

GP/GLP/GDP80VX, GP/GLP/GDP90VX, GP/GLPGDP100VX, GP/GLP/ GDP110VX, GP/GLP/GDP120VX (G813) SERVICE MANUAL CONTENTS

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Service information for Cummins diesel engines can be ordered through the Hyster Literature Distribution Center.
9000 YRM 1112 ON CD

PART NO. 524329176 (12/14)

SAFETY PRECAUTIONS

MAINTENANCE AND REPAIR

- The Service Manuals are updated on a regular basis, but may not reflect recent design changes to the product. Updated technical service information may be available from your local authorized Yale® dealer. Service Manuals provide general guidelines for maintenance and service and are intended for use by trained and experienced technicians. Failure to properly maintain equipment or to follow instructions contained in the Service Manual could result in damage to the products, personal injury, property damage or death.
- When lifting parts or assemblies, make sure all slings, chains, or cables are correctly fastened, and that the load being lifted is balanced. Make sure the crane, cables, and chains have the capacity to support the weight of the load.
- Do not lift heavy parts by hand, use a lifting mechanism.
- Wear safety glasses.
- DISCONNECT THE BATTERY CONNECTOR before doing any maintenance or repair on electric lift trucks. Disconnect the battery ground cable on internal combustion lift trucks.
- Always use correct blocks to prevent the unit from rolling or falling. See HOW TO PUT THE LIFT TRUCK ON BLOCKS in the **Operating Manual** or the **Periodic Maintenance** section.
- Keep the unit clean and the working area clean and orderly.
- Use the correct tools for the job.
- Keep the tools clean and in good condition.
- Always use **YALE APPROVED** parts when making repairs. Replacement parts must meet or exceed the specifications of the original equipment manufacturer.
- Make sure all nuts, bolts, snap rings, and other fastening devices are removed before using force to remove parts.
- Always fasten a DO NOT OPERATE tag to the controls of the unit when making repairs, or if the unit needs repairs.
- Be sure to follow the **WARNING** and **CAUTION** notes in the instructions.
- Gasoline, Liquid Petroleum Gas (LPG), Compressed Natural Gas (CNG), and Diesel fuel are flammable. Be sure to follow the necessary safety precautions when handling these fuels and when working on these fuel systems.
- Batteries generate flammable gas when they are being charged. Keep fire and sparks away from the area. Make sure the area is well ventilated.

NOTE: The following symbols and words indicate safety information in this manual:



WARNING

Indicates a hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury and property damage.

On the lift truck, the WARNING symbol and word are on orange background. The CAUTION symbol and word are on yellow background.

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GP/GLP/GDP035VX, GP/GLP/GDP040SVX) [C810];
GLC20-35VX (GC/GLC040-070VX, GC/GLC055SVX) [A910];
GLC050LX [A967];
GLP/GDP20-35VX (GP/GLP/GDP040-070VX) [B875];
GLP/GDP20-25LX (GLP/GDP050LX) [A974];
GLC40, 45, 55VX; GLC55SVX (GC/GLC080, 100, 120VX; GC/GLC080,
100VXBCS; GC/GLC120SVX; GC/GLC120VXPRS) [E818, F818];
GLP/GDP40VX5/VX6; GLP/GDP45SVX5, GLP/GDP45VX6, GLP/GDP50-55VX
(GP/GLP/GDP080, 090, 100, 110, 120VX) [F813, G813, H813, J813];
GLC/GDC60VX, GLC/GDC70VX (GC/GLC/GDC135VX, GC/GLC/GDC155VX)
[C879, D879, E879, F879];
GLP/GDP60VX, GLP/GDP70VX (GP/GLP/GDP135VX, GP/GLP/GDP155VX)
[C878, D878, E878];
GLP/GDP80VX, GLP/GDP80VX9, GLP/GDP90VX (GLP/GDP170VX,
GLP/GDP175VX36, GLP/GDP190VX) [A909, B909]

General

This section contains the repair and replacement instructions for the radiator, coolant level sensor, fan

assembly (pusher type), fan shroud, coolant hoses, coolant recovery bottle, and optional debris screen.

Cooling System Checks

EXHAUST LEAKS INTO COOLING SYSTEM



WARNING

During engine operation, be careful not to touch the fan, pulleys, or drive belts. Contact with these parts can cause serious injury.

To check for exhaust leaks into the cooling system, use a Combustion Leak Test Kit for this purpose. Follow the manufacturer's instructions when doing the test.

WATER FLOW RESTRICTIONS IN RADIATOR



WARNING

During engine operation, be careful not to touch the fan, pulleys, or drive belts. Contact with these parts can cause serious injury.

To check for water flow restrictions in the radiator, run engine until it is warm.



WARNING

The radiator or other parts of the cooling system may be hot or under pressure and can cause serious injury. Wait 30 minutes for the radiator to cool. Do a touch test by touching the radiator with your hand. If the radiator is still hot to the touch, wait another 30 minutes before attempting to check or fix any part of the cooling system.

Shut engine **OFF** and feel the radiator. The temperature must be even across the radiator. (The radiator will be hotter near the top radiator hose.) Cold spots on radiator indicate restrictions.

If radiator has leaks, either replace the radiator or have it repaired by trained personnel.

RADIATOR HOSES



WARNING

The radiator or other parts of the cooling system may be hot or under pressure and can cause serious injury. Wait 30 minutes for the radiator to cool.

Do a touch test by touching the radiator with your hand. If the radiator is still hot to the touch, wait another 30 minutes before attempting to check or fix any part of the cooling system.

Inspect all radiator hoses. If they feel spongy or have visible cracks, replace hoses.

WATER PUMP



WARNING

During engine operation, be careful not to touch the fan, pulleys, or drive belts. Contact with these parts can cause serious injury.



WARNING

The radiator or other parts of the cooling system may be hot or under pressure and can cause serious injury.

Run engine until it is warm. Check the operation of water pump by holding the top radiator hose. If the pump is operating, there will be pressure surges in the hose.

Check for leaks around the timing belt cover near the base of the oil pump.

Check the weep hole where coolant that leaks past the water pump seal can be drained before reaching the water pump bearings. If there is a drip, check the pump shaft seal and water pump. Replacement of the pump shaft seal or water pump may be necessary.

For repair procedures for the GM 2.4L water pump, refer to the section **GM Engine Repair, GM 2.4 Liter Engine** 600 YRM 1121.

For repair procedures for the Mazda FE and F2 water pump, refer to the section **Mazda Engine, FE and F2** 600 YRM 1122.

For replacement procedures for the Yanmar 2.6L and 3.3L water pump, refer to the section **Yanmar Diesel Engines, 2.6L, 3.0L and 3.3L** 600 YRM 1205.

For replacement procedures for the GM 4.3L water pump, refer to the section **GM Engines, 4.3 Liter V-6** 600 YRM 1251.

For replacement procedures for the GM 5.7L water pump, refer to the section **GM Engines, 5.7 Liter V-8 LPG** 600 YRM 1432.

For replacement procedures for the Kubota water pump, refer to the section

- **Kubota Diesel 3.8L Engines** 600 YRM 1557
- **Kubota Diesel 3.6L Engine** 600 YRM 1579
- **Kubota Diesel 3.8L Engines, with Diesel Particulate Filter (DPF)** 600 YRM 1590

For replacement procedures for the Cummins 4.5L and QSB 3.3L water pump, contact your local **Yale** dealer or see **Yale Access Online**.

Flushing the Cooling System

COOLING SYSTEM, CLEAN



WARNING

Compressed air can move particles so that they cause injury to the user or to other personnel. Make sure the path of the compressed air is away from all personnel. Wear protective goggles or a face shield to prevent injury to the eyes.



WARNING

The radiator fins on the radiator are very sharp and can cause serious injury. Wear gloves while checking the radiator fins.

1. Check radiator fins. Clean exterior of radiator with compressed air or water as needed.



WARNING

DO NOT remove the radiator cap from the radiator when the engine is hot. When the radiator cap is removed, the pressure is released from the system. If the system is hot, the steam and boiling coolant can cause burns.



WARNING

The radiator or other parts of the cooling system may be hot or under pressure and can cause serious injury. Wait 30 minutes for the radiator to cool. Do a touch test by touching the radiator with your hand. If the radiator is still hot to the touch, wait another 30 minutes before attempting to check or fix any part of the cooling system.



CAUTION

Disposal of lubricants and fluids must meet local environmental regulations.

2. Drain cooling system. Fill cooling system with clean water. See sections below for more information:

- Radiator, Remove for Lift Trucks Models GC/GLC030VX, GC/GLC035VX, GC/GLC040SVX (C809); GLP/GDP16VX, GLP/GDP18VX, GLP/GDP20SVX (GP/GLP/GDP030VX, GP/GLP/GDP035VX, GP/GLP/GDP040SVX) (C810); GLC20-35VX (GC/GLC040-070VX, GC/GLC055SVX) (A910); GLC050LX (A967); GLP/GDP20-35VX (GP/GLP/GDP040-070VX) (B875); GLP/GDP20-25LX (GLP/GDP050LX) (A974); GLC40, 45, 55VX, GLC55SVX, (GC/GLC080, 100, 120VX, GC/GLC080, 100VXBCS, GC/GLC120SVX, GC/GLC120VXPRS) (E818, F818) and GLP/GDP40VX5/VX6, GLP/GDP45SVX5, GLP/GDP45VX6, GLP/GDP50-55VX (GP/GLP/GDP080, 090, 100, 110, 120VX) (F813, G813, H813, J813)
- Radiator, Remove for Lift Truck Models S6.0FT, S7.0FT (S135FT, S155FT) (D024, E024, F024, G024)GLC/GDC60VX, GLC/GDC60VX, (GC/GLC/GDC135VX, GC/GLC/GDC135VX) (C879, D879, E879, F879)
- Radiator, Remove for Lift Truck Models GLP/GDP60VX, GLP/GDP70VX (GP/GLP/GDP135VX, GP/GLP/GDP155VX) (C878, D878, E878) and GLP/GDP80VX, GLP/GDP80VX9, GLP/GDP90VX (GLP/GDP170VX, GLP/GDP175VX36, GLP/GDP190VX) (A909, B909)

3. Install radiator cap. Run engine until top radiator hose is hot. Stop engine and let engine cool.
4. Drain water from radiator. If water is dirty, fill system with water and repeat procedure until water is clean.

**CAUTION**

Follow the manufacturer's instructions when using a chemical radiator cleaner.

5. If water does not clean system, use a chemical radiator cleaner.

**CAUTION**

Follow the manufacturer's instructions when using special equipment to reverse clean the radiator.

6. If radiator or cooling system is very dirty or has a restriction, use reverse cleaning method. This

method uses water pressure to force water through radiator in opposite direction of normal flow.

**CAUTION**

Additives may damage the cooling system. Before using additives, contact your local Yale dealer.

7. Fill cooling system with ethylene glycol boron-free antifreeze. Purchase a pre-diluted 50/50 solution; or mix 50 percent concentrate with 50% distilled or deionized water. The 50/50 mixture will protect cooling system to -37°C (-35°F). Add coolant as necessary to keep level between the ADD and FULL marks on the reservoir.

Radiator Replacement

RADIATOR, REMOVE FOR LIFT TRUCKS MODELS GC/GLC030VX, GC/GLC035VX, GC/GLC040SVX (C809); GLP/GDP16VX, GLP/GDP18VX, GLP/GDP20SVX (GP/GLP/GDP030VX, GP/GLP/GDP035VX, GP/GLP/GDP040SVX) (C810); GLC20-35VX (GC/GLC040-070VX, GC/GLC055SVX) (A910); GLC050LX (A967); GLP/GDP20-35VX (GP/GLP/GDP040-070VX) (B875); GLP/GDP20-25LX (GLP/GDP050LX) (A974); GLC40, 45, 55VX, GLC55SVX, (GC/GLC080, 100, 120VX, GC/GLC080, 100VXBCS, GC/GLC120SVX, GC/GLC120VXPRS) (E818, F818) AND GLP/GDP40VX5/VX6, GLP/GDP45SVX5, GLP/GDP45VX6, GLP/GDP50-55VX (GP/GLP/GDP080, 090, 100, 110, 120VX) (F813, G813, H813, J813)

**WARNING**

The radiator or other parts of the cooling system may be hot or under pressure and can cause serious injury. Wait 30 minutes for the radiator to cool. Do a touch test by touching the radiator with your hand. If the radiator is still hot to the touch, wait another 30 minutes before attempting to check or fix any part of the cooling system.

1. Turn **OFF** truck.
2. Remove the hood and seat combination.

See **Frame** 100 YRM 1120 for lift truck models

- GC/GLC030VX, GC/GLC035VX, GC/GLC040SVX (C809)
- GLP/GDP16VX, GLP/GDP18VX, GLP/GDP20SVX (GP/GLP/GDP030VX, GP/GLP/GDP035VX, GP/GLP/GDP040SVX) (C810)
- GLC20-35VX (GC/GLC040-070VX, GC/GLC055SVX) (A910)
- GLP/GDP20-35VX (GP/GLP/GDP040-070VX) (B875)

See **Frame** 100 YRM 1243 for lift truck models

- GLC40, 45, 55VX; GLC55SVX; (GC/GLC080, 100, 120VX; GC/GLC080, 100VXBCS; GC/GLC120SVX; GC/GLC120VXPRS) (E818, F818)
- GLP/GDP40VX5/VX6; GLP/GDP45SVX5, GLP/GDP45VX6, GLP/GDP50-55VX (GP/GLP/GDP080, 090, 100, 110, 120VX) (F813, G813, H813, J813)

See **Frame** 100 YRM 1423 for lift truck models

- GLC050LX (A967)
- GLP/GDP20-25LX (GLP/GDP050LX) (A974)

**WARNING**

Always disconnect the cable at the negative terminal first. Install a tag on the battery terminals so that no one connects the cables on the terminals.

3. Disconnect the negative battery cable.
4. Disconnect the positive battery cable.

**WARNING**

DO NOT remove the radiator cap from the radiator when the engine is hot. When the radiator cap is removed, the pressure is released from the system. If the system is hot, the steam and boiling coolant can cause burns.

- Let coolant cool to ambient temperature. Place a drain pan with a capacity greater than the capacity of the cooling system under radiator. Remove radiator cap.

**CAUTION**

Disposal of lubricants and fluids must meet local environmental regulations.

- Open the drain plug or loosen hose clamp and disconnect the lower hose.
- Lift trucks equipped with a Cummins QSB 3.3L diesel engine: Loosen clamps and disconnect the charge air cooler hoses from charge air cooler. See Figure 6.
- Lift trucks equipped with a Kubota 3.8L diesel engine: Loosen clamps and disconnect transmission cooler hoses from transmission cooler. See Figure 8.
- Once coolant is drained from engine, loosen hose clamps and disconnect coolant hoses from radiator. Cap radiator hoses.
- Loosen hose clamp and disconnect hose from reservoir and remove reservoir.

See Figure 1 for lift truck models

- GC/GLC030VX, GC/GLC035VX, GC/GLC040SVX (C809)
- GLP/GDP16VX, GLP/GDP18VX, GLP/GDP20SVX (GP/GLP/GDP030VX, GP/GLP/GDP035VX, GP/GLP/GDP040SVX) (C810)
- GLC20-35VX (GC/GLC040-070VX, GC/GLC055SVX) (A910)
- GLP/GDP20-35VX (GP/GLP/GDP040-070VX) (B875)
- GLC050LX (A967)
- GLP20-25LX (GLP050LX) (A974)

See Figure 2 or Figure 3 for lift truck models

- GLC40, 45, 55VX; GLC55SVX; (GC/GLC080, 100, 120VX; GC/GLC080, 100VXBCS;

GC/GLC120SVX; GC/GLC120VXPRS) (E818, F818)

See Figure 4 or Figure 5 for lift truck models

- GLP/GDP40VX5/VX6; GLP/GDP45SVX5, GLP/GDP45VX6, GLP/GDP50-55VX (GP/GLP/GDP080, 090, 100, 110, 120VX) (F813, G813)

See Figure 6 for lift truck models below equipped with a Cummins QSB 3.3L diesel engine

- GLP/GDP40VX5/VX6; GLP/GDP45SVX5, GLP/GDP45VX6, GLP/GDP50-55VX (GP/GLP/GDP080, 090, 100, 110, 120VX) (G813)
- GLC/GDC60VX, GLC/GDC70VX (GC/GLC/GDC135VX, GC/GLC/GDC155VX) (D879)

See Figure 7 for lift truck models below equipped with Yanmar 2.6L diesel engine

- GDP20-25LX (GDP050LX) (A974)

See Figure 8 for lift truck models below equipped with a Kubota 3.8L diesel engine

- GLP/GDP40VX5/VX6; GLP/GDP45SVX5, GLP/GDP45VX6; GLP/GDP50-55VX (GP/GLP/GDP080, 090, 100, 110, 120VX) (H813, J813)

- Remove battery and battery tray.
 - If equipped, disconnect electrical connector to the coolant level sensor.
- NOTE:** For Mazda LPG engine, the LPG converter bracket needs to be moved for clearance of radiator.
- Remove screws and washers from the shroud and move shroud out of the way.
 - Place radiator guard shield between radiator and fan so damage to radiator does not occur during fan removal.

- Remove fan, fan spacer, and pulley.

- Remove radiator guard shield.

- Remove capscrews and upper radiator bracket.

See Figure 1 for lift truck models

- GC/GLC030VX, GC/GLC035VX, GC/GLC040SVX (C809)
- GLP/GDP16VX, GLP/GDP18VX, GLP/GDP20SVX (GP/GLP/GDP030VX, GP/GLP/GDP035VX, GP/GLP/GDP040SVX) (C810)
- GLC20-35VX (GC/GLC040-070VX, GC/GLC055SVX) (A910)

- GLP/GDP20-35VX (GP/GLP/GDP040-070VX) (B875)
- GLC050LX (A967)
- GLP20-25LX (GLP050LX) (A974)

See Figure 2 or Figure 3 for lift truck models

- GLC40, 45, 55VX; GLC55SVX; (GC/GLC080, 100, 120VX; GC/GLC080, 100VXBCS; GC/GLC120SVX; GC/GLC120VXPRS) (E818, F818)

See Figure 4 or Figure 5 for lift truck models

- GLP/GDP40VX5/VX6; GLP/GDP45SVX5, GLP/GDP45VX6, GLP/GDP50-55VX (GP/GLP/GDP080, 090, 100, 110, 120VX) (F813, G813)

See Figure 6 for lift truck models below equipped with a Cummins QSB 3.3L diesel engine

- GLP/GDP40VX5/VX6; GLP/GDP45SVX5, GLP/GDP45VX6, GLP/GDP50-55VX (GP/GLP/GDP080, 090, 100, 110, 120VX) (G813)

- GLC/GDC60VX, GLC/GDC70VX (GC/GLC/GDC135VX, GC/GLC/GDC155VX) (D879)

See Figure 7 for lift truck models below equipped with Yanmar 2.6L diesel engine

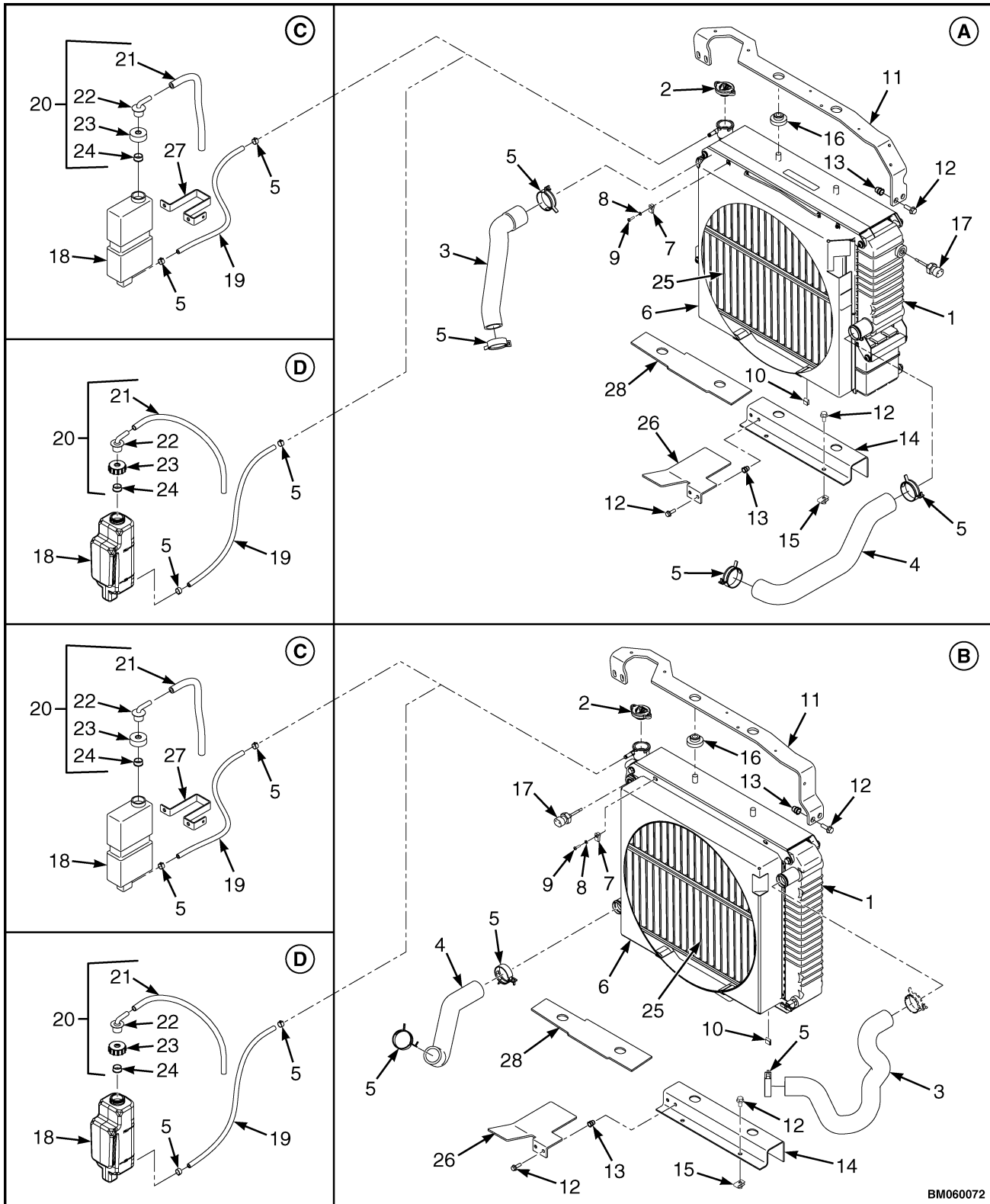
- GDP20-25LX (GDP050LX) (A974)

See Figure 8 for lift truck models below equipped with a Kubota 3.8L diesel engine

- GLP/GDP40VX5/VX6; GLP/GDP45SVX5, GLP/GDP45VX6; GLP/GDP50-55VX (GP/GLP/GDP080, 090, 100, 110, 120VX) (H813, J813)

18. Remove radiator from truck.

19. If necessary, remove the coolant level sensor.



BM060072

Figure 1. Cooling System for Lift Truck Models GC/GLC030VX, GC/GLC035VX, GC/GLC040SVX (C809); GLP/GDP16VX, GLP/GDP18VX, GLP/GDP20SVX (GP/GLP/GDP030VX, GP/GLP/GDP035VX, GP/GLP/GDP040SVX) (C810); GLC20-35VX (GC/GLC040-070VX, GC/GLC055SVX) (A910) GLC050LX (A967); GLP/GDP20-35VX (GP/GLP/GDP040-070VX) (B875) and GLP20-25LX (GLP050LX) (A974)

Legend for Figure 1

- | | |
|---|------------------------------------|
| A. RADIATOR WITH EXTERNAL COOLER | C. RESERVOIR BEFORE MAY '06 |
| B. RADIATOR WITH INTERNAL COOLER, MODINE SHOWN | D. RESERVOIR AFTER MAY '06 |
-
- | | |
|---|---|
| 1. RADIATOR | 15. NUT-CLIP, GC/GLC040-070VX, GC/GLC055SVX [A910] AND GLC050LX (A967) |
| 2. CAP | 16. ISOLATOR |
| 3. UPPER HOSE | 17. COOLANT LEVEL SENSOR |
| 4. LOWER HOSE | 18. RESERVOIR |
| 5. CLAMP | 19. TUBE |
| 6. SHROUD | 20. OUTLET ASSEMBLY |
| 7. CLIP | 21. HOSE |
| 8. WASHER | 22. RESERVOIR OUTLET |
| 9. SCREW | 23. CAP |
| 10. CLIP | 24. BUSHING |
| 11. UPPER RADIATOR BRACKET | 25. SCREEN ASSEMBLY (OPTIONAL) |
| 12. CAPSCREW, GC/GLC040-070VX, GC/GLC055SVX [A910] AND GLC050LX (A967) | 26. HEAT SHIELD |
| 13. INSERT | 27. RESERVOIR BRACKET |
| 14. LOWER BRACKET, GC/GLC040-070VX, GC/GLC055SVX [A910] AND GLC050LX (A967) | 28. HEAT SHIELD, GLP/GDP20-35VX (GP/GLP/GDP040-070VX) [B875] AND GLP20-25LX (GLP050LX) (A974) |

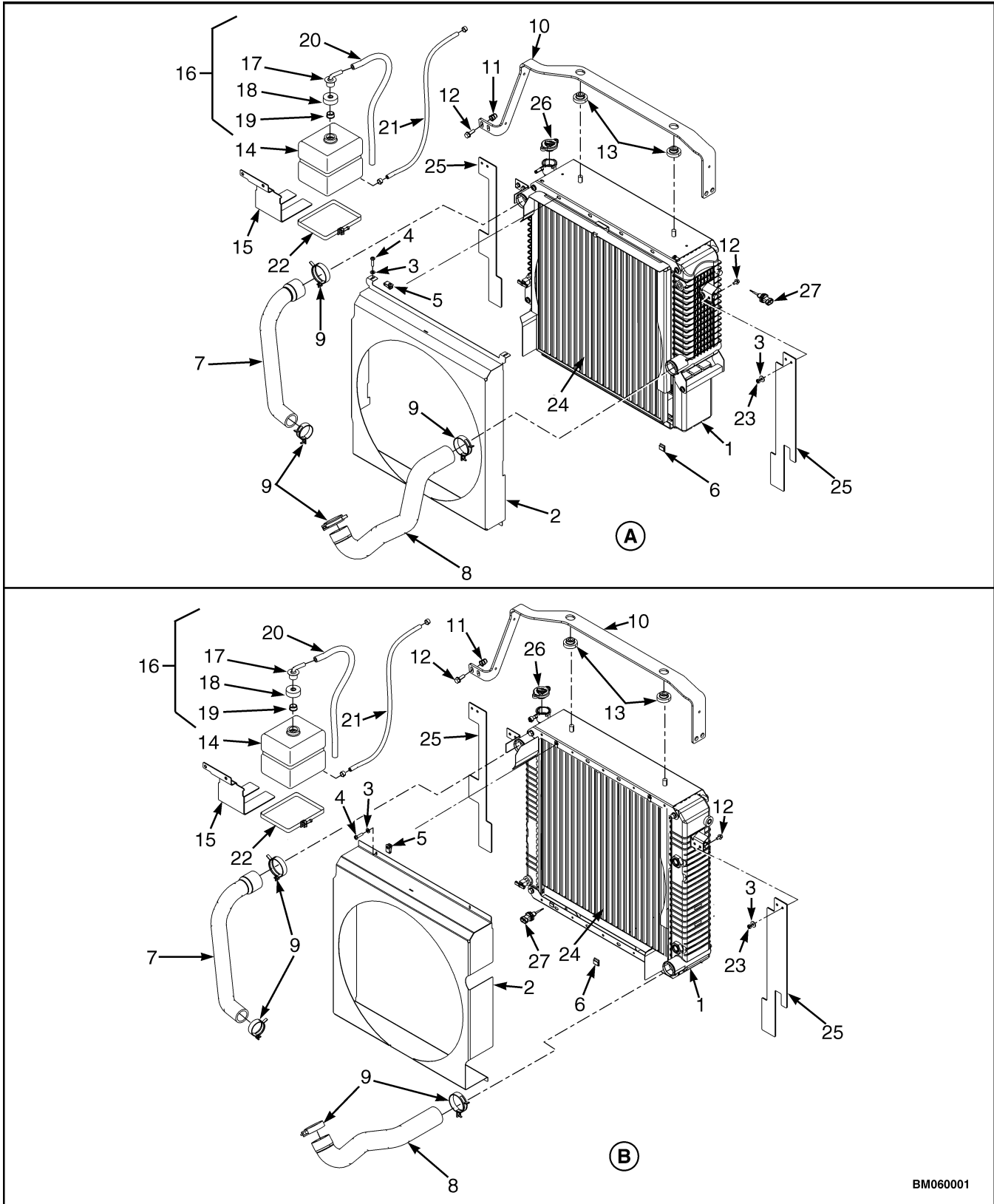


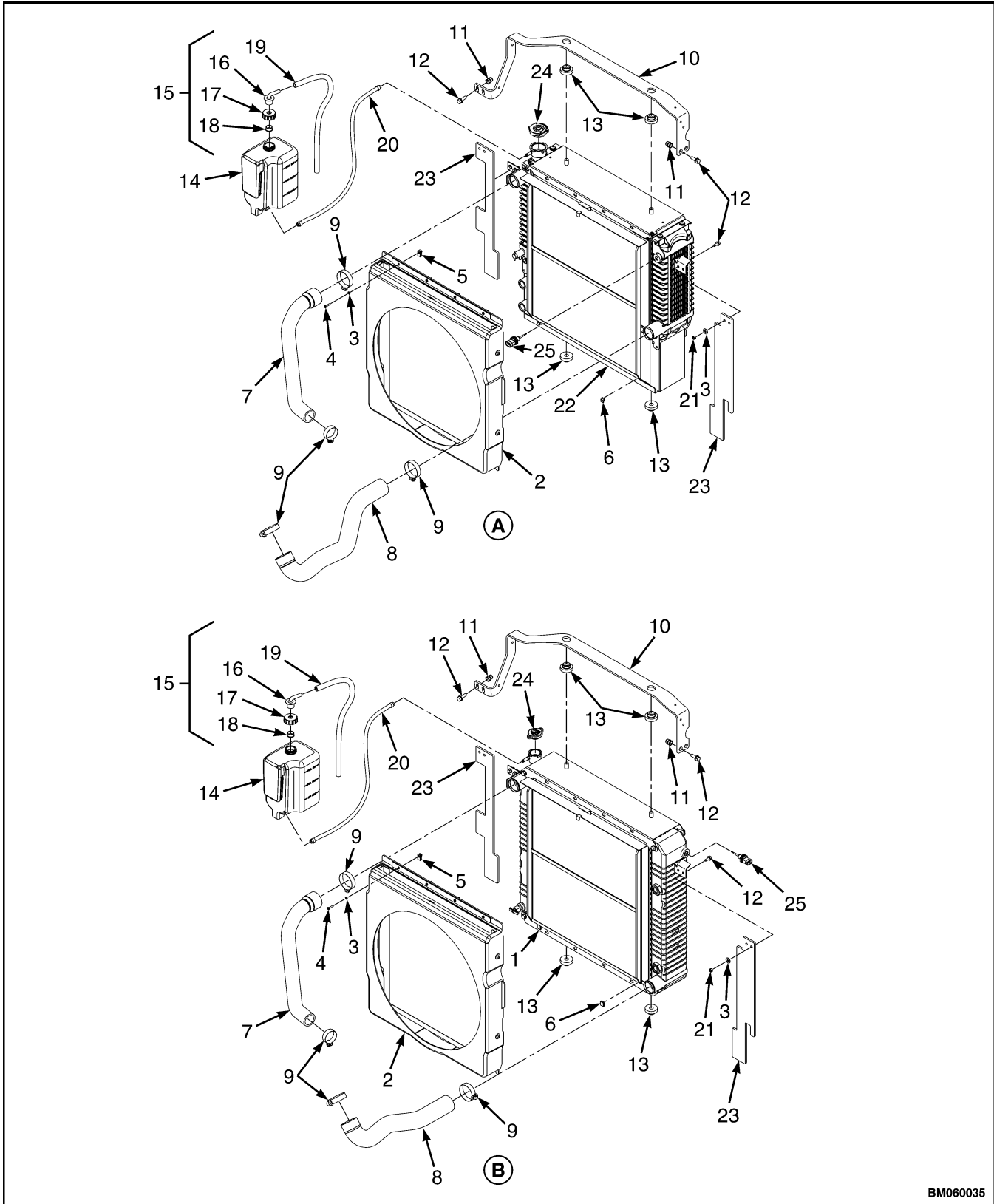
Figure 2. Cooling System for Lift Truck Models GLC40, 45, 55VX; GLC55SVX; (GC/GLC080, 100, 120VX; GC/GLC080, 100VXBCS; GC/GLC120SVX; GC/GLC120VXPRS) (E818) Before 2011

Legend for Figure 2**A. RADIATOR WITH EXTERNAL COOLER**

1. RADIATOR
2. SHROUD
3. WASHER
4. SCREW
5. CLIP NUT
6. CLIP
7. UPPER HOSE
8. LOWER HOSE
9. CLAMP
10. UPPER RADIATOR BRACKET
11. INSERT
12. CAPSCREW
13. ISOLATOR
14. RESERVOIR

B. RADIATOR WITH INTERNAL COOLER

15. RESERVOIR BRACKET
16. OUTLET ASSEMBLY
17. OUTLET
18. CAP
19. BUSHING
20. HOSE
21. TUBE
22. STRAP
23. NUT
24. SCREEN
25. BAFFLE (RH AND LH)
26. RADIATOR CAP
27. COOLANT LEVEL SENSOR



BM060035

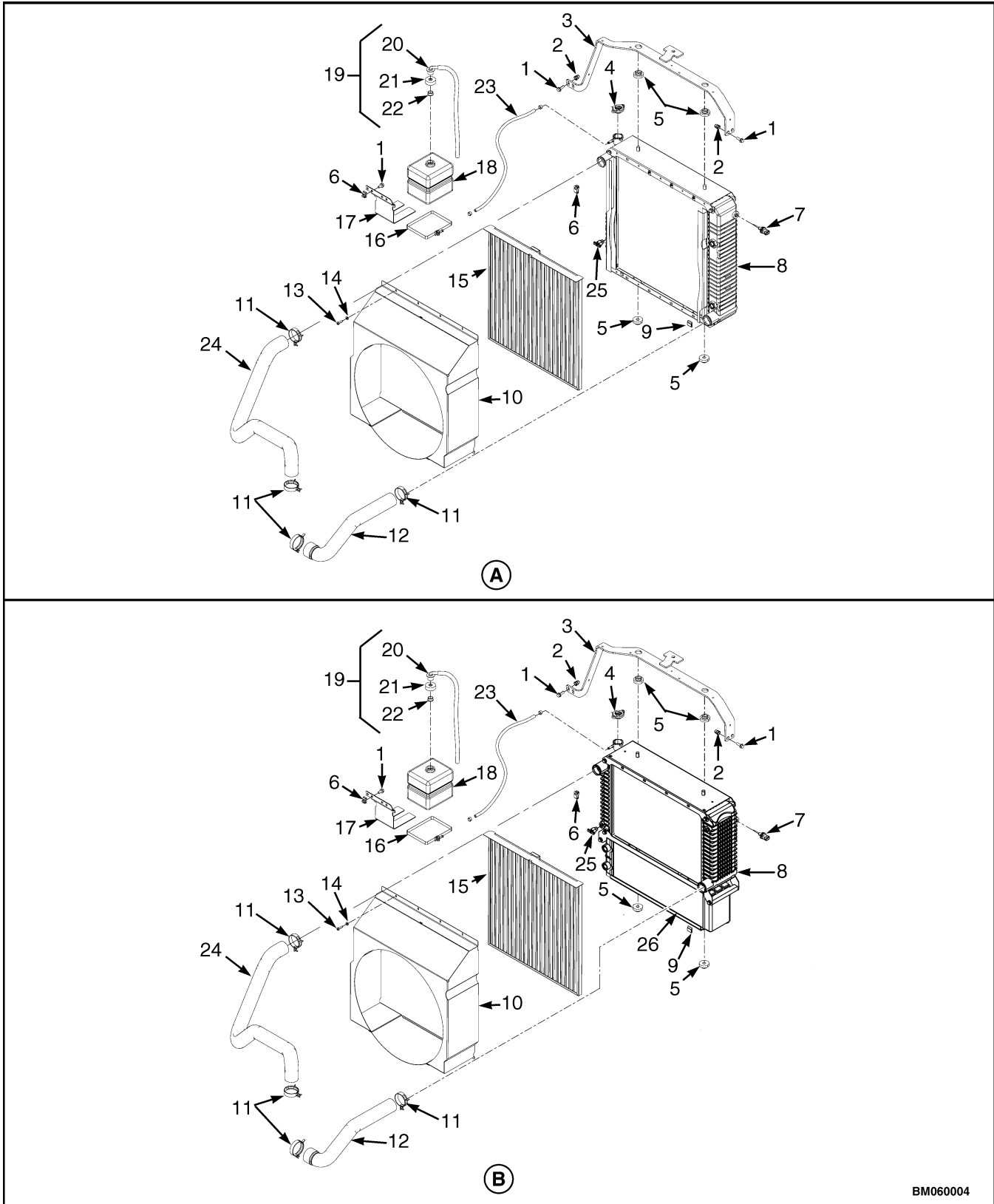
Figure 3. Cooling System for Lift Truck Models GLC40, 45, 55VX; GLC55SVX; (GC/GLC080, 100, 120VX; GC/GLC080, 100VXBCS; GC/GLC120SVX; GC/GLC120VXPRS) (E818, F818) After 2011

Legend for Figure 3**A. RADIATOR WITH EXTERNAL COOLER**

1. RADIATOR
2. SHROUD
3. WASHER
4. SCREW
5. CLIP NUT
6. CLIP
7. UPPER HOSE
8. LOWER HOSE
9. CLAMP
10. UPPER RADIATOR BRACKET
11. INSERT
12. CAPSCREW
13. ISOLATOR

B. RADIATOR WITH INTERNAL COOLER

14. RESERVOIR
15. OUTLET ASSEMBLY
16. OUTLET
17. CAP
18. BUSHING
19. HOSE
20. TUBE
21. NUT
22. SCREEN
23. BAFFLE (RH AND LH)
24. RADIATOR CAP
25. COOLANT LEVEL SENSOR



BM060004

Figure 4. Cooling System for Lift Truck Models GLP/GDP40VX5/VX6; GLP/GDP45SVX5, GLP/GDP45VX6, GLP/GDP50-55VX (GP/GLP/GDP080, 090, 100, 110, 120VX) (F813, G813) Before 2011

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