

# Technical Bulletin



Bulletin No: TCH-001-060

Effective Date: 6-13-2014

Cancels: TCH-001-060 dated 1-13-2011

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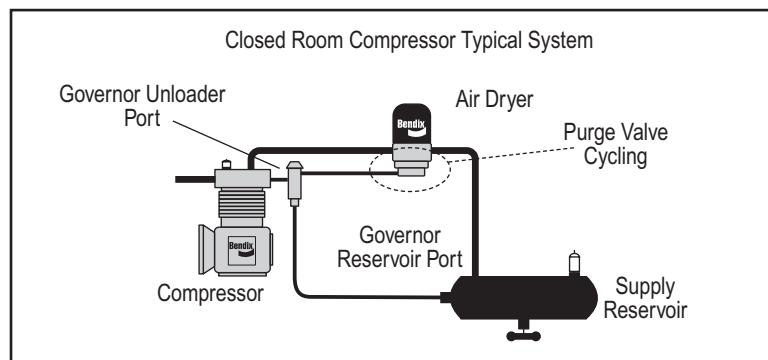
Subject: **ESS REPLACEMENT FOR BENDIX® BA-921® COMPRESSORS**

This bulletin is in reference to Bendix® BA-921® compressors installed on Detroit™ DD15® and DD13® engines. These compressors contain an Energy Saving System (ESS) within the cylinder head that may require servicing while the compressor is still covered under warranty. The life expectancy of the ESS varies according to the vehicle vocation and duty cycle. High air usage systems will result in reduced life of the compressor ESS. In such cases, the ESS can be diagnosed for leakage and replaced if necessary.

This bulletin details the proper diagnostic and replacement procedures for the ESS. **Failure to follow these procedures may result in a denied warranty claim if the ESS portion of the compressor, submitted for warranty consideration, is deemed causal.** Note that if excessive carbon is present in the discharge fitting of the compressor, with a film greater than 10% of the inside diameter, the entire compressor should be replaced.

If the nature of the compressor issue, or complaint, is any of the following, the ESS is the likely source (assuming that checks for other system malfunctions have been carried out).

- |  |  |
|--|--|
| (A) ESS leaking when pressurized                         | (E) System will not build air pressure |
| (B) Compressor safety valve popping off                  | (F) System slow to build               |
| (C) Air dryer purge valve and compressor cycling rapidly | (G) Compressor leaking air             |
| (D) Compressor does not unload                           |  |



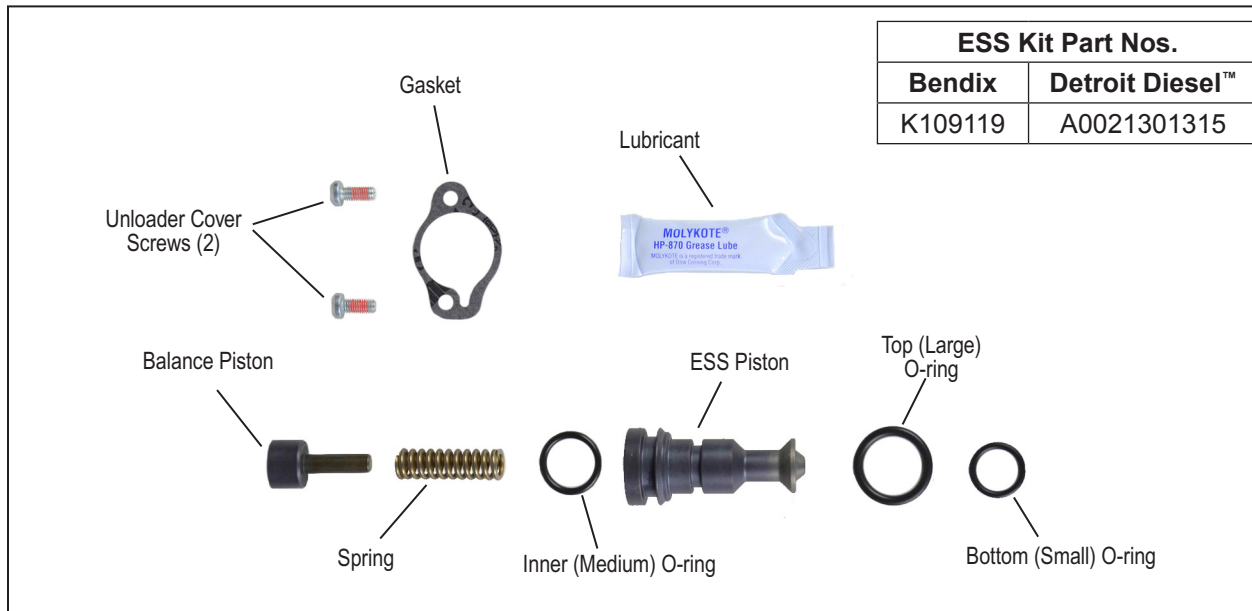
## DIAGNOSING THE UNLOADER SYSTEM FOR PROPER OPERATION AND PRESSURE SETTING

When performing any service, be sure to follow all safety guidelines outlined in the BA-921 compressor Service Data Sheets, SD-01-690, or instruction sheet as applicable.

1. Using shop air, pressurize the unloader line to 120 psi and check for leaks in this line. Remove the air pressure and ensure the unloader line is properly seated in the governor fitting. Using shop air, check the unloader line, again, for leaks. If there are no leaks, return the vehicle to service. If a leak is still present, go to step 2.
2. Remove the compressor from the vehicle and closely inspect for any non-ESS-related issues. If there are non-ESS issues, submit the compressor for warranty consideration.
3. If there aren't any obvious non-ESS related issues, service the ESS using the ESS service replacement kit as outlined in this bulletin.

*Continued...*

**ESS SERVICE REPLACEMENT KIT CONTENTS**

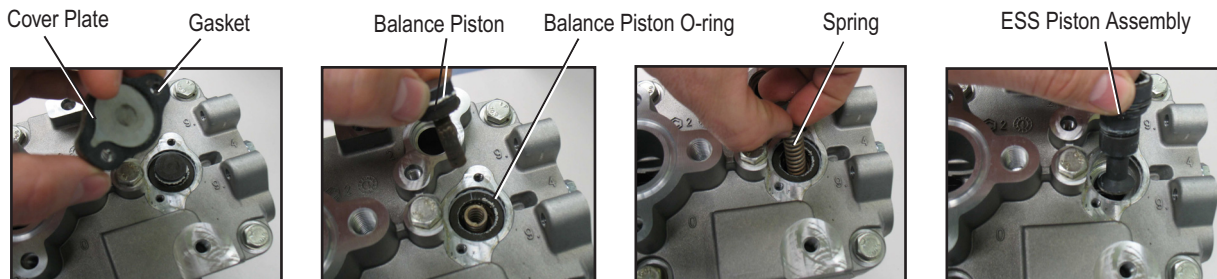


**THE FOLLOWING GUIDELINES ARE FOR REFERENCE. THE ESS SERVICE REPLACEMENT KIT CONTAINS ADDITIONAL INSTRUCTIONS.**

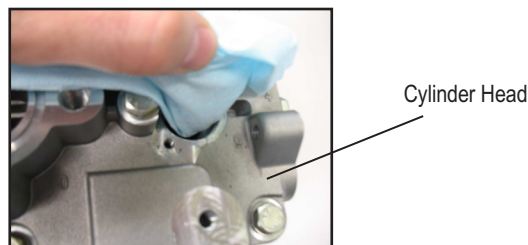
**ESS REMOVAL AND CLEANING**

*Refer to the illustrations below. If the compressor being serviced is under warranty, retain the removed components for warranty consideration.*

1. Using a T25 Torx head screwdriver, remove the ESS cover plate screws and ESS cover plate from the compressor cylinder head.
2. Remove the balance piston, balance piston o-ring, spring, and ESS piston assembly from the cylinder head.



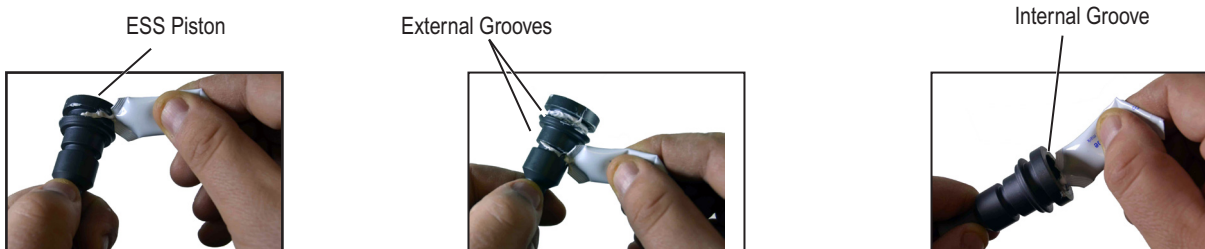
3. Thoroughly clean the cylinder head and ESS cover plate; removing all dirt, carbon, grease, gasket materials and any foreign matter from the ESS piston cavity.



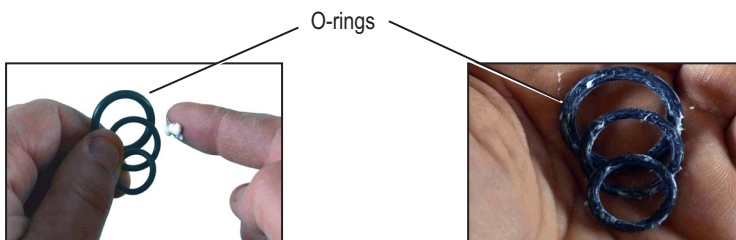
## ESS INSTALLATION

Use the entire contents of this kit and only use the lubricant provided. Proper lubrication is extremely important in the installation. The entire tube of lubricant must be used. Use the illustrations provided with each step as a guide. **Note:** Retain the cover plate (i.e. unloader cap) removed from the compressor being serviced. It will be reused during the “ESS installation” process.

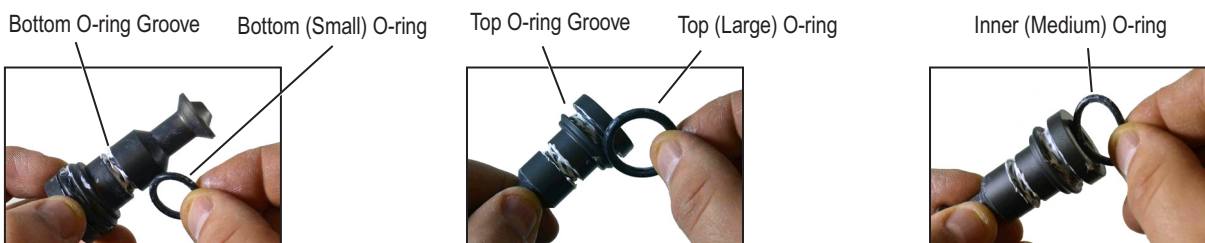
- Using the lubricant provided, lubricate the 3 o-ring grooves on the ESS piston. The lubricant should cover 360 degrees of each groove. **Note:** Two of the o-ring grooves are on the outside surface of the piston and one is on the inside at the larger end of the ESS piston.



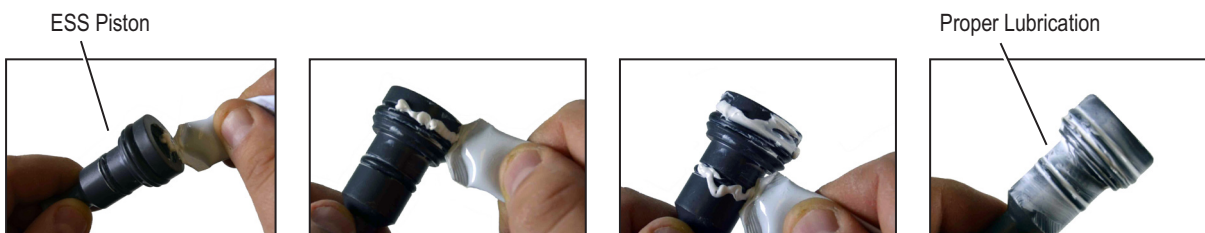
- Lubricate each of the three (3) o-rings thoroughly.



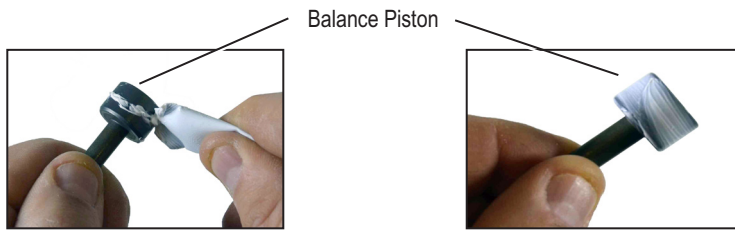
- Install the o-rings on the ESS piston. Compare and identify the sizes of the three (3) o-rings included in the kit. Install the bottom (small) and top (large) o-rings on the outside of the ESS piston and the inner (medium) o-ring in the internal groove as shown in the illustrations below. Be sure not to twist or tear the o-rings during installation.



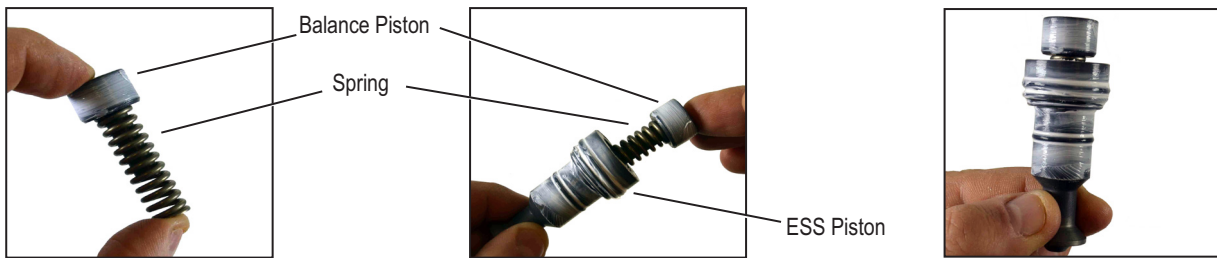
- Lubricate the entire ESS piston assembly as shown below. Pay special attention to lubricating the three (3) installed o-rings.



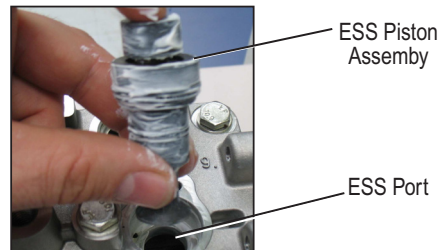
- Lubricate the balance piston as shown. Be sure to thoroughly lubricate the entire surface.



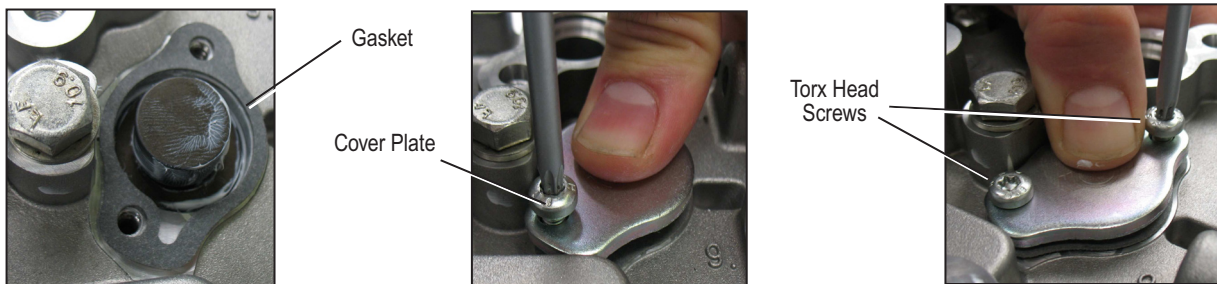
- Slide the spring onto the stem of the balance piston. Install these two parts into the ESS piston assembly (open end) as shown below.



- Apply lubricant onto the two ESS piston bores in the cylinder head. Install the ESS piston assembly into the ESS piston bore of the compressor cylinder head as shown in the following illustration. If additional lubricant is available in the tube, add it to the outside of the ESS piston assembly before installation.



- Install the new gasket on the boss of the ESS port, aligning the gasket with the boss contours and holes. Place the previously removed cover plate—removed in step 2—over the gasket and secure it to the cylinder head with the two new T25 Torx head screws included in the maintenance kit. While pushing down on the cover plate, tighten the screws manually with a screw driver. Once the screws can't be turned further, use a torque wrench to achieve the recommended tightening torque of  $7 \pm 1.5$  Nm.



9. Reinstall the compressor on the vehicle. Refer to the service data sheet for additional guidelines and compressor test procedures.
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10. If the compressor is under warranty, submit the removed components for warranty consideration following your normal warranty processes.

**For additional assistance contact the  
Bendix Tech Team at 1-800-AIR-BRAKE, option 2**  
(1-800-247-2725, option 2)  
or [techteam@bendix.com](mailto:techteam@bendix.com)

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