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2018 CHEVROLET Suburban OEM Service and Repair Workshop Manual

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YOUR CURRENT VEHICLE

K71 Transmission Control Module: Programming and Setup

K71 Transmission Control Module: Programming and Setup (8L90 (M5U))

Diagnostic Instructions

- Perform the Diagnostic System Check prior to using this diagnostic procedure: Diagnostic System Check - Vehicle
- Review the description of Strategy Based Diagnosis: Strategy Based Diagnosis

NOTE

Note

- Do NOT program a control module unless directed to by a service procedure or a service bulletin. If the control module is not properly configured with the correct calibration software, the control module will not control all of the vehicle features properly.
- Verify the programming tool is equipped with the latest software and is securely connected to the data link connector. If there is an interruption during programming, programming failure or control module damage may occur.
- Stable battery voltage is critical during programming. Any fluctuation, spiking, over voltage or loss of voltage will interrupt programming. When required, install a battery maintainer or power supply that provides a steady and stable voltage. Do not use a battery charger, as charging voltage will often fluctuate when connected to the vehicle. This may interrupt programming. If a battery maintainer is not available, connect a fully charged 12 V jumper or booster pack disconnected from the AC voltage supply.
- Turn Off or disable systems that may put a load on the vehicle's battery. For example, interior lights, daytime running lights, HVAC, and radio.
- During the programming procedure, follow the Service Programming System (SPS) prompts for correct ignition switch position.

Parameter	System State	Expected Value	Description
Intake Camshaft Position Active Counter	—	Counts	This parameter displays a rolling count of the number of intake cam position sensor pulses for bank 1.
Intake Camshaft Position Actuator Solenoid Valve Control Circuit High Voltage Test Status	—	OK	This parameter displays the state of the camshaft position actuator solenoid control circuit voltage. The parameter displays Malfunction if the camshaft position actuator solenoid control circuit voltage is shorted to voltage.
Intake Camshaft Position Actuator Solenoid Valve Control Circuit Low Voltage Test Status	—	OK	This parameter displays the state of the camshaft position actuator solenoid control circuit voltage. The parameter displays Malfunction if the camshaft position actuator solenoid control circuit voltage is shorted to ground.
Intake Camshaft Position Actuator Solenoid Valve Control Circuit Open Test Status	—	OK	This parameter displays the state of the camshaft position actuator solenoid control circuit voltage. The parameter displays Malfunction if the camshaft position actuator solenoid control circuit voltage is open.
Intake Camshaft Position Command	—	%	This parameter displays the commanded duty cycle for the intake cam phase output for bank 1.
Intake Camshaft Position Variance	—	°	This parameter displays the absolute difference between the desired and actual positions of the intake camshaft for bank 1 in terms of degrees of camshaft rotation.
Intake Manifold Pressure	—	70–75 kPa / 10–11 PSI	This parameter displays the pressure difference between the MAP and the barometric pressure (BARO) as calculated by the control module. The scan tool will display a higher value during high vacuum conditions, such as idle or deceleration. The scan tool will display a lower value during low vacuum conditions, such as wide open throttle or low load cruising.
Knock Retard	—	°	This parameter indicates the amount of spark advance the control module removes from the ignition control (IC) spark advance in response to the signal from the knock sensors. The scan tool displays a high value for a large amount of spark retard, and a low value for a small amount of spark retard.
Long Term Fuel Trim Bank 1 or Bank 2	—	0% ± 10%	This parameter is calculated by the control module based on the Short Term FT value. The Long Term FT bank 1 is used for

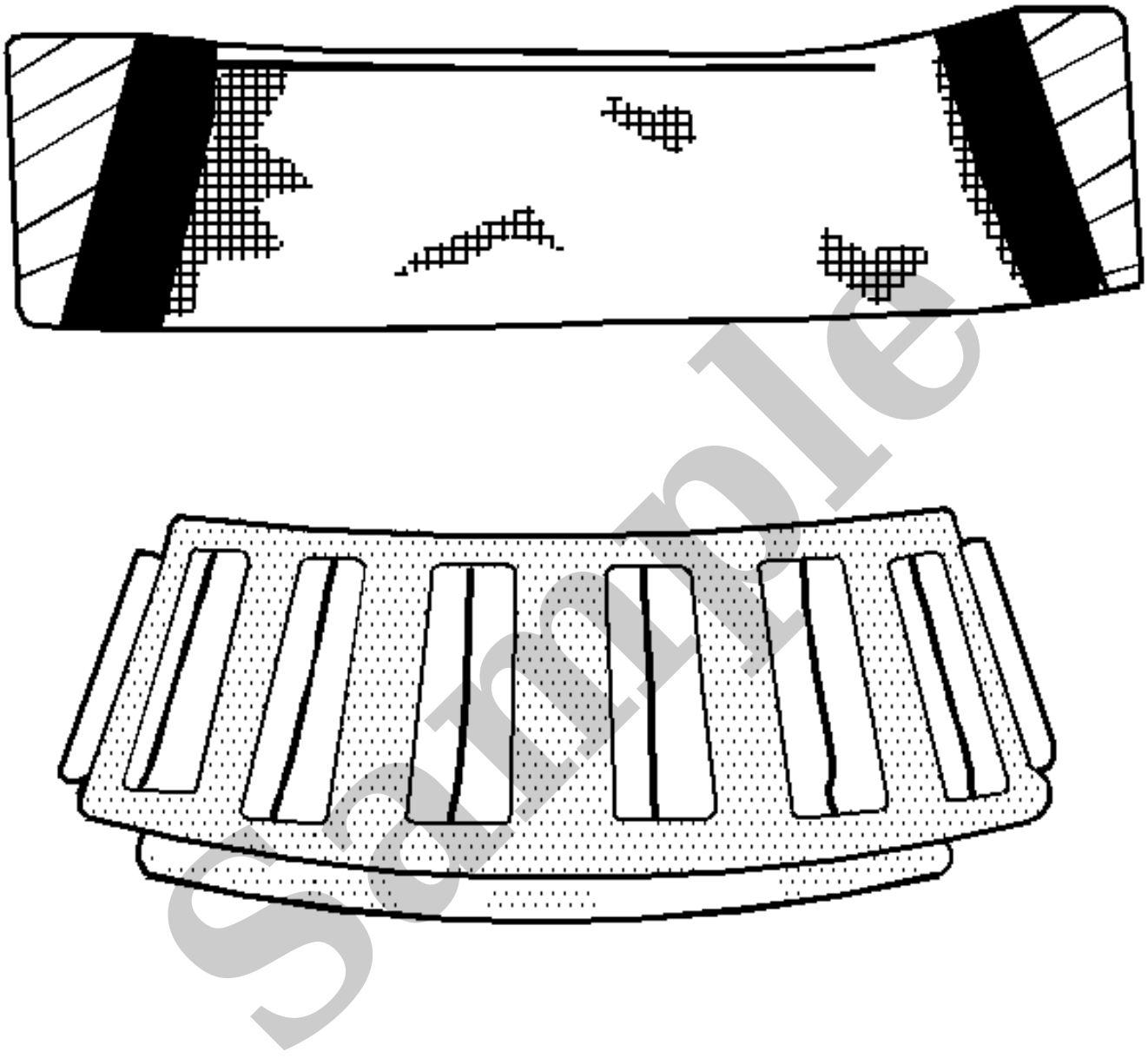
Output Control	Description
High Side Driver 1	• The TCM commands the driver for the solenoid voltage supply ON and OFF. • When the ignition is ON, and the engine is OFF, there are no limits to this control. • High side drivers may not be commanded ON and OFF with the scan tool if the engine is running.

Line PC Solenoid	• The scan tool is used to request pressure in increments of 200 kPa (30 psi) from 200–2000 kPa (30–290 psi). The TCM will then command the line PC solenoid to achieve the requested increment.
	• When the ignition is ON, and the engine is OFF, the pressure request may be controlled within calibrated limits. There is a limit to the output control of 200 kPa (290 psi) when the engine is OFF. If the request is above specified amount, the message “Request override current out of range” will display.
	• When the engine is running, the following control limits apply:
	  ▪ When the transmission range is Park or Neutral, the pressure request may be controlled within calibrated limits. The engine speed must be less than 1,500 RPM. If the engine speed is greater than 1,500 RPM, the message "TR in park/neutral and engine speed over 1,500 RPM" appears on the scan tool display.
	  ▪ When the transmission range is not Park or Neutral, the requested pressure can only be controlled equal to or greater than the pressure determined by the TCM. The TCM does not allow a pressure to be selected that may cause damage to the transmission. If the requested pressure is less than allowed by the TCM, the message "Requested pressure for the Line PC Solenoid is too low" appears on the scan tool display.
	  ▪ Transmission range DTCs must not be active. If a transmission range DTC is active, the message "Engine running with transmission DTC present" appears on the scan tool display.

PC Solenoid 2 Command	• The TCM commands the pressure control solenoid in order to apply or release the clutches.
	• When the ignition is ON, and the engine is OFF, there are no limits to this control. The solenoid remains ON until commanded OFF, and vice versa. When the output control is exited, the solenoid state is determined by the TCM.
	• When the engine is running, the following control limits apply:
	  ▪ The transmission range must be in Park or Neutral. If the transmission range is not Park or Neutral, the message "Engine running and transmission range is not Park/Neutral" appears on the scan tool display.
	  ▪ The solenoid remains ON until commanded OFF, and vice versa. When the output control is exited, the solenoid state is determined by the TCM.

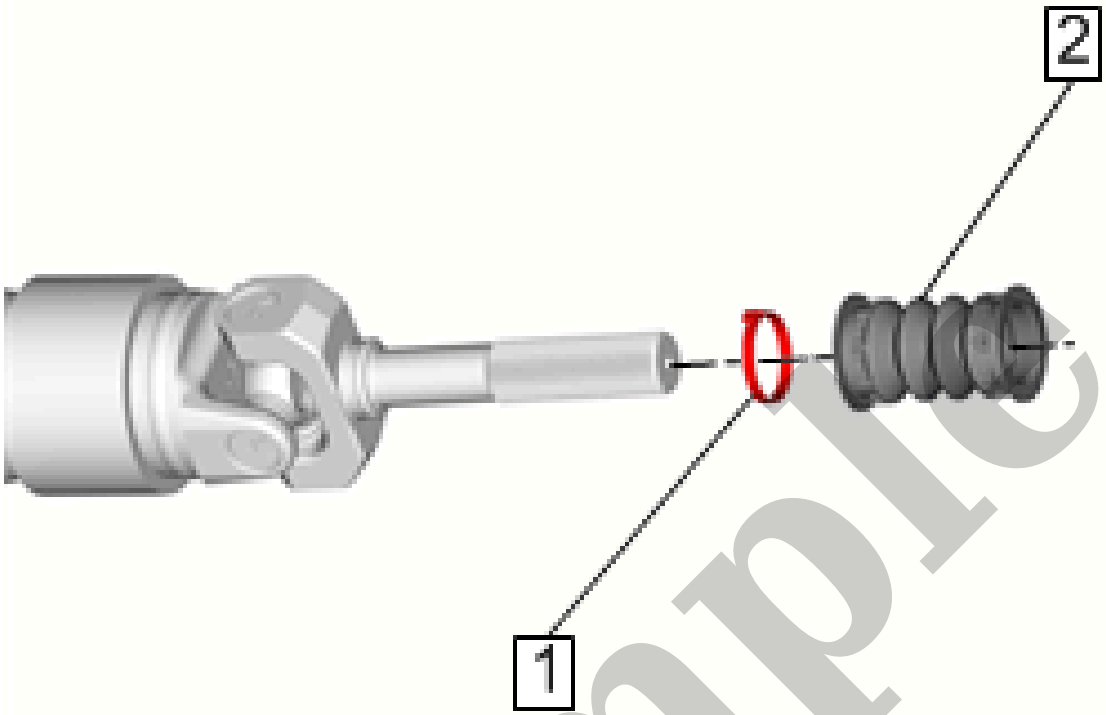
PC Solenoid 3 Command	
PC Solenoid 4 Command	

Stain Discoloration



Discoloration ranging from light brown to black. This discoloration is caused from incorrect lubrication or moisture. Reuse the bearing if you can remove the stains with light polishing. Reuse the bearing if there is no evidence of overheating. Check the seals and the related parts for damage.

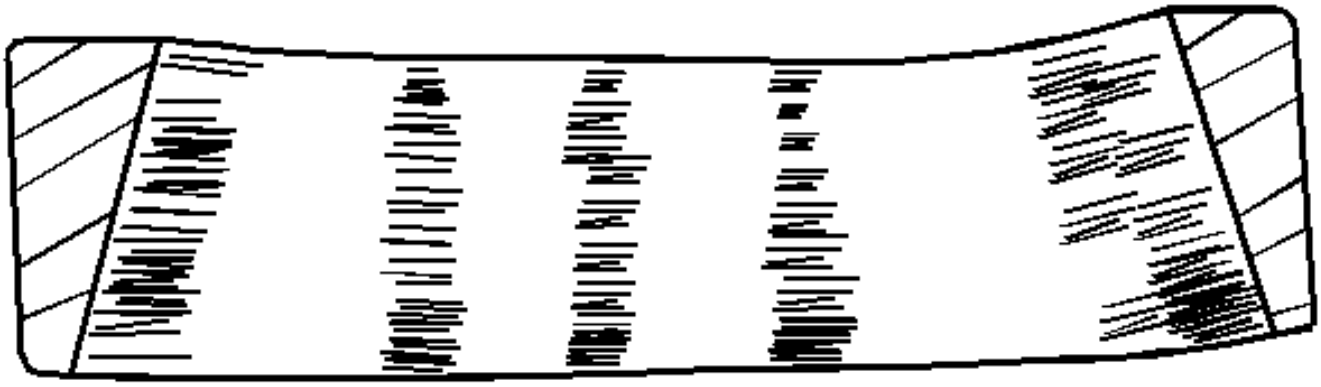
Heat Discoloration

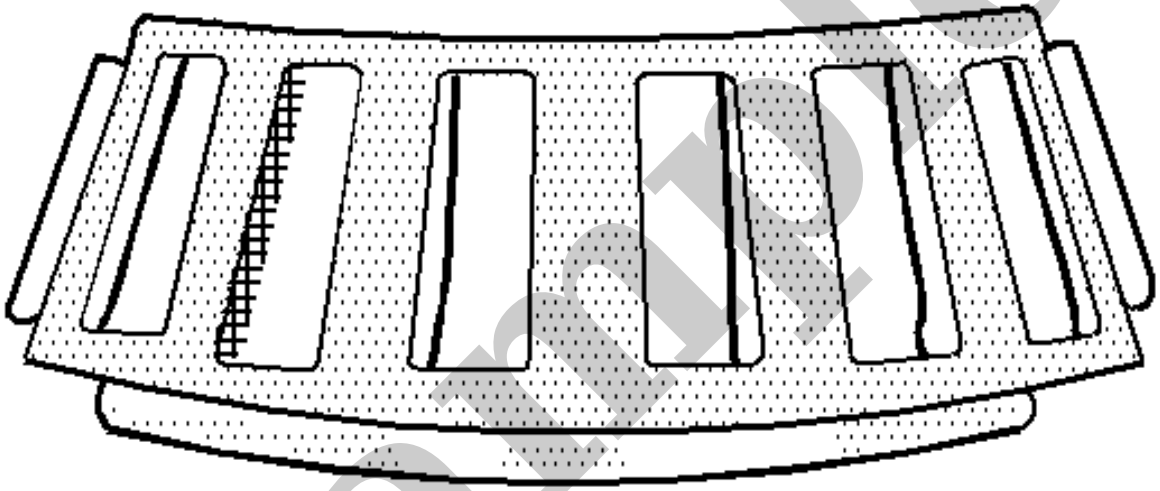


1.

Install the propeller shaft boot clamp (1).

2. Install the propeller shaft boot (2).





Wear around the outside diameter of the cage and the roller pockets caused by abrasive material. Wear caused from inefficient lubrication. Clean the related parts and the housings. Check the seals. Replace the bearings.

Indentations

Set of Data (MSD) message to the call center.

The MSD message contains control data, vehicle information, direction, position and time. When an emergency call is connected to the call center the MSD message is sent by in-band transmission by default. In the event in-band transmission is unsuccessful, Short Message Service (SMS) will be used as a backup.

To enter the Test Mode turn ignition ON and make sure the vehicle has not moved for at least 1 minute, then press and hold the TEST button for longer than 4 seconds. A series of voice prompts will instruct the user to perform certain functions. At the end of Test Mode one of two messages will be played, TEST OK or Emergency Call System Test Indicates a Failure.

Microphone

The microphone is located in the headliner or roof console. The telematics communication interface control module supplies approximately 10V to the microphone on the microphone signal circuit. The microphone modifies the 10V depending on the volume and voice being detected. A microphone low reference circuit or a drain wire provides a ground for the microphone. The microphone signal circuits pass through the telematics communication interface control module to support entertainment voice recognition. Thus, the module uses the same microphone as the infotainment system. In the event the infotainment system uses two microphones only one will pass through the telematics communication interface control module.

Cellular and GPS/Glonass Antennas

The antenna will have any of the following functions when equipped with ERA Glonass:

- Input cellular element
- Output cellular element
- GPS/Glonass element

The ERA Glonass system uses the input and output cellular antenna elements to send and receive cellular data. The cellular signal is carried by a coax cable that connects the antenna directly to the telematics communication interface control module.

The GPS/Glonass antenna element is used to collect the signals of the orbiting satellites. The GPS/Glonass signal is carried by a coax cable that connects directly to the telematics communication interface control module.

Back-up Battery

NOTE

Note

- Information is not shown on the rear display

Conditions for Clearing the DTC

- The Media Disc Player detects a properly synced digital video signal.
- A history DTC will clear once 50 consecutive malfunction-free ignition cycles have occurred.

Reference Information

Schematic Reference

Video System Schematics

Connector End View Reference

Master Electrical Component List

Description and Operation

Video Entertainment System Description and Operation

Electrical Information Reference

- Circuit Testing
- Connector Repairs
- Testing for Intermittent Conditions and Poor Connections
- Wiring Repairs

Scan Tool Reference

Control Module References for scan tool information

Special Tools

- **EL-50334-2** ***Type A female to Mini B male USB Cable***
- **EL-50334-4** ***Type A female to Mini B female Adapter***
- **EL-50334-12** ***Infotainment Test Cable – RSE***
- **EL-50334-13** ***Infotainment Test Cable – RSE Splitter***
- **EL-50334-14** ***Infotainment Test Cable***
- **EL-50334–15** ***Mini B Male USB to Mini B Male USB***