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So, on behalf of the ATRA staff and the ATRA Chapters that have worked so hard to put this program together, I’d like to welcome you, and thank you for doing your part to keep our industry strong. We hope you have a wonderful day, and a terrific learning experience.

Lance Wiggins
ATRA Technical Director
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Exedy is a powertrain specialist and tier one supplier to the automotive industry world wide. Exedy’s products range: From wet & dry friction material, torque converters, complete transmission systems for highway, off-highway and industrial applications.

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Established in 1959, EVT PARTS began by serving the Southern California Region and has grown into a national company proudly serving the entire United States of America and beyond.
VIN Code Information

All Units

To identify a GM vehicle through its VIN (Vehicle Identification Number) you will need to access a new AC Delco website.

1. The web address is www.acdelcotechconnect.com.

2. With your web browser enter the web address.

3. On the homepage, there is a link along the left side of the page labeled "GM VIN Information." Click the link (1) as shown in the graphic below.

4. You may access VIN information ranging from the current model year, back to 1972 by simply clicking on the model year you wish to view from the displayed list. The information on the web is presented as an electronic version of the familiar VIN card in the identical format (.pdf file). If you do not have unlimited access to the web, you may print the VIN information or save the individual model year file to your hard drive for use offline in Windows® by selecting:
   - “File”
   - Then select “Save As”
   - Give the file a name and save it to a preferred location on your hard drive.
All Models

Identifying Non-OEM Calibrations

Today’s vehicles present many challenges for the technicians that are required to repair them.

A common concern for today’s repair shop is the installation of aftermarket calibrations. Most shops are aware that there are calibrations available that significantly increase engine torque over the stock calibration. The Powertrain in a specific application is designed to handle a specific amount of torque. In fact many OEM’s “Detune” their calibrations due to the limitations of the stock drivetrain.

While the aftermarket calibrations are typically designed for “off road use only” we are all aware that this is not happening. Many of the vehicles you are called upon to repair have performance enhancing software installed. Many shops would like to have a method to help identify if a NON-OEM calibration was installed. On late model GM vehicles this can be accomplished by using a “Calibration Verification Number” (CVN). To locate the CVN for a vehicle proceed as follows:

1. Access the GM TIS2WEB website located at http://tis2web.service.gm.com (You can also search GM service and choose “GM service and parts operations”, then “TIS”, then “vehicle calibration information”).
2. Once at the website, enter the vehicle VIN in the box and press “GET CAL ID”.
3. At the new screen highlight the controller you wish to check for calibration. Click the next button.
4. At the new screen you will be again able to select the type of calibration information you are interested in.
5. You also have another choice which we would suggest you utilize. Click on the box for “complete history”. This will give you access to all the calibrations for the various modules. Click the next key.
6. You will notice the website will now display your calibration ID as a “part number” The part number is typically listed as “CAL ID” on your scan tool. The part numbers from the website can then be compared to the CAL ID number on your scan tool to determine if your software is current.
7. Note the website also includes the CVN with the part number. On your scan tool you will typically find the CVN with the CAL ID information. Many scanners include both the CVN and the CAL ID as a part of their data list parameters. Some scanners do not and you will need to choose the “OBD II GENERIC” feature and then select the “MODE 9” function to access the information.
8. The CVN’s listed on the website should match the CVN’s on your scan tool. If all the CVN’s match a GM cal was installed. If a any CVN fails to match, an aftermarket calibration was likely installed.
All Models

Identifying Non-OEM Calibrations (continued)

If you already have a calibration number and would like to get a CVN to check the calibration number against, place the calibration number in the CVN box on the website and press (“GET CVN”).

The CVN will be displayed for the calibration number entered if it is a GM calibration. If the display states “Error” or “Invalid Part number” an aftermarket calibration is indicated.

To obtain the latest electronic controller calibration information for your vehicle, enter the vehicle's 17 character Vehicle Identification Number (VIN) and select 'Get CAL ID'.

To obtain the Calibration Verification Number (CVN) for any calibration part number, enter the part number of the calibration ID and select 'Get CVN'.

Vin: [Input VIN Number] | Get CAL ID | Part Number: [Input Part Number] | Get CVN

IF YOU ALREADY HAVE A CALIBRATION # BUT NEED A CVN PLACE THE CAL # HERE, CLICK GET CVN

Visit the General Motors site to see the entire GM family of brands.

The TIS software application does not support the use of the browser's Forward and Back buttons. Errors will occur. Please only use the buttons that are displayed on the application screens and not on the toolbar.
## All Models

### Identifying Non-OEM Calibrations

(continued)

<table>
<thead>
<tr>
<th>Controller</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASC Assist Step Control Module (Pass Thru Only)</td>
<td></td>
</tr>
<tr>
<td>BCM Body Control Module</td>
<td></td>
</tr>
<tr>
<td>DDM Driver Door Module - After Market Heated Seat kit</td>
<td></td>
</tr>
<tr>
<td>DDS Driver Door Switch</td>
<td></td>
</tr>
<tr>
<td>DPM Driver Position Module (Seat Modules)</td>
<td></td>
</tr>
<tr>
<td>DDS Driver Door Switch</td>
<td></td>
</tr>
<tr>
<td>EBCM Electronic Brake Control Module</td>
<td></td>
</tr>
<tr>
<td>ECM Engine Control Module</td>
<td></td>
</tr>
<tr>
<td>ESCM Electronic Suspension Control Module</td>
<td></td>
</tr>
<tr>
<td>HVAC HVAC Control Module</td>
<td></td>
</tr>
<tr>
<td>IPC Instrument Panel Cluster</td>
<td></td>
</tr>
</tbody>
</table>

The TIS software application does not support the use of the browser's Forward and Back buttons. Errors will occur. Please only use the buttons that are displayed on the application screens and not on the toolbar.
All Models

**Identifying Non-OEM Calibrations** (continued)

The TIS software application does not support the use of the browser's Forward and Back buttons. Errors will occur. Please only use the buttons that are displayed on the application screens and not on the toolbar.

---

### Part Number | CVN | Description
---|---|---
12614088 | 00000F82 | New software to ensure proper ethanol content calculation.  
12612291 | 000092CC | Main Operating System  
12605898 | 0000E863 | Operating System

**Selected Options:**

- **VIN:** 1GNFK13027R428011  
- **Controller:** ECM Engine Control Module
# All Models

## Identifying Non-OEM Calibrations (continued)

GM Vehicle Calibration Information

| VIN: | IGNFK13027R428011 |
| Controller: | ECM Engine Control Module |

### Calibration History for: **Main Operating System**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CVN</th>
<th>Bulletin #</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>12614088</td>
<td>00000F82</td>
<td>-</td>
<td>New software to ensure proper ethanol content calculation.</td>
</tr>
<tr>
<td>12612291</td>
<td>000092CC</td>
<td>-</td>
<td>Main Operating System</td>
</tr>
<tr>
<td>12605898</td>
<td>0000E863</td>
<td>-</td>
<td>Operating System</td>
</tr>
</tbody>
</table>

### Calibration History for: **System**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CVN</th>
<th>Bulletin #</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>12623184</td>
<td>00002C72</td>
<td>07-01-38-010</td>
<td>New calibration to reduce potential for A/C compressor failure. Also addresses customer complaint of compressor noise.</td>
</tr>
<tr>
<td>12614232</td>
<td>00008B79</td>
<td>-</td>
<td>New calibration for improved fan control.</td>
</tr>
<tr>
<td>12613969</td>
<td>0000F431</td>
<td>-</td>
<td>New calibration to address customer complaint of A/C inoperative in hot restart situations.</td>
</tr>
<tr>
<td>12605945</td>
<td>0000BD4D</td>
<td>-</td>
<td>System</td>
</tr>
</tbody>
</table>

### Calibration History for: **Fuel System**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CVN</th>
<th>Bulletin #</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>12614218</td>
<td>0000D7F0</td>
<td>-</td>
<td>New calibration to ensure proper fuel data DIC display.</td>
</tr>
<tr>
<td>12605942</td>
<td>0000962E</td>
<td>-</td>
<td>Fuel System</td>
</tr>
</tbody>
</table>

### Calibration History for: **Speedometer**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CVN</th>
<th>Bulletin #</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>12614305</td>
<td>731</td>
<td>-</td>
<td>New calibration to ensure proper display of DIC messages.</td>
</tr>
<tr>
<td>12606011</td>
<td>000051D5</td>
<td>-</td>
<td>Speedometer</td>
</tr>
</tbody>
</table>
### All Models

**Identifying Non-OEM Calibrations (continued)**

Calibration History for: **Engine Diagnostic**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CVN</th>
<th>Bulletin #</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>12616059</td>
<td>0000A7BB</td>
<td>-</td>
<td>New calibration with diagnostic enhancements for DTC P0449.</td>
</tr>
<tr>
<td>12614140</td>
<td>0000D87E</td>
<td>-</td>
<td>New calibration to ensure proper display of DIC messages.</td>
</tr>
<tr>
<td>12610355</td>
<td>0000FF9D</td>
<td>-</td>
<td>New calibration with diagnostic enhancements for DTCs P0121, P0521, P0851, P1400, and P1629.</td>
</tr>
<tr>
<td>12606880</td>
<td>000050ED</td>
<td>-</td>
<td>Engine diagnostic</td>
</tr>
</tbody>
</table>

M4455: There are 2 calibration part numbers that are valid for 'Engine Operation'. Read the descriptions from the following tables to determine the correct calibration for this vehicle.

Calibration History for: **Engine Operation**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CVN</th>
<th>Bulletin #</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>12614095</td>
<td>000064ED</td>
<td>-</td>
<td>New calibration to ensure proper display of DIC messages.</td>
</tr>
<tr>
<td>12605905</td>
<td>3.00E+05</td>
<td>-</td>
<td>Engine Operation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CVN</th>
<th>Bulletin #</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>12637932</td>
<td>000032B8</td>
<td>-</td>
<td>Select this only to address cruise drop out occurring when activating the power window or heated washer solvent switches. Fuel economy will be negatively impacted. Use labor op code N9629 - Reprogram ECM to Correct Cruise Control Drop-Off Issue.</td>
</tr>
<tr>
<td>12605905</td>
<td>3.00E+05</td>
<td>-</td>
<td>Engine Operation</td>
</tr>
</tbody>
</table>

Calibration History for: **Slave Operating System**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CVN</th>
<th>Bulletin #</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>12605899</td>
<td>0000C846</td>
<td>-</td>
<td>Slave Operating System</td>
</tr>
</tbody>
</table>
4T40/45E, 4T65E

New PSM Code P0843

P0843 has been introduced as a new TCC pressure switch code. P0843 will set if the following criteria are met:

- No MAP, TCC Slip, ISS, or TCC electrical DTC’s are set
- TFT is between 68-266°F (20-130°C)
- Engine torque is greater than 37 lb ft. (50 Nm)
- TCC is commanded “ON”
- TCC slip indicates the TCC is applied
- The TCC release switch indicates the TCC is “Released”
- The following conditions are present for longer than 6 seconds

If a P0843 is set the PCM will,
- command the TCC OFF.
- freeze the shift adapts.
- inhibited 4th gear in Hot Mode.

To identify the cause of the concern, clear the DTC. Operate the vehicle in 4th gear with the TCC applied and observe the TCC Release Switch status with your scan tool. The release switch should indicate the TCC is applied by displaying “NO” for the TCC release switch parameter on your scan tool. If the release switch displays “YES” on your scan tool when TCC is commanded on, you will need to check the switch and its electrical circuit for proper operation.
4T40/45E, 4T65E

New PSM Code P0843 (continued)

TCC release switch indicates “YES” when the TCC is commanded “ON”

1. Key ON, Engine OFF, monitor the TCC release switch with your scan tool. The TCC release switch should now read “NO”.

2. If it continues to read “YES” proceed to step 3. If the TCC release switch now reads “NO”, proceed to step 4.

3. Unplug the transmission electrical connector with the key “ON”, engine “OFF”. Jump the TCC release switch circuit to ground on the engine harness side of the transmission connector (pin “U” CKT 657). If the scanner continues to display YES you will need to check for an open between the TCM pin “9” (CKT 657) and pin “U” (CKT 657) of the engine side of the transmission electrical connector. With circuit 657 grounded, if the TCC release switch displays NO, check for an open with an ohm meter between the TCC release switch pin “D” (CKT 1804) (Located in the PSM) and the transmission case connector pin “U” (CKT 1804). If the wiring tests good, with your ohm meter check from pin “D” of the PSM to the metal body of the PSM. You should have full continuity. If the resistance does not indicate continuity replace the switch. This process will help isolate if the problem exists in the wiring for the TCC release switch or in the switch itself.

4. If the switch and its circuits indicate that a problem is not present inspect the following:
   • TCC Seal
   • Debris blocking the channel plate TCC release passage
   • Leak in the oil pump seal or the seal/bearing was installed backwards
   • Misaligned or restricted valve body or channel plate gasket
   • Turbine shaft or sprocket seal damaged
   • #1 Check ball (4T65E Only)

NOTE: As noted above some failures may result in a TCC partial applying with some of the apply oil venting into the TCC release switch passage resulting in the DTC being set.
4T40/45E, 4T65E

New PSM Code P0843 (continued)

When testing the systems, note the 4T40/45E has a three switch PSM and the 4T65E has only one. The wiring below is an example of a 4T40/45E PSM.

When you jumper the TCC release switch circuit to ground on the engine harness side of the transmission connector, the locations are always pin “9” at the TCM and pin “U” at the transmission.

Pin “9” to Pin “U” Yellow 4T40/45E
Pin “9” to Pin “U” White 4T65E

NOTE: Wire colors may vary always go by pin location.
4T40/45E

Erratic Transmission Operation

This condition may be caused by a loss of input speed to the TCM. The Input Speed Sensor wiring may become damaged due to improper routing. Road speed and engine RPM may influence an intermittent short to ground in the input speed sensor harness. The short to ground commonly occurs at one of the wiring clips attaching the input speed sensor to the valve body. A loss of input speed to the TCM may or may not set a P0716 or a P0717 input speed sensor fault.

To help isolate the concern measure the resistance from the transmission connector pins “S” and “V” to ground. There should be NO continuity to ground. Inspect the Input Speed Sensor wiring for evidence of a ground out condition. If a problem is found, repair or replace the sensor and insulate the sensor from the harness clips.
4T40/45E

P2135, P2138 APP Performance Codes

2004 and later vehicles equipped with a 4T40E/4T45E transmission may set an APP (Accelerator Pedal Position) DTC P2138. In some cases this may be accompanied by a P2135 DTC.

The following should be inspected:

• Water intrusion into connector C201
• Poor pin tension or connection at the APP sensor
• The harness may be rubbing on the A/C lines (about 3-6” from PCM connectors)
• The harness may be rubbing on the edge of the PCM case
• The harness may be rubbing on the engine block at the oil filter housing area
• The harness may be rubbing on the EVAP purge valve bracket
• The harness may be rubbing at the upper edge of the transmission bell housing area
• The harness may be rubbing on the UBEC (Underhood Bussed Electrical Center)
• Check for poor terminal crimps at the ECM connector pins (Connector C2 Pins 58, 29, 31, 36, 24, 26 on 2006 2.2L engines) (Connector C2 or X2 Pins 40, 53, 57, 59 2007-08 2.2L engines) (Connector C2 Pins 29, 44, 66, 64 Connector C3 Pins 28,44 2006-2007 2.4L engines) (Connector X2 Pins 40, 53, 57, 59 2008-2009 2.4L engine)

Repair and reposition the harness as required.
AF23/33-5
Slips/No 3rd After Repair

The AF 23-5 used in the Saturn Ion and the AF 33-5 used in the Saturn Vue, Chevrolet Equinox and Buick Torrent applications may experience a slipping complaint or no 3rd gear concern after the transmission fluid has been serviced or after an internal repair has been performed.

The technician may have removed the wrong bolt to adjust the unit’s fluid level. If the technician removed the 3rd gear band anchor bolt instead of the fill bolt, it may allow the anchor to fall out of place leading to the concern. If the technician has removed the wrong bolt, the transmission will need to be disassembled to correct the concern.
4T65E

2nd Gear Starts After Overhaul

4T65E 2004 and up Volvo and GM vehicles with the TAP shift mode second gear starts after overhaul. The computer commands show first gear is being commanded. This may be caused by using the wrong valve body gaskets.

Most overhaul kits supply only the non-TAP shift model valve body gaskets. A separate gasket sub kit or the bonded separator plate must be ordered when servicing these model vehicles.
2nd Gear Starts After Overhaul (continued)

4T65E Non-Tap Shift Valve Body Gasket

4T65E Tap Shift Valve Body Gasket
4L60/65E with NV246

Service 4X4 Light “ON”, and/or DTC C0550

2004 Chevrolet Trailblazer, 2003-2004 GMC Envoy, Sierra, Yukon, 2002-2004 Oldsmobile Bravada, with an electronic shift or active transfer case, may experience an inoperative four wheel drive system. A "service 4x4" light may be illuminated, a code C0550 set in the TCCM or a loss of communication with the TCCM. This may be due to the TCCM not receiving the "wake-up" call during key on or start-up.

If the TCCM does not receive this wake up call during key on or start-up, the TCCM will remain in "sleep" mode. When the TCCM is in "sleep" mode, the TCCM is unable to communicate with the class II data system. If you encounter a "no communication" problem with the TCCM, remove the ATCM, TREC or TCCM fuse for 30 seconds. Reinstall the fuse and recheck the TCCM for communication.

If code C0550 is present in the TCCM, check the TCCM power and grounds circuits. If TCCM power and ground circuits are okay, replace the TCCM.

NOTE: Some models may require the new TCCM to be programmed upon installation.

Remove the ATCM, TREC or TCCM fuse for 30 seconds.
Line pressure boost on GM vehicles is regulated by engine load. Engine load is determined by several load inputs and a software program known as torque modeling. This process started in the mid 1990’s. On these applications, it is common to have a slip complaint or transmission damage that can be caused by a lower than required line pressure boost.

In years past, this was an issue that related more to RWD applications than to FWD applications. Now the problem is starting to appear on FWD vehicles also. In most cases no DTC’s are set.

MAF is the main input the PCM/TCM/ECM uses to determine engine load. MAF sensor problems not only effect the engine operation but also effect the transmission operation. A skewed or shifted MAF value may worsen with high ambient temperatures (95°F/35°C or above).

MAF problems are compounded by engine health issues such as carbon deposits, compression etc. You should make sure carbon and engine health issues are not the root cause of the concern prior to condemning the MAF sensor. This concern may also be caused by overly oiled aftermarket air filters. With normal use the MAF element can get dirty leading to a lower than actual air flow calculations. In some instances the MAF can simply be cleaned with MAF cleaner such as CRC #599C or #0510. Other times the MAF will need to be replaced.
Too much oil on the aftermarket filter can create line rise issues.

Contamination builds up here and creates a poor signal to the PCM.
**4L60/65/70E**

**Hard/Erratic Shifts, DTC P0716 and/or P0717**

4L60E/4L65E/4L70E applications equipped with an input speed sensor may exhibit a hard/erratic shift complaint accompanied by P0716 and/or P0717 DTC stored in memory.

The input speed sensor is a hall switch. The sensor must have a good power supply and ground to operate. Check the power (Pin “E”) and ground (Pin “V”) supplied to the transmission with your digital multimeter.

The fastest way to check the sensor signal circuit is to use a signal generator and your scan tool. Remove the case connector and use the signal generator to supply a 12 volt square wave to the controller on the signal circuit. Monitor the input speed with your scan tool. If a speed signal is present, the problem is intermittent or you have a problem inside the transmission with the sensor or the harness.

If you do not have access to a signal generator visually inspect the signal circuit for damage between the transmission connector (pin “K”) and the PCM/TCM connector (pin “3” ckt 1230). With the PCM/TCM connector and the transmission connector disconnected, check ckt 1230 for a short to ground with an ohmmeter. If problems are not found, you will need to visually inspect the internal transmission harness and ISS for proper connection and damage.

One common cause for P0716/P0717 DTC has been the input speed sensor wiring. The sensor wiring has been known to short to ground on the pump assembly. Part of the ISS wiring is not shielded in conduit. Casting flash can lead to the sensor shorting to ground on the pump. If either the sensor signal circuit or the sensor voltage feed circuit short to ground, the sensor will not function. If you find the sensor wiring damaged you will need to replace the sensor and dress the sharp edges on the pump that caused the damaged.
4L60/65/70E

Hard/Erratic Shifts, DTC P0716 and/or P0717 (continued)

Input Speed Sensor wiring
Codes P0741, P0894 and P1870 are all TCC slip DTC’s. P0894 is a new generation code that has replaced P1870. The vast majority of the criteria needed to set one of the DTC’s applies to all of the DTC’s. The vehicle and software programming determine which DTC is used to represent TCC slip in your particular application.

A couple of the items are new to the list and have become common as of late, such as cracked solenoids, and converter delamination. The following items can cause the TCC slip DTC’s to set:
- TCC ON/OFF solenoid cracking---This is a new item to the list. The solenoid plastic body develops a crack in it leading to leakage
- TCC apply orifice #238 in the pump gets restricted with debris
- TCC apply valve sticks (TCC valve must stroke at least .5 inches)
- TCC regulator valve worn or side loading in the bore causing it to stick intermittently.
- Stator support bushings
- A slipped stator support sleeve
- Faulty TCC PWM solenoid
- Improperly wound TCC valve spring
- AFL valve worn
- TCC O-ring seal
- Torque converter delamination (S/T truck applications built between June-September of 2008 had a problem with the TCC friction material)
4L60/65/70E

Identification Process

Identifying the type of 4L60 series transmission they are working on. The fastest way if you have access to the vehicle is to look at the RPO (Regular Production Option) label which may also be referred to as a SPID (Service Parts Identification) label. The RPO/SPID label will tell you everything about your GM vehicle. The label contains the vehicle VIN, Paint and Trim codes as well as codes that denote the exact equipment the vehicle was built with. This includes the type of transmission that was used in the vehicle. The RPO/SPID label is typically located in one of the following areas:

- The glove box
- The center console
- The spare tire cover
- The trunk

The 4L60 family of transmissions use the following RPO codes to denote the type of transmission used:

- M30 4L60E
- M32 4L65E (4L60EHD)
- M33 Parallel Hybrid 4L60E (PHT)
- M70 4L70E

If the vehicle is not available, the transmission type can also be identified by looking at the code on the transmission tag or pan rail. The following codes are used to designate the 4L65E and 4L70E applications.

**4L65 (RPO M32) (May be called a 4L60E HD)**

1KZD
2KZD
3KZD
4SSD, 4KZD, 4CTD
5HMD, 5KSD, 5KCD, 5SZD, 5CSD, 5CTD, 5CZD
6HMD, 6KSD, 6KCD, 6CZD, 6SZD
7CSD, 7HBD, 7KZD, 7SZD
8HBD
9HBD, 9HED

**4L70 (RPO M70)**

9TYD, 9YSD
8KGD, 8SKD, 8LGD, 8TKD, 8CFC
7CFC, 7CMD, 7CWD, 7KFD, 7KMD, 7SKD, 7TKD
6KMD, 6CID, 6CMD, 6TKD, 6SKD
4L60/65/70E

Lack of Power, No DTC’s Set

Vehicles equipped with the 4L60E, 4L65E or 4L70E may experience a condition described as a lack of power, detonation, miss and/or hesitation or possible erratic shifts. In most instances this condition is not accompanied by DTC’s.

A couple of areas that have been known to cause some of these concerns include:

- Stripped stator support splines. This is not a new problem as we have covered it in previous seminars. This condition is again starting to pop up because of improper heat treatment of the stator support splines. Detonation under load is commonly accompanied by a lack of power when the splines are stripped. Stall speed testing can be used to help diagnose this concern.

- Monitor the operation of the Pressure Switch Manifold (PSM) (TFP) with your scan tool while the complaint is present. If the PSM (TFP) indicates that one of the signals is changing without the driver moving the shift lever a problem with the switch or its circuits may exist. Engine families that use the 4L60E/65E/70E transmission utilize a software set that forces the engine into a reduced power mode when unrecognized PSM (TFP) signal change occurs. If this is the case you will need to inspect the wiring for opens and shorts to ground before replacing the PSM (TFP).

<table>
<thead>
<tr>
<th>Range Signal</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Park</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>Reverse</td>
<td>ON</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>Neutral</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>OD</td>
<td>OFF</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>D</td>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
</tr>
<tr>
<td>M2</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>M1</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>ILLEGAL</td>
<td>ON</td>
<td>OFF</td>
<td>ON</td>
</tr>
<tr>
<td>ILLEGAL</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
</tr>
</tbody>
</table>
Known by transmission professionals as "The Beast" for its remarkable weight and strength, the ProSelect sungear shell has been redesigned to eliminate cracking and breaking. In fact, our aftermarket Beast is even better and stronger than OE sungear shells designed for TH700-R4, 4L60E and 4L65E transmissions. We’ve strengthened and reinforced the neck collar spine with heavier and thicker material to eliminate fatigue failure on the shell. What’s more, transmissions protected by The Beast won’t lose Reverse or Second and Fourth gears as they frequently do with the OEM sungear shells.

If you want a sungear shell that’s better than the OE, ask for The Beast by ProSelect.

You’ll discover the real King of the Beasts
4L80E

Cracked Flexplate

While working on a 2000-2004 Chevrolet/GMC trucks with a 6.0L engine, you may encounter a cracked or broken flexplate. GM has developed an updated flexplate kit for these vehicles, p/n 12621399.
LCT 1000
Identification

(1) Date of Manufacture
(2) Transmission Identification Number
(3) Engineering Feature Configuration Number
(4) Serial Number
**LCT 1000**

*Fluid Capacity and Specifications*

The spin on filter should be changed at every service. Make sure to reinstall the magnet prior to installing the filter.

Note: Some units with auxiliary equipment can use up to 20 liters of oil.

<table>
<thead>
<tr>
<th>Transmission</th>
<th>Initial Fill</th>
<th>Refill</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Quarts</td>
<td>Liters</td>
</tr>
<tr>
<td>Allison 1000</td>
<td>12.7</td>
<td>12</td>
</tr>
</tbody>
</table>

Some aftermarket filter holes may be too close to the center causing the original magnet to cover the holes.

*Magnet Part# 29535617*
LCT 1000

Fluid Pressure Specifications

Checking main line pressure helps to determine if a transmission malfunction is due to a mechanical or an electrical condition.

Caution: Keep the brakes applied at all times in order to prevent unexpected vehicle motion. Personal injury may result if the vehicle moves unexpectedly.

- Remove the oil pressure tap plug.
- Install the oil pressure gauge. All transmission fluid level and pressure checks must be made at normal operating temperatures 71-93°C (160-200°F) sump; 82-104°C (180-220°F) converter-out. Check the transmission fluid level.
- Connect a 0-2070 kPa (0-300 PSI) oil pressure gauge to the pressure test adapter fitting.
- Use the scan tool to check the engine RPM.
- With the brakes applied, record the line pressure values at 600 RPM engine speed in NEUTRAL and REVERSE range. The transmission will be in converter mode, torque converter clutch not applied.
- With the brakes applied, record the line pressure values with the engine running at 2,100 RPM in NEUTRAL. The transmission will be in converter mode, torque converter clutch not applied.
- With the brakes applied, use your scan tool to check pressures in FIRST through FIFTH gear ranges at 600 RPM. The transmission will be in converter mode, torque converter clutch not applied, at 600 RPM.
- Compare the data recorded to the line pressure specifications.
- Disconnect the oil pressure gauge.
- Install the oil pressure tap plug.
### LCT 1000

**Fluid Pressure Specifications (continued)**

<table>
<thead>
<tr>
<th>LCT 1000 Pressure Specs</th>
<th>2000-2003</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Range</strong></td>
<td><strong>Main Pressure @ 600 rpm</strong></td>
</tr>
<tr>
<td>Forward (Torque Converter Clutch not Applied)</td>
<td>101-200 psi (700-1380 kPa)</td>
</tr>
<tr>
<td>Forward (Torque Converter Clutch Applied)</td>
<td>N/A</td>
</tr>
<tr>
<td>Reverse</td>
<td>101-200 psi (700-1380 kPa)</td>
</tr>
<tr>
<td>Neutral/Park</td>
<td>130-240 psi (800-1655 kPa)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LCT 1000 Pressure Specs</th>
<th>2004-On</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Range</strong></td>
<td><strong>Main Pressure @ 600 rpm</strong></td>
</tr>
<tr>
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<td>101-200 psi (700-1380 kPa)</td>
</tr>
<tr>
<td>Forward (Torque Converter Clutch Applied)</td>
<td>N/A</td>
</tr>
<tr>
<td>Reverse</td>
<td>101-200 psi (700-1380 kPa)</td>
</tr>
<tr>
<td>Neutral/Park</td>
<td>85-105 psi (590-720 kPa)</td>
</tr>
</tbody>
</table>
**LCT 1000**

*Adaptive Strategy Function*

If you are experiencing erratic transmission operation, after overhaul or a battery disconnect, it is important to verify which particular gears the erratic operation is occurring. Use the scan tool to determine these shift sequences.

If the shift timing between two gears is not met, the TCM will attempt to adapt the timing of that shift within the program specifications. The vehicle will need to be driven more with the intention of performing that particular type of shift. Many times this will correct the condition. It is possible to reset individual shifts without affecting the other shifts. Monitor the adaptive cells on the scan tool to determine if the adaptive strategies have been met.

**NOTE: WHEN REPLACING A FAILED TRANSMISSION WITH A REPLACEMENT UNIT, IT IS IMPORTANT TO RESET THE TCM TO BASE CALIBRATION AND FAST ADAPTS FOR ALL SHIFTS.**

This can be done in one step with fast learn. If this is not done, the TCM adaptive values will be at the settings that it learned for the old transmission, and will be in slow adaptive mode. Under these conditions, it would take an unacceptably long time for the adaptive values to converge to levels suitable for the new transmission.
LCT 1000

Principle of Operation

The Allison transmission incorporates control logic that enables the transmission to revert to a limited total hydraulic operation. The hydraulic system provides a limp home mode, allowing the operator to drive the vehicle to a service location. If power is interrupted while the transmission is operating in Reverse or Neutral, the transmission defaults to or continues neutral operations.

The operator may turn off the engine and start the engine again. The shift selector provides Reverse/Neutral/Drive capability regardless of the range where the failure occurred. In this state, pressure control solenoid 1 (PCS1) or Trim A solenoid, is de-energized and allowed the 3rd, 5th and reverse clutch to be applied. If the selector valve is moved to the Reverse position, main pressure is routed to the low and reverse clutch, allowing Reverse operation. If the selector valve is moved to the Drive position, main pressure is routed to the 1-2-3-4 clutch, allowing 3rd range operation.

If a No Forward, No Reverse, or Will Not Move condition occurs follow the steps below.

- Set the parking brake.
- With the ignition OFF, disconnect the X-175 case connector at the transmission.
- Using a fused jumper wire, connect terminal R (Black/White) of the automatic transmission inline 20-way connector to a known good ground.
- Start the engine and move the range selector to Reverse position.
- The transmission should engage Reverse range.
- Move the range selector to the Drive position.
- The transmission should engage Third range.

If Reverse and 3rd range are available in limp home mode, an electrical failure may be indicated. If only 1 of the 2 ranges, or neither, was obtainable, this may indicate an internal hydraulic failure such as one of the following:

- Failed clutch
- Stuck valve
- Solenoid failure
- 1-2-3-4 clutch, 3rd, 5th and reverse clutch, and the low and reverse clutch
LCT 1000

Clutch Clearance

When rebuilding an LCT 1000, be aware that there are no clutch clearance specifications for the C4 clutch assembly.

The C3 clutch adjustment specifications are the same as for the C4 clutch, except the backing plate is 0.6033” min. and the attached thrust washer thickness is 0.115” min.

The manufacturer recommends checking each of the five friction plates for a minimum thickness of 0.0935” in addition to a maximum cone height of 0.0089”. The top reaction plate minimum thickness is 0.1224” with a maximum cone height of 0.0157”.

The remaining three steel plates need to be a minimum thickness of 0.0961” with a maximum cone height of 0.0157”. The backing plate should be at least 0.6063” thick with no measurable cone (warpage). Any variation within nominal specifications will be adapted for by the TCM.

The Allison TCM will tolerate a wide range of clutch clearance. During overhaul or repairs, the factory recommended procedure to set the clutch clearance is to measure each friction and steel. If it is thicker than the minimum specification, it can be used. If a selective plate is used, it will have an ID mark on it. Measure the selective plate thickness. If the thickness is within the specification shown for the specific plate, it can be installed for use.

Under normal use, the computer tracks the clutch operation under all driving conditions to maintain clutch feel. This is called adaptive strategy. After an overhaul, it is important for the computer to have its adaptive strategy reset. A scan tool should be attached to the vehicle and the transmission should have the “Fast Learn” performed.
LCT 1000

Clutch Clearance (continued)

Some of the clutch assemblies used on the LCT 1000 transmission are very hard to calculate with normal shop measuring equipment. Fortunately, the Allison is designed to calculate the clutch apply and release times much like the system used by Chrysler for its 41TE transaxle.

C1 Clutch assembly is the center clutch

C2 Clutch assembly is the outer clutch
LCT 1000

C1/C2 Piston Assemblies

The C1/C2 housing requires special tools, J43777 for the C1 Clutch and J43776 for the C2 Clutch for disassembly and reassembly. The tools shown below can be fabricated in your shop. In this example we used a late 4T65E reaction shell, an all-threaded T-Bar and a spring compressor fitting.
LCT 1000

1-2-3-4 Clutch Backplate

Clutch clearance specifications for the 1-2-3-4 (C1) or the 4-5-6 (C2) clutch pack assembly is difficult to check without the proper tool. If a repeat failure of the C1 or C2 clutch is happening, use the tooling to verify you have the correct spacer plate. The incorrect spacer plate may have been installed prior to you rebuilding the unit.

If the transmission has never been overhauled, replace the original spacer plate with a new one based on the ID marks. Make sure the friction plates are .0935” min. and the steel plates are .0841” min. On the C1, use the ID# stamped on the 1-2-3-4 (C1) clutch backing plate and compare it to the thickness shown in the charts. If the backing plate is less than the specification, replace it.

<table>
<thead>
<tr>
<th>Identification</th>
<th>Plate Thickness</th>
<th>Metric</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>2420</td>
<td>11.1-11.9 mm</td>
<td>0.4370-0.04685&quot;</td>
<td></td>
</tr>
<tr>
<td>8521</td>
<td>11.54-12.34 mm</td>
<td>0.4543-0.4858&quot;</td>
<td></td>
</tr>
<tr>
<td>8522 (6222)</td>
<td>11.98-12.78 mm</td>
<td>0.4717-0.5031&quot;</td>
<td></td>
</tr>
<tr>
<td>8523 (6223)</td>
<td>12.43-13.23 mm</td>
<td>0.4894-0.5209&quot;</td>
<td></td>
</tr>
<tr>
<td>8524 (6224)</td>
<td>12.88-13.68 mm</td>
<td>0.5071-0.5386&quot;</td>
<td></td>
</tr>
</tbody>
</table>
**LCT 1000**

**Overall Endplay**

The overall endplay can be checked with the unit positioned with the bell housing facing up. To check the endplay, the PTO gear is levered up and down with a dial indicator measuring input shaft movement. The endplay should be between .0110-.0610.

The endplay adjustment shims are located on the output shaft. The adjustment shim fits between the collar on the output shaft and the support bearing in the tail housing.

<table>
<thead>
<tr>
<th>Shim Thickness</th>
<th>Metric</th>
<th>English</th>
<th>Identification</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.245-0.295 mm</td>
<td>0.0096-0.0116&quot;</td>
<td>0 Holes</td>
<td></td>
</tr>
<tr>
<td>0.475-0.525 mm</td>
<td>0.0187-0.0207&quot;</td>
<td>1 Hole</td>
<td></td>
</tr>
<tr>
<td>0.705-0.755 mm</td>
<td>0.0278-0.0297&quot;</td>
<td>2 Holes</td>
<td></td>
</tr>
<tr>
<td>0.935-0.985 mm</td>
<td>0.0368-0.0388&quot;</td>
<td>3 Holes</td>
<td></td>
</tr>
<tr>
<td>1.165-1.215 mm</td>
<td>0.0459-0.0478&quot;</td>
<td>4 Holes</td>
<td></td>
</tr>
<tr>
<td>1.395-1.445 mm</td>
<td>0.0549-0.0569&quot;</td>
<td>5 Holes</td>
<td></td>
</tr>
<tr>
<td>1.625-1.675 mm</td>
<td>0.0640-0.0659&quot;</td>
<td>6 Holes</td>
<td></td>
</tr>
</tbody>
</table>

This shim fits between this collar and the bearing in the tail housing and controls overall unit endplay.
LCT 1000

Oil Pump Updates and Specifications

The Pump Converter Bushing has been updated to improve pump operation and noise. The Lube Regulator Spring was updated to maintain a minimum of 40 psi of lube pressure. The Converter Relief Spring was updated to improve torque converter drainback. All these can be replaced with a pump assembly. The Converter Relief Spring can be purchased separately.

<table>
<thead>
<tr>
<th>Part Measured</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump Bushing, Max I.D.</td>
<td></td>
</tr>
<tr>
<td><strong>Important:</strong> The pump bushing must have a complete burnt orange Teflon coating. If any portion of the coating is worn and bronze bushing material is visible, the bushing must be replaced.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Inside Pump Gear, Maximum Distance Between Flats</td>
<td>52.165mm</td>
</tr>
<tr>
<td>Inside Pump Gear, Maximum Side Clearance</td>
<td>0.066mm</td>
</tr>
<tr>
<td>Outside Pump Gear, Minimum O.D.</td>
<td>109.907mm</td>
</tr>
<tr>
<td>Outside Pump Gear, Maximum Side Clearance</td>
<td>0.056mm</td>
</tr>
<tr>
<td>Outside Pump Gear to Crescent Maximum Clearance</td>
<td>0.0455mm</td>
</tr>
<tr>
<td>Pump Body Gear Cavity, Maximum Depth</td>
<td>22.245mm</td>
</tr>
<tr>
<td>Pump Body Gear Cavity, Maximum I.D.</td>
<td>110.191mm</td>
</tr>
<tr>
<td>Wear Plate, Minimum Thickness</td>
<td>2.950mm</td>
</tr>
</tbody>
</table>
LCT 1000
Internal Mode Switch Logic

When diagnosing the IMS with your scan tool, use the following chart to verify the proper “ON-OFF” operation.

<table>
<thead>
<tr>
<th>Range</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>OFF</td>
<td>ON</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>R Transitional</td>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>R</td>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>N</td>
<td>ON</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>D Transitional</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>D</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
</tr>
<tr>
<td>*M</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>D1 Transitional</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>1</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
<td>ON</td>
</tr>
<tr>
<td>Invalid</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>Invalid</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>Invalid</td>
<td>OFF</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
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<td>Invalid</td>
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<td>ON</td>
</tr>
<tr>
<td>Invalid</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
</tr>
<tr>
<td>Invalid</td>
<td>ON</td>
<td>ON</td>
<td>OFF</td>
<td>ON</td>
</tr>
</tbody>
</table>

ON = Open Circuit
OFF = Grounded Circuit
*M mode allows TAP Up/TAP Down feature to properly function between 1st and 6th gears.
In this range, logic states do not change.
**LCT 1000**

**Internal Mode Switch Installation**

Place the new detent lever/IMS assembly in position in the transmission case. Rotate the detent lever/IMS assembly to engage the park pawl apply assembly.

Reinstall the manual shift shaft through the manual shift shaft seal and through the detent lever/IMS assembly. Push the manual shift shaft into the final position in the transmission case. Install the round pin into the transmission case that retains the manual shift shaft. Install the detent lever/IMS retaining bolt using a T27 TORX® bit. Tighten the bolt to 10 N·m (92 lb in).

The fast learn, adapt, procedure must be performed. This can be done in one step using a scan tool. If this procedure is not done, the TCM adaptive values will be at the settings that it learned for the old components and will be in slow adaptive mode. Under these conditions, it will take an unacceptably long time for the adaptive values to converge to levels suitable for the new transmission. Perform the fast learn procedure.

*Thanks to Ted Keating at www.tktsales.com for the pictures.*
**LCT 1000**

**P0842, P0847, P0872**

**DTC Descriptions**

DTC P0842: Transmission Fluid Pressure (TFP) Switch 1 Solenoid Circuit Low Voltage

DTC P0847: Transmission Fluid Pressure (TFP) Switch 2 Solenoid Circuit Low Voltage

DTC P0872: Transmission Fluid Pressure (TFP) Switch 3 Solenoid Circuit Low Voltage

<table>
<thead>
<tr>
<th>Circuit</th>
<th>Short to Ground</th>
<th>Open/High Resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS1 Signal</td>
<td>P0752, P0842</td>
<td>P0751, P0843</td>
</tr>
<tr>
<td>PS2 Signal</td>
<td>P0757, P0847</td>
<td>P0756, P0848</td>
</tr>
<tr>
<td>PS3 Signal</td>
<td>P0762, P0872</td>
<td>P0761, P0873</td>
</tr>
</tbody>
</table>

These codes can be caused by a fault in a clutch circuit, the valve body, a shift solenoid, or a faulty pressure switch circuit. If you clear the code and drive it, the code might come right back or only appear intermittently. Therefore these codes can be difficult to diagnose.

As a means of verifying whether a shift solenoid, shift valve or clutch is at fault, the shift solenoids C, D and E can be swapped. With the valve body removed, each clutch can be air checked. See ATRA bulletin #1296 for air check positions.

**NOTE:** Always service the spin on oil filter at regular intervals. Make sure the magnet located at the top of the filter is present. Always make sure the valve body bolts are evenly tighten to 84-110 in. lbs.

A burnishing tool to smooth out any irregular marks in the bore for the E shift valve is available in the aftermarket. If the E shift valve sticks in its bore, it usually effects 4th gear and sets P0872. If the code is cleared, the vehicle will shift normally 1-2-3.
LCT 1000

Pressure Switch Manifold Logic

The easiest part of the system to test is the pressure switches. Connect a scan tool and display the four pressure switch circuits. With the engine off and ignition key on, the pressure switch 1, 2 and 3 should show “Open” and the reverse switch should be “Closed”.

Start the engine and shift the transmission into Reverse. Each pressure switch should immediately display the opposite switch position. Try wiggling the harness to see if the switches change state. If the pressure switches test okay, the next test is to confirm the clutch operation. Using the appropriate scan tool, perform a clutch apply test. The scan tool will indicate if any clutches are unable to function.

<table>
<thead>
<tr>
<th>Range</th>
<th>Pressure Switch 1-N/O</th>
<th>Pressure Switch 2-N/O</th>
<th>Pressure Switch 3-N/O</th>
<th>Pressure Switch 4-N/C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Switch Status</td>
<td>Scan Tool Status</td>
<td>Switch Status</td>
<td>Scan Tool Status</td>
</tr>
<tr>
<td>R</td>
<td>Open</td>
<td>High*</td>
<td>Closed</td>
<td>Low</td>
</tr>
<tr>
<td>N</td>
<td>Closed</td>
<td>Low</td>
<td>Closed</td>
<td>Low</td>
</tr>
<tr>
<td>1</td>
<td>Open</td>
<td>High</td>
<td>Closed</td>
<td>Low</td>
</tr>
<tr>
<td>2</td>
<td>Open</td>
<td>High</td>
<td>Open</td>
<td>High</td>
</tr>
<tr>
<td>3</td>
<td>Closed</td>
<td>Low</td>
<td>Open</td>
<td>High</td>
</tr>
<tr>
<td>4</td>
<td>Closed</td>
<td>Low</td>
<td>Open</td>
<td>High</td>
</tr>
<tr>
<td>5</td>
<td>Open</td>
<td>High</td>
<td>Open</td>
<td>High</td>
</tr>
<tr>
<td>6</td>
<td>Open</td>
<td>High</td>
<td>Open</td>
<td>Low</td>
</tr>
</tbody>
</table>

N/C = Normally Closed
N/O = Normally Open
* Pressure switch 1 (PS1) reverts to the Closed/Low state with throttle applied in reverse.
Allison LCT 1000

Gear Ratio Error in 5th (P0735 2001-2005), or 6th (P0736 2006-On) Before and After Overhaul.

This problem can be caused by a damaged range fork in the transfer case causing the transfer case to pop out of gear at freeway speeds. Units affected are 2001-Current K Series Chevy Silverado/GMC Sierra 2500HD/3500. The 4x4 Allison transmission uses the vehicle speed sensor on the transfer case as an output speed sensor. When the transfer case goes to neutral, the computer sees input RPM change as vehicle speed maintains and thinks that the transmission is slipping.

One of the main causes for this failure is a lack of lubrication due to low fluid level. Over time, the pump assembly wears a pin hole into the magnesium case and produces a small leak. GM has released an updated clip that resists wear from the pump into the case.

GM has also released an updated range fork and hub assembly to help with wear issues. Anaheim Gear of Anaheim, California recommends using GM Autotrac fluid for improved durability.

Autotrak Fluid Part #: 12378508
Range Fork Part #'s: 12544310 (261 XHD) 12384964 (263 XHD)

New Style
LCT 1000

Gear Ratio Error in 5th (continued)

Technical Bulletin # 1256

Range Hub Part #: 12384958

Updated Case Clip Part #: 89059653

CLIP IMPROVES CASE DURABILITY WHERE THE PUMP RIDES
LCT 1000

Gear Ratio Error in 5th (continued)

We’ve also found the snap ring groove in the rear case half for the output bearing is wearing out. The magnesium case is too soft and the axial movement of the output shaft causes the snap ring groove to widen as much as 0.0200”. This excess clearance causes the entire shaft to walk back and forth, resulting in range fork wear and a freeway speed neutral condition.

There is no fix for the case other than replacement.
LCT 1000
Late/No Shifts, Lack of Power

LCT 1000 applications may exhibit late shifts, no shifts, or a lack of power complaint. This condition may be caused by the PTO switch indicating that the PTO is being commanded on. It may act very similar to a plugged fuel filter issue and likely will not set DTC’S. The TCM is being commanded by the ECM to change the shift points for the transmission. The engine speed will typically be limited to 2000-3000 RPM (depending on calibration).

The PTO switch can be monitored with a scan tool on most applications. If the PTO switch is activated or if the switch has failed, the ECM will limit the engine speed no matter what throttle opening is being commanded. In addition you may note that turbo boost pressure, MAF and fuel delivery commands indicate that the engine is not under full load.

When these conditions are met, the ECM will command the TCM to change the shift points which can lead to the complaint. If the switch is in the off position, check the switch and wiring with your scan tool or multimeter and replace/repair as necessary. The PTO switch on the 2001-06 applications is located right of center on the dash.

NOTE: Many customers are installing PTO switches in vehicles that were not originally equipped with a PTO from the factory. The factory harness is in place up to connector C106 so the installation is fairly simple. PTO switch kits are available from several sources. This means this condition may occur even though the vehicle is not equipped with a PTO. Customers are using the PTO input to force the engine to “idle up” to speed the engine warm up.
**LCT 1000**

**No Shifts and/or No Movement, DTC’s**

LCT 1000 applications may exhibit any of the following conditions:

- Transmission will not move forward or reverse (range inhibited)
- Possible electrical related shift solenoid, temp sensor or PSM DTC’s
- Transmission will move forward and reverse but will not shift
- Concern may be intermittent

Inspect the main transmission harness for being pinched where the frame rail meets the body (at the body mounts). If the harness is pinched repair the wiring and reroute it to prevent it from becoming pinched again. This problem is common on crew cab applications.
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