07 GRP13_6L80E_6L50E LH2_LC3.DOC

SENSED PARAMETER	FAULT CODE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALF DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	MONITORING TIME LENGTH AND FREQUENCY OF CHECK	DTC TYPE
Transmission Electro-Hydraulic Control Module Read Only Memory	P0601	EPROM/Flash memory corruption (Incorrect program/calibrations checksum)	ROM test fail count ≥ 5	Ignition is On	Immediate Continuous	A
Transmission Electro-Hydraulic Control Module Not Programmed	P0602	Non-programmed TEHCM (calibrations)	KeMEMD_b_NoStartCal= TRUE	Ignition is On	Immediate Continuous	A
Transmission Electro-Hydraulic Control Module Long-Term Memory Reset	P0603	Wrong copy of Non-volatile Memory to RAM	Non-volatile memory (static or dynamic) checksum failure	Ignition is On	Immediate Continuous	A
Transmission Electro-Hydraulic Control Module Random Access Memory	P0604	RAM failure	RAM read/write failure (single word) RAM test fail count ≥ 5	Ignition is On	Immediate Continuous	A
Transmission Electro-Hydraulic Control Module Long Term Memory Performance	P062F	NVM write error at key-down	TCM Non-Volatile Memory Incorrect flag = 1	Ignition voltage enable Ignition ON	Immediate Continuous	A
Transmission Electro-Hydraulic Control Module Internal Temperature Too High	P0634	DTC detects the electronic circuitry is at high operating temperature	substrate temperature ≥ 146.3 DegC FWD or 142.1 DegC RWD for time ≥ 5.0 sec, OR ignition voltage >= 18.0 V and substrtate temperature ≥ 50.0 DegC for time ≥ 2.0 seconds	]e enable 0.0 DegC ≤ substrate temperature ≤ 240 DegC for time ≥ 0.25 sec P0634 not FA AND TFTKO	Time > 5 seconds Continuous	A

Common engine speed enable: 500 RPM <= engine speed <= 7800 RPM for time >= 5.0 seconds
Common ignition voltage enable: 8.6 volts <= ignition voltage <= 19.0 volts
Common vehicle speed enable: 5.0 KPH <= vehicle speed for time >= 5.0 seconds,

SENSED PARAMETER	FAULT CODE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALF DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	MONITORING TIME LENGTH AND FREQUENCY OF CHECK	DTC TYPE
TCM internal temperature thermistor failed at a constant value or toggling at high frequency.	P0667	DTC Detects Substrate Sensor Performance Error	fail case 1 or fail case 2 or fail case 3 independently fail fail case 1: vehicle speed >= 8 KPH for time >= 300 seconds cumulative, TCC slip > 120 RPM for time >= 300 seconds cumulative, (-55.0 DegC <= TCM internal temperature <= 21.0 DegC), TFT >= 70.0 DegC, TFT delta from start up >= 55.0 DegC, TCM internal temperature delta < 2.0 DegC for time >= 100 seconds fail case 2: vehicle speed >= 8 KPH for time >= 300 seconds cumulative, TCC slip > 120 RPM for time >= 300 seconds cumulative, (120 DegC <= TCM internal temperature <= 150 DegC), TFT >= 70.0 DegC, TFT delta from start up >= 55.0 DegC, TCM internal temperature delta < 2.0 DegC for time >= 100 seconds fail case 3: TCM internal temperature delta >= 20 DegC, delta occurs 14 times over a 7 second sample period	P0667, P0716, P0717, P0722, P0723 not FA or TFTKO, P0711, P0712, P0713 not FA, Ignition voltage enable, engine speed enable, -54 DegC <= TCM internal temperature <= 149 DegC	Fail case 1 & 2: Time > 100 seconds Fail case 3: 14 counts in Time ≤ 7 seconds Continuous	C
TCM internal temperature thermistor failed at a high temperature (short to power).	P0668	Substrate Sensor Short to Power Error	TCM substrate temperature >= 249 DegC for time >= 4.0 seconds	ignition voltage enable, engine speed enable, P0668 not frault active or test fail this key on	4.0 sec Continuous	C
TCM internal temperature thermistor failed at a low temperature (open or short to ground).	P0669	Substrate Sensor Open/StoG Error	TCM substrate temperature <= -249 DegC for time >= 10 seconds	ignition voltage enable, engine speed enable, P0669, P0716, P0717, P0722, P0723 not FAor TFTKO, TOSS speed >= 200 RPM for time >= 200 seconds, TCC slip >= 120 RPM for time >= 200 seconds,	10.0 sec Continuous	C

Common engine speed enable: 500 RPM <= engine speed <= 7800 RPM for time >= 5.0 seconds
Common ignition voltage enable: 8.6 volts <= ignition voltage <= 19.0 volts
Common vehicle speed enable: 5.0 KPH <= vehicle speed for time >= 5.0 seconds,

SENSED PARAMETER	FAULT CODE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALF DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	MONITORING TIME LENGTH AND FREQUENCY OF CHECK	DTC TYPE
Trans Fluid Temp Sensor Circuit Range/ Performance	P0711	The DTC detects the following failure modes of the transmission fluid temperature sensor: 1) A sensor that remains at a constant value 2) A sensor that remains at a value 4) Transmission fluid temperature remains below 20° C for a calibrated time as a function of startup transmission fluid temperature.	fail case 1 or fail case 2 or fail case 3 or fail case 4 independently fail <u>Fail Case 1</u> vehicle speed >= 8 KPH for time >= 300 seconds cumulative, TCC slip > 120 RPM for time >= 300 seconds cumulative, -50.0 <= TFT<= 21.0 DegC, engine coolant temperature >= 70.0 DegC, engine coolant temperature delta from start up >= 55.0 DegC TFT delta < 2.0 DegC for time >= 100 seconds <u>Fail Case 2</u> vehicle speed >= 8 KPH for time >= 300 seconds cumulative, TCC slip > 120 RPM for time >= 300 seconds cumulative, 129 DegC <= TFT <= 170 DegC, engine coolant temperature >= 70.0 DegC, engine coolant temperature delta from start up >= 55.0 DegC, TFT delta < 2.0 DegC for time >= 100 seconds <u>Fail Case 3</u> TFT delta >= 20 DegC, Delta occurs 14 times over a 7 second sample period <u>Fail Case 4</u> TFT < 20° C after a calibrated amount of time based on a 2D lookup table.	<u>For fail case 1, 2, and 4:</u> P0711, P0716, P0717, P0722, P0723 not FA or TFTKO,engine coolant temperature valid, ignition voltage enable, engine speed enable, P0711 not TPTKO, -49 <= TCM internal temperature <= 169 DegC <u>Fail case 1:</u> -50 deg C <= trans fluid temp <= +21 C at startup, Engine coolant => 70 deg C, Engine Coolant has changed => 55 deg C since startup, Vehicle speed since startup => 8 KPH for time => 300 seconds (cumulative timer) <u>Fail case 2:</u> +129 deg C <= trans fluid temp <= +170 C at startup, Engine coolant => 70 deg C, Engine Coolant has changed => 55 deg C since startup, Vehicle speed since startup => 8 KPH for time => 300 seconds (cumulative timer) <u>Fail case 3:</u> System Voltage is between 8 – 18 Volts. Engine Speed 450-7500 for 5 seconds. <u>Fail case 4:</u> Acceleration position valid, engine torque accurate, engine speed accurate, ECT accurate, No soft landing default action present, No immediate landing default action present, 50<=engine torque<= 1492Nm, 8 <= TPS <= 100%, 511 kph>=vehicle speed>= 8 kph, 6500>= engine speed >= 500 RPM, 149 DegC>=Coolant>=-39 DegC	<u>Fail case 1:</u> Time => 100.0 seconds Continuous <u>Fail case 2:</u> Time => 100.0 seconds Continuous <u>Fail case 3:</u> Time => 7.0 seconds 14 counts	C
Transmission fluid temperature thermistor failed at a low temperature (short to ground).	P0712	Continuous short to ground in transmission fluid temperature sensor circuit	transmission fluid temperature <= -74 DegC for time >= 25 seconds	ignition voltage enable, engine speed enable, TOSS speed >= 200 RPM for time >= 200 seconds, TCC slip >= 120 RPM for time >= 200 seconds, P0712 not fault active or test fail this key on	25 seconds	C
Transmission fluid temperature thermistor failed at a high temperature (open or short to power).	P0713	Continuous short to voltage in transmission fluid temperature sensor circuit	transmission fluid temperature >= 174 DegC for time >= 10 seconds	ignition voltage enable, engine speed enable, P0713 not FA or TFTKO	10 seconds	C

Common engine speed enable: 500 RPM <= engine speed <= 7800 RPM for time >= 5.0 seconds
Common ignition voltage enable: 8.6 volts <= ignition voltage <= 19.0 volts
Common vehicle speed enable: 5.0 KPH <= vehicle speed for time >= 5.0 seconds,

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SENSED PARAMETER	FAULT CODE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALF DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	MONITORING TIME LENGTH AND FREQUENCY OF CHECK	DTC TYPE
Input Speed Sensor Performance	P0716	Unrealistically large drop in transmission input speed signal	0 < input speed delta < 500 RPM FWD or 327 RPM RWD for time >= 2 seconds, Raw input speed >= 1050 RPM FWD or 686 RPM RWD for time >= 2 seconds, Input speed drops more than 1000 RPM FWD or 653 RPM RWD and does not recover for time >= 0.80 seconds	P0716 is not FA or TFTKO, ignition voltage enable, engine speed enable, engine torque valid, 1492 >=engine torque >= 0.0 Nm, throttle position is valid from ECM, throttle position >= 0.0 %, no P0717 P0722 P0723 FA or TFTKO, vehicle speed >= 0.0 KPH	Time>= 3.25 seconds Continuous	A
Input Speed Sensor Circuit Low Voltage	P0717	Low transmission input speed signal with high vehicle speed	TISS < 100 RPM FWD or 65 RPM RWD for time >= 4.5 seconds	P0717 is not FA or TFTKO, ignition voltage enable, engine speed enable, engine torque valid from ECM, vehicle speed >= 16 KPH, engine torque >= 50 Nm, P0722 P0723 not FA or TFTKO	Fail timer >= 4.5 seconds Continuous	A
Output Speed Sensor Circuit Low Voltage	P0722	Low vehicle speed with large engine speed in drive range	transmission output speed <= 70 RPM for time >= 4.5 seconds	ignition voltage enable, engine speed enable, engine torque valid from ECM, 1492>=engine torque >= 50 Nm, throttle position valid from ECM, throttle position >= 8 %, P0716 P0717 P0723 not FA or TFTKO, PRNDL is not park/neutral, 1000 <= input speed <= 6500 RPM, 3200<=engine speed<=5000 RPM, TFT>=0°C	Fail timer >= 4.5 seconds Continuous	A
Output Speed Sensor Circuit Intermittent	P0723	Unrealistically large drop in transmission output speed signal	input speed delta < 500 RPM for time >= 2 seconds, 0 < output speed delta < 500 RPM for time >= 2 seconds, raw output speed >= 1000 RPM for time >= 2 seconds, output speed drops more than 1200 RPM and does not recover for time >= 1.5 seconds	P0723 is not FA or TFTKO, ignition voltage enable, engine speed enable, no P0716 P0717 P0722 FA or TFTKO, range change timer >= 6 seconds	Fail timer >= 1.5 seconds Continuous	A

Common engine speed enable: 500 RPM <= engine speed <= 7800 RPM for time >= 5.0 seconds
Common ignition voltage enable: 8.6 volts <= ignition voltage <= 19.0 volts
Common vehicle speed enable: 5.0 KPH <= vehicle speed for time >= 5.0 seconds,

SENSED PARAMETER	FAULT CODE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALF DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	MONITORING TIME LENGTH AND FREQUENCY OF CHECK	DTC TYPE
TCC System Stuck OFF	P0741	High TCC slip with TCC commanded on	TCC Pressure >=800 Kpa for 2.0 seconds, When TCC slip error >= 50 (Table based)rpm for time >= 6 seconds Increment fail counter by one, Set P0741 when fail counter >= 2 counts	ignition voltage enable, no P0716, P0717, P0722, P0723, P2762, P2763, P2764, P0742 FA or TFTKO, 20 DegC <= TFT <= 130 DegC, engine torque valid from ECM, engine torque >= 50 Nm, throttle position valid from ECM, 8 % <= throttle position <= 100 %, See gear ratio enable windows in this file  2007 RWD and FWD P0741 P0742 TCC commanded "on",	Fail timer >= 6.0 seconds Fail Counter = 2 Continuous	B
TCC System Stuck ON	P0742	Low TCC slip with TCC commanded off.	-20 RPM FWD or -12 RPM RWD <= TCC slip speed <= 30 RPM FWD or 13 RPM RWD for time >= 2.5 seconds FWD or 3.0 seconds RWD Increment fail counter by one, failure counter >= 6 counts FWD or 5 counts RWD	ignition voltage enable, No P0716, P0717, P0722, P0723, P1751, P2762, P2763, P2764, P0741 FA or TFTKO, 20 DegC <=TFT <= 130 DegC, engine torque valid from ECM, 80 <=engine torque <= 1492 Nm, Throttle position valid from ECM, 8 % <= throttle position <= 100 %, vehicle speed >= 16 KPH, 500 <= engine speed <= 6500 RPM, See gear ratio enable windows in this file  2007 RWD and FWD P0741 P0742 Command Gear >= 2, Solenoid A (mode 2 valve) enabled, TCC commanded "off"	Fail timer >= 2.5 sec Fail Counter = 6 or fail timer >= 3.0 sec fail counter = 5 Continuous	A

Common engine speed enable: 500 RPM <= engine speed <= 7800 RPM for time >= 5.0 seconds
Common ignition voltage enable: 8.6 volts <= ignition voltage <= 19.0 volts
Common vehicle speed enable: 5.0 KPH <= vehicle speed for time >= 5.0 seconds,

SENSED PARAMETER	FAULT CODE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALF DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	MONITORING TIME LENGTH AND FREQUENCY OF CHECK	DTC TYPE
Shift Solenoid Valve A Stuck On	P0752	This DTC detects a neutral condition when 3rd gear is commanded and the mode 2 valve is stuck in the ON position	gear box slip ≥ 100.0 RPM	Command gear has achieved 1st lock, 1st free-wheel, or second, command gear = 3rd	Time ≥ 5.0 sec Continuous	A
Shift Solenoid Valve B Stuck Off	P0756	This DTC detects a neutral condition when 1st lock or 1st free-wheel is commanded and the mode 3 valve is stuck in the OFF position	In sequence: event 1: command gear is 1st lock or 1st free-wheel and gear box slip ≥ 100.0 RPM, event 2: command gear = 2nd and 2nd gear gear box slip ≤ 35.2 RPM OR gear box slip ≤ 100.0 RPM and shift time-out occurs, CB26 VBS is at maximum command pressure	Ignition votage enable, No P0716, P0717, P0722, P0723, P1915, P1825 DTCs FA AND TFTKO, High side driver is enabled, Throttle position signal and engine torque signals valid from ECM, throttle position ≥ 10.0 %, 120.0 Nm ≤ engine torque ≤ 1492.0 Nm, transmission fluid temperature ≥ 0.0	event 1: time ≥ 5.0 sec event 2: time ≤ 4.0 sec Continuous	A

Common engine speed enable: 500 RPM <= engine speed <= 7800 RPM for time >= 5.0 seconds
Common ignition voltage enable: 8.6 volts <= ignition voltage <= 19.0 volts
Common vehicle speed enable: 5.0 KPH <= vehicle speed for time >= 5.0 seconds,

SENSED PARAMETER	FAULT CODE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALF DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	MONITORING TIME LENGTH AND FREQUENCY OF CHECK	DTC TYPE
Pressure Control (PC) Solenoid B Stuck Off [C35R]	P0776 Dynamic Test	This DTC detects a neutral condition when 3rd or 5th gear is commanded, or steady state 3rd or 5th gear is achieved, C35R clutch system stuck OFF failure DTC will set due to either a steady state or dynamic test failure	Dynamic test (shift in progress): High speed mode: TOSS >= 60 RPM. High speed mode: command gear slip >= 100 RPM for time >= 2.25 seconds. Low speed mode: TOSS < 60 RPM. Low speed mode: turbine speed >= ((60 RPM * commanded gear ratio) + 100 RPM)	Dynamic test (shift in progress): transmission fluid temperature >= 0.0 DegC, no P0716, P0717, P0722, P0723, P1815, P1820, P1822, P1823, P1825, P1826, turbine speed >= 60 RPM, C35R is on-coming clutch and C35R on coming control is complete.	Dynamic test (shift in progress): time ≥ 2.25 sec Continuous	A
	P0776 Steady State Test 3rd Gear	This DTC detects a neutral condition when 3rd or 5th gear is commanded, or steady state 3rd or 5th gear is achievied, C35R clutch system stuck OFF failure	Steady state test: in sequence from 3rd gear: event 1: command gear is 3rd and gear box slip ≥ 100.0 RPM event 2: induce 3-4 upshift command gear is 4th and 4th gear gear box slip <= 35.2 RPM AND gear box slip <= 100.0 RPM, C456 VBS is at maximum command pressure	Steady state test: Ignition votage enable, transmission fluid temperature >= 0.0 DegC, no P0716, P0717, P0722, P0723, P1915, P1825 DTCs FA AND TFTKO, High side driver is enabled, average driven wheel speed ≥ 80.0 RPM, side-to-side wheel speed diference ≤ 150 RPM, delta wheel speed (average driven wheel to average non-driven wheel) ≤ 7.0 % for time ≤ 6.0 sec, 3rd or 5th gear ratio achieved.	Steady state test: event 1: fail time >= 5.0 seconds event 2: fail time <= 4.0 seconds in a 5.0 second window Continuous	Same as Dynamic Test
	P0776 Steady State Test 5th Gear	This DTC detects a neutral condition when 3rd or 5th gear is commanded, or steady state 3rd or 5th gear is achievied, C35R clutch system stuck OFF failure	Steady state test: in sequence from 5th gear event 1: command gear is 5th and gear box slip ≥ 100.0 RPM event 2: induce 5-6 upshift command gear is 6th and 6th gear gear box slip <= 35.2 RPM AND gear box slip <= 100.0 RPM, C456 VBS is at maximum command pressure	Steady state test: Ignition votage enable, transmission fluid temperature >= 0.0 DegC, no P0716, P0717, P0722, P0723, P1915, P1825 DTCs FA AND TFTKO, High side driver is enabled, average driven wheel speed ≥ 80.0 RPM, side-to-side wheel speed diference ≤ 150 RPM, delta wheel speed (average driven wheel to average non-driven wheel) ≤ 7.0 % for time ≤ 6.0 sec, 3rd or 5th gear ratio achieved.	Steady state test: event 1: fail time >= 5.0 seconds event 2: fail time <= 4.0 seconds in a 5.0 second window Continuous	Same as Dynamic Test

Common engine speed enable: 500 RPM <= engine speed <= 7800 RPM for time >= 5.0 seconds
Common ignition voltage enable: 8.6 volts <= ignition voltage <= 19.0 volts
Common vehicle speed enable: 5.0 KPH <= vehicle speed for time >= 5.0 seconds,

SENSED PARAMETER	FAULT CODE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALF DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	MONITORING TIME LENGTH AND FREQUENCY OF CHECK	DTC TYPE
Pressure Control (PC) Solenoid B Stuck On [C35R]	P0777 Dynamic Test	This DTC detects a tie-up condition when a shift from 3rd or 5th gear is commanded, or steady state 1st, 2nd, 4th, or 6th gear, C35R clutch system stuck ON failure DTC will set due to either a steady state or dynamic test failure	Dynamic test (shift in progress) C35R clutch command pressure = 0 kPa for time >= C35R zero capactiy delay time, where C35R zero capacity delay time = f(transmission fluid temperature) and {[on-coming clutch delta transition pressure > 50 kPa and 300 kPa < on-coming command clutch command pressure < 1950 kPa] or [C35R clutch control state = exhaust and on-coming clutch control state = maximum pressure]}. Attained gear slip <= 40 RPM for time >= calculated fail time, where calculated fail time = f(shift type, throttle position, transmission fluid temperature)	Dynamic test (shift in progress) Transmission fluid temperature >= 0.0 DegC, no P0716, P0717, P0722, P0723, P1815, P1820, P1822, P1823, P1825, P1826. TOSS >= 200 RPM, Turbine Speed >= 200 RPM. C35R is off-going clutch.	Dynamic test (shift in progress) Time ≥ 1.2 sec Continuous	A
	P0777 Steady State Test	Tie-up when holding clutch is C35R.	Steady state test: in sequence from command gear ≠ 3rd OR ≠ 5th gear: event 1: (scaling factor = 1 if command gear ≠ 1st scaling factor = 2 if command gear = 1st) transmission output speed decelaration ≥ (1676 RPM/sec*scaling factor) for time >= 0.30 sec or) transmission output speed decelaration ≥ (900 RPM/sec*scaling factor) for time >= 0.30 sec with C35R pressure switch = "exhausted" event 2: release holding clutch, see "ss tie-uptest DTC map", 35.2 RPM ≤ gear box slip ≤ 100.0 RPM	Steady state test: Ignition votage enable,No P0716, P0717, P0722, P0723, P1915, P1825 DTCs FA AND TFTKO,Throttle position signal and engine torque signals valid from ECM,High side driver is enabled,brake state = off OR delta gear box torque ≥ 250.0 Nm in time ≤ 0.350 sec,(if command gear = 1st free-wheel, throttle position ≥ 10.0% and 120.0 Nm ≤ engine torque ≤ 1492.0 Nm),average driven wheel speed ≥ 80.0 RPM,side-to-side wheel speed diference ≤ 150 RPM,delta wheel speed (average driven wheel to average non-driven wheel) ≤ 7.0 % for time ≤ 6.0 sec,transmission output speed delta ≥ 1300 RPM/sec or PS2 is exhausted with transmission output speed delta ≥ 10 RPM/sec,command gear = 1st, 2nd, 4th, or 6th and gear ratio achieved.	Steady State Test event 1: Time ≥ 0.30 Seconds event2: time <= 4.0 seconds in a 3.0 second window Continuous	Same as Dynamic Test

Common engine speed enable: 500 RPM <= engine speed <= 7800 RPM for time >= 5.0 seconds
Common ignition voltage enable: 8.6 volts <= ignition voltage <= 19.0 volts
Common vehicle speed enable: 5.0 KPH <= vehicle speed for time >= 5.0 seconds,

SENSED PARAMETER	FAULT CODE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALF DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	MONITORING TIME LENGTH AND FREQUENCY OF CHECK	DTC TYPE
Pressure Control (PC) Solenoid C Stuck Off [C456]	P0796 Dynamic Test	This DTC detects a neutral condition when 4rd, 5th, or 6th gear is commanded, or steady state 4th, 5th, or 6th gear, C456 clutch system stuck OFF failure DTC will set due to either a steady state or dynamic test failure	Dynamic test (shift in progress): High speed mode: TOSS >= 60 RPM. High speed mode: command gear slip >= 100 RPM for time >= 2.25 seconds. Low speed mode: TOSS < 60 RPM. Low speed mode: turbine speed >= ((60 RPM * commanded gear ratio) + 100 RPM)	Dynamic test (shift in progress): Transmission fluid temperature >= 0.0 DegC, no P0716, P0717, P0722, P0723, P1815, P1820, P1822, P1823, P1825, P1826, turbine speed >= 60 RPM, C456 is on-coming clutch and C456 on coming control is complete.	Dynamic test (shift in progress): Time ≥ 2.25 sec	A
	P0796 Steady State Test in 4th	Neutral when holding clutch C456 is enabled for 4th gear.	Steady state test: in sequence from 4th gear: event 1: command gear is 4th and gear box slip ≥ 100.0 RPM event 2: induce 4-5 upshift command gear is 5th and 5th gear gear box slip <= 35.2 RPM AND gear box slip <= 100.0 RPM, C35R VBS is at maximum command pressure	Steady state test: Ignition votage enable, No P0716, P0717, P0722, P0723, P1915, P1825 DTCs FA AND TFTKO, High side driver is enabled, average driven wheel speed ≥ 80.0 RPM, side-to-side wheel speed diference ≤ 150 RPM, delta wheel speed (average driven wheel to average non-driven wheel) ≤ 7.0 % for time ≤ 6.0 sec, 4th, 5th, or 6th gear ratio achieved.	Steady state test: event 1: fail time >= 5.0 seconds event 2: fail time <= 4.0 seconds in a 5.0 second window Continuous	Same as Dynamic Test
	P0796 Steady State Test in 5th	Neutral when holding clutch C456 is enabled for 5th gear.	Steady state test: in sequence from 5th gear: event 1: command gear is 5th and gear box slip ≥ 100.0 RPM event 2: induce 5-6 upshift command gear is 6th and 6th gear gear box slip <= 35.2 RPM AND gear box slip <= 100.0 RPM, CB26 VBS is at maximum command pressure	Steady state test: Ignition votage enable, No P0716, P0717, P0722, P0723, P1915, P1825 DTCs FA AND TFTKO, High side driver is enabled, average driven wheel speed ≥ 80.0 RPM, side-to-side wheel speed diference ≤ 150 RPM, delta wheel speed (average driven wheel to average non-driven wheel) ≤ 7.0 % for time ≤ 6.0 sec, 4th, 5th, or 6th gear ratio achieved.	Steady state test: event 1: fail time >= 5.0 seconds event 2: fail time <= 4.0 seconds in a 5.0 second window Continuous	Same as Dynamic Test

Common engine speed enable: 500 RPM <= engine speed <= 7800 RPM for time >= 5.0 seconds
Common ignition voltage enable: 8.6 volts <= ignition voltage <= 19.0 volts
Common vehicle speed enable: 5.0 KPH <= vehicle speed for time >= 5.0 seconds,

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	P0796 Steady State Test in 6th	Neutral when holding clutch C456 is enabled for 6th gear.	Steady state test: in sequence from 6th gear: event 1: command gear is 6th and gear box slip ≥ 100.0 RPM event 2: induce 6-5 downshift command gear is 5th and 5th gear gear box slip <= 35.2 RPM AND gear box slip <= 100.0 RPM, CB26 VBS is at maximum command pressure	Steady state test: Ignition votage enable, No P0716, P0717, P0722, P0723, P1915, P1825 DTCs FA AND TFTKO, High side driver is enabled, average driven wheel speed ≥ 80.0 RPM, side-to-side wheel speed diference ≤ 150 RPM, delta wheel speed (average driven wheel to average non-driven wheel) ≤ 7.0 % for time ≤ 6.0 sec, 4th, 5th, or 6th gear ratio achieved.	Steady state test: event 1: fail time >= 5.0 seconds event 2: fail time <= 4.0 seconds in a 5.0 second window Continuous	Same as Dynamic Test
Pressure Control (PC) Solenoid C Stuck On [C456]	P0797 Dynamic Test	This DTC detects a tie-up condition when a shift from 4th, 5th, or 6th gear is commanded, or steadt state 1st, 2nd, or 3rd gear, C456 clutch system stuck ON failure DTC will set due to either a steady state or dynamic test failure	Dynamic test (shift in progress): gear box slip ≤ 40.0 RPM,	Dynamic test (shift in progress): C456 clutch command pressure = 0 kPa for time >= C456 zero capactiy delay time, where C456 zero capacity delay time = f(transmission fluid temperature) and {[on-coming clutch delta transition pressure > 50 kPa and 300 kPa < on-coming command clutch command pressure < 1950 kPa] or [C456 clutch control state = exhaust and on-coming clutch control state = maximum pressure]}. Attained gear slip <= 40 RPM for time >= calculated fail time, where calculated fail time = f(shift type, throttle position, transmission fluid temperature)	Dynamic test (shift in progress): Time ≥ 1.2 sec Continuous	A
	P0797 Steady State Test	Tie-up when holding clutch is C456.	Steady state test: in sequence from command gear ≠ 4th OR ≠ 5th OR ≠ 6th gear: event 1: (scaling factor = 1 if command gear ≠ 1st scaling factor = 2 if command gear = 1st) transmission output speed decelaration ≥ (1676 RPM/sec*scaling factor) for time >= 0.30 sec or) transmission output speed decelaration ≥ (900 RPM/sec*scaling factor) for time >= 0.30 sec with C456 pressure switch = "exhausted" event 2: release holding clutch, see "ss tie-uptest DTC map", 35.2 RPM ≤ gear box slip ≤ 100.0 RPM	Steady state test: Ignition votage enable,No P0716, P0717, P0722, P0723, P1915, P1825 DTCs FA AND TFTKO,Throttle position signal and engine torque signals valid from ECM,High side driver is enabled,brake state = off OR delta gear box torque ≥ 250.0 Nm in time ≤ 0.350 sec,(if command gear = 1st free-wheel, throttle position ≥ 10.0% and 120.0 Nm ≤ engine torque ≤ 1492.0 Nm),average driven wheel speed ≥ 80.0 RPM,side-to-side wheel speed diference ≤ 150 RPM,delta wheel speed (average driven wheel to average non-driven wheel) ≤ 7.0 % for time ≤ 6.0 sec,transmission output speed delta ≥ 1300 RPM/sec or PS4 is exhausted with transmission output speed delta ≥ 10 RPM/sec,command gear = 1st, 2nd, or 3rd and gear ratio achieved.	Steady State Test event 1: Time ≥ 0.30 Seconds event2: time <= 4.0 seconds in a 3.0 second window Continuous	Same as Dynamic Test

Common engine speed enable: 500 RPM <= engine speed <= 7800 RPM for time >= 5.0 seconds
Common ignition voltage enable: 8.6 volts <= ignition voltage <= 19.0 volts
Common vehicle speed enable: 5.0 KPH <= vehicle speed for time >= 5.0 seconds,

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Upshift Switch Circuit	P0815	This DTC detects the upshift switch Stuck ON	Fail Case 1: Switch stuck ON in P N or R for at least 3 seconds. Fail Case 2: Switch stuck ON in D6 for 600 seconds Fail Case 1 & 2 are true:	Common engine speed enable, common ignition voltage enable, No IMS Failures, No P0826 Set, Range Change Timer >6 seconds,	fail timer 1 ≥ 3.0 sec AND fail timer 2 ≥ 600.0 sec Continuous	C
Downshift Switch Circuit	P0816	This DTC detects the downshift switch Stuck ON	Fail Case 1: Switch stuck ON in P N or R for at least 3 seconds. Fail Case 2: Switch stuck ON in D6 for 600 seconds Fail Case 1 & 2 are true:	Common engine speed enable, common ignition voltage enable, No IMS Failures, No P0826 Set, Range Change Timer >6 seconds,	fail timer 1 ≥ 3.0 sec AND fail timer 2 ≥ 600.0 sec Continuous	C
Up and Down Shift Switch Circuit	P0826	This DTC detects the upshift/downshift switch circuit at an illegal voltage	TUTD Circuit Invalid voltage for 8 seconds	Common engine speed enable, common ignition voltage enable	Fail timer ≥ 8.0 seconds Continuous	C
S2 pressure switch circuit low voltage.	P0842	C35R Pressure Switch is Exhausted when it should be Pressurized (Short to Ground)	start up test: not enabled normal test: TCM shutdown not in process, C35R hydraulic pressure <= 100 kPa for stable time >= 0.45 seconds and pressure switch remains closed for time >= 5.5 seconds	Engine speed enable, Ignition voltage enable, P1915,P1825, P0711, P0712, P0713, P0965, P0966, P0967, P0969, P0970, P0971, P0973, P0974, P0976, P0977, P2719, P2720, P2721, P2728, P2729, P2730 not FA or TFTKO, 20 DegC <= TFT <= 150 DegC, Engine speed >= 1100rpm	Fail timer ≥ 5.5 seconds Continuous	C
S2 pressure switch circuit high voltage.	P0843	C35R Pressure Switch is Pressurized when it should be Exhausted (Open or StoP)	start up test: not enabled normal test: TCM shutdown not in process, engine speed enable, C35R hydraulic pressure >= 600 kPa for stable time >= 1 second and pressure switch remains open for time >= 5.5 seconds	Engine speed enable, Ignition voltage enable, P1915,P1825, P0711, P0712, P0713, P0965, P0966, P0967, P0969, P0970, P0971, P0973, P0974, P0976, P0977, P2719, P2720, P2721, P2728, P2729, P2730 not FA or TFTKO, 20 DegC <= TFT <= 150 DegC, Engine speed >=1100rpm	Fail timer ≥ 5.5 seconds Continuous	C
S3 pressure switch circuit low voltage.	P0872	CB26 Pressure Switch is Exhausted when it should be Pressurized (StoG)	start up test: not enabled normal test: TCM shutdown not in process, CB26 hydraulic pressure <= 100 kPa for stable time >= 0.45 seconds and pressure switch remains closed for time >= 5.5 seconds	Engine speed enable, Ignition voltage enable, P1915,P1825, P0711, P0712, P0713, P0965, P0966, P0967, P0969, P0970, P0971, P0973, P0974, P0976, P0977, P2719, P2720, P2721, P2728, P2729, P2730 not FA or TFTKO, 20 DegC <= TFT <= 150 DegC, Engine speed >=1100rpm	Fail timer ≥ 5.5 seconds Continuous	C
S3 pressure switch circuit high voltage.	P0873	CB26 Pressure Switch is Pressurized when it should be Exhausted (Open or StoP)	start up test: not enabled normal test: TCM shutdown not in process, engine speed enable, CB26 hydraulic pressure >= 600 kPa for stable time >= 1 second and pressure switch remains open for time >= 5.5 seconds	Engine speed enable, Ignition voltage enable, P1915,P1825, P0711, P0712, P0713, P0965, P0966, P0967, P0969, P0970, P0971, P0973, P0974, P0976, P0977, P2719, P2720, P2721, P2728, P2729, P2730 not FA or TFTKO, 20 DegC <= TFT <= 150 DegC, Engine speed >=1100rpm	Fail timer ≥ 5.5 seconds Continuous	C

Common engine speed enable: 500 RPM <= engine speed <= 7800 RPM for time >= 5.0 seconds
Common ignition voltage enable: 8.6 volts <= ignition voltage <= 19.0 volts
Common vehicle speed enable: 5.0 KPH <= vehicle speed for time >= 5.0 seconds,

SENSED PARAMETER	FAULT CODE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALF DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	MONITORING TIME LENGTH AND FREQUENCY OF CHECK	DTC TYPE
S1 pressure switch circuit low voltage.	P0877	C1234 Pressure Switch is Exhausted when it should be Pressurized (StoG)	start up test: not enabled normal test: TCM shutdown not in process, C1234 hydraulic pressure <= 100 kPa for stable time >= 0.45 seconds and pressure switch remains closed for time >= 5.5 seconds	Engine speed enable, Ignition voltage enable, P1915,P1825, P0711, P0712, P0713, P0965, P0966, P0967, P0969, P0970, P0971, P0973, P0974, P0976, P0977, P2719, P2720, P2721, P2728, P2729, P2730 not FA or TFTKO, 20 DegC <= TFT <= 150 DegC, Engine speed >=1100rpm	Fail timer ≥ 5.5 seconds Continuous	C
S1 pressure switch circuit high voltage.	P0878	C1234 Pressure Switch is Pressurized when it should be Exhausted (Open or StoP)	start up test: not enabled normal test: TCM shutdown not in process, engine speed enable, C1234 hydraulic pressure >= 600 kPa for stable time >= 1 second and pressure switch remains open for time >= 5.5 seconds	Engine speed enable, Ignition voltage enable, P1915,P1825, P0711, P0712, P0713, P0965, P0966, P0967, P0969, P0970, P0971, P0973, P0974, P0976, P0977, P2719, P2720, P2721, P2728, P2729, P2730 not FA or TFTKO, 20 DegC <= TFT <= 150 DegC, Engine speed >=1100rpm	Fail timer ≥ 5.5 seconds Continuous	C
Pressure Control (PC) Solenoid A Control Circuit Low Voltage	P0962	This DTC detects a continuous short to ground in the transmission line pressure VBS control circuit	hardware circuitry detects low pressure error is true for 300 milliseconds in a 375 millisecond sample	P0962 is not fault active or test fail this key on, ignition voltage enable, engine speed enable, line pressure control solenoid enabled	Fail time ≥ 0.30 sec in 0.375 sec sample Continuous	A
Pressure Control (PC) Solenoid B Control Circuit Low Voltage	P0966	This DTC detects a continuous short to ground in the C35R VBS control circuit	hardware circuitry detects low pressure error is true for 300 milliseconds in a 375 millisecond sample	P0966 is not fault active or test fail this key on, ignition voltage enable, engine speed enable	Fail time ≥ 0.30 sec in 0.375 sec sample Continuous	A
Pressure Control (PC) Solenoid B Control Circuit High Voltage	P0967	This DTC detects a continuous short to power or open in the C35R VBS control circuit	hardware circuitry detects high pressure error is true for 300 milliseconds in a 375 millisecond sample	P0967 is not fault active or test fail this key on, ignition voltage enable, engine speed enable	Fail time ≥ 0.30 sec in 0.375 sec sample Continuous	A
Pressure Control (PC) Solenoid C Control Circuit Low Voltage	P0970	This DTC detects a continuous short to ground in the C456/CBR1 VBS control circuit	hardware circuitry detects low pressure error is true for 300 milliseconds in a 375 millisecond sample	P0970 is not fault active or test fail this key on, ignition voltage enable, engine speed enable	Fail time ≥ 0.30 sec in 0.375 sec sample Continuous	A
Pressure Control (PC) Solenoid C Control Circuit High Voltage	P0971	This DTC detects a continuous short to power or open in the C456/CBR1 VBS control circuit	hardware circuitry detects high pressure error is true for 300 milliseconds in a 375 millisecond sample	P0971 is not fault active or test fail this key on, ignition voltage enable, engine speed enable	Fail time ≥ 0.30 sec in 0.375 sec sample Continuous	A
Shift Solenoid A Control Circuit Low	P0973	This DTC detects a continuous short to ground in the mode 2 on/off solenoid control circuit	hardware circuitry detects ground short error is true for 1.2 seconds in 1.5 second sample	P0973 is not fault active or test fail this key on, ignition voltage enable, engine speed enable	Fail time ≥ 1.2 sec in 1.5 sec sample Continuous	A
Shift Solenoid A Control Circuit High	P0974	This DTC detects a continuous short to power or open in the mode 2 on/off solenoid control circuit	hardware circuitry detects open or power short error is true for 1.2 seconds in 1.5 second sample	P0974 is not fault active or test fail this key on, ignition voltage enable, engine speed enable	Fail time ≥ 1.2 sec in 1.5 sec sample Continuous	B
Shift Solenoid B Control Circuit Low	P0976	This DTC detects a continuous short to ground in the mode 3 on/off solenoid control circuit	hardware circuitry detects open or power short error is true for 1.2 seconds in 1.5 second sample	P0976 is not fault active or test fail this key on, ignition voltage enable, engine speed enable	Fail time ≥ 1.2 sec in 1.5 sec sample Continuous	B

Common engine speed enable: 500 RPM <= engine speed <= 7800 RPM for time >= 5.0 seconds
Common ignition voltage enable: 8.6 volts <= ignition voltage <= 19.0 volts
Common vehicle speed enable: 5.0 KPH <= vehicle speed for time >= 5.0 seconds,

SENSED PARAMETER	FAULT CODE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALF DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	MONITORING TIME LENGTH AND FREQUENCY OF CHECK	DTC TYPE
Shift Solenoid B Control Circuit High	P0977	This DTC detects a continuous short to power or open in the mode 3 on/off solenoid control circuit	hardware circuitry detects open or power short error is true for 1.2 seconds in 1.5 second sample	P0977 is not fault active or test fail this key on, ignition voltage enable, engine speed enable	Fail time ≥ 1.2 sec in 1.5 sec sample Continuous	A
S4 pressure switch circuit low voltage.	P0989	CBR1/C456 Pressure Switch is Exhausted when it should be Pressurized (StoG)	start up test: not enabled normal test: TCM shutdown not in process, CBR1/C456 hydraulic pressure <= 100 kPa for stable time >= 0.45 seconds and pressure switch remains closed for time >= 5.5 seconds	Engine speed enable, Ignition voltage enable, P1915,P1825, P0711, P0712, P0713, P0965, P0966, P0967, P0969, P0970, P0971, P0973, P0974, P0976, P0977, P2719, P2720, P2721, P2728, P2729, P2730 not FA or TFTKO, 20 DegC <= TFT <= 150 DegC, Engine speed >= 1100rpm	Fail time ≥ 5.5 seconds Continuous	C
S4 pressure switch circuit high voltage.	P0990	CBR1/C456 Pressure Switch is Pressurized when it should be Exhausted (Open or StoP)	start up test: not enabled normal test: TCM shutdown not in process, engine speed enable, CBR1/C456 hydraulic pressure >= 600 kPa for stable time >= 1 second and pressure switch remains open for time >= 5.5 seconds	Engine speed enable, Ignition voltage enable, P1915,P1825, P0711, P0712, P0713, P0965, P0966, P0967, P0969, P0970, P0971, P0973, P0974, P0976, P0977, P2719, P2720, P2721, P2728, P2729, P2730 not FA or TFTKO, 20 DegC <= TFT <= 150 DegC, Engine speed >= 1100rpm	Fail time ≥ 5.5 seconds Continuous	C
Shift valve 1 performance	P1751	This DTC detects gear box slip when the mode 2 valve solenoid is commanded ON as part of P0742 TCC Stuck OFF Test	triggered by event 3 gear box slip ≥ 100.0 RPM increment fail and sample counter, reset latch protect delay timer to 3.0 sec, mode 2 valve solenoid request = FALSE	P1751 uses P0742 enable, transmission input speed ≥ 1200.0 RPM and then maintains ≥ 900 RPM test sequence: event1 if latch protect pressure = 0.0 kPa, set establish latch delay timer = 0.5 sec event 2 if establish latch delay timer = 0.0 and mode 2 valve solenoid request = FALSE and gear box slip ≤ 110.0 RPM, set line pressure command to 1300.0 kPa minimum latch protect pressure and and count down establish protect delay timer event 3 when establish latch protect delay timer = 0.0 sec and command gear ≠ 2nd, mode 2 valve solenoid request = TRUE (command mode 2 valve solenoid = ON) event 4 count down latch protect delay timer	Fail counter = 5 counts out of 5 sample counts Continuous	B

Common engine speed enable: 500 RPM <= engine speed <= 7800 RPM for time >= 5.0 seconds
Common ignition voltage enable: 8.6 volts <= ignition voltage <= 19.0 volts
Common vehicle speed enable: 5.0 KPH <= vehicle speed for time >= 5.0 seconds,

SENSED PARAMETER	FAULT CODE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALF DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	MONITORING TIME LENGTH AND FREQUENCY OF CHECK	DTC TYPE
Internal Mode Switch-Invalid Range	P1825	This DTC detects an error in the decoded value for the IMS switches.	Any fail case will set P1825 IMS Invalid Range fail case 1: IMS range = TRANSITIONL1 for time ≥ 8.0 sec in both conditions, increment fail counter fail case 2: TRANSITIONL13 for time ≥ 8.0 sec, increment fail counter fail case 3: TRANSITIONL8 for time ≥ 1.25 sec, increment fail counter fail case 4: IMS range ≠ PARK OR NEUTRAL OR AND IMS range = (PARK OR NEUTRAL) OR IMS range = Illegal fail case 5: TRANSITIONL11 for time ≥ 3.0 sec, increment fail counter	Ignition votage enable, Engine speed enable, fail case 1: C1234 or CB26 pressure switch = PRESSURIZED AND command gear = 1st lock, CB26 pressure switch = PRESSURIZED fail case 2: C1234 or CB26 pressure switch = PRESSURIZED fail case 3: C1234 or CB26 pressure switch = PRESSURIZED fail case 4: ECM park/neutral serial data signal = PARK OR NEUTRAL OR ECM park/neutral serial data signal ≠ (PARK OR NEUTRAL) fail case 5: vehicle speed ≥ 16 KPH, C1234 or CB26 pressure switch = PRESSURIZED	 fail case 1: fail counter ≥ 1 fail case 2: fail counter ≥ 1 fail case 3: fail counter ≥ 6 fail case 4: fail timer ≥ 6.25 sec fail case 5: fail counter ≥ 1 Continuous	A
Pressure Control (PC)/Shift Lock Solenoid Control Circuit Low Voltage	P1831	High side driver #1 open or short to ground.	open or ground short is detected by hardware circuitry, fail counter >= 3 counts out of 5 count sample (0.3 sec out of 0.5 sec)	ignition voltage enable, engine speed enable, high side driver #1 enabled, P1831 not fault active or test fail this key on	Fail counter ≥ 3 out of 5 count sample at 100 msec count rate Continuous	A
TUTD Shift Switch Enabled while not in TUTD Range	P1876	This DTC detects a TUTD Shift Switch Enabled while not in TUTD Range	range is not TUTD range enable D4 FWD D6 RWD while switch indicates enable for 3 counts of 2 seconds	500<=Engine Speed<=6500 rpm for at least 5 seconds; Ignition voltage enabled; U0100, P0815, P0816, P0826, P1915, P1825 not FA or TFTKO	Fail Time ≥ 2.0 seconds for 3 counts Continuous	C

Common engine speed enable: 500 RPM <= engine speed <= 7800 RPM for time >= 5.0 seconds
Common ignition voltage enable: 8.6 volts <= ignition voltage <= 19.0 volts
Common vehicle speed enable: 5.0 KPH <= vehicle speed for time >= 5.0 seconds,

SENSED PARAMETER	FAULT CODE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALF DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	MONITORING TIME LENGTH AND FREQUENCY OF CHECK	DTC TYPE
Internal Mode Switch Does Not Indicate Park/Neutral (P/N) During Start	P1915	This DTC detects an error in the decoded value for the IMS switches during an engine start	PRNDL NOT park or neutral, Sequentially:engine speed < 50 RPM for time >= 250 ms, 50 RPM <= engine speed <= 480 RPM for time >= 70 ms, engine speed >= 525 RPM for time >= 3.25 sec. input shaft speed >= 200 RPM	6 V <= ignition voltage <= 18 V, P0722, P0723 not fault active or test fail this key on, transmission output speed <= 90 RPM,	Fail Time ≥ 3.25 seconds Once per ignition cycle	A
No Ignition Voltage at the TCM	P2534	Detects a continuous open in TCM Ignition 1 Switch circuit	ignition voltage <= 2 V for time >= 1.0 seconds (40 counts)	Ignition voltage enable, engine running flag	Fail Counts ≥ 40 out of 40 counts Continuous	A
Pressure Control (PC) Solenoid D Stuck Off [CB26]	P2714 Dynamic Test	This DTC detects a neutral condition when 2nd or 6th gear is commanded, CB26 clutch system stuck OFF failure DTC will set due to either a steady state or dynamic test failure	Dynamic test (shift in progress): High speed mode: TOSS >= 60 RPM. High speed mode: command gear slip >= 100 RPM for time >= 2.25 seconds. Low speed mode: TOSS < 60 RPM. Low speed mode: turbine speed >= ((60 RPM * commanded gear ratio) + 100 RPM) for time >= 2.25 seconds.	Dynamic test (shift in progress): Transmission fluid temperature >= 0.0 DegC, no P0716, P0717, P0722, P0723, P1815, P1820, P1822, P1823, P1825, P1826, turbine speed >= 60 RPM, CB26 is on-coming clutch and CB26 on coming control is complete.	Dynamic test (shift in progress): time ≥ 2.25 sec Continuous	A
	P2714 Steady State Test 2nd Gear	Neutral when holding clutch CB26 is enabled for 2nd gear.	Steady state test: in sequence from 2nd gear: event 1: command gear is 2nd and gear box slip ≥ 100.0 RPM event 2: induce 2-3 upshift command gear is 2nd and 2nd gear gear box slip <= 35.2 RPM AND gear box slip <= 100.0 RPM, C35R VBS is at maximum command pressure	Steady state test: Ignition votage enable, No P0716, P0717, P0722, P0723, P1915, P1825 DTCs FA AND TFTKO, High side driver is enabled, average driven wheel speed ≥ 80.0 RPM, side-to-side wheel speed diference ≤ 150 RPM, delta wheel speed (average driven wheel to average non-driven wheel) ≤ 7.0 % for time ≤ 6.0 sec, 2nd or 6th gear ratio achieved.	Steady state test: event 1: fail time >= 5.0 seconds event 2: fail time <= 4.0 seconds in a 5.0 second window Continuous	Same as Dynamic Test

Common engine speed enable: 500 RPM <= engine speed <= 7800 RPM for time >= 5.0 seconds
Common ignition voltage enable: 8.6 volts <= ignition voltage <= 19.0 volts
Common vehicle speed enable: 5.0 KPH <= vehicle speed for time >= 5.0 seconds,

SENSED PARAMETER	FAULT CODE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALF DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	MONITORING TIME LENGTH AND FREQUENCY OF CHECK	DTC TYPE
	P2714 Steady State Test 6th Gear	Neutral when holding clutch CB26 is enabled for 6th gear.	Steady state test: in sequence from 6th gear: event 1: command gear is 6th and gear box slip ≥ 100.0 RPM event 2: induce 6-5 downshift command gear is 5th and 5th gear gear box slip <= 35.2 RPM AND gear box slip <= 100.0 RPM, C35R VBS is at maximum command pressure	Steady state test: Ignition votage enable, No P0716, P0717, P0722, P0723, P1915, P1825 DTCs FA AND TFTKO, High side driver is enabled, average driven wheel speed ≥ 80.0 RPM, side-to-side wheel speed diference ≤ 150 RPM, delta wheel speed (average driven wheel to average non-driven wheel) ≤ 7.0 % for time ≤ 6.0 sec, 2nd or 6th gear ratio achieved.	Steady state test: event 1: fail time >= 5.0 seconds event 2: fail time <= 4.0 seconds in a 5.0 second window Continuous	Same as Dynamic Test
Pressure Control (PC) Solenoid D Stuck On [CB26]	P2715 Dynamic Test	Tie-up when on-coming clutch is CB26 DTC will set due to either a steady state or dynamic test failure	Dynamic test (shift in progress): Dynamic test: CB26 clutch command pressure = 0 kPa for time >= CB26 zero capactiy delay time, where CB26 zero capacity delay time = f(transmission fluid temperature) and {[on-coming clutch delta transition pressure > 50 kPa and 300 kPa < on-coming command clutch command pressure < 1950 kPa] or [CB26 clutch control state = exhaust and on-coming clutch control state = maximum pressure]}. Attained gear slip <= 40 RPM for time >= calculated fail time, where calculated fail time = f(shift type, throttle position, transmission fluid temperature)	Dynamic test (shift in progress): Dynamic test: Transmission fluid temperature >= 0.0 DegC, no P0716, P0717, P0722, P0723, P1815, P1820, P1822, P1823, P1825, P1826. TOSS >= 200 RPM, Turbine Speed >= 200 RPM. CB26 is off-going clutch.	Dynamic test (shift in progress) Time ≥ 1.2 sec Continuous	A

Common engine speed enable: 500 RPM <= engine speed <= 7800 RPM for time >= 5.0 seconds
Common ignition voltage enable: 8.6 volts <= ignition voltage <= 19.0 volts
Common vehicle speed enable: 5.0 KPH <= vehicle speed for time >= 5.0 seconds,

SENSED PARAMETER	FAULT CODE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALF DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	MONITORING TIME LENGTH AND FREQUENCY OF CHECK	DTC TYPE
Pressure Control (PC) Solenoid D Stuck On [CB26]	P2715 Steady State Test	Tie-up when holding clutch is CB26.	Steady state test: in sequence from command gear ≠ 2nd OR ≠ 6th gear: event 1: (scaling factor = 1 if command gear ≠ 1st scaling factor = 2 if command gear = 1st) transmission output speed decelaration ≥ (1676 RPM/sec*scaling factor) for time >= 0.30 sec or) transmission output speed decelaration ≥ (900 RPM/sec*scaling factor) for time >= 0.30 sec with CB26 pressure switch = "exhausted" event 2: release holding clutch, see "ss tie-uptest DTC map", 35.2 RPM ≤ gear box slip ≤ 100.0 RPM	Steady state test: Ignition votage enable,No P0716, P0717, P0722, P0723, P1915, P1825 DTCs FA AND TFTKO,Throttle position signal and engine torque signals valid from ECM,High side driver is enabled,brake state = off OR delta gear box torque ≥ 250.0 Nm in time ≤ 0.350 sec,(if command gear = 1st free-wheel, throttle position ≥ 10.0% and 120.0 Nm ≤ engine torque ≤ 1492.0 Nm),average driven wheel speed ≥ 80.0 RPM,side-to-side wheel speed diference ≤ 150 RPM,delta wheel speed (average driven wheel to average non-driven wheel) ≤ 7.0 % for time ≤ 6.0 sec,transmission output speed delta ≥ 1300 RPM/sec or transmission output speed delta ≥ 10 RPM/sec with PS3 Exhausted ,command gear = 1st, 3rd, 4th, or 5th and gear ratio achieved.	Steady State Test event 1: Time ≥ 0.30 Seconds event2: time <= 4.0 seconds in a 3.0 second window	Same as Dynamic Test
Pressure Control (PC) Solenoid D Control Circuit High	P2720	This DTC detects a continuous short to ground in the CB26 VBS control circuit	hardware circuitry detects high pressure error is true for 300 milliseconds in a 375 millisecond sample	P2720 is not fault active or test fail this key on, ignition voltage enable, engine speed enable	Fail time ≥ 0.30 sec in 0.375 sec sample Continuous	A
Pressure Control (PC) Solenoid D Control Circuit Low	P2721	This DTC detects a continuous short to power or open in the CB26 VBS control circuit	hardware circuitry detects low pressure error is true for 300 milliseconds in a 375 millisecond sample	P2721 is not fault active or test fail this key on, ignition voltage enable, engine speed enable	Fail time ≥ 0.30 sec in 0.375 sec sample Continuous	A
Pressure Control (PC) Solenoid E Stuck Off	P2723 Dynamic Test	Neutral when on-coming clutch C1234 is enabled. DTC will set due to either a steady state or dynamic test failure	Dynamic test (shift in progress): Transmission fluid temperature >= 0.0 DegC, no P0716, P0717, P0722, P0723, P1815, P1820, P1822, P1823, P1825, P1826, turbine speed >= 60 RPM, C1234 is on-coming clutch and C1234 on coming control is complete.	Dynamic test (shift in progress): High speed mode: TOSS >= 60 RPM. High speed mode: command gear slip >= 100 RPM for time >= 2.25 seconds. Low speed mode: TOSS < 60 RPM. Low speed mode: turbine speed >= ((60 RPM * commanded gear ratio) + 100 RPM) for time >= 2.25 seconds.	Dynamic test (shift in progress): time ≥ 2.25 sec Continuous	A

Common engine speed enable: 500 RPM <= engine speed <= 7800 RPM for time >= 5.0 seconds
Common ignition voltage enable: 8.6 volts <= ignition voltage <= 19.0 volts
Common vehicle speed enable: 5.0 KPH <= vehicle speed for time >= 5.0 seconds,

SENSED PARAMETER	FAULT CODE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALF DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	MONITORING TIME LENGTH AND FREQUENCY OF CHECK	DTC TYPE
	P2723 Steady State Test 1st gear	Neutral when holding clutch C1234 is enabled for 1st gear.	Steady state test: in sequence from 1st gear: event 1: command gear is 1st and gear box slip ≥ 100.0 RPM event 2: induce 1-2 upshift command gear is 2nd and 2nd gear gear box slip <= 35.2 RPM AND gear box slip <= 100.0 RPM, CB26 VBS is at maximum command pressure	Steady state test: Ignition votage enable, No P0716, P0717, P0722, P0723, P1915, P1825 DTCs FA AND TFTKO, High side driver is enabled, average driven wheel speed ≥ 80.0 RPM, side-to-side wheel speed diference ≤ 150 RPM, delta wheel speed (average driven wheel to average non-driven wheel) ≤ 7.0 % for time ≤ 6.0 sec, 1st, 2nd, 3rd, or 4th gear ratio achieved.	Steady state test: event 1: fail time >= 5.0 seconds event 2: fail time <= 4.0 seconds in a 5.0 second window Continuous	Same as DynamicTest
	P2723 Steady state test 2nd gear	Neutral when holding clutch C1234 is enabled for 2nd gear.	Steady state test: in sequence from 2nd gear: event 1: command gear is 2nd and gear box slip ≥ 100.0 RPM event 2: induce 2-3 upshift command gear is 3rd and 3rd gear gear box slip <= 35.2 RPM AND gear box slip <= 100.0 RPM, C35R VBS is at maximum command pressure	Steady state test: Ignition votage enable, No P0716, P0717, P0722, P0723, P1915, P1825 DTCs FA AND TFTKO, High side driver is enabled, average driven wheel speed ≥ 80.0 RPM, side-to-side wheel speed diference ≤ 150 RPM, delta wheel speed (average driven wheel to average non-driven wheel) ≤ 7.0 % for time ≤ 6.0 sec, 1st, 2nd, 3rd, or 4th gear ratio achieved.	Steady state test: event 1: fail time >= 5.0 seconds event 2: fail time <= 4.0 seconds in a 5.0 second window Continuous	Same as Dynamic Test
	P2723 Steady state test 3rd gear	Neutral when holding clutch C1234 is enabled for 3rd gear.	Steady state test: in sequence from 3rd gear: event 1: command gear is 3rd and gear box slip ≥ 100.0 RPM event 2: induce 3-4 upshift command gear is 4th and 4th gear gear box slip <= 35.2 RPM AND gear box slip <= 100.0 RPM, C456 VBS is at maximum command pressure	Steady state test: Ignition votage enable, No P0716, P0717, P0722, P0723, P1915, P1825 DTCs FA AND TFTKO, High side driver is enabled, average driven wheel speed ≥ 80.0 RPM, side-to-side wheel speed diference ≤ 150 RPM, delta wheel speed (average driven wheel to average non-driven wheel) ≤ 7.0 % for time ≤ 6.0 sec, 1st, 2nd, 3rd, or 4th gear ratio achieved.	Steady state test: event 1: fail time >= 5.0 seconds event 2: fail time <= 4.0 seconds in a 5.0 second window Continuous	Same as Dynamic Test

Common engine speed enable: 500 RPM <= engine speed <= 7800 RPM for time >= 5.0 seconds
Common ignition voltage enable: 8.6 volts <= ignition voltage <= 19.0 volts
Common vehicle speed enable: 5.0 KPH <= vehicle speed for time >= 5.0 seconds,

SENSED PARAMETER	FAULT CODE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALF DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	MONITORING TIME LENGTH AND FREQUENCY OF CHECK	DTC TYPE
	P2723 Steady state test 4th gear	Neutral when holding clutch C1234 is enabled for 4th gear.	Steady state test: in sequence from 4th gear: event 1: command gear is 4th and gear box slip ≥ 100.0 RPM event 2: induce 4-5 upshift command gear is 5th and 5th gear gear box slip <= 35.2 RPM AND gear box slip <= 100.0 RPM, C35R VBS is at maximum command pressure	Steady state test: Ignition votage enable, No P0716, P0717, P0722, P0723, P1915, P1825 DTCs FA AND TFTKO, High side driver is enabled, average driven wheel speed ≥ 80.0 RPM, side-to-side wheel speed diference ≤ 150 RPM, delta wheel speed (average driven wheel to average non-driven wheel) ≤ 7.0 % for time ≤ 6.0 sec, 1st, 2nd, 3rd, or 4th gear ratio achieved.	Steady state test: event 1: fail time >= 5.0 seconds event 2: fail time <= 4.0 seconds in a 5.0 second window Continuous	Same as Dynamic Test
Pressure Control (PC) Solenoid E Stuck On	P2724 Dynamic Test	Tie-up when off-going clutch is C1234 . DTC will set due to either a steady state or dynamic test failure	Dynamic test (shift in progress): C1234 clutch command pressure = 0 kPa for time >= C1234 zero capactiy delay time, where C1234 zero capacity delay time = f(transmission fluid temperature) and {[on-coming clutch delta transition pressure > 50 kPa and 300 kPa < on-coming command clutch command pressure < 1950 kPa] or [C1234 clutch control state = exhaust and on-coming clutch control state = maximum pressure]}. Attained gear slip <= 40 RPM for time >= calculated fail time, where calculated fail time = f(shift type, throttle position, transmission fluid temperature)	Dynamic test (shift in progress): Transmission fluid temperature >= 0.0 DegC, no P0716, P0717, P0722, P0723, P1815, P1820, P1822, P1823, P1825, P1826. TOSS >= 200 RPM, Turbine Speed >= 200 RPM. C1234 is off-going clutch.	Dynamic test (shift in progress): Time ≥ 1.2 sec Continuous	A

Common engine speed enable: 500 RPM <= engine speed <= 7800 RPM for time >= 5.0 seconds
Common ignition voltage enable: 8.6 volts <= ignition voltage <= 19.0 volts
Common vehicle speed enable: 5.0 KPH <= vehicle speed for time >= 5.0 seconds,

SENSED PARAMETER	FAULT CODE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALF DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	MONITORING TIME LENGTH AND FREQUENCY OF CHECK	DTC TYPE
	P2724 Steady state test	Tie-up when holding clutch is C1234.	Steady state test: in sequence from command gear ≠ 1st OR ≠ 2nd OR ≠ 3rdOR ≠ 4th gear: event 1: (scaling factor = 1 if command gear ≠ 1st scaling factor = 2 if command gear = 1st) transmission output speed decelaration ≥ (1676 RPM/sec*scaling factor) for time >= 0.30 sec or) transmission output speed decelaration ≥ (900 RPM/sec*scaling factor) for time >= 0.30 sec with C1234 pressure switch = "exhausted" event 2: release holding clutch, see "ss tie-uptest DTC map", 35.2 RPM ≤ gear box slip ≤ 100.0 RPM	Steady state test: Ignition votage enable,No P0716, P0717, P0722, P0723, P1915, P1825 DTCs FA AND TFTKO,Throttle position signal and engine torque signals valid from ECM,High side driver is enabled,brake state = off OR delta gear box torque ≥ 250.0 Nm in time ≤ 0.350 sec,(if command gear = 1st free-wheel, throttle position ≥ 10.0% and 120.0 Nm ≤ engine torque ≤ 1492.0 Nm),average driven wheel speed ≥ 80.0 RPM,side-to-side wheel speed diference ≤ 150 RPM,delta wheel speed (average driven wheel to average non-driven wheel) ≤ 7.0 % for time ≤ 6.0 sec,transmission output speed delta ≥ 1300 RPM/sec or transmission output speed delta ≥ 10 RPM/sec with PS1 Exhausted, command gear = 5th or 6th and gear ratio achieved.	Steady State Test event 1: Time ≥ 0.30 Seconds event2: time <= 4.0 seconds in a 3.0 second window	Same as Dynamic
Pressure Control (PC) Solenoid E Control Circuit High	P2729	This DTC detects a continuous short to ground in the C1234 VBS control circuit	hardware circuitry detects high pressure error is true for 300 milliseconds in a 375 millisecond sample	P2729 is not fault active or test fail this key on, ignition voltage enable, engine speed enable	Fail time ≥ 0.30 sec in 0.375 sec sample Continuous	A
Pressure Control (PC) Solenoid E Control Circuit Low	P2730	This DTC detects a continuous short to power or open in the C1234 VBS control circuit	hardware circuitry detects low pressure error is true for 300 milliseconds in a 375 millisecond sample	P2730 is not fault active or test fail this key on, ignition voltage enable, engine speed enable	Fail time ≥ 0.30 sec in 0.375 sec sample Continuous	A
Torque Converter Clutch Pressure Control Solenoid Control Circuit Low	P2763	This DTC detects a continuous short to power or open in the TCC VBS control circuit	hardware circuitry detects high pressure error is true for 4.4 seconds in 5 second sample	P2763 is not fault active or test fail this key on, ignition voltage enable, engine speed enable, high side driver is enabled	Fail Time ≥ 4.4 sec in a 5.0 sec sample Continuous	A
Torque Converter Clutch Pressure Control Solenoid Control Circuit High	P2764	This DTC detects a continuous short to ground in the TCC VBS control circuit	hardware circuitry detects low pressure error is true for 4.4 seconds in 5 second sample	P2764 is not fault active or test fail this key on, ignition voltage enable, engine speed enable, high side driver is enabled	Fail Time ≥ 4.4 sec in a 5.0 sec sample Continuous	A
Controller Area Network Bus Communication Error	U0073	TCM cannot communicate on the CAN Bus	GetCNDD_b_BusOffSt=TRUE for 5 counts (about 5 sec)	Ignition voltage enable	Fail Count = 5 out of 5 (Time ≈ 5 sec) Continuous	A
Lost Communications with Engine Control System	U0100	Communication between TCM & Engine Control System Lost	No valid ECM CAN message for 12 counts (about 12 sec)	Ignition voltage enable	Fail Count = 12 out of 12 (Time ≈ 12 sec) Continuous	A

Common engine speed enable: 500 RPM <= engine speed <= 7800 RPM for time >= 5.0 seconds
Common ignition voltage enable: 8.6 volts <= ignition voltage <= 19.0 volts
Common vehicle speed enable: 5.0 KPH <= vehicle speed for time >= 5.0 seconds,

SENSED PARAMETER	FAULT CODE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALF DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	MONITORING TIME LENGTH AND FREQUENCY OF CHECK	DTC TYPE

P0711 Fail Case 4 Table

Start-Up Transmission Temperature (DegC)	Time for Transmission Temp to reach 20 DegC (sec)
-50	2500
-25	1000
-10	800
-5	520
20	200

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Common ignition voltage enable: 8.6 volts <= ignition voltage <= 19.0 volts
Common vehicle speed enable: 5.0 KPH <= vehicle speed for time >= 5.0 seconds,

SENSED PARAMETER	FAULT CODE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALF DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	MONITORING TIME LENGTH AND FREQUENCY OF CHECK	DTC TYPE

steady state tie-up test

command gear		holding clutch to release	attained gear	DTC to set C1234	C35R	CB26	C456/CBR1
1st LKD	C1234						
	CBR1	X	2nd			P2715	
	CBR1	X	3rd		P0777		
1st FW	C1234						
	no holding		2nd			P2715	
	no holding		3rd		P0777		
	no holding		4th				797
2nd	C1234						
	CB26	X	3rd		P0777		
	CB26	X	4th				P0797
3rd	C1234						
	C35R	X	2nd			P2715	
	C35R	X	4th				P0797
4th	C1234	X	5th		P0777		
	C1234	X	6th			P2715	
	C456						
5th	C456						
	C35R	X	4th	P2724			
	C35R	X	6th			P2715	
6th	C456						
	CB26	X	4th	P2724			
	CB26	X	5th		P0777		

Revision Log

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Common engine speed enable: 500 RPM <= engine speed <= 7800 RPM for time >= 5.0 seconds
Common ignition voltage enable: 8.6 volts <= ignition voltage <= 19.0 volts
Common vehicle speed enable: 5.0 KPH <= vehicle speed for time >= 5.0 seconds,