



SERVICE BULLETIN

TOPIC: EXHAUST

NUMBER: 4-1304-A

SUPERSEDES:

DATE: MARCH 24, 2015

MODELS APPLICABLE TO: TEST METHOD:

- F-1/F-2 Combination D 2699, D 2700
- F-4 Supercharge D 909
- F-5 Cetane D613

ROUTE TO Distributor/End User

SUBJECT: EXHAUST BULLETIN SUPPLEMENT 4-1304A

Exhaust and Breather system safety alert

Based on feedback from the field regarding safety alert bulletin (4-1304), addressing Exhaust and Breather System safety concerns, CFR Engines Inc. is issuing the following supplement.

The original bulletin was released on August 2014 by GE based on a safety issue that occurred in the field. It is the intent of the safety bulletin to advise others of identified safety issues as well as the safety aspects that derived from it. In addition, there are suggested practices concerning setup and the materials used in the system as a result of the incident. Based on that, this bulletin is designed to add clarity to CFR Engines Inc. recommendations regarding setup and design.

CFR Engines Inc. recommends that its users follow the installation manual practices for setting up a unit within a facility. Specific layout of systems, specifications and materials currently noted within the manual or within this bulletin should be given full consideration when installing, updating system accessories and its potential effect on safety and performance.

With regards to materials used when installing the breather or the CFR Engine brand exhaust system, CFR Engines Inc. recommends the following:

- All piping for the breather and the surge tank exhaust system is recommended to be constructed, per the installation manual specifications (specific to each model), in a manner that provides a gas tight seal and allows all exhaust discharge to be evacuated to atmosphere efficiently. In addition, CFR Engines Inc. recommends the correct application and use of unions, or an adequate separation points in the breather circuit to provide a tight seal and also allow for maintenance of the circuit on an annual or as needed basis.
- Piping of the breather circuit into the exhaust stream is not recommended by CFR Engines Inc. Instead, it is recommended to be kept on its own dedicated circuit for safety, performance and for ease of troubleshooting.
- With regards to materials used in the piping of the CFR engine breather and



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surge tank exhaust system, CFR Engines Inc. recommends the use of steel piping, such as schedule 40 or equivalent that will withstand the typical exhaust temperatures seen from an internal combustion engine. Pipes should be assembled with a suitable sealant for the piping used, and should then be checked with a liquid leak detection agent such as Snoop or other suitable leak detection agent available to be sure joints are leak free.

- External Insulation material may be used to further wrap the exhaust surge tank itself to help further reduce noise and heat rejected from the unit.
- New gaskets should always be applied to the exhaust surge tank and associated exhaust system components when the system is dismantled for maintenance. Previously used gaskets will be compressed and may not offer a tight seal as required.
- Maintenance to the surge tank, cleaning and clearing of the tank itself or any piping going to atmosphere from the surge tank and to drain should take place every two years or as needed if a backpressure or blockage is identified. Regularly testing of piping connections should be performed to ensure all joints are sealed. Joints may loosen up from unit heating and cooling cycles over time and from maintenance to any piping in the circuit.
- If the exhaust stack is installed with a horizontal run through the side of a building structure to atmosphere, ensure that the vertical to horizontal transition is made with minimum amount of 45 degree elbows (suggested limit to no more than 2). A tight turn or a 90

degree elbow will result in a restriction which will affect breather and exhaust performance. A sweeping bend in the piping is acceptable, but care should be taken to inspect the pipe annually for any build-up of exhaust particulate that may cause blockage.

- If the unit is located in a climate where temperatures drops below 0°C (32°F) for extended time periods, it is highly suggested to plumb the breather exhaust vertically through the ceiling rather than through the wall. At freezing temperatures, exhaust condensate can build up inside the end of a horizontal pipe and freeze. This, in return, will create a blockage in the pipe resulting in excessive exhaust back pressure and potentially allow exhaust gases to get into the facility housing the unit. If you run your exhaust line horizontally, it is suggested to monitor back pressure on a regular basis. Back pressures levels indicated in the Operation and Maintenance manual (specific to each model) pertain only to the CFR surge tanks and exhaust assembly.
- The drain trap is recommended to be constructed of no more than 1 inch pipe with a sufficient height of at least 6 to 8 inches and a horizontal top length or at least 4 inches with a sufficient drop of piping to a floor drain. For further clarification from the previous bulletin, the drain pipe to the floor drain funnel or opening should be exposed to allow the operator to visually see the flow of the water in the system. Pipe larger than 1 inch can cause siphoning issues and may not allow the trap to be fully filled at all times to mitigate exhaust gases from entering the lab.



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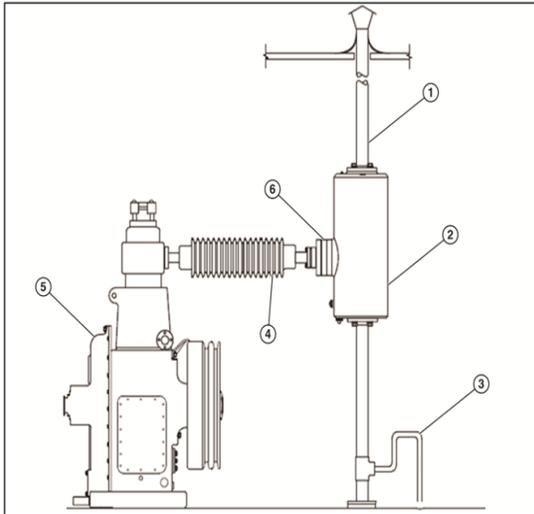


Figure 5: Proper Installation of the CFR Exhaust

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|------------------------------|---------------------------|
| 1 - 2 in. Pipe Stack | 4 - Flex Exhaust Manifold |
| 2 - Surge Tank | 5 - CFR Engine |
| 3 - Cooling Water Drain Trap | 6 - Spray Ring Assembly |

Aftermarket Components/ CFR Performance

CFR Engines Inc. recommends the use of the exhaust surge tank and its exhaust components as their design has been proven to perform with the rating of the CFR Unit as a whole, (if installed correctly with proper back pressure and resonance adhered to). New CFR Engines Units, and CFR genuine parts come with a one year warranty against defects and workmanship. The use of aftermarket components is the customer's choice, however, aftermarket parts outside of CFR Engine Inc.'s current offering are not covered under warranty. Consequential damage or any effect of the units rating performance that is determined to be related to aftermarket parts is also not warrantable under the CFR Engines Inc. Warranty Policy. CFR Engines Inc. takes no responsibility for adaptations of aftermarket equipment and or modifications outside of standard equipment as offered by CFR Engines Inc.

All safety systems as supplied by CFR Engines Inc. need to be in good working order and should be tested bi-monthly or monthly to confirm they are functioning to manufacturers recommendations listed in the respective Operational and

Maintenance manual (includes oil pressure shut down and the high jacket temperature shutdown capillary or RTD (XCP) on the coolant condenser).

- **OIL PRESSURE SHUTDOWN CHECK** - With the engine running the oil pressure regulator adjusting screw should be adjusted to drop the pressure below 18-20 PSI. The engine should shut down once below this point.
- **COOLANT CONDENSER CAPILLARY (Legacy Panel) or RTD (XCP) SHUTDOWN CHECK.** With the engine running, turn the water off using the manual valve that supplies the water to the unit. Once the capillary reaches approximately 160-175 degrees at the RTD or Capillary the unit should shutdown. It is normal to see steam coming from the relief hole in the riser vent when this happens.
- **SAFETY SHUTDOWN SWITCH or Optional Customer Safety Shutdown** (Red Mushroom button on Panel front- newer legacy and XCP panels) - Safety shutdown switch, when enabled, should shut down the unit.

For additional questions or concerns please contact your local CFR Distributor

Questions or concerns contact Dan Bemis at daniel.bemis@cfrengines.com.