SIL
SERVICE INFORMATION LETTER

Allison Transmission

Revisions to this document are noted by a stripe in the left-hand margin

SUBJECT: Engine Stop-Start (ES-S) Electric Pump Release Information

MODELS AFFECTED: 4000 Series™ Transmissions with ES-S Electric Pumps

Introduction

Allison Transmission is pleased to announce the launch of its new remote mount ES-S electric pump for use in applicable 4000 Series transmissions.

The ES-S electric pump allows the engine to shut down at idle opportunities where the pump is used to keep the transmission pressurized and first clutch engaged. This allows the transmission to receive input from the engine immediately after engine restart.

The ES-S electric pump provides many benefits including reduced operating costs due to increased fuel economy, quieter idling at stops, lowered emissions, reduced maintenance costs, and increased resale value for both the transmission and engine due to decreased use.

Operation

The ES-S electric pump allows the engine to shut down at idle when the following conditions are met:

- Vehicle is ready (e.g., vehicle is at a stop, in neutral or a forward range, brake pedal is depressed, no accelerator pedal input, and no interlocks/inhibits)
- System is ready (e.g., battery is capable of next start)
- Transmission is ready (e.g., hydraulic pressure is good and fluid is within temperature specification)
- Engine is ready (e.g., no after treatment regeneration in progress)

While the engine is shut down, the ES-S electric pump keeps the transmission clutch pressurized so that it maintains **1** (First Range). Once movement is desired and the brake pedal is released, the engine starts and torque is available immediately for transmission and vehicle movement.

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Please Note: *Allison Transmission Service Information Letters are intended for use by professional, trained technicians, not for the "do-it-yourselfer." They are written to inform those technicians of conditions that may occur on some transmission models (or serial numbers ranges) or to provide information that could assist in the proper servicing of a specific Allison transmission. Properly trained technicians have the equipment, tools, safety instructions, and know-how to do a job properly and safely. If a condition is described, do not assume that the Service Information Letter applies to your transmission, or that your transmission has the condition described. Product evolution and information updates are inevitable. Please see your authorized Allison Transmission service leader or distributor to understand if your particular transmission may benefit from the information contained within the Service Information Letter.*

ES-S Electric Pump Integration

Pump Mounting

The ES-S electric pump is designed to integrate with the 4000 Series transmission. OEMs are responsible for ES-S pump mounting and mounting location; however, Allison recommends a chassis mount. The pump features three mounting bolts. Refer to Figure 1.

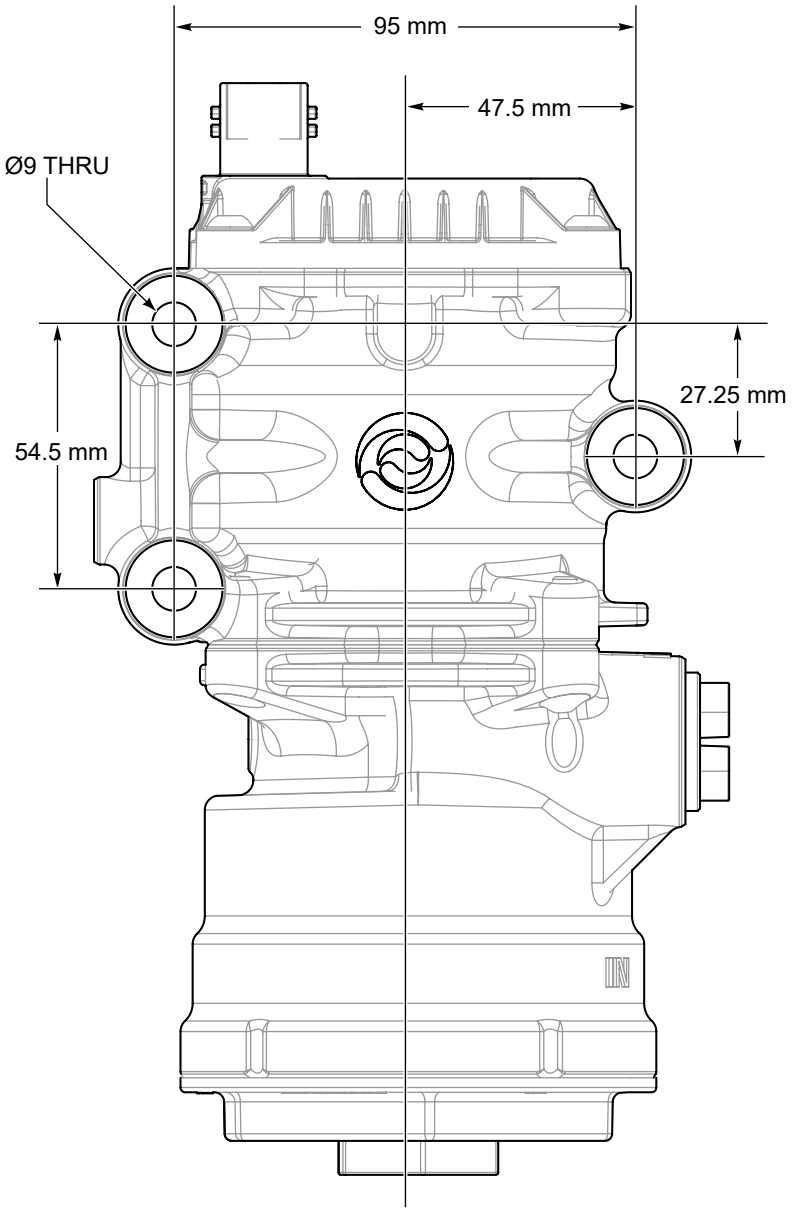


Figure 1. ES-S Electric Pump Bolt Locations and Dimensions

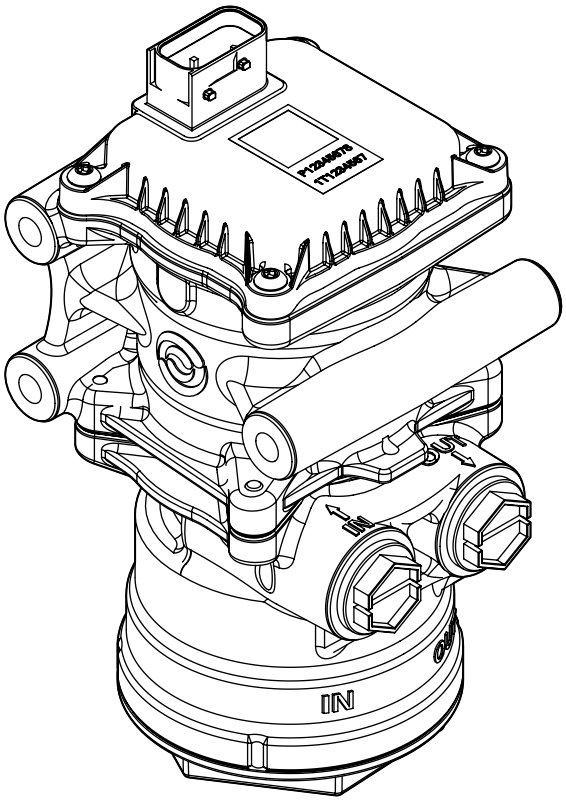
Exact mounting requirements can be found in Allison Tech Data.

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NOTE: ES-S electric pump must be mounted so that the electrical connector is never facing up.

Hydraulic Connections

The ES-S electric pump features an oil inlet and an oil outlet. The oil inlet uses an SAE #10 hose and the oil outlet uses an SAE #8 hose. Refer to Figure 2.



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Figure 2. Oil Inlet and Outlet Ports

New 4000 Series Channel Plate

A new 4000 Series channel plate, 4" sump, P/N 29566620 has been released to accommodate the electric pump. A new oil port has been created to connect to the ES-S electric pump inlet and outlet. Refer to Figure 3. An ES-S label has been cast into the bottom of the channel plate to identify the location of the new port. Refer to Figure 4.

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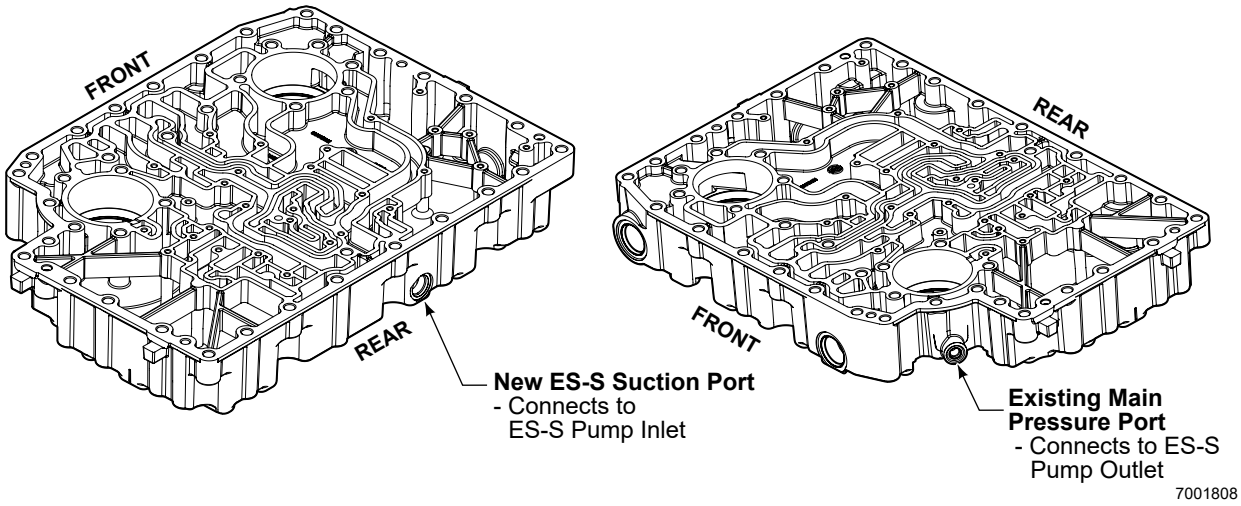


Figure 3. New Channel Plate and Oil Port Locations

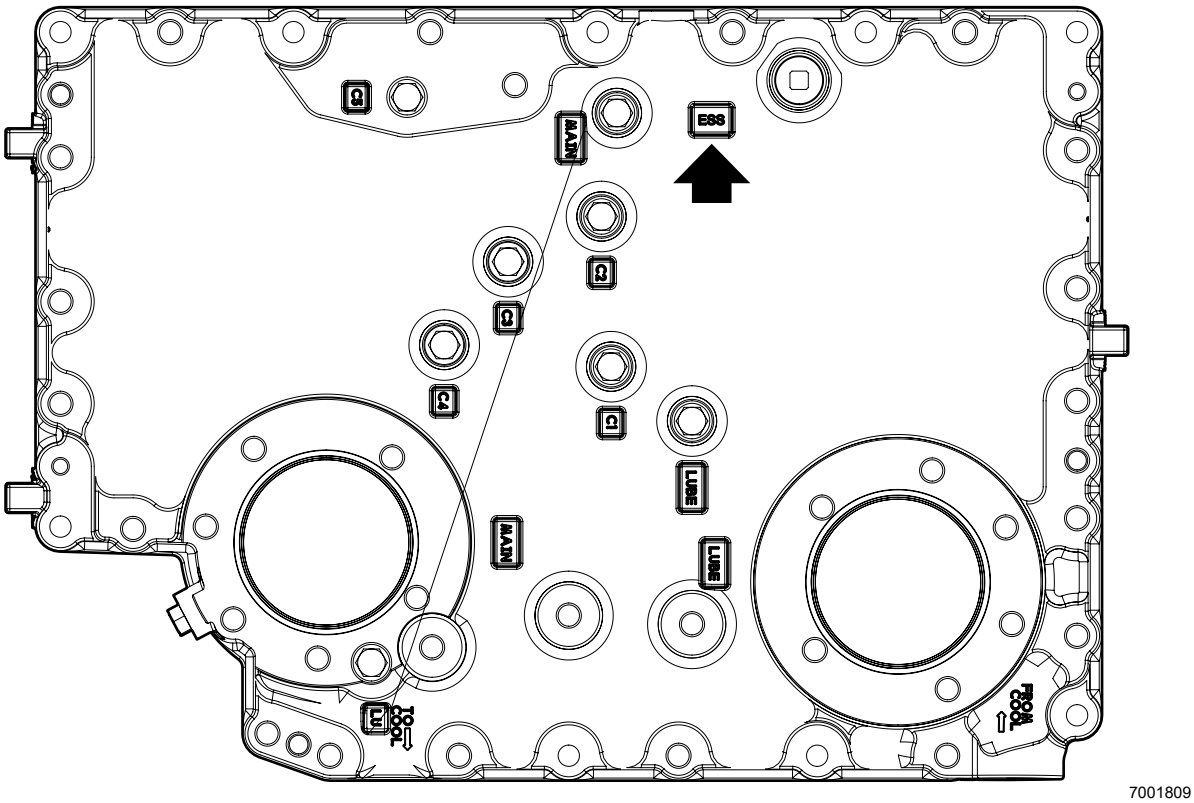


Figure 4. Cast Labeling of ES-S

Special Tools

No special tools are required to service the ES-S electric pump.

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New Diagnostic Codes

Three new Diagnostic Troubleshooting Codes (DTCs) have been introduced with the ES-S electric pump. Refer to Table 1. DTC descriptions and troubleshooting steps can be found in the 3000 and 4000 Series Troubleshooting Manual, *TS8794EN*.

Table 1. New Engine Stop-Start Electric Pump DTCs

Code	Name
U0287	Lost Communication with the Engine Stop-Start Electric Pump
P2797	Engine Stop-Start System Pressure Loss
P0C2B	Engine Stop-Start Electric Pump Fault

Dry Prime Procedure

There are situations where the ES-S electric pump head may be dry and/or clearances may not allow the pump to pull oil through the suction tube. To assist in recovering the ES-S electric pump from this dry state, a Dry Prime procedure was developed. The Dry Prime procedure can be found below and in 4000 Series Service Manual (*SM4014EN*).

The Dry Prime procedure must be completed when:

- Suction or pressure hoses are removed from the ES-S electric pump or the transmission
- ES-S electric pump is removed
- Transmission sump is drained and/or a transmission filter service event is completed
- TCM is replaced
- Software or calibration is updated

Requirements to run the Dry Prime procedure include:

- Key ON, engine OFF
- Sump temperature is greater than 15°C (59°F) and less than 120°C (248°F)
- Pump is connected
- CAN, ignition and power wires are connected
- Vehicle is on level ground

Dry Prime Procedures

1. Complete action request: “Engine Off at Stop — Reset Dry Prime”.

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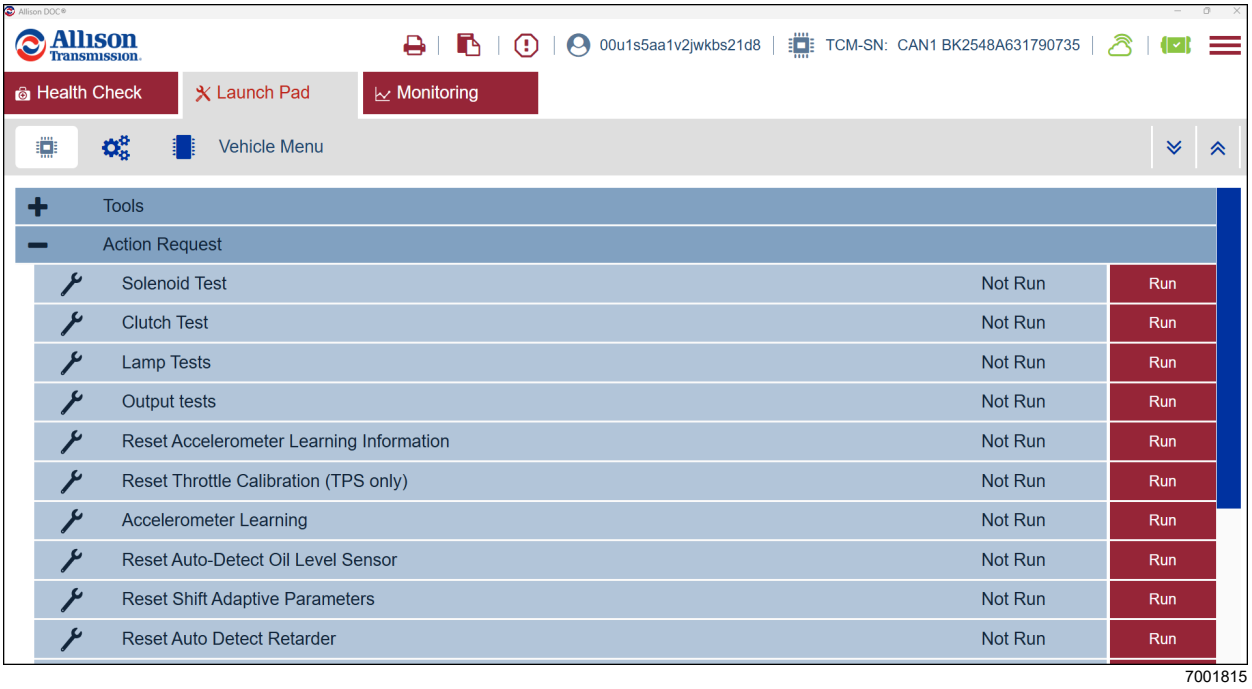


Figure 5. Dry Prime Action Request

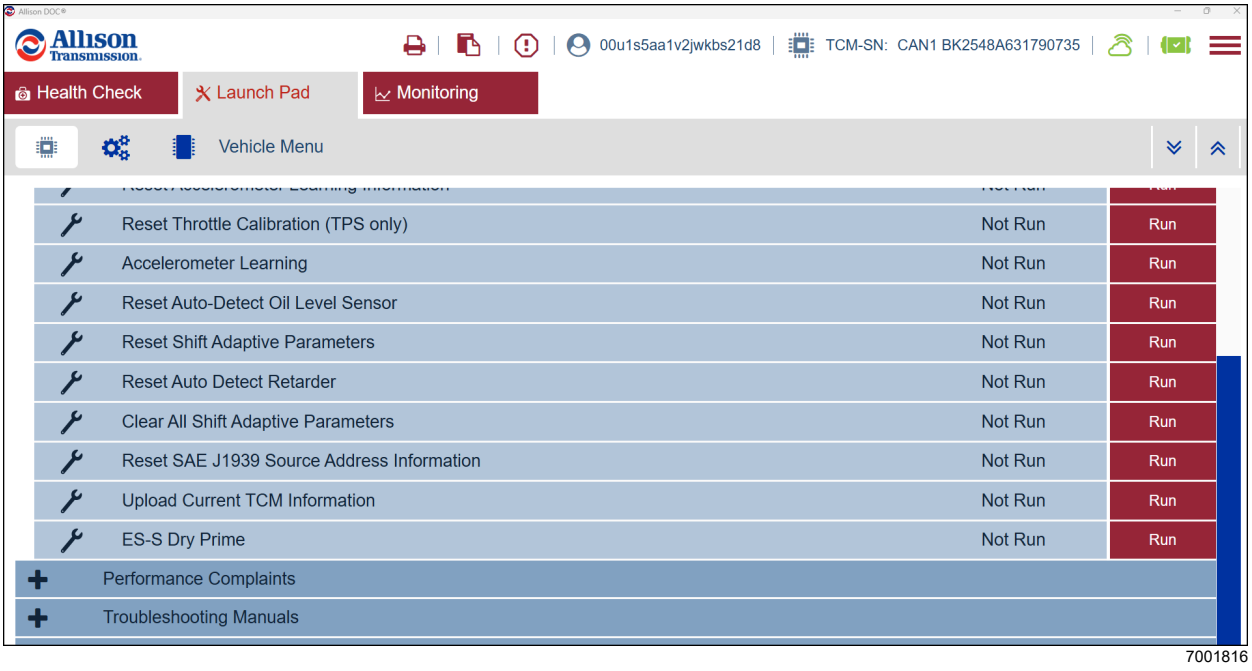


Figure 6. Select ES-S Dry Prime from Action Request Menu and Run the Program

2. Follow the Preconditions for ES-S Dry Prime and select "Next".

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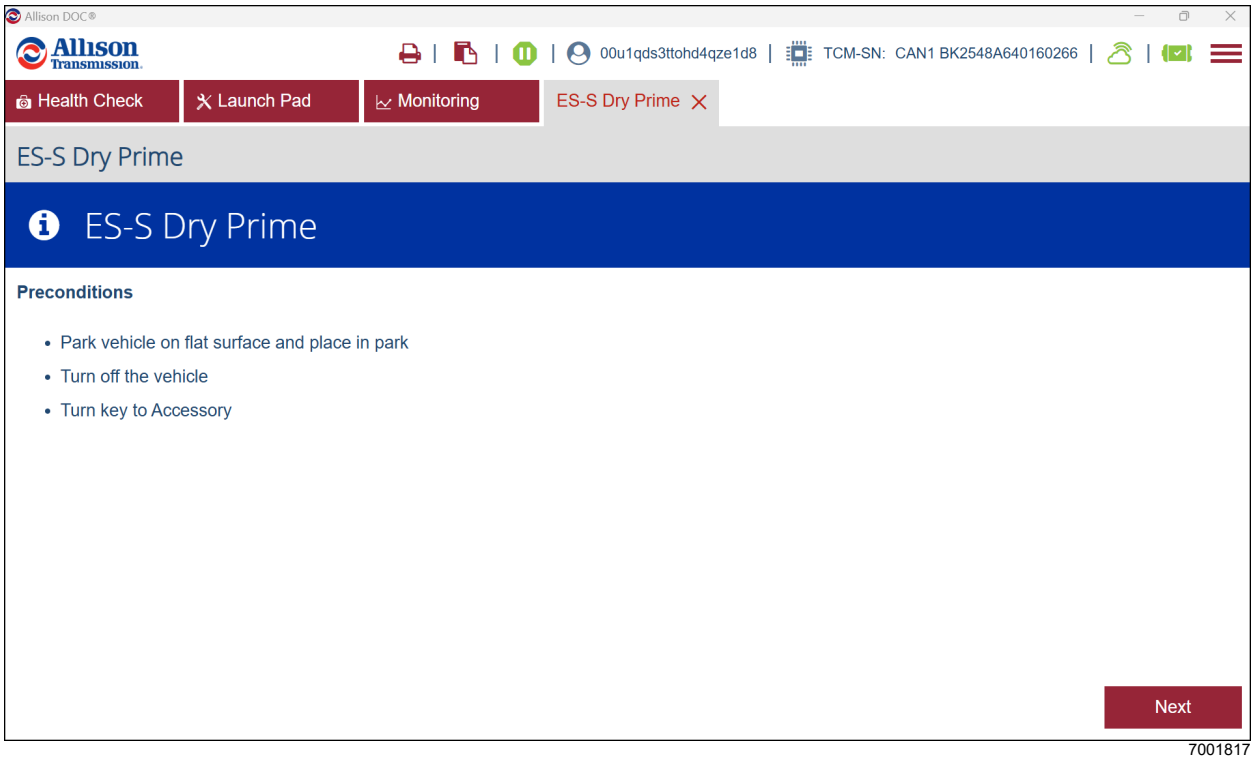


Figure 7. Dry Prime Reset

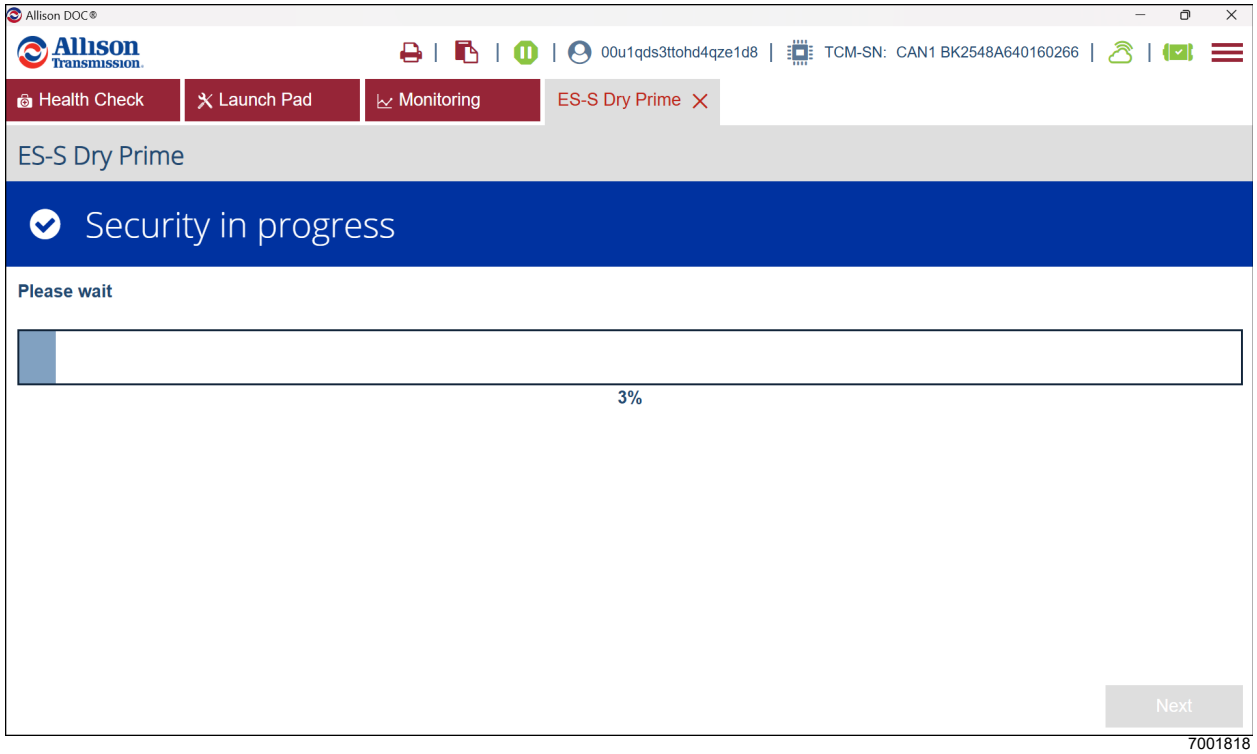


Figure 8. ES-S Security in Progress

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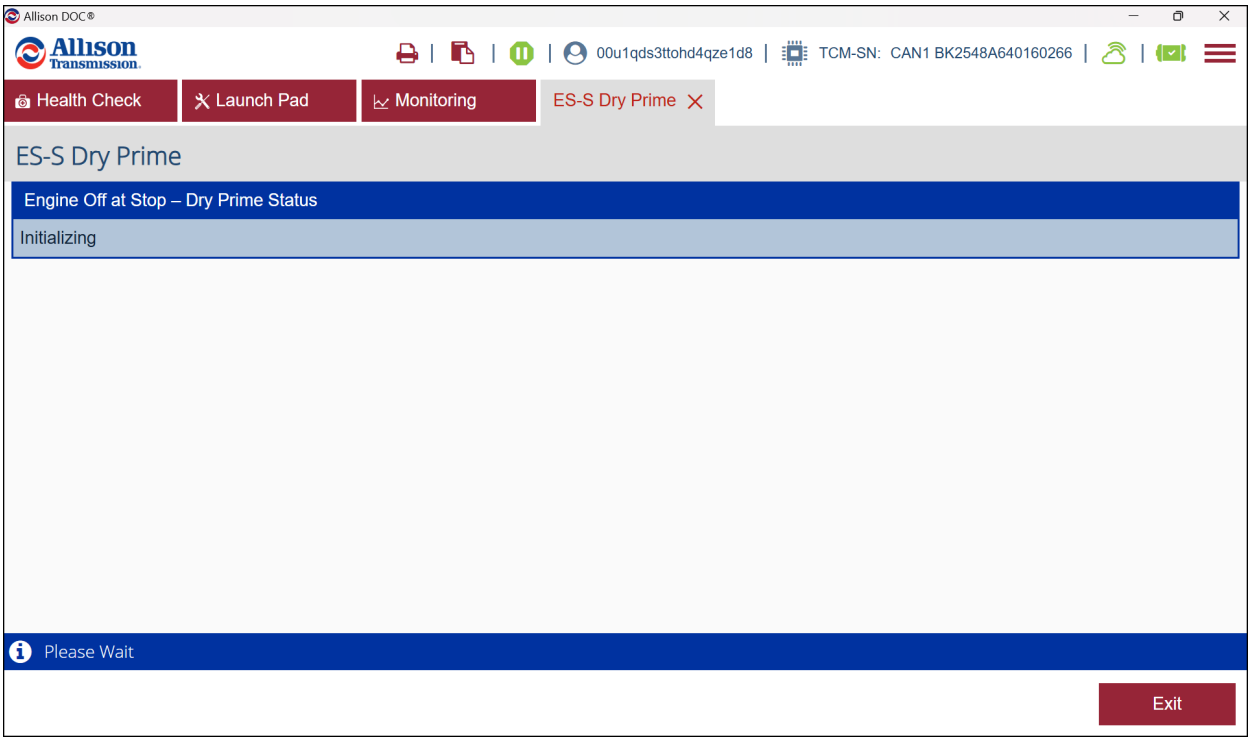


Figure 9. Engine Off at Stop — Dry Prime Status

3. Dry Prime complete window pops up.

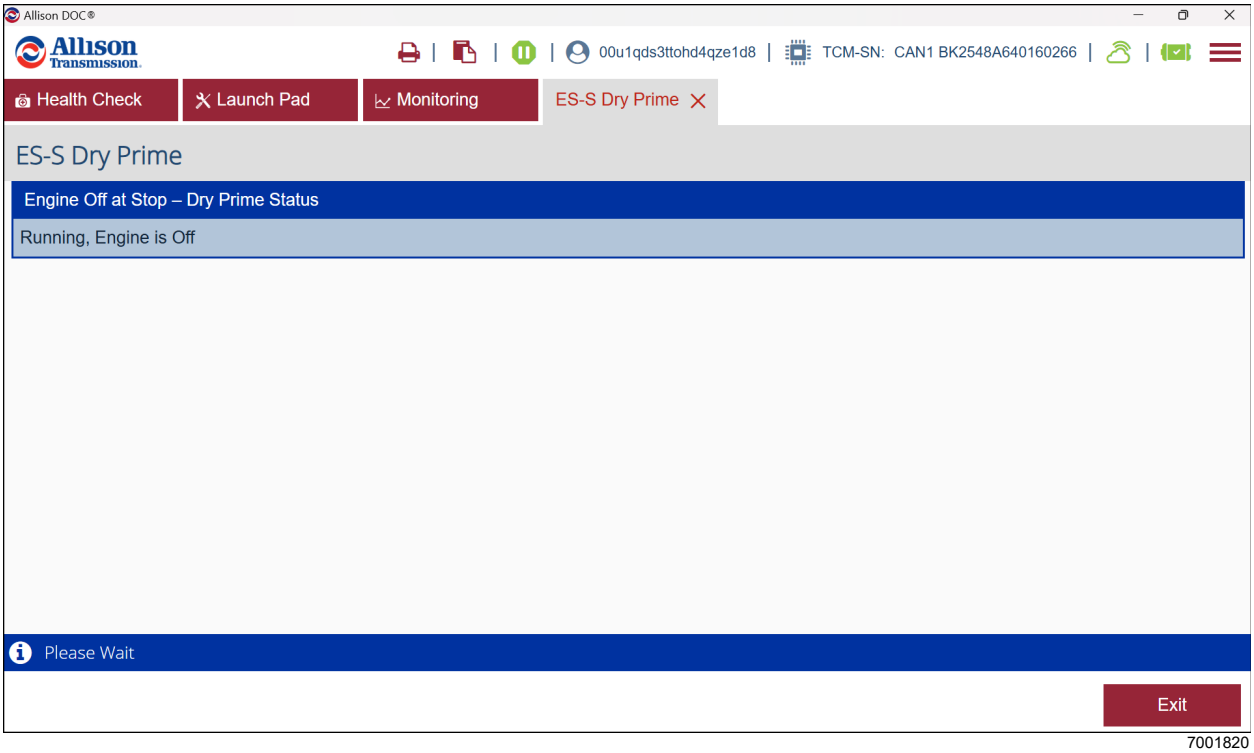


Figure 10. Running, Engine is Off

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4. Verify Dry Prime status in the data monitor.

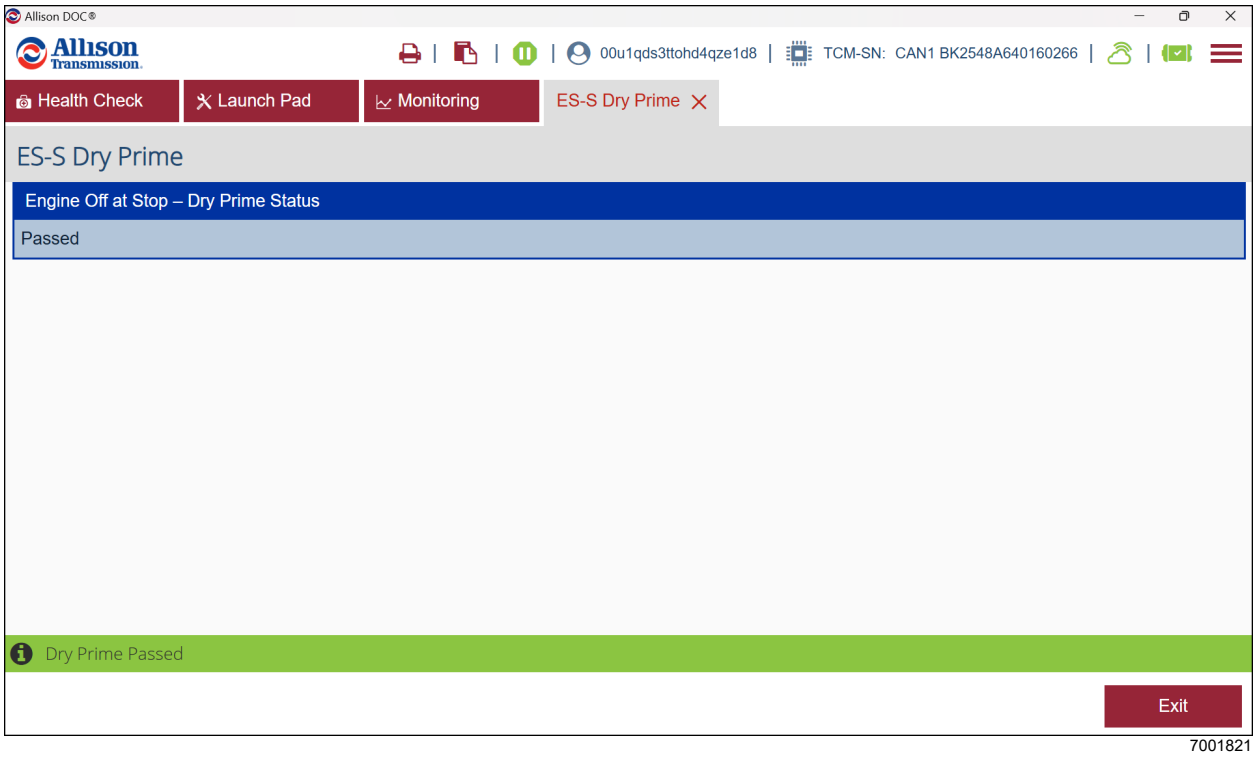


Figure 11. Verify Dry Prime Status

NOTE: If the Dry Prime procedure fails to complete due to a timeout issue or an error from failing to follow the listed requirements, address the error and complete the Dry Prime procedure again. Do this until Dry Prime passes.

ES-S Electric Pump Installation and Removal Procedure

Removal Procedure

For transmission and/or ES-S electric pump service, the pump may need to be removed from the vehicle.

1. Ensure the engine and transmission are not operating. Ensure the engine and transmission are off, brakes are applied, and wheels are chocked.
2. Using a flathead screwdriver, wedge the tip between the retaining clip and the connector on the ES-S electric pump to unlock the connector. Refer to Figure 12 and Figure 13.

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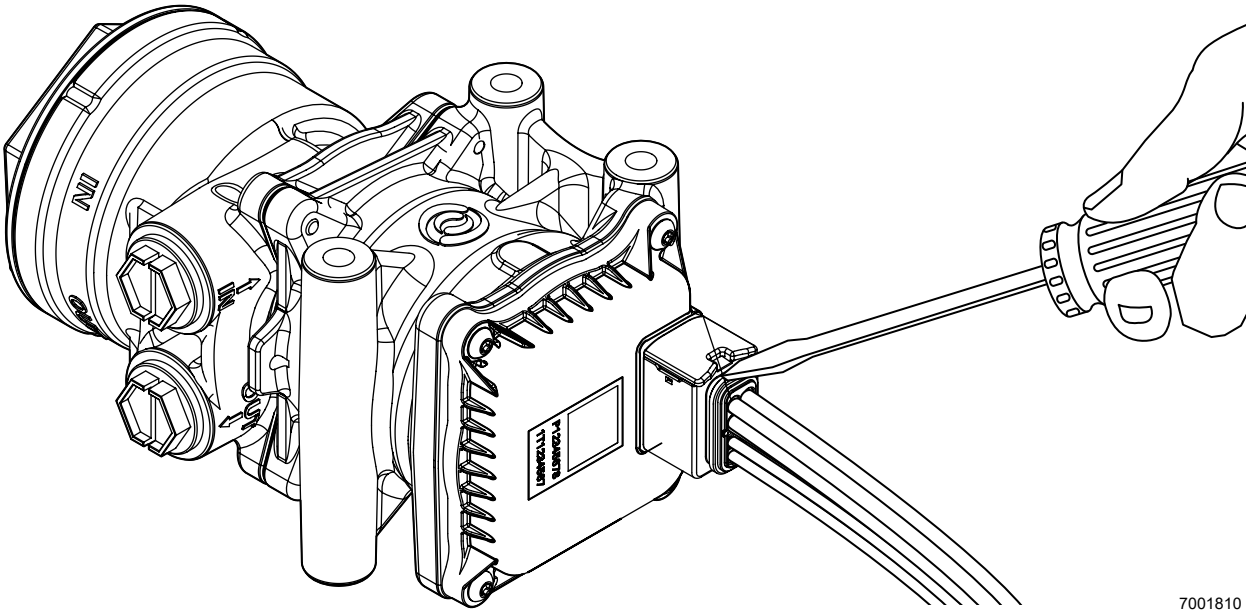


Figure 12. Flathead Screwdriver with Connector

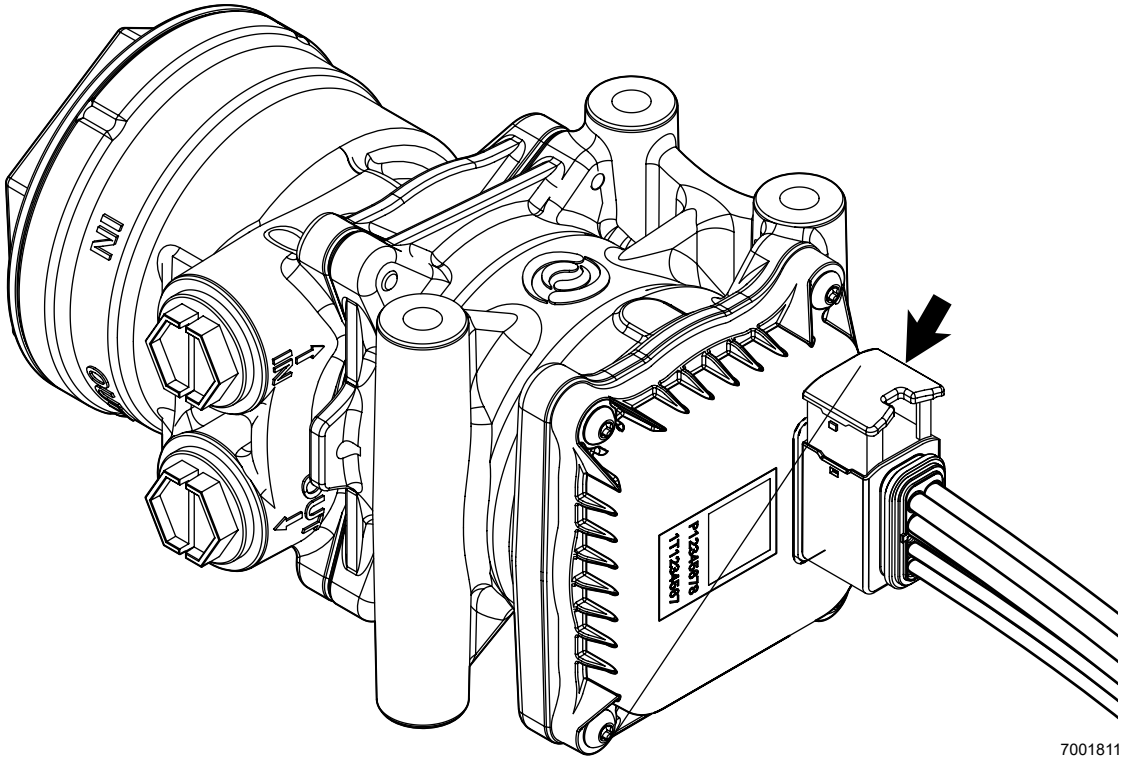


Figure 13. ES-S Retaining Clip Extended

3. Remove the connector from the ES-S electric pump controller.
4. Remove input and output hoses from the ES-S electric pump, and install port plugs on the ES-S pump input and output ports.
5. Remove the three ES-S electric pump mounting bolts 75 N·m (55 lb ft).

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NOTE: Pump will be mounted on a chassis mount designed/created by the OEM.

CAUTION: Plugs have to be installed on the input and output ports of the ES-S pump if the ES-S is not connected to the hydraulic circuit of the transmission.

Installation Procedure

Once service is complete on the ES-S electric pump and/or transmission, install the ES-S electric pump using the steps below.

1. Align ES-S electric pump mount bolt holes with bolt holes on the OEM-supplied chassis mount.
2. Install the three mounting bolts in the 3 bolt holes and torque to 75 N·m (55 lb ft).
3. Remove the installed plugs from the hydraulic input and output port of the ES-S pump.
4. Install the input hose connecting the “IN” port on the ES-S electric pump to the suction port (.875”-14 UNF-2B, SAE-10 port) on the channel plate.
5. Install the output hose connecting the “OUT” port on the ES-S electric pump to the main pressure port (7/16”-20 UNF-2B, SAE-04 port) on the channel plate.
6. Install the electrical connector onto the ES-S electric pump controller.
7. Press the retaining clip back into the locked position on the connector to ensure proper fit and connection.
8. Check the ES-S electric pump and electrical connector to ensure proper installation.
9. Complete the dry prime procedure listed in 4000 Series Service Manual (*SM4014EN*).

ES-S Service Kits

ES-S Spin-On Suction Filter and Filter O-Ring Service Kit

The ES-S electric pump suction filter and filter cap are made serviceable by P/N 29564210. This filter/cap assembly includes the filter cartridge, filter cartridge O-ring, filter cap, and filter cap O-ring. Refer to Figure 14 and Figure 15 for the complete assembly and exploded assembly. The two O-rings can be purchased separately from the filter and filter cap in Service Kit P/N 29568877.

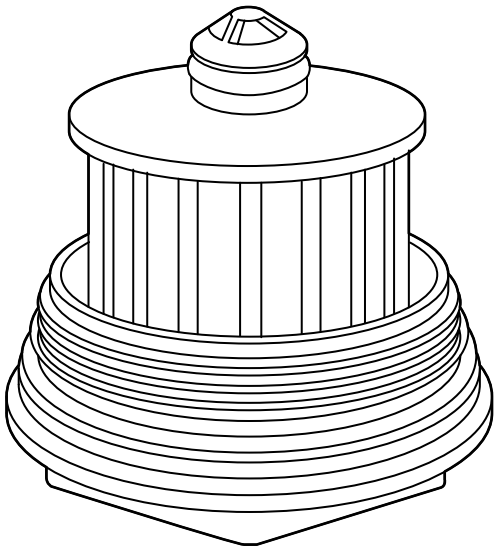
The ES-S electric pump filter should last the lifetime of the transmission under normal wear and operation. During transmission service, if extreme wear and debris is found, the ES-S pump filter/filter cap assembly must be changed. Refer to the steps below and/or the steps outlined in the service manual for proper ES-S electric pump filter/filter cap installation.

The ES-S electric pump filter/filter cap assembly can be serviced while the pump is still mounted on the chassis and the input and output hoses are installed. If the ES-S electric pump application does not allow proper working room to service the filter assembly while on the vehicle, refer to the ES-S electric pump removal process for proper removal of the ES-S electric pump. The filter cover may be removed with a 34 mm hex socket. The filter cartridge is press fit into the filter cap and can be removed.

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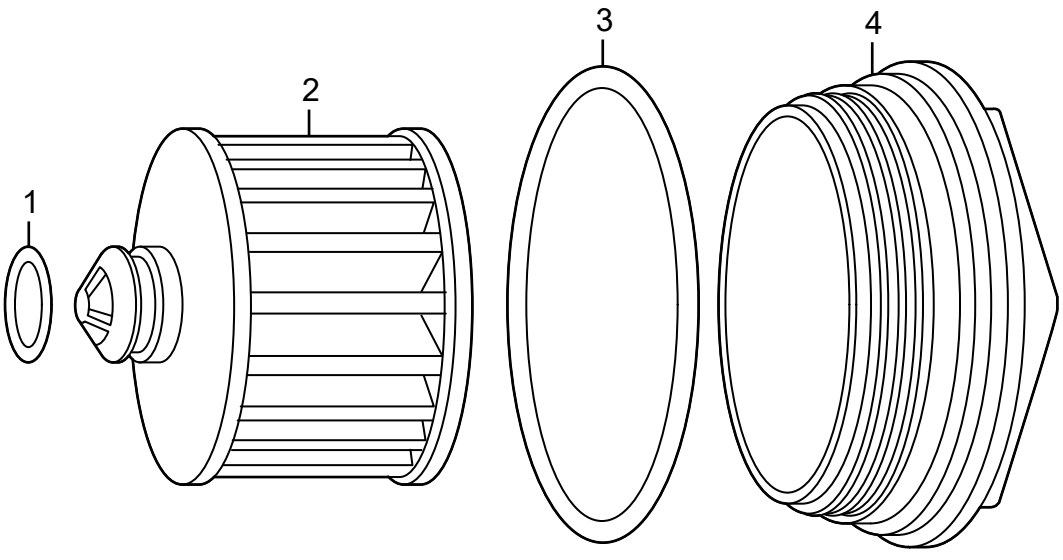
Table 2. ES-S Spin-On Suction Filter and Filter O-Ring Service Kit

Part Name (indented indicates content)	Qty	P/N	Figure
ES-S Spin-On Suction Filter Assembly	1	29564210	Figure 14
ES-S Filter/Filter Cap O-ring Service Kit	1	29568877	Figure 15
Filter O-ring	1	29568875	1
Filter O-ring	1	29568876	3



7001812

Figure 14. ES-S Filter and Filter Cap Assembly



7001813

Figure 15. ES-S Filter and Filter Cap Exploded Assembly

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ES-S Check Valve Service Kit with Instruction Sheet #371

The ES-S electric pump utilizes a check ball and valve in the fluid outlet port. This check ball prevents backflow from the main transmission pump into the ES-S electric pump. It is serviceable using Check Valve Service Kit P/N 29569366. Refer to Instruction Sheet #371 for service procedures.

The Retaining Ring P/N 29568885, may be purchased separately if service is completed on the check valve and the check valve components are deemed reusable. The retaining ring should be replaced each time the check valve is removed and inspected.

Table 3. ES-S Check Valve Kit

Part Name (indented indicates content)	Qty	P/N	Figure
Check Valve Service Kit with Instruction Sheet	1	29569366	Figure 16
Steel Ball	1	29568881	1
Return Spring	1	29568882	2
Carrier	1	29568883	3
Instruction Sheet #371s	1	29568884	-
Retaining Ring*	1	29568885	4

* Retaining Ring can also be purchased separately.

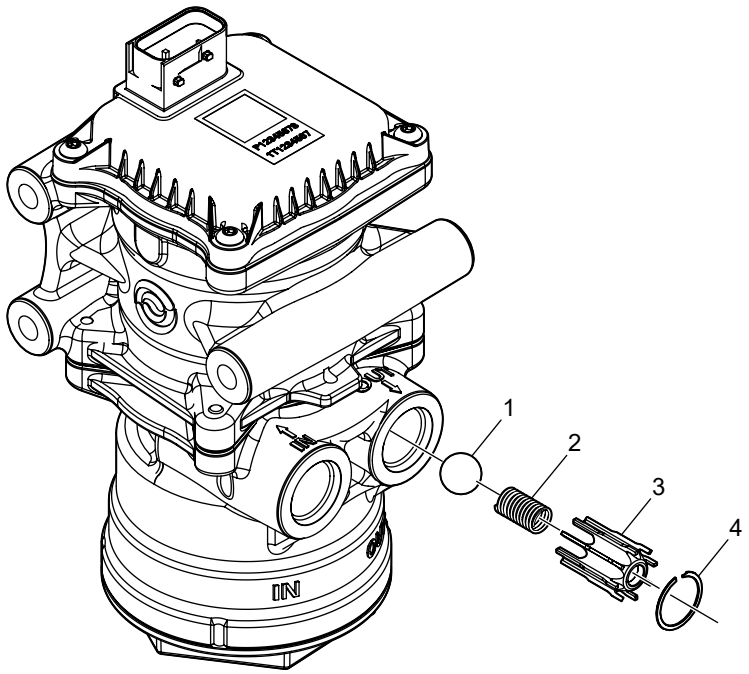


Figure 16. ES-S Electric Pump Check Valve Exploded Assembly

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