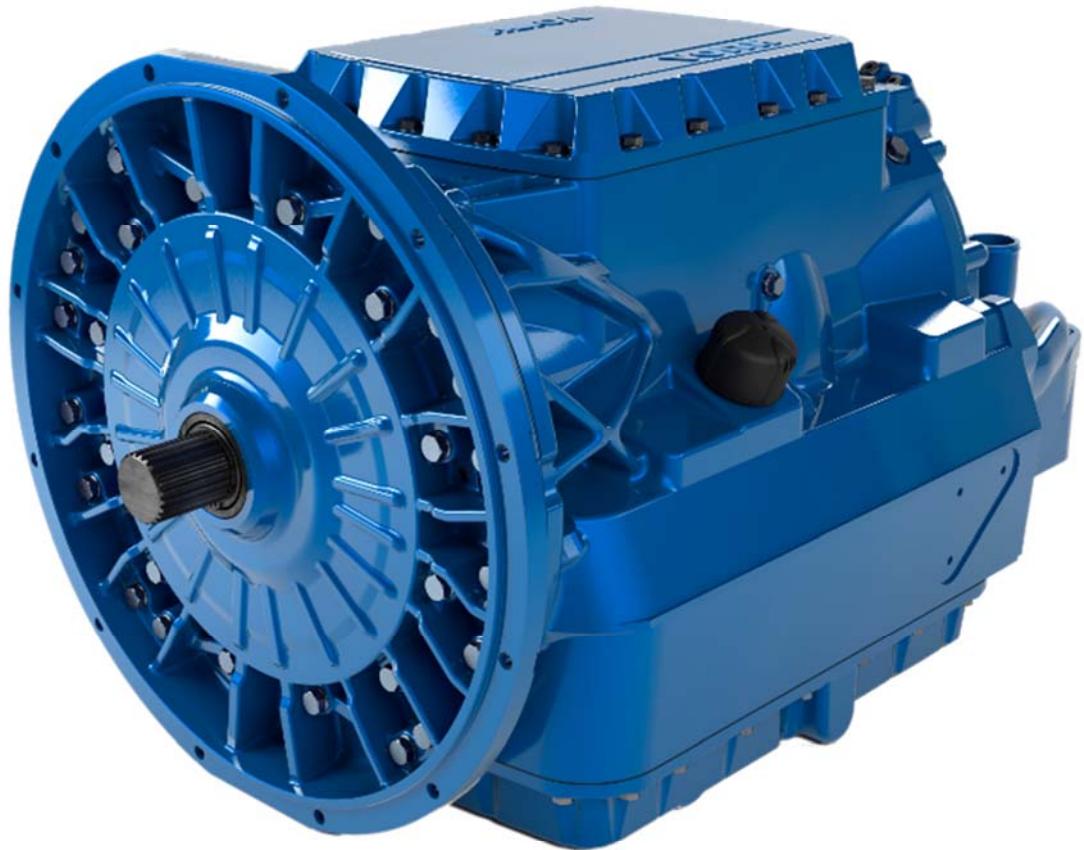


**VOITH**

**VOITH SERVICE X-CHANGE TRANSMISSION  
PROGRAM MANUAL**

**REMANUFACTURING PROGRAM**

**VOITH DIWA® - TRANSMISSIONS**



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## SECTION 1 – SERVICE X-CHANGE PROGRAM INTRODUCTION

Thank you for your interest in the Voith Service X-Change Program. The transmission that you receive will be completely overhauled in Voith's ISO 9001:2008 certified facility, and our factory trained technicians use only genuine Voith spare parts. Voith Service X-Change Transmissions are overhauled in strict compliance with Voith specifications.

This Voith Service X-Change Program Manual has been designed to provide you with important information about the Voith Service X-Change Program. Please refer to this manual for all relevant guidelines pertinent to the Voith Service X-Change Program.

For quick replies to your questions, please email [VTI-Xchange@voith.com](mailto:VTI-Xchange@voith.com).

## SECTION 2 – VOITH SERVICE X-CHANGE PROGRAM ORDER PLACEMENT

### 2.1 – ORDERING A VOITH SERVICE X-CHANGE TRANSMISSION

To order a Voith Service X-Change Transmission (VSXT), you have two options:

1. Visit <http://voithusa.com/road> and open the X-Change Products drop-down menu. Open the X-Change On-Line Order Form and fill in the required information.
2. Download and complete the X-Change On-Line Order Form as a PDF and email the On-Line Order Form along with your Purchase Order (PO) to [VTI-Xchange@voith.com](mailto:VTI-Xchange@voith.com).

(Note: This second option is available due to various Company firewalls.)

During the order process, you will need to supply the information contained on the transmission Serial Number Plate and the transmission Data Tag. (See Figure 2a).

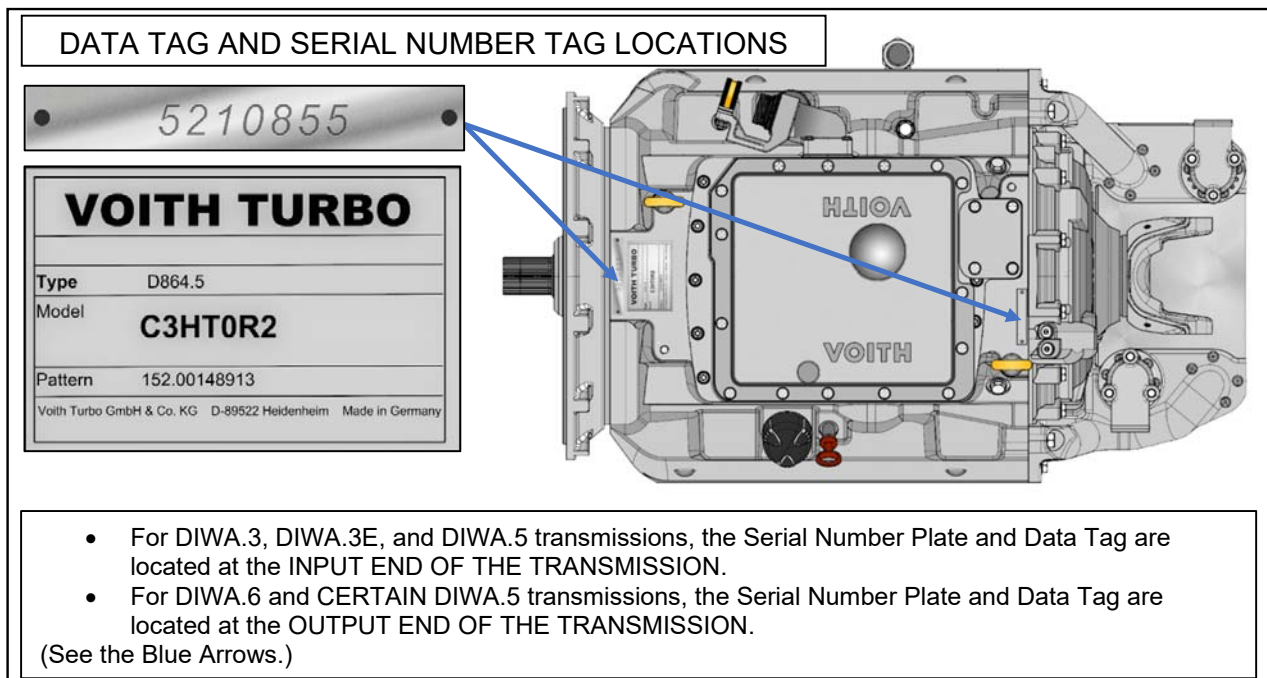


Figure 2.1a—Transmission Data Tag Location

Once the Purchase Order (PO) is received by Voith, you will receive an Order Acknowledgment via email. This email will also contain the details for the return of the transmission core.

In addition to the purchase of the X-Change Transmission, you may want to consider the following additions to your purchase.

Checkbox	Description	Price
<input type="checkbox"/>	Add an additional one-year warranty to the standard two-year warranty.	Pricelist on Road Website
<input type="checkbox"/>	Add a Hydrodamp (Vibration Damper) to the order. The Hydrodamp frequently requires replacement after many years or miles of service.	Pricelist on Road Website
<input type="checkbox"/>	Send in your Voith Electronic Control Unit (ECU) to be reprogrammed with latest software and dataset. (See Section 2.2)	Pricelist on Road Website
<input type="checkbox"/>	Purchase a Reconditioned Voith Electronic Control Unit (ECU) complete with the latest Software and Dataset for your application. (See Section 2.2)	Pricelist on Road Website

## 2.2 – SOFTWARE REQUIREMENTS

### DIWA.5 AND DIWA.6 TRANSMISSIONS

It is imperative that your vehicle meets the software level requirements. DIWA.5 and DIWA.6 Voith Service X-Change Transmissions require that the Voith Electronic Control Unit (ECU) be updated to software version 5.14.11.0S or higher. This software upgrade includes many enhanced features that increase the operational life and performance of the Voith transmission.

### DIWA.3 AND DIWA.3E TRANSMISSIONS

DIWA.3 and DIWA.3E Voith Service X-Change Transmissions require that the Voith Electronic Control Unit (ECU) be updated to software version 18.27.8 or higher. This software upgrade includes many enhanced features that increase the operational life and performance of the Voith transmission.

You must ensure that the updated software is installed in the ECU when the Voith Service X-Change Transmission is installed in the vehicle. You can have your local Voith Service Provider (VSP) install the new Software and Dataset, or you can ship your ECU to Voith to be programmed for an additional fee.

Please contact [VTI-Xchange@voith.com](mailto:VTI-Xchange@voith.com) for more details. Direct all Software and Dataset questions to the Voith Road Service Team at [VTI-RoadService@voith.com](mailto:VTI-RoadService@voith.com).

## SECTION 3 – COMPLETE VOITH SERVICE X-CHANGE TRANSMISSIONS

### 3.1 – DIWA TRANSMISSION CORE POLICY

#### Core & Adder Charges

You will have 45 days from the day the Voith Service X-Change Transmission ships from Voith to return the core before any late penalty is incurred. Cores will be inspected and graded upon receipt. The following grades and descriptions will determine the amount of core credit received back. **No core credit will be received after 90 days.** Please see online price sheets for cost of core and deductions at <http://voithusa.com/road.com> or email [VTI-Xchange@Voith.com](mailto:VTI-Xchange@Voith.com) for pricing

#### CORE GRADE SCALE

Core Grade	Core Grade Description	Core Credit Reason	Core Credit Result
A	Excellent	No issues = Full Credit	Full Credit
B	Good Core	Fluid not drained, paperwork missing, improperly groomed / will need to remove parts to send back to customer.	See Price Sheet on Voith Road Service Website
C	Good Core	Shipping case missing / not returned in supplied crate, missing wiring harness or sensors, excessive dirt/grease	See Price Sheet on Voith Road Service Website
D	Fair Core	Case is cracked but internals are still usable, disassembled, damaged oil pan	See Price Sheet on Voith Road Service Website
F	Poor Core	Rust or severe damage from abuse of core	See Price Sheet on Voith Road Service Website

**THE TRANSMISSION CORE MUST BE THE SAME TYPE, MODEL, AND PATTERN NUMBER AS THE VOITH SERVICE X-CHANGE TRANSMISSION BEING PURCHASED! VOITH DOES NOT BANK CORES.**

**NOTE:** The transmission type, model number, pattern number, and serial number must be provided when placing an order for a Voith Service X-Change Transmission. This information can be found on the transmission data tag located on top of the transmission at either input or output. (See Figure 3.1a)

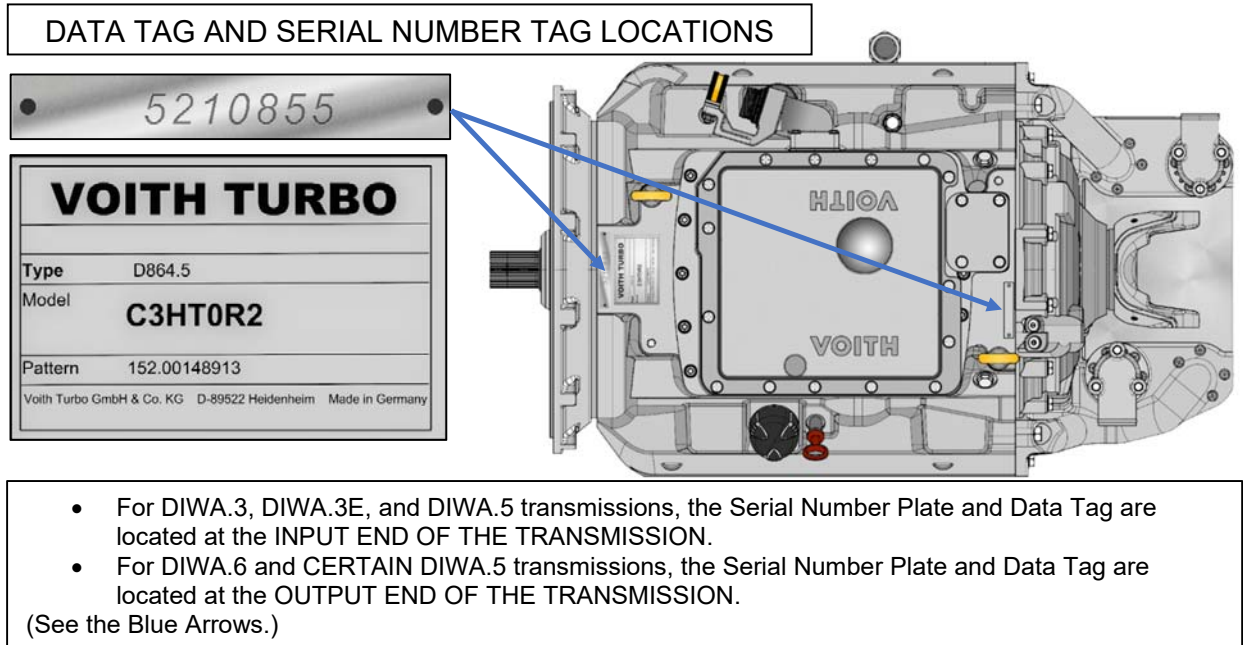


Figure 3.1a—Transmission Data Tag Location

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### 3.2 – CORE GROOMING GUIDELINES

- Please drain the transmission and heat exchanger of any fluids prior to shipment. Properly plug any holes for shipping so oil does not leak out while in transit. Reuse the plugs supplied on the Voith Service X-Change Transmission to plug the holes. Please do not use rags to plug holes.
- Scrape off any undercoating or heavy road debris buildup on the transmission housing. **Note: If the core is returned to Voith without removing the undercoating or heavy road debris, you will only receive partial credit for your core.**
- Pressure wash the transmission before removing any hardware or plugs. **Caution: To prevent the entry of water, protect the transmission breather with tape or a plastic bag before pressure washing. Failure to prevent the entry of water into the transmission will eliminate your core credit refund. See Figure 3.2a.**



Figure 3.2a—Breather protected from water entry by using tape or plastic and tie strap.

- Remove all P-Clamps and brackets that support Original Equipment Manufacturer (OEM) components. Disconnect the Cable one from the internal wiring of the transmission. **Note: Failure to reinstall these components could cause a premature failure, and could void or limit the Voith Service X-Change Transmission warranty.**
- Remove and save all oil hose lines. (Figure 3.2c – Figure 3.2f)
  - Note: Oil Hoses only have a suggested 8 year life before replacement.
- Remove and save any external oil filter assemblies and mounting brackets. (Figure 3.2c)
- Remove the heat exchanger from the mounting brackets on DIWA.3 and DIWA.3E transmissions. Ship the heat exchanger with the core transmission. Retain the brackets, cooling pipes, and oil fittings. (Figures 3.2c – 3.2f)
- Do not remove heat exchangers on DIWA.5 and DIWA.6 transmissions. The heat exchanger must remain mounted to the transmission.
- Remove and save any OEM brackets and any oil or water fittings. (Figures 3.2c-3.2j)
- Remove and save any oil temperature switches and/or fittings from the oil pan. **Note: be sure to use the plugs provided from the Voith Service X-Change transmission on the core you are returning.**
- Remove the oil level sensor on DIWA.3 and DIWA.3E transmissions. Retain the oil level sensor for installation on the Voith Service X-Change Transmission. (See Voith Service Bulletin 119 for oil level sensor repair information, if needed.) (Figures 3.2c & 3.2f)
- Remove the OEM dipstick tube and 90° elbow from the oil pan and retain the parts for installation on the Voith Service X-Change Transmission. Use the plug provided on the Voith Service X-Change Transmission to plug the opening on the oil pan. (Figures 3.2f – 3.2j)
- **Do Not** send the Hydrodamp back to Voith.
- **Do Not** send the Bell Housing Adapter (also called mounting/connection flange) back to Voith. (Figure 3.2b)
- **Do Not** send the Electronic Control Unit (ECU) to Voith unless the ECU is to be reprogrammed, or if the ECU is to be exchanged for a reconditioned ECU.

## DIWA.3

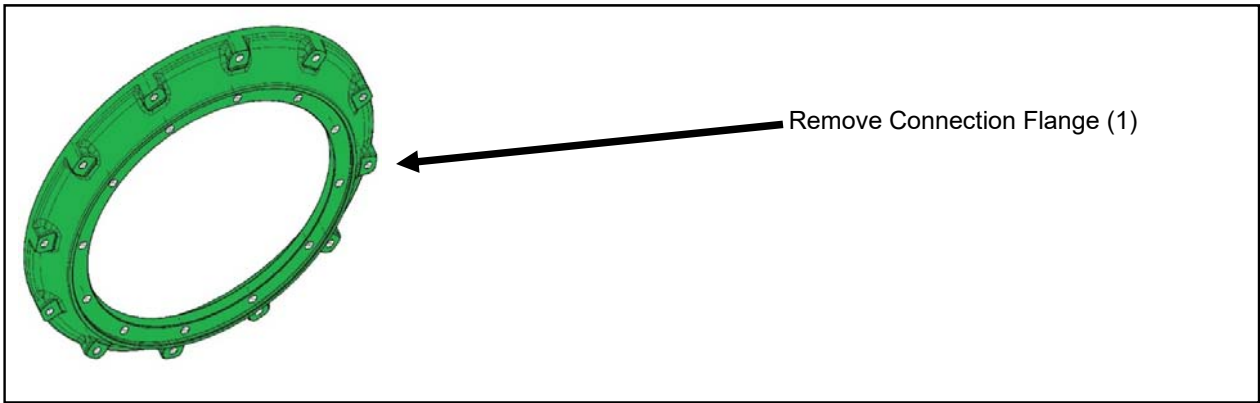


Figure 3.2b—DIWA.3 Connection Flange

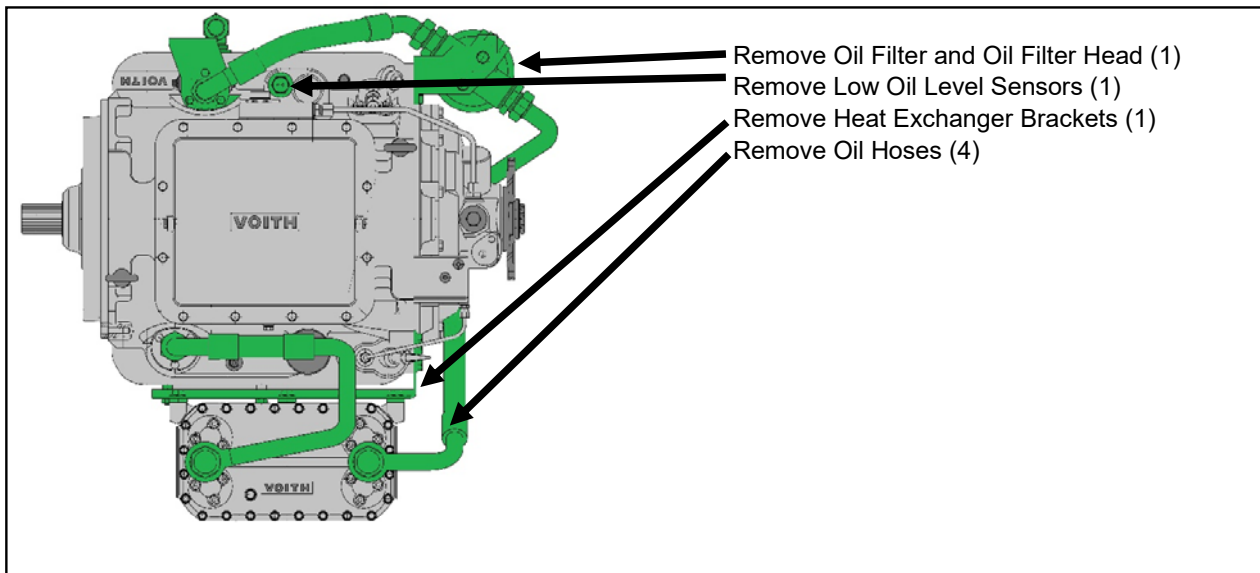


Figure 3.2c—DIWA.3 Top View

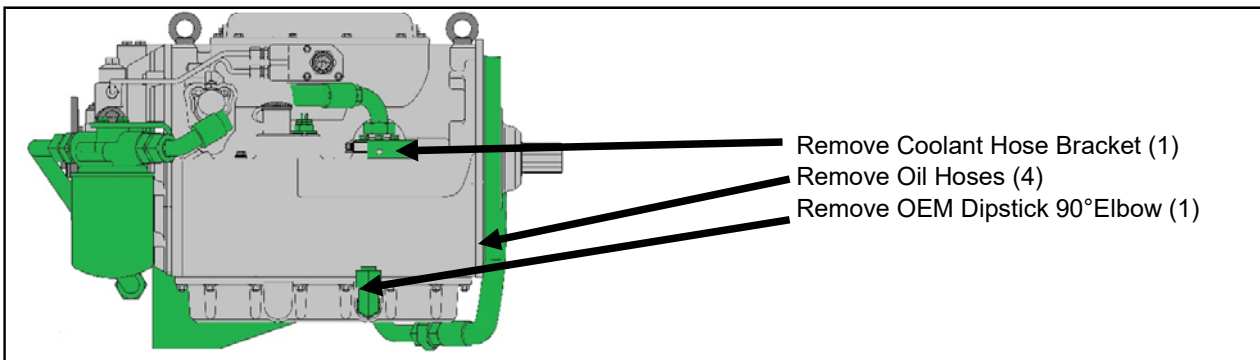


Figure 3.2d—DIWA.3 Side View

Remove the grooming parts highlighted in green. Please follow these guidelines carefully. Please remove and retain any OEM brackets that may be installed on the Voith transmission. Voith is not responsible for any items that are left on the transmission. You will be responsible for the freight charges to return of any components left on the core transmission. (**Warning: Never remove the output yoke or the output flange.**)

## DIWA.3E

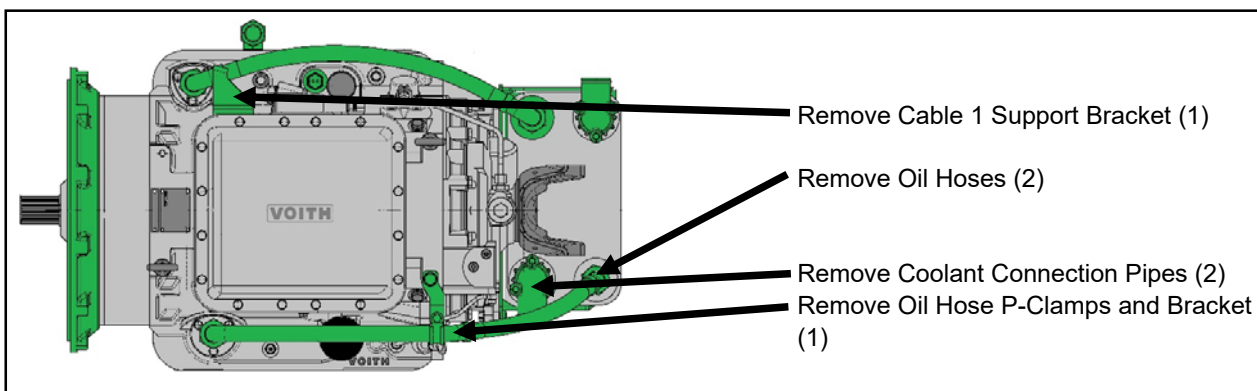


Figure 3.2e—DIWA.3E Top View

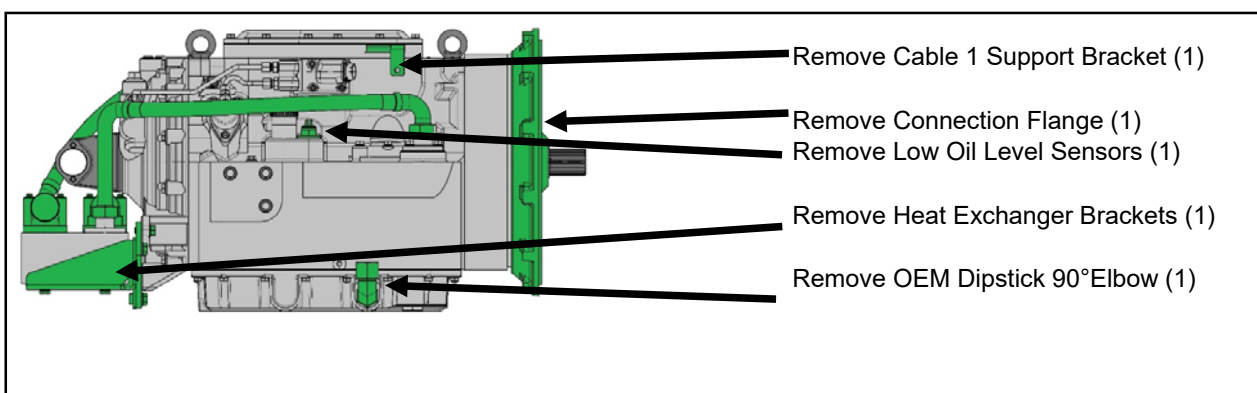


Figure 3.2f—DIWA.3E Side View

Remove the grooming parts highlighted in green. Please follow these guidelines carefully. Please remove and retain any OEM brackets that may be installed on the Voith transmission. Voith is not responsible for any items that are left on the transmission. You will be responsible for the freight charges to return of any components left on the core transmission. **(Warning: Never remove the output yoke or the output flange.)**



## DIWA.5

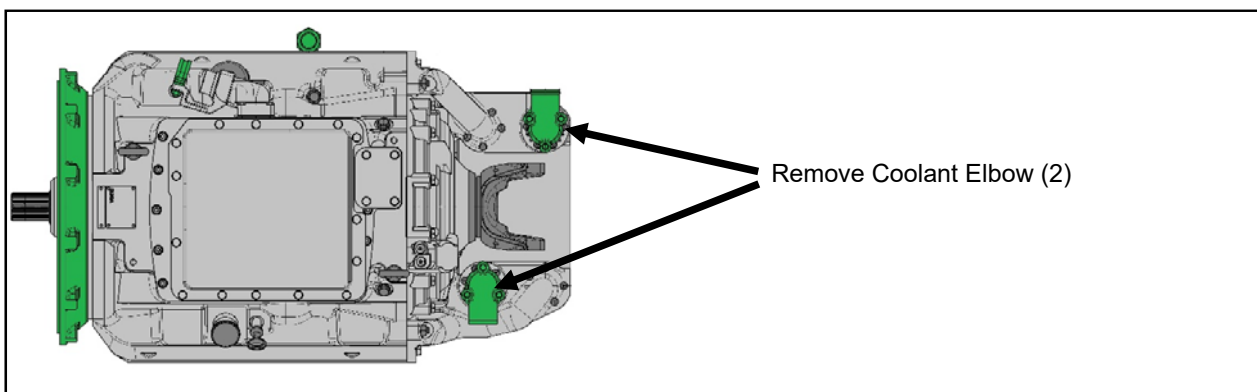


Figure 3.2g—DIWA.5 Top View

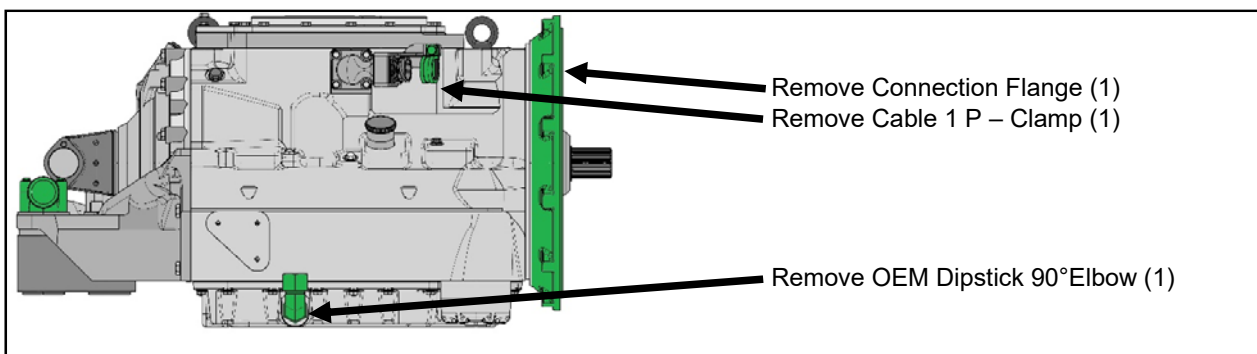


Figure 3.2h—DIWA.5 Side View

Remove the grooming parts highlighted in green. Please follow these guidelines carefully. Please remove and retain any OEM brackets that may be installed on the Voith transmission. Voith is not responsible for any items that are left on the transmission. You will be responsible for the freight charges to return of any components left on the core transmission. **(Warning: Never remove the output yoke or the output flange.)**

## DIWA.6

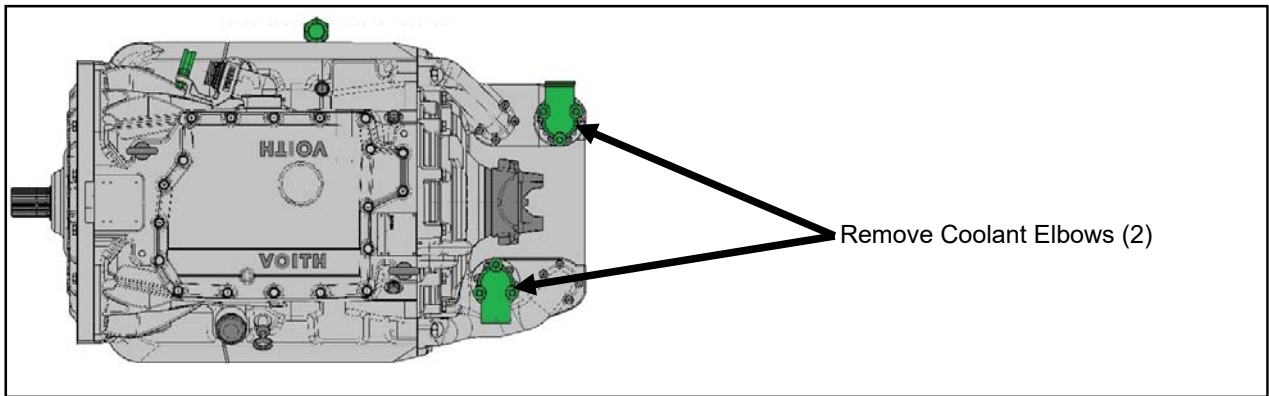


Figure 3.2i—DIWA.6 Top View

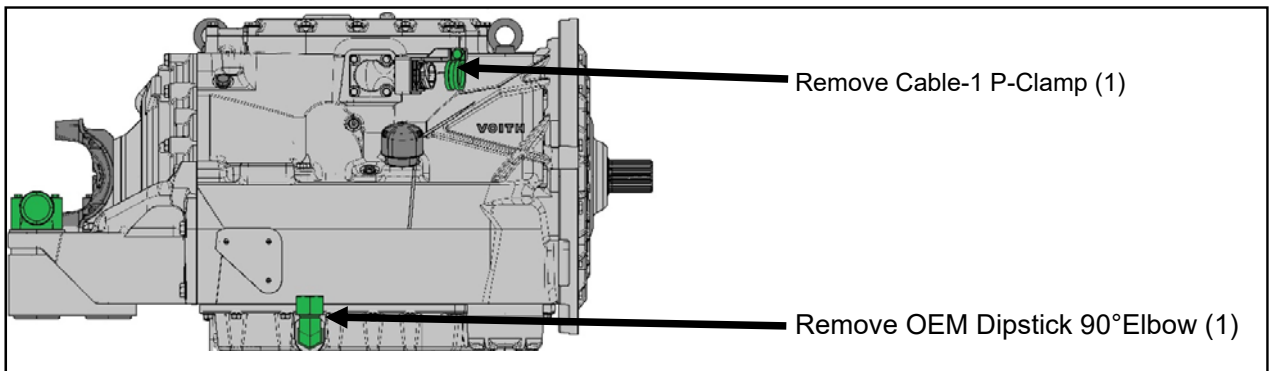


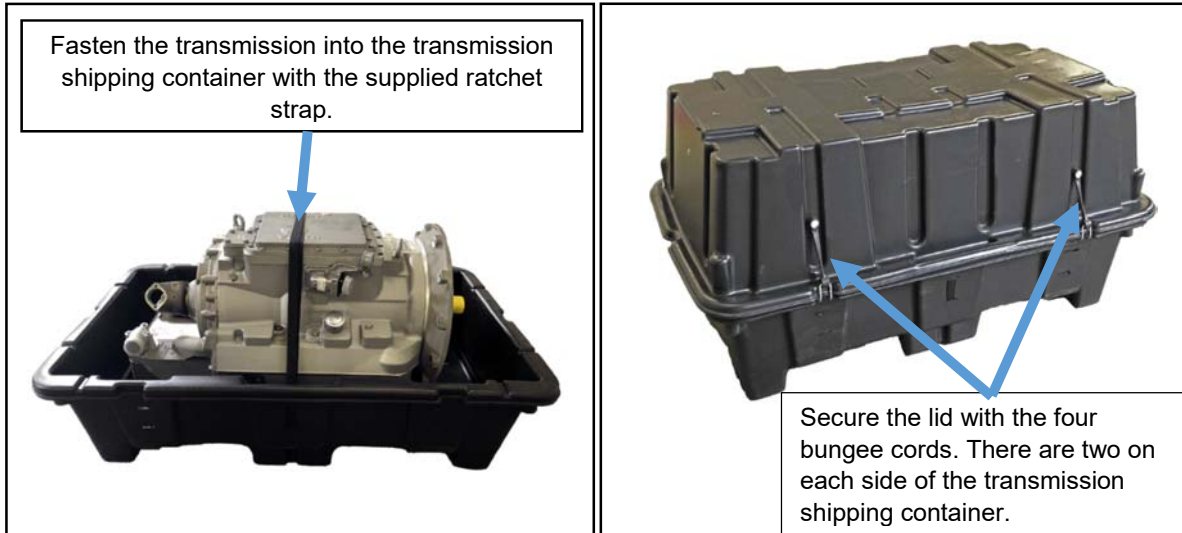
Figure 3.2j—DIWA.6 Side View

Remove the grooming parts highlighted in green. Please follow these guidelines carefully. Please remove and retain any OEM brackets that may be installed on the Voith transmission. Voith is not responsible for any items that are left on the transmission. You will be responsible for the freight charges to return of any components left on the core transmission. **(Warning: Never remove the output yoke or the output flange.)**

## SECTION 4 – PACKAGING REQUIREMENTS FOR THE VOITH SERVICE X-CHANGE

### TRANSMISSION

**YOUR VOITH SERVICE X-CHANGE TRANSMISSION WILL BE SHIPPED TO YOU IN AN APPROVED TRANSMISSION SHIPPING CONTAINER (Figures 4a & 4b). YOU WILL REMOVE THE VOITH SERVICE X-CHANGE TRANSMISSION AND PLACE YOUR CORE TRANSMISSION IN SAME SHIPPING CONTAINER FOR RETURN SHIPMENTS.**



Figures 4a & 4b—Transmission Shipping Container

The output end of the transmission shipping container has a flat area where the heat exchanger sits. The input end of the transmission shipping container has a cutout for the input end of the transmissions. The transmission will only fit securely into the transmission shipping container one way. Please make sure you have placed the transmission into the transmission shipping container correctly to ensure safe shipping of the core.

Voith will supply a Core Return Tag (Fig 4c) with all the necessary information to identify your transmission core. Please attach the Core Return Tag to the core transmission with a zip tie or twisty tag.

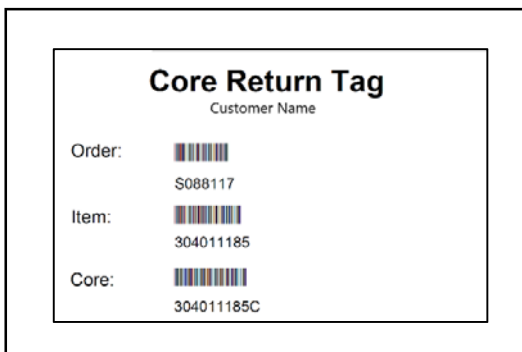


Figure 4c—Core Return Tag

**EXCEPTIONS** to the above case would be if there is not a Voith Service X-Change Transmission available within the Voith Service Exchange Program, such as an Angle Drive transmission or a transmission that is considered to be obsolete in the Voith Service X-Change Program. Voith would ship exchange transmission in a wood crate at no charge. An open pallet or skid may be used to ship the transmission with approval from Voith. If a pallet or skid is used, the following must be observed:

1. The pallet or skid must be of sufficient length and width to provide enough coverage for the transmission so that the transmission DOES NOT hang over the edge of the pallet or skid. An inadequately sized pallet or skid could result in damage to the transmission during transportation. The transmission should be secured to the skid or pallet using banding (preferably metal) designed for that purpose.

2. All peripheral components (heat exchanger, lifting rings, ECU) must be securely wrapped, boxed, and secured to the pallet.
3. Identify the transmission appropriately, and please indicate the Return Goods Authorization (RGA) number. Voith will provide the RGA number after you place your Voith Service X-Change Transmission order. The RGA number should be written on any additional boxes used for the peripheral components. Failure to properly identify your core could result in lost core credit.

## SECTION 5.0 – WARRANTY AND INSTALLATION CHECKLIST

### 5.1 - WARRANTY ADMINISTRATION

**NOTE:** All inquiries for warranty administration for the Service X-Change Program must be directed to: [VTI-RoadService@voith.com](mailto:VTI-RoadService@voith.com)

### 5.2 - WARRANTY ACTIVATION

The Voith Service X-Change Transmission Warranty Certificate is available online and can be accessed using the Voith Technical Support Website at [www.voithusa.com/road](http://www.voithusa.com/road), or the Voith Service X-Change Transmission Warranty Certificate can be submitted via email to [VTI-RoadService@voith.com](mailto:VTI-RoadService@voith.com).

See Section 5.3 for the Installation Checklist. The Installation Checklist serves as:

- A checklist to ensure that you have attended to all of the necessary details relating to the installation of the Voith Service X-Change Transmission.
- A Warranty Activation Record
- A reminder to check the Approved Oil List to ensure that you are using an oil that is approved for use in the Voith Service X-Change Transmission. Refer to the most current version of Service Bulletin 13 or 118 depending on transmission type.
- A reminder to be aware of oil and filter change intervals for your Voith Service X-Change Transmission. See Service Schedule.

ALL FIELDS IN THE WARRANTY REGISTRATION FORM MUST BE COMPLETED. THE WARRANTY REGISTRATION FORM MUST BE SUBMITTED ONLINE OR EMAILED TO ACTIVATE THE VOITH SERVICE X-CHANGE WARRANTY.

**Note: Failure to file a warranty certificate means the warranty will start on the day of invoice instead of day of installation.**

**Note: Transmission warranties could be limited if installation procedures are not followed.**

### 5.3 – INSTALLATION CHECKLIST

Required Installation Checklist for DIWA.3, DIWA.3 E, DIWA.5, DIWA.6				
Serial Number:		Trans. Type:		
Date Installed:		Trans.Pattern:		
Mileage at Install:		Engine Type:		
Business Name:				
Unit Number:		VIN Number		
Bus Manufacture:		City:		
Contact Name:		State:		
Contact Email:		Zip Code:		
Contact Phone Number:		Order Number:		
Task	Task Type	Task Description	Yes/Ok	Additional info.
Hydrodamp	Inspection	Checked for spline wear in hub  Oil Level  Not Leaking	<input type="checkbox"/>	DIWA.6 15001201112 service manual pg. 44 DIWA.5 15000382110 workshop manual pg. 36 DIWA.3 & DIWA.3E 55.6704.14 repair manual pg. 24
Input Shaft	Grease	Confirm grease applied	<input type="checkbox"/>	See Service Bulletin 137 on proper grease to apply. Note please apply small amounts just to fill spline grooves.
Driveshaft	Inspection	Confirm driveshaft alignment and properly balanced.  Replacement of U-Joints  Confirm ride height as per manufacture specifications	<input type="checkbox"/>	See driveshaft manufactures specifications and OEMs requirements for ride height.  <b><u>Never remove Output flange or Yoke on the Voith transmission.</u></b>
Radiator	Visual Inspection	Vehicle radiator and air charge cooler	<input type="checkbox"/>	
		Fins Clean  Fins are not bent.  Airflow not blocked	<input type="checkbox"/>	Should be able to use a flashlight throughout radiator and see light to other side.



Task	Task Type	Task Description	Yes/Ok	Additional info.
Coolant	Inspection	Approved Antifreeze		Heat Exchanger Cooling Service Bulletin 41A
		Replacement of Heat exchanger coolant hoses	<input type="checkbox"/>	
Cable 1	Visual Inspection	Cable 1 ECU to Transmission		
		No oxidation or cracked lock ring at connection No bent pins at transmission connection No cracks or chafing of insulation. No Sharp bends in cabling Install P-Clamp to support connection	<input type="checkbox"/>    <input type="checkbox"/>	Failure to meet any of these criteria. Replacement of Cable 1 required
Hoselines	Visual Inspections	External Hoselines DIWA.3 & DIWA.3E	<input type="checkbox"/>	Should be replaced after 8 years of service.
Oil		Correct Automatic Transmission Fluid Oil Level Check	<input type="checkbox"/>	See Current Service Bulletin 13 & 118 Oil level check should be confirmed using Voith's dipstick on transmission
Oil Manufacture:				
Oil Type:				
Oil Approval Number:				
Diagnostic	Diagnostic test using ALADIN with bus at a standstill ignition on.			
	Aladin 6.5 or higher	Diagnostics Clear Events in Fault Monitor Delete adaptation data	<input type="checkbox"/>	

Task	Task Type	Task Description	Yes/Ok	Additional info.
	Software ECU	DIWA.5 and DIWA.6 Software version 5.14.11.0S or higher  DIWA.3 and DIWA.3E Software version 18.28.8 or higher	<input type="checkbox"/>	
Diagnostic	Diagnostic test using ALADIN road test to operating temperature			Operating oil temperature is 80° to 90° C
	Transmission Monitoring	Sensor Selector Brake Signals Actuator Test	<input type="checkbox"/>	Voith Diagnostic Program
	Upload	Event Memory No Malfunctions Send ALADIN Upload to Voith Attach Upload File	<input type="checkbox"/>	Priority 1, 2 or 7 should be corrected before put into service.  Send ALADIN upload to VTI-RoadService@voith.com
Fluid	Oil and Antifreeze	Oil Level Coolant level Check for leaks	<input type="checkbox"/>	Oil level check should be confirmed using Voith's supplied dipstick on transmission. <b><u>Not OEM</u></b>
	Initial Oil Filter Change	Filter replacement DIWA 5 & DIWA 6  Oil and filter replacement DIWA.3 & DIWA.3E	<input type="checkbox"/>	Filter replacement must occur at 10,000 miles on DIWA.5 & DIWA.6 (VT1942EN&VT2355 EN)  Oil and Filter replacement must occur at 2,500 miles and 11,500 miles (G1734e & G1735e)

**Notice: This checklist would be understood by a certified installer. If you do not have the equipment or certification to perform this above task you may limit or have your warranties denied.**

**Please call the toll free techline +1-877-374-1339 and you will be directed to the nearest installer or schedule a training class to become a certified installer.**

**Bulletins and Diagnostic Software and Tool List are available online**  
<http://www.voithusa.com/Road/>