

**VOLVO** - OWN

Volvo Trucks North America  
Greensboro, NC USA

# Field Service Bulletin Trucks

Date	Group	No.	Release	Page
9.2010	431	001		1(6)

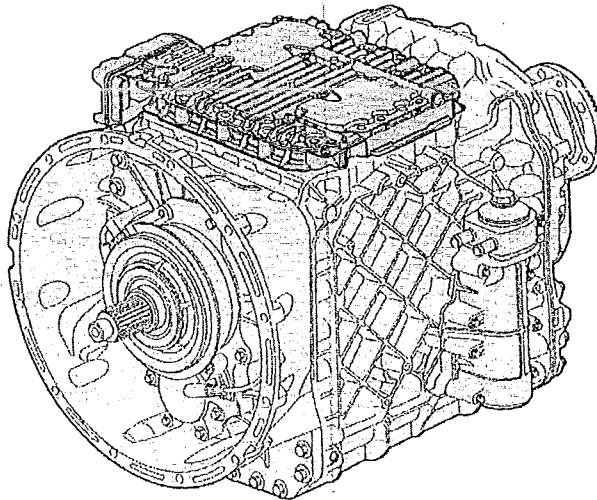
ATO 2512-C  
 ATO 2612-D  
 ATO 3112-D

I-Shift Transmission With Mixed Components  
 Version-C  
 AT2512C, ATO2512C, and ATO3112C  
 VN, VHD, VT

## FSB 431-001, I-Shift Transmission With Mixed Components

(September 2010)

The installation of replacement parts in an I-Shift transmission (Version-C) may result in diagnostic trouble codes (DTC's) MID130 PID160 FMI1 or FMI2. The DTCs are due to a hardware mismatch of transmission control module-D (TECU-D) or TECU-C, cable harness with speed sensor and sensor wheel in the generation D (New) or C (Old) versions of the I-Shift transmissions. To determine the combination of mixed components, a conversion kit is available and used to eliminate the DTCs MID130 PID160 FMI1 or FMI2.



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You must read and understand the precautions and guidelines in Service Information, group 4, "General Safety Practices, Transmission" before performing this procedure. If you are not properly trained and certified in this procedure, ask your supervisor for training before you perform it.

Service personnel: Please circulate, read and initial

Service Manager	Warranty Administrator	Workshop Foreman	Service Technicians						

## I-Shift Transmission With Mixed Components

### Concerns

All VN, VT and VHD vehicles with I-shift transmissions, generation C (AT2512C, ATO2512C, and ATO3112C).

### Problem

DTCs MID130 PID160 FMI1 or FMI2 may occur after installation of replacement parts.

### Reason

As of June, 2009 the new generation I-Shift transmission (Generation D) was released for production. There are three parts used in combination with the generation D (New) or C (Old) versions of the I-Shift transmissions (see figure below).

1 Transmission Electronic Control Unit (TECU).

TECU-D (New generation)

TECU-C (Old generation)

2 Cable harness including speed sensor.

Speed-sensor-D (New generation)

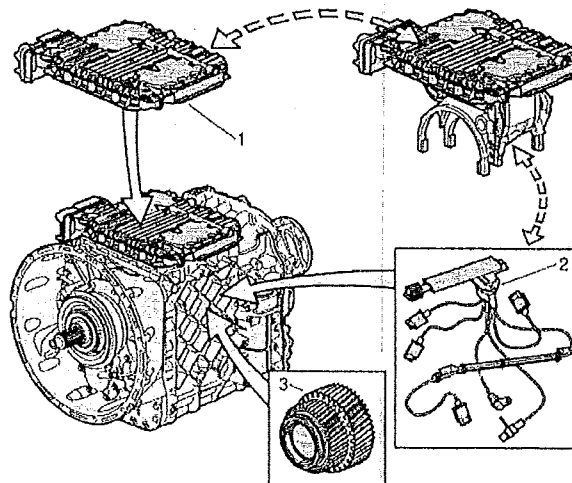
Speed-sensor-C (Old generation)

3 Sensor wheel.

72 tooth (New Generation)

30 tooth (Old Generation)

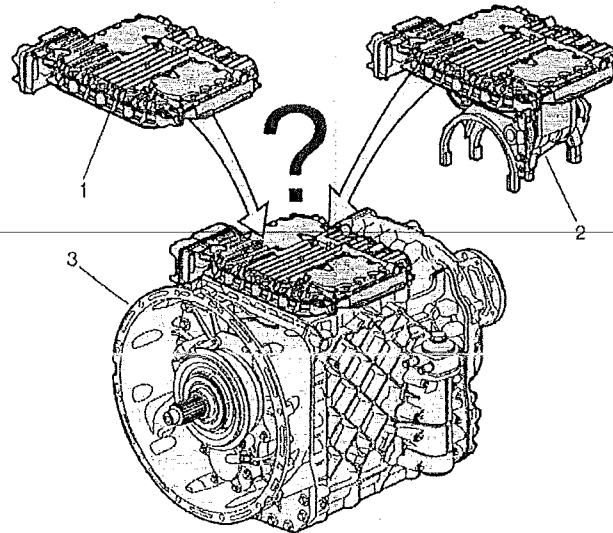
**Note:** The difference between the new generation Gear Control Unit (GCU-D) assembly and the old generation Gear Control Unit (GCU-C) assembly is the TECU-D (1) and the new speed-sensor-D (2). The rest of the GCU is equivalent to the old generation.



**Action/Information**

**TECU and GCU**

When installing a replacement part TECU-D or complete GCU-D assembly in an I-Shift generation C transmission, a conversion kit must be run. Follow download of software to MID130, enabling the TECU-D to identify if it is installed in an I-Shift generation C transmission. To select the correct conversion kit, TPI 432-014 and TPI 432-015 have been released. Both are connected to the related part numbers in Impact. The conversion kit will add parameters KBQ and KBR to the TECU-D. By setting these in different combinations the software will identify if either a TECU-D or complete GCU-D is installed in an I-Shift generation C transmission. If the correct conversion kit is not run, a DTC MID130 PID160 FMI1 or FMI2 will result.



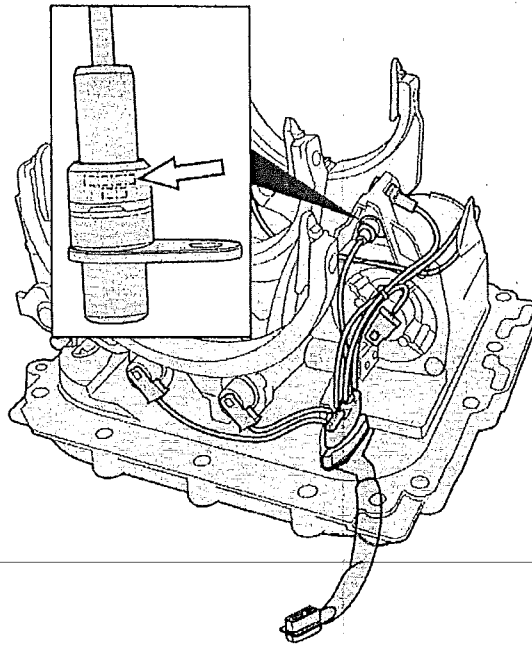
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I-Shift Generation-C Transmission (AT2512C, ATO2512C, and ATO3112C) Conversion Kit Selection			
Item	Control Unit	Conversion Kit	Parameters
1	TECU-D	85120150	KBQ1, KQR1
2	GCU-D	85120151	KBQ1, KBR0

**Cable Harness With Speed Sensor**

The new cable harness includes a new speed-sensor. The cable harnesses are not marked with different part numbers. To identify the speed sensor generation, look at the number stamped on the sensor.

**Note:** To identify speed sensor with cable harness, see graphic below for details.

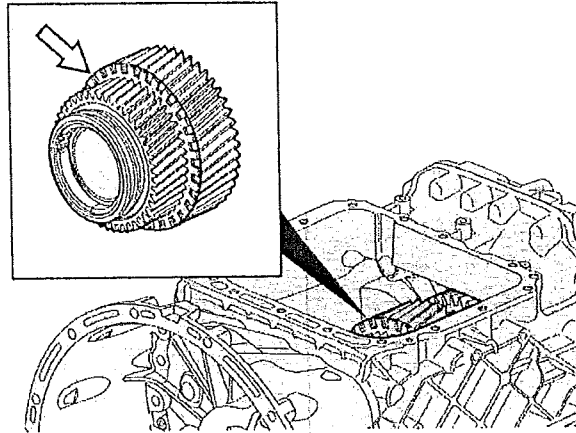


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Identify Cable Harness With Speed Sensor			
I-Shift Transmission Version	Cable Harness	Speed Sensor Version	Speed Sensor Number
Generation-C	20775027	Generation-C	4410371001
Generation-D	21068284	Generation-D	4410371051

#### Sensor Wheel

For the main shaft there is a new sensor wheel which has 72 tooth compared to the old version which had 30 tooth. The 72 tooth sensor wheel is installed in the I-Shift generation D transmissions and I-Shift generation C transmissions built beginning June, 2009. There will be 72 tooth sensor wheels installed in I-shift generation-C Reman units where a complete GCU-D was installed at remanufacturing.



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Sensor Wheel Configuration	
Sensor Wheel Part Number	Sensor Wheel Tooth Number
20542400	30
21034006	72

**Information for Future Repairs**

The possibility exists for a hardware mismatch in the future. Impact Parts system does not check for changes in vehicle data administration (VDA), causing a hardware mismatch. A hardware mismatch will result in DTC MID130 PID160 FMI1 or FMI2.

DTCs Caused by Hardware Mismatch	
DTC	Description
FMI1	"The main shaft speed differs from both the value of the countershaft speed and the vehicle speed received from the vehicle ECU." This indicates the "incorrect" number tooth sensor wheel.
FMI2	"The sensor indicates wrong travelling direction." This indicates a "wrong" speed sensor (cable harness). The two FMIs should be corrected by setting the parameters KBQ and KBR, with VCADS, to the correct combination. There is no needed to replace the sensor wheel or the speed sensor with harness.

Parameter Definitions	
Parameter	Definition
KBQ = 0	The main shaft has a 72 tooth sensor wheel
KBQ = 1	The main shaft has a 30 tooth sensor wheel
KBR = 0	There is a speed-sensor-D installed
KBR = 1	There is a speed-sensor-C installed

Examples of How to Correct DTCs Using Parameter Settings	
<b>Example 1</b>	I-Shift generation-C transmission (built before June, 2009) was previously repaired using a complete GCU-D assembly, with KBQ = 1 and KBR = 0  new cable harness with speed sensors included, a speed sensor-C. The mismatch created DTC MID130 PID160 FMI2, that is corrected by changing the parameters, with VCADS, to KBQ = 1 and KBR = 1.
<b>Example 2</b>	The truck was previously repaired with a complete I-Shift generation D transmission, (which has GCU-D, TECU-D, and speed-sensor-D) with 72 tooth sensor wheel, and KBQ = 0 and KBR = 0.  The new cable harness with speed sensors included, a speed sensor-C. The mismatch created DTC MID130 PID160 FMI2, that is corrected by changing the parameters, with VCADS, to KBQ = 0 and KBR = 1.

**Miscellaneous Information**

Note: TECU-C is identified by the part number 20829012 marked on the top cover plate (This is the only part number for the TECU-C).

Note: Prior to any repair, it is recommended to view parameter programming (Operation Number 1700-22-03-03) with VCADS. Identify KBQ and KBR settings to verify sensor wheel and speed sensor combination using the table below. If KBQ and KBR are not present, and TECU-C can be identified by the p/n 20829012 marked on the top cover plate, it is an "Original Equipment Configuration" AMT-C.

To summarize this field service bulletin (FSB), the table below shows various combinations of applicable and non-applicable KBQ and KBR parameter settings for mixed hardware (sensor wheel/ speed sensor) combinations.

KBQ and KBR Parameter Settings for Mixed Hardware		
Hardware Combinations	30 Tooth Sensor Wheel	72 Tooth Sensor Wheel
TECU-D with speed-sensor-D	KBQ = 1 KBR = 0	KBQ = 0 KBR = 0
TECU-D with speed-sensor-C	KBQ = 1 KBR = 1	KBQ = 0 KBR = 1
TECU-C with speed-sensor-D	Not applicable	Not applicable
TECU-C with speed-sensor-C	"Original" I-Shift generation C software needed where KBQ & KBR have no function. Use conversion kit part number 85124923.	Not applicable

Vanderlely's Truck Sales & Service, Inc.  
 34 Durham Road  
 Ottsville, PA 18942

Phone : (610) 847-5204 Fax : ( )

INVOICE

Date : 11/13/14 No. : 44273  
 Due Date: 11/13/14 Page: 1

WELLER  
 WELLER REMAN CENTER  
 800-872-6697

Ship To/Remarks  
 2007 PETERBILT CAR CARRIER  
 SER # 666258  
 MILES 596348

Via	FOB	Terms 0/ 0/ N0	Your#	Our#	Rep.
Description Item Number	Ordered Measure	Unit Price Discount %	Extended		
LABOR	30.5	85.0000	30.5		2592.50
Item #: LABOR	....Hour				
UGO, SYN. 75W/90, 50W, PINT	62.0	5.5500	62.0		344.10
Item #: UGOSYN/1	....PINT				
BRAKE-KLEEN	2.0	3.9000	2.0		7.80
Item #: 05089	....EACH				
CHECK TRANS FOR HARD SHIFTING AND STICK MOVING AS YOU USE THE THROTTLE REMOVE STICK AND CHECK FOR PROBLEMS REMOVE LID FROM TRANS FOUND MAIN SHAFT MOVING REMOVE TRANS SWAP PARTS 2 A SECOND WELLER UNIT AND INSTALL IN TRUCK FILL WITH NEW OIL ROAD TEST IN LOW RANGE TRANS WOULD DISENGAGE OUT OF RANGE RETURN TO SHOP PERFORM MINUR CHECK UP CALL WELLER FOR PERMISSION TO REMOVE AUX SECTION DISSASSEMBLE IT WAS DECIDED TO TAKE A THIRD UNIT REMOVE AUX SECTION AND INSTALL IN TRUCK FILL WITH NEW OIL ROAD TEST ALL OK . AFTER AUX SECTION ARRIVED FROM WELLER REINSTALL ON TRANS # 3. TRANS # 1 701561 RTLO18913 TRANS # 2 726078 RTLO18913					

Sub-Total : 2944.40  
 Tax : 0.00  
 Total : 2944.40

Net To Pay: 2944.40