



PUMP MODE (4TH LOCKUP) INPUT INPUT AJ

ALLISON 5TH GENERATION CONTROLS

NOTE: This function has more than one implementation. The wire numbers for each implementation are specified by the Input/Output Package in the TCM calibration. Be sure to select the schematic with the implementation and wire numbers specified in your TCM calibration.

How to determine the wire numbers:

- If you know the I/O Package Number, refer to the [I/O Package Guide](#) for your geographical region.
- If you do not know the I/O Package Number:
 - Go to [ACCT \(Allison Calibration Configuration Tool\)](#) on the Extranet.
 - In the Search box enter the Allison Part Number (APN) or the corresponding Customer Part Number (CPN) for your TCM calibration.
 - In the resulting report, the General Purpose Inputs and Outputs Package number is listed in the Basic information.
 - Refer to the [I/O Package Guide](#) for your geographical region.
- If you have a vehicle with a functioning transmission, you can use the [Allison DOC® for PC](#) service tool to determine the active I/O Package Number and the wire number assigned to this function in the active package.

GUIDELINES FOR SELECTING INPUT AJ, PUMP MODE (4TH LOCKUP)

Two variations of this function are offered. The following descriptions provide guidance for the selection of the proper installation for your application:

AJ1 Operator and Pump Activated: TCM commands shift from road mode to pump mode based on position of Pump Mode switch, **plus** detection of positive engagement of the split shaft PTO in the pump position.

AJ2 Operator Only Activation: TCM commands shift from road mode to pump mode based only on position of Pump Mode switch.

The table below lists the wiring schematics for Input AJ: Pump Mode (4th Lockup) Input:

TYPE OF ACTIVATION	PRODUCT FAMILY	INPUT		OUTPUT	
		ID	WIRES	ID	WIRE
Operator & Pump Activated	3000, 4000	AJ1	122 & 123	C	145
Operator & Pump Activated	3000, 4000	AJ1	117 & 143	C	145
Operator & Pump Activated	3000, 4000	AJ1	122 & 143	C	145
Operator-Only Activation	3000, 4000	AJ2	122 & 123	C	145
Operator-Only Activation	3000, 4000	AJ2	117 & 143	C	145
Operator-Only Activation	3000, 4000	AJ2	122 & 143	C	145

WARNING: This input function involves the use of complex algorithms in the control logic. If the function is enabled in the calibration but the control circuit for the function is not installed, there is a potential risk for one or more system faults which could result in undesirable transmission operation. Therefore, the activation circuit for this function **MUST BE** properly integrated in the vehicle in which it is installed. If the function will not be used in the final vehicle, it **MUST NOT** be ordered in the calibration.

For specific installations, the vehicle may be operated prior to full integration of the function into the vehicle wiring. For example, a bare chassis transported to a body builder where the function will be wired into the completed vehicle. In these cases, if the function is activated in the calibration, the specific wires related to the function must be electrically isolated, completely and individually. Until properly integrated into the final vehicle wiring, the chassis builder must protect the wires such that they do not make electrical contact with the following:

- each other, if the function involves more than one wire
- any other transmission wiring
- any other vehicle wires
- any part of the vehicle or chassis.

PUMP MODE (4TH LOCKUP) INPUT – OPERATOR AND PUMP ACTIVATED INPUT AJ1: WIRES 122 & 123 / OUTPUT C: WIRE 145

APPLICABLE TRANSMISSIONS: 3000 Product Family, 4000 Product Family

DESCRIPTION: This function is enabled when wire 123 is switched to send power to the TCM, and a switch is closed to complete the circuit between input wire 122 and ground. The TCM will command the transmission to operate in direct drive (1:1) lockup when:

- Function is enabled
- Vehicle park brake is activated
- Pump Mode is selected
- Auxiliary equipment is fully engaged
- Drive is selected on the shift selector

NOTE: If a butt-tooth condition hinders full engagement of the pump when the switch on wire 123 is closed, the TCM will command limited rotation of the output shaft in order to promote pump engagement. This ceases when the TCM detects pump engagement on wire 122. This is repeated when the pump is disengaged until a range shift is commanded, or after 30 seconds, whichever occurs first.

The switch on wire 123 reflects the selection of Pump Mode by the operator and the application of the park brake. The separate switch on wire 122 indicates that the split-shaft PTO is fully engaged physically, and illuminates the OK To Pump lamp.

NOTE: Lock-up Clutch Re-Engagement - If the lock-up clutch drops while this function is enabled. Select Neutral, disable the input signals, re-enable the input signals, and select Drive to re-enable this function and re-apply the lock-up clutch.

USES: This function is used in commercial vehicles, but **not fire trucks or other emergency vehicles**. Typical vehicle configuration has a split-shaft PTO to drive a pump, fan or other auxiliary equipment. Activation of this feature initiates the engagement of the split-shaft PTO and shifts the transmission to direct drive lockup.

CUSTOMER MODIFIABLE CONSTANTS:

- Range Indicator, 6-Speed Models
- Range Indicator, 4000 7-Speed Models

Required Value

4th Gear
5th Gear

Default Value

Neutral
Neutral

Allowable Range

R,N,6,5,4,3,2,1
R,N,7,6,5,4,3,2,1

Units

range
range

VOCATIONS: Sewer Cleaners

FUNCTION RESPONSE TO TCM POWER INTERRUPTION

(power-off, followed by power restored):

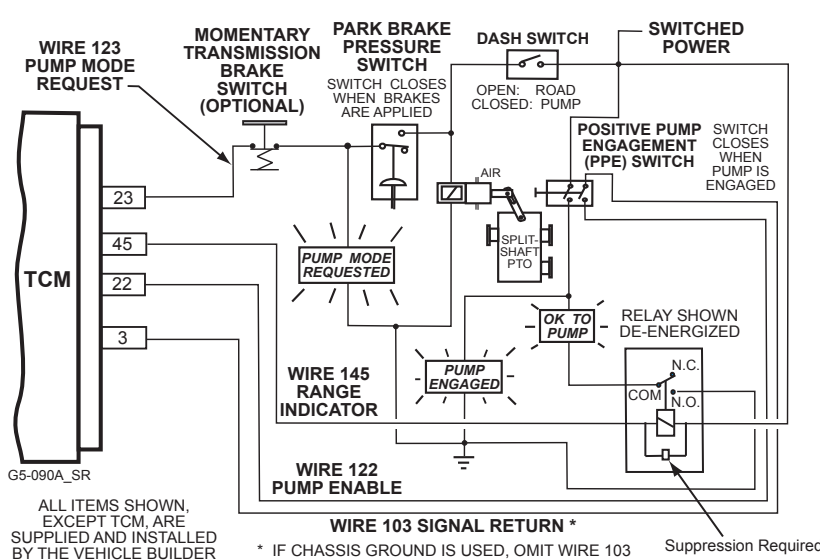
Power off: Lockup clutch off. Transmission remains in 1:1 gear.

Power restored: Lockup clutch off. Transmission remains in 1:1 gear.

NOTE: The Range Indicator default is Neutral. For installations utilizing Pump Mode (4th Lock-up), RANGE INDICATOR MUST BE CHANGED TO 4TH GEAR FOR 6-SPEED MODELS, 5TH GEAR FOR 4000 7-SPEED MODELS, when the TCM calibration is defined or with Allison DOC®.

WARNING: If this function is enabled in the shift calibration, the function MUST be integrated into the vehicle wiring. Refer to this function's cover sheet.

SINGLE POINT FAULTS: This function may contain one or more single point faults that can lead to undesirable function behavior. The OEM is responsible for understanding the impact of these faults in their application.



SYSTEM OPERATION OPERATOR ACTION - System Response

TO ENGAGE:

1. SELECT NEUTRAL USING THE SHIFT SELECTOR: Transmission shifts to Neutral.
2. APPLY PARK BRAKE: None
3. SELECT PUMP WITH DASH SWITCH: Turns on Pump Mode Requested light. Turns on input signal to TCM (wire 123) which requests pump mode. When split-shaft shifts, wire 122 is activated and the Pump Engaged light is turned on.
4. SELECT DRIVE: Transmission shifts to 1:1 lockup. OK To Pump light is turned on.

TO DISENGAGE:

1. SELECT NEUTRAL USING THE SHIFT SELECTOR: Transmission shifts to Neutral if output shaft speed is less than 1000 rpm.
2. SELECT ROAD MODE: PTO disengages. If output shaft rotation continues, press the Momentary Trans. Brake switch before selecting Road Mode. This will cause the transmission output shaft to stop if the transmission is in Neutral and output shaft speed is less than 175 rpm.

WARNING! This schematic shows the intended use of the specified controls feature which has been validated in the configuration shown. Any miswiring or use of this feature which differs from that shown could result in damage to equipment or property, serious personal injury, or death. Allison Transmission is not liable for consequences associated with miswiring or unintended use of this feature.

PUMP MODE (4TH LOCKUP) INPUT – OPERATOR AND PUMP ACTIVATED

INPUT AJ1: WIRES 117 & 143 / OUTPUT C: WIRE 145

APPLICABLE TRANSMISSIONS: 3000 Product Family, 4000 Product Family

DESCRIPTION: This function is enabled when wire 143 is switched to send power to the TCM, and a switch is closed to complete the circuit between input wire 117 and ground. The TCM will command the transmission to operate in direct drive (1:1) lockup when:

- Function is enabled
- Vehicle park brake is activated
- Pump Mode is selected
- Auxiliary equipment is fully engaged
- Drive is selected on the shift selector

NOTE: If a butt-tooth condition hinders full engagement of the pump when the switch on wire 143 is closed, the TCM will command limited rotation of the output shaft in order to promote pump engagement. This ceases when the TCM detects pump engagement on wire 122. This is repeated when the pump is disengaged until a range shift is commanded, or after 30 seconds, whichever occurs first.

The switch on wire 143 reflects the selection of Pump Mode by the operator and the application of the park brake. The separate switch on wire 117 indicates that the split-shaft PTO is fully engaged physically, and illuminates the OK To Pump lamp.

NOTE: Lock-up Clutch Re-Engagement - If the lock-up clutch drops while this function is enabled. Select Neutral, disable the input signals, re-enable the input signals, and select Drive to re-enable this function and re-apply the lock-up clutch.

USES: This function is used in commercial vehicles, but **not fire trucks or other emergency vehicles**. Typical vehicle configuration has a split-shaft PTO to drive a pump, fan or other auxiliary equipment. Activation of this feature initiates the engagement of the split-shaft PTO and shifts the transmission to direct drive lockup.

CUSTOMER MODIFIABLE CONSTANTS:

- Range Indicator, 6-Speed Models
- Range Indicator, 4000 7-Speed Models

Required Value

4th Gear
5th Gear

Default Value

Neutral
Neutral

Allowable Range

R,N,6,5,4,3,2,1
R,N,7,6,5,4,3,2,1

Units

range
range

VOCATIONS: Sewer Cleaners

FUNCTION RESPONSE TO TCM POWER INTERRUPTION

(power-off, followed by power restored):

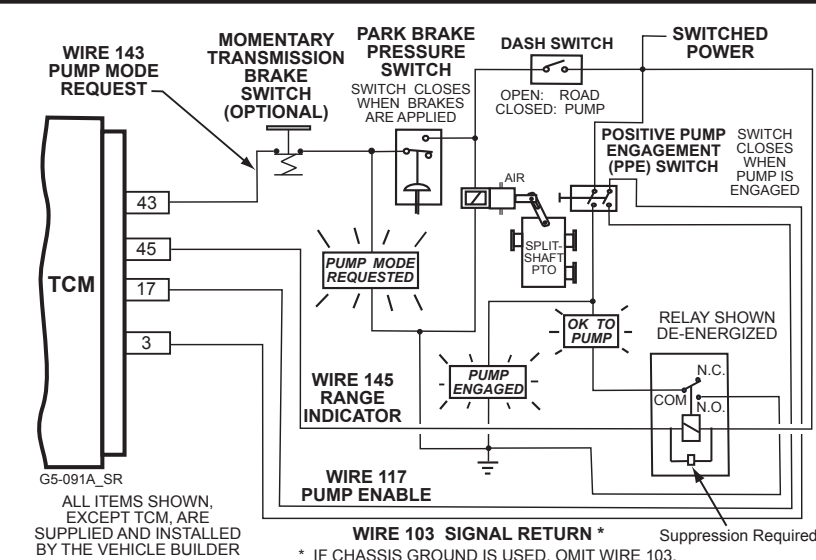
Power off: Lockup clutch off. Transmission remains in 1:1 gear.

Power restored: Lockup clutch off. Transmission remains in 1:1 gear.

NOTE: The Range Indicator default is Neutral. For installations utilizing Pump Mode (4th Lock-up), RANGE INDICATOR MUST BE CHANGED TO 4TH GEAR FOR 6-SPEED MODELS, 5TH GEAR FOR 4000 7-SPEED MODELS, when the TCM calibration is defined or with Allison DOC®.

WARNING: If this function is enabled in the shift calibration, the function MUST be integrated into the vehicle wiring. Refer to this function's cover sheet.

SINGLE POINT FAULTS: This function may contain one or more single point faults that can lead to undesirable function behavior. The OEM is responsible for understanding the impact of these faults in their application.



SYSTEM OPERATION

OPERATOR ACTION - System Response

TO ENGAGE:

1. SELECT NEUTRAL USING THE SHIFT SELECTOR: Transmission shifts to Neutral.
2. APPLY PARK BRAKE: None
3. SELECT PUMP WITH DASH SWITCH: Turns on Pump Mode Requested light. Turns on input signal to TCM (wire 143) which requests pump mode. When split-shaft shifts, wire 117 is activated and the Pump Engaged light is turned on.
4. SELECT DRIVE: Transmission shifts to 1:1 lockup. OK To Pump light is turned on.

TO DISENGAGE:

1. SELECT NEUTRAL USING THE SHIFT SELECTOR: Transmission shifts to Neutral if output shaft speed is less than 1000 rpm.
2. SELECT ROAD MODE: PTO disengages. If output shaft rotation continues, press the Momentary Trans. Brake switch before selecting Road Mode. This will cause the transmission output shaft to stop if the transmission is in Neutral and output shaft speed is less than 175 rpm.

WARNING! This schematic shows the intended use of the specified controls feature which has been validated in the configuration shown. Any miswiring or use of this feature which differs from that shown could result in damage to equipment or property, serious personal injury, or death. Allison Transmission is not liable for consequences associated with miswiring or unintended use of this feature.

PUMP MODE (4TH LOCKUP) INPUT – OPERATOR AND PUMP ACTIVATED INPUT AJ1: WIRES 122 & 143 / OUTPUT C: WIRE 145

APPLICABLE TRANSMISSIONS: 3000 Product Family, 4000 Product Family

DESCRIPTION: This function is enabled when wire 143 is switched to send power to the TCM, and a switch is closed to complete the circuit between input wire 122 and ground. The TCM will command the transmission to operate in direct drive (1:1) lockup when:

- Function is enabled
- Vehicle park brake is activated
- Pump Mode is selected
- Auxiliary equipment is fully engaged
- Drive is selected on the shift selector

NOTE: If a butt-tooth condition hinders full engagement of the pump when the switch on wire 143 is closed, the TCM will command limited rotation of the output shaft in order to promote pump engagement. This ceases when the TCM detects pump engagement on wire 122. This is repeated when the pump is disengaged until a range shift is commanded, or after 30 seconds, whichever occurs first.

The switch on wire 143 reflects the selection of Pump Mode by the operator and the application of the park brake. The separate switch on wire 122 indicates that the split-shaft PTO is fully engaged physically, and illuminates the OK To Pump lamp.

NOTE: Lock-up Clutch Re-Engagement - If the lock-up clutch drops while this function is enabled. Select Neutral, disable the input signals, re-enable the input signals, and select Drive to re-enable this function and re-apply the lock-up clutch.

USES: This function is used in commercial vehicles, but **not fire trucks or other emergency vehicles**. Typical vehicle configuration has a split-shaft PTO to drive a pump, fan or other auxiliary equipment. Activation of this feature initiates the engagement of the split-shaft PTO and shifts the transmission to direct drive lockup.

CUSTOMER MODIFIABLE CONSTANTS:

- Range Indicator, 6-Speed Models
- Range Indicator, 4000 7-Speed Models

Required Value

4th Gear
5th Gear

Default Value

Neutral
Neutral

Allowable Range

R,N,6,5,4,3,2,1
R,N,7,6,5,4,3,2,1

Units

range
range

VOCATIONS: Sewer Cleaners

FUNCTION RESPONSE TO TCM POWER INTERRUPTION (power-off, followed by power restored):

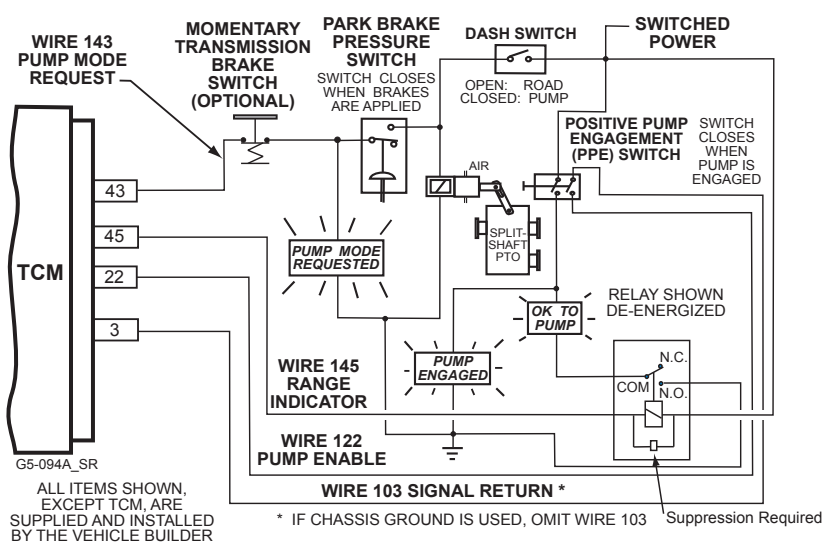
Power off: Lockup clutch off. Transmission remains in 1:1 gear.

Power restored: Lockup clutch off. Transmission remains in 1:1 gear.

NOTE: The Range Indicator default is Neutral. For installations utilizing Pump Mode (4th Lock-up), RANGE INDICATOR MUST BE CHANGED TO 4TH GEAR FOR 6-SPEED MODELS, 5TH GEAR FOR 4000 7-SPEED MODELS, when the TCM calibration is defined or with Allison DOC®.

WARNING: If this function is enabled in the shift calibration, the function MUST be integrated into the vehicle wiring. Refer to this function's cover sheet.

SINGLE POINT FAULTS: This function may contain one or more single point faults that can lead to undesirable function behavior. The OEM is responsible for understanding the impact of these faults in their application.



SYSTEM OPERATION OPERATOR ACTION - System Response

TO ENGAGE:

1. SELECT NEUTRAL USING THE SHIFT SELECTOR: Transmission shifts to Neutral.
2. APPLY PARK BRAKE: None
3. SELECT PUMP WITH DASH SWITCH: Turns on Pump Mode Requested light. Turns on input signal to TCM (wire 143) which requests pump mode. When split-shaft shifts, wire 122 is activated and the Pump Engaged light is turned on.
4. SELECT DRIVE: Transmission shifts to 1:1 lockup. OK To Pump light is turned on.

TO DISENGAGE:

1. SELECT NEUTRAL USING THE SHIFT SELECTOR: Transmission shifts to Neutral if output shaft speed is less than 1000 rpm.
2. SELECT ROAD MODE: PTO disengages. If output shaft rotation continues, press the Momentary Trans. Brake switch before selecting Road Mode. This will cause the transmission output shaft to stop if the transmission is in Neutral and output shaft speed is less than 175 rpm.

WARNING! This schematic shows the intended use of the specified controls feature which has been validated in the configuration shown. Any miswiring or use of this feature which differs from that shown could result in damage to equipment or property, serious personal injury, or death. Allison Transmission is not liable for consequences associated with miswiring or unintended use of this feature.

PUMP MODE (4TH LOCKUP) INPUT – OPERATOR-ONLY ACTIVATION

INPUT AJ2: WIRES 122 & 123 / OUTPUT C: WIRE 145

APPLICABLE TRANSMISSIONS: 3000 Product Family, 4000 Product Family

DESCRIPTION: This function is enabled when wire 123 is switched to send power to the TCM, and a switch is closed to complete the circuit between input wire 122 and ground. The TCM will command the transmission to operate in direct drive (1:1) lockup when:

- Function is enabled
- Vehicle park brake is activated
- Pump Mode is selected
- Drive is selected on the shift selector

NOTE: If a butt-tooth condition hinders full disengagement of the pump when the switch on wire 123 is opened, the TCM will command limited rotation of the output shaft in order to promote pump disengagement. This ceases when a range shift is commanded, or after 30 seconds, whichever occurs first.

The switches on wires 122 and 123 reflect the selection of Pump Mode by the operator and the application of the park brake. A separate switch indicates that the split-shaft PTO is fully engaged physically, and illuminates the OK To Pump lamp.

NOTE: Lock-up Clutch Re-Engagement - If the lock-up clutch drops while this function is enabled. Select Neutral, disable the input signals, re-enable the input signals, and select Drive to re-enable this function and re-apply the lock-up clutch.

USES: This function is used in commercial vehicles, but **not fire trucks or other emergency vehicles**. Typical vehicle configuration has a split-shaft PTO to drive a pump, fan or other auxiliary equipment. Activation of this feature initiates the engagement of the split-shaft PTO and shifts the transmission to direct drive lockup.

CUSTOMER MODIFIABLE CONSTANTS:

- Range Indicator, 6-Speed Models
- Range Indicator, 4000 7-Speed Models

Required Value

4th Gear
5th Gear

Default Value

Neutral
Neutral

Allowable Range

R,N,6,5,4,3,2,1
R,N,7,6,5,4,3,2,1

Units

range
range

VOCATIONS: Sewer Cleaners

FUNCTION RESPONSE TO TCM POWER INTERRUPTION

(power-off, followed by power restored):

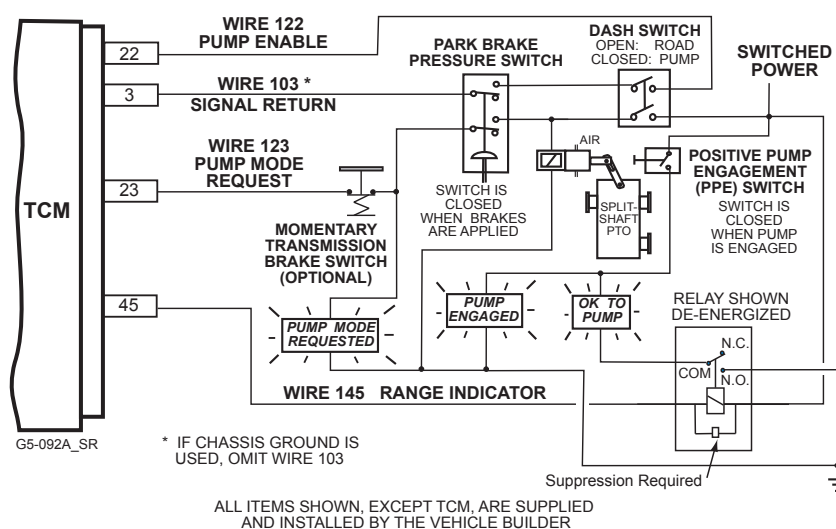
Power off: Lockup clutch off. Transmission remains in 1:1 gear.

Power restored: Lockup clutch off. Transmission remains in 1:1 gear.

NOTE: The Range Indicator default is Neutral. For installations utilizing Pump Mode (4th Lockup), RANGE INDICATOR MUST BE CHANGED TO 4TH GEAR FOR 6-SPEED MODELS, 5TH GEAR FOR 4000 7-SPEED MODELS, when the TCM calibration is defined or with Allison DOC®.

WARNING: If this function is enabled in the shift calibration, the function **MUST** be integrated into the vehicle wiring. Refer to this function's cover sheet.

SINGLE POINT FAULTS: This function may contain one or more single point faults that can lead to undesirable function behavior. The OEM is responsible for understanding the impact of these faults in their application.



SYSTEM OPERATION OPERATOR ACTION - System Response

TO ENGAGE:

1. SELECT NEUTRAL USING THE SHIFT SELECTOR: Transmission shifts to Neutral.
2. APPLY PARK BRAKE: None
3. SELECT PUMP: Turns on Pump Mode Requested light. Turns on both input signals to TCM (wires 122 and 123) which activates pump mode. When split-shaft shifts, Pump Engaged light is turned on.
4. SELECT DRIVE: Transmission shifts to 1:1 lockup. OK To Pump light is turned on.

TO DISENGAGE:

1. SELECT NEUTRAL USING THE SHIFT SELECTOR: Transmission shifts to Neutral if output shaft speed is less than 1000 rpm.
2. SELECT ROAD MODE: PTO disengages. If output shaft rotation continues, press the Momentary Trans. Brake switch before selecting Road Mode. This will cause the transmission output shaft to stop if the transmission is in Neutral and output shaft speed is less than 175 rpm.

WARNING! This schematic shows the intended use of the specified controls feature which has been validated in the configuration shown. Any miswiring or use of this feature which differs from that shown could result in damage to equipment or property, serious personal injury, or death. **Allison Transmission is not liable for consequences associated with miswiring or unintended use of this feature.**

PUMP MODE (4TH LOCKUP) INPUT – OPERATOR-ONLY ACTIVATION

INPUT AJ2: WIRES 117 & 143 / OUTPUT C: WIRE 145

APPLICABLE TRANSMISSIONS: 3000 Product Family, 4000 Product Family

DESCRIPTION: This function is enabled when wire 143 is switched to send power to the TCM, and a switch is closed to complete the circuit between input wire 117 and ground. The TCM will command the transmission to operate in direct drive (1:1) lockup when:

- Function is enabled
- Vehicle park brake is activated
- Pump Mode is selected
- Drive is selected on the shift selector

NOTE: If a butt-tooth condition hinders full disengagement of the pump when the switch on wire 143 is opened, the TCM will command limited rotation of the output shaft in order to promote pump disengagement. This ceases when a range shift is commanded, or after 30 seconds, whichever occurs first.

The switches on wires 117 and 143 reflect the selection of Pump Mode by the operator and the application of the park brake. A separate switch indicates that the split-shaft PTO is fully engaged physically, and illuminates the OK To Pump lamp.

NOTE: Lock-up Clutch Re-Engagement - If the lock-up clutch drops while this function is enabled. Select Neutral, disable the input signals, re-enable the input signals, and select Drive to re-enable this function and re-apply the lock-up clutch.

USES: This function is used in commercial vehicles, but **not fire trucks or other emergency vehicles**. Typical vehicle configuration has a split-shaft PTO to drive a pump, fan or other auxiliary equipment. Activation of this feature initiates the engagement of the split-shaft PTO and shifts the transmission to direct drive lockup.

CUSTOMER MODIFIABLE CONSTANTS:

- Range Indicator, 6-Speed Models
- Range Indicator, 4000 7-Speed Models

Required Value

4th Gear
5th Gear

Default Value

Neutral
Neutral

Allowable Range

R,N,6,5,4,3,2,1
R,N,7,6,5,4,3,2,1

Units

range
range

VOCATIONS: Sewer Cleaners

FUNCTION RESPONSE TO TCM POWER INTERRUPTION (power-off, followed by power restored):

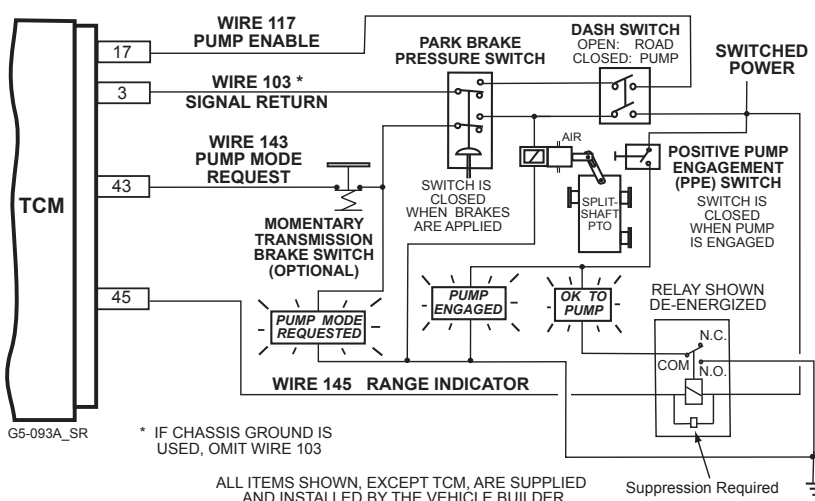
Power off: Lockup clutch off. Transmission remains in 1:1 gear.

Power restored: Lockup clutch off. Transmission remains in 1:1 gear.

NOTE: The Range Indicator default is Neutral. For installations utilizing Pump Mode (4th Lockup), RANGE INDICATOR MUST BE CHANGED TO 4TH GEAR FOR 6-SPEED MODELS, 5TH GEAR FOR 4000 7-SPEED MODELS, when the TCM calibration is defined or with Allison DOC®.

WARNING: If this function is enabled in the shift calibration, the function MUST be integrated into the vehicle wiring. Refer to this function's cover sheet.

SINGLE POINT FAULTS: This function may contain one or more single point faults that can lead to undesirable function behavior. The OEM is responsible for understanding the impact of these faults in their application.



SYSTEM OPERATION OPERATOR ACTION - System Response

TO ENGAGE:

1. SELECT NEUTRAL USING THE SHIFT SELECTOR: Transmission shifts to Neutral.
2. APPLY PARK BRAKE: None
3. SELECT PUMP: Turns on Pump Mode Requested light. Turns on both input signals to TCM (wires 117 and 143) which activates pump mode. When split-shaft shifts, Pump Engaged light is turned on.
4. SELECT DRIVE: Transmission shifts to 1:1 lockup. OK To Pump light is turned on.

TO DISENGAGE:

1. SELECT NEUTRAL USING THE SHIFT SELECTOR: Transmission shifts to Neutral if output shaft speed is less than 1000 rpm.
2. SELECT ROAD MODE: PTO disengages. If output shaft rotation continues, press the Momentary Trans. Brake switch before selecting Road Mode. This will cause the transmission output shaft to stop if the transmission is in Neutral and output shaft speed is less than 175 rpm.

WARNING! This schematic shows the intended use of the specified controls feature which has been validated in the configuration shown. Any miswiring or use of this feature which differs from that shown could result in damage to equipment or property, serious personal injury, or death. Allison Transmission is not liable for consequences associated with miswiring or unintended use of this feature.

PUMP MODE (4TH LOCKUP) INPUT – OPERATOR-ONLY ACTIVATION

INPUT AJ2: WIRES 122 & 143 / OUTPUT C: WIRE 145

APPLICABLE TRANSMISSIONS: 3000 Product Family, 4000 Product Family

DESCRIPTION: This function is enabled when wire 143 is switched to send power to the TCM, and a switch is closed to complete the circuit between input wire 122 and ground. The TCM will command the transmission to operate in direct drive (1:1) lockup when:

- Function is enabled
- Vehicle park brake is activated
- Pump Mode is selected
- Drive is selected on the shift selector

NOTE: If a butt-tooth condition hinders full disengagement of the pump when the switch on wire 143 is opened, the TCM will command limited rotation of the output shaft in order to promote pump disengagement. This ceases when a range shift is commanded, or after 30 seconds, whichever occurs first.

The switches on wires 122 and 143 reflect the selection of Pump Mode by the operator and the application of the park brake. A separate switch indicates that the split-shaft PTO is fully engaged physically, and illuminates the OK To Pump lamp.

NOTE: Lock-up Clutch Re-Engagement - If the lock-up clutch drops while this function is enabled. Select Neutral, disable the input signals, re-enable the input signals, and select Drive to re-enable this function and re-apply the lock-up clutch.

USES: This function is used in commercial vehicles, but **not fire trucks or other emergency vehicles**. Typical vehicle configuration has a split-shaft PTO to drive a pump, fan or other auxiliary equipment. Activation of this feature initiates the engagement of the split-shaft PTO and shifts the transmission to direct drive lockup.

CUSTOMER MODIFIABLE CONSTANTS:

- Range Indicator, 6-Speed Models
- Range Indicator, 4000 7-Speed Models

Required Value

4th Gear
5th Gear

Default Value

Neutral
Neutral

Allowable Range

R,N,6,5,4,3,2,1
R,N,7,6,5,4,3,2,1

Units

range
range

VOCATIONS: Sewer Cleaners

FUNCTION RESPONSE TO TCM POWER INTERRUPTION

(power-off, followed by power restored):

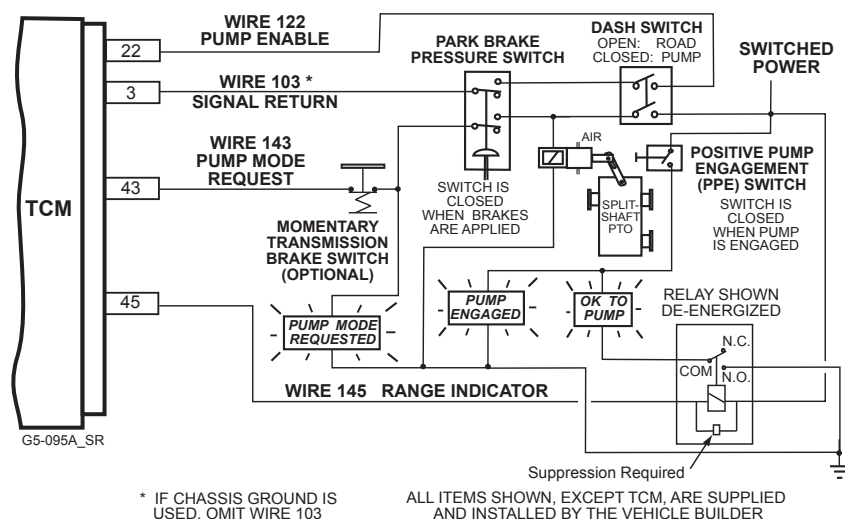
Power off: Lockup clutch off. Transmission remains in 1:1 gear.

Power restored: Lockup clutch off. Transmission remains in 1:1 gear.

NOTE: The Range Indicator default is Neutral. For installations utilizing Pump Mode (4th Lockup), RANGE INDICATOR MUST BE CHANGED TO 4TH GEAR FOR 6-SPEED MODELS, 5TH GEAR FOR 4000 7-SPEED MODELS, when the TCM calibration is defined or with Allison DOC®.

WARNING: If this function is enabled in the shift calibration, the function MUST be integrated into the vehicle wiring. Refer to this function's cover sheet.

SINGLE POINT FAULTS: This function may contain one or more single point faults that can lead to undesirable function behavior. The OEM is responsible for understanding the impact of these faults in their application. Contact your Allison Application Engineer for additional information.



SYSTEM OPERATION

OPERATOR ACTION - System Response

TO ENGAGE:

1. SELECT NEUTRAL USING THE SHIFT SELECTOR: Transmission shifts to Neutral.
2. APPLY PARK BRAKE: None
3. SELECT PUMP: Turns on Pump Mode Requested light. Turns on both input signals to TCM (wires 122 and 143) which activates pump mode. When split-shaft shifts, Pump Engaged light is turned on.
4. SELECT DRIVE: Transmission shifts to 1:1 lockup. OK To Pump light is turned on.

TO DISENGAGE:

1. SELECT NEUTRAL USING THE SHIFT SELECTOR: Transmission shifts to Neutral if output shaft speed is less than 1000 rpm.
2. SELECT ROAD MODE: PTO disengages. If output shaft rotation continues, press the Momentary Trans. Brake switch before selecting Road Mode. This will cause the transmission output shaft to stop if the transmission is in Neutral and output shaft speed is less than 175 rpm.

WARNING! This schematic shows the intended use of the specified controls feature which has been validated in the configuration shown. Any miswiring or use of this feature which differs from that shown could result in damage to equipment or property, serious personal injury, or death. Allison Transmission is not liable for consequences associated with miswiring or unintended use of this feature.

REFERENCED DOCUMENTS

- [ACCT \(Allison Calibration Configuration Tool\)](#)
 - [Allison DOC® for PC](#)
 - [I/O Package Guides](#)
-

REVISION HISTORY

Input AJ: Pump Mode (4th Lockup) Input

September 3, 2019

- Added Lock-up re-engagement note.
- Removed, “When either of the input signals is disabled, normal automatic shifting resumes”
- Removed, “Contact your Allison Application Engineering representative for more information”

October 27, 2016

- Added Single Point Faults note to Warning on Schematics.

November 10, 2014

- No functional change. Revised appropriate schematics to illustrate suppressed relays.

January 29, 2013

- Added that the Range Indicator must be specified as 5th Gear for 4000 7-speed models.

January 14, 2013

- Created new document for Allison 5th Generation Controls Pump Mode (4th Lockup) Input.
- Includes update to NOTE describing transmission operation when a butt-tooth condition exists.