

**** SOLUTION ****

Title Volvo Chassis - Automated Manual Transmission (AMT, I-Shift) Repair Strategy; Component Inspection And Reuse Guidelines And Instructions; Required Tasks When Disassembling An AMT For Repair - **For use with Service News SNV19-020e**

Volvo Models

Volvo Model VNL , VNM , VNR , VNX , VAH , VHD

Emission Standard

Emission Standard US07 , US10 , US10+OBD13 , US14+OBD13 , US14+OBD15 , US14+OBD16 , US17+OBD16 , US17+OBD18 , US17+OBD19

Engine family

Engine family 11L Engine , 13L Engine , 16L Engine

Transmission

Transmission AMT-C , AMT-D , AMT-F With Crawler Gears , AMT-F Without Crawler Gears

**** SOLUTION ****

Cause TMAC and Warranty have been receiving core returns and warranty claims for complete transmissions replaced due to failures when only a partial transmission or component replacement was necessary. This solution provides an explanation of the process for inspecting the AMT gearbox for suitability for repair to prevent items from being overlooked and proper repair instructions for relevant findings.

This solution is to be followed when a failure has been identified and transmission components need to be inspected to determine the viability of repair or replacement.

Solution **This solution should be used together with [SNV19-020e](#).**

NOTE: Duplicated or excessive labor charged to a claim due to a component failure that is missed during initial diagnosis and teardown may be denied by warranty.

Inspection

- Operation [4311-06-02-01 Transmission Reuse or Replacement Guidelines](#), found under the Service tab in Impact, should be used for guidance when inspecting the components below. This operation contains very detailed information on what are and are not acceptable appearances, conditions and specifications for each component.

- Individual components removed during disassembly for repair should be inspected and replaced as necessary.

- All major areas of the transmission should be inspected **prior to making repair decisions** to prevent items from being overlooked:

Several of the items listed below may already have been inspected during the diagnostic process

- Control Housing Assembly
- Main shaft and countershaft components in the main gearbox
- Input shaft, radial and/or axial play
- Rear of gearbox and range housing assembly

The PTO cover or range housing assembly should be removed as necessary to complete inspection

- If a significant amount of debris is found in the gearbox:

- Remove the range housing assembly
- Remove the lubrication pipe (lube tube) from the main shaft

Check for a buildup of metal flakes inside the main shaft that is also visible in the lubrication pipe and on the o-rings.

- **If this condition is observed the main box and oil cooler must be replaced.**

- **NOTE:** A loose or failed high range synchronizer cone does not automatically warrant replacement of the complete synchronizer assembly or range housing if the short gearbox is being replaced.

Repair



AS OF 26 MARCH 2019: Per SNV19-020e an eService case is required prior to utilizing any of the information below. The eService case MUST INCLUDE a THOROUGH description of the initial symptoms AND findings from the Inspection section.



The charts below outline the correct repair path for the most AMT issues encountered. Once the failure is identified, refer to the correct description at the top of each chart for the proper components that should be used for each repair. If the secondary (yellow) option needs to be used due to progressive damage or parts availability, eService will advise on how to proceed.

- **Green** - Denotes the typical repair for the given failure. This option should be considered first.
- **Yellow** - Denotes the secondary option if progressive (additional) damage is found upon inspection or if there are issues with parts availability
 - **NOTE:** Tech support should be contacted via eService for further review if a secondary option is required due to parts availability **ONLY**.

All Components




	Remanufactured						
	Basic	Short	Range Housing	Synchro Repair Kit	Control Housing, Without TECU	Control Housing, With TECU	TECU ONLY
Lubrication							
Low Lube	x						
Oil Leak Resulting in Catastrophic Failure	x						
Wear and Breakage							
Gear Engaging Tooth Damage	x	x					
Excessive Output Shaft Play	x		x				
Loss of Input/Main Shaft Preload	x	x					
Broken Shift Rod					x		
Shift Fork Broken					x		
Split Synchro Detent Plunger Failure	x	x					
Screws Loose or Missing in GCU					x		
Towing	x	x					
Loose/Broken Range Cone	See Chart Below						
Noise							
Gear Whine	x	x					
Grinding: Range Shift High to Low AND Low to High			x	x			
Grinding: Range Shift Low to High ONLY			x	x			
Grinding: Range Shift High to Low ONLY			x	x			
Fault Codes (DTCs) and Data Link							
Fault(s): Jumping Out of Gear (Splitter)		x			x		
Fault(s): Jumping Out of Gear (1-R)		x			x		x
Fault(s): Jumping Out of Gear (2-3)		x			x		x
Fault(s): Jumping Out of Gear (Range)			x				
Loss of Communication							x

Range Cone (HRC)

	Remanufactured			
	Basic	Short	Range Housing	Synchro Repair Kit
Loose HRC ONLY			x	x
Loose HRC With Damaged Friction Ring			x	x
Broken HRC			x	x
Broken HRC With Damaged Friction Ring	x		x	x
Worn/Damaged Friction Ring			x	x
HRC With Main Box Gear Damage	x	x		
HRC With Main & Auxiliary Box Gear Damage	x			
HRC With Auxiliary Box Gear/Housing Damage			x	x

Pictures and descriptions of common replacement parts can be found below:

	<u>Basic Transmission</u>
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	<p>- Same as complete, but does not include the CCA, TECU, or Top Cover Assembly & Solenoid</p>
	<p><u>Short Transmission</u></p> <p>Same as Basic, but without Range Shift Assembly</p>
	<p><u>Range Housing Assembly</u></p>

Internal comments (FO)

SAVED FOR FUTURE USE:

~~The only time pre-authorization and an eService case is required is when:~~

~~—Diagnostics at the dealership level determines that a Complete or Basic Repair, or a New Complete Transmission is required.~~

~~—A new vehicle with low mileage (less than 50,000 mi, 80,000 km) experiences an internal Transmission failure that may be a candidate for a New assembly as opposed to Repair.~~

~~—A secondary repair option is required due to parts availability. (See Repair section below)~~

~~—All diagnostic options and materials have been exhausted without the root cause identified and additional support is needed.~~

~~All other repairs to the transmission—including replacing a section of the transmission—DO NOT require an eService case or authorization.~~

Internal comments (BO)

Warranty

~~The only time pre-authorization and an eService case is required is when:~~

~~—A new vehicle with low mileage (less than 50,000 mi, 80,000 km) experiences an~~

~~internal Transmission failure that may be a candidate for a New assembly as opposed to Reman.~~

~~—A Complete Transmission has to be replaced (New OR Reman)~~

~~—A secondary repair option is required due to parts availability (See Repair section above)~~

~~—All diagnostic options and materials have been exhausted without the root cause identified, and additional support is needed~~

~~All other repairs to the transmission—including replacing a section of the transmission—DO NOT require an eService case or authorization.~~

For any other questions or additional information, refer to the Warranty Operations Manual, which can be found on [Trucks Dealer Portal \(TDP\)](#).

Warranty Claim Submission

- The following Standalone Items will be allowed on the same claim line:

- Short Transmission
- Basic Transmission
- Control Housing
- Range Housing

- The Add-on Items below may be combined with the Standalone Components above, if justified by the extent of the failure:

- Transmission Oil Cooler
- Internal (Ribbon) Harness Kit
- Gaskets and/or Seals
- Transmission Oil

Refer to [SNV17-05 I-Shift Lubricant on Warranty Claims](#) for more information.

- The Items below should be filed on another claim line if discovered during an AMT Repair:

- Flywheel
- Clutch Control Actuator (CCA)
- Clutch Control Valve (CCV)
- Clutch Kit

Labor Codes

- **Short Transmission**

- 1700-16-01-01 Take Charge
- 1700-16-03-01 Diagnostic Time
- 4311-03-02-06 Transmission, Replacement
- 1700-20-09-01 Road Test

- **Basic Transmission**

- 1700-16-01-01 Take Charge
- 1700-16-03-01 Diagnostic Time
- 4311-03-02-05 Transmission, Replacement (Basic)
- 1700-20-09-01 Road Test

- **Range Assembly**

- 1700-16-01-01 Take Charge
- 1700-16-03-01 Diagnostic Time
- 4315-03-02-02 Range Synchronizer, Replacement
- 4319-04-02-01 Range Cylinder, Overhaul
- 1700-20-09-01 Road Test

- **Control Housing**

- 1700-16-01-01 Take Charge
- 1700-16-03-01 Diagnostic Time
- 4329-03-02-38 Control Housing, Replacement
- 1700-20-09-01 Road Test

- **Transmission Electronic Control Unit (TECU)**

- 1700-16-01-01 Take Charge
- 1700-16-03-01 Diagnostic Time
- 4319-03-02-03 Transmission ECU, Replacement
- 1700-20-09-01 Road Test

NA_Sister solutions	K45673535
Campaign code	SNV19-020e
Solution visibility	Dealer distribution
Function(s)/component(s) affected	
Function affected	Transmission , Diagnostic tool , SNV
Function Group	
Function Group	43 gearbox , 47 gearbox and reverse gear (or forward gear) combined system
Customer effect	
Main customer effect	diagnostics/methodology , judder , slipping
Visual appearance	wear , crack/fracture , part lost/missing function
Conditions	
Vehicle operating mode	when driving , when stationary , engagement
Frequency of occurrence of problem	random
Gear ratio	upshifting , downshifting , reverse gear
Administration	

Author	RU4469V
Dealer ID	RU4469V
Last modified by	RU4469V
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Variantes Kola

RWX - TRANSMISSION AT2412D - VPT AUTOMATED TRANSMISSION 2400NM 12SPEED , AT2612D - VPT AUTOMATED TRANSMISSION 2600NM 12SPEED , ATO2612D , ATO3112D - VPT AUTOMATED TRANSMISSION 3100NM OVERDRIVE 12SPEED , AT2812D - VOLVO AUTOMATED TRANSMISSION 2800NM 12SPEED , ATO8006 - AMT 800NM 6 SPEED (AUTOMATED MECHANICAL TRANSMISSION) , ATO1056 - AMT 1050NM 6 SPEED (AUTOMATED MECHANICAL TRANSMISSION) , ATO1212 - AMT 1200NM 12 SPEED (AUTOMATED MECHANICAL TRANSMISSION) , AT2412F - VPT AUTOMATED TRANSMISSION 2400NM 12SPEED , AT2612F - VPT AUTOMATED TRANSMISSION 2600NM 12SPEED , ATO2612F - VPT AUTOMATED TRANSMISSION 2600NM OVERDRIVE , AT2412C - VOLVO AUTOMATED TRANSMISSION 2400NM , AT2512C - VOLVO AUTOMATED TRANSMISSION 2500NM (1850 LB FT) , ATO2512C - VOLVO AUTOMATED TRANSMISSION 2500NM (1850 LB FT) OVERDRIVE , AT2812C - VOLVO AUTOMATED TRANSMISSION 2800NM (2050 LB FT)