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MEDIUM DUTY TRUCK

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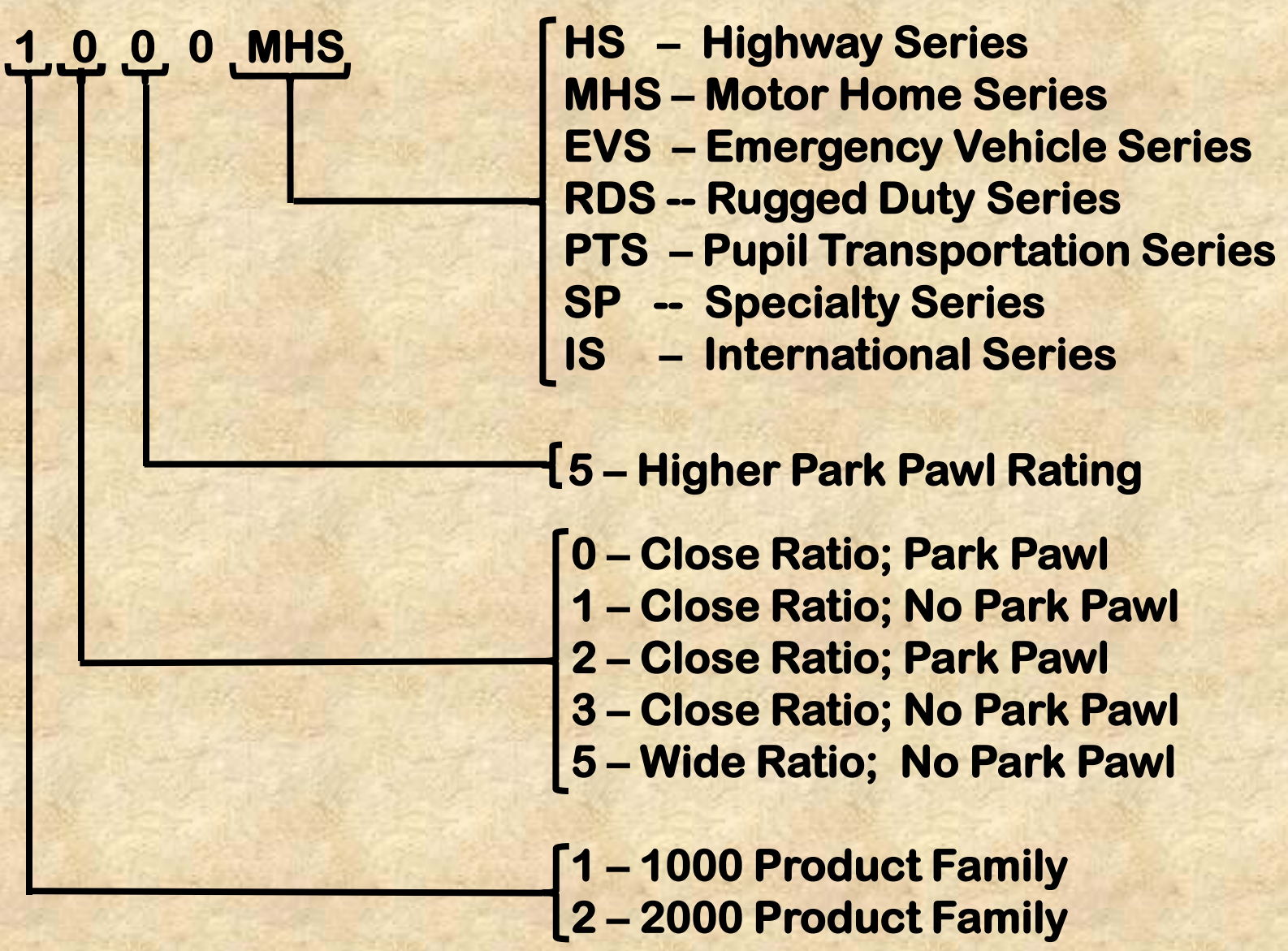
Allison Transmission.

1000/2000 SERIES

TRANSMISSION CODE IDENTIFICATION

PPT



TRANSMISSION FAMILIES & VOCATION ID

PPT

Highway Series:
1000 HS; 1350 HS; 2100 HS; 2200 HS; 2300 HS; 2350 HS; 2500 HS; 2550 HS

Motor Home Series:
1000 MHS; 1350 MHS; 2100 MHS; 2200 MHS; 2350 MHS; 2500 MHS; 2550 MHS

Emergency Vehicle Series:
1000 EVS; 1350 EVS; 2100 EVS; 220 EVS; 2350 EVS; 2500 EVS; 2550 EVS

Rugged Duty Series:
1000 RDS; 1350 RDS; 2100 RDS; 2200 RDS; 2300 RDS; 2350 RDS; 2500 RDS; 2550 RDS

Pupil Transport Series:
1000 PTS; 1350 PTS; 2100 PTS; 2200 PTS; 2350 PTS; 2500 PTS; 2550 PTS

Specialty Series:
1000 SP; 1350 SP; 2100 SP; 2200 SP; 2350 SP; 2500 SP; 2550 SP

International Series:
1000 IS; 1350 IS; 2100 IS; 2200 IS; 2350 IS; 2500 IS; 2550 IS

TRANSMISSION LOAD RATINGS

1000 SERIES:
Heavy Duty Automatic Transmission With Parking Pawl
Maximum GVW 19,850 Lbs/Maximum GCW 26,000 Lbs

2000 SERIES:
Heavy Duty Automatic Transmission Without Parking Pawl
Maximum GVW 30,000 Lbs/Maximum GCW 30,000 Lbs

2000 MH SERIES:
Heavy Duty Automatic Transmission Without Parking Pawl
Maximum GVW 30,000 Lbs/Maximum GCW 30,000 Lbs

2400 SERIES:
Heavy Duty Automatic Transmission With Parking Pawl
Maximum GVW 26,000 Lbs/Maximum GCW 26,000 Lbs

2500 SERIES:
Heavy Duty Automatic Transmission With Parking Pawl
Maximum GVW 30,000 Lbs/Maximum GCW 30,000 Lbs

THE GENERATION GAP

GENERATION 1 – 3:

- Generation 1 – 3 TCMs and electronic controls were used from 2001 -2005.
- TCMs come in both 12 and 24 volt configurations.
- These TCMs has two 32 pin connectors.
- Gen 1 – 3 has one high speed CAN communication line.
- Gen 1 – 3 TCMs has two high side drivers to provide solenoid power.
- A significant change took place in the 2004 model year electronic line pressure control was introduced.
- Solenoid “G” was added as well as additional valves to lower line pressure at an idle in order to reduce a very audible pump whine.
- Software version DEE was developed to provide operation of Solenoid “G” and also provide code capability for an electrical fault.
- An externally mounted Neutral Safety Back Up Switch is present
- To provide the TCM with gear shift selection information.
- Communications were enhanced to provide an improved J1939 High Speed network.
- Gen 1 – 3 uses a 20 pin transmission case connector but could have 21 pins if the system has TransID.

GENERATION 4:

- Gen 4 was used at the start of production for the 2006 model year.
- Gen 4 controls were used until the 2012 model year.
- These TCMs come in 12 or 24 volt configurations.
- These TCMs have a single 80 pin connector.
- The control system has two high speed CAN Communication lines.
- These TCMs contain two high side drivers to provide solenoid power.
- These TCMs accommodate both 1000 and 2000 Series transmissions as an electronically created six speed transmission.
- A significant change took place for the 2009 model year when "Prognostics were introduced which contained software to monitor transmission health as well as oil & filter service intervals.
- With the advent of "Prognostics", additional DTC capability was provided.
- Gen 1 – 3 uses a 20 pin transmission case connector but could have 21 pins if the system has TransID.

THE GENERATION GAP

GENERATION 5:

- Started for the 2013 Model Year and is currently being used.
- The TCM comes in 12 and 24 volt configurations.
- The TCM has one 80 pin connector like Gen 4 for back service compatibility when replacing a 4th Gen with a 5th Gen TCM.
- The 5th Gen TCM has 3 Hi Speed CAN Comm Lines.
- The 5th Gen TCM has 3 Hi Side Drivers to provide solenoid power.
- The 5th Gen system retains the IMS for TCM gear select information.
- The transmission Case Connector contains 24 pins.
- The 5th Gen TCM can contain software features to enhance fuel economy, driveability and to protect the transmission from damage.
- The 5th Gen TCM contains an Inclinometer as an integral part which will sense road grade for better LBSS operation.

GENERATION 5 SOFTWARE FEATURES

These software features are:

- RELS = Reduced Engine Load At A Stop
  - ➢Neutral at a stop for better fuel economy.
- LBSS = Load Based Shift Scheduling
  - ➢Economy or Performance operation depending on vehicle load.
- COTP = Converter Overtemp Torque Protection
  - ➢Protects the torque converter from failure from excessive slip.
- VAC = Vehicle Acceleration Control
  - ➢Controls the level of acceleration rate for better fuel economy.
- SEM = Shift Energy Management
  - ➢Engine torque will be reduced during shifts for reduced driveline stress.
- LRTP = Low Range Torque Protection
  - ➢Creates the appropriate “Startability” on initial take-off.
- Enhanced “Prognostics”
  - ➢Monitors transmission health & oil & filter life.
- Enhanced Lock Up In 2nd Gear
  - ➢Primarily for 4 cylinder engines for improved fuel economy.

PPT

Part Number	29544772
TCM Date	TBD
HCN / CCN	0 / N/A
VIN	1GBE5E1226F414041
This Tool S/N	120243
Last Tool S/N	N/A

SEM/LRTP & Autodetected Information	Value
SEM Validated	ECM doesn't support SEM
LRTP Validated	ECM doesn't support LRTP
SEM/LRTP Compatibility	Not Compatible
SEM Enabled Status	Disabled
LRTP Enabled Status	Disabled
SEM Torque Reduction Status	N/A
LRTP Torque Reduction Status	N/A
Unapproved SEM Torque Reducing Device	N/A
Unapproved LRTP Torque Reducing Device	N/A

	Signal Source	Signal State	Function Name	Function State
	Databus		Input - Secondary Mode	OFF
	101	Disable	Input - Auxiliary Function Range Inh...	Disable

5/23

5TH GENERATION TCMS

A59 – (4th Gen Service TCM) – This TCM will replace all 4th Gen Model A53 TCMs as a direct replacement for 4th Gen control systems.

A61 - (Basic 12 Volt) – This TCM is used only by 1000/2000/3000/4000 Series transmissions that are installed into commercial applications with up to 6 speeds and that use a 12 volt electrical system.

A62 – Expanded 12 Volt) – This TCM is required for 3000/4000 applications with 7 Speed capability, that uses a retarder and has a 12 volt electrical system.

A63 – 12/24 Volt Universal) – This TCM will be used to service all chassis mount TCM models A61 and A62.

- **5th Gen controls will no longer support J1850 Class 2, J1708/J1587 & ISO 9141 communications links or pass through wiring harnesses that were available with 4th Gen TCMs.**

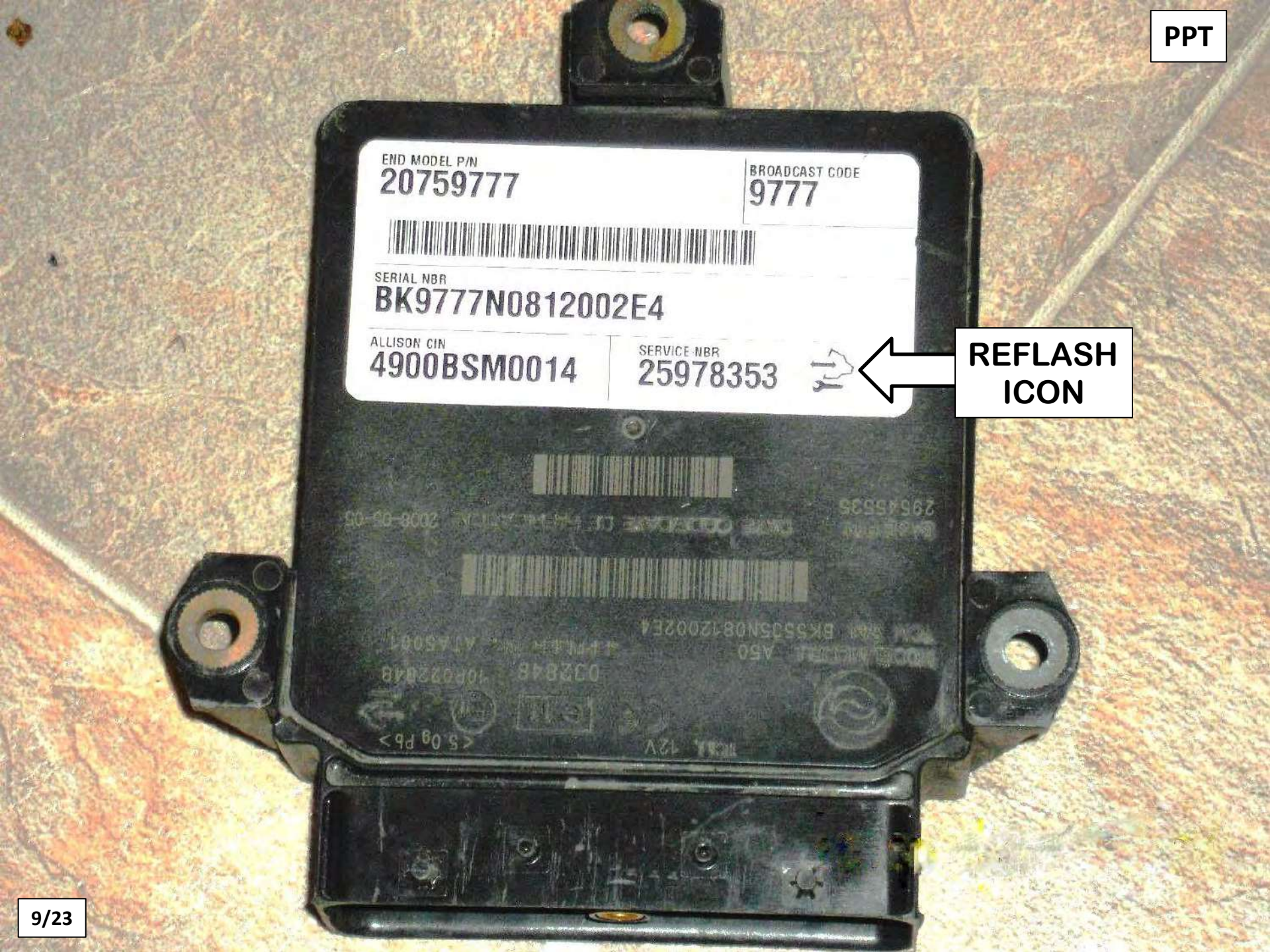
- **These features and capabilities will be supported by the A59 Model TCM.**

- **Allison programming Version 3.0 and higher will prevent loading a calibration package into an incompatible TCM.**

TCM WIRING ASSIGNMENT DIFFERENCES

PIN NUMBER	4TH GEN PIN ASSIGNMENT	5TH GEN PIN ASSIGNMENT
32	J1708/J1587 (+)	CAN3 (+)
46	ISO 9141	CAN3 Shield
47	CAN2 (-) Pass-Through	Solenoid 10
68	CAN1 (-) Pass-Through	Solenoid 11
72	J1708/J1587 (-)	CAN3 (-)
76	TransID	High Side Driver 4

1ST-3RD GENERATION TCM

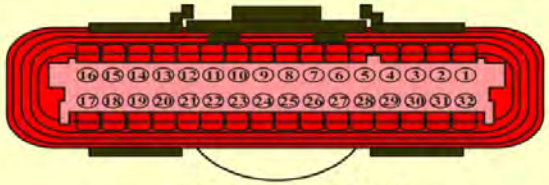

PPT
END MODEL P/N
20759777
BROADCAST CODE
9777
SERIAL NBR
BK9777N0812002E4
ALLISON CIN
4900BSM0014
SERVICE NBR
25978353
REFLASH ICON
9/23

4TH GENERATION TCM

5TH GENERATION TCM

5TH GENERATION TCM

1ST-3RD GENERATION TCM



TCM "J2" (Red) Harness Connector (Face View)

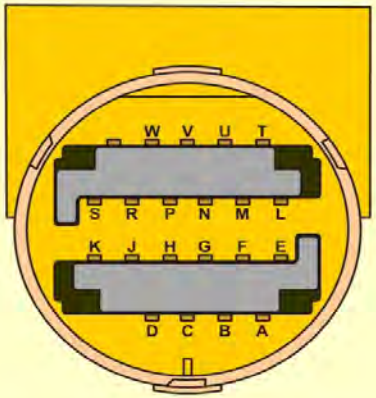
Pin	Circuit Function	Circuit Ends
1	PSM Input	Trans-D
2	PSM Input	Trans-F
3	PSM Input	Trans-E
4	PSM Input	Trans-K
5	NSBU Input	NSBU-4A
6	NSBU Input	NSBU-4D
7	NSBU Input	NSBU-4B
8	NSBU Input	NSBU-4C
9	Throttle Position Sensor	TPS-B
10	Trans Sump Temp Input	Trans-G
11	Retarder Temp Input (Opt)	R Temp-A
12	Engine Coolant Temp	ECTS-A
13	Turbine Speed Sensor (High)	TSS-A
14	Turbine Speed Sensor (Low)	TSS-B
15	Output Speed Sensor (High)	OSS-A
16	Output Speed Sensor (Low)	OSS-B
17	Engine Speed Sensor (High)	ESS-A
18	Engine Speed Sensor (Low)	ESS-B
19	TPS Voltage Supply	TPS-C
20	Analog Ground	Trans-H, ECTS-A, Temp-B, NSBU-7D R-Temp-B, TPS-A
21	TRANS ID	Trans-T
22	Trim Solenoid A (High)	Trans-L
23	Trim Solenoid A (Low)	Trans-M
24	Trim Solenoid B (High)	Trans-N
25	Trim Solenoid B (Low)	Trans-P
26	C Solenoid Ground (On/Off)	Trans-A
27	D Solenoid Ground (On/Off)	Trans-B
28	E Solenoid Ground (On/Off)	Trans-W
29	F Solenoid Low (PWM)	Trans-J
30	G Solenoid Low (PWM)	Trans-J
31	C, D, E Solenoid 12V Supply	Trans-C
32	F Solenoid High (TCC PWM)	Trans-S

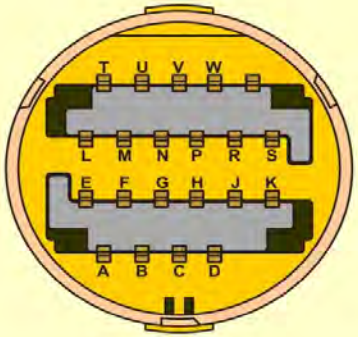
TCM "J1" (Gray) Harness Connector (Face View)

Pin	Circuit Function	Circuit Ends
1	Battery Ground	Vehicle System
2	Ignition Power	Vehicle System
3	Battery Power	Vehicle System
4	Ignition Power	Vehicle System
5	Battery Ground	Vehicle System
6	GPI 1*	Vehicle System
7	GPI 2	Vehicle System
8	GPI 3	Vehicle System
9	GPI 4	Vehicle System
10	GPI 5	Vehicle System
11	GPI 6	Vehicle System
12	GPI 7	Vehicle System
13	GPI 8	Vehicle System
14	GPI 9	Vehicle System
15	Retarder Mod. Reg. (Opt)	RMR-B
16	PWM Throttle	Vehicle System
17	Sensor Power	RMR-C
18	Analog Ground	RMR-A
19	GPO 1**	Vehicle System
20	GPO 2	Vehicle System
21	GPO 3	Vehicle System
22	GPO 4	Vehicle System
23	Range Inhibit Indicator	Vehicle System
24	GPO 6	Vehicle System
25	CHECK TRANS Lamp	Vehicle System
26	Vehicle Speed	Vehicle System
27	Vehicle Speed	Vehicle System
28	Digital Ground	Vehicle System
29	CAN High (+)	J 1939 A or H
30	ISO 9141	Vehicle System
31	CAN Shield	J 1939 C or S
32	CAN Low (-)	J 1939 B or L

*GPI = General Purpose Input
**GPO = General Purpose Output

1ST-3RD GENERATION 20 PIN CASE CONNECTOR

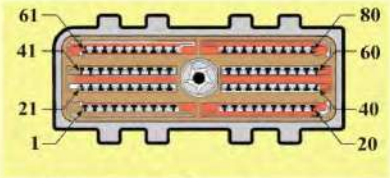




Pin	Wire Color	Circuit Function	Circuit Ends
A	Green	Shift Solenoid "C" Low (ON/OFF)	TCM J2-26
B	Yel/Blk	Shift Solenoid "D" Low (ON/OFF)	TCM J2-27
C	Pnk or Brn	12 Volt Reference	TCM J2-31
D	Pnk or Lt Grn	Fluid Pressure Switch Signal "C"	TCM J2-1
E	Red	Fluid Pressure Switch Signal "E"	TCM J2-3
F	Dk Blu	Fluid Pressure Switch Signal "D"	TCM J2-2
G	Yel/Blk or Yel	TFT Sensor Signal	TCM J2-10
H	Black	Ground	TCM J2-20
J	Brown	TCC Solenoid (F) Low (PWM)	TCM J2-29
K	Lt Grn/Blk or Tan	Fluid Pressure Switch Reverse Signal	TCM J2-4
L	Lt Blu/Wht or Red/Blk	Trim Solenoid "A" High (VBS)	TCM J2-22
M	Red/Blk or Lt Blu	Trim Solenoid "A" Low (VBS)	TCM J2-23
N	Pnk/Blk or Gray	Trim Solenoid "B" High (VBS)	TCM J2-24
P	Brn/Wht or Ppl	Trim Solenoid "B" Low (VBS)	TCM J2-25
R	Dk Blu or Blu	Solenoid "G" Low (ON/OFF)	TCM J2-30
S	Dk Grn/Wht or Blu	TCC & "G" Solenoid High	TCM J2-32
T	Ppl or Wht	Trans ID	TCM J2-21
U-V	Not Used	———	———
W	Orn/Wht or Blk/Wht	Shift Solenoid "E" Low (ON/OFF)	TCM J2-28

If Connector Has 21 Pins, That Is The TransID Circuit

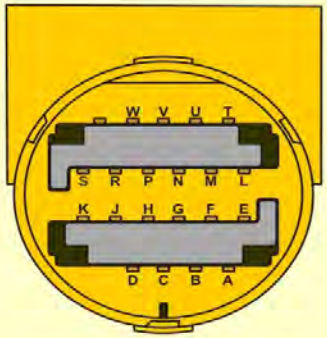
4TH GENERATION TCM

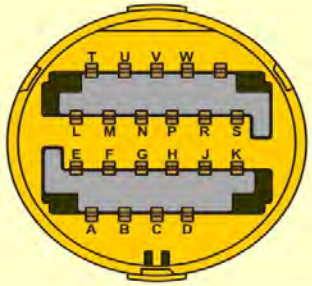


Pin	Circuit Function	Circuit Ends	Pin	Circuit Function	Circuit Ends
1	GPI 6	Vehicle System	41	B+ TCM Output for Neutral Start Relay	Starter
2	GPI 2	Vehicle System	42	GPI 5	Vehicle System
3	Ground (Optional)	Vehicle System	43	GPI 3/Accessory Wakeup Serial Data	Vehicle System
4	GPO 2	Vehicle System	44	PWM Input and TPS (Torque Signal)	Vehicle System
5	GPO 4	Vehicle System	45	GPO 3	Vehicle System
6	CAN High 2 (+) J2284	Data Link Conn	46	Class 2 Serial Data (J1850/ISO9141)	Vehicle System
7	Internal Terminating Resistor CAN 1	Vehicle System	47	CAN 2 Low (-)	J2284 Low
8	CAN 1 Low (-) J1939	Data Link Conn	48	CAN 1 High (+)	J1939
9	TCM Ground	Engine Block	49	CAN 1 Shield	J1939
10	Battery Voltage +	Vehicle System	50	GPO 7	Vehicle System
11	High Side Driver 1 Feed (HSD1)	Trans Conn L (14)	51	Shift Solenoid 3 (Low)	Trans Conn C (3)
12	TPS 5 Volt Supply	TPS Pin "C"	52	Shift Solenoid 1 (Low)	Trans Conn A (1)
13	GPO 8	Vehicle System	53	IMS Range "B"	Trans Conn U (21)
14	IMS Range"C"	Trans Conn T (20)	54	TFT Sensor Signal	Trans Conn G (8)
15	Not Used	———	55	Pressure Control Solenoid 1 (Low)	Trans Conn M (15)
16	Not Used	———	56	Not Used	———
17	Fluid Pressure Switch 1 (A)	Trans Conn D (4)	57	Fluid Pressure Switch 3 [C]	Trans Conn E (6)
18	Rear Signal High	ECM Pin 18	58	IMS Ground	Trans Conn H (9)
19	Not Used	———	59	Input Speed Sensor (+)	ISS Pin A
20	Turbine Speed Sensor Signal (Low)	TSS Pin B	60	Output Speed Sensor (+)	OSS Pin A
21	GPI 8	Vehicle System	61	GPI 7 (OD Cancel Signal)	OD Cancel Sw
22	GPI 4	Vehicle System	62	GPI 9	Vehicle System
23	GPI 1	PTO	63	Ignition 1 Voltage Supply	Fuse Box
24	Range Inhibit	Vehicle System	64	GPO 6	Vehicle System
25	Vehicle Speed Signal	Speedometer	65	Reverse Lamp Relay	Exterior Lighting
26	Internal Terminating Resistor CAN 2	Vehicle System	66	CAN 2 High (+)	J2284 High
27	CAN 2 Low (-)	J2284 Low	67	CAN 2 Shield	Vehicle System
28	CAN 1 High (+)	Vehicle System	68	CAN 1 Low (-)	J1939
29	Check Trans/Do Not Shift Lamp	Instr Cluster	69	Ground	Chassis
30	Not Used	———	70	Battery Voltage Supply	Fuse/Relay Box
31	Not Used	———	71	High Side Driver 2 Feed (HSD2)	Trans Conn N (16)
32	Not Used	———	72	Not Used	———
33	Shift Solenoid 2 (Low)	Trans Conn B (2)	73	IMS Range "A"	Trans Conn V (22)
34	IMS Range "P"	Trans Conn W (23)	74	Main Modulation Pressure Solenoid (-)	Trans Conn S (19)
35	Not Used	———	75	Not Used	———
36	Pressure Control Solenoid 2 (Low)	Trans Conn P (17)	76	Trans ID	Trans Conn (24)
37	Not Used	———	77	Fluid Pressure Switch 4 (Reverse)	Trans Conn K (11)
38	IMS Neutral Start Input to TCM/ECM	Trans Conn R (18)	78	TCC PWM Solenoid (-)	Trans Conn J (10)
39	Input Speed Sensor (-)	ISS Pin B	79	Fluid Pressure Switch 2 (B)	Trans Conn F (7)
40	Output Speed Sensor (-)	OSS Pin B	80	Turbine Speed Sensor Signal (High)	TSS Pin A

*GPI = General Purpose Input
**GPO = General Purpose Output

4TH GENERATION 20 PIN CASE CONNECTOR

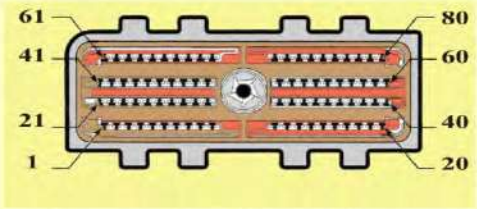




Pin	Wire Color	Circuit Function	Circuit Ends
A	Lt Grn	Shift Solenoid 1 Low	TCM Pin 52
B	Yel/Blk or Yel	Shift Solenoid 2 Low	TCM Pin 33
C	Orn/Wht or Wht	Shift Solenoid 3 Low	TCM Pin 51
D	Pink or Blue	Fluid Press Switch Signal 1	TCM Pin 17
E	Pink or Dk Blue	Fluid Press Switch Signal 2	TCM Pin 79
F	Red or White	Fluid Press Switch Signal 3	TCM Pin 57
G	Yel/Blk or Tan	TFT Sensor Signal	TCM Pin 54
H	Black or Green	TFT/Internal Mode Switch Ground	TCM Pin 58
J	Brown or White	TCC PCS Solenoid Low	TCM Pin 78
K	Lt Grn/Blk or Grn	Fluid Press Switch Signal - Reverse	TCM Pin 77
L	Red/Blk or Orn	Actuator Feed Voltage (HSD1)	TCM Pin 11
M	Brn/Wht or Wht	Pressure Control Solenoid 1 Low	TCM Pin 55
N	Brn or Yel	Actuator Feed Voltage (HSD2)	TCM Pin 71
P	Lt Blu/Wht or Orn	Pressure Control Solenoid 2 Low	TCM Pin 36
R	Purple or Orange	Internal Mode Switch P/N Signal	TCM Pin 38
S	Dk Blu or Blu	Main Modulation Solenoid Low	TCM Pin 74
T	Gray	Internal Mode Switch C Signal	TCM Pin 14
U	Yellow	Internal Mode Switch B Signal	TCM Pin 53
V	Blk/Wht or Blu	Internal Mode Switch A Signal	TCM Pin 73
W	White	Internal Mode Switch P Signal	TCM Pin 34

If Connector Has 21 Pins, That Is The TransID Circuit

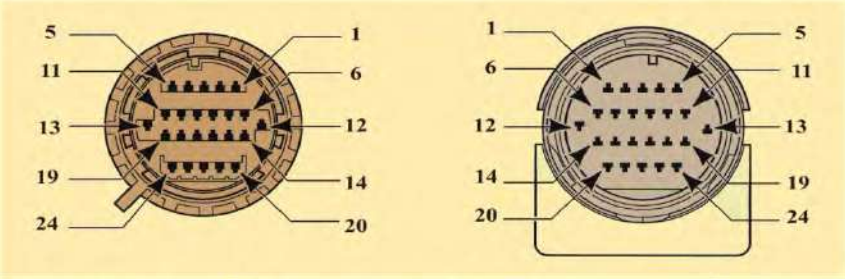
5TH GENERATION TCM



Pin	Circuit Function	Circuit Ends	Pin	Circuit Function	Circuit Ends
1	GPI 6	Vehicle System	41	B+ TCM Output for Neutral Start Relay	Starter
2	GPI 2	Vehicle System	42	GPI 5	Vehicle System
3	Ground (Optional)	Vehicle System	43	GPI 3	Vehicle System
4	GPO 2	Vehicle System	44	PWM Input and TPS (Torque Signal)	Vehicle System
5	GPO 4	Vehicle System	45	GPO 3	Vehicle System
6	CAN High 2 (+) J2284	Data Link Conn	46	CAN 3 Shield	Vehicle System
7	Internal Terminating Resistor CAN 1	Vehicle System	47	Not Used	———
8	CAN 1 Low (-) J1939	Data Link Conn	48	CAN 1 High (+)	J1939
9	TCM Ground	Engine Block	49	CAN 1 Shield	J1939
10	Battery Voltage +	Vehicle System	50	GPO 7	Vehicle System
11	High Side Driver 1 Feed (HSD1)	Trans Conn (14)	51	Shift Solenoid 3 (Low)	Trans Conn (3)
12	TPS 5 Volt Supply	TPS Pin "C"	52	Shift Solenoid 1 (Low)	Trans Conn (1)
13	GPO 8 (Trans Service Lamp)	Vehicle System	53	IMS Range "B"	Trans Conn (21)
14	IMS Range"C"	Trans Conn (20)	54	TFT Sensor Signal	Trans Conn (8)
15	Not Used	———	55	Pressure Control Solenoid 1 (Low)	Trans Conn (15)
16	Not Used	———	56	3 Position Shift Selector Hold Switch	Vehicle System
17	Fluid Pressure Switch 1	Trans Conn (4)	57	Fluid Pressure Switch 3	Trans Conn (6)
18	Not Used	———	58	IMS Ground	Trans Conn (9)
19	Not Used	———	59	Input Speed Sensor (+)	ISS Pin A
20	Turbine Speed Sensor Signal (Low)	TSS Pin B	60	Output Speed Sensor (+)	OSS Pin A
21	GPI 8	Vehicle System	61	GPI 7	Vehicle System
22	GPI 4	Vehicle System	62	GPI 9	Vehicle System
23	GPI 1	PTO	63	Ignition 1 Voltage Supply	Fuse Box
24	Range Inhibit	Vehicle System	64	GPO 6	Vehicle System
25	Vehicle Speed Signal	Speedometer	65	Reverse Lamp Relay	Exterior Lighting
26	Internal Terminating Resistor CAN 2	Vehicle System	66	CAN 2 High (+)	J2284 High
27	CAN 2 Low (-)	J1939	67	CAN 2 Shield	Vehicle System
28	CAN 1 High (+)	Vehicle System	68	Not Used	———
29	Check Trans Lamp	Instr Cluster	69	Ground	Chassis
30	Not Used	———	70	Battery Voltage Supply	Fuse/Relay Box
31	High Side Driver 3 (HSD3)	Trans Conn (13)	71	High Side Driver 2 Feed (HSD2)	Trans Conn (16)
32	CAN 3 High (+)	Vehicle System	72	CAN 3 (-)	Vehicle System
33	Shift Solenoid 2 (Low)	Trans Conn (2)	73	IMS Range "A"	Trans Conn (22)
34	IMS Range "P"	Trans Conn (23)	74	Main Modulation Pressure Solenoid (-)	Trans Conn (19)
35	Not Used	———	75	Not Used	———
36	Pressure Control Solenoid 2 (Low)	Trans Conn (17)	76	Not Used	———
37	Press Control Solenoid 3/RELS (Low)	Trans Conn (12)	77	Fluid Pressure Switch 4 (Reverse)	Trans Conn (11)
38	IMS Neutral Start Input to TCM/ECM	Trans Conn (18)	78	TCC PWM Solenoid (-)	Trans Conn (10)
39	Input Speed Sensor (-)	ISS Pin B	79	Fluid Pressure Switch 2	Trans Conn (7)
40	Output Speed Sensor (-)	OSS Pin B	80	Turbine Speed Sensor Signal (High)	TSS Pin A

*GPI = General Purpose Input
**GPO = General Purpose Output

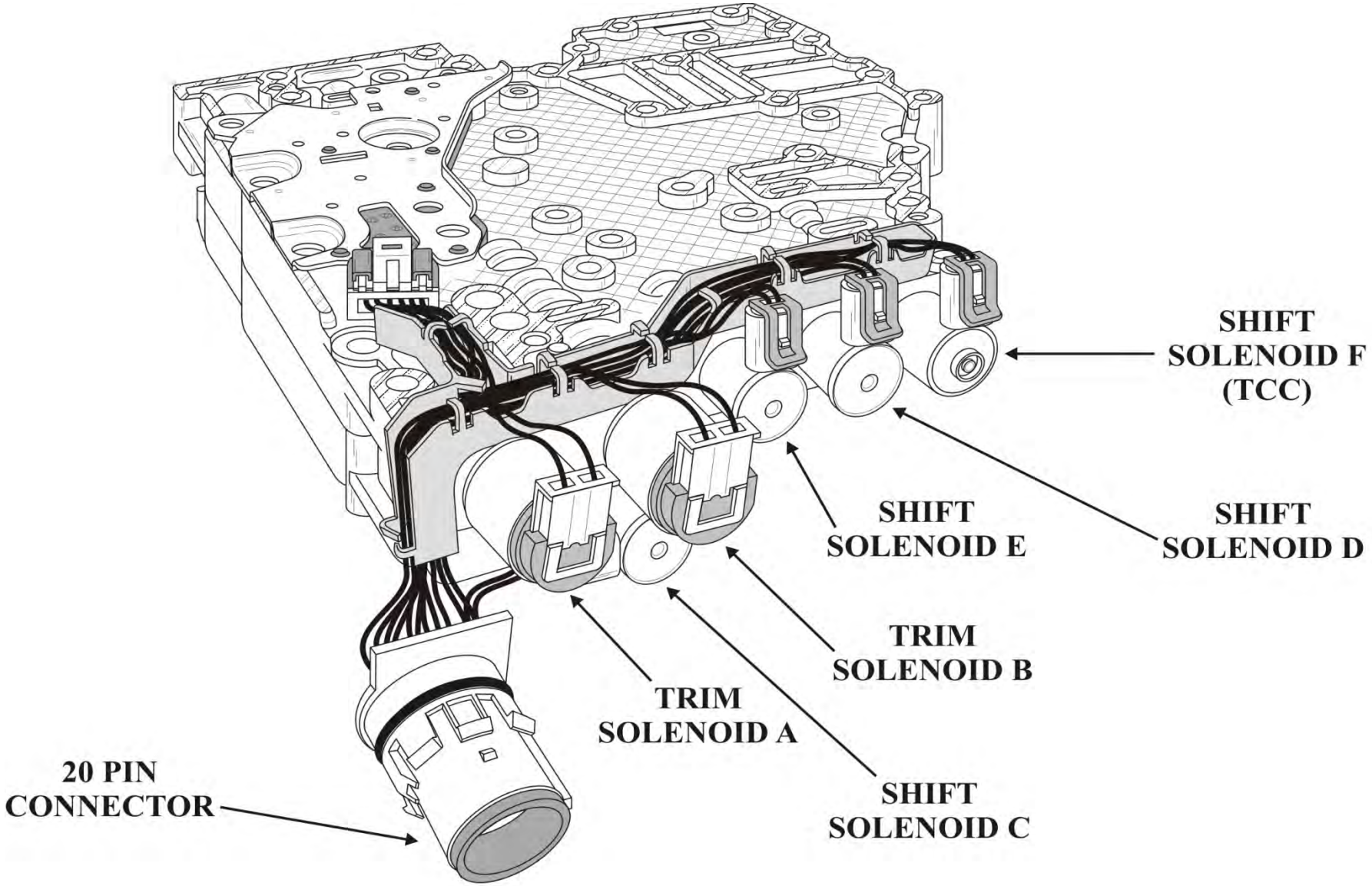
5TH GENERATION 24 PIN CASE CONNECTOR

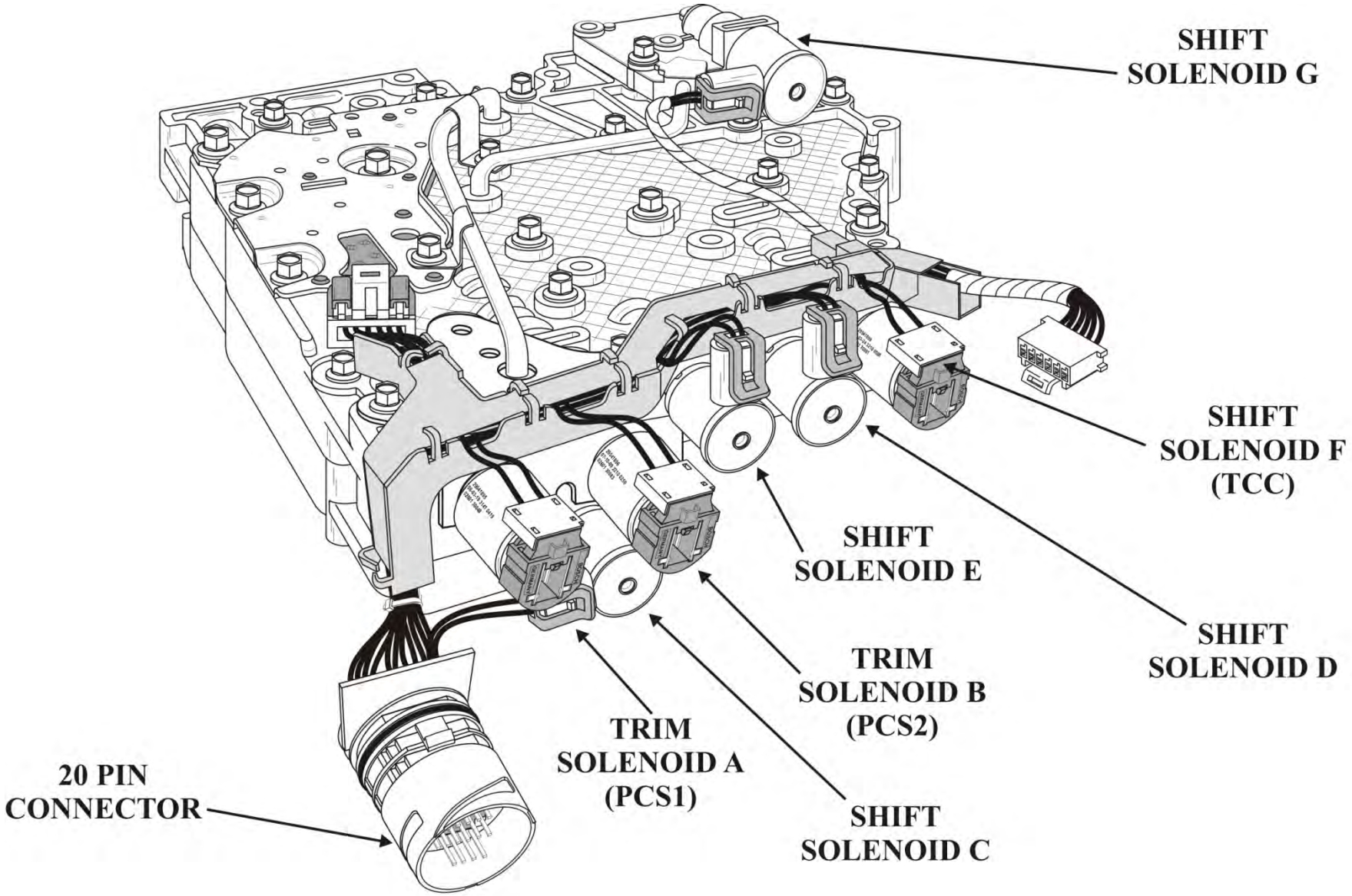


Pin	Wire Number	Circuit Function	Circuit Ends
1	152	Shift Solenoid 1 Low	TCM Pin 52
2	133	Shift Solenoid 2 Low	TCM Pin 33
3	151	Shift Solenoid 3 Low	TCM Pin 51
4	117	Fluid Press Switch Signal 1	TCM Pin 17
5	———	Not Used	———
6	157	Fluid Press Switch Signal 3	TCM Pin 57
7	179	Fluid Press Switch Signal 2	TCM Pin 79
8	154	TFT Sensor Signal	TCM Pin 54
9	158	TFT, IMS Ground	TCM Pin 58
10	178	TCC Solenoid (Low)	TCM Pin 78
11	177	Fluid Press Switch 4 Signal - Reverse	TCM Pin 77
12	137	Pressure Control Solenoid 3 Low*	TCM Pin 37
13	131	Actuator Feed Voltage (HSD3)*	TCM Pin 31
14	111	Actuator Feed Voltage (HSD1)	TCM Pin 11
15	155	Pressure Control Solenoid 1 (Low)	TCM Pin 55
16	171	Actuator Feed Voltage (HSD2)	TCM Pin 71
17	136	Pressure Control Solenoid 2 (Low)	TCM Pin 36
18	138	Internal Mode Switch P/N Signal	TCM Pin 38
19	174	Main Modulation Solenoid (Low)	TCM Pin 74
20	114	Internal Mode Switch C Signal	TCM Pin 14
21	153	Internal Mode Switch B Signal	TCM Pin 53
22	173	Internal Mode Switch A Signal	TCM Pin 73
23	134	Internal Mode Switch P Signal	TCM Pin 34
24	———	TRANSID	———

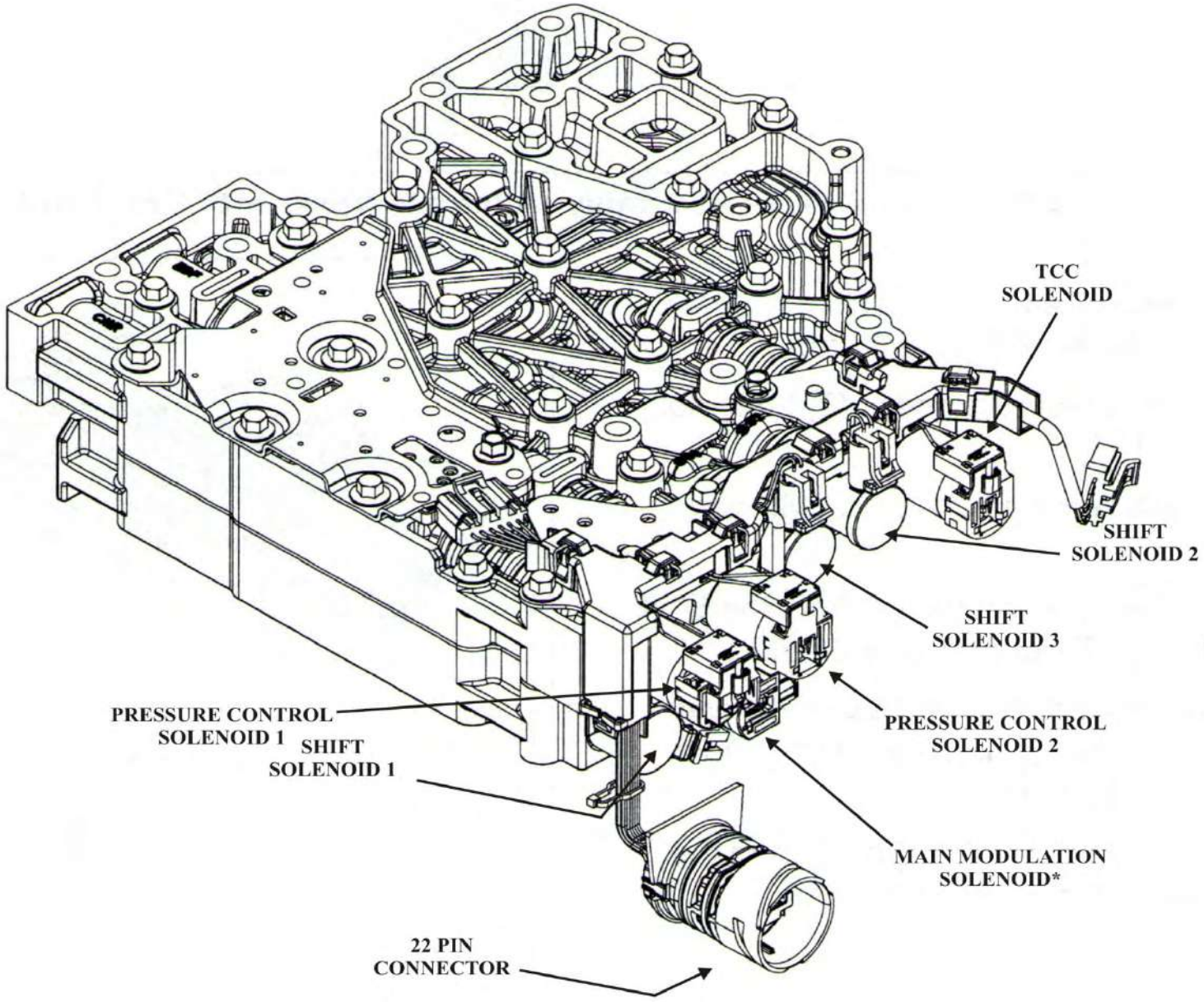
*If Equipped With "Neutral At A Stop".

1ST – 2ND GENERATION SOLENOID ID





2010 UPRATE 4TH & 5TH GENERATION SOLENOID ID (WITHOUT RELS)



MAIN MODULATION LINE PRESSURE CONTROL

- As of the 2010 Uprate, the Main Modulation Solenoid, formerly known as Solenoid "G", is now a variable controlled solenoid rather than an ON/OFF.
- This allows main line pressure to be constantly adjusted to load imposed on on the transmission as well as throttle position.
- Electrical system failures will cause the TCM to shut down the solenoid circuit which will result in maximum line pressure operation.
- Some diagnostic codes will allow only a stepped increment type of line pressure operation.
- In order for full functionality of Variable Modulated Pressure feature, Shift Energy Management (SEM) and Low Range Torque Protection (LRTP) must be fully operational.

LINE PRESSURE SPECS WITH SEM

Gear Select Range	Main Pressure @ 750-775 Rpm Variable Modulated Main Pressure Active Off	Main Pressure @ 1400 Rpm Variable Modulated Main Pressure Active Off	Main Pressure @ 770-775 Rpm Variable Modulated Main Pressure Active	Main Pressure @ 1400 Rpm Variable Modulated Main Pressure Active
Reverse			369 - 451 kPa 54 - 65 PSI	720 - 880 kPa 104 - 128 PSI
Neutral			414 - 605 kPa 60 - 88 PSI	450 - 550 kPa 65 - 80 PSI
1st Range	1170 - 1430 kPa 170 - 207 PSI	1584 - 1936 kPa 230 - 281 PSI	360 - 440 kPa 52 - 64 PSI	639 - 781 kPa 93 - 113 PSI
2nd Range	792 - 968 kPa 115 - 140 PSI	1566 - 1914 kPa 227 - 278 PSI	369 - 451 kPa 54 - 65 PSI	648 - 792 kPa 64 - 115 PSI
3rd Range	801 - 979 kPa 116 - 142 PSI	1566 - 1914 kPa 227 - 278 PSI	360 - 440 kPa 52 - 64 PSI	594 - 726 kPa 86 - 105 PSI
4th Range	999 - 1221 kPa 145 - 177 PSI	1611 - 1969 kPa 234 - 286 PSI	351 - 429 kPa 51 - 62 PSI	513 - 627 kPa 74 - 91 PSI
5th Range	954 - 1166 kPa 138 - 169 PSI	1593 - 1947 kPa 231 - 282 PSI	396 - 484 kPa 57 - 70 PSI	648 - 792 kPa 94 - 115 PSI
6th Range	954 - 1166 kPa 138 - 169 PSI	1593 - 1947 kPa 231 - 282 PSI	387 - 473 kPa 56 - 69 PSI	594 - 726 kPa 86 - 105 PSI

LINE PRESSURE SPECS WITHOUT SEM

Gear Select Range	Main Pressure @ 750-775 Rpm Variable Modulated Main Pressure Active Off	Main Pressure @ 1400 Rpm Variable Modulated Main Pressure Active Off	Main Pressure @ 770-775 Rpm Variable Modulated Main Pressure Active	Main Pressure @ 1400 Rpm Variable Modulated Main Pressure Active
Reverse			486 - 594 kPa 70 - 86 PSI	621 - 759 kPa 90 - 110 PSI
Neutral			414 - 506 kPa 60 - 74 PSI	450 - 550 kPa 62 - 80 PSI
1st Range	1170 - 1430 kPa 170 - 207 PSI	1575 - 1925 kPa 228 - 279 PSI	387 - 473 kPa 59 - 69 PSI	783 - 957 kPa 114 - 139 PSI
2nd Range	792 - 968 kPa 115 - 140 PSI	1575 - 1925 kPa 228 - 279 PSI	396 - 484 kPa 57 - 70 PSI	873 - 1072 kPa 127 - 155 PSI
3rd Range	819 - 1001 kPa 119 - 145 PSI	1575 - 1925 kPa 228 - 279 PSI	396 - 484 kPa 57 - 70 PSI	756 - 924 kPa 110 - 134 PSI
4th Range	1080 - 1320 kPa 157 - 191 PSI	1611 - 1969 kPa 234 - 286 PSI	378 - 462 kPa 55 - 67 PSI	639 - 781 kPa 93 - 113 PSI
5th Range	1008 - 1232 kPa 146 - 179 PSI	1602 - 1958 kPa 232 - 284 PSI	441 - 539 kPa 64 - 78 PSI	819 - 1001 kPa 119 - 145 PSI
6th Range	999 - 1221 kPa 145 - 177 PSI	1602 - 1958 kPa 232 - 284 PSI	423 - 517 kPa 61 - 75 PSI	765 - 935 kPa 111 - 136 PSI

4TH & 5TH GENERATION "PROGNOSTICS"

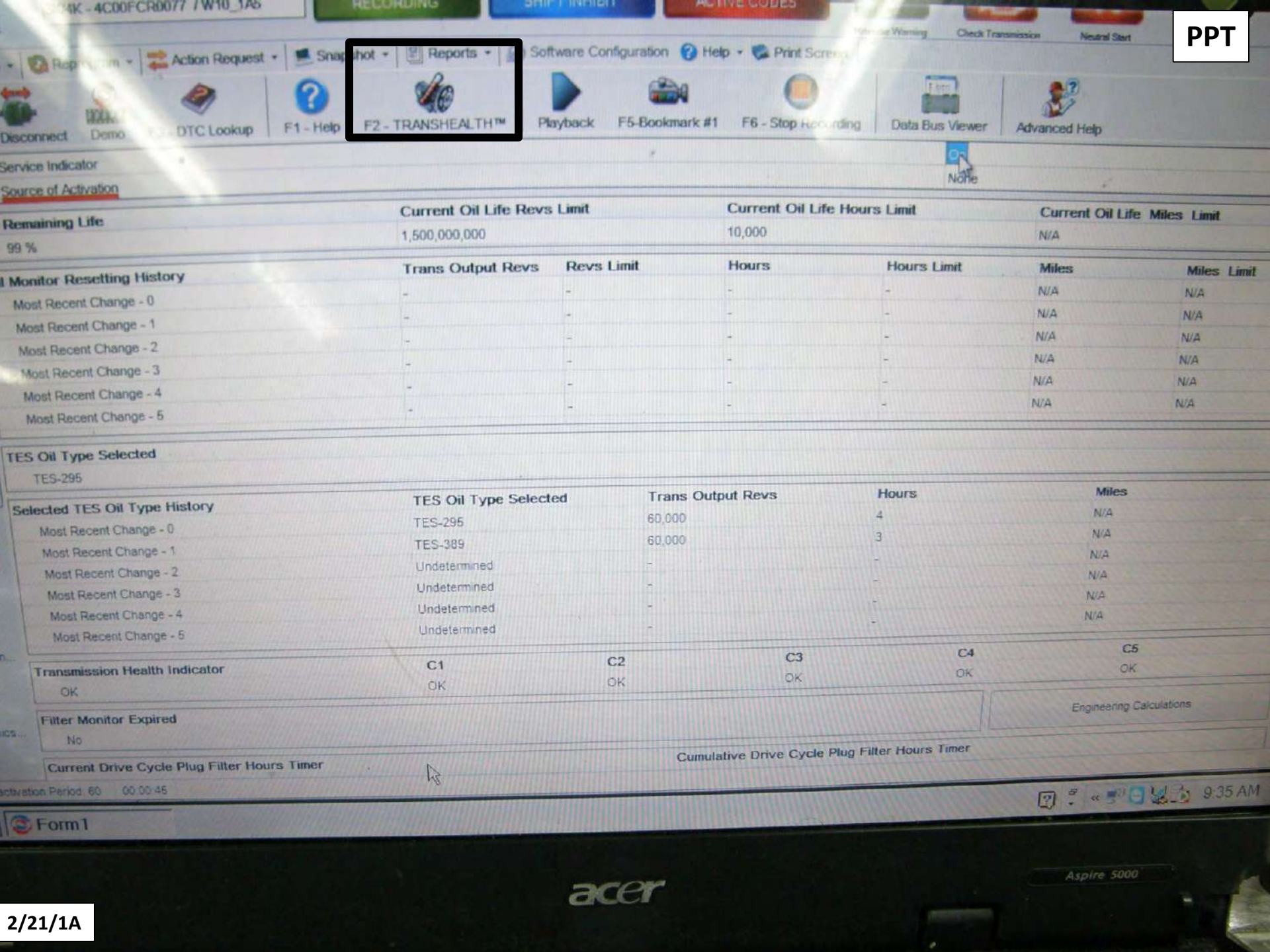
- At the start of production for the 2009 model year Allison introduced "Prognostics" for the GEN 4 control systems and continued its use into the present for GEN 5 control systems.

- "Prognostics" is software that monitors transmission oil life, filter life and transmission health. The software is a combination of computer strategies designed to maximize transmission fluid, filter and friction plate health.

- "Prognostics can be enabled or disabled using the Allison "DOC" Service Tool.

- The monitoring process is performed by the TCM which utilizes the following inputs:
  - Shifts Per Mile
  - Transmission Revolutions
  - Hours Of Run Time
  - Clutch Adaptives

- "Prognostics" provides the following additional DTC capability:
  - P0897 = Transmission Fluid Deteriorated
  - P088B = Transmission Filter Very Deteriorated
  - P2789 = Clutch Adaptive Learning At Limit


PPT
Action Request
Reports
Software Configuration
Help
Print Screen
Disconnect
Demo
DTC Lookup
F1 - Help
F2 - TRANSHEALTH™
Playback
F5-Bookmark #1
F6 - Stop Recording
Data Bus Viewer
Advanced Help
Service Indicator
None
Source of Activation
Remaining Life
99 %
Current Oil Life Revs Limit
1,500,000,000
Current Oil Life Hours Limit
10,000
Current Oil Life Miles Limit
N/A
Monitor Resetting History
Trans Output Revs
Revs Limit
Hours
Hours Limit
Miles
Miles Limit
Most Recent Change - 0
Most Recent Change - 1
Most Recent Change - 2
Most Recent Change - 3
Most Recent Change - 4
Most Recent Change - 5
TES Oil Type Selected
TES-295
Selected TES Oil Type History
TES Oil Type Selected
Trans Output Revs
Hours
Miles
Most Recent Change - 0
TES-295
60,000
4
N/A
Most Recent Change - 1
TES-389
60,000
3
N/A
Most Recent Change - 2
Undetermined
Most Recent Change - 3
Undetermined
Most Recent Change - 4
Undetermined
Most Recent Change - 5
Undetermined
Transmission Health Indicator
OK
C1
OK
C2
OK
C3
OK
C4
OK
C5
OK
Filter Monitor Expired
No
Engineering Calculations
Current Drive Cycle Plug Filter Hours Timer
Cumulative Drive Cycle Plug Filter Hours Timer
9:35 AM
Form1
acer
Aspire 5000
2/21/1A

TES-295

PPT

Selected TES Oil Type History	TES Oil Type Selected	Trans Output Re
Most Recent Change - 0	TES-295	60,000
Most Recent Change - 1	TES-389	60,000
Most Recent Change - 2	Undetermined	-
Most Recent Change - 3	Undetermined	-
Most Recent Change - 4	Undetermined	-
Most Recent Change - 5	Undetermined	-

Transmission Health Indicator	C1	C2
OK	OK	OK

Filter Monitor Expired

No

Current Drive Cycle Plug Filter Hours Timer Cumulative D

tivation Period: 60 | 00:03:00

PPT

Type Selected	Trans Output Revs	Hours	Miles
	60,000	4	N/A
	60,000	3	N/A
ined	-	-	N/A
ined	-	-	N/A
ined	-	-	N/A
ined	-	-	N/A

C2	C3	C4	C5
OK	OK	OK	OK

Engineering Calculations

Cumulative Drive Cycle Plug Filter Hours Timer

acer

Aspire 5000

4/21

4TH & 5TH GENERATION "PROGNOSTICS"

Allison insists that only approved fluids and high quality filters be used for "Prognostics " to have maximum effect. The following is a list of approved fluids.

Approved Synthetic Fluids

TES 295 Approval Number	Approved Product Marketer	Brandname
AN-011001	Castrol Heavy Duty Lubricants	TranSynd
AN-031002	BP Lubricants	Autran Syn 295
AN-031003	Cognis Corporation	Emgard 2805
AN-031004	International Truck & Engine Company	Fleetrite Synthetic ATF
AN-051005	ExxonMobil Lubricants	Mobil Delvac Synthetic ATF
AN-071006	John Deere & Company	HD SynTran
AN-101007	Volvo Trucks North America	Bulldog Synthetic ATF
AN-121009	Case New Holland CNH	HD Synthetic ATF
AN-121008	Shell International Petroleum Co. LTD.	Shell Spirax S6 ATF A295


Allison
TRANSMISSION
TranSynd
Full Synthetic Transmission Fluid
Exceeds
Allison TES 295
Proven
performance
transmissions
Castrol
1 U.S. Gallon

4TH & 5TH GENERATION "PROGNOSTICS"

OIL LIFE MONITOR:

- Vehicles equipped with "Prognostics" are equipped with a "Service Trans" Lamp which will illuminate for 2 minutes after each TCM initialization when the TCM determines that the "Oil Life Monitor" has detected that oil life is at 2%. Oil Life can be reset to 100% using the Allison "DOC" Service Tool or by the following manual reset procedure:

- Using the manual shift selector lever, select N-R-N-R-N-D-N pausing briefly *(Less Than 3 Seconds)* between each selector lever movement with key ON and engine OFF.

- If the reset is not performed, then the "Check Trans" Lamp will illuminate and DTC P0897 = "Transmission Fluid Deteriorated" will be set.

4TH & 5TH GENERATION "PROGNOSTICS"

FILTER LIFE MONITOR:

- The "Service Trans" Lamp will flash with each TCM initialization when the TCM determines that the oil filter has reached the end of its life.

- The lamp will continue to flash for 2 minutes after Drive has been selected.

- The filter life can be reset to 100% using the Allison "DOC" Service Tool or it can be manually reset by using the manual shift selector lever, select N-R-N-R-N-D-N with key ON and engine OFF pausing briefly between each selector lever movement *(Less Than 3 Seconds).*

- Failure to perform the reset will result in the "Check Trans" Lamp illuminating and DTC P088B = "Transmission Filter Very Deteriorated" being set.

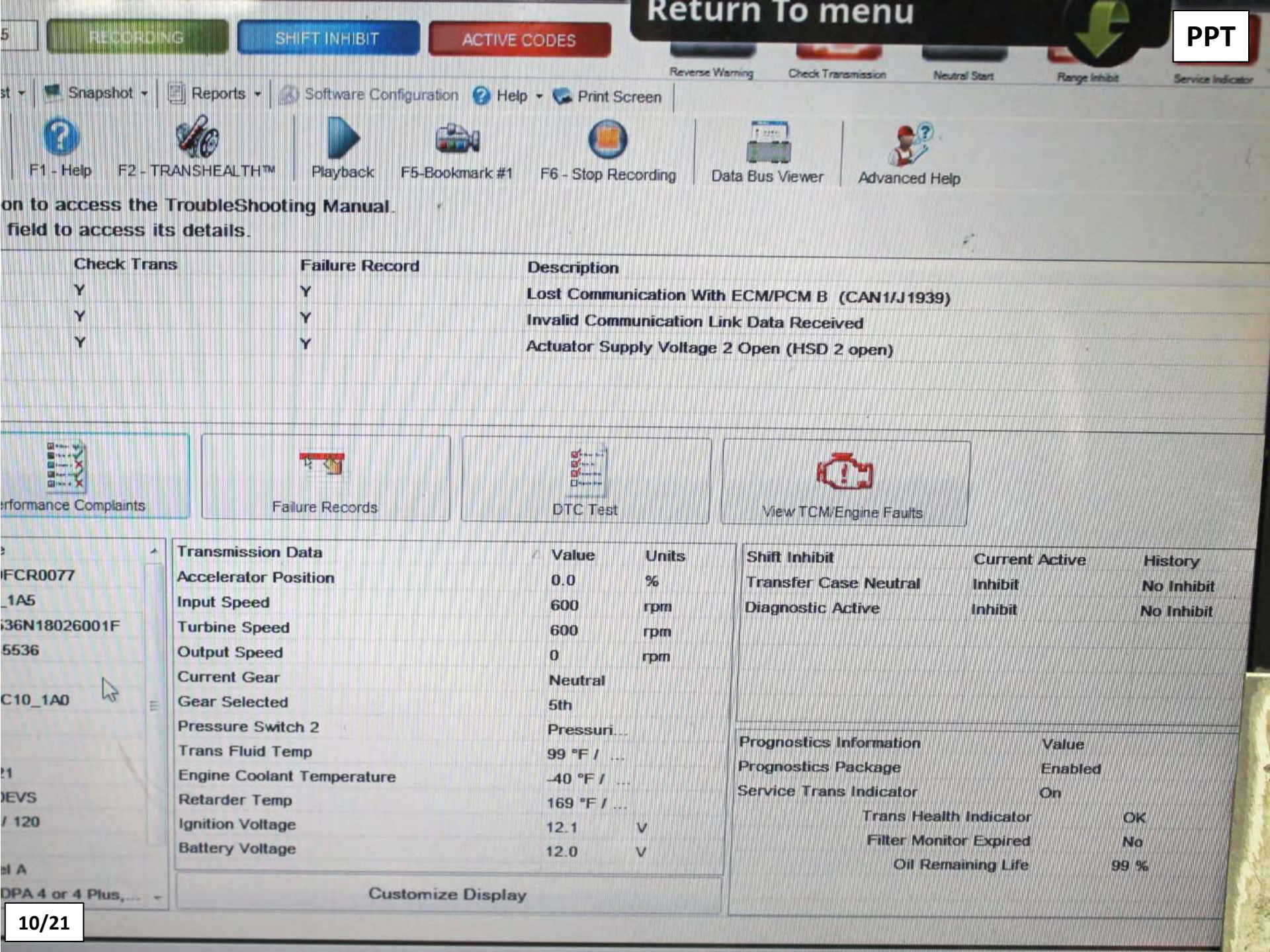
4TH & 5TH GENERATION "PROGNOSTICS"

TRANSMISSION HEALTH MONITOR:

- The "Service Trans" Lamp will illuminate steadily with each TCM initialization when the TCM determines that the "Transmission Health Monitor" indicates that remaining clutch life reached approximately 10%, or if clutch clearance exceeds maximum value.

- The indicator will reset when the clutch clearance issue is resolved or by using the Allison "DOC" Service Tool.

- If the "Health Monitor" has not been reset within 100 hours, the "Check Trans" Lamp will illuminate and DTC P2789 = "Clutch Adaptive Learning At Limit" will set.

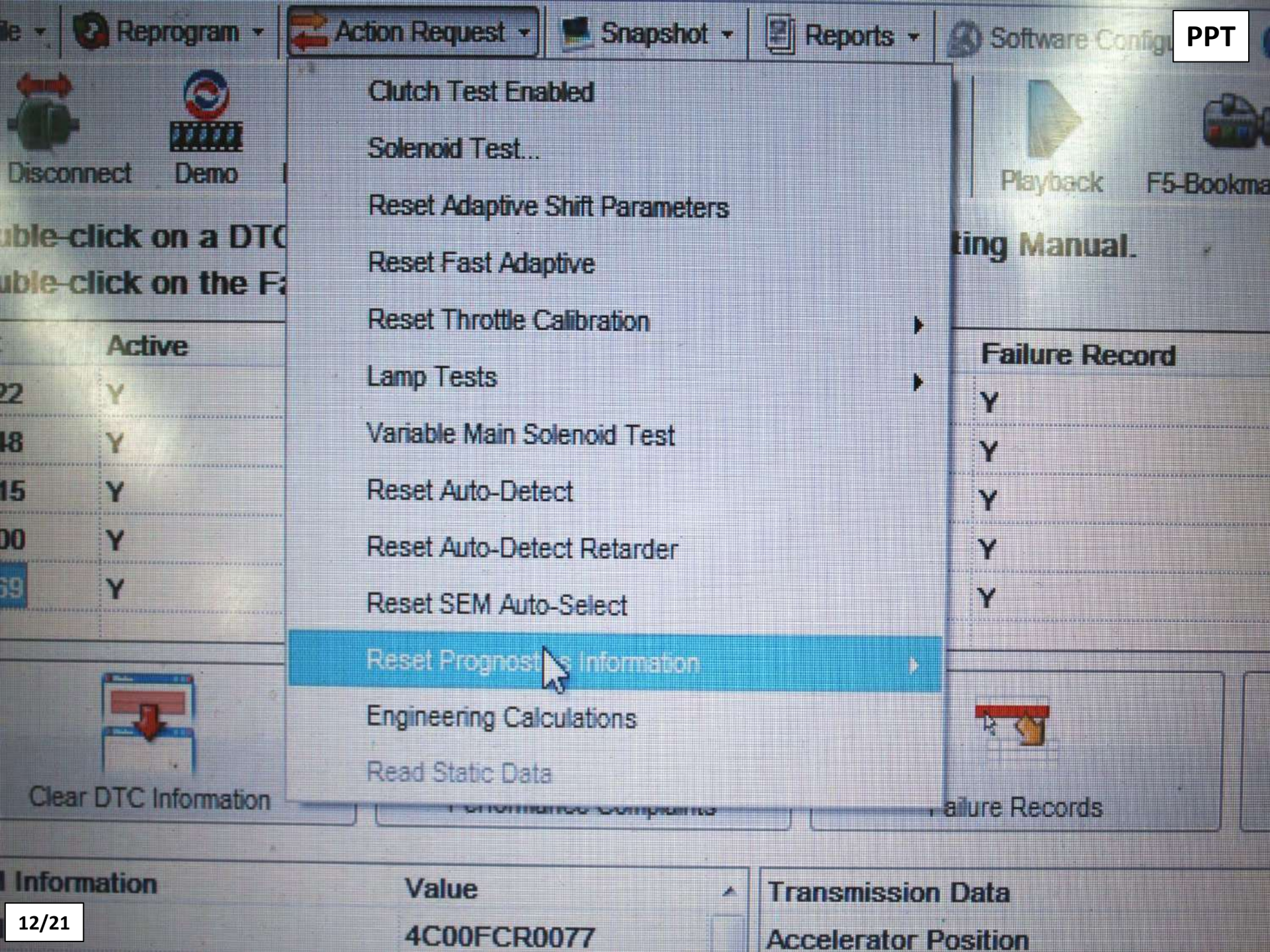

RECORDING
SHIFT INHIBIT
ACTIVE CODES
Return To menu
PPT
Reverse Warning
Check Transmission
Neutral Start
Range Inhibit
Service Indicator
Snapshot
Reports
Software Configuration
Help
Print Screen
F1 - Help
F2 - TRANSHEALTH™
Playback
F5-Bookmark #1
F6 - Stop Recording
Data Bus Viewer
Advanced Help
on to access the TroubleShooting Manual.
field to access its details.
Check Trans
Failure Record
Description
Y
Y
Lost Communication With ECM/PCM B (CAN1/J1939)
Y
Y
Invalid Communication Link Data Received
Y
Y
Actuator Supply Voltage 2 Open (HSD 2 open)
rformance Complaints
Failure Records
DTC Test
View TCM/Engine Faults
FCR0077
_1A5
536N18026001F
5536
C10_1A0
EVS
/ 120
DPA 4 or 4 Plus,...
Transmission Data
Value
Units
Accelerator Position
0.0
%
Input Speed
600
rpm
Turbine Speed
600
rpm
Output Speed
0
rpm
Current Gear
Neutral
Gear Selected
5th
Pressure Switch 2
Pressuri...
Trans Fluid Temp
99 °F / ...
Engine Coolant Temperature
-40 °F / ...
Retarder Temp
169 °F / ...
Ignition Voltage
12.1
V
Battery Voltage
12.0
V
Customize Display
Shift Inhibit
Current Active
History
Transfer Case Neutral
Inhibit
No Inhibit
Diagnostic Active
Inhibit
No Inhibit
Prognostics Information
Value
Prognostics Package
Enabled
Service Trans Indicator
On
Trans Health Indicator
OK
Filter Monitor Expired
No
Oil Remaining Life
99 %
10/21

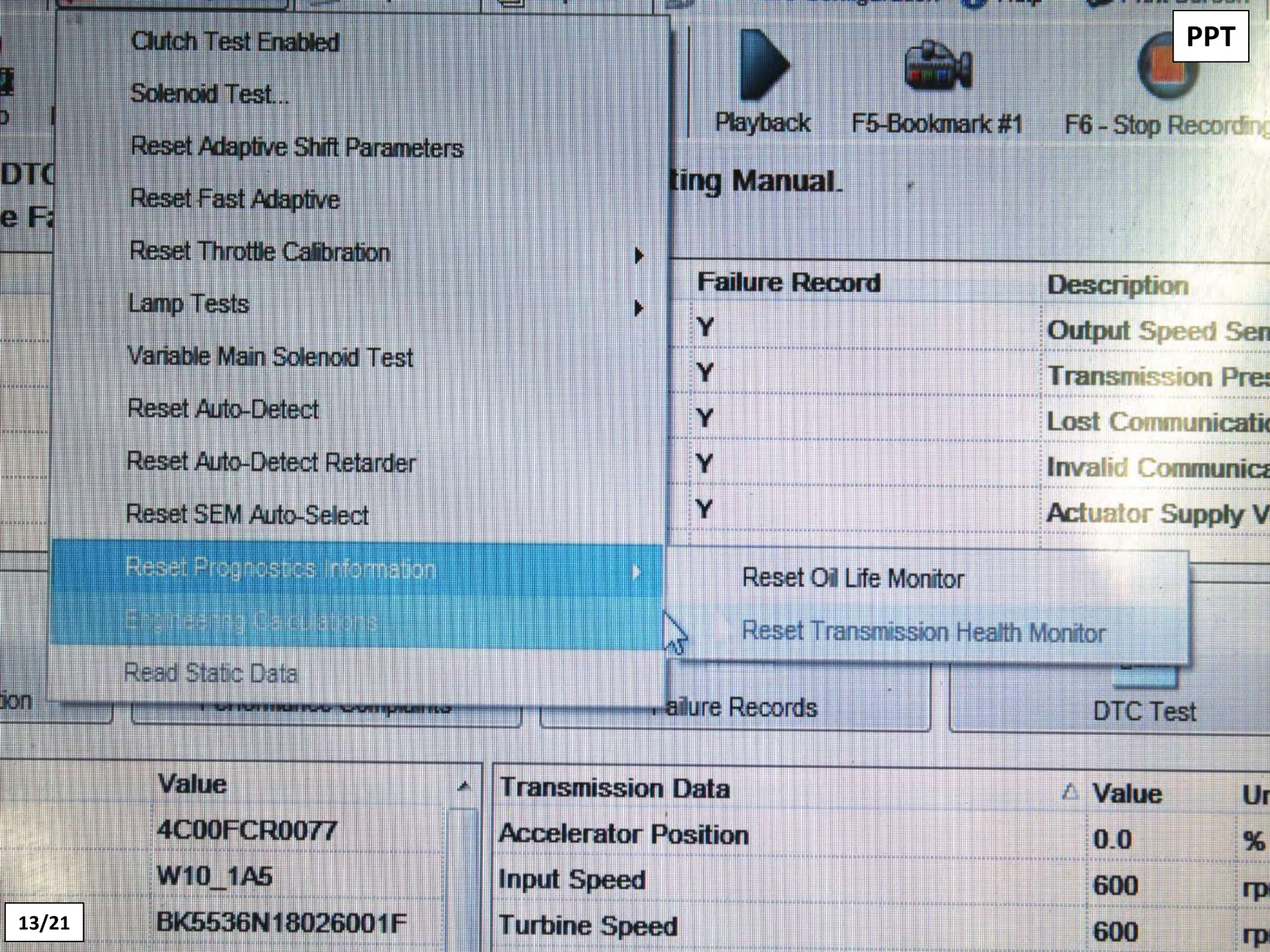
Diagnostic Active	Inhibit	No Inhibit

Prognostics Information	Value
Prognostics Package	Enabled
Service Trans Indicator	On
Trans Health Indicator	OK
Filter Monitor Expired	No
Oil Remaining Life	99 %

PPT

11/21


Reprogram
Action Request
Snapshot
Reports
Software Configu
PPT
Disconnect
Demo
Playback
F5-Bookma
uble-click on a DTC
uble-click on the Fa
ting Manual.
Clutch Test Enabled
Solenoid Test...
Reset Adaptive Shift Parameters
Reset Fast Adaptive
Reset Throttle Calibration
Lamp Tests
Variable Main Solenoid Test
Reset Auto-Detect
Reset Auto-Detect Retarder
Reset SEM Auto-Select
Reset Prognostics Information
Engineering Calculations
Read Static Data
Active
Failure Record
22
48
15
00
69
Y
Clear DTC Information
ailure Records
Information
Value
4C00FCR0077
Transmission Data
Accelerator Position
12/21


PPT
Clutch Test Enabled
Solenoid Test...
Reset Adaptive Shift Parameters
Reset Fast Adaptive
Reset Throttle Calibration
Lamp Tests
Variable Main Solenoid Test
Reset Auto-Detect
Reset Auto-Detect Retarder
Reset SEM Auto-Select
Reset Prognostics Information
Engineering Calibrations
Read Static Data
Reset Oil Life Monitor
Reset Transmission Health Monitor
Playback
F5-Bookmark #1
F6 - Stop Recording
ting Manual
Failure Record
Description
Y
Output Speed Sen
Y
Transmission Pres
Y
Lost Communicati
Y
Invalid Communica
Y
Actuator Supply V
ailure Records
DTC Test
Value
4C00FCR0077
W10_1A5
BK5536N18026001F
Transmission Data
Value
Accelerator Position
0.0
%
Input Speed
600
rp
Turbine Speed
600
rp
13/21

SHALLOW PAN SUMP FILTER

PREVIOUS FILTER

CURRENT FILTER

SHALLOW PAN

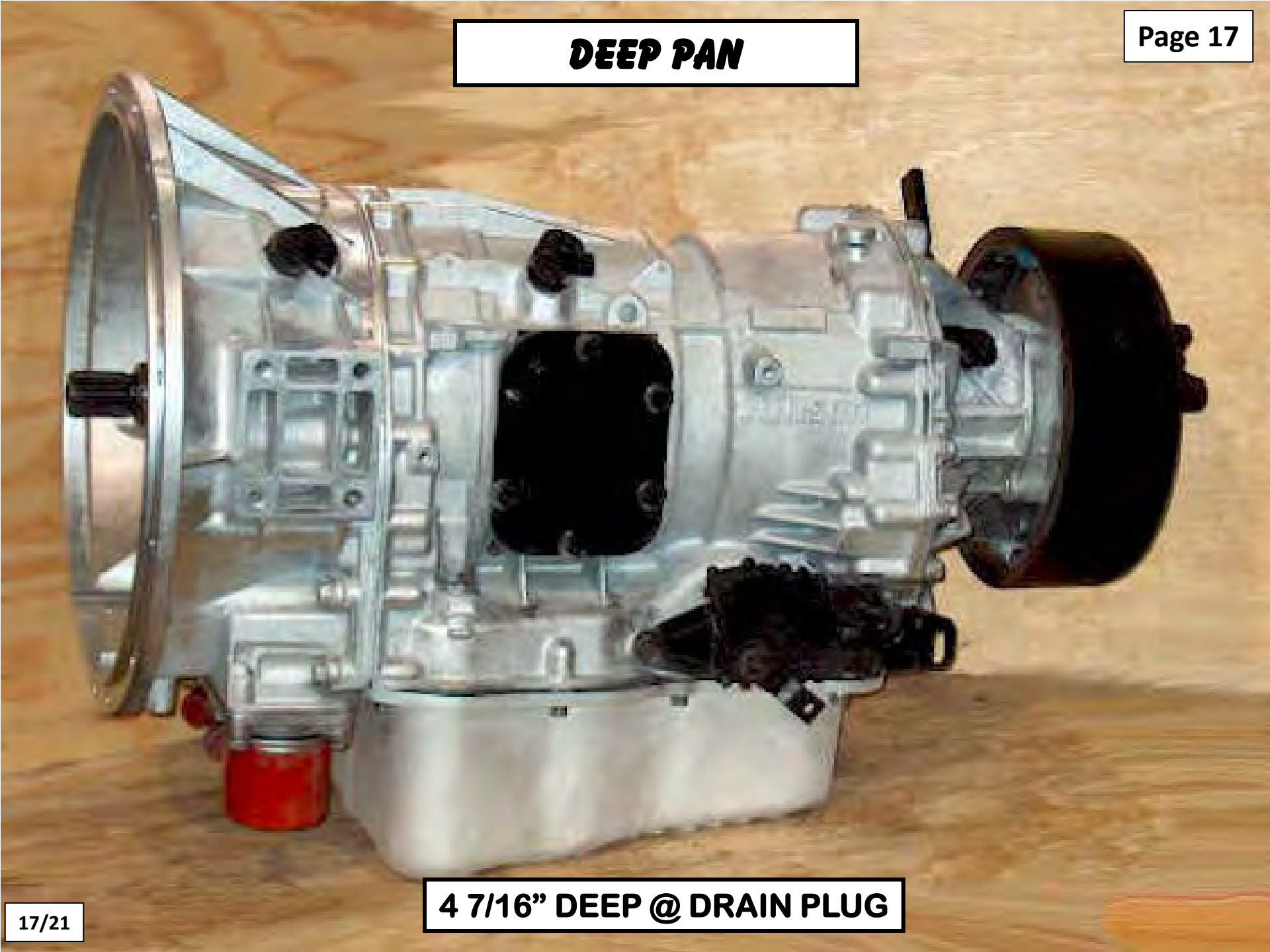
2 5/8” DEEP @ DRAIN PLUG

DEEP PAN SUMP FILTER

PREVIOUS FILTER

CURRENT FILTER

DEEP PAN



4 7/16” DEEP @ DRAIN PLUG

HIGH PERFORMANCE DEEP PAN

PPT

TRANSMISSION FLUID SPECIFICATIONS

SUMP TYPE	DRY FILL*	SERVICE FILL*
	QUARTS (LITERS)	QUARTS (LITERS)
STANDARD (DEEP) PAN	14.8 (14)	10.6 (10)
SHALLOW PAN	12.7 (12)	7.4 (7)

**Does not include cooler, cooler lines and hoses.*
Check dip stick to adjust final fluid level.

SPIN-ON TRANSMISSION FILTER

SPIN-ON TRANSMISSION FILTER

WATCH FOR MAGNET RESTRICTING HOLES ON SOME FILTERS

REDUCED ENGINE LOAD AT A STOP (RELS)

- At the start of production for the 2013 Model Year, Allison introduced to the 1000/2000 Series "Reduced Engine Load At A Stop" (RELS) which can also be referred to as Neutral At A Stop which is meant to reduce engine load which results in better fuel economy.

- RELS will require new software as well as additional hardware and is considered optional which means not all vehicles will have this feature.

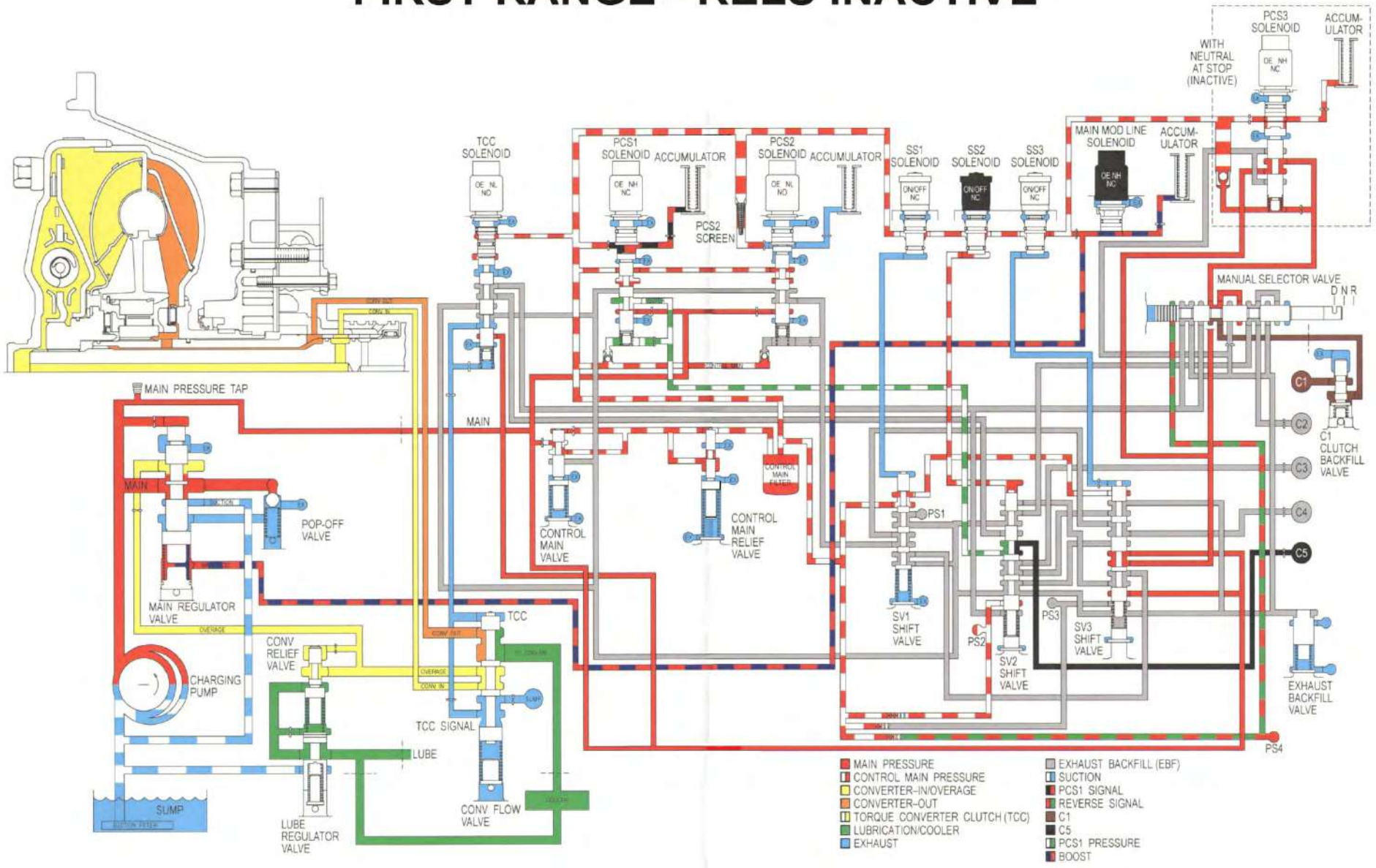
- When RELS is active, the TCM will command low pressure to the C1 Clutch using Pressure Control Solenoid 3 and its regulating valve.

- To Activate RELS, the vehicle must be in 1st Range, at a stop, service brakes applied, throttle at zero % and the TCM must see B+ from a customer supplied Brake Pressure Switch. RELS deactivates when the service brake is released.

- Should RELS become in a Stuck ON or OFF condition, DTC P071A = "Neutral at A Stop Input Failed ON" will be set.

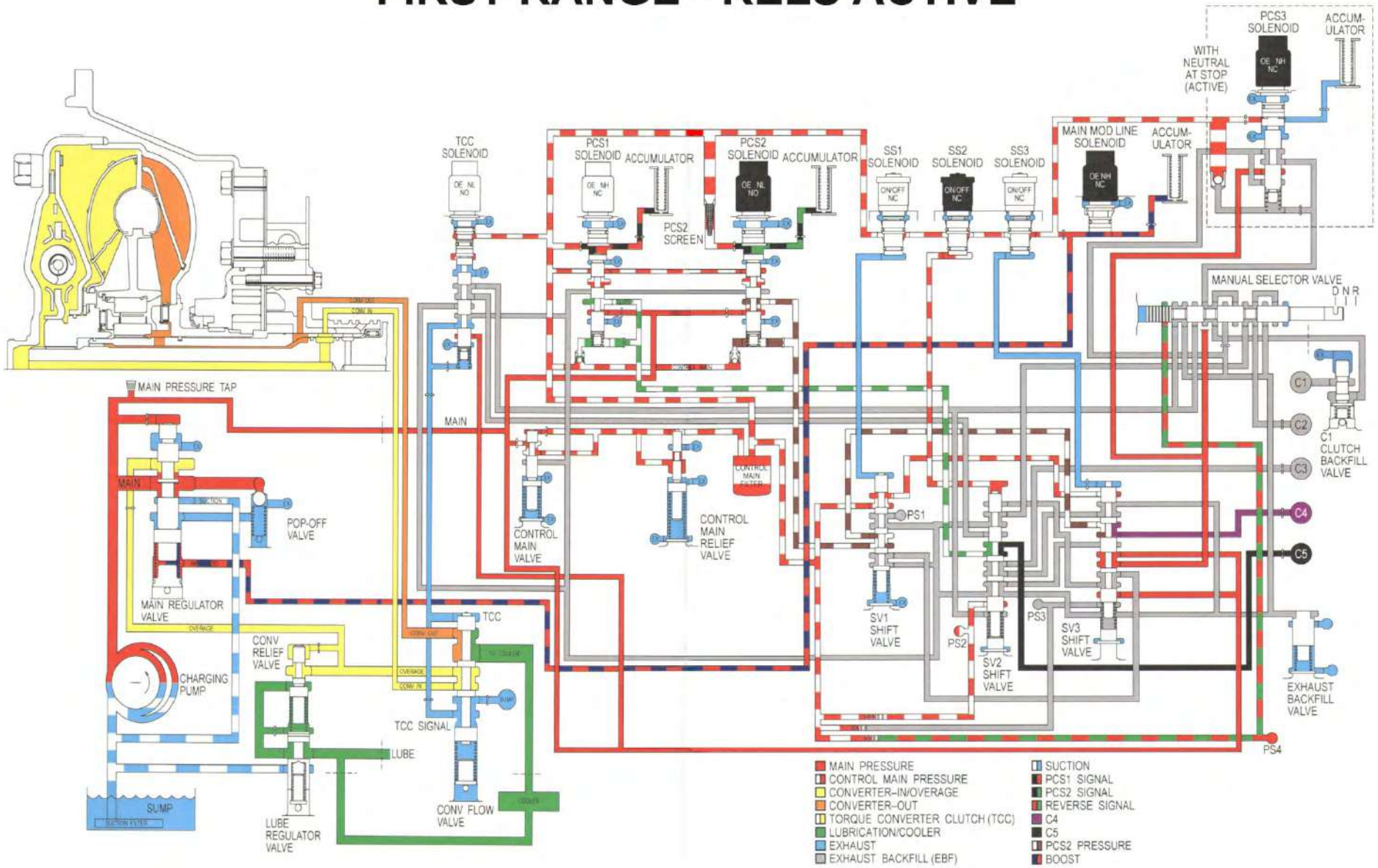
PPT

FIRST RANGE - RELS INACTIVE



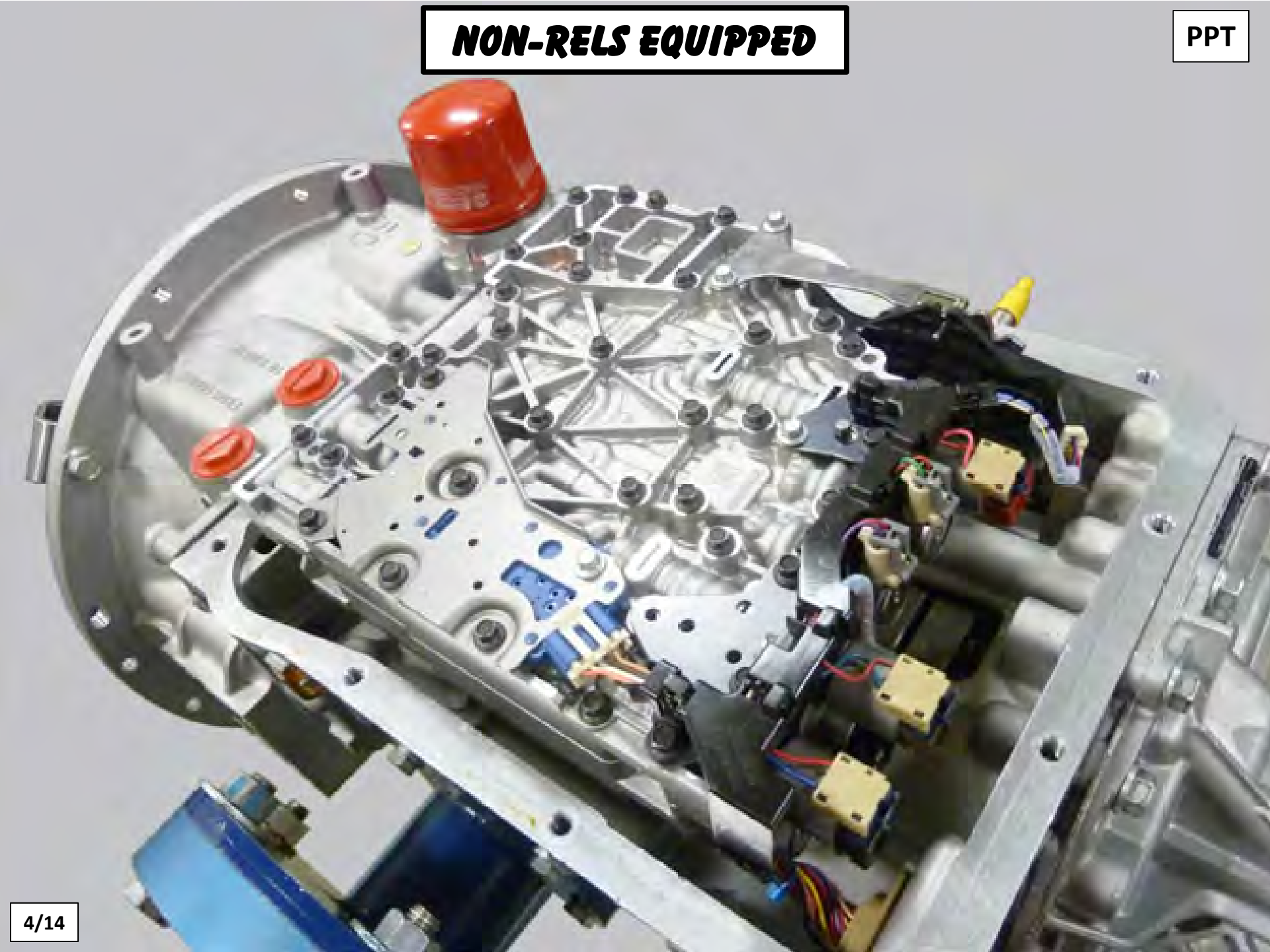
PPT

FIRST RANGE - RELS ACTIVE

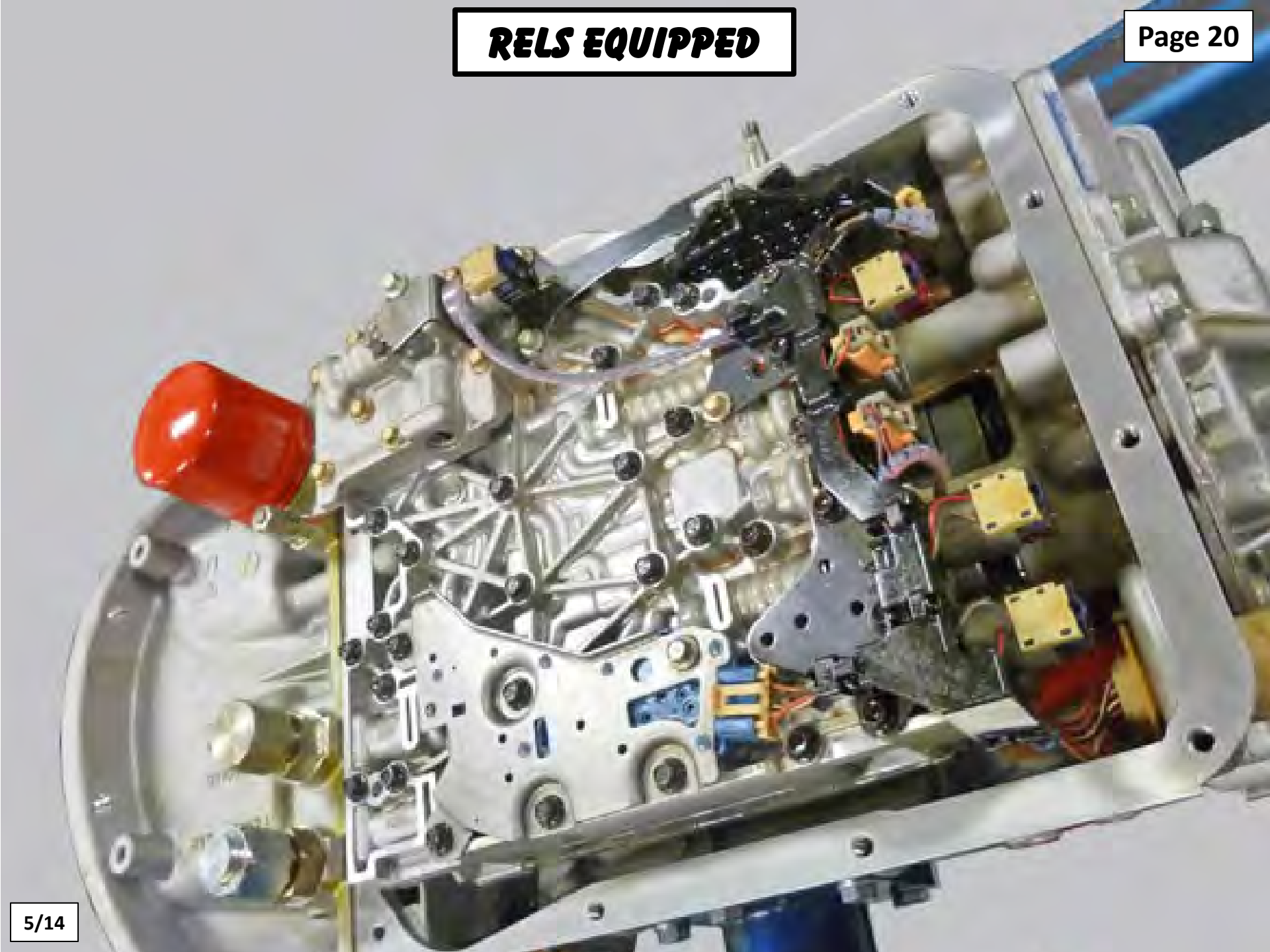


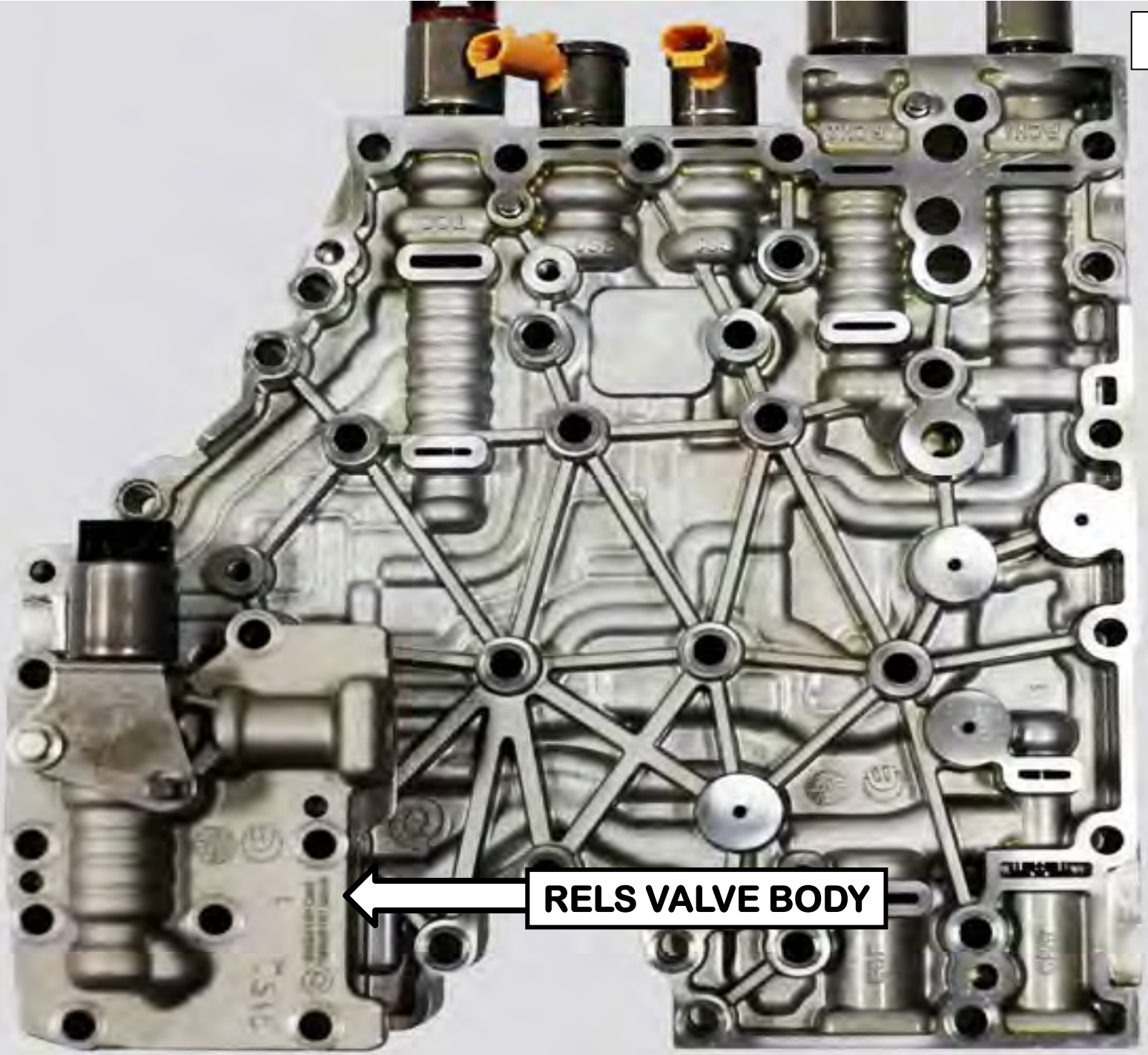
NON-RELS EQUIPPED

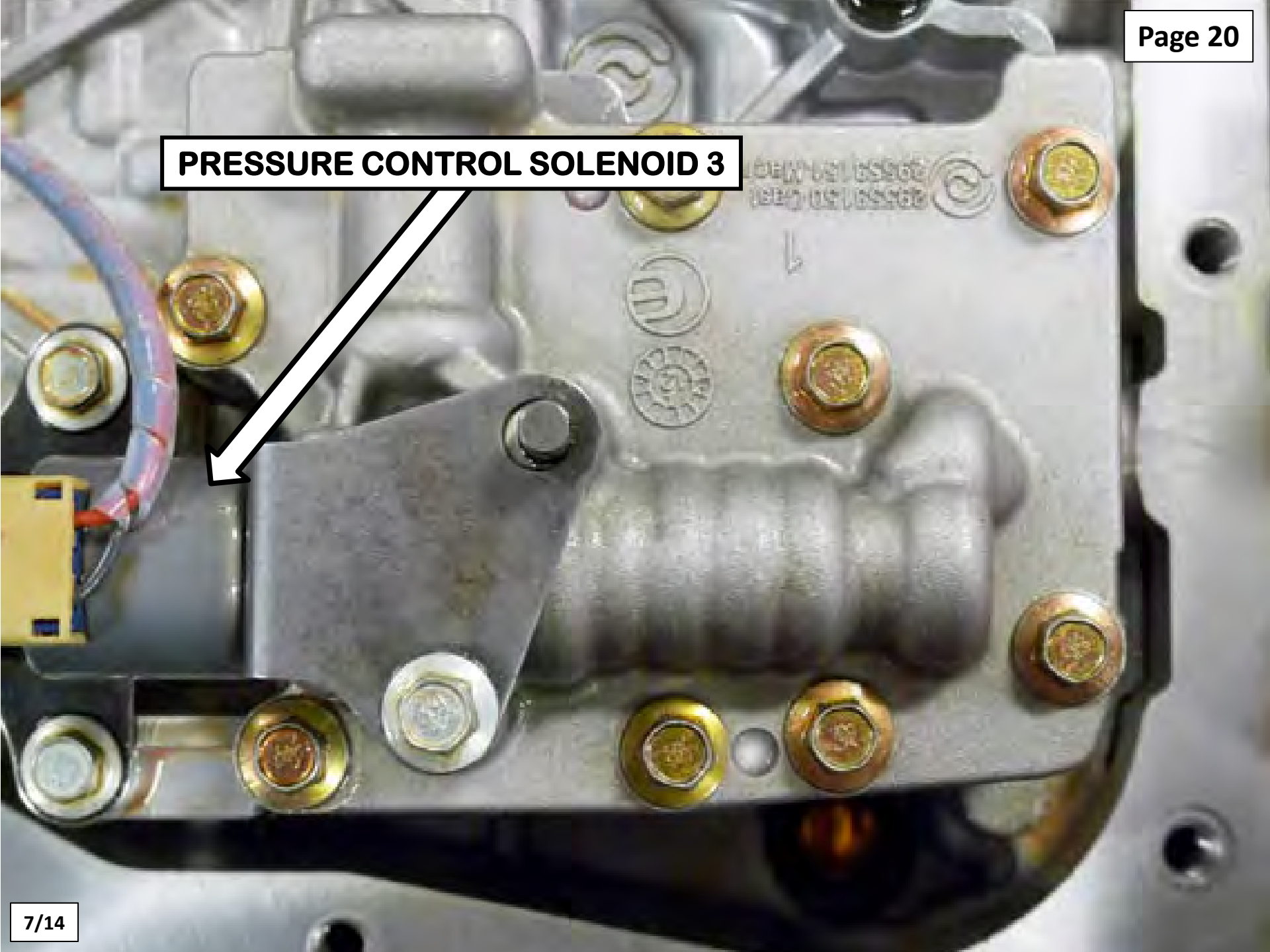
PPT



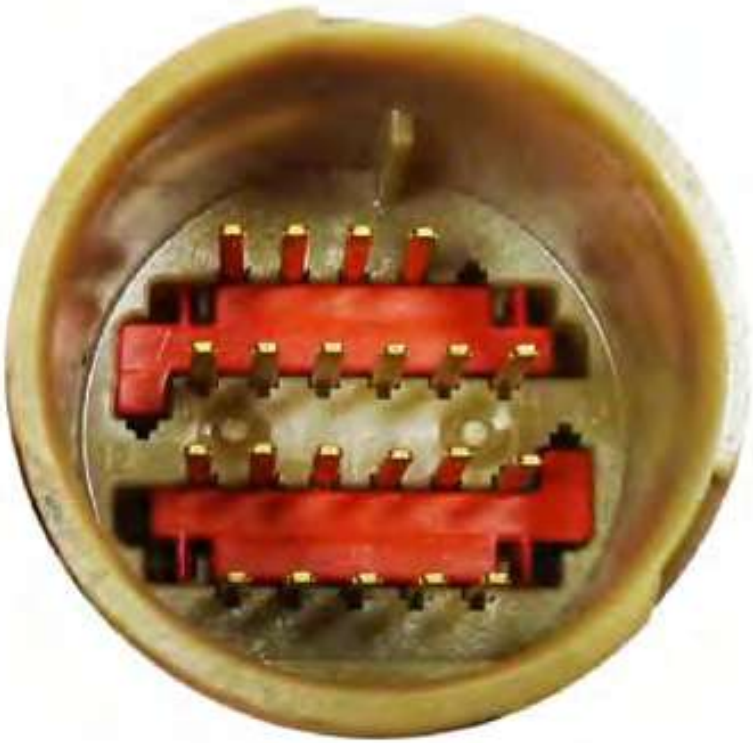
RELS EQUIPPED



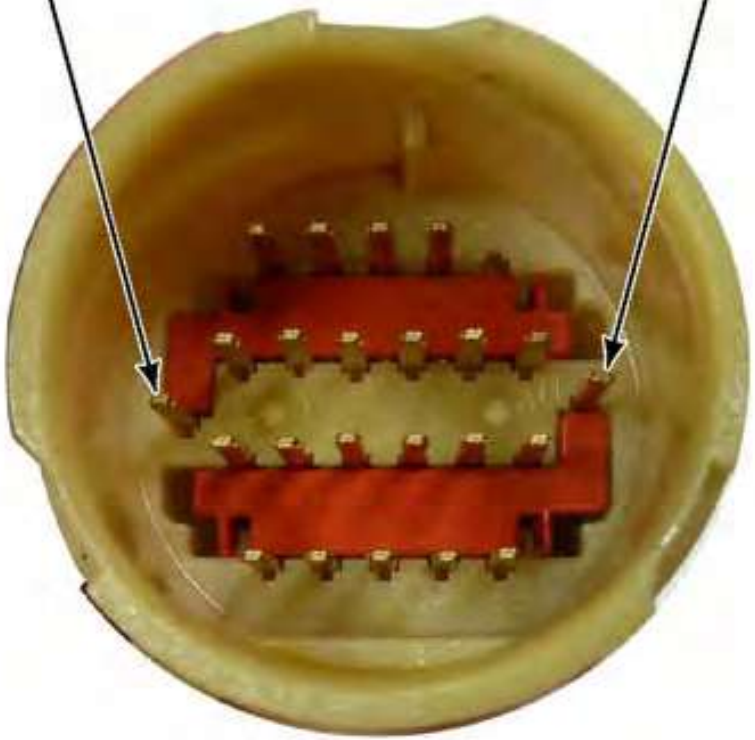

RELS VALVE BODY


PRESSURE CONTROL SOLENOID 3

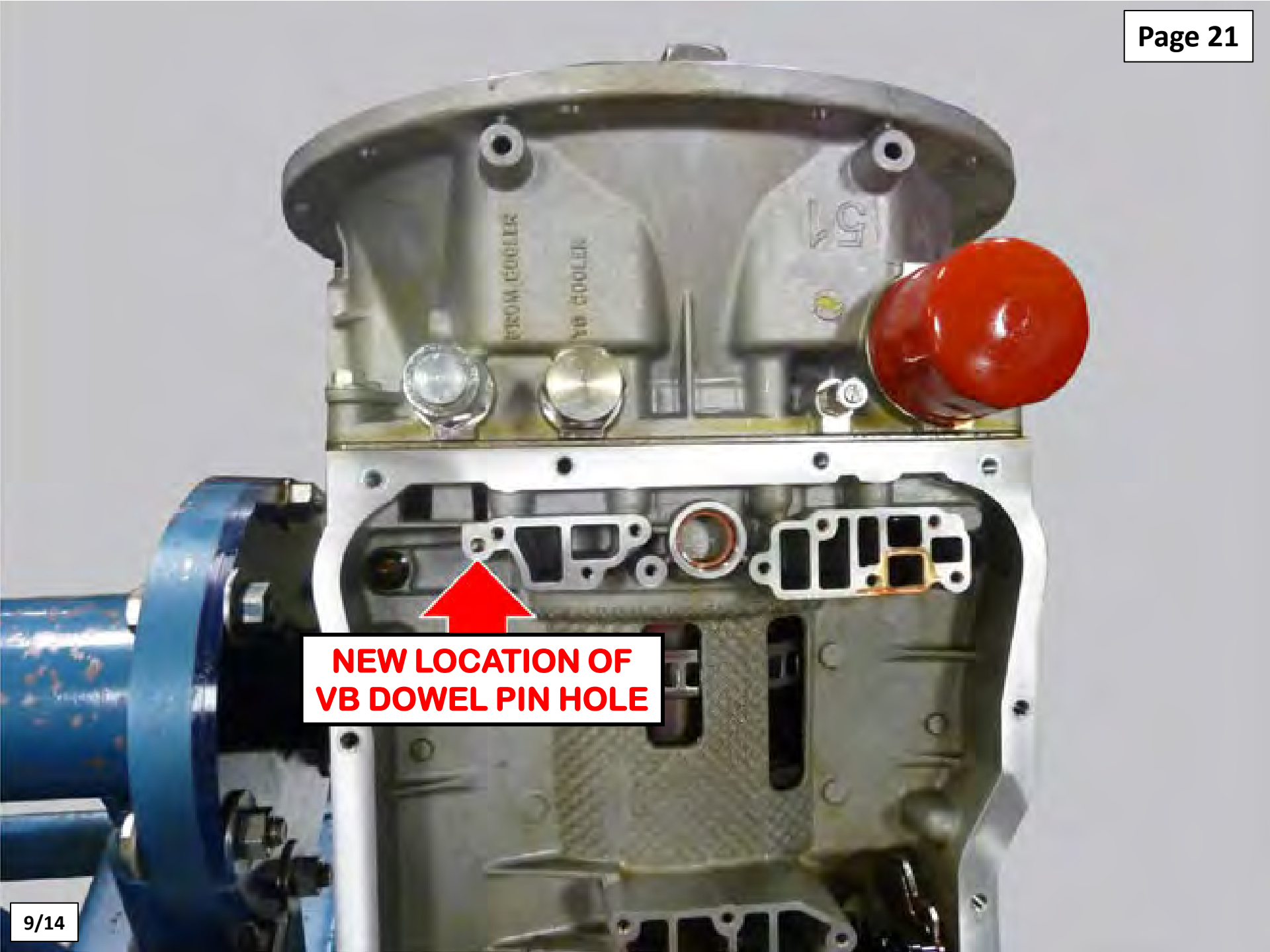
TRANSMISSION CASE CONNECTOR

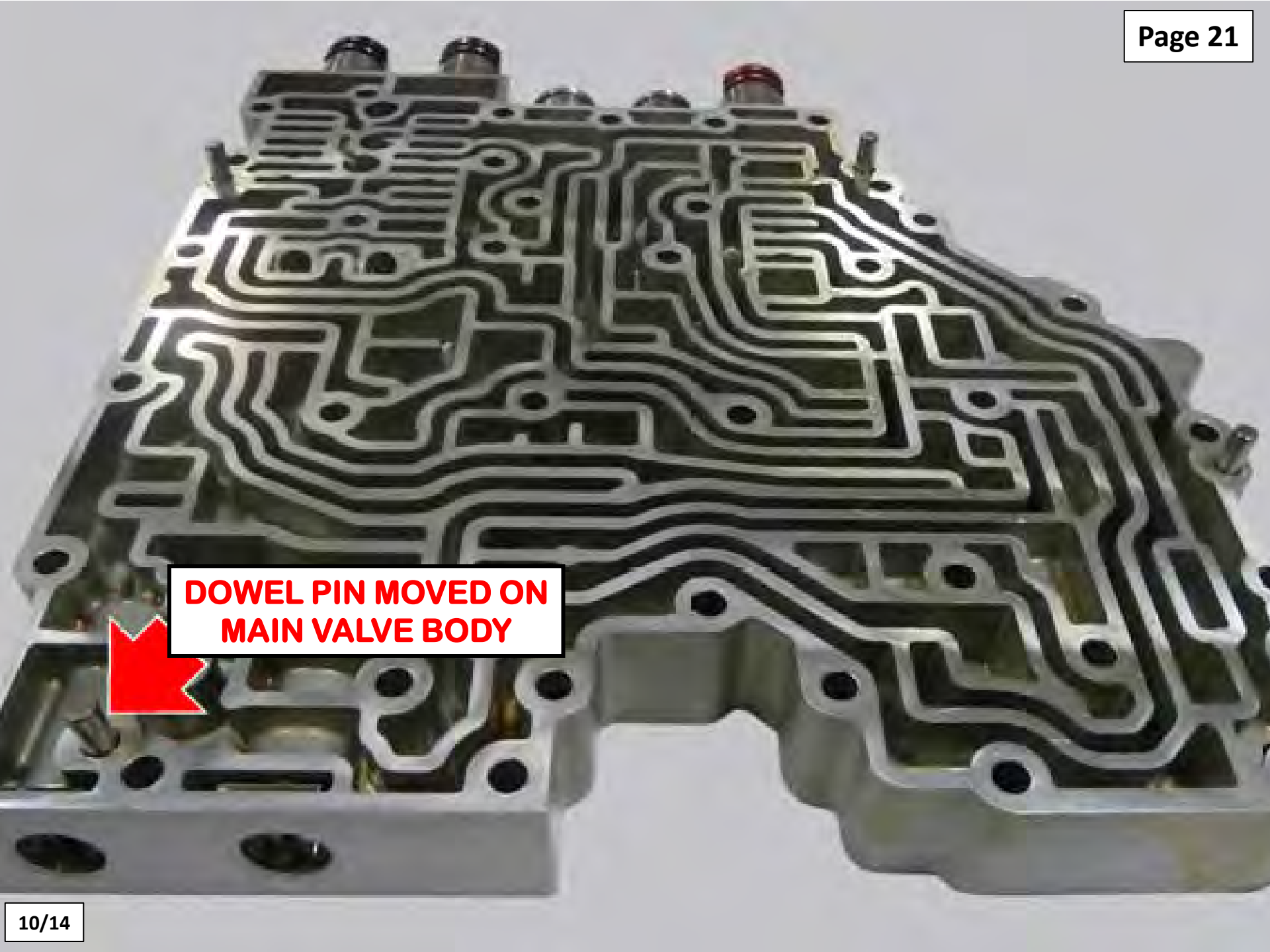


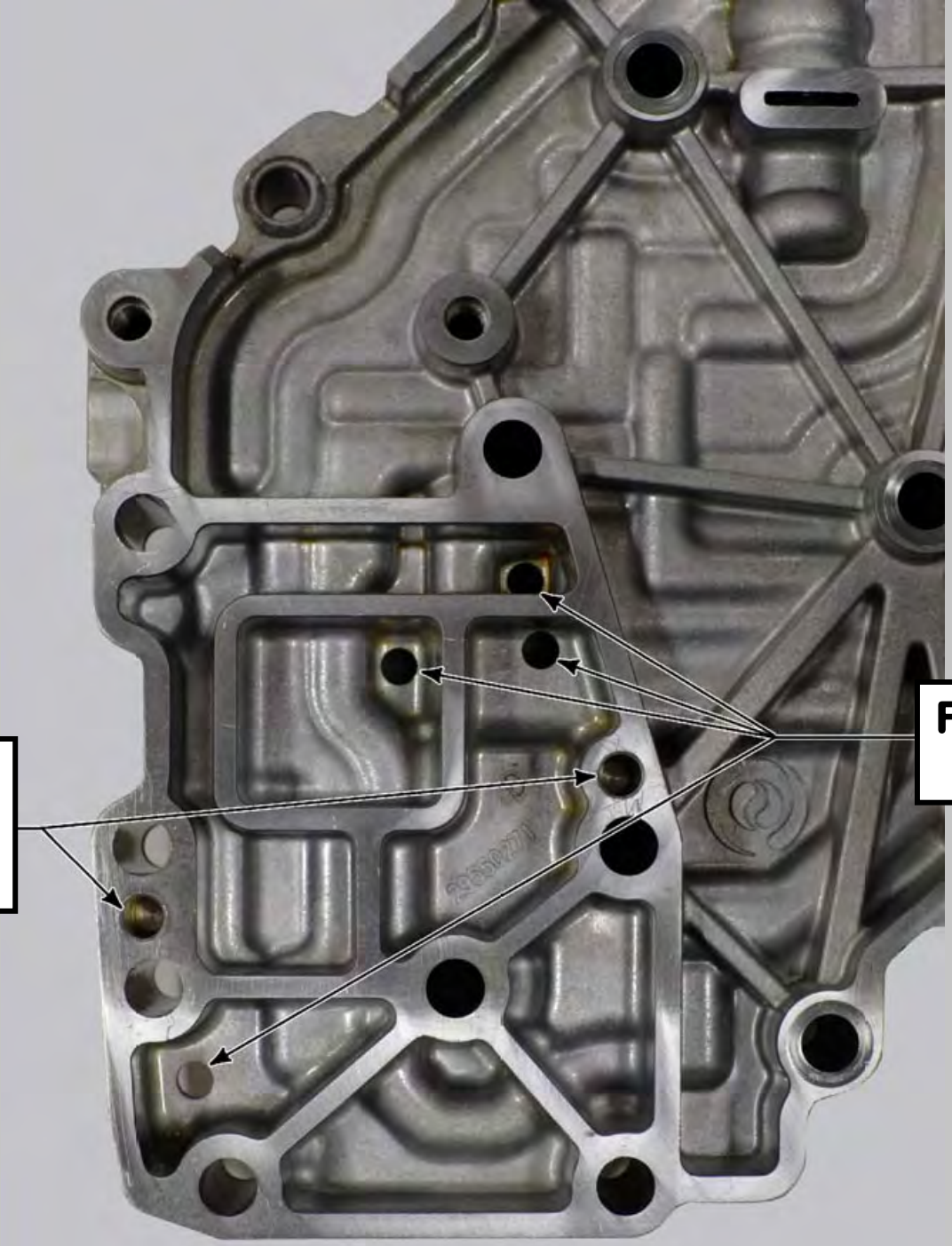
WITHOUT RELS
22 PINS



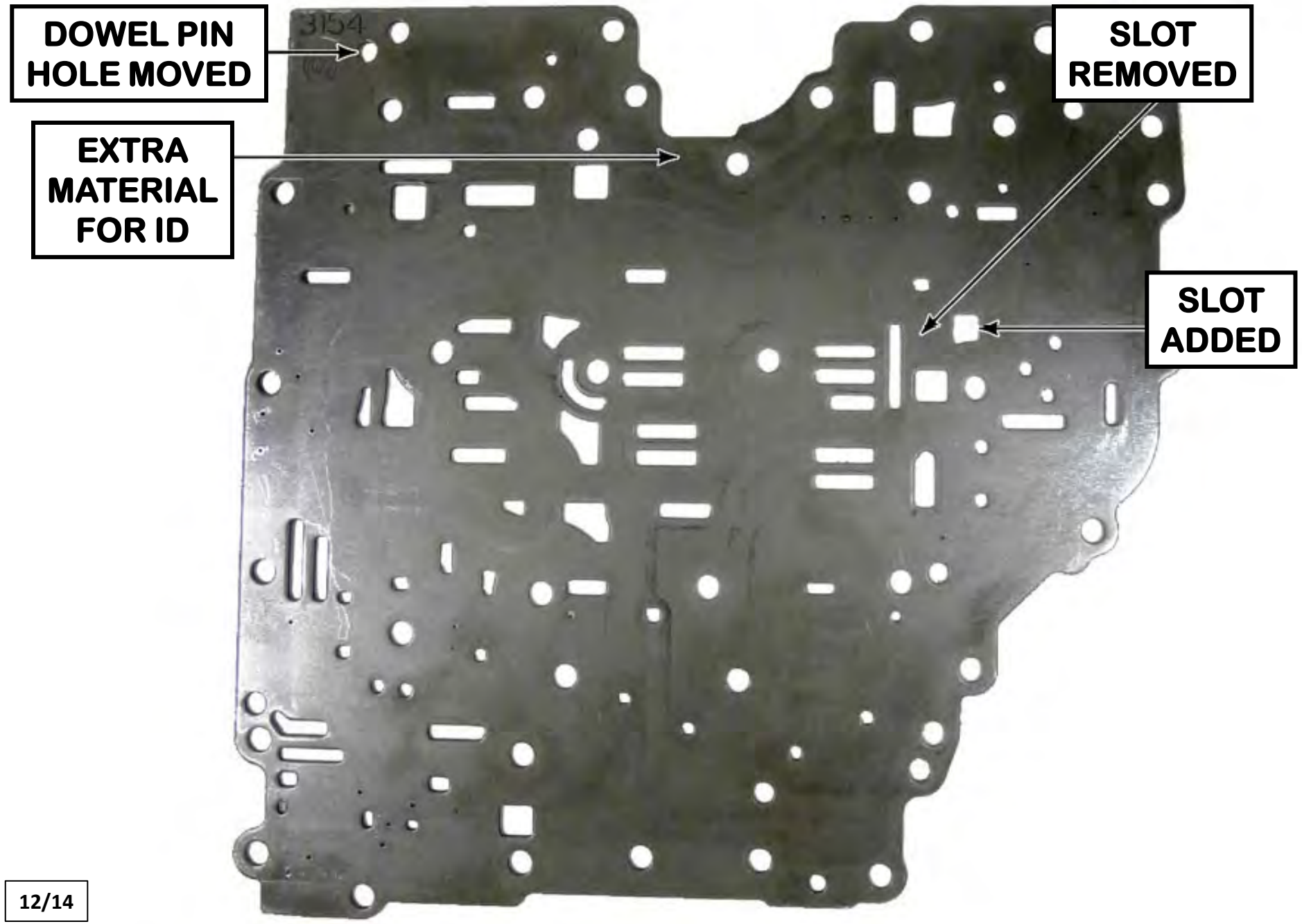
WITH RELS
24 PINS


NEW LOCATION OF
VB DOWEL PIN HOLE

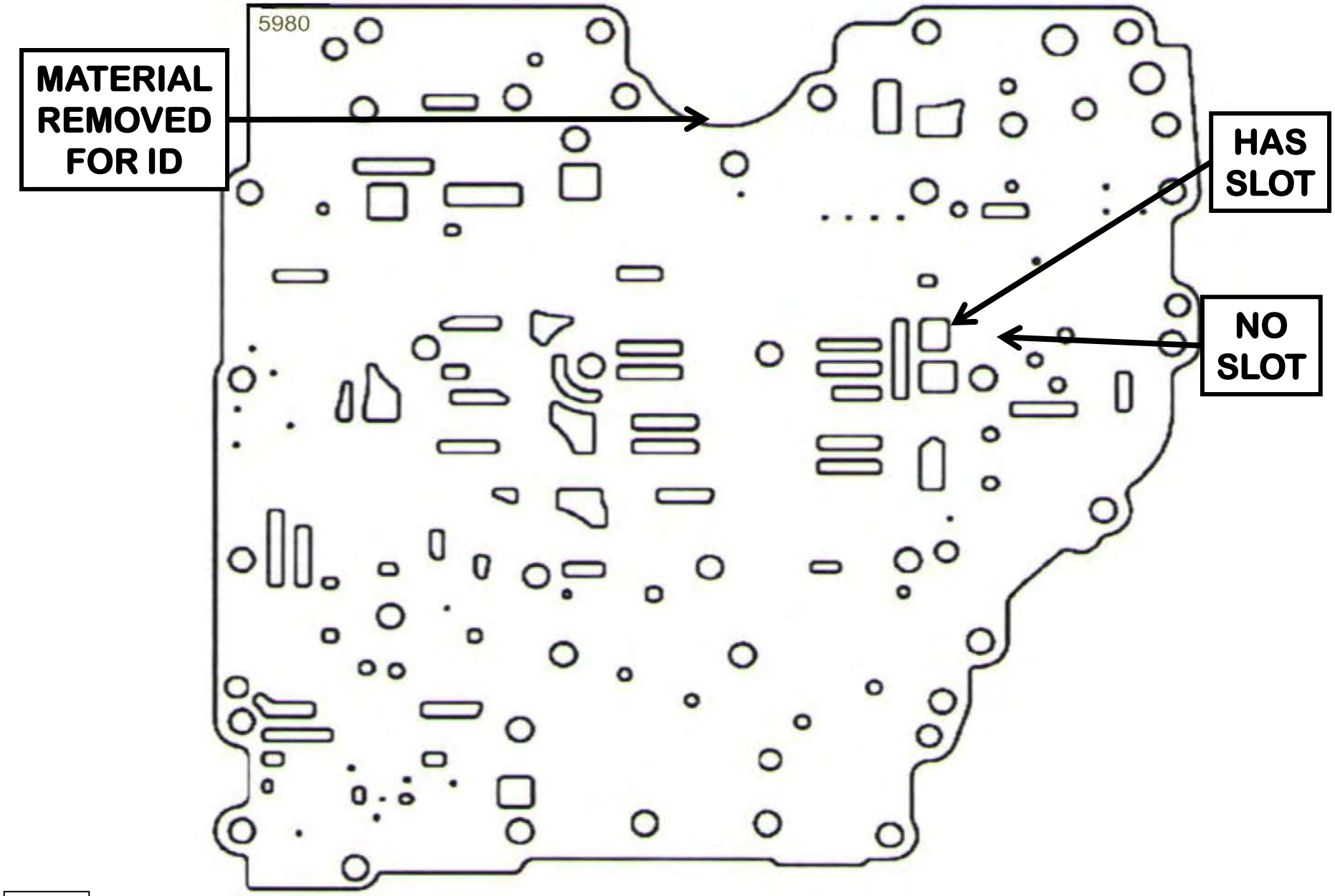

DOWEL PIN MOVED ON
MAIN VALVE BODY

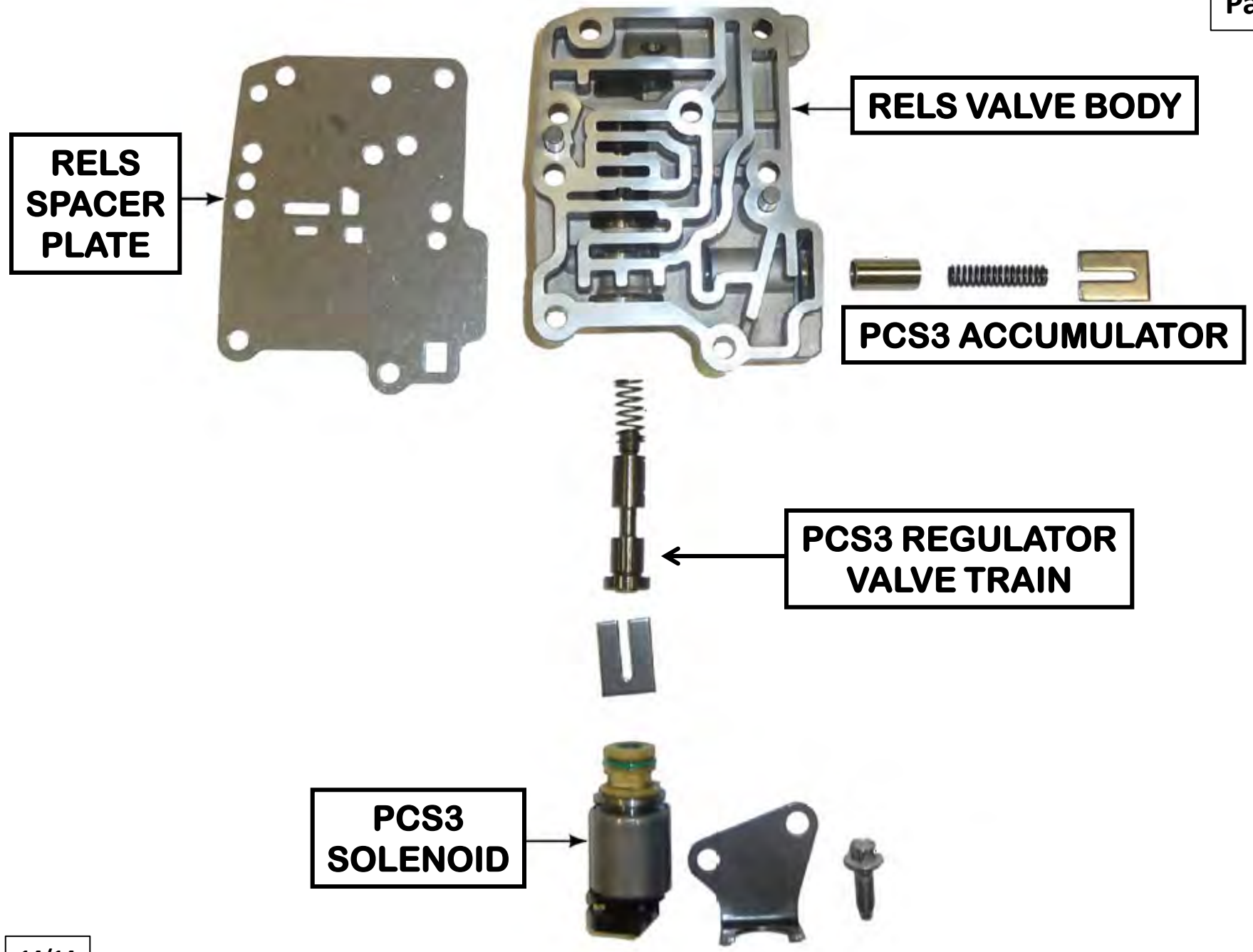

ADDED DOWEL PIN ALIGNMENT HOLES
FLUID PASSAGE HOLES

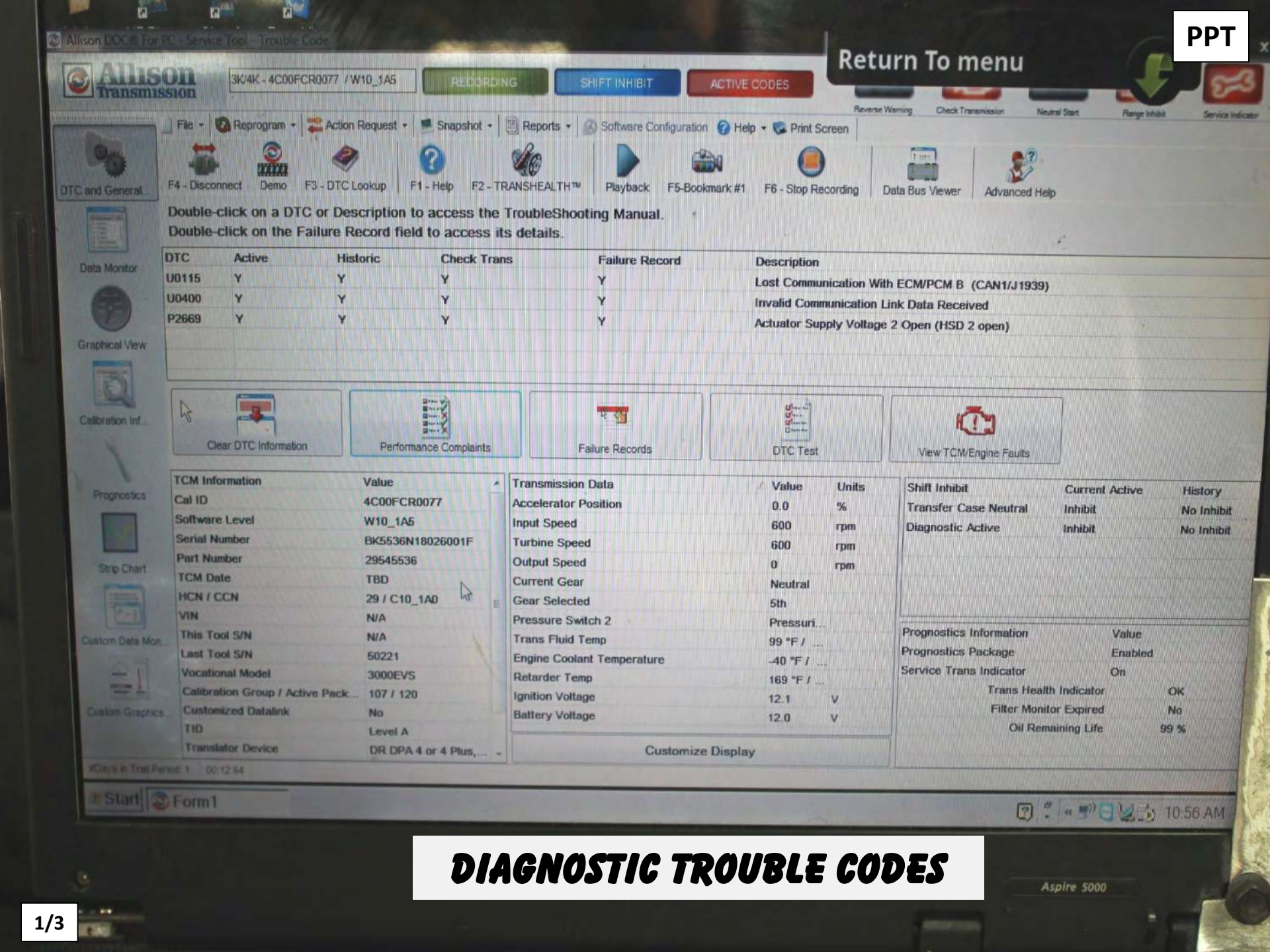
RELS SPACER PLATE



NON-RELS SPACER PLATE




RELS SPACER PLATE
RELS VALVE BODY
PCS3 ACCUMULATOR
PCS3 REGULATOR VALVE TRAIN
PCS3 SOLENOID



DIAGNOSTIC TROUBLE CODES

ALLISON 1000/2000 DIAGNOSTIC TROUBLE CODES

Pgs 26 - 30

- DTCs listed in the handout service 1st through 5th generation control systems.
- Vehicles that are NON-OBD-II compliant have a “Check Trans” Lamp.
- Vehicles that are OBD-II compliant have a “Malfunction Indicator” Lamp as well as a “Check Trans” Lamp.
- Many fault codes will place the transmission in “Limp Mode”, this is sometimes perceived as a “No Move” condition. To determine which you have disconnect the transmission case connector and see if the transmission has 3rd and Reverse ranges, if it does its in “Limp Mode”.
- If the key is cycled ON and OFF when the “Check Trans” Lamp is illuminated, and an active code is stored, The transmission may remain in NEUTRAL with no response from the shift selector lever. This can cause the “Shift Inhibit “ Lamp to illuminate.
- Some malfunctions will cause the PRNDL Indicator Lamps to flash.
- Some DTCs can be logged without turning ON the “Check Trans” Lamp if the TCM determines the problem will not cause immediate damage to the transmission.

PPT

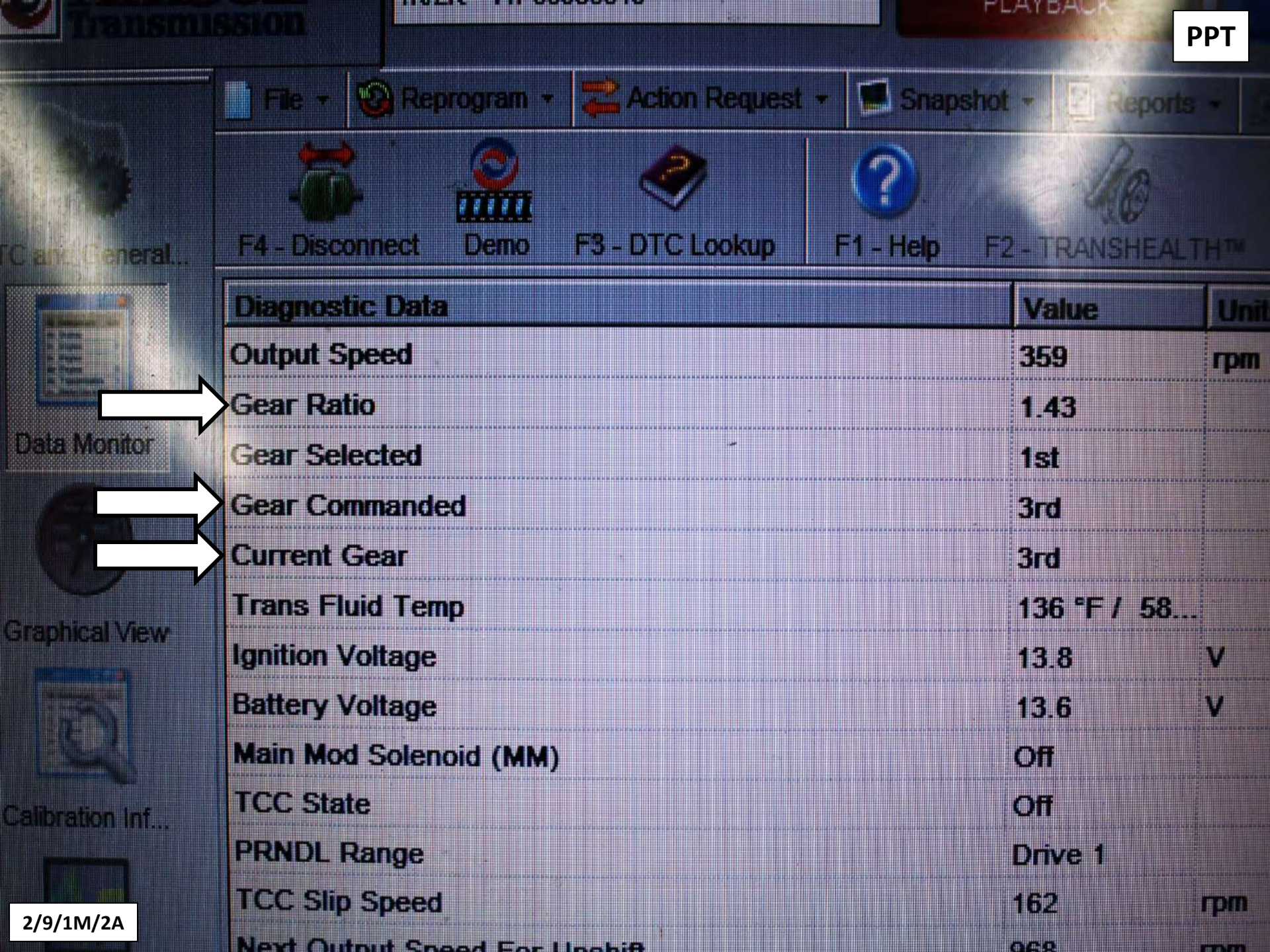
OPERATING RANGES DURING ELECTRICAL INTERRUPTION

	RANGE OBTAINED AFTER ELECTRICAL INTERRUPTION FOR MANUAL SELECTOR POSITION		
RANGE WHEN ELECTRICAL INTERRUPTION OCCURS	R	P or N	OD - D - 2 - 1
R (With Throttle)	N	N	5
N	N	N	N
1	R	N	1*
2, 3	R	N	3
4, 5	N	N	5
6	N	N	5
RANGE AFTER ENGINE SHUTDOWN & RESTART	R	N	3

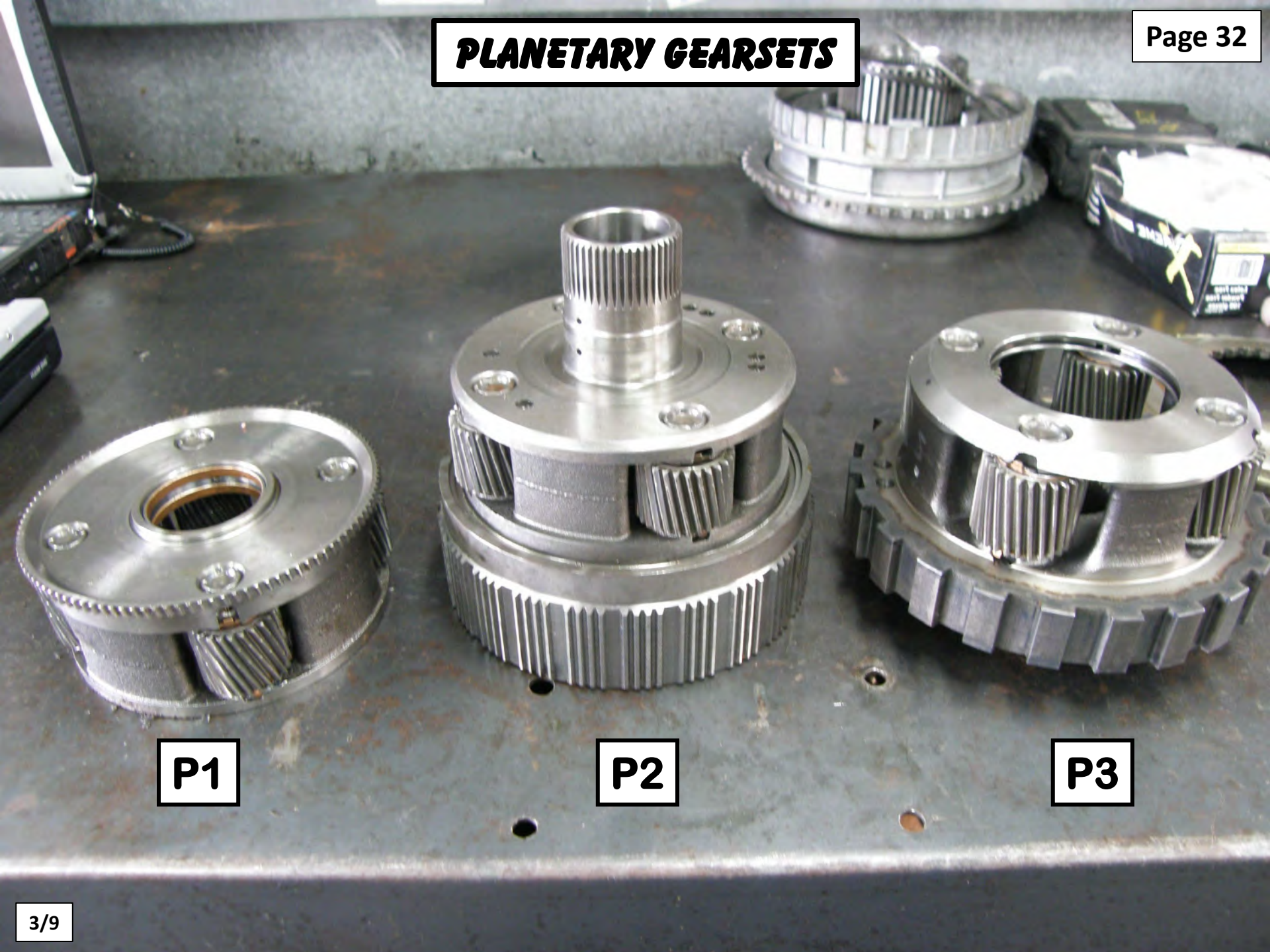
*THIRD RANGE AFTER REVERSE IS SELECTED

ALLISON 1000/2000 GEAR RATIOS

RANGE	CLOSE RATIO	WIDE RATIO
FIRST	3.10:1	3.51:1
SECOND	1.81:1	1.90:1
THIRD	1.41:1	1.44:1
FOURTH	1.00:1	1.00:1
FIFTH	0.71:1	0.74:1
SIXTH	0.61:1	0.64:1
REVERSE	-4.49:1	-5.09:1


PPT
File
Reprogram
Action Request
Snapshot
Reports
F4 - Disconnect
Demo
F3 - DTC Lookup
F1 - Help
F2 - TRANSHEALTH™
Data Monitor
Graphical View
Calibration Inf...
2/9/1M/2A
Diagnostic Data
Value
Unit
Output Speed
359
rpm
Gear Ratio
1.43
Gear Selected
1st
Gear Commanded
3rd
Current Gear
3rd
Trans Fluid Temp
136 °F / 58...
Ignition Voltage
13.8
V
Battery Voltage
13.6
V
Main Mod Solenoid (MM)
Off
TCC State
Off
PRNDL Range
Drive 1
TCC Slip Speed
162
rpm

PLANETARY GEARSETS



SUN GEARS

P1

P2

P3

RING GEARS

P1

P2

P3

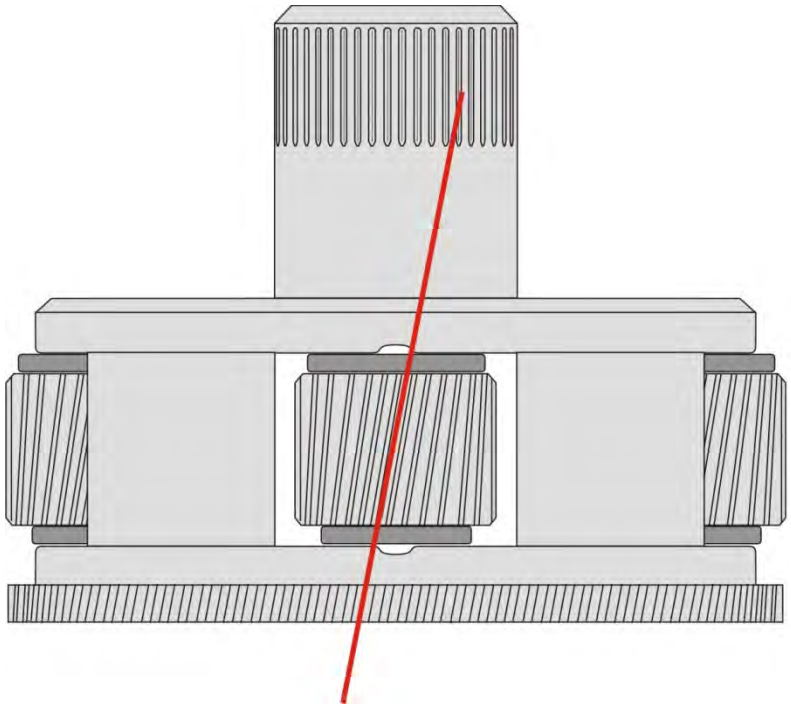
GEARTRAIN COMPONENT TOOTH COUNTS

1000		2000	
COMPONENT	TOOTH COUNT	COMPONENT	TOOTH COUNT
P1 Planetary Pinions	25	P1 Planetary Pinions	25
P2 Planetary Pinions	27	P2 Planetary Pinions	27
P3 Planetary Pinions	27 or 29*	P3 Planetary Pinions	31
P1 Sun Gear	61	P1 Sun Gear	61
P2 Sun Gear	57	P2 Sun Gear	57
P3 Sun Gear	49 or 53*	P3 Sun Gear	41
P1 Ring Gear	111	P1 Ring Gear	111
P2 Ring Gear	111	P2 Ring Gear	111
P3 Ring Gear	103 or 111*	P3 Ring Gear	103
*Later Model 1000 Transmissions Will Use 53 Tooth P3 Sun Gear With A 29 Tooth P3 Planet And A 111 Tooth P3 Ring Gear.			

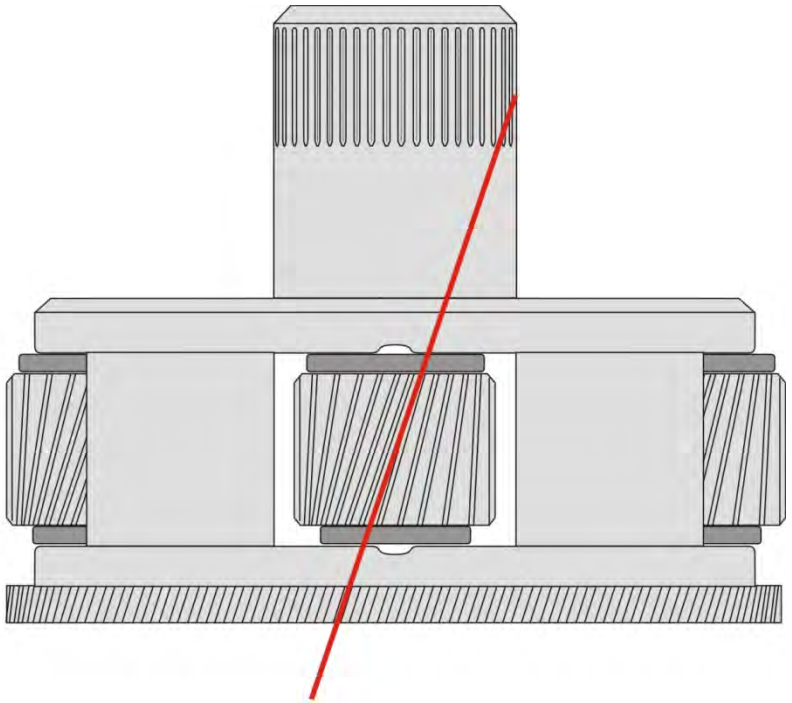
CLOSE RATIO

WIDE RATIO

GEARTRAIN COMPONENT TOOTH PITCH



80° PITCH



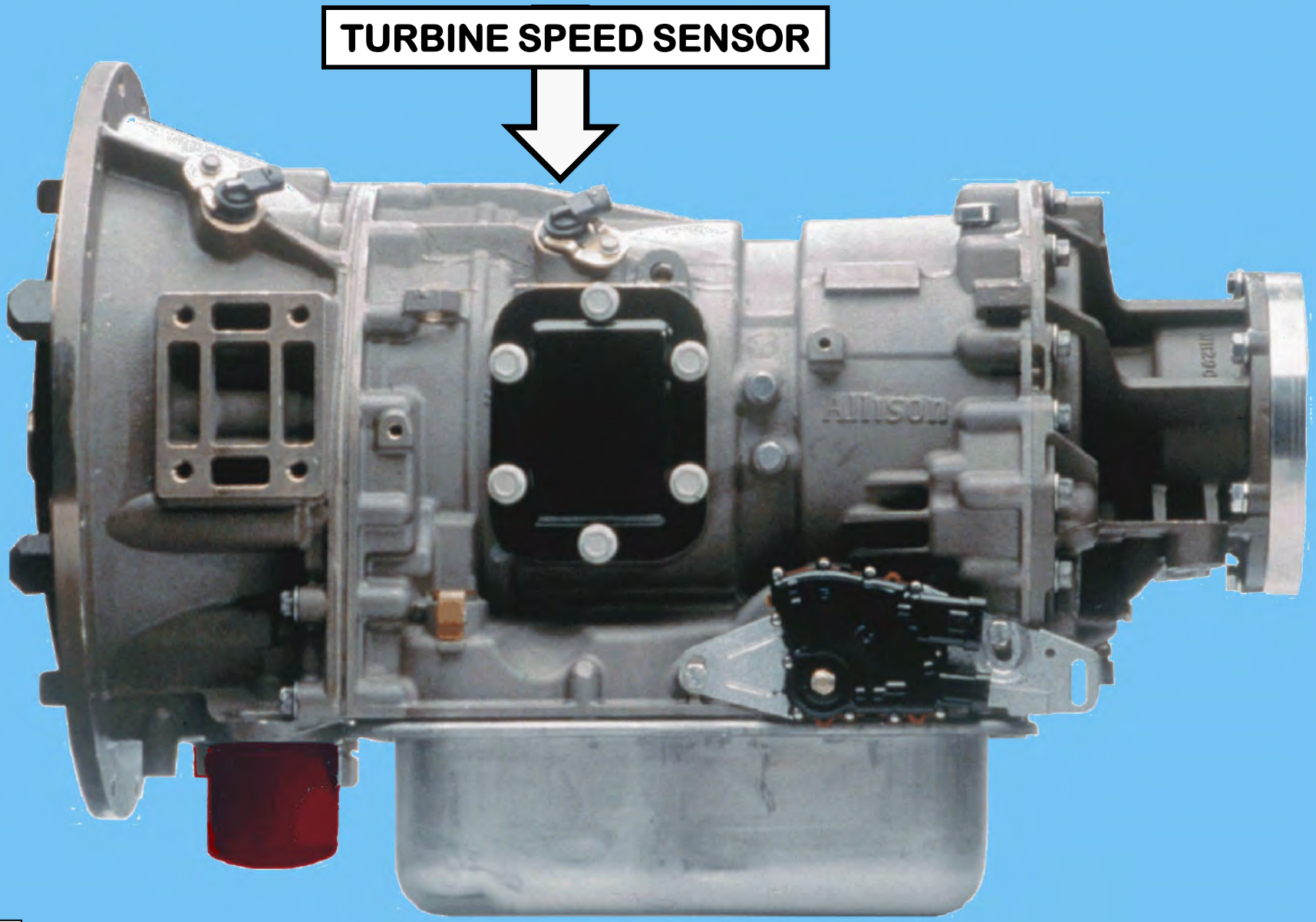
72° PITCH

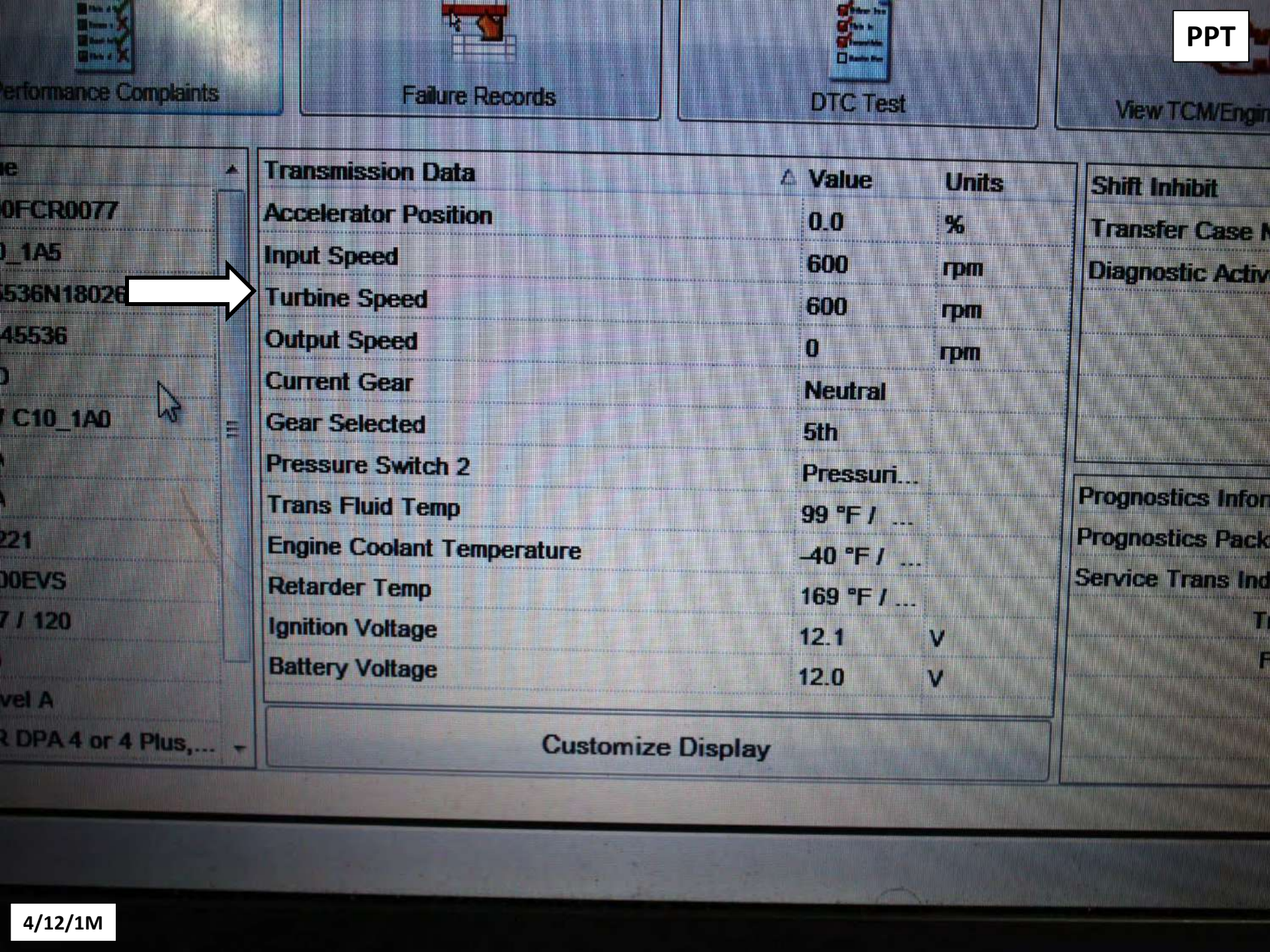
Geartrain Component Teeth Prior To 2006 Have A 72 Degree Pitch.
Geartrain Component Teeth After To 2006 Have A 80 Degree Pitch.

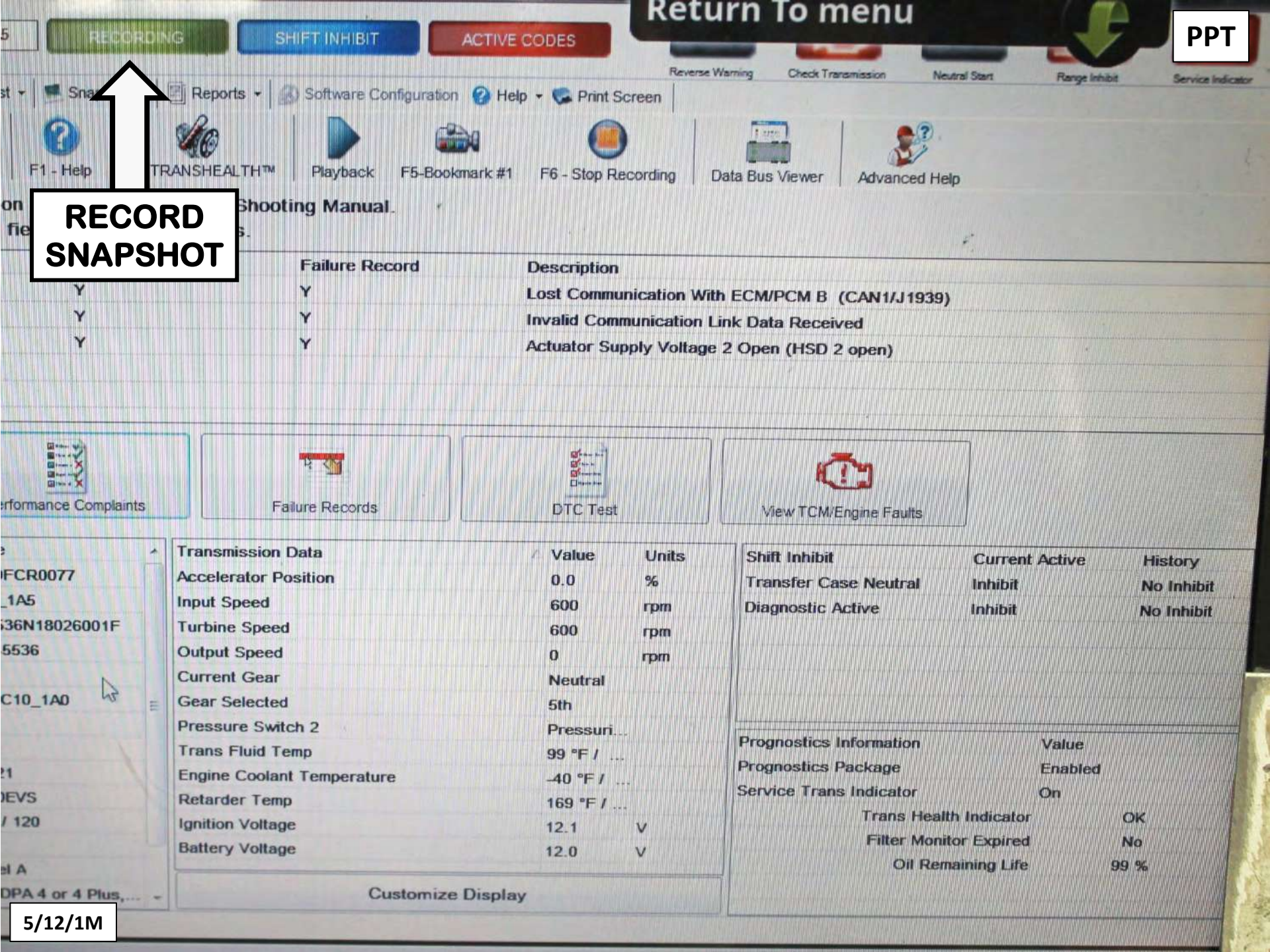

P1 PLANETARY
PPT
Check P1 Planet Teeth To P2 Ring Gear For Wear
9/9

Harsh, Slipping or Flared Shifts, Solenoid Performance Codes Set

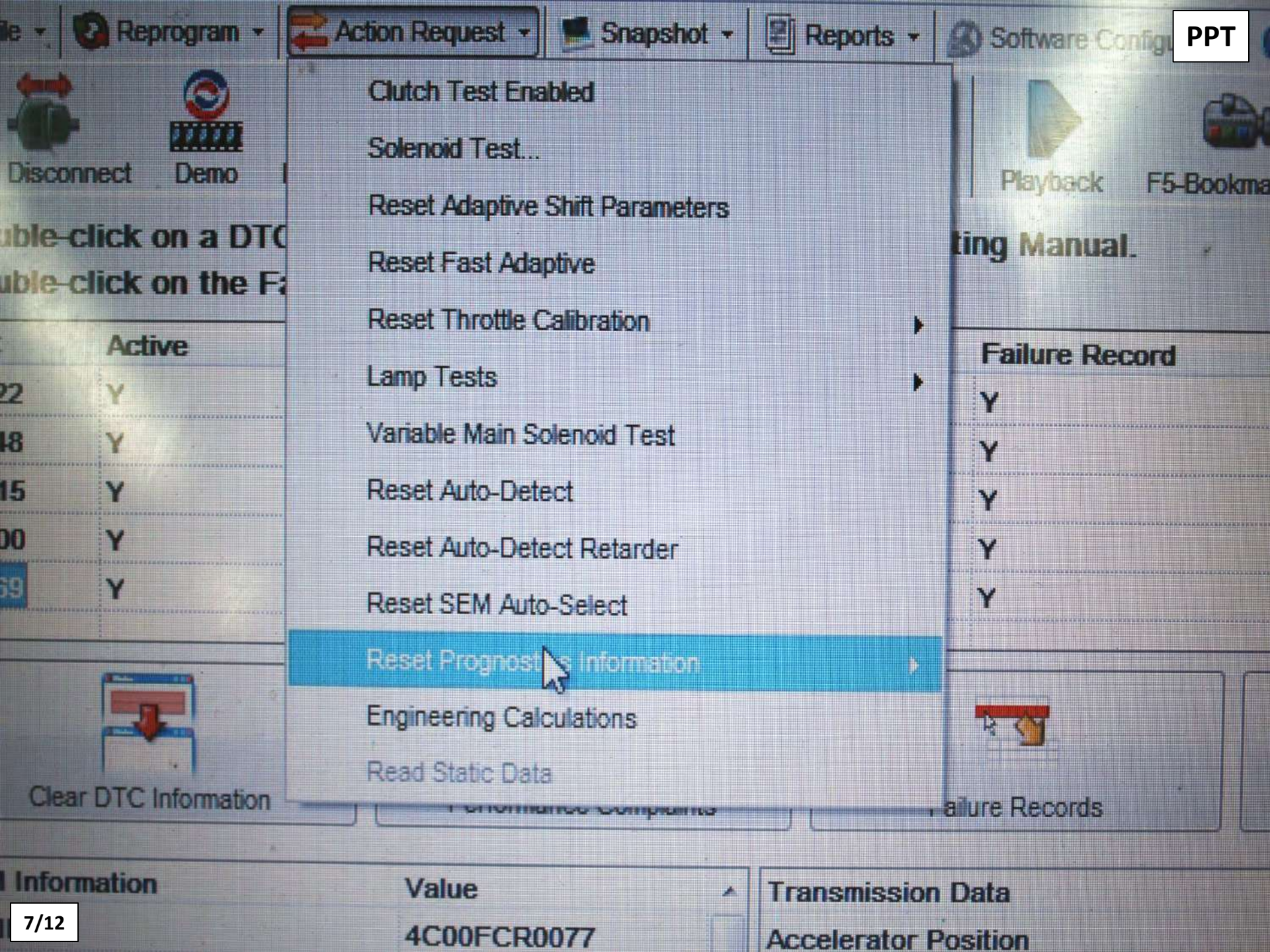
PPT




Performance Complaints
Failure Records
DTC Test
View TCM/Engin
PPT
0FCR0077
0_1A5
4536N18026
45536
C10_1A0
221
00EVS
7 / 120
vel A
R DPA 4 or 4 Plus,...
Transmission Data
Value
Units
Accelerator Position
0.0
%
Input Speed
600
rpm
Turbine Speed
600
rpm
Output Speed
0
rpm
Current Gear
Neutral
Gear Selected
5th
Pressure Switch 2
Pressuri...
Trans Fluid Temp
99 °F / ...
Engine Coolant Temperature
-40 °F / ...
Retarder Temp
169 °F / ...
Ignition Voltage
12.1
V
Battery Voltage
12.0
V
Shift Inhibit
Transfer Case
Diagnostic Activ
Prognostics Infor
Prognostics Pack
Service Trans Ind
Customize Display
4/12/1M

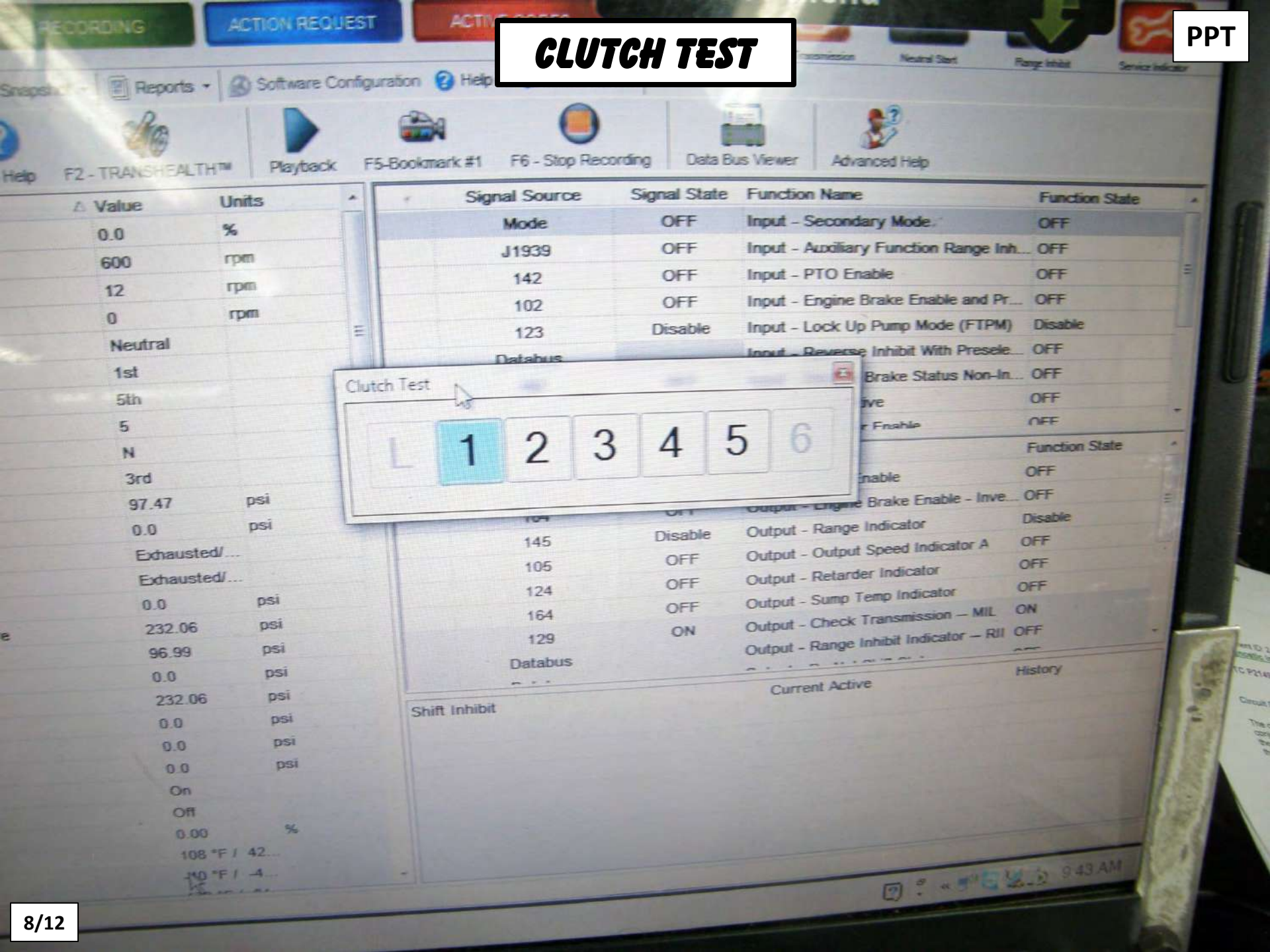

RECORDING
SHIFT INHIBIT
ACTIVE CODES
Return To menu
PPT
Reverse Warning
Check Transmission
Neutral Start
Range Inhibit
Service Indicator
Reports
Software Configuration
Help
Print Screen
F1 - Help
TRANSHEALTH™
Playback
F5-Bookmark #1
F6 - Stop Recording
Data Bus Viewer
Advanced Help
RECORD SNAPSHOT
Shooting Manual.
Failure Record
Description
Y
Y
Lost Communication With ECM/PCM B (CAN1/J1939)
Y
Y
Invalid Communication Link Data Received
Y
Y
Actuator Supply Voltage 2 Open (HSD 2 open)
rformance Complaints
Failure Records
DTC Test
View TCM/Engine Faults
FCR0077
_1A5
536N18026001F
5536
C10_1A0
EVS
/ 120
DPA 4 or 4 Plus,...
Transmission Data
Value
Units
Accelerator Position
0.0
%
Input Speed
600
rpm
Turbine Speed
600
rpm
Output Speed
0
rpm
Current Gear
Neutral
Gear Selected
5th
Pressure Switch 2
Pressuri...
Trans Fluid Temp
99 °F / ...
Engine Coolant Temperature
-40 °F / ...
Retarder Temp
169 °F / ...
Ignition Voltage
12.1
V
Battery Voltage
12.0
V
Customize Display
Shift Inhibit
Current Active
History
Transfer Case Neutral
Inhibit
No Inhibit
Diagnostic Active
Inhibit
No Inhibit
Prognostics Information
Value
Prognostics Package
Enabled
Service Trans Indicator
On
Trans Health Indicator
OK
Filter Monitor Expired
No
Oil Remaining Life
99 %
5/12/1M


PPT
REL Δ
MIN MAX
HOLD
RANGE
Hz % ms
SETUP
mV
Ω
°C
°F
mA
µA
6/12


Reprogram
Action Request
Snapshot
Reports
Software Configu
PPT
Disconnect
Demo
Playback
F5-Bookma
uble-click on a DTC
uble-click on the Fa
ting Manual.
Clutch Test Enabled
Solenoid Test...
Reset Adaptive Shift Parameters
Reset Fast Adaptive
Reset Throttle Calibration
Lamp Tests
Variable Main Solenoid Test
Reset Auto-Detect
Reset Auto-Detect Retarder
Reset SEM Auto-Select
Reset Prognostics Information
Engineering Calculations
Read Static Data
Active
Failure Record
22
48
15
00
69
Y
Clear DTC Information
ailure Records
Information
Value
4C00FCR0077
Transmission Data
Accelerator Position
7/12

CLUTCH TEST

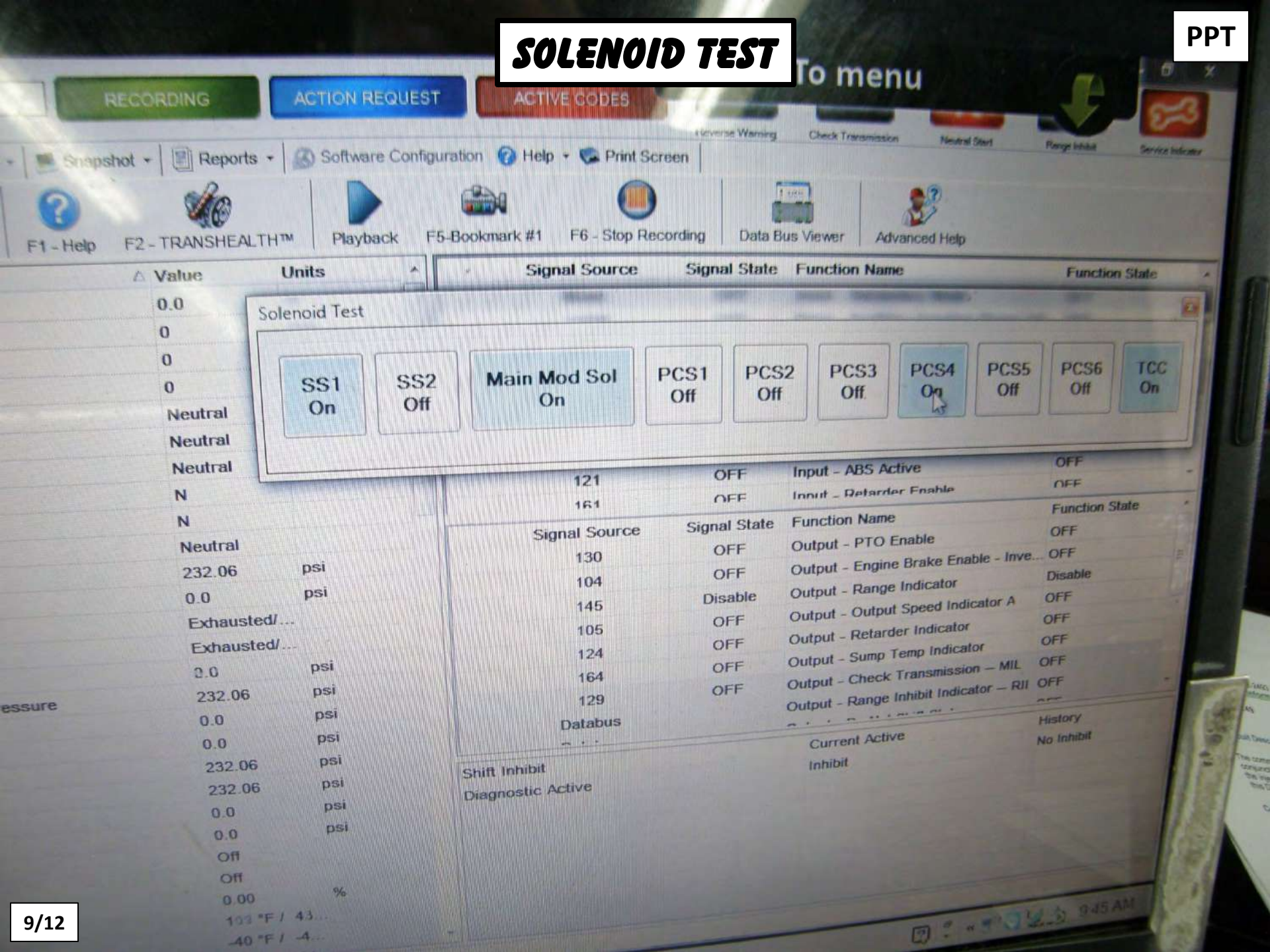
PPT



8/12

SOLENOID TEST

PPT

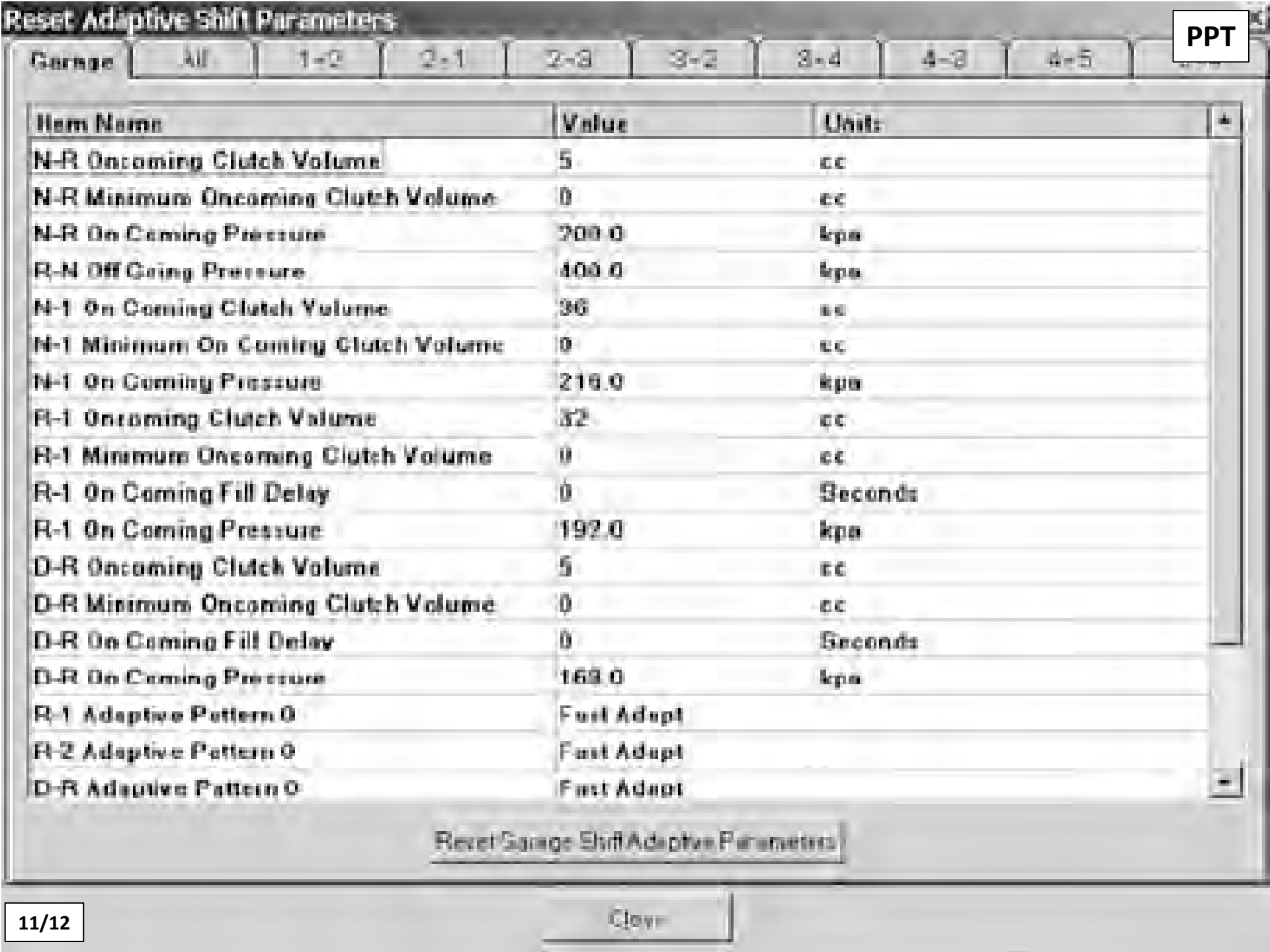


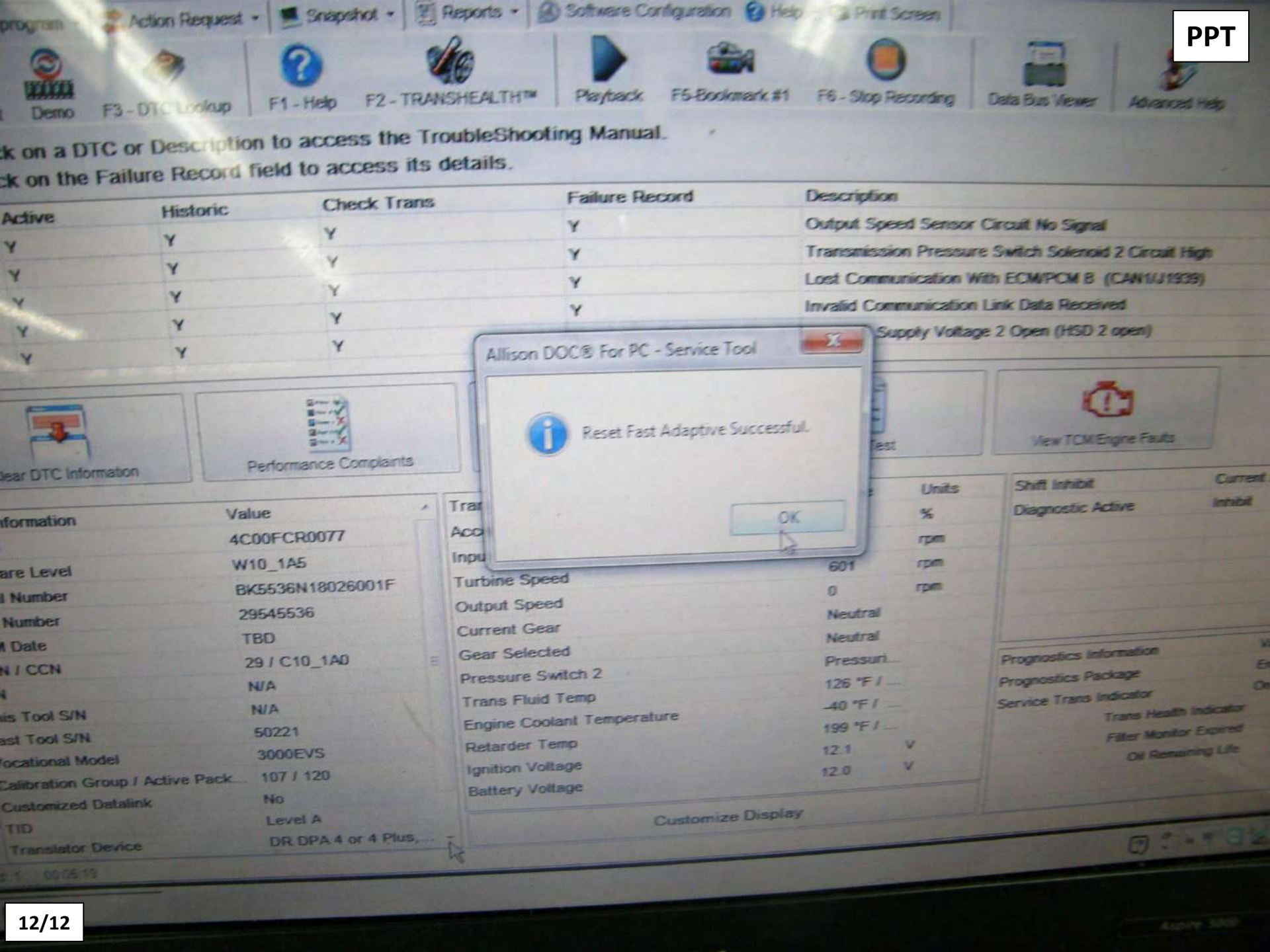
9/12

SHIFT ADAPTS

- Select “Fast Shift Adapts”.
- This will allow the TCM to make large changes in initial shift conditions.
- It will adjust for major system tolerances such as solenoid to solenoid, main pressure and clutch to clutch variations.
- Once the initial reset has been performed, the TCM will enter “Slow Adaptive” Mode, this will fine tune shift logic as the vehicle is driven.
- It is normal to see the TCM switch between Fast and Slow Modes.

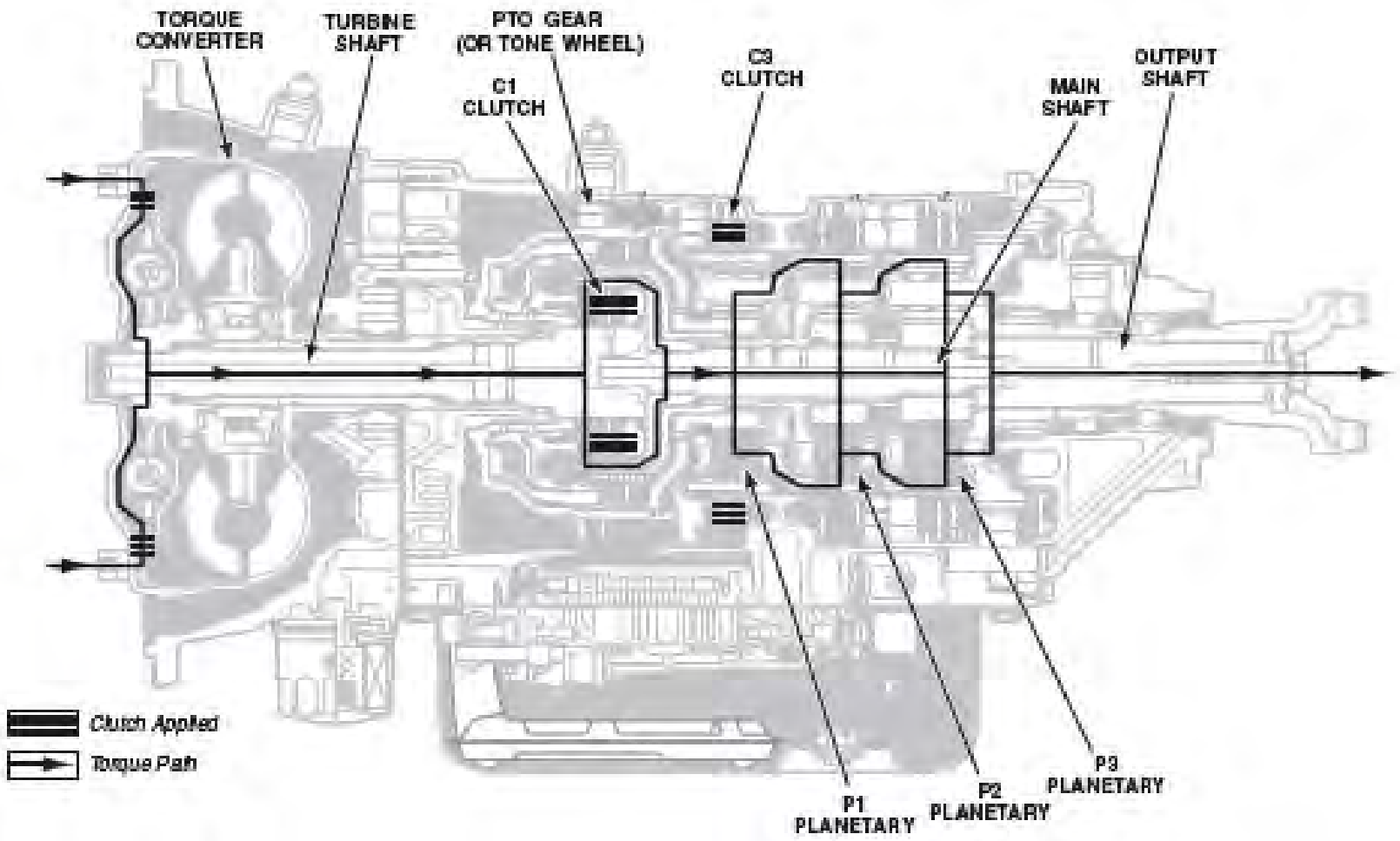
- Scan Tool Display:
- VALUE = The amount of units provided for a particular shift.
- UNITS = The type of measurement for a given value.
- ONCOMING CLUTCH VOLUME = The total amount of fluid used to apply an oncoming clutch.
- ONCOMING PRESSURE = The hydraulic pressure being applied to the shifts oncoming clutch.
- OFF GOING PRESSURE = The hydraulic pressure remaining in the shifts off going clutch apply circuit.
- ONCOMING FILL DELAY = Indicates the lag time between when the clutch is commanded ON by the TCM vs. actual clutch apply time.


Reset Adaptive Shift Parameters
PPT
Garage
All
1-2
2-1
2-3
3-2
3-4
4-3
4-5
Item Name
Value
Unit
N-R Oncoming Clutch Volume
5
cc
N-R Minimum Oncoming Clutch Volume
0
cc
N-R On Coming Pressure
200.0
kpa
R-N Off Going Pressure
400.0
kpa
N-1 On Coming Clutch Volume
36
cc
N-1 Minimum On Coming Clutch Volume
0
cc
N-1 On Coming Pressure
216.0
kpa
R-1 Oncoming Clutch Volume
32
cc
R-1 Minimum Oncoming Clutch Volume
0
cc
R-1 On Coming Fill Delay
0
Seconds
R-1 On Coming Pressure
192.0
kpa
D-R Oncoming Clutch Volume
5
cc
D-R Minimum Oncoming Clutch Volume
0
cc
D-R On Coming Fill Delay
0
Seconds
D-R On Coming Pressure
168.0
kpa
R-1 Adaptive Pattern 0
Fast Adapt
R-2 Adaptive Pattern 0
Fast Adapt
D-R Adaptive Pattern 0
Fast Adapt
Reset Garage Shift Adaptive Parameters
Close
11/12


Action Request
Snapshot
Reports
Software Configuration
Help
Print Screen
Demo
F3 - DTC Lookup
F1 - Help
F2 - TRANSHEALTH™
Playback
F5-Bookmark #1
F6 - Stop Recording
Data Bus Viewer
Advanced Help
ck on a DTC or Description to access the TroubleShooting Manual.
ck on the Failure Record field to access its details.
Active
Historic
Check Trans
Failure Record
Description
Output Speed Sensor Circuit No Signal
Transmission Pressure Switch Solenoid 2 Circuit High
Lost Communication With ECM/PCM B (CAN1/J1939)
Invalid Communication Link Data Received
Supply Voltage 2 Open (HSD 2 open)
Allison DOC® For PC - Service Tool
Reset Fast Adaptive Successful.
OK
lear DTC Information
Performance Complaints
View TCM/Engine Faults
Value
4C00FCR0077
W10_1A5
BK5536N18026001F
29545536
TBD
29 / C10_1A0
N/A
N/A
50221
3000EVS
107 / 120
No
Level A
DR DPA 4 or 4 Plus,...
Units
601
rpm
Turbine Speed
0
rpm
Output Speed
Neutral
Current Gear
Neutral
Gear Selected
Pressure Switch 2
126 °F /
Trans Fluid Temp
-40 °F /
Engine Coolant Temperature
199 °F /
Retarder Temp
12.1
V
Ignition Voltage
12.0
V
Battery Voltage
Shift Inhibit
Diagnostic Active
Prognostics Information
Prognostics Package
Service Trans Indicator
Trans Health Indicator
Filter Monitor Expired
Oil Remaining Life
Customize Display

3RD RANGE

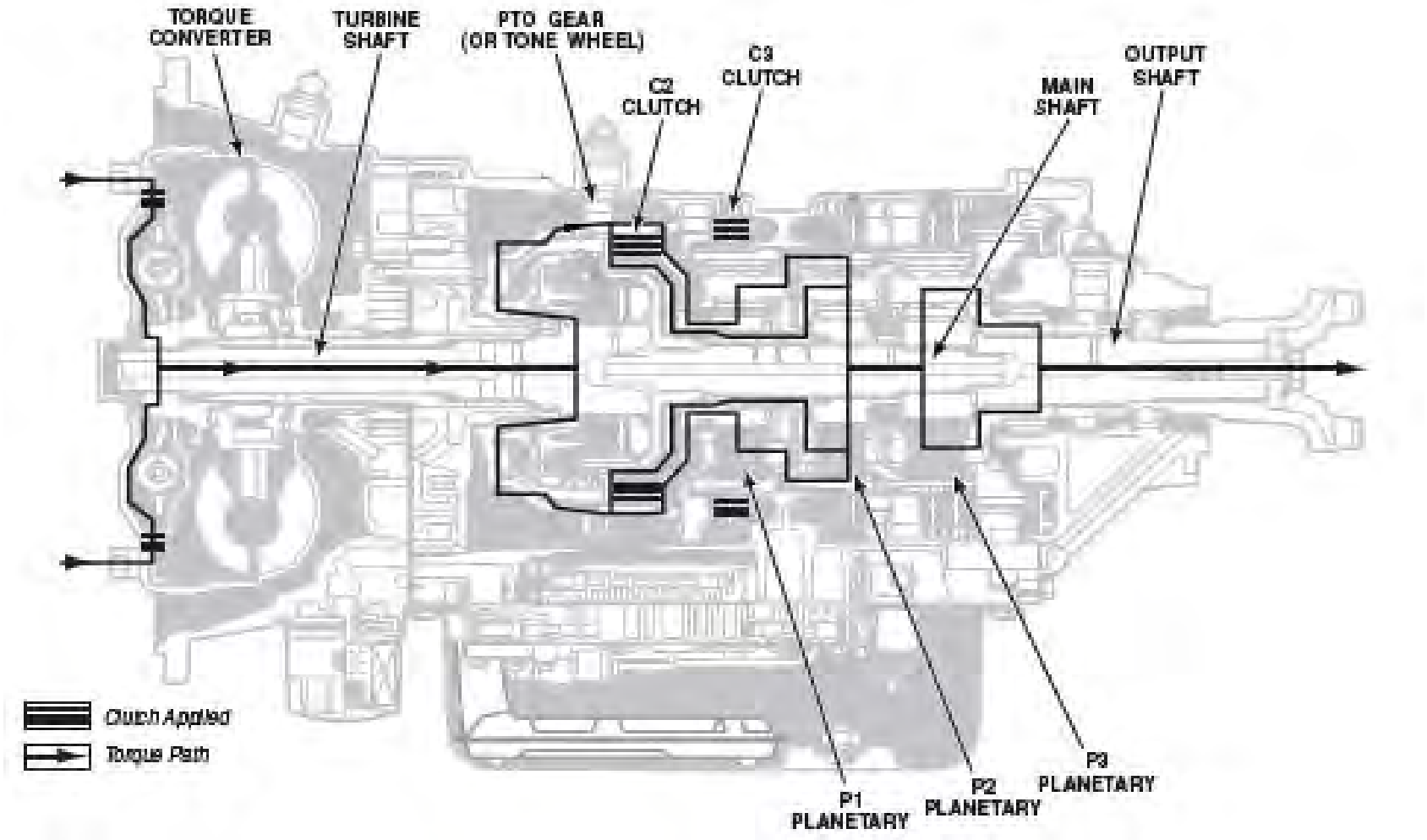
PPT



C1 & C3 clutches are applied. C1 clutch application locks the turbine shaft and the main shaft together causing them to rotate at the same speed and in the same direction. The P1 sun gear rotates with the clutch inside the P1 carrier. The P1 sun gear transmits the torque produced at the clutch to the P1 carrier. Applying stationary clutch C3 prevents the P1 ring gear from rotating. With the P1 ring gear held and the P1 sun gear providing first stage torque input, the P1 carrier Is the first stage output member in 3rd range.

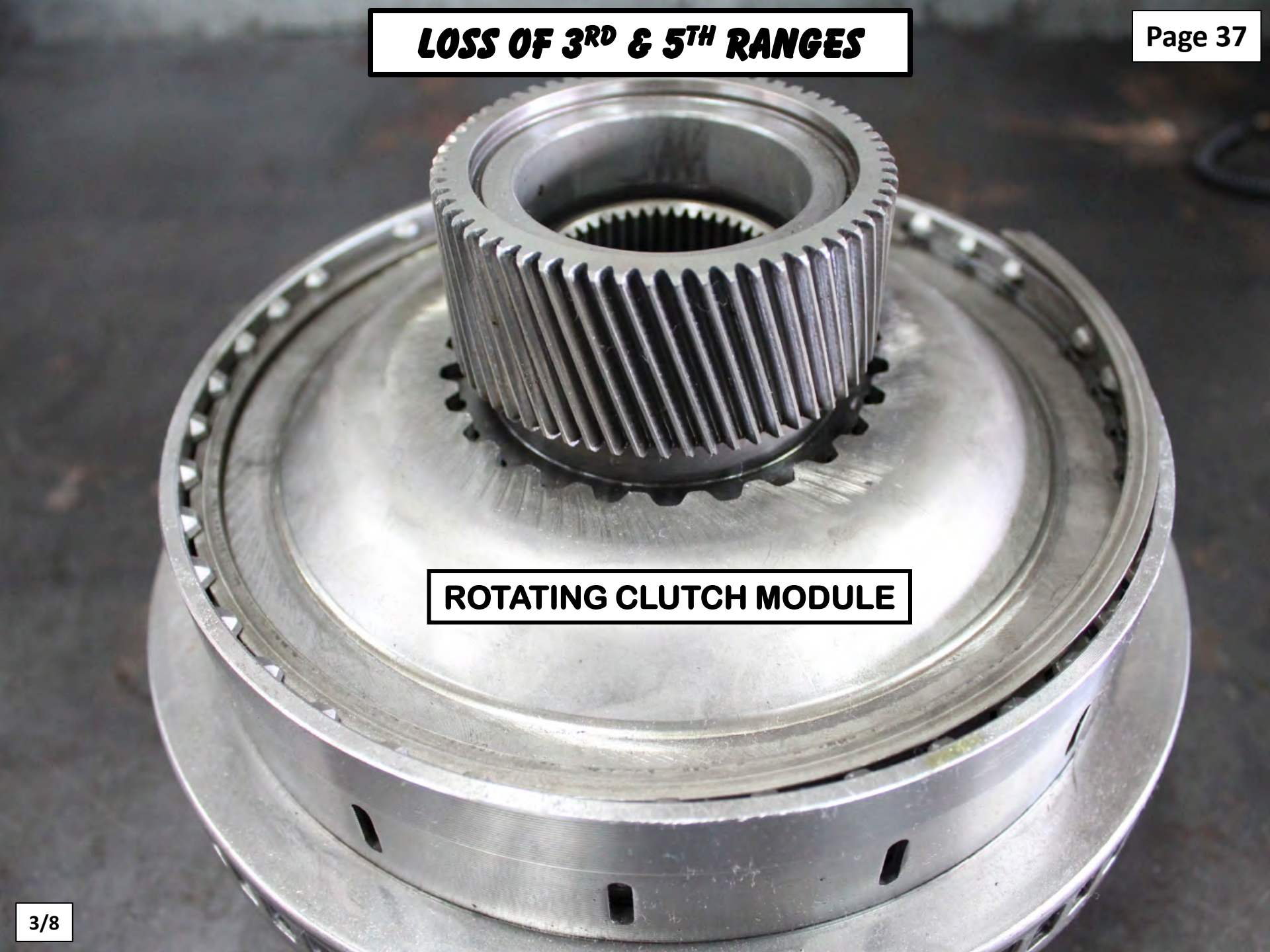
5TH RANGE

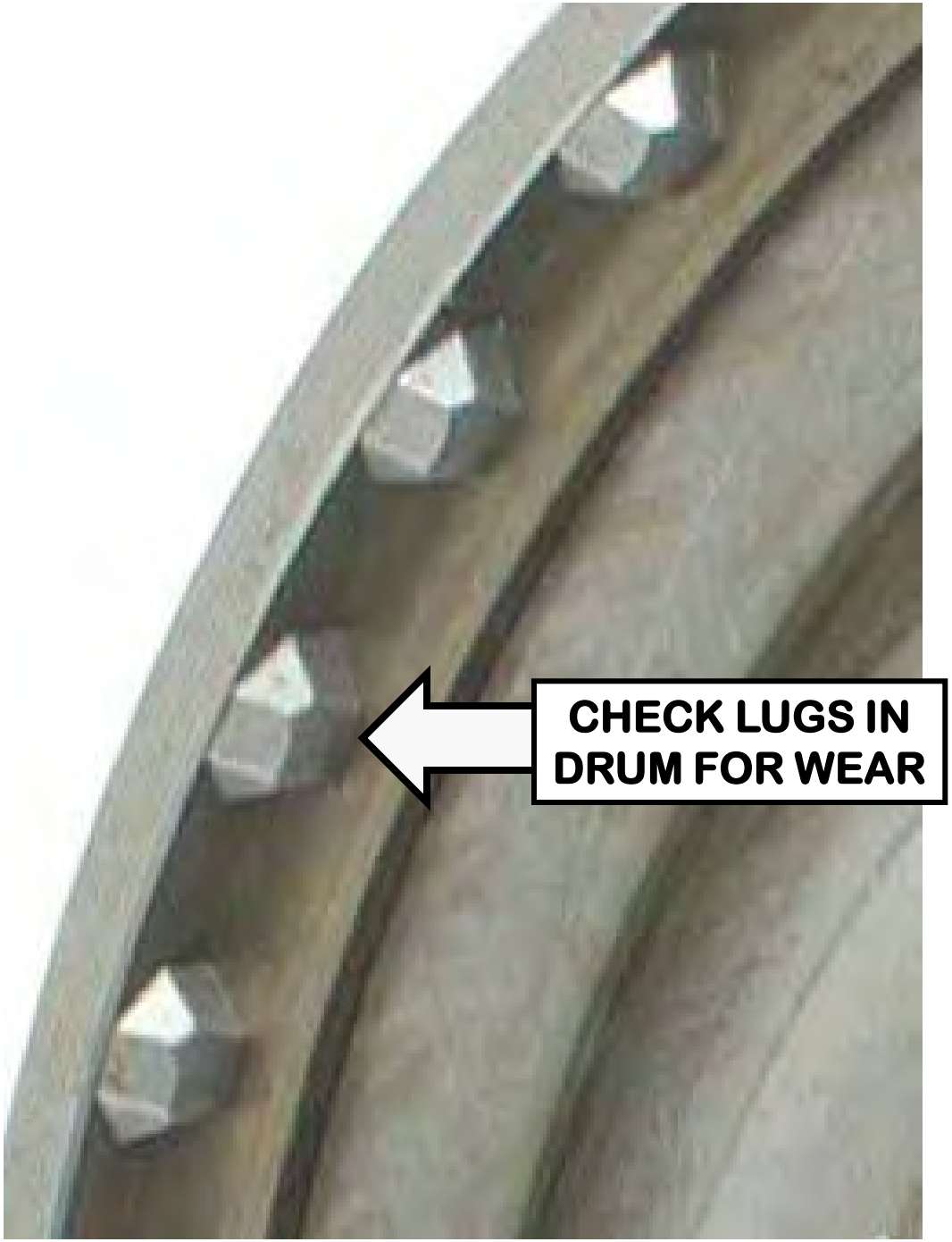
PPT

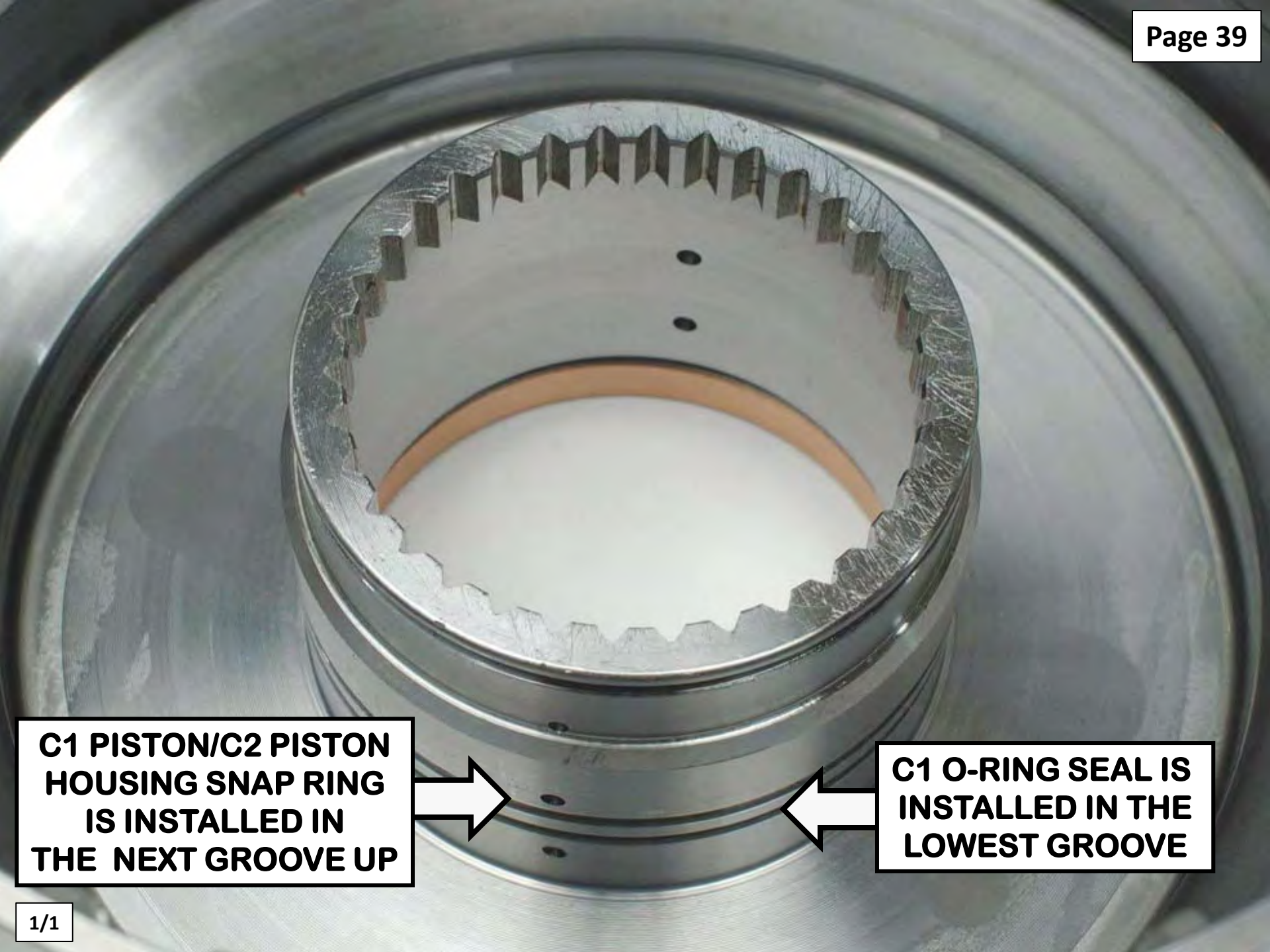


C2 & C3 clutches are applied. C2 clutch application locks the turbine shaft & the P2 carrier together, causing them to rotate as one at the same speed and in the same direction.
Input to the P1 planetary is through the P1 sun gear. The P1 sun gear is part of the rotating clutch. When the C3 clutch is engaged, the P1 ring gear is held. The P1 sun gear rotating inside the P1 Carrier which provides output to the P2 ring gear.

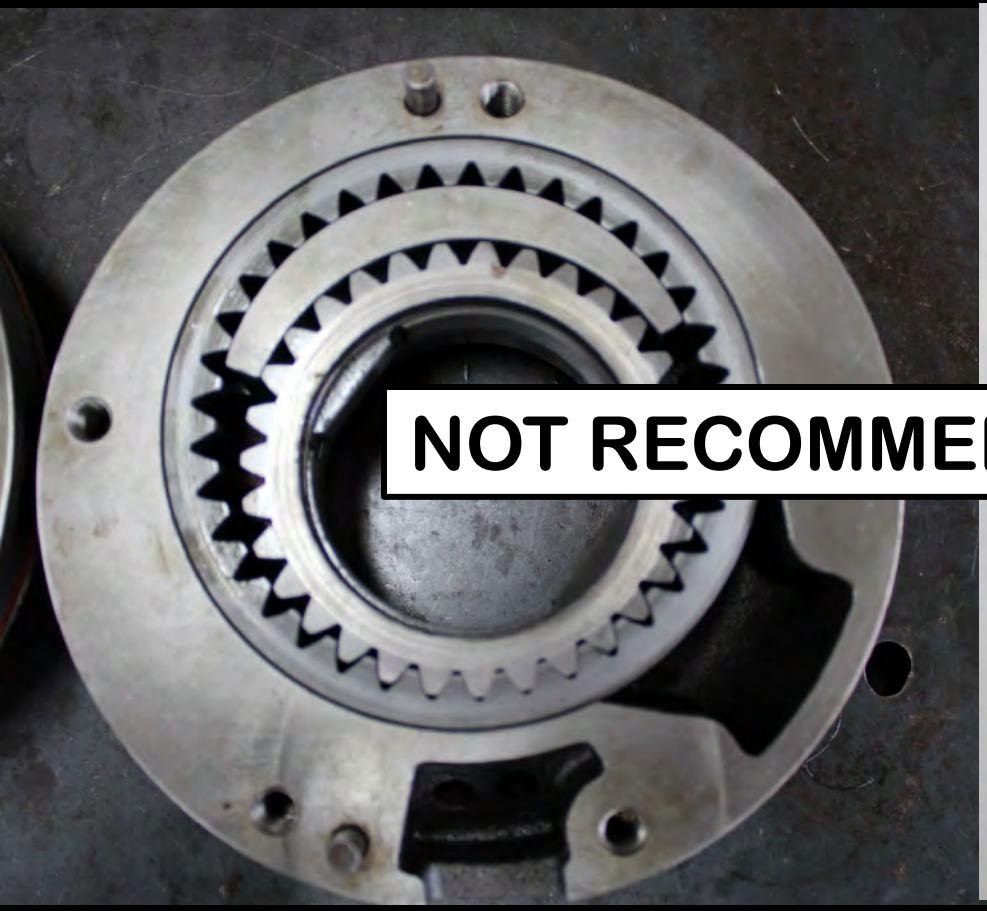
LOSS OF 3RD & 5TH RANGES

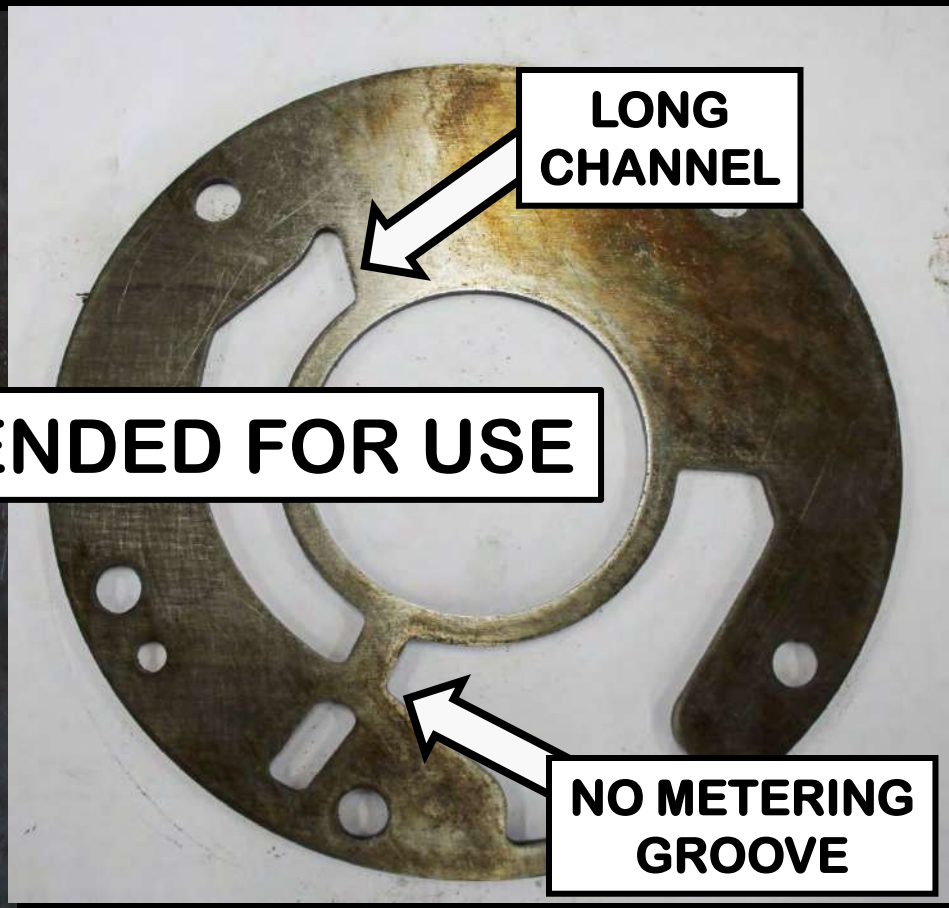



CHECK LUGS IN
DRUM FOR WEAR


C1 PISTON/C2 PISTON HOUSING SNAP RING IS INSTALLED IN THE NEXT GROOVE UP
C1 O-RING SEAL IS INSTALLED IN THE LOWEST GROOVE

1ST DESIGN LEVEL

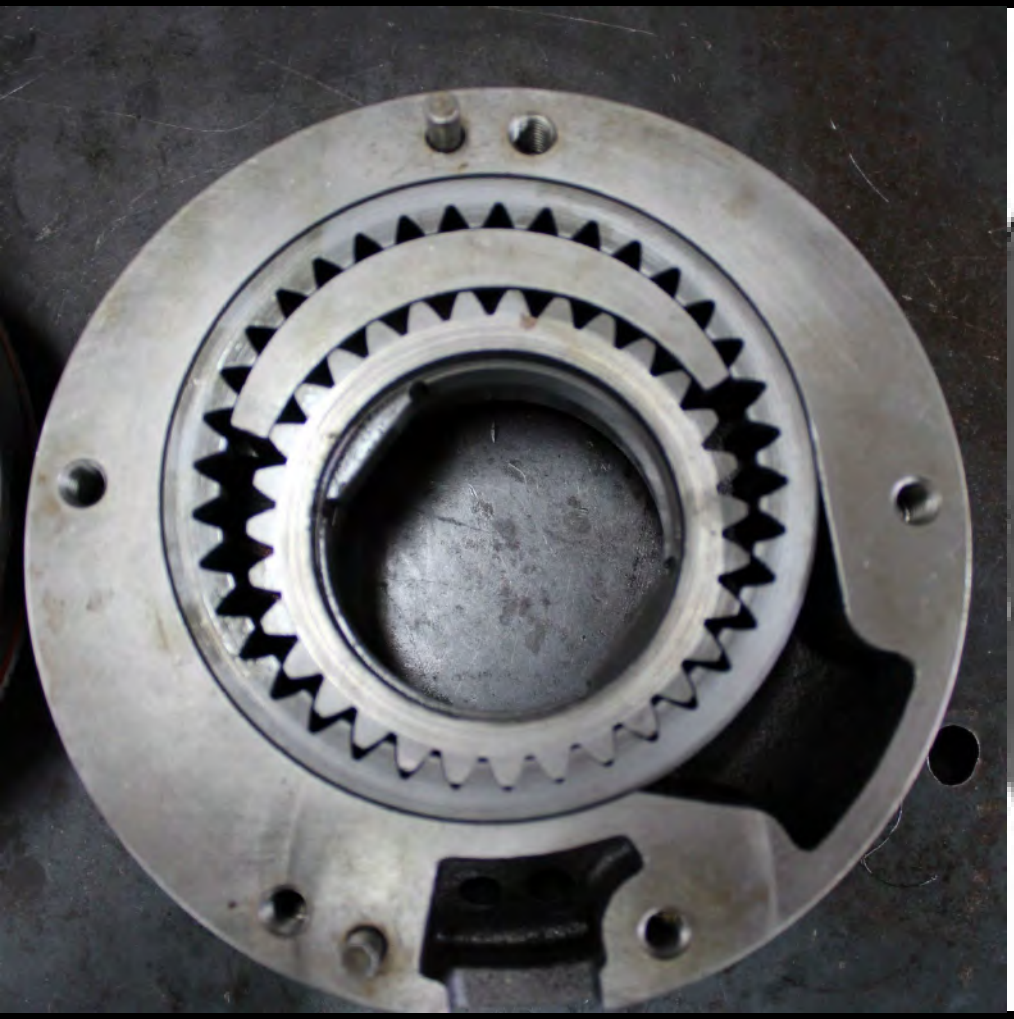


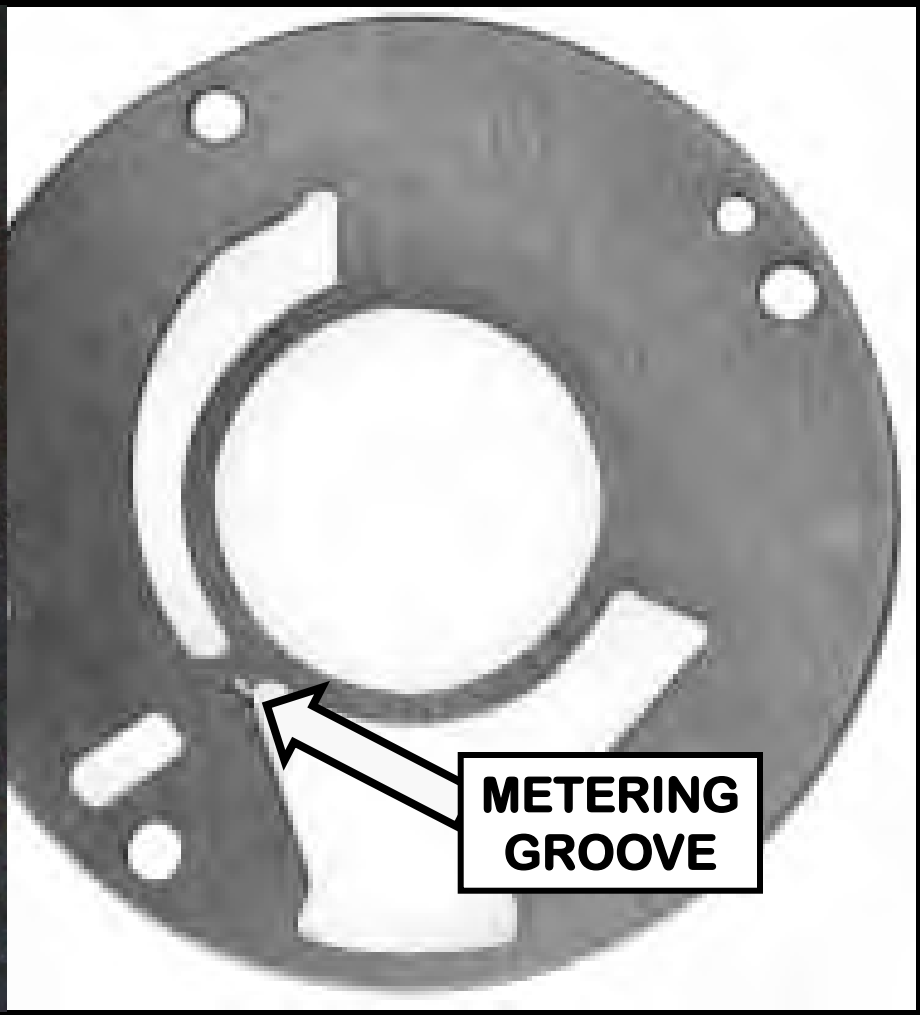


NOT RECOMMENDED FOR USE

37 TOOTH OUTER GEAR
31 TOOTH INNER GEAR

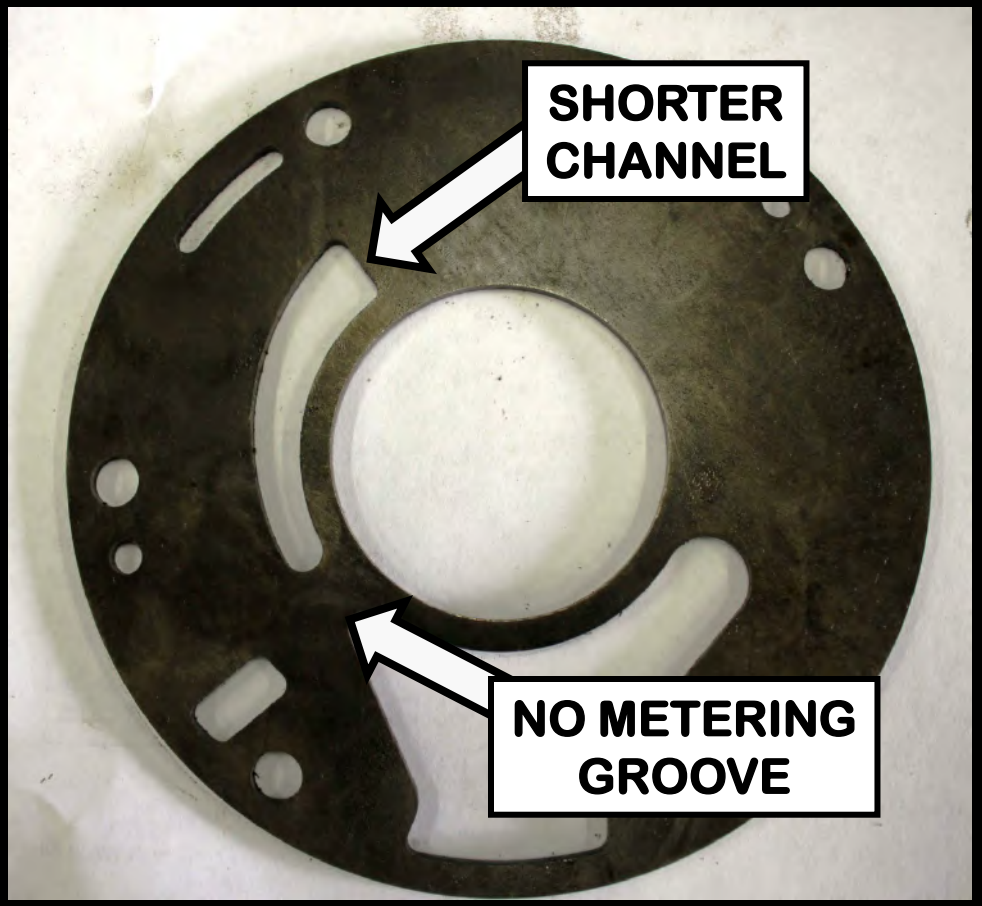
2ND DESIGN LEVEL





37 TOOTH OUTER GEAR
31 TOOTH INNER GEAR

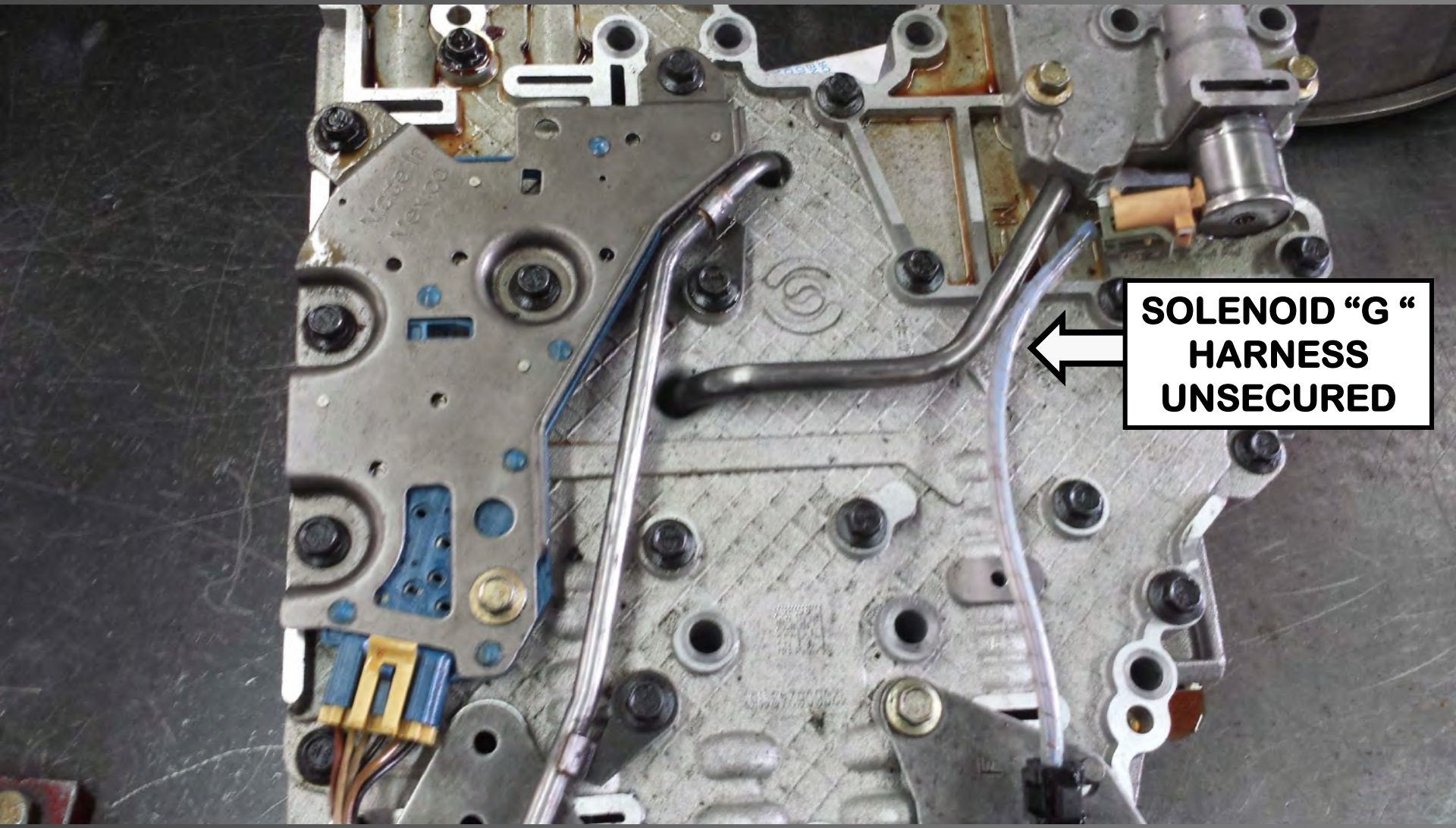
3RD DESIGN LEVEL



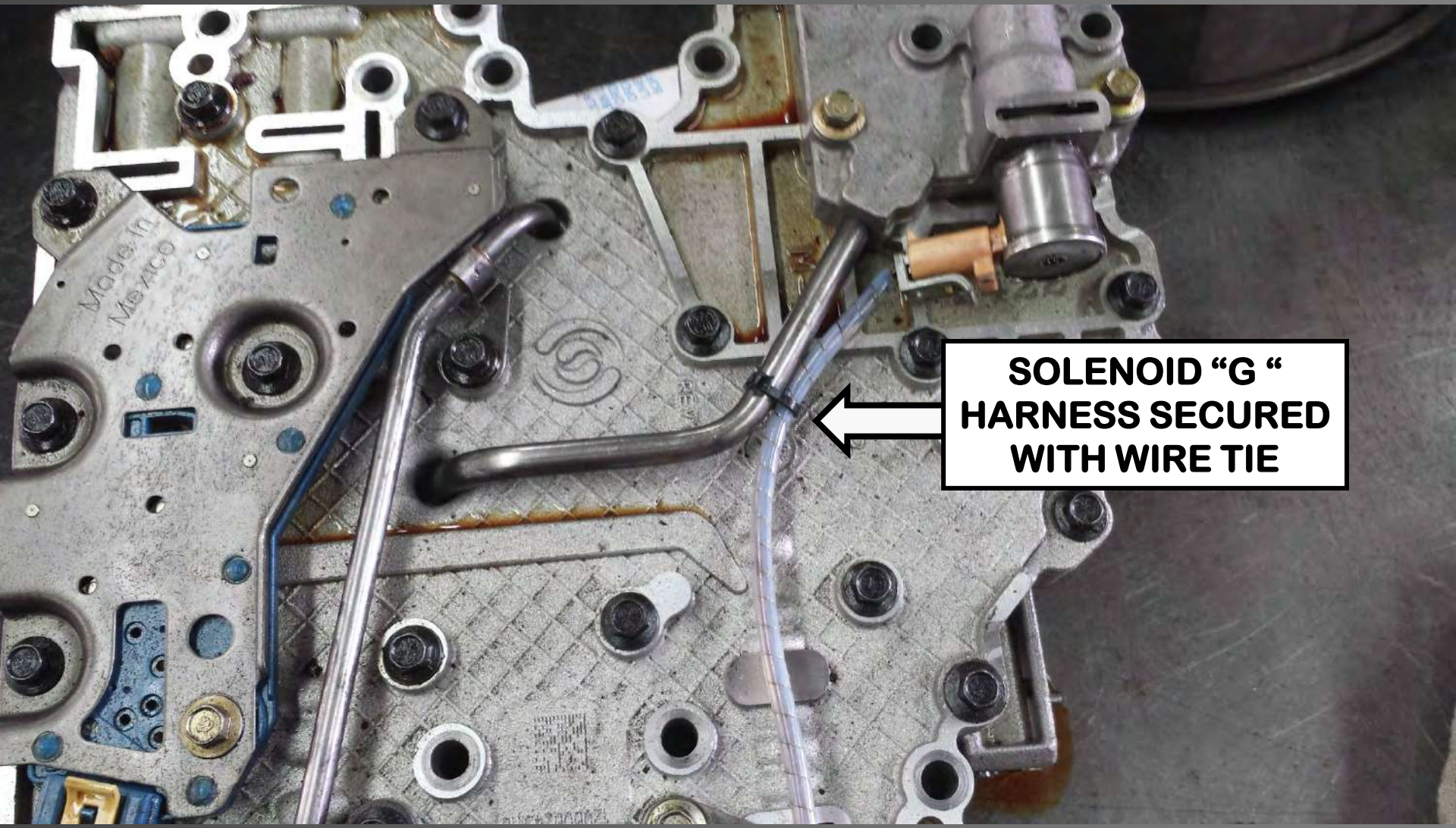
26 TOOTH OUTER GEAR
22 TOOTH INNER GEAR


PPT
23539582
4/4

DTC P0960 = SOLENOID "G " CIRCUIT OPEN



DTC P0960 = SOLENOID "G " CIRCUIT OPEN



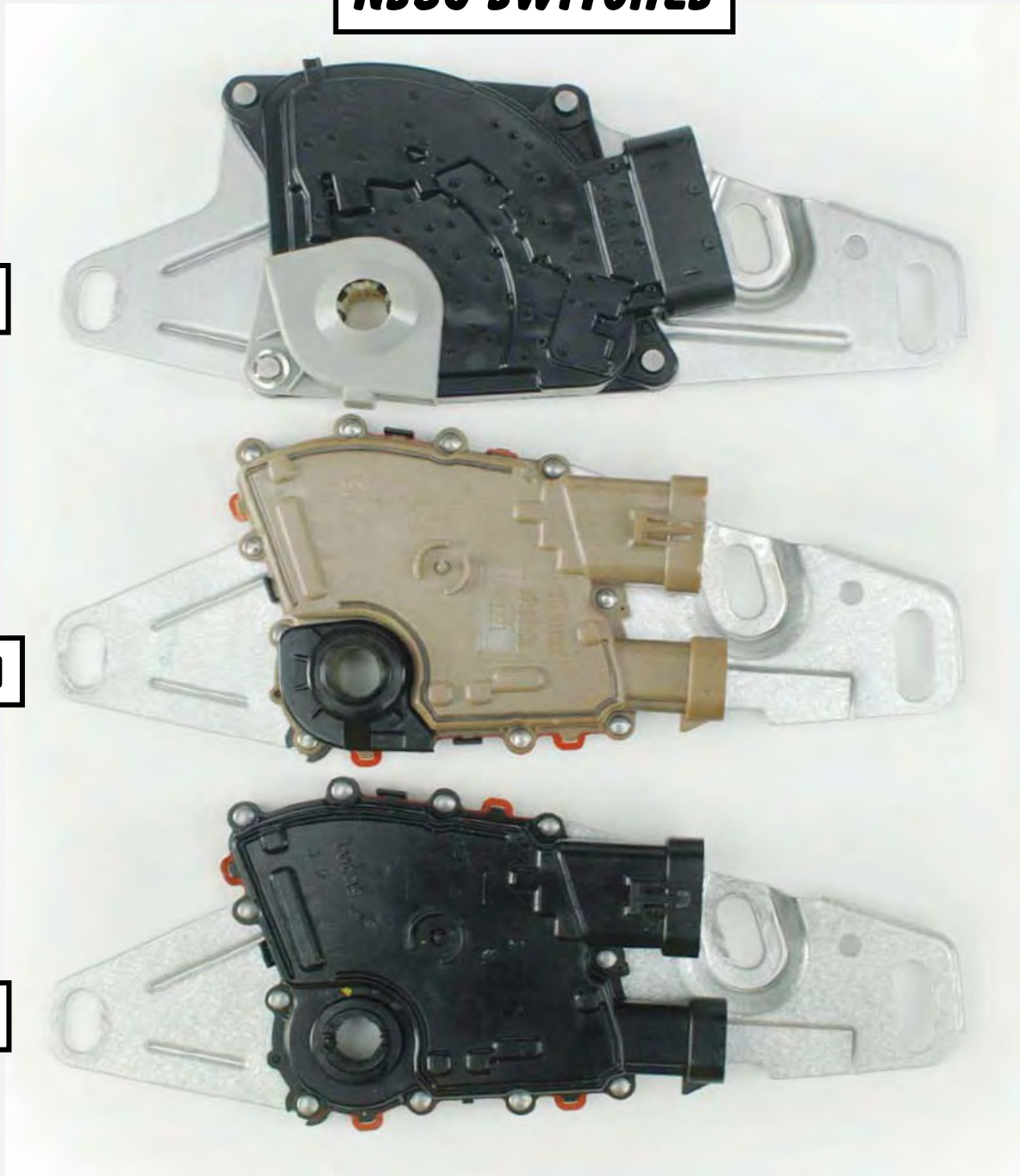
NSBU SWITCHES

PPT

3RD DESIGN

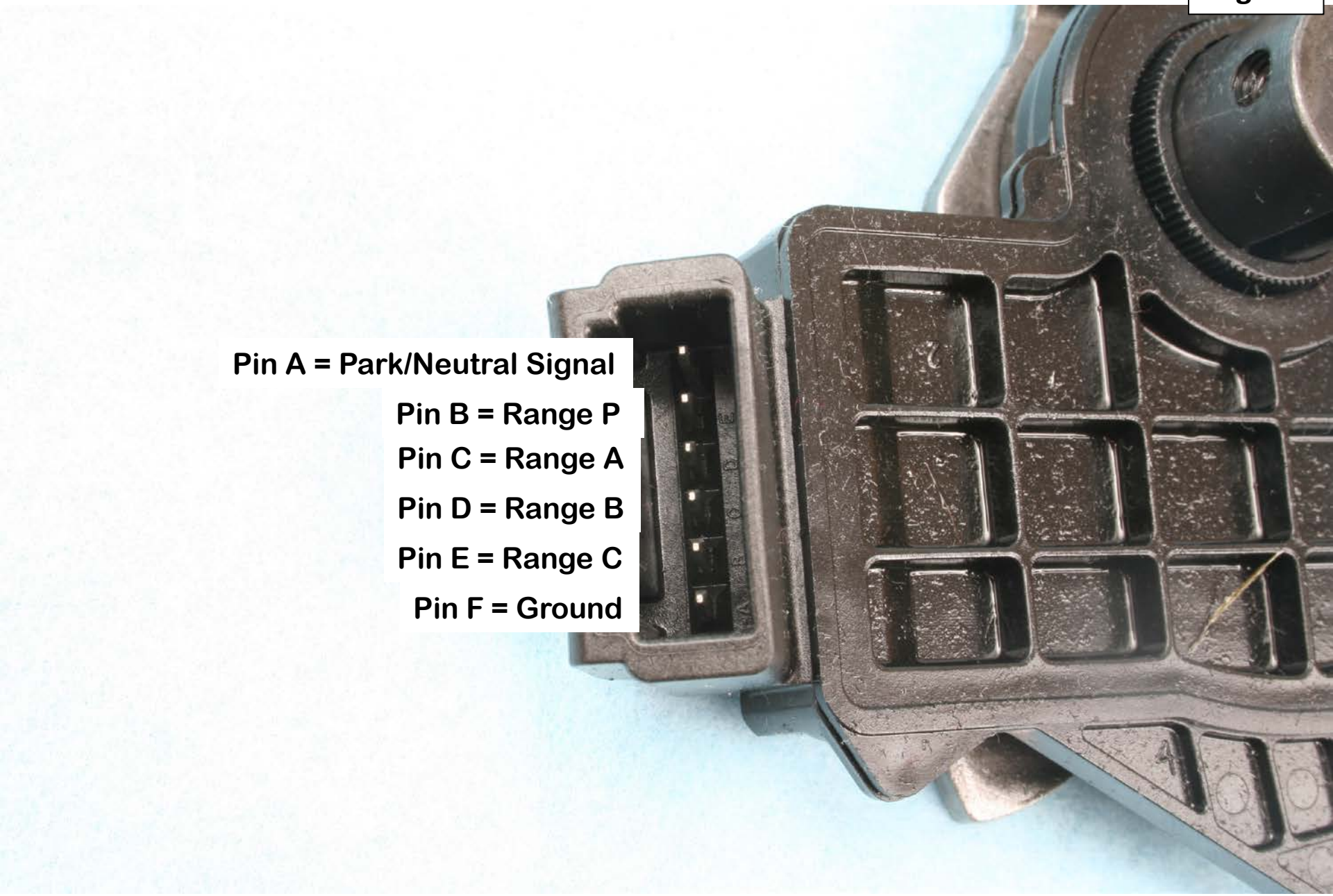
2ND DESIGN

1ST DESIGN



INTERNAL MODE SWITCH

INTERNAL MODE SWITCH

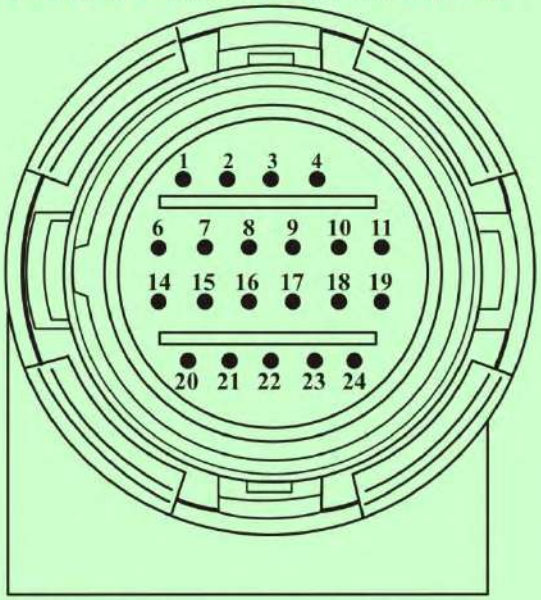

Pin A = Park/Neutral Signal
Pin B = Range P
Pin C = Range A
Pin D = Range B
Pin E = Range C
Pin F = Ground

IMS CASE CONNECTOR TERMINAL ID

PIN	WIRE COLOR	CIRCUIT	PIN DESIGNATION
1	Grn	1222	Solenoid 1Ground
2	Lt Grn	1223	Solenoid 2 Ground
3	Violet	2527	Solenoid 3 Ground
4	Org	1224	PSA Signal C
6	Grey	1226	PSA Signal E
7	Wht	1225	PSA Signal D
8	Tan	1227	TFT Sensor 5 Volt Ref
9	Blk	2762	TFT/Internal Mode Switch Gnd
10	Pink	418	TCC PWM Sol Signal Low
11	Brn	2529	PSA Signal Reverse
14	Red	1228	Epc/TCC/PCS 1 Power 12V
15	Dk Blue	1229	Pressure Control Solenoid 2 Low
16	Red/Blk	323	Sol 1/2/3/PCS 2 Power 12V
17	Blue	2469	Pressure Control Solenoid 1 Low
18	Violet/Blk	1786	Internal Mode Switch P/N Signal
19	Yellow	1530	Line Pressure EPC Low
20	Blk/White	773	Internal Mode Switch C Signal
21	Tan/White	772	Internal Mode Switch B Signal
22	Yellow/Blk	771	Internal Mode Switch A Signal
23	Pink/Blk	776	Internal Mode Switch P Signal
24	Red	1228	Epc/TCC/PCS 1 Power 12V

Note: Pin 14 and 24 both feed the same solenoids.

TRANSMISSION HARNESS CONNECTOR PIN ID WITH INTERNAL MODE SWITCH

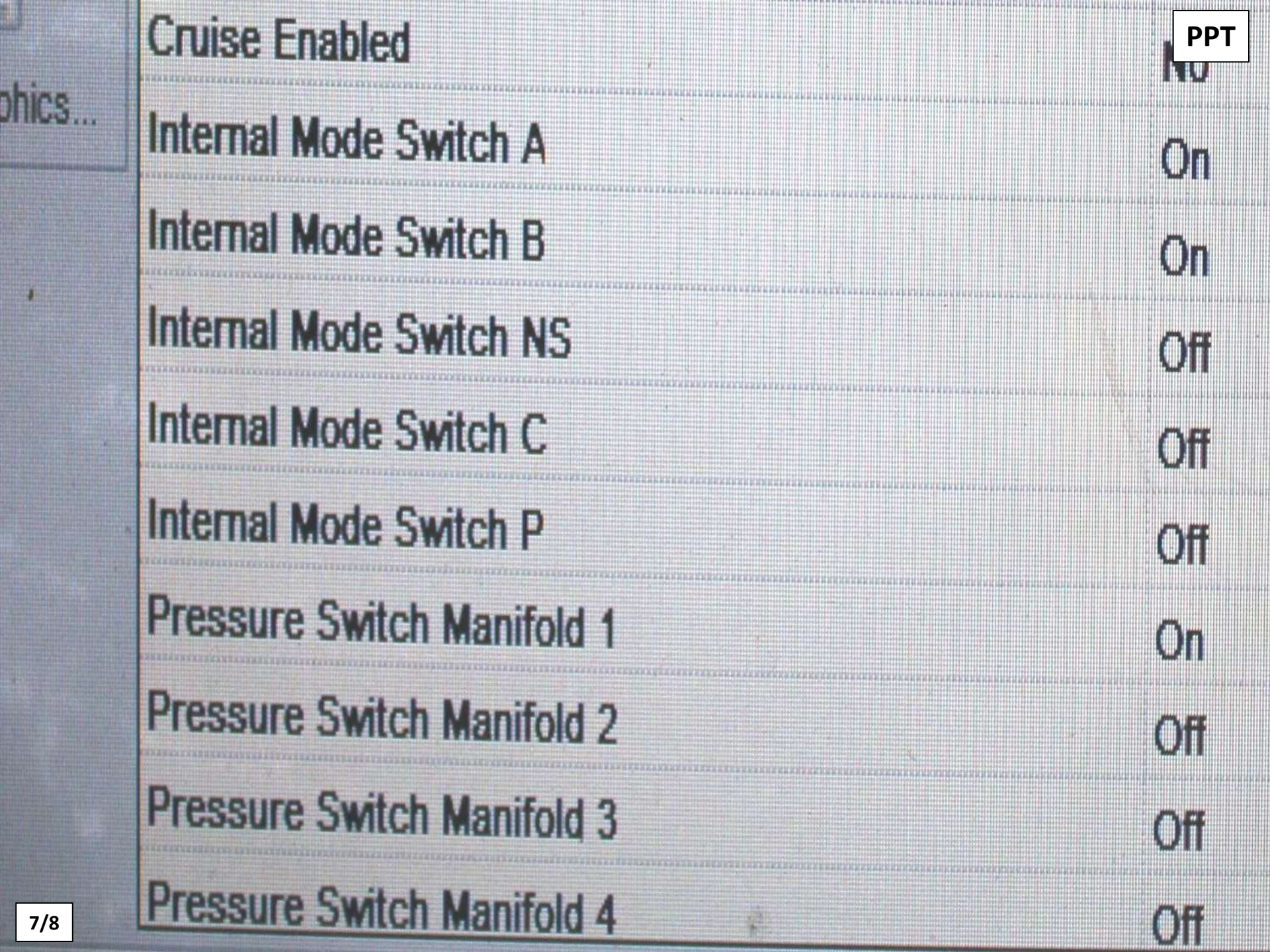


TRANSMISSION EXTERNAL CONNECTOR FACE VIEW WITH INTERNAL WIRE COLORS

IMS RANGE LOGIC

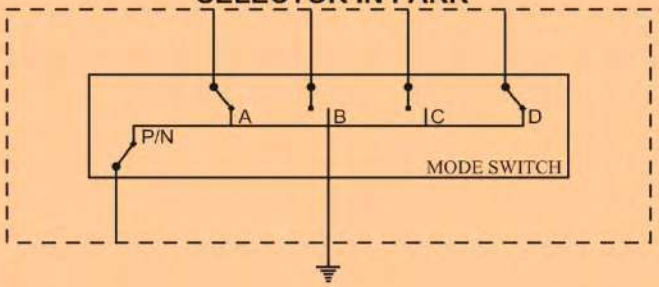
RANGE	INTERNAL MODE SWITCH SIGNAL A	INTERNAL MODE SWITCH SIGNAL B	INTERNAL MODE SWITCH SIGNAL C	INTERNAL MODE SWITCH SIGNAL P
P	LOW/OFF	HIGH/ON	HIGH/ON	LOW/OFF
R	LOW/OFF	LOW/OFF	HIGH/ON	HIGH/ON
N	HIGH/ON	LOW/OFF	HIGH/ON	LOW/OFF
5	HIGH/ON	LOW/OFF	LOW/OFF	HIGH/ON
4	LOW/OFF	LOW/OFF	LOW/OFF	LOW/OFF
2	LOW/OFF	HIGH/ON	LOW/OFF	HIGH/ON
1	HIGH/ON	HIGH/ON	LOW/OFF	LOW/OFF

NOTE: HIGH/ON = APPROXIMATELY 5 VOLTS
LOW/OFF = APPROXIMATELY 0 VOLTS

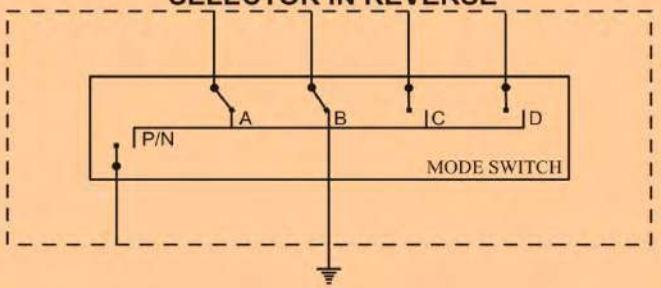

PPT
Cruise Enabled
Internal Mode Switch A
On
Internal Mode Switch B
On
Internal Mode Switch NS
Off
Internal Mode Switch C
Off
Internal Mode Switch P
Off
Pressure Switch Manifold 1
On
Pressure Switch Manifold 2
Off
Pressure Switch Manifold 3
Off
Pressure Switch Manifold 4
Off
7/8

IMS SWITCH STATE

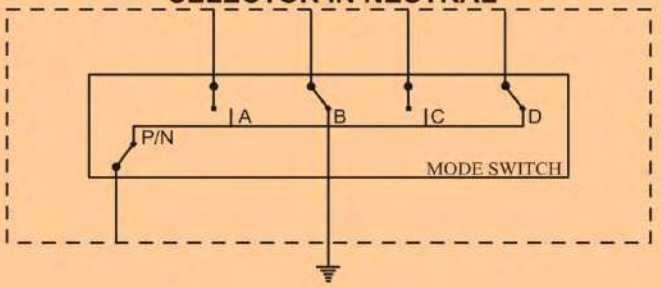
SELECTOR IN PARK



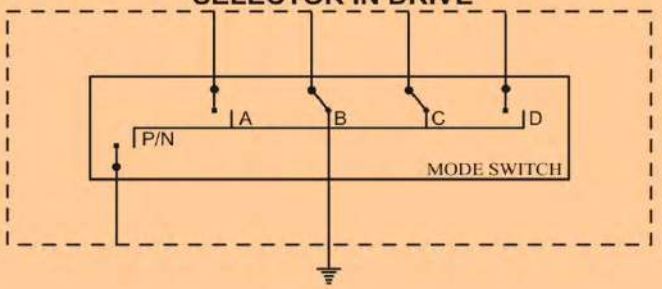
SELECTOR IN REVERSE



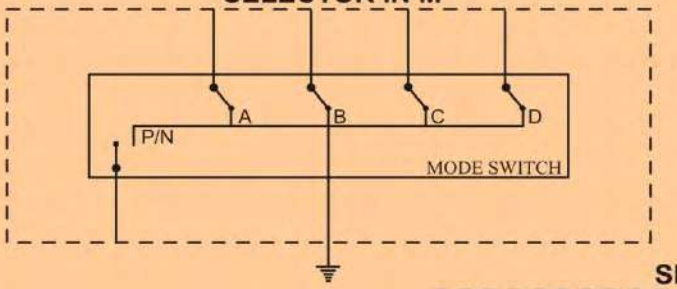
SELECTOR IN NEUTRAL



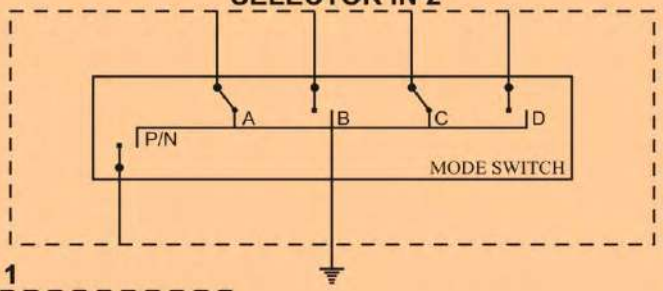
SELECTOR IN DRIVE



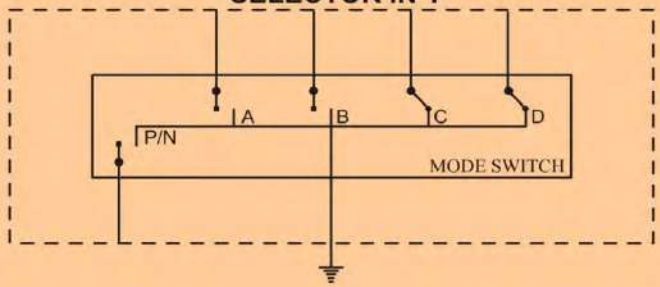
SELECTOR IN M



SELECTOR IN 2



SELECTOR IN 1



PPT


GMC
C5500
DURAMAX
DIESEL

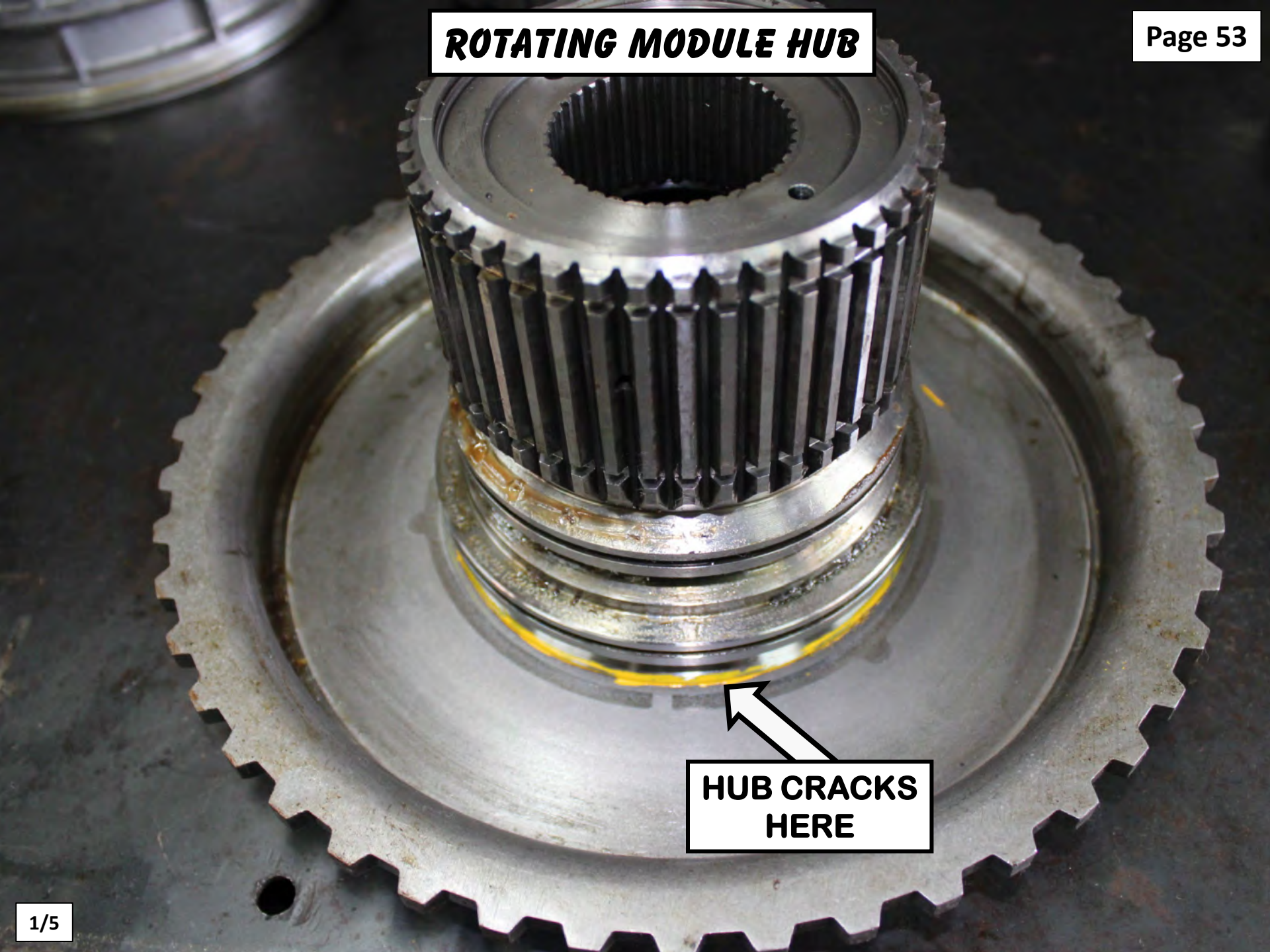
PPT

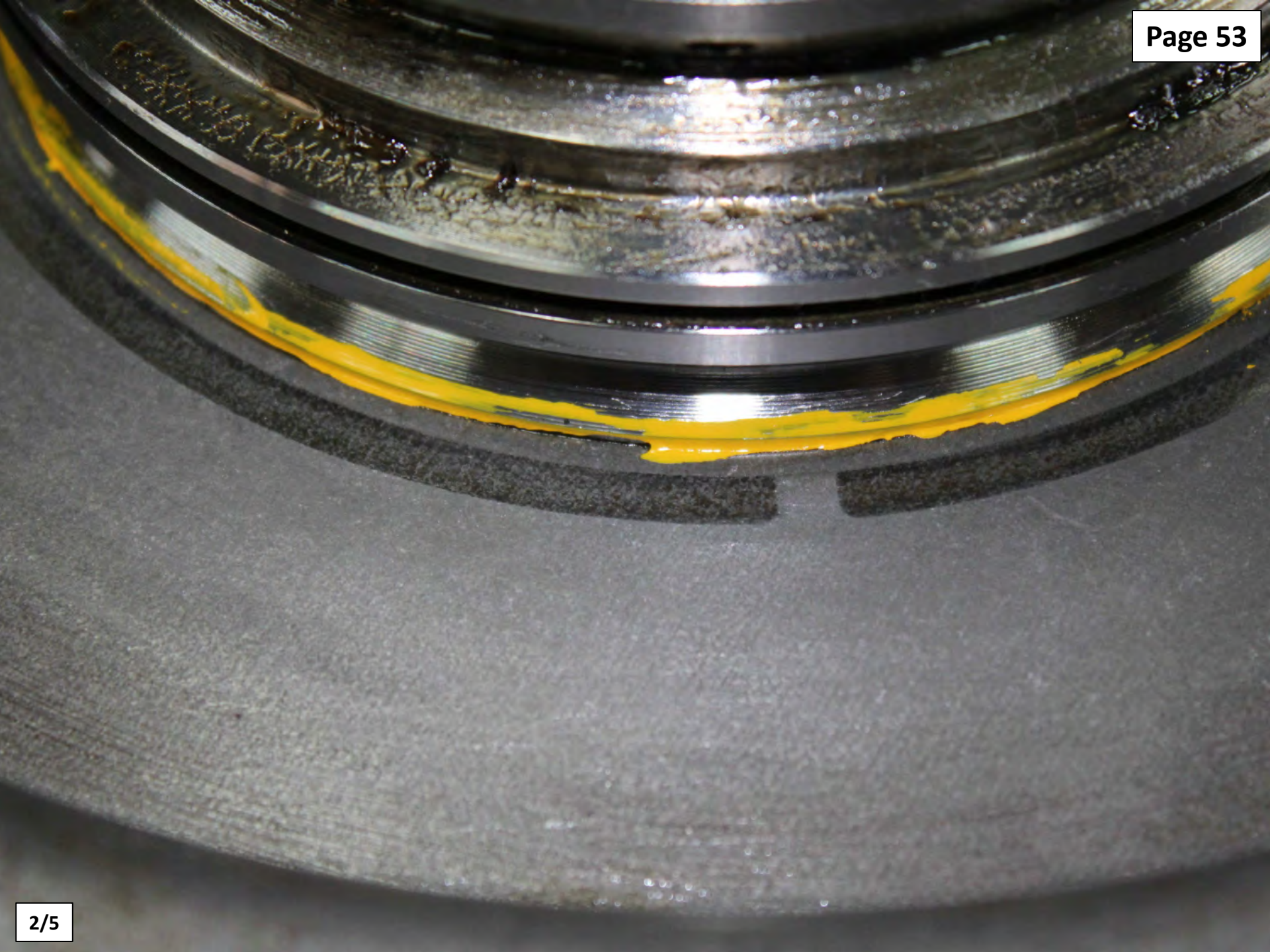
PPT

Allison Transmission.

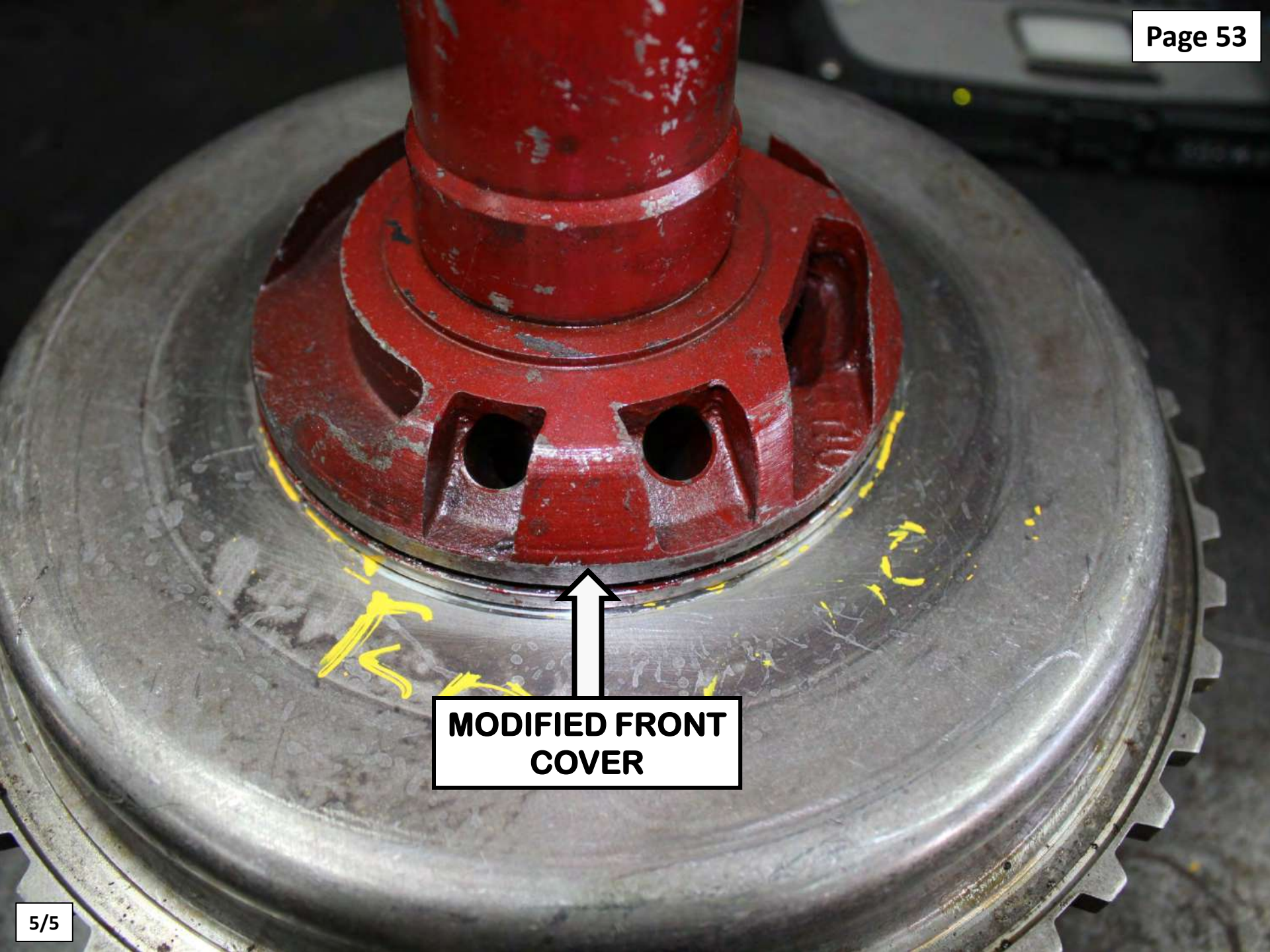
3000/4000 SERIES

ROTATING MODULE HUB





FRONT COVER


MODIFIED FRONT COVER

AISIN 6 (A465) SERIES

AISIN 6 (A465) TRANSMISSION

2007 - 2013 Isuzu “N” Series trucks and 2007 - 2010 Chevrolet/GMC “W” Series Trucks equipped with the A465 6 Speed Transmission and 5.2L or 3.0L Diesel Engine and a diesel particulate filter may have a complaint of the “Check Trans” Lamp illuminated with one or more of the following DTCs:

2007 – 2010 Model Years:

P0745 = Exhaust Brake Cut Request Circuit Malfunction
P0742 = TCC “Stuck ON”
P0751 = Shift solenoid 1 “Stuck OFF”
P0756 = Shift Solenoid 1 “Stuck ON”
P0761 = Shift Solenoid 3 “Stuck ON”
P0766 Shift Solenoid 3 “Stuck OFF”
P0796 = Pressure Control Solenoid 3 Performance

2011 – 2013 Model Years (5.2L Diesel Engine):

P0503 = Vehicle Speed Sensor Circuit Intermittent Fault
P0707 = Transmission Range Switch Circuit Low
P0708 = Transmission Range Switch Circuit High
P0742 = TCC “Stuck ON”
P0746 = Pressure Control Solenoid 1 Performance
P0751 = Shift solenoid 1 “Stuck OFF”

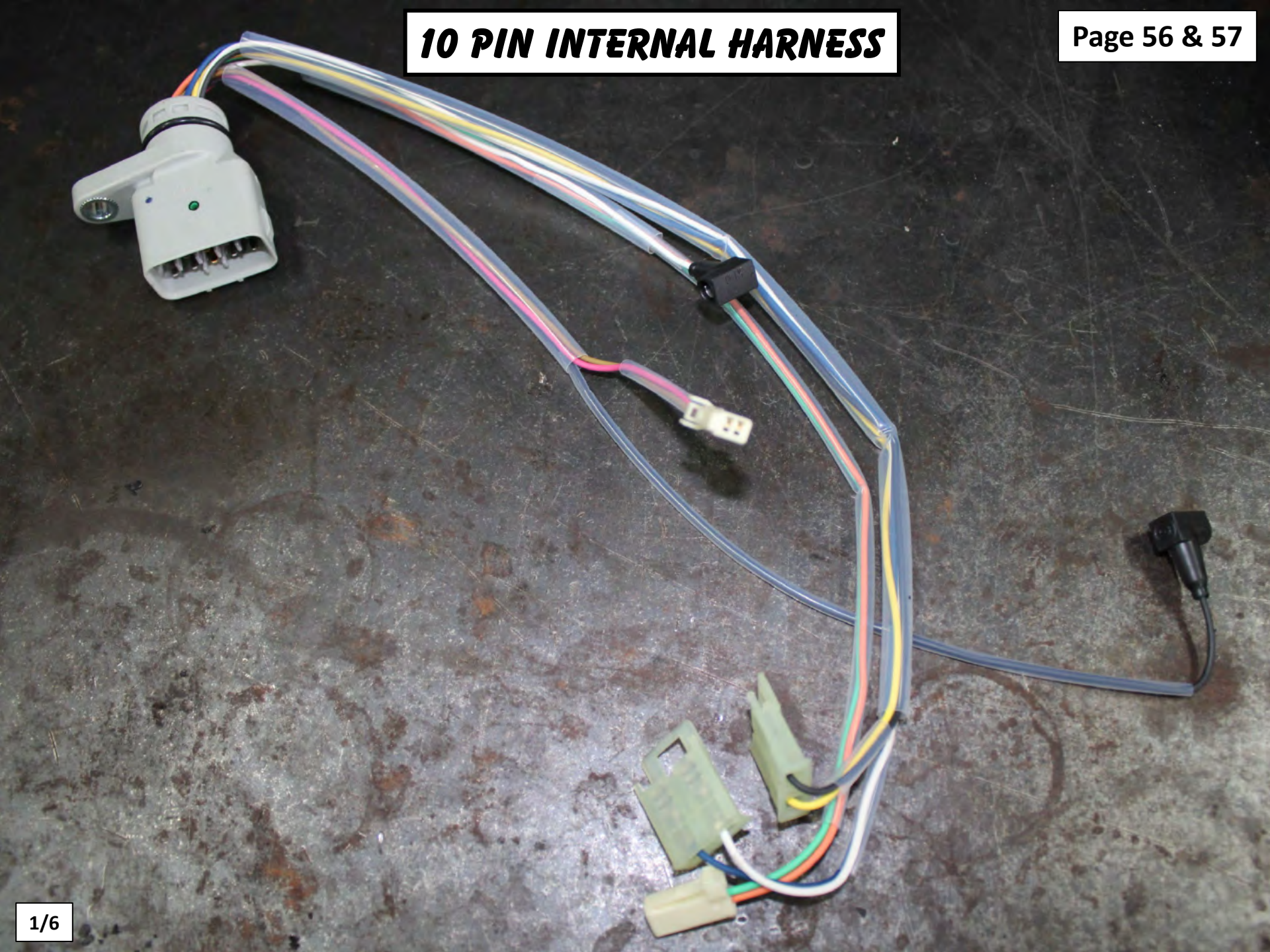
2011 – 2013 Model Years (3.0L Diesel Engine):

P0756 = Shift Solenoid 1 "Stuck ON"
P0761 = Shift Solenoid 3 "Stuck ON"
P0766 Shift Solenoid 3 "Stuck OFF"
P0776 = Pressure Control Solenoid 2 Performance
P0796 = Pressure Control Solenoid 3 Performance
P084B = Transmission Fluid Pressure Switch 8 Performance

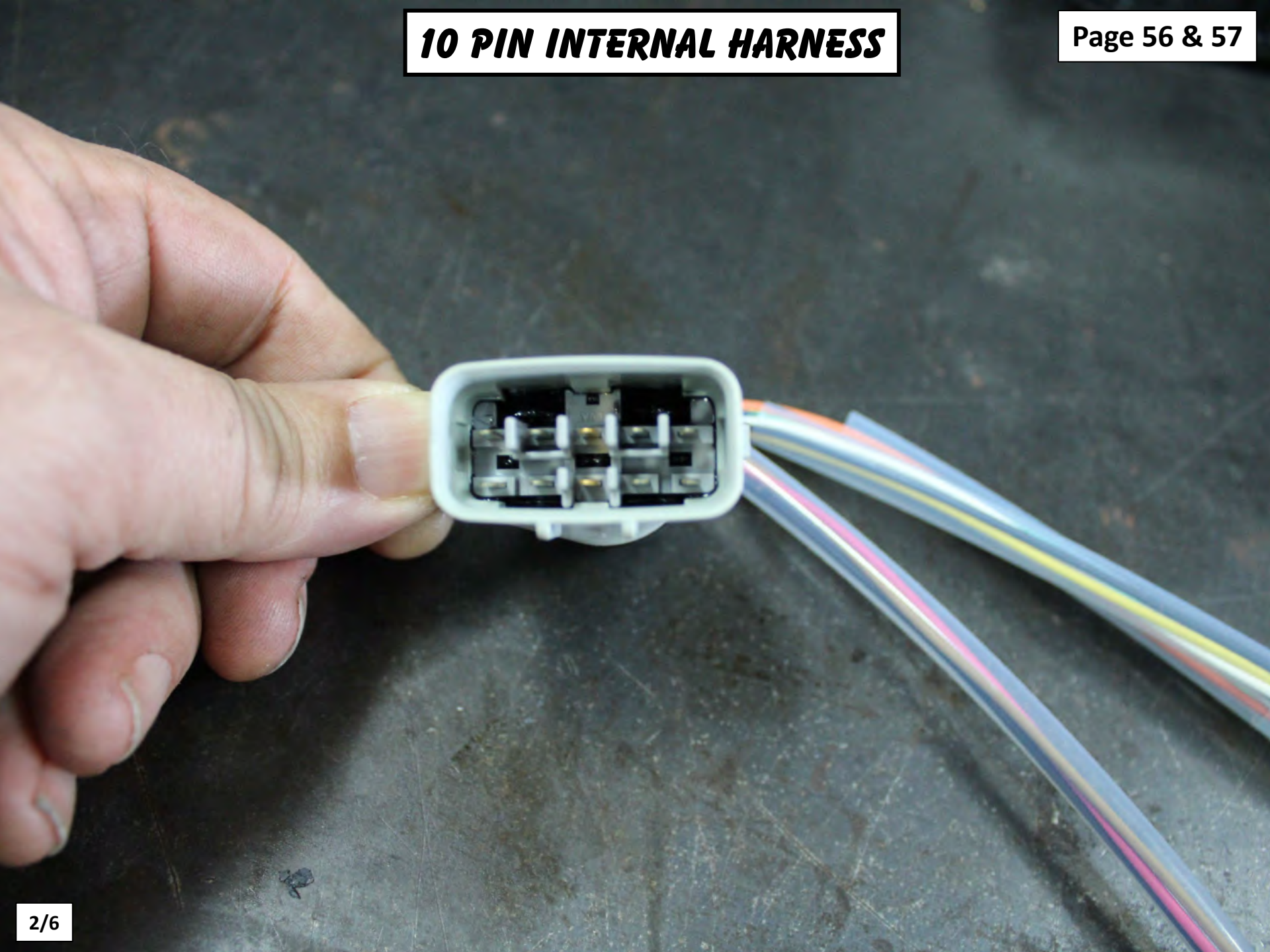
CAUSE: TCM Software Conflicts.

Correction: Reprogram TCM with latest software calibrations.

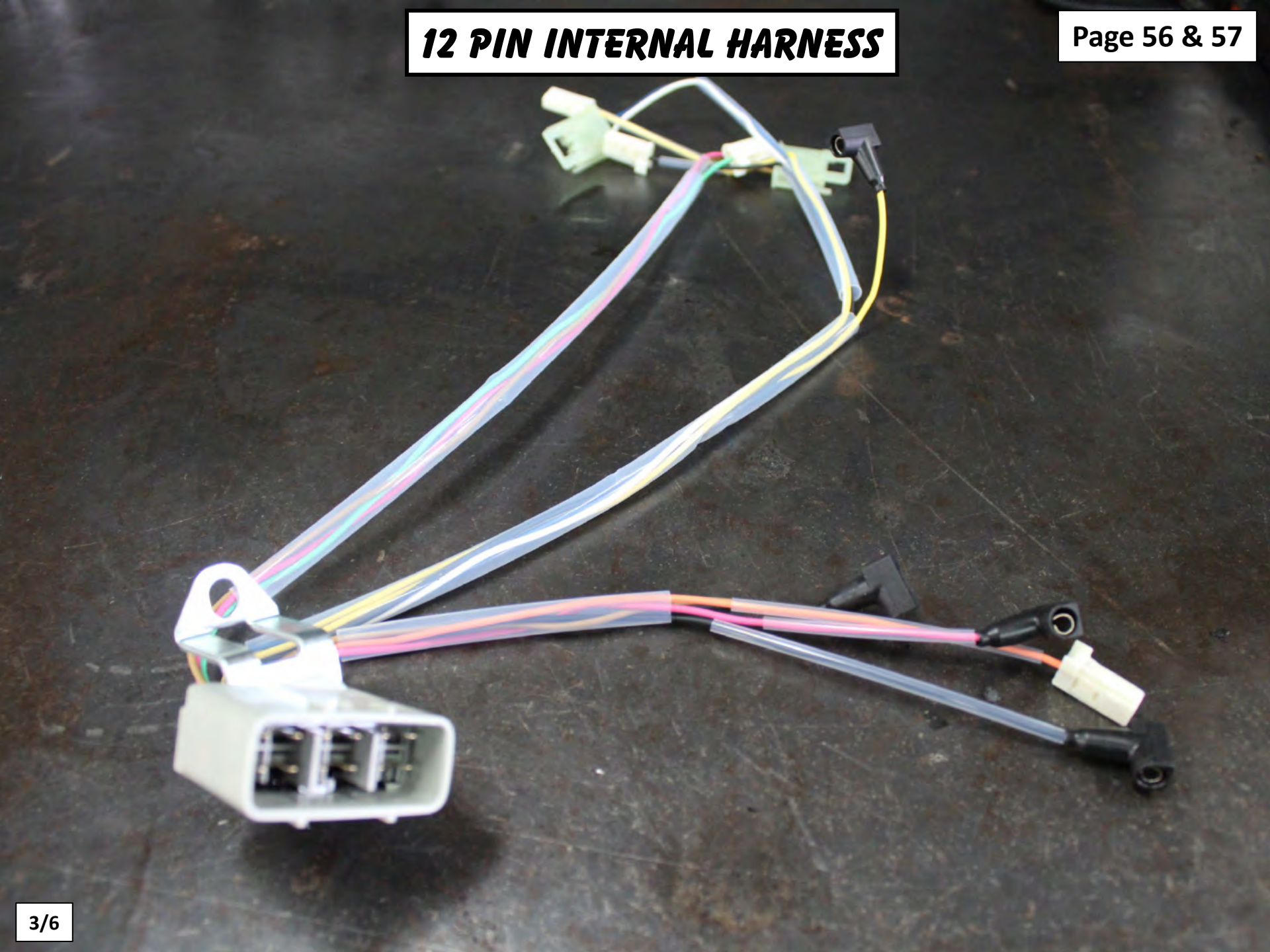
10 PIN INTERNAL HARNESS



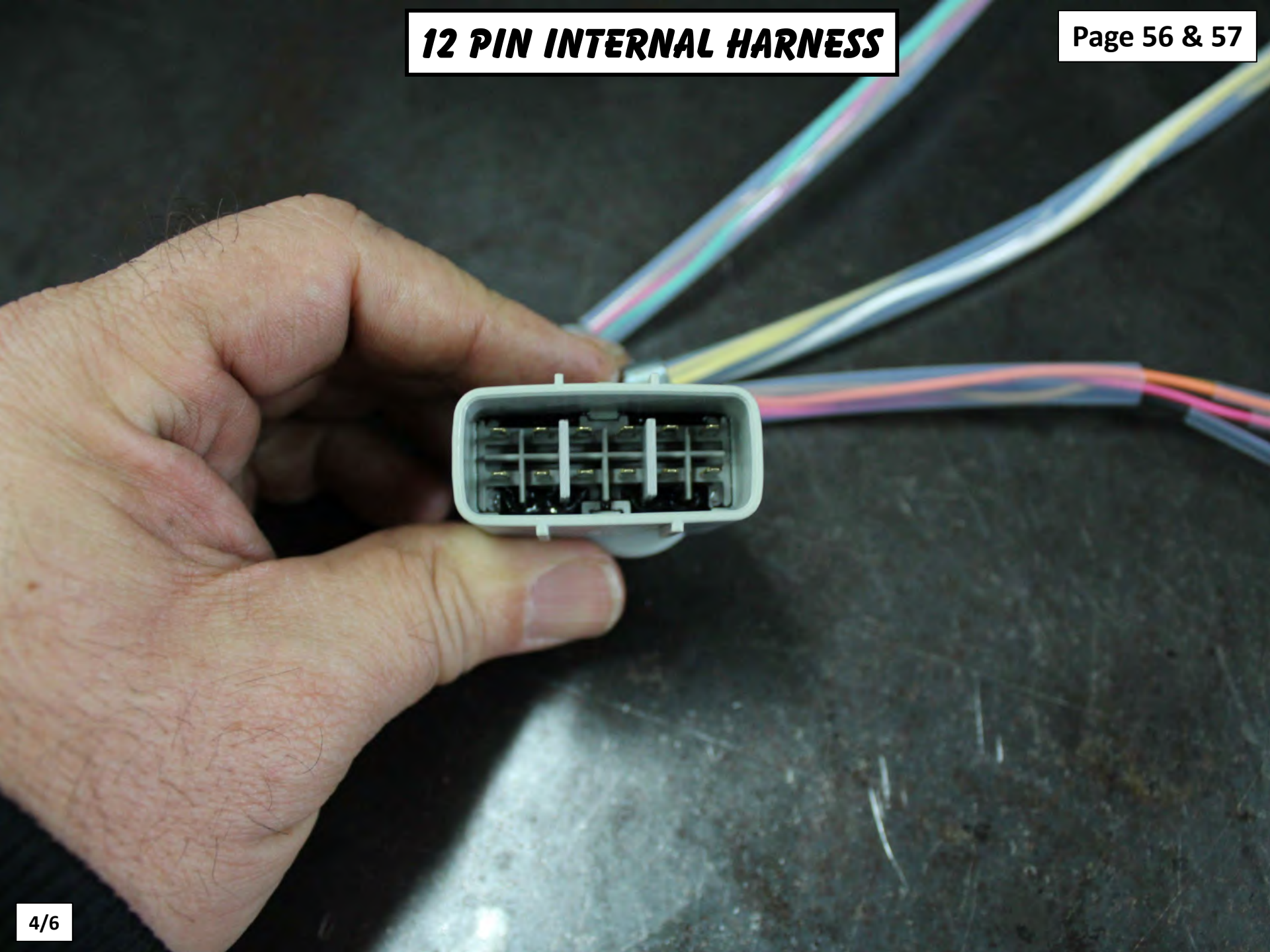
10 PIN INTERNAL HARNESS



12 PIN INTERNAL HARNESS



12 PIN INTERNAL HARNESS



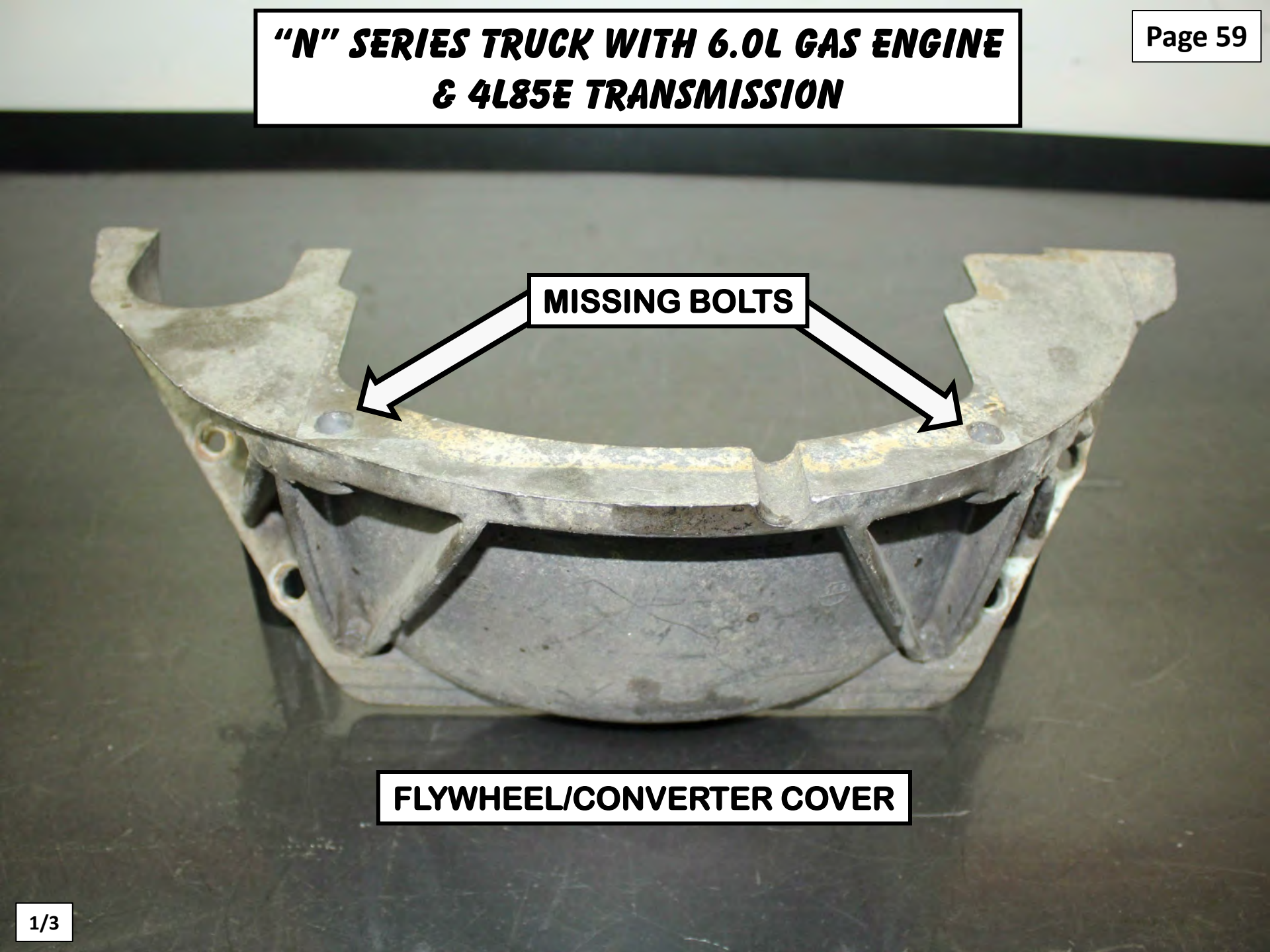
ISUZU PN-8-98179-069-0


Page 56 & 57
ISUZU PN-8-98179-070-0
GM# 98179070
GR. 4.265
ISUZU
GENUINE PARTS
ISUZU MOTORS LIMITED JAPAN
MADE IN JAPAN
QTY. 1
8-98179070-0
244-301
M CC
8320
JAPAN
BATCH
LINE NO
SORT CODE
0011
C
6/6

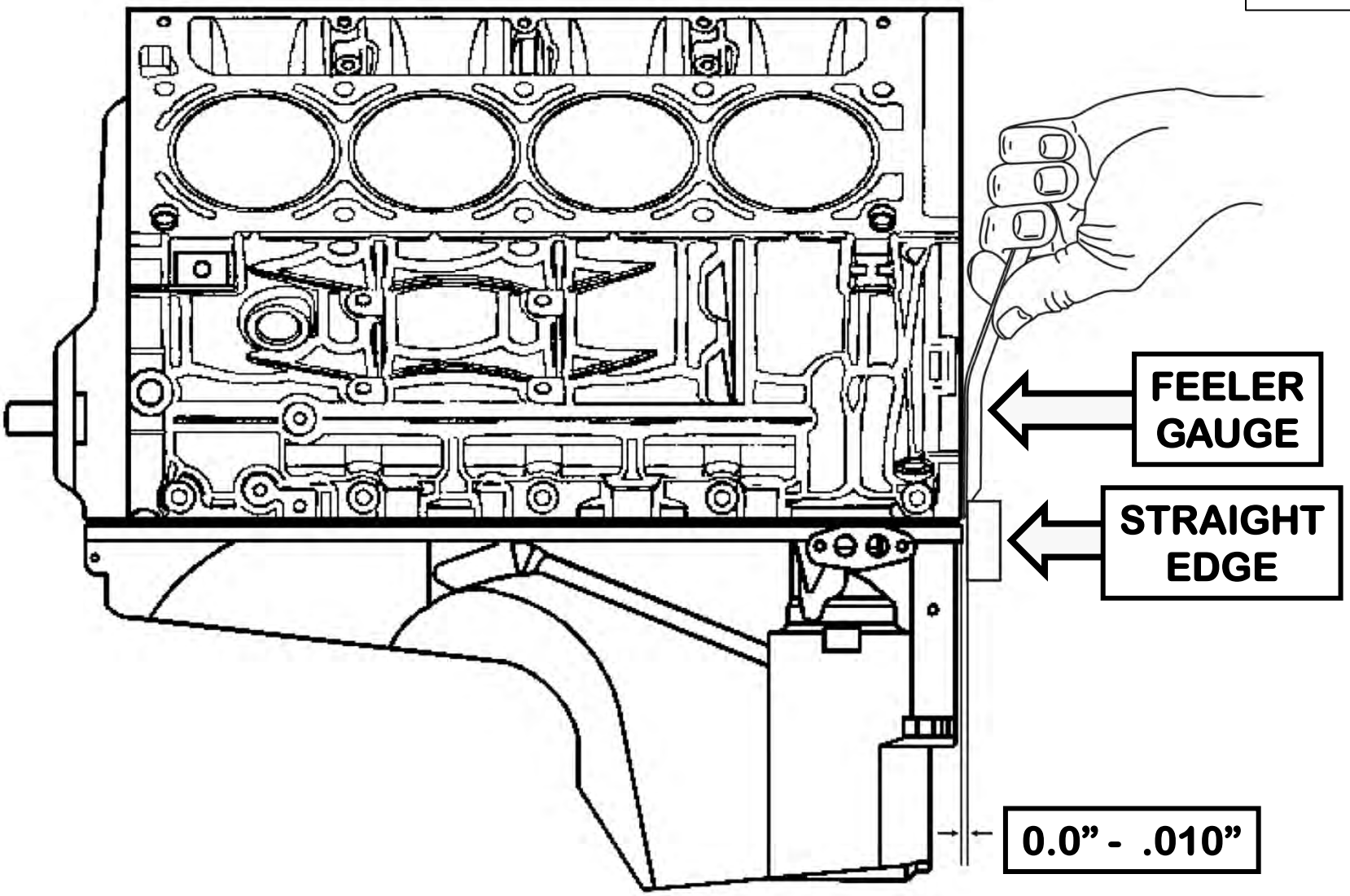

RC TRUCK PARTS
305-863-3933
4X4
ISUZU
DXT
1/1/1M

4L80E SERIES

"N" SERIES TRUCK WITH 6.0L GAS ENGINE & 4L85E TRANSMISSION



6.0L GAS ENGINE




HINO
TRUCKS

HINO TRUCKS WITH "IN CAB" MERITOR WABCO ABS ECU

ACTIVE ABS CODES CAUSE NO LOCKUP WITH A SEVERE TRANSMISSION OVERTEMP CONDITION

Diagnosis

File(F) Diagnosis(D) View(V) Check functions(E) Configuration(C) Options(S) Window(W) Help(H)

File(F)

Diagnosis(D)

Equipment DTC

Diagnostic Infomation

View(V)

[HINO-BOWIE

Diagnosis

- Hino Diagnostic eXplorer -

- **Equipment DTC**
  Diagnostic information is read from the specific ECU you choose.

- **Diagnostic Information**
  Reference material regarding diagnosis of problems.

*Before continuing with any diagnosis, please ensure that the key switch is in the "ON" position.

<Hino Motors, Ltd.>

Diagnosis - [Diagnostic Infomation]

File(F) Diagnosis(D) View(V) Check functions(E) Configuration(C) Options(S) Window(W) Help(H)

File(F)

Diagnosis(D)

Equipment DTC

Diagnostic Infomation

View(V)

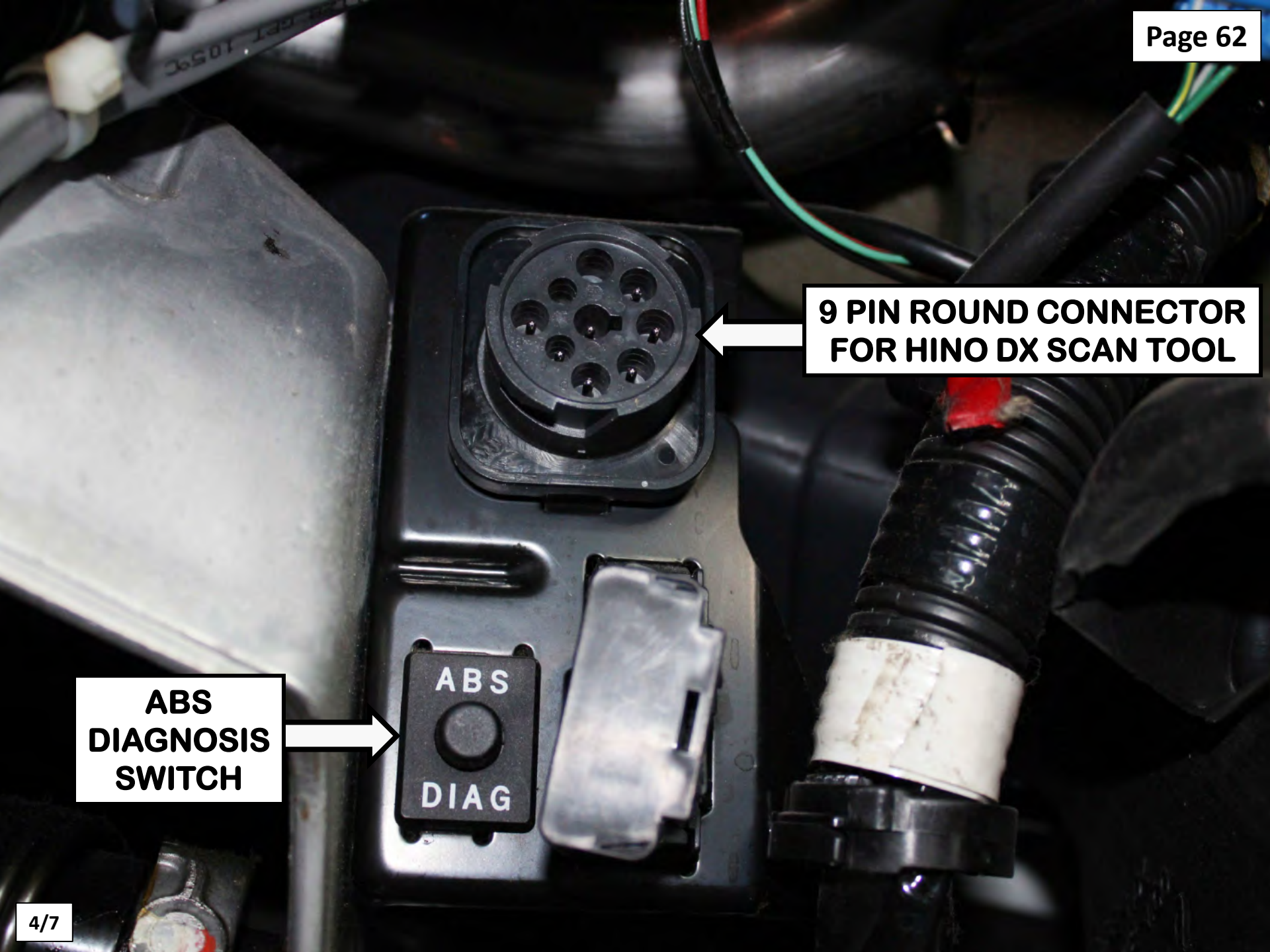
[MINO-BOWIE

Symptom Based Diagnostic Procedure(S) DTC Based Diagnostic Procedure(D)

Show(V)

Equipment	File Name	Prepare Date
Engine	CR_03_L	2008/09/25 16:38:00
Engine	CR_03_J08E	2006/10/20 00:00:00
Engine	CR_03_J05D	2006/10/20 00:00:00
Engine	COMMON RAIL(J05E)	2008/04/14 11:03:34
Engine	COMMON RAIL(J08E)	2008/04/14 11:12:18
Engine	EngineECU_KOR_RUS	2008/04/14 11:17:24
Engine	CR_03_J08E_US	2008/04/08 09:36:44
Engine	CR_03_J05D_US	2008/04/08 09:07:58
Engine	COMMON RAIL(A09C)	2008/04/09 11:48:24
VCS	VEHICLE CONTROL	2008/04/09 15:10:30
Suspension	Air	2006/10/20 00:00:00
Engine	300Series	2008/09/24 14:44:20
Hybrid	HV	2008/04/15 11:21:00
Inverter	INV	2008/04/15 11:37:08
Battery	BATT	2008/04/15 11:15:14
Brake(ABS)	ABS_300 Series	2008/09/19 13:40:42
Brake(ABS)	ABS_500 Series	2008/09/19 13:45:06
Transmission	AT_45043LE	2006/10/20 00:00:00

Help(F1) Close


9 PIN ROUND CONNECTOR FOR HINO DX SCAN TOOL
ABS DIAGNOSIS SWITCH
ABS
DIAG

ABS CODE RETRIEVAL & CLEARING USING ABS WARNING LAMP & "DIAGNOSTIC SWITCH"

CODE RETRIEVAL:

- Turn starter key ON.
- Press & hold for one second the "Diagnosis Switch", then release it.
- Count 2 digit flashes from the ABS Warning Lamp to determine code.
- After the 1st digit flashes there will be a 1.5 second pause until the 2nd digit starts flashing.
- After the 2nd digit flashes there will be a 4 second pause between the next code or to repeat the previous code.
- Use the code definition chart in Figure 4.

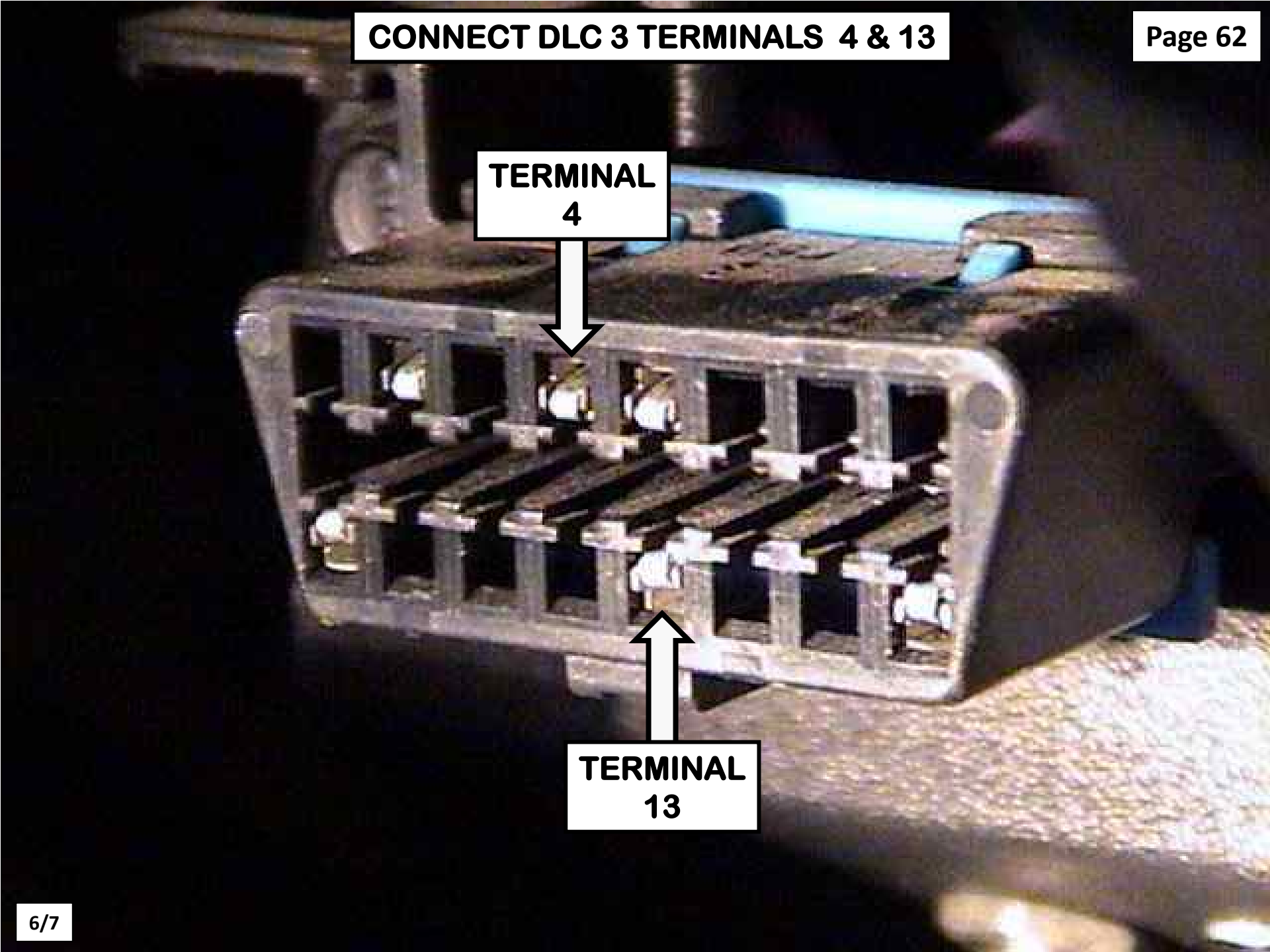
CODE CLEARING:

- Turn starter key ON.
- Press & hold the "Diagnosis Switch" for at least 3 seconds, then release it.
- The ABS Warning Lamp should now flash 8 times.

IMPORTANT NOTE:

The vehicle must reach a speed of at least 4 MPH for the ABS Warning Lamp to go out.

CONNECT DLC 3 TERMINALS 4 & 13



ABS CODE RETRIEVAL & CLEARING USING ABS WARNING LAMP & "DLC3 CONNECTOR

CODE RETRIEVAL:

- Connect a jumper wire to DLC3 connector terminals 4 (CG) and 13 (TC).
- Turn starter key ON.
- Read the flash code pattern from the ABS Warning Lamp using chart in Figure 5.
- There will be a 1.5 second pause between the 1st & 2nd digit followed by a 4 second pause until the next code starts flashing or repeats the previous code.
- Remove Jumper wire from the DLC3 .

CODE CLEARING:

- Connect a jumper wire to DLC3 connector terminals 4 (CG) and 13 (TC).
- Turn starter key ON & operate the brake pedal at least 8 times within 5 seconds.
- The ABS Warning Lamp should flash steadily and then go out.
- Remove jumper wire from the DLC3.

automechanika
CHICAGO

PRESENTED BY:

ABRN Motor Age UBM UBM ADVANSTAR messe frankfurt

THANK YOU TO OUR PARTNERS TST AND ATSG

TST ATSG

THANK YOU FOR YOUR ATTENTION