

# SHIFT SELECTOR OPERATION AND CODE MANUAL

MY09 4TH GENERATION /  
4TH GENERATION ELECTRONIC CONTROLS



Oil level information, diagnostic codes and prognostic features for  
3000/4000 SERIES ALLISON TRANSMISSIONS

## The Allison Advantage

Your Allison Automatic is fully electronically controlled. The Allison electronic controls package oversees the operation of the transmission, controlling transmission upshifts and downshifts, and providing important information on the operation of your drive system.

Through readouts on your shift selector, you will be able to monitor transmission oil levels, read diagnostic codes and prognostic information. This manual will help you understand shift selector readouts and enjoy long, trouble-free operation of your Allison Automatic.

---

## Shift Selector Models

Detailed information on oil levels, diagnostic codes and prognostic features for your specific shift selector can be found on the following pages.

If your vehicle has a shift selector that has a:

- *Double-digit display and was release after July 2008, equipped with Model Year '09 prognostics, see the section for **Model Year '09 4th Generation Electronic Controls Shift Selectors**.*
- *Double-digit display and was released after July 2008, not equipped with prognostics, see the section for **4th Generation Electronic Controls Shift Selectors**.*
- *Double-digit display and was released prior to July 2008, see the section for **4th Generation Electronic Controls Shift Selectors**.*

Model Year '09 4th Generation Electronic Controls Shift Selectors

4-12

4th Generation Electronic Controls Shift Selectors

13-18

# General Information

## FLUID LEVELS

The transmission fluid cools, lubricates and transmits hydraulic power, so it is important the proper fluid level be maintained at all times. If the fluid level is too low, the converter and clutches do not receive an adequate supply of fluids. If the fluid level is too high, the fluid can aerate causing the transmission to shift erratically or overheat.

---

## DIAGNOSTICS

The Transmission Control Module (TCM) of your Allison Automatic monitors the transmission's electronic controls; and when a problem condition is detected, it:

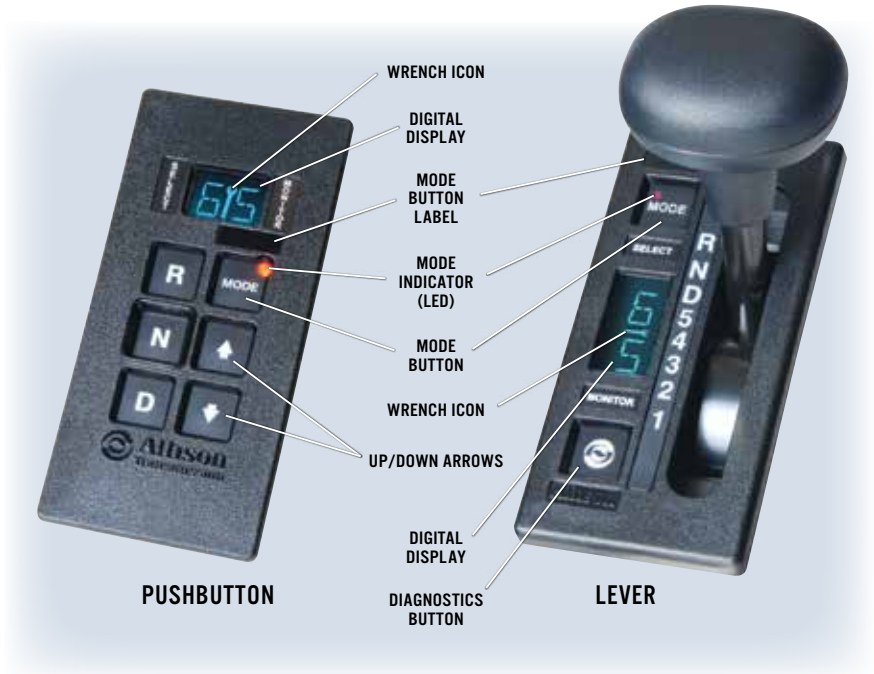
- Restricts shifting
- Illuminates the **CHECK TRANS\*** light on the instrument panel
- Registers a diagnostic code

Continued illumination of the **CHECK TRANS** light during vehicle operation (other than start-up) indicates that the TCM has signaled a diagnostic code.

---

*\* For some problems, diagnostic codes may be registered without the TCM activating the **CHECK TRANS** light. Your Allison Transmission authorized service outlet should be consulted whenever there is a transmission-related concern. They have the equipment to check for diagnostic codes and to correct problems.*

## Model Year '09 4th Generation Electronic Controls Shift Selectors



OEMs may supply shift selectors for some vehicles equipped with Model Year '09 prognostics. If your Allison-equipped vehicle's shift selector is different from those shown above, contact your OEM for further details.

## Prognostic Features

If the **WRENCH ICON** illuminates briefly after you turn the key to the run position on your Allison-equipped vehicle, then prognostics are enabled.



PUSHBUTTON



LEVER

### OIL LIFE MONITOR

When fluid is due for a change: The **WRENCH ICON** is illuminated and remains solid for two minutes after the **DRIVE RANGE** is selected.



### FILTER LIFE MONITOR

When the filter(s) is due for a change: The **WRENCH ICON** flashes on and off for two minutes after the **DRIVE RANGE** is selected.



### TRANSMISSION HEALTH MONITOR

When clutch maintenance is due: The **WRENCH ICON** comes on and remains solid during entire operational time of vehicle.



## Accessing Prognostics

When you are alerted via the **WRENCH ICON** on the shift selector that service is due, you can check the status by toggling through the shift selector display as follows. *Be sure to park the vehicle on a level surface, shift to N (Neutral) and apply the parking brake before accessing prognostics through the shift selector.*

### OIL LIFE MONITOR



Using a *pushbutton shift selector* simultaneously press the **UP** and **DOWN** arrows two times.



Using a *lever shift selector* press the **DIAGNOSTICS** button two times.



“oM” appears followed by a number, from 99 to 0, which represents the percentage of oil life remaining before a fluid change is required.

### FILTER LIFE MONITOR



Using a *pushbutton shift selector* simultaneously press the **UP** and **DOWN** arrows three times.



Using a *lever shift selector* press the **DIAGNOSTICS** button three times.



“FM” appears followed by either “oK” or “Lo”. “oK” means filters do not need to be changed and “Lo” means filters need to be changed.

### TRANSMISSION HEALTH MONITOR



Using a *pushbutton shift selector* simultaneously press the **UP** and **DOWN** arrows four times.



Using a *lever shift selector* press the **DIAGNOSTICS** button four times.



“TM” appears followed by either “oK” or “Lo”. “oK” means no clutch maintenance is required, and “Lo” means clutch maintenance is required.

## Resetting Prognostics

### OIL LIFE MONITOR



Using either a *pushbutton* or *lever shift selector*, press and hold **MODE** button for approximately 10 seconds while in Oil Life Monitor mode.

Or

Using either a *pushbutton* or *lever shift selector*, perform the following shift sequence with the ignition on but the engine off. Do not stop the sequence for more than three seconds once you have started.

**N-D-N-D-N-R-N**

**Note:** A “99” will display verifying that Oil Life Monitor has been reset.

### FILTER LIFE MONITOR



Using either a *pushbutton* or *lever shift selector*, press and hold **MODE** button for approximately 10 seconds while in Filter Life Monitor mode.

Or

Using either a *pushbutton* or *lever shift selector*, perform the following shift sequence with the ignition on but the engine off. Do not stop the sequence for more than three seconds once you have started.

**N-R-N-R-N-D-N**

**Note:** The **WRENCH ICON** will illuminate briefly and “oK” will display verifying Filter Life Monitor has been reset.

### TRANSMISSION HEALTH MONITOR

The **WRENCH ICON** clears automatically when appropriate conditions are detected. Transmission Health Monitor must be reset manually using Allison DOC™ after correcting a clutch system issue.

## Checking Fluid Levels

Use the following procedure to display oil level information.

### To enter the oil level function:

1. Park the vehicle on a level surface, shift to **N** (Neutral) and apply the parking brake.
2. Using a *pushbutton shift selector*, simultaneously press the **UP** and **DOWN** arrows one time.



Using a *lever shift selector*, press the **DIAGNOSTICS** button one time.



3. The fluid level reading may be delayed until the following conditions are met:
  - Engine is at idle.
  - The fluid temperature is between 60°C (140°F) and 104°C (220°F).
  - Transmission is in N (Neutral).
  - The vehicle has been stationary for approximately two minutes to allow the fluid to settle.
  - The engine is at idle (below 1000 rpm - not “fast” idle).

- **DELAYED FLUID LEVEL CHECK** – The indication of a delayed fluid level check for *pushbutton and lever shift selectors* is a flashing display and a numerical countdown.





4. The shift selector displays the oil level data as follows:

- **CORRECT FLUID LEVEL** – “oL” is displayed (“oL” represents “Fluid (Oil) Level Check”) followed by “oK.” The “oK” display indicates the fluid is within the correct fluid level zone. The sensor display and the transmission dipstick may not agree exactly because the oil level sensor compensates for fluid temperature.



- **LOW FLUID LEVEL** – “oL” is displayed (“oL” represents “Fluid (Oil) Level Check”) followed by “Lo” (“Lo” represents “Low Oil Level”) and the number of quarts the transmission fluid is low.

*Example: oL Lo 02* “2” indicates that 2 additional quarts of fluid will bring the fluid level within the middle of the “oK” zone.



- **HIGH FLUID LEVEL** – “oL” is displayed (“oL” represents “Fluid (Oil) Level Check”) followed by “HI” (“HI” represents “High Oil Level”) and the number of quarts the transmission fluid is overfilled.

*Example: oL HI 01* “1” indicates 1 quart of fluid above the full transmission level.



- **INVALID FOR DISPLAY** – If any of the previous conditions are not met, the shift selector will display “oL” (“oL” represents “Fluid (Oil) Level Check”) followed by “- -” and a numerical display. The numerical display is a fault code and indicates conditions are not proper to receive the fluid level information or there is a system malfunction.

The fault codes that may be encountered are shown below:

DISPLAY FAULT CODE	FLUID LEVEL FAULT CODE DESCRIPTION
oL, --, 0X*	Setting time too short
oL, --, 50 or , EL	Engine speed too low
oL, --, 59 or , EH	Engine speed too high
oL, --, 65 or , SN	Neutral must be selected
oL, --, 70 or , TL	Sump fluid temperature too low
oL, --, 79 or , TH	Sump fluid temperature too high
oL, --, 89 or , SH	Output speed high
oL, --, 95 or , FL	Oil level sensor failed**

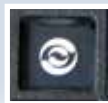
\*A number between 8 and 1 that flashes during countdown period.

\*\*Report sensor failure display to a distributor or dealer in your area.

**CAUTION:** A low or high fluid level can cause overheating and irregular shift patterns. Incorrect fluid level can damage the transmission.

### To exit the oil level function:

- **Pushbutton shift selector:**  
Press any range button.
- **Lever shift selector:**  
Press the **DIAGNOSTICS** button one time.



## Diagnostic Codes

### To enter the diagnostic code function:

1. Bring the vehicle to a complete stop. Apply the parking brake.
2. Using a *pushbutton shift selector*, simultaneously press the **UP** and **DOWN** arrows five times.

Using a *lever shift selector*, press the **DIAGNOSTICS** button five times.



### To read diagnostic codes in the digital display:

Diagnostic codes will appear two characters at a time on a *pushbutton* or *lever selector*.

When the diagnostic function is entered, the first code (position **d1**) is displayed as follows:

Example Code: **P 07 22**      Displayed as: **d1, P, 07, 22**



The Code Position (**d1**) is the first item displayed, followed by the Diagnostic Trouble Code (DTC),\*\* **P, 07, 22**. Each item is displayed for about one second. The display cycles continuously until the next code list position is accessed by pressing the **MODE** button.

For a detailed list of Diagnostic Transmission Codes for Model Year '09 Shift Selectors, see pages 32 through 35.

\*\* *Diagnostic Trouble Code (DTC)* – The diagnostic trouble code number referring to the general condition or area of fault detected by the TCM.

## To clear diagnostic codes:

Press and hold the **MODE** button for 10 seconds to clear both active and inactive codes.



**Note:** *Be sure to record all codes displayed before they are cleared. This is essential for troubleshooting. Begin operating as normal.*

---

Drive the vehicle and check for code recurrence. If codes continue to recur, bring the vehicle to an authorized Allison Transmission service outlet to diagnose and repair the problem causing the codes.

## 4th Generation Electronic Controls Shift Selectors



*Vehicle manufacturers may choose different types of shift selectors for their vehicles. The shift selector in your Allison-equipped vehicle will be similar to the pushbutton or lever style shown above.*

## Checking Fluid Levels

Use the following procedure to display oil level information.

### To enter the oil level function:

1. Park the vehicle on a level surface, shift to **N** (Neutral) and apply the parking brake.
2. Using a *pushbutton shift selector*, simultaneously press the **UP** and **DOWN** arrow buttons one time.



Using a *lever shift selector*, press the **DIAGNOSTICS** button one time.



3. The fluid level reading may be delayed until the following conditions are met:
  - Engine is at idle.
  - The fluid temperature is between 60°C (140°F) and 104°C (220°F).
  - Transmission is in N (Neutral).
  - The vehicle has been stationary for approximately two minutes to allow the fluid to settle.
  - The engine is at idle (below 1000 rpm - not “fast” idle).

- **DELAYED FLUID LEVEL CHECK** – The indication of a delayed fluid level check for *pushbutton and lever shift selectors* is a flashing display and a numerical countdown.



4. The shift selector displays the oil level data as follows:

- **CORRECT FLUID LEVEL** – “oL” is displayed (“oL” represents “Fluid (Oil) Level Check”) followed by “oK.” The “oK” display indicates the fluid is within the correct fluid level zone. The sensor display and the transmission dipstick may not agree exactly because the oil level sensor compensates for fluid temperature.



- **LOW FLUID LEVEL** – “oL” is displayed (“oL” represents “Fluid (Oil) Level Check”) followed by “Lo” (“Lo” represents “Low Oil Level”) and the number of quarts the transmission fluid is low.

*Example: oL Lo 02*

“2” indicates that 2 additional quarts of fluid will bring the fluid level within the middle of the “oK” zone.



- **HIGH FLUID LEVEL** – “oL” is displayed (“oL” represents “Fluid (Oil) Level Check”) followed by “HI” (“HI” represents “High Oil Level”) and the number of quarts the transmission fluid is overfilled.

*Example: oL HI 01      “1” indicates 1 quart of fluid above the full transmission level.*



- **INVALID FOR DISPLAY** – If any of the previous conditions are not met, the shift selector will display “oL” (“oL” represents “Fluid (Oil) Level Check”) followed by “- -” and a numerical display. The numerical display is a fault code and indicates conditions are not proper to receive the fluid level information, or that there is a system malfunction.

The fault codes that may be encountered are shown on page 18.

**CAUTION:** A low or high fluid level can cause overheating and irregular shift patterns. Incorrect fluid level can damage the transmission.

## To exit the oil level function:

- *Pushbutton shift selector:*  
Press any range button.
- *Lever shift selector:*  
Press the **DIAGNOSTICS** button one time.



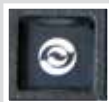


## Diagnostic Codes

### To enter the diagnostic code function:

1. Bring the vehicle to a complete stop. Apply the parking brake.
2. Using a *pushbutton shift selector*, simultaneously press the **UP** and **DOWN** arrows two times.

Using a *lever shift selector*, press the **DIAGNOSTICS** button two times.



### To read diagnostic codes in the digital display:

Diagnostic codes will appear two characters at a time on a *pushbutton* or *lever selector*.

When the diagnostic function is entered, the first code (position **d1**) is displayed as follows:

*Example Code: P 07 22*      *Displayed as: d1, P, 07, 22*



The Code Position (**d1**) is the first item displayed, followed by the Diagnostic Trouble Code (DTC)\*\* **P, 07, 22**. Each item is displayed for about one second. The display cycles continuously until the next code list position is accessed by pressing the **MODE** button.

For a detailed list of Diagnostic Transmission Codes for 4th Generation Shift Selectors, see pages 32 through 35.

\*\* *Diagnostic Trouble Code (DTC) - The diagnostic trouble code number referring to the general condition or area of fault detected by the TCM.*

## To clear diagnostic codes:

Press and hold the **MODE** button for 10 seconds to clear both active and inactive codes.



**Note:** *Be sure to record all codes displayed before they are cleared. This is essential for troubleshooting. Begin operating as normal.*

---

Drive the vehicle and check for code recurrence. If codes continue to recur, bring the vehicle to an authorized Allison Transmission service outlet to diagnose and repair the problem causing the codes.

# Diagnostic Transmission Codes

DIAGNOSTIC CODE	CODE DESCRIPTION
C1312	RETARDER REQUEST SENSOR, FAILED LOW
C1313	RETARDER REQUEST SENSOR, FAILED HIGH
P0122	PEDAL POSITION SENSOR, LOW VOLTAGE
P0123	PEDAL POSITION SENSOR, HIGH VOLTAGE
P0218	TRANSMISSION FLUID OVER TEMPERATURE
P0602	TCM NOT PROGRAMMED
P0610	TCM VEHICLE OPTIONS (TRANSID) ERROR
P0613	TCM PROCESSOR
P0614	TORQUE CONTROL DATA MISMATCH—ECM/TCM
P0634	TCM INTERNAL TEMPERATURE TOO HIGH
P063E	AUTO CONFIGURATION THROTTLE INPUT NOT PRESENT
P063F	AUTO CONFIGURATION ENGINE COOLANT TEMP INPUT NOT PRESENT
P0658	ACTUATOR SUPPLY VOLTAGE 1 (HSD1), LOW
P0659	ACTUATOR SUPPLY VOLTAGE 1 (HSD1), HIGH
P0701	TRANSMISSION CONTROL SYSTEM PERFORMANCE
P0702	TRANSMISSION CONTROL SYSTEM ELECTRICAL (TRANSID)
P0703	BRAKE SWITCH CIRCUIT MALFUNCTION
P0708	TRANSMISSION RANGE SENSOR, HIGH
P070C	TRANSMISSION FLUID LEVEL SENSOR, LOW
P070D	TRANSMISSION FLUID LEVEL SENSOR, HIGH
P0711	TRANSMISSION FLUID TEMPERATURE SENSOR PERFORMANCE
P0712	TRANSMISSION FLUID TEMPERATURE SENSOR, LOW
P0713	TRANSMISSION FLUID TEMPERATURE SENSOR, HIGH
P0716	TURBINE SPEED SENSOR PERFORMANCE
P0717	TURBINE SPEED SENSOR, NO SIGNAL
P0719	BRAKE SWITCH ABS, INPUT LOW
P071A	RELS INPUT, FAILED ON
P071D	GENERAL PURPOSE FAULT
P0721	OUTPUT SPEED SENSOR PERFORMANCE
P0722	OUTPUT SPEED SENSOR, NO SIGNAL

## Diagnostic Transmission Codes

DIAGNOSTIC CODE	CODE DESCRIPTION
P0726	ENGINE SPEED SENSOR PERFORMANCE
P0727	ENGINE SPEED SENSOR, NO SIGNAL
P0729	INCORRECT 6TH GEAR RATIO
P0731	INCORRECT 1ST GEAR RATIO
P0732	INCORRECT 2ND GEAR RATIO
P0733	INCORRECT 3RD GEAR RATIO
P0734	INCORRECT 4TH GEAR RATIO
P0735	INCORRECT 5TH GEAR RATIO
P0736	INCORRECT REVERSE GEAR RATIO
P0741	TORQUE CONVERTER CLUTCH SYSTEM, STUCK OFF
P0776	PRESSURE CONTROL SOLENOID 2, STUCK OFF
P0777	PRESSURE CONTROL SOLENOID 2, STUCK ON
P0796	PRESSURE CONTROL SOLENOID 3, STUCK OFF
P0797	PRESSURE CONTROL SOLENOID 3, STUCK ON
P0842	TRANSMISSION PRESSURE SWITCH 1, LOW
P0843	TRANSMISSION PRESSURE SWITCH 1, HIGH
P088A	DETERIORATED FILTER
P088B	VERY DETERIORATED FILTER
P0880	TCM POWER INPUT SIGNAL
P0881	TCM POWER INPUT SIGNAL PERFORMANCE
P0882	TCM POWER INPUT SIGNAL, LOW
P0883	TCM POWER INPUT SIGNAL, HIGH
P0894	TRANSMISSION COMPONENT SLIPPING
P0897	TRANSMISSION FLUID AT LIMIT
P0960	PRESSURE CONTROL SOLENOID MAIN MOD CONTROL, OPEN
P0962	PRESSURE CONTROL SOLENOID MAIN MOD CONTROL, LOW
P0963	PRESSURE CONTROL SOLENOID MAIN MOD CONTROL, HIGH
P0964	PRESSURE CONTROL SOLENOID 2 CONTROL, OPEN
P0966	PRESSURE CONTROL SOLENOID 2 CONTROL, LOW
P0967	PRESSURE CONTROL SOLENOID 2 CONTROL, HIGH

## Diagnostic Transmission Codes

DIAGNOSTIC CODE	CODE DESCRIPTION
P0968	PRESSURE CONTROL SOLENOID 3 CONTROL, OPEN
P0970	PRESSURE CONTROL SOLENOID 3 CONTROL, LOW
P0971	PRESSURE CONTROL SOLENOID 3 CONTROL, HIGH
P0973	SHIFT SOLENOID 1 CONTROL, LOW
P0974	SHIFT SOLENOID 1 CONTROL, HIGH
P0975	SHIFT SOLENOID 2 CONTROL, OPEN
P0976	SHIFT SOLENOID 2 CONTROL, LOW
P0977	SHIFT SOLENOID 2 CONTROL, HIGH
P0989	RETARDER PRESSURE SENSOR, FAILED LOW
P0990	RETARDER PRESSURE SENSOR, FAILED HIGH
P1739	INCORRECT LOW GEAR RATIO
P1891	THROTTLE POSITION SENSOR PWM SIGNAL, LOW
P1892	THROTTLE POSITION SENSOR PWM SIGNAL, HIGH
P2184	ENGINE COOLANT TEMPERATURE SENSOR, LOW
P2185	ENGINE COOLANT TEMPERATURE SENSOR, HIGH
P2637	TORQUE MANAGEMENT FEEDBACK SIGNAL (SEM)
P2641	TORQUE MANAGEMENT FEEDBACK SIGNAL (LRTP)
P2670	ACTUATOR SUPPLY VOLTAGE 2 (HSD2), LOW
P2671	ACTUATOR SUPPLY VOLTAGE 2 (HSD2), HIGH
P2685	ACTUATOR SUPPLY VOLTAGE 3 (HSD3), LOW
P2686	ACTUATOR SUPPLY VOLTAGE 3 (HSD3), HIGH
P2714	PRESSURE CONTROL SOLENOID 4, STUCK OFF
P2715	PRESSURE CONTROL SOLENOID 4, STUCK ON
P2718	PRESSURE CONTROL SOLENOID 4 CONTROL, OPEN
P2720	PRESSURE CONTROL SOLENOID 4 CONTROL, LOW
P2721	PRESSURE CONTROL SOLENOID 4 CONTROL, HIGH
P2723	PRESSURE CONTROL SOLENOID 1, STUCK OFF
P2724	PRESSURE CONTROL SOLENOID 1, STUCK ON
P2727	PRESSURE CONTROL SOLENOID 1 CONTROL, OPEN
P2729	PRESSURE CONTROL SOLENOID 1 CONTROL, LOW
P2730	PRESSURE CONTROL SOLENOID 1 CONTROL, HIGH

## Diagnostic Transmission Codes

DIAGNOSTIC CODE	CODE DESCRIPTION
P2736	PRESSURE CONTROL SOLENOID 5 CONTROL, OPEN
P2738	PRESSURE CONTROL SOLENOID 5 CONTROL, LOW
P2739	PRESSURE CONTROL SOLENOID 5 CONTROL, HIGH
P2740	RETARDER OIL TEMPERATURE, HOT
P2742	RETARDER OIL TEMPERATURE SENSOR, LOW
P2743	RETARDER OIL TEMPERATURE SENSOR, HIGH
P2761	TCC PCS CONTROL, OPEN
P2763	TCC PCS CONTROL, HIGH
P2764	TCC PCS CONTROL, LOW
P278A	KICKDOWN INPUT, FAILED ON
P2789	CLUTCH ADAPTIVE LEARNING AT LIMIT
P2793	GEAR SHIFT DIRECTION
P2808	PRESSURE CONTROL SOLENOID 6, STUCK OFF
P2809	PRESSURE CONTROL SOLENOID 6, STUCK ON
P2812	PRESSURE CONTROL SOLENOID 6 CONTROL, OPEN
P2814	PRESSURE CONTROL SOLENOID 6 CONTROL, LOW
P2815	PRESSURE CONTROL SOLENOID 6 CONTROL, HIGH
U0001	HIGH SPEED CAN BUS RESET COUNTER OVERRUN (IESCAN)
U0010	CAN BUS RESET COUNTER OVERRUN
U0100	LOST COMMUNICATION WITH ECM/PCM (J1587)
U0103	LOST COMMUNICATION WITH GEAR SHIFT MODULE (SHIFT SELECTOR) 1
U0115	LOST COMMUNICATION WITH ECM
U0291	LOST COMMUNICATION WITH GEAR SHIFT MODULE (SHIFT SELECTOR) 2
U0304	INCOMPATIBLE GEAR SHIFT MODULE 1 (SHIFT SELECTOR ID)
U0333	INCOMPATIBLE GEAR SHIFT MODULE 2 (SHIFT SELECTOR ID)
U0404	INVALID DATA RECEIVED FROM GEAR SHIFT MODULE (SHIFT SELECTOR) 1
U0592	INVALID DATA RECEIVED FROM GEAR SHIFT MODULE (SHIFT SELECTOR) 2

*Information contained in this brochure is designed to give you an overview of the Oil Level Sensor, Diagnostics and Prognostic Features on your Allison Automatic and is not intended to replace your Operator's Manual. To order an Operator's Manual, go to [www.allisontransmission.com](http://www.allisontransmission.com) or call toll free 888-666-5799.*



P.O. Box 894, Speed Code PF3  
Indianapolis, Indiana 46206-0894  
[www.allisontransmission.com](http://www.allisontransmission.com)

SA7498EN (2014/07) Litho in U.S.A.  
ISO/QS 9000 and ISO 14001 Certified  
© 2014 Allison Transmission, Inc. All rights reserved.