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SUBJECT: Input/Output Functions Available on Chevrolet® Silverado® 4500HD, 5500HD and 6500HD

MODELS AFFECTED: 1700, 1750, 2700, and 2750 Series Transmissions

## Introduction

The purpose of this Service Tip is to provide a brief description of the input and output functions available to the user on Allison Transmission equipped Chevrolet® Silverado® 4500HD, 5500HD, and 6500HD vehicles.

## Definitions

- **Input Functions** send discrete signals to the Transmission Control Module (TCM) indicating an operator's request(s) or the operating state of other vehicle systems. Specific transmission operation or function will then be coordinated with the indicated state of the vehicle.
- **Output Functions** send discrete signals out of the Transmission Control Module (TCM) for use in controlling the operation of other non-transmission components. The output functions may be turned on and off based on the state of related input function signals or the operating state of the transmission.

## Application and Usage

When the transmission is purchased from the vehicle manufacturer, the required input and output functions must be specified at that time and are usually in the form of standard "packages." The dealer sales person can help determine which packages are available. In many cases, multiple input/output packages have been created for vehicles used in specific vocations. If the function programming in a transmission control module must be altered after the vehicle is delivered, consult with the nearest authorized service location for reprogramming instructions. There may be a charge for this service.

Depending on the selection, both input and output signals can be broadcasted by wire or through GMLAN datalink messages.

The TCM cannot contain all of the available input/output functions. A vehicle's duty cycle usually determines which combination of available inputs and outputs is chosen. Your vehicle dealer can advise you regarding which input/output packages are released in their chassis.

Not all functions are compatible. Use of certain functions excludes the possibility of using others. Under no circumstances should emergency vehicle calibrations and option packages be used in non-emergency vehicle applications and vice versa.

Information contained in this publication is current at the time of publication and is subject to change without notice.

## Input Functions

Name	Description	Input via GMLAN or Input Wire
SECONDARY MODE INPUT A	When the function is enabled, the TCM will command the transmission to shift according to the secondary shift calibration. Operation in primary mode resumes when the function is disabled. Primary mode will also be re-enabled each time the TCM is re-initialized.	GMLAN
PTO DRIVE INTERFACE 1 INPUT C1	<p>The TCM activates the PTO Drive Interface Output by switching power to one wire when the following conditions have been met:</p> <ul style="list-style-type: none"> <li>• The function has been requested</li> <li>• Throttle position is low</li> <li>• Engine speed is within Customer Modifiable Constant limits</li> <li>• Output speed is within Customer Modifiable Constant limits</li> </ul>	GMLAN
AUXILIARY FUNCTION RANGE INHIBIT – SINGLE INPUT E	This function is enabled when a switch is opened to break the circuit between an input wire and ground. When an interfaced auxiliary vehicle function is activated, as denoted by the open state of the enable switch, the TCM commands an inhibit on all transmission shifts from Neutral-to-Drive, Neutral-to-Reverse, and, if applicable, Park-to-Drive and Reverse.	Wire 101
ENGINE BRAKE INTERFACE (STANDARD) INPUT H	<p>This function is enabled when one wire is switched to send power to the TCM. When the throttle is closed, the transmission lockup clutch is engaged and this function is enabled. The TCM activates the function by switching one wire from ground to open. Simultaneously, the TCM will command preselect downshifts based on the specified Preselect Strategy, Standard or Low, and the Customer Modifiable Constants.</p>	GMLAN
ANTI-LOCK BRAKE SYSTEM (ABS) INPUT Y	This function disengages the transmission lockup clutch, modifies the downshift schedule, and disables the retarder (if equipped) during vehicle braking conditions which activate the vehicle's ABS system.	GMLAN
SERVICE BRAKE STATUS INPUT AA	This function is enabled when a switch is closed to complete the circuit.	GMLAN
GRADE BRAKING/REGENERATIVE INPUT BS	This function is enabled when one wire is switched to send power to the TCM.	GMLAN

Name	Description	Input via GMLAN or Input Wire
HIGH N/v RATIO INPUT CC	This function is enabled when a switch is closed to complete the circuit between an input wire and ground, and a switch between a wire and switched power is opened. This condition alerts the TCM that the transfer case shift mechanism has been shifted to the Low position which results in a high N/v ratio.	GMLAN

### Output Functions

Name	Description	Output via GMLAN or Output Wire
ENGINE BRAKE INTERFACE OUTPUT A	<p>This function is enabled to signal that the TCM is in a state to allow engine brake activation. When the throttle is closed, the transmission lockup clutch is engaged and this function is enabled. The TCM activates the function via GMLAN.</p> <p>Simultaneously, the TCM will command preselect downshifts based on the specified Preselect Strategy, Standard or Low, and the Customer Modifiable Constants.</p>	GMLAN
SUMP/RETARDER TEMPERATURE INDICATOR OUTPUT B	<p>This output function is activated by the TCM switching one wire from open to ground when the TCM detects one of the following over-temperature conditions in the sump:</p> <ul style="list-style-type: none"> <li>• 121° C (250° F) for 15 minutes</li> <li>• 128° C (262° F) for 1.5 minutes</li> <li>• 132° C (270° F) for 3 seconds</li> </ul>	Wire 164
RANGE INDICATOR (5th Generation DEFAULT IS ALWAYS NEUTRAL/PARK) OUTPUT C	This output function is activated by the TCM switching one wire from open to ground, which occurs when the specified gear (or gears) is commanded by the TCM. The range at which activation occurs is adjustable with diagnostic tools.	Wire 145
OUTPUT SPEED INDICATOR A OUTPUT D	This output function is activated by the TCM switching one wire from ground to open, which occurs when the TCM detects that a preset output speed has been exceeded in either the forward or reverse direction. The speed setting at which activation occurs is adjustable with diagnostic tools.	Wire 105

Name	Description	Output via GMLAN or Output Wire
PTO DRIVE INTERFACE 1 OUTPUT G1	<p>The TCM activates the PTO Drive Inter-face Output by switching power to one wire when the following conditions have been met:</p> <ul style="list-style-type: none"> <li>• The function has been requested</li> <li>• Throttle position is low</li> <li>• Engine speed is within Customer Modifiable Constant limits</li> <li>• Output speed is within Customer Modifiable Constant limits</li> </ul>	GMLAN
TRANSMISSION SERVICE INDICATOR OUTPUT O	<p>This output function is activated by the TCM switching one wire from open to ground indicating that transmission service is required. The function is deactivated when the service condition has been addressed and the indicator reset.</p>	GMLAN
RANGE INHIBITED INDICATOR OUTPUT AD	<p>This output function is activated by the TCM switching one wire from open to ground when the TCM is temporarily limiting transmission shifts. An active Range Inhibited signal alerts the operator to the following:</p> <ul style="list-style-type: none"> <li>• Shifts from Neutral-to-Drive or Neutral-to-Reverse are inhibited.</li> <li>• Directional change shifts are inhibited.</li> <li>• The transmission is in Neutral even though a Drive range or Reverse is selected.</li> </ul>	Wire 124 and GMLAN