Coolant Draining From Surge Tank Pressure Cap Overflow Hose

M-261-004

(January 2009)

Valid for

All CXU,CHU,GU trucks

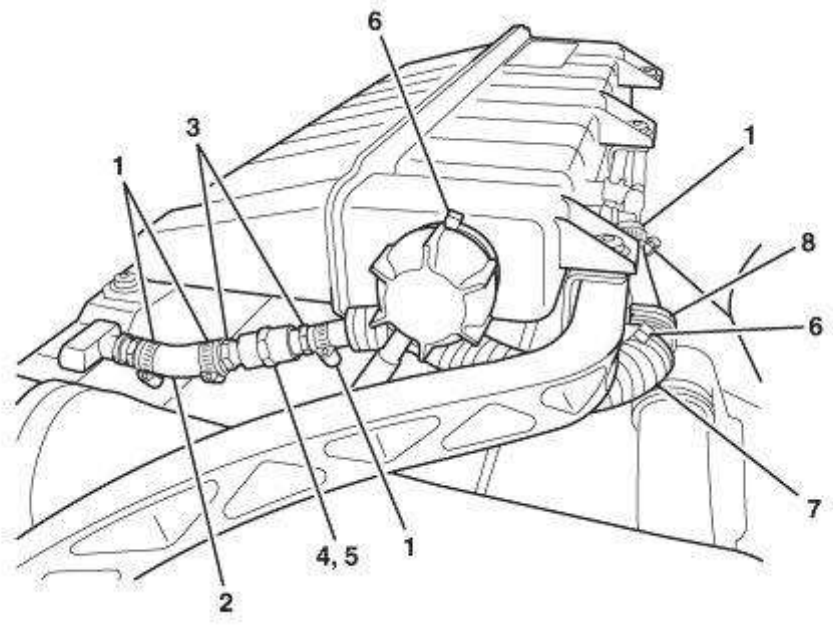
Case description

On certain CXU, CHU and GU model chassis, coolant may be seen draining from the surge tank pressure cap overflow hose. This condition can be caused by the volume of coolant flowing into the left-hand side of the surge tank not flowing to the right-hand side of the tank at a fast enough rate. To correct this condition, a locally fabricated ball-check valve must be installed in the deaeration line between the radiator upper tank and the surge tank.

Parts

Parts required are as follows

Ball-Check Valve Assembly (CHU with Current Surge Tank Mounting Arrangement Shown)



Key	Qty.	Part number	Description
1	4	25106045	Clamp, hose
2	-	8077449	Hose, length required depends upon chassis model
3	2	25176564	Fitting, threaded hose
4	1	25084590	Fitting, connector, brass

5	1	21289024	Check ball, brass
6	2	25164660	Tie wrap
7	1	796AX12F	Protective conduit, length required depends upon chassis model
8	1	25089412	P-clamp
-	1	21289031	Label, “FULL COLD MAX LEVEL” (not shown in view above), CHU and GU models with current surge tank mounting arrangement, and all CXU models
	1	21289027	Label, “FULL COLD MAX LEVEL” (not shown in view above), CHU and GU models with previous surge tank mounting arrangement

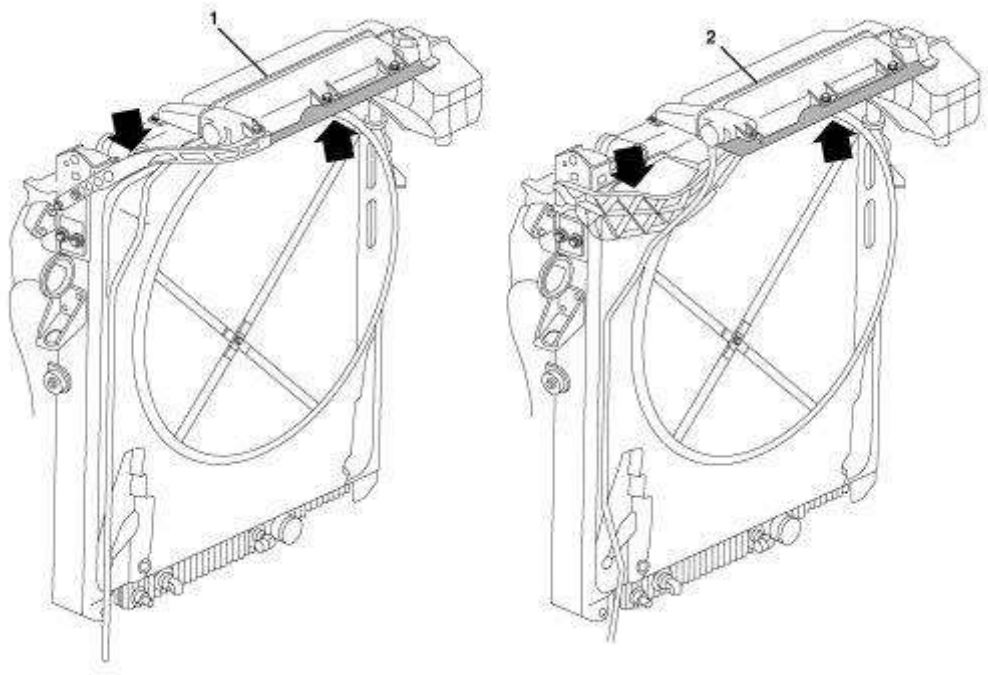
In addition to the parts listed above, the following hardware will be required for CHU and GU models having the previous surge tank mounting arrangement (a description of the current and previous surge tank mounting arrangements follows):

Qty.	Part number	Description
1	946440	Bolt
1	955782	Nut

Repair

On CHU and GU models, a revised surge tank mounting arrangement was implemented into production on September 10, 2007 (refer to service bulletin SB232039). The differences between the two mounting arrangements are shown in the following illustration.

Current and Previous Surge Tank Mounting Arrangement — CHU and GU Models



1. Current Arrangement (September 10, 2007 and Later)	2. Previous Arrangement (Prior to September 10, 2007)

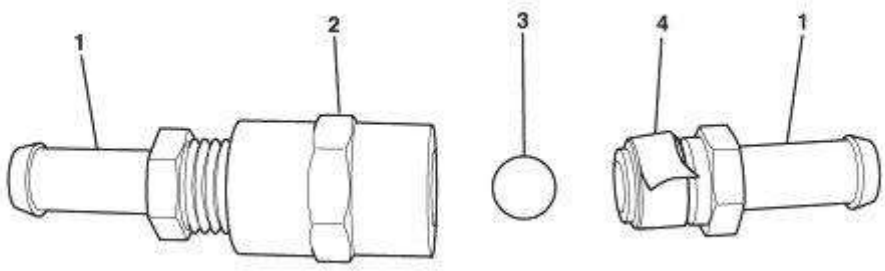
The current surge tank mounting arrangement on CHU and GU models utilizes a slender, curved aluminum bracket to support the left-hand side of the surge tank, whereas the previous arrangement uses a heavier aluminum bracket (as shown in the illustration above). The differences between the two mounting arrangements affects the way the ball-check valve assembly is secured on these two models. For all models (CXU, CHU and GU), assemble the ball-check valve assembly as outlined below. To install the ball-check valve assembly, refer to the applicable instructions for the vehicle being serviced.

Note: The previous surge tank mounting arrangement has been terminated and superseded in the MACK Parts System. Because of this, it is possible that a chassis manufactured prior to September 10, 2007 may be equipped with the current surge tank mounting arrangement.

Ball-Check Valve Assembly

1. Wrap approximately three layers of Teflon® tape around the threaded end of two threaded hose fittings (part number 25176564).
2. Assemble one of the threaded hose fittings into a connector fitting (part number 25084590) and tighten.
3. Place a brass check ball (part number 21289024) into the connector fitting, and then assemble the second threaded hose fitting to the connector fitting.

Ball-Check Valve Assembly

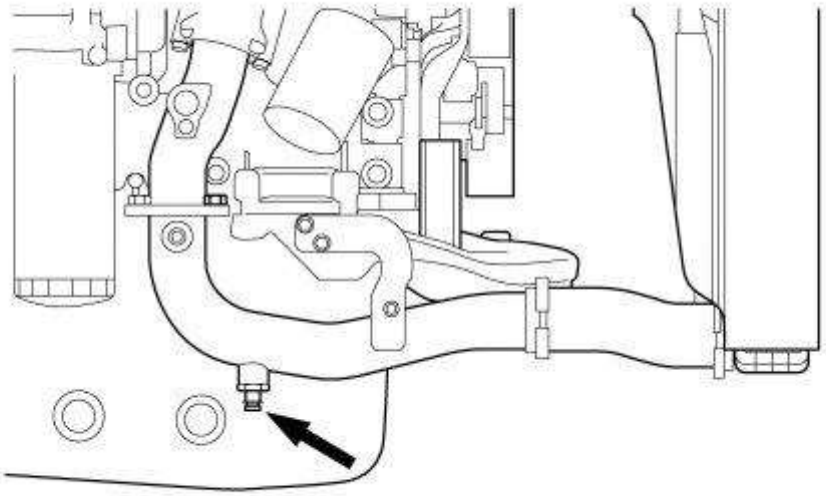


1. Threaded Hose Fitting (part number 25176564)	3. Check Ball (part number 21289024)
2. Connector Fitting (part number 25084590)	4. Teflon® Tape

Ball-Check Valve Installation — CHU and GU Models with Current Surge Tank Mounting Arrangement

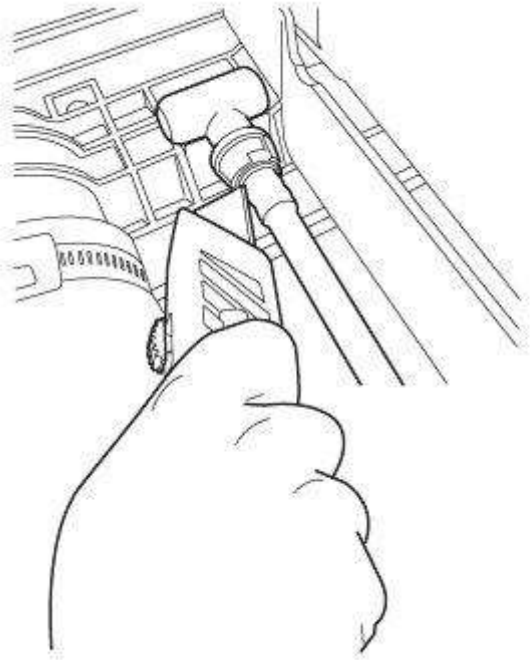
1. Secure the chassis for service, apply the parking brakes and block the wheels to prevent the vehicle from moving.
2. Using the coolant extractor (tool No. 2815-2V700), drain the coolant from the system. The quick connect fitting for the extractor on CHU and GU models is located in the lower radiator tube. If a coolant extractor is not available, use a drain hose (tool No. 9996049) to drain the coolant into a suitable container. Cover the container to prevent dirt and other contaminants from entering, as the same coolant will be used to refill the system when the repair is competed.

Coolant Drain Quick-Connect Fitting



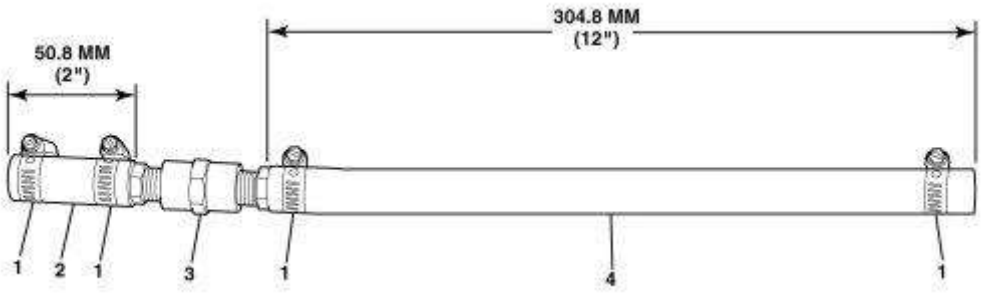
3. Using a sharp utility knife, carefully cut the end of the plastic tubing from each of the quick-connect fittings on the line between the left-hand port of the surge tank and the port located in the upper radiator tank. Use care not to cut into the barbed ends of the quick-connect fitting, as the ball-check valve assembly will be connected to these barbed ends and secured with hose clamps.

Cut Tubing from Quick-Connect Fitting



4. Cut two lengths of hose (part number 8077449) to the following lengths:
    - One hose section — 50.8 mm (2″) long
    - Second hose section — 304.8 mm (12″) long
5. Slide each hose section onto the ends of the fabricated ball-check valve assembly.
6. Slide four hose clamps (part number 25106045) over each of the hoses (two clamps per hose).

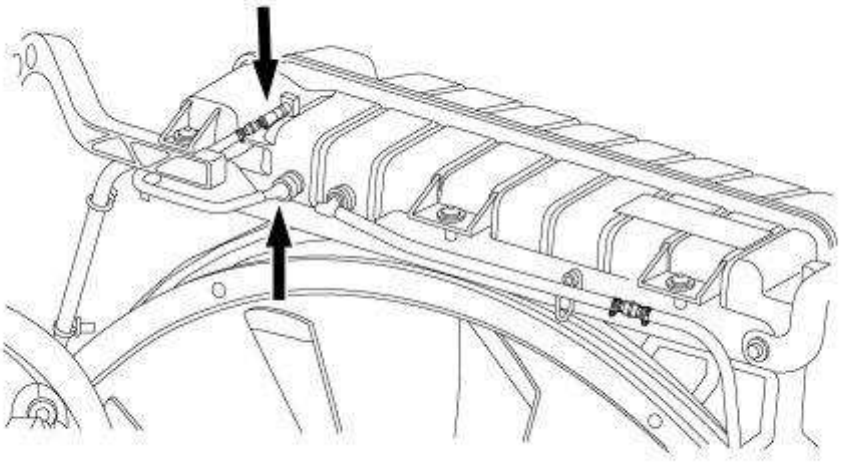
Ball-Check Valve Assembly



1. Clamp, Hose (part number 25106045)	3. Ball-Check Valve Assembly
2. Hose, 50.8 mm (2″) long, (part number 8077449)	4. Hose, 304.8 mm (12″) long, (part number 8077449)

7. Connect the ball-check valve assembly to the radiator and surge tank as follows:

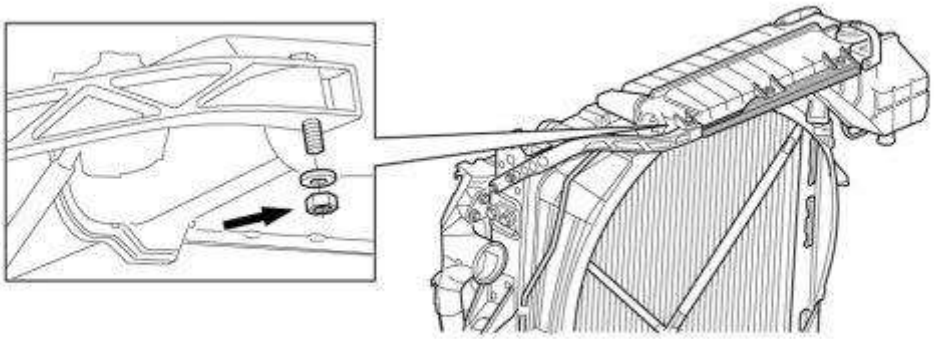
Connecting Ball-Check Assembly



   a. Connect the short hose to the straight fitting (part number 20850966) in the radiator
   b. Connect the long hose to the 90-degree elbow fitting (part number 20850964) in the surge tank.

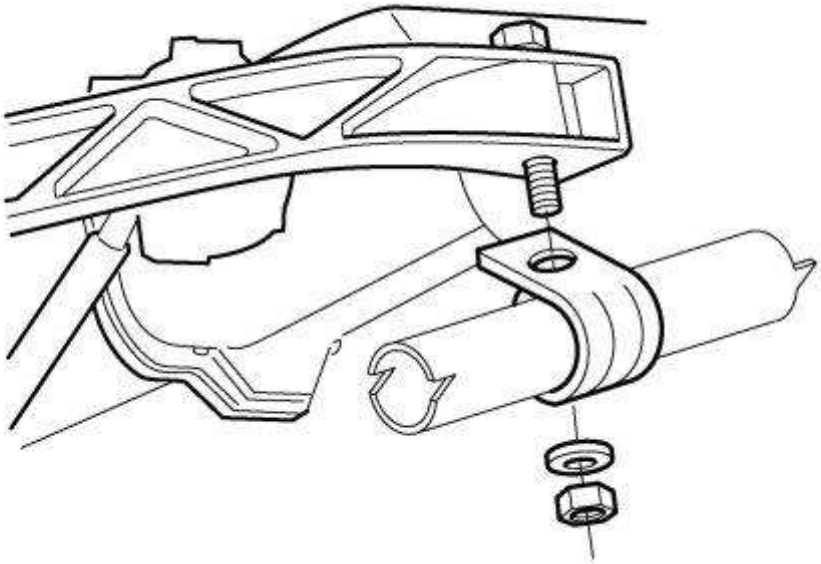
8. Remove the nut from the Torx® fastener which secures the surge tank to the aluminum bracket.

Remove Nut from Surge Tank Mounting Bracket Fastener



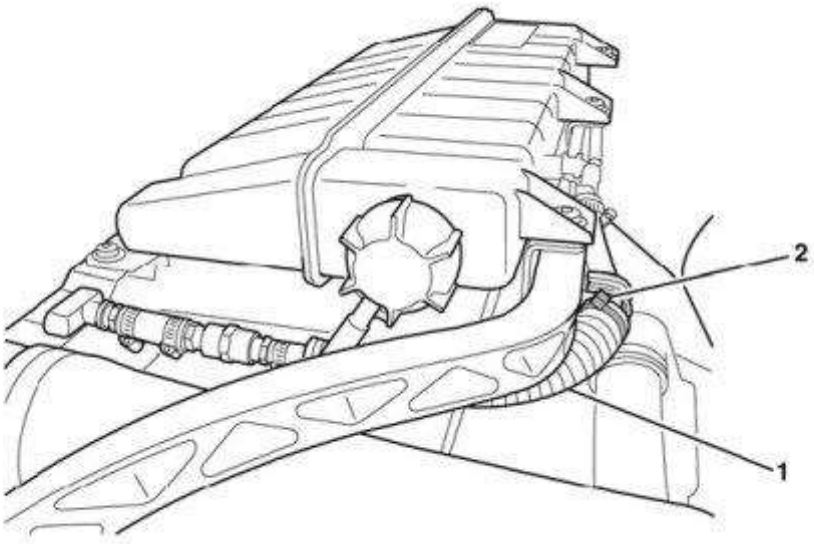
9. Using a P-clamp (part number 25089412), secure the ball-check valve hose to the surge tank mounting bracket fastener by sliding the clamp onto the Torx® fastener and reinstalling the nut.

Secure Ball-Check Valve Assembly to Surge Tank Mounting Bracket



10. Install a 6″ length of protective conduit (part number 796AX12F) around the long length of hose to prevent chaffing against the aluminum bracket. Use two tie wraps (part number 25164660) to secure the protective conduit to the hose.

Install Protective Conduit

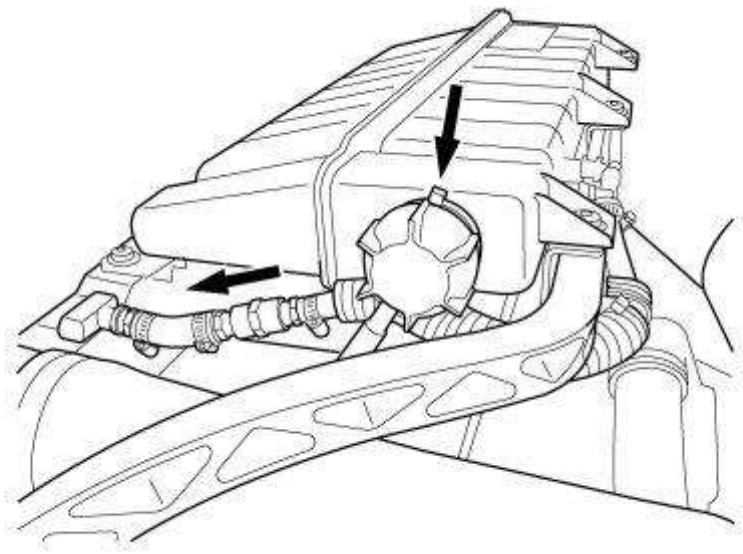


1. Protective Conduit (part number 796AX12F)	2. Tie Wrap (part number 25164660)

11. Tighten the four hose clamps to 3.1 N•m (27.5 lb-in).
12. Secure the ball-check assembly so that it slopes slightly downward toward the upper radiator tank by wrapping a tie wrap (part number 25164660) around the hose and the pressure cap fill neck on the surge tank.

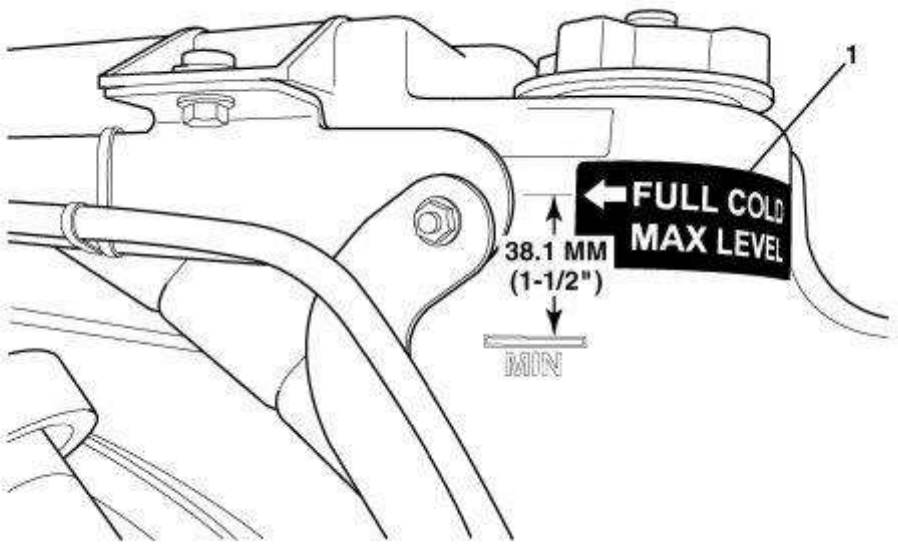
Note: It is important that the ball-check assembly slopes slightly downward toward the upper radiator tank. If not, the valve will not function properly.

Securing Ball-Check Valve Assembly to Slope Downward Toward Upper Radiator Tank



13. Using a black waterproof marker (such as a Sharpie®), mark a 76.2 mm (3″) horizontal line on the surge tank, 38.1 mm (1-1/2″) up from the “MIN” line on the surge tank. This black line becomes the new COLD MAX fill line.
14. Install the “FULL COLD MAX LEVEL” label (part number 21289031) on the surge tank mounting bracket with the arrow on the label pointing at the new COLD fill line.

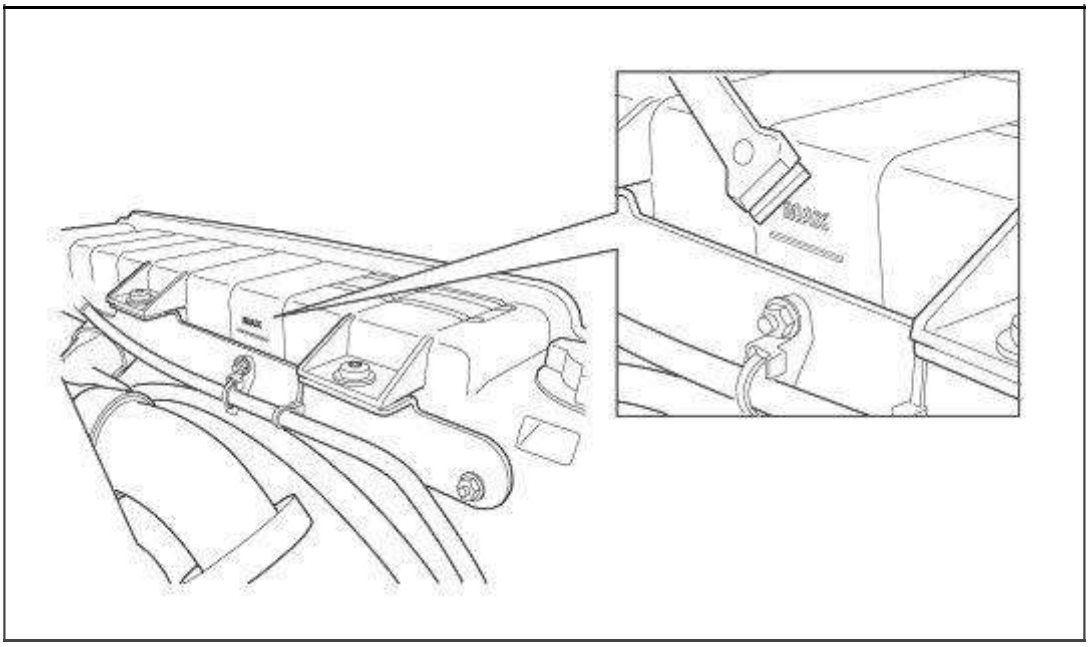
“FULL COLD MAX LEVEL” Label



1. Label, Full Cold Max Level (part number 21289031)

15. Using a suitable razor blade scraper, remove the word “MAX” and the fill line from the surge tank.

Remove “MAX” and the Fill Line from the Surge Tank

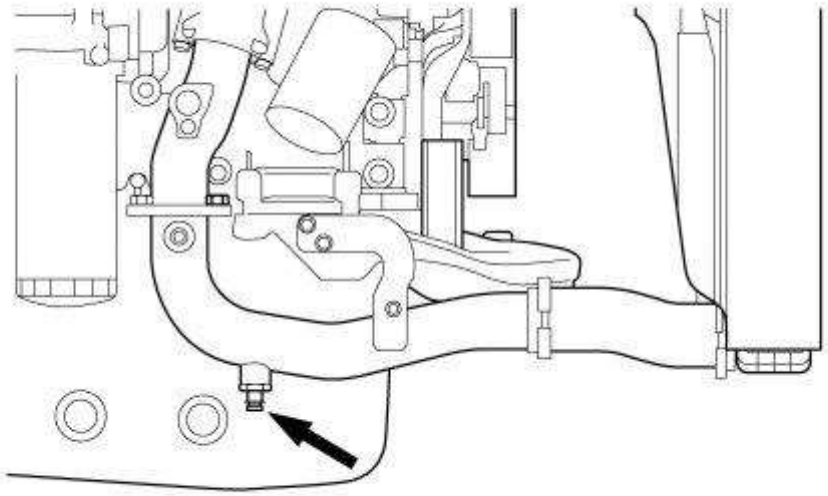


16. Using the coolant extractor, refill the cooling system. If the system was drained using the drain hose, refill the cooling system through the surge tank fill cap, using the same coolant that was drained originally.
17. Add enough approved coolant to the surge tank to bring the level up to the new COLD FULL level mark on the surge tank.
18. Start the engine and check for coolant leaks. Allow the engine to idle until normal operating temperature is achieved, and then stop the engine. Recheck the coolant level in the surge tank.

Ball-Check Valve Installation — CHU and GU Models with Previous Surge Tank Mounting Arrangement

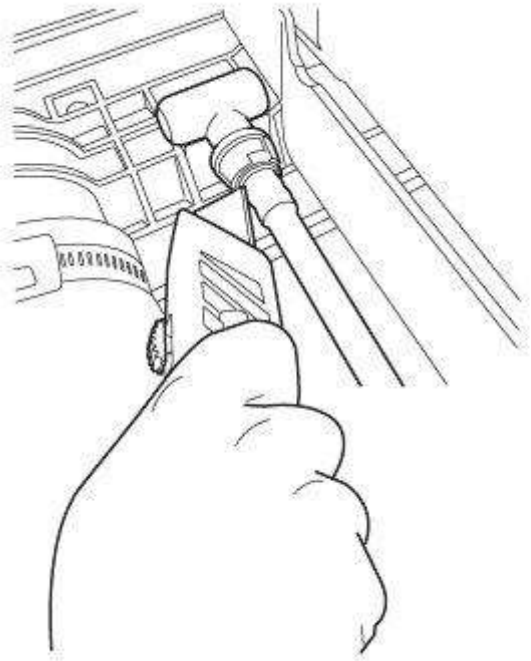
1. Secure the chassis for service, apply the parking brakes and block the wheels to prevent the vehicle from moving.
2. Using the coolant extractor (tool No. 2815-2V700), drain the coolant from the system. The quick connect fitting for the extractor on CHU and GU models is located in the lower radiator tube. If a coolant extractor is not available, use a drain hose (tool No. 9996049) to drain the coolant into a suitable container. Cover the container to prevent dirt and other contaminants from entering, as the same coolant will be used to refill the system when the repair is competed.

Coolant Drain Quick-Connect Fitting in Lower Radiator Tube



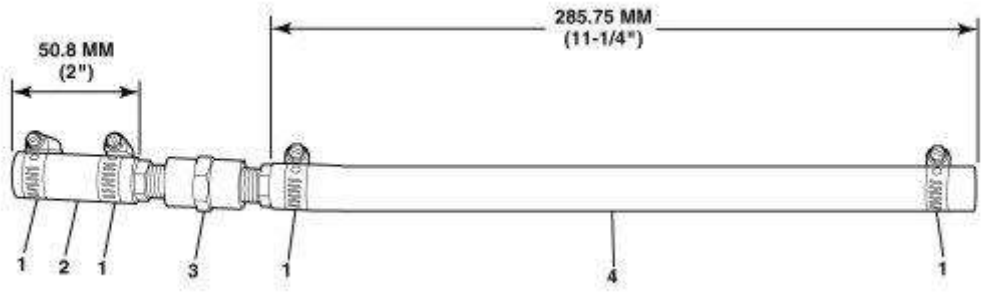
3. Using a sharp utility knife, carefully cut the end of the plastic tubing from each of the quick-connect fittings on the line that runs between the left-hand port of the surge tank and the port located in the upper radiator tank. Use care not to cut into the barbed ends of the quick-connect fitting.

Cut Tubing from Quick-Connect Fitting



4. Cut two lengths of hose (part number 8077449) to the following lengths:
    - One hose section — 50.8 mm (2″) long
    - Second hose section — 285.75 mm (11-1/4″) long
5. Assemble each hose to the ends of the fabricated ball-check valve assembly
6. Slide four hose clamps (part number 25106045) onto each of the hoses (two clamps per hose).

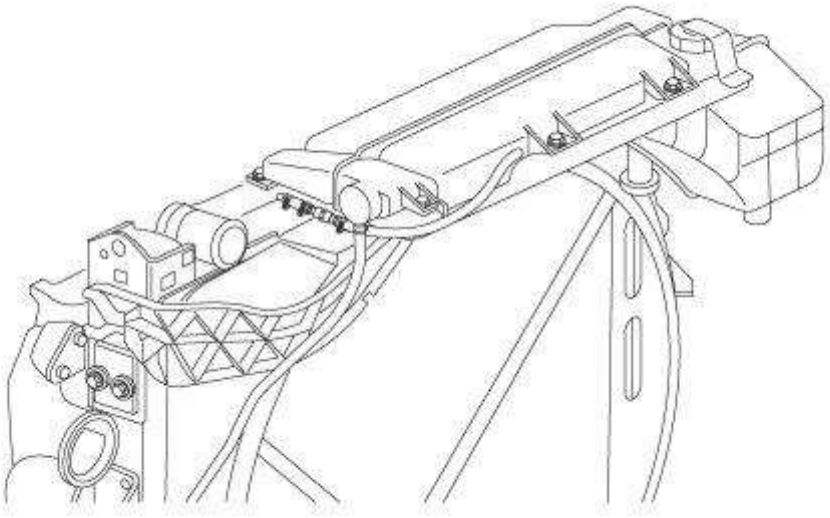
Ball-Check Valve Assembly



1. Clamp, Hose (part number 25106045)	3. Ball-Check Valve Assembly
22. Hose, 50.8 mm (2″) long, (part number 8077449)	4. Hose, 285.75 mm (11-1/4″) long, (part number 8077449)

7. Connect the ball-check valve assembly to the radiator and surge tank as follows:

Connecting Ball-Check Assembly

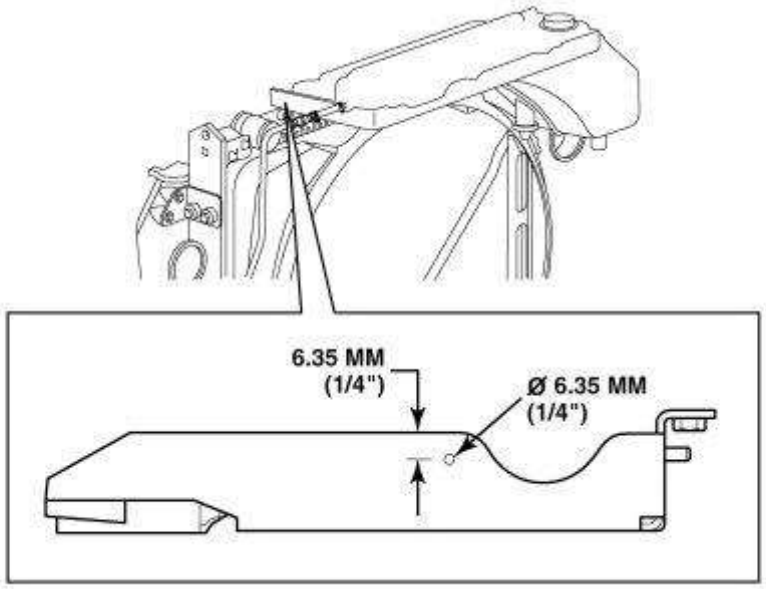


   a. Connect the short hose to the straight fitting (part number 20850966) in the radiator.

   b. Connect the long hose to the 90-degree elbow fitting (part number 20850964) in the surge tank.

8. Drill a 6.35 mm (1/4″) hole in the surge tank mounting bracket, approximately 6.35 mm (1/4″) below the top edge of the bracket, just to the left of the surge tank pressure cap.

Drilling Location in Surge Tank Mounting Bracket

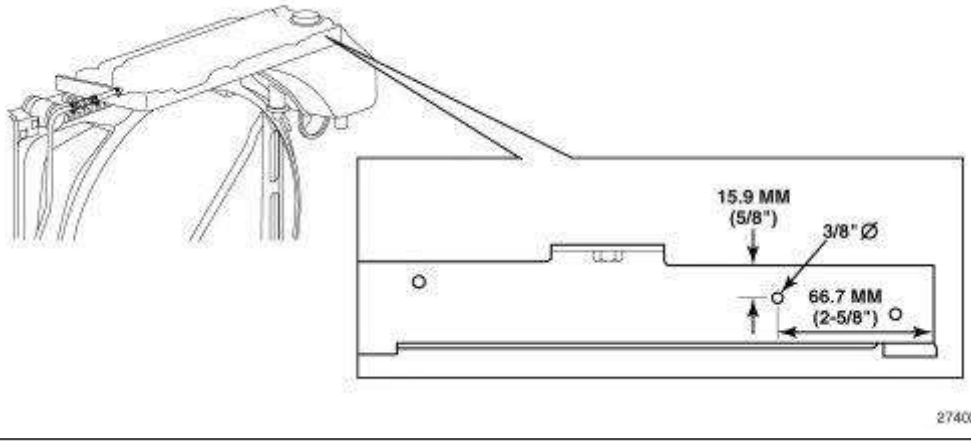


9. Using a P-clamp (part number 25089412), bolt (part number 946440), and nut (part number 955782), secure the ball-check valve and hose assembly to the surge tank mounting bracket.

   Note: It is important that the ball-check valve assembly slopes slightly downward toward the upper radiator tank. If not, the valve will not function properly.

10. Tighten the four hose clamps to 3.1 N•m (27.5 lb-in).
11. Install a 101.6 mm (4″) length of protective conduit (part number 796AX12F) around the ball-check valve hose where it is routed underneath the surge tank pressure cap. Use two tie wraps (part number 25164660) to secure the conduit to the hose.
12. Mark a location on the rear face of the surge tank mounting bracket 15.9 mm (5/8″) from the top edge of the bracket and 66.7 mm (2-5/8″) from the right-hand side of the bracket as shown in the following illustration.

Mark Drilling Location on Rear Face of Surge Tank Mounting Bracket

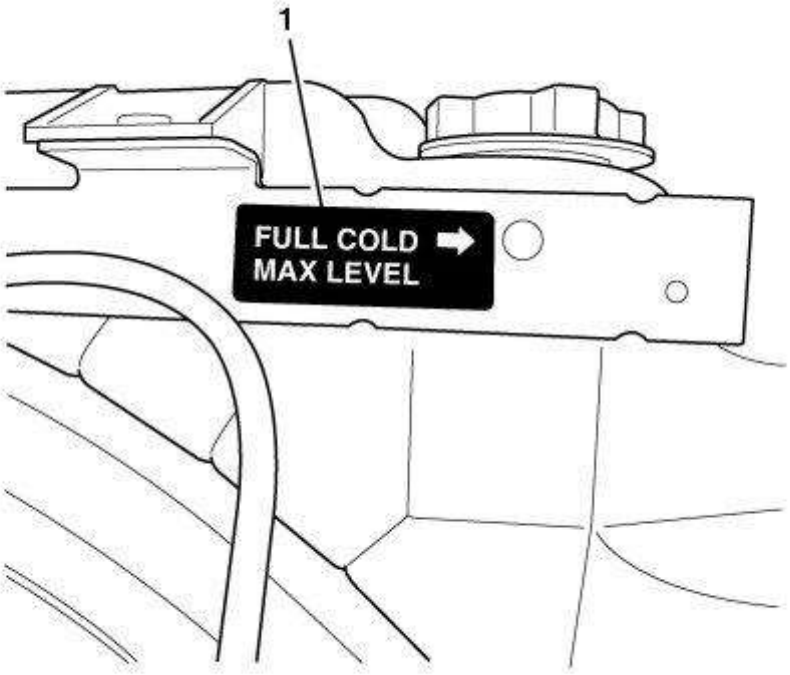


13. Center punch the marked location, and then drill a 3/8″ hole through the bracket.

    Note: To avoid damaging the surge tank, place a piece of steel flat stock between the bracket and surge tank before drilling the hole.

14. Install the “FULL COLD MAX LEVEL” label (part number 21289027) on the bracket next to the 3/8″ hole, with the arrow on the label aligned with the horizontal centerline of the hole. This becomes the new COLD FULL level.

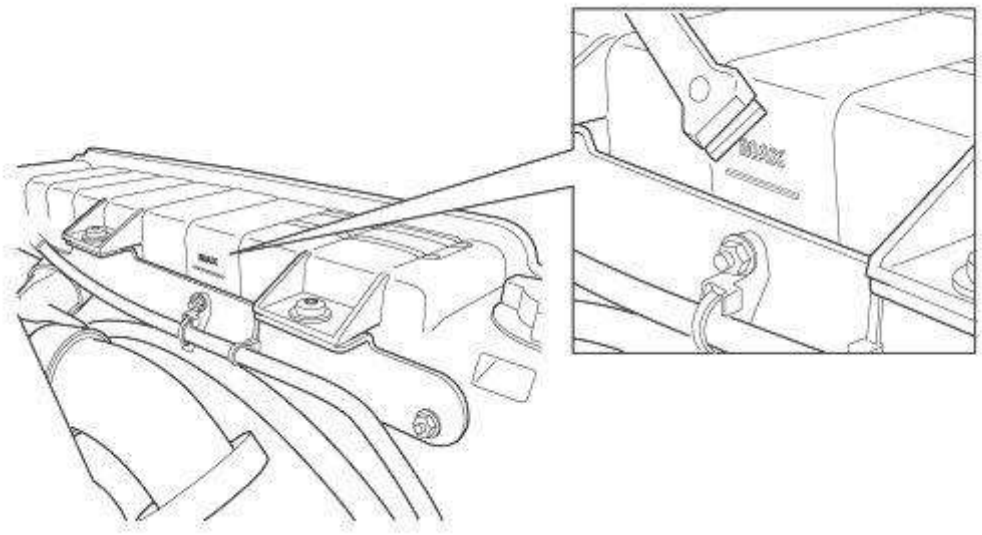
“FULL COLD MAX LEVEL” Label



1. Label, Full Cold Max Level (part number 21289027)

15. Using a suitable razor blade scraper, remove the word “MAX” and the fill line from the surge tank.

Remove “MAX” and the Fill Line from the Surge Tank

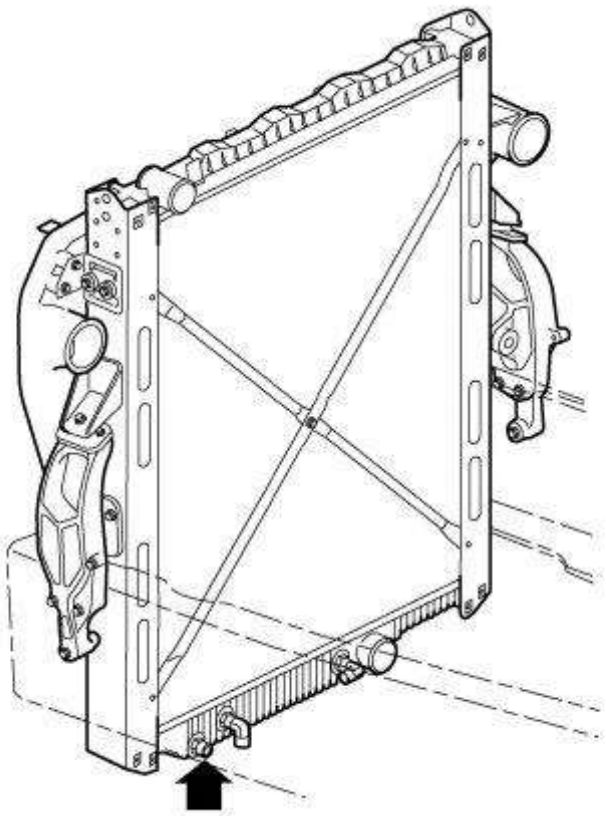


16. Using the coolant extractor, refill the cooling system. If the system was drained using the drain hose, refill the cooling system through the surge tank fill cap, using the same coolant that was drained originally.
17. Add additional approved coolant to the surge tank until coolant is visible inside the 3/8″ hole in the surge tank mounting bracket.
18. Start the engine and check for coolant leaks. Allow the engine to idle until normal operating temperature is achieved, and then stop the engine. Recheck the coolant level in the surge tank.

Ball-Check Valve Installation — CXU

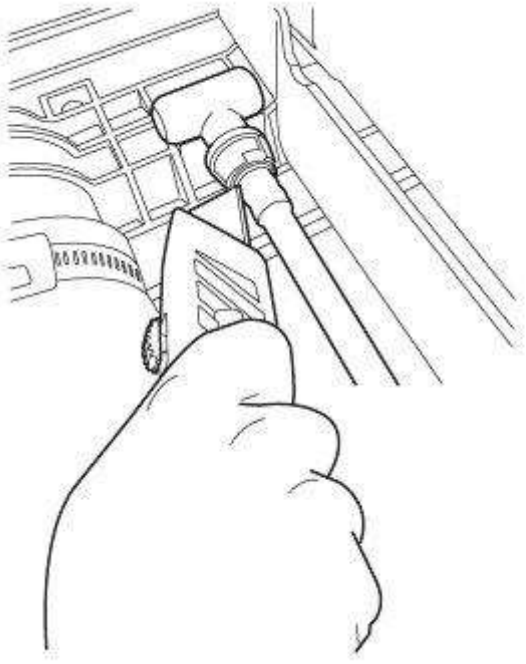
1. Secure the chassis for service, apply the parking brakes and block the wheels to prevent the vehicle from moving.
2. Using the coolant extractor (tool No. 2815-2V700), drain the coolant from the system. The quick connect fitting for the extractor on CXU models is located in the lower radiator tank. If a coolant extractor is not available, use a drain hose (tool No. 9996049) to drain the coolant into a suitable container. Cover the container to prevent dirt and other contaminants from entering, as the same coolant will be used to refill the system when the repair is completed.

Coolant Drain Quick-Connect Fitting



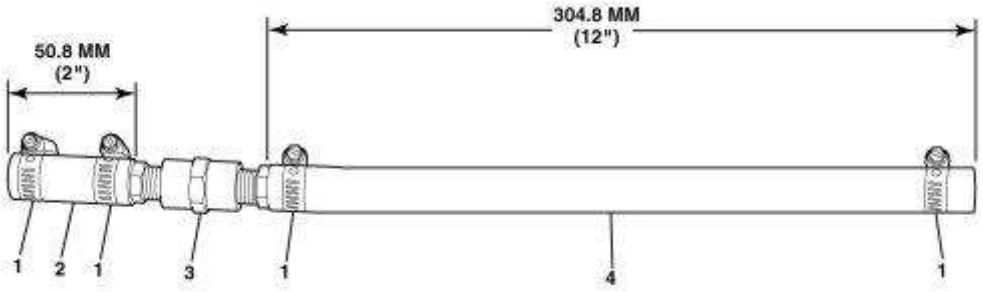
3. Using a sharp utility knife, carefully cut the end of the plastic tubing from each of the quick-connect fittings on the line between the left-hand port of the surge tank and the port located in the upper radiator tank. Use care not to cut into the barbed ends of the quick-connect fitting, as the ball-check valve assembly will be connected to these barbed ends and secured with hose clamps.

Cut Tubing from Quick-Connect Fitting



4. Cut two lengths of hose (part number 8077449) to the following lengths:
   - One hose section — 50.8 mm (2″) long
   - Second hose section — 304.8 mm (12″) long
5. Assemble each hose to the ends of the fabricated ball-check valve assembly.
6. Slide four hose clamps (part number 25106045) over each of the hoses (two clamps per hose).

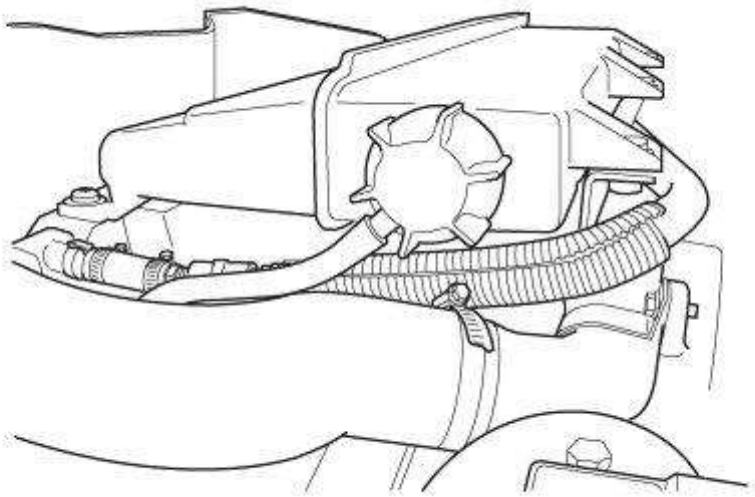
Ball-Check Valve Assembly



1. Clamp, Hose, (part number 25106045)	3. Ball-Check Valve Assembly
2. Hose, 50.8 mm (2″) long, (part number 8077449)	4. Hose, 304.8 mm (12″) long, (part number 8077449)

7. Connect the ball-check valve assembly to the radiator and surge tank as follows:

Connecting Ball-Check Assembly

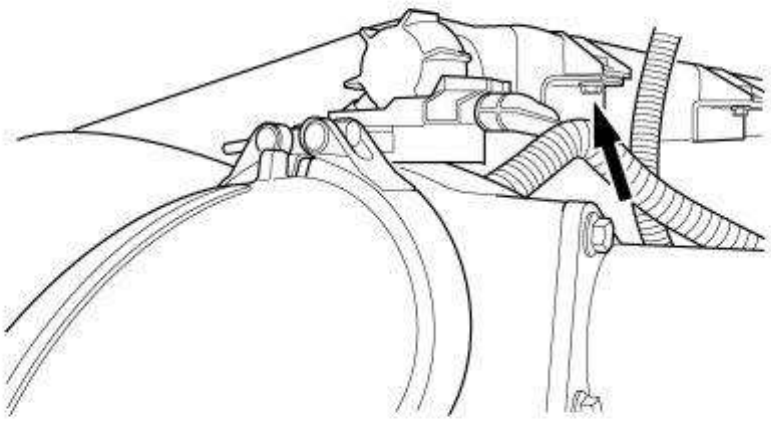


a. Connect the short hose to the straight fitting (part number 20850966) in the radiator.

b. Connect the long hose to the 90-degree elbow fitting (part number 20850964) in the surge tank.

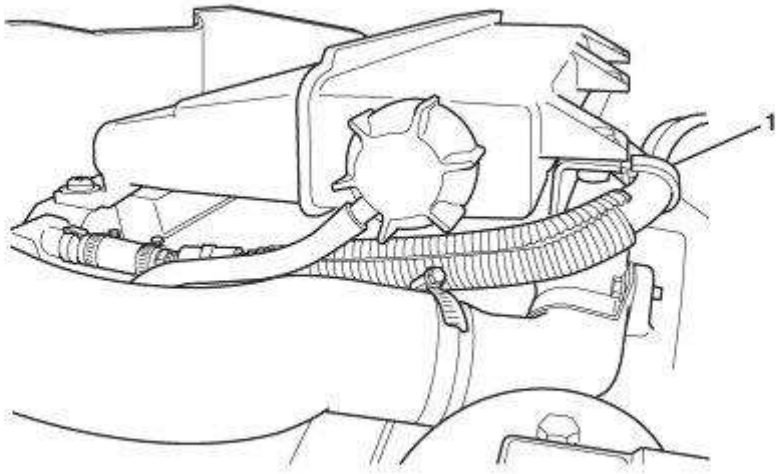
8. Remove the nut from the Torx® fastener which secures the surge tank to the mounting bracket.

Remove Nut from Surge Tank Mounting Bracket Fastener



9. Using a P-clamp (part number 25089412), secure the ball-check valve hose to the surge tank mounting bracket fastener by sliding the clamp onto the Torx® fastener and reinstalling the nut.

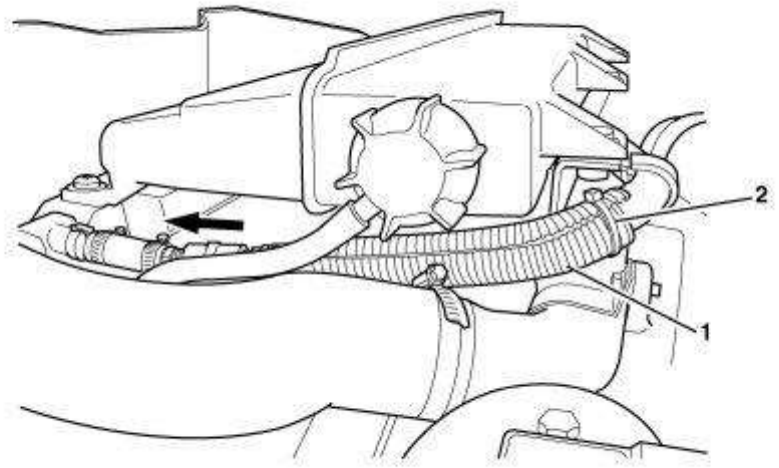
Secure Ball-Check Valve Assembly to Surge Tank Mounting Bracket



1. P-Clamp (part number 25089412)

10. Install a 152.4 mm (6″) length of protective conduit (part number 796AX12F) around the long length of hose to prevent chaffing against the aluminum bracket. Use two tie wraps (part number 25164660) to secure the protective conduit to the hose.

Install Protective Conduit

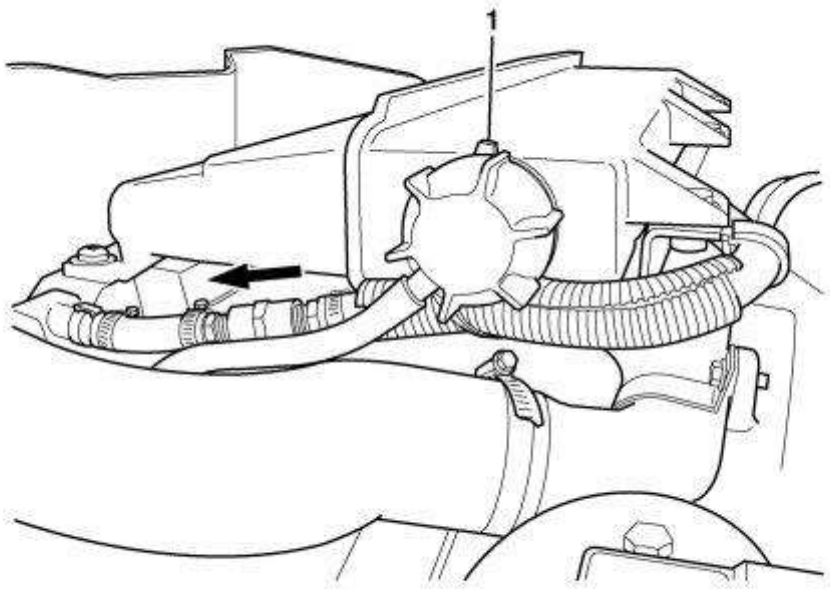


1. Protective Conduit (part number 796AX12F)	2. Tie Wraps (part number 25164660)

11. Tighten the four hose clamps to 3.1 N•m (27.5 lb-in).
12. Secure the ball-check assembly so that it slopes slightly downward toward the upper radiator tank by wrapping a tie wrap (part number 25164660) around the hose and the pressure cap fill neck on the surge tank.

    Note: It is important that the ball-check assembly slopes slightly downward toward the upper radiator tank. If not, the valve will not function properly.

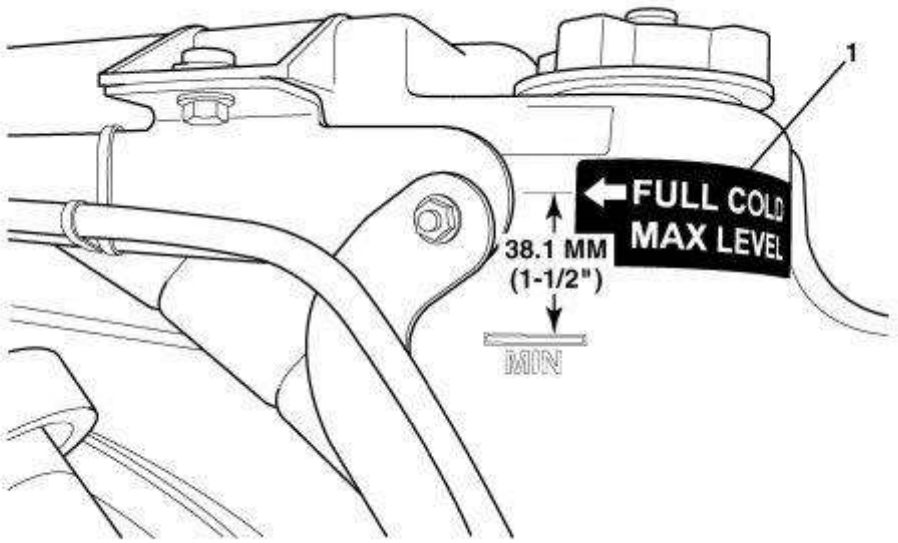
Securing Ball-Check Valve Assembly to Slope Downward Toward Upper Radiator Tank



1. Tie Wrap (part number 25164660)

13. Using a black waterproof marker (such as a Sharpie®), mark a 76.2 mm (3″) horizontal line on the surge tank, 38.1 mm (1-1/2″) up from the “MIN” line on the surge tank. This black line becomes the new COLD MAX fill line.
14. Install the “FULL COLD MAX LEVEL” label (part number 21289031) on the surge tank mounting bracket with the arrow on the label pointing at the new COLD fill line.

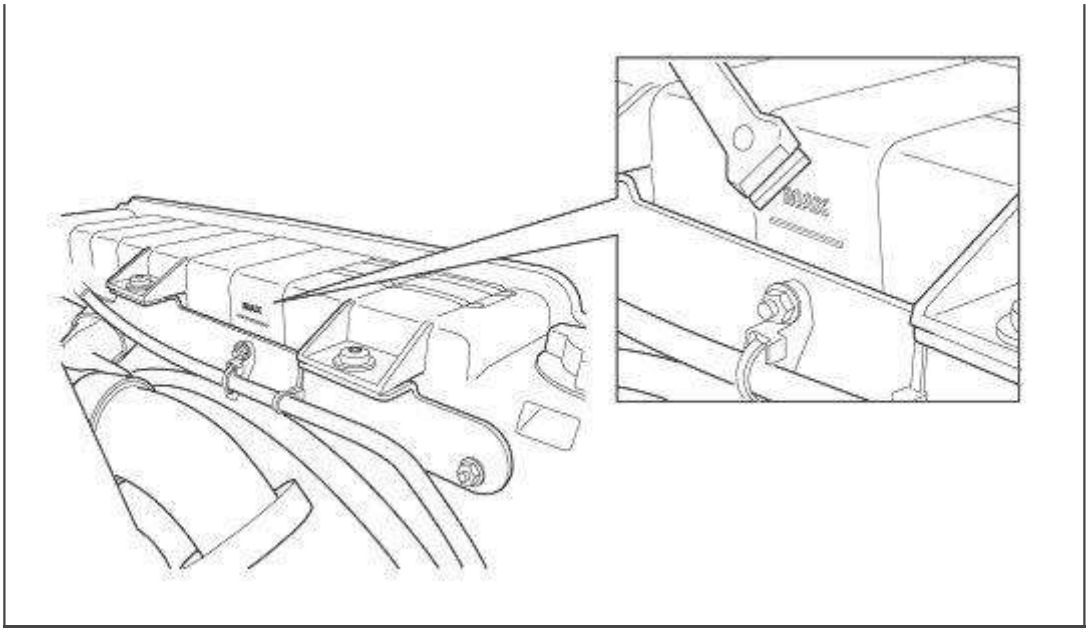
“FULL COLD MAX LEVEL” Label



1.Label, Full Cold Max Level (part number 21289031)

15. Using a suitable razor blade scraper, remove the word “MAX” and the fill line from the surge tank.

Remove “MAX” and the Fill Line from the Surge Tank



16. Using the coolant extractor, refill the cooling system. If the system was drained using the drain hose, refill the cooling system through the surge tank fill cap, using the same coolant that was drained originally.
17. Add enough approved coolant to the surge tank to bring the level up to the new COLD FULL level line in the surge tank.
18. Start the engine and check for coolant leaks. Allow the engine to idle until normal operating temperature is achieved, and then stop the engine. Recheck the coolant level in the surge tank.

Warranty information

Reimbursement

This Repair may be eligible for reimbursement if a product failure was experienced within the time and mileage limits of the applicable warranty coverage. Reimbursement is obtained via normal claim handling process.	
Claim Type (used only when uploading from the Dealer Bus. Sys.)	01
Labour Code	
Primary Labor Code	232-6A 00 80 — 0.4 hr., time allowed to install surge tank check valve on CHU and GU models with current surge tank mounting arrangement and all CXU models. Does not include “take-charge” time.
	232 6B 00 80 — 0.5 hr., time allowed to install surge tank check valve on CHU and GU models with previous surge tank mounting arrangement. Does not include “take-charge” time.
Causal Part	

Issued by

Technical Service

Mack Trucks, Inc. engages in a continuous program of testing and evaluating to provide the best possible product. Mack Trucks, Inc., however, is not committed to, or liable for updating existing chassis.