



## **COOLER FITTINGS – INSTALLATION INSTRUCTIONS**

### **ALLISON ON-HIGHWAY TRANSMISSIONS**

**APPLICABLE MODELS:** 1000 Product Family  
2000 Product Family  
3000 Product Family  
4000 Product Family

### **Contents:**

**1.0 Introduction**

**2.0 Referenced Documents**

**3.0 Installation Instructions**

**3.1 Installing Straight-Thread O-Ring Fittings**

**3.2 Installing the Hose-End onto the Straight-Thread O-Ring Fitting**

**List of Referenced Documents**

**Revision History**

# **COOLER FITTING INSTALLATION INSTRUCTIONS**

## **1.0 INTRODUCTION**

The purpose of this document is to provide instructions for installing straight-thread o-ring fittings into the transmission cooler ports. For installation instructions relating to cooling system components which are not attached directly to the transmission, refer to the manufacturers of those components.

For transmission cooling system design requirements and recommendations, refer to the [\*Transmission Cooling – Basic\*](#) and [\*Transmission Cooling – Retarder\*](#) documents.

## **2.0 REFERENCED DOCUMENTS**

Unless otherwise noted, all documents referenced in this document may be found in the Extranet channel of the Allison Transmission website, [www.allisontransmission.com](http://www.allisontransmission.com). To locate the referenced documents, look for Tech Data under the Engineering heading on the Extranet home page. In this document, these references are identified by *italic* font. Contact your Allison Transmission representative if you do not have access to the Allison Transmission Extranet. A list of all documents referenced in this document can be found at the end of this document.

## **3.0 INSTALLATION INSTRUCTIONS**

If the transmission or other nearby components are painted, the transmission cooler ports must be protected from over-spray. Paint must not be allowed to enter the transmission. In addition, the transmission cooler ports are designed to prevent the leakage of oil out of the transmission. In order to maintain the integrity of this interface, the transmission cooler ports must not be contaminated by paint over-spray. This is best accomplished by one of the following procedures:

- Install the cooler fittings, hydraulic lines and cooler prior to the painting process
- If the painting process precedes installation of the cooler fittings and cooler circuit, retain the plastic shipping plugs in the transmission cooler ports during the painting process to protect the ports against over-spray. Remove the plugs only after all painting is complete.

Paint, debris and other contaminants must be kept out of fittings, coolers, hoses, tubing, and all other components in the transmission cooling system. Best practice is to:

- Cap the ends of hose or tube assemblies during shipping and storage
- Cap or plug the fittings on all cooler circuit components during shipping and storage
- Do not remove the caps until immediately prior to installation of the components

**NOTE:** The instructions in this document refer to the cooler ports. However, the same procedures are used for attaching fittings and hydraulic lines to the remote filter covers which are available for the 3000 and 4000 Product Families. Refer to the [\*Remote Filter Installation Requirements Installation Drawings, AS66-461 \(3000 Product Family\) and AS67-461 \(4000 Product Family\)\*](#).

### **3.1 INSTALLING STRAIGHT-THREAD O-RING FITTINGS**

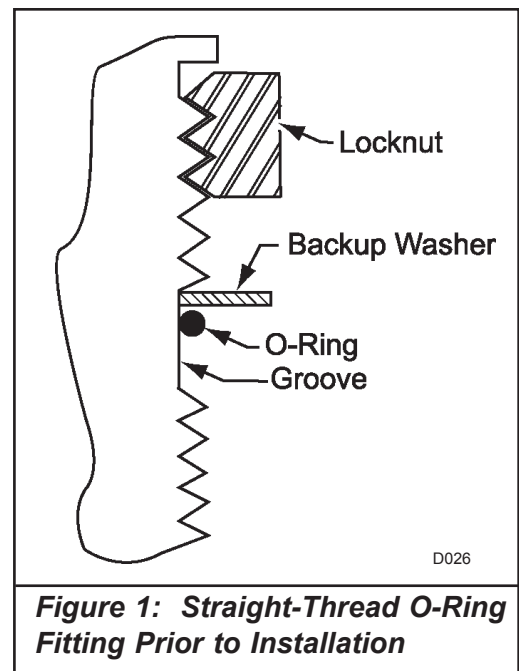
Following is the procedure for installing straight-thread o-ring fittings into the transmission cooler ports.

1. Prior to installation, keep the transmission cooler ports and fittings clean and protected from contamination.
2. Most hose and fitting manufacturers supply straight-thread o-ring fittings with the o-ring installed. If the o-ring is not installed on the fitting, lubricate the o-ring with transmission fluid or petroleum

jelly. Install the o-ring in the unthreaded groove next to the metal backup washer (Figure 1). Be careful to not nick the o-ring.

**NOTE:** Make sure that the o-ring is made of a fluorocarbon elastomer such as Viton®, per the External Hydraulic Circuit requirements in [Transmission Data](#) for the [1000/2000](#), the [3000](#) or the [4000](#) Product Family.

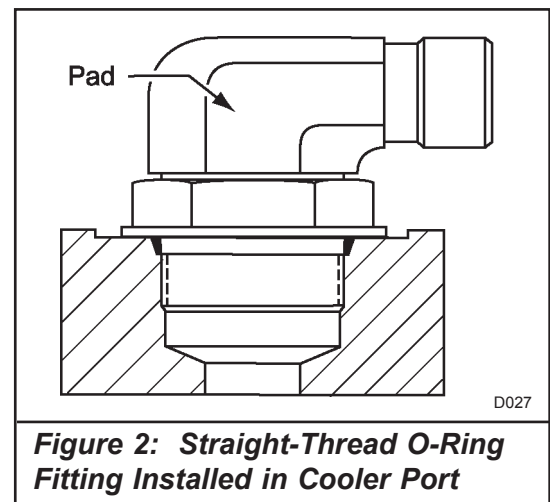
3. Back off the locknut as far as possible. Make sure that the backup washer is not loose and is located at the end of the groove closest to the locknut. Refer to Figure 1.
4. Remove and discard the shipping plugs from the cooler ports on the transmission. Do not use the o-rings from the shipping plugs on the permanent cooler fittings. These o-rings were specified for "shipping only" and do not meet the fluorocarbon elastomer "Viton" material specifications required for operation.



5. Install the fitting into the cooler port by hand until the backup washer contacts the spotface of the cooler port and forces the o-ring into the o-ring port in the transmission.
6. If required for an angled fitting, position the fitting by unscrewing it (turning counterclockwise) up to a maximum of one turn.

7. Hold the fitting in the desired position using a wrench on the pad above the locknut. Refer to Figure 2. Use a torque wrench to tighten the locknut to the torque specified on the appropriate [Installation Drawing](#):

- [AS64-471, External Hydraulic Circuit Requirements](#), for 1000/2000 Product Family transmissions
- [AS66-417, Basic Installation Drawings](#), for rear cooler ports on 3700 model transmission
- [AS66-474, Cooler Port Provisions](#), for the 3000 Product Family - 6-speed models
- [AS67-474, Cooler Port Provisions](#), for the 4000 Product Family



**CAUTION:** The torque specifications for installing straight-thread o-ring fittings into the transmission straight-thread o-ring ports are lower than the industry standard torque specifications for straight-thread o-ring fittings. The industry standard torques apply to steel fittings installed into steel housings. Allison's transmission housings are cast aluminum, which require lower torque specifications. Fittings installed at the industry standard torque could damage the cooler port spotface and reduce the integrity of the seal, especially when removed and re-installed in the field.

8. Inspect the installation to verify the following:
  - the o-ring is not pinched

- the backup washer is seated flat on the spotface of the port

### **3.2 INSTALLING THE HOSE-END ONTO THE STRAIGHT-THREAD O-RING FITTING**

1. Remove the protective cap from the straight-thread o-ring fitting in the transmission cooler port. Remove the protective cap from the hose-end fitting.
2. Prevent the straight-thread o-ring fitting from turning by holding it in place with a wrench on the locknut or on the pad of the fitting above the locknut. Refer to Figure 2.
3. Install the hose end fitting onto the straight-thread o-ring fitting by hand.
4. Continuing to hold the straight-thread o-ring fitting in place with a wrench, use a torque wrench to torque the hose-end fitting to the manufacturer's specification. This is referred to as the two-wrench method.

**CAUTION:** The straight-thread o-ring fitting must be prevented from turning during the installation and torquing of the hose-end fitting. Failure to prevent the straight-thread o-ring fitting from turning may result in exceeding the Allison torque specification for the fitting in the transmission port. Exceeding the Allison torque specification could damage the cooler port spotface and reduce the integrity of the seal between the fitting and the transmission.

## LIST OF REFERENCED DOCUMENTS

- [Transmission Cooling –Basic](#)
- [Transmission Cooling – Retarder](#)
- [Transmission Data](#) for the:
  - [1000/2000 Product Families](#)
  - [3000 Product Family](#)
  - [4000 Product Family](#)

### [Installation Drawings – 1000/2000 Product Family](#)

- [AS64-471, External Hydraulic Circuit Requirements](#)

### [Installation Drawings – 3000 Product Family](#)

- [AS66-417, Basic 7-Speed Dropbox Option Installation Drawing](#)
- [AS66-461, Remote Filter Installation Requirements Drawing](#)
- [AS66-470, Direct-Mount Cooler Option, Non-Retarder Models](#)
- [AS66-472, Direct-Mount Cooler Option, Retarder Models](#)
- [AS66-474, Cooler Port Provisions](#)
- [AS66-476, Retarder/Sump Cooler Provision - Direct-Mount](#)
- [AS66-477, Retarder/Sump Cooler Provision - Remote Mount](#)

### [Installation Drawings – 4000 Product Family](#)

- [AS67-461, Remote Filter Installation Requirements Drawing](#)
- [AS67-474, Cooler Port Provisions](#)
- [AS67-470, Non-Retarder Direct-Mount Cooler Options](#)
- [AS67-476, Retarder/Sump Cooler Provision - Direct-Mount](#)
- [AS67-477, Retarder/Sump Cooler Provision - Remote Mount](#)

## REVISION HISTORY

### **July 11, 2017**

- In 3.1, item 4, added statement to not use the o-ring from the cooler port shipping plugs for the permanent fittings since these o-rings don't meet the fluorocarbon elastomer "Viton" material specifications required for operation.

### **November 7, 2016**

- Updated the document to reflect the new consolidated 3000 and 4000 Installation Drawings; AS66-416, AS66-417, AS66-418, AS67-416, AS67-417, AS67-418.

### **July 17, 2008**

- Prepared document for Extranet publication

### **June 11, 2008**

- Created new document, *Cooler Fitting Installation Instructions*.

# Contents

Cooler Fittings –

Installation Instructions

1.0 Introduction

2.0 Referenced Documents

3.0 Installation Instructions

3.1 Installing Straight-Thread O-Ring Fittings

3.2 Installing the Hose-End onto the Straight-Thread O-Ring Fitting

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