



Standard & Optional Coolants

MODELS AFFECTED: All School Bus Models

UPDATE

ISSUE

Blue Bird has implemented new engine coolant specifications for all buses built upon Blue Bird built chassis with Cummins® engines. These include A3FE (All American Forward Engine), A3RE (All American Rear Engine), D3FE (All American Forward Engine), D3RE (All American Rear Engine), and BBCV (Vision). Optional long life coolant is also available for Cummins® engines on these products.

This update also includes coolant information for the BBCV propane with GM® 8.1 engine.

John Deere® Cool Gard will only be used in John Deere engines.

APPLICATIONS

Standard Equipment Coolant

The table below lists coolant specifications and effectivity dates:

Prior to March 26, 2009

ENGINE	COOLANT LIFE	FEATURE COOLANT, STANDARD	FEATURE COOLANT, OPTIONAL
Caterpillar®	Standard	4011107 John Deere Cool-Gard 50/50 (Green)	4011109 Caterpillar® ELC 50/50 (Red)
Cummins®	Standard	4011107 John Deere Cool-Gard 50/50 (Green)	4011108 Fleet Guard® ES Optimax 60/40 (Red)
John Deere®	Extended	4011107 John Deere Cool-Gard 50/50 (Green)	
GM®	Extended	4011104 Havoline Dex-Cool 7995 50/50 (Orange)	

On Or After March 26, 2009

ENGINE	COOLANT LIFE	FEATURE COOLANT, STANDARD	FEATURE COOLANT, OPTIONAL
Caterpillar®	Extended	4011109 Caterpillar® ELC 50/50 (Red)	
Cummins®	Standard	4011111 Fleetguard ES Optimax 50/50 (Blue)	4011108 Fleet Guard® ES Optimax 60/40 (Red)
GM®	Extended	4011104 Havoline Dex-Cool 7995 50/50 (Orange)	

Coolant Filter: Caterpillar & Cummins

On buses equipped with any of the above-listed Caterpillar® or Cummins® engine and also equipped with an optional coolant filter, the same Wix® replacement filter element cartridge is used:

BLUE BIRD PART NUMBER: 0064641

WIX PART NUMBER: 24070

The coolant filter should be replaced every 6 months or 6,000 miles; whichever occurs first.

Coolant Decals

On buses equipped with any of the above-listed engines, Blue Bird installs a decal stating:

- The type of coolant installed at the factory.
- The coolant manufacturer's part number for one gallon quantity, suitable for regular top-off and refill.
- The coolant manufacturer's part number for one gallon quantity of the concentrate version of the installed coolant, suitable for formulating stronger glycol mixture ratio.

Blue Bird also installs a second decal containing radiator warnings. Both decals are mounted near the coolant fill neck.

S1003

S E R V I C E U P D A T E



COOLANTS

John Deere® Cool-Gard

Green in color.
 Standard equipment coolant in all A3FE, A3RE, BBCV, BCCV with Caterpillar, Cummins, and John Deere engines. before March 26, 2009.
 On and after March 26, 2009, John Deere Cool-Gard is used for John Deere engines only.
 Qualifies as extended-life coolant in John Deere engines.
 Considered standard-life coolant in Caterpillar and Cummins engines.
 Concentrate version may be mixed with the pre-mix version to lower freezing point.
 New John Deere Cool-Gard II may be used with John Deere Cool-Gard.

50/50 Premix	BLUE BIRD NUMBER	JOHN DEERE NUMBER
1 Gallon Container	0109179	TY25081
2 1/2 Gallon Container		TY16036
55 Gallon Drum		TY16037
330 Gallon Tote		TY24504
Concentrate		
1 Gallon Container		TY16034

Caterpillar® ELC

Red in color.
 Optional coolant in A3FE, A3RE, BBCV, BCCV with Caterpillar engines.
 Qualifies as extended-life coolant in Caterpillar engines.
 Blue Bird installs 50/50 premix, which is available in one gallon and larger (listed) containers.
 The 50/50 premix may be mixed with the concentrate version per Caterpillar's instructions to achieve 60/40 ratio.
 Concentrate version may be mixed with the pre-mix version to lower freezing point.

50/50 Premix	BLUE BIRD NUMBER	CATERPILLAR NUMBER
1 Gallon Container		101-2844
Case of six 1 Gallon Containers	0113986	
55 Gallon Drum		101-2845
275 Gallon Tote		222-1534
Concentrate		
1 Gallon Container	0113987	119-9150



Fleetguard® ES Compleat (March 26, 2009 and later)

Blue in color.

Standard coolant in all Blue Bird buses with Cummins engines.

Blue Bird installs 50/50 premix, which is available in one gallon containers and in larger containers (listed).

The 50/50 premix may be mixed with the concentrate version per Fleetguard's instructions to achieve 60/40 ratio.

Concentrate version may be mixed with the pre-mix version to lower freezing point.

50/50 Premix	BLUE BIRD NUMBER	FLEETGUARD NUMBER
1 Gallon Container		CC2825
55 Gallon Drum		CC2826
275 Gallon Tote		CC2834
Concentrate		
1 Gallon Container		CC2820

Fleetguard® ES Optimax

Red in color.

Optional coolant in A3FE, A3RE, BBCV, BCCV with Cummins engines.

Qualifies as extended-life coolant in Cummins engines.

Blue Bird installs 60/40 premix, which is not available in one gallon containers, but is available in larger containers (listed).

The 50/50 premix may be mixed with the concentrate version per Fleetguard's instructions to achieve 60/40 ratio.

Concentrate version may be mixed with the pre-mix version to lower freezing point.

50/50 Premix	BLUE BIRD NUMBER	FLEETGUARD NUMBER
1 Gallon Container	0109178	CC2785/2785X
60/40 Premix		
55 Gallon Drum		CC2770/2770X
275 Gallon Tote		CC2790/2790X
Concentrate		
1 Gallon Container	0109552	CC2780/2780X

Havoline® DEX-COOL

Orange in color.

Standard coolant in BBCV Propane with GM 8.1 engine.

Qualifies as extended-life coolant.

Blue Bird installs 50/50 premix, which is available in one gallon containers, and in larger containers (listed).

The 50/50 premix may be mixed with the concentrate version per Havoline instructions to achieve 60/40 ratio.

Concentrate version may be mixed with the pre-mix version to lower freezing point.

50/50 Premix	BLUE BIRD NUMBER	HAVOLINE NUMBER
Gallon		7995
Concentrate		
Gallon		7994



COOLANT MAINTENANCE

Blue Bird advises strictly abiding by the following policy for all coolant maintenance for the life of the vehicle:

Never Mix Coolant Types

Routine coolant addition (top-off) must match the installed coolant type and brand. Do not mix coolants of different colors, types, or brands in the same engine.

Strictly Follow The Engine Manufacturer's Specifications

Each engine manufacturer publishes its own specific requirements for testing and maintaining coolant in their respective engines. Blue Bird recommends strictly abiding by the engine manufacturer's testing and maintenance schedules and draining, flushing, refilling procedures to maintain compliance with the engine warranty requirements. Blue Bird further recommends that you maintain accurate vehicle-specific service records of all coolant system maintenance procedures performed.

For Caterpillar or Cummins engines equipped with John Deere Cool-Gard coolant, follow the engine manufacturer's maintenance schedules for standard-life coolant, not for extended-life coolant.

For Caterpillar engines using Caterpillar ELC extended life coolant, perform testing at a qualified coolant laboratory per the Caterpillar Operation and Maintenance Manual. Label sample as Extended-Life coolant.

For Cummins engines using Fleetguard ES Compleat coolant, send coolant samples to Fleetguard for Monitor C testing, as specified in the Cummins Operator's Manual. Label sample as Conventional coolant.

For Cummins engines using Fleetguard ES Optimax extended-life coolant, send coolant samples to Fleetguard for Monitor C testing, as specified in the Cummins Operator's Manual. Label sample as Extended-Life coolant.

For Caterpillar, Cummins, or John Deere engines using John Deere Cool-Gard coolant, send coolant samples to a John Deere lab for Cool Scan testing; or test manually using a John Deere Three-Way test strip, supplied in John Deere 3-Way Heavy Duty Coolant Test Kit TY6175.

The cost of testing is the owner's responsibility as part of the engine manufacturer's requirements for cooling system maintenance. If a test indicates a coolant defect, the dealer may submit a preapproval claim (either warranty or policy), with the test report and bus coolant service records attached, before any repairs are performed. As with all warranty and policy claims, defective parts must be retained until the claim has been paid. Dealers and/or owners should retain at least one gallon of the drained coolant until the claim is paid, in case Blue Bird, or the engine manufacturer, or the coolant manufacturer requires further testing.

Always Mix Concentrate With Premix Coolant, Not Water

If concentrated coolant is added in order to raise the glycol ratio, use only the concentrate version of the same premix coolant type and brand as installed. Do not mix the concentrate with water. Instead, mix the concentrate with the premix version of the same coolant.

Only Add Tap Water In Emergency Situations

A regularly-scheduled bus inspection and maintenance program should be followed to prevent coolant losses due to damaged or worn hoses, loose clamps, etc.

If coolant is lost while the bus is in use, and roadside emergency measures are called for, replenish the coolant with the same premix type and brand if possible. If the proper coolant is not available, and water must be used, use only de-ionized water if possible. Ordinary tap water should only be used if proper coolant or de-ionized water are not available.

Whenever tap water has been added, the bus should be taken to a service facility and the entire cooling system should be completely drained, flushed, and refilled with premix coolant.



COOLANT SYSTEM FLUSH & REFILL FOR A3FE, A3RE, AND BBCV WITH CATERPILLAR® ENGINE

Always read the entire procedure before performing. Blue Bird recommends the flush and refill procedure for Caterpillar engines being performed by an authorized Caterpillar dealer/distributor.

CAUTION After acid type cleaners such as those mentioned in this procedure are used, the system must be flushed with fresh water 3 to 5 times to ensure complete removal of the cleaner from the system. If cleaner is not completely removed, ammonia salt residue may remain and severe copper corrosion can occur.

CAUTION If differences between instructions in this Service Update and the engine manufacturer's Operation and Maintenance Manuals are encountered, the engine manufacturer's information takes precedence.

1 Follow Caterpillar's instruction in the *Caterpillar Operation and Maintenance Manual* for chemically flushing the entire cooling system.

If the engine cooling system is contaminated by sludge or oil, the system should be flushed with Caterpillar's 30-Day cleaner. If the engine cooling system is contaminated by scale and deposits the system should be flushed with Caterpillar Quick Flush cleaner.

2 After the engine has been stopped and the cooling system has cooled, perform **Procedure 1: Cooling and Heater System Drain**, included in this Service Update.

3 Rinse the cooling system with fresh water three to five times, as follows:

- 3.1 Open all heater circuit valves.
- 3.1 Fill the system with fresh water.
- 3.3 Start the engine. Turn on the heater system pumps.
- 3.4 Run the engine for a minimum of 30 minutes at high idle with heater pumps on and all heater valves open.
- 3.5 Turn off the engine and allow it to cool completely.
- 3.6 After the cooling system has cooled, again perform **Procedure 1: Cooling and Heater System Drain** through Step 2.4.
- 3.7 With the hoses disconnected and the drain valves open, run fresh water through the heater system, radiator, transmission cooler, and engine until the water is clear.
- 3.8 Perform **Procedure 1: Cooling and Heater System Drain** Step 3.

3.9 Repeat Steps 2 through 3 of this procedure as many times as required to ensure that the system is clean and the flush chemicals are completely removed.

4 If the bus is equipped with a coolant filter, thoroughly clean the filter head and lines, removing all of the old coolant and residue. Reinstall the filter assembly. Install a new coolant filter element.

5 Perform the coolant refill procedure for Caterpillar engines, as follows:

- 5.1 Install Caterpillar® ELC Premixed 50/50 following Caterpillar instructions in the *Caterpillar Operation and Maintenance Manual*.
- 5.2 Operate engine to open thermostats and allow the air to escape from the system. If the coolant level drops when the thermostats open or during bleeding of the heater system, stop and add premix coolant.

6 Perform **Procedure 2: Heater System Bleeding** to bleed trapped air from the heater system.

7 After operating the bus for approximately 30 days, submit samples of the installed coolant to a coolant laboratory equipped to perform a Caterpillar SOS Level 2 coolant test, to ensure that the system is free of heavy metals contamination, that the cleaner has been completely removed, and that the corrosion protection and glycol levels are correct.

After the 30 day test, resume the regular testing schedule as specified by the engine manufacturer.



COOLANT SYSTEM FLUSH & REFILL FOR BBCV, A3FE, & A3RE WITH CUMMINS® ENGINE

Always read the entire procedure before performing. Blue Bird recommends that the flush and refill procedure for Cummins® engines is performed by an authorized Cummins dealer/distributor.

CAUTION After acid type cleaners such as those mentioned in this procedure are used, the system must be flushed with fresh water 3 to 5 times to ensure complete removal of the cleaner from the system. If cleaner is not completely removed, ammonia salt residue may remain and severe copper corrosion can occur.

CAUTION If differences between instructions in this Service Update and the engine manufacturer's Operation and Maintenance Manuals are encountered, the engine manufacturer's information takes precedence.

1. Follow Cummins instruction for chemically flushing the entire cooling system.

If the engine cooling system is contaminated by sludge or oil, the system should be flushed with Restore. If the engine cooling system is contaminated by scale and deposits the system should be flushed with Restore Plus.

2 After the engine has been stopped and the cooling system has cooled, perform **Procedure 1: Cooling and Heater System Drain**, included in this Service Update.

3 Rinse the cooling system with fresh water three to five times, as follows:

- 3.1 Open all heater circuit valves.
- 3.1 Fill the system with fresh water.
- 3.3 Start the engine. Turn on the heater system pumps.
- 3.4 Run the engine for a minimum of 30 minutes at high idle with heater pumps on and all heater valves open.
- 3.5 Turn off the engine and allow it to cool completely.
- 3.6 After the cooling system has cooled, again perform **Procedure 1: Cooling and Heater System Drain** through Step 2.4.
- 3.7 With the hoses disconnected and the drain valves open, run fresh water through the heater system, radiator, transmission cooler, and engine until the water is clear.
- 3.8 Perform **Procedure 1: Cooling and Heater System Drain** Step 3.

3.9 Repeat Steps 2 through 3 of this procedure as many times as required to ensure that the system is clean and the flush chemicals are completely removed.

4 If the bus is equipped with a coolant filter, thoroughly clean the filter head and lines, removing all of the old coolant and residue. Reinstall the filter assembly. Install a new coolant filter element.

5 Perform the coolant refill procedure for Cummins engines, as follows:

5.1 Install Fleet Guard ES Optimax Ethylene Glycol Premixed 50/50 following Cummins instructions.

5.2 Operate engine to open thermostats and allow the air to escape from the system. If the coolant level drops when the thermostats open or during bleeding of the heater system, stop and add premix coolant.

6 Perform **Procedure 2: Heater System Bleeding** to bleed trapped air from the heater system.

7 After operating the bus for approximately 30 days, submit samples of the installed coolant to a coolant laboratory equipped to perform a Monitor C Cummins Fleet Guard coolant test, to ensure that the system is free of heavy metals contamination, that the cleaner has been completely removed, and that the corrosion protection and glycol levels are correct.

After the 30 day test, resume the regular testing schedule as specified by the engine manufacturer.



COOLANT SYSTEM FLUSH & REFILL FOR A3RE WITH JOHN DEERE ENGINE

Always read the entire procedure before performing. Blue Bird recommends that the flush and refill procedure for John Deere engines is performed by an authorized John Deere dealer/distributor.

CAUTION After acid type cleaners such as those mentioned in this procedure are used, the system must be flushed with fresh water 3 to 5 times to ensure complete removal of the cleaner from the system. If cleaner is not completely removed, ammonia salt residue may remain and severe copper corrosion can occur.

CAUTION If differences between instructions in this Service Update and the engine manufacturer's Operation and Maintenance Manuals are encountered, the engine manufacturer's information takes precedence.

1 With the engine fully cooled, remove the engine thermostat.

CAUTION The engine thermostats must be removed to allow entire cooling system to be flushed.

- 1.1 Remove the engine thermostat cover.
- 1.2. Remove the thermostats from the engine.
- 1.3 Reinstall the thermostat cover and gasket, tightening the three cover cap screws to 47 Nm (35 lb-ft).
- 1.4 If the engine is equipped with a coolant filter, close the coolant filter valve. Remove the coolant filter.

2 Fill the cooling system with clean water and Fleetguard® Restore Plus™. Refer to the manufacturer's instructions on the cleaner label for correct mixture.

- 2.1 Run engine for one hour on high idle with the heater pump on and all valves open.
- 2.2 Stop the engine and allow it to cool for 10 minutes.

2 After the engine has been stopped and the cooling system has cooled, perform **Procedure 1: Cooling and Heater System Drain**, included in this Service Update.

3 Rinse the cooling system with fresh water three to five times, as follows:

- 3.1 Open all heater circuit valves.
- 3.1 Fill the system with fresh water.
- 3.3 Start the engine. Turn on the heater system pumps.
- 3.4 Run the engine for a minimum of 30 minutes at high idle with heater pumps on and all heater valves open.

3.5 Turn off the engine and allow it to cool for 10 minutes.

3.6 After the cooling system has cooled, again perform **Procedure 1: Cooling and Heater System Drain** through Step 2.4.

3.7 With the hoses disconnected and the drain valves open, run fresh water through the heater system, radiator, transmission cooler, and engine until the water is clear.

4 Disconnect these additional connections and flush thoroughly with clean water:

- 4.1 Remove one heater hose at the transmission cooler and run clean fresh water into the heater hose to the bus heater.
- 4.2 Remove the hose from the bottom of the surge tank. Fill the tank with allow to fill and drain.
- 4.3 At the radiator, remove the tube leading to the thermostat housing. Flush into the engine and into the radiator.
- 4.4 Remove the hose at the air compressor and flush.
- 4.5 At the coolant filter, open the filter valves and flush up into the ports at the filter flange.

5. Run shop air through the system (15 PSI maximum) at following locations until all water is expelled:

- 5.1 Blow through the heater hoses.
- 5.2 At the air compressor, open the petcock located below the coolant pump to also drain the engine block.

CAUTION All chemical flush must be completely removed. If the water is not clear, repeat steps 3 through 5 as required.



6 Reinstall all hoses to engine block, transmission cooler, surge tank, and radiator.

3.8 Perform **Procedure 1: Cooling and Heater System Drain** Step 3.

7 If the bus is equipped with an engine coolant filter, install a new filter element.

8 Install new thermostats as follows:

8.1 Remove the thermostat cover and install new thermostats into engine block with new gasket.

8.2 Reinstall the thermostat cover and tighten the three cover cap screws to 47 Nm (35 lb-ft).

9 Perform the coolant refill procedure for John Deere engines, as follows:

9.1 Open the bleeder valve located near the surge tank.

9.1 Fill cooling the system with approximately 14 gallons of John Deere Premixed 50/50 COOL-GARD coolant.

9.3 With the heater valves open and the heater pump on, run the engine on high idle. As air bleeds from the system, add coolant as necessary. Drive the vehicle on the road for 10-15 minutes, recheck the coolant level, and replenish as required.

CAUTION *All air must be expelled from the cooling system. Open bleeder valve located near side of surge tank when filling system. Close valve when all air has been expelled.*

10 After the correct coolant level has been reached, allow the bus to cool. Remove a coolant sample from the radiator petcock for testing.

- Test John Deere COOL-GARD coolant with a John Deere 3 WAY Heavy Duty test strip. **Check expiration date on the test strips before using.** If the coolant does not meet John Deere requirement on the test kit chart, follow John Deere recommendation for correcting the coolant mixture.

- An alternate method is to check glycol level with a refractometer to be sure the percentage of glycol is correct.

11 Perform **Procedure 2: Heater System Bleeding** to bleed trapped air from the heater system. After the coolant level is correct, pressure test the cooling system for leaks.

12 After operating the bus for approximately 30 days, submit samples of the installed coolant to a coolant laboratory equipped to perform a John Deere Cool Scan coolant test, to ensure that the system is free of heavy metals contamination, that the cleaner has been completely removed, and that the corrosion protection and glycol levels are correct.

After the 30 day test, resume the regular testing schedule as specified by the engine manufacturer.



PROCEDURE 1: COOLING AND HEATER SYSTEM DRAIN

Always read the entire procedure before performing.

CAUTION *If differences between instructions in this Service Update and the engine manufacturer's Operation and Maintenance Manuals are encountered, the engine manufacturer's information takes precedence.*

1. Prepare the bus for draining the coolant, as follows:

- 1.1 Park bus on a level surface, apply parking brake and chock the wheels. Turn off the engine, remove ignition key.
- 1.2 Locate and open all heater valves for flushing the entire cooling system. All heater valves must be open in order to completely drain the system.
- 1.3 Run the engine on high idle with heater valves open and heater pump on until normal operating temperature is achieved.
- 1.4 Turn off the engine, remove ignition key. Allow the engine to cool completely.

2. Drain and discard the coolant, as follows:

WARNING *Sudden release of fluids from a pressurized cooling system can cause serious burns. Do not remove the radiator cap when the engine is running. Remove the filler cap only when cool enough to touch with bare hands. Slowly loosen cap to its first stop to relieve pressure, before removing completely. Ensure that the cooling system is cool before draining and flushing.*

- 2.1 If the system is equipped with a coolant filter, close the valves to the filter and remove the filter.
- 2.2 Position a coolant drain pan under the radiator drain. Open the radiator cap. Remove the radiator drain plug.

WARNING *Engine coolant is toxic and is an eye and skin irritant. Protective gear should be worn when working with coolant. Engine coolant is a threat to the environment. Use appropriate containers for disposal. Observe all applicable federal, state, and local laws when disposing of coolant.*

- 2.3 After the system has drained, remove both the pressure and return heater hoses. Use a shop air hose set at a maximum of 15 PSI, to blow the remaining coolant from the heater system.

- 2.4 Position a coolant drain pan under the lowest drain port or plug on the engine to drain any remaining coolant.

If the engine is a John Deere® engine, open the drain valve below the coolant pump and attach a drain hose to the fitting.

Removal of the thermostat may assist in draining. Follow the engine manufacturer's recommendation regarding thermostat removal and installation.

- 3 After draining is complete, close all drains. Reinstall the heater hoses removed in Step 2.3. Reinstall all plugs that have been opened or removed. Reinstall thermostats that were removed following engine manufacturer's procedures.



PROCEDURE 2: HEATER SYSTEM BLEEDING

After flushing and refilling the coolant system, perform this procedure to remove trapped air from the heater system. Always read the entire procedure before performing.

CAUTION Only replenish coolant with the same premix coolant as installed. Do not top off coolant level with water or other brand coolants. Do not mix coolant brands or colors.

1. Prepare the bus, as follows:

- 1.1 Park bus on a level surface, apply parking brake. Turn off the engine, remove ignition key. Chock the wheels.
- 1.2 Locate and open all heater valves.
- 1.3 With the heater pump on, run the engine on high idle until normal operating temperature is achieved.
- 1.4 Turn off the engine, remove ignition key. Allow the engine to cool completely.

2 With the engine stopped and a cool engine, remove the radiator cap. Locate the ¼" black bleeder tube. Place the open end of the bleeder tube into the filler neck of the deaeration tank, and open the bleeder valve.

3 Bleed the system as follows:

- 3.1 Start engine and operate at 1800 to 2000 rpm until all air has been purged from the system. Using the same 50/50 premix coolant as installed, replenish the coolant to maintain the coolant level.
- 3.2 After all air has been purged, and a solid stream of coolant is evident, close the bleeder valve and store the bleeder line. Reinstall the radiator cap.

4 Operate the engine until the thermostats open. Stop and let engine cool. Recheck coolant levels and top off the approved 50/50 premixed coolant.

If the coolant level drops during bleeding of the heater system, stop the engine and add the same engine-appropriate premix coolant as installed.

5 After bleeding the heater system, allow the system to cool. Check the coolant level in the deaeration tank. If required, top off with the same engine-appropriate premix coolant installed. Run the engine again until the thermostats open to mix the new added coolant.

6 Turn off the engine and wait 15-30 minutes. Drain a coolant sample from the bottom of the radiator. Test the sample with a refractometer to verify the glycol level is 50%. If the glycol level is less than 50%, drain the appropriate amount of coolant and add the concentrated version of the same type of coolant as installed, according to the engine manufacturer's procedure for increasing glycol percentage to the correct level.

7 When the system has been successfully bled and the coolant level remains at the correct level, pressure test the cooling system for leaks. If no leaks are found, the bus may be returned to normal service.