Repair problem.
Perform [Verification Procedure](#).

NO: [GO TO 2](#)

BK34394,0000E11 -19-04MAY11-4/6

2 Circuit Check

1. Connect Diagnostic Test Box:
 - A to B5301 connector female sockets 1 (+).
 - B to B5301 connector female sockets 2 (-).
2. Set S1 to position 9 on Diagnostic Test Box.
3. Monitor voltage on multimeter.
4. Perform [Wiggle Test](#).

Does voltage remain between 1.3 V and 1.7 V?

YES: Replace sensor.
Perform [Verification Procedure](#).

NO: Voltage goes greater than 1.7 V. [GO TO Short to Voltage Procedure](#).

NO: Voltage goes less than 1.3 V. [GO TO 3](#)

Continued on next page

BK34394,0000E11 -19-04MAY11-5/6

4 Sensor Inspection

1. Remove crankshaft position sensor.
2. Visually inspect crankshaft position sensor for damage to threads or tip.

Any damage found?

YES: Replace sensor.
Perform [Verification Procedure](#).

NO: [GO TO 5](#)

BK34394,0000E15 -19-22JUL15-7/17

5 Physical Damage Inspection

Using [JDG11100A](#) Flexible Borescope, inspect gear through crankshaft sensor port for physical damage while turning engine over by hand using [JDG820](#) Flywheel Turning Tool.

Any damage found to gear?

YES: Repair problem.
Perform [Verification Procedure](#).

NO: [GO TO 6](#)

BK34394,0000E15 -19-22JUL15-8/17

6 Terminal Check

1. Disconnect ECU connector A5501.
2. Perform [Terminal Test](#) on A5501 connector female sockets 30 and 51. And corresponding ECU male pins.

Were any problems found?

YES: Repair problem.
Perform [Verification Procedure](#).

NO: [GO TO 7](#)

BK34394,0000E15 -19-22JUL15-9/17

7 Continuity Check

NOTE: This check is performed to verify that crankshaft position sensor signal and return wires are in the specified connector cavities (not swapped).

1. Measure resistance between A5501 connector female socket 30 and B5301 connector female socket 1.
2. Measure resistance between A5501 connector female socket 51 and B5301 connector female socket 2.

Are both resistances less than 5 ohms?

YES: [GO TO 8](#)

NO: Repair harness problem. Perform [Verification Procedure](#).

BK34394,0000E15 -19-22JUL15-10/17

8 Wire-to-Wire Short

1. Disconnect ECU connectors A5502 and A5503.
2. Measure resistance between A5501 connector female socket 51 and all other sockets in ECU connectors A5501, A5502, and A5503.

Are any of the resistance measurements less than 100k ohms?

YES: Repair short in harness. Perform [Verification Procedure](#).

NO: [GO TO 9](#)

BK34394,0000E15 -19-22JUL15-11/17

9 Shorted Sensor Return

On A5501 connector, measure resistance between female socket 30 and single point ground.

Is resistance less than 100k ohms?

YES: Repair short to ground in harness. Perform [Verification Procedure](#).

NO: [GO TO 13](#)

BK34394,0000E15 -19-22JUL15-12/17

Continued on next page

Diagnostic Procedure

Troubleshooting Sequence:

00641.05
00641.06
00641.09

When DTC is Displayed:

When the ignition is on and the error is active.

Related Information:

This fault indicates that the ECU is unable to communicate via CAN communication to the VGT actuator, or the VGT actuator is sending a CAN message to the ECU indicating that the VGT actuator is not receiving CAN messages from the ECU.

Alarm Level:

Warning

Control Unit Response:

The ECU uses a default value for the VGT actuator position.
The VGT actuator defaults to 25% closed as long as the actuator has power.

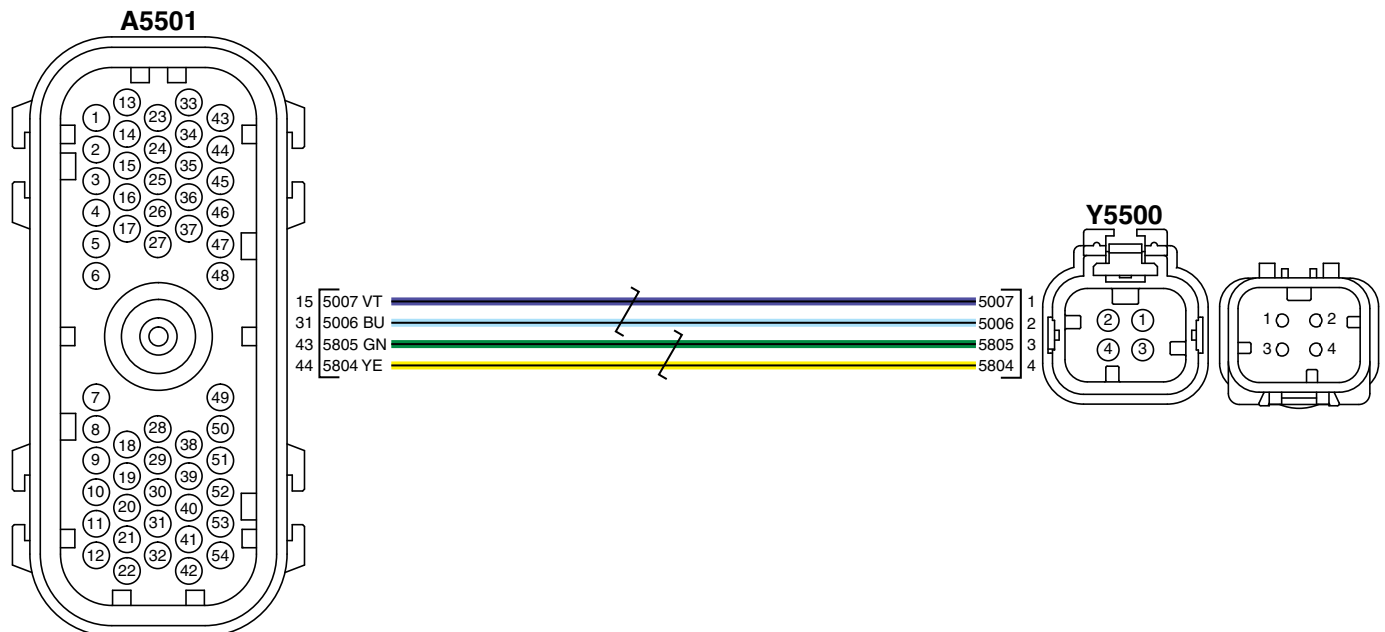
Additional References:

For VGT actuator location see [Y5500 — VGT Actuator](#) in Section 03, Group 140.
For more information on how to use Diagnostic Test Box, see [Diagnostic Test Box — Using](#) in Section 04, Group 160.
For more information on the Control Unit Information and Overview test, see [Control Unit Information and Overview Test](#) in Section 04, Group 160.

NOTE: The wiring diagrams provided are for a typical John Deere supplied OEM harness. Wire number, colors, and jumper connectors do not apply to all applications.

For connector repair or complete wiring information:

- see [Connector Repair Information Table](#)
 - see [6.8L Wiring Diagram 5](#)
- located in Section 06, Group 210.



VGT Actuator Wiring Diagram

A5501 – 15—Supply
A5501 – 31—Return

A5501 – 43—CAN Low

A5501 – 44—CAN High

IMPORTANT: Terminal damage occurs if anything other than the specified flex probe from [JDG10466 Flex Probe Kit](#) is used.

Continued on next page

RE42287,00002BE -19-14FEB12-2/14

6 Terminal Check

1. Disconnect connector Y5005.
2. Perform Terminal Test on male and female terminals of Y5005 connector.

Were any problems found?

YES: Repair problem.
Perform Verification Procedure.

NO: GO TO 7

BK34394,0000A8B -19-01MAR11-9/12

7 Continuity Check

Measure the resistance between Y5005 connector female socket 2 and Y5014 connector female socket A.

Is resistance less than 5 ohms?

YES: Replace harness containing Y5014 and Y5005 connectors. Perform Verification Procedure.

NO: Repair open or high resistance on signal wire in harness between A5503 and Y5005 connectors. Perform Verification Procedure.

BK34394,0000A8B -19-01MAR11-10/12

8 Terminal Check

1. Disconnect connector Y5005.
2. Perform Terminal Test on male and female terminals of Y5005 connector.

Were any problems found?

YES: Repair problem.
Perform Verification Procedure.

NO: GO TO 9

BK34394,0000A8B -19-01MAR11-11/12

9 Continuity Check

Measure the resistance between Y5005 connector female socket 3 and Y5014 connector female socket B.

Is resistance less than 5 ohms?

YES: Replace harness containing Y5014 and Y5005 connectors. Perform Verification Procedure.

NO: Repair open or high resistance on return wire in harness between A5503 and Y5005 connectors. Perform Verification Procedure.

BK34394,0000A8B -19-01MAR11-12/12

000647.06 — Engine Fan Drive Circuit Has Low Resistance

The ECU has detected that the fan drive circuit has low resistance.

Continued on next page

BK34394,0000A8C -19-01MAR11-1/13

8 Harness and Injector Check

On A5501 connector, measure resistance between female sockets:

- 34 and 6 (Injector #1)
- 23 and 6 (Injector #2)
- 33 and 6 (Injector #3)
- 13 and 8 (Injector #4)
- 24 and 8 (Injector #5)
- 14 and 8 (Injector #6)

Are any resistances less than 100k ohms?

YES: Repair short in harness. Perform [Verification Procedure](#).

NO: [GO TO 9](#)

RE42287,00003BF -19-21MAR11-11/15

9 Controller Check

1. Reconnect all connectors.
2. Ignition ON, Engine OFF.
3. In Service ADVISOR, perform Harness Diagnostic Mode Test.

Is DTC 000651.06 active?

YES: Replace ECU. Perform [Verification Procedure](#).

NO: [GO TO 10](#)

RE42287,00003BF -19-21MAR11-12/15

10 Terminal Check

1. Ignition OFF, Engine OFF.
2. Disconnect injector harness connector X5000.
3. Perform [Terminal Test](#) on engine harness and injector harness sides of connector.

Were any problems found?

YES: Repair problem. Perform [Verification Procedure](#).

NO: [GO TO 11](#)

RE42287,00003BF -19-21MAR11-13/15

11 Terminal Check

1. Disconnect ECU connector A5501.
2. Perform [Terminal Test](#) on A5501 connector female sockets 6 and 34. And corresponding ECU male pins.

Were any problems found?

YES: Repair problem. Perform [Verification Procedure](#).

NO: [GO TO 12](#)

RE42287,00003BF -19-21MAR11-14/15

Continued on next page

000653.02 — Injector #3 Part Number Data Invalid

The ECU detects an invalid injector part number has been entered into the ECU.

RE42287,00003C7 -19-27APR15-1/7

Diagnostic Procedure

Troubleshooting Sequence: 000653.02

When DTC is Displayed:

When the ignition is on and the error is active.

Related Information:

The ECU detects an invalid injector part number for injector #3 has been entered into the ECU. Engine performance may be dramatically affected. The engine may also be out of emissions compliance.

Alarm Level:

Warning

Control Unit Response:

The ECU tries to maintain proper operating conditions.

Additional References:

For more fuel injector information, see [Electronic Injector \(EI\) Operation](#) in Section 03, Group 130.

For more fuel system information, see [High-Pressure Fuel System Operation](#) in Section 03, Group 130.

For more electronic injector calibration information, see [Electronic Injector — Calibration Information](#) in Section 04, Group 160.

RE42287,00003C7 -19-27APR15-2/7

1 Read DTCs and Store Snapshot Information

1. Connect Service ADVISOR, see [Connecting to Service ADVISOR](#) in Section 04, Group 160.

NOTE: When DTCs are cleared, Snapshot information for ALL DTCs is cleared.

2. Ignition ON, Engine OFF.
3. If any DTCs have snapshot capture or snapshot recording information, save the information. For instructions on saving and using snapshot information, see [Snapshot Instructions](#) in Section 04, Group 160.
4. In Service ADVISOR, perform Control Unit Information and Overview test.
5. Refresh codes.

Is DTC 000653.02 active?

YES: [GO TO 2](#)

NO: [GO TO 5](#)

RE42287,00003C7 -19-27APR15-3/7

2 Check Injector Part Number

Compare the current injector part number from the Control Unit Information and Overview Test to the part number listed on the injector data sheet.

NOTE: If datasheet is unavailable, the injector part number must be read off the injector body

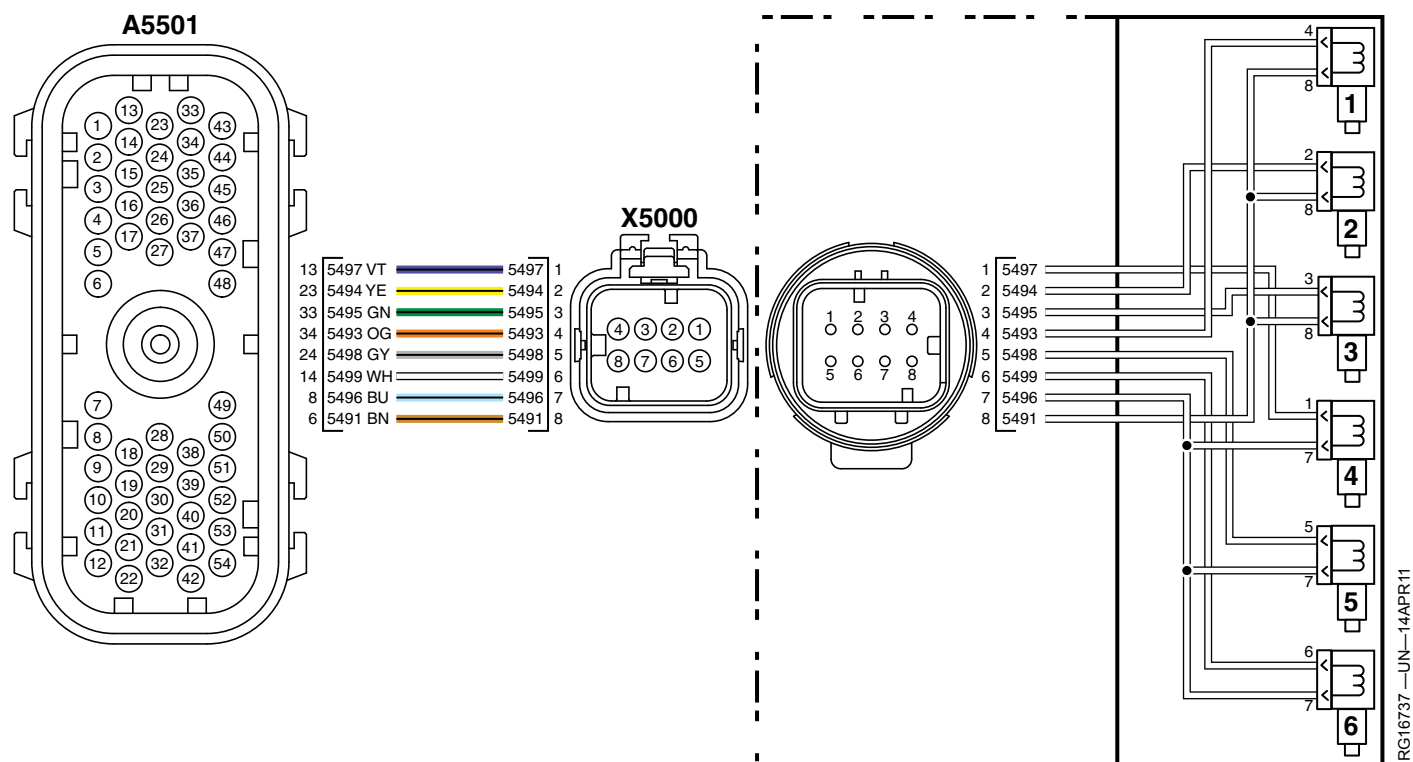
Do the part numbers match?

YES: [GO TO 3](#)

NO: In Service ADVISOR, perform Injector Calibration using correct information. Perform [Verification Procedure](#).

Continued on next page

RE42287,00003C7 -19-27APR15-4/7



IMPORTANT: Terminal damage occurs if anything other than the specified flex probe from JDG10466 Flex Probe Kit is used.

Flex probes:

Sensor

- JDG10460 — Female — Yellow/Purple
- JDG10461 — Male — Yellow/Purple

ECU

- JDG10460 — Female — Yellow/Purple
- JDG10461 — Male — Yellow/Purple

Tools:

- JT07306 — Digital Multimeter
- J-35616-20 — Test Leads

Continued on next page

RE42287_00003CD -19-21MAR11-3/16

000655.06 — Injector #5 Circuit Has Low Resistance

The ECU detected low resistance in the injector #5 circuit.
Continued on next page

RE42287,00003D3 -19-21MAR11-1/15

8 Harness and Injector Check

On A5501 connector, measure resistance between female sockets:

- 34 and 6 (Injector #1)
- 23 and 6 (Injector #2)
- 33 and 6 (Injector #3)
- 13 and 8 (Injector #4)
- 24 and 8 (Injector #5)
- 14 and 8 (Injector #6)

Are any resistances less than 100k ohms?

YES: Repair short in harness. Perform [Verification Procedure](#).

NO: [GO TO 9](#)

RE42287,00003D8 -19-21MAR11-11/15

9 Controller Check

1. Reconnect all connectors.
2. Ignition ON, Engine OFF.
3. In Service ADVISOR, perform Harness Diagnostic Mode Test.

Is DTC 000656.06 active?

YES: Replace ECU. Perform [Verification Procedure](#).

NO: [GO TO 10](#)

RE42287,00003D8 -19-21MAR11-12/15

10 Terminal Check

1. Ignition OFF, Engine OFF.
2. Disconnect injector harness connector X5000.
3. Perform [Terminal Test](#) on engine harness and injector harness sides of connector.

Were any problems found?

YES: Repair problem. Perform [Verification Procedure](#).

NO: [GO TO 11](#)

RE42287,00003D8 -19-21MAR11-13/15

11 Terminal Check

1. Disconnect ECU connector A5501.
2. Perform [Terminal Test](#) on A5501 connector female sockets 8 and 14. And corresponding ECU male pins.

Were any problems found?

YES: Repair problem. Perform [Verification Procedure](#).

NO: [GO TO 12](#)

RE42287,00003D8 -19-21MAR11-14/15

Continued on next page

Diagnostic Procedure**Troubleshooting Sequence:****000676.06****000676.31****When DTC is Displayed:**

The ignition is ON and the conditions exists where the ECU is detecting the cold start aid relay is energized when it should not be, or the feedback signal wire has high resistance.

Related Information:

The ECU supplies Battery Voltage control to the cold start aid relay to energize the relay. The ECU monitors the output of the relay to determine if cold start aid relay is energized.

Alarm Level:

Warning

Control Unit Response:

The ECU tries to maintain proper operating conditions.

Additional References:

For further cold start aid information, see Cold Start Aid Operation in Section 03, Group 135.

For more information on connector and terminal testing see Terminal Test in Section 04, Group 160.

For more information on the Control Unit Information and Overview Test, see Control Unit Information and Overview Test in Section 04, Group 160.

For more information on the Harness Diagnostic Mode Test, see Harness Diagnostic Mode Test instructions in Section 04, Group 160.

NOTE: The wiring diagrams provided are for a typical John Deere supplied OEM harness. Wire number, colors, and jumper connectors do not apply to all applications.

Continued on next page

RE42287,00000FF -19-11SEP14-2/12

1 Read DTCs and Store Snapshot Information

1. Connect Service ADVISOR, see [Connecting to Service ADVISOR](#) in Section 04, Group 160.

NOTE: When DTCs are cleared, Snapshot information for ALL DTCs is cleared.

2. Ignition ON, Engine OFF.
3. If any DTCs have snapshot capture or snapshot recording information, save the information. For instructions on saving and using snapshot information, see [Snapshot Instructions](#) in Section 04, Group 160.
4. In Service ADVISOR, perform Control Unit Information and Overview test.
5. Refresh codes.

Is DTC 003512.03 active or stored?

YES: GO TO [003513.03](#)
— [Sensor Supply #5](#)
[Voltage Out of Range High](#)
procedure.

NO: [GO TO 2](#)

RE42287,00000E3 -19-09AUG11-4/17

2 Code Check

Is DTC 000974.03 active?

YES: [GO TO 3](#)

NO: [GO TO 10](#)

RE42287,00000E3 -19-09AUG11-5/17

3 Terminal Check

1. Ignition OFF, Engine OFF.
2. Disconnect remote analog throttle connector R5002.
3. Perform [Terminal Test](#) on sensor and R5002 connector.

Were any problems found?

YES: Repair problem.
Perform [Verification Procedure](#).

NO: [GO TO 4](#)

RE42287,00000E3 -19-09AUG11-6/17

4 Signal Circuit Check

1. Connect Diagnostic Test Box :
 - A to R5002 connector female socket C (+).
 - B to R5002 connector female socket B (-).
2. Set S1 to position 9 on Diagnostic Test Box.
3. Connect multimeter to Diagnostic Test Box.
4. Ignition ON, Engine OFF.
5. Monitor voltage on multimeter.
6. Perform [Wiggle Test](#).

NOTE: A negative voltage is less than 2.3 V.

Does voltage remain between 2.3 V and 2.7 V?

YES: [GO TO 8](#)

NO: Voltage greater than 2.7 V. GO TO [Short to Voltage Procedure](#).

NO: Voltage less than 2.3 V. [GO TO 5](#)

RE42287,00000E3 -19-09AUG11-7/17

5 Open Circuit Check

Press and hold S2 on Diagnostic Test Box while performing [Wiggle Test](#).

Does voltage remain between 2.3 V and 2.7 V?

YES: Repair open in return wire. Perform [Verification Procedure](#).

NO: [GO TO 6](#)

Continued on next page

RE42287,00000E3 -19-09AUG11-8/17

Diagnostic Procedure**Troubleshooting Sequence:**
001176.12**When DTC is Displayed:**

When the ignition is on and the fault is active.

Related Information:

The ECU compares the intake air pressure sensor to the manifold air pressure sensor, exhaust manifold pressure sensor, and the barometric pressure sensor.

Alarm Level:

Warning

Control Unit Response:

The ECU tries to maintain proper operating conditions.

The ECU uses a default value for the intake air pressure.

Additional References:

For more Intake Air Sensor information, see [B5500 - Intake Air Sensor](#) in Section 03, Group 140.

For more information on the Control Unit Information and Overview test, see [Control Unit Information and Overview Test](#) in Section 04, Group 160.

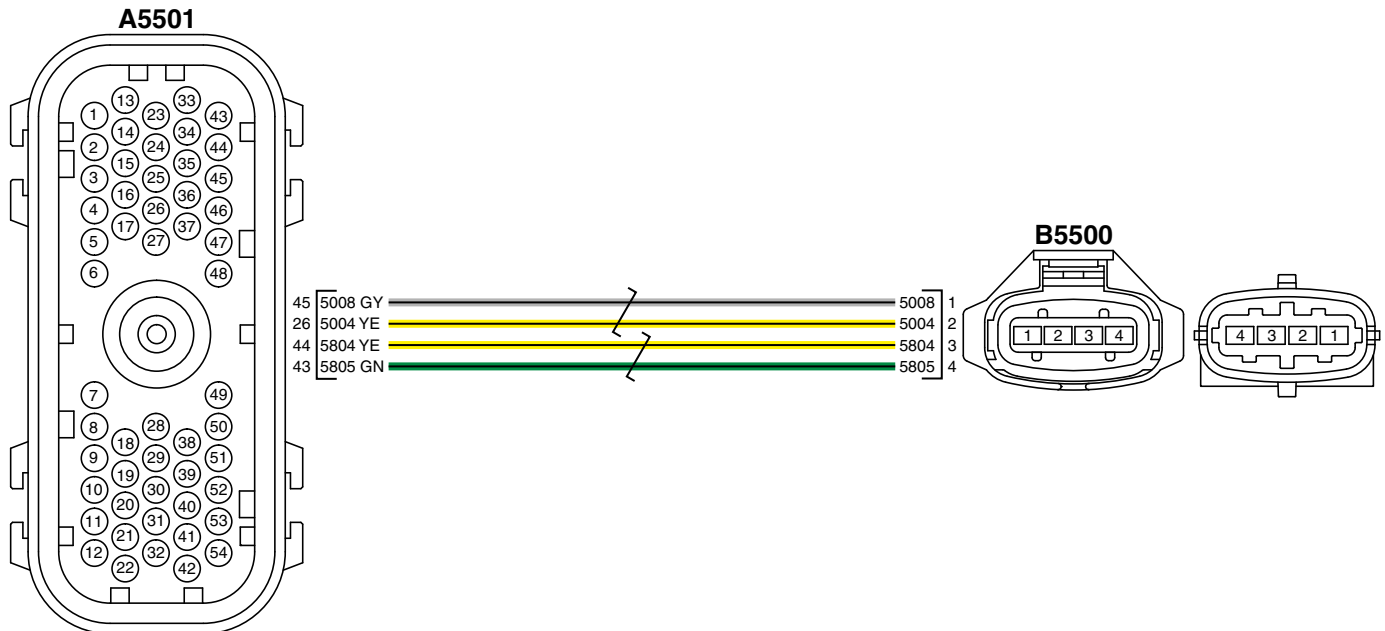
NOTE: The wiring diagrams provided are for a typical John Deere supplied OEM harness. Wire number, colors, and jumper connectors do not apply to all applications.

For connector repair or complete wiring information:

- see Connector Repair Information Table

- see 6.8L Wiring Diagram 5

located in Section 06, Group 210.



Intake Air Sensor Wiring Diagram

A5501 – 45—Supply
A5501 – 26—Return

A5501 – 44—CAN High

A5501 – 43—CAN Low

IMPORTANT: Terminal damage occurs if anything other than the specified flex probe from [JDG10466 Flex Probe Kit](#) is used.

Flex probes:

Sensor

- JDG10233 — Female — Blue/Red

- JDG10243 — Male — Blue/Red

Continued on next page

RE42287,0000101 -19-07APR11-2/4

**001209.04 — Exhaust Manifold Pressure
Signal Out of Range Low**

*The exhaust manifold pressure signal is lower than
the sensor low voltage specification.*

Continued on next page

RE42287,0000104 -19-27APR15-1/17

Diagnostic Procedure**Troubleshooting Sequence:**

000168.01
 000168.18
 000970.31
 000640.11
 001321.31
 001321.05
 001321.06
 001075.04
 001347.01
 001347.18
 001347.05
 001347.06
 000611.04
 000612.04
 000651.05
 000652.05
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 000656.06
 001321.16

When DTC is Displayed:

When the ignition is in start position, engine is cranking and the fault is active.

When the ignition is on, engine off, and the fault is active.

Related Information:

The ECU has detected the starter has been engaged for too long.

Alarm Level:

Warning

Control Unit Response:

The ECU will prevent the starter from being engaged for 60 seconds.

The fault code will go from active to stored after the starter has been inactive for 60 seconds.

Additional references:

For more information on the Control Unit Information and Overview test, see [Control Unit Information and Overview Test](#) in Section 04, Group 160.

Tools:

- [JT07306](#) – Digital Multimeter

Continued on next page

BK34394,0000A94 -19-17FEB12-2/3

11 Check Wiring Harness

1. On A5501 connector, measure resistance between female socket 16 and all other sockets in A5501 connector while performing Wiggle Test.
2. On A5501 connector, measure resistance between female socket 35 and all other sockets in A5501 connector while performing Wiggle Test.

Are all resistance measurements greater than 100k ohms?

YES: GO TO Problem Not Found Procedure.

NO: Repair short in wiring harness. Perform Verification Procedure.

RE42287,00003E2 -19-27APR15-14/14

Diagnostic Procedure

Troubleshooting Sequence:

00647.05
001639.01

When DTC is Displayed:

When the ignition is on, engine is running, and the fault is active.

Related Information:

The ECU has detected that the fan speed is extremely low.

Alarm Level:

Warning

Control Unit Response:

The ECU tries to maintain proper operating conditions.

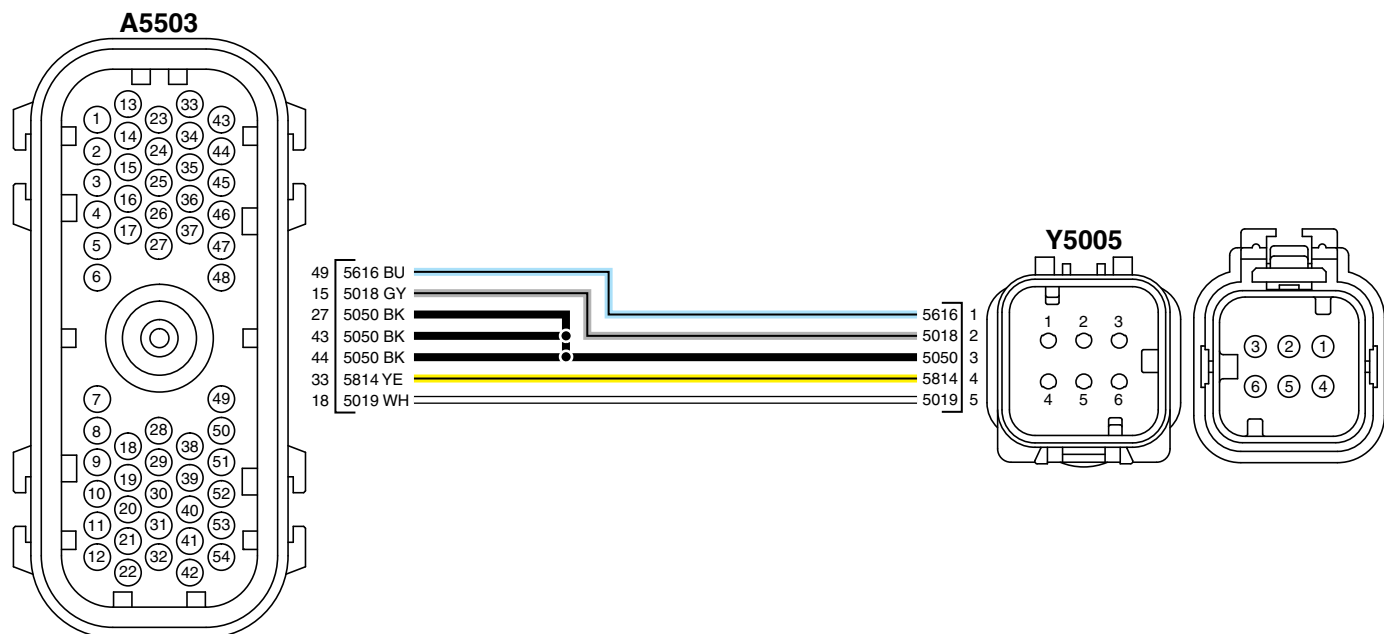
Additional references:

For more information on the Control Unit Information and Overview test, see [Control Unit Information and Overview Test](#) in Section 04, Group 160.

NOTE: The wiring diagrams provided are for a typical John Deere supplied OEM harness. Wire number, colors, and interconnects do not apply to all applications.

For connector repair or complete wiring information:

- see [Connector Repair Information Table](#)
 - see [6.8L Wiring Diagram 7](#)
- located in Section 06, Group 210.



Fan Drive Wiring Diagram

A5503—49—Supply A5503—27—Battery Negative A5503—44—Battery Negative A5503—18—Speed Signal
A5503—15—Fan Clutch Control A5503—43—Battery Negative A5503—33—Return

IMPORTANT: Terminal damage occurs if anything other than the specified flex probe from **JDG10466 Flex Probe Kit** is used.

Flex probes:

Sensor

- JDG10460 — Female — Yellow/Purple
- JDG10461 — Male — Yellow/Purple

Continued on next page

BK34394,0000A9A -19-24OCT11-2/11

002030.09 — No CAN Message Received From Source Address 30

The ECU did not receive a CAN message from another control unit.

Diagnostic Procedure

See CAN Message Not Received in Section 04, Group 155.

BK34394,0000AF1 -19-14FEB11-1/1

002030.14 — Incorrect CAN Message Received From Source Address 30

The ECU received an incorrect CAN message from another control unit.

Diagnostic Procedure

See CAN Message Received Is Incorrect in Section 04, Group 155.

BK34394,0000AF2 -19-16FEB11-1/1

002030.19 — Communication Error with Source Address 30

The ECU received an error message from another control unit.

Diagnostic Procedure

See CAN Message Received Error in Section 04, Group 155.

BK34394,0000AF3 -19-17FEB11-1/1

002031.09 — No CAN Message Received From Source Address 31

The ECU did not receive a CAN message from another control unit.

Diagnostic Procedure

See CAN Message Not Received in Section 04, Group 155.

BK34394,0000AF4 -19-14FEB11-1/1

002031.14 — Incorrect CAN Message Received From Source Address 31

The ECU received an incorrect CAN message from another control unit.

Diagnostic Procedure

See CAN Message Received Is Incorrect in Section 04, Group 155.

BK34394,0000AF5 -19-16FEB11-1/1

002031.19 — Communication Error with Source Address 31

The ECU received an error message from another control unit.

Diagnostic Procedure

See CAN Message Received Error in Section 04, Group 155.

BK34394,0000AF6 -19-17FEB11-1/1

002032.09 — No CAN Message Received From Source Address 32

The ECU did not receive a CAN message from another control unit.

Diagnostic Procedure

See CAN Message Not Received in Section 04, Group 155.

BK34394,0000AF7 -19-14FEB11-1/1

002076.19 — Communication Error with Source Address 76

The ECU received an error message from another control unit.

Diagnostic Procedure

See CAN Message Received Error in Section 04, Group 155.

BK34394,0000B80 -19-17FEB11-1/1

002077.09 — No CAN Message Received From Source Address 77

The ECU did not receive a CAN message from another control unit.

Diagnostic Procedure

See CAN Message Not Received in Section 04, Group 155.

BK34394,0000B81 -19-14FEB11-1/1

002077.14 — Incorrect CAN Message Received From Source Address 77

The ECU received an incorrect CAN message from another control unit.

Diagnostic Procedure

See CAN Message Received Is Incorrect in Section 04, Group 155.

BK34394,0000B82 -19-16FEB11-1/1

002077.19 — Communication Error with Source Address 77

The ECU received an error message from another control unit.

Diagnostic Procedure

See CAN Message Received Error in Section 04, Group 155.

BK34394,0000B83 -19-17FEB11-1/1

002078.09 — No CAN Message Received From Source Address 78

The ECU did not receive a CAN message from another control unit.

Diagnostic Procedure

See CAN Message Not Received in Section 04, Group 155.

BK34394,0000B84 -19-14FEB11-1/1

002078.14 — Incorrect CAN Message Received From Source Address 78

The ECU received an incorrect CAN message from another control unit.

Diagnostic Procedure

See CAN Message Received Is Incorrect in Section 04, Group 155.

BK34394,0000B85 -19-16FEB11-1/1

002078.19 — Communication Error with Source Address 78

The ECU received an error message from another control unit.

Diagnostic Procedure

See CAN Message Received Error in Section 04, Group 155.

BK34394,0000B86 -19-17FEB11-1/1

002123.14 — Incorrect CAN Message Received From Source Address 123

The ECU received an incorrect CAN message from another control unit.

Diagnostic Procedure

See CAN Message Received Is Incorrect in Section 04, Group 155.

BK34394,0000C0C -19-16FEB11-1/1

002123.19 — Communication Error with Source Address 123

The ECU received an error message from another control unit.

Diagnostic Procedure

See CAN Message Received Error in Section 04, Group 155.

BK34394,0000C0D -19-17FEB11-1/1

002124.09 — No CAN Message Received From Source Address 124

The ECU did not receive a CAN message from another control unit.

Diagnostic Procedure

See CAN Message Not Received in Section 04, Group 155.

BK34394,0000C0E -19-14FEB11-1/1

002124.14 — Incorrect CAN Message Received From Source Address 124

The ECU received an incorrect CAN message from another control unit.

Diagnostic Procedure

See CAN Message Received Is Incorrect in Section 04, Group 155.

BK34394,0000C0F -19-16FEB11-1/1

002124.19 — Communication Error with Source Address 124

The ECU received an error message from another control unit.

Diagnostic Procedure

See CAN Message Received Error in Section 04, Group 155.

BK34394,0000C10 -19-17FEB11-1/1

002125.09 — No CAN Message Received From Source Address 125

The ECU did not receive a CAN message from another control unit.

Diagnostic Procedure

See CAN Message Not Received in Section 04, Group 155.

BK34394,0000C11 -19-14FEB11-1/1

002125.14 — Incorrect CAN Message Received From Source Address 125

The ECU received an incorrect CAN message from another control unit.

Diagnostic Procedure

See CAN Message Received Is Incorrect in Section 04, Group 155.

BK34394,0000C12 -19-16FEB11-1/1

002170.09 — No CAN Message Received From Source Address 170

The ECU did not receive a CAN message from another control unit.

Diagnostic Procedure

See [CAN Message Not Received](#) in Section 04, Group 155.

BK34394,0000C98 -19-14FEB11-1/1

002170.14 — Incorrect CAN Message Received From Source Address 170

The ECU received an incorrect CAN message from another control unit.

Diagnostic Procedure

See [CAN Message Received Is Incorrect](#) in Section 04, Group 155.

BK34394,0000C99 -19-16FEB11-1/1

002170.19 — Communication Error with Source Address 170

The ECU received an error message from another control unit.

Diagnostic Procedure

See [CAN Message Received Error](#) in Section 04, Group 155.

BK34394,0000C9A -19-17FEB11-1/1

002171.09 — No CAN Message Received From Source Address 171

The ECU did not receive a CAN message from another control unit.

Diagnostic Procedure

See [CAN Message Not Received](#) in Section 04, Group 155.

BK34394,0000C9B -19-14FEB11-1/1

002171.14 — Incorrect CAN Message Received From Source Address 171

The ECU received an incorrect CAN message from another control unit.

Diagnostic Procedure

See [CAN Message Received Is Incorrect](#) in Section 04, Group 155.

BK34394,0000C9C -19-16FEB11-1/1

002171.19 — Communication Error with Source Address 171

The ECU received an error message from another control unit.

Diagnostic Procedure

See [CAN Message Received Error](#) in Section 04, Group 155.

BK34394,0000C9D -19-17FEB11-1/1

002172.09 — No CAN Message Received From Source Address 172

The ECU did not receive a CAN message from another control unit.

Diagnostic Procedure

See [CAN Message Not Received](#) in Section 04, Group 155.

BK34394,0000C9E -19-14FEB11-1/1

002216.19 — Communication Error with Source Address 216

The ECU received an error message from another control unit.

Diagnostic Procedure

See CAN Message Received Error in Section 04, Group 155.

BK34394,0000D27 -19-17FEB11-1/1

002217.09 — No CAN Message Received From Source Address 217

The ECU did not receive a CAN message from another control unit.

Diagnostic Procedure

See CAN Message Not Received in Section 04, Group 155.

BK34394,0000D28 -19-14FEB11-1/1

002217.14 — Incorrect CAN Message Received From Source Address 217

The ECU received an incorrect CAN message from another control unit.

Diagnostic Procedure

See CAN Message Received Is Incorrect in Section 04, Group 155.

BK34394,0000D29 -19-16FEB11-1/1

002217.19 — Communication Error with Source Address 217

The ECU received an error message from another control unit.

Diagnostic Procedure

See CAN Message Received Error in Section 04, Group 155.

BK34394,0000D2A -19-17FEB11-1/1

002218.09 — No CAN Message Received From Source Address 218

The ECU did not receive a CAN message from another control unit.

Diagnostic Procedure

See CAN Message Not Received in Section 04, Group 155.

BK34394,0000D2B -19-14FEB11-1/1

002218.14 — Incorrect CAN Message Received From Source Address 218

The ECU received an incorrect CAN message from another control unit.

Diagnostic Procedure

See CAN Message Received Is Incorrect in Section 04, Group 155.

BK34394,0000D2C -19-16FEB11-1/1

002218.19 — Communication Error with Source Address 218

The ECU received an error message from another control unit.

Diagnostic Procedure

See CAN Message Received Error in Section 04, Group 155.

BK34394,0000D2D -19-17FEB11-1/1

5 Reprogram ECU

1. Reprogram ECU. For more information, see Engine Control Unit (ECU) — Reprogramming Instructions in Section 04, Group 160.

2. Ignition ON, Engine OFF.

3. With Diagnostic Test Box still connected and S1 in position 7, in Service ADVISOR, monitor Charge Air Cooler Outlet Temperature Input Voltage.

Is voltage between 2.3 and 2.7 V?

YES: Perform Verification Procedure.

NO: Replace ECU.
Perform Verification Procedure.

RE42287,0000108 -19-24AUG12-8/9

6 Replace Sensor

1. Replace charge air cooler outlet temperature sensor.

2. If possible, run engine under operating conditions that set code.

3. Refresh codes.

Did DTC 002630.00 reappear?

YES: Investigate other potential mechanical problems:

- Internal Charge Air Cooler Plugging
- VGT vanes sticking
- Plugged EGR circuit
- Boost leak
- EGR system leak
- Exhaust leak
- EGR flow sensor low
- Air throttle restriction
- Exhaust restriction
- Damaged turbocharger
- VGT vane position sensor inaccurate

NO: Perform Verification Procedure.

RE42287,0000108 -19-24AUG12-9/9

Diagnostic Procedure**Troubleshooting Sequence:****003511.03****002659.03****When DTC is Displayed:**

When the ignition is on, and the fault is active.

Related Information:

The EGR flow sensor signal voltage to the ECU corresponds to a pressure higher than what is physically possible for the EGR flow sensor.

Alarm Level:

Warning

Control Unit Response:

The ECU tries to maintain proper operating conditions.

The ECU uses a default value for EGR flow.

Additional references:

For sensor location see B5103 - EGR Flow Sensor in Section 03, Group 140.

For more pressure sensor information, see Measuring Pressure in Section 03, Group 140.

For more information on how to use Diagnostic Test Box, see Diagnostic Test Box — Using in Section 04, Group 160.

For more information on the Control Unit Information and Overview test, see Control Unit Information and Overview Test in Section 04, Group 160.

NOTE: The wiring diagrams provided are for a typical John Deere supplied OEM harness. Wire number, colors, and jumper connectors do not apply to all applications.

For connector repair or complete wiring information:

- see Connector Repair Information Table

- see 6.8L Wiring Diagram 4

located in Section 06, Group 210.

Continued on next page

RE42287,00002C3 -19-28APR15-2/16

Tools:

- JDG10273 — Diagnostic Test Box
- JT07306 – Digital Multimeter
- J-35616-20 – Test Leads

RE42287,00002C7 -19-27APR15-4/13

1 Read DTCs and Store Snapshot Information

1. Connect Service ADVISOR, see Connecting to Service ADVISOR in Section 04, Group 160.

NOTE: When DTCs are cleared, Snapshot information for ALL DTCs is cleared.

2. Ignition ON, Engine OFF.
3. If any DTCs have snapshot capture or snapshot recording information, save the information. For instructions on saving and using snapshot information, see Snapshot Instructions in Section 04, Group 160.
4. In Service ADVISOR, perform Control Unit Information and Overview test.
5. Refresh codes.

Are any of the codes within the Troubleshooting Sequence active or stored?

YES: GO TO troubleshooting procedure for active or stored DTCs within list.

NO: GO TO 2

RE42287,00002C7 -19-27APR15-5/13

2 Check EGR Valve

NOTE: For EGR valve removal instructions, see EGR Valve — Removal in Section 02, Group 080 earlier in this manual.

1. Ignition OFF, engine OFF.
2. Remove EGR valve.
3. Check for stuck or broken EGR valve.
4. Inspect EGR cooler for EGR restrictions and fouling.

Were any problems found?

YES: Repair problem. Perform Verification procedure.

NO: Reinstall EGR valve. GO TO 3

RE42287,00002C7 -19-27APR15-6/13

3 Terminal Check

1. Ignition OFF, Engine OFF.
2. Disconnect EGR flow sensor connector B5103.
3. Perform Terminal Test on sensor and B5103 connector.

Were any problems found?

YES: Repair problem. Perform Verification Procedure.

NO: GO TO 4

RE42287,00002C7 -19-27APR15-7/13

Continued on next page

Diagnostic Procedure**Troubleshooting Sequence:****002791.05****002791.06****002791.07****When DTC is Displayed:**

When the ignition is on, engine is running, and the EGR valve is commanded to a position when the fault is active.
 When the ignition is on, during the Harness Diagnostic Mode Test with the fault active.

Related Information:

The ECU has detected the EGR valve is not reaching the desired position that is commanded by the ECU.

Alarm Level:

Warning

Control Unit Response:

The ECU tries to maintain proper operating conditions.

The ECU uses a default value for EGR valve position.

Additional references:

For component location, see [Y5400 - EGR Valve](#) in Section 03, Group 140.

For more EGR valve information, see [EGR Valve Operation](#) in Section 03, Group 135.

For more information on how to use Diagnostic Test Box, see [Diagnostic Test Box — Using](#) in Section 04, Group 160.

For more information on the Control Unit Information and Overview test, see [Control Unit Information and Overview Test](#) in Section 04, Group 160.

NOTE: The wiring diagrams provided are for a typical John Deere supplied OEM harness. Wire number, colors, and jumper connectors do not apply to all applications.

For connector repair or complete wiring information:

- see [Connector Repair Information Table](#)

- see [6.8L Wiring Diagram 4](#)

located in Section 06, Group 210.

Continued on next page

RE42287,00002CA -19-04MAY11-2/12

002797.06 — Injector High Voltage Supply #1 Circuit Has Low Resistance

The ECU has detected a problem with injector high voltage supply #1.

RE42287,00003E7 -19-04MAY11-1/4

Diagnostic Procedure

Troubleshooting Sequence: 002797.06

When DTC is Displayed:

When the ignition is on, engine running, and the fault is active.

Related Information:

The ECU has detected an internal problem with the injector high voltage supply #1 circuit.

Alarm Level:

Warning

Control Unit Response:

The ECU tries to maintain proper operating conditions.

Additional references:

For more electronic injector information, see [Electronic Injector \(EI\) Operation](#) in Section 03, Group 130.

For more information on the Control Unit Information and Overview test, see [Control Unit Information and Overview Test](#) in Section 04, Group 160.

NOTE: The wiring diagrams provided are for a typical John Deere supplied OEM harness. Wire number, colors, and interconnects do not apply to all applications.

For connector repair or complete wiring information:

- see [Connector Repair Information Table](#)
 - see [6.8L Wiring Diagram 1](#)
- located in Section 06, Group 210.

IMPORTANT: Terminal damage occurs if anything other than the specified flex probe from JDG10466 Flex Probe Kit is used.

ECU

- JDG10460 — Female — Yellow/Purple
- JDG10461 — Male — Yellow/Purple

RE42287,00003E7 -19-04MAY11-2/4

1 Read DTCs and Store Snapshot Information

1. Connect Service ADVISOR, see [Connecting to Service ADVISOR](#) in Section 04, Group 160.

NOTE: When DTCs are cleared, Snapshot information for ALL DTCs is cleared.

2. Ignition ON, Engine OFF.
3. If any DTCs have snapshot capture or snapshot recording information, save the information. For instructions on saving and using snapshot information, see [Snapshot Instructions](#) in Section 04, Group 160.

4. In Service ADVISOR perform Control Unit Information and Overview test.

5. Ignition ON, engine running.

6. Refresh codes.

Is DTC 002797.06 active?

YES: [GO TO 2](#)

NO: [GO TO Problem Not Found Procedure](#)

Continued on next page

RE42287,00003E7 -19-04MAY11-3/4

2 Terminal Check

1. Ignition OFF, Engine OFF.
2. Disconnect DPF differential pressure sensor connector B5109.
3. Perform Terminal Test on sensor and B5109 connector.

Were any problems found?

YES: Repair problem. GO TO 11

NO: GO TO 3

RE42287,00002F1 -19-27APR15-5/14

3 Supply Circuit Check

1. Connect Diagnostic Test Box :
 - A to B5109 connector female socket 1(+).
 - B to B5109 connector female socket 2 (-).
2. Set S1 to position 1 on Diagnostic Test Box.
3. Connect multimeter to Diagnostic Test Box.
4. Ignition ON, Engine OFF.
5. Monitor voltage on multimeter.
6. Press and hold S3 on Diagnostic Test Box.
7. Perform Wiggle Test.

Does voltage remain between 4.8 V and 5.2 V?

YES: GO TO 5

NO: Voltage greater than 5.2 V. GO TO Short to Voltage Procedure.

NO: Voltage less than 4.8 V. GO TO 4

RE42287,00002F1 -19-27APR15-6/14

4 Circuit Check

1. Press and hold both S2 and S3 buttons on Diagnostic Test Box.
2. Monitor voltage on multimeter.
3. Perform Wiggle Test.

Does voltage now remain between 4.8 V and 5.2 V?

YES: Repair open, high resistance, or short in return wire. Perform Exhaust Condition Check.

NO: Repair open, high resistance, or short in supply wire. Perform Exhaust Condition Check.

RE42287,00002F1 -19-27APR15-7/14

5 Signal Circuit Check

1. Ignition OFF, Engine OFF.
2. Connect Diagnostic Test Box :
 - A to B5109 connector female socket 3 (+).
 - B to B5109 connector female socket 2 (-).
3. Set S1 to position 9 on Diagnostic Test Box.
4. Connect multimeter to Diagnostic Test Box.
5. Ignition ON, Engine OFF.
6. Monitor voltage on multimeter.
7. Perform Wiggle Test.

NOTE: A negative voltage is less than 2.3 V.

Does voltage remain between 2.3 V and 2.7 V?

YES: GO TO 9

NO: Voltage greater than 2.7 V. GO TO Short to Voltage Procedure.

NO: Voltage less than 2.3 V. GO TO 6

Continued on next page

RE42287,00002F1 -19-27APR15-8/14

Tools:

- JT07306 – Digital Multimeter
- J-35616-20 – Test Leads

RE42287,00002CD -19-23FEB17-4/16

1 Read DTCs and Store Snapshot Information

1. Connect Service ADVISOR, see [Connecting to Service ADVISOR](#) in Section 04, Group 160.

NOTE: When DTCs are cleared, Snapshot information for ALL DTCs is cleared.

2. Ignition ON, Engine OFF.
3. If any DTCs have snapshot capture or snapshot recording information, save the information. For instructions on saving and using snapshot information, see [Snapshot Instructions](#) in Section 04, Group 160.
4. In Service ADVISOR, perform Control Unit Information and Overview test.
5. In Service ADVISOR, perform Harness Diagnostic Mode Test.

Is DTC 003464.05 active?

YES: [GO TO 2](#)

NO: [GO TO 9](#)

RE42287,00002CD -19-23FEB17-5/16

2 Terminal Check

1. Ignition OFF, Engine OFF.
2. Disconnect air throttle actuator connector Y5401.
3. Perform [Terminal Test](#) on air throttle actuator and Y5401 connector.

Were any problems found?

YES: Repair problem.
Perform [Verification Procedure](#).

NO: [GO TO 3](#)

RE42287,00002CD -19-23FEB17-6/16

3 Terminal Check

1. Disconnect ECU connector A5501.
2. Perform [Terminal Test](#) on A5501 connector female sockets 2, 4, 19, and 52. And corresponding ECU male pins.

Were any problems found?

YES: Repair problem.
Perform [Verification Procedure](#).

NO: [GO TO 4](#)

RE42287,00002CD -19-23FEB17-7/16

4 Short to Voltage Check

1. Ignition ON, Engine OFF.
2. Measure voltage between Y5401 connector female sockets 4 (+) and single point ground (-).
3. Measure voltage between Y5401 connector female sockets 6 (+) and single point ground (-).

Are both measurements less than 0.5 V?

YES: [GO TO 5](#)

NO: Repair drive wire short to voltage in harness.
Perform [Verification Procedure](#).

Continued on next page

RE42287,00002CD -19-23FEB17-8/16

6 Short To Voltage Check

1. ECU connector A5502 still disconnected.
2. On A5502 connector, measure the voltage between female socket 22 (+) and single point ground (-).
3. Ignition ON, Engine OFF.

Is voltage greater than 0.5 V?

YES: Repair short to voltage on supply wire in harness. Perform [Verification Procedure](#).

NO: [GO TO 7](#)

RE42287,000005A -19-27APR15-8/21

7 Wire to Wire Check

1. Ignition OFF, Engine OFF.
2. On the harness, measure the resistance between A5502 female socket 22 and all other female sockets in A5502.

Is any measurement less than 100k ohms?

YES: Repair short to supply wire in harness. Perform [Verification Procedure](#).

NO: Contact DTAC for Support.

RE42287,000005A -19-27APR15-9/21

8 Signal Wire Short To Voltage Check

1. B5100 still disconnected.
2. On B5100 connector, measure the voltage between female sockets 2 (+) and 1 (-).
3. While monitoring multimeter perform [Wiggle Test](#).
4. Ignition ON, Engine OFF.

Is voltage always less than 5.26 V?

YES: [GO TO 11](#)

NO: [GO TO 9](#)

RE42287,000005A -19-27APR15-10/21

9 Terminal Check

1. Ignition OFF, Engine OFF.
2. Disconnect ECU connector A5502.
3. Perform [Terminal Test](#) on A5502 connector female sockets 8, 22, and 30. And corresponding ECU male pins.

Were any problems found?

YES: Repair problem. Perform [Verification Procedure](#).

NO: [GO TO 10](#)

RE42287,000005A -19-27APR15-11/21

10 Continuity Check

1. Measure resistance between A5502 connector female socket 30 and B5100 connector female socket 1.
2. Measure resistance between A5502 connector female socket 8 and B5100 connector female socket 2.
3. Measure resistance between A5502 connector female socket 22 and B5100 connector female socket 3.

Are all resistances less than 5 ohms?

YES: Repair short to voltage on signal wire in harness. Replace fuel rail pressure sensor. Perform [Verification Procedure](#).

NO: Repair mis-pin in A5502 connector. Perform [Verification Procedure](#).

Continued on next page

RE42287,000005A -19-27APR15-12/21

11 Wire To Wire Check

1. Ignition OFF, Engine OFF.

2. On the harness, measure between A5501 female socket 52 and all other terminals in A5501.

Is any measurement less than 100k ohms?

YES: Repair short to supply wire in harness. Perform [Verification Procedure](#).**NO:** Contact DTAC for support.

RE42287,000005E -19-27APR15-13/37

12 Signal Wire Short To Voltage Check

1. Y5401 still disconnected.

2. On Y5401 connector, measure voltage between female sockets 3 (+) and 2 (-).

3. In Service ADVISOR, monitor Air Throttle Actuator Position Input Voltage.

4. While monitoring voltages perform [Wiggle Test](#).

5. Ignition ON, Engine OFF.

Are both voltages always less than 0.5 V?

YES: [GO TO 15](#)**NO:** [GO TO 13](#)

RE42287,000005E -19-27APR15-14/37

13 Terminal Check

1. Ignition OFF, Engine OFF.

2. Disconnect ECU connectors A5501 and A5502.

3. Perform [Terminal Test](#) on A5501 female sockets 2, 4, 19 and 52 also on **A5502** female socket 12. And corresponding ECU male pins.

Were any problems found?

YES: Repair problem. Perform [Verification Procedure](#).**NO:** [GO TO 14](#)

RE42287,000005E -19-27APR15-15/37

14 Continuity Check

1. Measure resistance between A5501 connector female socket 52 and Y5401 connector female socket 1.

2. Measure resistance between A5501 connector female socket 19 and Y5401 connector female socket 2.

3. Measure resistance between A5501 connector female socket 2 and Y5401 connector female socket 4.

4. Measure resistance between A5501 connector female socket 4 and Y5401 connector female socket 6.

5. Measure resistance between **A5502** connector female socket 12 and Y5401 connector female socket 3.

Are all resistances less than 5 ohms?

YES: Repair short to voltage on signal wire in harness. Replace air throttle actuator. Perform [Verification Procedure](#).**NO:** Repair mis-pin. Perform [Verification Procedure](#).

Continued on next page

RE42287,000005E -19-27APR15-16/37

003513.03 — Sensor Supply #5 Voltage Out of Range High

The ECU detects a supply voltage above specification on the ECU 5 V supply #5 circuit.

RE42287,0000062 -19-26DEC14-1/13

Diagnostic Procedure**Troubleshooting Sequence:****003513.03****When DTC is Displayed:**

When the ignition is on and the error is active.

Related Information:

The ECU detects a supply voltage greater than 5.26 V on the Sensor Supply #5 circuit.

Alarm Level:

Warning

Components Using Sensor Supply #5 Voltage:

Secondary Analog Throttle (optional), Remote Throttle (optional).

NOTE: There may be other application specific devices using this sensor supply circuit. Refer to your application technical manual for other possible devices.

Control Unit Response:

The ECU tries to maintain proper operating conditions.

Additional References:

For more sensor supply #5 information, see [Sensor Supply #5](#) in Section 03, Group 140.

For more analog throttle information, see [Analog Throttle](#) in Section 03, Group 140.

For more information on the Control Unit Information and Overview test, see [Control Unit Information and Overview Test](#) in Section 04, Group 160.

NOTE: The wiring diagrams provided are for a typical John Deere supplied OEM harness. Wire number, colors, and, jumper connectors do not apply to all applications.

For connector repair or complete wiring information:

- see [Connector Repair Information Table](#)
 - see [6.8L Engine Schematic 2](#)
 - see [OEM Instrument Panel Schematic](#)
- located in Section 06, Group 210.

IMPORTANT: Terminal damage occurs if anything other than the specified flex probe from JDG10466 Flex Probe Kit is used.

Flex Probes:

ECU

- [JDG10460](#) – Female – Yellow/Purple
- [JDG10461](#) – Male – Yellow/Purple

Tools:

- [JT07306](#) – Digital Multimeter
- [J-35616-20](#) – Test Leads

Continued on next page

RE42287,0000062 -19-26DEC14-2/13

Tools:

- JT07306 – Digital Multimeter
- J-35616-20 – Test Leads

RE42287,0000065 -19-27APR15-3/20

1 Read DTCs and Store Snapshot Information

1. Connect Service ADVISOR, see Connecting to Service ADVISOR in Section 04, Group 160.

NOTE: When DTCs are cleared, Snapshot Information for ALL DTCs is cleared.

2. Ignition ON, Engine OFF.
3. If any DTCs have snapshot capture or snapshot recording information, save the information. For instructions on saving and using snapshot information, see Snapshot Instructions in Section 04, Group 160.
4. In Service ADVISOR, perform Control Unit Information and Overview test.
5. Refresh codes.

Is DTC 003514.03 stored?

YES: GO TO 003514.03 — Sensor Supply #6 Voltage Out of Range High

NO: GO TO 2

RE42287,0000065 -19-27APR15-4/20

2 DTC List Review

Review DTC List.

Is 003514.04 active?

YES: GO TO 3

NO: GO TO 12

RE42287,0000065 -19-27APR15-5/20

3 Terminal Check

1. Ignition OFF, Engine OFF.

2. Disconnect one component that uses Sensor Supply #6 voltage.

NOTE: For a list of components that use Sensor Supply #6, see Sensor Supply #6 in this procedure.

3. Perform Terminal Test on component and connector that was disconnected.

Were any problems found?

YES: Repair problem. Perform Verification Procedure.

NO: GO TO 4

RE42287,0000065 -19-27APR15-6/20

4 Disconnected Component Code Check

1. Ignition ON, Engine OFF.

2. Refresh codes.

Is DTC 003514.04 active?

YES: GO TO 5

NO: GO TO 9

RE42287,0000065 -19-27APR15-7/20

5 Next Associated Component Check

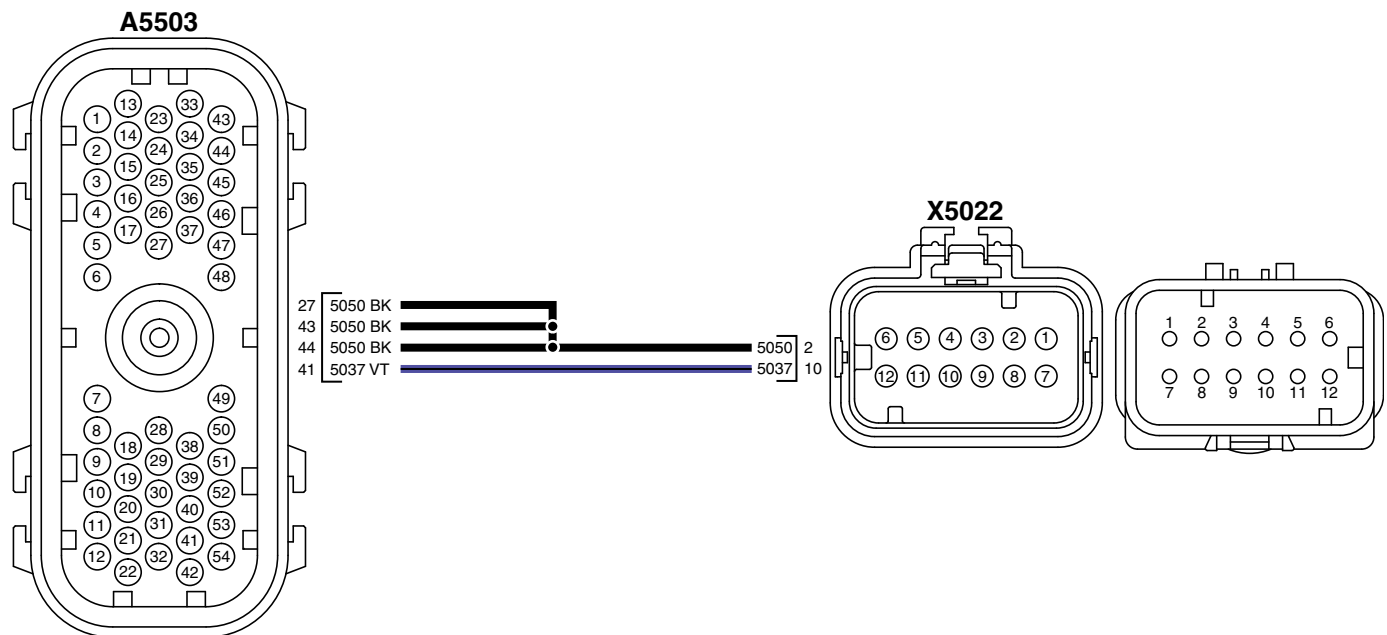
Have all components that use Sensor Supply #6 voltage been disconnected?

YES: GO TO 6

NO: GO TO 3 and check next associated component.

Continued on next page

RE42287,0000065 -19-27APR15-8/20



Regeneration Connector Wiring Diagram

IMPORTANT: Terminal damage occurs if anything other than the specified flex probe from **JDG10466 Flex Probe Kit** is used.

Flex probes:

Sensor

- JDG10460 — Female — Yellow/Purple

- JDG10461 — Male — Yellow/Purple

ECU

- JDG10460 — Female — Yellow/Purple

- JDG10461 — Male — Yellow/Purple

RG18621 —UN—02JUN10

RE42287,00002E3 -19-14NOV16-3/16

1 Read DTCs and Store Snapshot Information

1. Connect Service ADVISOR, see [Connecting to Service ADVISOR](#) in Section 04, Group 160.

NOTE: When DTCs are cleared, Snapshot information for ALL DTCs is cleared.

2. Ignition ON, Engine OFF.
3. If any DTCs have snapshot capture or snapshot recording information, save the information. For instructions on saving and using snapshot information, see [Snapshot Instructions](#) in Section 04, Group 160.
4. In Service ADVISOR, perform Control Unit Information and Overview test.
5. Monitor the Exhaust Filter Cleaning Inhibit Status in the snapshot information.

Does status read "Not Inhibited"?

YES: [GO TO 2](#)

NO: [GO TO 3](#)

RE42287,00002E3 -19-14NOV16-4/16

2 Service Regeneration

1. Ignition ON, Engine Running.
2. In Service ADVISOR, perform Service Regeneration test.

Does Service Regeneration complete successfully?

YES: Talk to operator about application usage and Exhaust Filter Cleaning process.

NO: [GO TO 13](#)

Continued on next page

RE42287,00002E3 -19-14NOV16-5/16

004490.12 — Intake Air Humidity Error

The intake air sensor has detected a problem with measuring intake air humidity.

Continued on next page

RE42287,000010D -19-07APR11-1/4

2 Temperature Comparison

1. In Service ADVISOR, monitor DOC Inlet Temperature.
 2. In Service ADVISOR, monitor DOC Outlet Temperature.
 3. In Service ADVISOR, monitor DPF Outlet Temperature.
- Are all three measurements within 16 °C (29 °F) of each other?

YES: GO TO 4

NO: Replace exhaust filter temperature module. Perform Exhaust Condition Check.

RE42287,000030A -19-27APR15-4/7

3 Temperature Comparison

1. Ignition OFF, Engine OFF.
-  **CAUTION: Wait until exhaust filter is cool enough to touch to avoid burning or injury.**
2. Remove exhaust filter temperature sensors from exhaust filter assembly.
 3. Allow the temperature sensors to hang freely in the air without the sensor ends touching anything and as close to each other as possible.
 4. Ignition ON, Engine OFF.
 5. In Service ADVISOR, monitor DOC Inlet Temperature.
 6. In Service ADVISOR, monitor DOC Outlet Temperature.
 7. In Service ADVISOR, monitor DPF Outlet Temperature.
 8. Allow all three temperature measurements to stabilize.
- Are all three measurements within 16 °C (29 °F) of each other?

YES: GO TO 4

NO: Replace exhaust filter temperature module. Perform Exhaust Condition Check.

RE42287,000030A -19-27APR15-5/7

4 Exhaust Inspection

Thoroughly inspect the exhaust system for any signs of leaks.

Were any leaks found?

YES: Repair exhaust leaks. Perform Exhaust Condition Check.

NO: GO TO 5

RE42287,000030A -19-27APR15-6/7

5 Fuel Quality Check

Test fuel quality. See, Testing Diesel Fuel in Section 01, Group 155.

Did fuel pass quality check?

YES: Perform Exhaust Condition Check.

NO: Remove fuel and clean fuel tank. Put appropriate fuel in tank. Perform Exhaust Condition Check.

RE42287,000030A -19-27APR15-7/7

Diagnostic Procedure**Troubleshooting Sequence:****005125.03****005125.04****When DTC is Displayed:**

When the ignition is on and the error is active.

Related Information:

The ECU detects a supply voltage less than 4.6 V on the sensor supply #7 circuit.

IMPORTANT: Verify that too many devices have not been connected to this Sensor Supply. If the load on this Sensor Supply circuit is too great, the ECU will activate a current limit shut down on this supply.**Alarm Level:**

Warning

Sensors Using Sensor Supply #7 Voltage:

Manifold Air Pressure Sensor, Engine Crankcase Pressure Sensor.

Control Unit Response:

The ECU tries to maintain proper operating conditions.

Additional References:For more sensor supply #7 information, see Sensor Supply #7 in Section 03, Group 140.For more manifold air pressure sensor information, see B5104 - Manifold Air Pressure (MAP) Sensor in Section 03, Group 140.For more engine crankcase pressure sensor information, see B5105 — Engine Crankcase Pressure Sensor in Section 03, Group 140.For more information on the Control Unit Information and Overview test, see Control Unit Information and Overview Test in Section 04, Group 160.*NOTE: The wiring diagrams provided are for a typical John Deere supplied OEM harness. Wire number, colors, and jumper connectors do not apply to all applications.*

For connector repair or complete wiring information:

- see Connector Repair Information Table- see 6.8L Wiring Diagram 2

located in Section 06, Group 210.

IMPORTANT: Terminal damage occurs if anything other than the specified flex probe from JDG10466 Flex Probe Kit is used.**Flex Probes:**

B5104 – Manifold Air Pressure (MAP) Sensor:

- JDG10460 – Female – Yellow/Purple

- JDG10461 – Male – Yellow/Purple

B5105 – Engine Crankcase Pressure Sensor:

- JDG10460 – Female – Yellow/Purple

- JDG10461 – Male – Yellow/Purple

ECU:

- JDG10460 – Female – Yellow/Purple

- JDG10461 – Male – Yellow/Purple

Tools:

- JT07306 – Digital Multimeter

- J-35616-20 – Test Leads

Continued on next page

RE42287,0000067 -19-01MAR11-2/19

10 Short to Voltage Check*NOTE: Component still disconnected.*

1. Ignition OFF, engine running.
2. Measure the voltage between B5204 connector female sockets 1 (+) and 2 (-) while performing Wiggle Test.
3. Measure the voltage between B5204 connector female sockets 3 (+) and 2 (-) while performing Wiggle Test.
4. Measure the voltage between B5204 connector female sockets 4 (+) and 2 (-) while performing Wiggle Test.

Did any measurement ever read greater than 12.5 V?

YES: Repair short to voltage in harness. Perform Verification Procedure.

NO: GO TO 11

RE42287,000006A -19-27APR15-13/24

11 Terminal Check

1. Ignition OFF, Engine OFF.
2. Disconnect ECU connectors A5501 and A5502.
3. Perform Terminal Test on ECU connector A5501 female sockets 10, 20 and **A5502** female sockets 31, 41. And associated ECU male pins.

Were any problems found?

YES: Repair problem. Perform Verification Procedure.

NO: GO TO 12

RE42287,000006A -19-27APR15-14/24

12 Continuity Check

1. Measure resistance between A5501 connector female socket 20 and B5204 connector female socket 3.
2. Measure resistance between A5501 connector female socket 10 and B5204 connector female socket 4.
3. Measure resistance between **A5502** connector female socket 41 and B5204 connector female socket 1.
4. Measure resistance between **A5502** connector female socket 31 and B5204 connector female socket 2.

Are all resistances less than 5 ohms?

YES: Contact DTAC for support.

NO: Repair mis-pin in applicable connector. Perform Verification Procedure.

RE42287,000006A -19-27APR15-15/24

13 Short to Voltage Check

1. Measure the voltage between B5500 connector female sockets 1 (+) and 2 (-) while performing Wiggle Test.
2. Measure the voltage between B5500 connector female sockets 3 (+) and 2 (-) while performing Wiggle Test.
3. Measure the voltage between B5500 connector female sockets 4 (+) and 2 (-) while performing Wiggle Test.

Did any measurement ever read greater than 12.5 V?

YES: Repair short to voltage in harness. Perform Verification Procedure.

NO: GO TO 14.

Continued on next page

RE42287,000006A -19-27APR15-16/24

**521214.14 — Immobilizer Control Device
Fault**

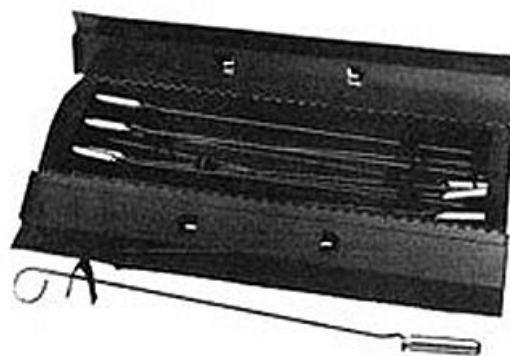
*For troubleshooting procedures please see the
application troubleshooting manual.*

BK34394,0000DA1 -19-22OCT10-1/1

D15001NU

Magnetic Follower Holder Kit

- Use to hold solid cam followers so the camshaft can be easily removed or installed when the engine is not rotated upside down.



D15001NU

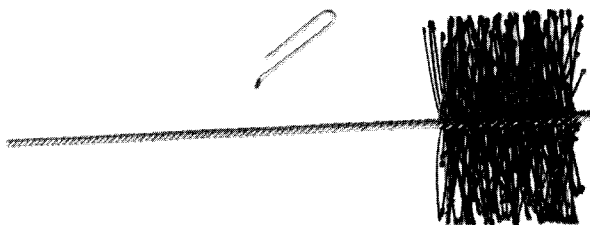
ZE59858,0000009 -19-17MAR16-1/1

RG21729 —UN—12JUL12

D17015BR

O-ring Groove Cleaning Brush

- Use to clean cylinder liner O-ring groove in block.



D17015BR

RG5075

DN22556,0000118 -19-28NOV13-1/1

RG5075 —UN—07NOV97

D17024BR

End Brush

- Use to clean valve seat and bores.



D17024BR

BK34394,0000300 -19-10SEP10-1/1

RG16289 —UN—15MAY08

JDG10461

Flex Probe, Male Yellow / Purple

- Essential for correctly connecting to terminals for making electrical measurements without destroying the terminal. Also use to test terminals for loose fit.



JDG10461

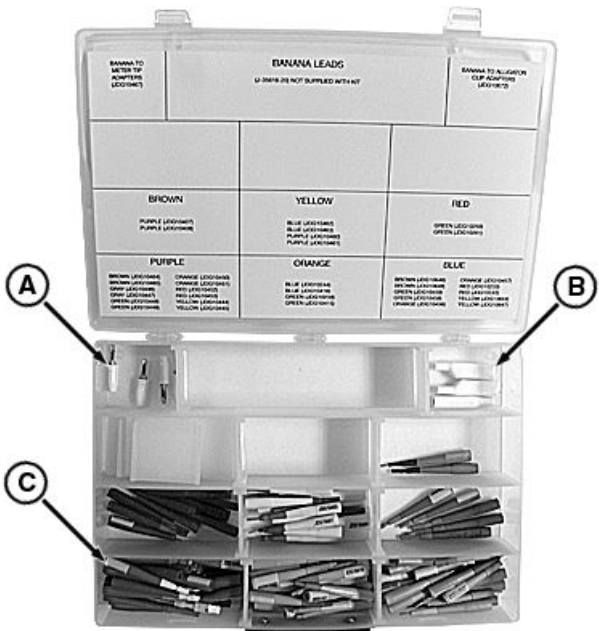
RG18409 —UN—11MAY10

BK34394,0000377 -19-30JUL15-1/1

JDG10466

Flex Probe Kit

- Use along with digital multimeter to make measurements on connector and sensor terminals. Kit contains Alligator Clips, Test Lead Adaptors, and Flex Probes. Flex Probes have mating terminals for harness and sensor connectors and are color coded to identify which terminal they are Use for. Can also be used to test terminals for proper fit.



JDG10466

RG20539 —UN—03JUN11

BK34394,000037C -19-11DEC15-1/1

JDG10467

Banana Jack Adapters

- Use to correctly connect meter leads to banana jacks.



JDG10467

RG21401 —UN—26MAR12

DN22556,00000FA -19-04DEC13-1/1

Item	Measurement	Specification
Camshaft Bore in Block (All Except No.1)	ID	55.986—56.012 mm (2.2042—2.2052 in.)
Camshaft Journal to Bushing (No. 1 Bore With Bushing)	Oil Clearance	0.076 - 0.102 mm (0.003—0.004 in.)
Camshaft Journal to Bushing (All Except No. 1)	Clearance	0.088—0.140 mm (0.0035—0.0055 in.)
Maximum Acceptable Out of Flat, Entire Length or Width (Used)	Measurement	0.08 mm (0.003 in.)
Maximum Acceptable Out of Flat (Any 150 mm [5.90 in.] Length)	Measurement.	0.025 mm (0.001 in.)
Top Deck (Surface Grind Only) (AA)	Surface Finish	0.7—3.2 micrometers (28—125 micro in.)
Top Deck Surface Finish	Maximum Wave Depth	0.012 mm (0.0005 in.)
Main Bearing Bore Center line to Cylinder Block Top Deck	Distance	337.896—337.972 mm (13.3029—13.3059 in.)
Cylinder Liner Flange Counter bore	Depth in Block	5.952—5.988 mm (0.2343—0.2357 in.)
Cylinder Liner Flange	Thickness	6.022—6.058 mm (0.2371—0.2385 in.)
Cylinder Liner	Height above Block	0.030—0.100 mm (0.001—0.004 in.)
Maximum Permissible Height Difference at Nearest Point of Two Adjacent Liners, or Within a Single Liner	Height Difference	0.1 mm (0.004 in.)
Cylinder Liner	Thickness	2.49 3.36 mm (0.098—0.132 in.)
Cylinder Liner Packing Step	Diameter	7.713 8.177 mm (0.303—0.321 in.)
Connecting Rod Cap Screws	Torque	58 N•m (43 lb.-ft.) +90° Turn
Piston Cooling Nozzle Cap Screw	Torque	16.5N•m (12.16 lb.-ft.)
Piston	Height (Measured from Center of Pin Bore to Top of Piston)	72.175—72.225 mm (2.841—2.843 in.)
Piston Pin	OD	41.271—41.277 mm (1.8610—1.8612 in.)
Piston Pin Bore	ID	41.287—41.293 mm (1.6254—1.6257 in.)
Piston Pin	OD	41.271—41.277 mm (1.624—1.625 in.)
Pin Bushing	ID	41.287—41.313 mm (1.625—1.626 in.)
Connecting Rod Pin to Bushing	Oil Clearance	0.016—0.036 mm (0.0006—0.0014 in.)
Bushing	Wear Limit	0.050 mm (0.001 in.)
Connecting Rod Pin to Bushing (Tapered Pin End)	Oil Clearance	0.023 0.055 mm (0.0009—0.0021 in.)
Connecting Rod Pin to Bushing (Straight Pin End)	Oil Clearance	0.016 – 0.036 mm (0.0006—0.0014 in.)
Piston	Protrusion	0.57—0.81 mm (0.022—0.031 in.)
Piston Skirt, at 11 mm [0.433 in.] from bottom of piston	Diameter	106.381—106.399 mm (4.188—4.189 in.)

Continued on next page

BK34394,0000EB2 -19-14JAN11-2/3

A—Focus 23 6.8L 4 Valve Engine Control Unit	A5501-30—[5448 Gray] Crankshaft Position Return	A5502-13—[5051 Brown] EGR Flow Pressure Signal	B5107—Low-Pressure Fuel Pressure Sensor
A5501—ECU Connection ECU 1	A5501-31—[5006 Blue] VGT Actuator Return	A5502-18—[5425 Green] EGR Valve Position Signal	B5108—Engine Coolant Pressure Sensor
A5501-1—[5423 Orange] EGR Valve PWM Drive #2	A5501-32—[5435 Green] VGT Speed Signal	A5502-19—[5455 Green] Charge Air Cooler Outlet Temperature Signal	B5205—Charge Air Cooler Outlet Temperature Sensor
A5501-2—[5013 Orange] Air Throttle Actuator PWM Drive #1	A5501-33—[5495 Green] Injector #3 Inject Pulse	A5502-21—[5010 Black] ECU Static Ground	B5206—Manifold Air Temperature Sensor
A5501-3—[5421 Brown] EGR Valve PWM Drive #1	A5501-34—[5493 Orange] Injector #1 Inject Pulse	A5502-22—[5946 Blue] 5 Volt Sensor Supply #1 Positive	B5207—EGR Temperature Sensor
A5501-4—[5011 Brown] Air Throttle Actuator PWM Drive #2	A5501-35—[5424 Yellow] Suction Control Valve High Drive	A5502-23—[5456 Blue] Manifold Air Temperature Signal	B5208—Engine Coolant Temperature Sensor
A5501-5—[5001 Brown] Low-Pressure Fuel Pump Signal	A5501-37—[5459 White] 5V Sensor Supply #2B Return	A5502-25—[5446 Blue] 5 Volt Sensor Supply #7A Return	B5209—Fuel Temperature Sensor
A5501-6—[5491 Brown] Injector #1,#2,#3 Power	A5501-41—[5469 White] Low-Pressure Fuel Signal	A5502-26—[5479 White] 5V Sensor Supply #1A Return	B5300—VGT Speed Sensor
A5501-8—[5496 Blue] Injector #4,#5,#6 Power	A5501-42—[5416 Blue] 5 Volt Sensor Supply #8 Positive	A5502-28—[5774 Yellow] 5 Volt Sensor Supply #6A Return	B5301—Crankshaft Position Sensor
A5501-9—[5410 Black] Wiring Shield	A5501-43—[5805 Green] Engine CAN Low Signal	A5502-30—[5427 Violet] 5 Volt Sensor Supply #1B Return	B5302—Camshaft Position Sensor
A5501-10—[5786 Blue] Exhaust Filter Temperature Module Signal	A5501-44—[5804 Yellow] Engine CAN High Signal	A5502-31—[5474 Yellow] 5 Volt Sensor Supply #6B Return	B5500—Intake Air Sensor
A5501-13—[5497 Violet] Injector #4 Inject Pulse	A5501-45—[5008 Gray] 10V Sensor Supply #9B Positive	A5502-40—[5428 Gray] Fuel Temperature Signal	B5600—Water-In-Fuel Sensor
A5501-14—[5499 White] Injector #6 Inject Pulse	A5501-46—[5429 White] Cold Start Aid Relay Control	A5502-41—[5437 Violet] 5 Volt Sensor Supply #6 Positive	D—See Engine Schematic 2
A5501-15—[5007 Violet] VGT Actuator Power On Signal	A5501-49—[5453 Orange] Water-In-Fuel Signal	A5502-42—[5009 White] Engine Coolant Pressure Signal	E—See Engine Schematic 2
A5501-16—[5419 White] Suction Control Valve Low Drive	A5501-51—[5447 Violet] Crankshaft Position Signal	A5502-48—[5461 Brown] Engine Coolant Temperature Signal	F—See Engine Schematic 2 For Mating Connector
A5501-17—[5443 Orange] Camshaft Position Return	A5501-52—[5466 Blue] 5V Sensor Supply #3 Positive	A5502-49—[5413 Orange] Cold Start Aid Relay Feedback	F5005—Fuse (50 Amp)
A5501-18—[5478 Gray] 5 Volt Sensor Supply #2A Return	A5501-53—[5445 Green] Camshaft Position Signal	A5502-52—[5465 Green] Exhaust Manifold Pressure Signal	G—CAN Terminator 120 Ohm Resistor
A5501-19—[5444 Yellow] 5V Sensor Supply #3 Return	A5501-54—[5484 Yellow] 5V Sensor Supply #2 Positive	A5502-53—[5441 Brown] 5 Volt Sensor Supply #7 Positive	K5803—Cold Start Aid Relay Connector
A5501-20—[5783 Orange] 10V Sensor Supply #9A Positive	A5502—ECU Connection ECU 2	A5502-54—[5504 Yellow] Crankcase Pressure Signal	K5803-3—[5082 Red] Unswitched Battery
A5501-23—[5494 Yellow] Injector #2 Inject Pulse	A5502-3—[5785 Green] DPF Differential Pressure Signal	B5100—Fuel Rail Pressure Sensor	R5602—24 V Low-Pressure Fuel Pump Resistor
A5501-24—[5498 Gray] Injector #5 Inject Pulse	A5502-4—[5468 Gray] Manifold Air Pressure Signal	B5101—Engine Oil Pressure Sensor	R5607—Cold Start Aid
A5501-25—[5016 Blue] Low-Pressure Fuel Pump Return	A5502-7—[5467 Violet] Engine Oil Pressure Signal	B5102—Exhaust Manifold Pressure Sensor	R5609—Cold Start Aid Resistor 1.5 kilo-ohm 1 Watt
A5501-26—[5004 Yellow] Sensor Supply Return	A5502-8—[5475 Green] Fuel Rail Pressure Sensor Signal	B5103—EGR Flow Sensor	X5000—Fuel Injector Harness Connector
A5501-27—[5414 Yellow] 5 Volt Sensor Supply #8 Return	A5502-9—[5463 Orange] EGR Temperature Signal	B5104—Manifold Air Pressure Sensor	X5001—ECU Static Ground
A5501-29—[5417 Violet] VGT Speed Return	A5502-12—[5509 White] Air Throttle Actuator Signal	B5105—Crankcase Pressure Sensor	X5002—Auxiliary Harness Interconnect

BK34394,0000440 -19-20JUN14-2/2

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