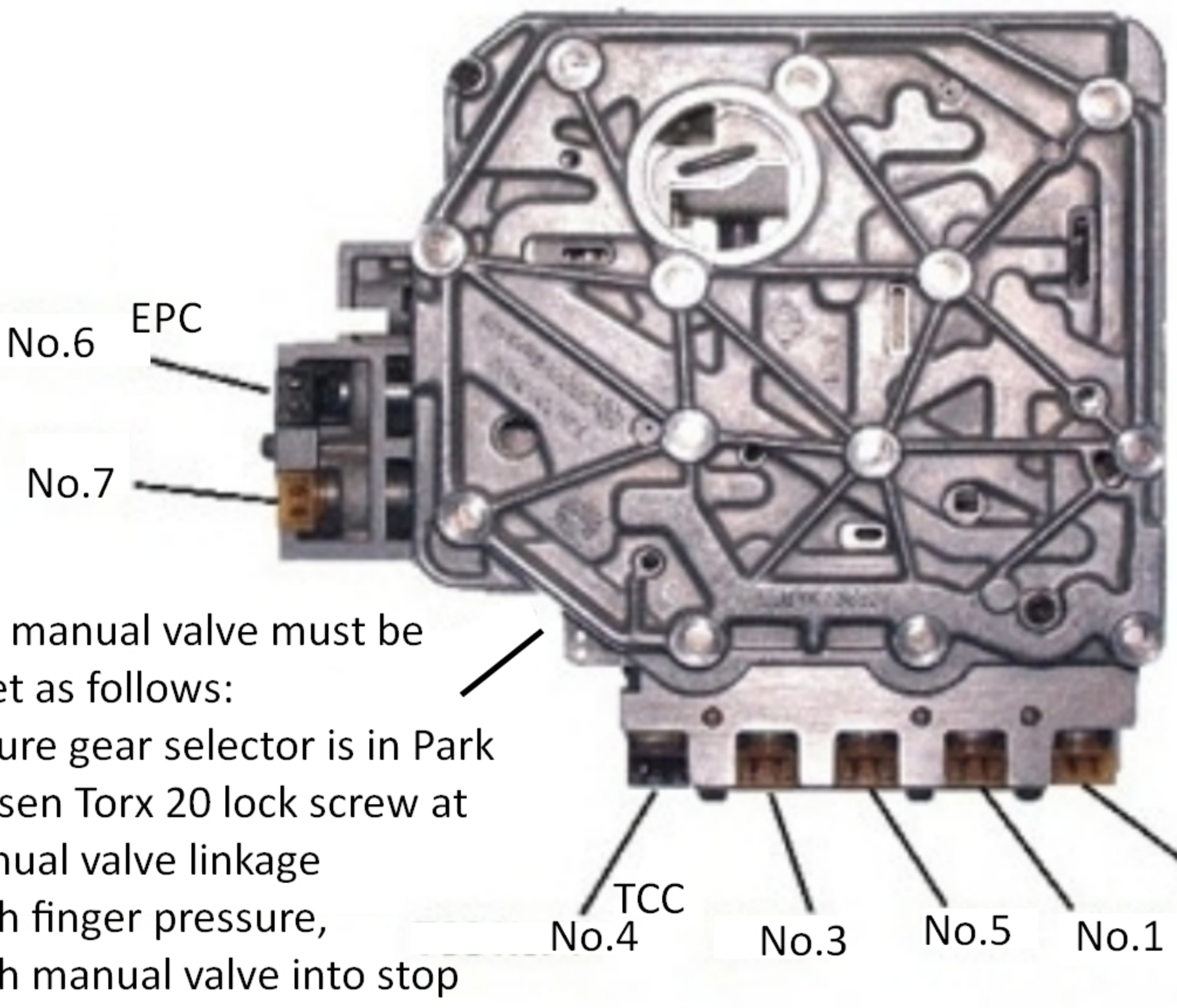
SINS

Simple is not Simple

095 096/01M 097/01N 098/01P

Technical Information

NOTES: Rest all computer strategies

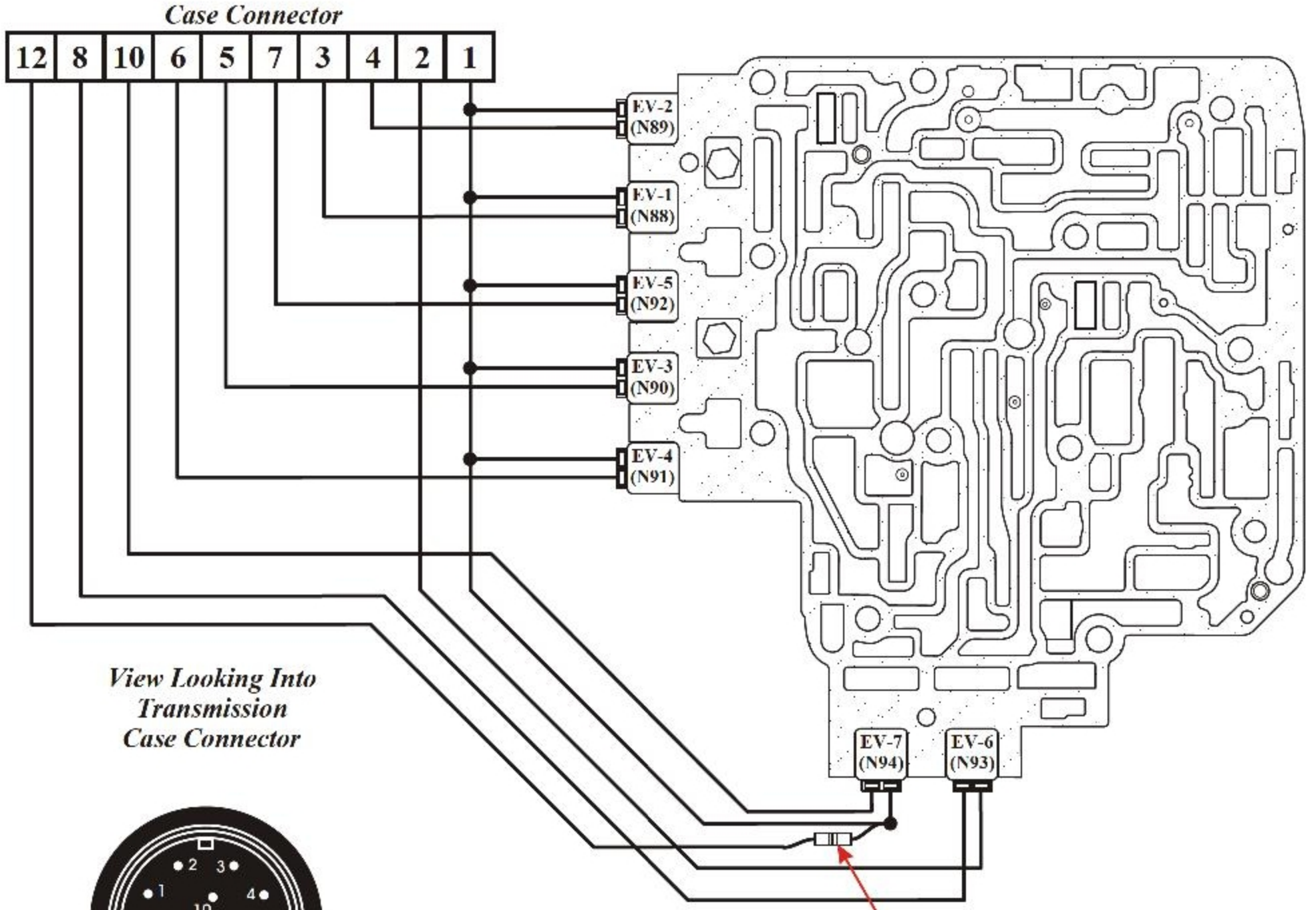


The manual valve must be reset as follows:
Ensure gear selector is in Park
Loosen Torx 20 lock screw at manual valve linkage
With finger pressure, push manual valve into stop
Retighten Torx 20 lock screw to 35 Inch Lb

119952: No.1, 2, 3, 5, 7
119954: No.4, 6

To prevent DTC or failsafe Always replace solenoid harness or output speed sensor

INTERNAL COMPONENT RESISTANCE CHART



Component	Pin No's.	Resistance @ 20°C (72°F)
Solenoid EV-1 (N88)	1 And 3	55-65 Ohms
Solenoid EV-2 (N89)	1 And 4	55-65 Ohms
Solenoid EV-3 (N90)	1 And 5	55-65 Ohms
Solenoid EV-4 (N91)	1 And 6	4.5-5.1 Ohms
Solenoid EV-5 (N92)	1 And 7	55-65 Ohms
Solenoid EV-6 (N93)	2 And 8	4.5-5.1 Ohms
Solenoid EV-7 (N94)	1 And 10	55-65 Ohms
TFT Sensor	1 And 12	190k-200k Ohms

DESCRIPTION OF SOLENOID OPERATION

EV-1 (N88) This solenoid feeds the K-1 clutch when it is de-energized (Off), and feeds the B-1 brake when it is energized (On), in Park, Neutral and 4th.

EV-2 (N89) This solenoid is energized in 2nd and 4th to apply the B-2 brake.

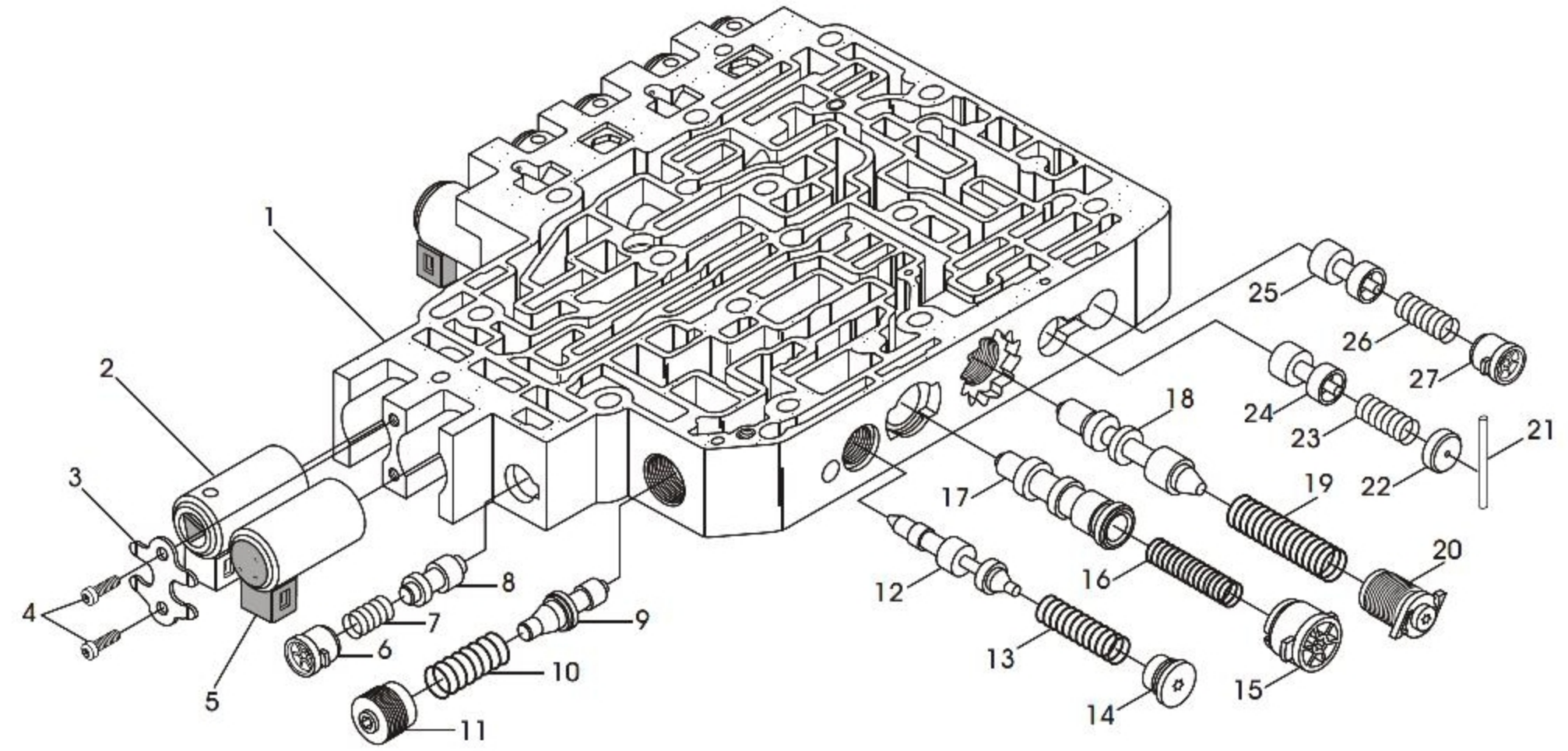
EV-3 (N90) This solenoid controls the K-3 clutch

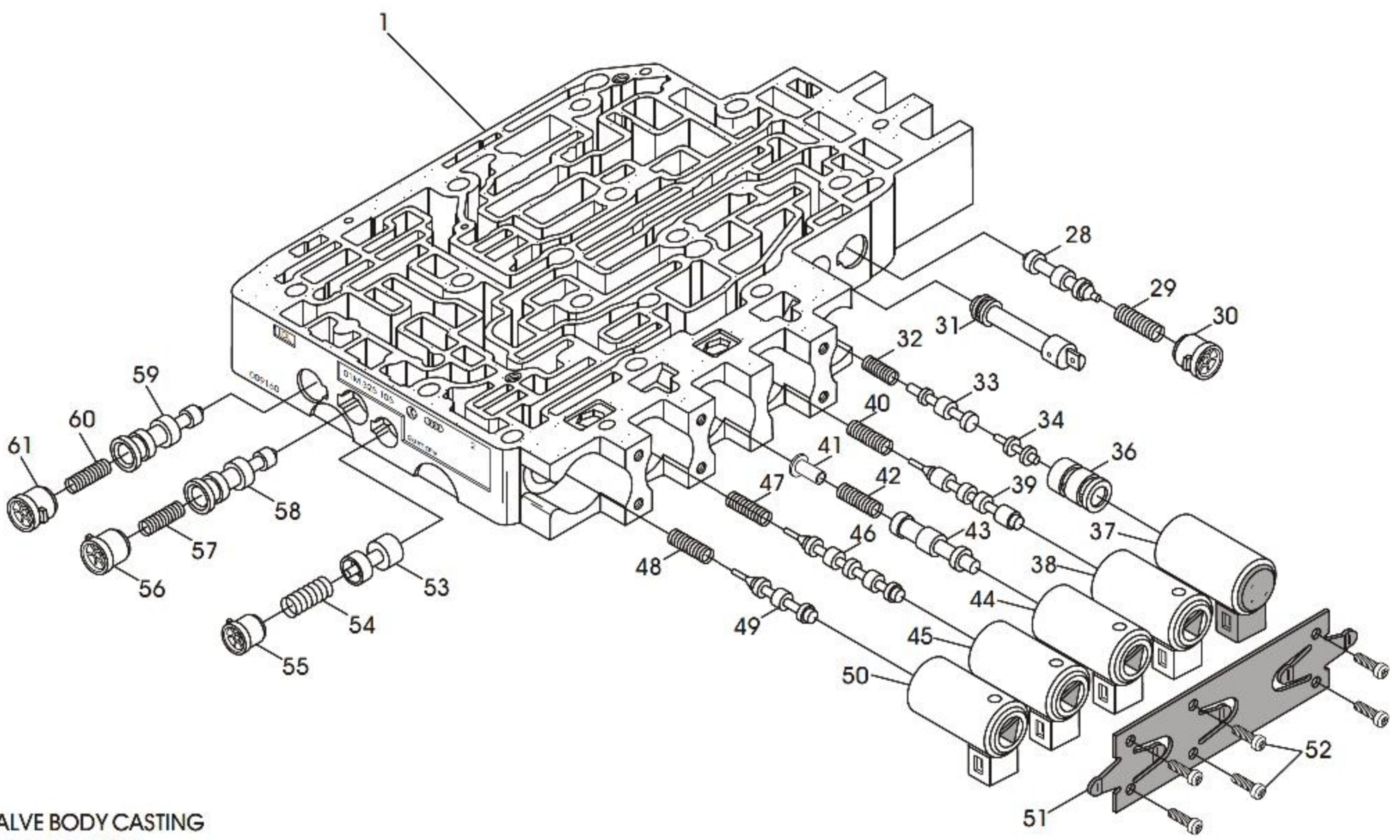
***EV-4 (N91)** This PWM solenoid applies the converter clutch when it is energized (On) and is dependent on engine temp, vehicle speed and throttle position.

****EV-5 (N92)** This solenoid is energized (On) during every shift, to drop line pressure, and orifices the apply oil to each clutch pack during the shift to provide smoother shifts. After the shift is completed, the solenoid is de-energized (Off).

*****EV-6 (N93)** This PWM solenoid controls main line pressure anytime the engine is running. This is a Pulse Width Modulated signal that varies with engine load and throttle position. When the solenoid is de-energized (Off) pressure goes to maximum.

EV-7 (N94) This solenoid controls the apply oil to the B-2 brake, to provide smoother shifts into 4th gear. It will also be energized (On) momentarily during the 2-3 shift.





1. MAIN VALVE BODY CASTING
2. EV-7 SOLENOID (N94)
3. SOLENOID RETAINING BRACKET
4. SOLENOID RETAINING BRACKET BOLTS
5. EV-6 SOLENOID (N93)
6. MANUAL 1ST LOCKING VALVE RETAINER (YELLOW)
7. MANUAL 1ST LOCKING VALVE SPRING (SEE SPRING SPEC)
8. MANUAL 1ST LOCKING VALVE
9. SOLENOID REGULATOR VALVE
10. SOLENOID REGULATOR VALVE SPRING (SEE SPRING SPEC)
11. SOLENOID REGULATOR VALVE RETAINER
12. CONVERTER REGULATOR VALVE
13. CONVERTER REGULATOR VALVE SPRING (SEE SPRING SPEC)
14. CONVERTER REGULATOR VALVE RETAINER
15. MAIN PRESSURE REGULATOR VALVE RETAINER (BROWN)
16. MAIN PRESSURE REG. VALVE SPRING (SEE SPRING SPEC)
17. MAIN PRESSURE REGULATOR VALVE
18. BOOST PRESSURE REGULATOR VALVE
19. BOOST PRESSURE REG. VALVE SPRING (SEE SPRING SPEC)
20. BOOST PRESSURE REGULATOR RETAINER (ADJUSTABLE)
21. K-3 REGULATOR VALVE RETAINING PIN
22. K-3 REGULATOR VALVE BORE PLUG
23. K-3 REGULATOR VALVE SPRING (SEE SPRING SPEC)
24. K-3 REGULATOR VALVE
25. K-1 REGULATOR VALVE
26. K-1 REGULATOR VALVE SPRING (SEE SPRING SPEC)
27. K-1 REGULATOR VALVE RETAINER (YELLOW)
28. MANUAL 1ST/K-3 LOCKOUT VALVE
29. MANUAL 1ST/K-3 LOCKOUT VALVE SPRING (SEE SPRING SPEC)
30. MANUAL 1ST/K-3 LOCKOUT RETAINER (YELLOW)
31. MANUAL VALVE
32. CONVERTER CLUTCH APPLY VALVE SPRING (SEE SPRING SPEC)
33. CONVERTER CLUTCH APPLY VALVE
34. CONVERTER CLUTCH CONTROL VALVE
36. CONVERTER CLUTCH CONTROL VALVE SLEEVE
37. EV-4 SOLENOID, CONVERTER CLUTCH (N91)
38. EV-3 SOLENOID (N90)
39. K-3 SHIFT VALVE
40. K-3 SHIFT VALVE SPRING (SEE SPRING SPEC)
41. B-1 APPLY VALVE SPRING SEAT
42. B-1 APPLY VALVE SPRING (SEE SPRING SPEC)
43. B-1 APPLY VALVE
44. EV-5 SOLENOID (N92)
45. EV-1 SOLENOID (N88)
46. K-1/B-1 SHIFT VALVE
47. K-1/B-1 SHIFT VALVE SPRING (SEE SPRING SPEC)
48. B-2 SHIFT VALVE SPRING (SEE SPRING SPEC)
49. B-2 SHIFT VALVE
50. EV-2 SOLENOID (N89)
51. SOLENOID RETAINING BRACKET
52. SOLENOID RETAINING BRACKET BOLTS (6)
53. B-2 REGULATOR VALVE
54. B-2 REGULATOR VALVE SPRING (SEE SPRING SPEC)
55. B-2 REGULATOR VALVE RETAINER (BLACK)
56. K-1 CONTROL VALVE RETAINER (BROWN)
57. K-1 CONTROL VALVE SPRING (SEE SPRING SPEC)
58. K-1 CONTROL VALVE
59. 2-3 TIMING VALVE
60. 2-3 TIMING VALVE SPRING (SEE SPRING SPEC)
61. 2-3 TIMING VALVE RETAINER (WHITE)

VOLKSWAGEN/AUDI

MANUAL PROCEDURE FOR "RETURN TO BASIC SETTINGS"

COMPLAINT: Once a Volkswagen/Audi vehicle has been repaired, in many cases, the Transmission Module (TCM) or the Engine Control Module (ECM) does not allow proper vehicle operation.
The symptoms may be, the transmission stuck in "Failsafe" or erratic shifting accompanied by driveability complaints.

CAUSE: It is of primary importance to clear all previously stored trouble codes, this is NOT an option. It is recommended to use a scan tool or computer based program to do this. Both are available to the aftermarket. Disconnecting the battery to accomplish this is not recommended due to other systems that may be adversely effected such as radio theft codes or the vehicle 's theft deterrent system.
If no other method is available, disconnecting the battery for one minute will clear the codes.
NOTE: Some codes can be cleared on OBD-II equipped vehicles using the Generic area of the scan tool if specialty equipment is not available.

The next mandatory procedure that **MUST** be performed is the ***"Return To Basic Settings"*** which is the Throttle Position Sensor and Kickdown relearn settings that both the TCM and the ECM must have in order to send proper commands for engine and transmission operation.

The ***"Return To Basic Settings"*** **MUST** be performed if any of the following conditions exist: 1. Replacement of the ECM.
2. The engine has been changed.
3. Repair or replacement of the throttle housing.
4. Replacement or adjustment of the Throttle Position Sensor.
5. Replacement of the TCM.

CORRECTION: Use the following procedure on all VW/AUDI vehicles equipped with 096, 097,098, 01M, 01N or 01P transmissions, to manually reset the "Basic Settings":

1. Turn the ignition "ON", Do not start the engine.
2. Move the gear selector lever to the "D4" position.
3. Depress the accelerator pedal all the way to the floor and hold it there for 30 seconds. Make certain the carpet or floor mat is not in the way of the pedal.
4. After 30 seconds, move the gear selector lever back to "PARK".
5. Release the accelerator pedal.
6. Turn the ignition "OFF".
7. After completion of the above, drive the vehicle on the road and perform three individual upshift sequences and kickdown at light, medium and heavy throttle conditions.

NOTE: The systems will fine tune themselves over the next 50 to 75 miles of driving.

VOLKSWAGEN / AUDI

UNCONTROLLABLE HARSH 1-2 UPSHIFT

COMPLAINT: Before or after overhaul, vehicles equipped with 01M, 01N and 01P transaxles, may exhibit a harsh 1-2 upshift along with firmer than normal engagements as well as firm upshifts to 3rd and 4th.

CAUSE: The cause may be,
1. Erratic or high line pressure.
2. An electrical malfunction in the EV5 solenoid electrical circuit.
3. A Hydraulic malfunction with EV5 solenoid.

(NOTE: The EV5 solenoid is grounded on each engagement and each upshift and downshift which helps control Clutch apply Pressure for smooth engagements as shown in Figures 3 and 4.)

CORRECTION: To correct this condition:

1. Connect a pressure gage to the line pressure port as shown in Figure 1. Line pressure should indicate 60 psi. in the Drive position at idle and should increase to 120-150 psi. at stall. Line pressure should cut back to between 65-75 psi. on each shift. If Line pressure does not cut back on each shift, or is at 120-150 psi. at all times, or is erratic on the gage, replace the EV6 solenoid and check the Boost Regulator and Main Regulator valve to ensure they are not stuck. Refer to Figure 2 for a description of how EV6 Solenoid operates.

2. Refer to Figure 5 and locate terminal 7 at harness connector. Back probe that terminal to verify that the computer is grounding EV5 during the 1-2 upshift. If the computer is not grounding that terminal, go to STEP A. If the Computer is grounding that terminal go to STEP B.

   STEP A. Connect a scan tool to the diagnostic connector and check to see if the TCM has set a trouble code 00266 (VAG) or a P0773 which are EV5 solenoid circuit faults. Repair the EV5 Solenoid circuit as needed. If the TCM has no trouble codes set and does not ground EV5 Solenoid during the 1-2 shift, the TCM may be faulty.

   STEP B. Go to Correction number 3.

3. Remove EV5 Solenoid from its bore. Ensure that the B1 Apply valve, which is located below the solenoid, is not sticking in it's bore. Air check EV5 solenoid and ensure it's proper operation as shown in Figure 6. If EV5 Solenoid does not close consistently replace as needed.

1996-2000 OBD-II CODE DEFINITIONS

COMPLAINT: When a VW/Audi vehicle is exhibiting a symptom or is in fail-safe, the technician, in many cases, is unable to communicate with the on-board diagnostics in order to retrieve codes.

CAUSE: The lack of aftermarket equipment, previously available to the technician, to allow access to vehicle on-board diagnostics such as, code retrieval, data lists and basic setting resets.

CORRECTION: With the OBD-II mandate beginning in 1996, it is possible to retrieve codes using the Generic OBD-II part of your scan tool. This will also allow access to the "freeze frame" and "pending code" categories which are diagnostic aids to help the technician retrieve codes and data.

There have also been recent developments which have made available, diagnostic tools which can communicate with VW/Audi vehicle modules which include pre-OBD-II diagnostics for codes and data.

Use the illustrations in figures 1 and 2 for diagnostic connector locations in all Volkswagen/Audi models equipped with 096, 097, 098, 01M, 01N and 01P transmissions.

Use the code definition charts in figures 3 to 12 for ECM codes for gasoline engine equipped vehicles.

Use the code definition charts in figures 13 to 15 for ECM codes for diesel engine equipped vehicles.

Use the code definition charts in figures 16 and 17 for TCM codes.