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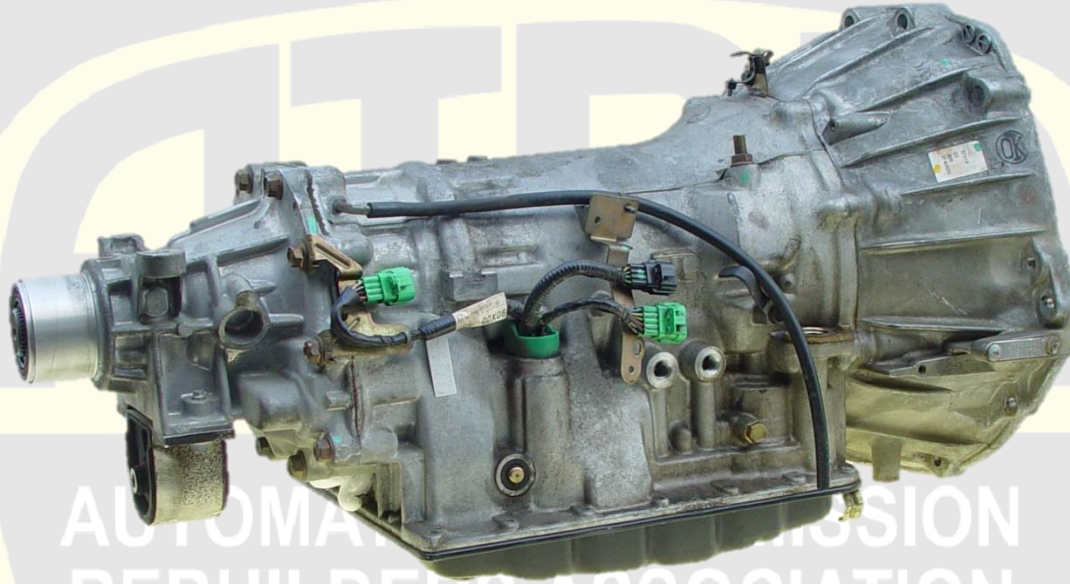


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RE5R05A



Presented by:
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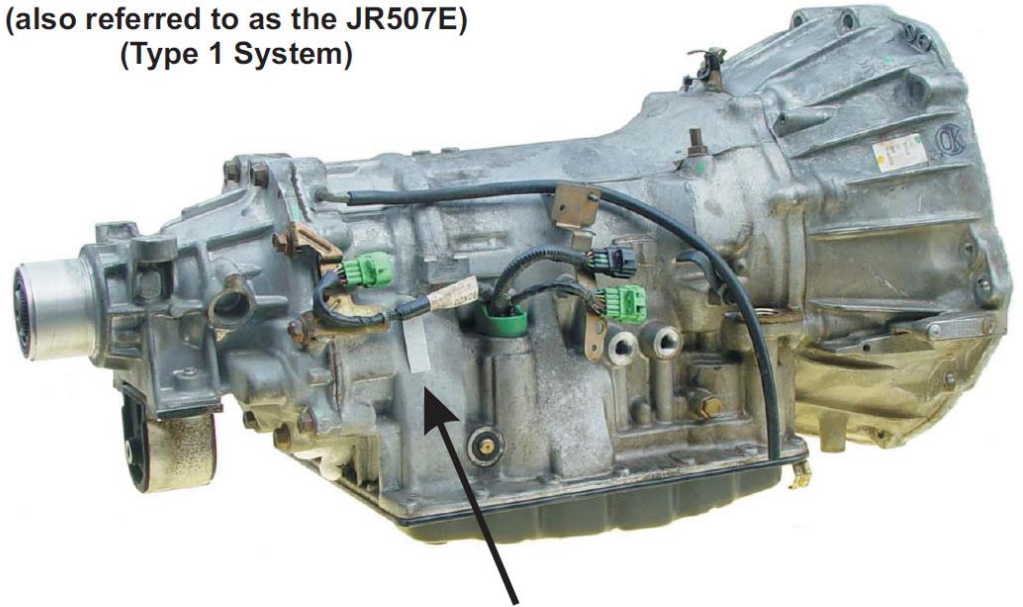
Introduction

Starting in mid 2002 JATCO introduced the RE5R05A: rear wheel drive, 5 speed automatic transmission used in the Infiniti Q45.

Since then, this unit has appeared in Infiniti, Kia and Nissan drivetrains.

There are many different planetary gear ratios based on year, make and model

2002 Jatco RE5R05A
(also referred to as the JR507E)
(Type 1 System)



Jatco Corporation
MODEL ##X##
NO. #####

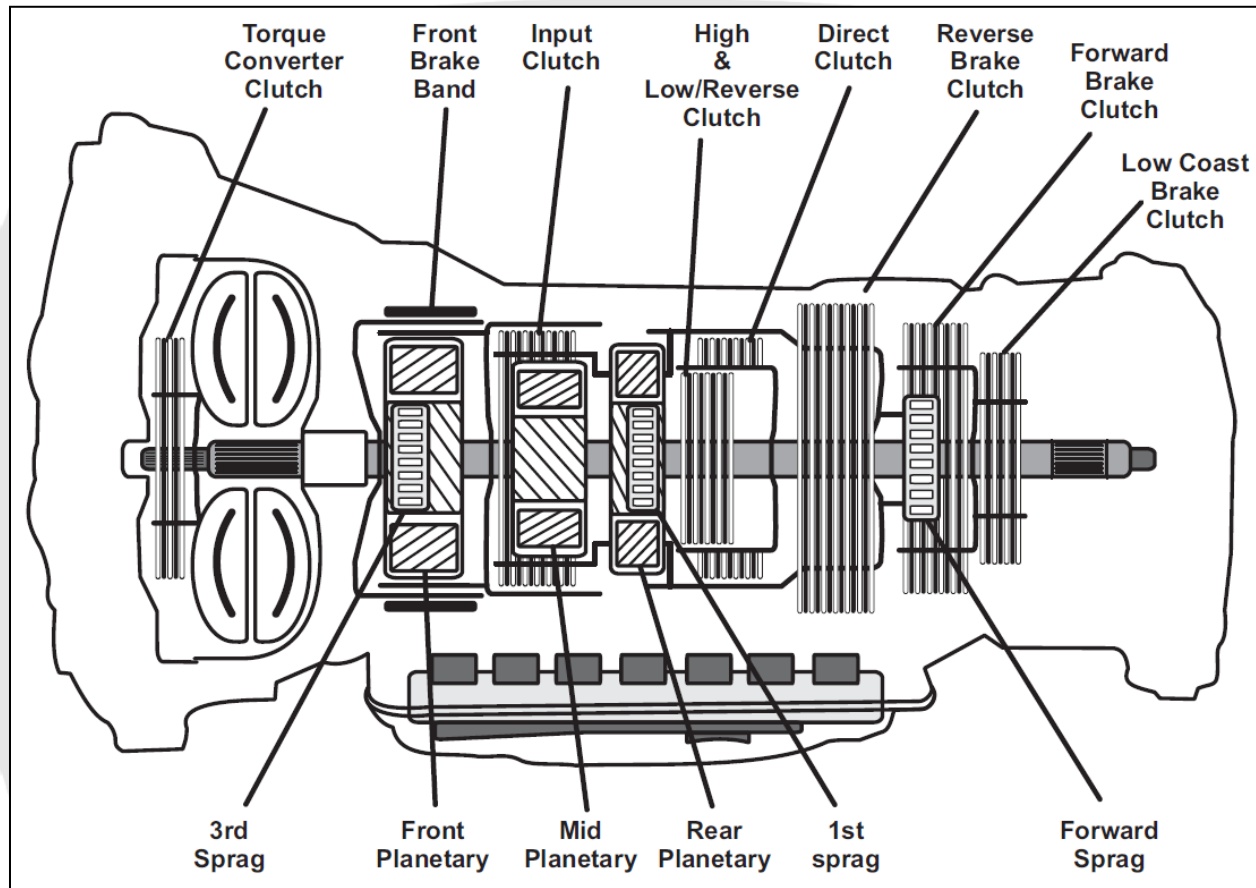


Application

Model	Geartrain	Year	Engine
<u>Infiniti (JR507E)</u>			
EX35	RWD/AWD	2008-11	3.5L V6
FX35	RWD/AWD	2003-08	3.5L V6
FX45	AWD	2003-08	4.5L V8
G35	RWD/AWD	2003-11	3.5L V6
G37	RWD/AWD	2007-08	3.7L V6
M35/X	RWD/AWD	2004-09	3.5L V6
M45	RWD	2002-09	4.5L V8
Q45	RWD	2002-07	4.5L V8
Qx56	RWD/4X4	2004-09	5.6L V8
<u>Nissan (RE5R05A)</u>			
350Z	RWD	2003-08	3.5L V6
Armada	RWD/4X4	2004-14	5.6L V8
Atlas	RWD/4X4	2012-14	2.0L L4
Caravan	RWD	2007-14	2.0L 2.5L L4
Cima	RWD	2000-11	3.0L V6 / 4.5L V8
Elgrand	RWD/AWD	2000-10	2.5L 3.5L V6
Fairlady Z/Roadster	RWD	2002-08	3.5L V6
Frontier	RWD/4X4	2004-11	2.4L 2.5L L4 / 4.0L V6
Fuga	RWD	2004-09	3.5L V6 / 4.5L V8
Navara	RWD/AWD	2005-14	2.3L 2.5L L4 / 4.0L V6
NV Series Van	RWD/AWD	2011-14	4.0L V6 / 5.6L V8
Pathfinder	RWD/4X4	2005-13	2.5L L4 / 4.0L V6 / 5.6L V8
Patrol	RWD/4X4	2010-14	5.6L V8
Safari	RWD/AWD	2003-14	4.8L L6
Skyline	RWD	2001-09	3.0L 3.5L V6
Stagea	RWD/AWD	2001-07	2.5L 3.0L 3.5L V6
Titan	RWD/4X4	2004-14	5.6L V8
Xterra XE	RWD/4X4	2005-09	4.0L V6
<u>Kia/Naza (A5SR1/2)</u>			
Mohave	RWD/4X4	2007-14	3.8L V6
Sorento	RWD/4X4	2005-12	2.5L L4 / 3.3L 3.5L 3.8L V6



Internal Component Locations



Recommended Fluid: Nissan Matic Fluid J (part synthetic)

Castrol Transmax J will work in place Nissan and Subaru J type fluids.

Meets requirements for Japanese JASO 1A standard, also approved by GM and Ford requiring DEXRON III or MERCON ATF.

Note: Not recommended for use with CVT transmissions.



Nissan Matic J Fluid

Nissan Matic Fluid J is no longer available and has been replaced with Matic S.

I was notified by Tim Prugh of CVC (Consolidated Vehicle Converters) that one of his customers contacted him stating that two Pathfinders were shuddering during lockup using his converters.

The shop only uses the Matic J fluid from Nissan but no longer available.

The shop tried using the Matic S fluid and the converters on both vehicles still shuddered.

Steve Younger at RatioTek stated that they have been battling this issue since the Matic J fluid has been discontinued.

The shop was told to use Honda fluid by Steve and it cured the problem.

Thanks, Tim and Steve for the heads up!



Component Apply Chart

Application Legend:

A = Applied

a1 = Operates under priming conditions

a2 = Operates under priming conditions

0 = Operates during progressive acceleration

00 = Operates and effects power while coasting

N = Engaged but not affective

Component ID:

I/C: Input Clutch

HLR/C: High and Low Reverse Clutch

D/C: Direct Clutch

R/B: Reverse Brake Clutch

FR/B: Front Brake Band

LC/B: Low Clutch Brake Clutch

Fwd/B: Forward Brake Clutch

1st OWC: 1st One-Way Clutch

Fwd OWC: Forward One-Way Clutch

3rd OWC: 3rd One-Way Clutch

Floor Shift Models

	GEAR	I/C	HLR/C	D/C	R/B	FR/B	LC/B	Fwd/B	1st OWC	Fwd OWC	3rd OWC
P			N			N					
R			A		A	A			0		0
N			N			N					
D	1st		a1			N	a2	A	0	0	0
	2nd			A		N		A		0	0
	3rd		A	A		A		N	00		0
	4th	A	A	A				N	00		
	5th	A	A			A		N	00		00
4	1st		a1			N	a2	A	0	0	0
	2nd			A		N		A		0	0
	3rd		A	A		A		N	00		0
	4th	A	A	A				N	00		
3	1st		a1			N	a2	A	0	0	0
	2nd			A		N		A		0	0
	3rd		A	A		A		N	00		0
	4th	A	A	A				N	00		
2	1st		a1			N	a2	A	0	0	0
	2nd			A		A	A	A		0	0
	3rd		A	A		A		N	00		0
	4th	A	A	A				N	00		
1	1st		A			A	A	A	0	0	0
	2nd			A		A	A	A		0	0
	3rd		A	A		A		N	00		0
	4th	A	A	A				N	00		



Component Apply Chart

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FR/B: Front Brake Band

LC/B: Low Clutch Brake Clutch

Fwd/B: Forward Brake Clutch

1st OWC: 1st One-Way Clutch

Fwd OWC: Forward One-Way Clutch

3rd OWC: 3rd One-Way Clutch

Column Shift Models

	GEAR	I/C	HLR/C	D/C	R/B	FR/B	LC/B	Fwd/B	1st OWC	Fwd OWC	3rd OWC
P			N			N					
R			A		A	A			0		0
N			N			N					
D	1st		a1			N	a2	A	0	0	0
	2nd			A		N		A		0	0
	3rd		A	A		A		N	00		0
	4th	A	A	A				N	00		
	5th	A	A			A		N	00		00
M5	1st		a1			N	a2	A	0	0	0
	2nd			A		N		A		0	0
	3rd		A	A		A		N	00		0
	4th	A	A	A				N	00		
	5th	A	A			A		N	00		00
M4	1st		a1			N	a2	A	0	0	0
	2nd			A		N		A		0	0
	3rd		A	A		A		N	00		0
	4th	A	A	A				N	00		
M3	1st		a1			N	a2	A	0	0	0
	2nd			A		N		A		0	0
	3rd		A	A		A		N	00		0
M2	1st		a1			N	a2	A	0	0	0
	2nd			A		A	A	A		0	0
M1	1st		A			A	A	A	0	0	0
	2nd			A		A	A	A		0	0



Adaptive Strategies

Before the transmission can start its adaptive learning process, the TCM must first relearn some very important parameters. The vehicle must be cleared of codes and at normal operating temperature.

The following Relearn procedures **MUST** be done if the Battery, Sensor connector, TCM or ECM is disconnected!

NOTE: The technician must use a clock to determine the time sequences.

1. Accelerator Pedal Released Position Learning: This is an operation to learn the fully released position of the Accelerator Pedal Position by monitoring the output signal.

Operation Procedure:

Make sure the accelerator pedal is fully released.

Turn the ignition switch to the ON position, wait at least 2 seconds.

Turn the ignition switch to the OFF position, wait at least 10 seconds.

Turn the ignition switch to the ON position, wait at least 2 seconds.

Turn the ignition switch to the OFF position, wait at least 10 seconds.

2. Throttle Valve Closed Position Learning:

This is an operation to learn the fully closed position of the Throttle Valve Position by monitoring the output signal.

Operation Procedure:

Make sure the accelerator pedal is fully released.

Turn the ignition switch to the ON position.

Turn the ignition switch to the OFF position, wait at least 10 seconds. (make sure the throttle valve moves during the 10 seconds in the OFF position by confirming the operating sound.)

All of these relearns can be done using the Consult 2 or manually. Be aware that all of the manual relearn procedures are done using time specifications.



Adaptive Strategies

3. Idle Air Volume Learning:

Preparation:

Before performing Idle Air Volume Learning, make sure the following conditions are met.

The learning procedure will stop if any of the following are not met prior to starting the procedure.

Battery Charging Voltage: More than 12.9V

Engine Coolant: (70 - 100°C) 158 - 212°F

PNP Switch: ON

Electrical Loads: OFF (A/C, Head lamps, Rear Window Defogger) **NOTE:** On vehicles equipped with daytime running light systems, apply the parking brake **BEFORE** you turn the ignition switch to the on position, this will keep the lights OFF. **Steering Wheel:** Neutral (Straight-ahead position)

Vehicle Speed: Stopped

Transmission: Operation temperature



Adaptive Strategies

Operation Procedure:

- 1. Perform the Accelerator Pedal Released Position Relearn**
- 2. Perform the Throttle Valve Closed Position Relearning procedure.**
- 3. Start the engine and run it until it reaches operation temperature.**
- 4. Once the engine is at operating temperature, turn the ignition OFF and wait for 10 seconds.**
- 5. Confirm the Accelerator Pedal is fully released, turn the ignition ON and wait for 3 seconds.**
- 6. Repeat the following procedures below QUICKLY five times within five seconds.**
- 7. Fully depress the accelerator pedal.**
- 8. Fully release the accelerator pedal..**
- 9. Wait 7 seconds, fully depress the accelerator pedal and keep it there for approximately 20 seconds until the MIL stops blinking and turned ON.**
- 10. Fully release the accelerator pedal within 3 seconds after the MIL light goes OUT.**
- 11. Start the engine and let it idle.**
- 12. Wait 20 seconds**
- 13. Rev the engine two or three times and make sure the idle speed and ignition timing are within the specifications. (InthePorNpositionIdle650RPM+/-50,15 BTDC)**
- 14. If the engine is not idling properly, the relearn procedure did not take or there is a problem with other engine related components.**



TCM Inputs

Control Item	Line Pressure Control	Vehicle Speed Control	Shift Control	Lock-up Control	Engine Brake Control	Fail-safe Function (*3)	Self-diag. Function
Accelerator pedal position signal (*4)	X	X	X	X	X	X	X
Vehicle speed sensor A/T (revolution sensor)	X	X	X	X		X	X
Vehicle speed sensor MTR (*1) (*4)	X	X	X	X			X
Closed throttle position signal (*4)	(*2) X	(*2) X		X	(*2) X		X
Wide open throttle position signal (*4)	(*2) X	(*2) X			(*2) X		X
Turbine revolution sensor 1	X	X		X		X	X
Turbine revolution sensor 2 (4th gear only)				X		X	X
Engine speed signals (*4)				X			X
PNP switch (park/neutral position)	X	X	X	X	X	X	X
A/T fluid temperature sensors 1 & 2	X	X	X	X	X	X	X
ASCD Operation signal (*4)		X	X	X	X		
ASCD Overdrive cancel signal (*4)		X		X	X		
TCM power supply voltage signal	X	X	X	X	X		X

*1: Spare for vehicle speed sensor A/T (revolution sensor)

*2: Spare for accelerator pedal position signal

*3: If these inputs and outputs are different, the TCM triggers the failsafe function

*4: CAN communications

ASCD: Automatic Speed Control Device refers to the steering column effects cruise control.



TCM Outputs

Control Item	Line Pressure Control	Vehicle Speed Control	Shift Control	Lock-up Control	Engine Brake Control	Fail-safe Function (*3)	Self-diag. Function
Direct clutch solenoid (ATF pressure switch 5)		X	X			X	X
Input clutch solenoid (ATF pressure switch 3)		X	X			X	X
High & low reverse clutch solenoid (ATF pressure switch 6)		X	X			X	X
Front brake solenoid (ATF pressure switch 1)		X	X			X	X
Low coast brake solenoid (ATF pressure switch 2)		X	X		X	X	X
Line pressure solenoid	X	X	X	X	X	X	X
TCC solenoid				X		X	X
Self-diagnostics table (*4)							X
Starter relay						X	X



Fail Safe Mode

The Fail Safe Mode for this transmission is fixed in 2nd, 4th or 5th depending on the failed position.

The customer will feel a “slipping” or “poor acceleration”. Even when the electronic circuits are normal, under special conditions (like wheel spin or drastically stopping the tire rotation), the transmission can go into Fail Safe Mode.

If this happens, switch “Off” the ignition switch for 10 seconds, then switch it “On” again to return to the normal shift pattern.

Gear Position		ATF pressure Switch Output				Fail-safe Function	Clutch pressure output pattern after fail-safe function					
	SW 3 (I/C)	SW 6 (HLR/C)	SW 5 (D/C)	SW 1 (FR/B)	SW 2 (LC/B)	Held	I/C	HLR/C	D/C	FR/B	LC/B	L/U
3rd	NG	X	X	NG		2nd	OFF	OFF	ON	OFF	OFF	OFF
4th	NG	X	X	NG		2nd	OFF	OFF	ON	OFF	OFF	OFF
5th	X	NG	NG	X		2nd	OFF	OFF	ON	OFF	OFF	OFF

NG = No Good

X = OK



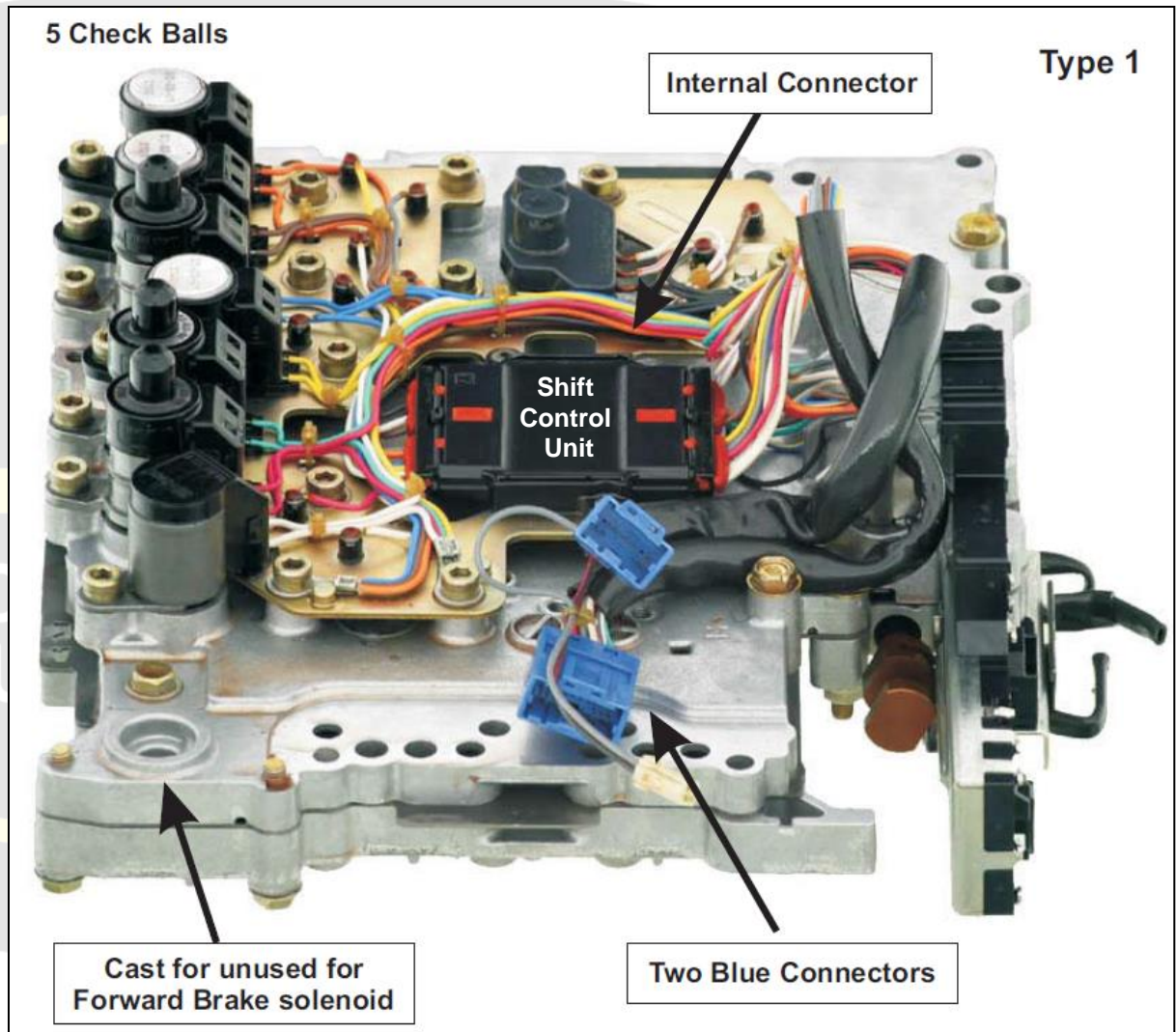
Solenoid & Sensor Locations

The Type 1 valve body system can be identified by the two blue connectors found in Infiniti vehicles up to Mid 2004.

The TCM for the Type 1 valve body system is located in the right kick panel next to the ECM.

In Mid 2004 the Type 2 valve body system the TCM was incorporated in all Infiniti and Nissan vehicles.

What is a Shift Control Unit?





“Shift Control Unit”

The “Shift Control Unit” is located on the lower side of the valve body attached to a bracket as part of the internal wire harness. According to the information found in factory manuals this shift control unit stores hydraulic correction and learned values for the initial shifting pressures for each solenoid (basic settings).

The transmission is test driven with hydraulic control valves (solenoids) and the input and output torque variation characteristics that the transmission undergoes during shifting. This data is stored in the shift control unit as initial learning values at the factory.

The current oil pressure characteristics of the linear solenoids are measured by the transmission control module. The stored shift control unit data is used by the transmission control module to initially control the solenoids until adjustments are made to fine tune shift control (shift learning control).

The shift control unit is often mistaken for the transmission control module (TCM). The TCM is located outside the transmission. Most common location is by the steering column dependent upon model and year.

Subaru 5AT transmission uses a similar system, the shift control unit in these models is referred to as the “Memory Box”.

Kia models refer to this as a “Sub Rom”.



Solenoid & Sensor Locations

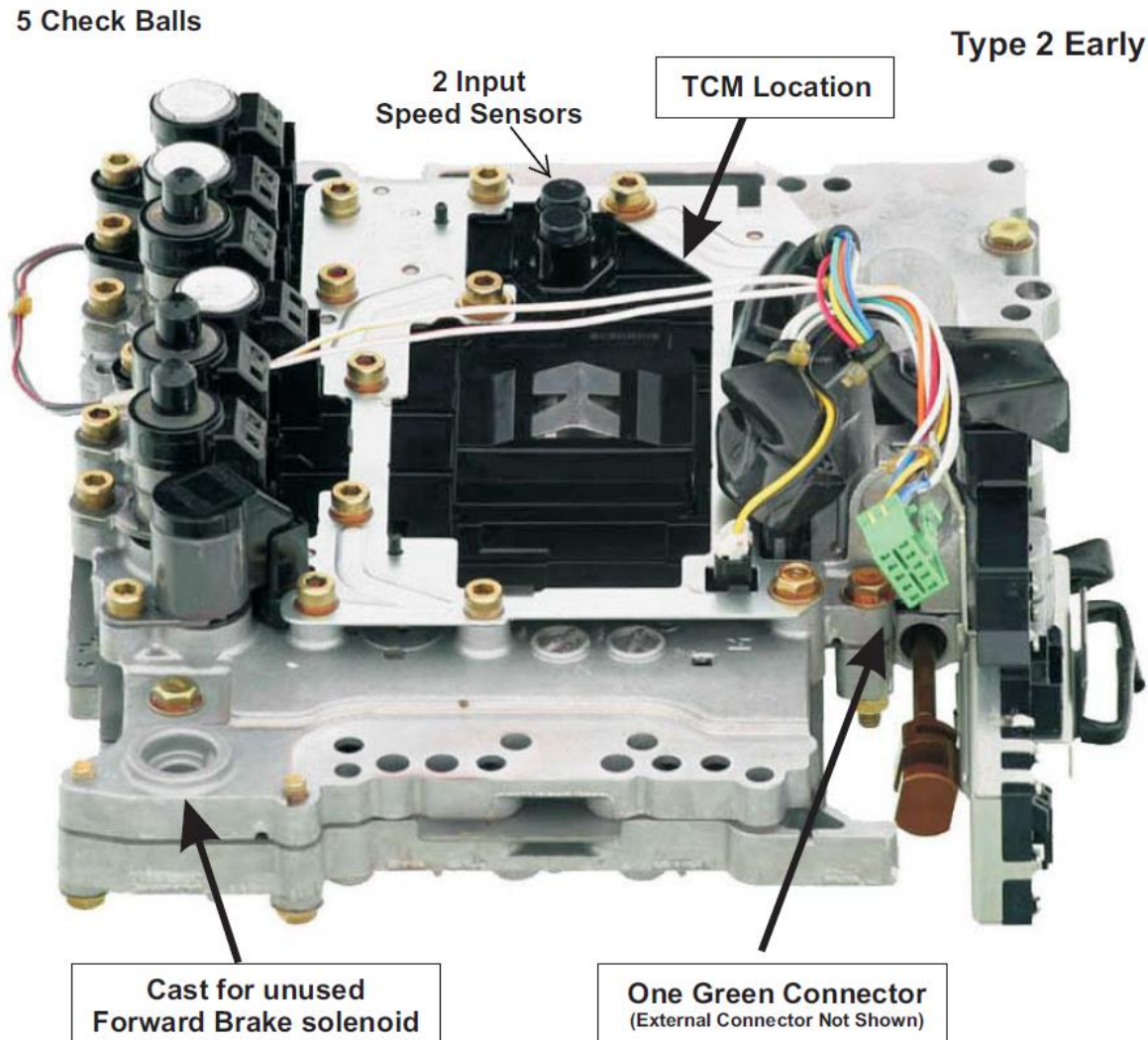
The Type 2 Early valve body system can be identified by the single green connector found on all Mid 2004 and later Infiniti and Nissan vehicles.

The TCM on the Type 2 combines the TCM, Pressure Switches, and 2 Input Speed Sensors.

The Range Sensor, Output Speed Sensor, Temp Sensors (2) and Solenoids are connected separately.

Valve body casting is easily identified by the unused Forward Brake Solenoid casting hole. This valve body has 5 check balls.

Type 1 and 2 are not interchangeable.





Solenoid & Sensor Locations

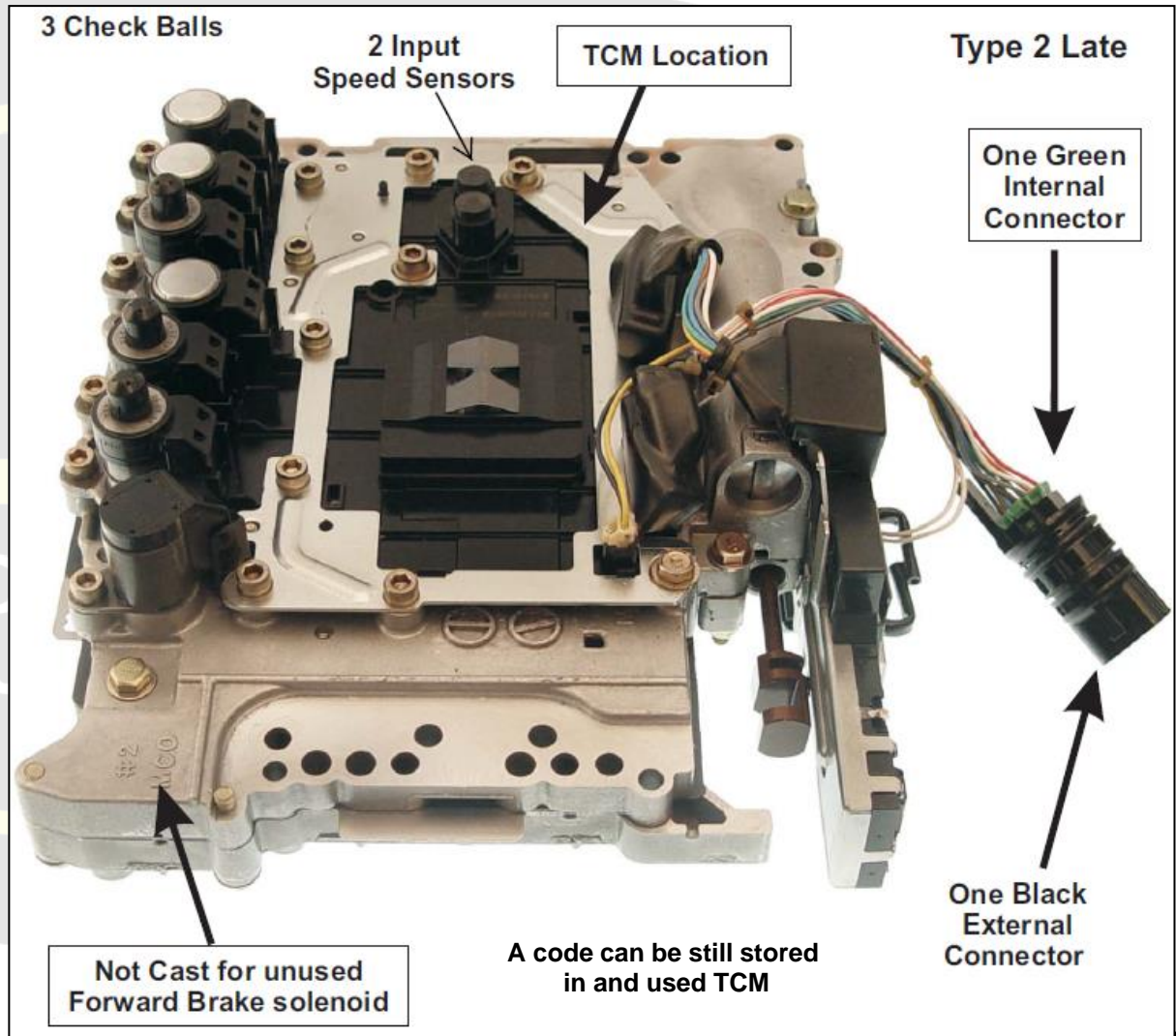
The Type 2 Late is identified by the unused Forward Brake Solenoid casting hole filled in. This valve body has 3 check balls.

Same as the early type 2 the TCM on this Type 2 combines the TCM, Pressure Switches, and 2 Input Speed Sensors.

The Range Sensor, Output Speed Sensor, Temp Sensors (2) and Solenoids are connected separately.

These can be interchanged as a complete assembly without being flashed to the vehicle.

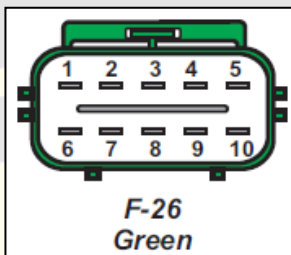
The replacement assembly must be from the same vehicle type. Due to ratio and shifter type (floor/column).



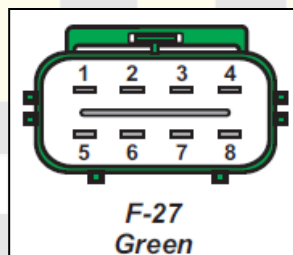


External Connector Views

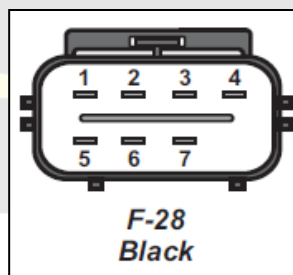
**2002 To Mid 2004 External
Connector & Terminal ID
(Type 1 System / External TCM
Models)**



Terminal	Connector F-26 Green
1	Ign. voltage signal from TCM to Shift Control Module
2	Data Bit 1 signal from TCM to Shift Control Module
3	PSB2 signal from Shift Control Module to TCM
4	PSC2 signal from Shift Control Module to TCM
5	SEL 1 signal from Shift Control Module to TCM
6	SEL 2 signal from Shift Control Module to TCM
7	SEL 3 signal from Shift Control Module to TCM
8	SEL 4 signal from Shift Control Module to TCM
9	TFT 1 Sensor signal to TCM
10	VSS signal out to TCM



Terminal	Connector F-27 Green
1	TFT 2 Sensor signal to TCM
2	TCM voltage signal to Low Coast Brake Clutch solenoid
3	TCM voltage signal to High & Low Reverse Clutch solenoid
4	TCM voltage signal to Direct Clutch solenoid
5	TCM voltage signal to Front Brake Band solenoid
6	TCM voltage signal to Input Clutch solenoid
7	TCM voltage signal to Line Pressure solenoid
8	TCM voltage signal to TCC solenoid

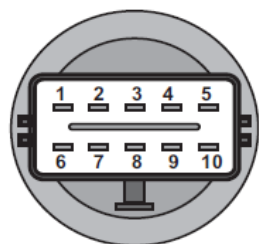


Terminal	Connector F-28 Black
1	S1 signal from PNP switch to TCM
2	S2 signal from PNP switch to TCM
3	SW 3 signal from Shift Control Module to TCM
4	S4 signal from PNP switch to TCM
5	MON signal from Shift Control Module to TCM
6	Turbine Revolution Sensor 1 signal to TCM
7	Turbine Revolution Sensor 2 signal to TCM
8	Not Used



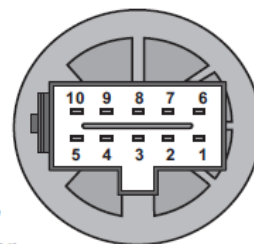
External Connector Views

**Mid 2004 & Up External
Connector & Terminal ID**
(Type 2 Systems / Internal TCM
Models)

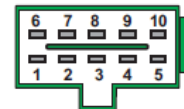


Top Side
F-10 Black
(female)

Single
Black
External
Connector



Bottom Side
F-10 Black
(female)



Male Internal
Green Harness
Connector

Terminal	Connector F-10 Black
1	Battery voltage supply 1 on at all times
2	Battery voltage supply 2 on at all times
3	CAN signal High to ECM and other devices
4	Data line out to Data Link Connector
5	Ground supply 2 to TCM
6	Ignition voltage from 10A fuse
7	Ground signal to Reverse Lamp Relay
8	CAN signal Low to ECM and other devices
9	Ground signal to Starter Relay
10	Ground supply 1 to TCM



Solenoid Location & Function

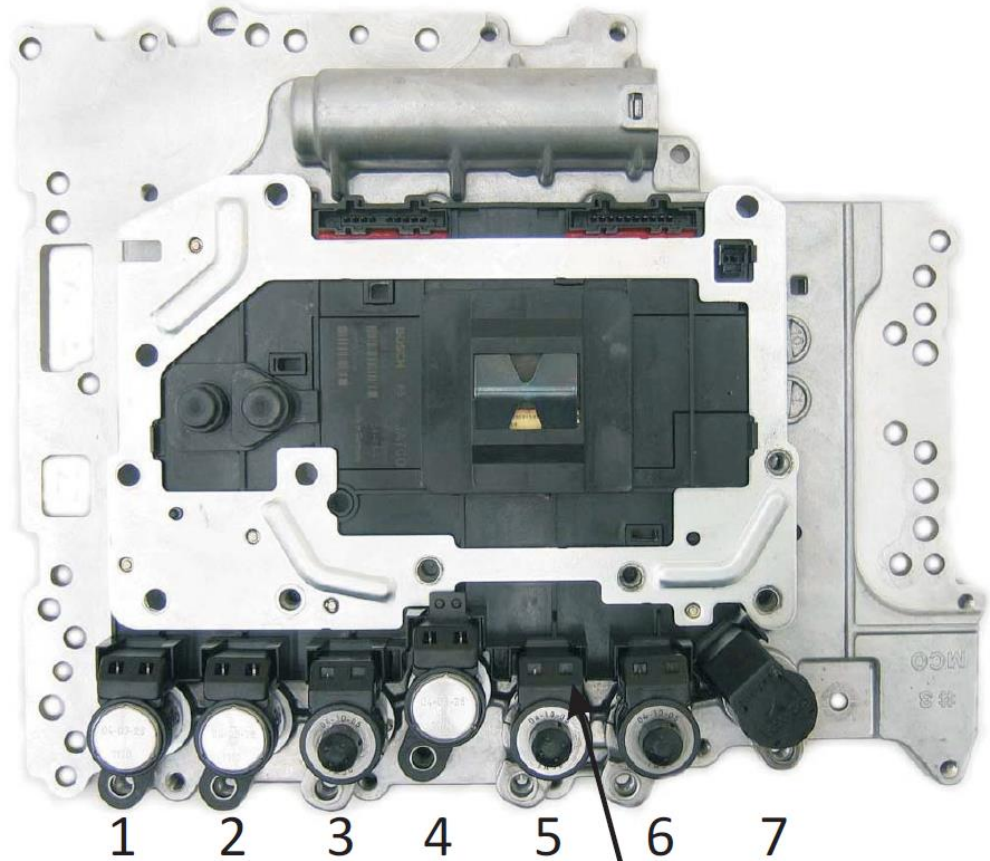
There are seven (7) solenoids on the valve body.

All of the solenoids except the Low Coast Brake solenoid (23 ohms) have 3.3 ohms resistance.

When checking the solenoid operation on scan tool data they will read between 0.0 to 0.8 amps.

For example, the TCC solenoid will run at 0.2 to 0.4 amps during slip and 0.4 to 0.7 amps when it's fully locked up.

The Input Clutch, Front Brake, Direct Clutch and High/Low Solenoids operate at 0.6 to 0.8 amps while disengaging the clutches (solenoids energized), and 0.0 to 0.05 amps when the clutches are engaged (solenoids de-energized).



1. Line Pressure Solenoid
2. TCC Solenoid
3. Direct Clutch Control Solenoid
4. Front Brake Control Solenoid
5. Input Clutch Control Solenoid
6. High/Low Reverse Solenoid
7. Low Coast Brake Solenoid

Check For Loose
Solenoid Pins



Solenoid Apply Chart

	Line Pressure N.V.	TCC Clutch N.V.	Direct Clutch N.A	Front Br Band N.V.	Input Clutch N.A.	High/Low Reverse N.A.	Low Coast Brake N.C.
Park	MOD	Off	On	On	On	Off	Off
Reverse	MOD	Off	On	On	On	Off	Off
1st	MOD	Off	On	On	On	Off	On (c)
2nd	MOD	Off	Off	On	On	On	Off
3rd	MOD	Off	Off	On	On	Off	Off
4th	MOD	On	Off	Off	Off	Off	Off
5th	MOD	On	On	On	Off	Off	Off

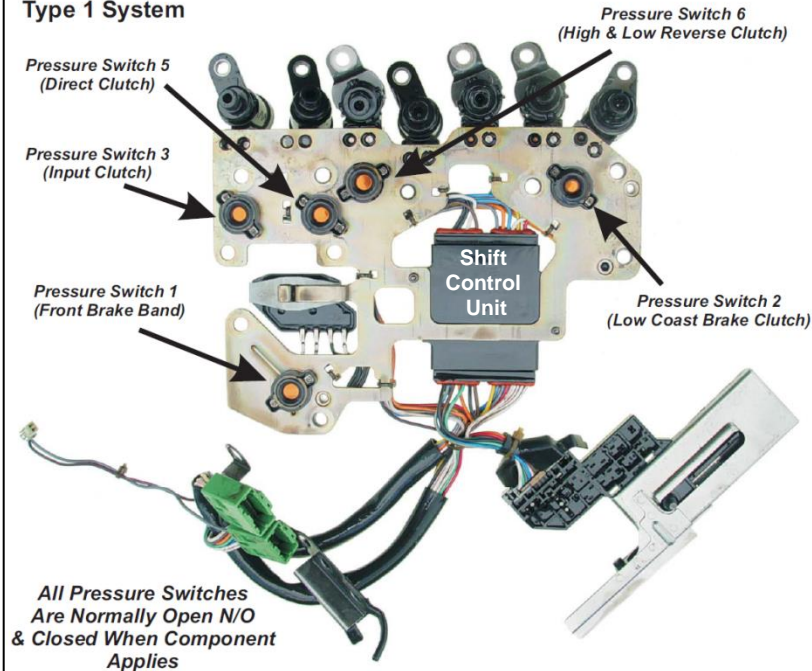
MOD: Modulating according to engine load

(c): During coast down

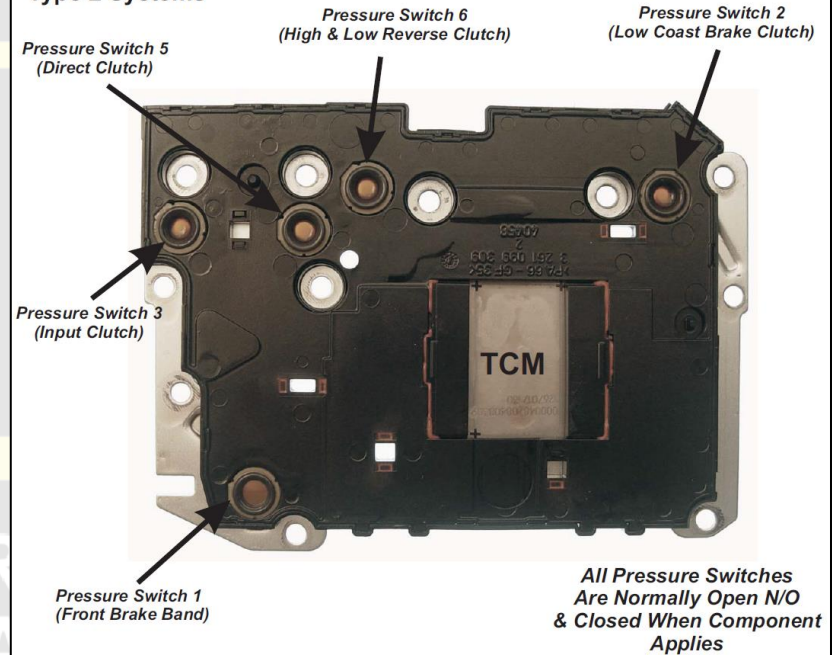


Pressure Switch ID & Function

Type 1 System



Type 2 Systems



Pressure Switch 1 (Front Brake Band)	Detects any malfunction in the front brake band hydraulic circuit. When it detects any malfunction, it puts the system into failsafe mode.
Pressure Switch 2 (Low Coast Brake Clutch)	Detects any malfunction in the low coast brake hydraulic circuit. When it detects any malfunction, it puts the system into failsafe mode.
Pressure Switch 3 (Input Clutch)	Detects any malfunction in the input clutch hydraulic circuit. When it detects any malfunction, it puts the system into failsafe mode.
Pressure Switch 5 (Direct Clutch)	Detects any malfunction in the direct clutch hydraulic circuit. When it detects any malfunction, it puts the system into failsafe mode.
Pressure Switch 6 (High & Low Reverse Clutch)	Detects any malfunction in the high & low reverse clutch hydraulic circuit. When it detects any malfunction, it puts the system into failsafe mode.



Pressure Apply Chart

Floor Shift Models

	GEAR	PS #1	PS #2	PS #3	PS #5	PS #6
P		A				
R		A				A
N		A				
D	1st	A				A
	2nd	A			A	
	3rd	A			A	A
	4th			A	A	A
	5th	A		A		A
4	1st	A				A
	2nd	A			A	
	3rd	A			A	A
	4th			A	A	A
3	1st	A				A
	2nd	A			A	
	3rd	A			A	A
2	1st	A				A
	2nd	A	A		A	
1	1st	A	A			A

A = Applied

PS #1 Front Brake Band
 PS #2 Low Coast Brake Clutch
 PS #3 Input Clutch
 PS #5 Direct Clutch
 PS #6 High & Low Reverse Clutch

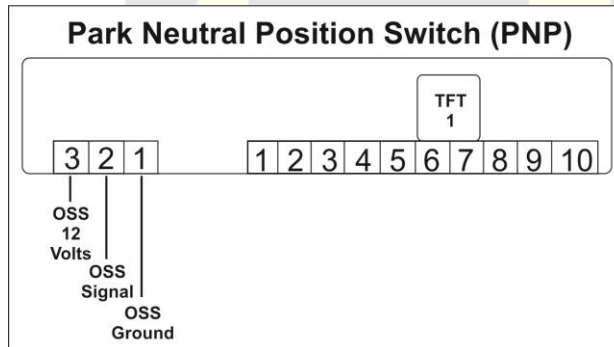
Column Shift Models

	GEAR	PS #1	PS #2	PS #3	PS #5	PS #6
P		A				
R		A				A
N		A				
D	1st	A				A
	2nd	A			A	
	3rd	A			A	A
	4th			A	A	A
	5th	A		A		A
M5	1st	A				
	2nd	A			A	
	3rd	A			A	A
	4th			A	A	A
	5th	A		A		A
M4	1st	A				
	2nd	A			A	
	3rd	A			A	A
	4th			A	A	A
M3	1st	A				
	2nd	A			A	
	3rd	A			A	A
M2	1st	A				A
	2nd	A	A		A	
M1	1st	A	A			A



Transmission Temperature Sensors (2)

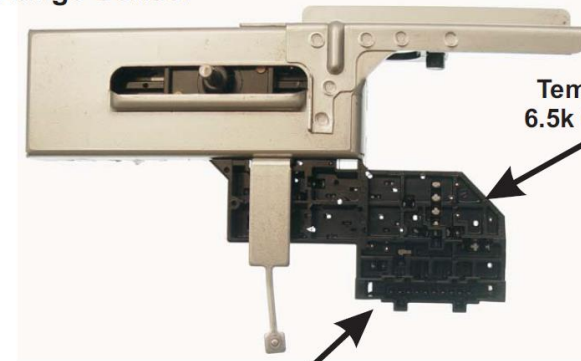
Temperature Sensor 1 (sump temperature) is integral to the Range Sensor (park/neutral position PNP) 6.5k ohm @ 68 F. Only Type 1 systems with external TCM can be checked without a scan tool.



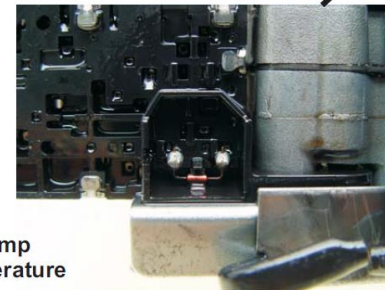
Transmission Temperature Sensor 2 (cooler hydraulic circuit) is separate from the TCM with 4k ohm resistance @ 68 F.

Eliminated on some models in mid 2007-08

Range Sensor



Temp Sensor 1
6.5k Ohm @ 68 F



Sump
Temperature

Sensor 2 Cooler Hydraulic Temp
0 C (32 F) 15k ohm
20 C (68 F) 4k ohm
80 C (172 F) 0.9k ohm

Sensor 1 Sump Temp
0 C (32 F) 10k ohm
20 C (68 F) 6.5k ohm
80 C (172 F) 0.5k ohm

Temp Sensor 2
4k Ohm @ 68 F



Connector

Cooler Hydraulic
Circuit



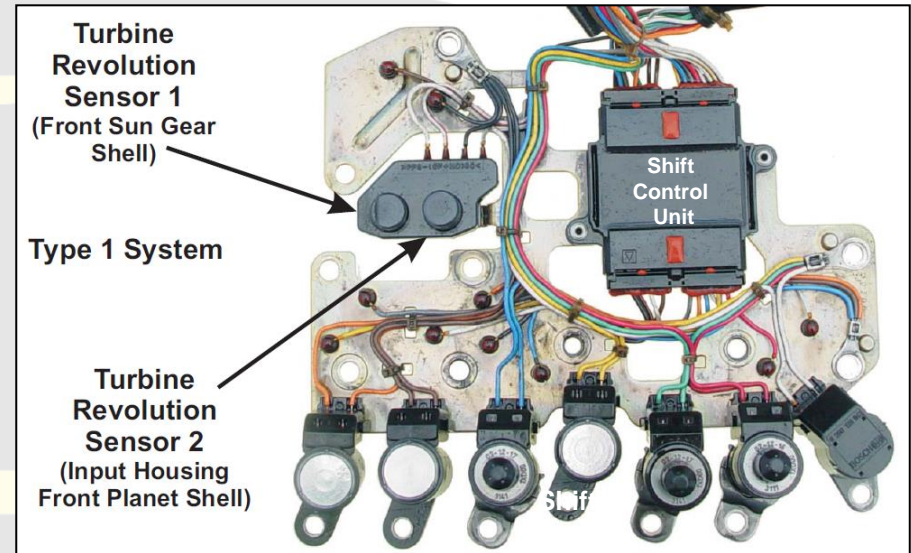
Turbine Revolution Sensors (2)

The Turbine Revolution Sensors on the Type 1 system can be checked externally.

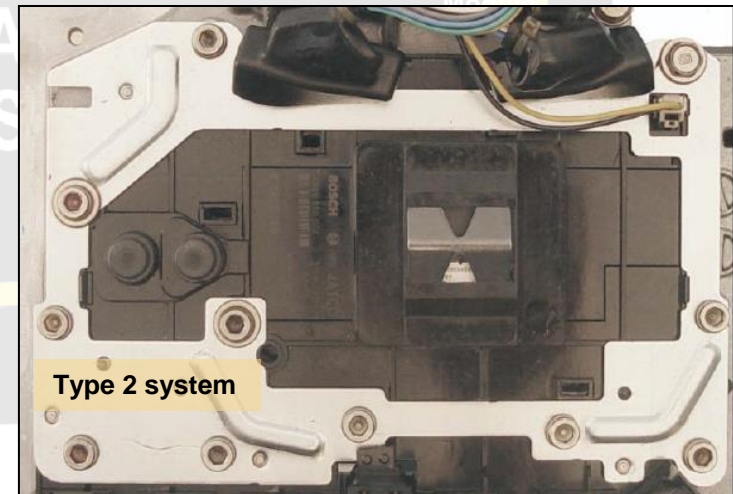
Turbine revolution sensor 1 When running at 50 km/h (31 MPH) in 4th speed with the closed throttle position switch "OFF" 1.3 (kHz).

Turbine Revolution Sensor 2 When moving at 20 km/h (12 MPH) in 1st speed with the closed throttle position switch "OFF" 1.3 (kHz)

On scan tool data Turbine RPM will closely match engine RPM.



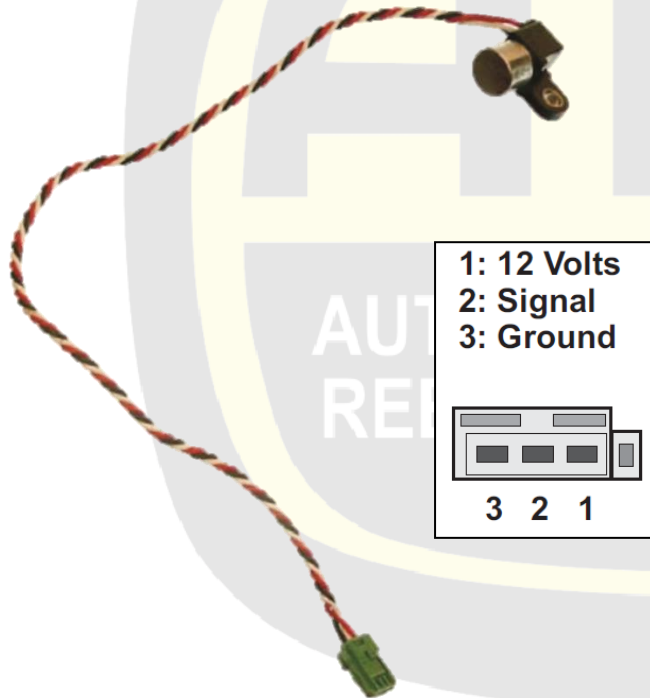
Type 2 systems require the use of capable scan tool or software.





Output Shaft Revolution Sensor

Output Shaft (Revolution) Sensor connects directly to the Range Sensor (Park/Neutral Position). When diagnosing a failed sensor; lower the pan disconnect the green connector, jump 12 volts to pin 1, ground pin 3 and with a DVOM check for a DC hertz signal on pin 2 while turning the output shaft (extension housing removed).

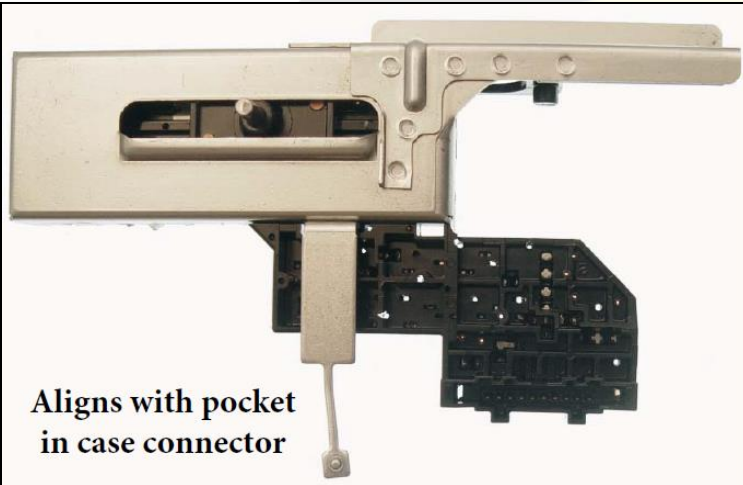


Can be bench tested



Park/Neutral Position Sensor (PNP)

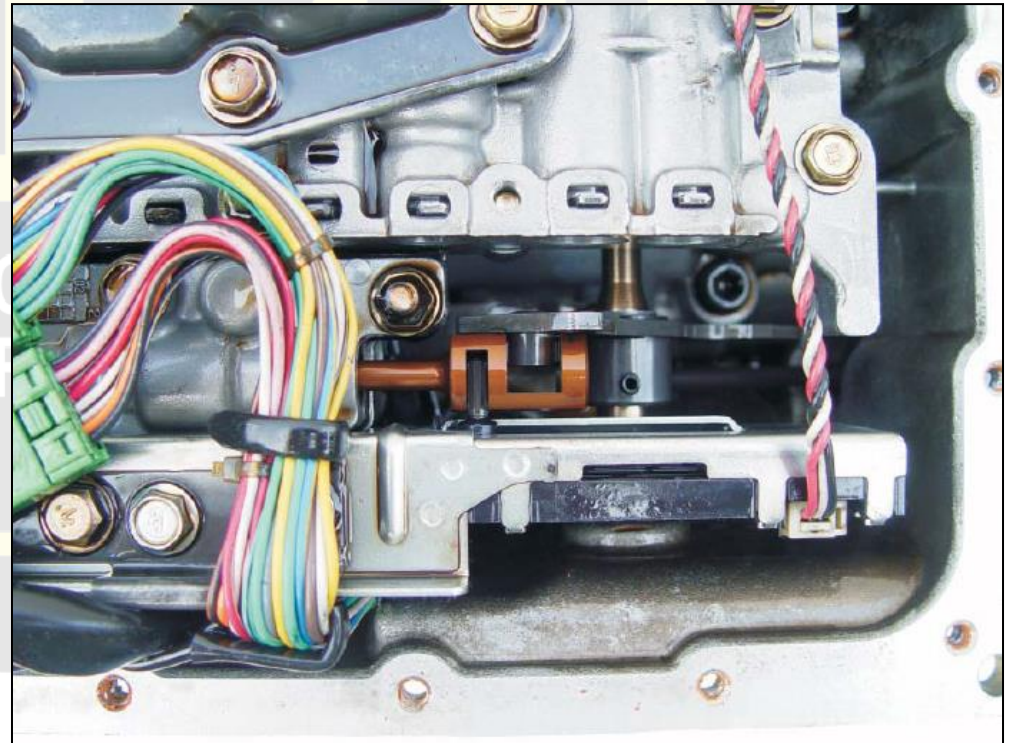
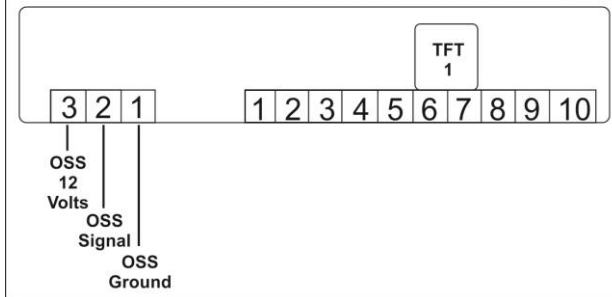
Park Neutral Position sensor PNP (range sensor) is located on the valve body



Aligns with pocket
in case connector

**Bent should be straight
(not found on external TCM models)**

Park Neutral Position Switch (PNP)



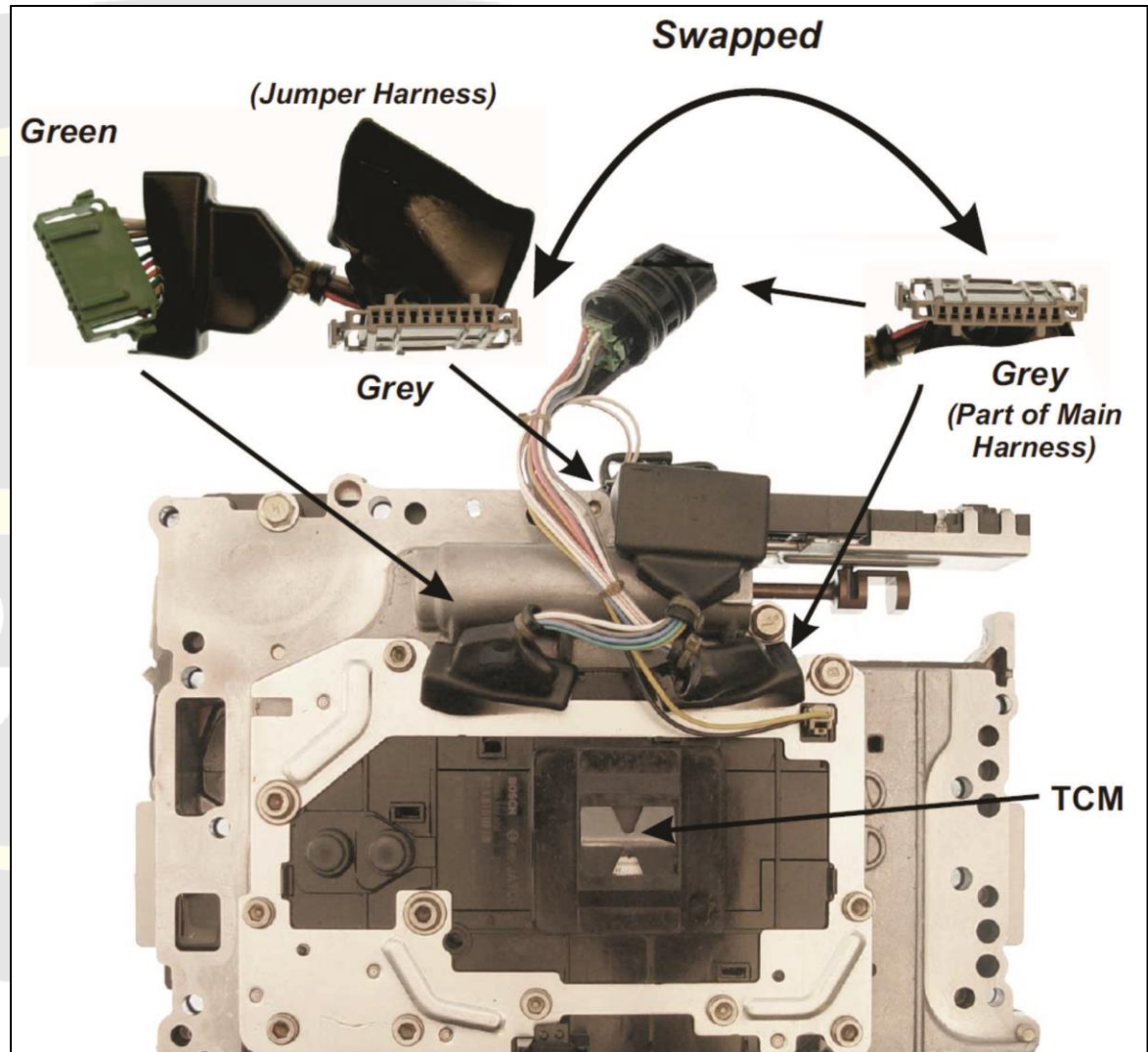


Connector Mismatch (Blown Fuse)

Several tech calls have been received on connector mismatch causing a blown fuse to the TCM.

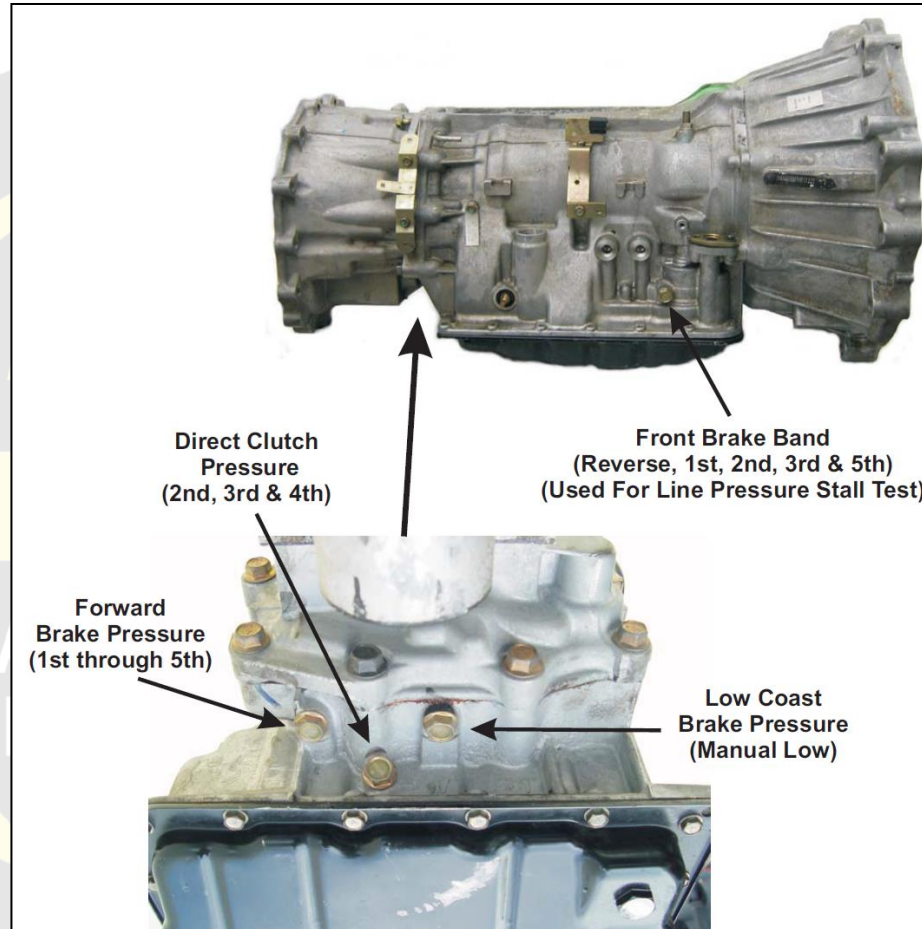
The problem occurs when the grey connector from the main harness is swapped with the grey connector for the park/neutral position sensor.

Battery voltage to the TCM is shorted out in the range sensor.





Pressure Test

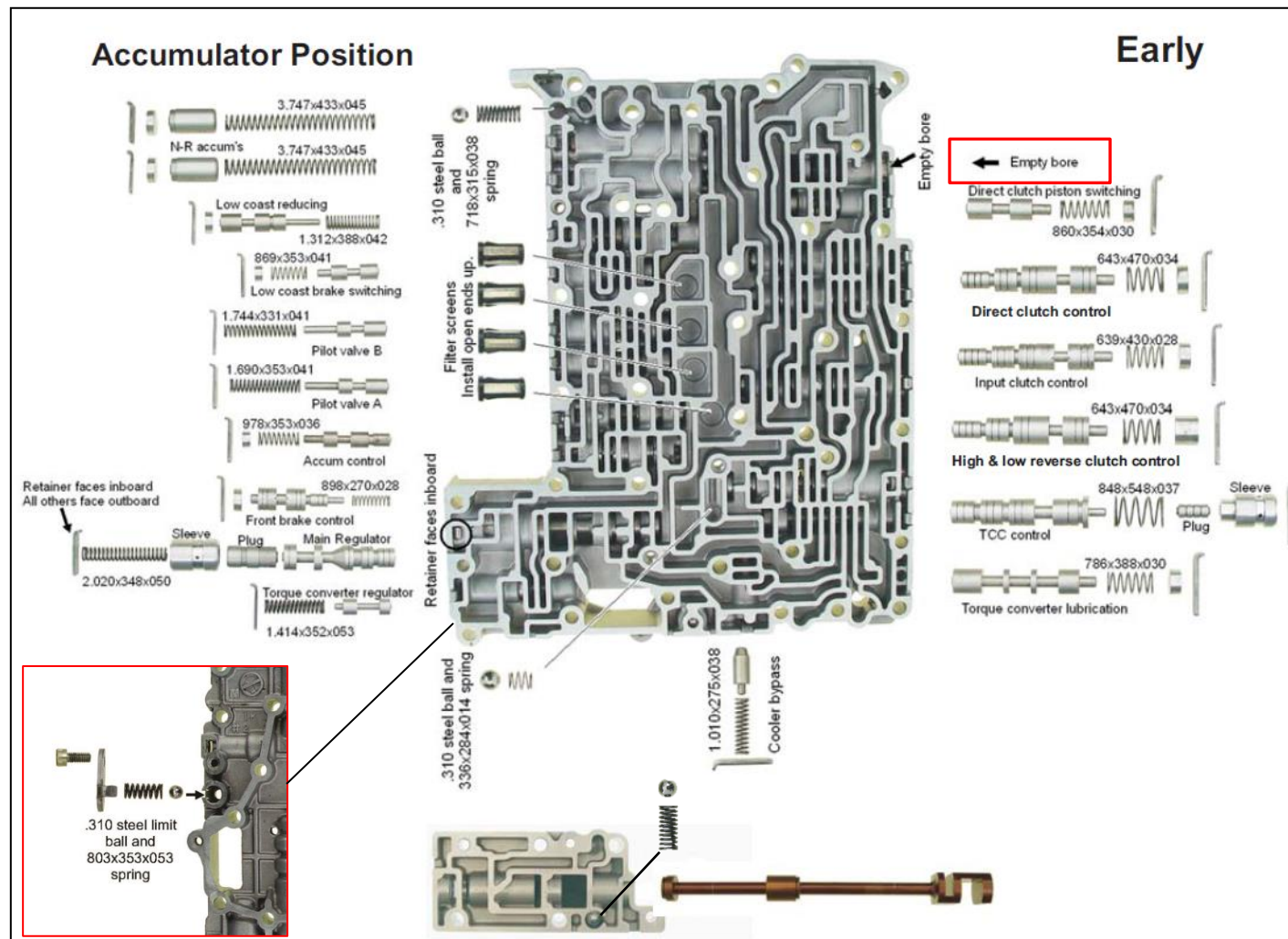


Line Pressure Specifications

Engine Speed	Reverse Position	Drive Position
AT Idle Speed	62 - 67 psi	55 - 62psi
At Stall Speed	233 - 283 psi	190 - 218 psi

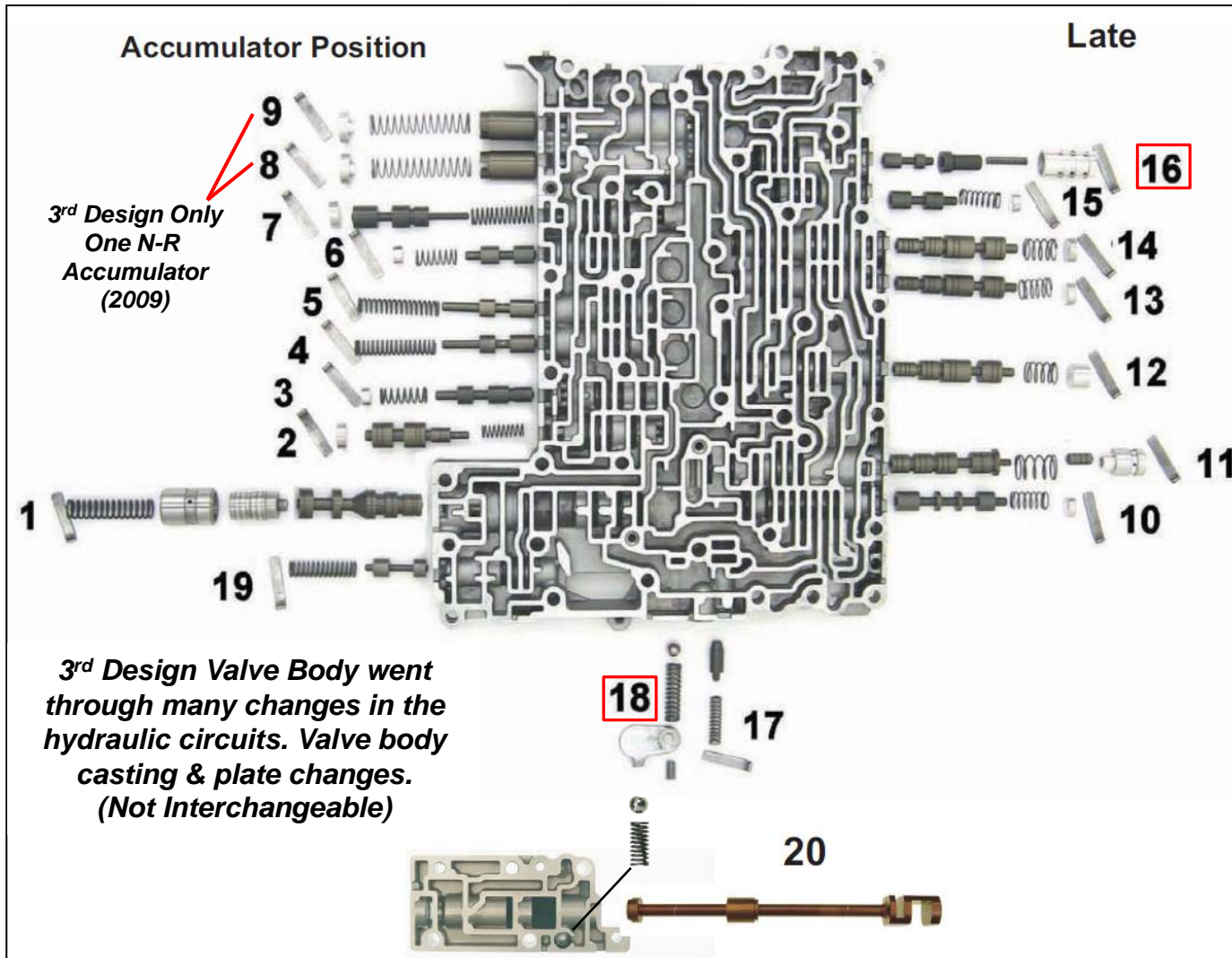


Lower Valve Body 2002-Mid 2004



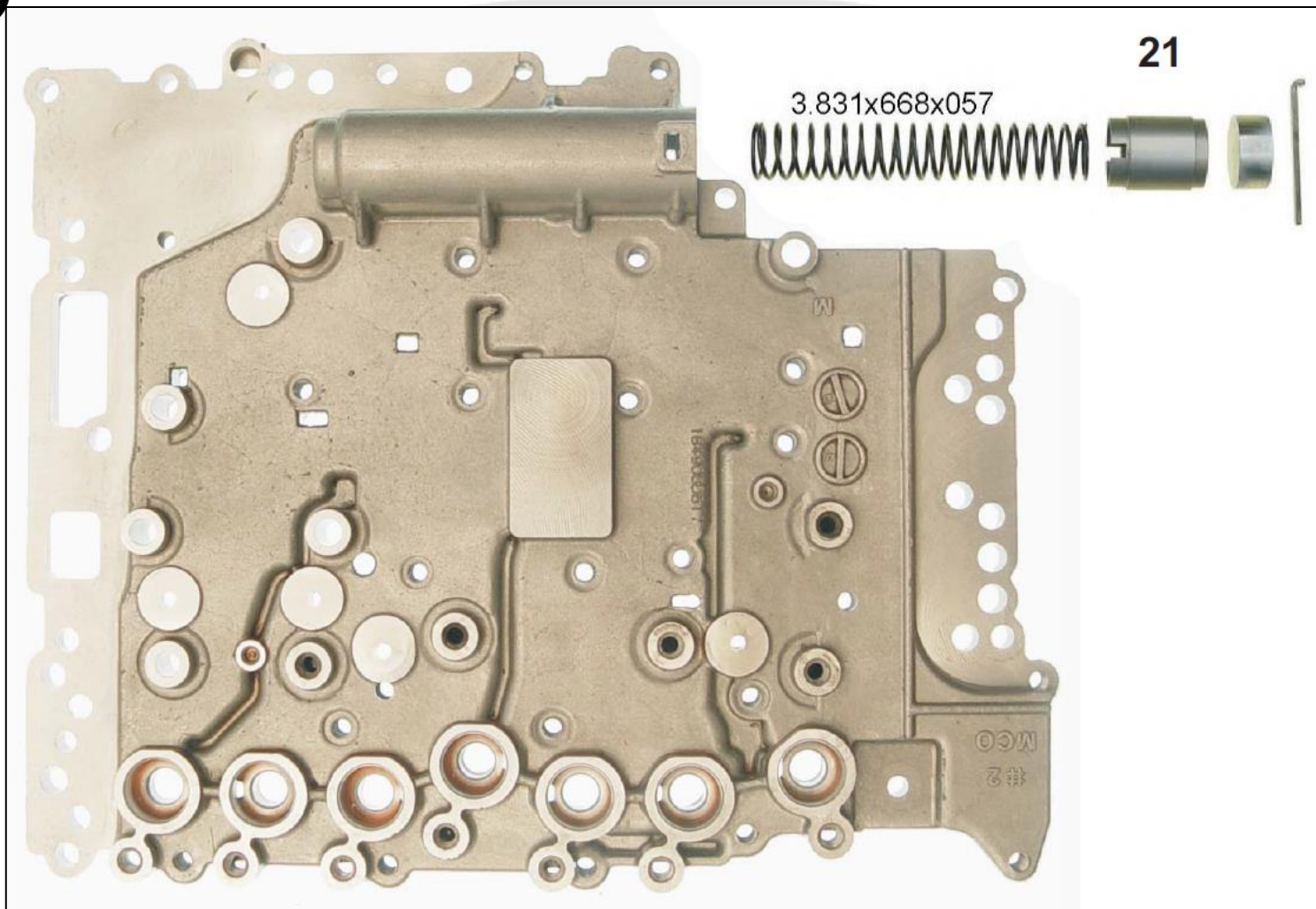
Not Interchangeable

Lower Valve Body Mid 2004 & Later





Upper Valve Body Early & Late





Valve Description

1. **Pressure Regulator Valve (a) Pressure Regulator Plug (b) Pressure Regulator Sleeve (c);** Adjusts the oil discharge from the oil pump to the optimum levels (line pressure) for normal operation.
2. **Front Brake Control Valve:** When the front brake is applied, this valve adjusts line pressure to optimum levels (front brake pressure) and supplies it to the front brake. (In 1st, 2nd, 3rd, and 5th gears, it adjusts the clutch pressure.
3. **Accumulator Control Valve:** Adjusts the pressure (accumulator control pressure) acting on the accumulator piston and low coast reducing valve for normal operation.
4. **Pilot Valve A:** Adjusts the line pressure and produces the constant pressure (pilot pressure) required for line pressure, shifting, and lockup control.
5. **Pilot Valve B:** Adjusts the line pressure and produces the constant pressure (pilot pressure) required for shifting.
6. **Low Coast Brake Switching Valve:** During engine braking, this valve supplies the line pressure to the low coast brake reducing valve.
7. **Low Coast Brake Reducing Valve:** When the low coast brake is applied, this valve adjusts the line pressure to optimum levels (low coast brake pressure) and supplies it to the low coast brake.
8. **N-R Accumulator:** Produces stabilizing pressure for N-R ranges.
9. **N-R Accumulator:** Produces stabilizing pressure in N-R ranges.
10. **Torque Converter Lubrication Valve:** Operates during lockup to switch the torque converter, cooling and lubrication systems' oil paths.
11. **Torque Converter Regulator Valve: (a) TCC Control Valve, (b) TCC Control Plug, (c) TCC Control Sleeve:** Applies or releases the converter clutch. By performing the lock-up operation transiently, it provides a smooth converter clutch apply.

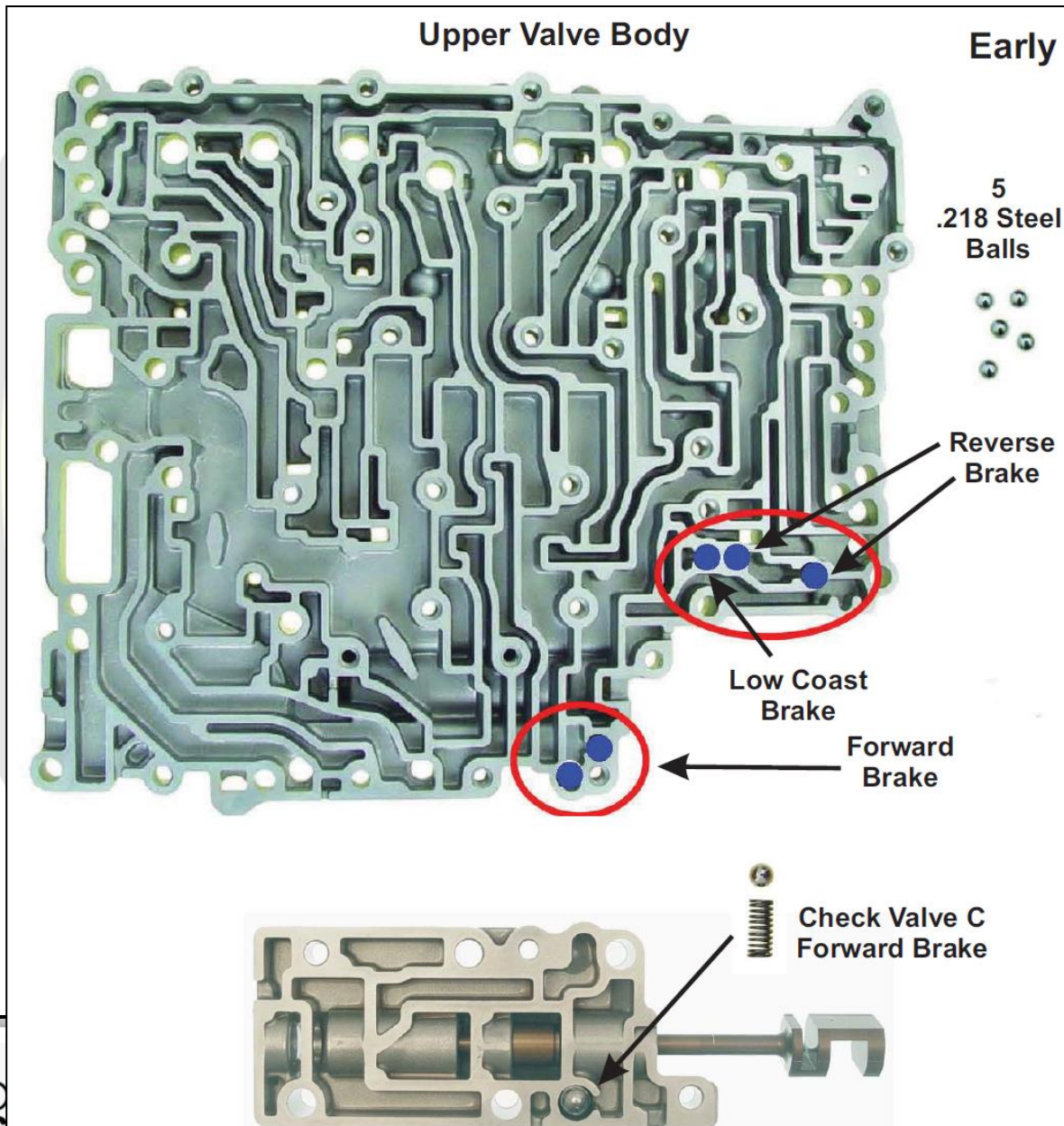


Valve Description

- 12. High and Low Reverse Clutch Control Valve:** When the high and low reverse clutch is applied, this valve adjusts line pressure to optimum levels (high and low reverse clutch pressure) and supplies it to the high and low reverse clutch. (In 1st, 3rd, 4th and 5th gears, it adjusts the clutch pressure.)
- 13. Input Clutch Control Valve:** When the input clutch is applied, this valve adjusts line pressure to optimum levels (input clutch pressure) and supplies it to the input clutch (In 4th and 5th gears, it adjusts the clutch pressure.)
- 14. Direct Clutch Control Valve:** When the direct clutch is applied, this valve adjusts line pressure to optimum levels (direct clutch pressure) and supplies it to the direct clutch. (In 2nd, 3rd, and 4th gears, it adjusts the clutch pressure.)
- 15. Direct Clutch Piston Switching Valve:** Operates in 4th gear and switches the direct clutch coupling capacity.
- 16. Direct Clutch Regulating Valve.**
- 17. Cooler Bypass Valve:** Allows excess oil to bypass cooler circuit without being fed into it.
- 18. Line Pressure Relief Valve:** Discharges excess oil from line pressure circuit.
- 19.** To prevent too much pressure from reaching the torque converter, line pressure is adjusted to optimum levels; this is called torque converter operating pressure.
- 20. Manual Valve:** Sends line pressure to each circuit according to the selector position.
- 21. Neutral to Drive Accumulator:** Stabilizes pressure when a Park or Neutral to drive shift is selected.

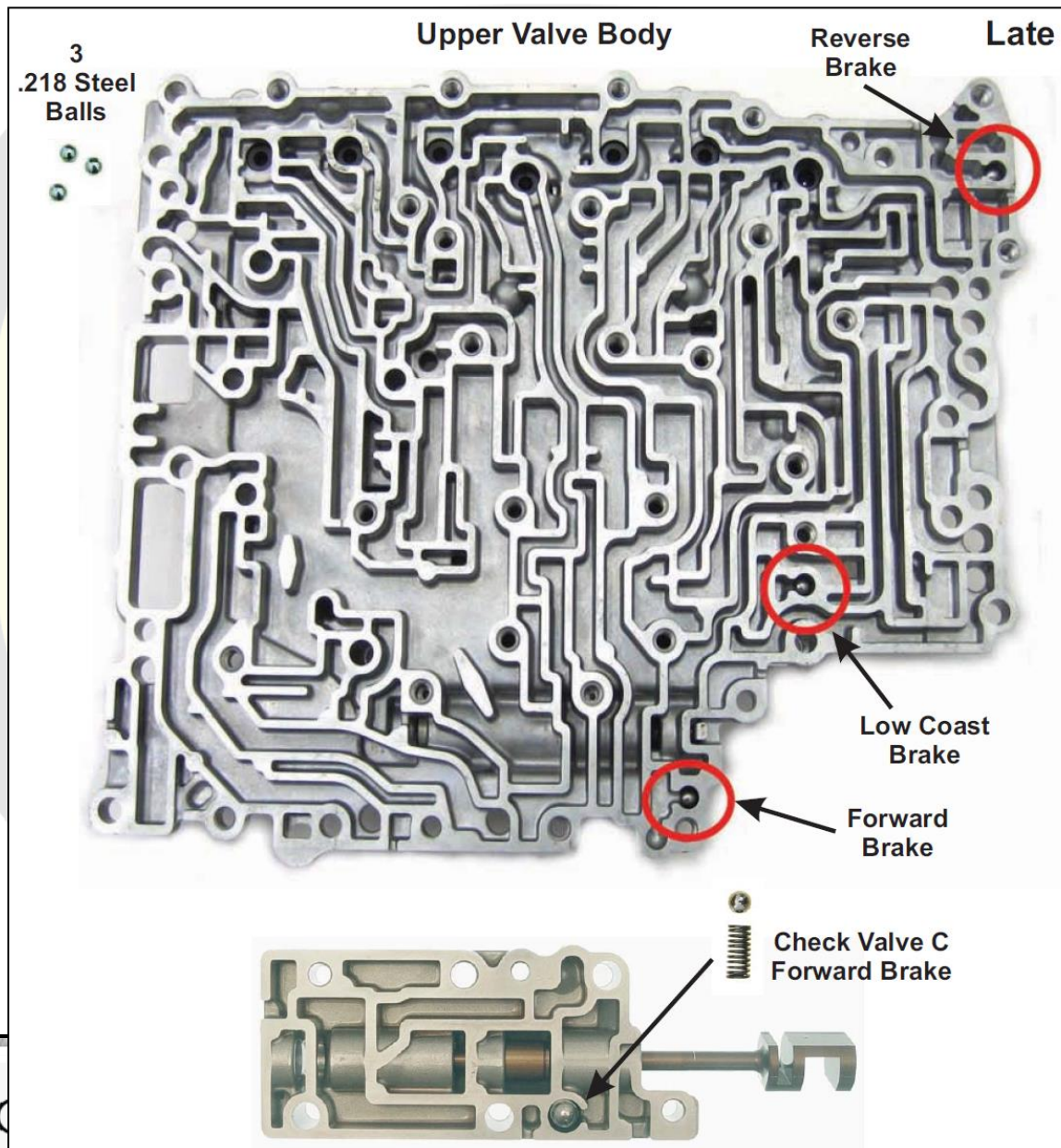


Upper Valve Body Check Ball Locations 2002-Mid 2004



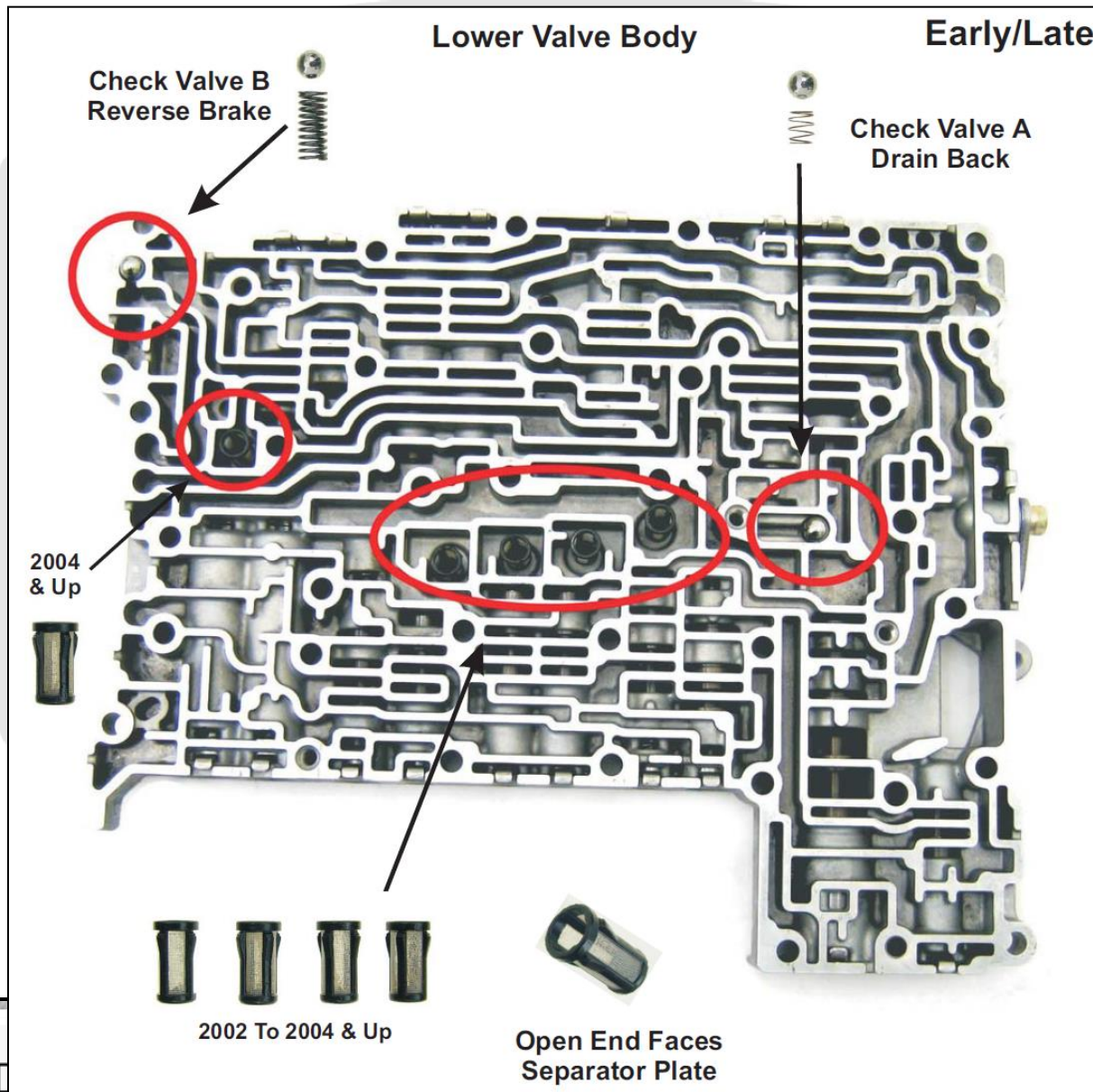


Upper Valve Body Check Ball Locations Mid 2004 & Later





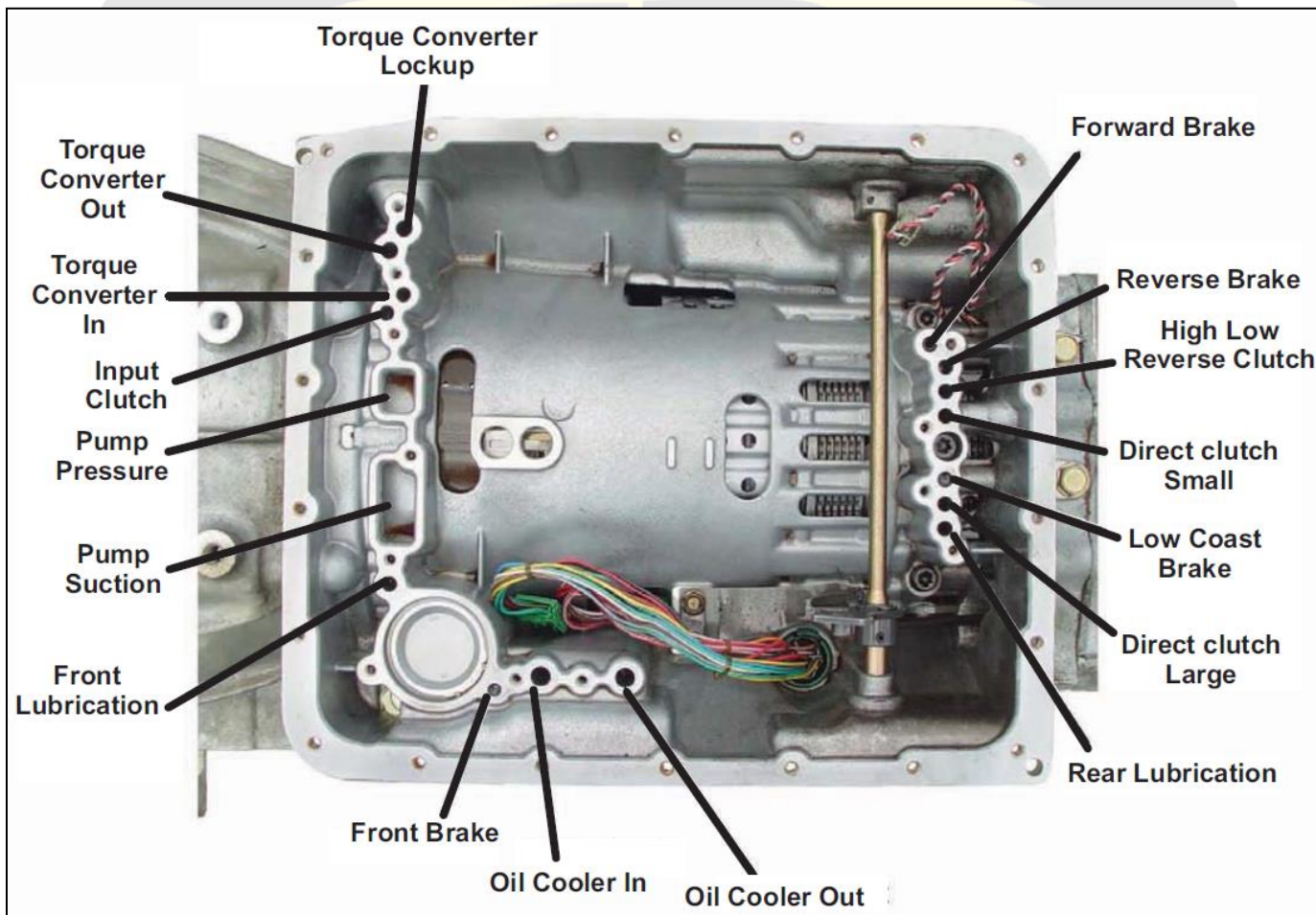
Lower Valve Body Check Valve & Filters All





Case Air Checks

Test should be done using 30 psi. of regulated shop air.



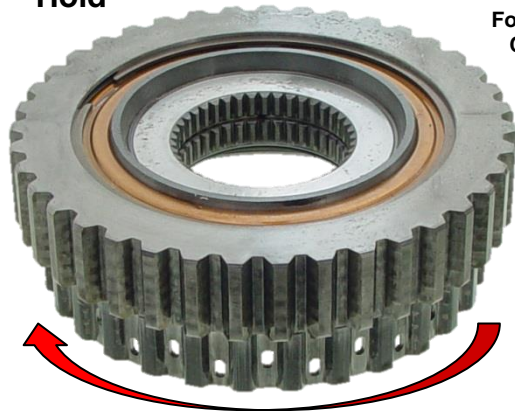


Sprag Rotation

Forward Sprag

Hold

Forward Brake
Clutch Hub



Low Coast
Brake Clutch
Hub

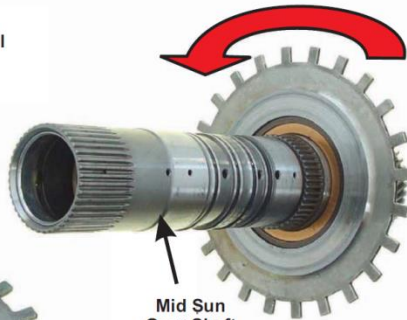
Hold mid sun gear shaft.
Rear sun gear should freewheel
in the direction of the arrow

1st Sprag Rotation

1st One Way



Mid Sun
Gear Shaft

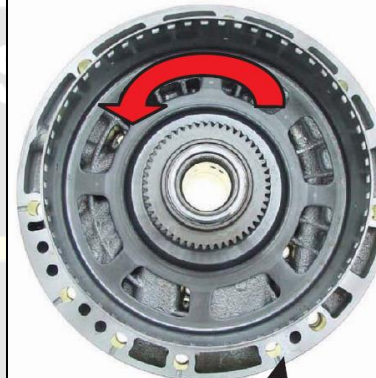


Rear Sun Gear

Hold pump, front sun gear shell should
freewheel in the direction of the arrow

3rd Sprag Rotation

3rd One Way



Hod pump assembly



Front Sun Shell



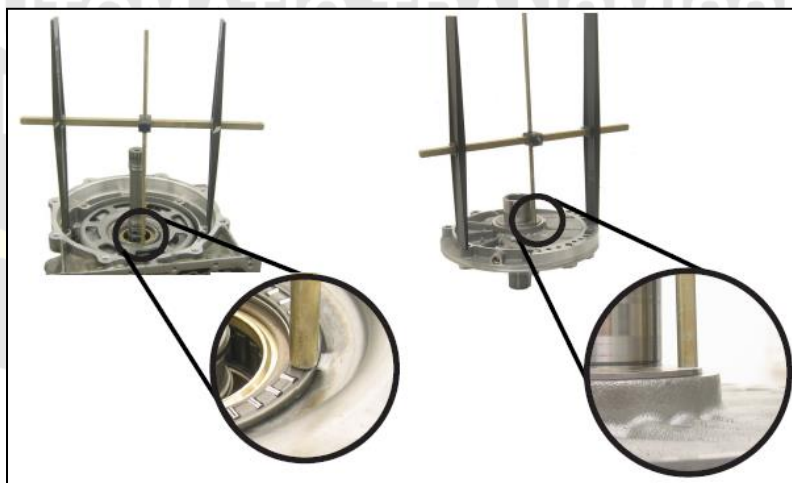
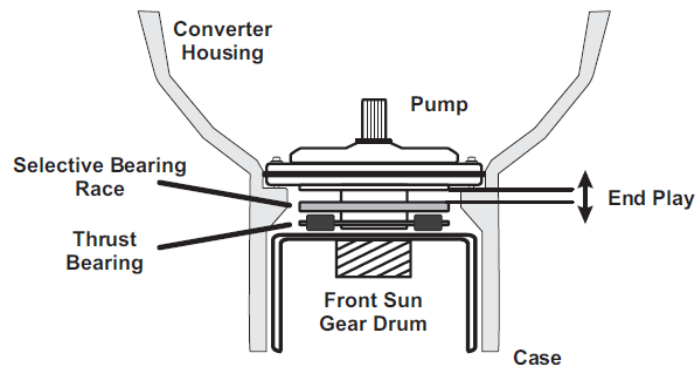
Endplay Specifications

Total Unit End Play

0.25 - 0.55mm (.010" - .022") measured from Pump surface to the Front Sun Gear Drum Selective Bearing Race. An H gauge would work well for this procedure.

Selective Race

Thickness	Part Number
0.8mm (.031")	31 43 5 95X00
1.0mm (.039")	31 43 5 95X01
1.2mm (.047")	31 43 5 95X02
1.4mm (.055")	31 43 5 95X03
1.6mm (.063")	31 43 5 95X04
1.8mm (.071")	31 43 5 95X05





Endplay Specifications

Clutch End Play Specifications

Input Clutch:

0.7 - 1.1 mm (.028" - .045") There are no selective components available for the Input Clutch. If clearance is not correct, there is a mis-assembly.

High & Low/Reverse Clutch:

1.0 - 1.5 mm (.040" - .060") There are no selective components available for the Input Clutch. If clearance is not correct, there is a mis-assembly.

Direct Clutch:

1.1 - 1.6 mm (.045" - .065") There are no selective components available for the Input Clutch. If clearance is not correct, there is a mis-assembly.

Reverse Brake Clutch:

1.1 - 1.6 mm (.045" - .065") There are selective Backing Plates available. (see chart below)

Low Coast Brake Clutch:

0.5 - 1.0 mm (.020" - .040") There are no selective components available for the Low Coast Brake Clutch. If clearance is not correct, there is a mis-assembly.

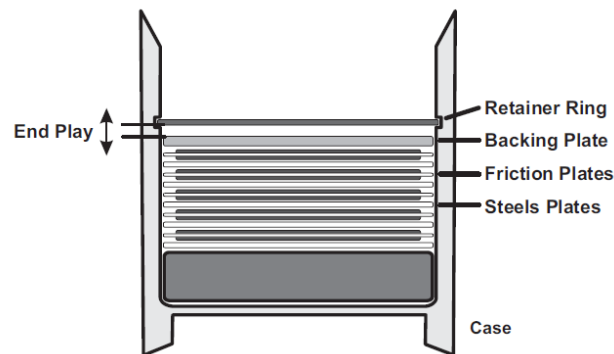
Forward Brake Clutch:

1.0 - 1.3 mm (.040" - .055") There are no selective components available. for the Forward Brake Clutch. If clearance is not correct, there is a mis-assembly.

There are some issues with aftermarket kits having clutches that are too thin on 2008 & later models

Selective Reverse Backing Plates

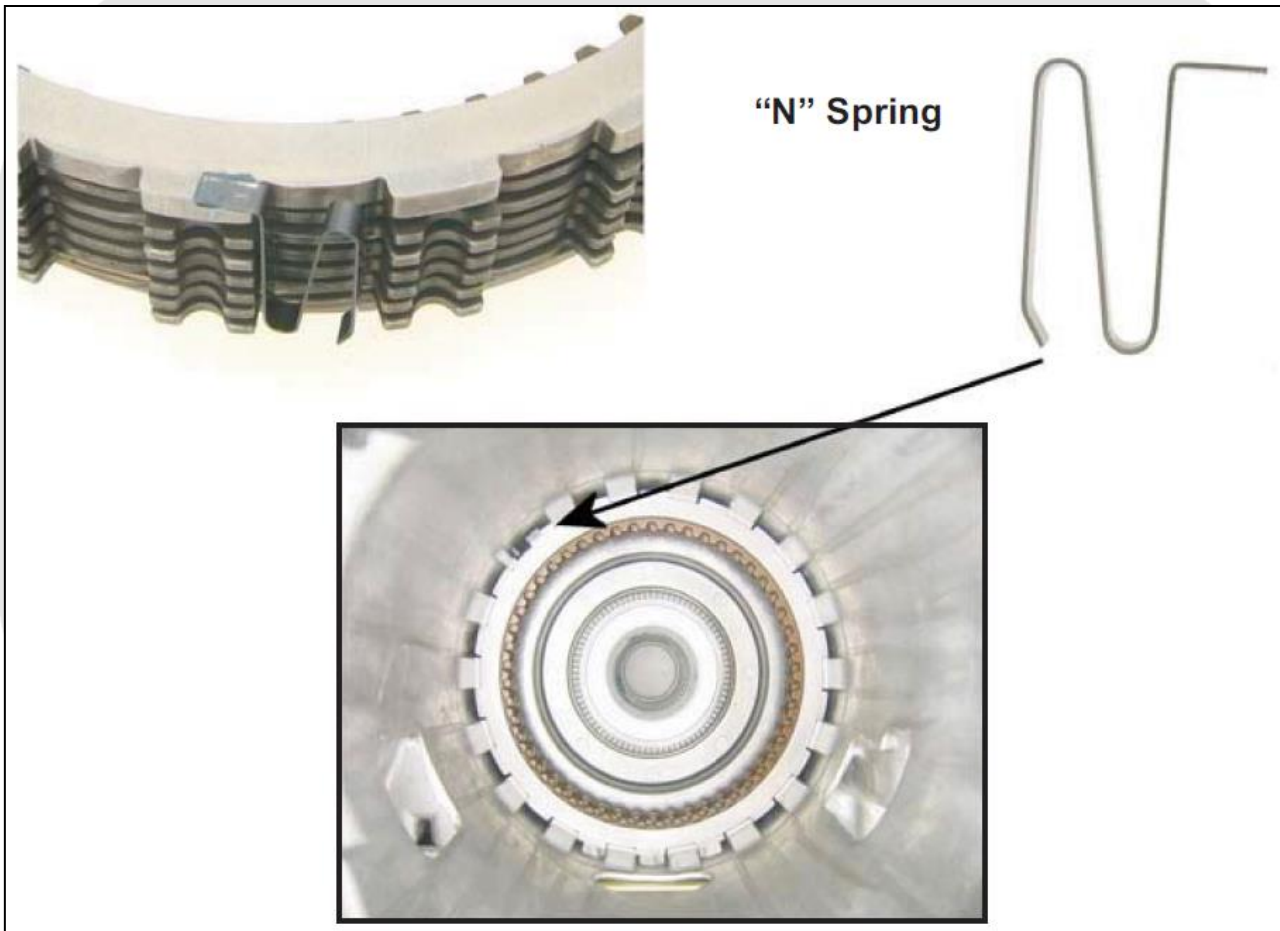
Thickness	Part Number
4.2mm (.165")	31 667 90X14
4.4mm (.173")	31 667 90X15
4.6mm (.181")	31 667 90X16
4.8mm (.189")	31 667 90X17
5.0mm (.197")	31 667 90X18
5.2mm (.205")	31 667 90X19





Anti Rattle Spring Location

Reverser Brake Clutch





Torque Specifications

Component	Nm	Ft-lb	In-lb
Band Anchor Adjustment Locking Nut	46	34	
Converter Housing to Case	61	45	
Cooler Line Banjo Fitting Bolts	49	36	
Dipstick Tube Adapter to Case	8		70
Drum Support to Case	23	17	
External Manual Shift Lever Nut	22		97
Inside Detent Spring to Case	8		70
Oil Pan Drain Plug	34	25	
Oil Pan to Case	8		70
Oil Pressure Test Plugs	7.3		65
Oil Pump Assembly to Case	48	35	
Oil Pump Cover to Pump Body	9		80
Output Revolution Sensor to Case	5.8		51
Transmission to Engine Bolts	113	83	
Valve Body & Solenoid Bolts	8		70
4WD Adapter Housing/Extension Housing to Case	61	45	



Torque Converter ID

There are four different converters each with a different overall height .
Three have 4 bolt pads and one has 6.

Overall Height

Bolt pad



Bench Top



ID Stamp



Stamp ID	Diameter	Bolt Circle	Overall Height	Number of Pads	Engine
P2	10.750"	9.750"	5.250"	4	V6
064	10.920"	9.725"	5.760"	4	4.5L V8
40B	11.250"	9.750"	6.350"	4	5.6L V8
RA	10.875"	9.100"	5.645"	6	Kia Applications



Pump Stator & Input Shaft Differences

There are two different Pump Stator & Turbine Shaft lengths. The longer shafts are found in the Armada and Titan vehicles with a V8 engine. The shorter shaft lengths are found in all other vehicle models. Also two different Stator Supports found on both length shafts, stepped and non stepped.

8.250" Armada & Titan V8
7.375" On All Others



3.125"



3.500"



Stepped Stator Support





Planetary Assembly Interchange

These units are built differently for all models, make sure you do a thorough job identifying the parts. As a rule, most of the steel hard parts are for truck applications.

Both Shaft Lengths



Input Clutch Front
Ring Gear 102T-106T

4 Pinion Aluminum
5 Pinion Steel
Front Planet



Front Planet Sun Gear
50T, 53T & 54T

4 & 5 Pinion
Center Planet



Center Ring Gear
77T & 78T



4 & 5 Pinion
Rear Planet



Rear Sun Gear
61T & 62T



Center Sun Gear
42T (5 Pinion Center Planet)
43T (4 Pinion Center Planet)



Rear Ring Gear
98T, 99T & 110T

Ratios can be found on Mitchell's or Alldata



Gear Ratios

There are 3 different ratio combinations for this transmission. Vehicle identification for each ratio application is shown in the following charts.

Gear Ratios

Gear	A	B	C
1st	3.842:1	3.827:1	3.540:1
2nd	2.353:1	2.368:1	2.264:1
3rd	1.529:1	1.520:1	1.417:1
4th	1.000:1	1.000:1	1.000:1
5th	.839:1	.834:1	.834:1
Reverse	2.765:1	2.613:1	2.370:1



Vehicle Identification

NISSAN	4X2 ID TAG	CHART	4X4 ID TAG	CHART
03 350Z	90X72/91X05/91X22	C		
04 350Z	92X06	C		
05 350Z	92X60	C		
06 350Z	90X5C	C		
07 350Z	98X5B	A		
08-09 350Z	99X5B	A		
05 Frontier	97X00	A	97X01	A
06 Frontier	97X06/97X0A	A	97X0B	A
07 Frontier	97X9E/98X0A	A	98X0B	A
08 Frontier	97X08/97X0A	A	97X0B	A
09 Frontier	3EX3D	A	99X9E/3EX0A	A
10 Frontier	3FX3D	A	3FX3A/3FX2D	A
11 Frontier	3FX7D	A	3FX7C/3FX7A	A



Vehicle Identification continued

***2009 Pathfinder 4X4 ID Tag
3EX0A/3EX0B
A Ratio VQ40DE Engine.**

**The 4X4 ID Tag
96X5B
B Ratio VK56DE Engine**

**2010-12 4X4 ID Tags & Matching Ratio
Are Separated By The Forward Slash /**

NISSAN	4X2 ID TAG	CHART	4X4 ID TAG	CHART
12 Frontier	3GX2A	A	3GX1A/3GX0B	A
13 Frontier	3GX4D	A	3GX4C/3GX4B	A
05 Pathfinder	97X00	A	97X01	A
06 Pathfinder	97X4A	A	97X4B	A
07 Pathfinder	98X0A	A	97X0B	A
08 Pathfinder 4.0L	98X3E	A	98X4A	A
08 Pathfinder 5.6L	96X0A	B	96X0B	B
09 Pathfinder*	99X9E	A	3EX0A/3EX0B/96X5B	A/B
10 Pathfinder*	3FX3A	A	3FX2D/94X8C	A/B
11 Pathfinder*	3FX7C	A	3FX7A/3DX3D	A/B
12 Pathfinder*	3GX1A	A	3GX0B/3DX3D	A/B
04 Armada/Titan	95X13/95X14	B	95X16	B
05 Armada/Titan	95X17	B	95X18	B
06 Armada/Titan	95X1C	B	95X1D	B
07 Armada/Titan	95X5B	B	95X5C	B
08 Armada/Titan	95X8D	B	95XE8	B
09 Armada/Titan	96X2E/96X3C	B	96X3A/96X3D	B
10 Armada	94X3B/94X3E	B	94X3C/94X4A	B
11 Armada	3DX2C	B	3DX2D/3DX3B	B
12 Armada	3HX0C	B	3HX0D/3HX1A	B
13 Armada	63X2B	B	63X2C/63X2E	B
10-11 Titan	94X9C/3DX0A	B	94X9D/3DX0B	B
12 Titan	3HX0C/3HX1B	B	3HX0D/3HX1A	B
13 Titan	63X2B/63X3A	B	63X2C/63X2E	B



Vehicle Identification continued

NISSAN	4X2 ID TAG	CHART	4X4 ID TAG	CHART
05/06 Xterra	97X0A	A	97X0B	A
07 Xterra	98X0A	A	98X0B	A
08 Xterra	99X1B	A	99X1C	A
09-10 Xterra	99X9E	A	3EX0A	A
11 Xterra	3FX7C	A	3FX7A	A
12 Xterra	3GX1A	A	3GX0B	A
13 Xterra	3GX4C	A	3GX4B	A
12 NV15/25/3500	94X7E/3HX5A	B	94X7D/3HX4E	B
13 NV15/25/3500	63X0E	B	63X0D	B
INFINITY	4X2 ID TAG	CHART	4X4 ID TAG	CHART
03 G35 Coupe	90X17	C		
03 G35 Sedan	90X09	C		
04 G35 Coupe	91X18	C		
04 G35 Sedan	91X17	C		
05 G35 Coupe	92X62	C		
05 G35 Sedan	92X18	C	92X19	C
06 G35 Coupe	97X3E	A		
06 G35 Sedan	97X3D	A	90X6D	C
07 G35 Coupe	90X4C	A		
07 G35 Sedan	97X2E	A	97X3A	A
08 G35 Coupe	97X3C	A		
08 G35 Sedan	99X6A	A	99X6B	A
03/04 FX35/45	91X07/91X08	C	FX45-91X09	C
05 FX35/45	92X20/92X21	C	FX45-92X22	C
06 FX35/45	90X4B/90X4C	C	FX45-95X2B	B
07 FX35/45	91X0E/91X1A	C	FX45-95X8C	B



Vehicle Identification continued

***2006 M35/M45 4X2 ID Tags and matching ratio are separated by the forward slash (/)**

INFINITY	4X2 ID TAG	CHART	4X4 ID TAG	CHART
08 FX35/45	91X3A/91X3B	C	FX45-96X1C	B
08 EX35	98X6E	A	98X7A	A
03 M45	90X69/91X14	C		
04/05 M45	91X78	C		
*06 M35/45	97X06/95X12	A/B	97X07	A
07 M35	98X1D	A	98X1C	A
07 M45	95X7A	B		
08 M35	99X1E	A	99X2A	A
08 M45	96X2A	B	96X2B	B
03 Q45	90X69	C		
04 Q45	91X78	C		
05 Q45	92X12	C		
04 QX56	95X13	B	95X14	B
05 QX56	95X17	B	95X18	B
06 QX56	95X1C	B	95X1D	B
07 QX56	95X5B	B	95X5C	B
08 QX56	95X5B	B	95X5C	B
09 EX35	3EX4C	A	3EX4D	A
09 M45	3EX1A	A	96X6A/96X6B	B
09 QX56	96X2E/96X3C	B	96X3A/96X3D	B
10 EX35	3EX4C	A	3EX4D	A
10 M45	3EX1A	A	96X6A/96X6B	B
10 QX56	96X2E/96X3C	B	96X3A/96X3D	B
KIA	4X2 ID TAG	CHART	4X4 ID TAG	CHART
09 Borrego	A58R2 (no tag)	B	A58R2 (no tag)	B
05-09 Sorento	A58R1/2 (no tag)	B	A58R1/2 (no tag)	B

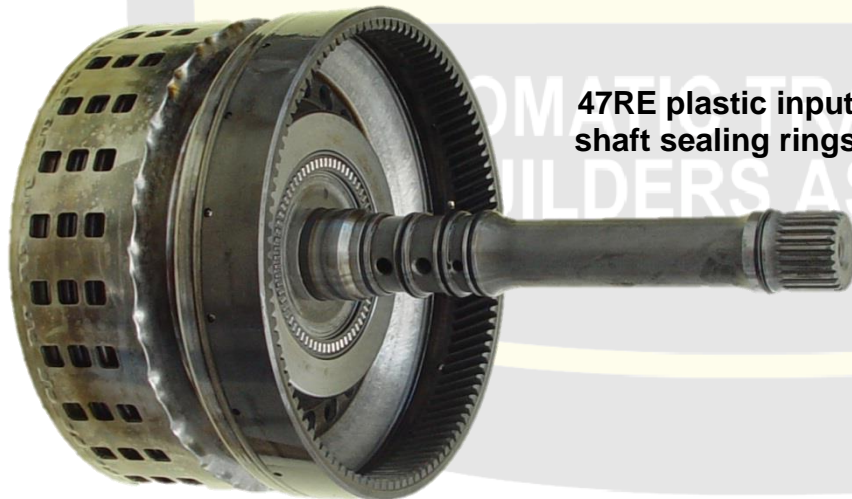


Sealing Ring Issues

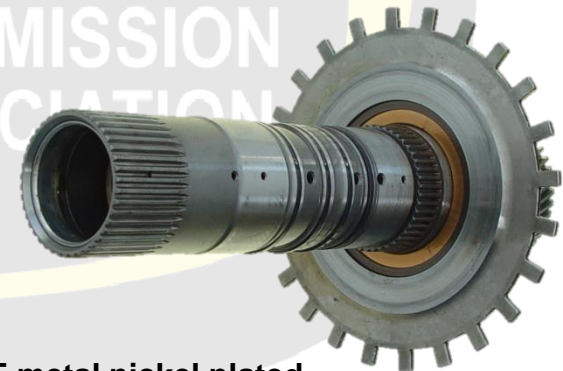
The two main areas of sealing ring concerns are the Input Shaft and Rear Sun Gear Shaft. The main problem is not the original rings or aftermarket rings but the handling of the rings during rebuild. These rings can easily be distorted during rebuild.

Most rebuilders reuse the original rings without removing them from the shafts. An alternative to using the original or aftermarket rings found in the overhaul kit are;

- Use the 47RE plastic input shaft sealing rings on the input shaft.
- Use the AODE metal nickel plated output shaft sealing rings on the rear sun gear shaft.



47RE plastic input
shaft sealing rings

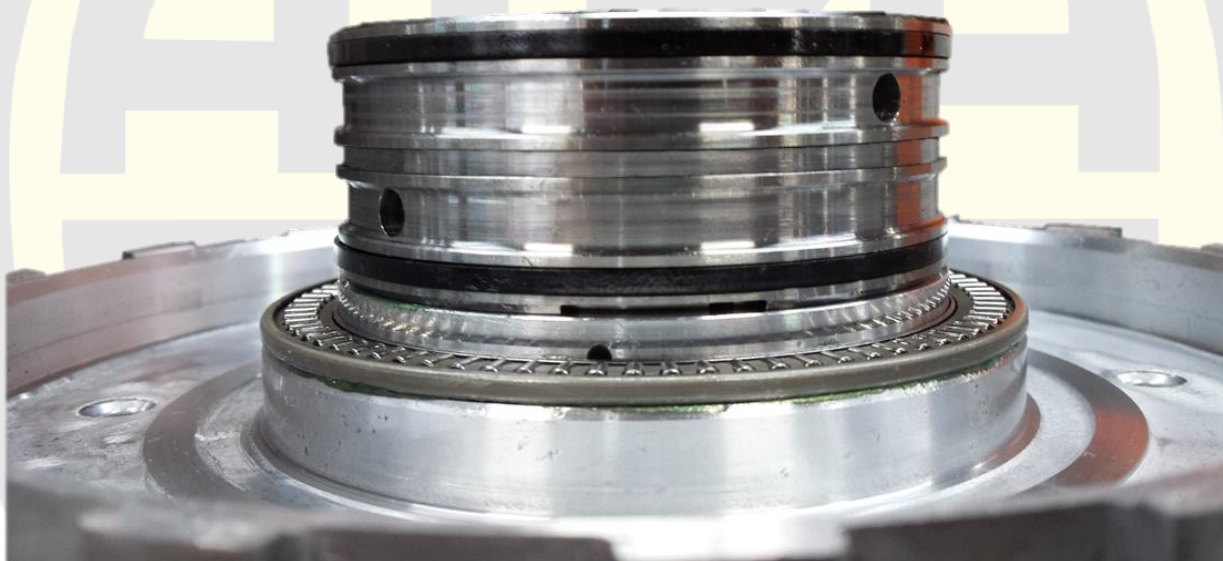


AODE metal nickel plated
output shaft sealing rings



Missing Sealing Ring

Several virgin units have shown up in shops and reman facilities with a missing sealing ring on the center support. This is most commonly found in mid 2008 and later Infiniti vehicles. These vehicles will have the 3rd design valve body.

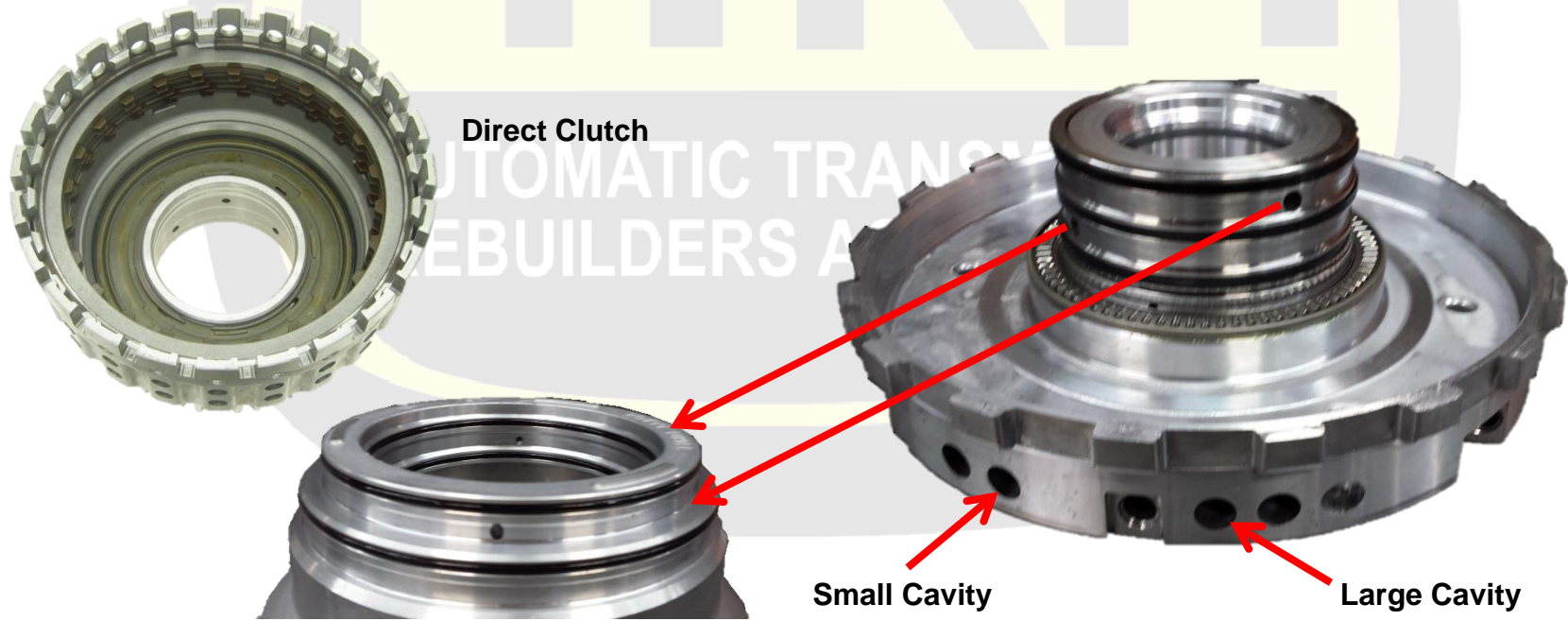




Missing Sealing Ring

On earlier hydraulics (shown on following pages) the Direct Clutch piston small and large cavity are filled in 2nd and 3rd gear but only the small cavity in 4th. Many times a slip would not be felt until 4th gear and misdiagnosed thinking it couldn't be the direct clutch because it didn't slip in 2nd or 3rd. Only to find a leak in the small cavity circuit.

With the changes on the 3rd design hydraulics both cavities are filled from 2nd, 3rd and 4th gear. This is similar to a modification that was done to the GM 400 to fill both cavities of the direct drum for high performance and heavy duty use.





Center Support Missing Thrust Washer

3 types of Center Supports

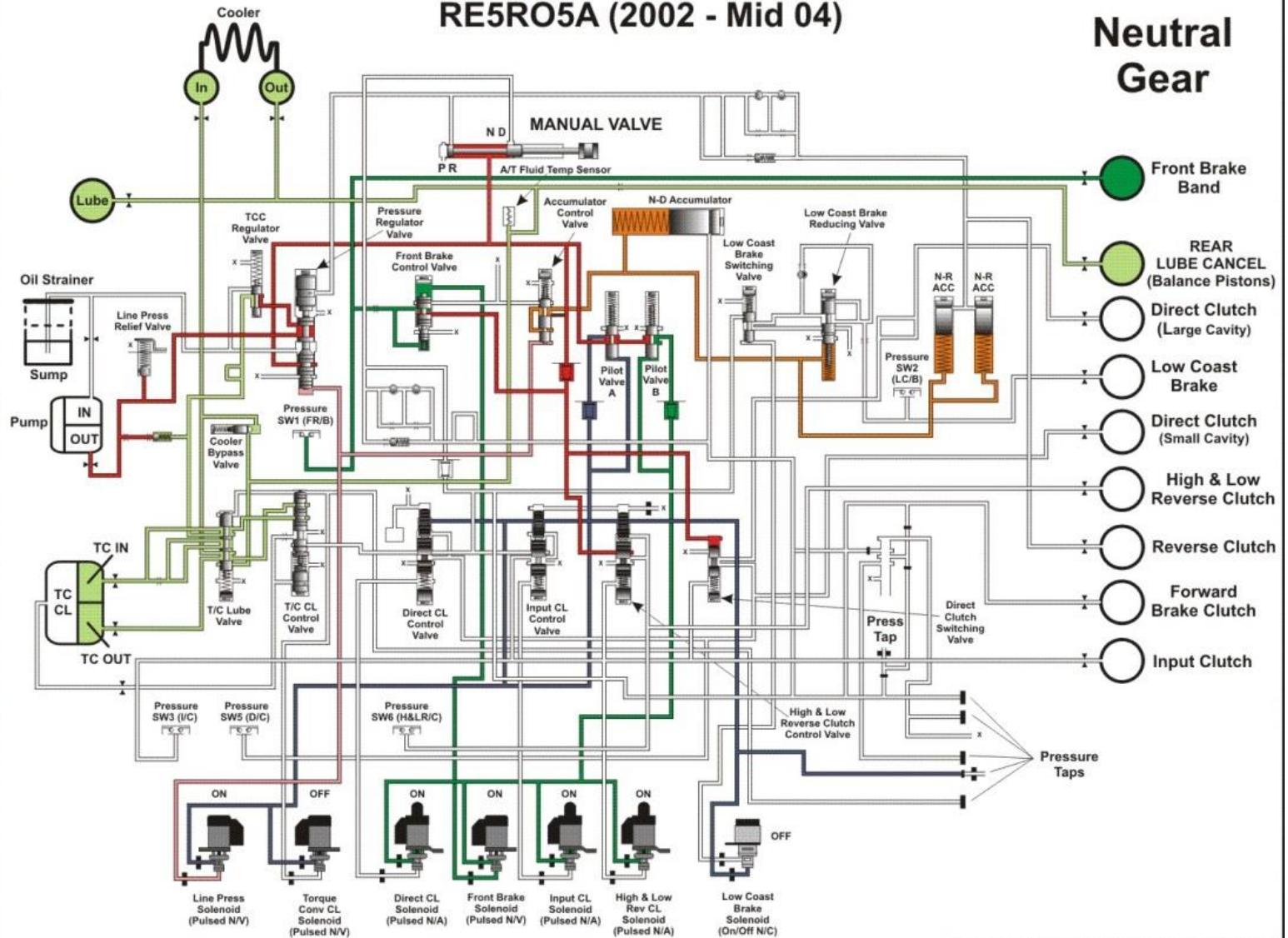
1. Overall height 2.52" (64.1mm)
no bushing surface for Direct Drum
no notches for tabs on thrust washer
4 ball plug wear bearing rides
2. Overall height 3.21" (81.5mm)
has bushing surface for Direct Drum
no notches for tabs on thrust washer
4 ball plug wear bearing rides
3. Overall height 3.21" (81.5mm)
has bushing surface for Direct Drum
has notches for tabs on thrust washer
5 ball plug wear bearing rides





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Neutral Gear

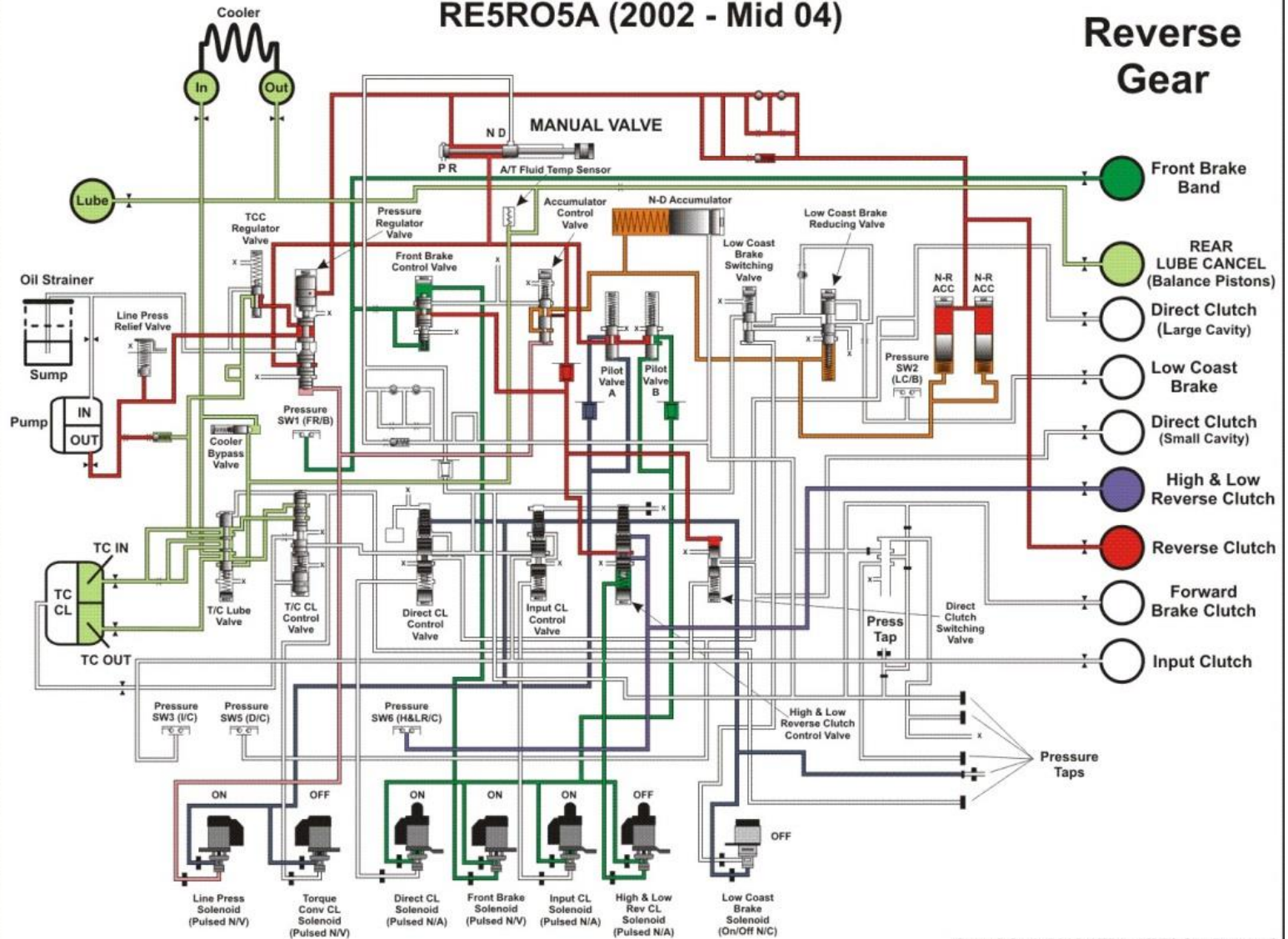


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RE5R05A (2002 - Mid 04)

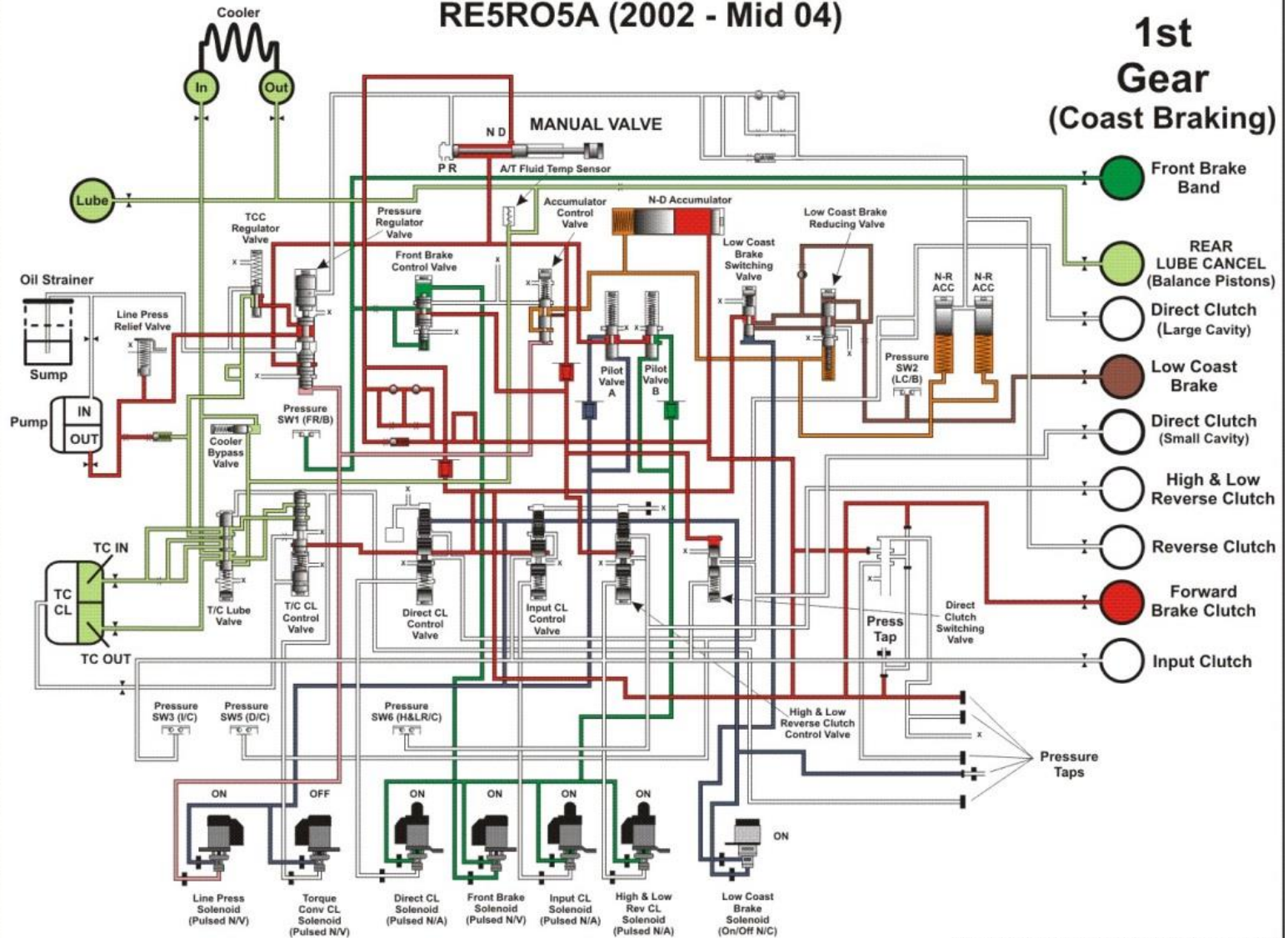
Reverse Gear





RE5R05A (2002 - Mid 04)

1st Gear (Coast Braking)

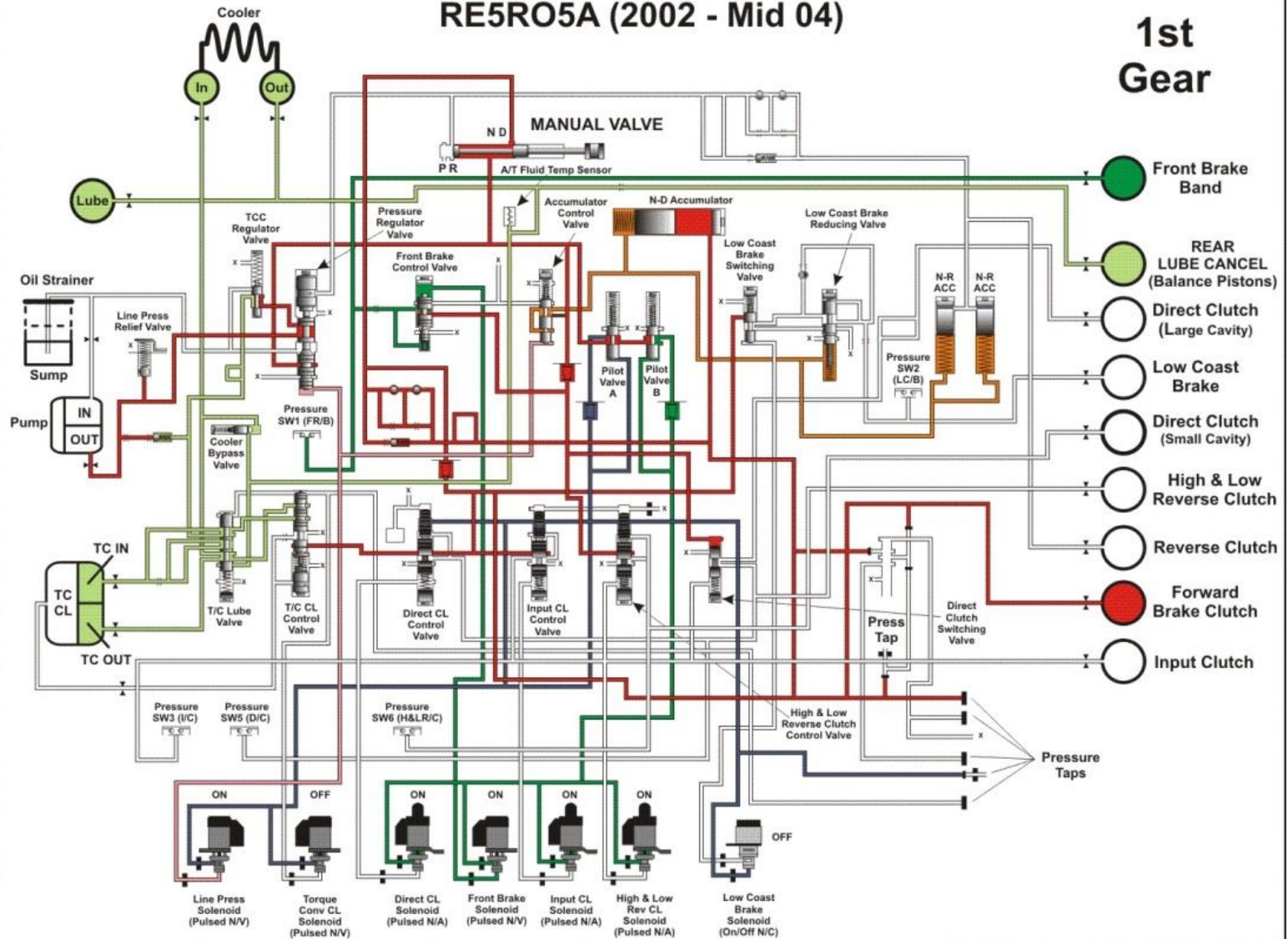


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RE5R05A (2002 - Mid 04)

1st Gear

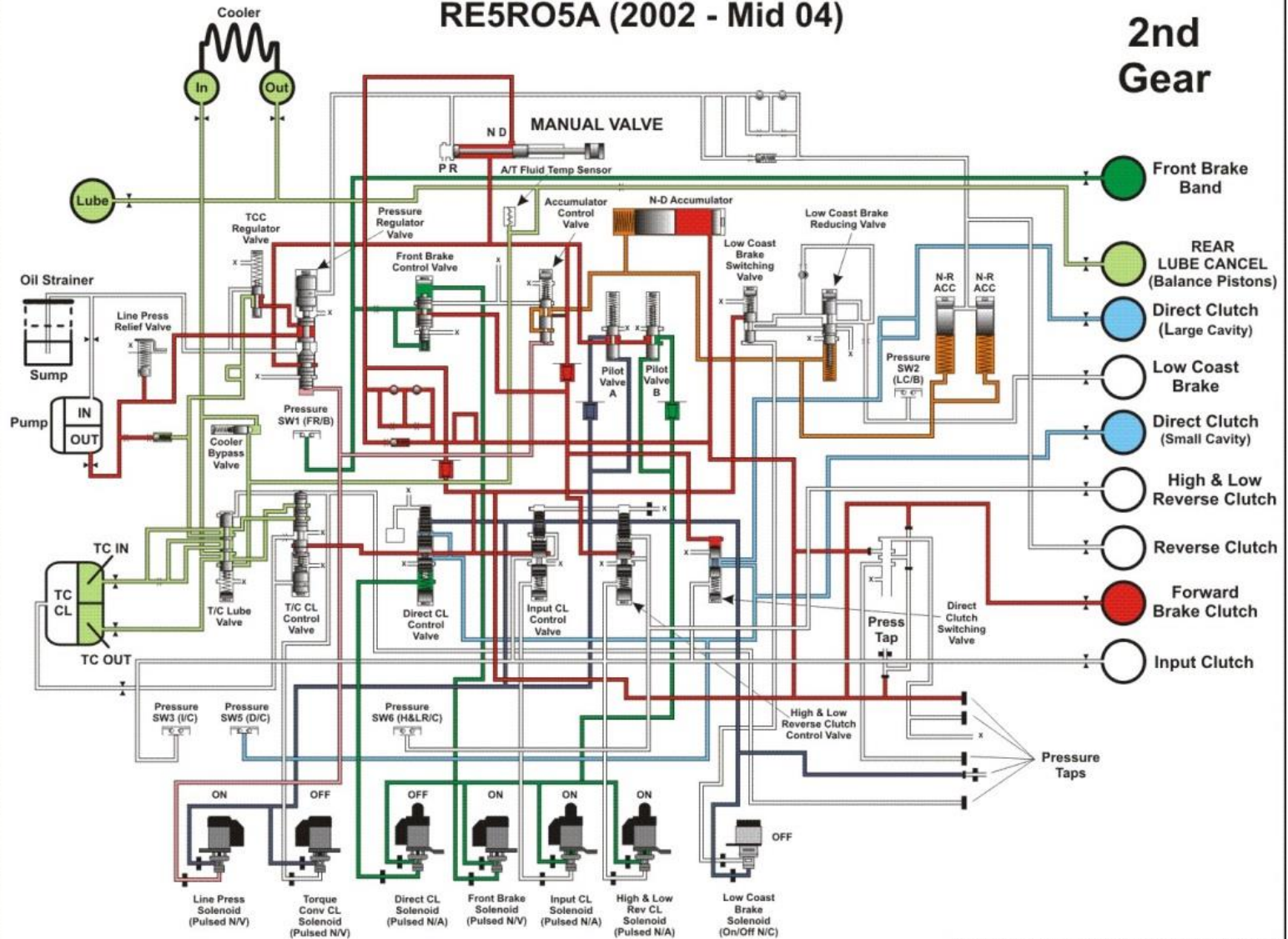


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RE5R05A (2002 - Mid 04)

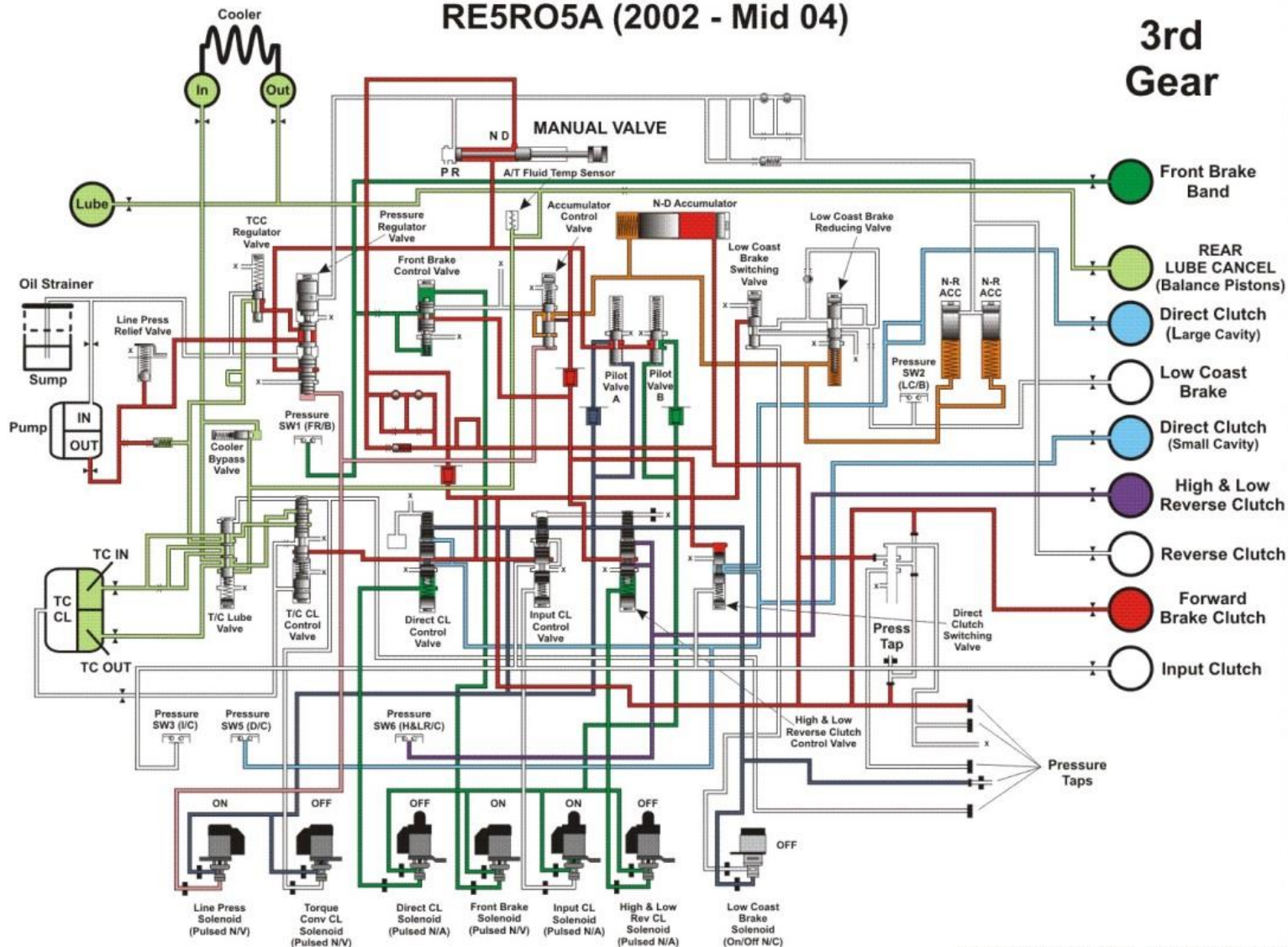
2nd Gear



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3rd Gear

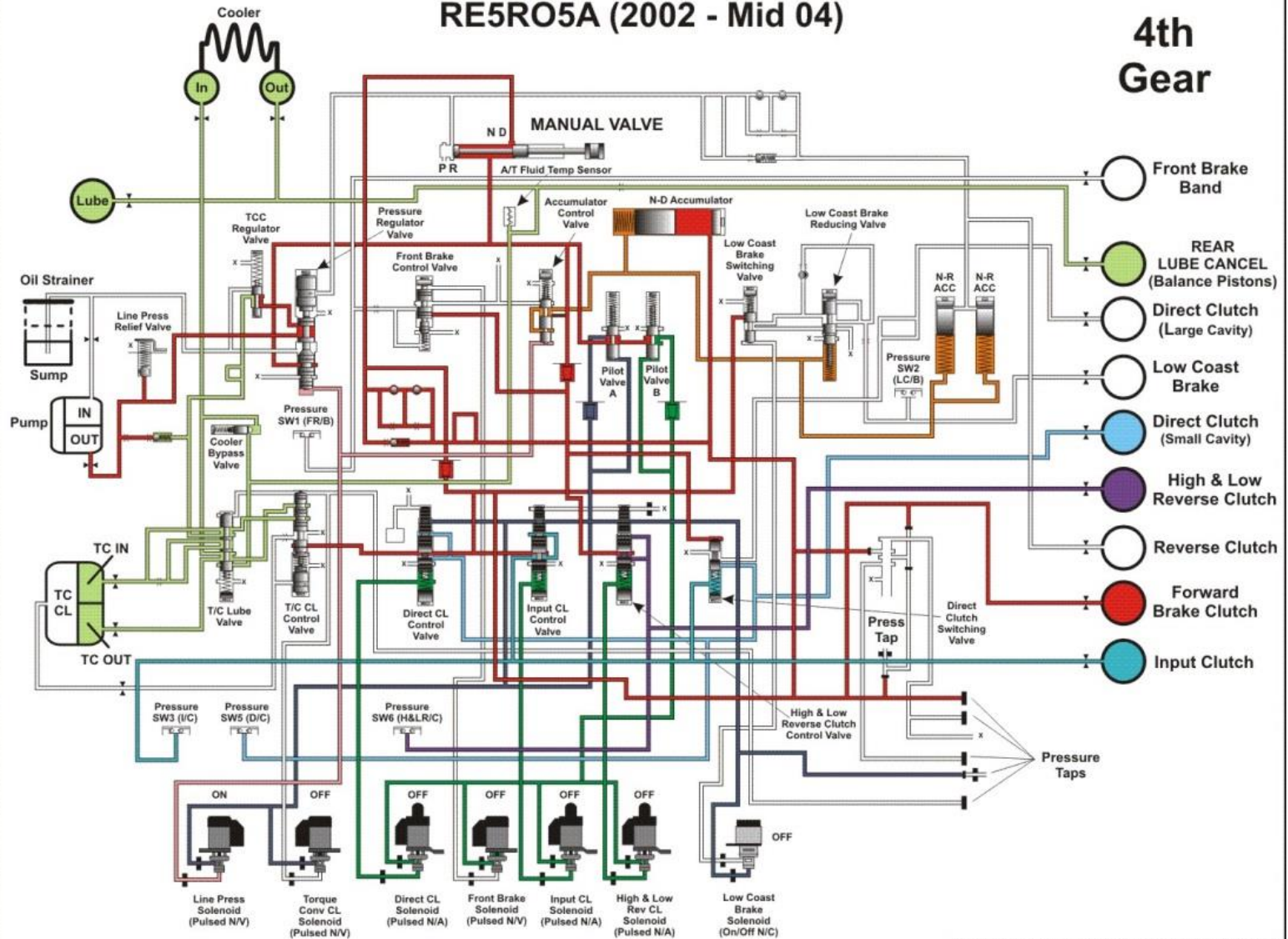


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4th Gear

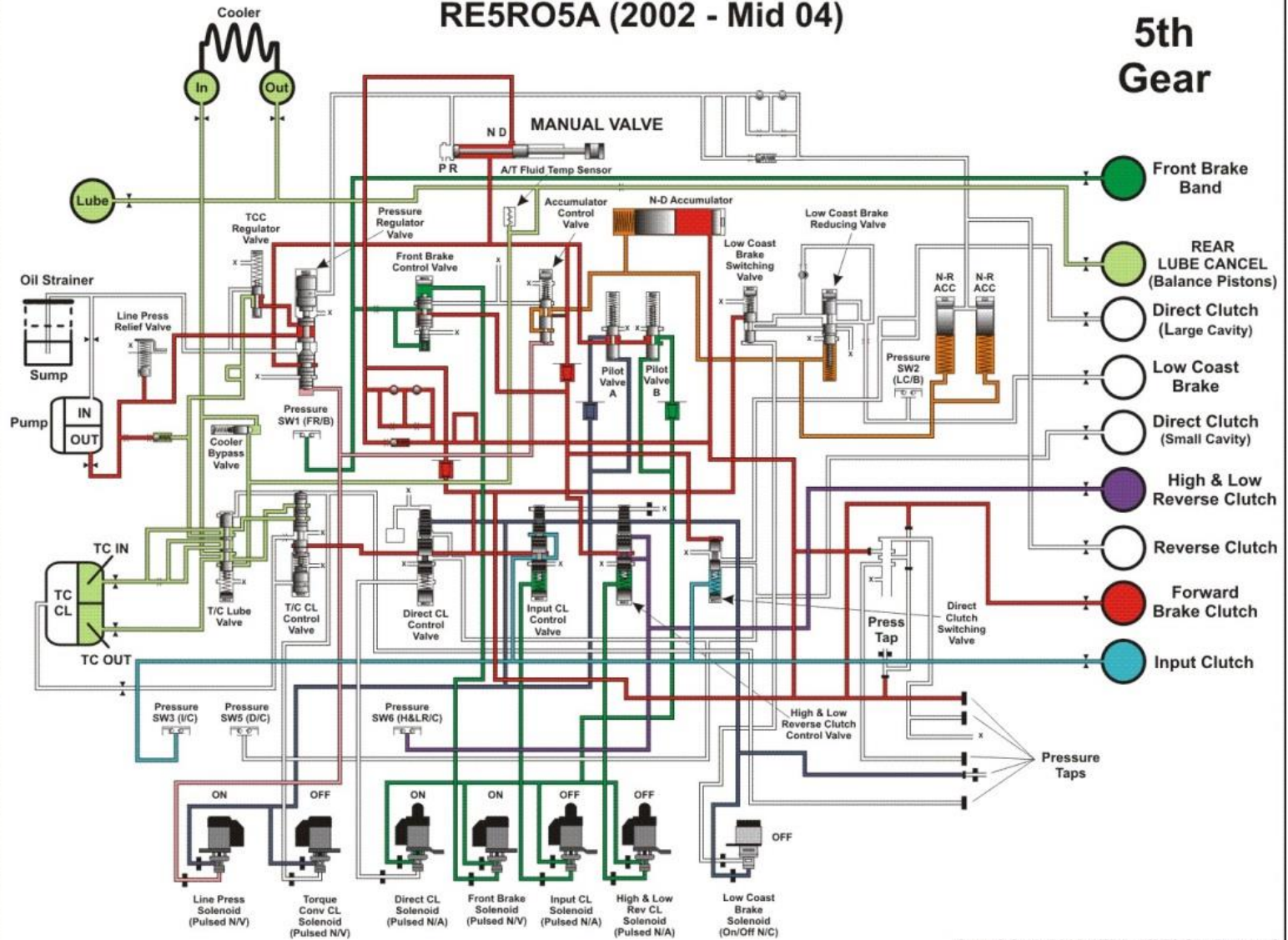


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5th Gear

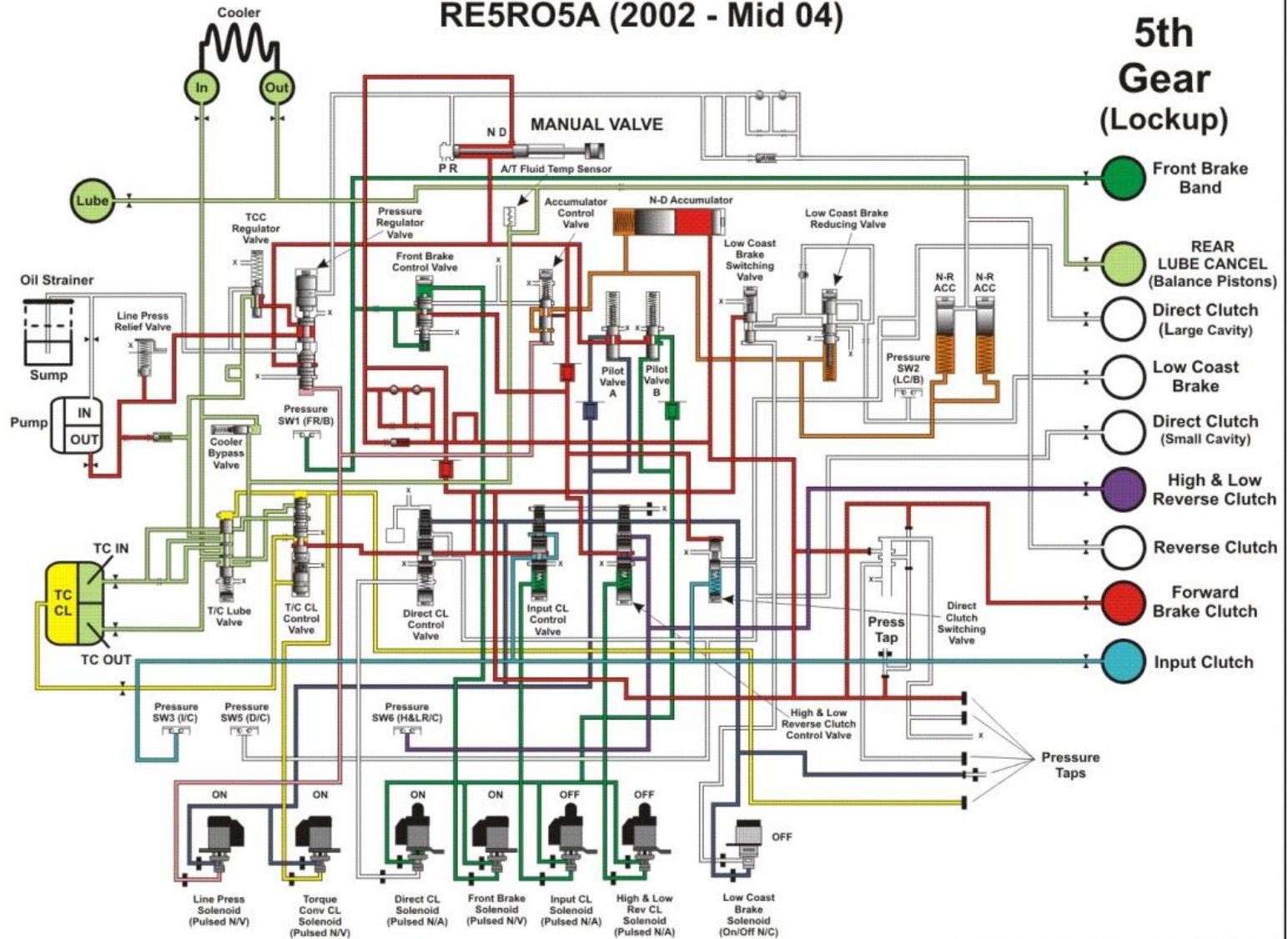


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RE5R05A (2002 - Mid 04)

5th Gear (Lockup)





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