

LACMTA: Air Compressor Suction Line Rework

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Property and Top Bus Number: LA 45CLFW, 218000, 269000



Issue: The air compressor is pumping oil into the air system.

Reason/ cause: The air compressor on the earlier Metro 45 CLFW fleet is naturally aspirated. During Q1 2010, Cummins and WABCO recommended modifying LA Metro bus fleet from naturally aspirated air to boosted air from the engine turbocharger for the purpose of improving the air compressor durability.

With the naturally aspirated air plumbing, the duty cycle and air compressor head temperatures on the 45CLFW fleet were found to be relatively high in certain operating conditions. Secondary, the lack of pressure above the pistons during the suction cycle lets oil pass through the piston rings. With this condition, oil may enter into to the air system.

Solution: This work instruction will convert the engine mounted air compressor to turbo-charged (boosted) air supply to reduce the duty cycle of the air compressor and help prevent the passage of oil into the air system.

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Number of affected buses: 301

Estimate repair hours/bus: 3 hours

Necessary parts:

Hump Hose, 4"IDx6", silicone,

Part #: **416.06.1530.912**,

1 / bus,



Clamps, constant torque, 4" ID,

Part #: **416.06-1530-916**,

2 / bus,

Plug, 1",

Part #: **10A-1355-007**,

1 / bus,

Hose, silicone, 1"ID, 4-ply, 144"L

Part #: **605-1375-013**,

as required,

Turbo Protection Valve Kit,

Graham White: **CKX5**

1 / bus,

Thread sealer,

Part #: **NPN**,

as required.

Necessary tools:

Regular hand tools (sockets, wrenches, etc.), 1 - 1-3/8 wrenches (for removing/installing fittings).



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SAFETY PRECAUTIONS MUST BE FOLLOWED ACCORDING TO ACCEPTED INDUSTRY STANDARDS AND LOCAL/PROPERTY REQUIREMENTS.

1. Park the bus and apply the parking brake.
2. Turn off main battery disconnect switch.
3. Open rear engine compartment access door.
4. Disconnect the air intake silicone elbow from the charge air cooler (CAC) pipe. Turn the elbow up and cover it to prevent from contamination.



5. Remove the engine hatch underneath the rear settee seats.
6. Disconnect silicone hose at the CAC pipe. Cover the exhaust port of the CAC to prevent from contamination.
7. Cut the CAC pipe 5" from the mounting clamp with a reciprocate saw.
8. Remove the two pieces of CAC pipes.



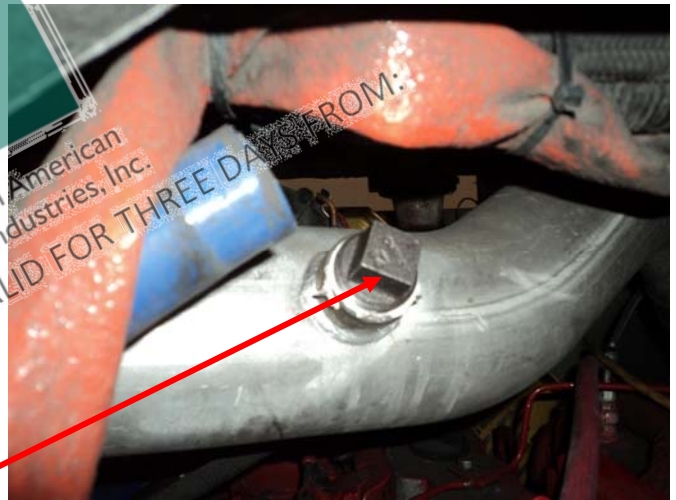
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9. Disconnect compressor suction hose from the air intake pipe.

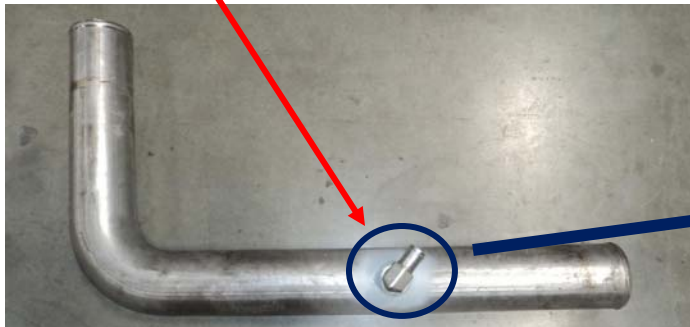


10. Remove fitting from the air intake pipe.



11. Install plug into the air intake pipe.

12. Install the 90° elbow fitting into the new engine side CAC pipe.



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13. Before installing the new CAC pipes, ensure that they are cleaned and free of contamination.
14. Install new CAC pipe piece into the silicone elbow at the engine intake side. Torque the clamps to 100 in-lb.



15. Install silicone hose at the CAC side. Torque the clamps to 100 in-lb.
16. Install silicone hose between the two CAC pipe pieces with clamps. Torque the clamp to 100 in-lb.



17. Secure the engine side CAC pipe with the original U-clamp to the original mounting bracket.

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18. Cut to fit the original compressor suction hose to the fitting on the engine side CAC pipe.
Replace hose if required.



19. Install clamp to the suction hose of the compressor hose and torqued it to 100 in-lb. Ensure that the hose is not kinked or rubbing.
20. Reinstall engine hatch underneath the rear settee seats.
21. Remove tools and unused parts from work area.
22. Clean out bus.

Installing Turbo Protection Valve on the Air Dryer

The turbo protection valve is required to be installed on the air dryer to protect the Cummins engine from boosted air power loss. Follow the instruction written in Graham White's official bulletin # RK CKX5 (see attached at the last page).



Conversion kit #CKX5

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After completing the rework on the air dryer:

23. Remove all the tools from work area.
24. Check for completeness of work.
25. Turn the main battery disconnect switch(es) on.
26. Start the bus and make sure that the air compressor is working correctly. Check for leaks.
27. Record bus number, date of repair and name of technician who completed the work.

PROPERTY OF:

North American
Bus Industries, Inc.
WHEN PRINTED VALID FOR THREE DAYS FROM:

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CONVERSION KIT X5 TURBO VALVE CKX5 FOR QBA15 AIR DRYER

BULLETIN: RK CKX5

EFFECTIVE: 9/4/08

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! WARNING !

DO NOT ATTEMPT TO SERVICE DRYER WHILE DRYER IS PRESSURIZED. COMPRESSED AIR CONTAINS HIGH LEVELS OF STORED ENERGY. ANY ATTEMPT TO CONNECT OR SERVICE THIS PRODUCT WITH A SYSTEM THAT IS PRESSURIZED OR WITH ELECTRICAL POWER CONNECTED CAN LEAD TO SERIOUS PERSONAL INJURY. VENT ALL AIR PRESSURE AND SHUT OFF ALL ELECTRICAL POWER SUPPLY PRIOR TO INSTALLING OR ATTEMPTING TO SERVICE THE QBA15 AIR DRYER. NEVER CONNECT OR DISCONNECT A HOSE OR LINE THAT IS PRESSURIZED. NEVER REMOVE A COMPONENT OR PLUG UNLESS YOU ARE CERTAIN THAT ALL AIR PRESSURE HAS BEEN VENTED.

Conversion Instructions:

- Remove existing retaining ring (A2) and end cap (A1) from diverter valve (A).
- Lubricate O-ring on new end cap (A1) and re-install in bore of valve. (A3) 1/4 fitting is threaded into new (A1) cap.
- Install new retaining ring, (A2), in the bore insuring that it is properly seated in groove.
- **Warning:** Retaining rings not properly seated can cause serious injury. Check all retaining rings before applying air pressure to assembly.
- Insert (B1) 1/4 tubing into (A3) 1/4 inch push connector that is threaded into the cap.

- Disconnect existing un-load air signal line tubing from Pre-filter body (C) and remove 1/4 fitting.
- Replace old fitting with 1/4 tubing & 1/4 NPT fitting (C1) in Pre-filter body (C) with pipe dope.
- Connect other end of (B1) tubing into (C1) and abandon old signal line properly. This may include a plug in the D-2 governor port on the other end.
- Remove with a 3/16" Allen the two existing, (C5), cap screws. Discard existing (C4) cap.
- Remove existing (C2) un-loader cartridge with use of pliers to pull out of body and discard.
- Lubricate O-ring on new (C2) un-loader cartridge and replace in bore. Place (C3) O-ring in (C4) un-loader cap. Replace (C4) un-loader cap with two (C5) new 3/16" Allen cap screws.
- Check for leaks and proper operation.

