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Coding Information

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**Title: Power Take Off (PTO) Programming on LT, RH and LoneStar Models with the Eaton® Endurant™ Transmission**

**Applies To: LT, RH, LoneStar, 13GZD, 13GYY, 13GYZ, 13GZA, 13GZB, 13GZC,**

## CHANGE LOG

Please refer to the change log text box below for recent changes to this article:

02/26/2019 - Initial article release	^ v
03/03/2019 - Corrected connector 1606 reference	

## DESCRIPTION

This document will guide the user, through the required Diamond Logic® Builder (DLB) and Eaton® ServiceRanger programming, to support Power Take Off (PTO) engagement, on the LT, RH and Lonestar model trucks, built with the Eaton® Endurant™ transmission.

The Transmission Control Module (TCM) and Body Controller (BC) must be programmed correctly and the correct wiring needs to be in place, for PTO engagement to work correctly.

For PTO applications, installed on the Eaton® Endurant™ Transmission, the TCM and the Body Controller send confirmation messages, to each other, over the J1939 Data Link.

The Body controller sends "PTO Request", to the TCM when the PTO switch is activated.

If all conditions in the Transmission are satisfied the TCM sends a message, back to the Body Controller, allowing it to send out the PTO activation signal.

The TCM also looks for a "PTO Confirm" signal from the Body Controller. The Body Controller sends "PTO Confirm" to the TCM, when the Body Controller sees the PTO feedback at either the Body Controller input or the RPM input, as programmed.

If a second PTO is installed, it can be configured to work the same as the first PTO or it can be set up or hardwired operation.

See the [Endurant™ Automated Transmission and Clutch System TRIG0950 EN-US](#) documentation for more information.

## SYMPTOM(s)

After installing a PTO and programming the Body Controller, for a PTO feature, the PTO will not engage.

**Diagnostic Trouble Code(s) & Dashboard Indicator Light(s):**

DTC/Light	Description
SPN 3456 FMI 13 Previously Active	Engagement Consent -Transmission input shaft PTO 1

SPN 3457 FMI 13 Previously Active	Engagement Consent -Transmission input shaft PTO 2
Eaton® Service Ranger™ 4 Code 910 3456-7	Eaton code for PTO engagement issue.

**Customer Observations or Concerns:**  
 PTO will not engage or momentarily engages and PTO switch indicator flashes.

**SPECIAL TOOL(s) / SOFTWARE**

Tool Description	Comments	Instructions
Eaton® Service Ranger™ 4		
International® Diamond Logic® Builder	You will need Level 2 Dealer access to perform any programming	

**DIAGNOSTIC STEP(s)**

**WARNING:**

To prevent property damage, personal injury, and / or death, park vehicle on hard flat surface, turn engine off, set parking brake, and install wheel chocks to prevent vehicle from moving in both directions.

**WARNING:**

To prevent personal injury and / or death, always wear safe eye protection when performing vehicle maintenance.

**WARNING:**

To prevent property damage, personal injury and / or death, remove the ground cable from the negative terminal of the battery box before disconnecting any electrical components. Always connect the ground cable last.

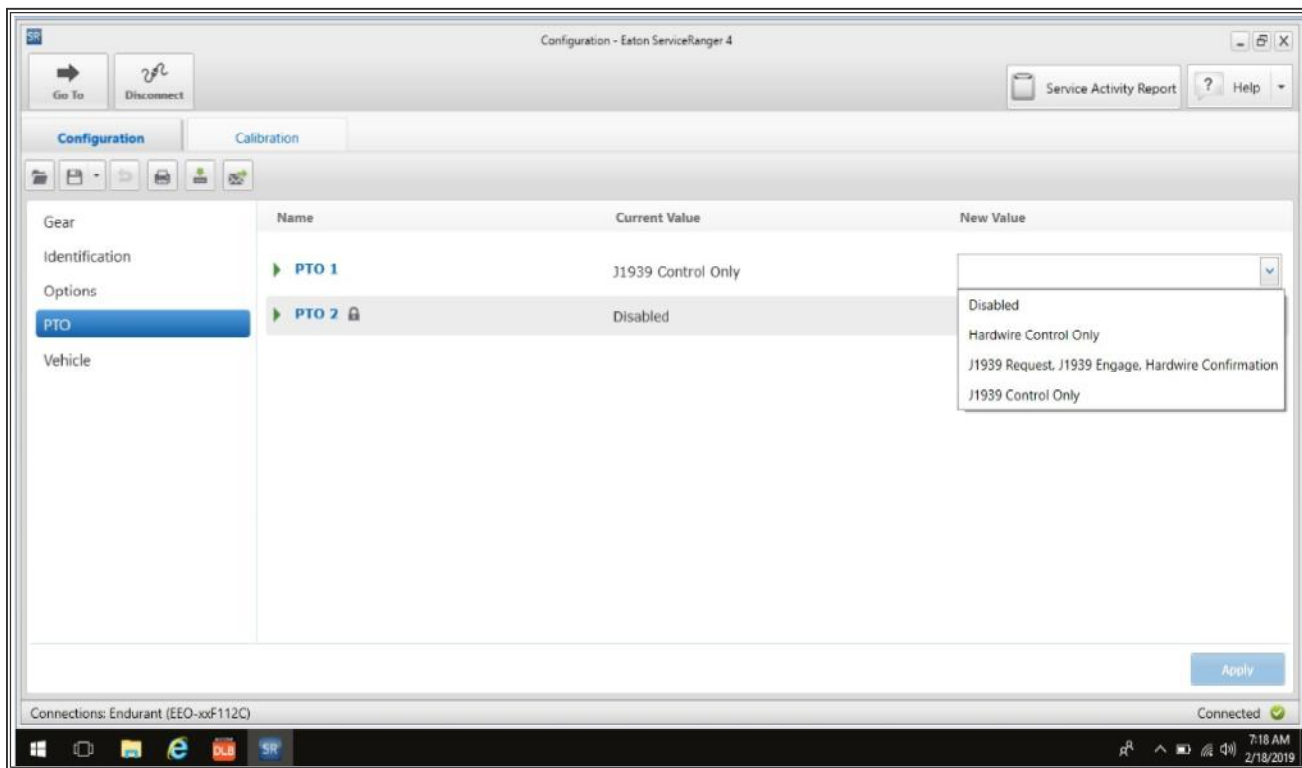
**CAUTION:**

You will be prosecuted to the extent possible under the law if you illegally access, use, alter, damage, disclose or destroy this computer system, data or documentation. International Truck and Engine Corporation will not be liable for personal injury or equipment damage resulting from the use of the Diamond Logic® Builder program. Users are encouraged to perform comprehensive vehicle testing of all programs created with Diamond Logic® Builder before releasing equipment for public sale or usage.

**NOTE:**  
 Ensure all other DTC's are resolved before proceeding with the diagnostics.

Step	Action	Decision

1	<p><b>DIAGNOSTIC:</b></p> <p>Connect to the TCM with ServiceRanger™ 4. Ensure the PTO programming is set, as shown in Figure 1. Is the programming set correctly ?</p>	<p><b>Yes.</b> Go to Diagnostic Step 2</p> <p><b>No.</b> Refer to Figure #1 1. Using Service Ranger 4, program the Transmission accordingly and Test PTO operation. 2. Operate the PTO to see if the PTO will engage and the PTO indicator in the cluster will illuminate, if it does return vehicle to service. 3. If the PTO does not engage or the PTO indicator in the cluster does not illuminate, go to Diagnostic Step 2</p>
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**Figure 1: Eaton® ServiceRanger™ 4 PTO Programming Settings**

Step	Action	Decision
2	<p><b>DIAGNOSTIC:</b></p> <p>Connect with DLB and ensure Feature 597276 is enabled, as shown in Figure 2. Is the programming set correctly ?</p>	<p><b>Yes.</b> Go to Step 3</p> <p><b>No.</b> Refer to Figure #2 1. Using Diamond Logic Builder, program the Body Controller for feature 597276 accordingly and Test PTO operation.</p>

	<p>2. Operate the PTO to see if the PTO will engage and the PTO indicator in the cluster will illuminate, if it does return vehicle to service.</p> <p>3. If the PTO does not engage or the PTO indicator in the cluster does not illuminate, go to Diagnostic Step 3.</p>
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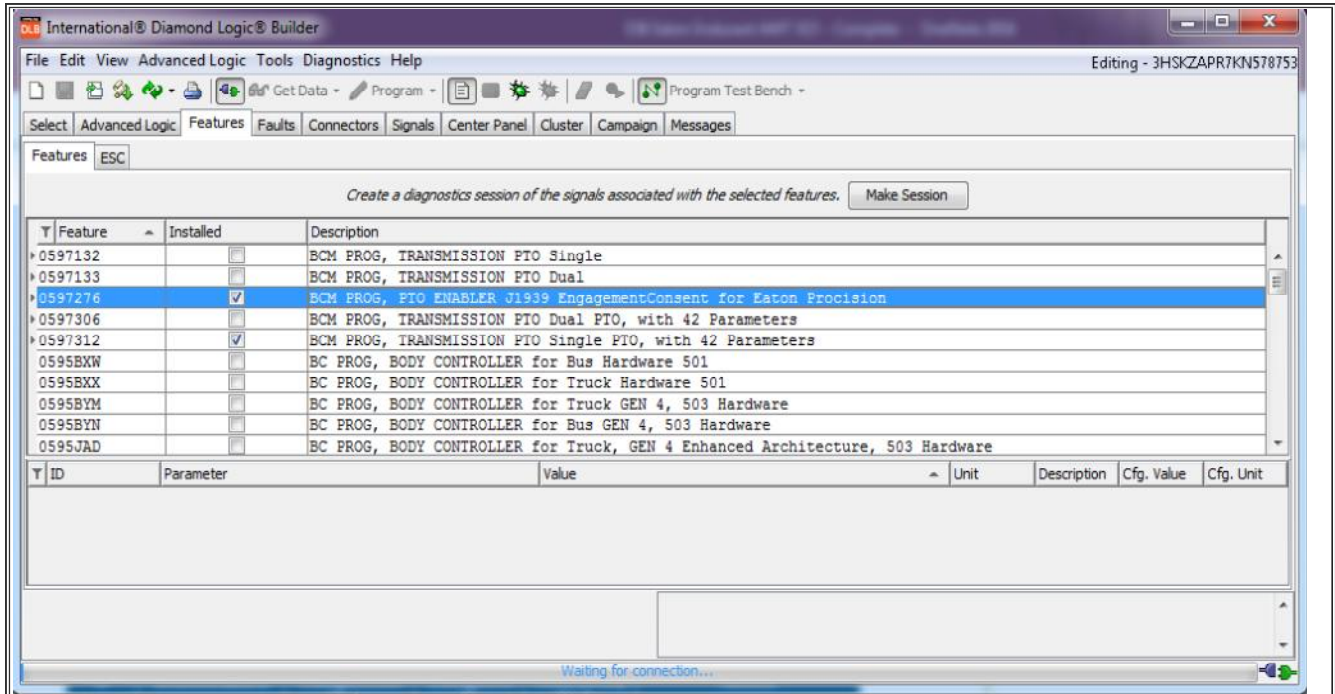


Figure 2: DLB PTO Feature Programming (Typical) Settings

Step	Action	Decision
3	<p><b>DIAGNOSTIC:</b></p> <p>Refer to Figure 2</p> <p>PTO programming on these models is limited to PTO feature codes 597132, 597133 or 597306, or 597312. These features automatically configure a ground PTO feedback to body controller.</p> <p>Is the correct programming for PTO enabled?</p> <p>Note: PTO programming configured with 597132 is automatically configured for PTO feedback to body controller Connector 1602 pin F14</p> <p>Note: PTO programming configured with 597133 is automatically configured for PTO feedback to body controller Connector 1602 pin F14 and 1602 pin F15</p> <p>Note: PTO programming configured with 597306 is automatically configured for PTO feedback to body controller Connector 1602 pin E9 and 1606 pin R.</p> <p>Note: PTO programming configured with 597312 is automatically configured for PTO feedback to body controller Connector 1602 pin E9.</p>	<p><b>Yes.</b> Go to Step 4</p> <p><b>No.</b> Refer to Figure #2</p> <p>1. Using Diamond Logic Builder, program the Body Controller to use feature codes 597132, 597133 or 597306, or 597312 for PTO feedback to the Body Controller.</p> <p>2. Go to diagnostic step 4.</p>
	<p><b>Step</b></p> <p><b>Action</b></p>	<p><b>Decision</b></p>

<b>4</b>	<p><b>DIAGNOSTIC:</b></p> <p>Use DLB, in diagnostic mode, to monitor the PTO feedback signal, when the correct feedback signal is applied to the Body Controller.</p> <p>Does the feedback signal activate when the PTO feedback signal is applied to the Body Controller?</p>	<p><b>Yes.</b> Go to Step 5</p>
		<p><b>No.</b></p> <p>Diagnose possible problem with Body Controller.</p>

Step	Action	Decision
<b>5</b>	<p><b>DIAGNOSTIC:</b></p> <p>Use DLB, in diagnostic mode, to monitor PTO engagement and the PTO feedback signal, when the PTO is engaged and the feedback signal is applied to the Body Controller.</p> <p>Does the PTO engage and feedback signal activate when the PTO engages?</p>	<p><b>Yes.</b> Return Vehicle to service.</p>
		<p><b>No.</b></p> <p>Diagnose the base PTO programming, the interlock programming, PTO wiring and PTO installation.</p> <p>Refer to the <a href="#">Power Take Off (PTO) section of the 2018-2020 HV™ Technician Manual (Service and Diagnostic)</a>.</p> <p>Refer to the <a href="#">PTO (Power Take Off) Section in the Navistar Electrical Systems Integration Guide</a> on the <a href="#">Body Builder Web Site</a>.</p>

## WARRANTY INFORMATION

### Warranty Claim Coding:

Refer to the [Warranty Coding Manual](#) for Group and Noun Codes.

### Standard Repair Time(s):

Refer to the [SRT Manual](#) for Repair Times

## OTHER RESOURCES

[Master Service Information Site](#)

[Eaton® PTO Information Guide TRIG2600 EN-US](#)

[Endurant™ Automated Transmission and Clutch System TRIG0950 EN-US](#)

[2017–2020 LT® / RH™ / LoneStar® Technician Manual \(Service and Diagnostic\)](#)

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