WTEC III SHIFT SELECTOR OPERATION AND CODE MANUAL

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 brochure will help you understand shift selector readouts and enjoy long, trouble-free operation of your Allison Automatic.

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

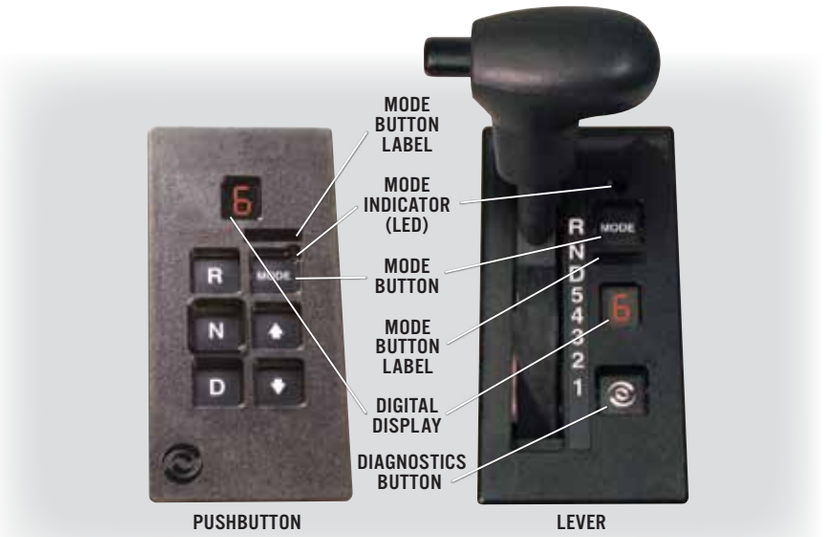
Continued illumination of the **CHECK TRANS** light during vehicle operation (other than start-up) indicates that the TCM has signaled a diagnostic code.

MODE BUTTON

Allison Automatics offer primary and secondary shift schedule modes to enhance performance or fuel economy. The vehicle always defaults to the primary mode (light off). You can switch to the secondary mode (light on) by pushing the **MODE** button.

* *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.*

WTEC III 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 one of the pushbutton or lever styles as 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

A delayed fluid level check for *pushbutton* and *lever selectors* is indicated by a "**-**" in the display window followed by 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 2** "**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 1** "**1**" *indicates 1 quart of fluid above the full transmission level.*

- **INVALID FOR DISPLAY** – If any of the above 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 below:

DISPLAY FAULT CODE	FLUID LEVEL FAULT CODE DESCRIPTION
o, L, –, 0, X*	Setting time too short
o, L, –, 5, 0	Engine speed too low
o, L, –, 5, 9	Engine speed too high
o, L, –, 6, 5	Neutral must be selected
o, L, –, 7, 0	Sump fluid temperature too low
o, L, –, 7, 9	Sump fluid temperature too high
o, L, –, 8, 9	Output speed high
o, L, –, 9, 5	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 selector:
Press the **NEUTRAL** button or simultaneously press the **UP** and **DOWN** arrows two times.

Lever selector:
Press the **DIAGNOSTICS** button two times or momentarily move the shift selector to any range and back to neutral.

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 the digital display codes:

Diagnostic codes will appear one digit at a time on a *lever* or *pushbutton selector.*

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

Example Code: **13 12**

Code Position: **d1** – indicates that this is the first diagnostic code listed in the TCM memory.

Main Code: **13** - (two digits displayed one at a time) is listed first and provides the general condition or area of a fault detected by the TCM.

Sub Code: **12** - (two digits displayed one at a time) is listed second and provides specific areas or conditions within the main code that caused the fault. This subcode indicates the problem is caused by low voltage.

For a detailed list of Diagnostic Transmission Codes for 3rd Generation Shift Selectors, see pages 25 through 30.

To clear diagnostic codes:

Press and hold the **MODE** button for approximately three seconds until the **MODE INDICATOR** (LED) flashes. Release the **MODE** button and active indicators will not be illuminated. To clear inactive codes, press and hold the **MODE** button for 10 seconds. Some codes are self-clearing and others require ignition cycles to clear.

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

MAIN CODE	SUB CODE	CODE DESCRIPTION
13	12	ECU INPUT VOLTAGE LOW
	13	ECU INPUT VOLTAGE MEDIUM LOW
	23	ECU INPUT VOLTAGE HIGH
14	12	OIL LEVEL SENSOR, FAILED LOW
	23	OIL LEVEL SENSOR, FAILED HIGH
21	12	THROTTLE POSITION SENSOR, FAILED LOW
	23	THROTTLE POSITION SENSOR, FAILED HIGH
22	14	ENGINE SPEED SENSOR
	15	TURBINE SPEED SENSOR
	16	OUTPUT SPEED SENSOR
23	12	PRIMARY SHIFT SELECTOR FAULT
	13	PRIMARY SHIFT SELECTOR MODE FAULT
	14	SECONDARY SHIFT SELECTOR FAULT
	15	SECONDARY SHIFT SELECTOR MODE FAULT
	16	SHIFT SELECTOR DISPLAY LINE FAULT
24	12	SUMP FLUID TEMPERATURE, COLD
	23	SUMP FLUID TEMPERATURE, HOT
25	00	OUTPUT SPEED SENSOR @ 0 RPM, LOW
	11	OUTPUT SPEED SENSOR @ 0 RPM, 1ST
	22	OUTPUT SPEED SENSOR @ 0 RPM, 2ND
	33	OUTPUT SPEED SENSOR @ 0 RPM, 3RD
	44	OUTPUT SPEED SENSOR @ 0 RPM, 4TH
	55	OUTPUT SPEED SENSOR @ 0 RPM, 5TH
	66	OUTPUT SPEED SENSOR @ 0 RPM, 6TH
	77	OUTPUT SPEED SENSOR @ 0 RPM, REVERSE
26	00	THROTTLE SOURCE NOT DETECTED
	11	ENGINE COOLANT SOURCE NOT DETECTED
32	00	C3 PRESSURE SWITCH OPEN IN LOW
	33	C3 PRESSURE SWITCH OPEN IN 3RD
	55	C3 PRESSURE SWITCH OPEN IN 5TH
	77	C3 PRESSURE SWITCH OPEN IN REVERSE
33	12	SUMP OIL TEMPERATURE SENSOR, FAILED LOW
	23	SUMP OIL TEMPERATURE SENSOR, FAILED HIGH
34	12	CALIBRATION COMPATIBILITY WRONG
	13	CALIBRATION BLOCK CHECKSUM
	14	POWER OFF BLOCK CHECKSUM
	15	DIAGNOSE QUEUE BLOCK CHECKSUM

Diagnostic Transmission Codes

MAIN CODE	SUB CODE	CODE DESCRIPTION
34	16	REAL TIME BLOCK CHECKSUM
	17	CUSTOMER MODIFIABLE CONSTANTS CHECKSUM
35	00	POWER INTERRUPTION
	16	REAL TIME WRITE INTERRUPTION
36	00	HARDWARE/SOFTWARE NOT COMPATIBLE
	01	TID NOT COMPATIBLE W/HARDWARE/SOFTWARE
	02	TID DID NOT COMPLETE
42	12	A SOLENOID SHORTED TO BATTERY
	13	B SOLENOID SHORTED TO BATTERY
	14	C SOLENOID SHORTED TO BATTERY
	15	D SOLENOID SHORTED TO BATTERY
	16	E SOLENOID SHORTED TO BATTERY
	21	F SOLENOID SHORTED TO BATTERY
	22	G SOLENOID SHORTED TO BATTERY
	23	H SOLENOID SHORTED TO BATTERY
	24	J SOLENOID SHORTED TO BATTERY
	26	N SOLENOID SHORTED TO BATTERY
44	12	A SOLENOID SHORTED TO GROUND
	13	B SOLENOID SHORTED TO GROUND
	14	C SOLENOID SHORTED TO GROUND
	15	D SOLENOID SHORTED TO GROUND
	16	E SOLENOID SHORTED TO GROUND
	21	F SOLENOID SHORTED TO GROUND
	22	G SOLENOID SHORTED TO GROUND
	23	H SOLENOID SHORTED TO GROUND
	24	J SOLENOID SHORTED TO GROUND
	26	N SOLENOID SHORTED TO GROUND
45	12	A SOLENOID CIRCUIT OPEN
	13	B SOLENOID CIRCUIT OPEN
	14	C SOLENOID CIRCUIT OPEN
	15	D SOLENOID CIRCUIT OPEN
	16	E SOLENOID CIRCUIT OPEN
	21	F SOLENOID CIRCUIT OPEN
	22	G SOLENOID CIRCUIT OPEN
	23	H SOLENOID CIRCUIT OPEN
	24	J SOLENOID CIRCUIT OPEN
	26	N SOLENOID CIRCUIT OPEN

Diagnostic Transmission Codes

MAIN CODE	SUB CODE	CODE DESCRIPTION
46	21	F SOLENOID CIRCUIT OVERCURRENT
	26	N & H SOLENOID CIRCUIT OVERCURRENT
	27	A-HI SOLENOID CIRCUIT OVERCURRENT
51	01	OFFGOING RATIO TEST, LOW TO 1
	10	OFFGOING RATIO TEST, 1 TO LOW
	12	OFFGOING RATIO TEST, 1 TO 2
	21	OFFGOING RATIO TEST, 2 TO 1
	23	OFFGOING RATIO TEST, 2 TO 3
	24	OFFGOING RATIO TEST, 2 TO 4
	35	OFFGOING RATIO TEST, 3 TO 5
	42	OFFGOING RATIO TEST, 4 TO 2
	43	OFFGOING RATIO TEST, 4 TO 3
	45	OFFGOING RATIO TEST, 4 TO 5
	46	OFFGOING RATIO TEST, 4 TO 6
	53	OFFGOING RATIO TEST, 5 TO 3
	64	OFFGOING RATIO TEST, 6 TO 4
	65	OFFGOING RATIO TEST, 6 TO 5
	XY	OFFGOING RATIO TEST, X TO Y
52	01	OFFGOING C3PS TEST, LOW TO 1
	08	OFFGOING C3PS TEST, LOW TO N1
	32	OFFGOING C3PS TEST, 3 TO 2
	34	OFFGOING C3PS TEST, 3 TO 4
	54	OFFGOING C3PS TEST, 5 TO 4
	56	OFFGOING C3PS TEST, 5 TO 6
	71	OFFGOING C3PS TEST, REVERSE TO 1
	72	OFFGOING C3PS TEST, REVERSE TO 2
	78	OFFGOING C3PS TEST, REVERSE TO N1
	99	OFFGOING C3PS TEST, N3 TO N2
	XY	OFFGOING C3PS TEST, X TO Y
53	08	OFFGOING SPEED TEST, LOW TO N1
	09	OFFGOING SPEED TEST, L TO NNC
	18	OFFGOING SPEED TEST, 1 TO N1
	19	OFFGOING SPEED TEST, 1 TO RELS
	28	OFFGOING SPEED TEST, 2 TO N1
	29	OFFGOING SPEED TEST, 2 TO N2
	38	OFFGOING SPEED TEST, 3 TO N1
	39	OFFGOING SPEED TEST, 3 TO N3

Diagnostic Transmission Codes

MAIN CODE	SUB CODE	CODE DESCRIPTION
53	48	OFFGOING SPEED TEST, 4 TO N1
	49	OFFGOING SPEED TEST, 4 TO N3
	58	OFFGOING SPEED TEST, 5 TO N1
	59	OFFGOING SPEED TEST, 5 TO N3
	68	OFFGOING SPEED TEST, 6 TO N1
	69	OFFGOING SPEED TEST, 6 TO N4
	78	OFFGOING SPEED TEST, REVERSE TO N1
	99	OFFGOING SPEED TEST, N2 TO N3 OR N3 TO N2
	XY	OFFGOING SPEED TEST, X TO Y
54	01	ONCOMING RATIO TEST, LOW TO 1
	07	ONCOMING RATIO TEST, LOW TO REVERSE
	10	ONCOMING RATIO TEST, 1 TO LOW
	12	ONCOMING RATIO TEST, 1 TO 2
	17	ONCOMING RATIO TEST, 1 TO REVERSE
	21	ONCOMING RATIO TEST, 2 TO 1
	23	ONCOMING RATIO TEST, 2 TO 3
	24	ONCOMING RATIO TEST, 2 TO 4
	27	ONCOMING RATIO TEST, 2 TO REVERSE
	32	ONCOMING RATIO TEST, 3 TO 2
	34	ONCOMING RATIO TEST, 3 TO 4
	35	ONCOMING RATIO TEST, 3 TO 5
	42	ONCOMING RATIO TEST, 4 TO 2
	43	ONCOMING RATIO TEST, 4 TO 3
	45	ONCOMING RATIO TEST, 4 TO 5
	46	ONCOMING RATIO TEST, 4 TO 6
	53	ONCOMING RATIO TEST, 5 TO 3
	54	ONCOMING RATIO TEST, 5 TO 4
	56	ONCOMING RATIO TEST, 5 TO 6
	64	ONCOMING RATIO TEST, 6 TO 4
	65	ONCOMING RATIO TEST, 6 TO 5
	70	ONCOMING RATIO TEST, REV. TO LOW
	71	ONCOMING RATIO TEST, REVERSE TO 1
	72	ONCOMING RATIO TEST, REVERSE TO 2
	80	ONCOMING RATIO TEST, N1 TO LOW
	81	ONCOMING RATIO TEST, N1 TO 1
	82	ONCOMING RATIO TEST, N1 TO 2
	83	ONCOMING RATIO TEST, N1 TO 3

Diagnostic Transmission Codes

MAIN CODE	SUB CODE	CODE DESCRIPTION
54	85	ONCOMING RATIO TEST, N1 TO 5
	86	ONCOMING RATIO TEST, N1 TO 6
	87	ONCOMING RATIO TEST, N1 TO REVERSE
	92	ONCOMING RATIO TEST, N2 TO 2
	93	ONCOMING RATIO TEST, N3 TO 3
	95	ONCOMING RATIO TEST, N3 TO 5
	96	ONCOMING RATIO TEST, N4 TO 6
	XY	ONCOMING RATIO TEST, X TO Y
55	07	ONCOMING C3PS TEST, LOW TO REVERSE
	17	ONCOMING C3PS TEST, 1 TO REVERSE
	27	ONCOMING C3PS TEST, 2 TO REVERSE
	87	ONCOMING C3PS TEST, N1 TO REVERSE
	97	ONCOMING C3PS TEST, NVL TO REVERSE
	XY	ONCOMING C3PS TEST, X TO Y
56	00	LOW RANGE VERIFICATION TEST
	11	1ST RANGE VERIFICATION TEST
	22	2ND RANGE VERIFICATION TEST
	33	3RD RANGE VERIFICATION TEST
	44	4TH RANGE VERIFICATION TEST
	55	5TH RANGE VERIFICATION TEST
	66	6TH RANGE VERIFICATION TEST
	77	REVERSE RANGE VERIFICATION TEST
57	11	1ST RANGE VERIFICATION C3PS TEST
	22	2ND RANGE VERIFICATION C3PS TEST
	44	4TH RANGE VERIFICATION C3PS TEST
	66	6TH RANGE VERIFICATION C3PS TEST
	88	N1 RANGE VERIFICATION C3PS TEST
	99	N2 OR N4 RANGE VERIFICATION C3PS TEST
61	00	RETARDER OIL TEMPERATURE, HOT
62	12	RETARDER TEMP. SENSOR, FAILED LOW
	23	RETARDER TEMP. SENSOR, FAILED HIGH
	32	ENGINE COOLANT TEMP. SENSOR, FAILED LOW
	33	ENGINE COOLANT TEMP. SENSOR, FAILED HIGH
63	00	INPUT FUNCTION FAULT
	26	KICKDOWN INPUT, FAILED ON
	40	SERVICE BRAKE STATUS INPUT, FAILED ON

Diagnostic Transmission Codes

MAIN CODE	SUB CODE	CODE DESCRIPTION
63	41	PUMP/PACK AND NEUTRAL GENERAL PURPOSE INPUT
	47	RELS INPUT, FAILED ON
64	12	RETARDER MODULATION SENSOR, FAILED LOW
	23	RETARDER MODULATION SENSOR, FAILED HIGH
65	00	ENGINE RATING TOO HIGH
	11	ENGINE NOT RESPONDING TO LRTP TORQUE REDUCTION
	12	ENGINE NOT RESPONDING TO DEFAULT TRANSMISSION TORQUE LIMIT
66	00	SERIAL COMMUNICATION INTERFACE FAULT
	11	S. C. I. ENGINE COOLANT SOURCE FAULT
	22	J1939 RETARDER REQUEST FAULT
	33	J1939 DRIVER DEMAND TORQUE FAULT
	34	ENGINE NOT RESPONDING TO J1939 SEM CONTROL
69	27	A-HIGH SWITCH INOPERATIVE IN ECU
	28	F-HIGH SWITCH INOPERATIVE IN ECU
	29	N & H-HIGH SWITCH INOPERATIVE IN ECU
	33	COMPUTER OPERATING PROPERLY TIMEOUT IN ECU
	34	ECU WRITE TIMEOUT
	35	ECU CHECKSUM TEST
	36	RAM SELF TEST IN ECU
	39	COMMUNICATION CHIP ADDRESSING ERROR
	41	I/O ASIC ADDRESSING TEST IN ECU
	42	SPI OUTPUT FAILURE
	43	SPI INPUT FAILURE
70	12	MINOR LOOP OVERRUN IN SOFTWARE
	13	ILLEGAL WRITE TO ADDRESS $0000
	14	MAJOR LOOP OVERRUN IN SOFTWARE

NOTE: *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. Refer to your Operator's Manual for complete information on Diagnostic Codes, Prognostic Features and Oil Level Sensor operation.*

To order an Operator's Manual,
go to **www.allisontransmission.com**
or call toll free: 888-666-5799

Allison Transmission

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P.O. Box 894, Speed Code PF3
Indianapolis, Indiana 46206-0894
www.allisontransmission.com

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