

Engine Maintenance

Break-In Maintenance

After a minimum of 100 hours and a maximum of 500 hours of operation:

- ☐ Replace Break-In™ Plus Engine Oil.

IMPORTANT: If make-up oil is required during the break-in period, John Deere Break-In™ Plus oil must be used whenever possible. New engines are filled at the factory with Break-In Plus engine oil.

Do not add make-up oil until the oil level is **BELOW** the ADD mark on dipstick. (See Fuel, Lubricant, and Coolants section)

If any of the following occur during the first 100 hours, it is advised to extend the break-in to 500 hours before changing the oil.

- Too much operating time at idle.
- Too much operating time at a constant speed.
- Too much light load usage.
- Make-up oil is required in the first 100 hours.

HK75640,000106F-19-14SEP20

Break-In Checks

IMPORTANT: Initial break-in maintenance interval of a new or rebuilt wet sleeve engine must last at least 100 hours with John Deere Break-In™ Plus oil. The surface mating of rings and liners usually occurs during the first 100 hours.

Maximum maintenance interval is the same as the maintenance interval recommended for your engine. (See Engine Oil and Filter Service Intervals in Fuels, Lubricants, and Coolants section.)

IMPORTANT: If engine oil must be added before first normal oil change, use John Deere Break-In Plus™ engine oil.

The engine is ready for normal operation. During first 100 hours of operation:

- Operate engine at heavy loads without reaching sustained maximum load.
- Avoid idling engine longer than 5 minutes. If engine idles longer than 5 minutes, stop engine.
- Closely observe coolant temperature during operation.
- Check air intake hoses and clamps. (See Air, Fuel, Coolant, and Exhaust Maintenance section.)
- Check for fluid leaks.
- Tighten wheel, wheel weight, and axle bolts after 3

HOURS, after **10 HOURS**, and **DAILY** for the first week of operation. (See Wheels and Tires Maintenance section.)

Daily or Every 10 Hours

Perform normal daily services:

- Check engine oil. (See Engine Maintenance section.)
- Clean dust unloading valve. (See Air, Fuel, Coolant, and Exhaust Maintenance section.)

For first 100 hours of machine operation, perform these additional services daily or every 10 hours:

- Drain water separator. (See Air, Fuel, Coolant, and Exhaust Maintenance section.)
- Check coolant level. (See Air, Fuel, Coolant, and Exhaust Maintenance section.)
- Lubricate rear and front hitch components. (See Hitch and Drawbar Maintenance section.)
- Inspect tires for cuts or punctures. (See Wheels and Tires Maintenance section.)

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Check Engine Oil Level

MAINTENANCE INTERVAL

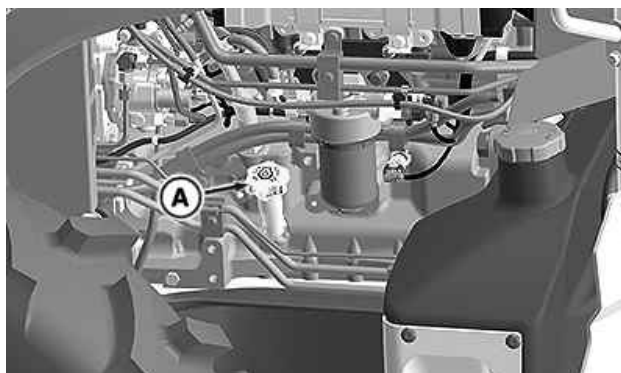
Daily or 10 Hours

IMPORTANT: Engine comes from the factory, filled with John Deere Break-In™ Plus oil. (See Break-In Maintenance in this section.)

IMPORTANT:

- Do not operate engine with the oil level below the lower mark on dipstick.
- Avoid damage by maintaining full oil level.
- Use seasonal viscosity grade oil. (See Fuels, Lubricants, and Coolants section.)

4.5 Liter 4 Cylinder Engine



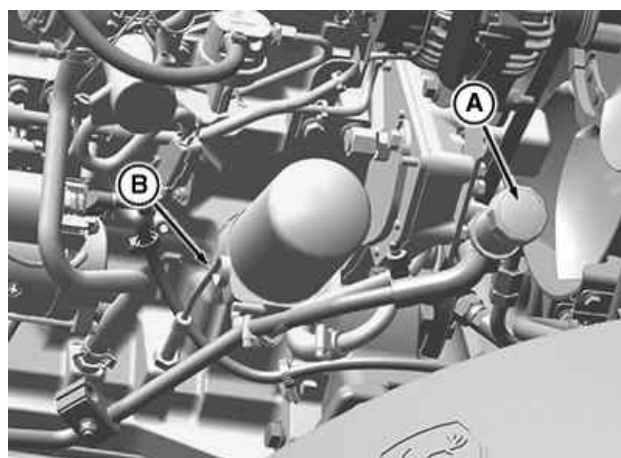
RXA0154377—UN—22FEB17

Left-Side of Engine

A—Engine Oil Fill Cap/Dipstick

1. Park machine on level ground and shutoff engine.
2. Remove key.
3. Allow engine to cool.
4. Remove engine oil fill cap/dipstick (A). Wipe off, then fully reinsert the dipstick. Oil level must be between two marks on dipstick.
5. If level is low, add oil through oil fill hole until even with the top mark on dipstick. Do not overfill.
6. Reinstall oil fill cap before operating engine.

2.9 Liter 3 Cylinder Engine



APY36918—UN—08JUN20

A—Engine Oil Fill Cap B—Dipstick

1. Park machine on level ground and shut off engine.
2. Remove key.
3. Allow engine to cool.
4. Remove dipstick (B). Wipe off, then fully reinsert the dipstick. Oil level must be between two marks on dipstick.
5. If level is low, remove oil fill cap (A) and add oil until even with the top mark on dipstick. Do not overfill.

6. Reinstall dipstick and oil fill cap before operating the engine.

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Change Engine Oil and Filter (4.5 Liter 4 Cylinder Engine)

MAINTENANCE INTERVAL

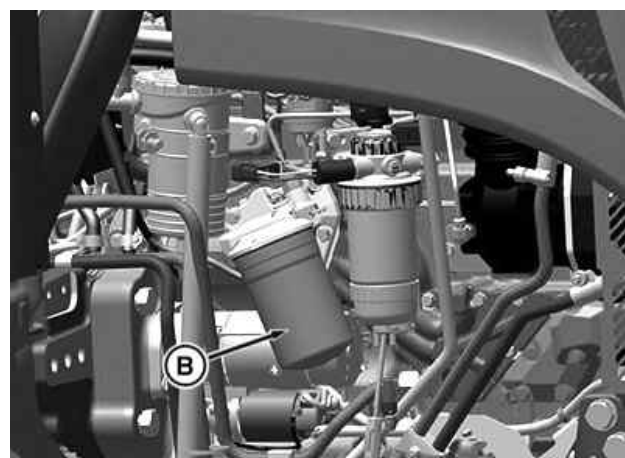
INITIAL — 100 to 500 Hours

REGULAR (AFTER INITIAL CHANGE) — 500 HOURS If John Deere Plus-50™ II oil and John Deere filter are used, maintenance interval is 250 hours for all other brands of oil or filters.



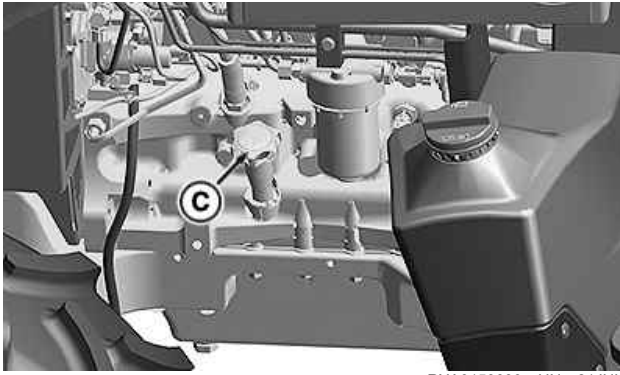
APY48036—UN—21APR21

Bottom Left-Side of Engine



APY33197—UN—08JUN20

Right-Side of Engine



RXA0153039—UN—21JUL16

Left-Side of Engine

A—Engine Oil Drain Plug
B—Engine Oil Filter
C—Crankcase Fill Cap

1. Operate engine to warm oil.
2. Park machine on level ground and shut off engine.
3. Remove key.
4. Place a container under the drain port, capture waste oil, and dispose of properly.
5. Remove drain plug (A) and allow oil to drain.
6. Open hood.
7. Remove engine oil filter (B). Make sure that old filter gasket is removed from housing before installing new filter.
8. Apply a film of oil on the new oil filter gasket and install new filter. Hand-tighten plus 1/2 turn.
9. Install drain plug.
10. Add oil to crankcase fill cap (C). (See Fuels, Lubricants, and Coolants section for oil grades and specifications.)

Specification

4.5 Liter 4 Cylinder Engine
Oil—Capacity. 13 L
(3.4 gal)

11. Reinstall fill cap and/or dipstick.
12. Start engine and inspect drain plug and filter for leaks.
13. Stop engine and remove key.
14. Recheck oil level on dipstick, add if necessary.
15. Lower hood.

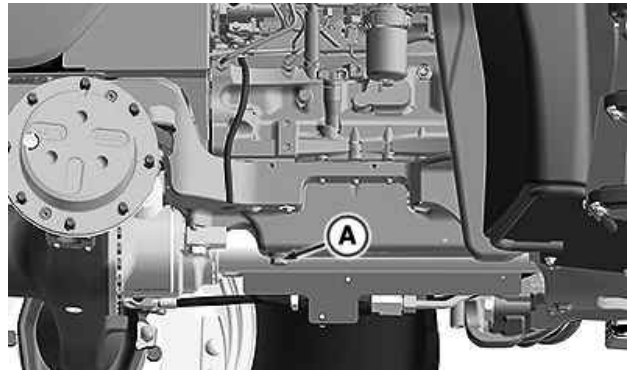
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Change Engine Oil and Filter (2.9 Liter 3 Cylinder Engine)

MAINTENANCE INTERVAL

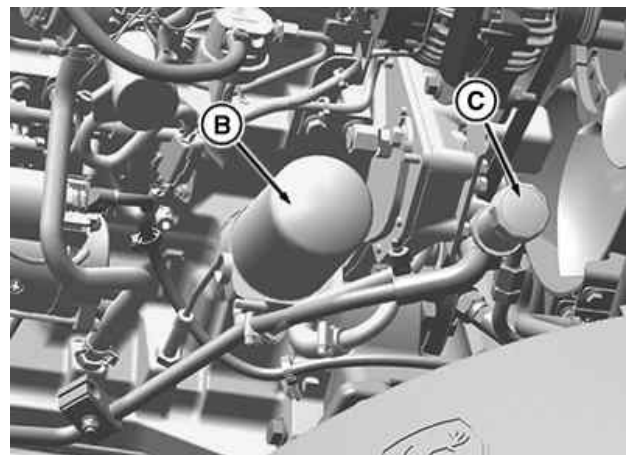
INITIAL — 100 to 500 Hours

REGULAR (AFTER INITIAL CHANGE) — 500 HOURS If John Deere Plus-50™ II oil and John Deere filter are used, maintenance interval is 150 hours for all other brands of oil or filters.



RXA0152210—UN—27OCT16

Bottom Left Side of Engine



APY36919—UN—08JUN20

Right-Side of Engine

A—Engine Oil Drain Plug
B—Engine Oil Filter
C—Crankcase Fill Cap

1. Operate engine to warm oil.
2. Park machine on level ground and shut off engine.
3. Remove key.
4. Place a container under the drain port, capture waste oil and dispose of properly.
5. Remove drain plug (A) and allow oil to drain.
6. Open hood.
7. Remove engine oil filter (B). Make sure that old filter gasket is removed from housing before installing new filter.

8. Apply a film of oil on the new oil filter gasket and install new filter. Hand-tighten plus 1/2 turn.
9. Install drain plug.
10. Add oil to crankcase fill cap (C). (See Fuels, Lubricants, and Coolants section for oil grades and specifications.)

Specification

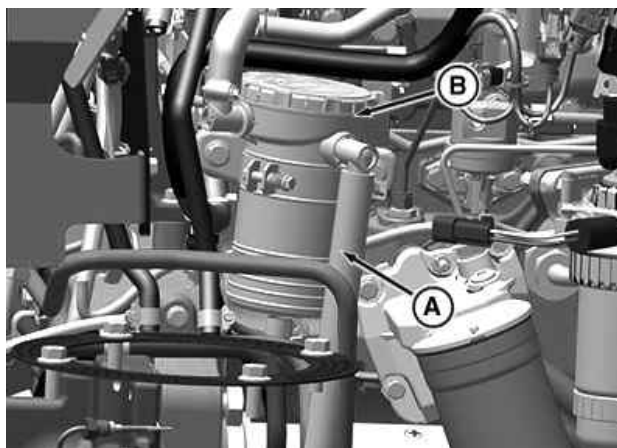
2.9 Liter 3 Cylinder Engine
 Oil—Capacity. 8.5 L
 (2.2 gal)

11. Reinstall fill cap and/or dipstick.
12. Start engine and inspect drain plug and filter for leaks.
13. Stop engine and remove key.
14. Recheck oil level on dipstick, add if necessary.
15. Lower hood.

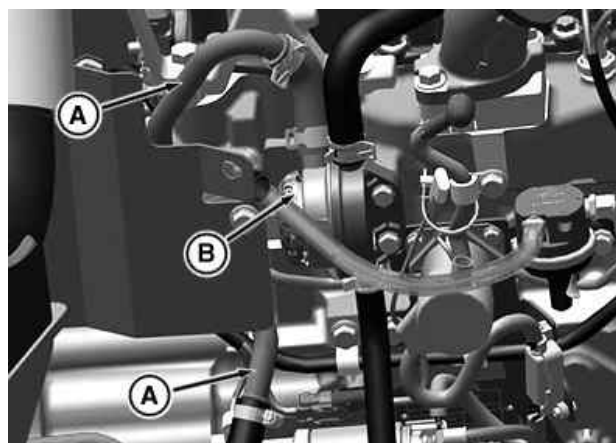
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Clean Open Crankcase Vent (OCV)

MAINTENANCE INTERVAL Every 600 Hours



APY33198—UN—08JUN20



APY33199—UN—08JUN20

Right-Side of 2.9 Liter 3 Cylinder Engine

A—Open Crankcase Vent Tube
 B—OCV Filter Housing

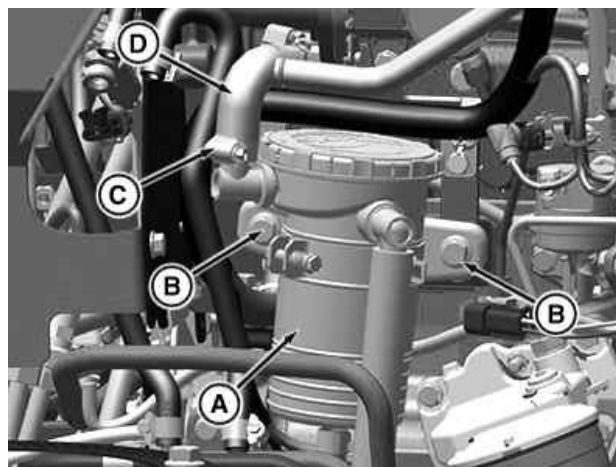
CAUTION: Reduce compressed air to less than 210 kPa (2 bar) (30 psi) when using for cleaning purposes. Clear area of bystanders, guard against flying chips, and wear personal protection equipment including eye protection.

1. Remove open crankcase vent tube (A) from the OCV filter housing (B).
2. Wash in solvent or blow clean with compressed air.
3. Install OCV tube to the OCV filter housing. Be sure that the vent tube is not kinked or pinched.

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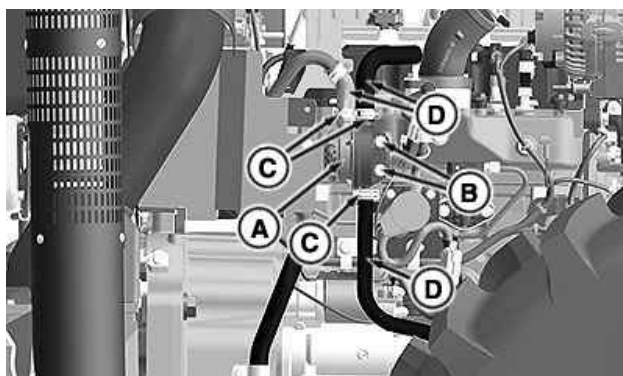
Change Open Crankcase Vent Filter (OCV)

MAINTENANCE INTERVAL Annually
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APY33200—UN—08JUN20

Right-Side of 4.5 Liter 4 Cylinder Engine



RXA0154379—UN—22FEB17

Right-Side of 2.9 Liter 3 Cylinder Engine

- A—OCV Filter Housing
B—Cap Screw (2 used)
C—Hose Clamp (1 or 3 used)
D—Hose (1 or 3 used)

1. Remove cap screws (B) and remove OCV filter housing (A).
2. Loosen clamps (C) and remove hoses (D).
3. For 4.5 Liter 4 Cylinder Engine:
 - a. Unscrew filter housing and remove filter.
 - b. Clean filter housing.
 - c. Install new filter and reassemble filter housing.
4. For 2.9 Liter 3 Cylinder Engine, replace assembly.
5. Reinstall hoses to the filter housing and tighten clamps.
6. Reinstall filter housing and tighten cap screws to proper torque.

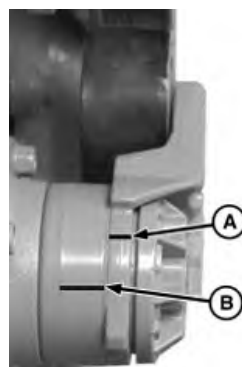
Specification

Cap Screw—Torque. 70 N·m
(52 lb·ft)

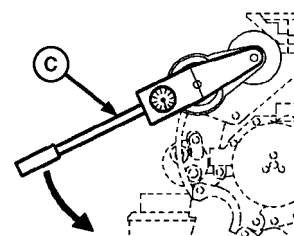
HK75640,0001075-19-14SEP20

Check Fan Belt Tensioner (4.5 Liter 4 Cylinder Engine)

MAINTENANCE INTERVAL
Every 1200 Hours



LV12526—UN—13APR05



LV12528—UN—12APR05

- A—Mark on Swing Arm
B—Mark on Tensioner Mounting Base
C—Torque Wrench

NOTE: A belt tension gauge does not provide an accurate measurement of the belt tension. Measure tensioner spring tension using a torque wrench.

1. Place machine in park and shutoff engine. Remove key.
2. Remove fan belt.
3. Put a mark (A) on the swing arm of the tensioner as shown.
4. Measure 21 mm (0.83 in) from (A) and put a mark (B) on tensioner mounting base.
5. Rotate the swing arm using a torque wrench until marks (A and B) are aligned.
Pull tensioner with torque wrench away from engine.
6. Record torque wrench measurement and compare with specification. If recorded measurement is below specifications, have your John Deere dealer replace tensioner assembly.

Specification

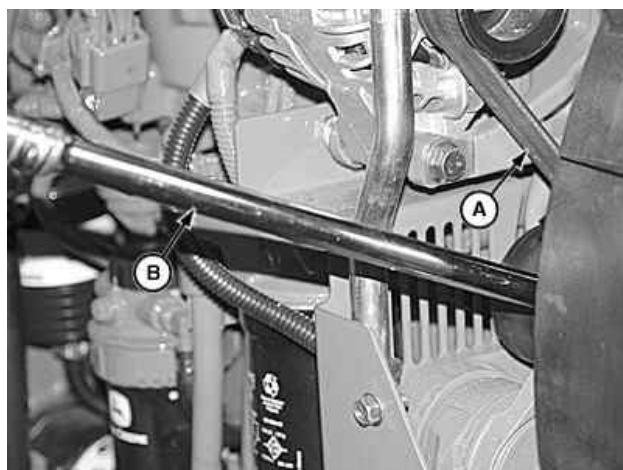
Belt Tensioner—Torque. 18—22 N·m
(159—195 lb·in)

7. Install fan belt. See procedure in this section.

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Replace Fan Belt (4.5 Liter 4 Cylinder Engine)

MAINTENANCE INTERVAL
Every 1200 Hours



LV14667—UN—18AUG11

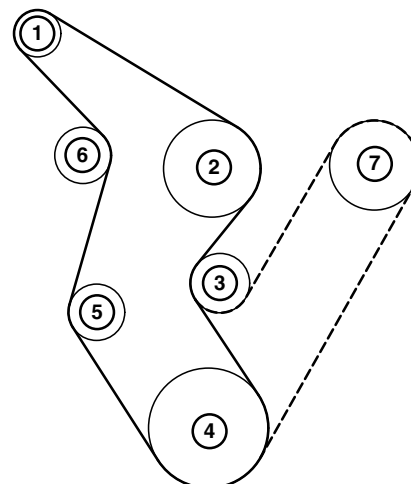


LV14668—UN—18AUG11

- A—Belt**
B—Breaker Bar
C—Fan Clutch Connector
D—Lock Nut and Flanged Screw
E—Wire Harness Support Bracket

NOTE: Fan belt drive has an automatic tensioner which does not require adjustment.

1. Place machine in park and shutoff engine. Remove key.
2. Release tension on belt using a long-handle 1/2 in drive breaker bar (B) to pull the tensioner away from engine.
Remove belt (A) from alternator pulley.
3. Release tension on tensioner and remove breaker bar.
4. Unplug fan clutch (C).
5. Remove lock nut and flanged screw (D) from wire harness support (E).
6. Remove belt by bringing it over the wire harness support and cooling fan. Slip it between the fan blades and fan shroud.
7. Install new belt in reverse order of removal.



LV22215—UN—24JUN14

Fan Belt Routing

Belt Routing	
1	Alternator
2	Fan Drive
3	Idler
4	Crankshaft Pulley
5	Coolant Pump
6	Tensioner
7	Air Conditioner Compressor

8. Install wire harness support with locknut and flanged bolt.

Specification

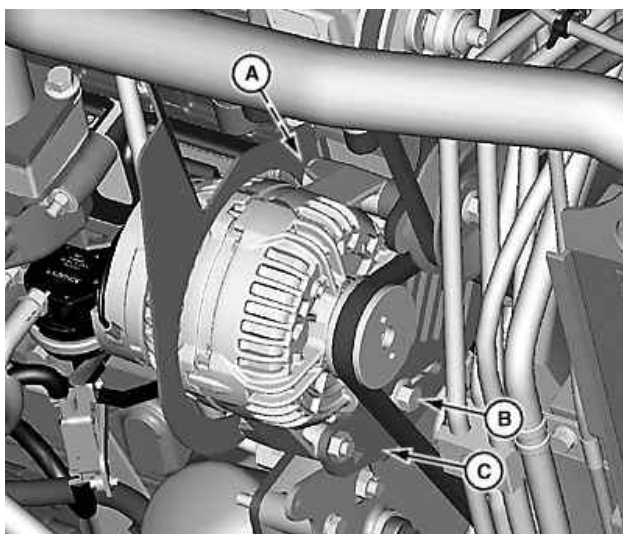
Wire Harness Support Lock
 Nut—Torque. 14 N·m
 (124 lb·in)

9. Tighten to specification.
10. Use breaker bar to push the tensioner into position for belt installation.

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Inspect and Adjust Alternator Belt (2.9 Liter 3 Cylinder Engine)

MAINTENANCE INTERVAL
 Every 1200 Hours



LV18466—UN—25JUL13

A—Tension Adjustment Cap Screw
B—Alternator Mounting Cap Screw
C—Alternator Frame

1. Place machine in park and shut off engine. Remove key.
2. Inspect alternator belt. Replace if worn or damaged.
3. Run engine for 5 minutes to warm a cold belt. Let a hot belt cool for 15 minutes before adjustment.
4. Check tension by pressing belt midway between pulleys. Belt deflection must be to specification.

Specification

Alternator Belt—Belt Tension—

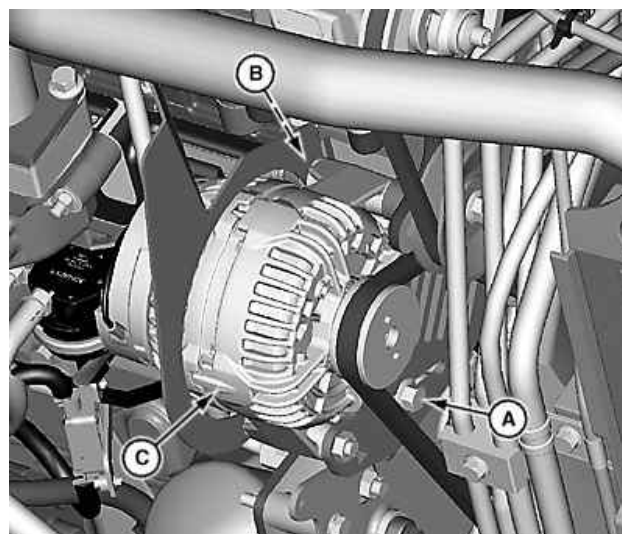
Deflection. 19 mm (0.75 in) at 89 N·m (20 lb·ft)

5. Adjust tension by loosening tension adjustment cap screw (A) and alternator mounting cap screw (B).
6. Use a breaker bar with a 3/8 in drive to apply downward force to the alternator frame (C) until belt tension is correct.
7. Tighten adjustment cap screw and alternator mounting cap screw.

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Replace Alternator Belt (2.9 Liter 3 Cylinder Engine)

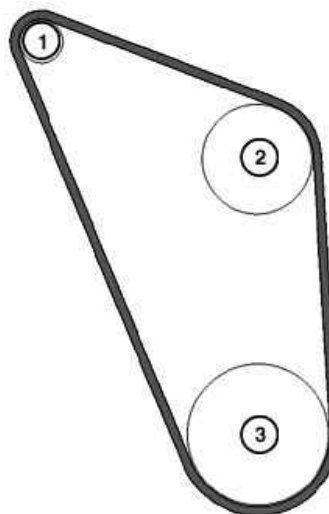
MAINTENANCE INTERVAL Every 1200 Hours



LV18489—UN—25JUL13

A—Alternator Cap Screw
B—Alternator Bolt
C—Alternator

1. Place machine in park and shut off engine. Remove key.
2. Remove the air conditioner compressor belt. See procedure in this section.
3. Loosen cap screw (A), bolt (B), and rotate the alternator (C) to loosen belt.
4. Remove belt from crankshaft pulley and coolant pump pulley.
5. Pull belt around the fan to remove.
6. Install new belt in reverse order of removal.
7. Adjust belt tension. See procedure in this section.



LV18486—UN—25JUL13

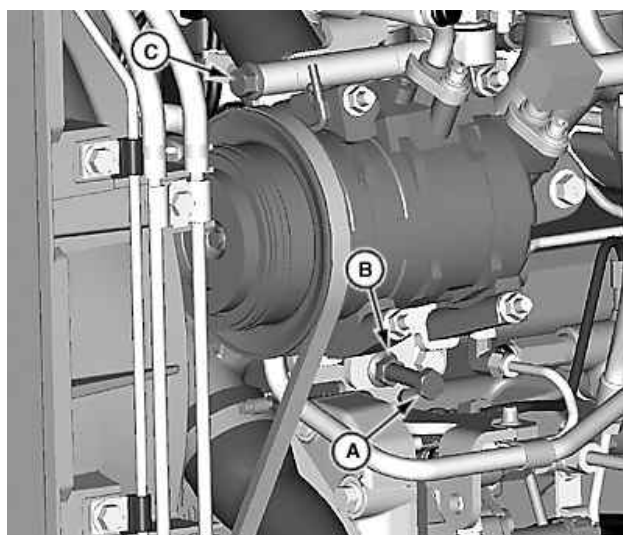
Alternator Belt Routing

Belt Routing	
1	Alternator
2	Coolant Pump
3	Crankshaft Pulley

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Inspect and Adjust Air Conditioner Compressor Belt (2.9 Liter 3 Cylinder Engine)

MAINTENANCE INTERVAL
Every 1200 Hours



LV18467—UN—25JUL13

A—Tension Adjustment Cap Screw
B—Tension Adjustment Lock Nut
C—Compressor Mounting Cap Screw

1. Place machine in park and shut off engine. Remove key.
2. Inspect alternator belt. Replace if worn or damaged.
3. Run engine for 5 minutes to warm a cold belt. Let a hot belt cool for 15 minutes before adjustment.
4. Check tension by pressing belt midway between pulleys. Belt deflection must be to specification.

Specification

Air conditioner Compressor

Belt—Belt Tension—Deflection 19 mm (0.75 in) at 89 N·m (20 lb·ft)

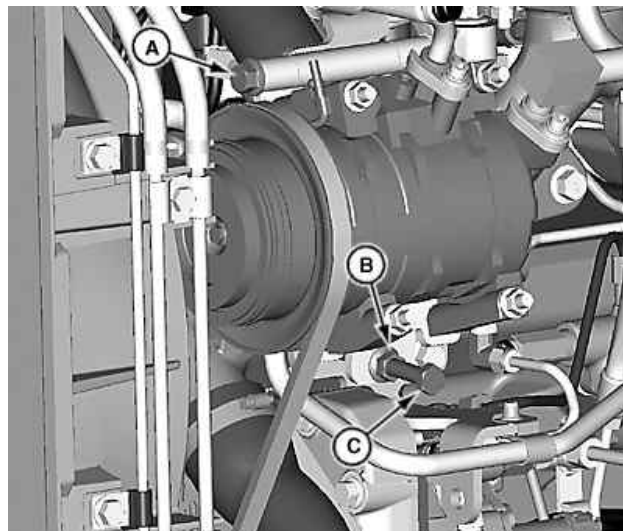
5. Adjust tension by loosening the tension adjustment lock nut (B) and compressor mounting cap screw (C).
6. Turn the tension adjustment cap screw (A) clockwise to tighten belt or counterclockwise to loosen belt.

7. Tighten the tension adjustment lock nut and compressor mounting cap screw.

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Replace Air Conditioner Compressor Belt (2.9 Liter 3 Cylinder Engine)

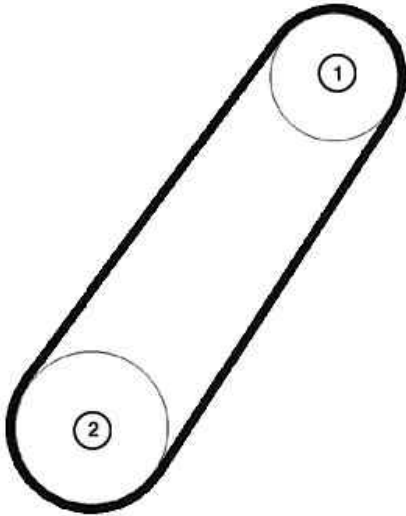
MAINTENANCE INTERVAL
Every 1200 Hours



LV18491—UN—25JUL13

A—Air Conditioner Compressor Pivot Bolt
B—Lock Nut
C—Adjustment Bolt

1. Place machine in park and shut off engine. Remove key.
2. Loosen compressor pivot bolt (A).
3. Loosen lock nut (B).
4. Turn adjustment bolt (C) counterclockwise to loosen belt.
5. Pull belt around the fan to remove.
6. Install new belt in reverse order of removal.
7. Adjust belt tension. See procedure in this section.



LV18490—UN—25JUL13

Air Conditioner Compressor Belt Routing

Belt Routing	
1	Air Conditioner Compressor
2	Crankshaft Pulley

LGCKF7U,0000C17-19-11MAY21

Adjust Engine Valve Clearance

MAINTENANCE INTERVAL

Every 1200 Hours (2.9 Liter 3 Cylinder Engines)

Every 3000 Hours (4.5 Liter 4 Cylinder Engines)

Have your John Deere dealer check and adjust engine valve clearance.

HK75640,000107C-19-14SEP20
