TRANSMISSION CHANGE AWARENESS

REMANUFACTURED ETE REMAN TRANSMISSIONS

ATSG AUTOMATIC TRANSMISSION SERVICE GROUP

APRIL 6TH, 2024

TST Seminars

Sat, Apr 06 | Westchester Marriott

TST 2024 LIVE IN PERSON 21th ANNUAL BIG EVENT & TRADE SHOW

All PAID attendees receive a Android Tablet. MUST HAVE TICKET TO ENTER THE EVENT. (MUST ATTEND TO RECEIVE A TABLET) ABSOLUTELY NO REFUNDS -

Transmission Change Awareness

- Welcome to “Transmission Change Awareness” sponsored by ATSG/ETE Reman.
- Please allow me to begin with a short “Shameless Self Promotion” ☺
- ETE Reman is in Milwaukee, Wisconsin, where it remanufactures approximately 330 transmissions a day offering a 3-year no hassle warranty to its customers.

Transmission Change Awareness

- ATSG is a technical organization supporting the automotive industry in diagnosing automatic transmission malfunctions. ATSG then provides technical seminars sharing the discovery of the many causes to these transmission malfunctions. ATSG also provides a variety of manuals from rebuilding to diagnosing and quick references guides.

- Both ETE Reman and ATSG started in 1985. In August of 2018, ETE Reman acquired ATSG bringing great support to both organizations for the benefit of the automotive industry.


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ETE Reman/ATSG Corporate Headquarters

ETE REMAN Shipping & Receiving Center
Trans-R-Us

ETE REMAN
Torque Converter Rebuilding Plant

THE ETE REMAN FACILITY


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TRANSMISSIONS

THE ETE REMAN FACILITY

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ETE'S MOBILE APP TAKES FLIGHT

Sorry Feathers,

some things are better done on the phone.

Convenience and Speed - ETE's app lets you search products by application, interchange or VIN. You can also...

- Quickly Check Price and Availability
- Effortlessly Scan to Read and Input VIN
- Schedule Core Returns
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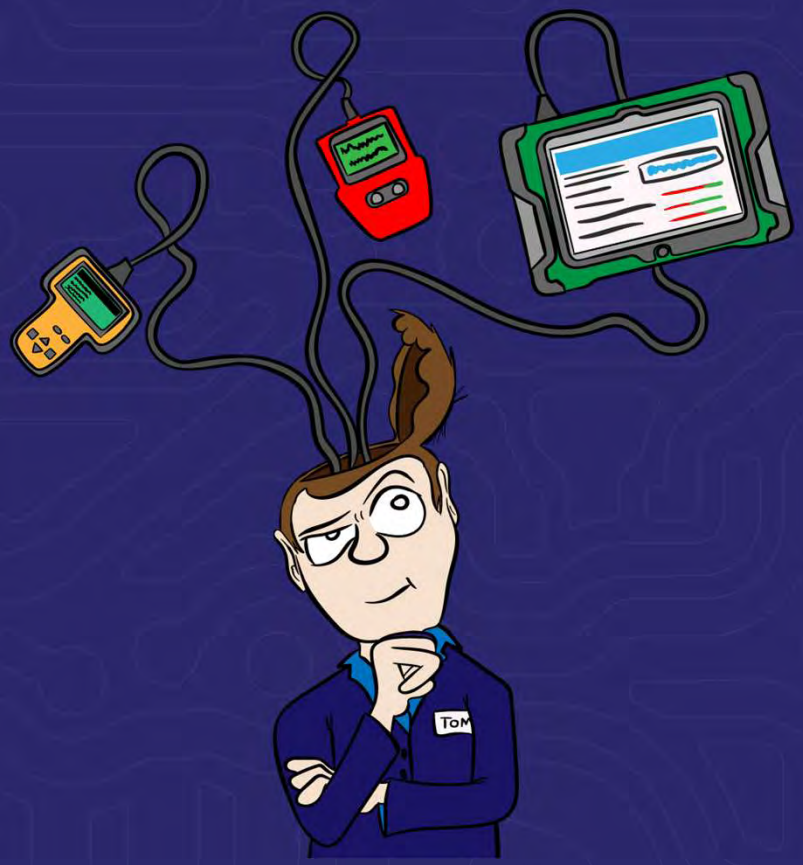
Repelled by high car prices, Americans are holding on to their vehicles longer than ever

May 15th, 2023

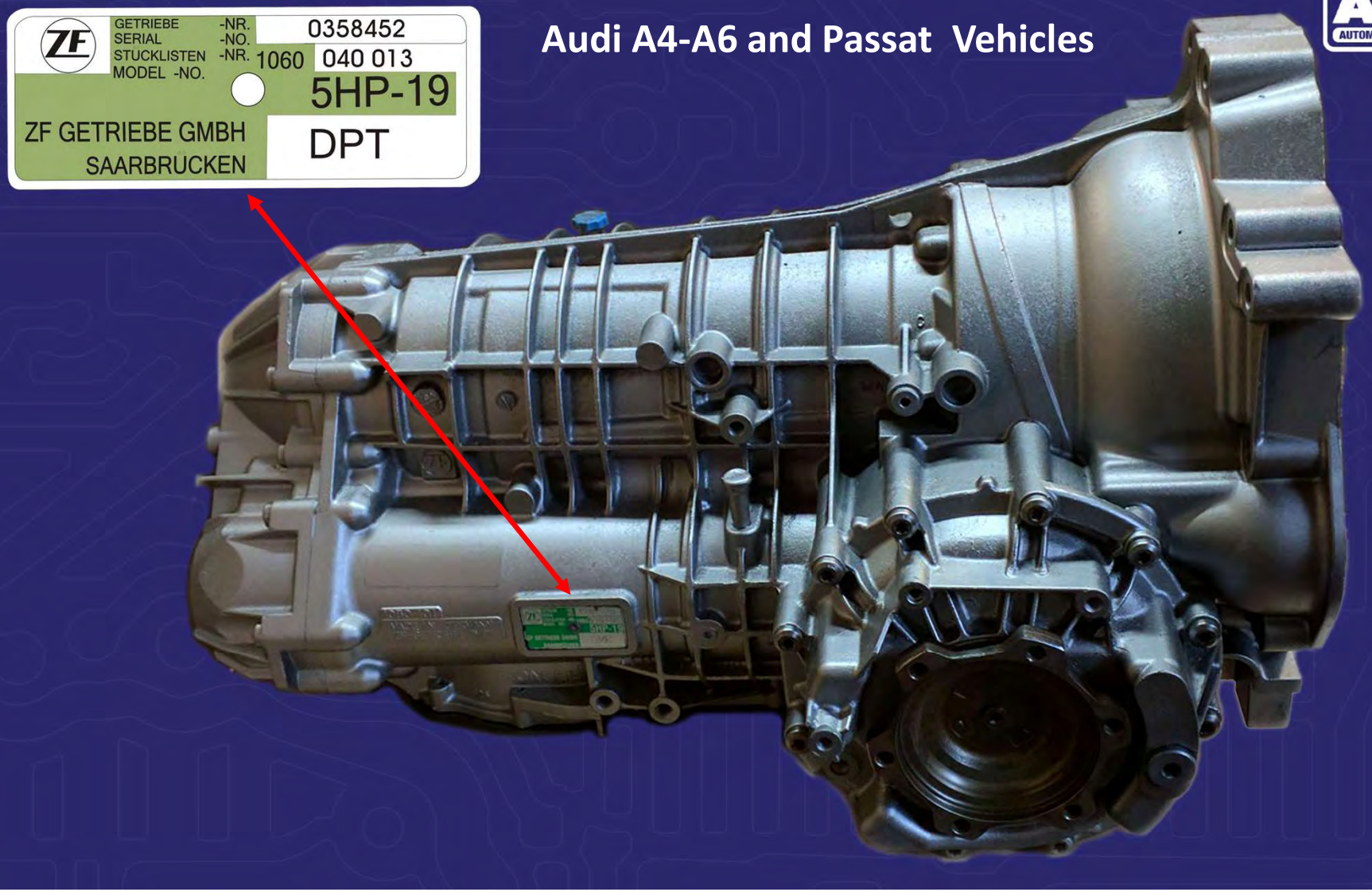
Automatic Transmission Rebuilders are in a steep decline.

Transmission Change Awareness



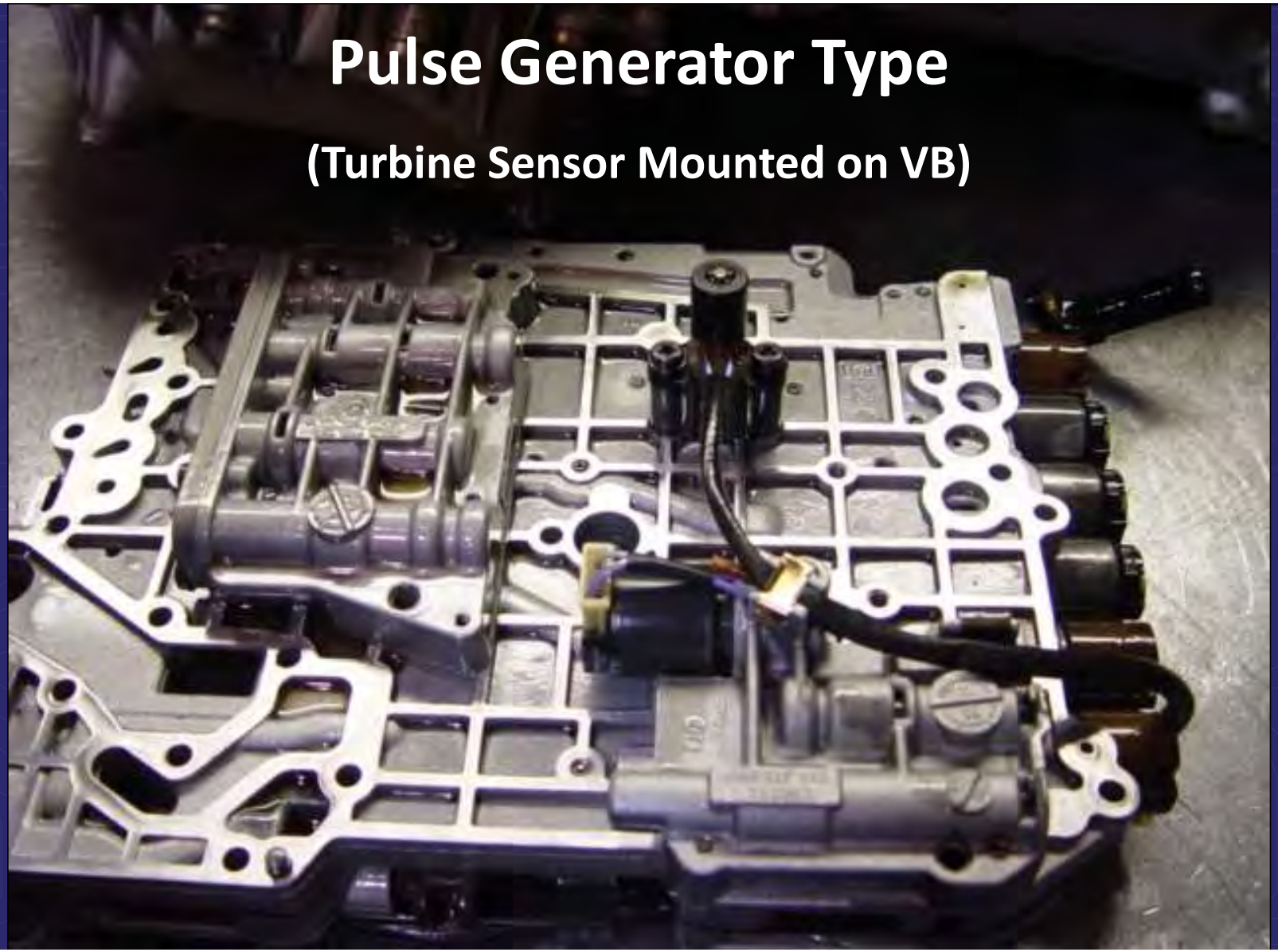
- Our presentation today will primarily cover from old to new *(from 4 to 10 speeds*), some changes that have occurred within a family of transmissions which if a tech is unaware of, will make it difficult to diagnose. We call this, “Transmission Change Awareness.”
- Some unrelated helpful tips will also be given peppered throughout this presentation.

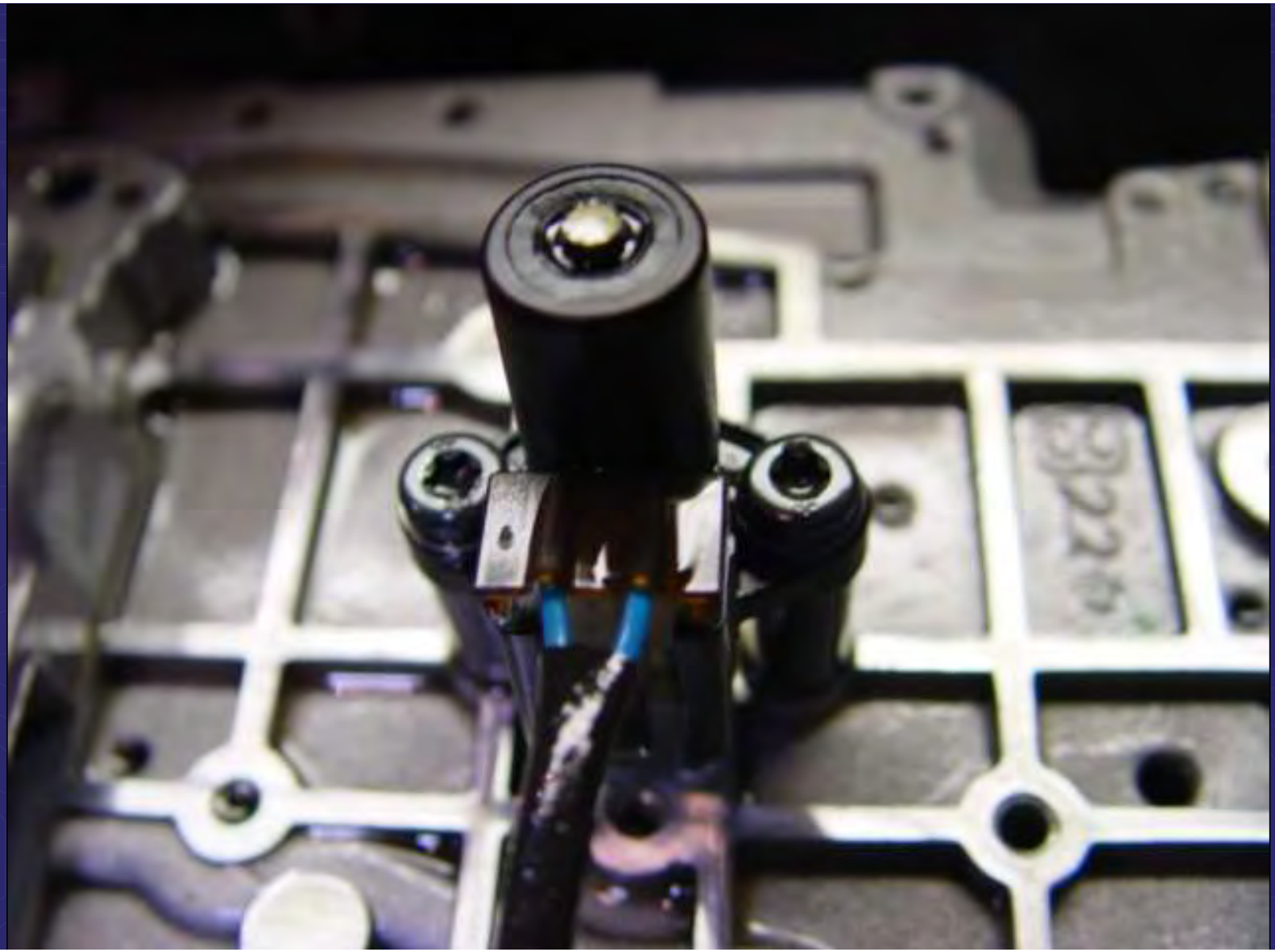
Audi A4-A6 and Passat Vehicles



Pulse Generator Type

(Turbine Sensor Mounted on VB)





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Sheet metal windows mounted on the spider clutch shell are used to excite the pulse generator.

Pulse Generator Reads Planet Speed so there is no Turbine Speed signal In 1st Gear

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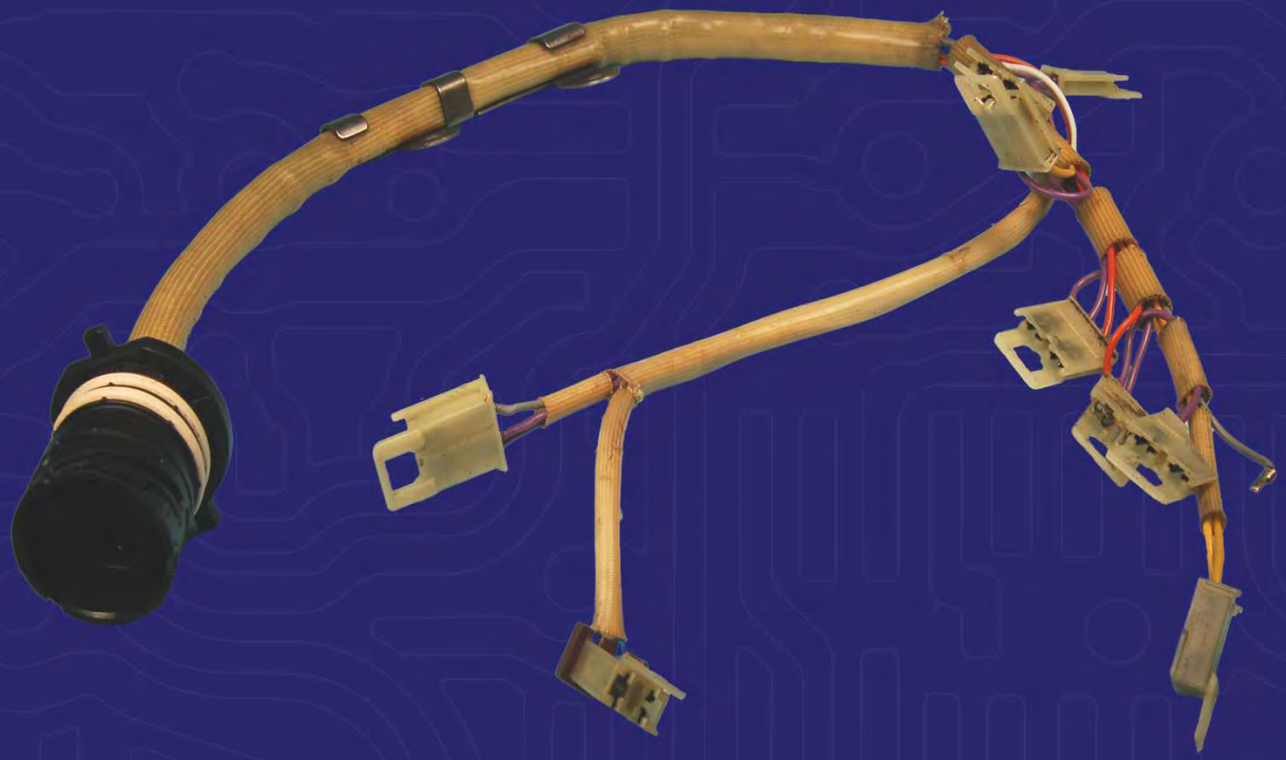
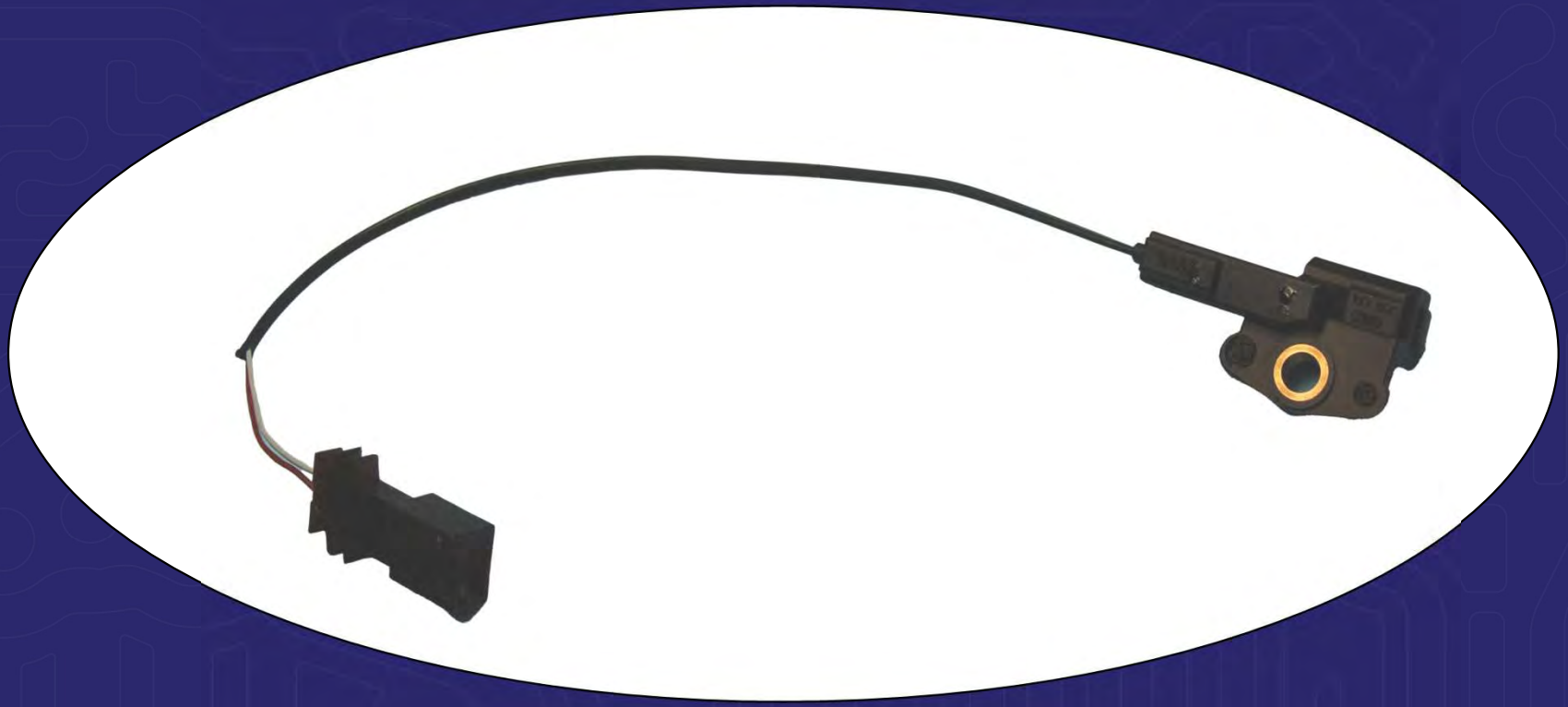
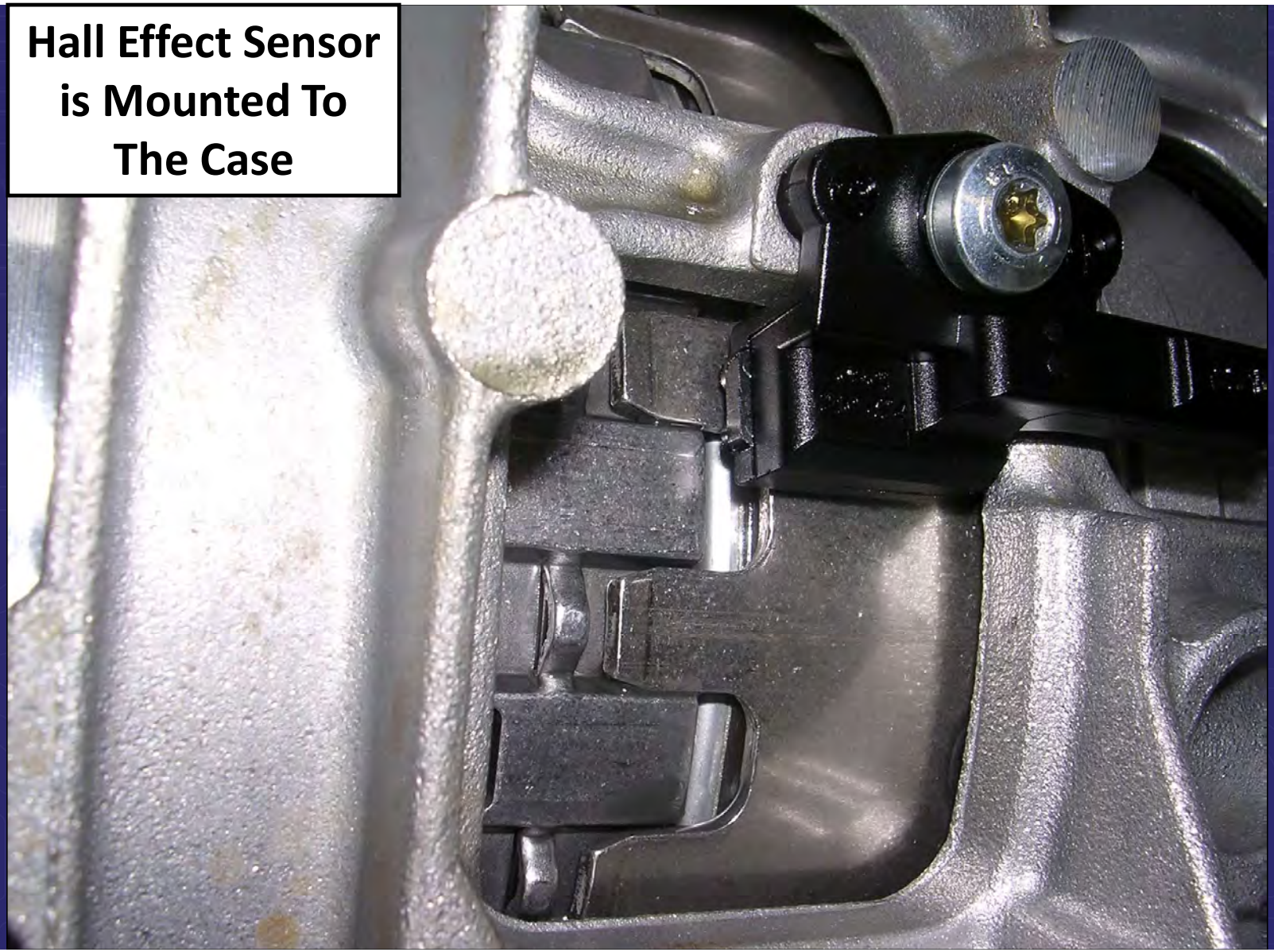
Internal Harness Using A Pulse Generator Turbine Sensor



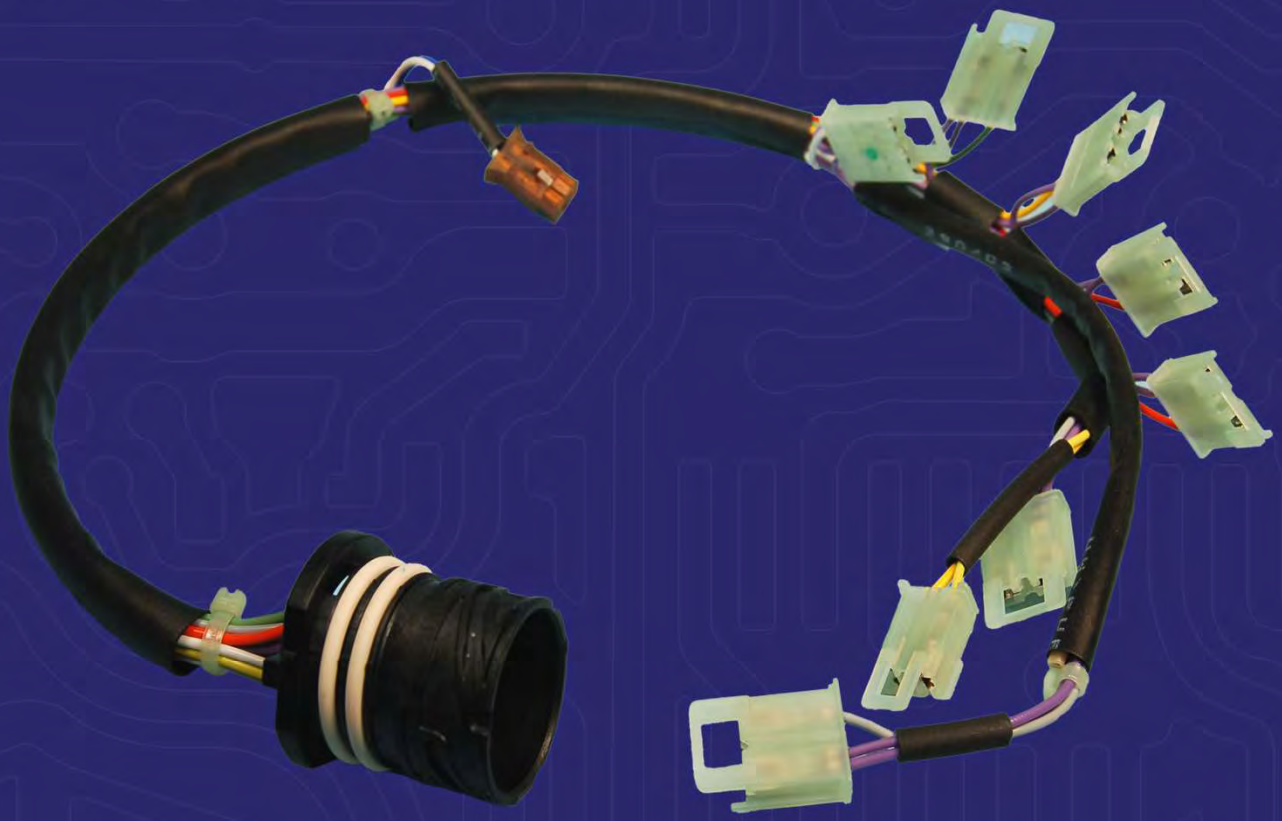
Hall Effects Sensor Reads Actual Input Speed From Forward Clutch (A)



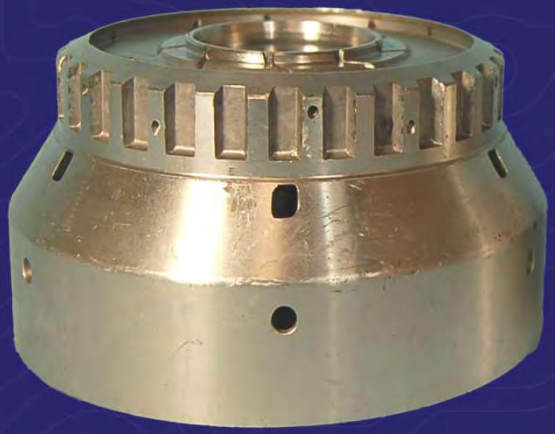
Hall Effect Sensor is Mounted To The Case



Internal Harness Using A Hall Effect Turbine Sensor



“A” CLUTCH DRUM FOR PULSE GENERATOR



“A” CLUTCH DRUM FOR HALL EFFECT SENSOR

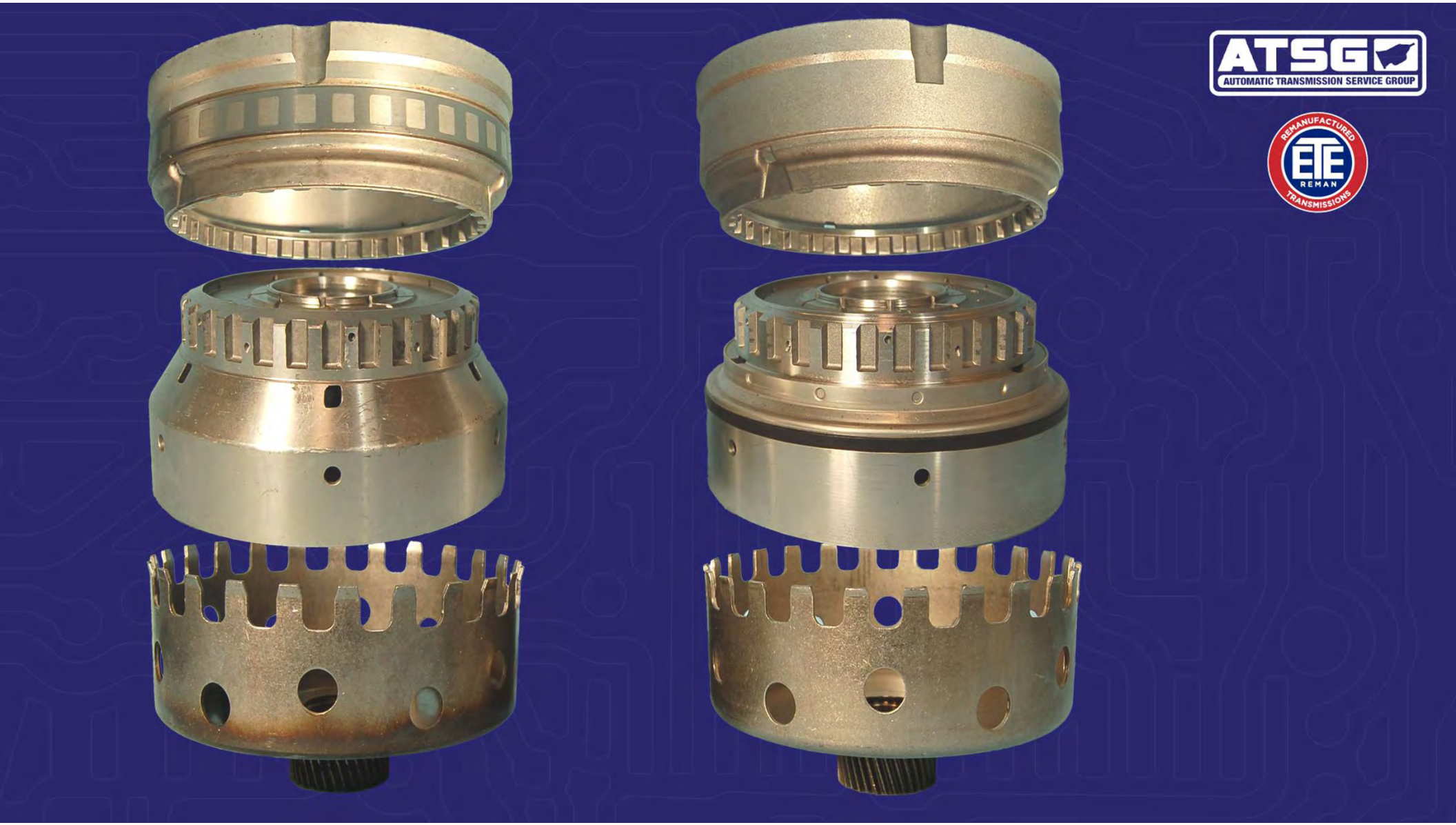
MAGNETIC BAND

SPIDER CLUTCH BELL FOR PULSE GENERATOR

SPIDER CLUTCH BELL FOR HALL EFFECT SENSOR

SUN SHELL FOR PULSE GENERATOR IS FERROUS

SUN SHELL FOR HALL EFFECT SENSOR IS NON-FERROUS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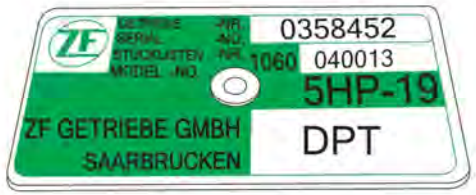
ZF5HP19FL/FLA
PULSE GENERATOR MODELS

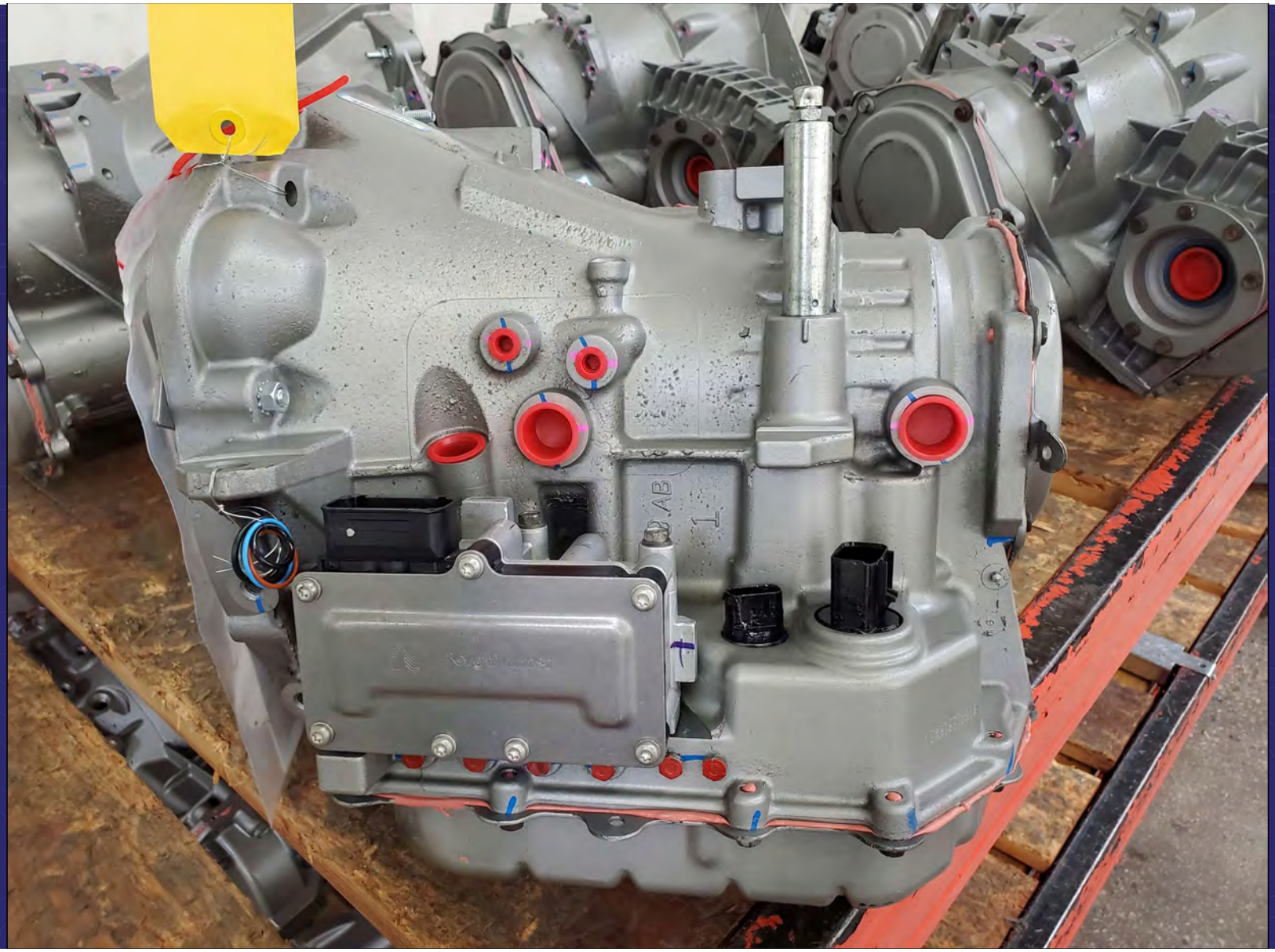
MAKE	MODEL	ENG.	YEAR	ZF PART #	CODE	TYPE
AUDI	A4 QUATTRO/AVANT	1.8	1996	1060-040-018	DTV	PULSE GENERATOR
AUDI	A4 QUATTRO/AVANT	2.8	1996	1060-040-002	CJP	PULSE GENERATOR
AUDI	A4 QUATTRO/AVANT	2.8	1996	1060-040-012	DRN	PULSE GENERATOR
AUDI	A4 QUATTRO/AVANT	1.8	1997	1060-040-018	DTV	PULSE GENERATOR
AUDI	A4 QUATTRO/AVANT	2.8	1997	1060-040-002	CJP	PULSE GENERATOR
AUDI	A4 QUATTRO/AVANT	2.8	1997	1060-040-012	DRN	PULSE GENERATOR
AUDI	A4 QUATTRO/AVANT	1.8	1998	1060-040-018	DTV	PULSE GENERATOR
AUDI	A4 QUATTRO/AVANT	2.8	1998	1060-040-012	DRN	PULSE GENERATOR
AUDI	A6 QUATTRO	2.8	1998	1060-040-013	DPT	PULSE GENERATOR
AUDI	A6 QUATTRO	2.8	1998	1060-040-036	EKX	PULSE GENERATOR
AUDI	A4 QUATTRO/AVANT	1.8	1999	1060-040-018	DTV	PULSE GENERATOR
AUDI	A4 QUATTRO/AVANT	2.8	1999	1060-040-012	DRN	PULSE GENERATOR
AUDI	A6 QUATTRO	2.8	1999	1060-040-013	DPT	PULSE GENERATOR
AUDI	A6 QUATTRO	2.8	1999	1060-040-036	EKX	PULSE GENERATOR
AUDI	A4 QUATTRO/AVANT	1.8	2000	1060-040-018	DTV	PULSE GENERATOR
AUDI	A4 QUATTRO/AVANT	2.8	2000	1060-040-012	DRN	PULSE GENERATOR
AUDI	A6 QUATTRO	2.8	2000	1060-040-013	DPT	PULSE GENERATOR
AUDI	A6 QUATTRO	2.8	2000	1060-040-036	EKX	PULSE GENERATOR
AUDI	A4 QUATTRO/AVANT	1.8	2001	1060-040-018	DTV	PULSE GENERATOR
AUDI	A4 QUATTRO/AVANT	2.8	2001	1060-040-012	DRN	PULSE GENERATOR
AUDI	A6 QUATTRO	2.8	2001	1060-040-013	DPT	PULSE GENERATOR
AUDI	A6 QUATTRO	2.8	2001	1060-040-036	EKX	PULSE GENERATOR
AUDI	A4 QUATTRO/AVANT	1.8	2002	1060-040-018	DTV	PULSE GENERATOR
AUDI	A4 QUATTRO/AVANT	2.8	2002	1060-040-012	DRN	PULSE GENERATOR
VW	PASSAT	2.8	1999	1060-040-012	DRN	PULSE GENERATOR
VW	PASSAT	2.8	2000	1060-040-012	DRN	PULSE GENERATOR
VW	PASSAT	2.8	2001	1060-040-012	DRN	PULSE GENERATOR



TAG IS AN EXAMPLE OF AN
AUDI A6 QUATTRO 2.8 1998 MODEL YEAR
TRANS ID CODE: DPT
PULSE GENERATOR MODEL

ZF5HP19FL/FLA
HALL EFFECT SENSOR MODELS

MAKE	MODEL	ENG.	YEAR	ZF PART #	CODE	TYPE
AUDI	A6 QUATTRO	2.7	1998	1060-040-044	EMP	HALL EFFECT
AUDI	A6 QUATTRO	2.7	1998	1060-040-063	FAQ	HALL EFFECT
AUDI	A6 QUATTRO	2.8	1998	1060-040-035	EKD	HALL EFFECT
AUDI	A4 QUATTRO/AVANT	1.8	1999	1060-040-030	EFQ	HALL EFFECT
AUDI	A4 QUATTRO/AVANT	1.8	1999	1060-040-054	FAL	HALL EFFECT
AUDI	A4 QUATTRO/AVANT	2.8	1999	1060-040-035	EKD	HALL EFFECT
AUDI	A6 QUATTRO	2.7	1999	1060-040-044	EMP	HALL EFFECT
AUDI	A6 QUATTRO	2.8	1999	1060-040-035	EKD	HALL EFFECT
AUDI	S4 QUATTRO/AVANT	2.7	1999	1060-040-044	EMP	HALL EFFECT
AUDI	A4 QUATTRO/AVANT	1.8	2000	1060-040-030	EFQ	HALL EFFECT
AUDI	A4 QUATTRO/AVANT	1.8	2000	1060-040-054	FAL	HALL EFFECT
AUDI	A4 QUATTRO/AVANT	2.8	2000	1060-040-035	EKD	HALL EFFECT
AUDI	A6 QUATTRO	2.7	2000	1060-040-044	EMP	HALL EFFECT
AUDI	A6 QUATTRO	2.8	2000	1060-040-035	EKD	HALL EFFECT
AUDI	S4 QUATTRO/AVANT	2.7	2000	1060-040-044	EMP	HALL EFFECT
AUDI	A4 QUATTRO/AVANT	1.8	2001	1060-040-030	EFQ	HALL EFFECT
AUDI	A4 QUATTRO/AVANT	1.8	2001	1060-040-054	FAL	HALL EFFECT
AUDI	A4 QUATTRO/AVANT	2.8	2001	1060-040-035	EKD	HALL EFFECT
AUDI	A6 QUATTRO	2.7	2001	1060-040-044	EMP	HALL EFFECT
AUDI	A6 QUATTRO	2.8	2001	1060-040-035	EKD	HALL EFFECT
AUDI	A6 ALLROAD QUATTRO	NA	2001	1060-040-093	FXL	HALL EFFECT
AUDI	A6 ALLROAD QUATTRO	2.7	2001	1060-040-053	EYK	HALL EFFECT
AUDI	S4 QUATTRO/AVANT	2.7	2001	1060-040-044	EMP	HALL EFFECT
AUDI	A4 QUATTRO/AVANT	1.8	2002	1060-040-030	EFQ	HALL EFFECT
AUDI	A4 QUATTRO/AVANT	1.8	2002	1060-040-054	FAL	HALL EFFECT
AUDI	A4 QUATTRO/AVANT	1.8	2002	1060-040-073	FEP	HALL EFFECT
AUDI	A4 QUATTRO/AVANT	1.8	2002	1060-040-101	GBF	HALL EFFECT
AUDI	A4 QUATTRO/AVANT	2.8	2002	1060-040-035	EKD	HALL EFFECT
AUDI	A4 QUATTRO/AVANT	3.0	2002	1060-040-087	FEQ	HALL EFFECT
AUDI	A4 QUATTRO/AVANT	3.0	2002	1060-040-103	GBJ	HALL EFFECT
AUDI	A6 QUATTRO	3.0	2002	1060-040-075	FEJ	HALL EFFECT
AUDI	S4 QUATTRO/AVANT	2.7	2002	1060-040-044	EMP	HALL EFFECT
VW	PASSAT	2.8	1999	1060-040-035	EKD	HALL EFFECT
VW	PASSAT	2.8	2000	1060-040-035	EKD	HALL EFFECT
VW	PASSAT	2.8	2001	1060-040-035	EKD	HALL EFFECT
VW	PASSAT	4.0	2001	1060-040-100	GAK	HALL EFFECT



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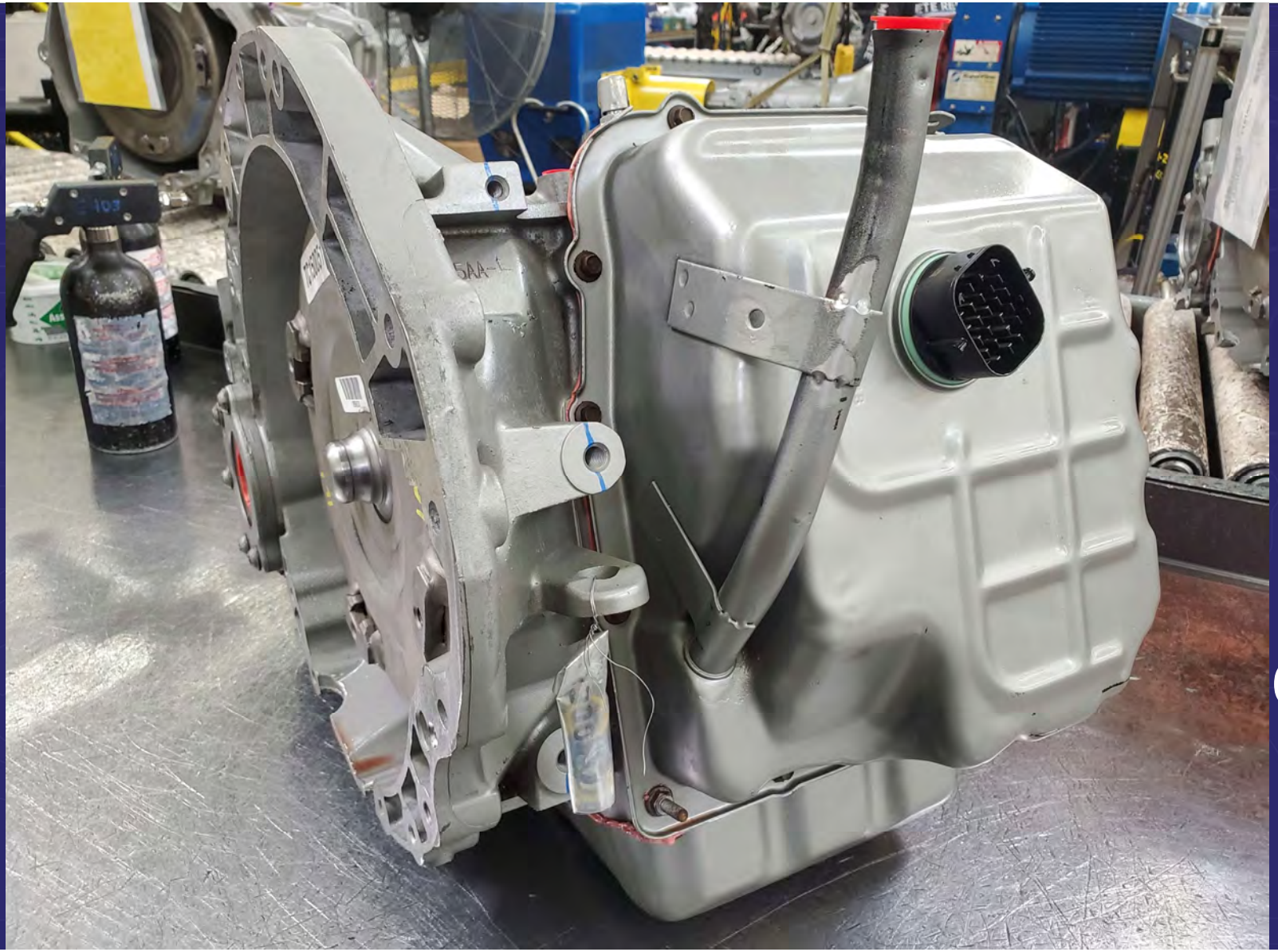
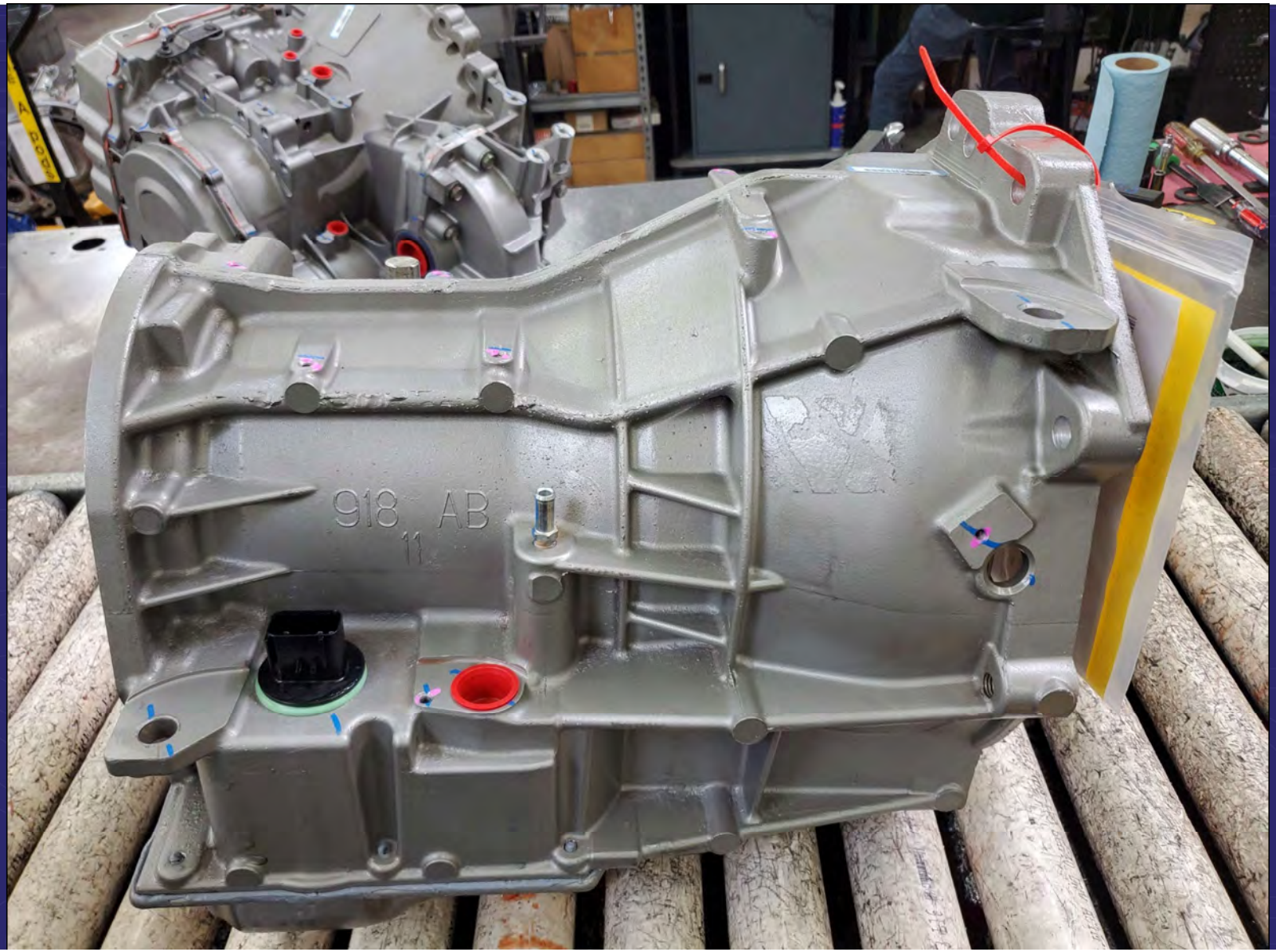
ETE REMAN
REMANUFACTURED TRANSMISSIONS

41TE
42RLE
45RFE
545RFE
62TE
65RFE
66RFE
68RFE

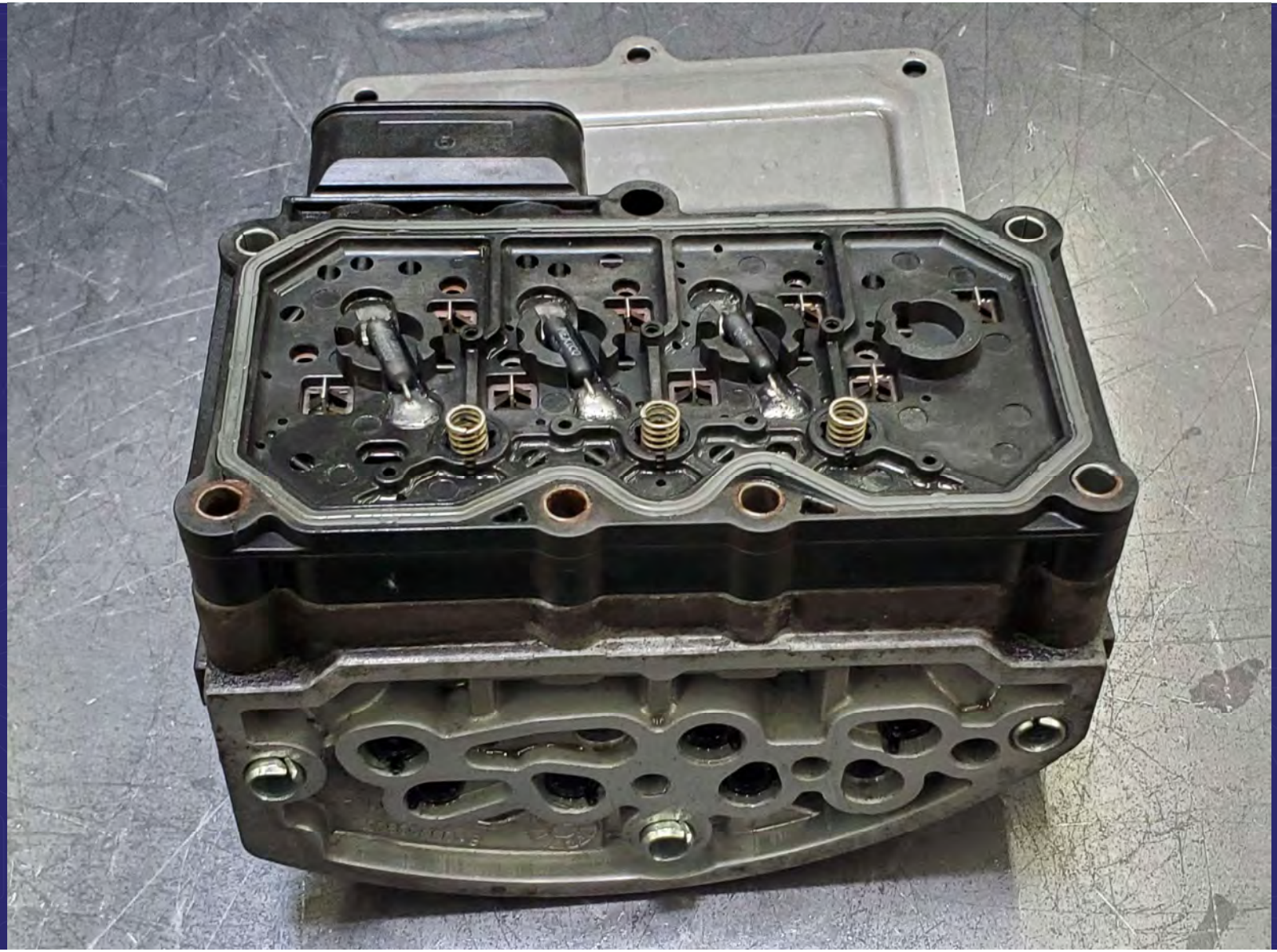


62TE Solenoid Body Pass Through Connector View

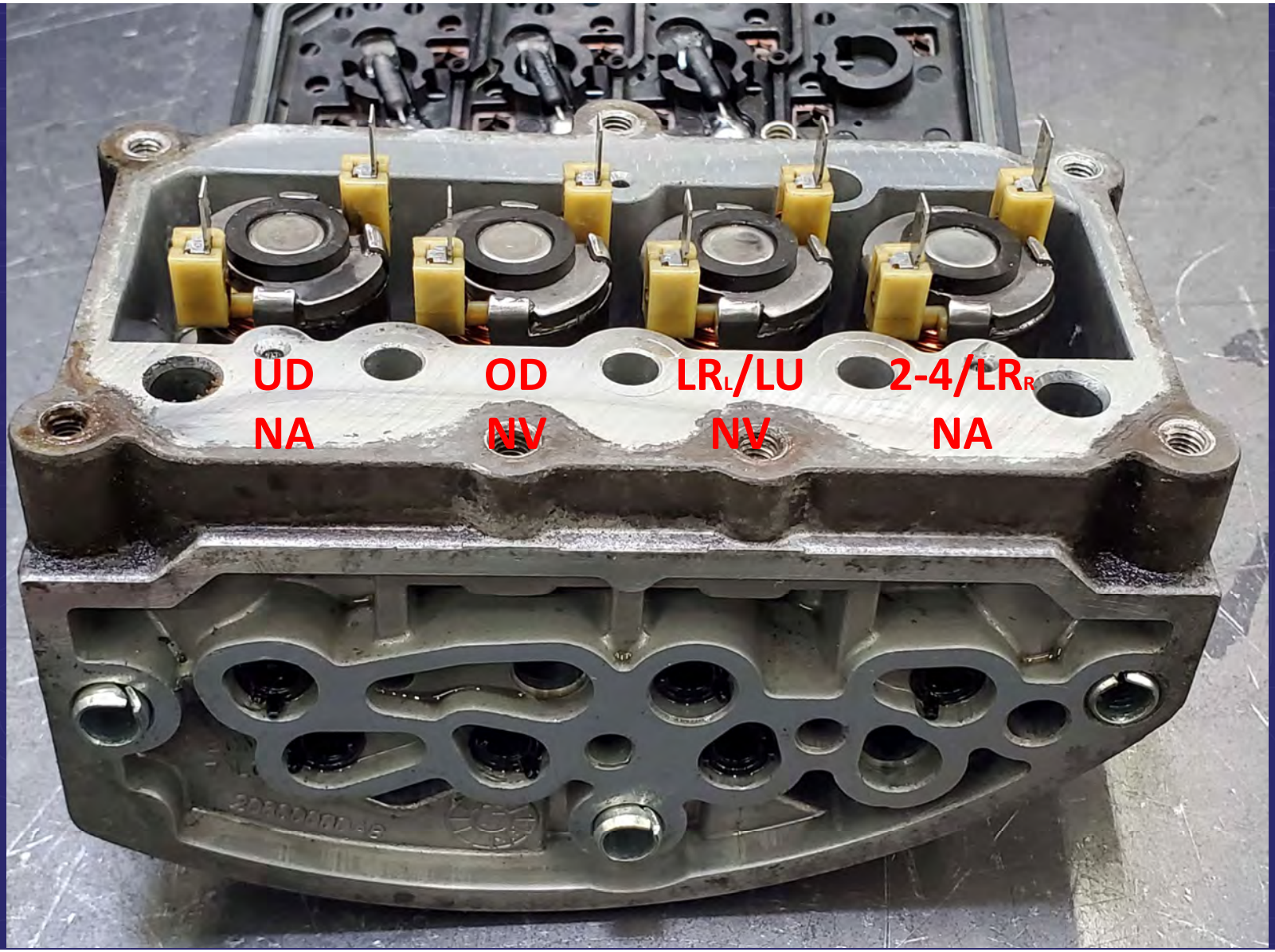


42RLE Solenoid Body Pass Through Connector View

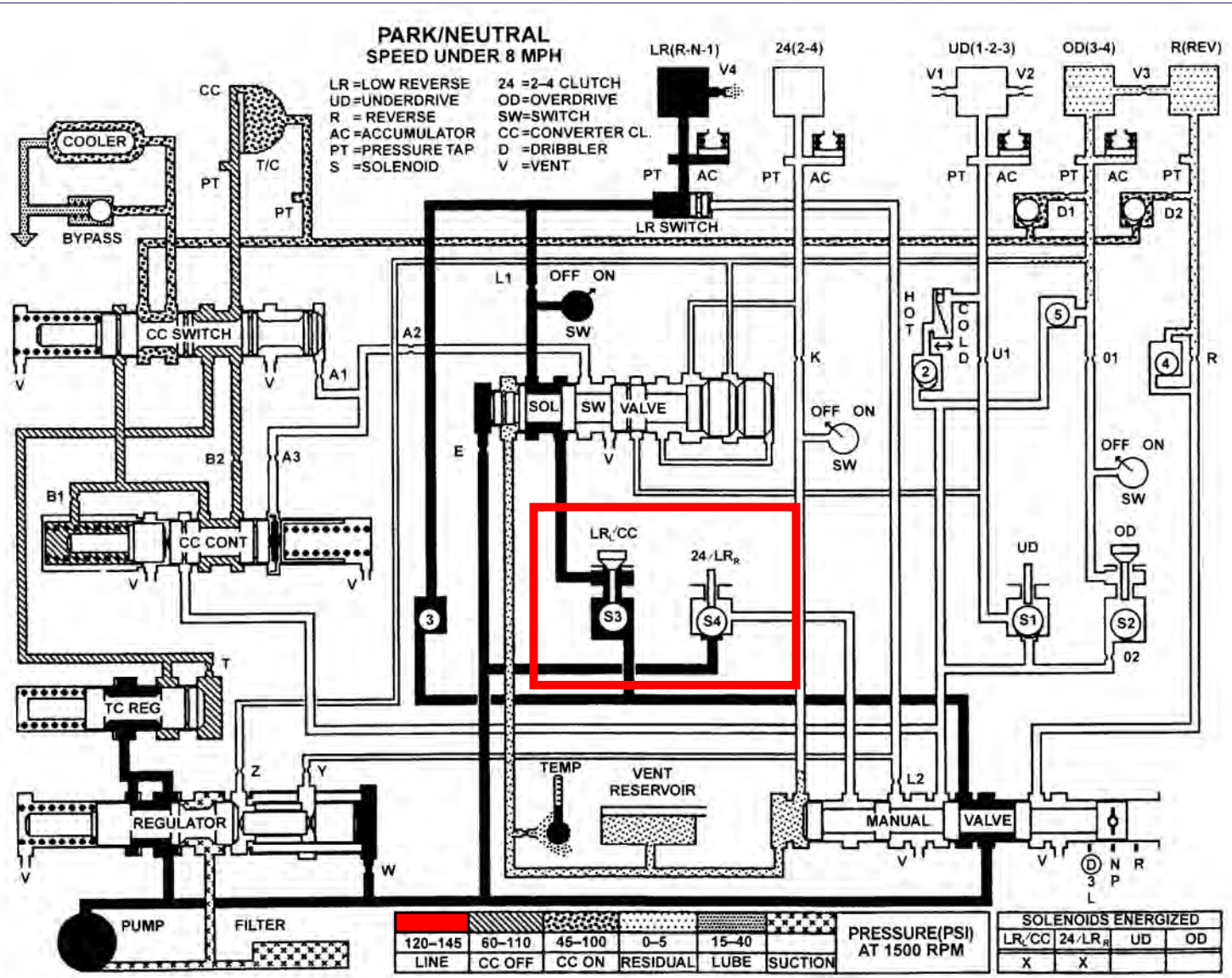
41TE (A604) Solenoid Body Assembly

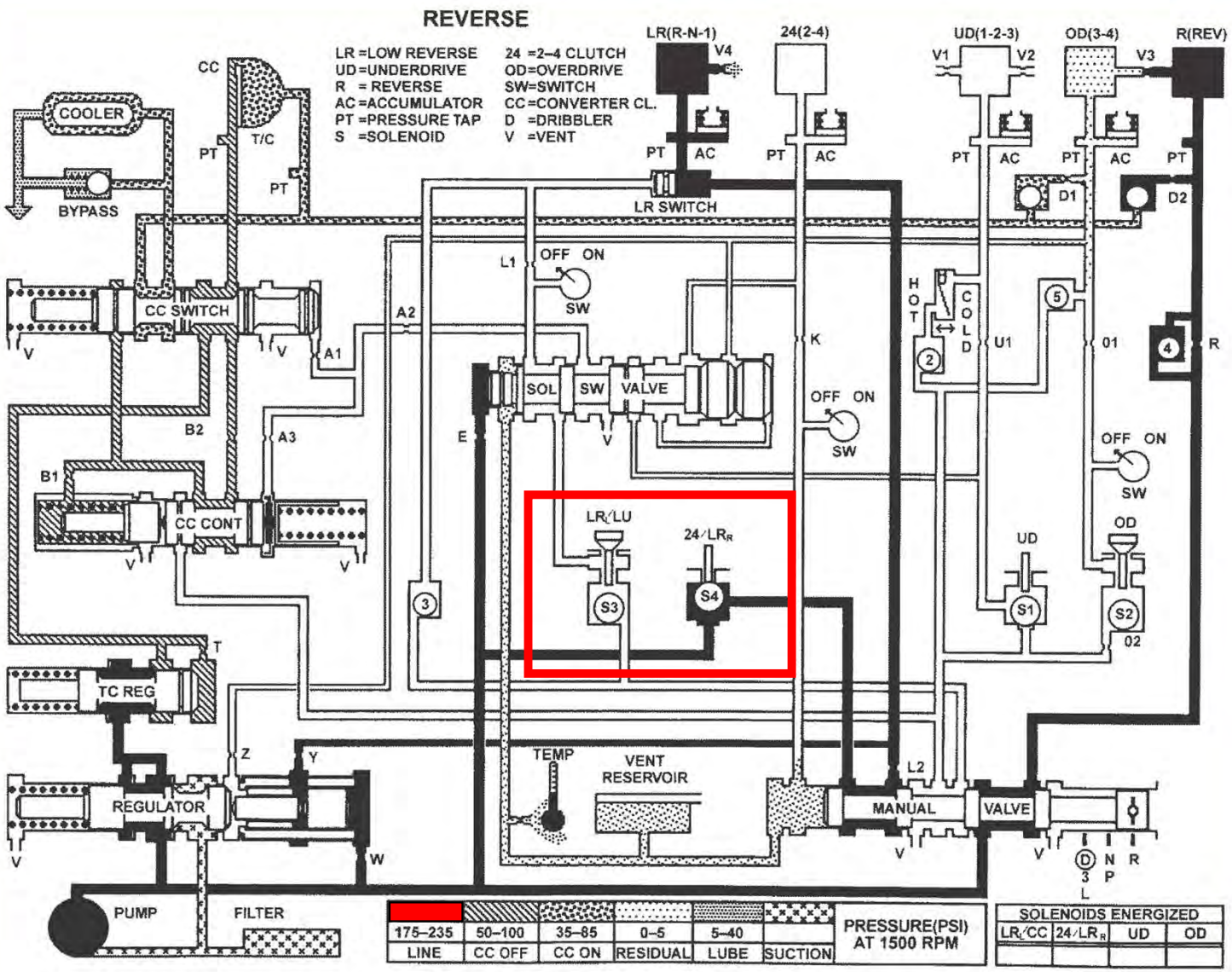


41TE (A604) Pressure Switches



41TE (A604) NA and NV Solenoids


PARK/NEUTRAL
SPEED UNDER 8 MPH
LR =LOW REVERSE
UD =UNDERDRIVE
R = REVERSE
AC =ACCUMULATOR
PT =PRESSURE TAP
S =SOLENOID
24 =2–4 CLUTCH
OD=OVERDRIVE
SW=SWITCH
CC =CONVERTER CL.
D =DRIBBLER
V =VENT
LR(R-N-1)
24(2-4)
UD(1-2-3)
OD(3-4)
R(REV)
COOLER
BYPASS
CC
T/C
PT
LR SWITCH
L1
OFF ON
SW
CC SWITCH
A1
A2
A3
B1
B2
SOL
VALVE
E
K
HOT
COLD
U1
01
R
D1
D2
CC CONT
LR/CC
24/LR
S1
S2
S3
S4
UD
OD
TC REG
REGULATOR
TEMP
VENT
RESERVOIR
MANUAL
VALVE
L2
PUMP
FILTER
W
T
Z
Y
N
P
R
L
120–145
LINE
60–110
CC OFF
45–100
CC ON
0–5
RESIDUAL
15–40
LUBE
SUCTION
PRESSURE(PSI)
AT 1500 RPM
SOLENOIDS ENERGIZED
LR/CC
24/LR
UD
OD
X
X


REVERSE
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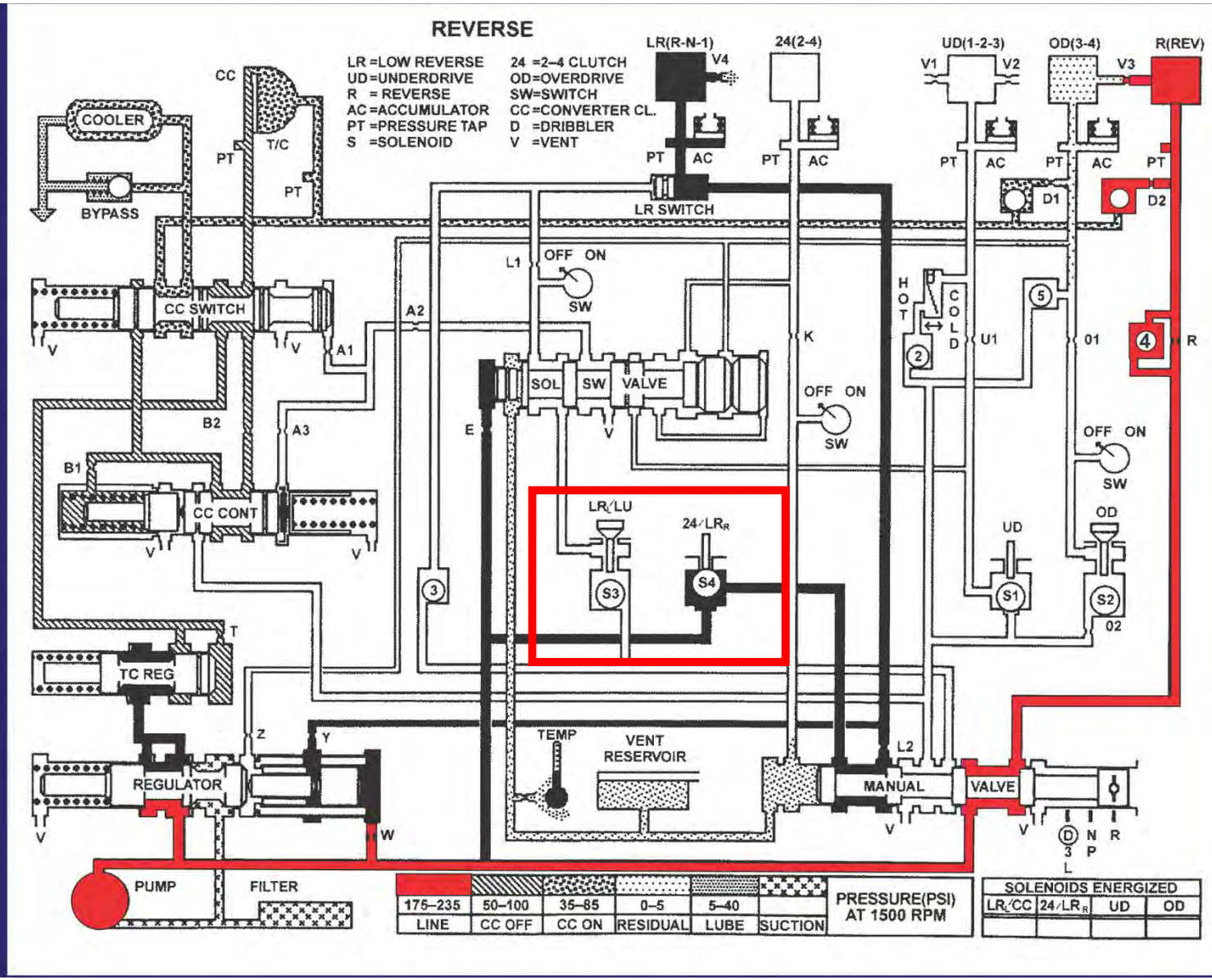
COOLER
BYPASS
CC
T/C
PT
AC
LR SWITCH
D1
D2
L1
OFF ON
SW
CC SWITCH
A1
A2
A3
B1
B2
SOL
VALVE
K
HOT
COLD
U1
01
R
E
CC CONT
LR/LU
24/LR
S3
S4
UD
OD
S1
S2
02
TC REG
REGULATOR
TEMP
VENT
RESERVOIR
MANUAL
VALVE
L2
PUMP
FILTER
W
D 3 L
N
P
R
175–235
LINE
50–100
CC OFF
35–85
CC ON
0–5
RESIDUAL
5–40
LUBE
SUCTION
PRESSURE(PSI)
AT 1500 RPM
SOLENOIDS ENERGIZED
LR/CC
24/LR
UD
OD


REVERSE
LR =LOW REVERSE
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LR(R-N-1)
24(2-4)
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R(REV)
V1
V2
V3
V4
CC
COOLER
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T/C
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LR SWITCH
D1
D2
L1
OFF ON
SW
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A1
A2
A3
B1
B2
K
HOT
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SOL
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E
CC CONT
LR/LU
24/LR
S3
S4
S1
S2
UD
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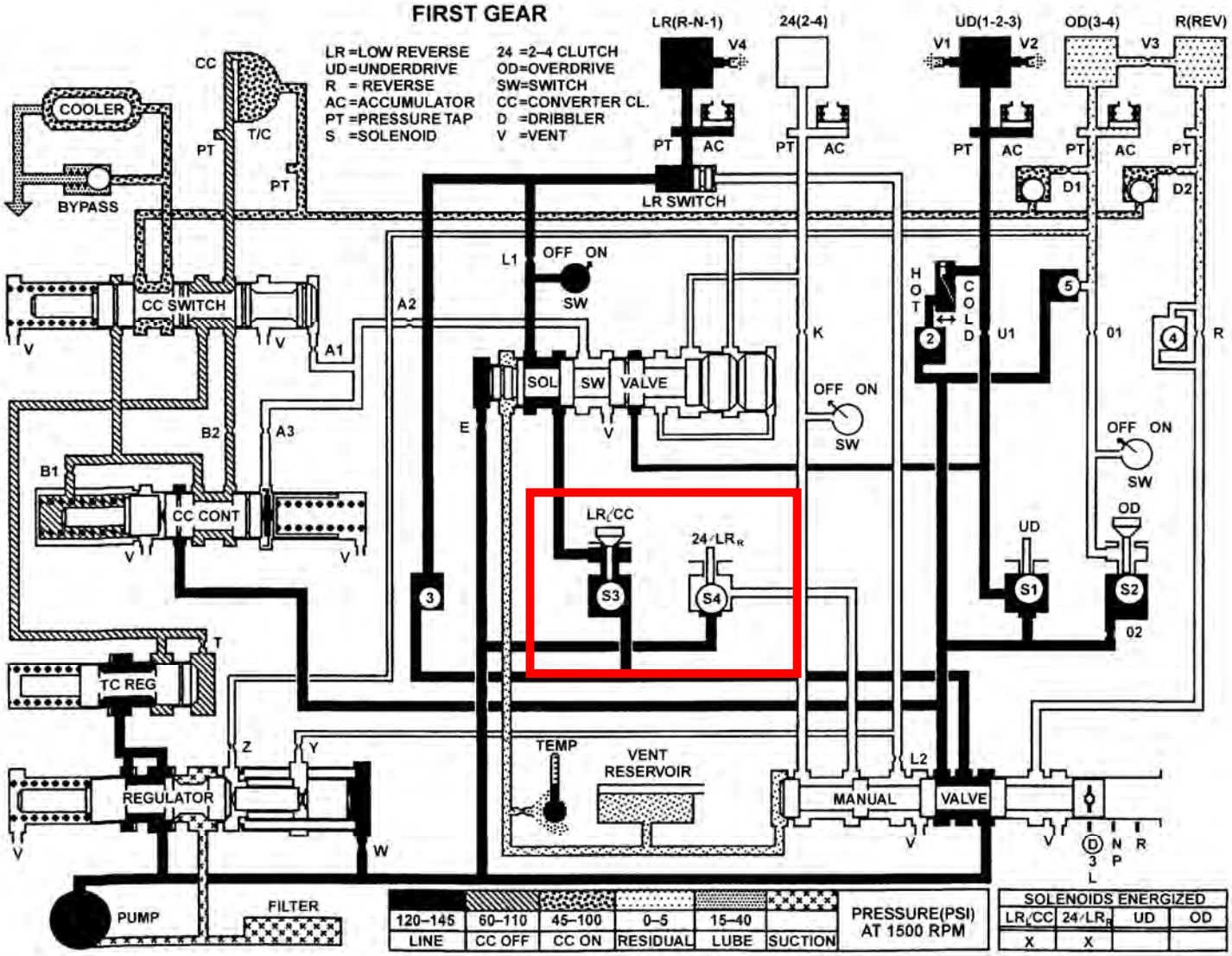
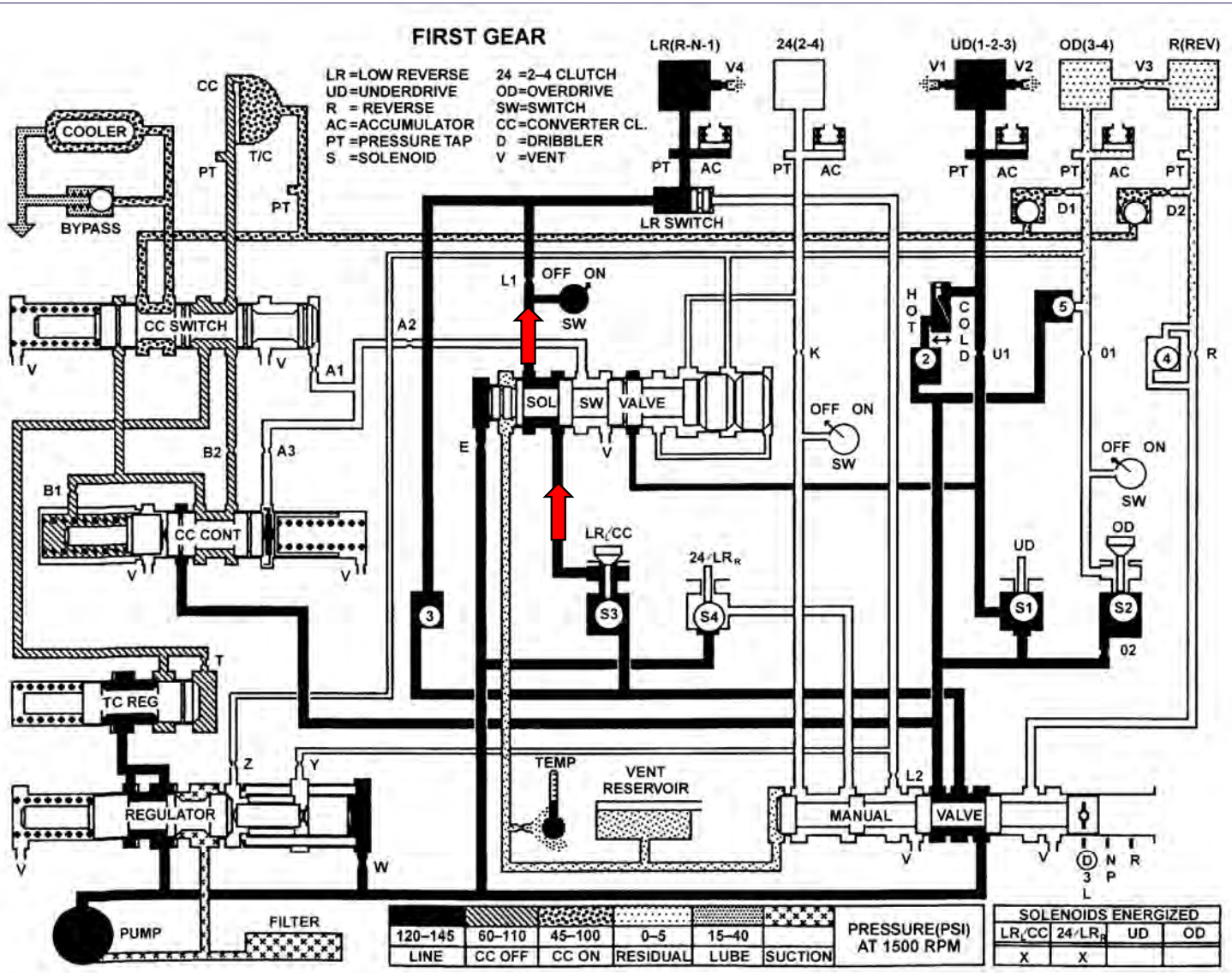
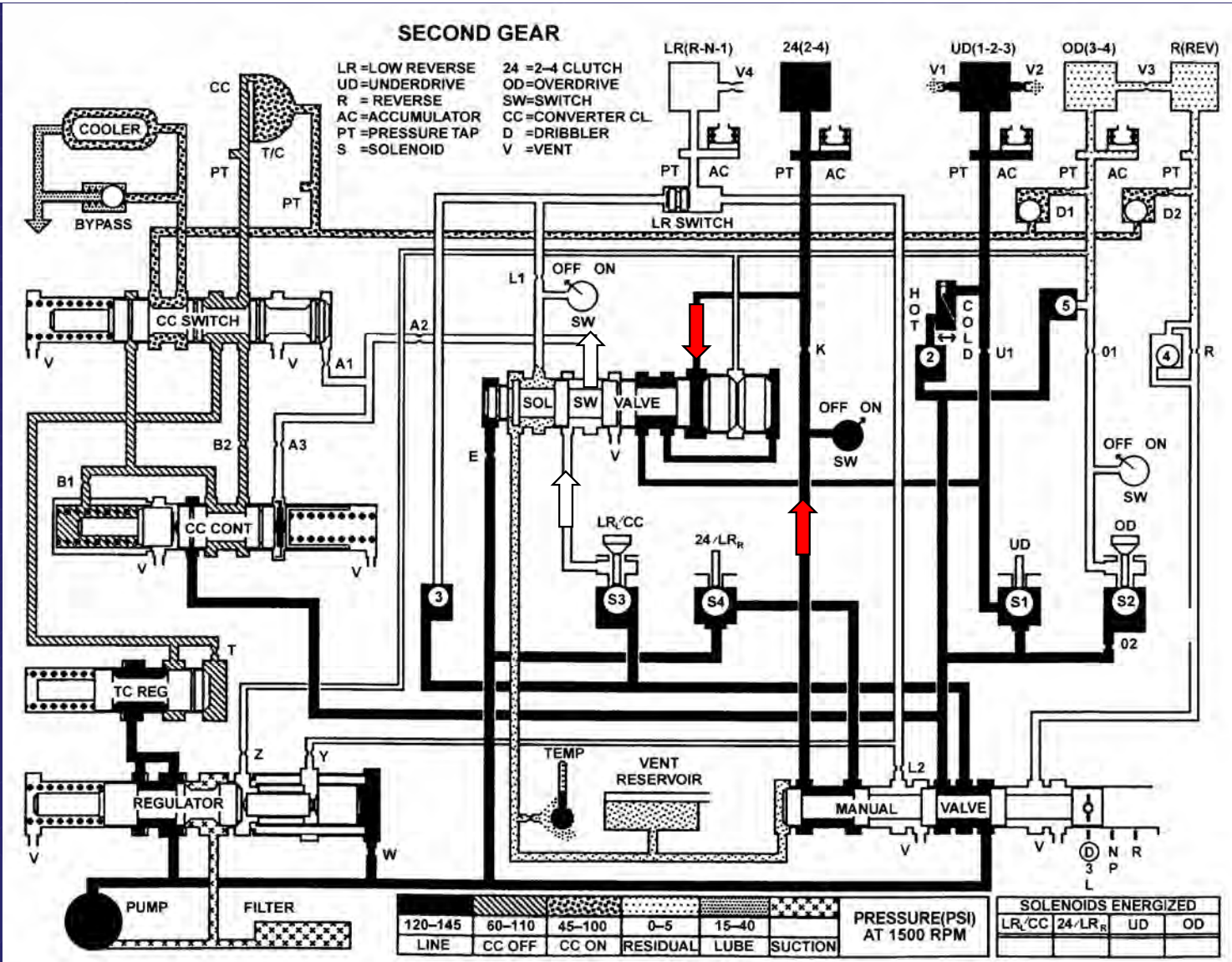
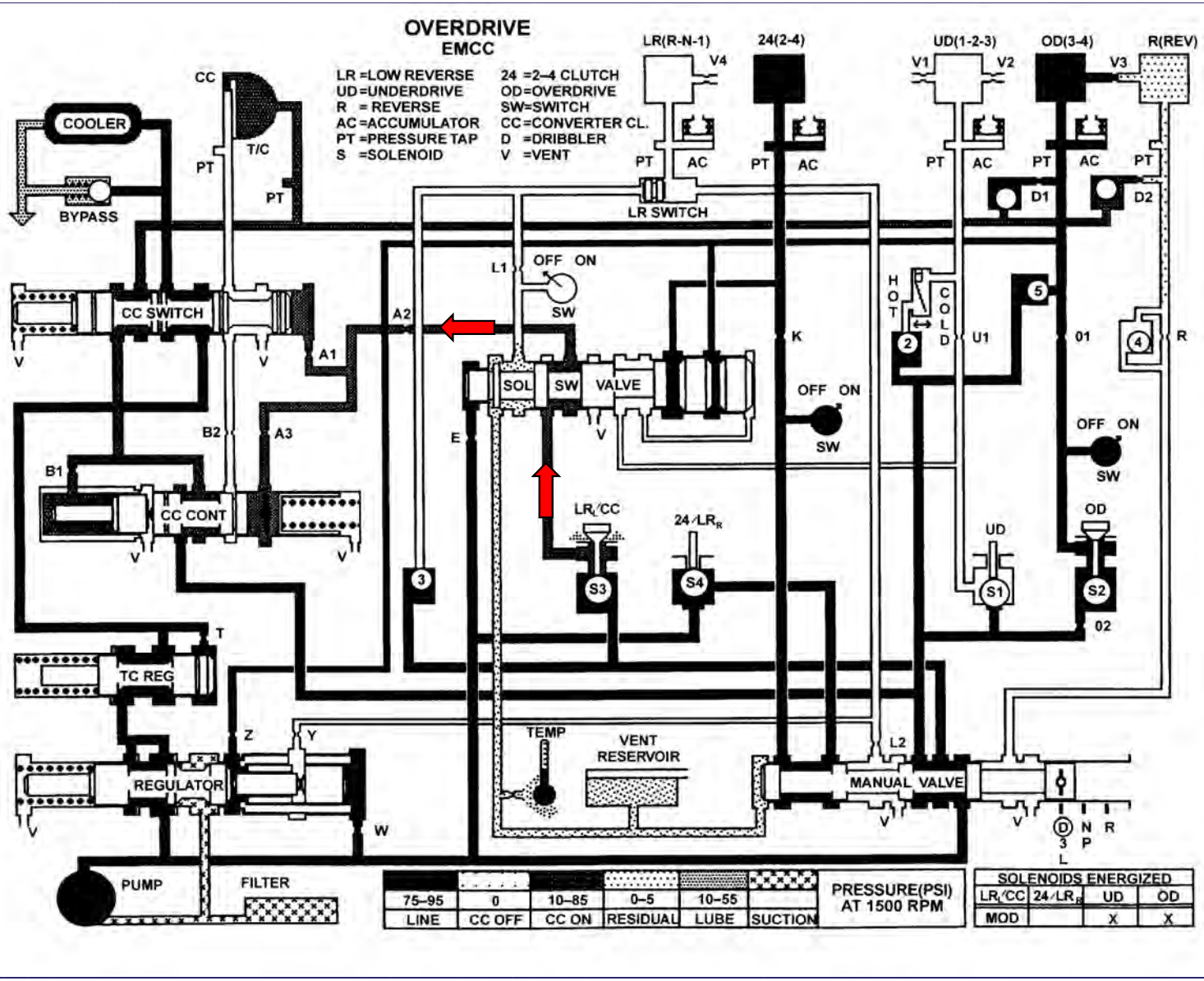
02
T
TC REG
Z
Y
REGULATOR
W
TEMP
VENT
RESERVOIR
L2
MANUAL
VALVE
D
3
N
P
R
L
PUMP
FILTER
175–235
LINE
50–100
CC OFF
35–85
CC ON
0–5
RESIDUAL
5–40
LUBE
SUCTION
PRESSURE(PSI)
AT 1500 RPM
SOLENOIDS ENERGIZED
LR/CC
24/LR
UD
OD

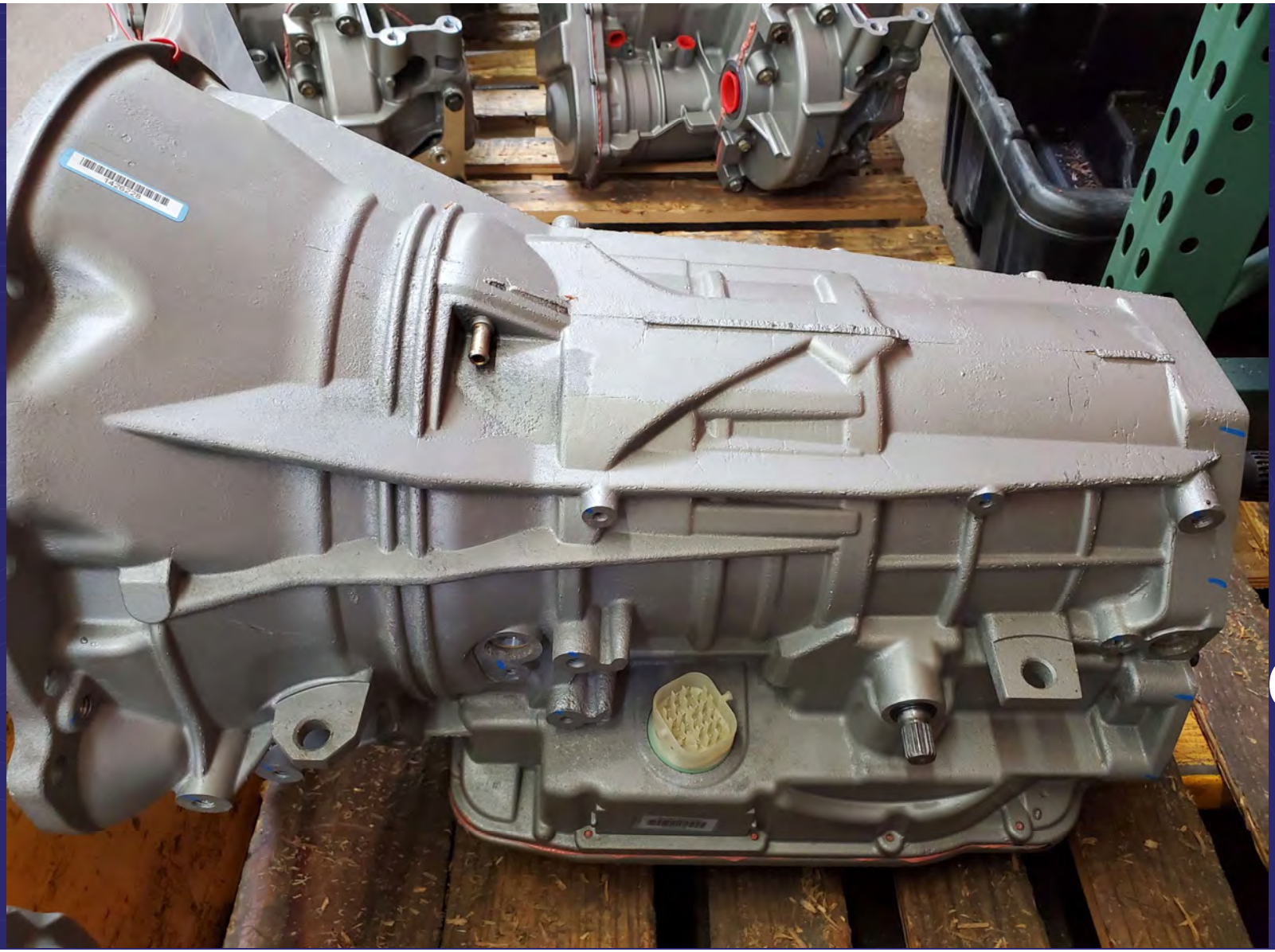

FIRST GEAR
LR =LOW REVERSE
UD=UNDERDRIVE
R = REVERSE
AC=ACCUMULATOR
PT =PRESSURE TAP
S =SOLENOID
24 =2–4 CLUTCH
OD=OVERDRIVE
SW=SWITCH
CC=CONVERTER CL.
D =DRIBBLER
V =VENT
LR(R-N-1)
24(2-4)
UD(1-2-3)
OD(3-4)
R(REV)
COOLER
BYPASS
CC
T/C
PT
V1
V2
V3
V4
AC
D1
D2
LR SWITCH
L1
OFF ON
SW
CC SWITCH
A1
A2
A3
B1
B2
K
HOT
COLD
U1
01
R
SOL
VALVE
E
CC CONT
LR/CC
24/LR
S1
S2
S3
S4
UD
OD
02
T
TC REG
Z
Y
W
TEMP
VENT
RESERVOIR
L2
MANUAL
VALVE
N
P
R
PUMP
FILTER
120–145
LINE
60–110
CC OFF
45–100
CC ON
0–5
RESIDUAL
15–40
LUBE
SUCTION
PRESSURE(PSI)
AT 1500 RPM
SOLENOIDS ENERGIZED
LR/CC
24/LR
UD
OD
X
X


FIRST GEAR
LR =LOW REVERSE
UD=UNDERDRIVE
R = REVERSE
AC=ACCUMULATOR
PT =PRESSURE TAP
S =SOLENOID
24 =2-4 CLUTCH
OD=OVERDRIVE
SW=SWITCH
CC=CONVERTER CL.
D =DRIBBLER
V =VENT
LR(R-N-1)
24(2-4)
UD(1-2-3)
OD(3-4)
R(REV)
COOLER
BYPASS
CC
T/C
PT
V1
V2
V3
V4
AC
D1
D2
LR SWITCH
L1
OFF ON
SW
CC SWITCH
A1
A2
A3
B1
B2
SOL
VALVE
E
K
HOT
COLD
U1
01
R
CC CONT
LR/CC
24/LR
S1
S2
S3
S4
UD
OD
02
TC REG
T
Z
Y
W
REGULATOR
TEMP
VENT
RESERVOIR
MANUAL
L2
PUMP
FILTER
D
N
P
R
3
L
120–145
LINE
60–110
CC OFF
45–100
CC ON
0–5
RESIDUAL
15–40
LUBE
SUCTION
PRESSURE(PSI)
AT 1500 RPM
SOLENOIDS ENERGIZED
LR/CC
24/LR
UD
OD
X
X


SECOND GEAR
LR =LOW REVERSE
UD =UNDERDRIVE
R = REVERSE
AC =ACCUMULATOR
PT =PRESSURE TAP
S =SOLENOID
24 =2–4 CLUTCH
OD=OVERDRIVE
SW=SWITCH
CC =CONVERTER CL
D =DRIBBLER
V =VENT
LR(R-N-1)
24(2-4)
UD(1-2-3)
OD(3-4)
R(REV)
COOLER
BYPASS
T/C
CC
PT
LR SWITCH
CC SWITCH
OFF ON
SW
SOL
VALVE
HOT
COLD
CC CONT
TC REG
REGULATOR
TEMP
VENT
RESERVOIR
MANUAL
VALVE
PUMP
FILTER
PRESSURE(PSI) AT 1500 RPM
120–145
LINE
60–110
CC OFF
45–100
CC ON
0–5
RESIDUAL
15–40
LUBE
SUCTION
SOLENOIDS ENERGIZED
LR/CC
24/LR
UD
OD

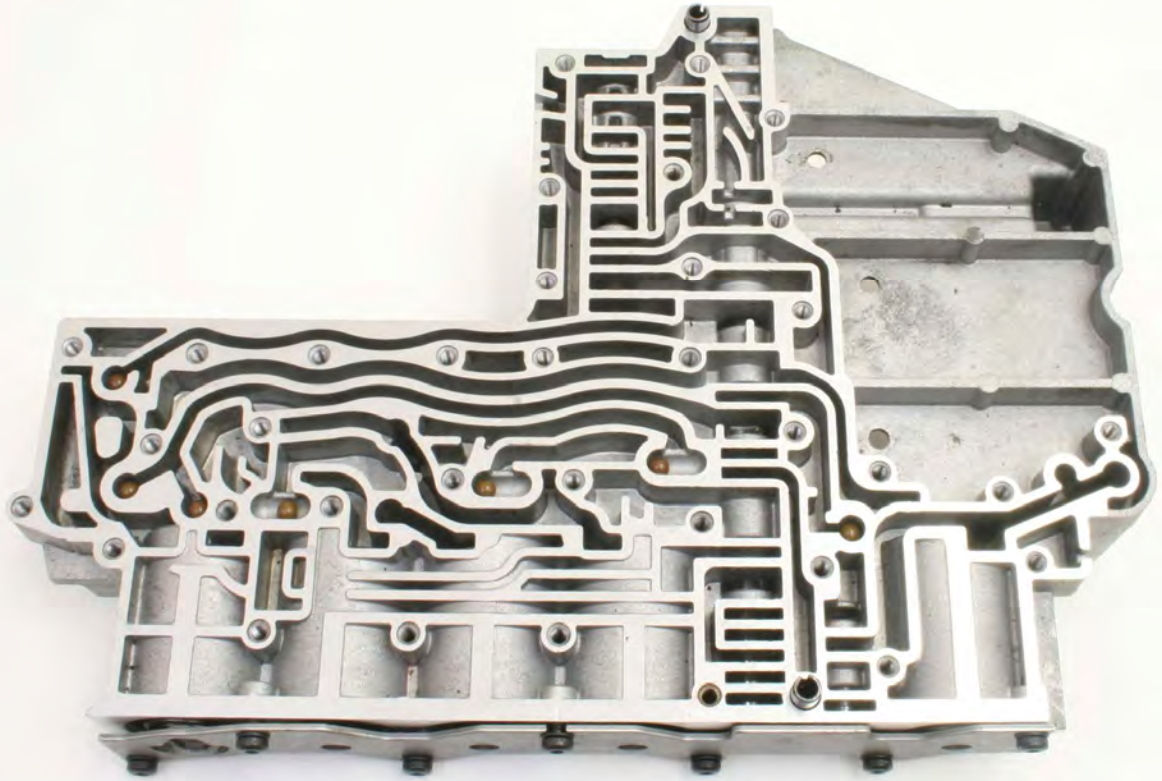

OVERDRIVE
EMCC
LR =LOW REVERSE
UD =UNDERDRIVE
R = REVERSE
AC =ACCUMULATOR
PT =PRESSURE TAP
S =SOLENOID
24 =2–4 CLUTCH
OD=OVERDRIVE
SW=SWITCH
CC=CONVERTER CL.
D =DRIBBLER
V =VENT
LR(R-N-1)
24(2-4)
UD(1-2-3)
OD(3-4)
R(REV)
COOLER
BYPASS
CC
T/C
PT
LR SWITCH
AC
D1
D2
L1
OFF ON
SW
CC SWITCH
A1
A2
A3
B1
B2
SOL
VALVE
E
K
HOT
COLD
U1
01
R
CC CONT
LR/CC
24/LR
S1
S2
S3
S4
UD
OD
02
TC REG
REGULATOR
TEMP
VENT
RESERVOIR
MANUAL VALVE
L2
PUMP
FILTER
N
P
R
L
75–95
LINE
0
CC OFF
10–85
CC ON
0–5
RESIDUAL
10–55
LUBE
SUCTION
PRESSURE(PSI)
AT 1500 RPM
SOLENOIDS ENERGIZED
LR/CC
24/LR
UD
OD
MOD
X
X

68RFE

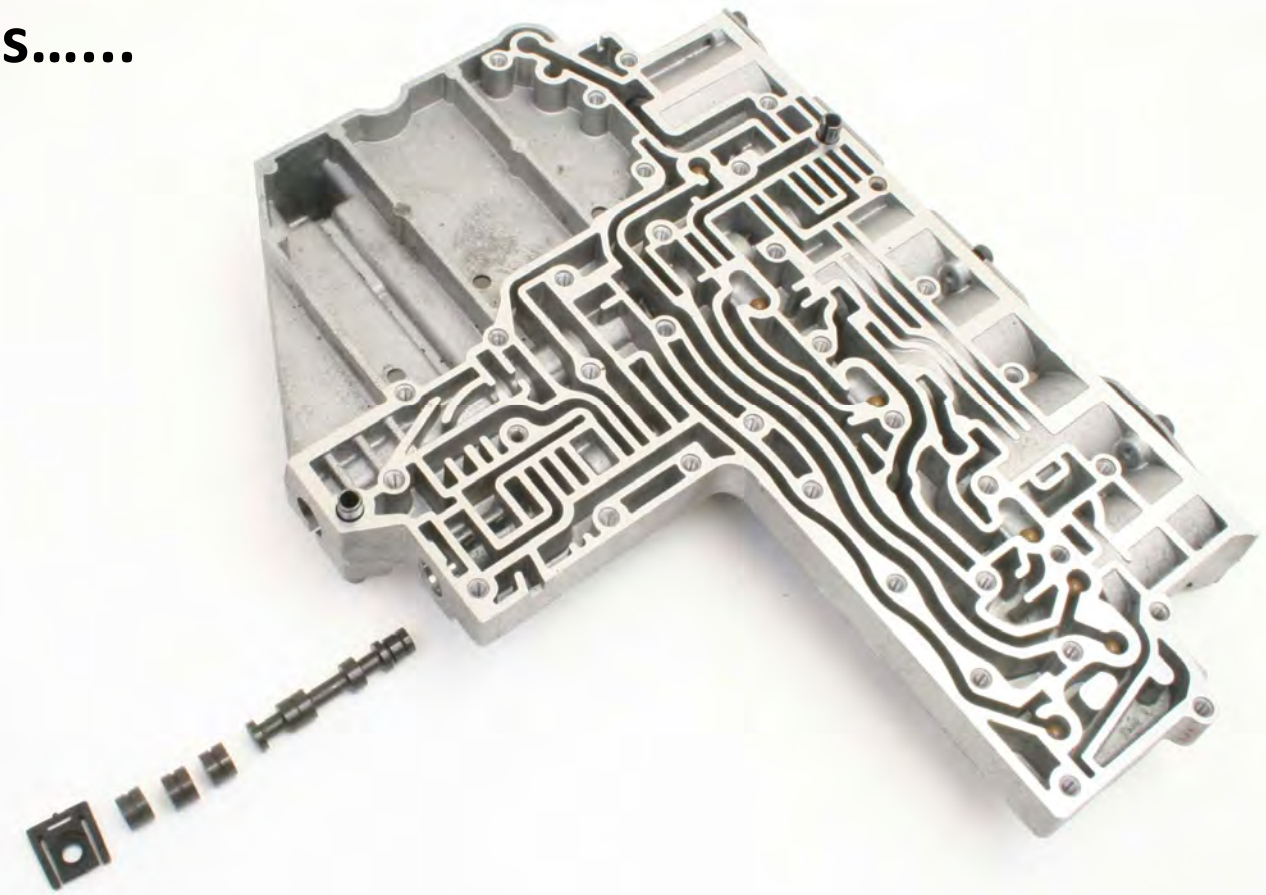


68RFE Solenoid Body Pass Through Connector View

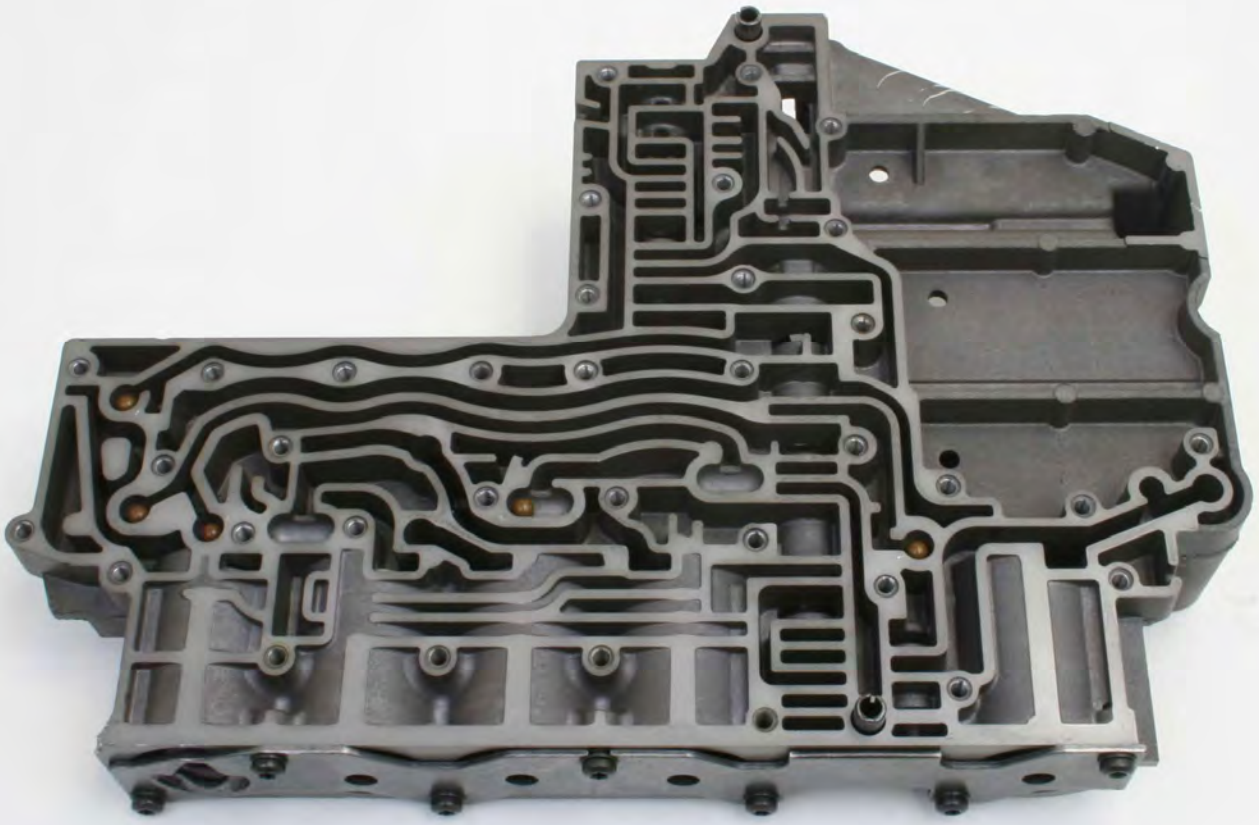
2010 Changes were made to the valve body assembly and the solenoid assembly.



To reduce solenoid switch valve bore wear issues……



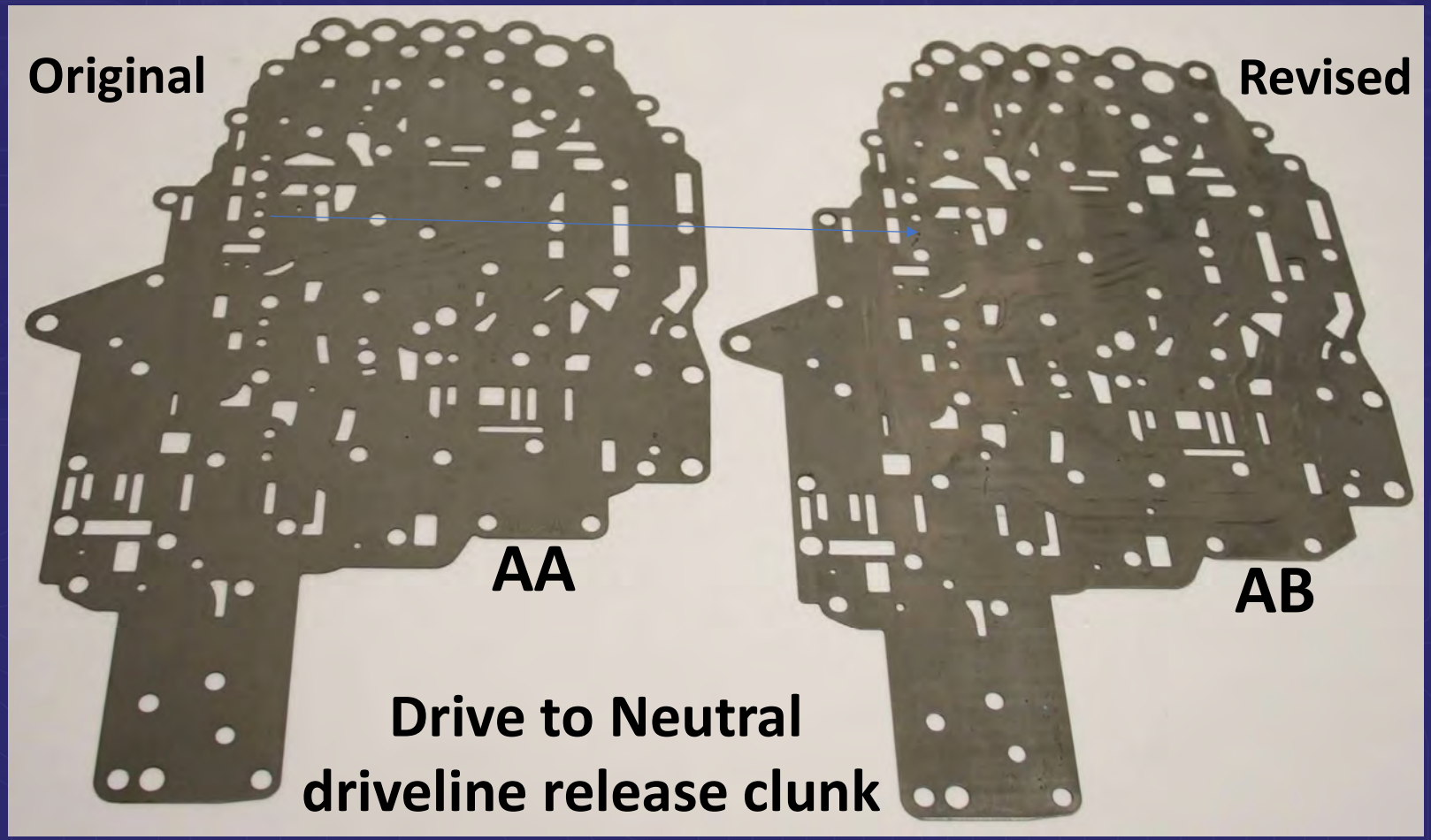
The casting became anodized.



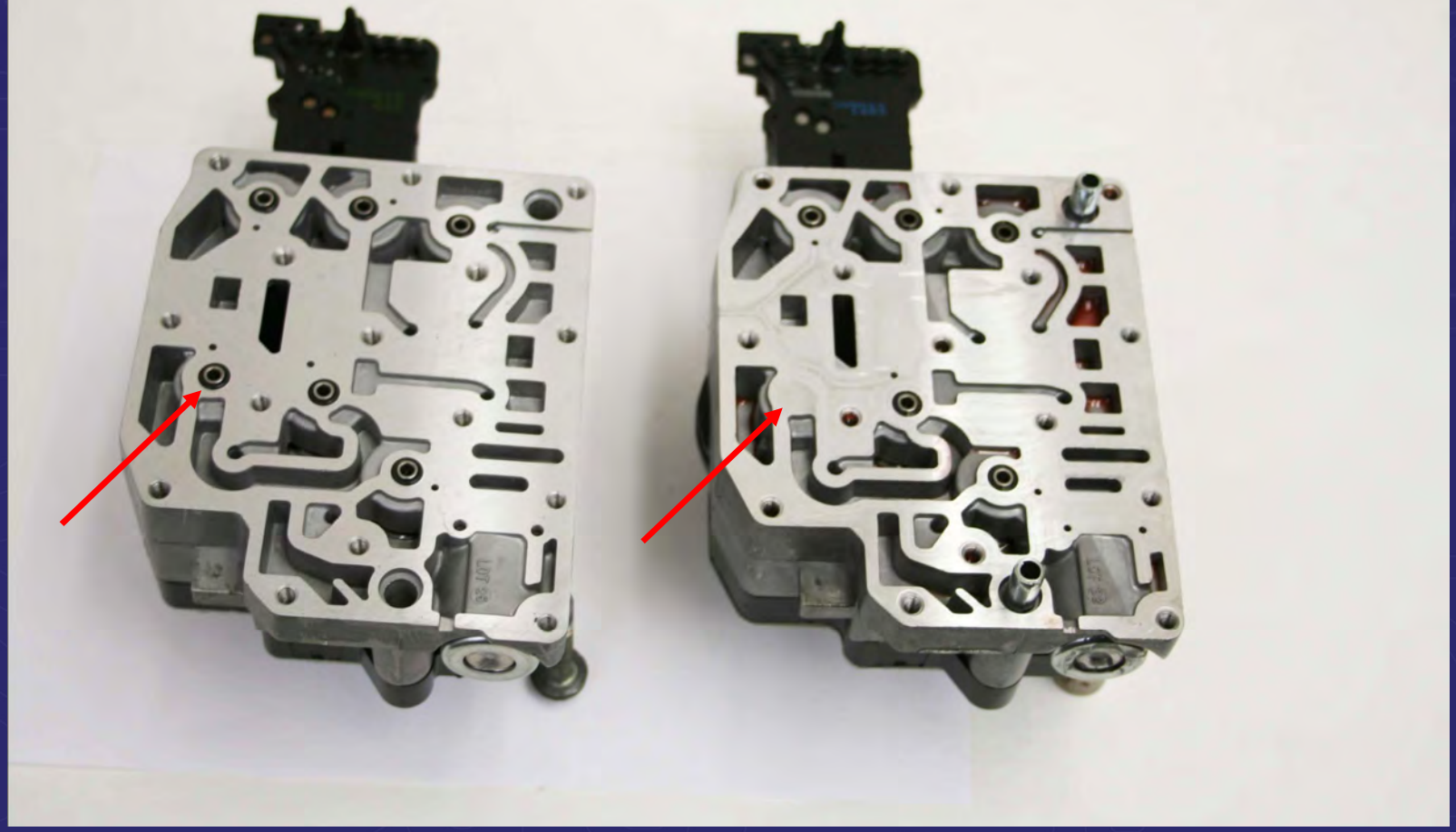
Updated MV

Original MV

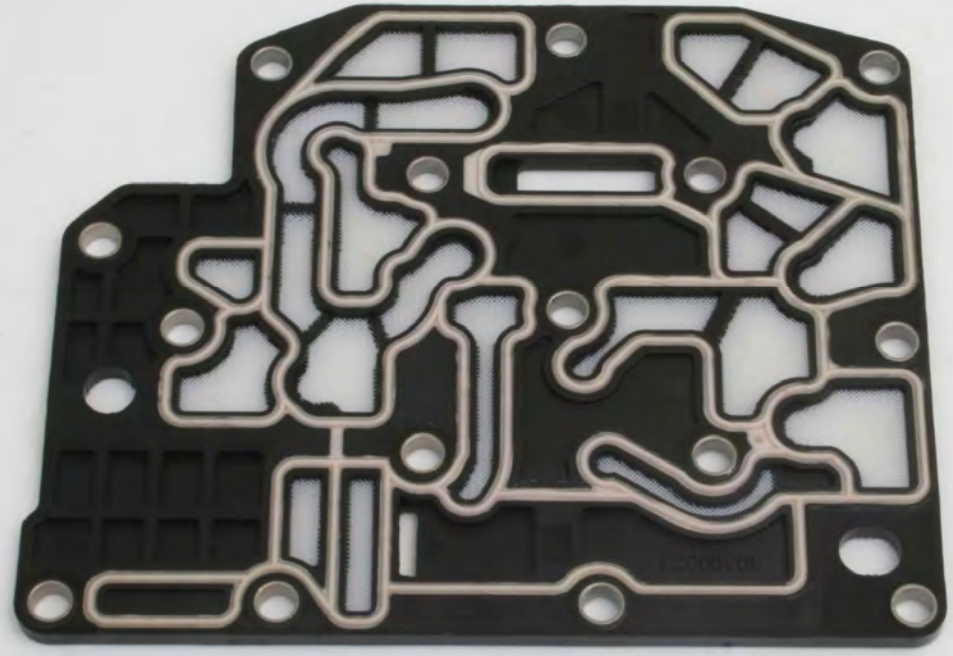
Reverse to Neutral driveline release clunk


Original
Revised
AA
AB
Drive to Neutral
driveline release clunk

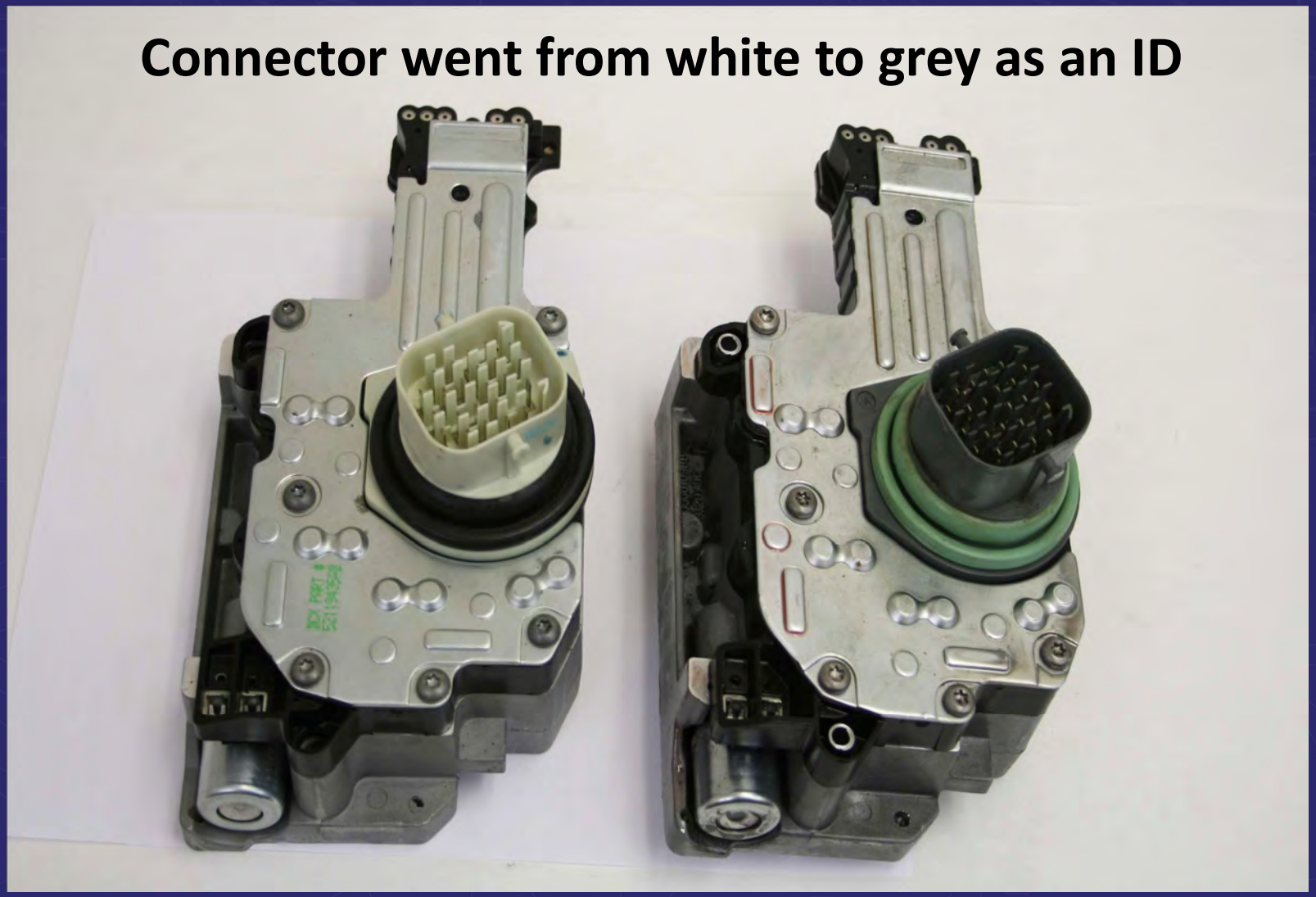
The big change to be aware of is the OD Solenoid was eliminated

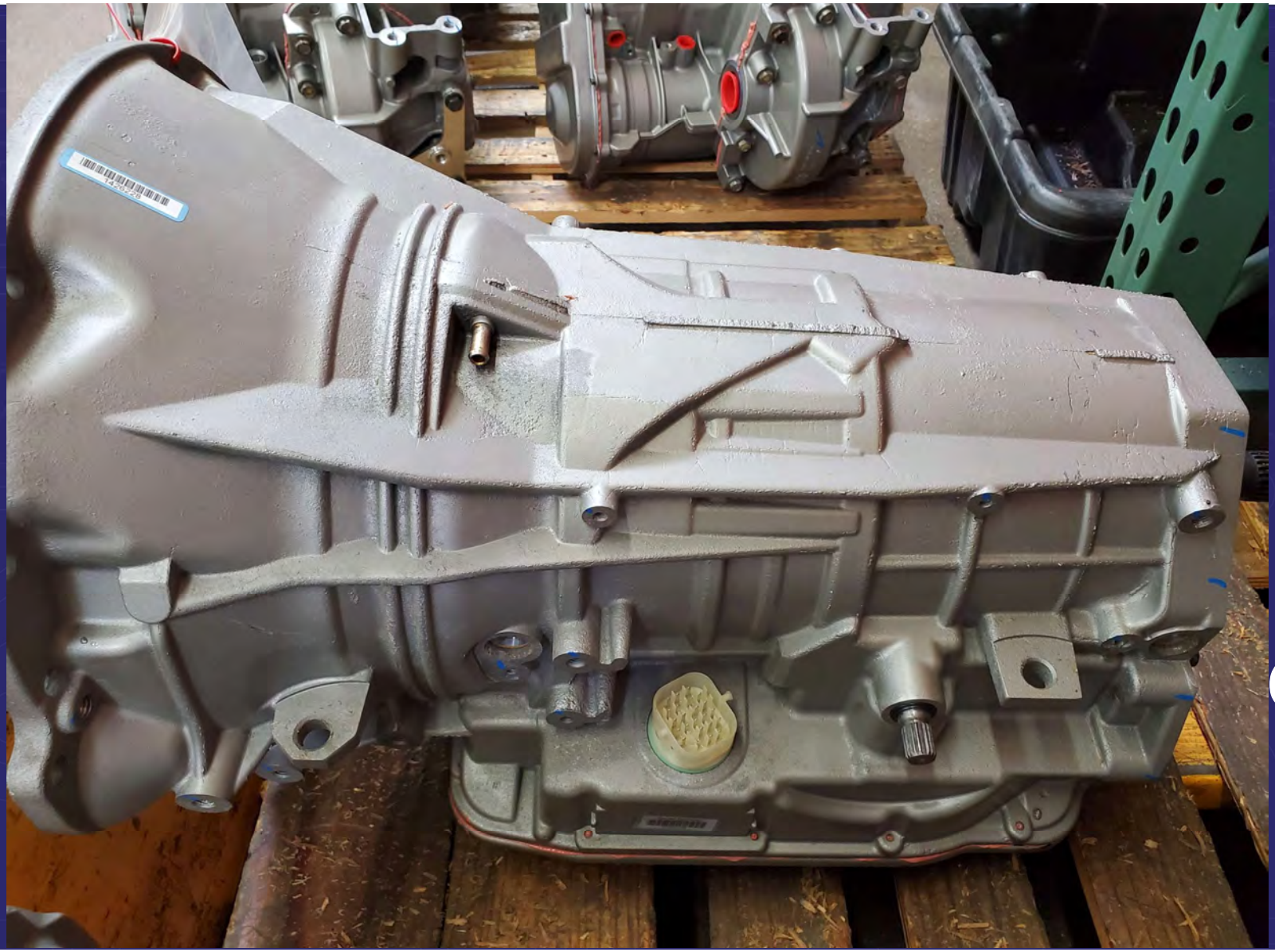


The beaded gasket between the solenoid block and VB remained the same

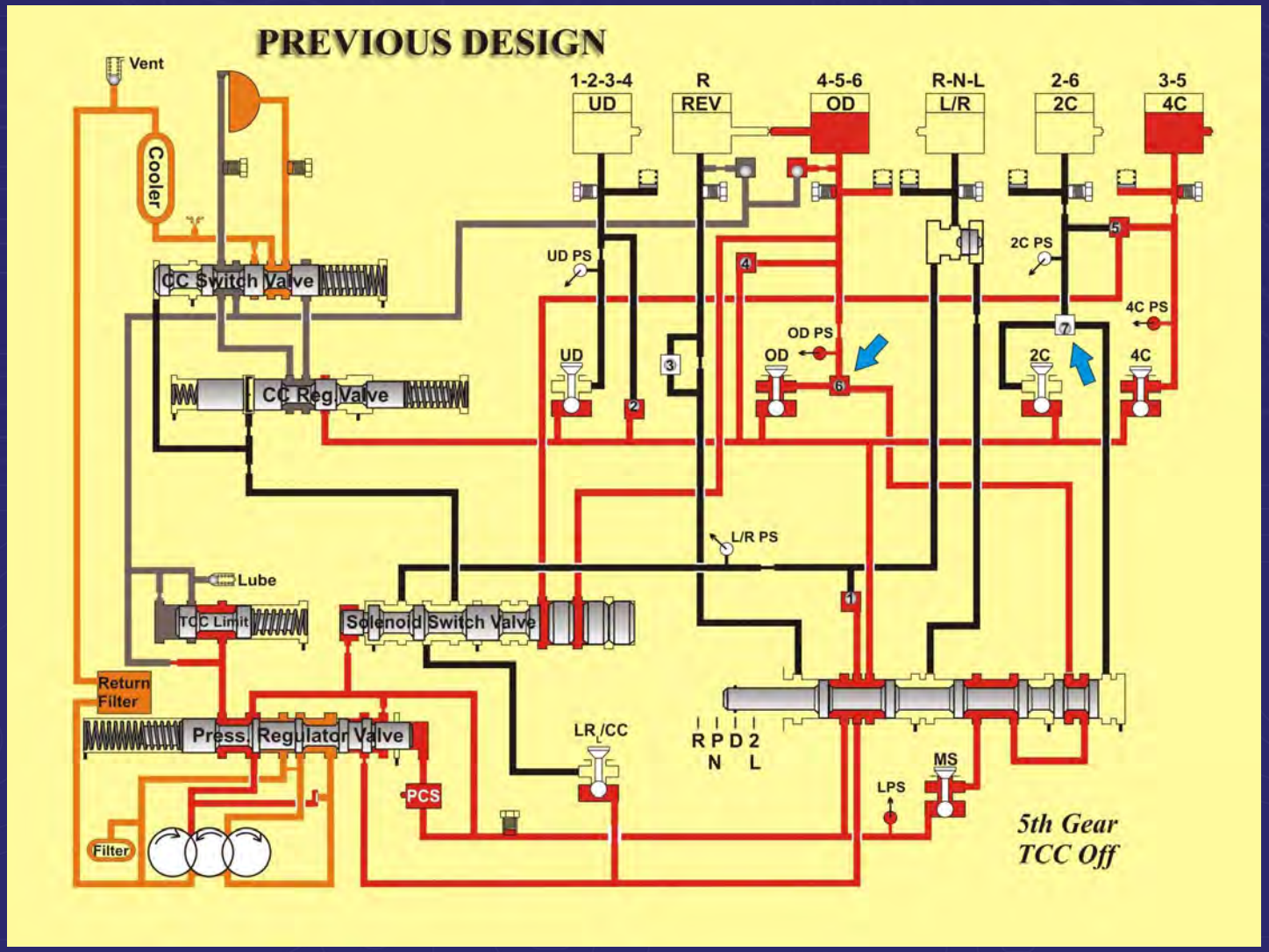


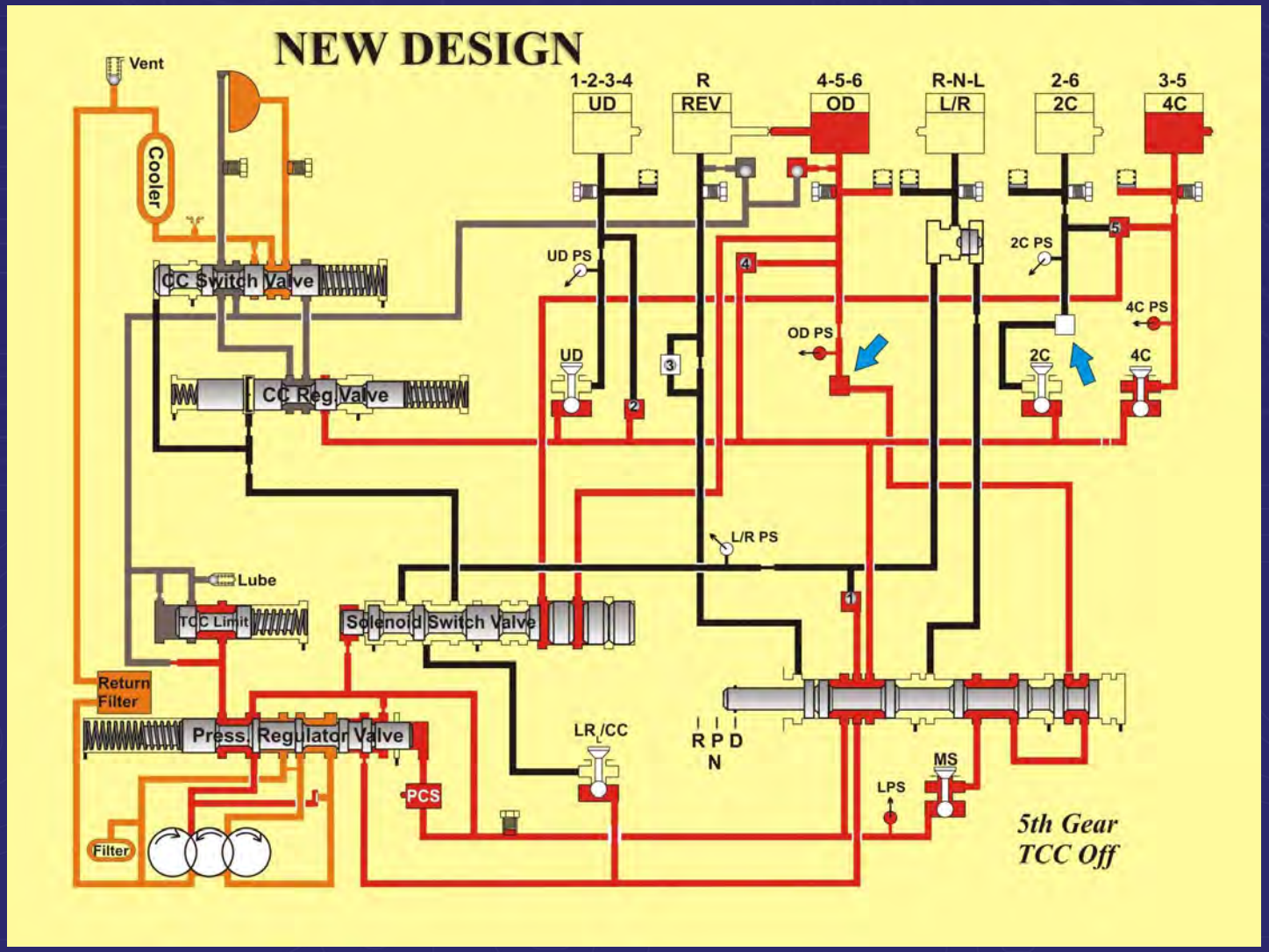
Connector went from white to grey as an ID

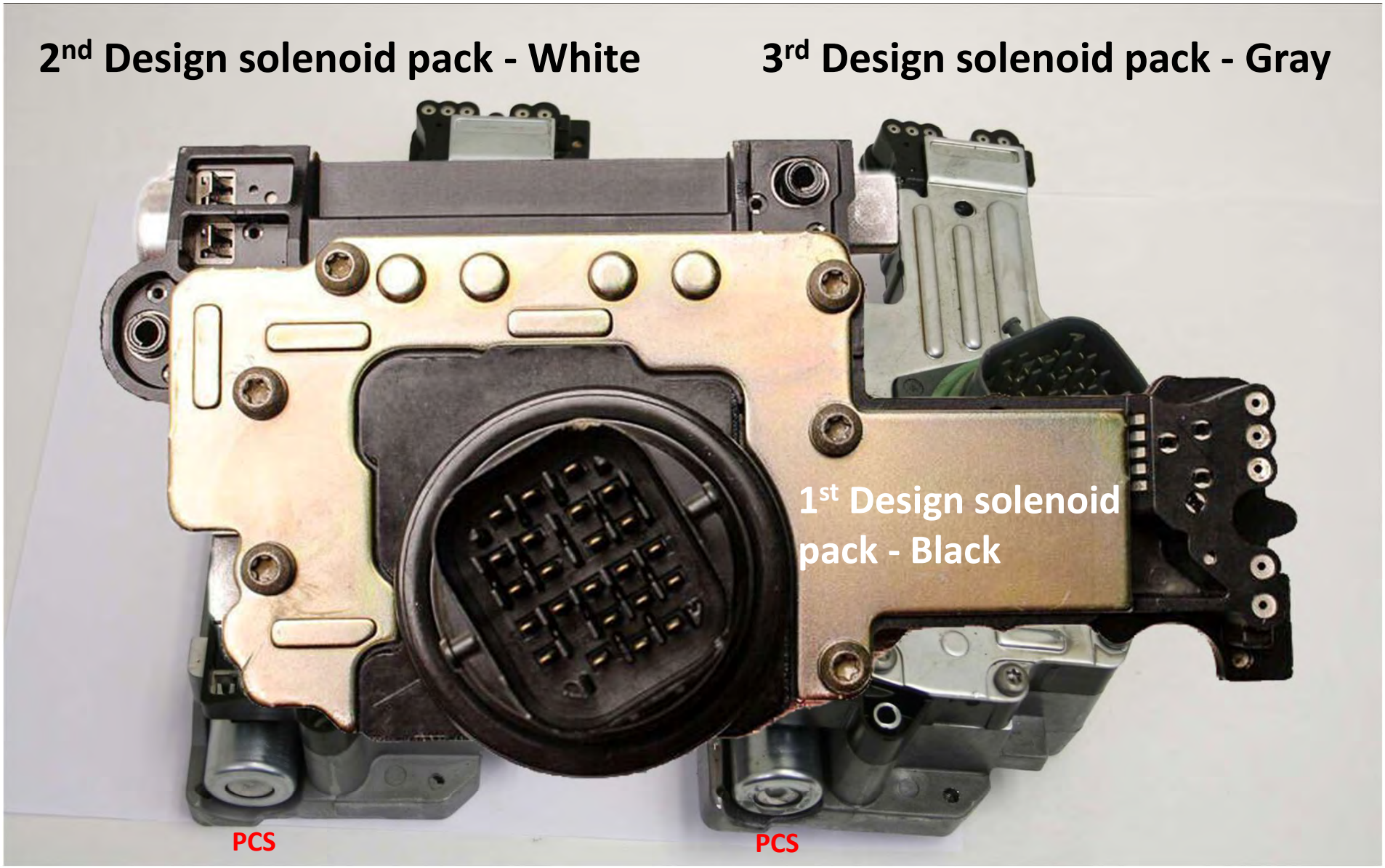




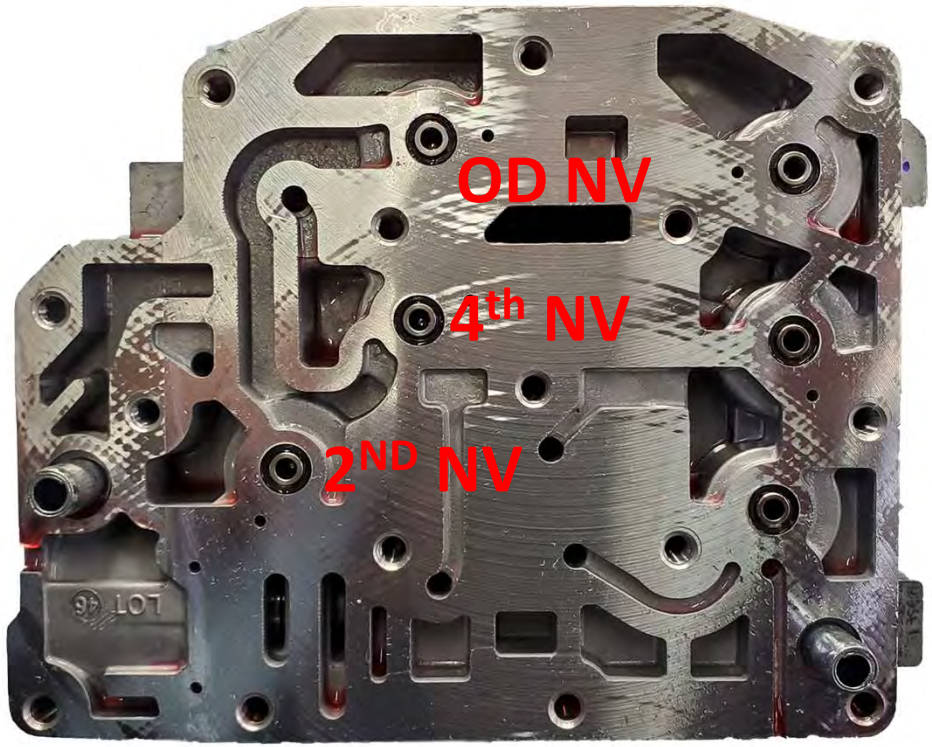
68RFE Solenoid Body Pass Through Connector View


PREVIOUS DESIGN
Vent
Cooler
CC Switch Valve
CC Reg Valve
Lube
TCC Limit
Solenoid Switch Valve
Return Filter
Press Regulator Valve
Filter
PCS
LR/CC
UD PS
OD PS
L/R PS
2C PS
4C PS
1-2-3-4
UD
R
REV
4-5-6
OD
R-N-L
L/R
2-6
2C
3-5
4C
R P D 2
N L
MS
LPS
5th Gear
TCC Off

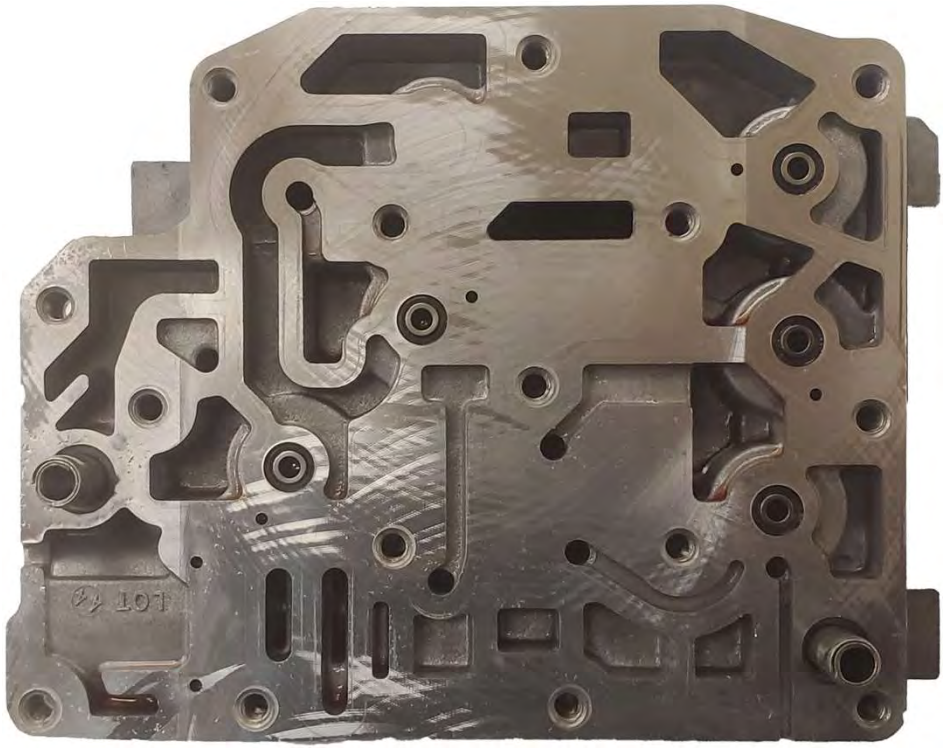

NEW DESIGN
Vent
Cooler
CC Switch Valve
CC Reg Valve
Lube
TCC Limit
Solenoid Switch Valve
Return Filter
Press Regulator Valve
Filter
PCS
LR/CC
1-2-3-4
UD
R
REV
4-5-6
OD
R-N-L
L/R
2-6
2C
3-5
4C
UD PS
OD PS
L/R PS
2C PS
4C PS
R P D N
LPS
MS
5th Gear
TCC Off


2nd Design solenoid pack - White
3rd Design solenoid pack - Gray
1st Design solenoid pack - Black
PCS
PCS

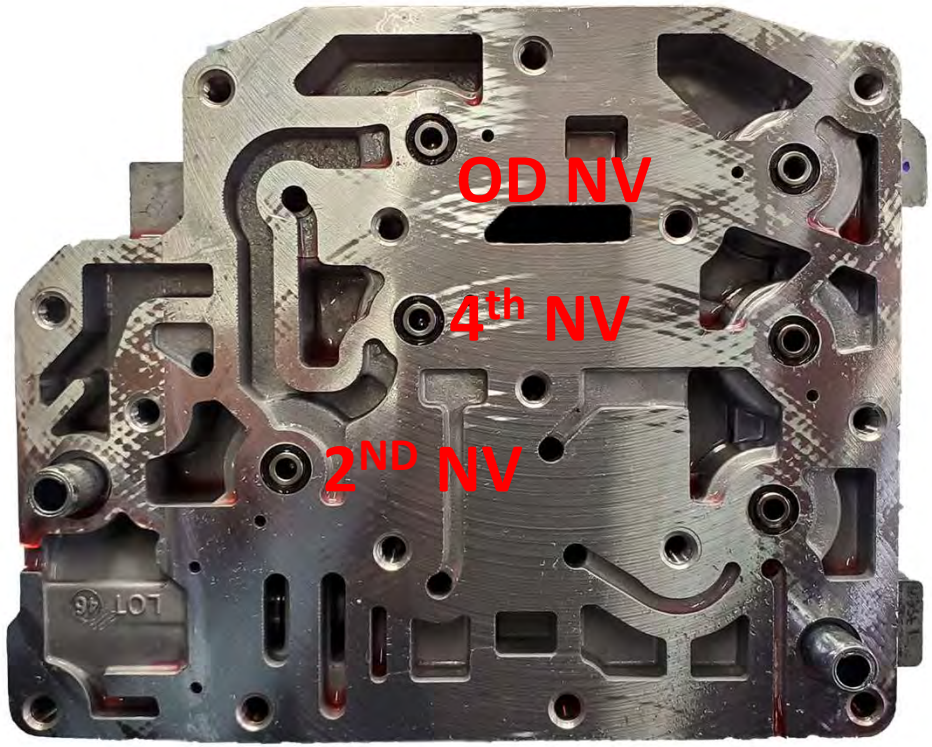
White with OD Solenoid



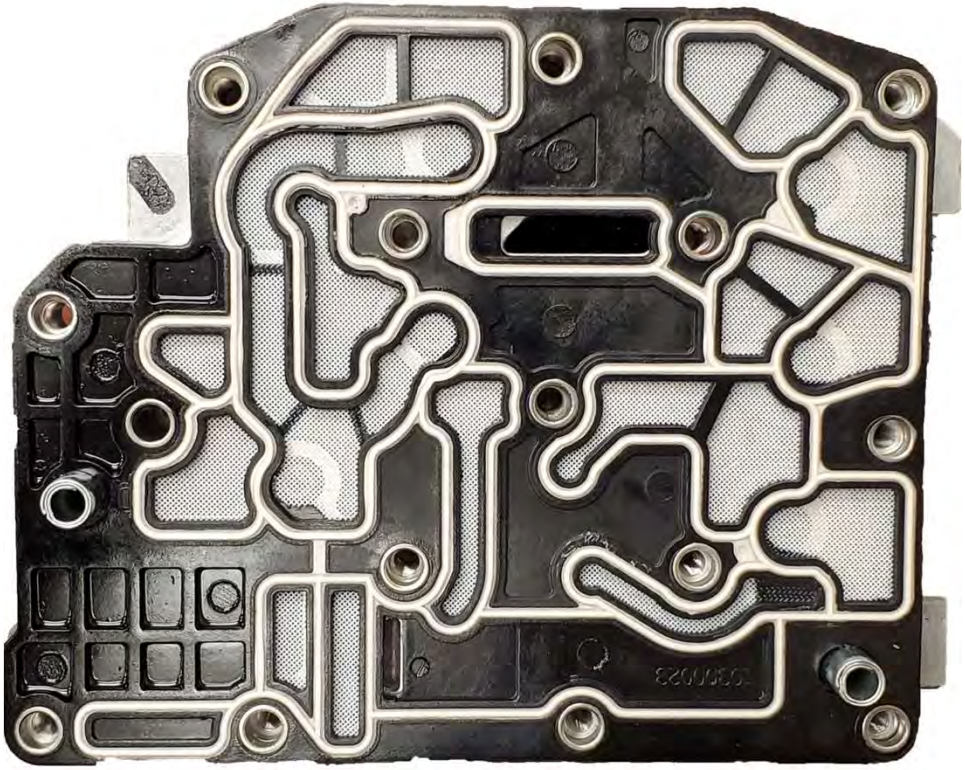
GRAY with OD Solenoid Eliminated



White with OD Solenoid

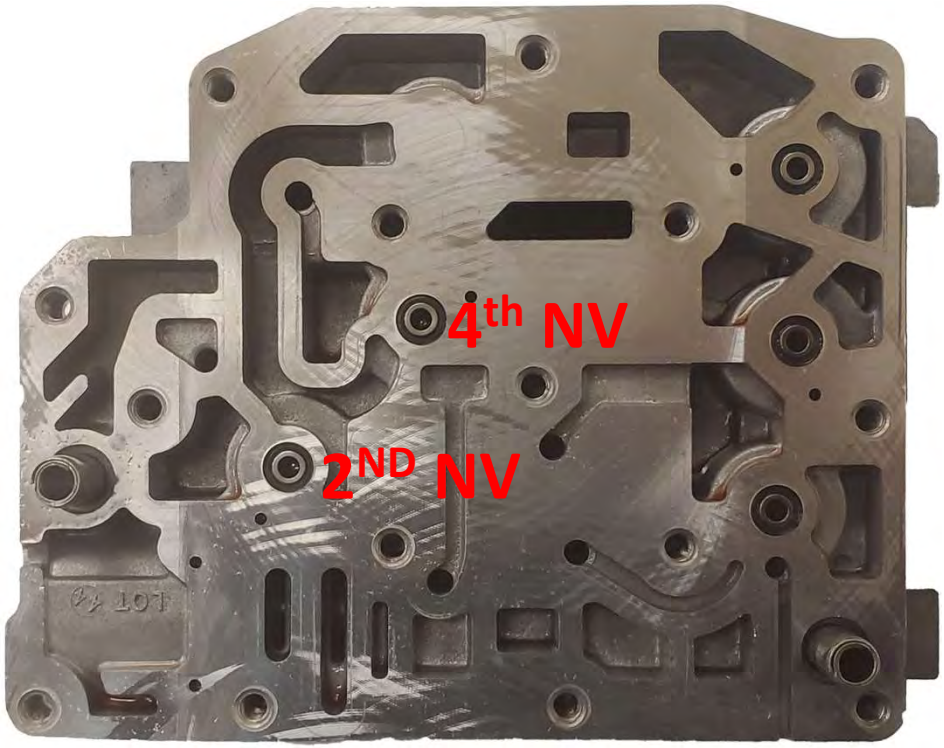


D21 LINE PRESSURE FEED TO 2ND , 4th & OD SOLENOID

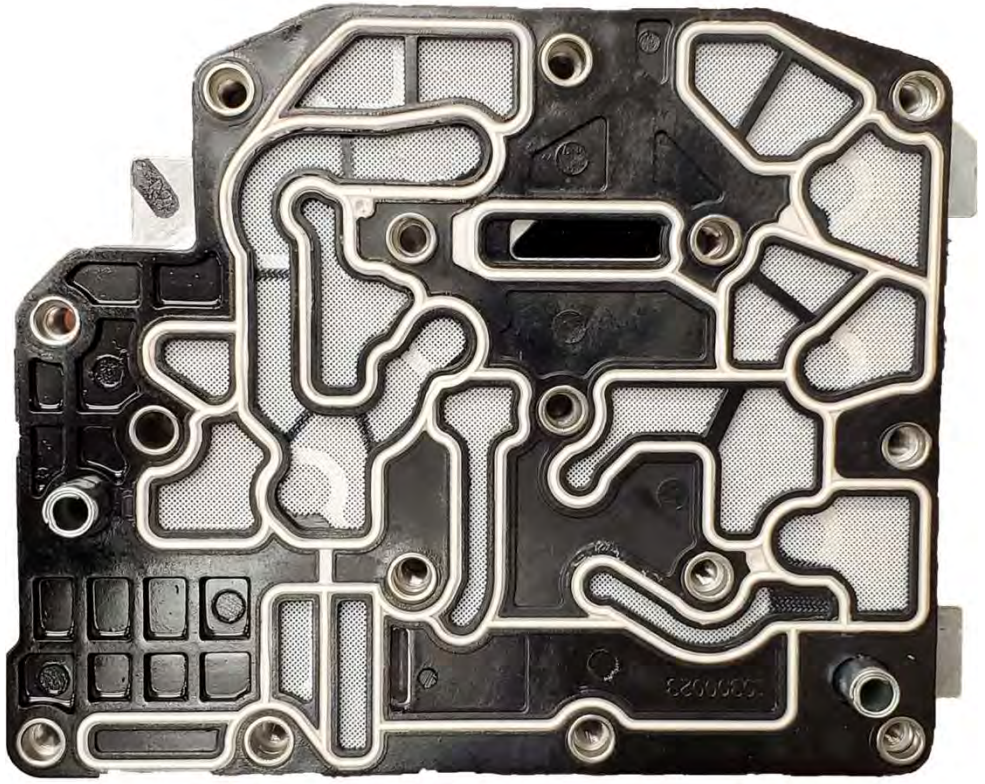


Beaded Gasket Design

Gray with OD Solenoid Eliminated

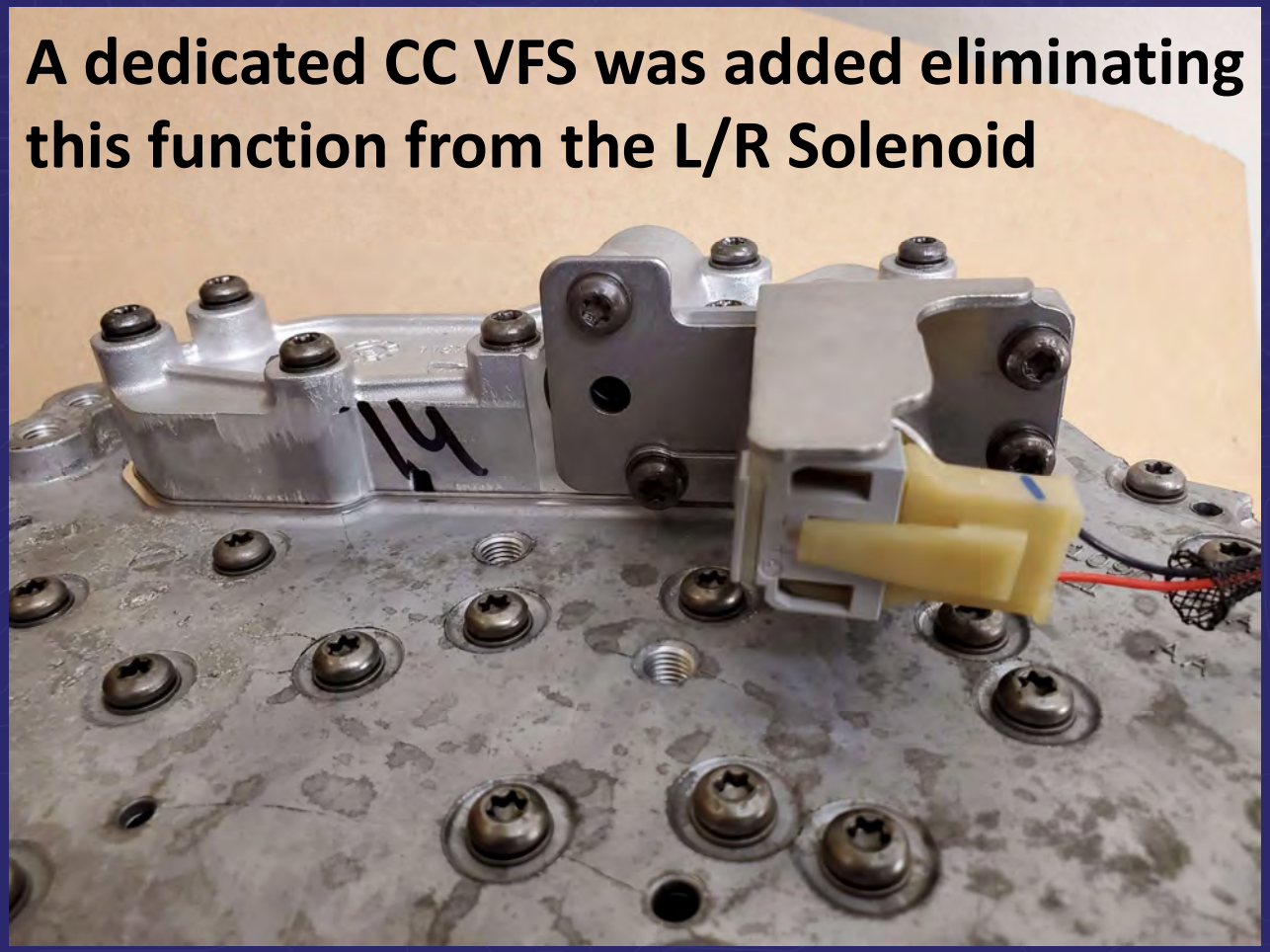


D21 LINE PRESSURE FEED TO 2ND & 4th SOLENOID



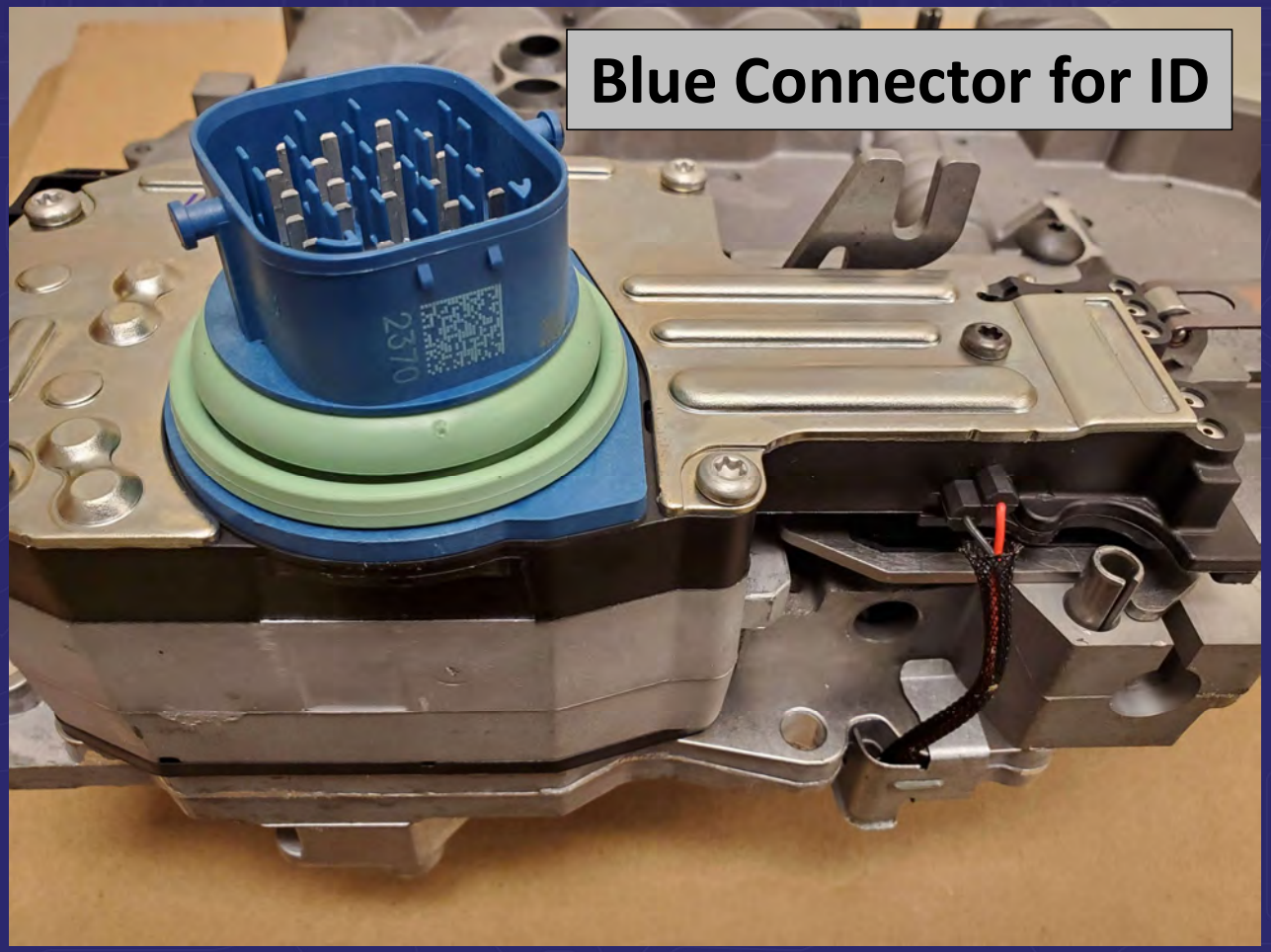
BIG CHANGE IN 2019

A dedicated CC VFS was added eliminating this function from the L/R Solenoid

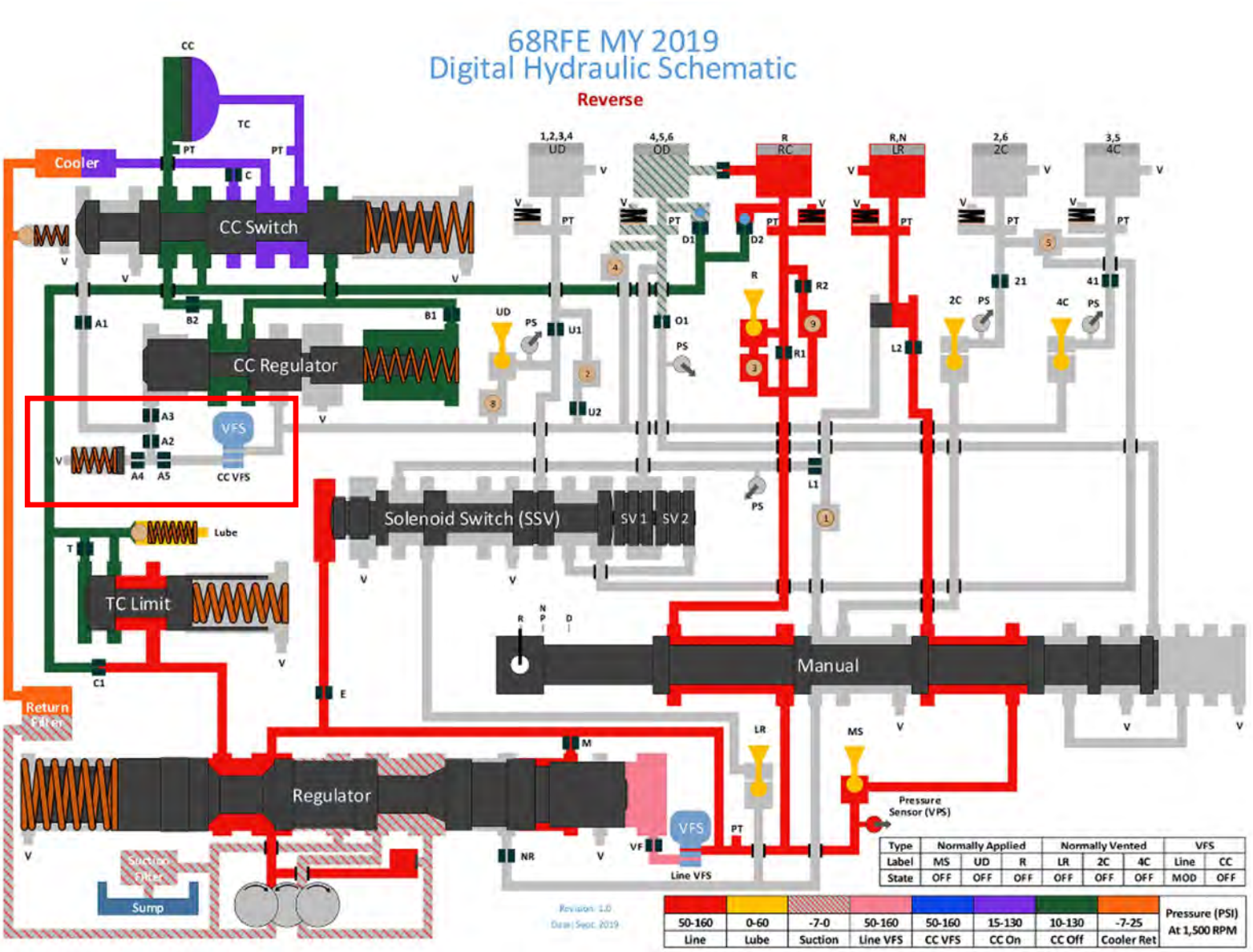


BIG CHANGE IN 2019

BIG CHANGE IN 2019



- Aside from adding a converter clutch variable force solenoid , they also added:
- A solenoid to control the reverse clutch engagement after 30 years of not having this solenoid.

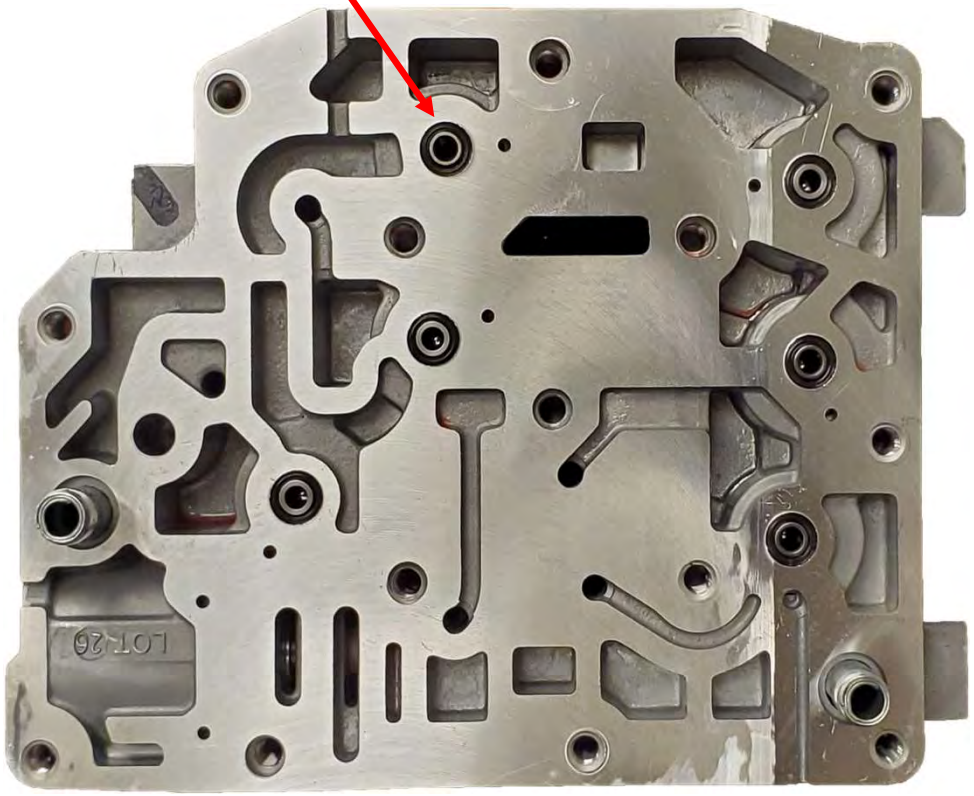


Type	Normally Applied			Normally Vented			VFS	
Label	MS	UD	R	LR	2C	4C	Line	CC
State	OFF	OFF	OFF	OFF	OFF	OFF	MOD	OFF

50-160	0-60	-7-0	50-160	50-160	15-130	10-130	-7-25	Pressure (PSI) At 1,500 RPM
Line	Lube	Suction	Line VFS	CC VFS	CC On	CC Off	Cooler Ret	

- 2019 RAM 3500 6.7L D 68RFE
- GOOD REVERSE
- BINDS GOING FORWARD

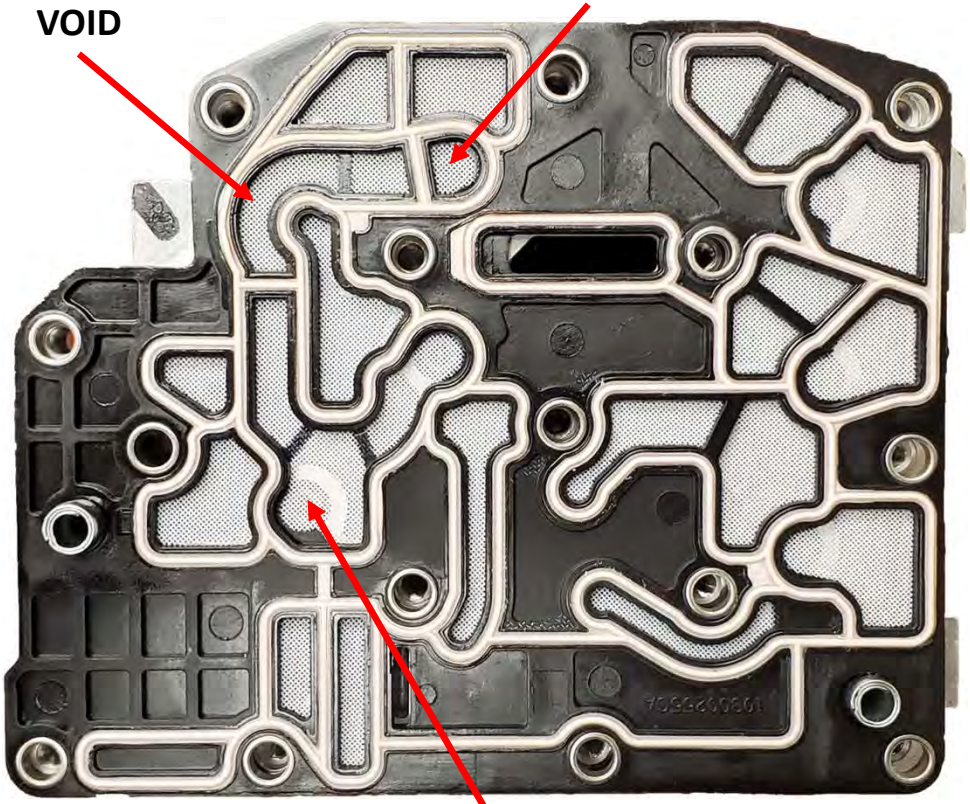
REVERSE CLUTCH SOLENOID - NA



2019 & LATER

LINE PRESSURE SUPPLY FROM MANUAL VALVE IN THE REVERSE POSITION ONLY

VOID

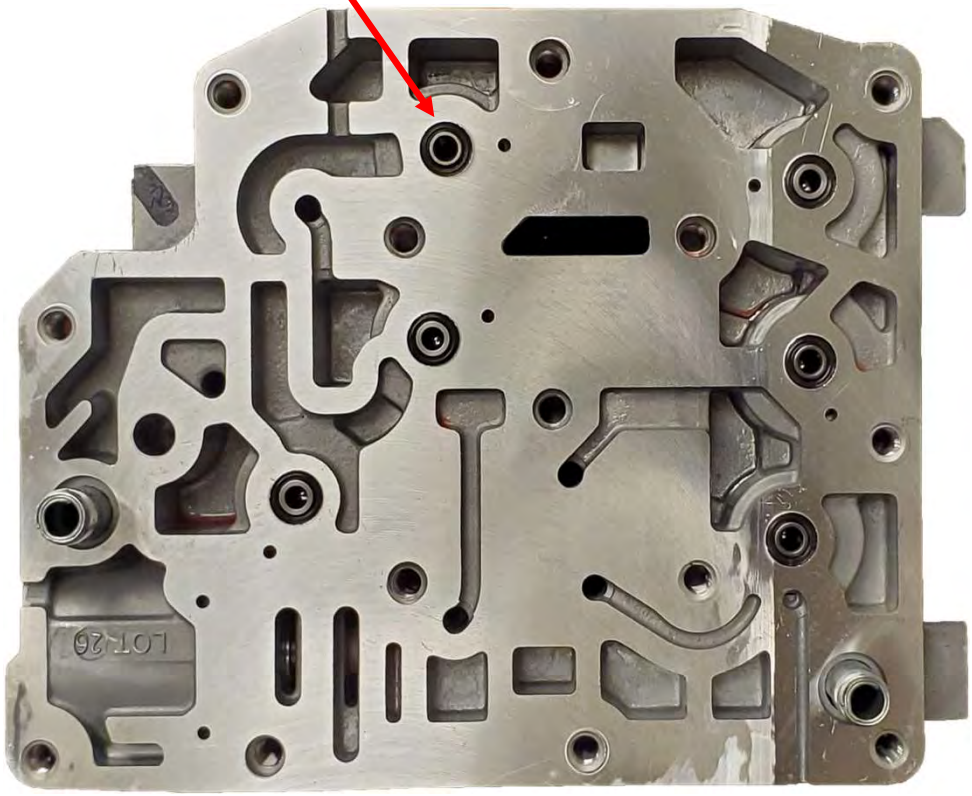


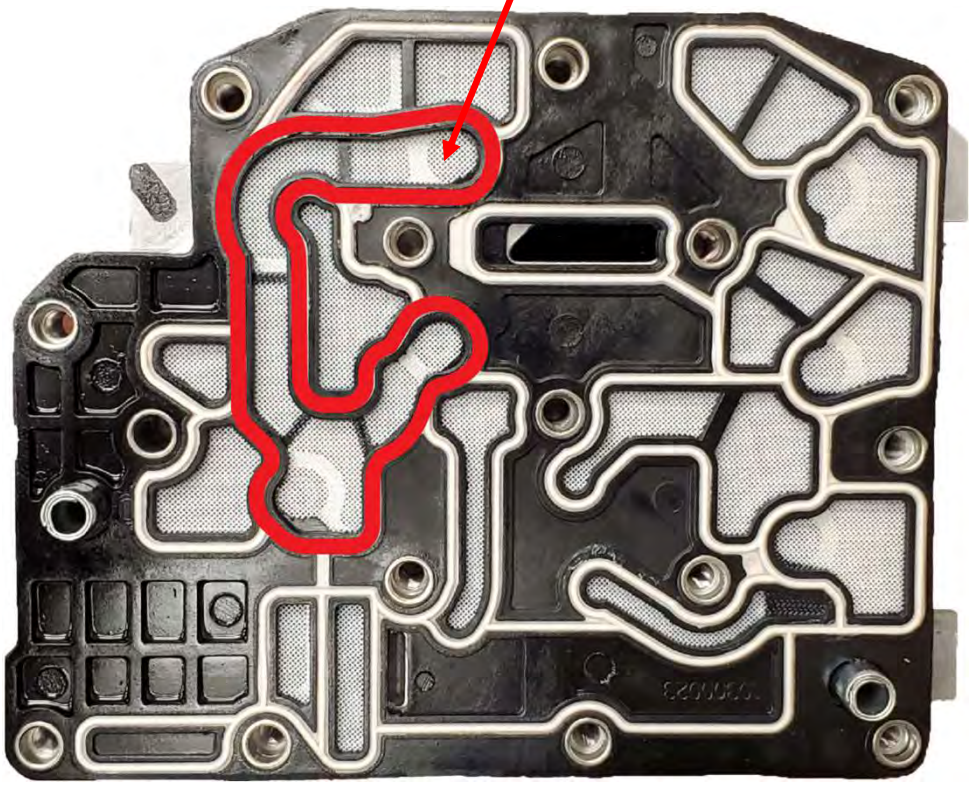
D21 LINE PRESSURE SUPPLY FROM MANUAL VALVE FOR 2ND & 4TH SOLENOID

REVERSE CLUTCH SOLENOID - NA

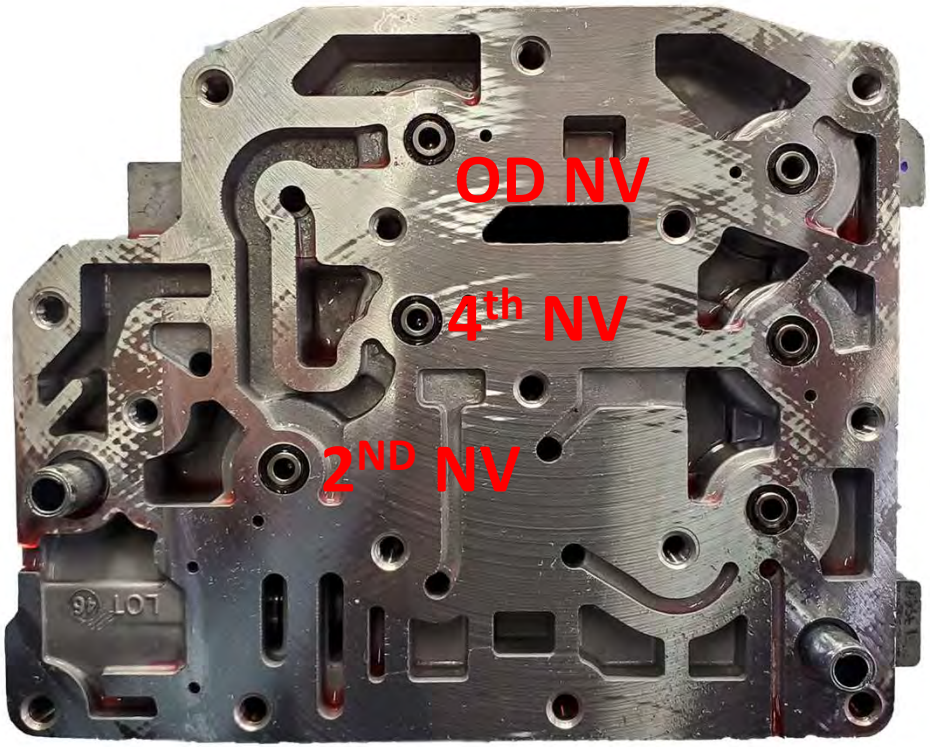
2018 WITH EARLY GASKET

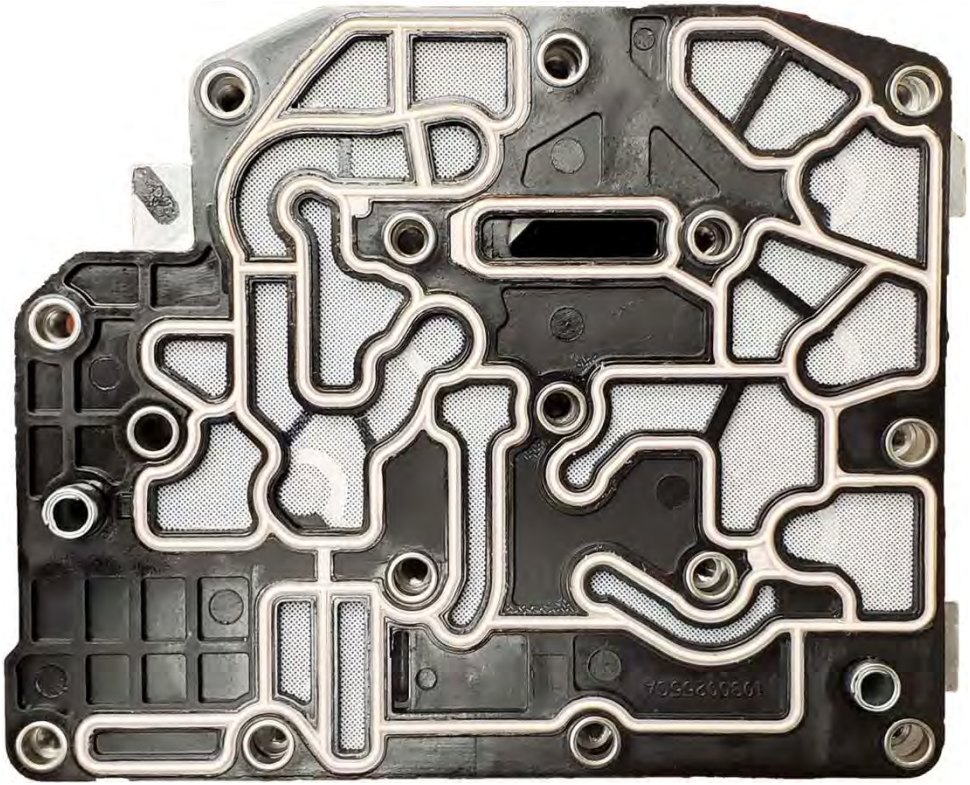
D21 LINE PRESSURE FEED TO 2ND & 4TH SOLENOID



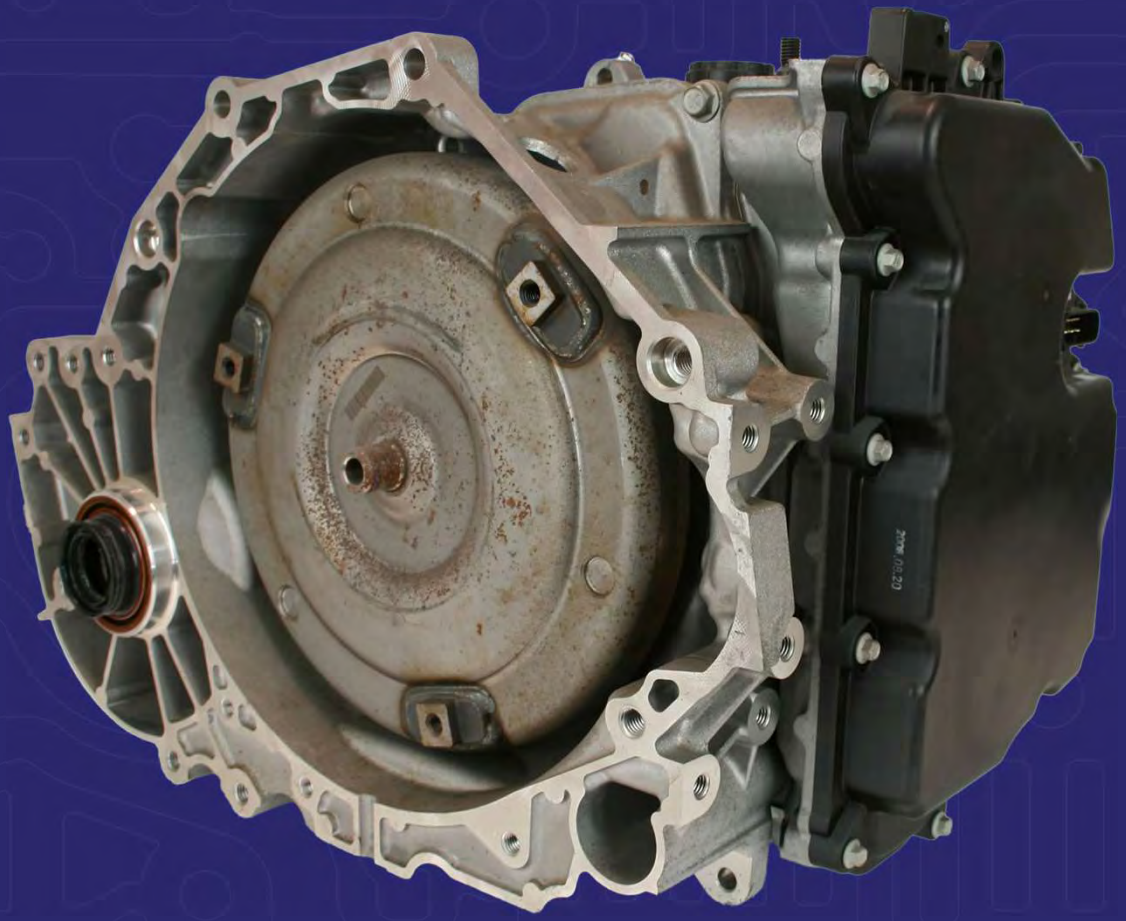


White with OD Solenoid with Blue Connector Beaded Gasket





GM 6T30/40/45/50 SERIES TRANSMISSIONS



General Motors 6T Series Transmissions 6T30/40/45/50

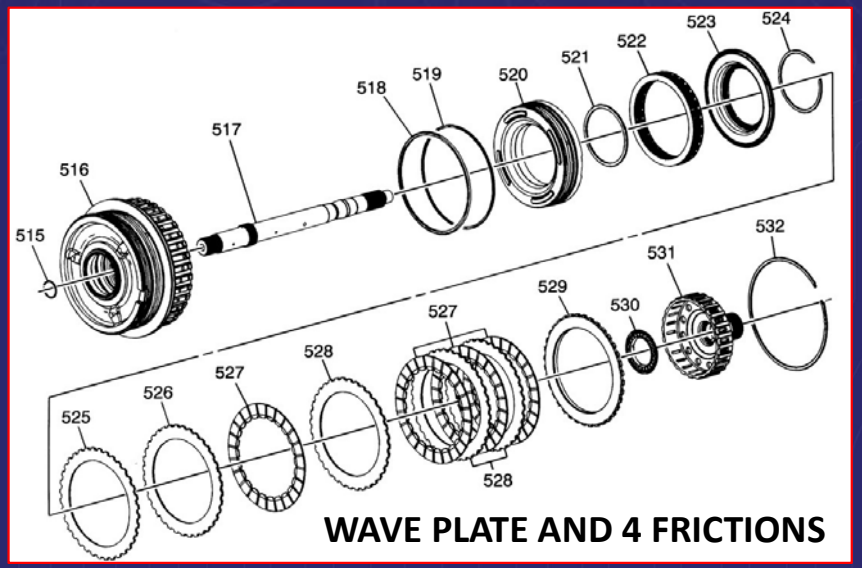
- These series of transmissions began service with the 2007 model year.

- GM 6T40 Series Generation 2 arrived in 2012 and was selectively used and cannot back service previous design levels – Pressure switches were eliminated, and solenoid changes were made as well – *variable bleed to variable feed solenoids* as well as computer strategy.

- By 2015 all platforms using the 6T series transmissions should be Generation 2 equipped.

Example Of An Architectural Hardware Change

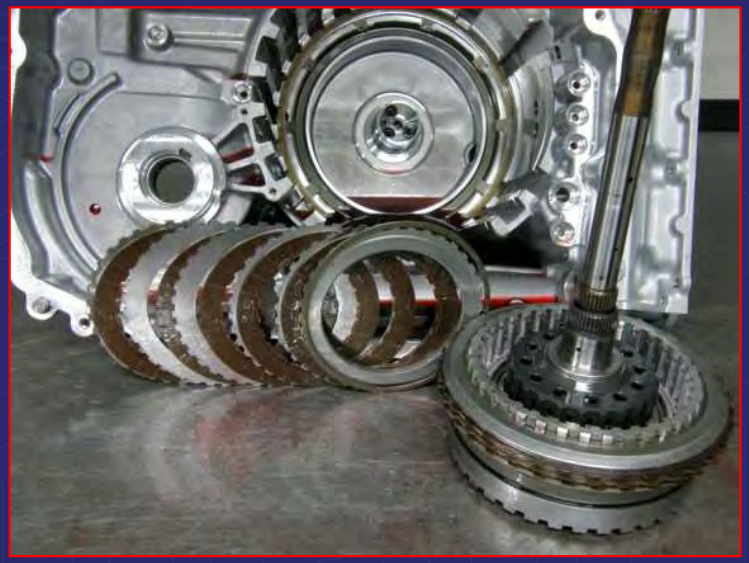
- For increased torque capacity, the wave plate was removed from the 4-5-6 clutch pack assembly and was replaced with an additional friction plate.

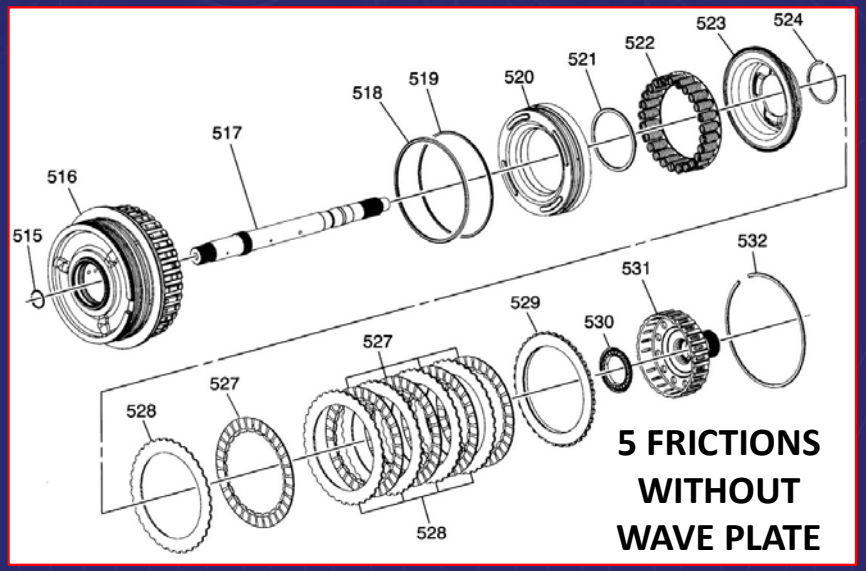


WAVE PLATE AND 4 FRICTIONS

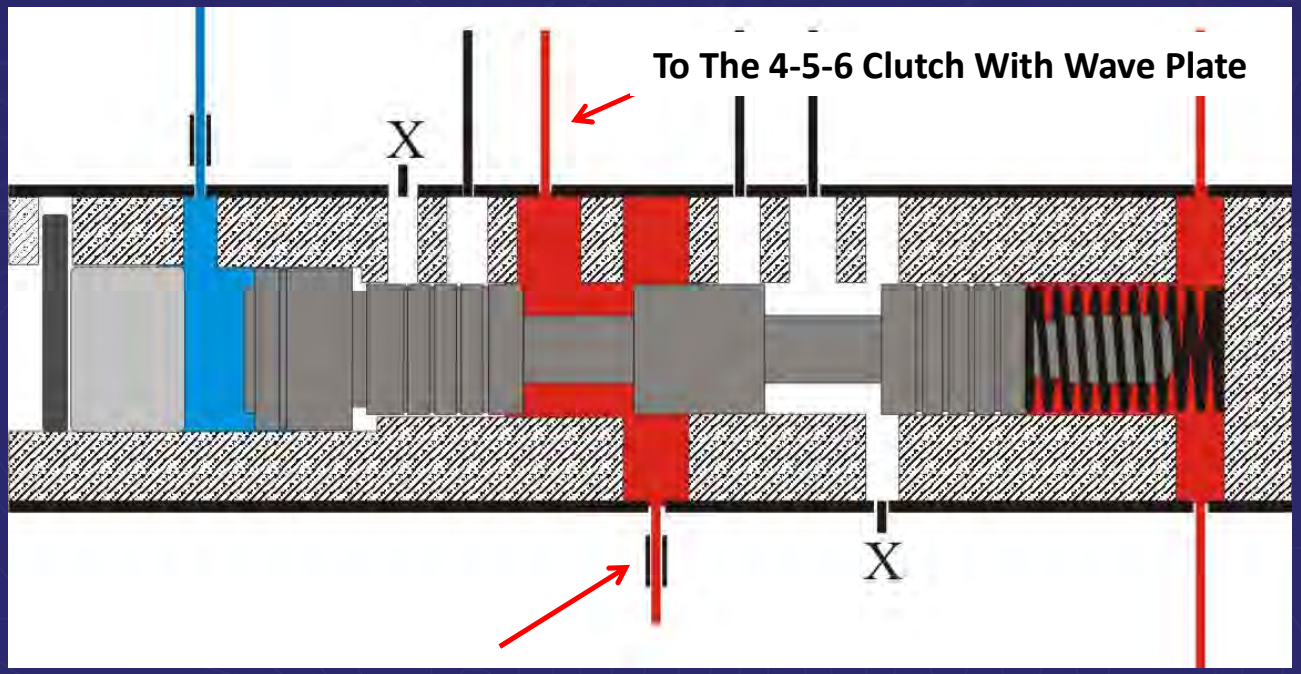
Example Of An Architectural Hardware Change

- For increased torque capacity, the wave plate was removed from the 4-5-6 clutch pack assembly and was replaced with an additional friction plate.



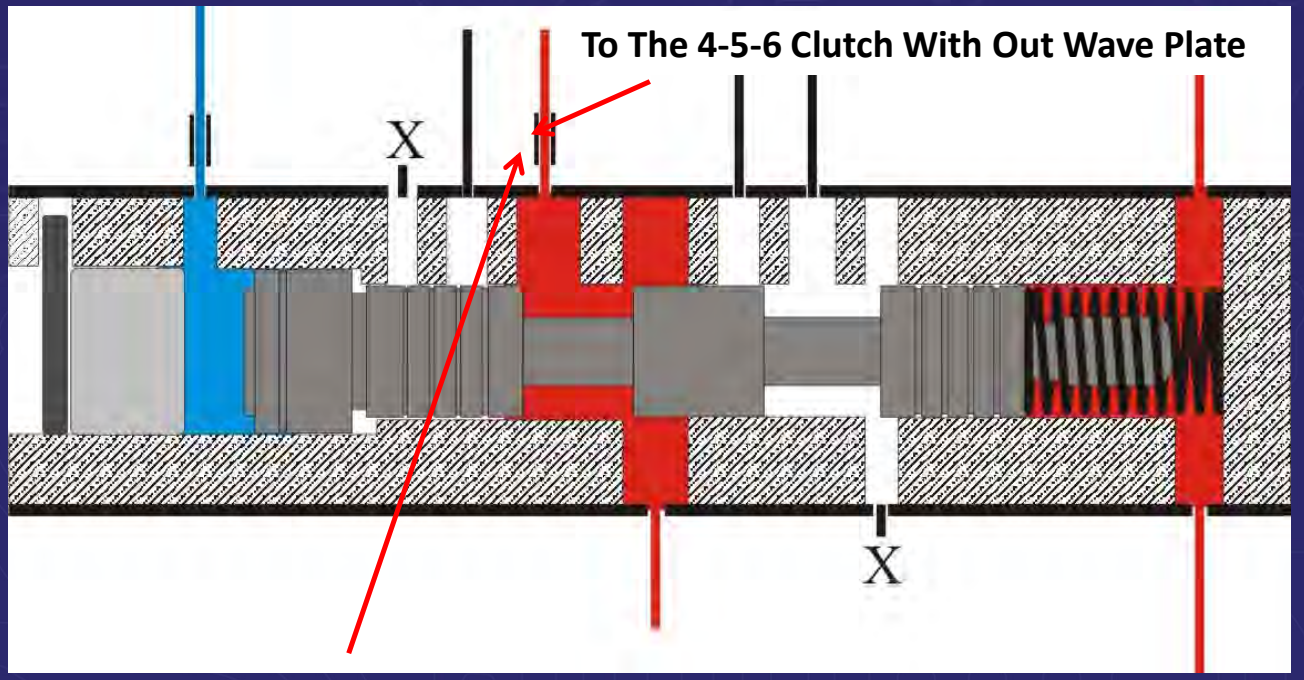


Example Of An Architectural Hardware Change



An Orifice Is Placed In The Line Pressure Feed Circuit To The R1/4-5-6 Clutch Regulator Valve

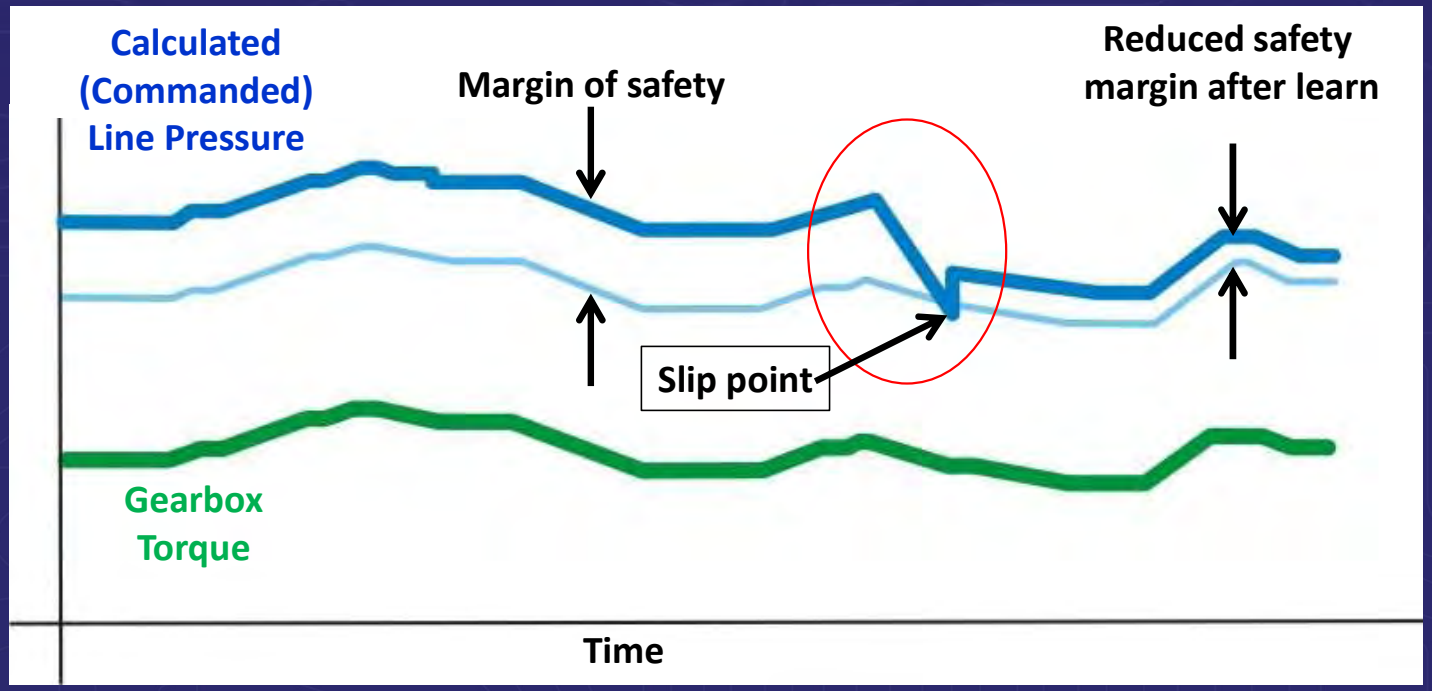
Example Of An Architectural Hardware Change



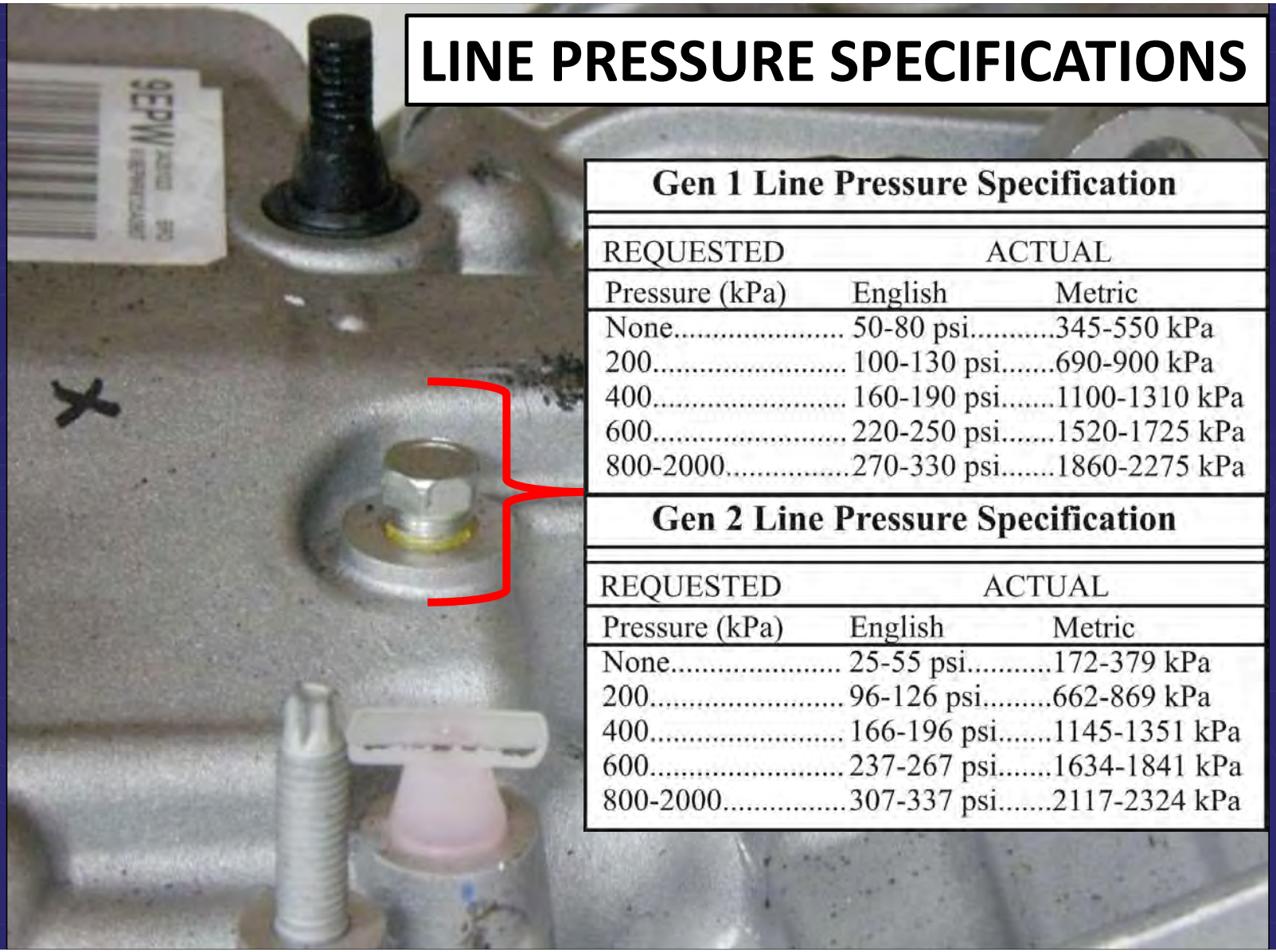
The Line Pressure Feed Orifice Was Moved To The 4-5-6 Clutch Feed Circuit

Example Of A Software Change

System Pressure Learn



LINE PRESSURE SPECIFICATIONS



Gen 1 Line Pressure Specification

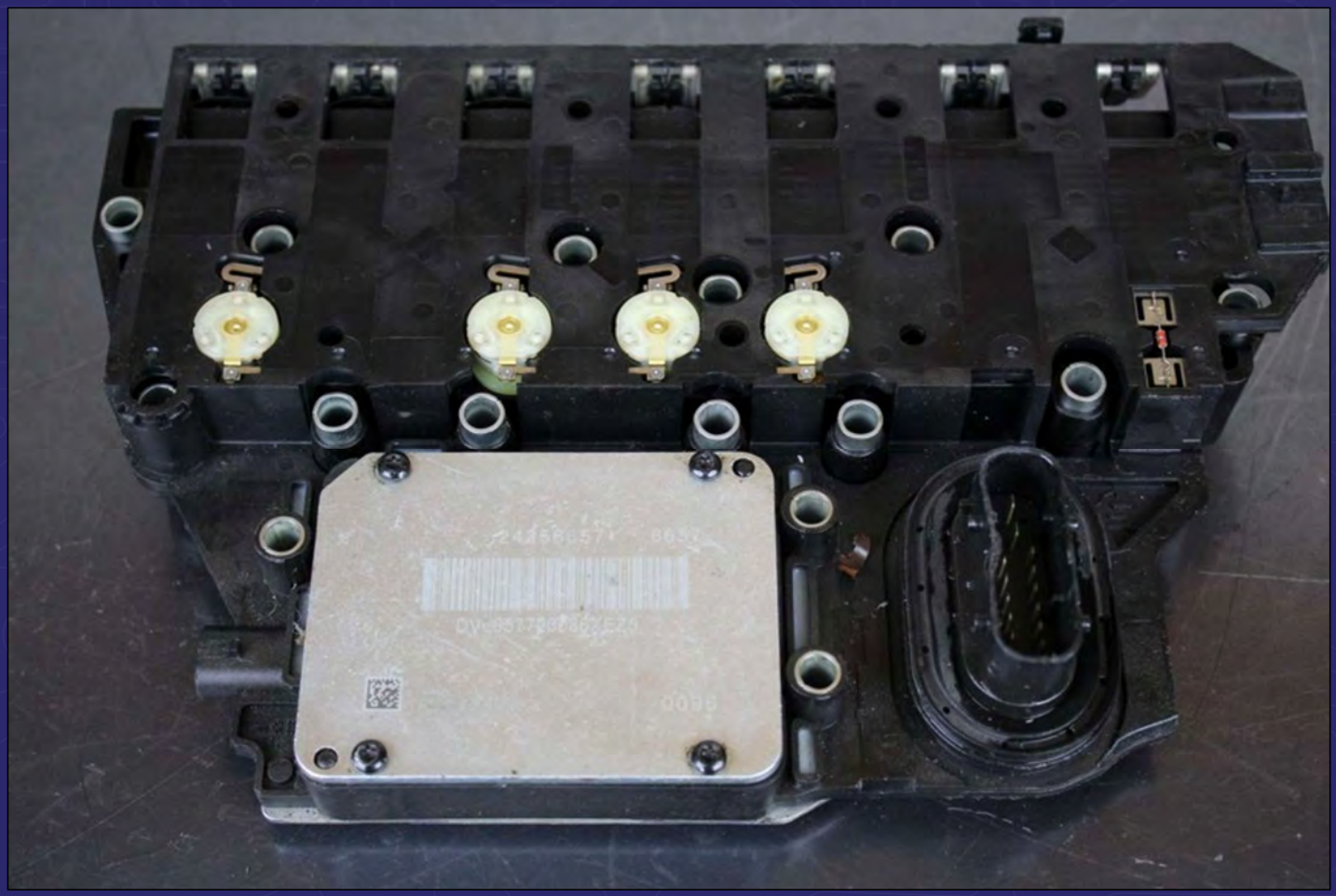
REQUESTED	ACTUAL	
Pressure (kPa)	English	Metric
None	50-80 psi	345-550 kPa
200	100-130 psi	690-900 kPa
400	160-190 psi	1100-1310 kPa
600	220-250 psi	1520-1725 kPa
800-2000	270-330 psi	1860-2275 kPa

Gen 2 Line Pressure Specification

REQUESTED	ACTUAL	
Pressure (kPa)	English	Metric
None	25-55 psi	172-379 kPa
200	96-126 psi	662-869 kPa
400	166-196 psi	1145-1351 kPa
600	237-267 psi	1634-1841 kPa
800-2000	307-337 psi	2117-2324 kPa

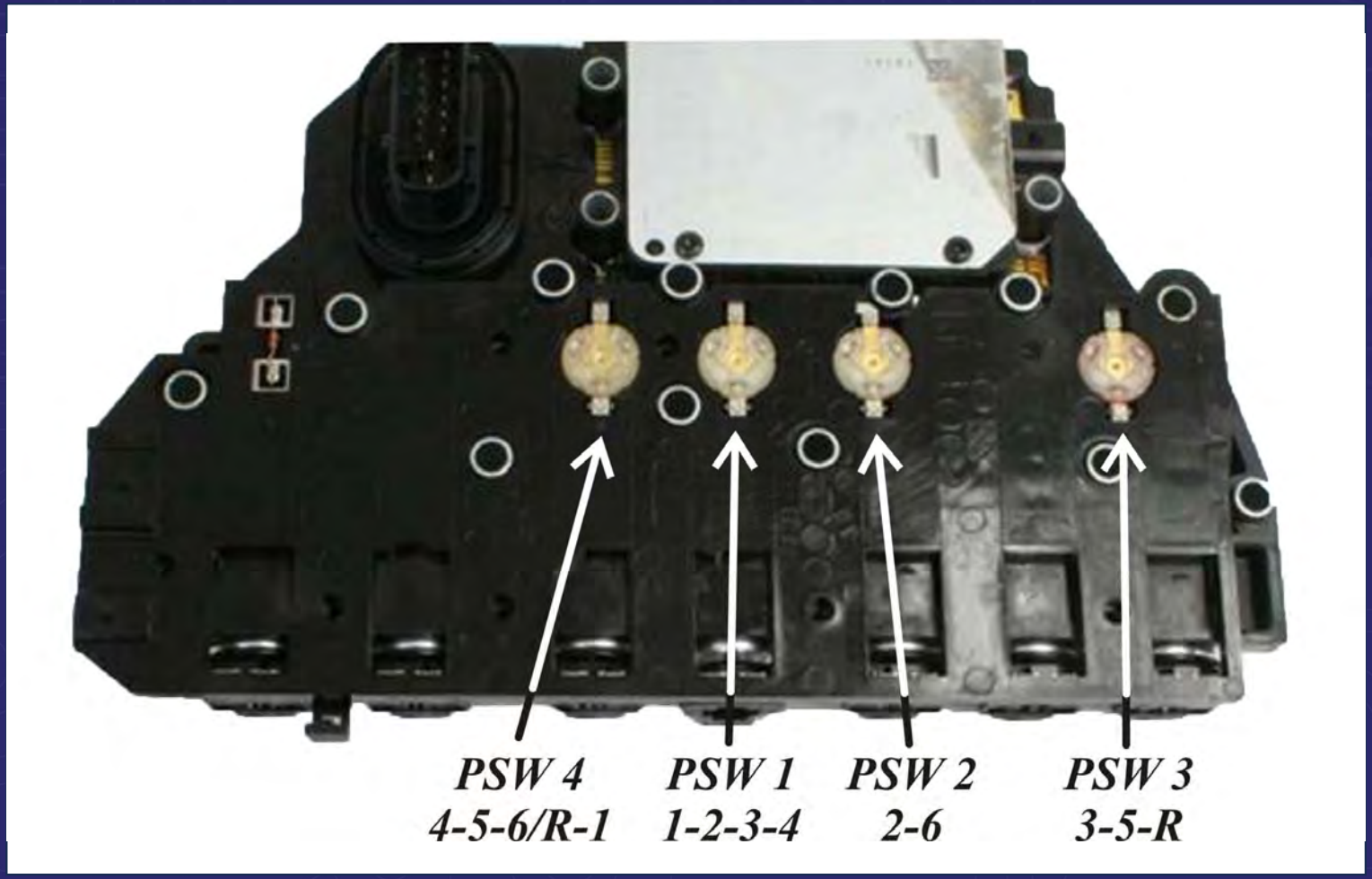
GENERATION 1 TEHCM

Transmission Electro-Hydraulic Module



GENERATION 1 TEHCM

GENERATION 1 TEHCM



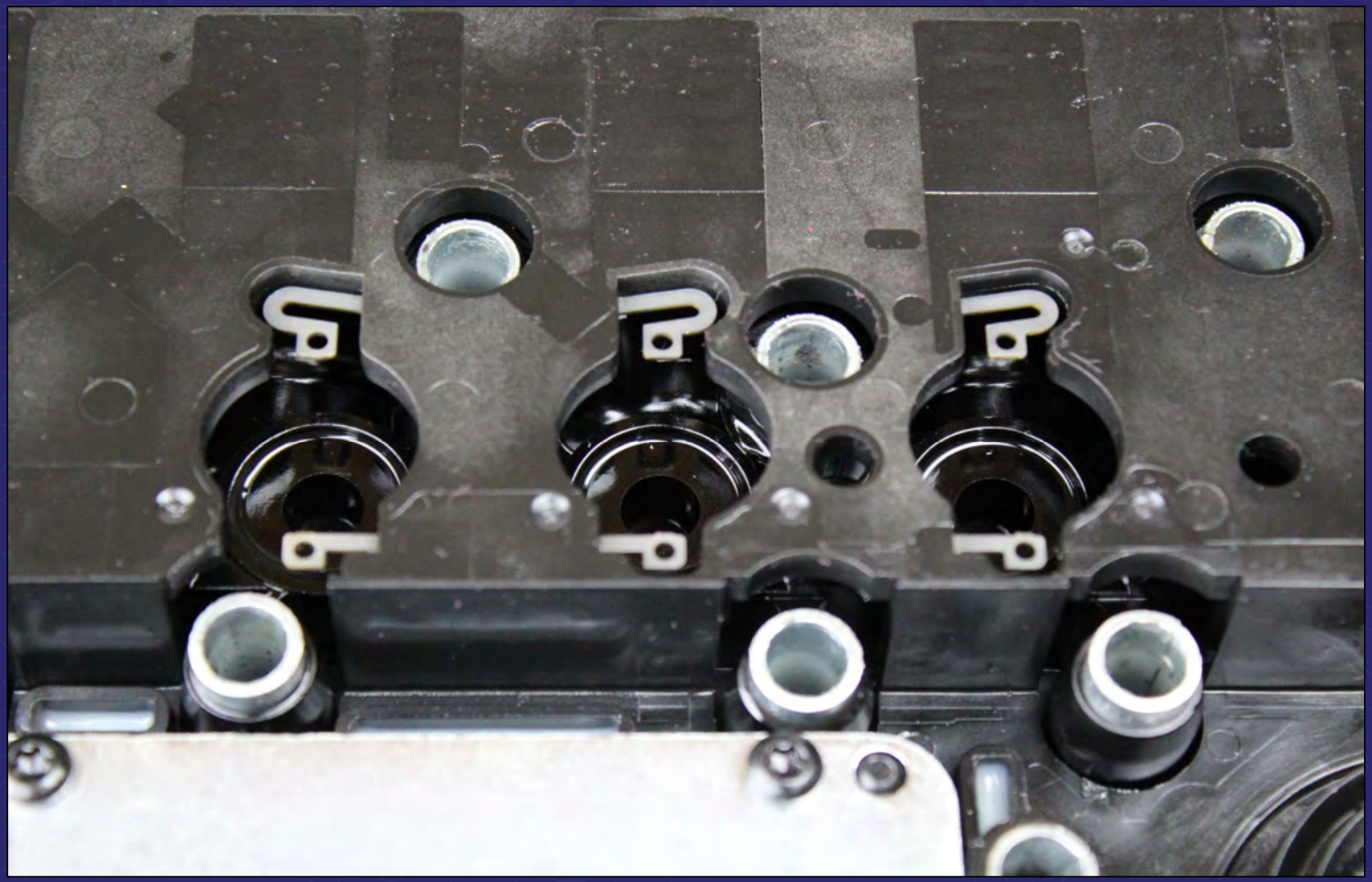
SHIFT ADAPTS

Coming Off  Kiss Point 30 psi 0.5 seconds  Coming On

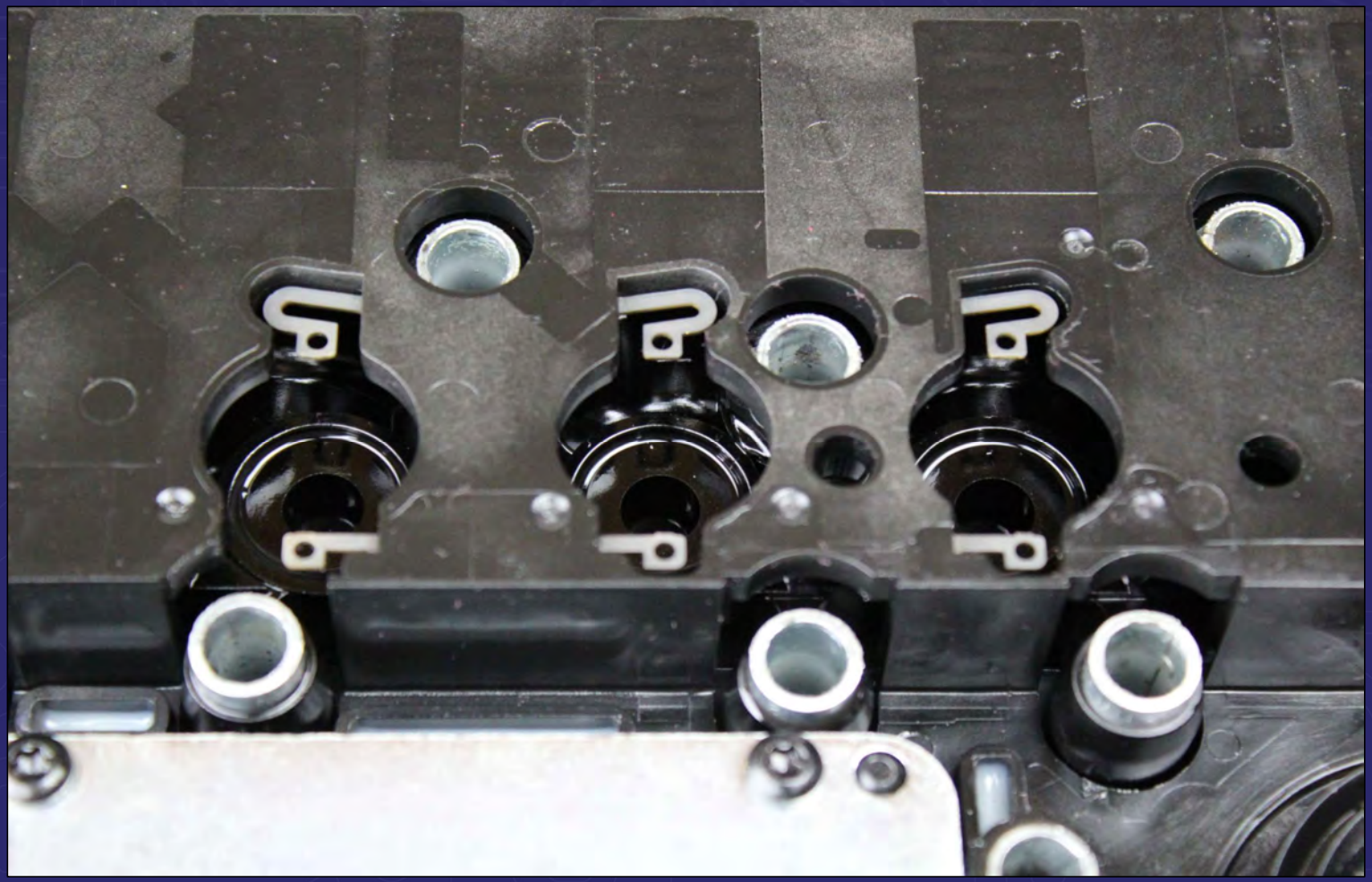
ISS/OSS

RANGE	GEAR	RATIO	SHIFT SOL (On/Off)	1-2-3-4CL PC SOL 5 N.L.	2-6 CL PC SOL 4 N.L.	3-5 REV CL PC SOL 2 N.H.	LO/REV 4-5-6 CL PC SOL 3 N.H.	4-5-6 CLUTCH	3-5 REV CLUTCH	2-6 CLUTCH	LOW ONE-WAY CLUTCH	LO/REV CLUTCH	1-2-3-4 CLUTCH
PARK	P		ON	OFF	OFF	ON	OFF					APPLIED*	
REV	R	2.940	ON	OFF	OFF	OFF	OFF		APPLIED			APPLIED	
NEUT	N		ON	OFF	OFF	ON	OFF					APPLIED*	
Neutral Stop Capable ← DRIVE	1ST BRAKING	4.584	OFF	ON	OFF	ON	OFF					APPLIED	APPLIED
	1ST	4.584	OFF	ON	OFF	ON	ON				HOLD		APPLIED
	2ND	2.964	OFF	ON	ON	ON	ON			APPLIED			APPLIED
	3RD	1.912	OFF	ON	OFF	OFF	ON		APPLIED				APPLIED
	4TH	1.446	OFF	ON	OFF	ON	OFF	APPLIED					APPLIED
	5TH	1.000	OFF	OFF	OFF	OFF	OFF	APPLIED	APPLIED				
	6TH	0.746	OFF	OFF	ON	ON	OFF	APPLIED		APPLIED			

GENERATION 2 TEHCM



GENERATION 2 TEHCM



Clutch Pulse Learn

- Patent App Pub. US 20120067690 A1 entitled:
- *Hydraulic clutch and method for determining an adaptive clutch fill volume of the hydraulic clutch*
- A method for learning a characteristic filling volume of a hydraulic clutch:
- The method comprising of:

Clutch Pulse Learn

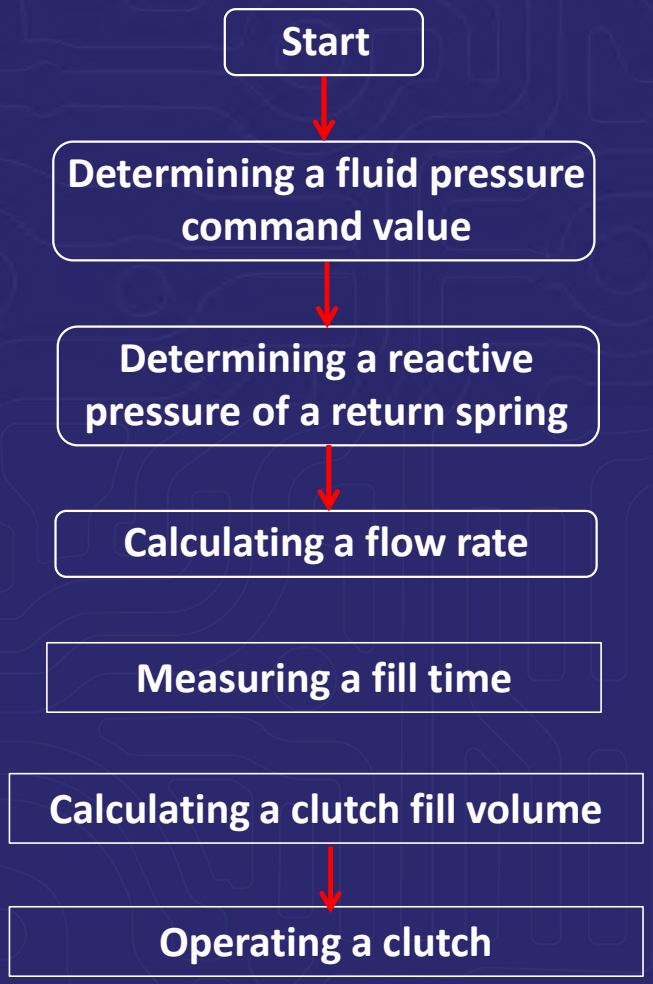
- Applying a pressure pulse to the hydraulic clutch when the hydraulic clutch is in a disengaged state.
- Determining an inflection event at a torque path that comprises the hydraulic clutch.
- Deriving the characteristic filling volume of the hydraulic clutch from the inflection event.

Clutch Pulse Learn

Clutch Pulse Learn Event	
Disengaged Clutch	**Gear Clutch is Pulsed**
4-5-6 Clutch	3rd Gear
1-2-3-4 Clutch 2-6 Clutch	5th Gear
3-5-R Clutch	6th Gear
Clutch Pulse Learn occurs every 1,000 miles or more	

GM calls the Clutch Pulse Learn strategy as a Non-Shifting Clutch Function Verification

Clutch Pulse Learn



When to Perform Adaptation Procedures

- Transmission internal service/overhaul
- Valve body repair or replacement
- Control solenoid valve assembly replacement
- TCM software/calibration update
- Any service in response to a shift quality concern

Adaptation Abort

- TFT too cold or too hot
- Brake Pedal Position Sensor Malfunction
- DTC’s stored in system
- TPS signal too high
- TRS malfunction
- Line pressure out of specification
- Vehicle is moving or vibrating excessively
- Improper clutch assembly

Neutral Idle Control

- Neutral Idle is commanded ON when:
- The transmission is in Drive 1st Gear
- Brakes Applied
- Temperature is at 99 degrees F or greater

Neutral Idle Control

- What is being commanded to provide Neutral Idle:
- The Low/Reverse Clutch remains applied.
- The TCM will command PCS 5 to reduce 1-2-3-4 Clutch apply pressure allowing the clutch to slip/release.

- NOTE: There are no indicator lights to inform the driver this fuel saving strategy has been initiated.

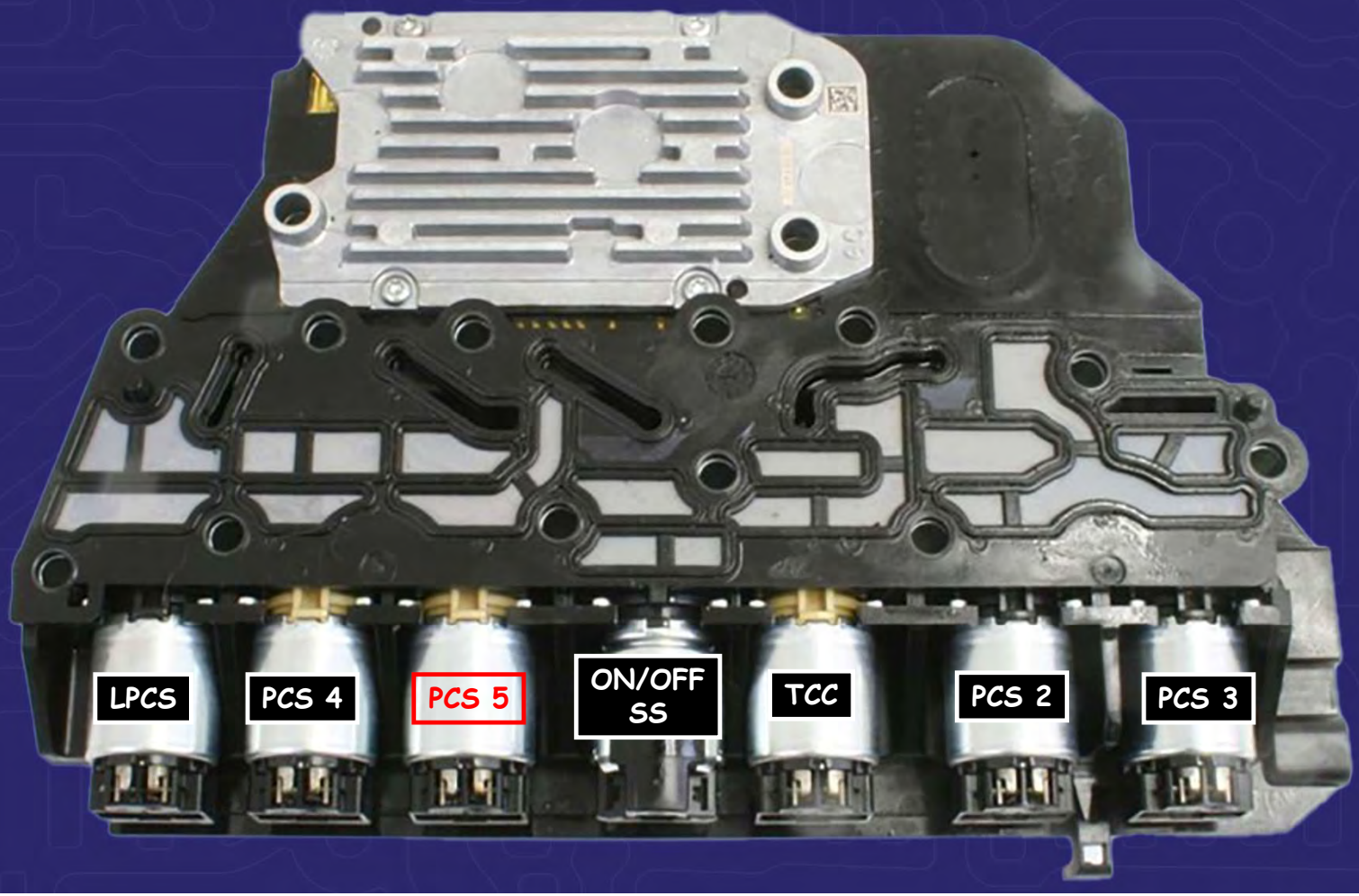
Brake Pedal Position Sensor

BPPS DTC Descriptors

- **DTC P057B**
- **Brake Pedal Position Sensor Performance**
- DTC P057C
- Brake Pedal Position Sensor Circuit Low Voltage
- DTC P057D
- Brake Pedal Position Sensor Circuit High Voltage

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Signal	P057C	P057C	P057D	P057B
5 V Reference	P057C P0651	P057C	P0651	–
Low Reference	–	P057D	P057D	–

Pressure Control Solenoids

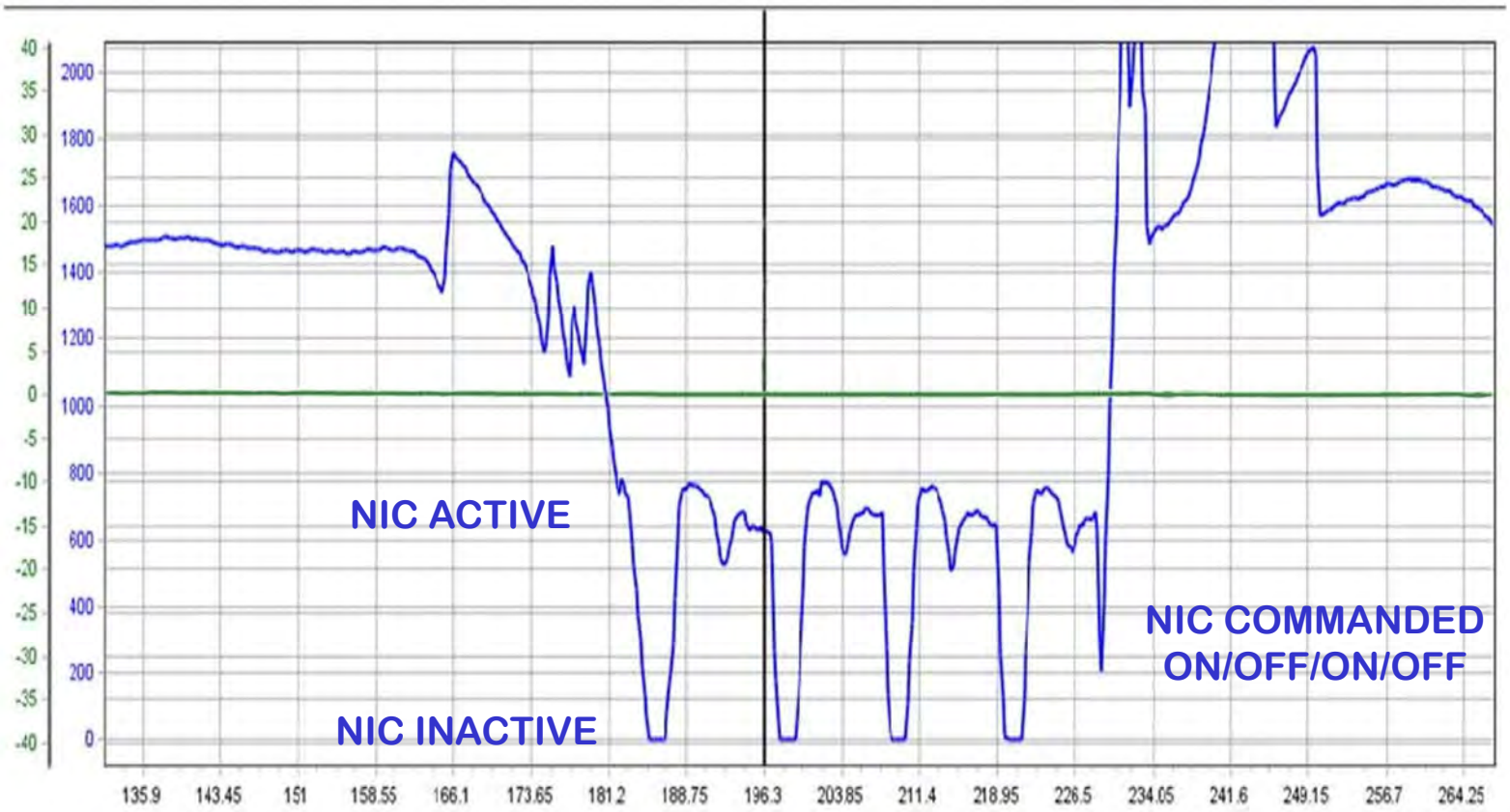


Pressure Control Solenoids

Gear	Shift SOL 1	1-2-3-4 CL PC SOL 5 N.L.	2-6 CL PC SOL 4 N.L.	3-5 REV CL PC SOL 2 N.H.	LOW REV 4-5-6 CL PC SOL 3 N.H.
Park	ON	OFF	OFF	OFF	ON
Reverse	ON	OFF	OFF	ON	ON
Neutral	ON	OFF	OFF	OFF	ON
1st Braking	ON	ON	OFF	OFF	ON
1st	OFF	ON	OFF	OFF	OFF
2nd	OFF	ON	ON	OFF	OFF
3rd	OFF	ON	OFF	ON	OFF
4th	OFF	ON	OFF	OFF	ON
5th	OFF	OFF	OFF	ON	ON
6th	OFF	OFF	ON	OFF	ON

Pressure Control Solenoids

Parameter	System State	Expected Value	Description
Pressure Control Solenoid Valve 5 Control Circuit Low Voltage Test Status	OK	OK, Malfunction, Not Run	This parameter displays whether a short to ground exists in the pressure control solenoid valve 5 control circuit. The scan tool displays OK, Malfunction, or Not Run.
Pressure Control Solenoid Valve 5 Control Circuit High Voltage Test Status	OK	OK, Malfunction, Not Run	This parameter displays whether a short to voltage exists in the pressure control solenoid valve 5 control circuit. The scan tool displays OK, Malfunction, or Not Run.
Pressure Control Solenoid Valve 5 Performance Test Status	OK	OK, Malfunction, Not Run	This parameter displays whether a performance issue exists in the pressure control solenoid valve 5 control circuit by comparing the commanded current with the expected current. The scan tool displays OK, Malfunction, or Not Run.
Pressure Control Solenoid Valve 5 Pressure Command	Varies	kPa (psi)	This parameter displays kPa (psi).



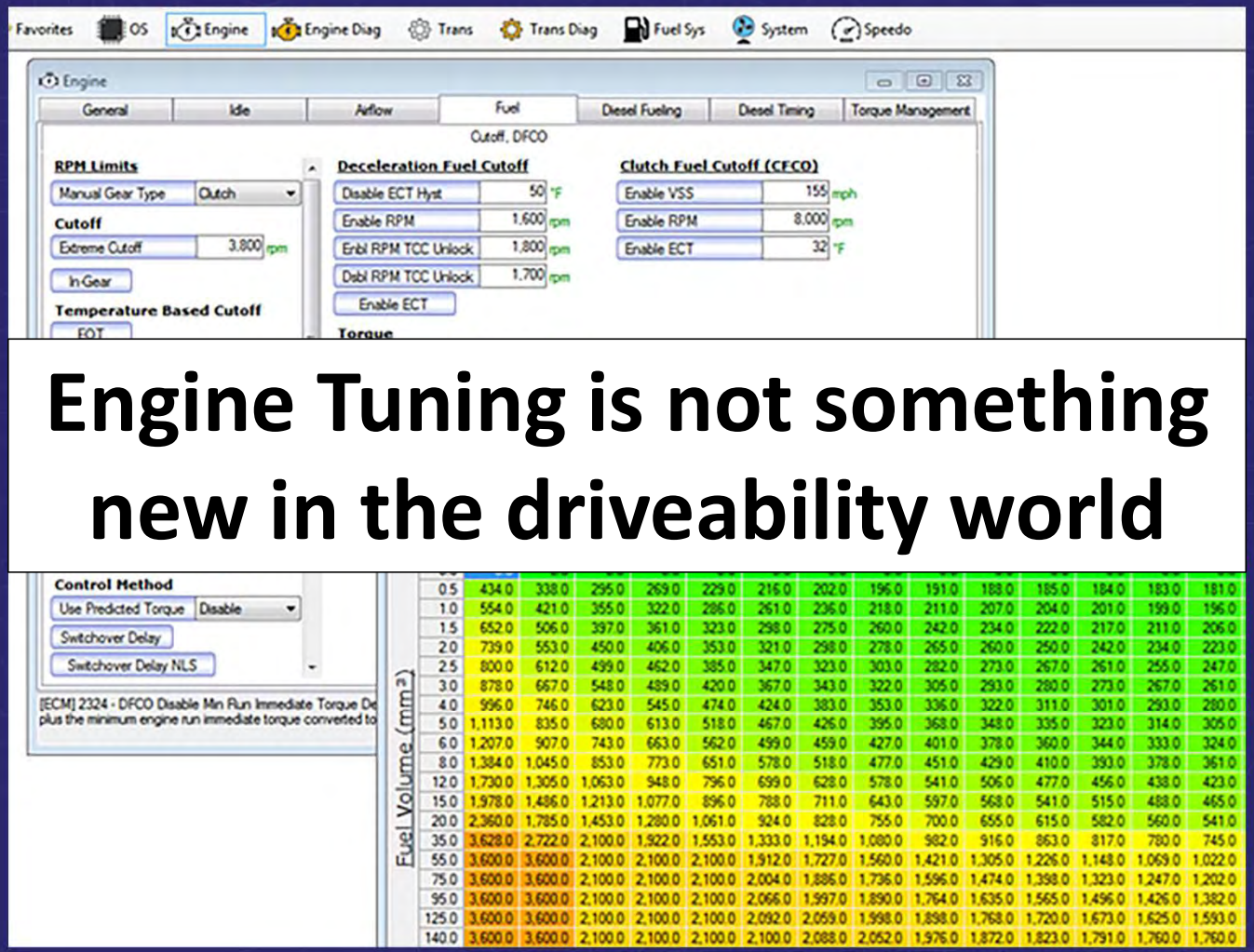
Set Cursor

Legend	Parameter Name	Control Module	Value 1	Value 2	Delta	Unit
	Transmission ISS	Transmission Control Module	623			RPM
	Transmission OSS	Transmission Control Module	0			RPM

AUTOMOTIVE CALIBRATION AND DIAGNOSTIC TOOL

HPtuners

AUTOMOTIVE CALIBRATION AND DIAGNOSTIC TOOL



Engine Tuning is not something new in the driveability world

ATSG
AUTOMATIC TRANSMISSION SERVICE GROUP

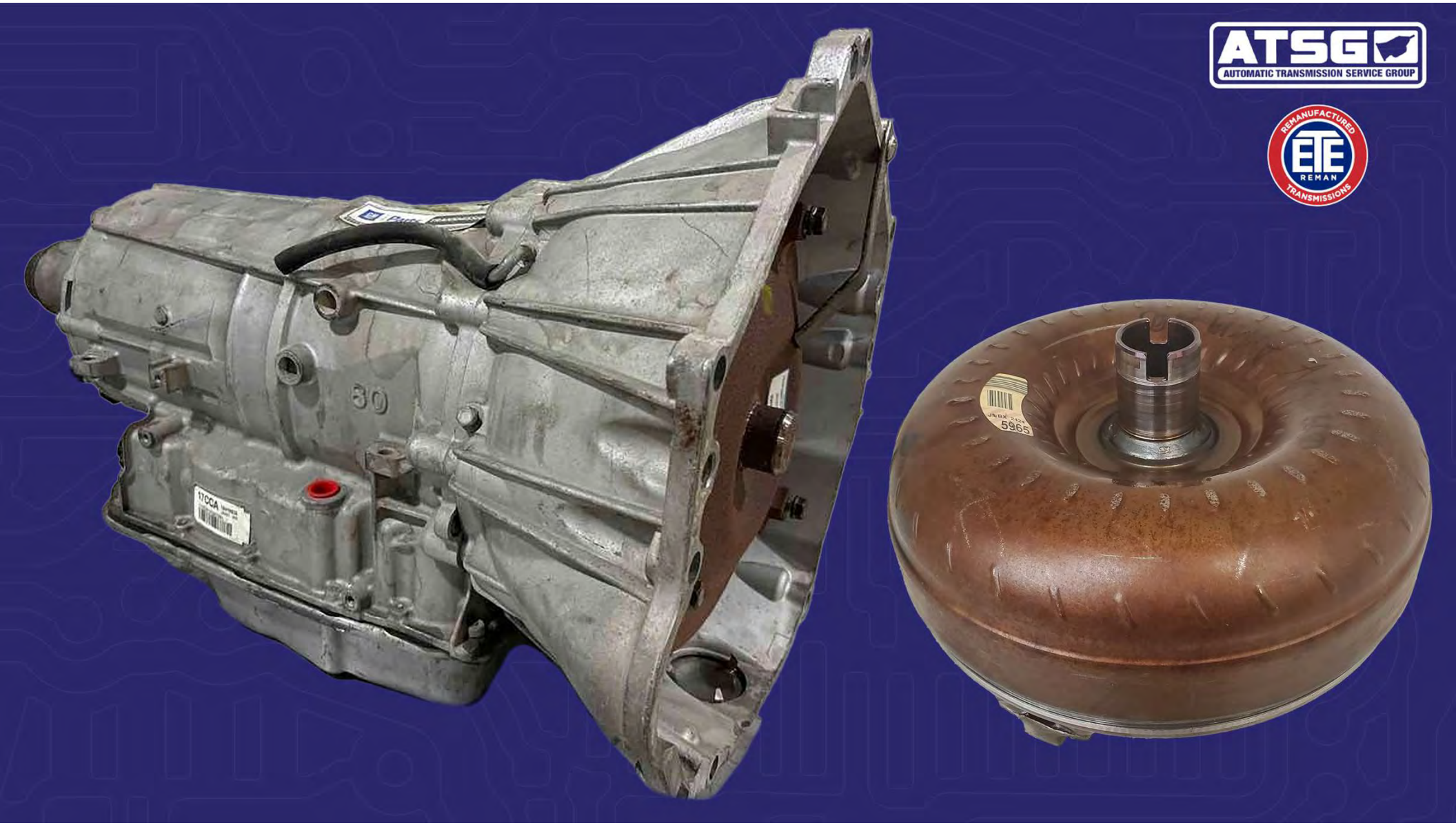
REMANUFACTURED ETE REMAN TRANSMISSIONS

Greg Banish publications have helped many in their tuning quest.

ATSG
AUTOMATIC TRANSMISSION SERVICE GROUP

REMANUFACTURED ETE REMAN TRANSMISSIONS

- The Transmission World has been getting into this now for a number of years changing transmission shift and TCC strategies.
- This has opened new issues if you are not aware of pervious work done.


ATSG
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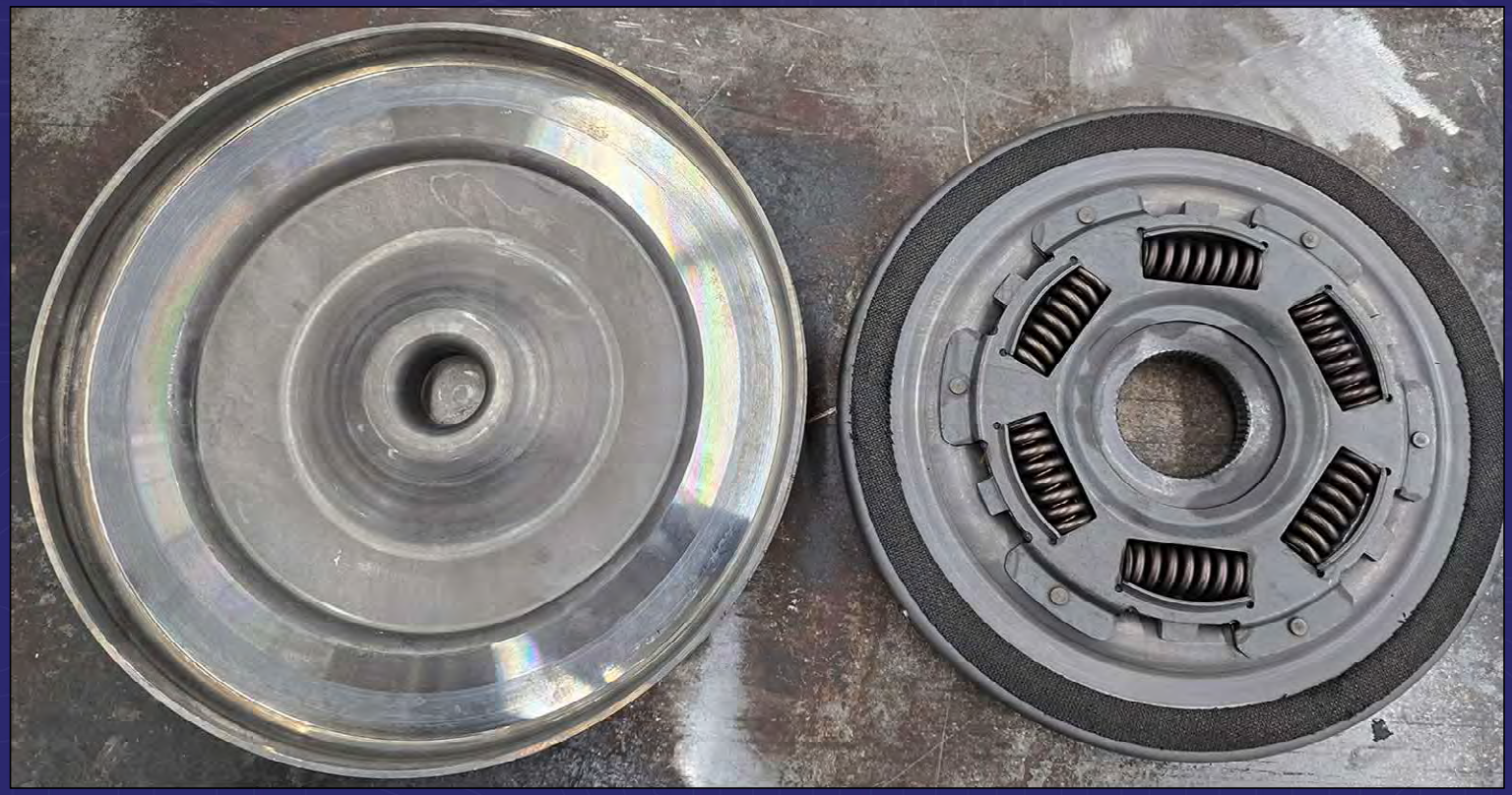
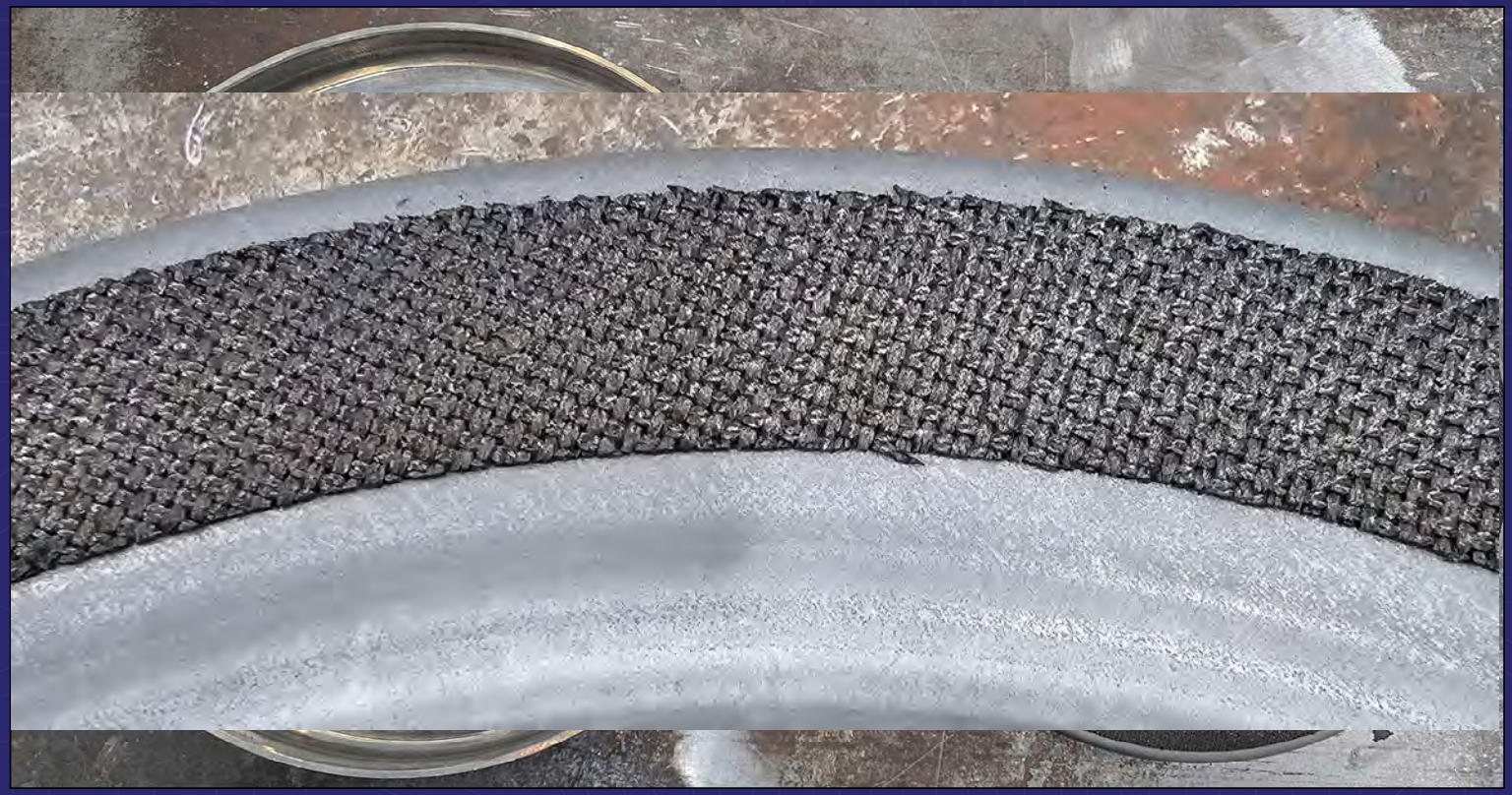
REMAN
TRANSMISSIONS
5965

6L80 Woven Fiber Clutch

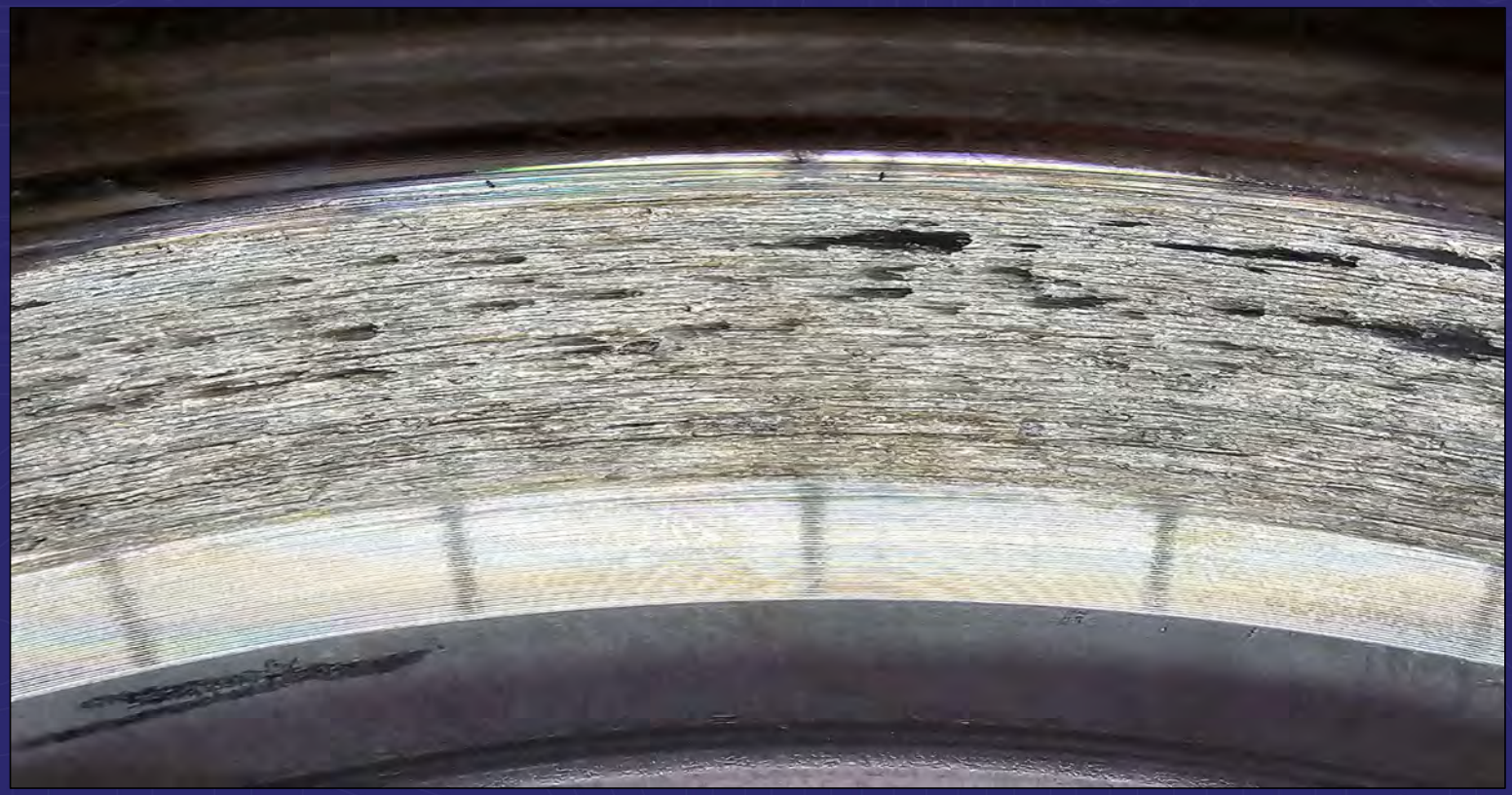


6L80 Woven Fiber Clutch



6L80 Woven Fiber Clutch

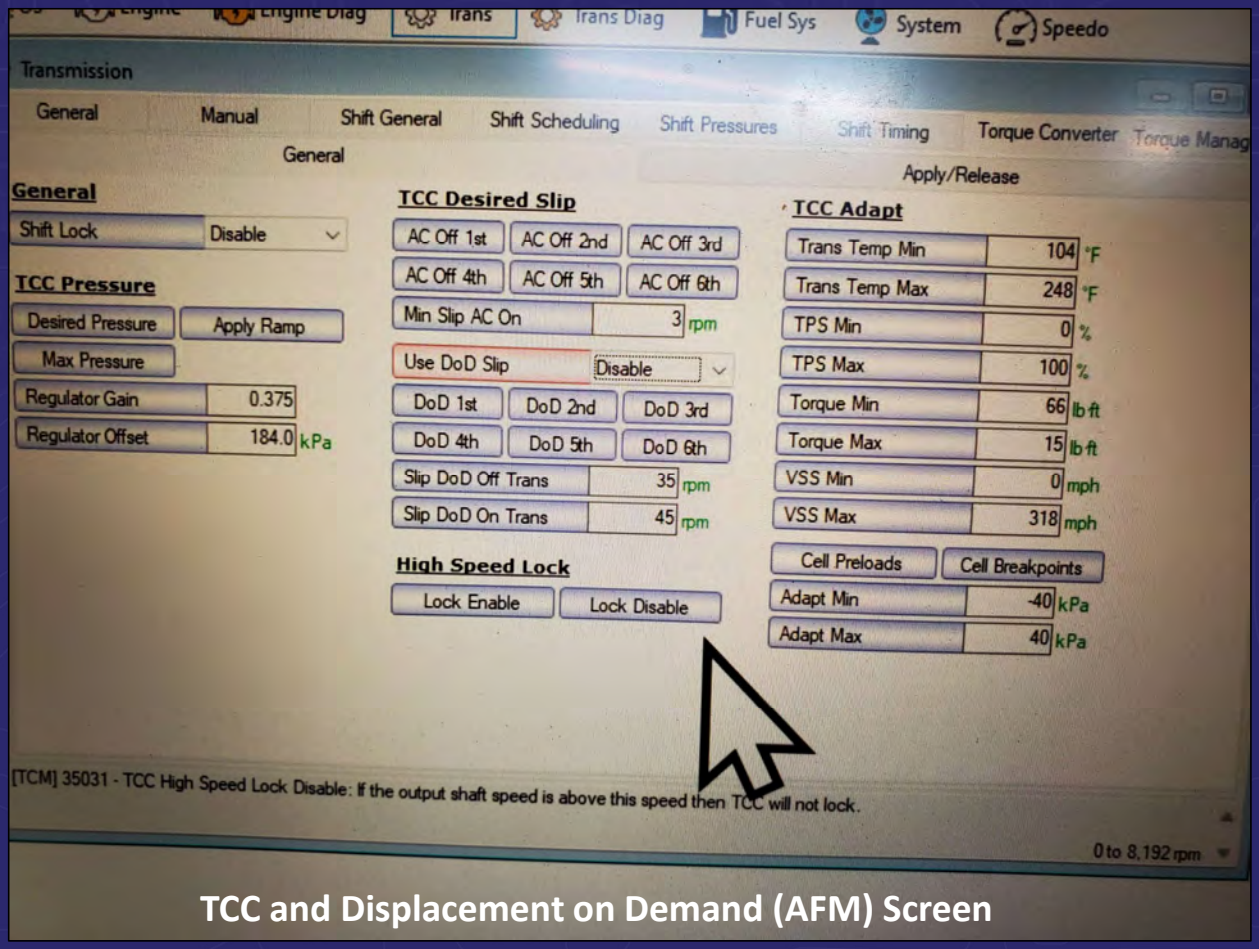
6L80 Woven Fiber Clutch




06/6/23

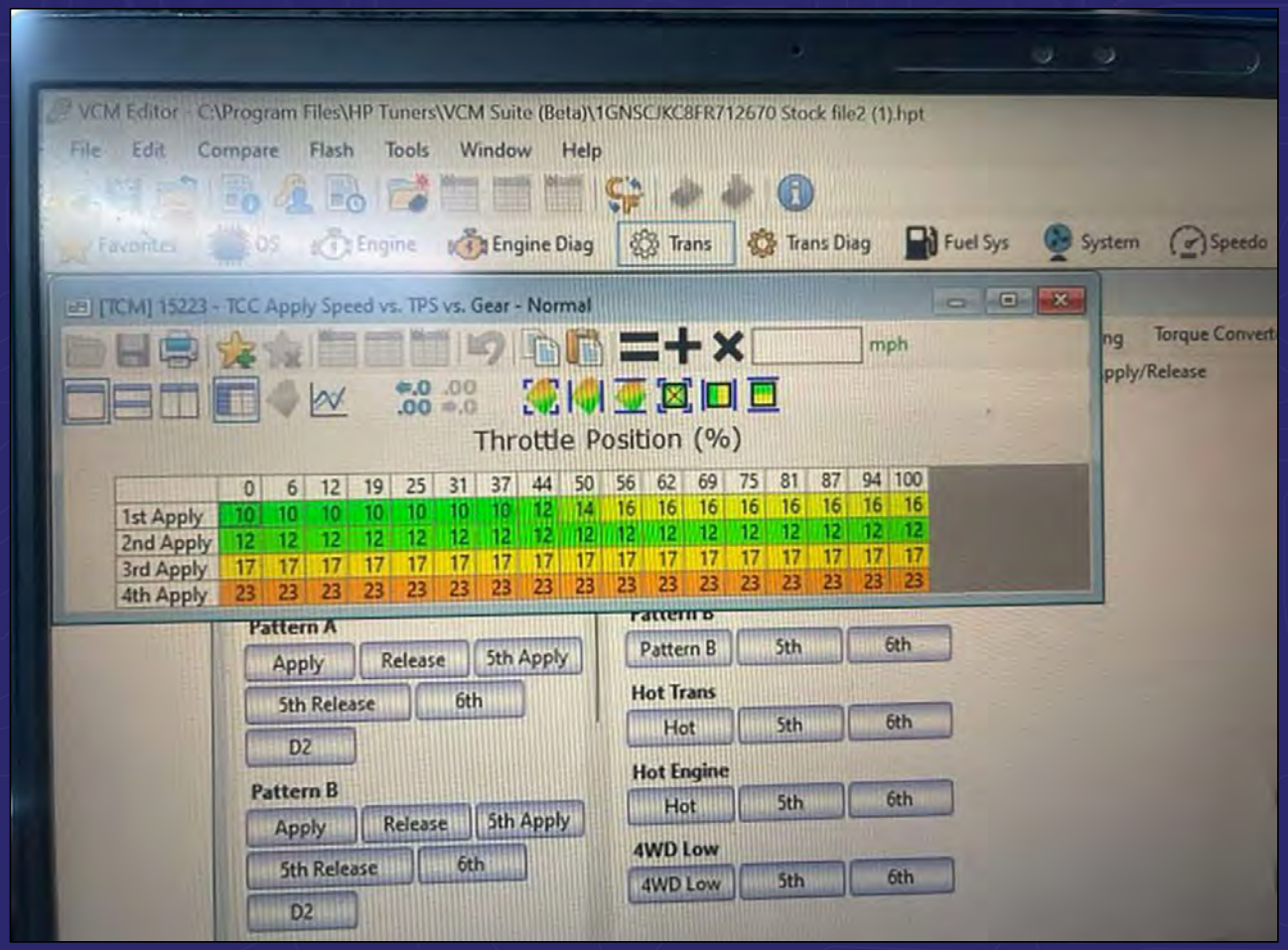

06/5/23

TCC Strategy and HP Tuning

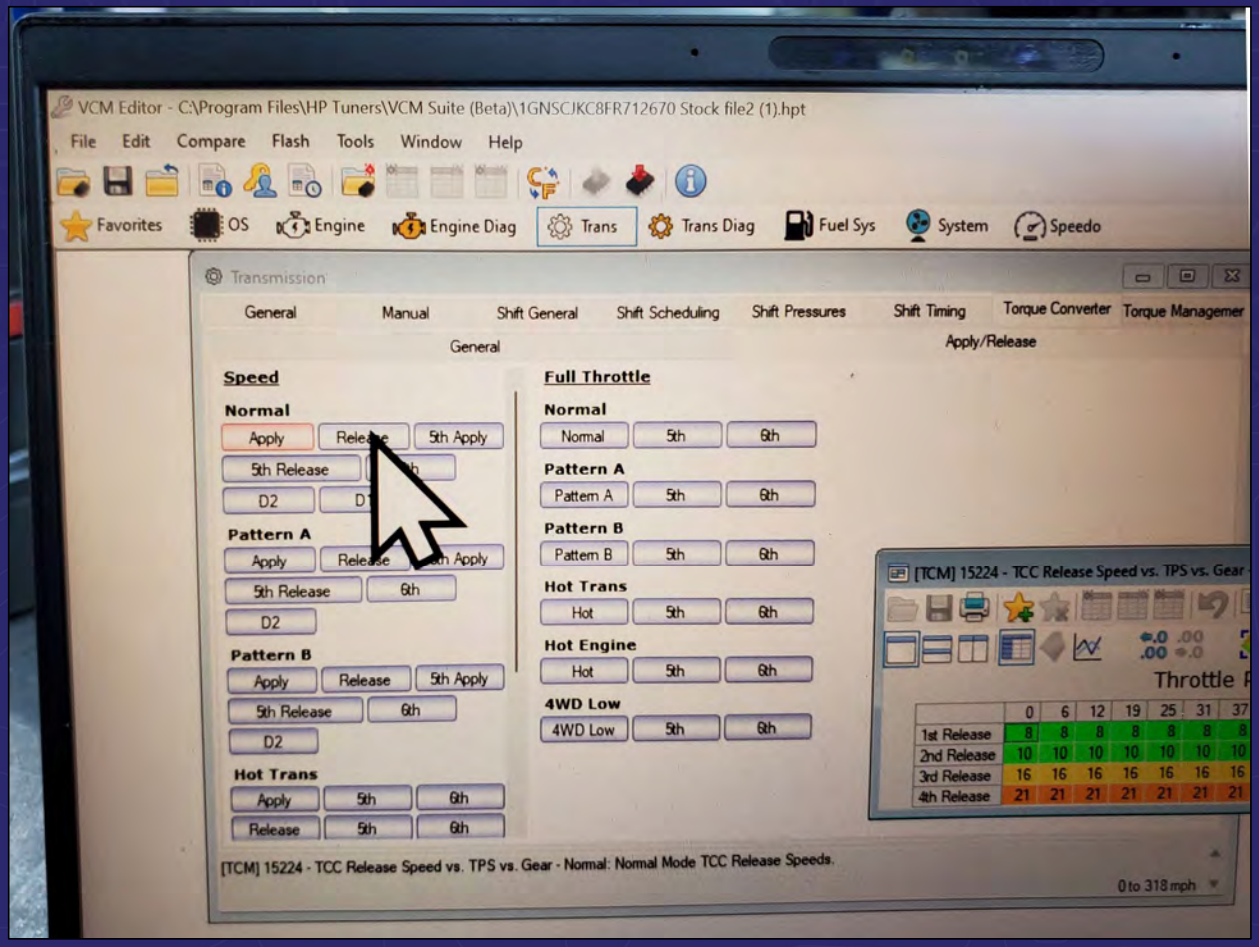


TCC and Displacement on Demand (AFM) Screen

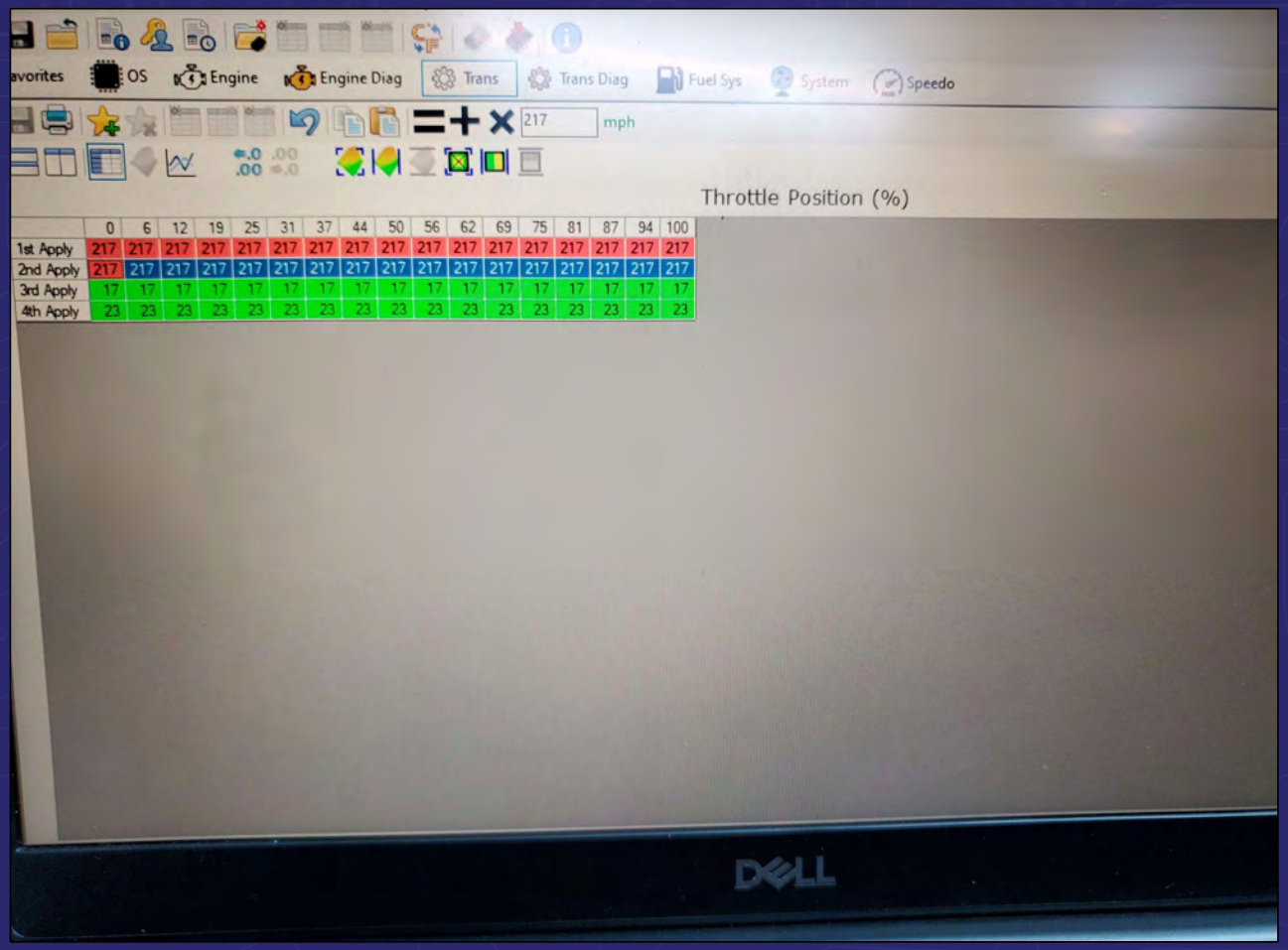
TCC Strategy and HP Tuning



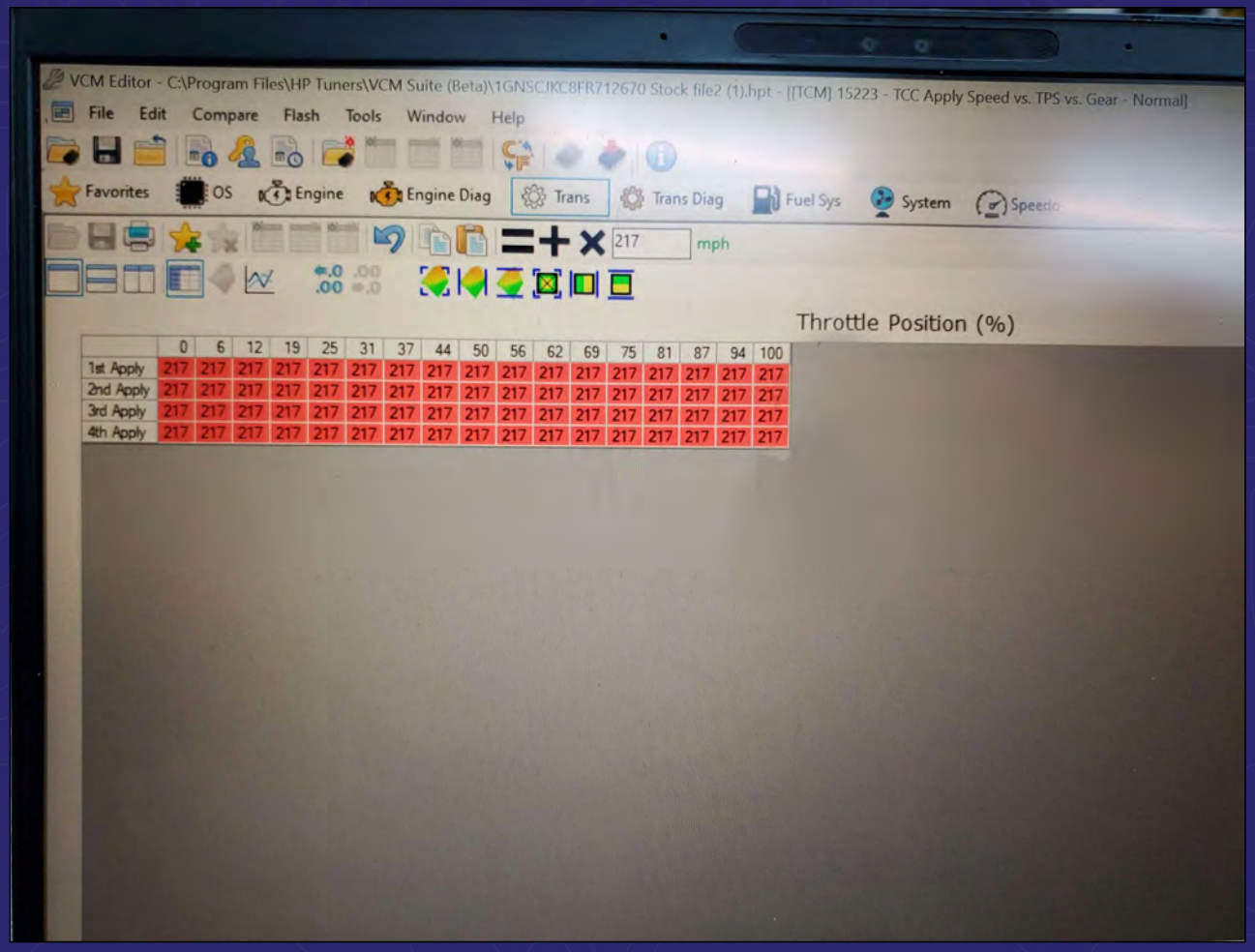
TCC Strategy and HP Tuning



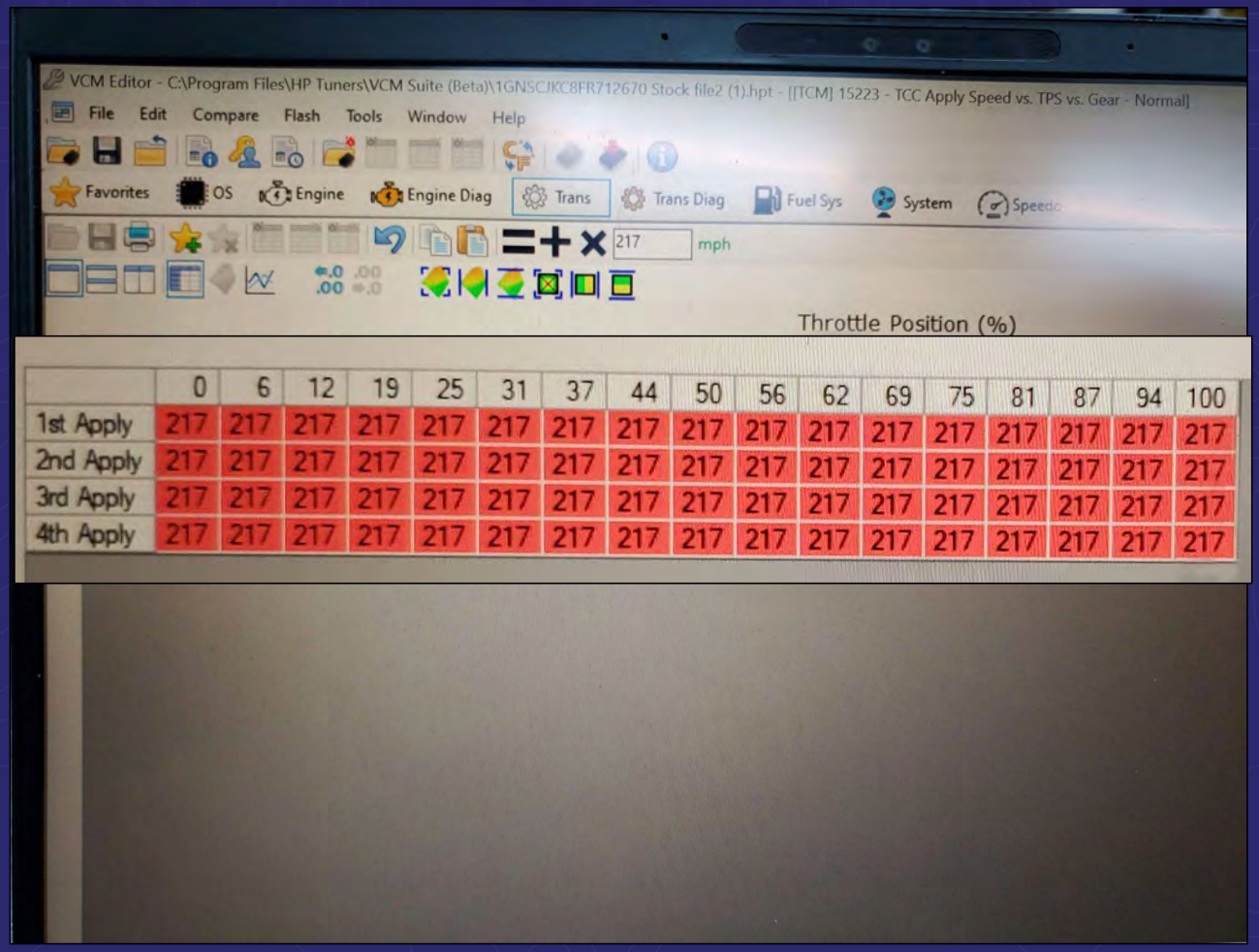
TCC Strategy and HP Tuning



TCC Strategy and HP Tuning

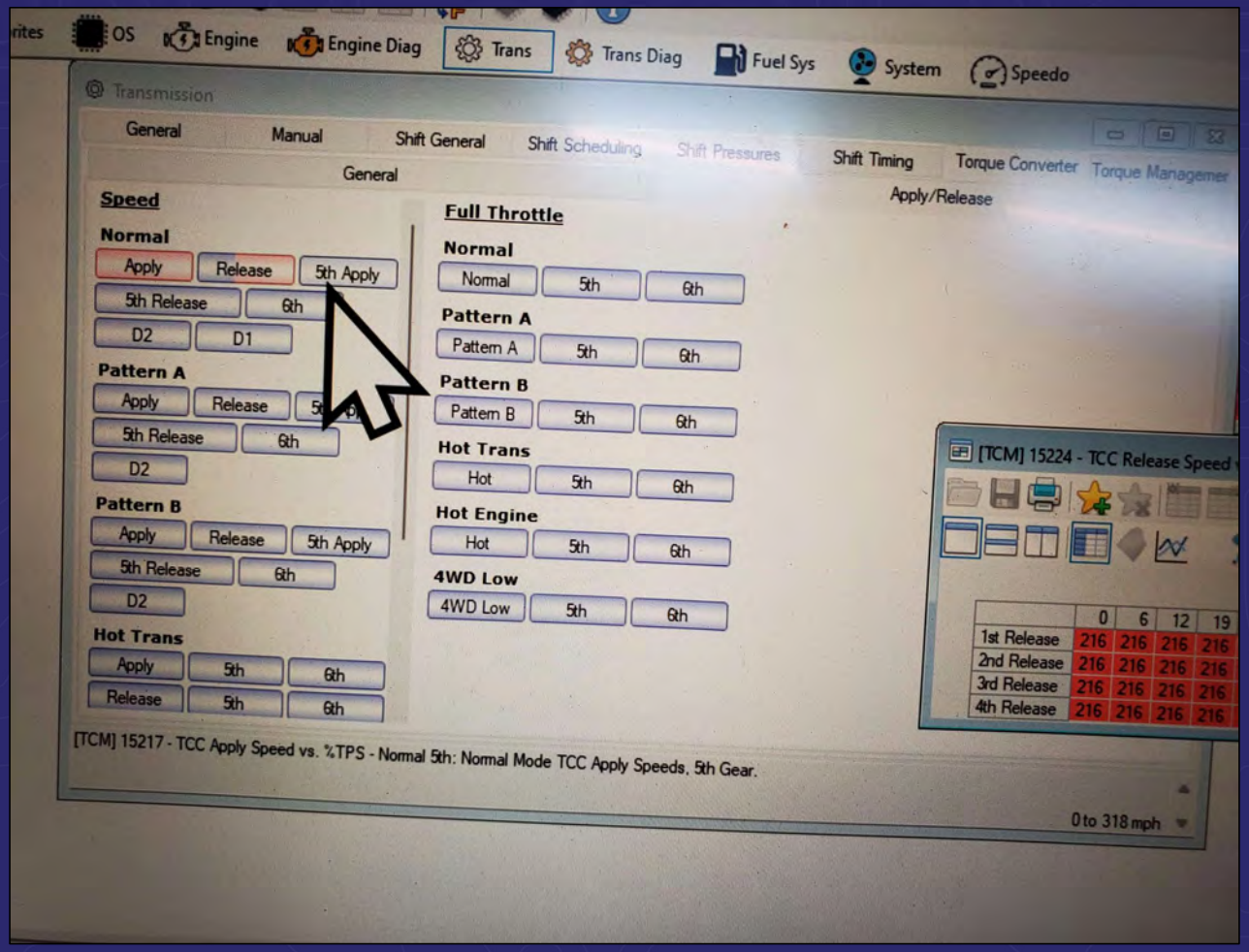


TCC Strategy and HP Tuning

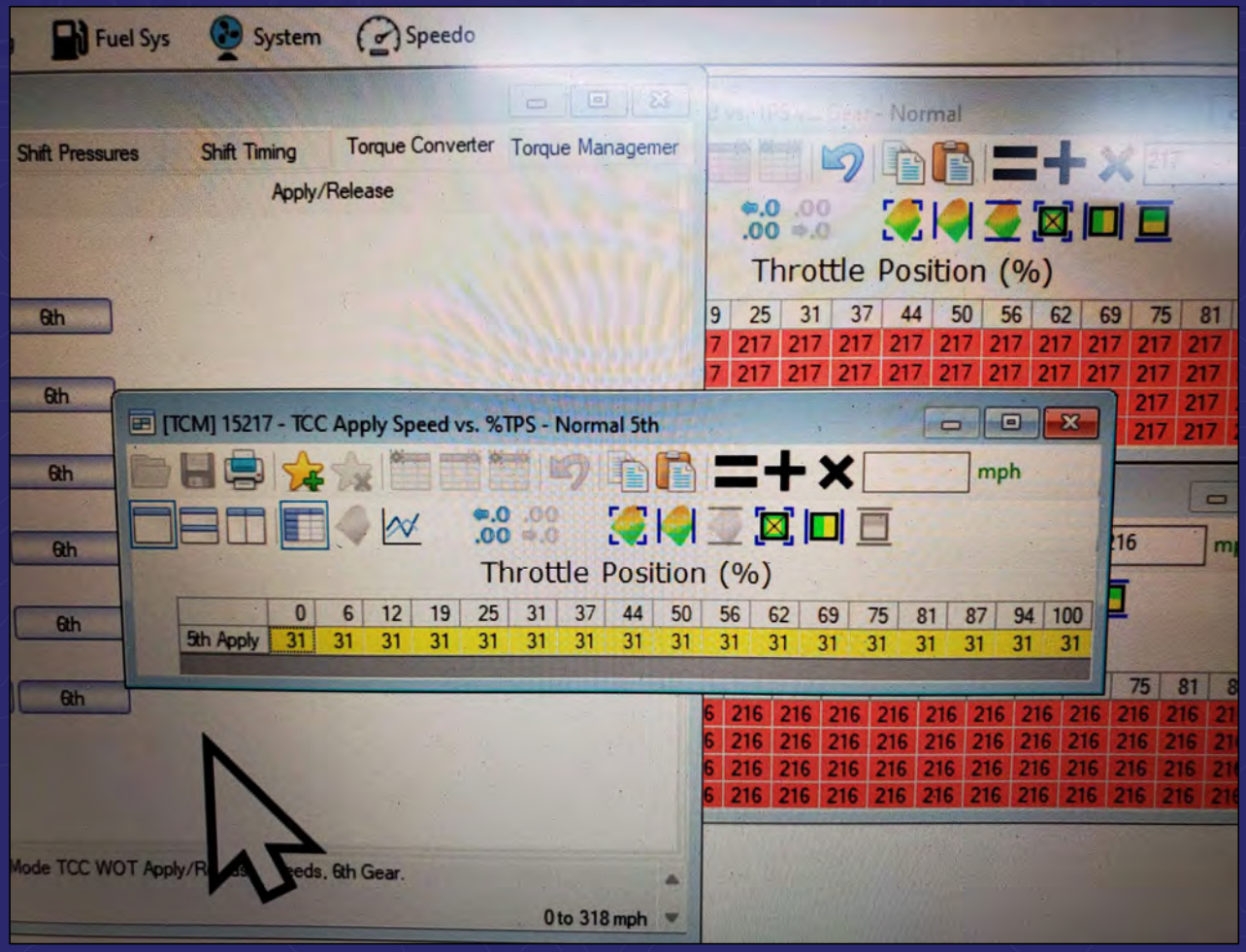


	0	6	12	19	25	31	37	44	50	56	62	69	75	81	87	94	100
1st Apply	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217
2nd Apply	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217
3rd Apply	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217
4th Apply	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217

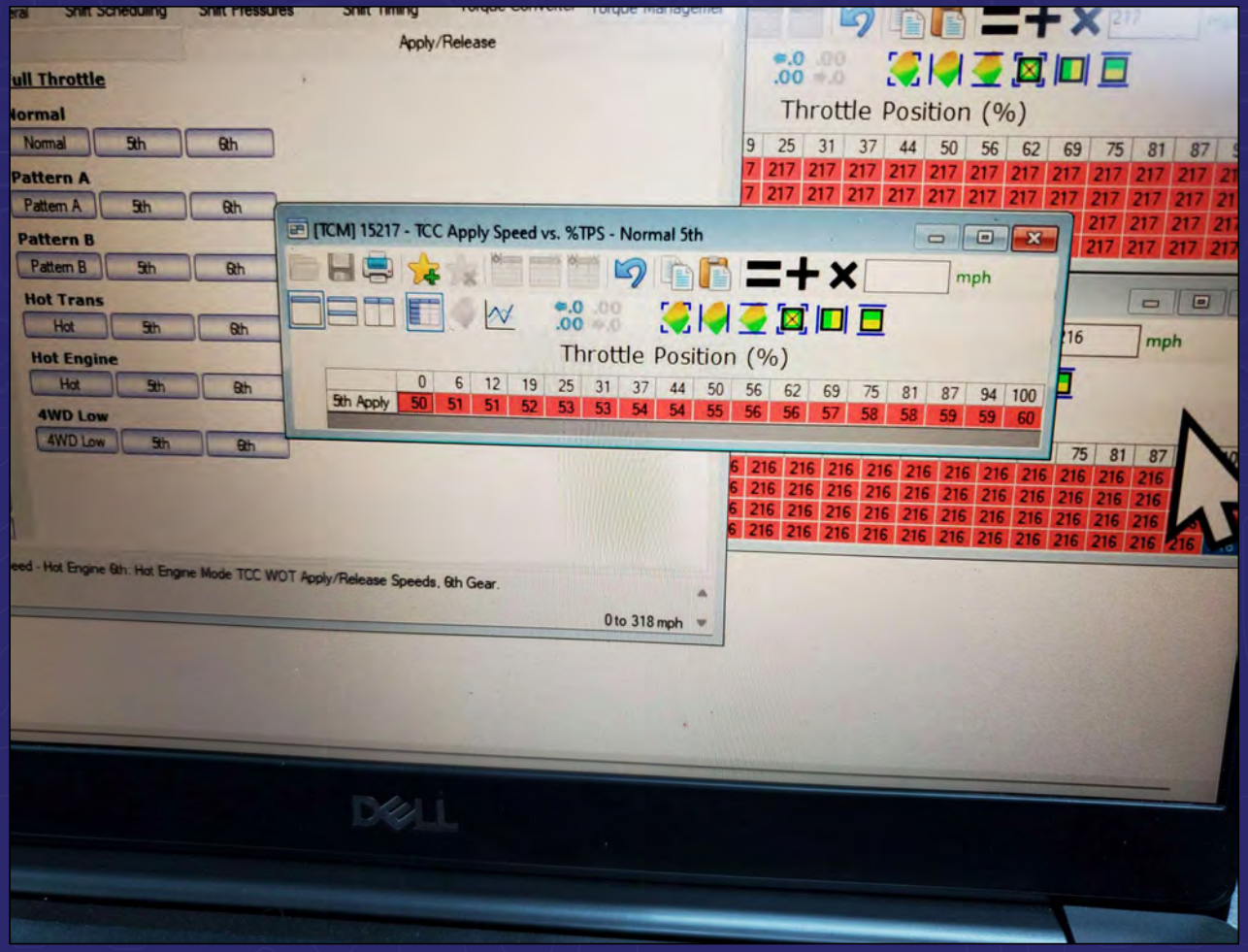
TCC Strategy and HP Tuning



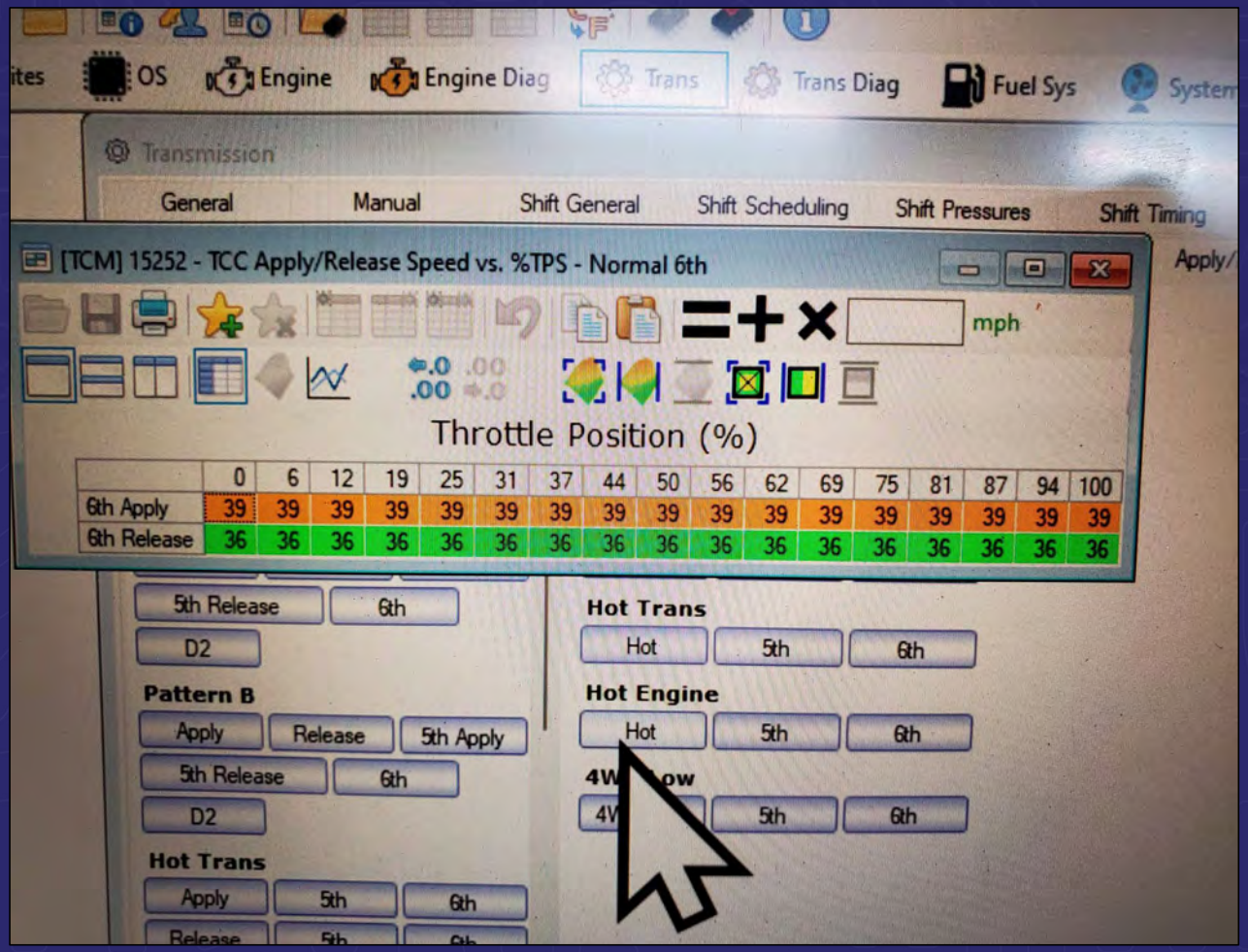
TCC Strategy and HP Tuning



TCC Strategy and HP Tuning



TCC Strategy and HP Tuning



HP Tuning Scenarios

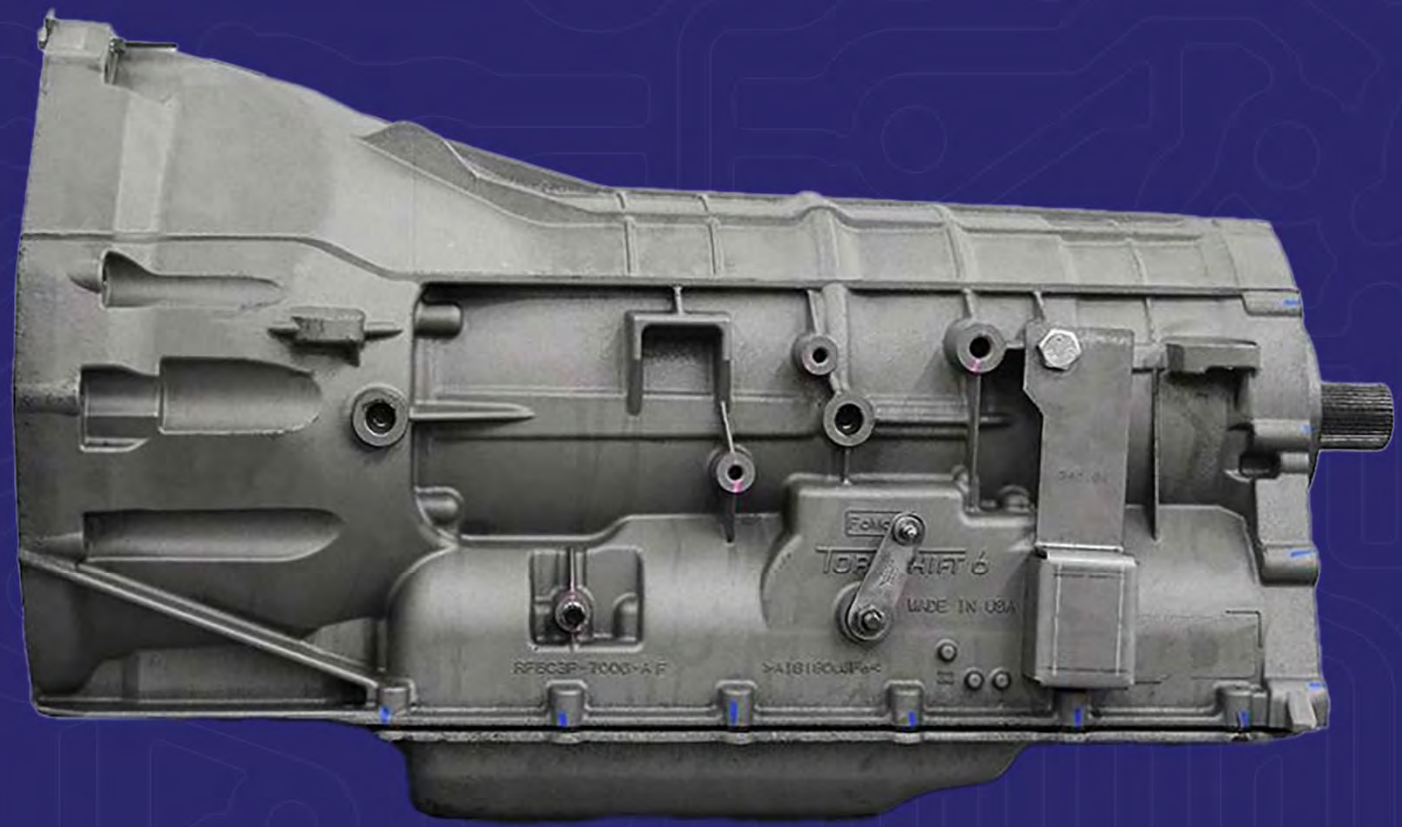
- **Scenario 1**
- A 2012 GMC Yukon 5.3L comes into your shop using the 6L80 transmission not knowing it was once serviced by a transmission shop where it was HP Tuned.
- The vehicle needs a new PCM.
- Or you reprogram it.
- Customer now knows something is different and complains about it.
- **Scenario 2**
- It comes from a shop that used HP Tuning incorrectly causing odd shifting patterns and/or TCC issues.
- You spend hours of diagnostics trying to determine what the HELL is going on!!!

The 6R140 Delayed Reverse Engagement

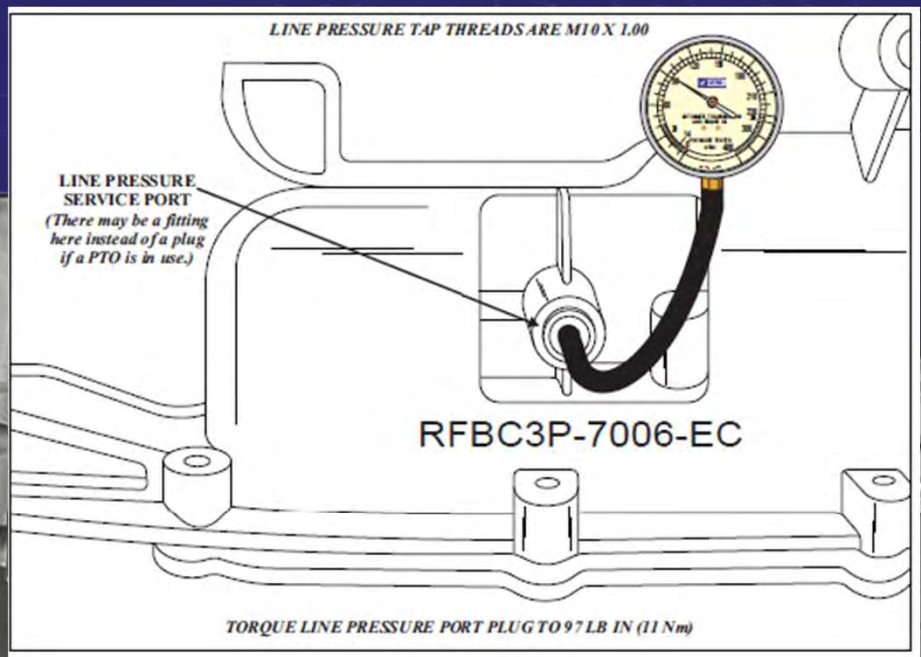
USING HP TUNERS AS A DIAGNOSTIC TOOL

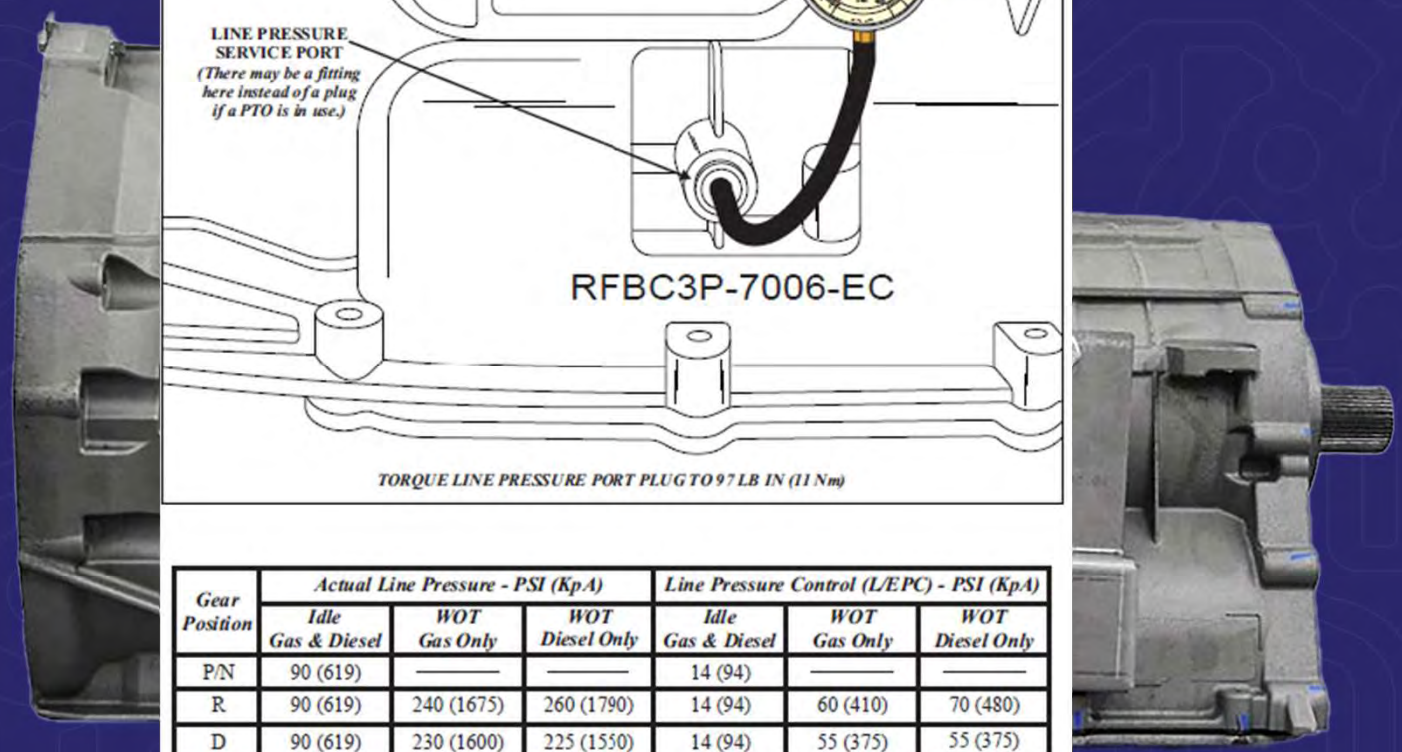
The 6R140 Delayed Reverse Engagement

USING HP TUNERS AS A DIAGNOSTIC TOOL



The 6R140 Delayed Reverse Engagement





Gear Position	Actual Line Pressure - PSI (KpA)			Line Pressure Control (L/EPC) - PSI (KpA)		
	Idle Gas & Diesel	WOT Gas Only	WOT Diesel Only	Idle Gas & Diesel	WOT Gas Only	WOT Diesel Only
P/N	90 (619)	———	———	14 (94)	———	———
R	90 (619)	240 (1675)	260 (1790)	14 (94)	60 (410)	70 (480)
D	90 (619)	230 (1600)	225 (1550)	14 (94)	55 (375)	55 (375)
3	90 (619)	180 (1230)	160 (1100)	14 (94)	40 (275)	35 (240)
2	90 (619)	240 (1675)	235 (1650)	14 (94)	60 (410)	60 (410)
1	90 (619)	230 (1600)	225 (1550)	14 (94)	55 (375)	55 (375)

The 6R140 Delayed Reverse Engagement

COMPONENT APPLICATION CHART

RANGE	1-2-3-4 Clutch (Fwd)	3-5-Rev Clutch (Direct)	2-6 Clutch (Int)	Low/ Reverse Clutch	4-5-6 Clutch (OD)	Low One-Way Clutch	Torque Converter Clutch		Gear Ratio
Park				On					
Reverse		On		On					3.13
Neutral				On					
"D"-1st	On			^On		Hold	Applied*		3.97
"D"-2nd	On		On				Applied*		2.32
"D"-3rd	On	On					Applied*		1.52
"D"-4th	On				On		Applied*		1.15
"D"-5th		On			On		Applied*		0.86
"D"-6th			On		On		Applied*		0.67

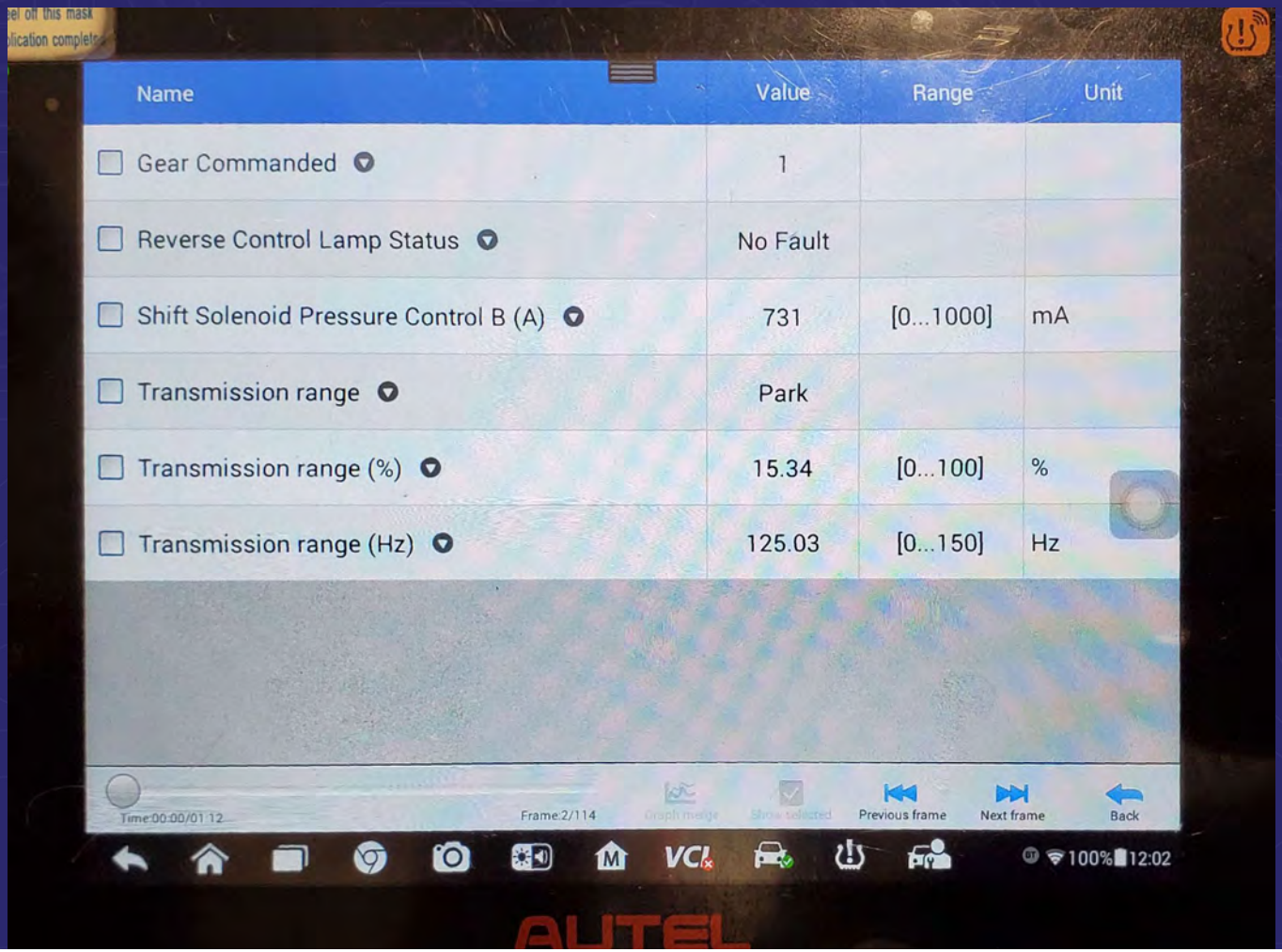
The 6R140 Delayed Reverse Engagement

SOLENOID APPLICATION CHART

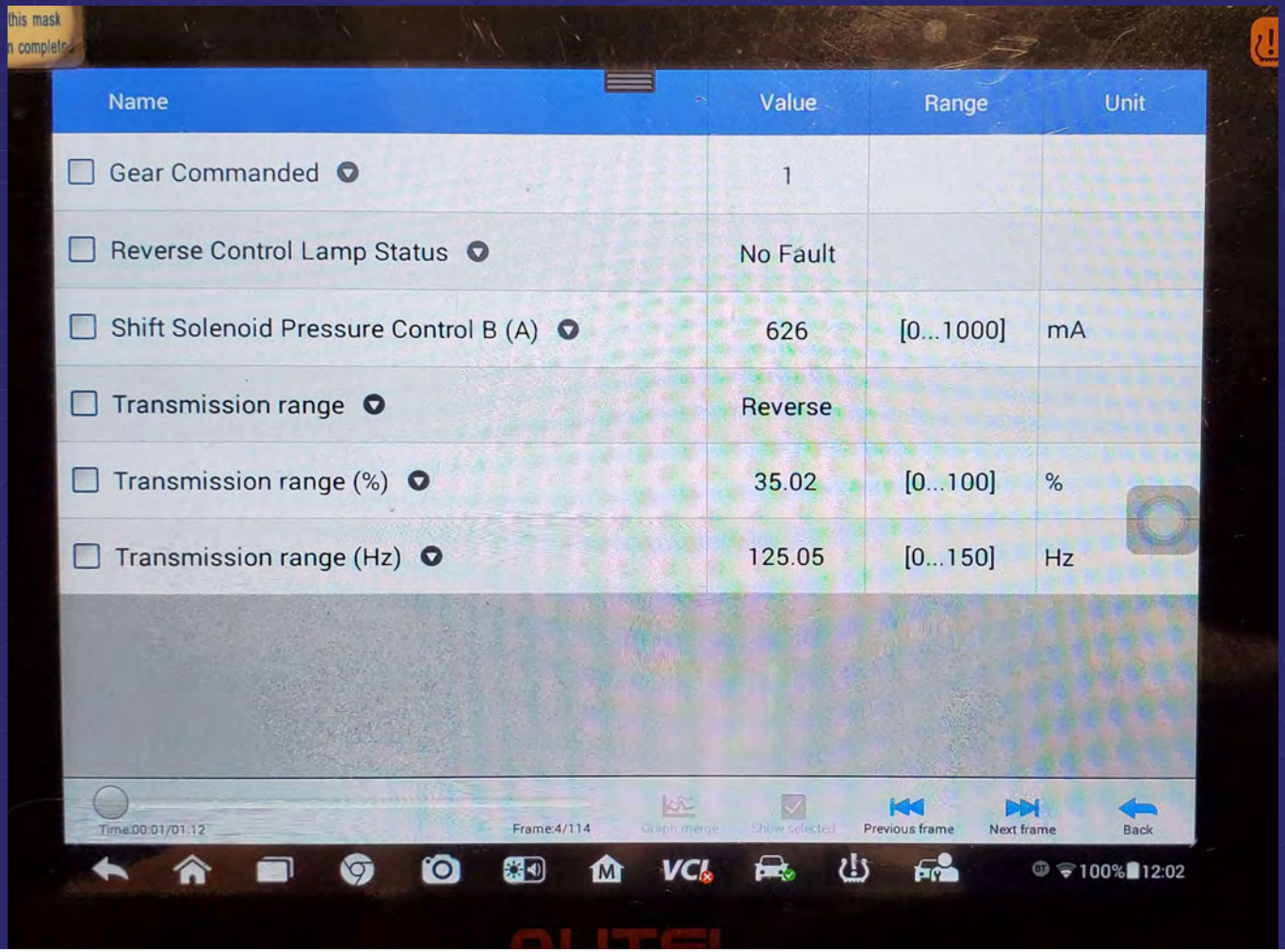
SSB is on in Park. It ramps off in reverse for a controlled apply

Selector Lever Position	Commanded Gear	1-2-3-4 (SSA) NL	3-5-Rev (SSB) NH	2-6 (SSC) NL	L-Rev (SSD) NL	4-5-6 (SSE) NH	Torque Converter Clutch NL
P	P	Off	On	Off	On	On	Off
R	R	Off	Off	Off	On	On	Off
N	N	Off	On	Off	On	On	Off
D	1	On	On	Off	Off^	On	On/Off*
	2	On	On	On	Off	On	On/Off*
	3	On	Off	Off	Off	On	On/Off*
	4	On	On	Off	Off	Off	On/Off
	5	Off	Off	Off	Off	Off	On/Off
	6	Off	On	On	Off	Off	On/Off
L	L	On	On	Off	On	On	Off

The 6R140 Delayed Reverse Engagement



The 6R140 Delayed Reverse Engagement



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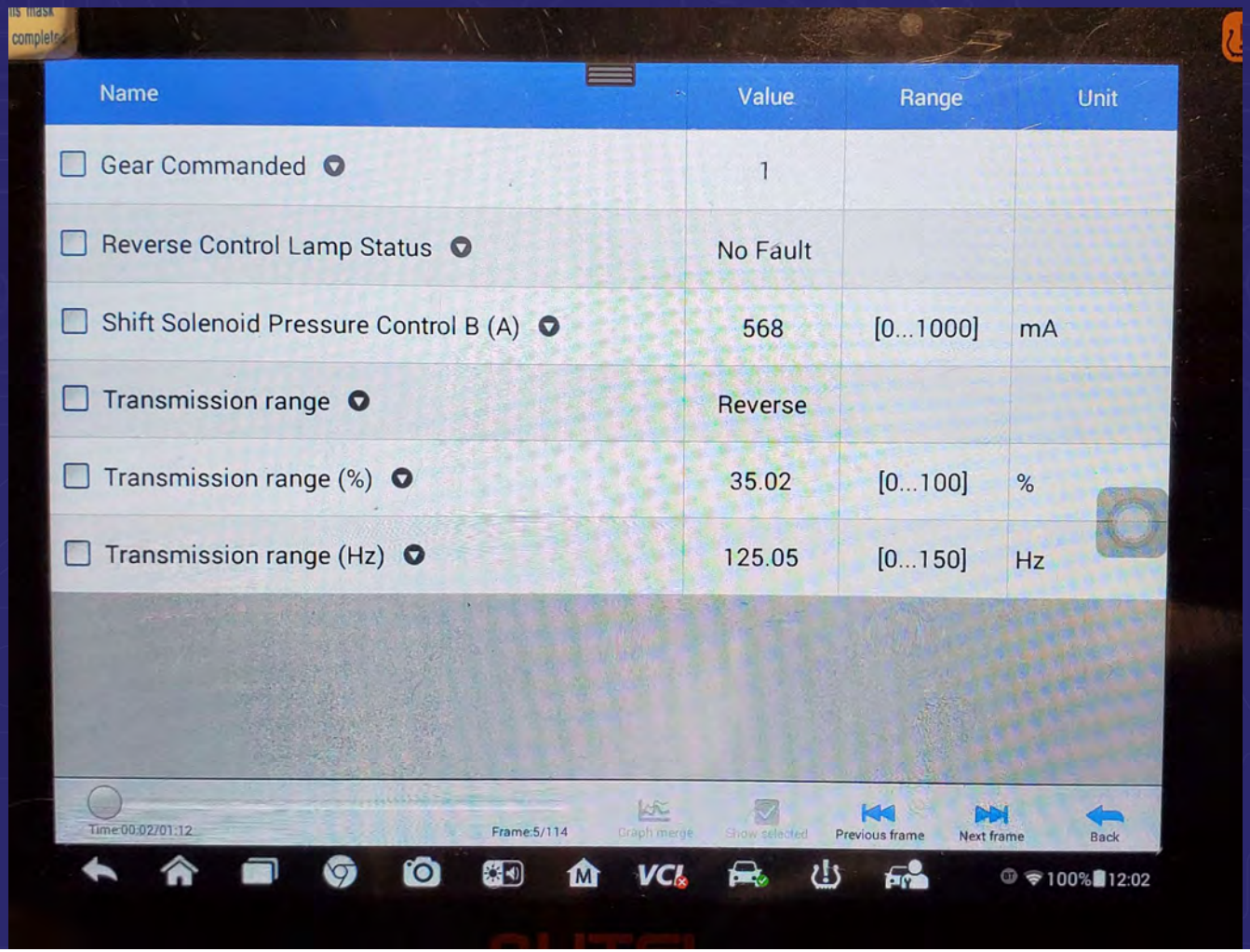

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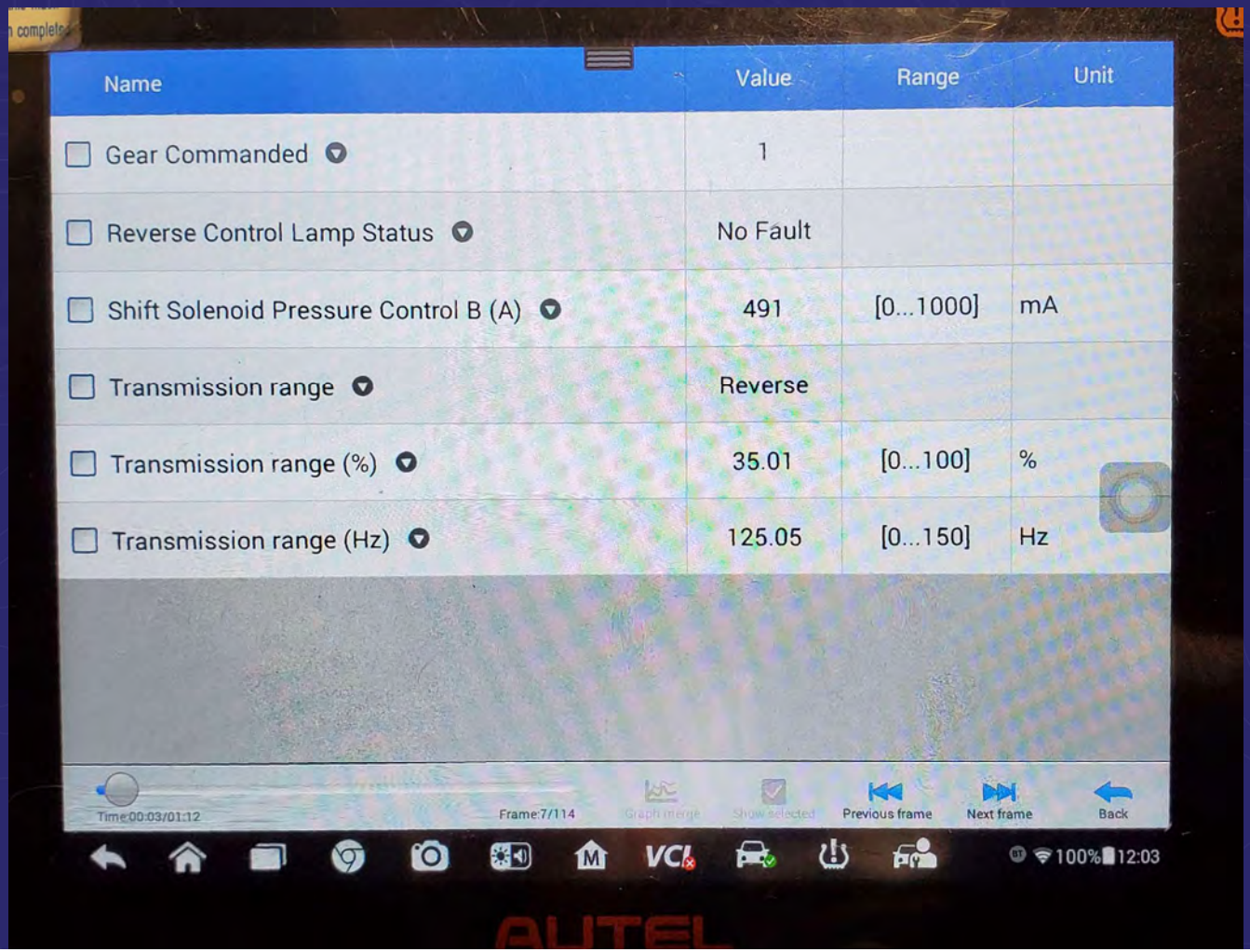

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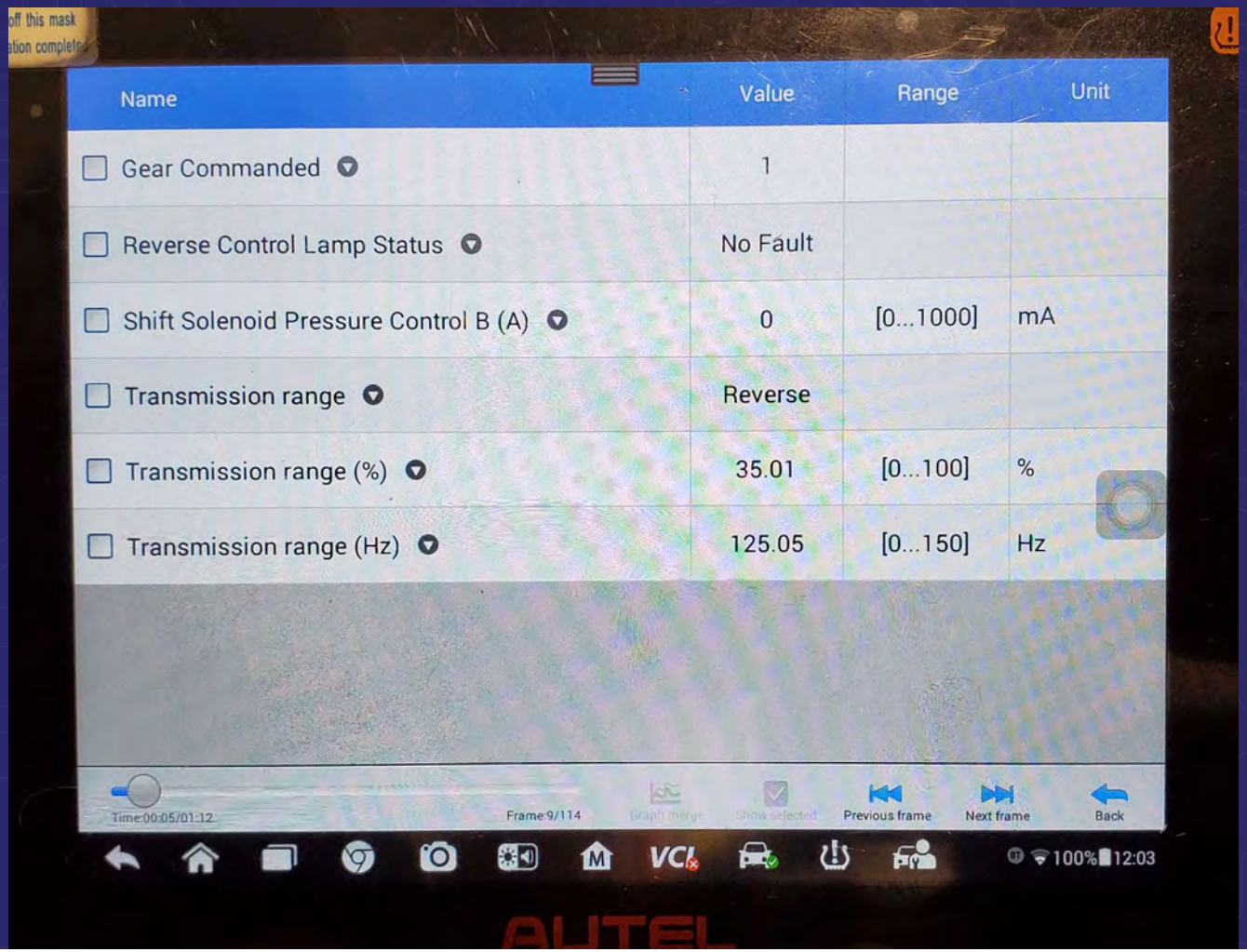

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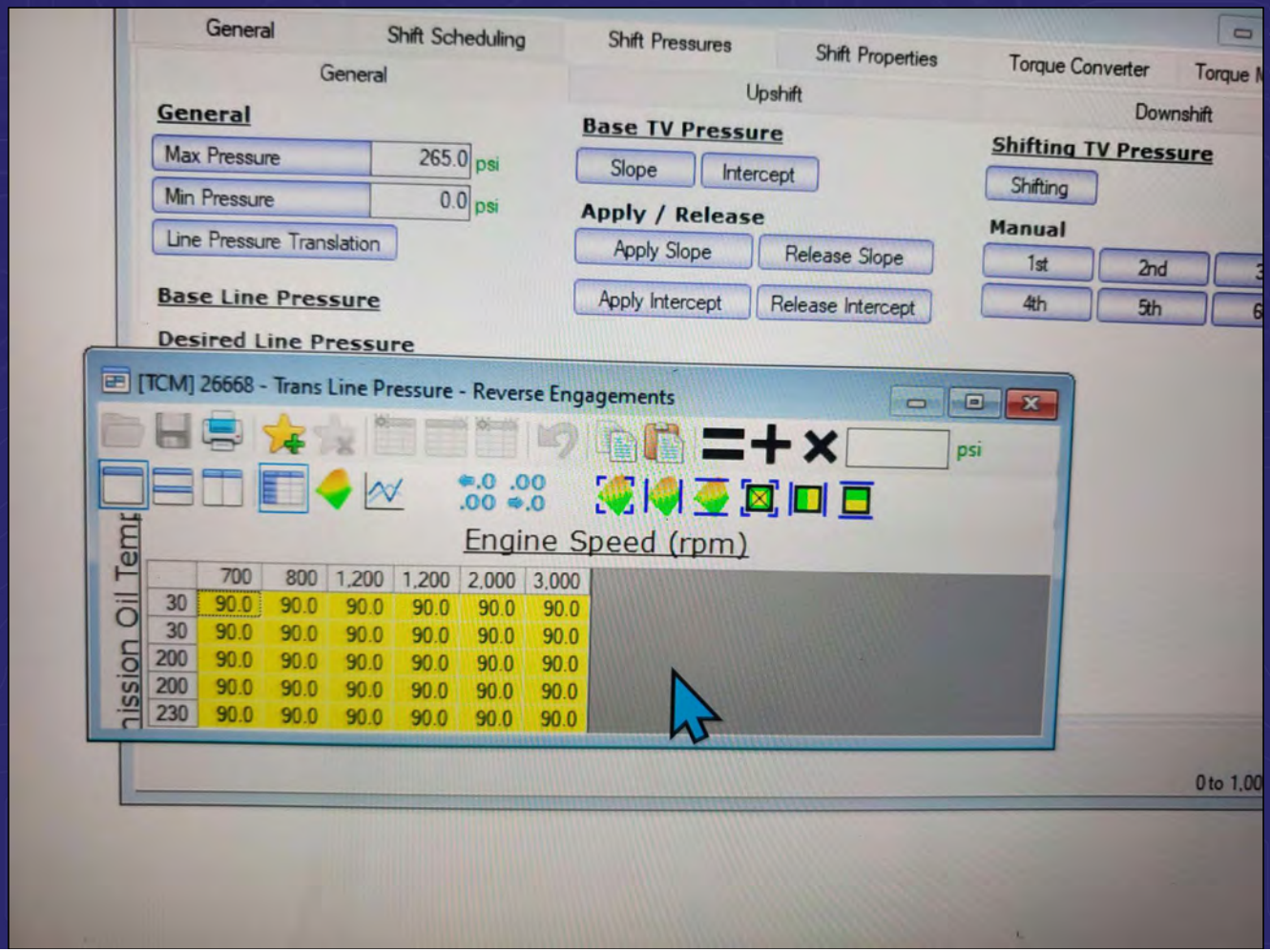

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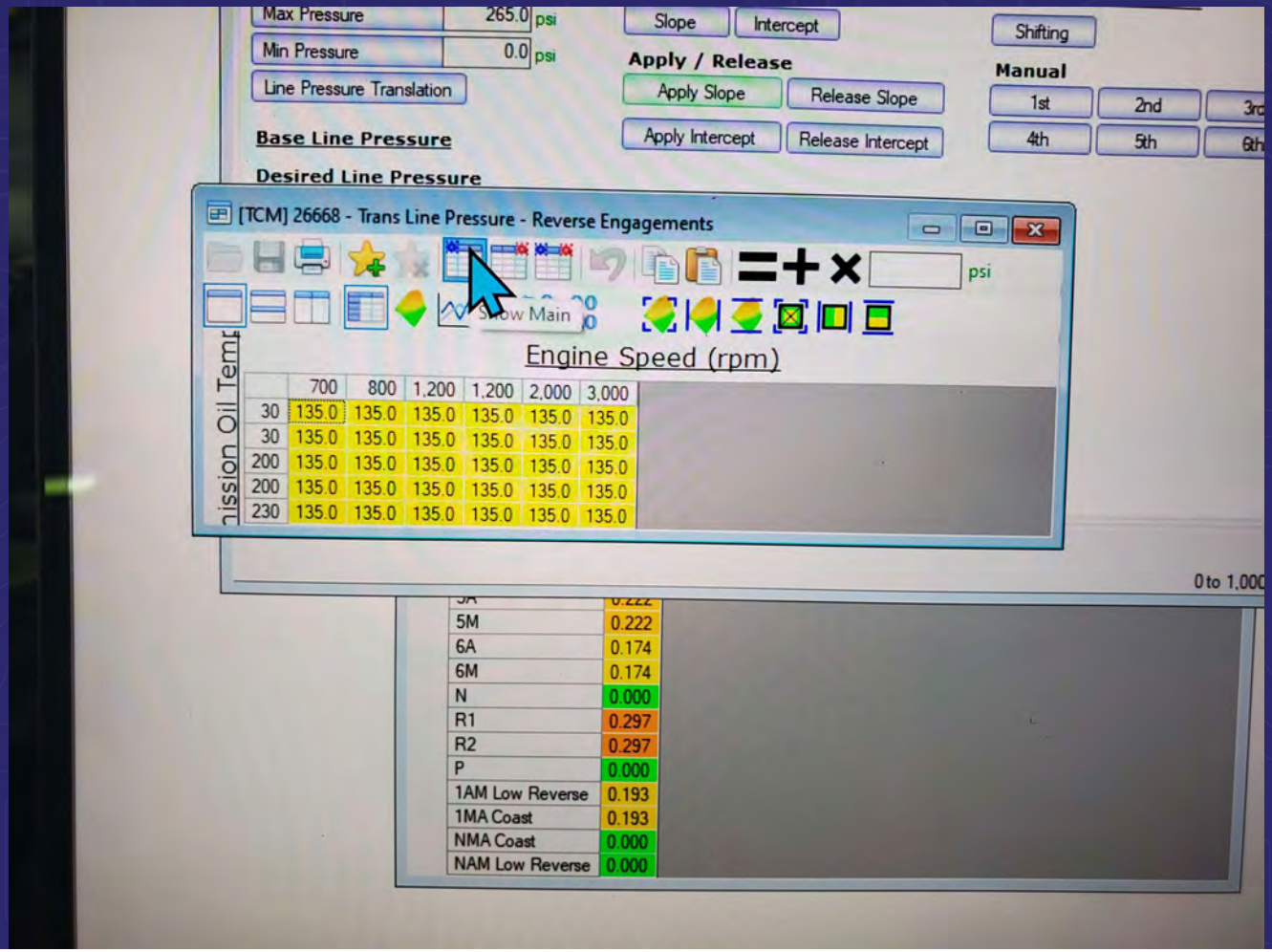

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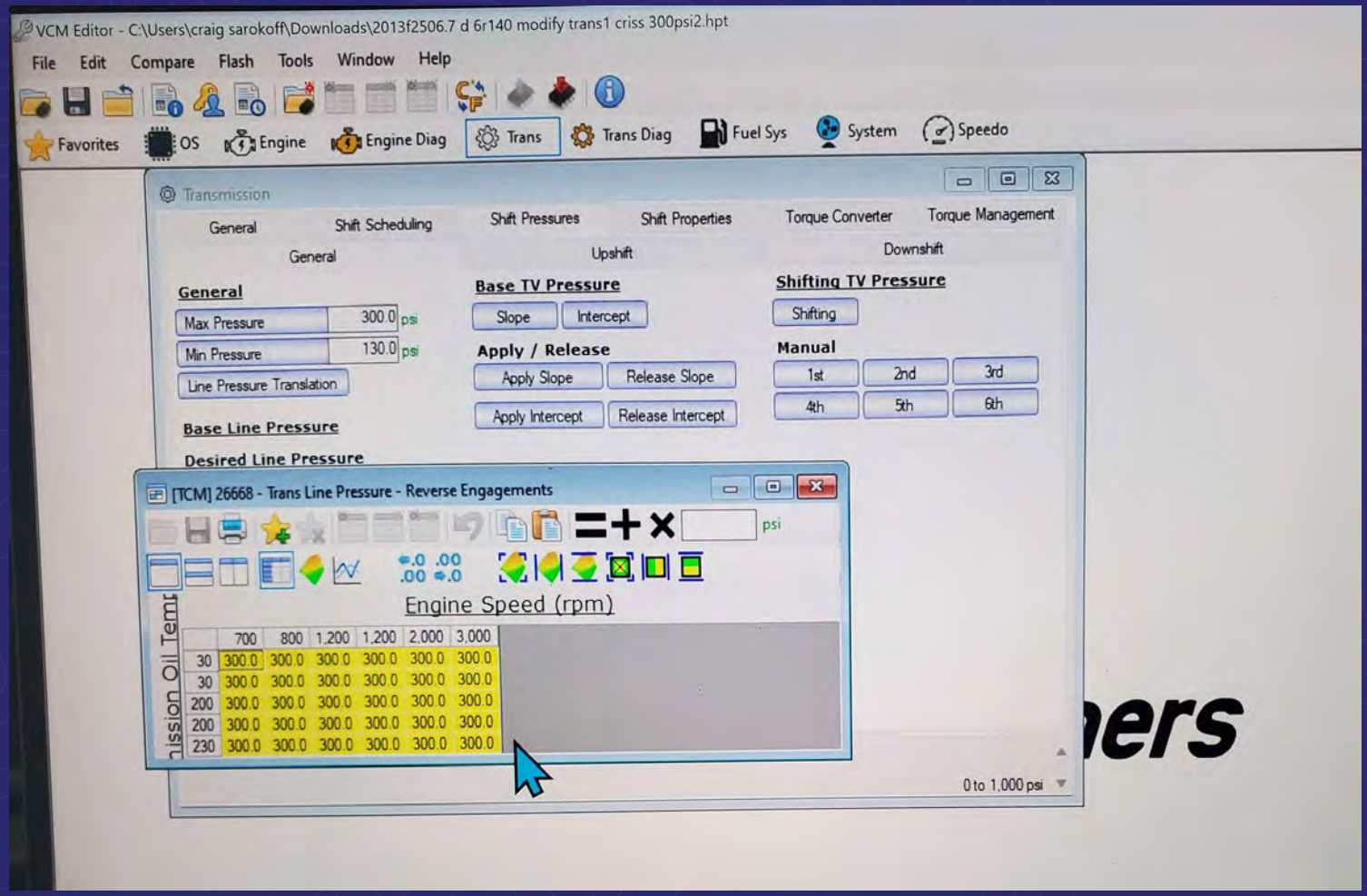

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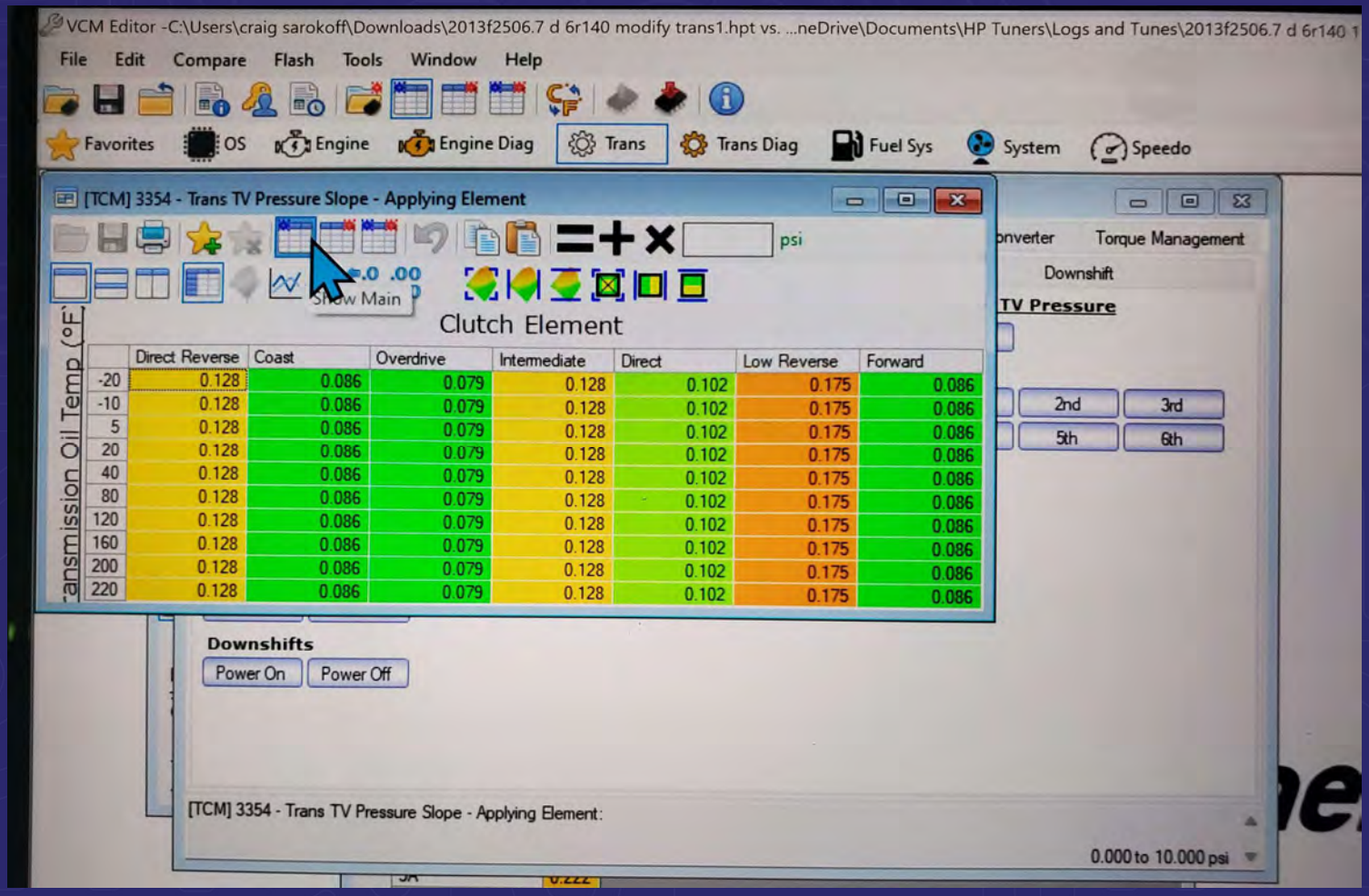
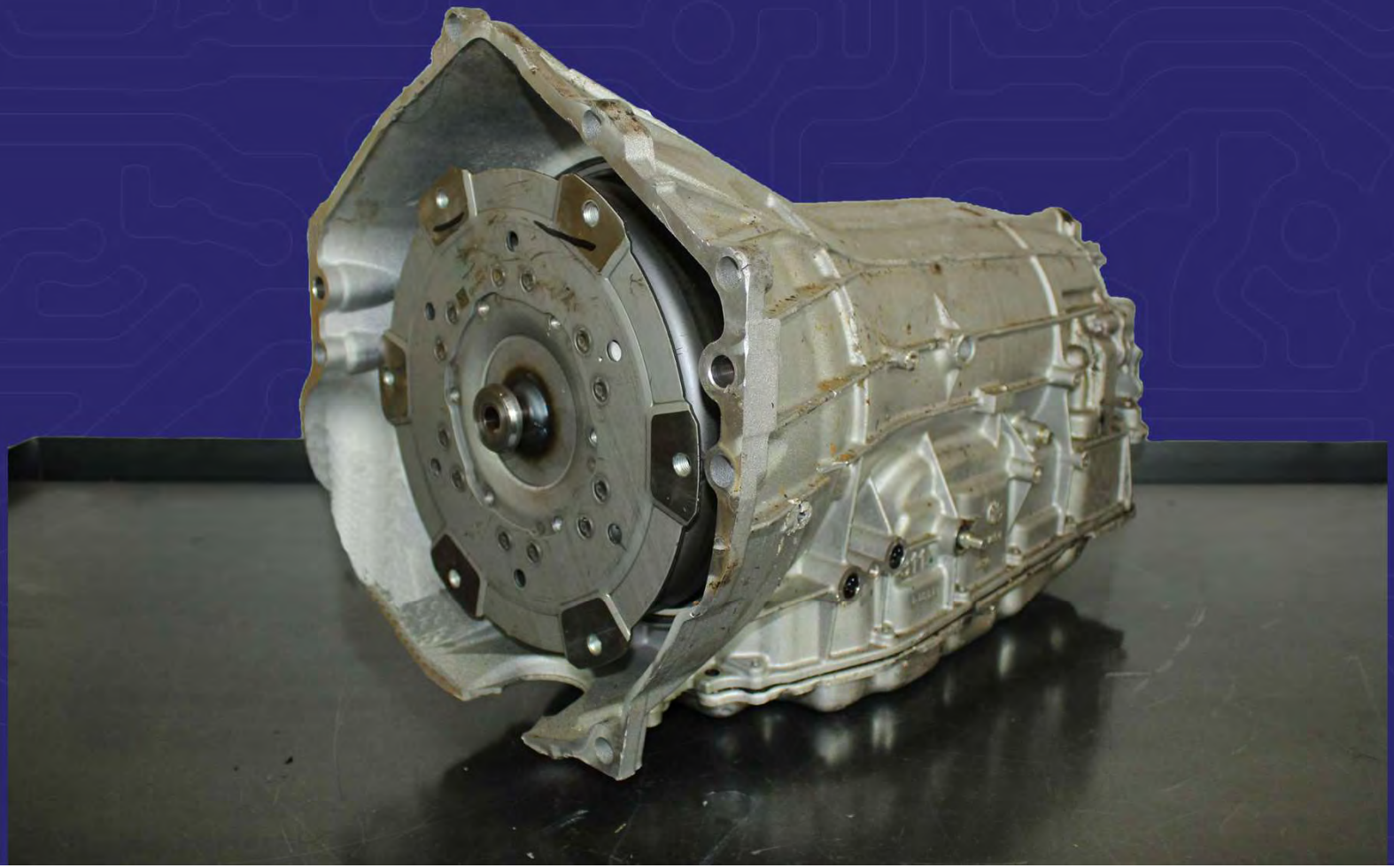


The 6R140 Delayed Reverse Engagement

The F250 needs a new PCM

The 8L90 Transmission



The 8L90 Transmission

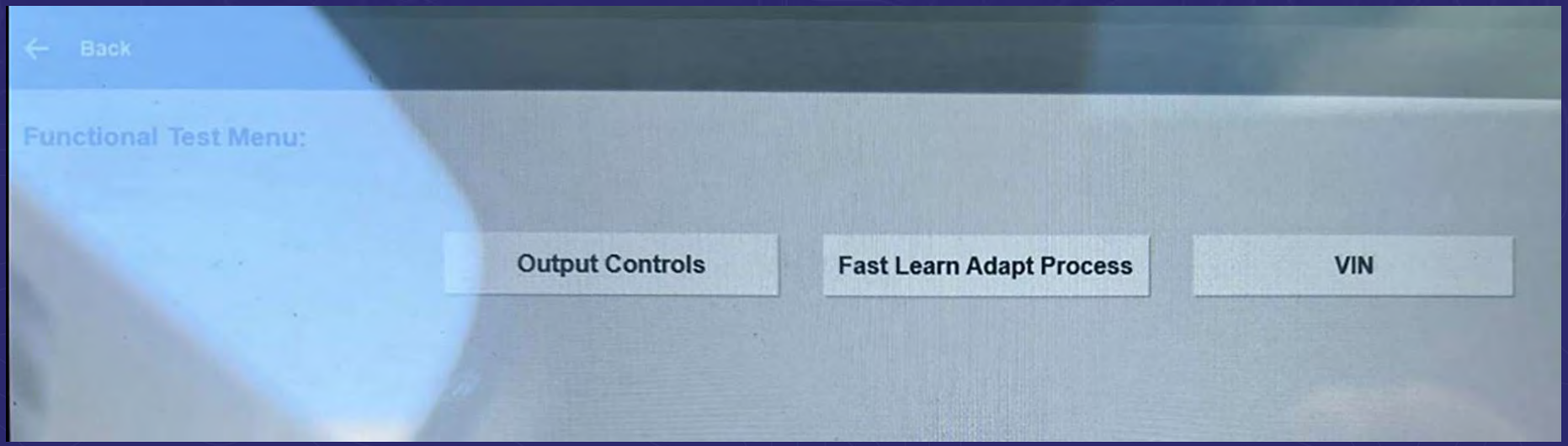
Transmission Unique Number (TUN)
Part Unique Number (PUN)

The 8L90 Transmission

- We sent out a unit with the exact broadcast code with its own TUN.
- When the shop entered the new TUN, it was rejected.
- He tried entering the PUN and it was rejected.
- After entering the original TUN, he could enter the new PUN.
- Shifts were brutal preventing a complete road test.

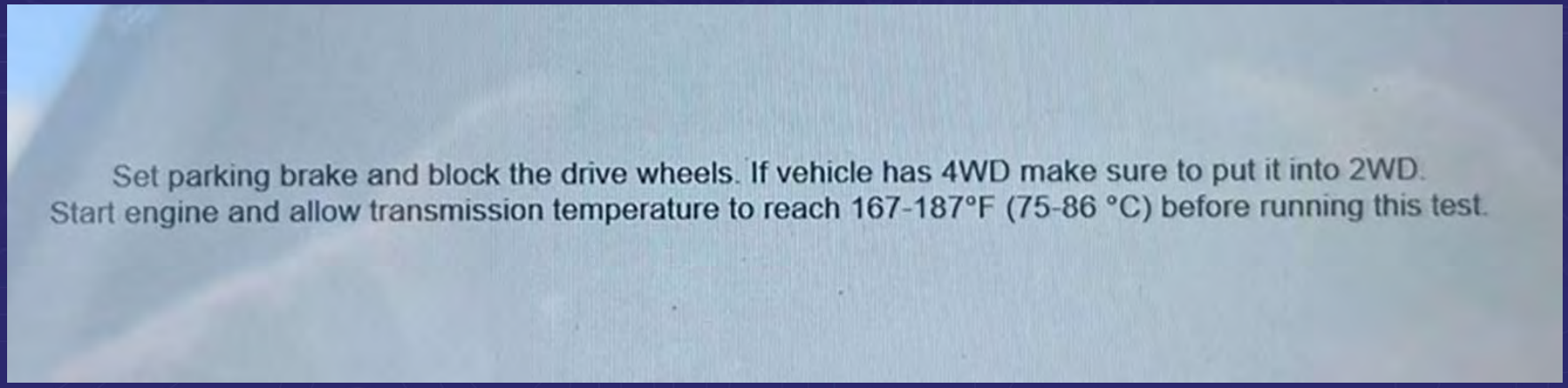
The 8L90 Transmission

- It is necessary to perform a Fast Learn Adapt Process



The 8L90 Transmission

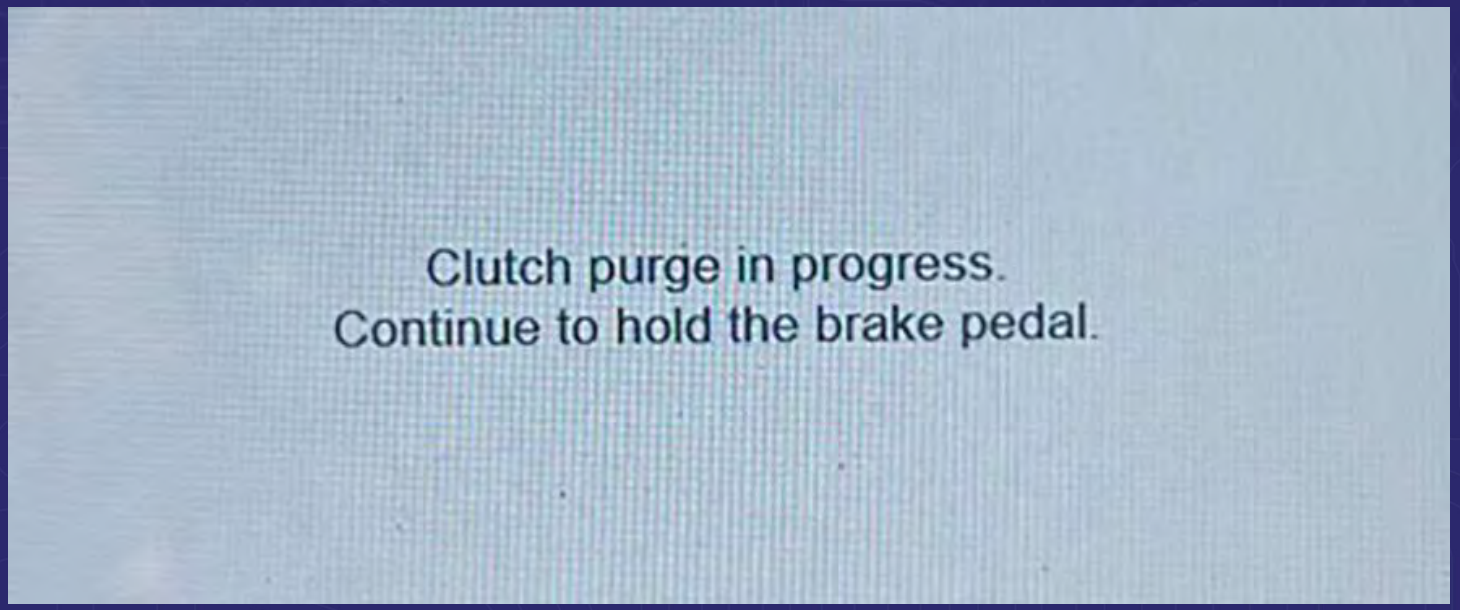
RESSETTING SHIFT ADAPTS – 12-15 MINUTES



- **Here is the caveat.**
- **It's too difficult to drive to bring vehicle up to operating temperature.**
- **Idle vehicle to about 130° F. Place in reverse and brake torque to operating temperature**

The 8L90 Transmission

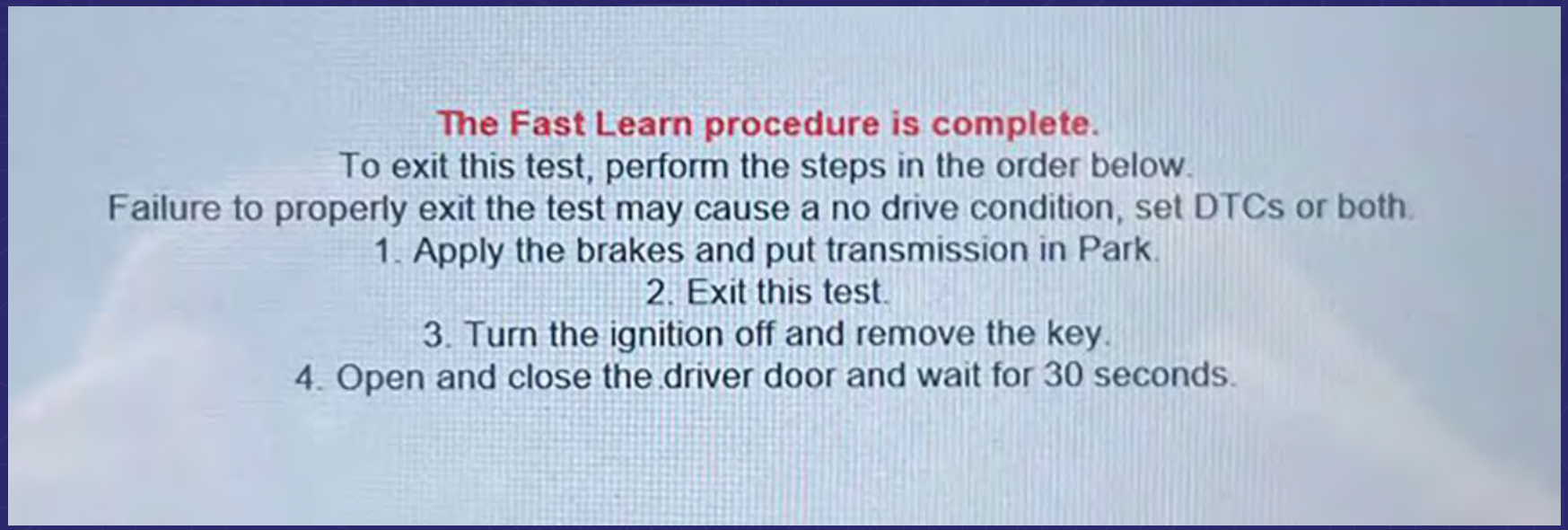
- **RESSETTING SHIFT ADAPTS – 12-15 MINUTES**



The 8L90 Transmission

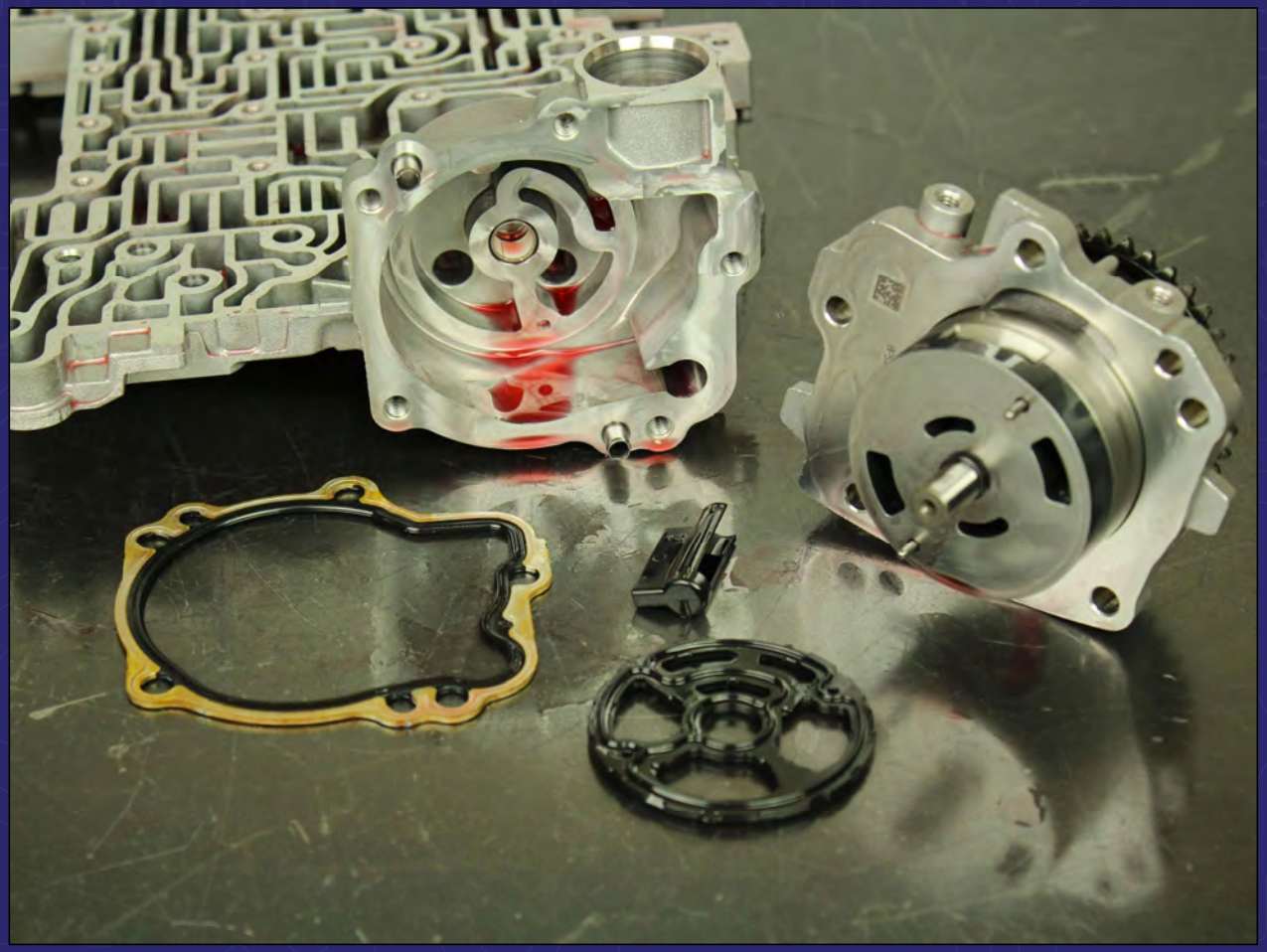
RESSETTING SHIFT ADAPTS – 12-15 MINUTES

- **It is necessary to perform a Fast Learn Adapt Process**

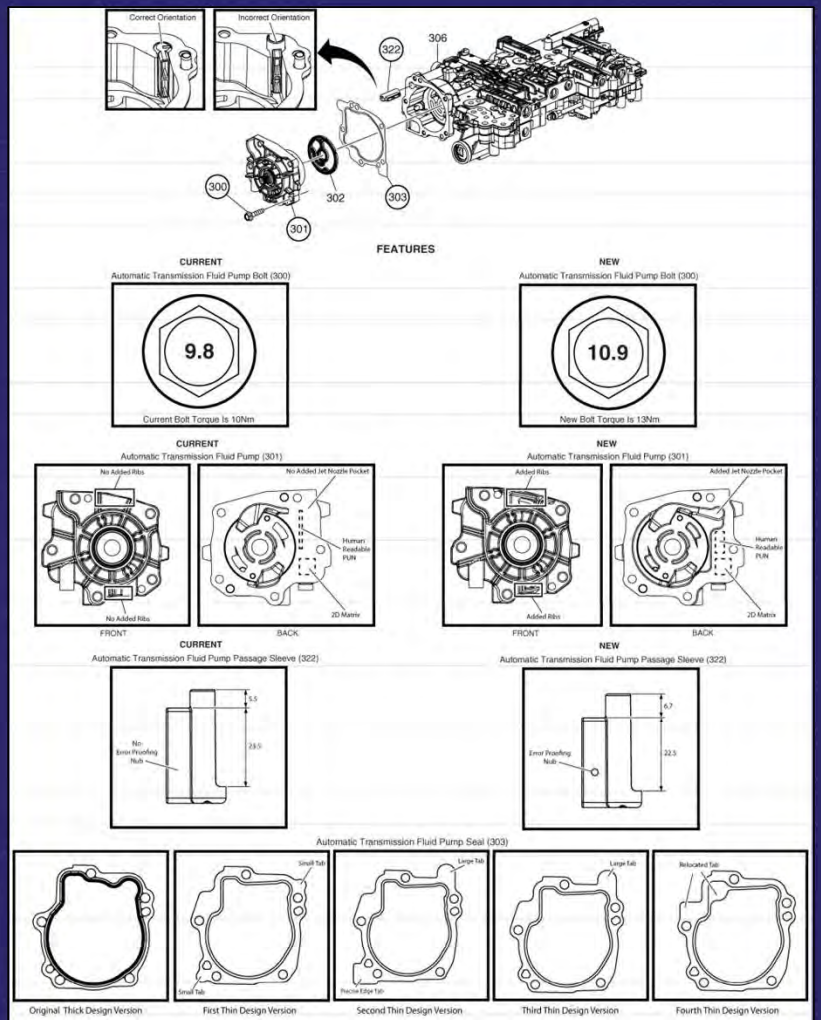


The 8L90 Pump

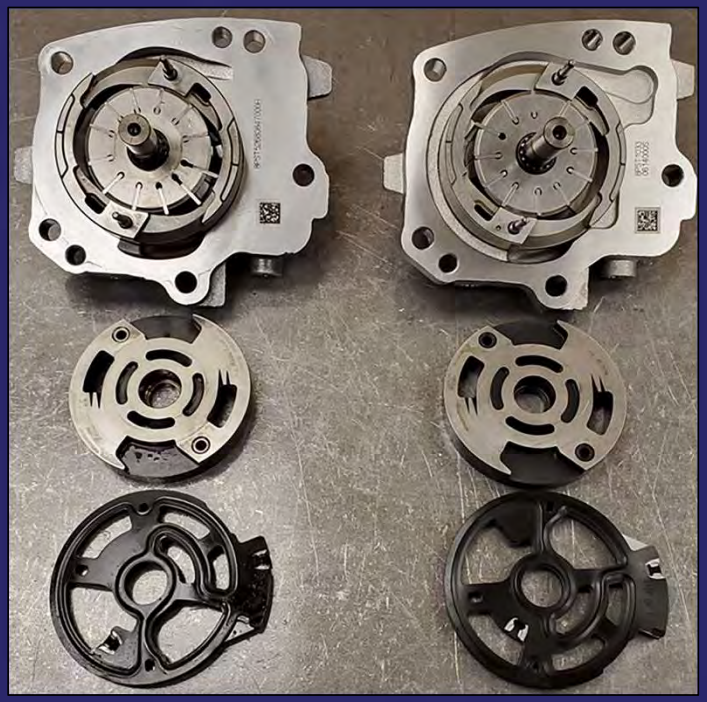
BINARY POSITIVE DISPLACEMENT VANE TYPE PUMP



The 8L90 Pump

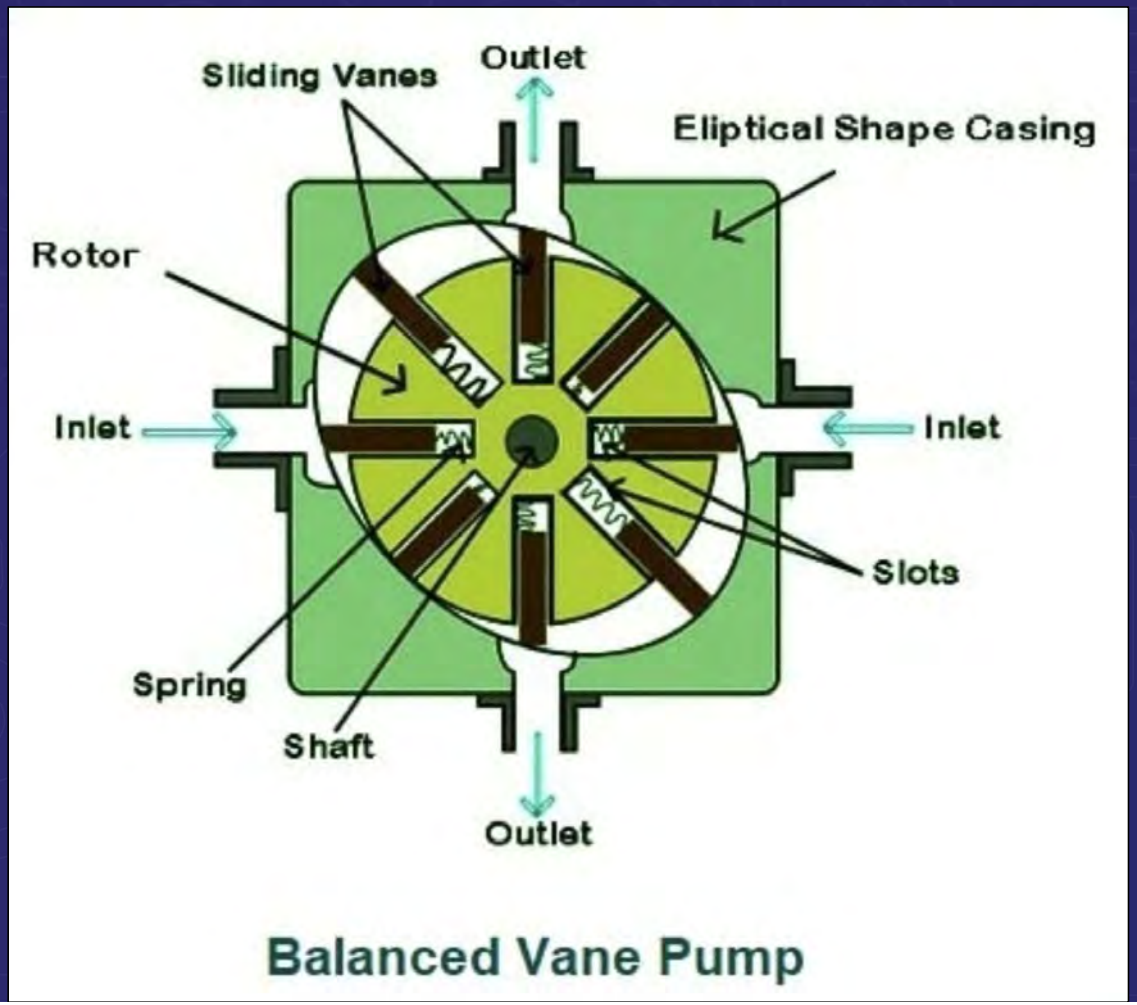


- TWO PUMPS
- 5 DIFFERENT GASKETS

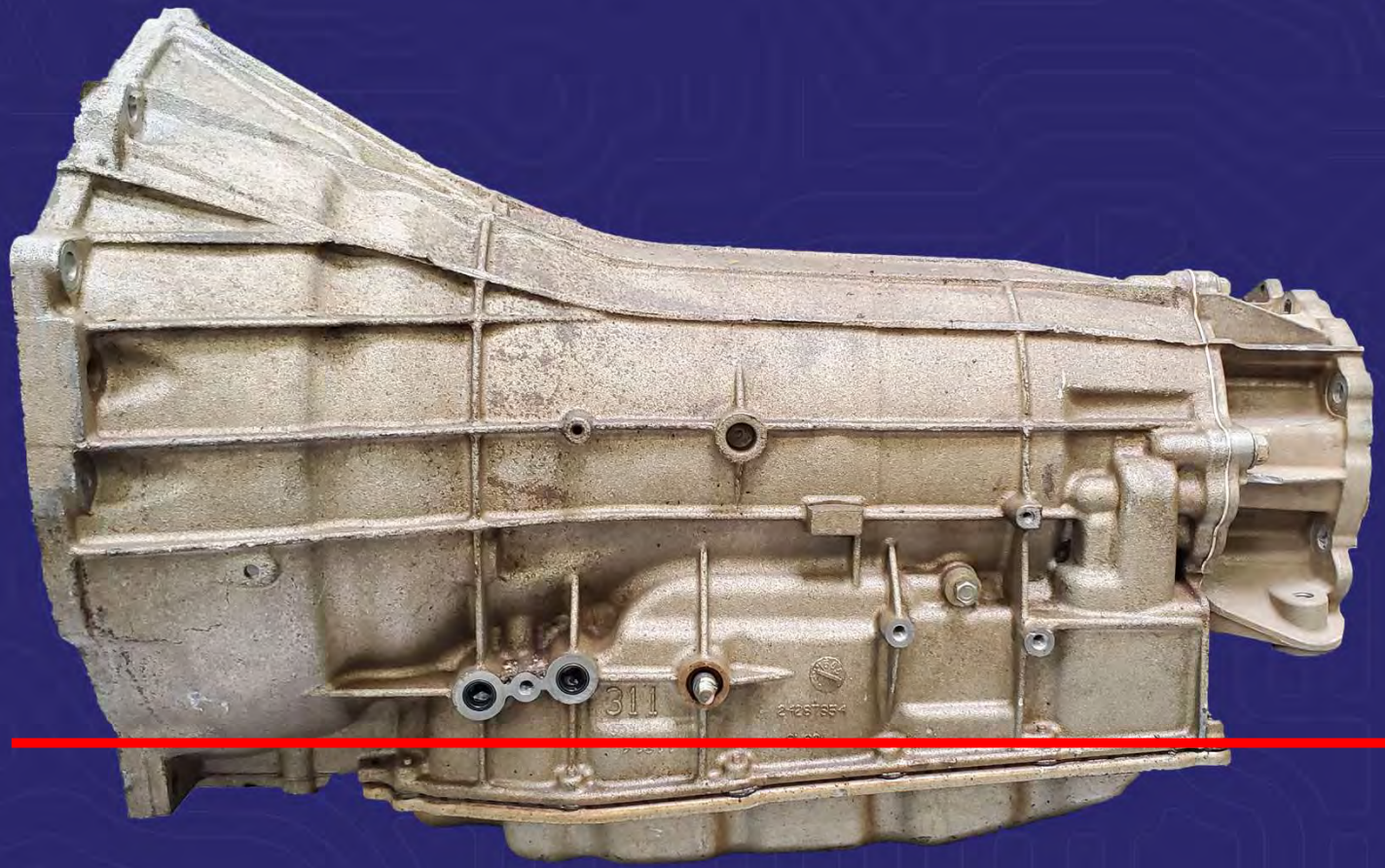


The 8L90 Pump

The 8L90 Pump

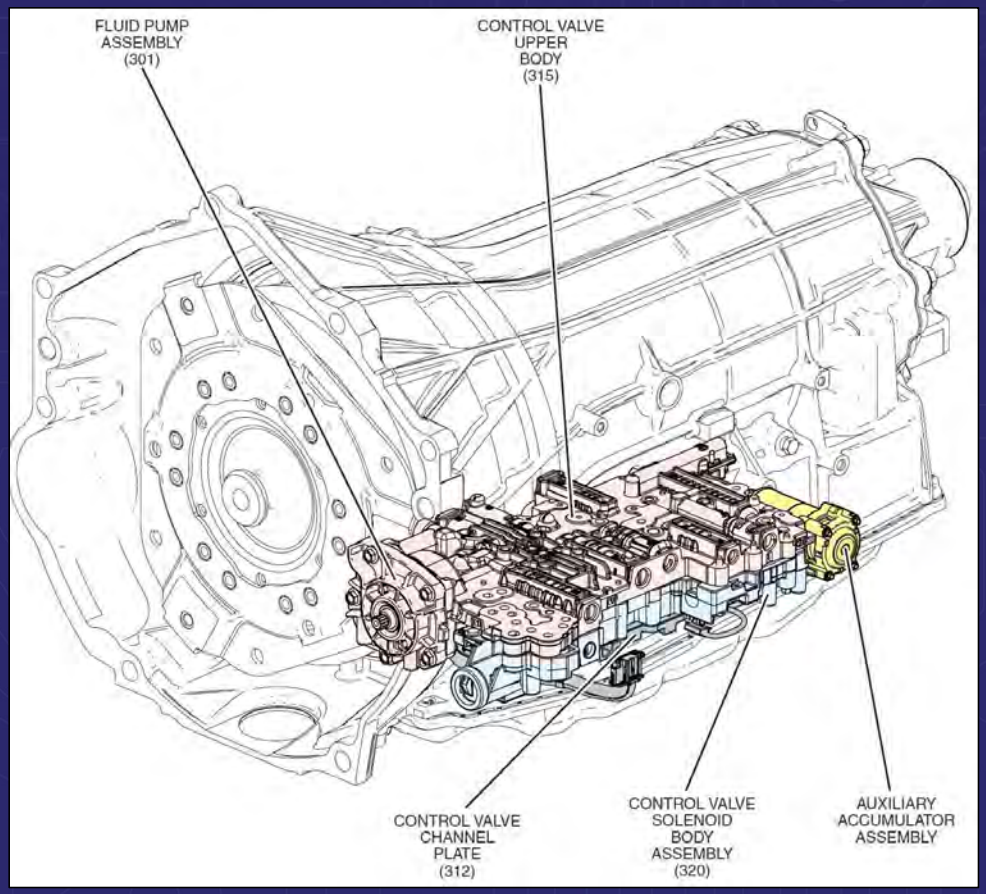


The 8L90 Pump



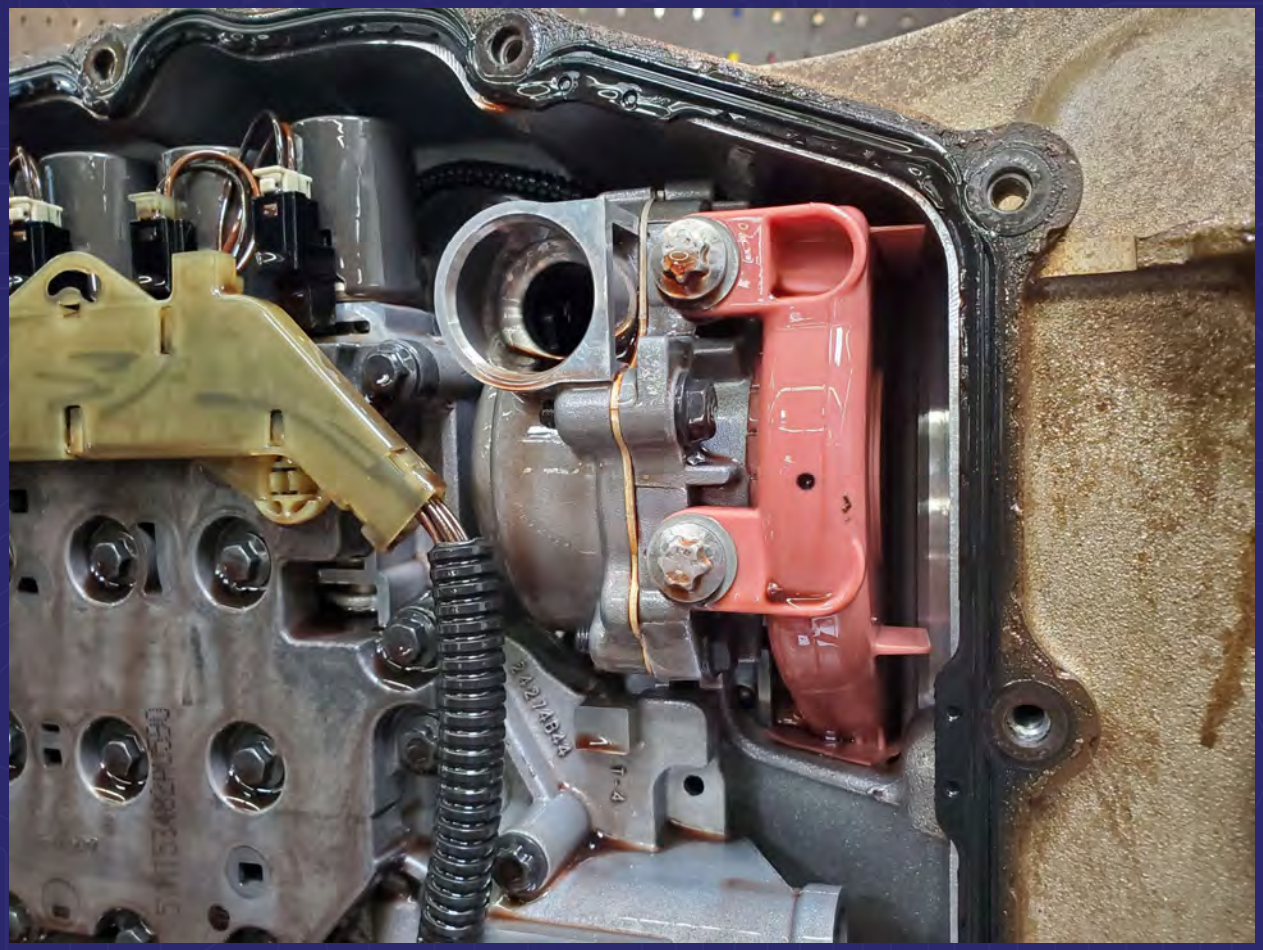
FLUID LEVEL

The 8L90 Pump

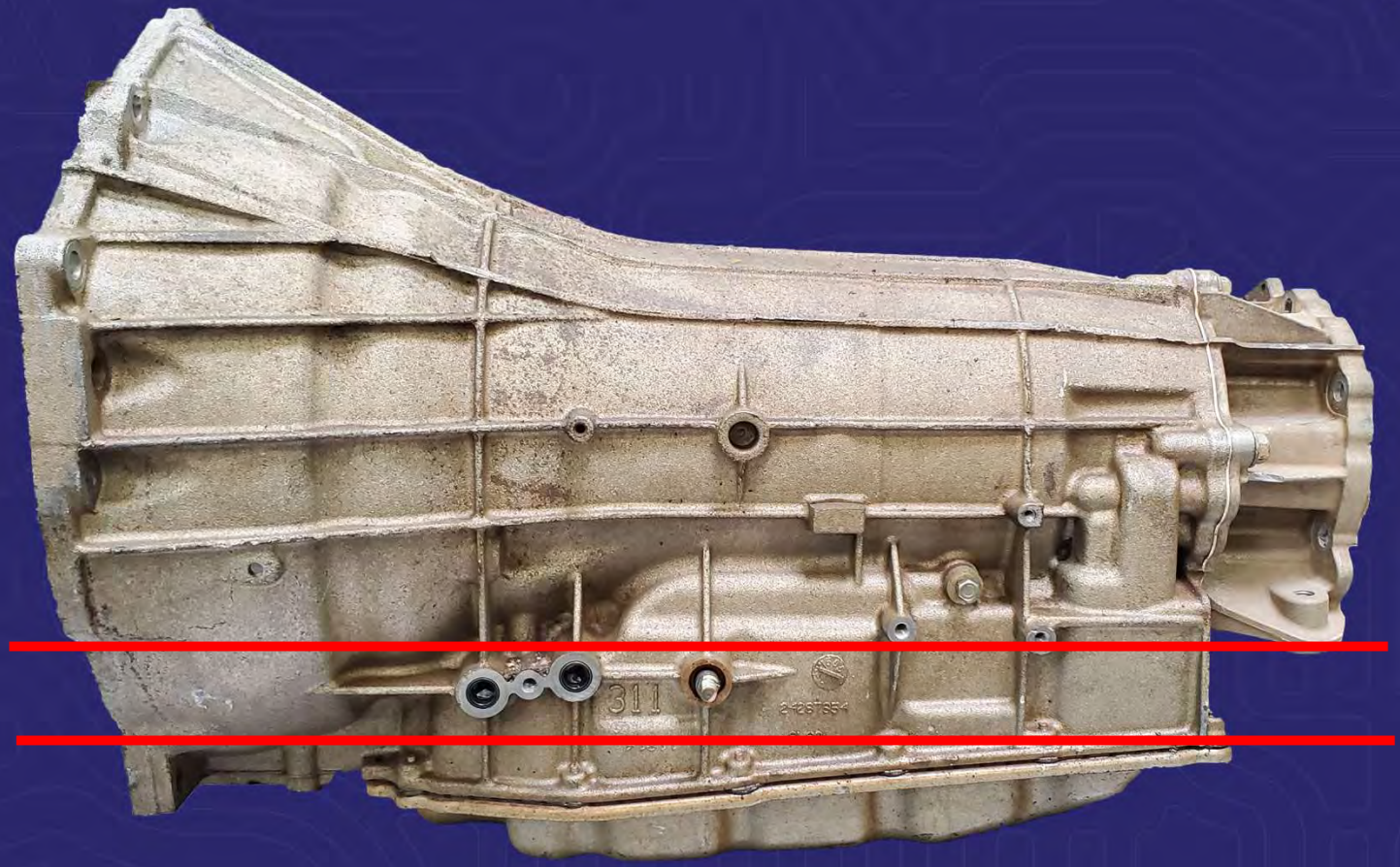


The 8L90 Pump

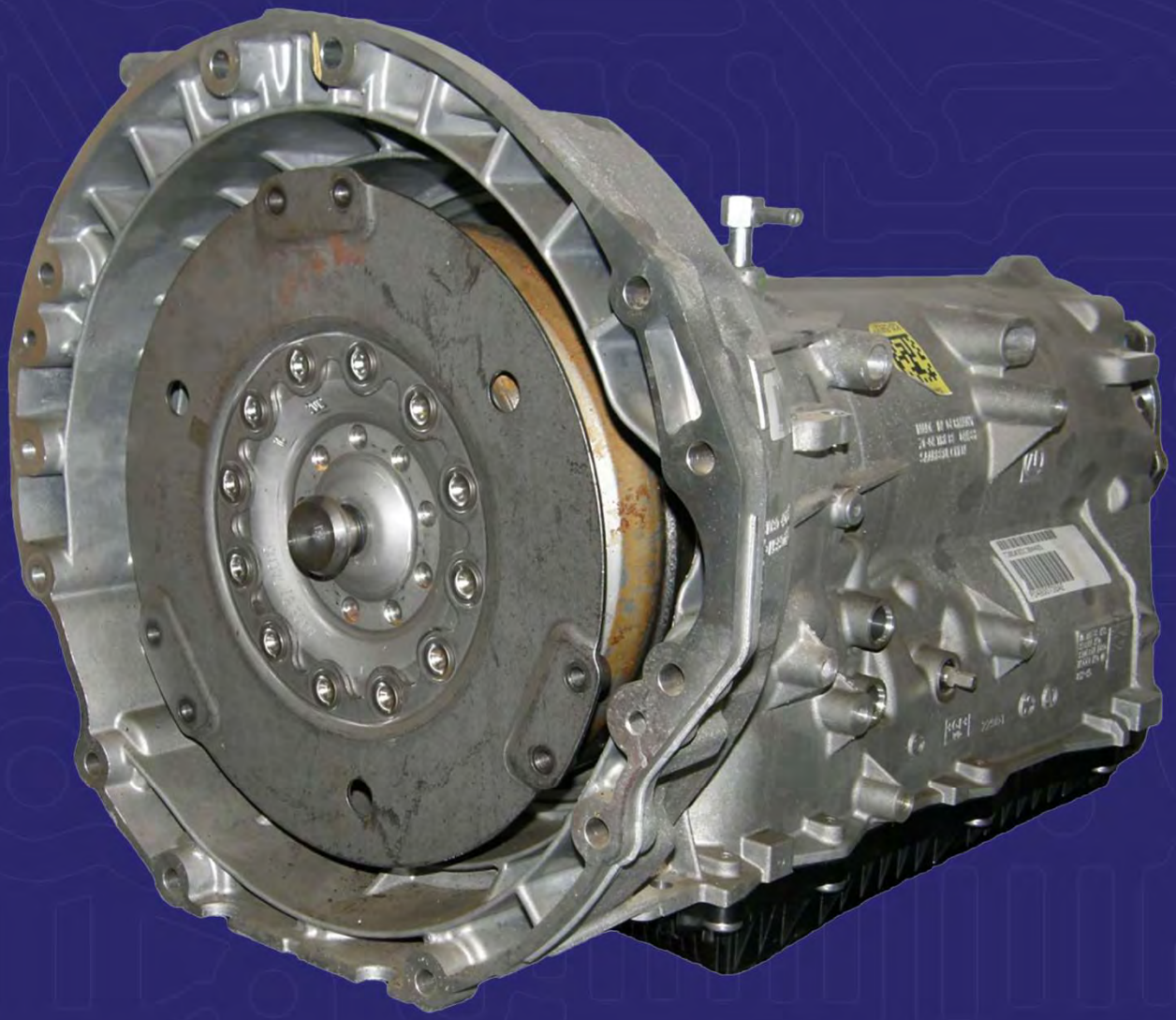
The 8L90 Pump



The 8L90 Pump

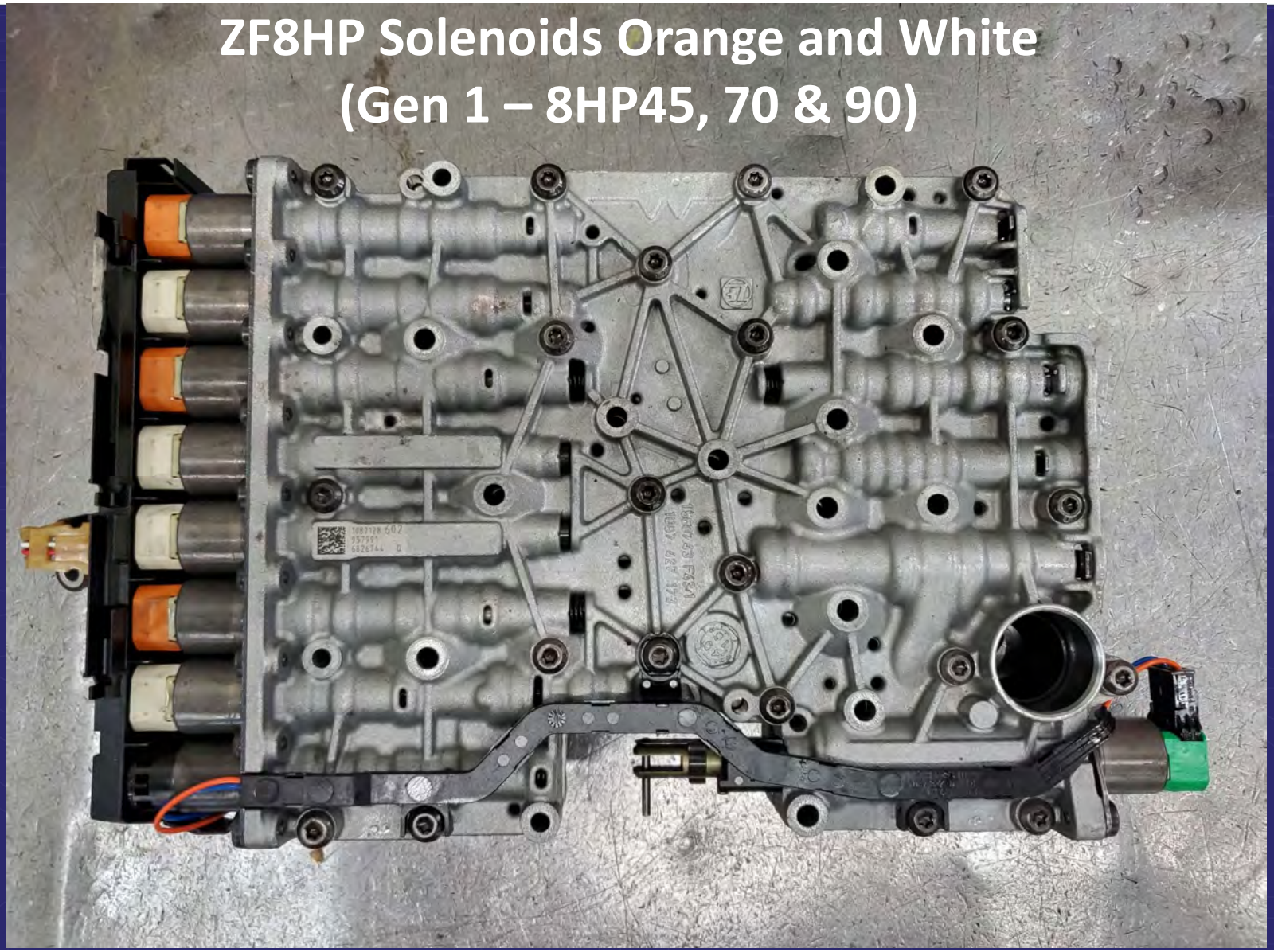


FLUID LEVEL



ZF8HP
VS
845RE

ZF8HP Solenoids Orange and White
(Gen 1 – 8HP45, 70 & 90)



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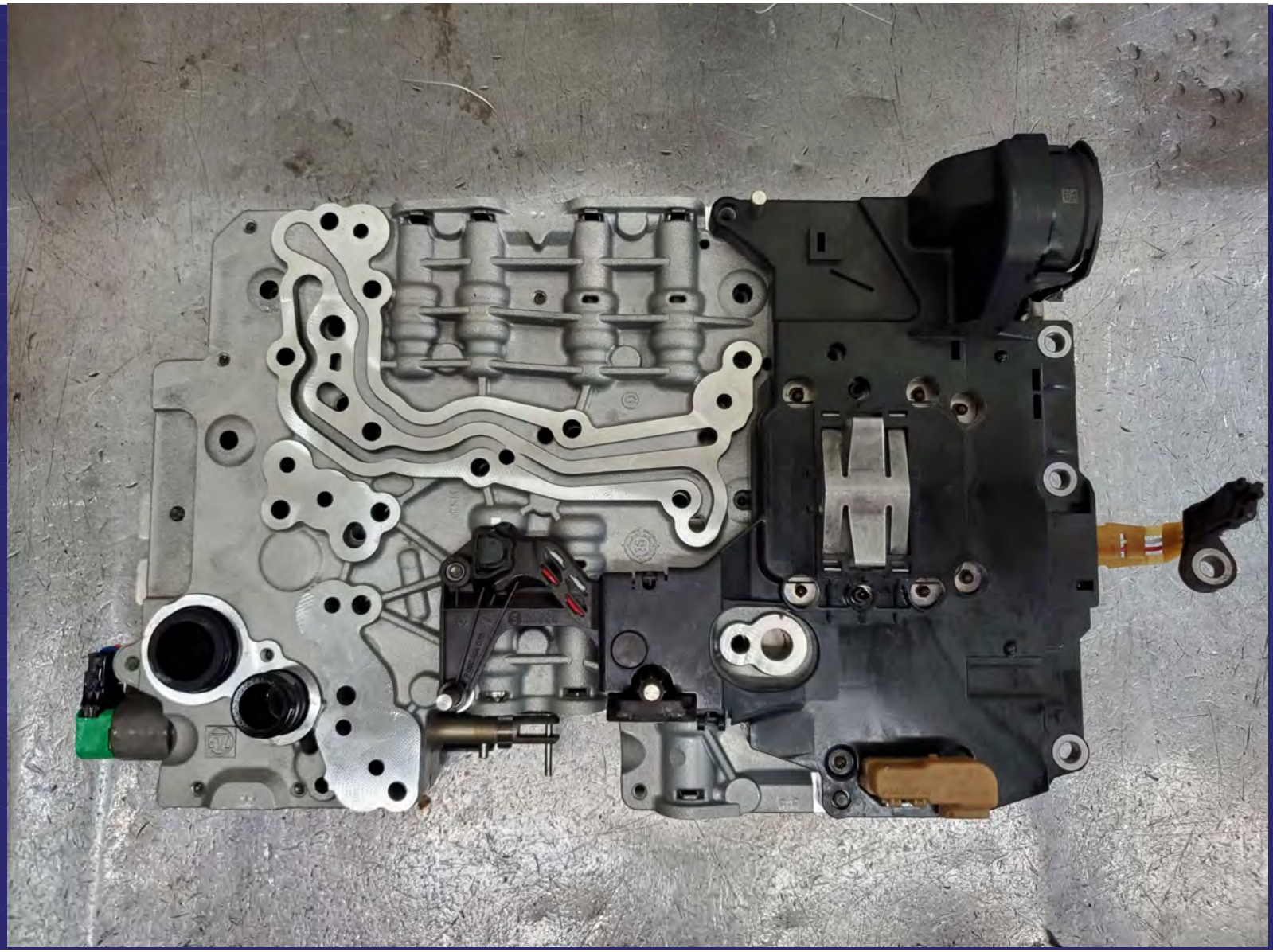
REMANUFACTURED ETE REMAN TRANSMISSIONS



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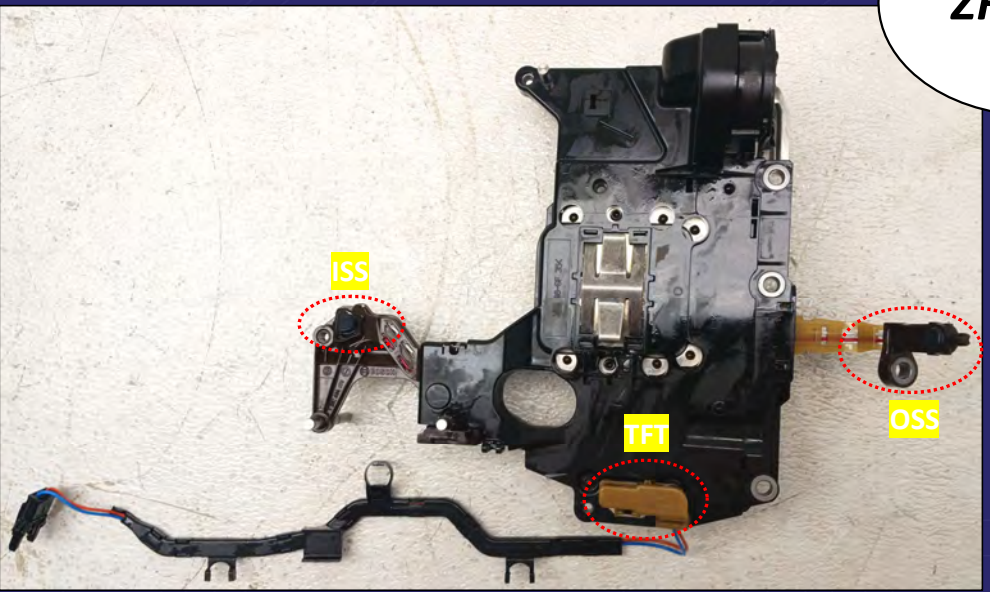
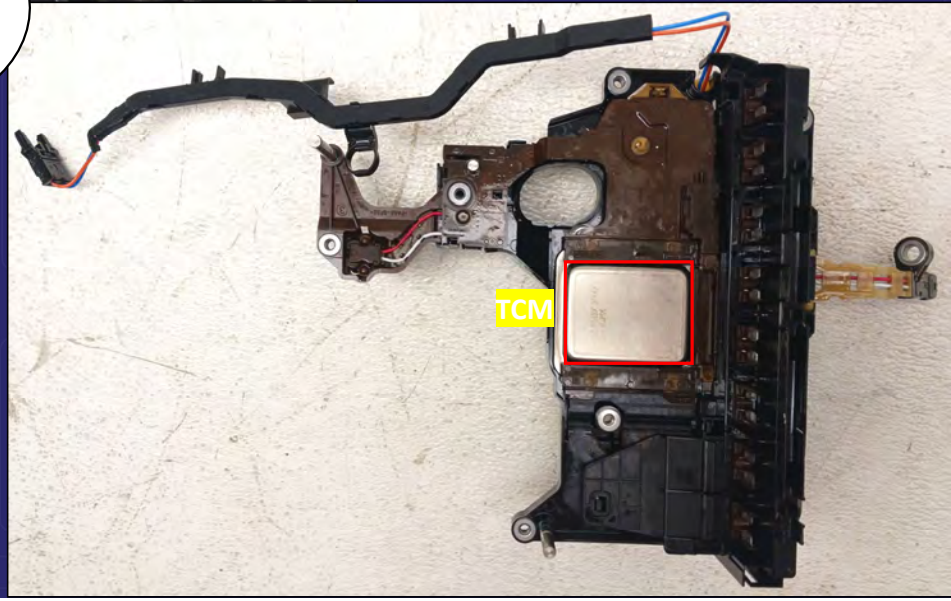
REMANUFACTURED
ETE
REMAN
TRANSMISSIONS

ZF8HP Mechatronic

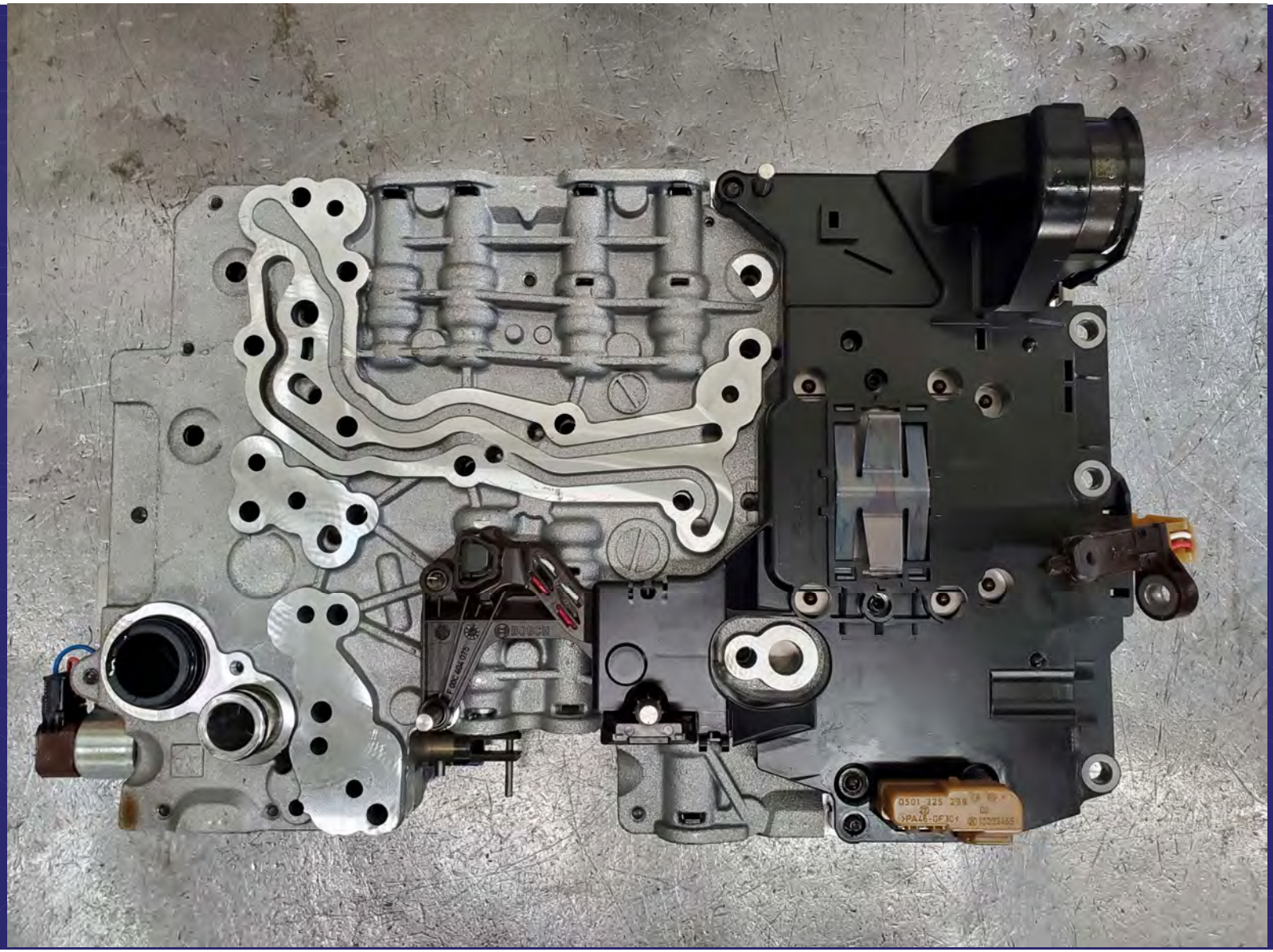
ZF Logo





845RFE Solenoids Blue and Yellow Gen 2 – 8HP50, 75 and 95)

Transitional change began in 2019



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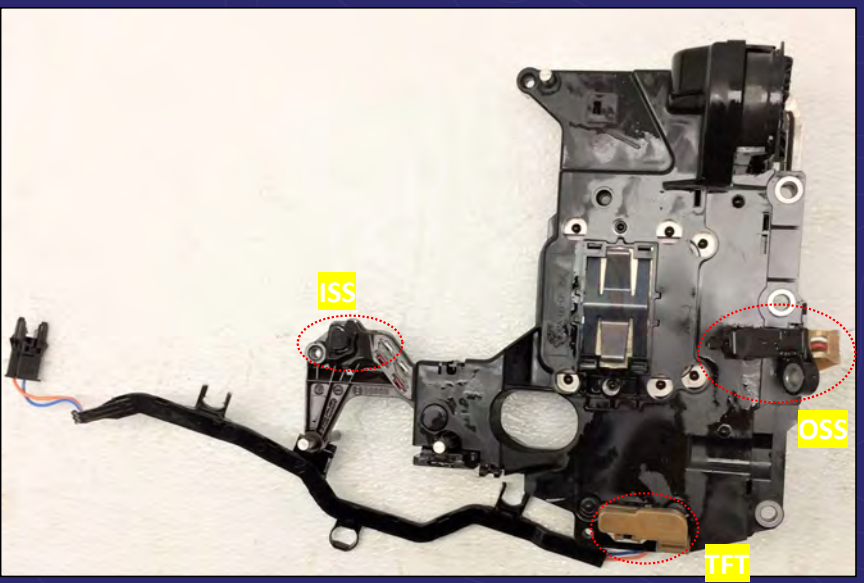
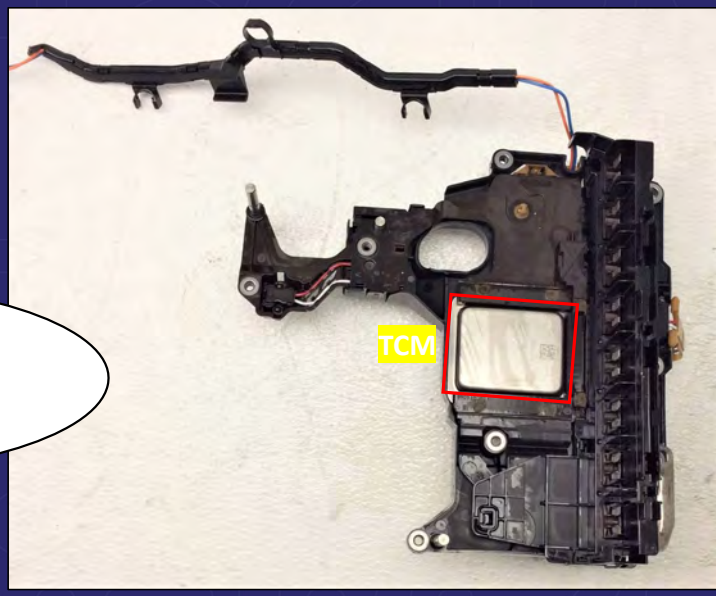
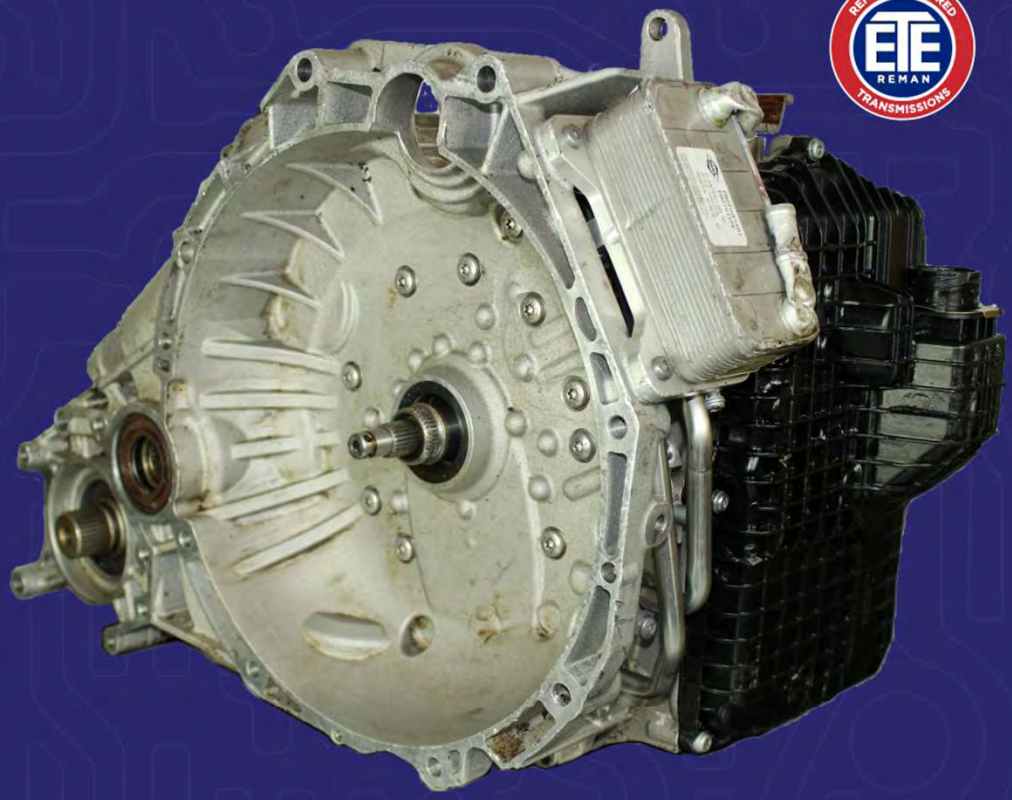
REMANUFACTURED
ETE
REMAN
TRANSMISSIONS

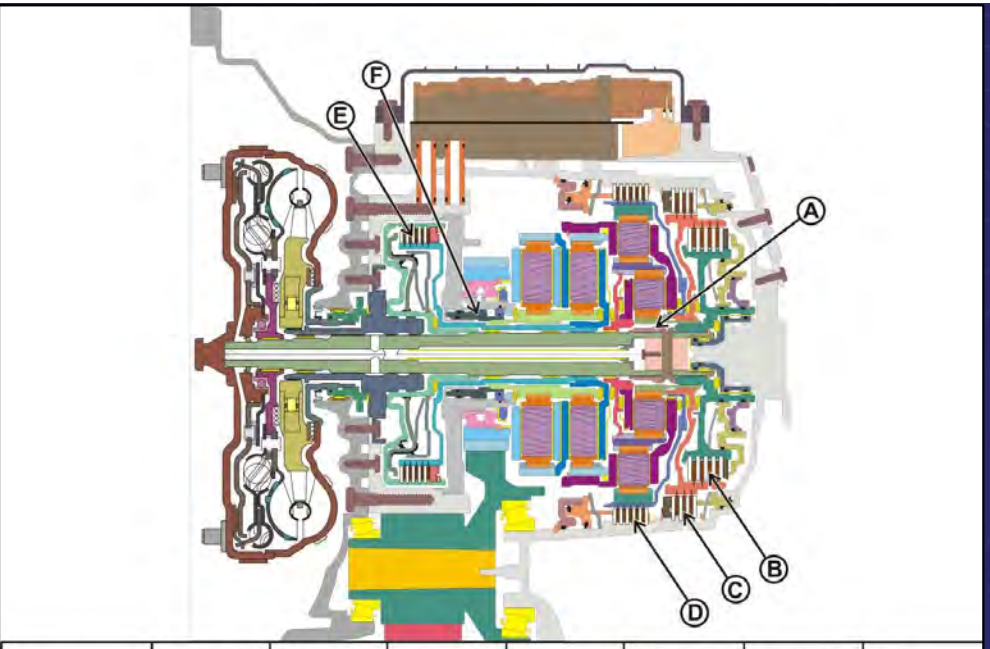
845RE Mechatronic





THE ZF9HP48-948TE





	A Clutch (Dog)***	B Clutch	C Brake	D Brake	E Clutch	F Clutch (Dog)***	Ratio
P/N	Open			ON		Closed	
Reverse	Open	ON		ON		Closed	3.830
1st Gear	Closed			ON		Closed	4.713
2nd Gear	Closed		ON			Closed	2.842
3rd Gear*	Closed	ON				Closed	1.909
4th Gear**	Closed				ON	Closed	1.382
5th Gear	Closed	ON			ON	Open	1.000
6th Gear	Closed		ON		ON	Open	0.808
7th Gear	Closed			ON	ON	Open	0.699
8th Gear	Open		ON	ON	ON	Open	0.580
9th Gear	Open	ON		ON	ON	Open	0.479

* - *Failsafe Gear according to Land Rover*
** - *Default Gear according to Dodge*
*** - *Dog Clutch shift transitions dependent upon proper engine and shaft speed*

DOG CLUTCHES A & F

Hydraulically engaged and disengaged synchro devices providing a non-slipping connection of two components.

- To engage or disengage a dog clutch, the TCM sends a request for the PCM to increase or decrease engine RPM and torque to allow speed matching.
- Example: As the engine rpm increases, the transmission slips one or more of the multi-disc clutches until the components of the dog clutch are at the same speed.

BAD PRESS

- 2015 Jeep Cherokee3.2L 4WD Trailhawk – 948TE Transmission
- P0887 TCM Power Control Circuit High
- U1412 Implausible VSS Signal Received
- U0001 – CAN C Bus
- P061B Internal Control Module Torque Calculation Performance

BAD PRESS

- 5-4 Coast downshift issues
- Low speed acceleration issues
- Bad shift qualities
- Hill climb and descent shift issues
- Stop/Start Engagement issues
- Slow to upshift after lift throttle

BAD PRESS

CHRYSLER RECALLS 410,000 VEHICLES OVER WIRING PROBLEMS

Fiat Chrysler says wiring harness problems can cause loss of propulsion in nearly 410,000 vehicles.

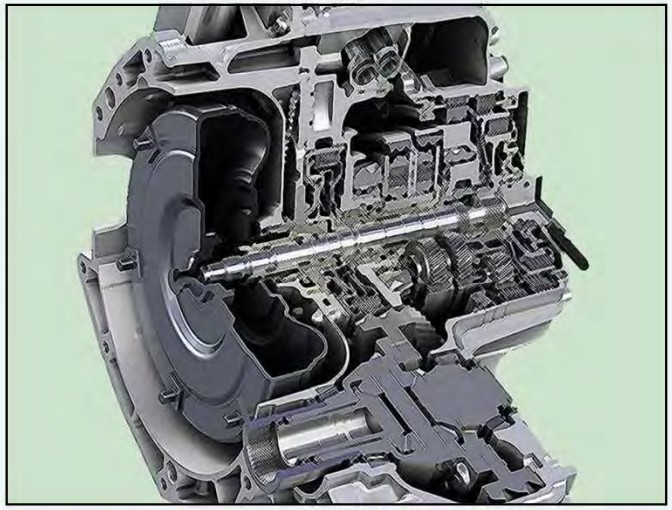
July 25, 2016 — Fiat Chrysler (FCA US) is recalling nearly 410,000 vehicles to replace wire harnesses and update software, fixing problems that could cause the vehicles to stop moving forward.

Included in the recall are the 2015 Chrysler 200, 2015 RAM ProMaster City, 2015 Jeep Renegade and 2015 Cherokee. Certain 2014 Jeep Cherokees are also affected. The automaker says the vehicles are equipped with 9HP48 or 948TE transmissions.

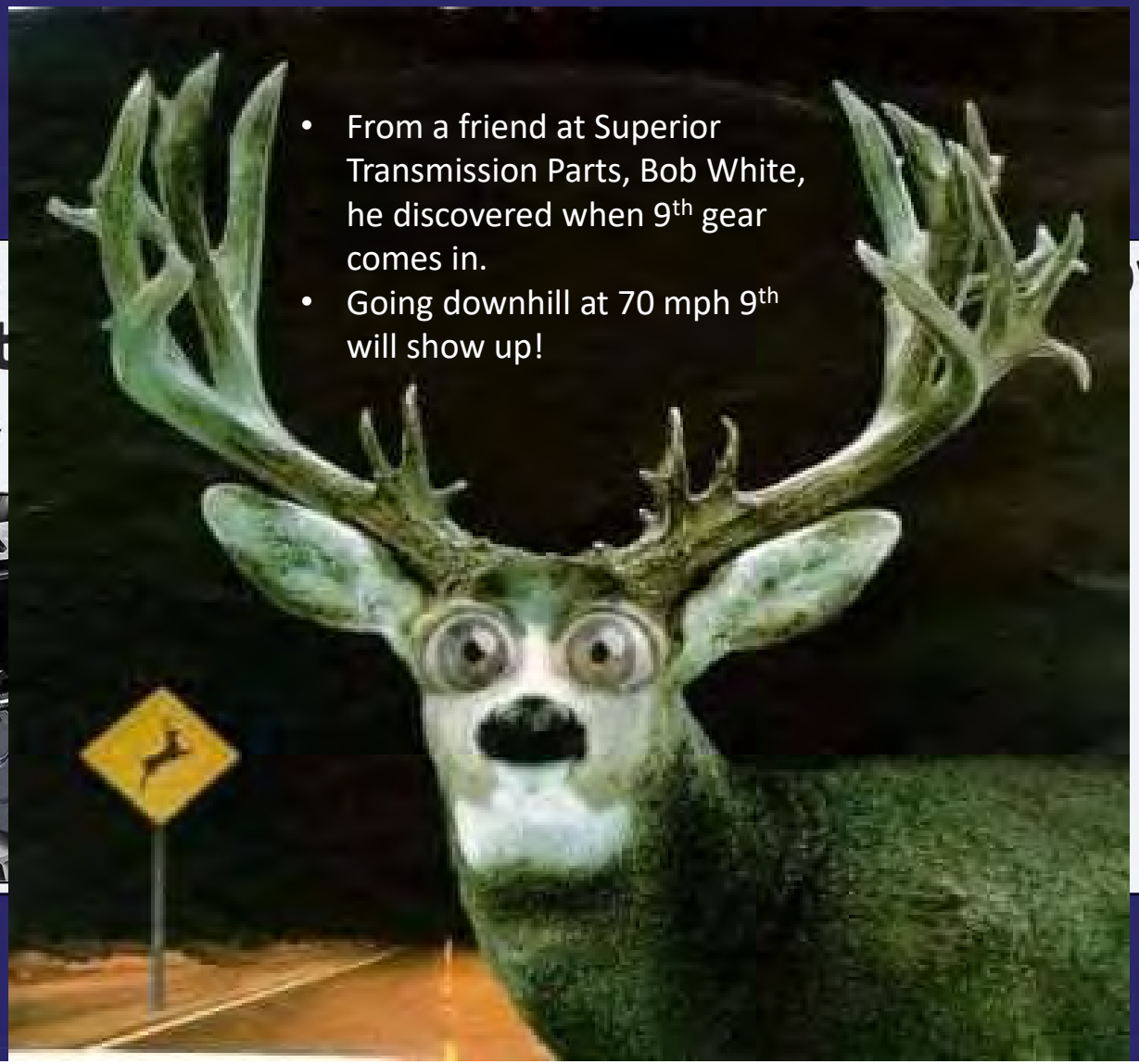
BAD PRESS

Hard, Strange Shifts and Sudden Shutdowns with the ZF 9-Speed Transmission

December 12, 2018 Scott McCracken #transmission #lawsuit #settlement #recall

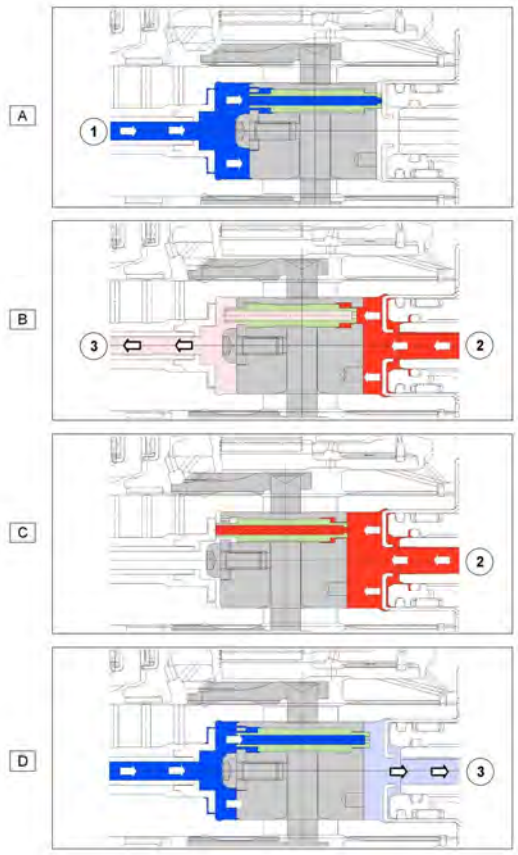


- 2014-2015 were the worst
- After programming 9th gear is seemingly lost.
- The dealer says that it will engage under certain driving conditions.
- When asked what are those conditions:

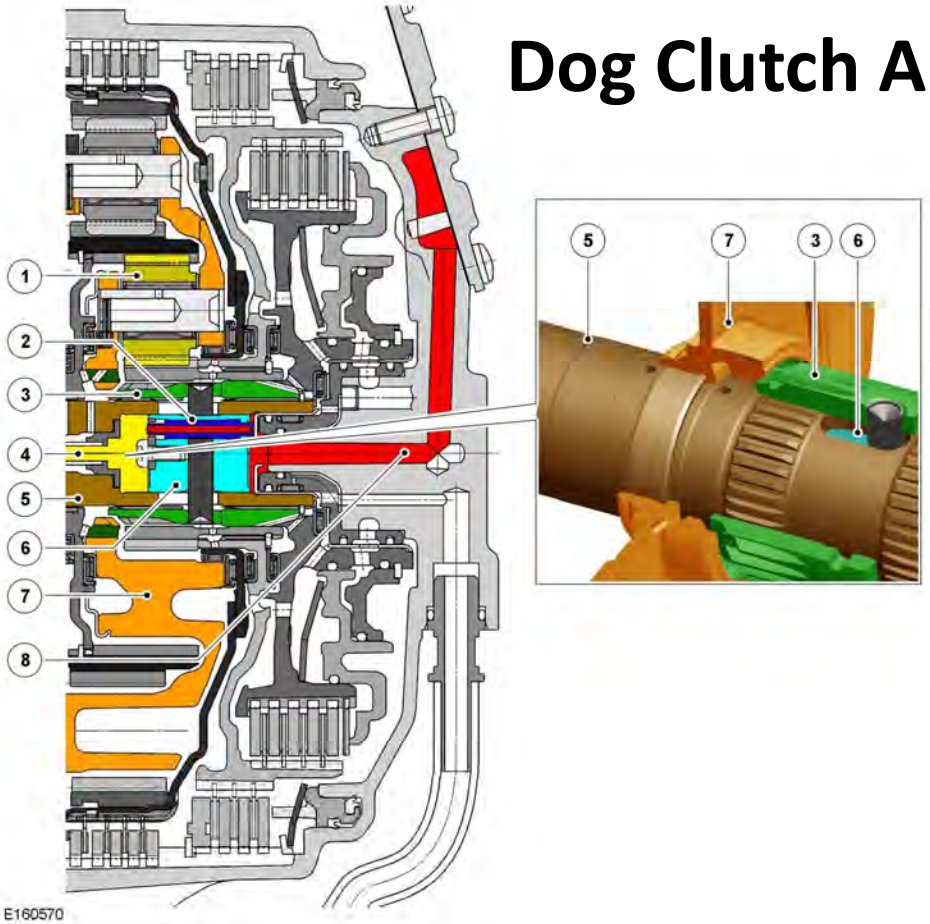


- From a friend at Superior Transmission Parts, Bob White, he discovered when 9th gear comes in.
- Going downhill at 70 mph 9th will show up!

Dog Clutch A



E160571



E160570

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ETE
REMAN
TRANSMISSIONS

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ETE
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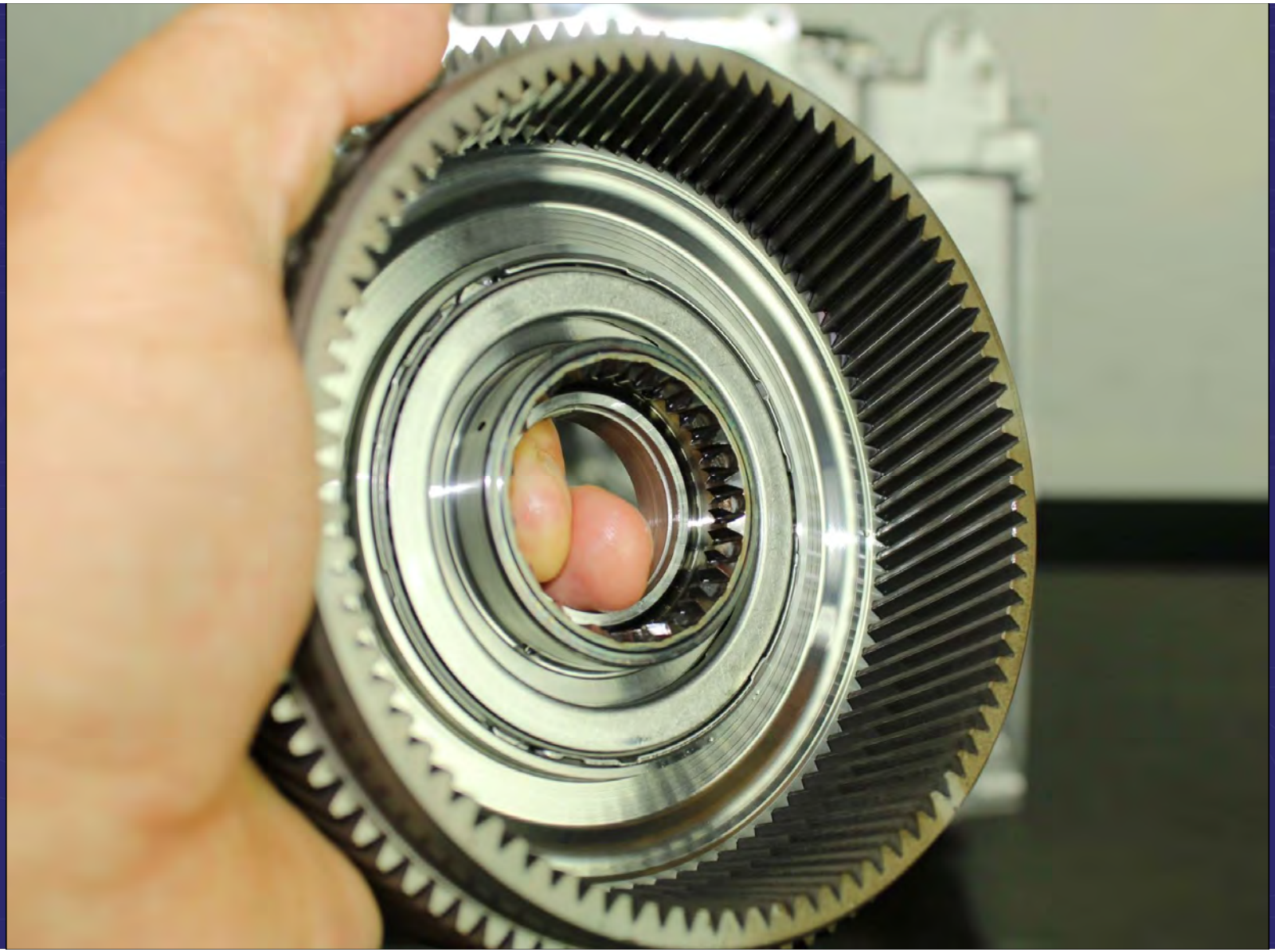
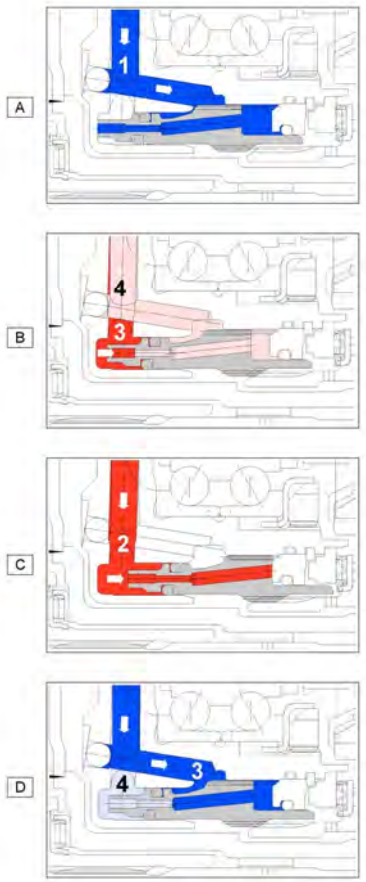
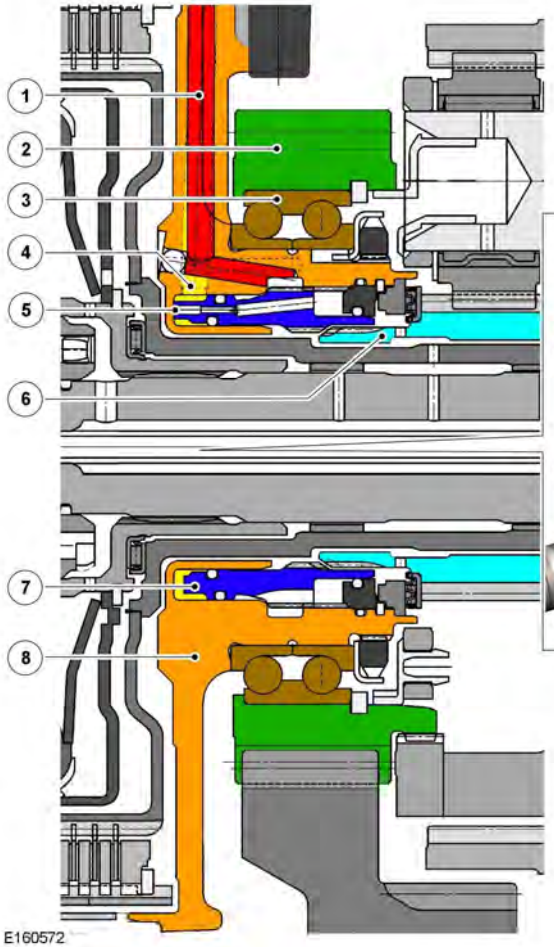
TRANSMISSIONS



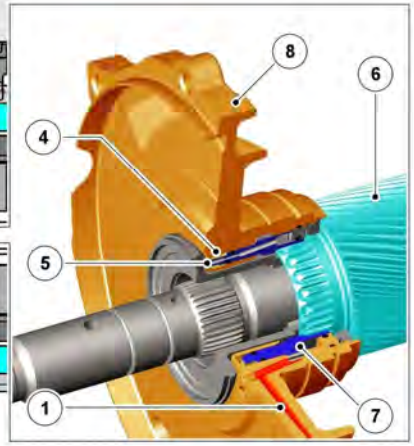
Dog Clutch F

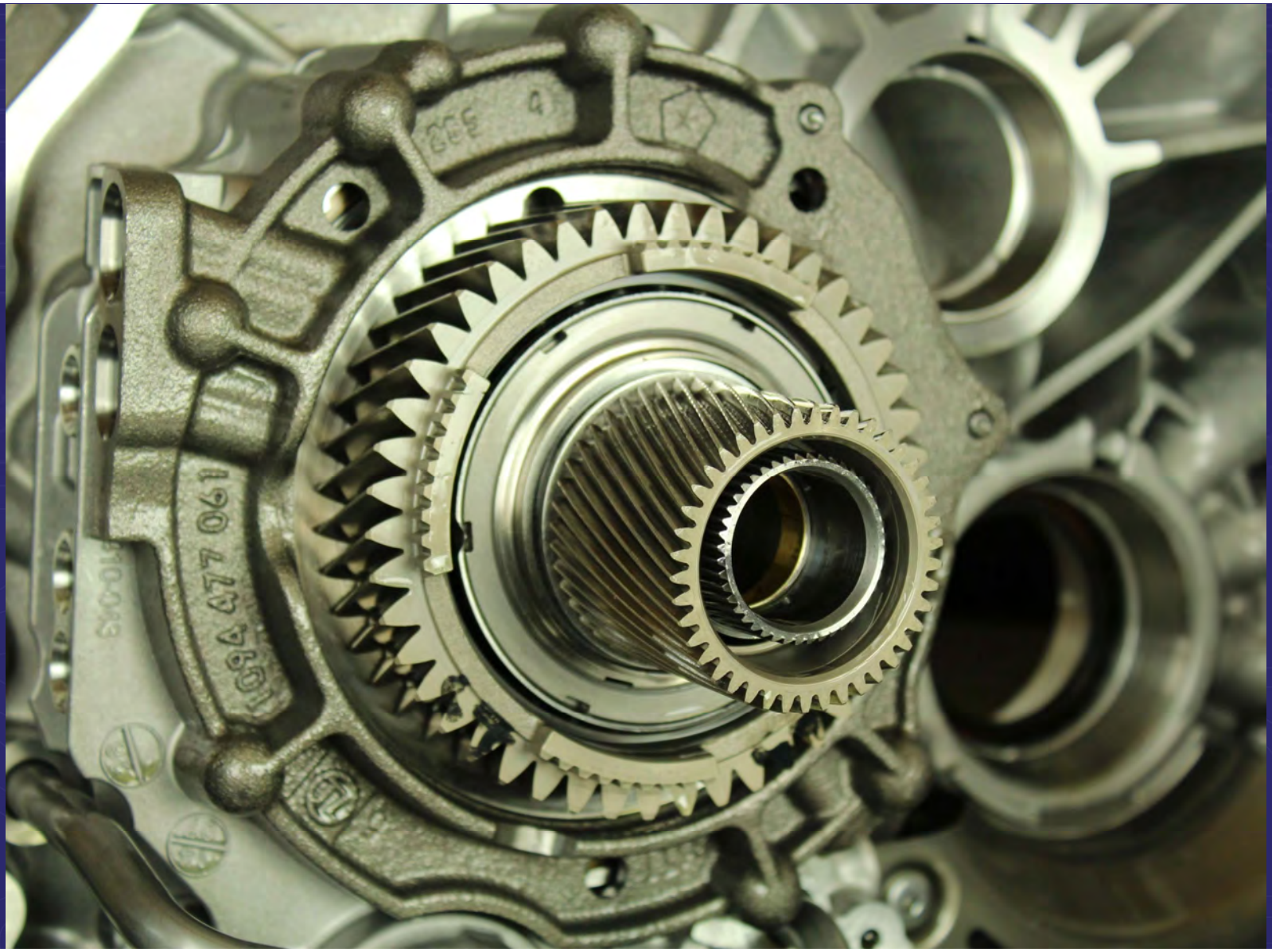


E160573



E160572





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ETE
REMAN
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REMANUFACTURED
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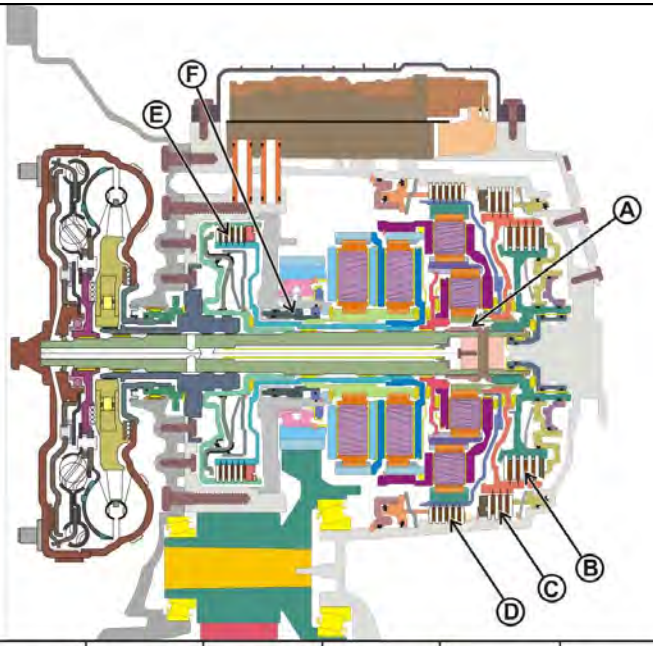

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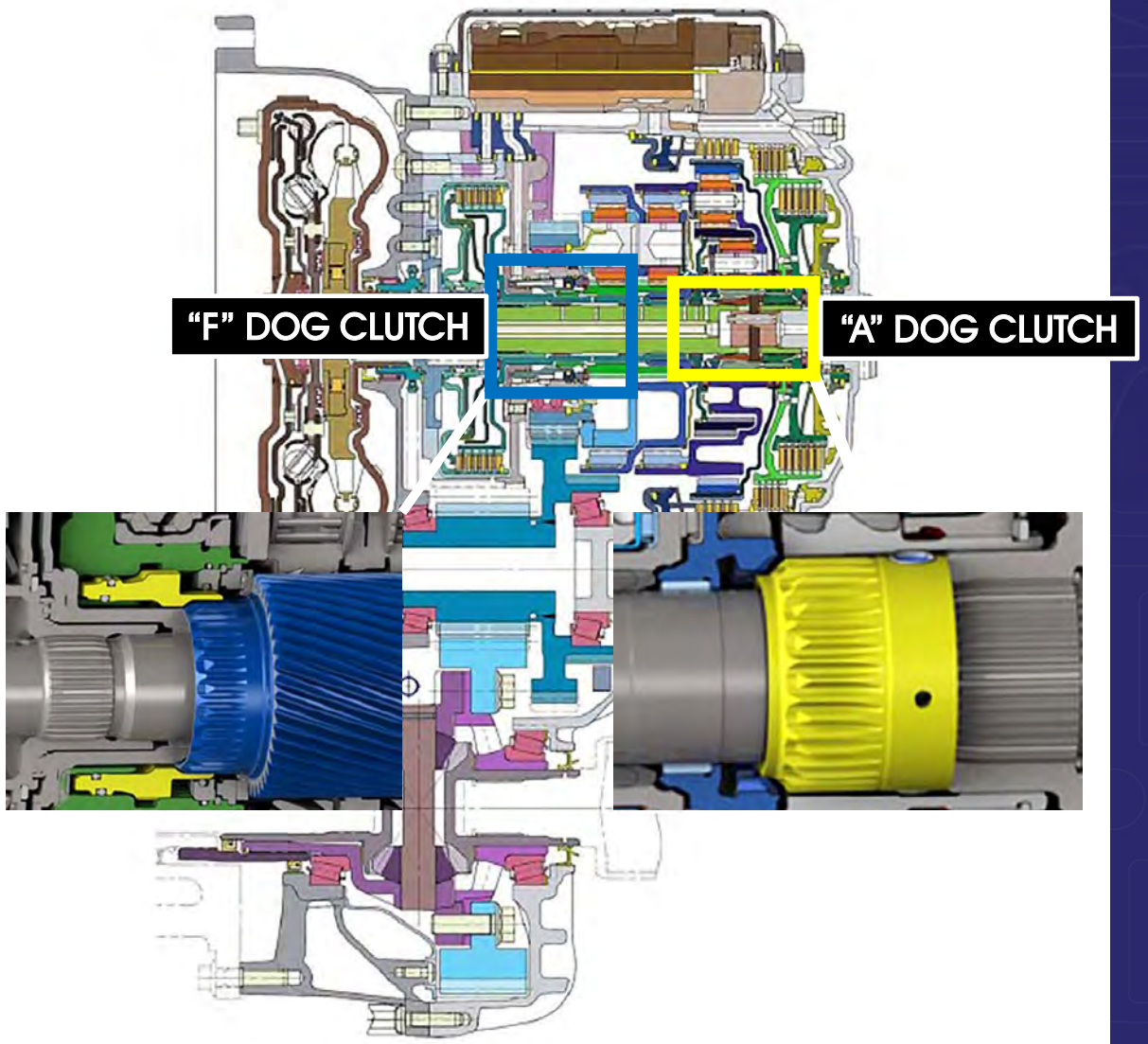
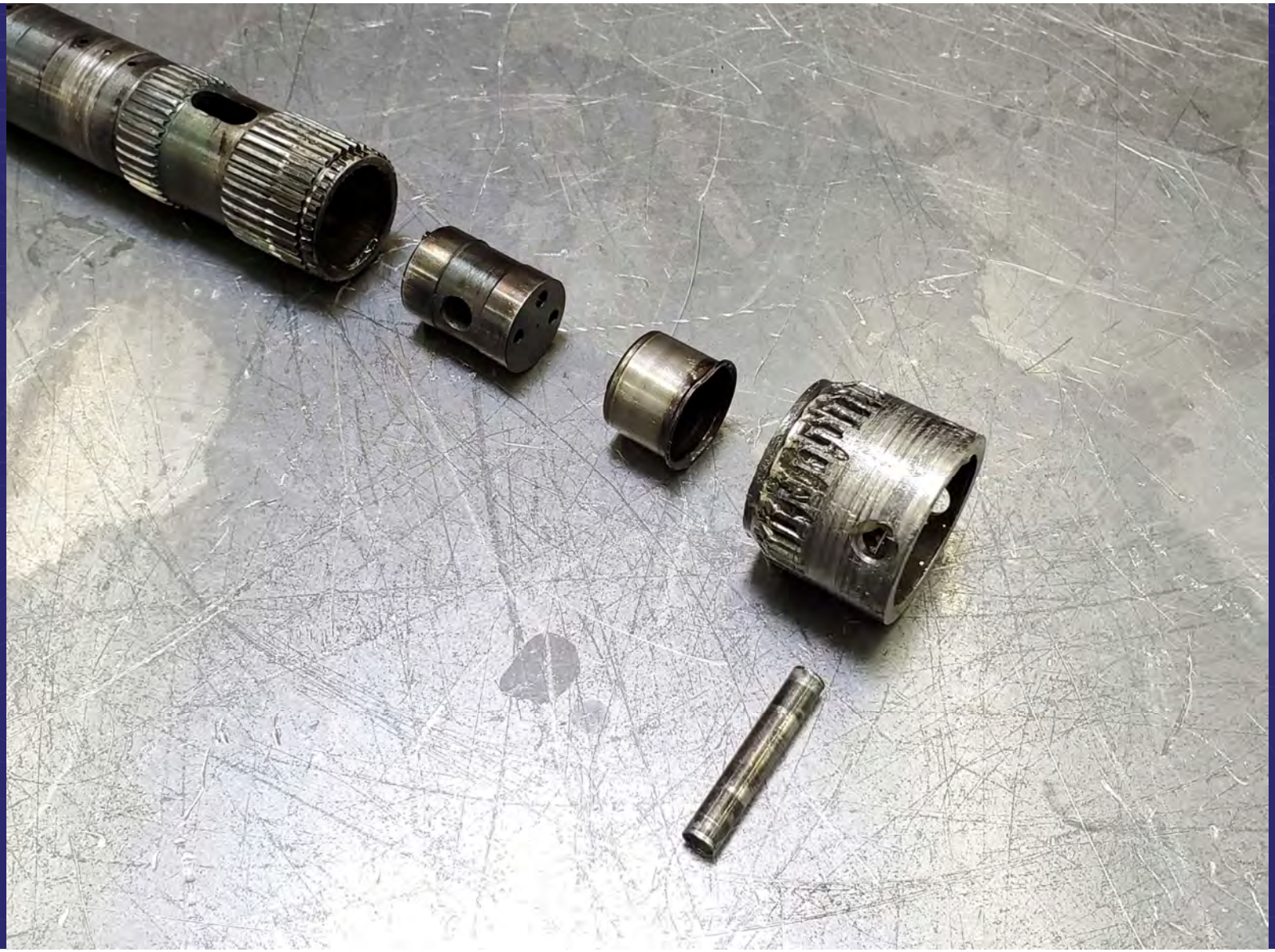
* - *Failsafe Gear according to Land Rover*
** - *Default Gear according to Dodge*
*** - *Dog Clutch shift transitions dependent upon proper engine and shaft speed*

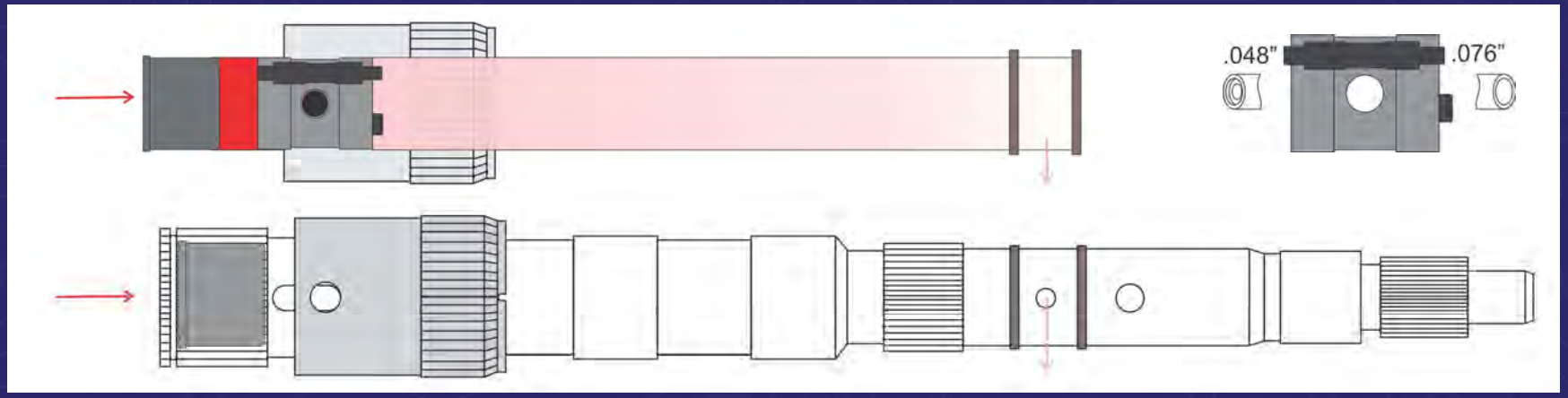
Intermittent No Forward

DTC P0730 – Incorrect Gear Ratio
DTC P07A6 – Clutch C Performance

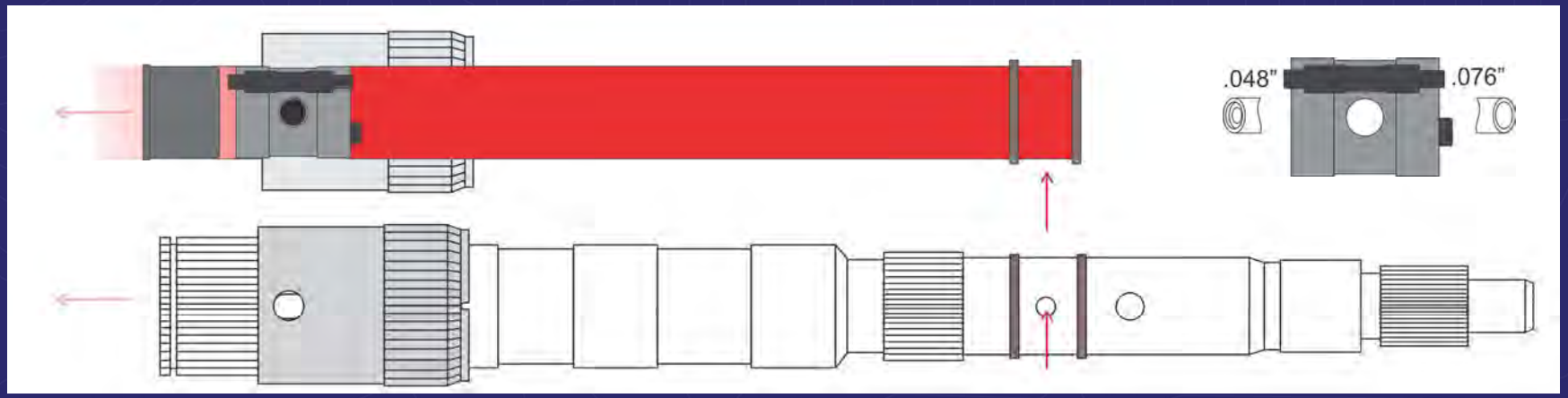

"F" DOG CLUTCH
"A" DOG CLUTCH



For the curious mind



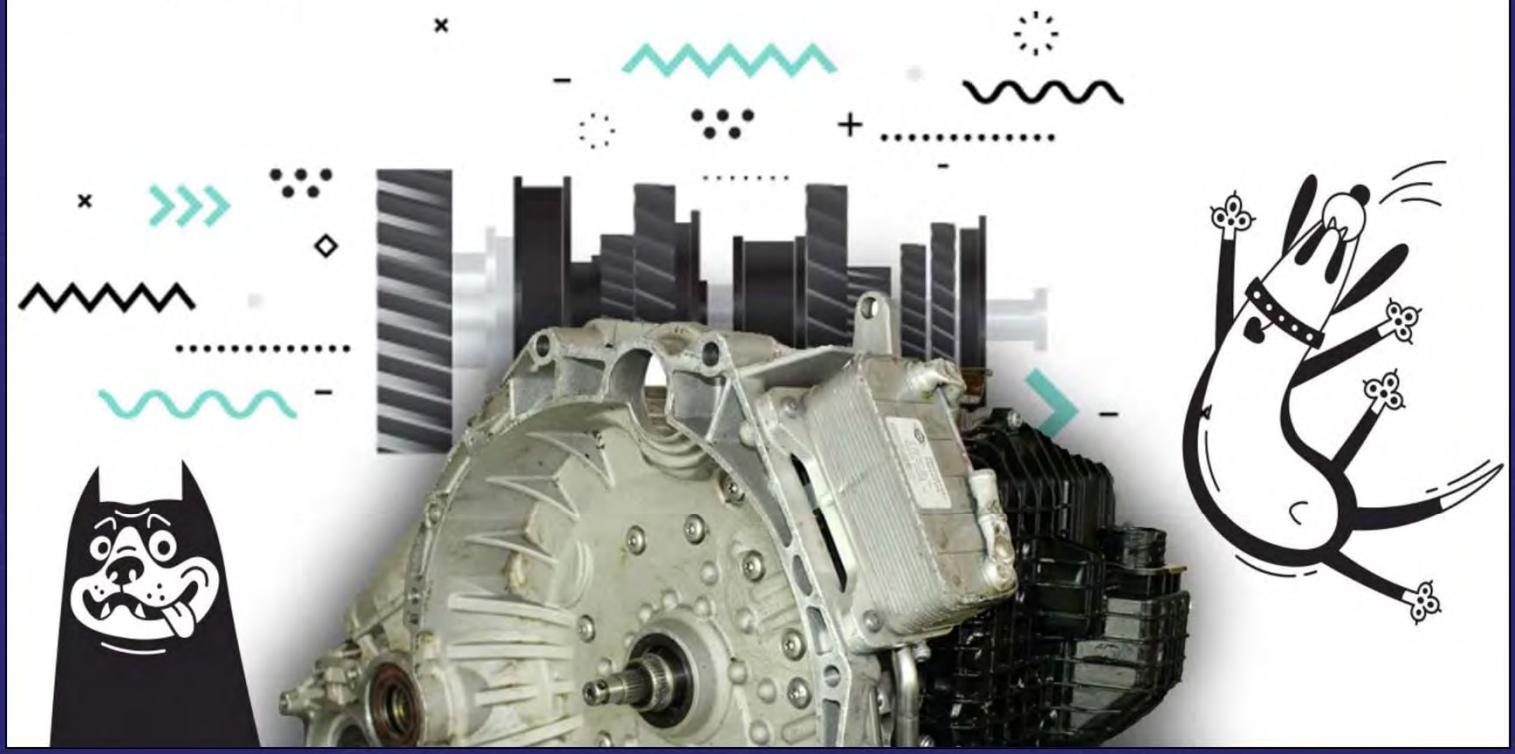
https://www.transmissiondigest.com/chrysler-948te-doggy-dog-transmission



Chrysler 948TE: It's a doggy dog transmission

By **Wayne Colonna**

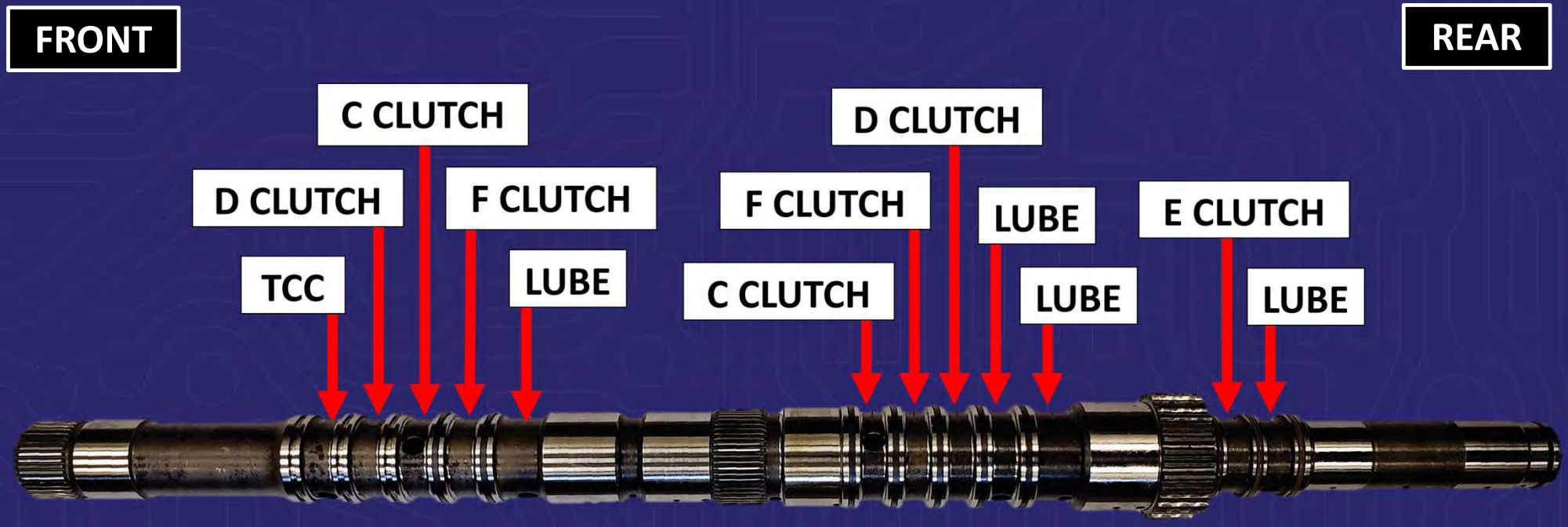
Published: August 4, 2022



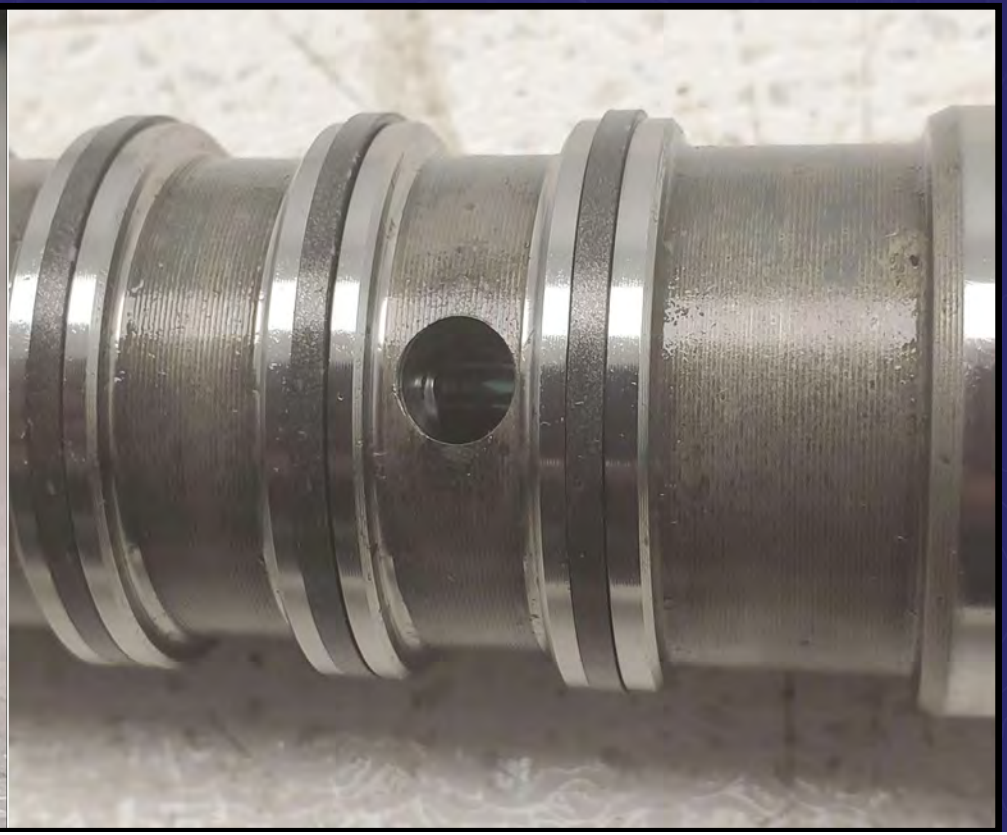
Ford 10R80/140W Transmission

Ford 10R80/140W
Examples of Several Transmission Issues

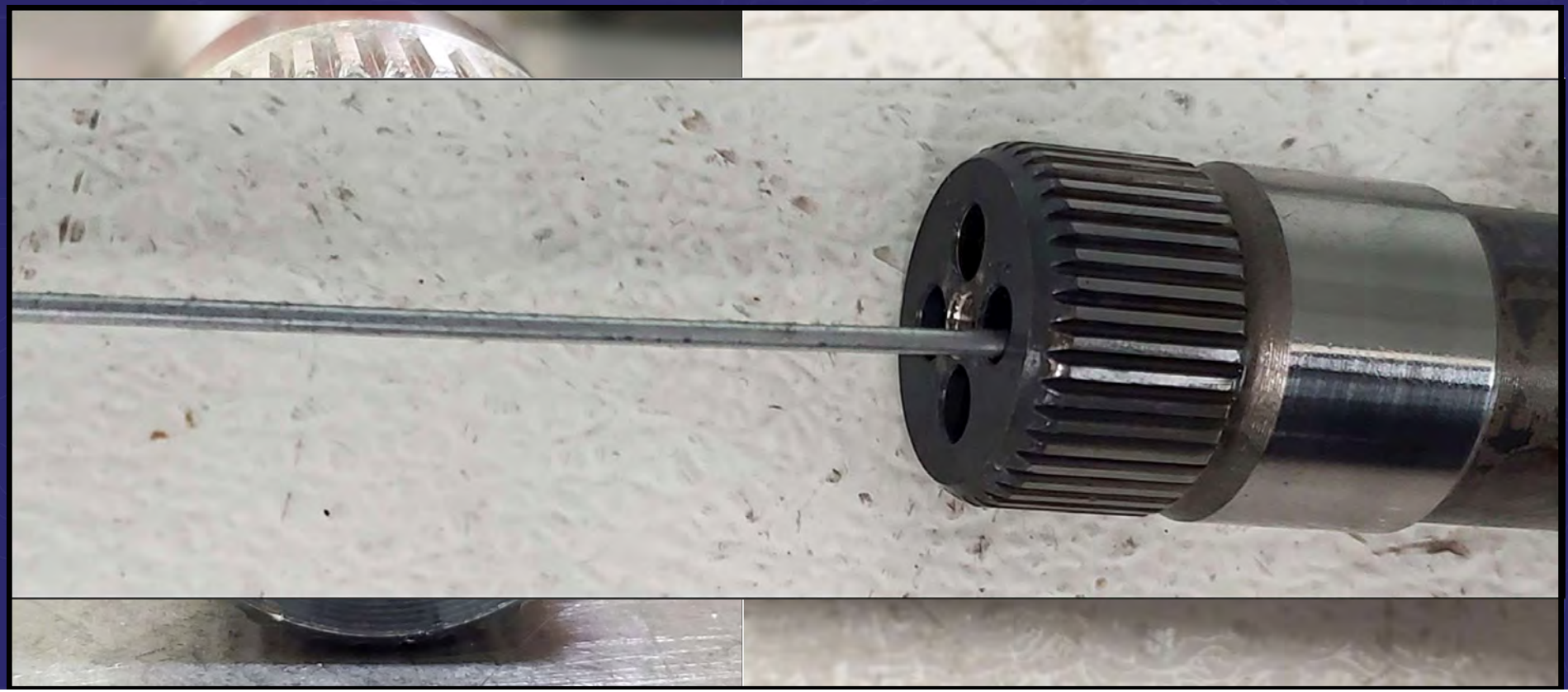
Ford 10R80/140W
Examples of Several Transmission Issues



Ford 10R80/140W
Examples of Several Transmission Issues



Ford 10R80/140W
Examples of Several Transmission Issues

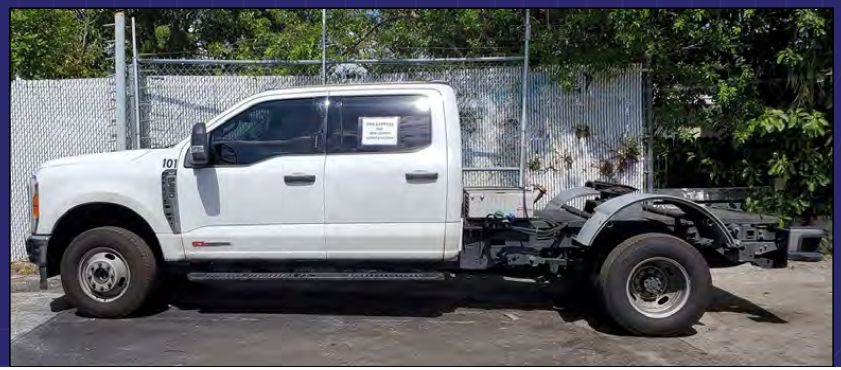


Ford 10R80/140W
Examples of Several Transmission Issues

Programming Issue

Scenario #1

- 2023 F350 4WD Super Duty 6.7L Turbo Diesel
- After a transmission exchange the Solenoid Body Strategy and ID numbers were programmed into the TCM.
- The shops normal operating procedures is to run updates after repairs.
- During a programming event it wrote to the PCM, then the TCM and then to the Glow Plug Module (Glow Dosing Module).



Programming Issue

Scenario #1

- Halfway into it the program freezes.
- Various codes were set: IAT, DEF, etc.
- Vehicle was sent to the dealer for the module to be replaced.
- The dealer says this occurs frequently.

Programming Issue
Scenario #2

- 2019 F250 Super Duty 2WD 6.7L Deisel
- 10R140 Transmission needed replacement
- The Solenoid Body Strategy and ID numbers were programmed into the TCM.
- The shops normal operating procedures is to run updates after repairs.

Programming Issue
Scenario #2

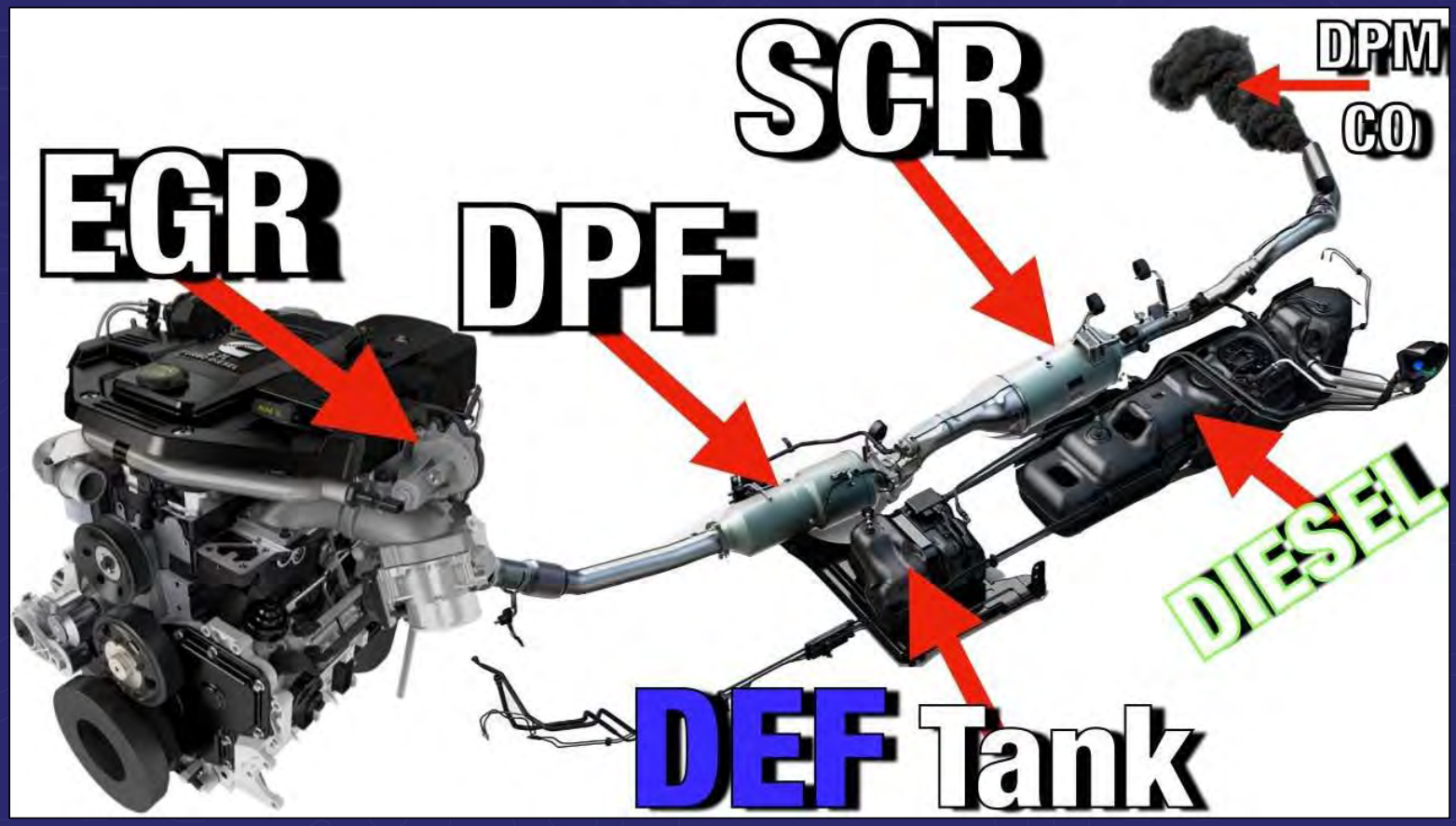
- During a programming the DEF warning lamp started flashing. The Red Stop Lamp illuminated. An audible warning beep occurred, and the MIL illuminated as well.
- Vehicle initiated Low Power Mode.
- The shop was unaware of:

Programming Issue

Scenario #2

Programming Issue

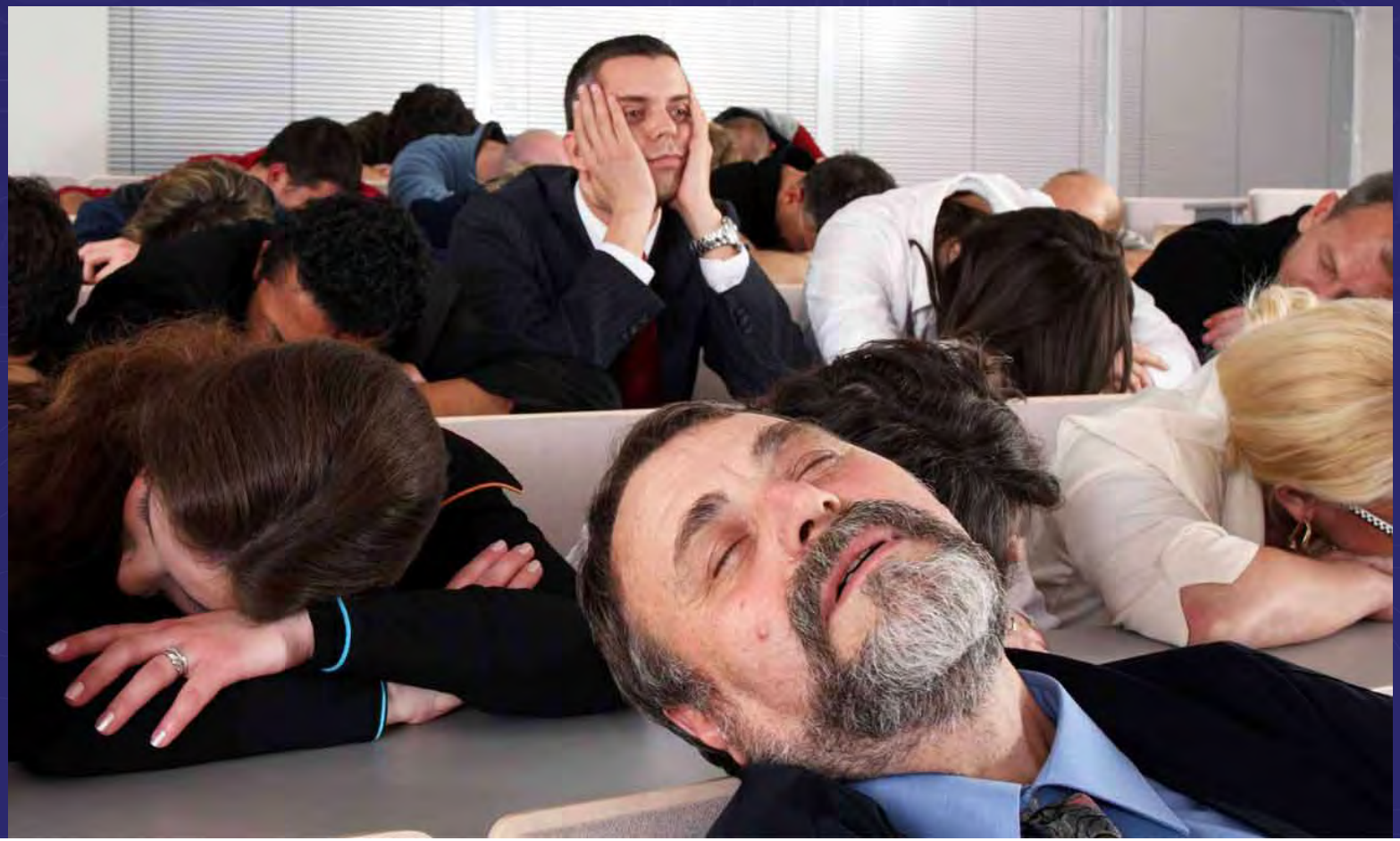
Scenario #2



Programming Issue
Scenario #2

- EGR/DPF/DEF Delete Kits
- The shop was faced with talking to the customer to restore the delete or
- To bring it to the one who tuned the delete.

Thank You For Your Time



TRANSMISSION CHANGE AWARENESS

REMANUFACTURED ETE REMAN TRANSMISSIONS

ATSG AUTOMATIC TRANSMISSION SERVICE GROUP

APRIL 6TH, 2024

TST Seminars