



CNG Field Service Bulletin

OMB ESA Cylinder Valve Repair:

Solenoid Coil Replacement

PRD Replacement

ENP-604

Rev. A: August 29, 2018

Introduction by Agility Fuel Solutions

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There are two procedures in this bulletin:

- 1) Removing and replacing an OMB ESA cylinder valve coil
- 2) Installing a pressure relief device (PRD) into an OMB ESA cylinder valve

Procedure 1: Removing and replacing an OMB ESA cylinder valve coil

Under some circumstances, removing and replacing the solenoid valve coil does not require depressurization or defueling.

If the solenoid valve cannot be opened when voltage is applied, the cylinder connected to the valve must be defueled.

Cylinder depressurization and defueling procedures are covered in the Agility Fuel Solutions publications, "Truck and Tractor CNG Fuel System Operation, Maintenance & Inspection Manual," ENP-516 and Field Service Bulletin, "Safely Working on CNG Fuel Systems," ENP-391.

Defective OMB valves are to be returned to Agility Customer Care Group: Identify the valve with the Claim Reference Number (CRN) on the package and label and ship UPS collect to:

Agility Fuel Solutions
Attn: Warranty Processing – CRN _____
5117 NW 40th Street
Lincoln, NE 68524 USA
Phone: +1 402 470 8440

Acronyms Used in the OMB Cylinder Valve Solenoid Coil Document

EFD: Excess flow device

SOV: Solenoid operated valve

TPRD: Temperature pressure relief device (same as pressure relief device: PRD)

Torque Specifications

Torque is determined by the boss material (steel or aluminum), regardless of cylinder type. For 1-1/8-12 UNF thread valve:

Steel: 74 ft-lb. to 96 ft-lb. (100 Nm to 130 Nm)

Aluminum: 70 ft-lb. min to 96 ft-lb. max (95 Nm min. to 130 Nm max.)

Note: ESA valve installation tool, Agility part number 240322-01, should be used to apply torque during removal and reinstallation.

Section 3, TPRD Venting Procedure, Step 3

Before applying heat to the PRD, make sure to protect the cylinder using a metal heat shield or other suitable protection to prevent damage to the cylinder.

The OMB information follows.



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ESA Valve

DISASSEMBLING THE VALVE FROM THE TANK

If the valve is in good operating condition, follow the procedure to empty the tank as described in section 1 (standard procedure).

If the valve solenoid coil/internal component is not functioning properly/not activating, follow the procedure described in section 2 (SOV disassembling procedure).

If for any reason, other than the coil, the valve cannot be defueled through the side valve ports, follow the procedure described in section 3 (TPRD venting procedure).

If there are any questions regarding the following procedures, ask through the field service department of where the vehicle/component was purchased.

1. STANDARD VENTING PROCEDURE

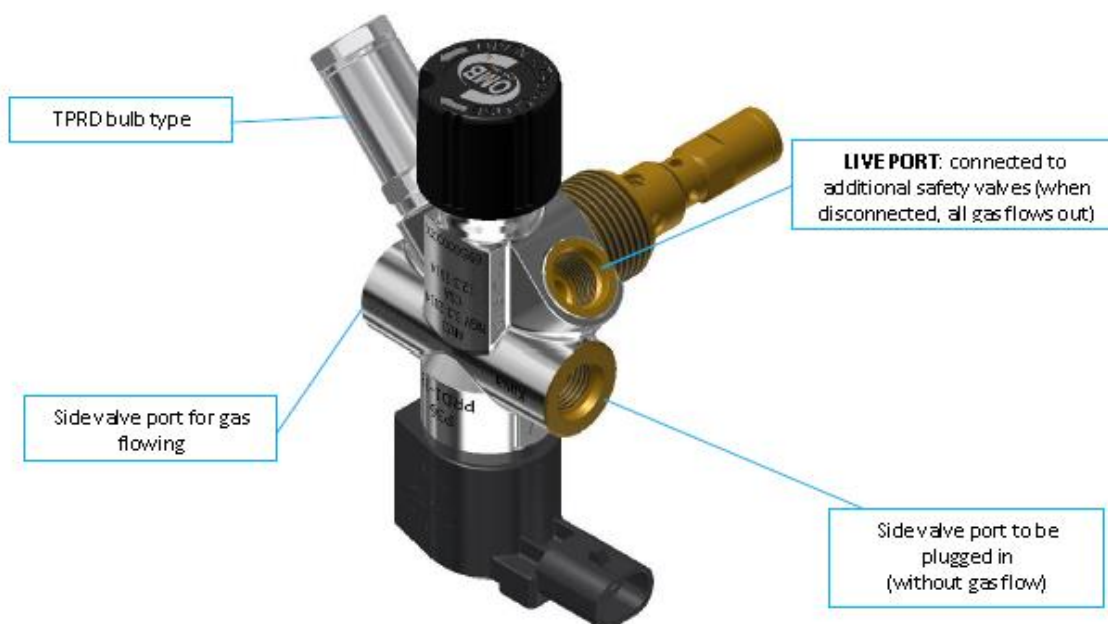


Figure 1: 3D drawing depicting the ESA valve.



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First, make sure that the tank is empty. OMB Saleri SpA declines any responsibility in case of residual pressure in the tank.

Emptying the tank requires the following steps:

1. Close the manual tap by rotating the handwheel CLOCKWISE.
2. Connect to a closed transfer system or an approved method of atmospheric venting in accordance with the procedures and recommendations of the CNG System Manufacturer.
3. The closed transfer system or method of atmospheric venting shall comply with requirements of the applicable standards, CNG system and cylinder manufacturers, and the authority having jurisdiction. Requirements shall cover, but is not limited to:
 - a) use of proper grounding to prevent buildup of static electrical charge;
 - b) rate of cylinder defuel;
 - c) proper mounting of vent system and system components.

DO NOT UNSCREW THE FITTINGS COMPLETELY UNTIL ALL THE GAS IN THE PLUMBINGS IS RELEASED.

4. Connect a pipe on the side valve for gas flowing (Figure 1). The other end of this pipe must be fixed in a convenient place, considering the path of the outflowing gas (this decision is taken under the customer's responsibility). Plug the other side valve connection (Figure 1).
5. While the handwheel is held in the CLOSED position, supply to the coil 12V or 24V depending on the coil voltage (this action, while keeping the handwheel closed, allows the solenoid valve to open completely).
6. Open carefully the manual tap by rotating the plastic handwheel COUNTERCLOCKWISE.

Follow the next steps ONLY IN THE PRESENCE OF THE EXCESS FLOW DEVICE (EFD):

7. Open the manual tap by rotating the plastic handwheel COUNTERCLOCKWISE. The opening action must be performed slowly to prevent the activation of the EFD.
8. In case of EFD activation, close the manual tap, wait for a short time, until the system resets (producing an audible "click") and reopen the manual tap stopping just before the EFD activation point.
9. As the pressure in the tank is dropping down, the flow will begin to decrease and it is allowed to open the manual tap further in order to increase the discharging flow.

As additional information, the longer the pipe is, the higher the effect it has on the amount of outflowing gas. For instance, a longer pipe gives a faster tank defuel, by avoiding the gas expansion in the vicinity of the valve. For more details, refer to APPENDIX A.

DO NOT REMOVE THE VALVE FROM THE TANK IF IT IS UNCERTAIN THAT IT IS EMPTY



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Once you are completely sure that the tank is empty, end the procedure by following the next steps:

1. Disconnect any lines connected to the side valve ports, TPRD vent port, and live port.
2. Using ESA special mounting tools and a torque wrench, unscrew the valve COUNTERCLOCKWISE, **for ~10° only!** Remember that the tightening torque for this valve must be kept between 100 and 130 Nm for a steel tank and between 95 and 130 Nm for an aluminum tank. If the correct installing torque has been employed, initially an equal or slightly higher force must be applied in order to barely unscrew the valve.
3. By using a torque wrench, verify that the unscrewing torque does not exceed the 5 Nm (p= 10 bar): this value was obtained by through experimentation*.

IF THE OPENING TORQUE IS HIGHER THAN 5 Nm AFTER THE ~10° ROTATION, IMMEDIATELY STOP UNSCREWING THE VALVE! THE PRESSURE IN THE TANK IS FAR HIGHER THAN 10 bar.

4. If the opening torque is lower than 5 Nm, continue to unscrew the valve carefully. If there is any residual pressurized gas in the tank, it will be released during the unscrewing.
5. Remove the valve from the tank and send it to OMB for analysis.

OMB recommends not disassembling any part of the valve!

*reference to the test report in attachment



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2. SOV DISASSEMBLING PROCEDURE

This procedure must be considered when the solenoid coil does not actuate.

If the valve is functioning properly, reference the standard defuel procedure (section 1).

If the solenoid is not the problem or this procedure fails to defuel the cylinder, reference the TPRD procedure (section 3). In comparison with the TPRD procedure described in section 3, the benefit to this procedure is that it provides a means to defuel the cylinder, which does not make the valve unusable in case investigation shows nothing wrong.

NOTE: a functioning coil can be used as part of maintenance tooling.

The SOV procedure is as follows:

1. Close the manual tap and discharge the gas from the system downstream of the SOV by keeping the coil energized (the manual tap must be closed for the valve with the damaged coil as well as all neighboring valves involved in the system, even if it is functioning properly).
2. Unscrew the coil nut.



3. Take out the coil nut paying attention not to drop the internal O-ring.





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4. Take out the coil paying attention not to drop the protection gasket.



At this point, the procedure shall be divided in the next two options.

The first option consists of exchanging the bad coil with a good one coming from the neighboring valve or from maintenance tooling. After having installed the good coil onto the bad valve, defuel the cylinder with bad valve. This is the safest way to complete the procedure if the coil is bad (reference to section 1, standard venting procedure).

Follow the second option only in case that the internal components of the solenoid are defective. The instructions are as follows:

5. **Check one more time that the manual tap is totally closed.**
6. Unscrew with care and attention the solenoid sleeve using a 25 mm wrench (**be careful**, some residual gas may be trapped inside).



7. Disassemble the solenoid sleeve.





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8. Take out the solenoid internal parts.



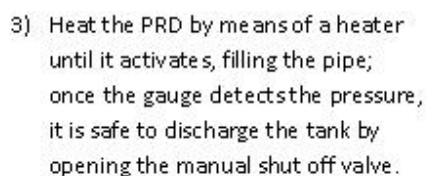
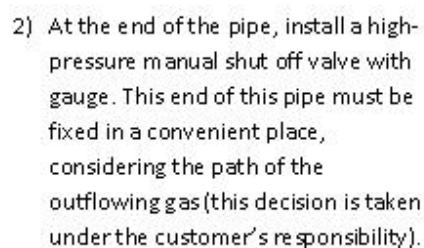
9. Reassemble the solenoid sleeve at 20 ± 1 Nm without the internal parts.



By following this second option, the SOV will be by-passed. It is possible to discharge the gas flow from the system by opening carefully the manual tap (reference to section 1, standard venting procedure considering that the coil has been removed earlier).

Nevertheless, in both cases the method of atmospheric venting shall comply with requirements of the applicable standards, CNG system and cylinder manufacturers, and the authority having jurisdiction.





NOTE: contact cylinder manufacture with any questions regarding heat hitting the cylinder surface.



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DO NOT USE FLAMES ON TPRD! USE ONLY A HEATER!

Still consider that the method of atmospheric venting shall comply with requirements of the applicable standards, CNG system and cylinder manufacturers, and the authority having jurisdiction.

Connect to a closed transfer system or an approved method of atmospheric venting in accordance with the procedures and recommendations of the CNG System Manufacturer and defuel the plumbing up to the valves per their recommended procedure.

APPENDIX A

Tank discharging and EFD rearm (only in case of presence of EFD).

WARNING: the discharge flow passes through the solenoid valve (SOV) and through the excess flow valve (EFV). In this phase, for a correct discharge (to make sure it does not take too long) it is necessary to ensure the complete opening of the SOV and the non-activation of the EFV:

- To ensure the complete opening of the SOV, close the manual tap of the tank valve before opening the SOV by applying 12V to the coil. When the entire volume of gas contained between the manual tap and the SOV (a small quantity) has been released, the SOV opens completely, indicated by a click-like noise.
- To ensure the non-activation of the EFV during the discharge phase, the discharge flow must be held low enough to prevent the activation of the EFV. For this purpose, OMB Saleri suggests to regulate the opening of the manual tap of the tank valve.

The complete tank discharging and EFV rearm procedure is listed as follows:

- a) Close the tank valve using the manual tap (and wait for 2 minutes until it ends)
- b) Apply the specific voltage to the coil and maintain it for the rest of the procedure (ATTENTION: there is a small volume of gas, but it could be highly pressurized)
- c) Wait a few seconds until the SOV opens completely: a successful opening is indicated by a click-like noise.
- d) Open the manual tap of the tank valve slowly until the activation of the EFV, and register the corresponding position. Consider that the EFV has already been activated whether the discharge flow is very light or even missing.
- e) To rearm the EFV, close the manual tap of the tank valve and wait (for 2 minutes max) the EFV deactivation (indicated by a click-like noise)
- f) Slowly open the manual tap of the tank valve without reaching the EFV activation position previously registered, and complete the tank discharging process.

NOTE: If you can't rearm the EFV valve by closing the manual tap and waiting for 2 minutes, the only way to rearm the EFV is to perform a refill, and then discharge the gas by opening the manual tap slowly and



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without reaching the EPV activation point.

These procedures refer to the operations performed on the valve. However, we recommend to refer and to apply all the regulations in force in terms of safety in order to avoid any risk to people and the environment. Beside this procedure, consider also the document "General Sales and Warranty Conditions" available on "OMB SALERI" website.

<http://www.omb-saleri.it/manuals/>



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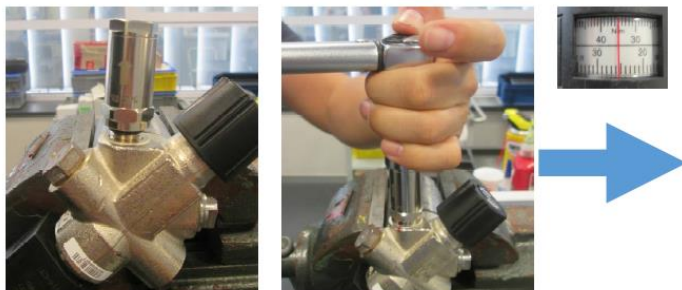
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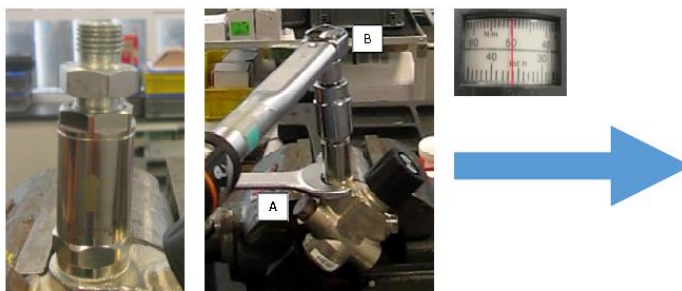
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(Extract from the website)

Procedure 2: Installing OMB ESA Cylinder Valve PRD



OMB ASSEMBLING PROCESS: PRD is assembled on the valve with a torque value of 35 Nm



RECOMMENDED PROCEDURE TO ASSEMBLING THE CONNECTION AND THE FITTING ON THE PRD:

- Block the PRD body by a wrench (detail A) and screw the connection on the PRD thread by the torque wrench (detail B)
- To apply the fitting on the connection: block the connection by a wrench and assemble the fitting by a torque wrench.

The torque value recommended is 40 Nm Min / 50 Nm Max

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