

# 8 Speed AT (A8LR1) with SBW



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## Spec Comparison

Category	New Opirus (GH)	KH	Remarks
Automatic Transmission	Front Wheel Drive 6 Speed	<b>Rear-Wheel 8-Speed AT + SBW</b>	Manual Transmission N/A

- 2011 Mohave is applied with the 8-Speed AT (only the model with SBC option)
- KH is applied with the SBW so there is H/W and S/W difference with the 8-Speed AT equipped in Mohave.



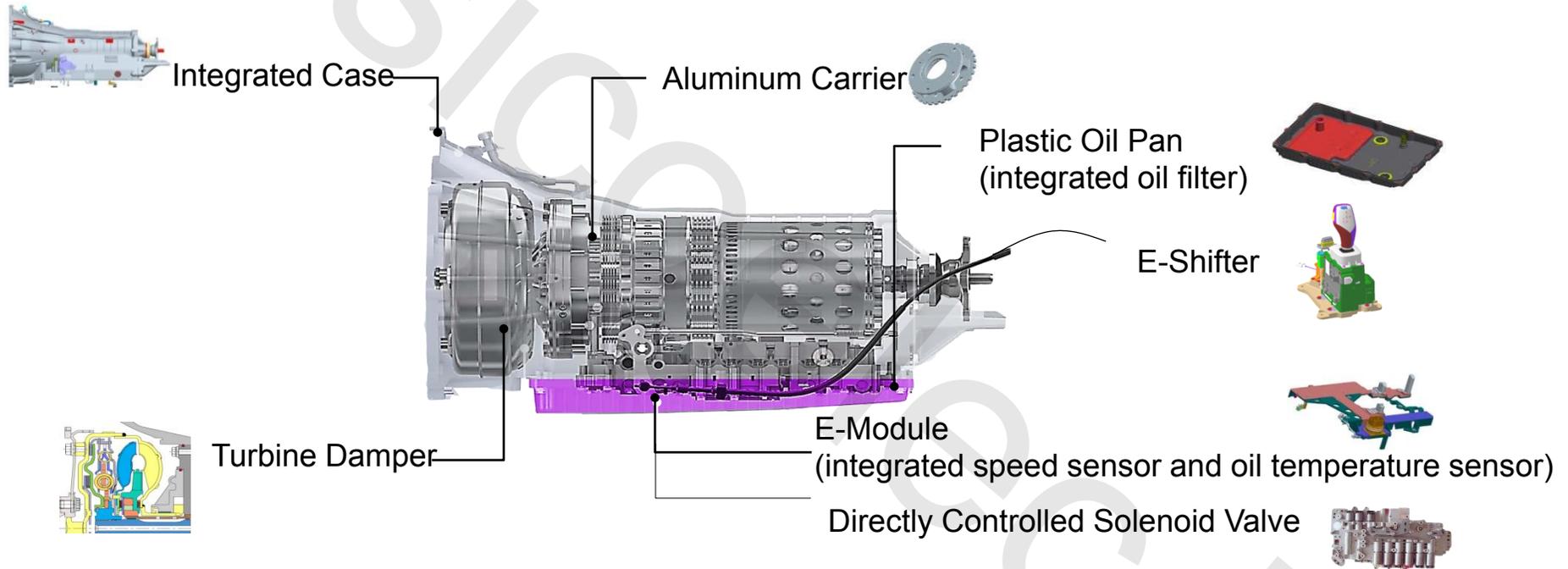
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## Main Specifications

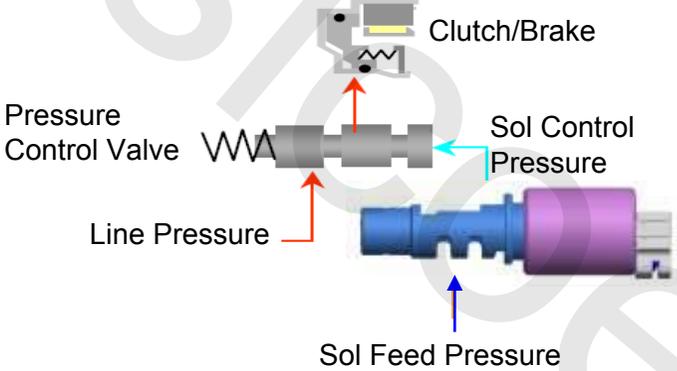
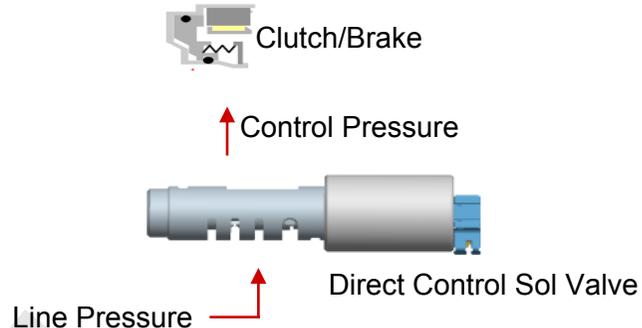
Category		Tau FR 8-Speed + SBC (A8TR1)	Lambda II FF 8-Speed + SBW (A8LR1)
Applied Model		Mohave S- II 3.0	KH 3.3/3.8 GDI
Torque (kgf.m)		55	44
Weight (including oil, kg)		95.7	85.7
Length(mm)		676	684
SBW		None	<b>Applied</b>
Composition Factor	Planetary Gear Type	Simple 2 + Complex 1	←
	Operating Factors	Clutch: 4 Brakes: 2 One-way Clutch: 1	←
	No. of Solenoid Valves	VFS: 8 ON/OFF : 1	VFS: 8 <b>ON/OFF : 3</b>
Gear Ratio	1/2/3/4 5/6/7/8	3.795/2.473/1.613/1.177 1.000/0.831/0.652/0.571	3.665/2.396/1.610/1.190 1.000/0.826/0.643/0.556
	Reverse	2.467	2.273

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## Main Features



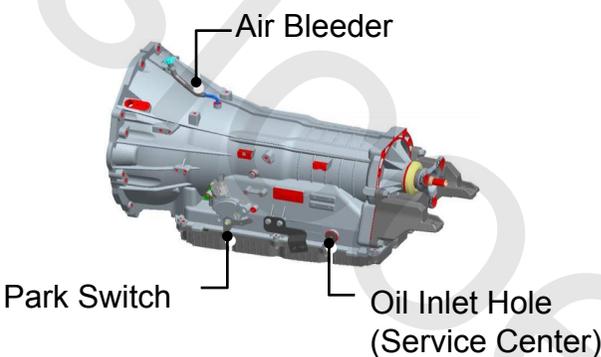
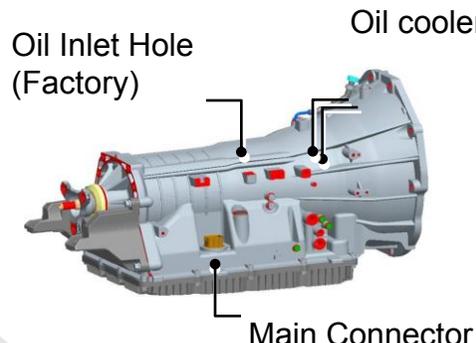
## Directly Controlled Solenoid Valve

Category	Previous Model: Indirect control type	KH: Direct control type
Image	 <p>The diagram shows a complex valve assembly. At the top is a 'Clutch/Brake' component. Below it is a 'Pressure Control Valve' with a spring symbol. A 'Line Pressure' arrow points to the valve. A 'Sol Feed Pressure' arrow points to the bottom of the valve body. A 'Sol Control Pressure' arrow points to the side of the valve body.</p>	 <p>The diagram shows a simpler valve assembly. At the top is a 'Clutch/Brake' component. Below it is a 'Control Pressure' arrow pointing to the top of the valve. A 'Line Pressure' arrow points to the side of the valve. The valve is labeled 'Direct Control Sol Valve'.</p>

- Improved oil pressure response / reduced weight by simplifying the valve body system

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## External Structure

Category	Right Side	Left Side
Image		

- Oil Used: SP-IV RR (red color)
- Oil Exchange Period: No Exchange (100,000Km in harsh condition)

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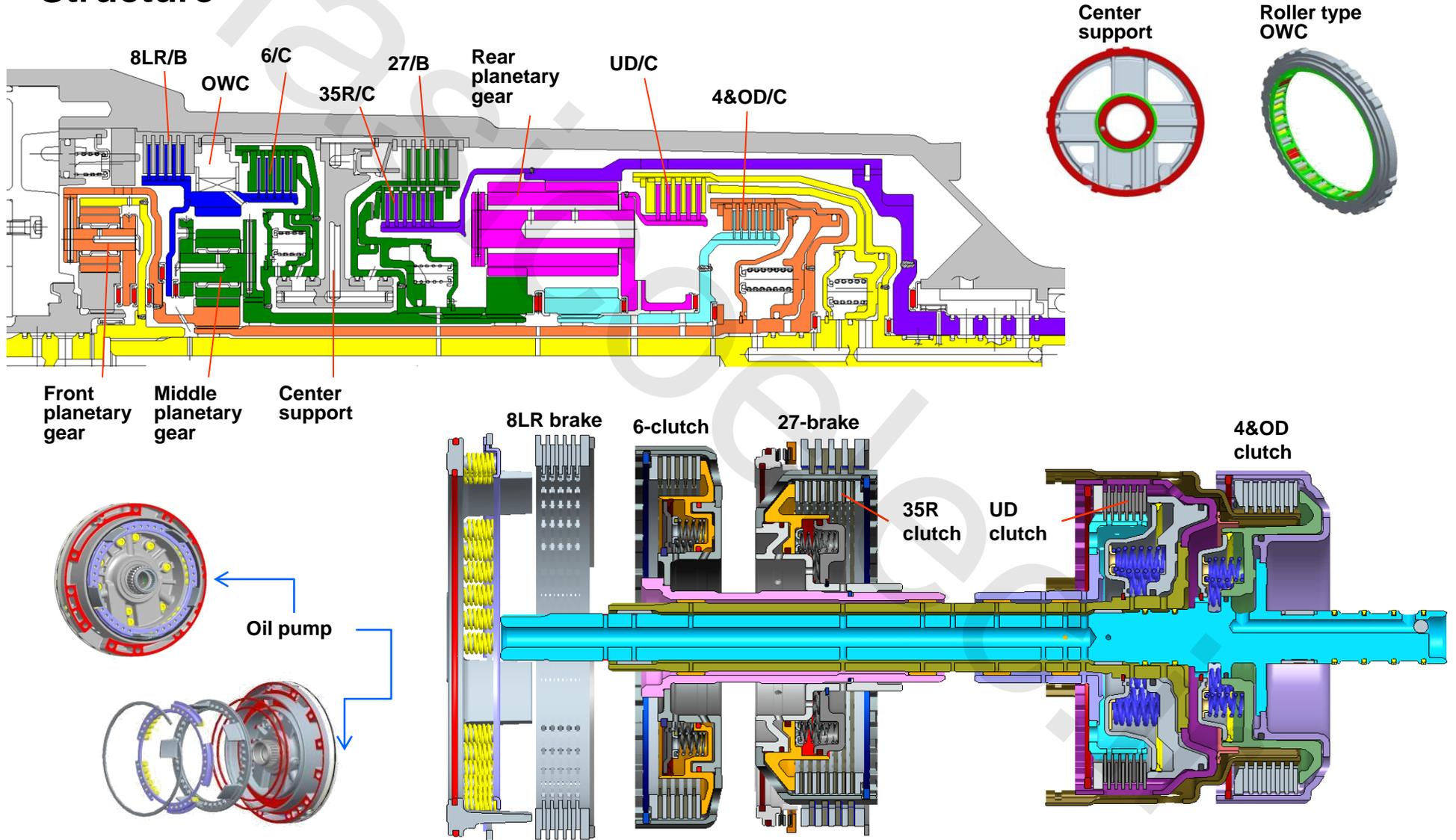
## Internal Structure

Category	Interior Side
Image	<p>The diagram illustrates the internal structure of the 8-speed automatic transmission (A8LR1) with SBW from the interior side. It features three planetary gear sets: a front planetary gear set, a middle planetary gear set, and a rear planetary gear set. The components are color-coded and labeled as follows:</p> <ul style="list-style-type: none"> <li><b>8LR/B</b> (orange): Clutch for 8th gear and reverse.</li> <li><b>OWC</b> (blue): Overdrive clutch.</li> <li><b>6/C</b> (green): Clutch for 6th gear.</li> <li><b>35R/C</b> (purple): Clutch for 3rd and 5th gears.</li> <li><b>27/B</b> (red): Brake for 2nd and 7th gears.</li> <li><b>UD/C</b> (yellow): Clutch for 4th and overdrive.</li> <li><b>4&amp;OD/C</b> (cyan): Clutch for 4th gear and overdrive.</li> </ul> <p>Labels for the planetary gear sets are: Planetary Gear (front), Planetary Gear (middle), and Planetary Gear (rear).</p>

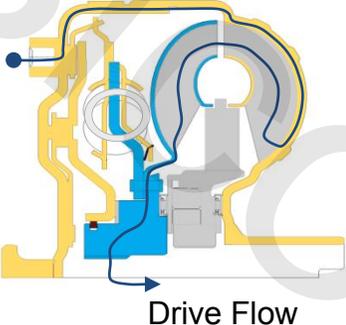
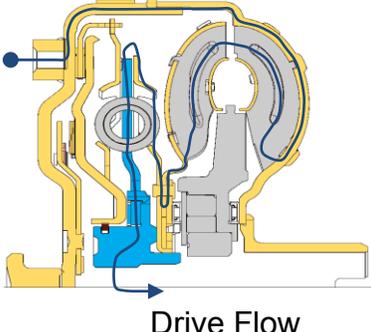
- Composed of 4 clutches and 2 brakes
- 2 simple and 1 complex planetary gear system

# 8 Speed AT (A8LR1) with SBW

## Structure



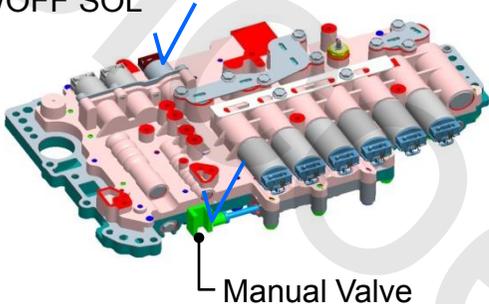
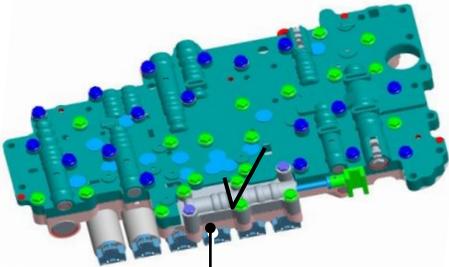
## Torque Converter

Category	Conventional Damper	Turbine Damper
Image	 <p style="text-align: center;">Drive Flow</p>	 <p style="text-align: center;">Drive Flow</p>

- Enhanced damper clutch operation range for improved fuel efficiency also absorbs damper's internal vibration.

※ Damper Operation Range (full direct): Vehicle speed above 20km/h, engine RPM above 1300 RPM, oil temperature above 20°C

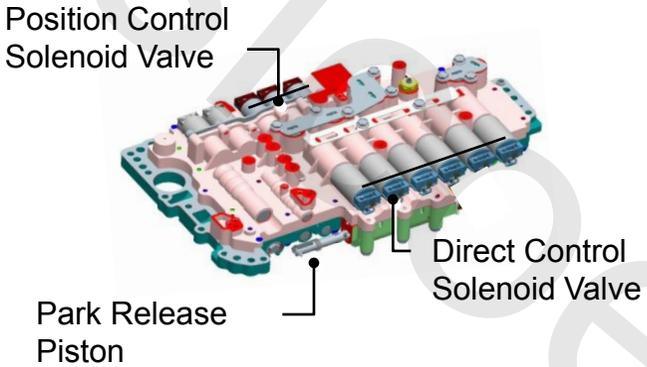
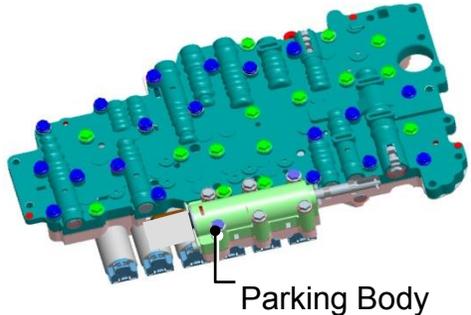
## Valve Body (SBC)

Category	Upper	Lower
Image	<p data-bbox="540 448 747 525">8LR F/S Valve ON/OFF SOL</p>  <p data-bbox="789 782 1011 815">Manual Valve</p>	 <p data-bbox="1562 768 1757 801">Manual Body</p>

- 2 solenoid valves and park body is additional installed and hydraulic circuit is changed compared to Mohave 8-Speed AT

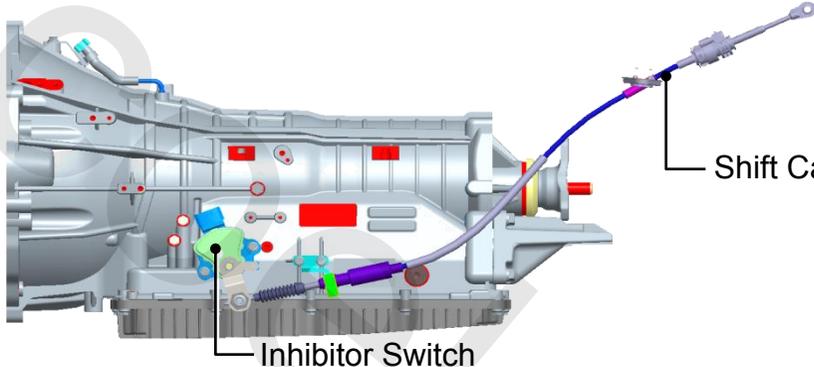
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## Valve Body (SBW)

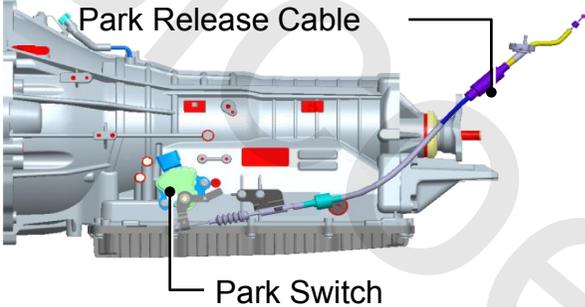
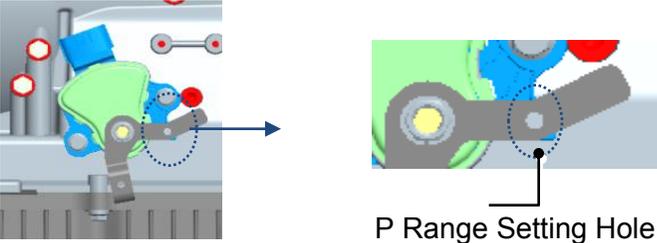
Category	Upper	Lower
Image	 <p>Position Control Solenoid Valve</p> <p>Park Release Piston</p> <p>Direct Control Solenoid Valve</p>	 <p>Parking Body</p>

- 2 solenoid valves and park body is additional installed and hydraulic circuit is changed compared to Mohave 8-Speed AT

## Inhibitor Switch (SBC)

Category	Inhibitor Switch
Image	 <p>The diagram illustrates the internal components of the Inhibitor Switch (SBC) mechanism. A purple shift cable is shown extending from the right side of the transmission housing, where it is labeled "Shift Cable". The cable is connected to a lever mechanism. This lever is part of the Inhibitor Switch, which is labeled "Inhibitor Switch". The switch mechanism includes a spring and various internal components, shown in a cutaway view of the transmission housing. The housing is depicted in a light gray color with various internal parts and components highlighted in different colors (red, blue, green, purple) to show the internal structure and the path of the shift cable.</p>

## Park Switch (SBW)

Category	Park Switch	P Range Setting Procedure
Image	 <p>Park Release Cable</p> <p>Park Switch</p>	 <p>P Range Setting Hole</p> <ul style="list-style-type: none"> <li>- Shift Lever at P Range (N in previous model)</li> <li>- Assemble Park Switch</li> <li>- P Range Setting Hole Alignment (important)</li> <li>- Tighten Park Switch Mounting Bolt</li> <li>- Tighten Lever Nut</li> </ul>

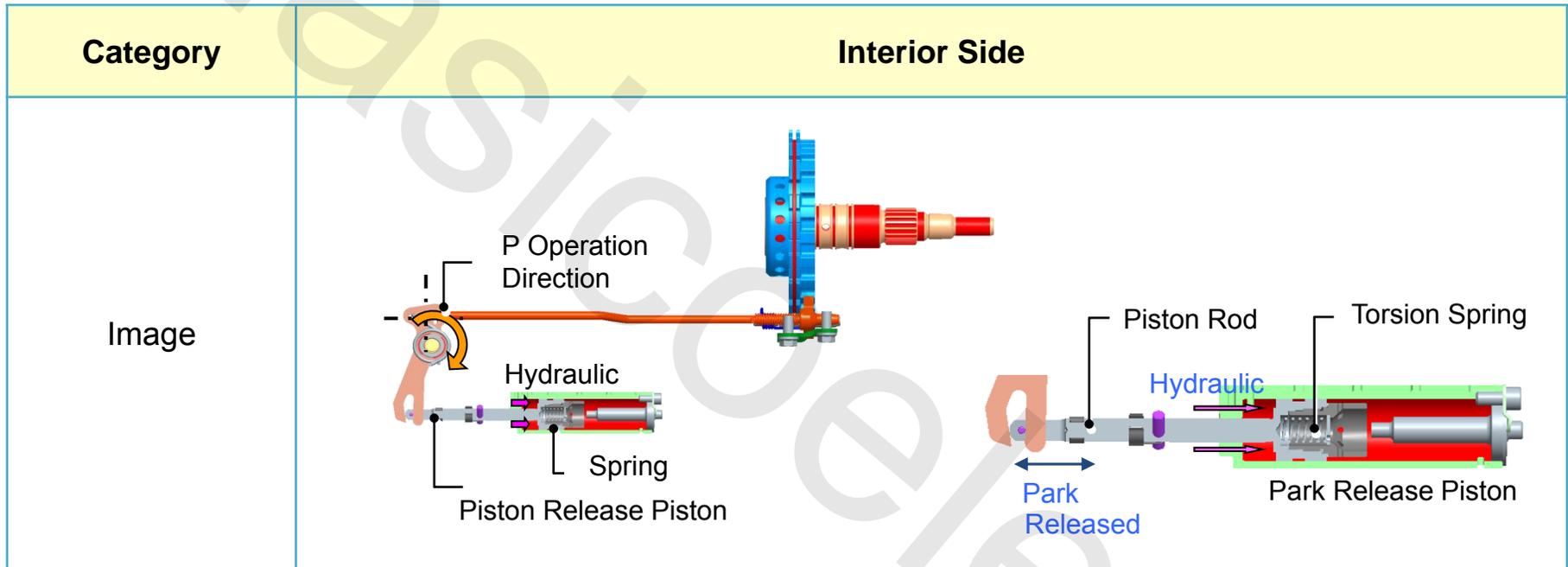
- Detect whether or not Park is engaged
- It is very important to set the P range after servicing relevant components (similar to N range setting in previous model)

## Parking Mechanism (SBC)

Category	Interior Side
Image	

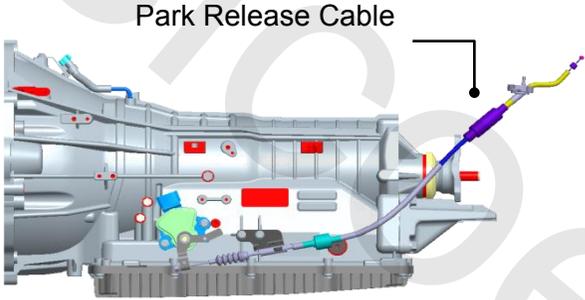
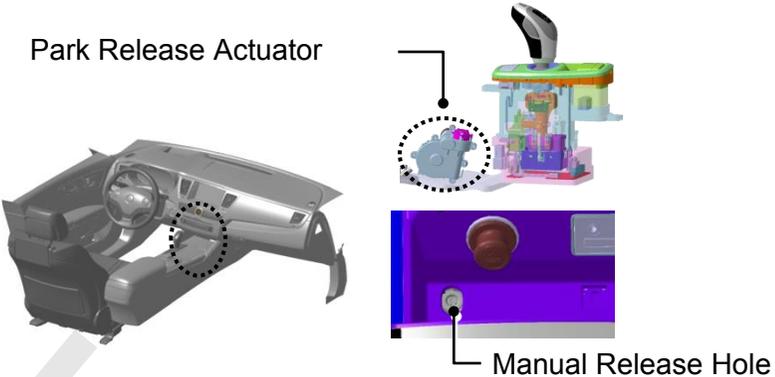
- Cam Type

## Parking Mechanism (SBW)



- IGN OFF: The piston rod is pushed to left by the torsion spring and Park is engaged
- IGN ON and Shift Lever other than P: The hydraulic pressure supplied by the P-Range Control Solenoid moves the piston rod to the right and releases Park.

## Parking release Actuator

Category	Park Release Cable	Manual Release Procedure
Image	 <p>Park Release Cable</p>	 <p>Park Release Actuator</p> <p>Manual Release Hole</p>

- Prevent parking when an engine off : Neutral parking, manual release when a battery flat
- Engage manual release only in a special condition (when battery discharge). When performing manual release, park the car on a flat surface to ensure the vehicle from moving, and then insert and turn (-) driver clockwise direction (10 turns by hand).
- System is internally designed to prevent manual release while in KEY ON Mode.

## P-Release Switch (Neutral Parking)

Category	P-Release Switch
Image	

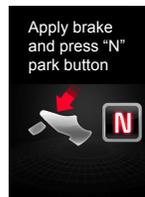
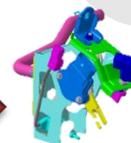


Engine OFF

Within  
3 min.



**“N” Parking**  
for parking lot or car wash



Without  
B/pedal



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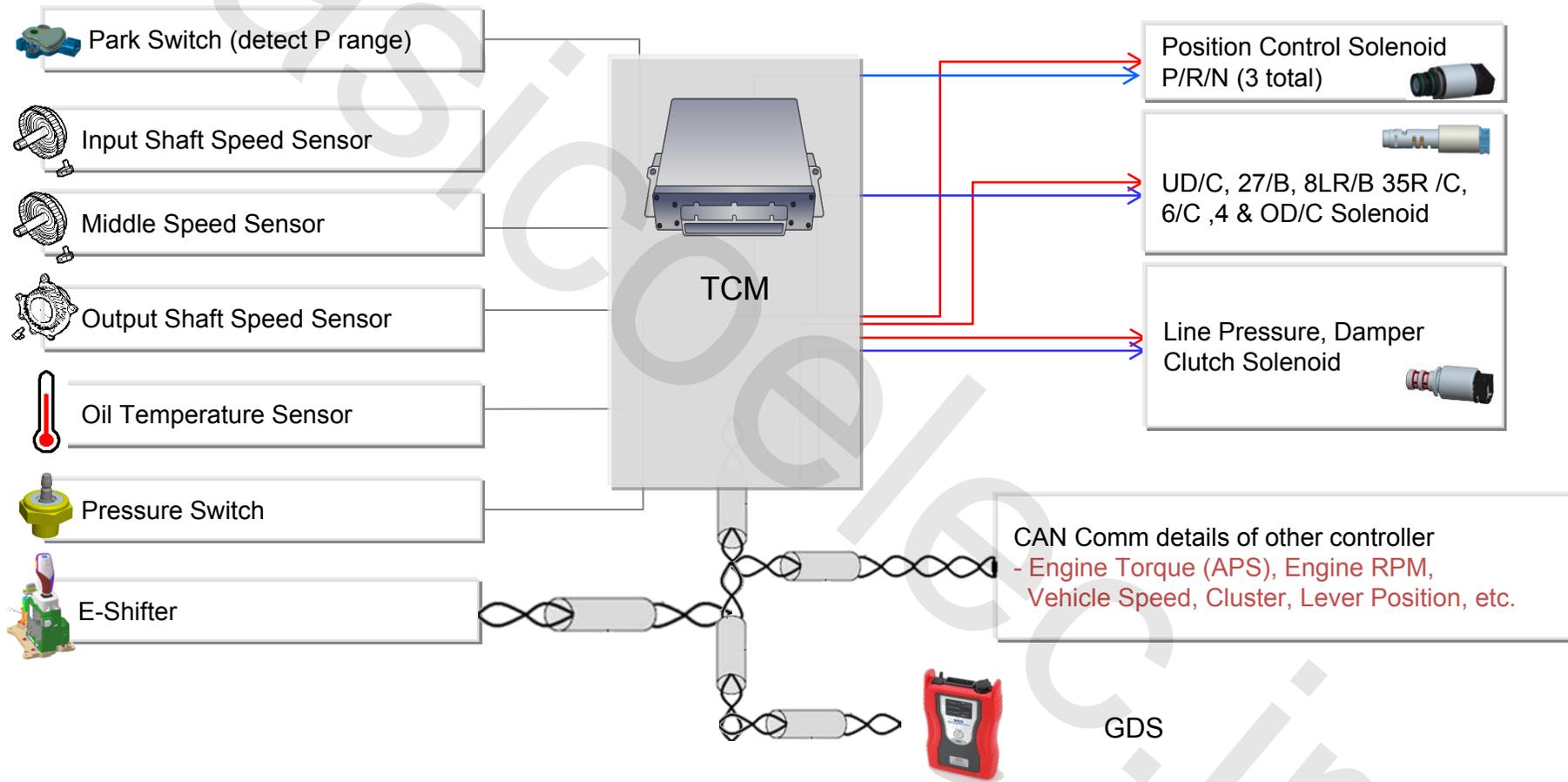
## Clutch & Brake Operation Table

Gear	Gear ratio		Clutch				Brake		OWC
	A8LR1	A8TR1	UD/C	6/C	4&OD/C	35R/C	8LR/B	27/B	
P	-	-				●		●	
R	2.273	2.467				●	●		
N	-	-					●		
1 <sup>st</sup>	3.665	3.795	●				○		●
2 <sup>nd</sup>	2.396	2.473	●					●	
3 <sup>rd</sup>	1.610	1.613	●			●			
4 <sup>th</sup>	1.190	1.177	●		●				
5 <sup>th</sup>	1.000	1.000			●	●			
6 <sup>th</sup>	0.826	0.831		●	●				
7 <sup>th</sup>	0.643	0.652			●			●	
8 <sup>th</sup>	0.556	0.571			●		●		

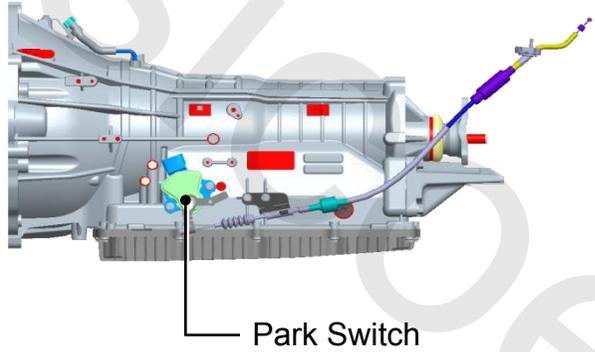
○ : operates at low speed only

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## In/Output Factors

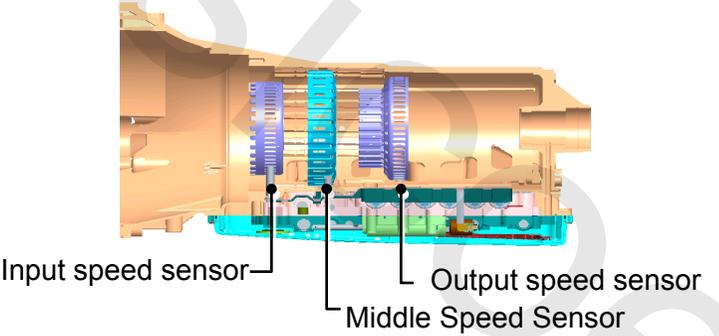
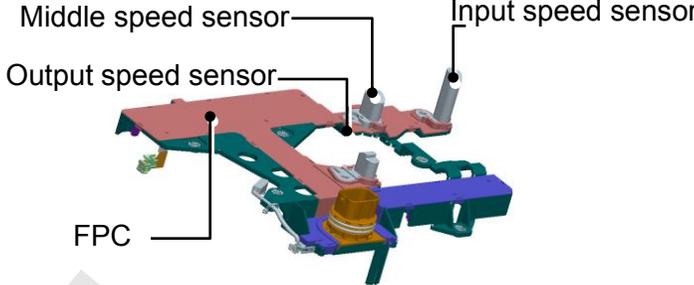


## Park Switch

Category	Park Switch	Output Signal														
Image		<table border="1"> <thead> <tr> <th data-bbox="1286 532 1469 605">Category</th> <th data-bbox="1469 532 1651 605">Signal1</th> <th colspan="2" data-bbox="1651 532 1833 605">Signal2</th> </tr> </thead> <tbody> <tr> <td data-bbox="1286 605 1469 678">P</td> <td data-bbox="1469 605 1651 678">1</td> <td colspan="2" data-bbox="1651 605 1833 678">0</td> </tr> <tr> <td data-bbox="1286 678 1469 751">Not P</td> <td data-bbox="1469 678 1651 751">0</td> <td colspan="2" data-bbox="1651 678 1833 751">1</td> </tr> </tbody> </table>			Category	Signal1	Signal2		P	1	0		Not P	0	1	
Category	Signal1	Signal2														
P	1	0														
Not P	0	1														

- Detect only whether or not Park is engaged (different from inhibitor S/W) / composed of 3 Pins
- It is very important to set the P range after servicing relevant components
- Only forward driving is possible in case of switch malfunction / Reverse is disabled

## Speed Sensor

Category	Mounting Location-1	Mounting Location-2
Image		

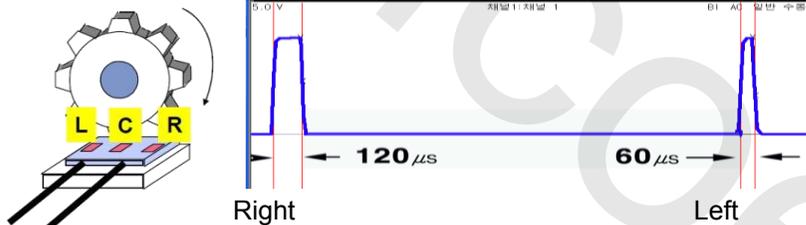
- Integrated into the E-Module
- 2 Pin Type Hall IC
- Gear is fixed at D Range 5-Speed in case of In/Output Speed Sensor failure / Sports Mode 2~5 Speed enabled / Reverse enabled

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## Speed sensors



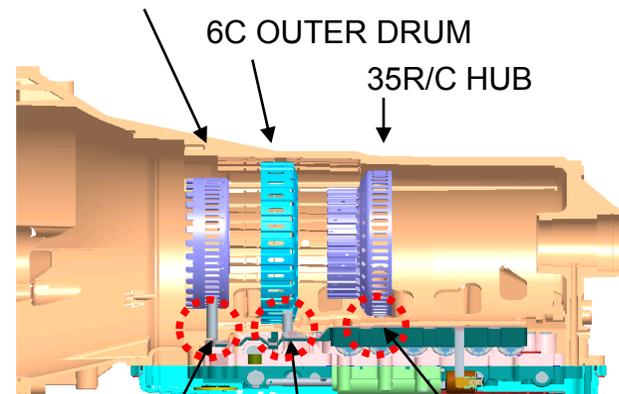
Middle



MID SUN CONN. PLATE

6C OUTER DRUM

35R/C HUB

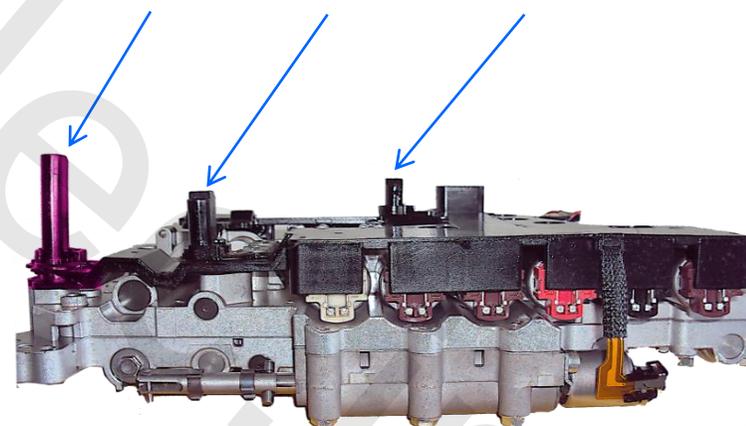


Input s/sensor

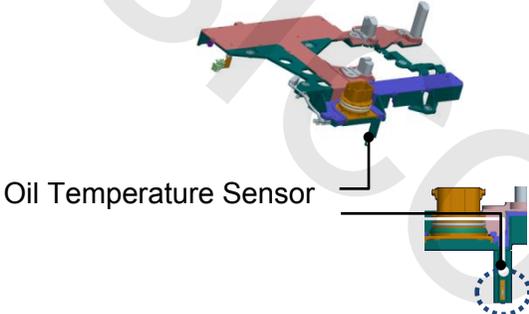
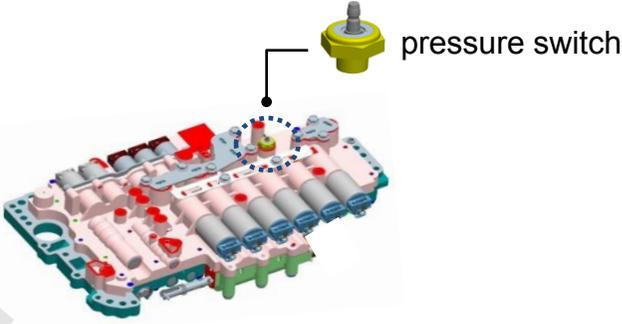
Middle s/sensor

Output s/sensor

Category		Input speed sensor	Middle speed sensor	Output speed sensor
Target wheel		MID SUN CONN. PLATE	6C OUTER DRUM	35R/C HUB
Air gap		1.3 (0.7~2)	1.3 (0.7~2)	1.3 (0.7~2)
Length	A8TR1	62.3	32	37.5
	A8LR1	65.4	28.8	39.5
Color	A8TR1	Gray	Gray	Gray
	A8LR1	Black	Black	Black



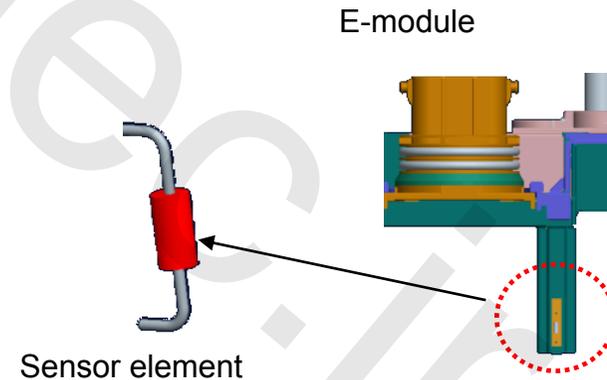
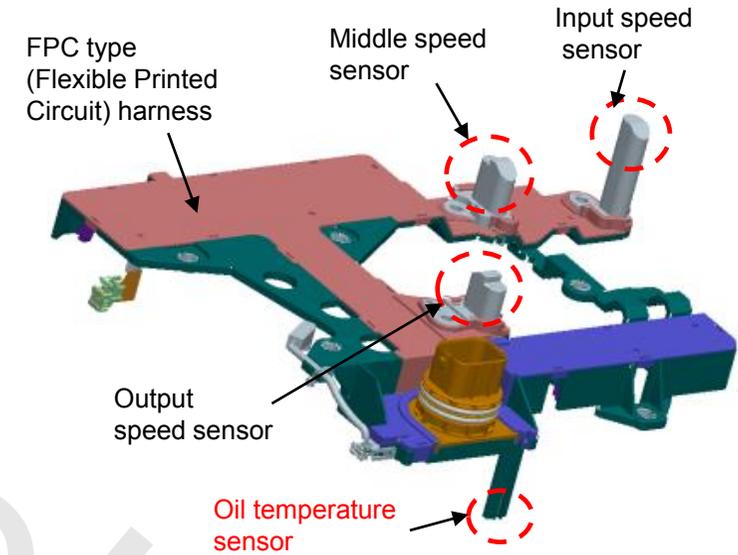
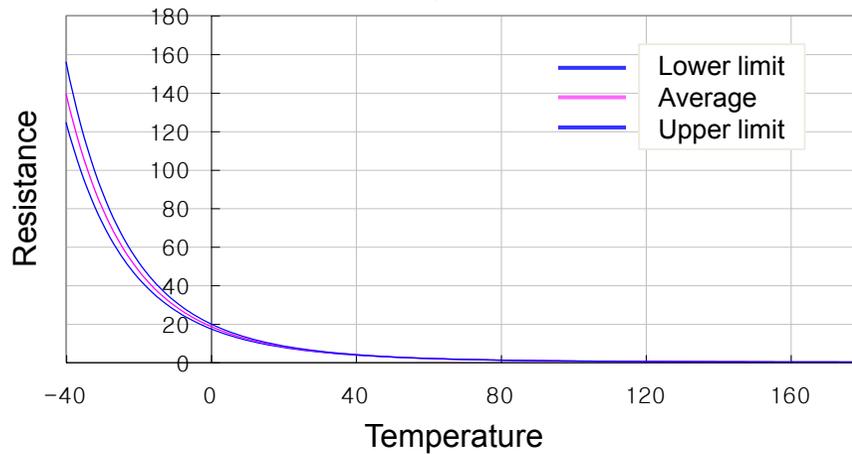
## Oil Temp Sensor / Pressure Switch

Category	Oil Temperature Sensor	pressure switch
Image	 <p>The diagram shows the oil temperature sensor being installed into the oil pan. A callout provides a cross-sectional view of the sensor tip submerged in the oil.</p>	 <p>The diagram shows the pressure switch being installed into the oil pan. A callout shows the pressure switch component separately.</p>

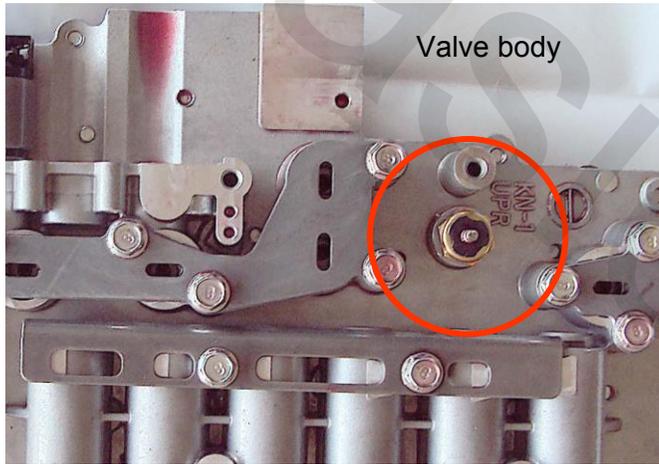
- Oil Temperature Sensor: Temperature is limited to 80°C in case of failure
- Pressure Switch: Check if abnormal oil pressure is supplied to 35R Clutch while in N range  
8LR oil pressure duty is controlled to 0% in N range in case of pressure switch failure

## Oil temperature sensor

Temperature (°C)	Resistance (kΩ)
-40	139.5
0	18.6
40	3.8
80	1.08
120	0.38
160	0.16

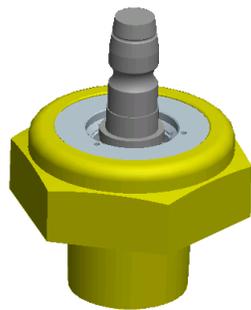


## Pressure switch

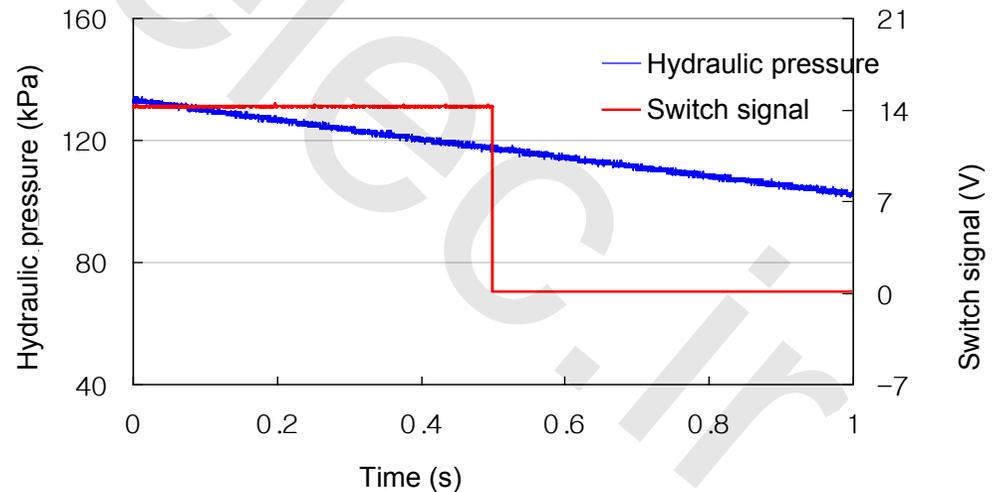


Function:  
it detects the abnormal hydraulic pressure  
in 35R clutch.

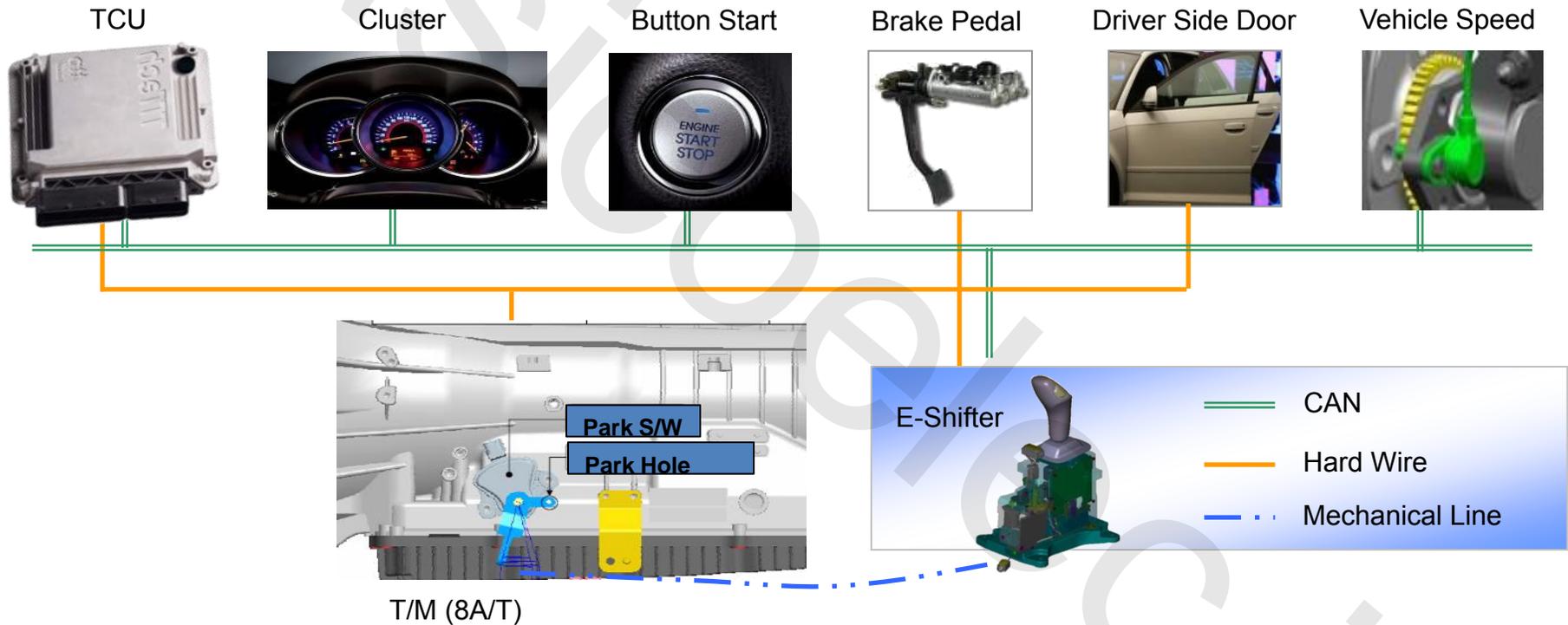
Signal shift	Specification (20°C)
OFF → ON	146±40kPa
ON → OFF	50 kPa



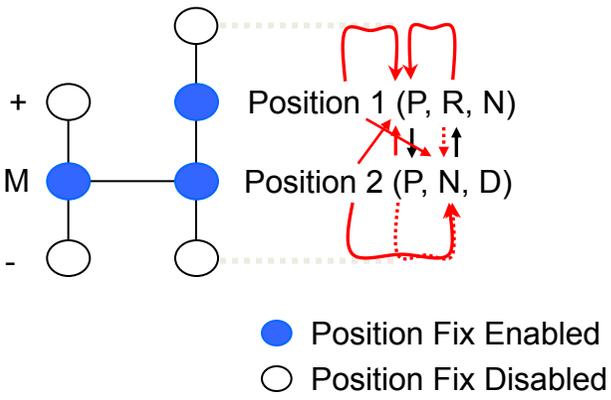
Pressure switch



## E-Shifter Layout



## E-Shifter

Category	E-Shifter	Transmission pattern
Image		

### A. Gear shift convenience:

Achieve fast gear shift with little operation and movement (patented by Hyundai & KIA Motors)

**B. Safety:** Automatically engages P range when engine is turned OFF.

**C. Improved Shift Range Visibility:** Shift range is displayed on the knob for quick visibility (remains ON for 30 seconds after IGN OFF and when the door is opened)

\* E-Shifter communicates with TCU via CAN communication / has addition of hard wire connection in case of CAN communication line failure

## E-Shifter Operation

- Operation Procedure (operates only when the Engine is ON)

### A. P→R, P→D

- KEY ON and holding the Brake ON, press the Unlock button and move the shift lever
- Cluster will display “Hold brake to change gear” message if attempting to move the shifter without hold down the brake

### B. N→D : Shift lever can be moved but the gear shift is limited by TCU based on below conditions

- If vehicle speed is over 2km/h: Gear shift is engaged when shift lever is moved
- If vehicle speed is less than 2km/h: Gear shift is engaged only if engine RPM is less than 3000 RPM, and brake is ON

### C. R→N, D→N : Gear shift is engaged when shift lever is moved



## E-Shifter Operation

**D. Shift to P Range:** If the P button on the upper section of the knob is pressed in any of the R/N/D/M range, the P range is engaged and the Shift Lever returns. However, P range is not engaged if the vehicle speed is over 1km/h

**E. R→D:** Move back 2 slots

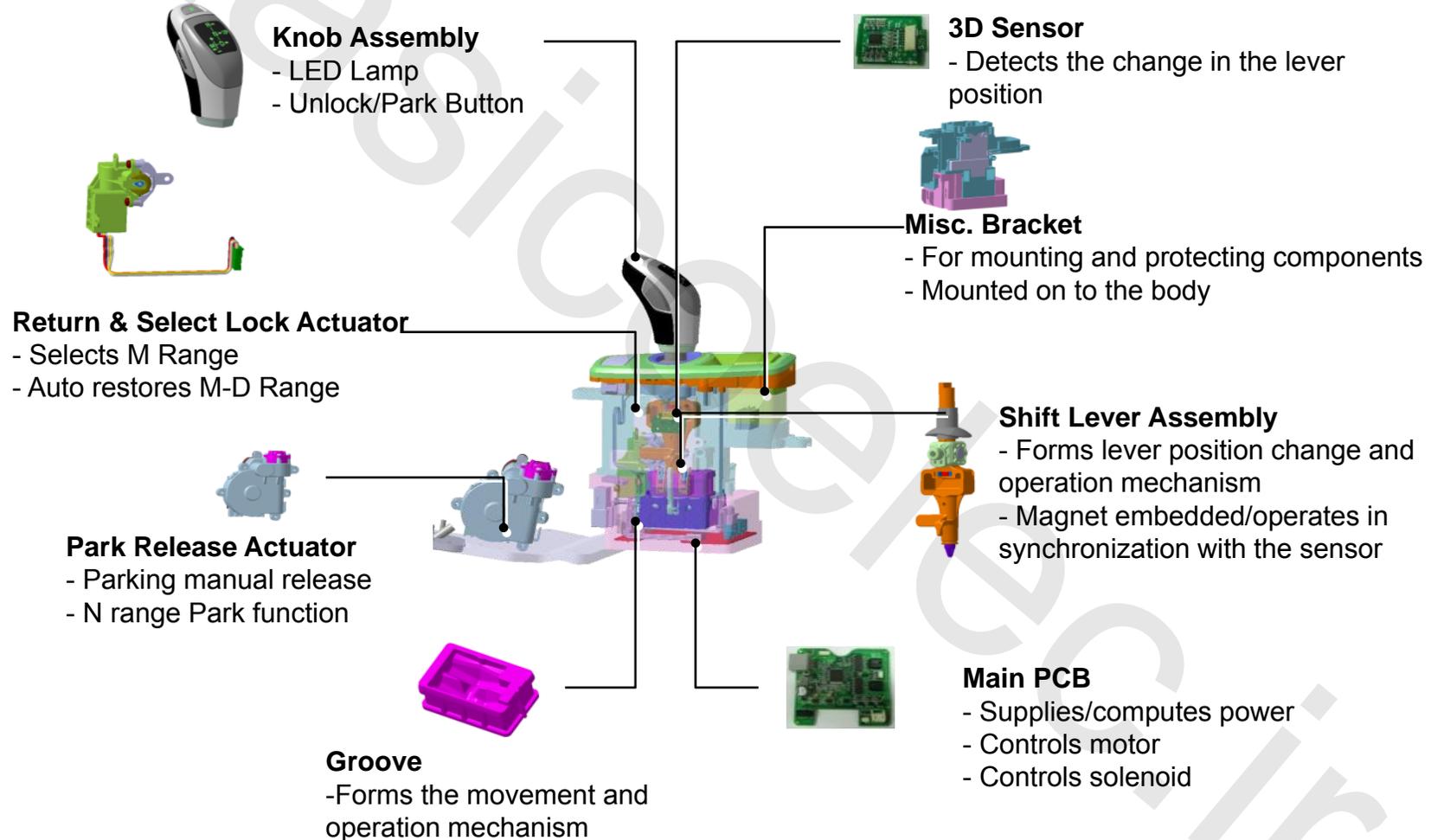
**F. P range is automatically engaged:** If the conditions: in any of D/R/M range seat belt OFF, accel & brake pedal OFF, door opened, vehicle speed less than 2km/h are satisfied.

**G. N→R**

- Gear shifts to R range if the shift is attempted while the brake is engaged, unlock button is pressed, and the vehicle speed is less than 2km/h
- Gear shifts to R range if the shift is attempted while unlock button is pressed and the vehicle speed is between 2~8km/h
- If the attempt is made to shift the gear to R range while the vehicle speed is over 8km/h, Cluster will display “Invalid gear shift condition.” message.

※ The Shift Lock is engaged by the TCU with consideration to the status of the Unlock button, Brake Switch, and the Key Mode → **There is no separate Shift Lock device**

## E-Shifter Configuration



- Shift Knob cannot be changed separately

## Sensor Output-SBW

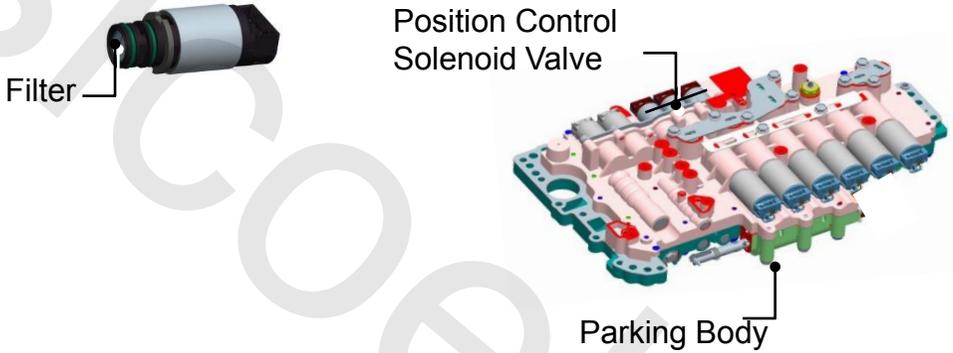
Category	Sensor Output																																																																																	
Image	<p>The screenshot shows the 'Current Data' window of a diagnostic tool. The left sidebar contains navigation options: Diagnosis, Basic Inspection, DTC Analysis, Data Analysis (selected), Symptom Analysis, Flight Record, Oscilloscope, and CARB OBD-II. The main area displays a table of sensor data. The 'ON/OFF Solenoid B(Reverse) (SBW)' is highlighted with a red box. Below the table is a navigation bar with buttons for Setup, Manual, TSB, Case Analysis, DTC, Current Data (active), Actuation Test, Flight Record, DVOM, Oscilloscope, Fault Code Searching, and Internet Update.</p> <table border="1"> <thead> <tr> <th>Sensor Name</th> <th>Value</th> <th>Unit</th> </tr> </thead> <tbody> <tr> <td><input checked="" type="checkbox"/> ON/OFF Solenoid C(Parking)</td> <td>OFF</td> <td>-</td> </tr> <tr> <td><input checked="" type="checkbox"/> ON/OFF Solenoid A(Drive)</td> <td>OFF</td> <td>-</td> </tr> <tr style="border: 2px solid red;"> <td><input checked="" type="checkbox"/> ON/OFF Solenoid B(Reverse) (SBW)</td> <td>OFF</td> <td>-</td> </tr> <tr> <td><input checked="" type="checkbox"/> Shift Control Solenoid Valve A(UD/C)</td> <td>0</td> <td>mA</td> </tr> <tr> <td><input checked="" type="checkbox"/> Shift Control Solenoid Valve D(4&amp;OD/C)</td> <td>0</td> <td>mA</td> </tr> <tr> <td><input checked="" type="checkbox"/> Shift Control Solenoid Valve E(27/B)</td> <td>0</td> <td>mA</td> </tr> <tr> <td><input checked="" type="checkbox"/> Shift Control Solenoid Valve C(35R/C)</td> <td>0</td> <td>mA</td> </tr> <tr> <td><input checked="" type="checkbox"/> Shift Control Solenoid Valve B(6/C)</td> <td>0</td> <td>mA</td> </tr> <tr> <td><input checked="" type="checkbox"/> Shift Control Solenoid Valve F(8LR/B)</td> <td>0</td> <td>mA</td> </tr> <tr> <td><input checked="" type="checkbox"/> Pressure Control Solenoid Valve(VFS) "A"</td> <td>0</td> <td>mA</td> </tr> <tr> <td><input checked="" type="checkbox"/> Malfunction Indicator Lamp On</td> <td>OFF</td> <td>-</td> </tr> <tr> <td><input checked="" type="checkbox"/> Torque Converter Clutch Solenoid Valve</td> <td>0</td> <td>mA</td> </tr> <tr> <td><input type="checkbox"/> Kick Down Switch</td> <td>Not Supported</td> <td>-</td> </tr> <tr> <td><input type="checkbox"/> OD Switch(O/D)</td> <td>Not Supported</td> <td>-</td> </tr> <tr> <td><input type="checkbox"/> Brake Switch</td> <td>OFF</td> <td>-</td> </tr> <tr> <td><input type="checkbox"/> Auto Cruise Switch</td> <td>OFF</td> <td>-</td> </tr> <tr> <td><input type="checkbox"/> 4L Switch (4WD Only)</td> <td>OFF</td> <td>-</td> </tr> <tr> <td><input type="checkbox"/> Sports Mode Select</td> <td>OFF</td> <td>-</td> </tr> <tr> <td><input type="checkbox"/> Sports Mode Up Switch</td> <td>OFF</td> <td>-</td> </tr> <tr> <td><input type="checkbox"/> Sports Mode Down Switch</td> <td>OFF</td> <td>-</td> </tr> <tr> <td><input type="checkbox"/> Reverse Lamp Relay Output</td> <td>OFF</td> <td>-</td> </tr> <tr> <td><input type="checkbox"/> Shift Lock Solenoid</td> <td>Not Supported</td> <td>-</td> </tr> <tr> <td><input type="checkbox"/> P&amp;N Relay</td> <td>ON</td> <td>-</td> </tr> <tr> <td><input type="checkbox"/> Pressure Switch</td> <td>OFF</td> <td>-</td> </tr> <tr> <td><input type="checkbox"/> Number of DTC</td> <td>0</td> <td>-</td> </tr> <tr> <td><input type="checkbox"/> ON/OFF Solenoid (SBC)</td> <td>OFF</td> <td>-</td> </tr> </tbody> </table>	Sensor Name	Value	Unit	<input checked="" type="checkbox"/> ON/OFF Solenoid C(Parking)	OFF	-	<input checked="" type="checkbox"/> ON/OFF Solenoid A(Drive)	OFF	-	<input checked="" type="checkbox"/> ON/OFF Solenoid B(Reverse) (SBW)	OFF	-	<input checked="" type="checkbox"/> Shift Control Solenoid Valve A(UD/C)	0	mA	<input checked="" type="checkbox"/> Shift Control Solenoid Valve D(4&OD/C)	0	mA	<input checked="" type="checkbox"/> Shift Control Solenoid Valve E(27/B)	0	mA	<input checked="" type="checkbox"/> Shift Control Solenoid Valve C(35R/C)	0	mA	<input checked="" type="checkbox"/> Shift Control Solenoid Valve B(6/C)	0	mA	<input checked="" type="checkbox"/> Shift Control Solenoid Valve F(8LR/B)	0	mA	<input checked="" type="checkbox"/> Pressure Control Solenoid Valve(VFS) "A"	0	mA	<input checked="" type="checkbox"/> Malfunction Indicator Lamp On	OFF	-	<input checked="" type="checkbox"/> Torque Converter Clutch Solenoid Valve	0	mA	<input type="checkbox"/> Kick Down Switch	Not Supported	-	<input type="checkbox"/> OD Switch(O/D)	Not Supported	-	<input type="checkbox"/> Brake Switch	OFF	-	<input type="checkbox"/> Auto Cruise Switch	OFF	-	<input type="checkbox"/> 4L Switch (4WD Only)	OFF	-	<input type="checkbox"/> Sports Mode Select	OFF	-	<input type="checkbox"/> Sports Mode Up Switch	OFF	-	<input type="checkbox"/> Sports Mode Down Switch	OFF	-	<input type="checkbox"/> Reverse Lamp Relay Output	OFF	-	<input type="checkbox"/> Shift Lock Solenoid	Not Supported	-	<input type="checkbox"/> P&N Relay	ON	-	<input type="checkbox"/> Pressure Switch	OFF	-	<input type="checkbox"/> Number of DTC	0	-	<input type="checkbox"/> ON/OFF Solenoid (SBC)	OFF	-
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## Actuation Test - SBW

Category	Actuation Test																																	
<p>Image</p>	<p><b>Diagnosis</b></p> <ul style="list-style-type: none"> <li>Basic Inspection</li> <li>DTC Analysis</li> <li><b>Data Analysis</b></li> </ul> <p>Select a Sensor Data item to view its relative information.</p> <p><b>Symptom Analysis</b></p> <p><b>Flight Record</b></p> <p><b>Oscilloscope</b></p> <p><b>CARB OBD-II</b></p> <hr/> <p><b>Current Data</b></p> <p>Selective Display   Full List   Graph   Items List   Reset Min.Max   Record   Stop   Grouping   VSS</p> <table border="1"> <thead> <tr> <th>Sensor Name</th> <th>Value</th> <th>Unit</th> </tr> </thead> <tbody> <tr> <td><input checked="" type="checkbox"/> ON/OFF Solenoid C(Parking)</td> <td>OFF</td> <td>-</td> </tr> <tr> <td><input checked="" type="checkbox"/> ON/OFF Solenoid A(Drive)</td> <td>ON</td> <td>-</td> </tr> <tr> <td><input checked="" type="checkbox"/> ON/OFF Solenoid B(Reverse) (SBW)</td> <td>OFF</td> <td>-</td> </tr> <tr> <td><input checked="" type="checkbox"/> Shift Control Solenoid Valve A(UD/C)</td> <td>0</td> <td>mA</td> </tr> <tr> <td><input checked="" type="checkbox"/> Shift Control Solenoid Valve D(4&amp;0D/C)</td> <td>0</td> <td>mA</td> </tr> <tr> <td><input checked="" type="checkbox"/> Shift Control Solenoid Valve E(27/B)</td> <td>0</td> <td>mA</td> </tr> <tr> <td><input type="checkbox"/> Kick Down Switch</td> <td>Not Supported</td> <td>-</td> </tr> <tr> <td><input type="checkbox"/> OD Switch(O/D)</td> <td>Not Supported</td> <td>-</td> </tr> <tr> <td><input type="checkbox"/> Brake Switch</td> <td>OFF</td> <td>-</td> </tr> <tr> <td><input type="checkbox"/> Auto Cruise Switch</td> <td>OFF</td> <td>-</td> </tr> </tbody> </table> <hr/> <p><b>Actuation Test</b></p> <p>Test Items</p> <ul style="list-style-type: none"> <li>3rd Gear Lamp</li> <li>4th Gear Lamp</li> <li>5th Gear Lamp</li> <li>6th Gear Lamp</li> <li>7th Gear Lamp</li> <li>8th Gear Lamp</li> <li><b>ON/OFF Solenoid A(Drive)</b></li> <li>ON/OFF Solenoid B(Reverse) (SBW)</li> <li>ON/OFF Solenoid (SBC)</li> <li>ON/OFF Solenoid A(Parking)</li> <li>ON/OFF Solenoid A(DRH)</li> </ul> <p>Duration: 3 Sec</p> <p>Conditions: IG, ON, ENG OFF, 'P' RANGE, NO DTC</p> <p>Result: Activation</p> <p>Start   Stop</p> <hr/> <p>Setup   Manual   TSB   Case Analysis   DTC   <b>Current Data</b>   <b>Actuation Test</b>   Flight Record   DVOM   Oscilloscope   Fault Code Searching   Internet Update</p>	Sensor Name	Value	Unit	<input checked="" type="checkbox"/> ON/OFF Solenoid C(Parking)	OFF	-	<input checked="" type="checkbox"/> ON/OFF Solenoid A(Drive)	ON	-	<input checked="" type="checkbox"/> ON/OFF Solenoid B(Reverse) (SBW)	OFF	-	<input checked="" type="checkbox"/> Shift Control Solenoid Valve A(UD/C)	0	mA	<input checked="" type="checkbox"/> Shift Control Solenoid Valve D(4&0D/C)	0	mA	<input checked="" type="checkbox"/> Shift Control Solenoid Valve E(27/B)	0	mA	<input type="checkbox"/> Kick Down Switch	Not Supported	-	<input type="checkbox"/> OD Switch(O/D)	Not Supported	-	<input type="checkbox"/> Brake Switch	OFF	-	<input type="checkbox"/> Auto Cruise Switch	OFF	-
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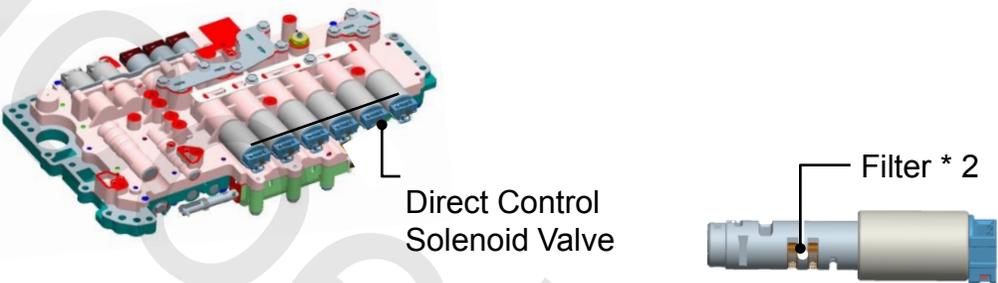
# 8 Speed AT (A8LR1) with SBW

## P/R/D Position Control Sol Valve (ON/OFF Type)

Category	Valve Body
Image	

- Role of the **manual valve** in conventional shifter: 3
- Resistance: 10.5Ω (based on 25°C)
- D range shift is enabled but reverse is disabled in case of solenoid valve malfunction

## Direct Control Sol Valve (VFS Type)

Category	Valve body
Image	 <p>The image shows two technical diagrams. On the left is a 3D cutaway view of the Direct Control Solenoid Valve, which is a rectangular component with multiple ports and internal solenoid actuators. A label 'Direct Control Solenoid Valve' points to one of the actuators. On the right is a detailed view of a cylindrical 'Filter * 2' component, showing its internal mesh and electrical connections.</p>

- Used when shifting: 6
- Resistance: 5.3Ω (based on 25°C)
- Gear is fixed at 5-Speed but reverse is disabled in case of solenoid valve malfunction

## Indirect Control Sol Valve (VFS Type)

Category	Valve body
Image	

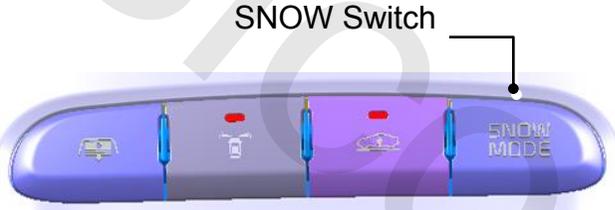
- Used for line pressure and damper clutch control: 2
- Resistance: 5.1Ω (based on 25°C)
- Gear is fixed at 5-Speed but reverse is disabled in case of solenoid valve malfunction

## D-Mode Control

Category	Switch Image	Cluster Indication Lamp
Image		

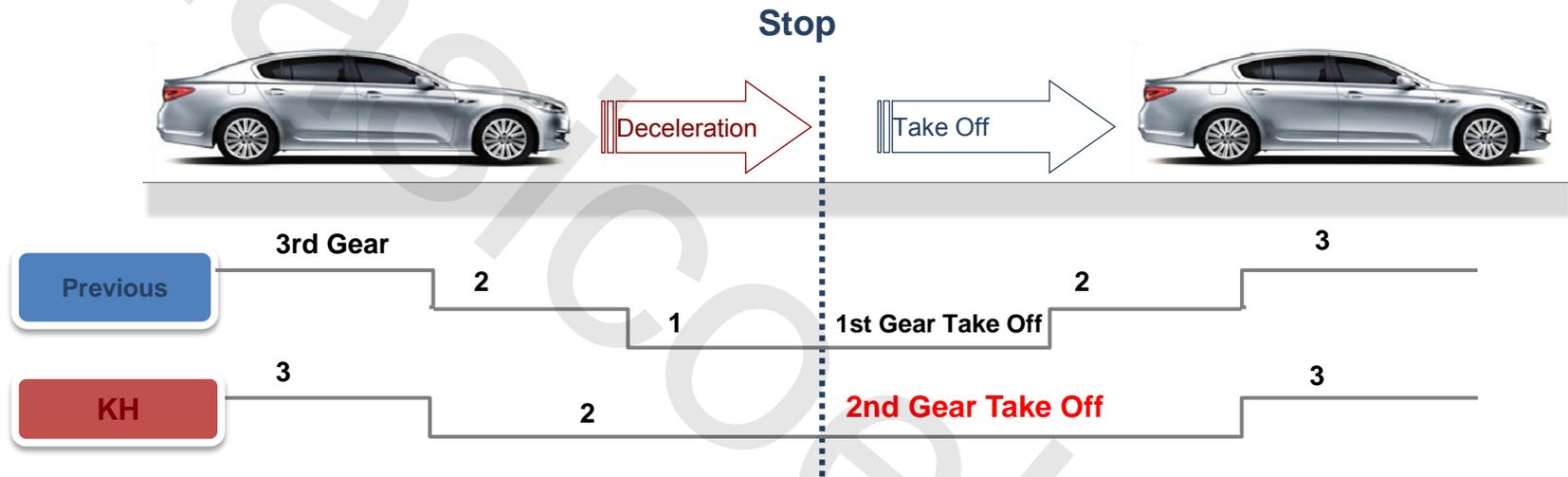
- **Normal:** General gear shift pattern
- **Sport:** Controls the gear shift pattern with expanded low range and increased engine torque
- **ECO:** Prevents down-shift during acceleration and reduces engine torque
  - Returns to the Normal Mode when the engine is turned OFF and restarted
- Each mode is indicated on the AVN monitor

## SNOW-Mode Control

Category	Switch Image	Cluster Indication Lamp
Image	 <p>Installed on the Arm Rest</p>	

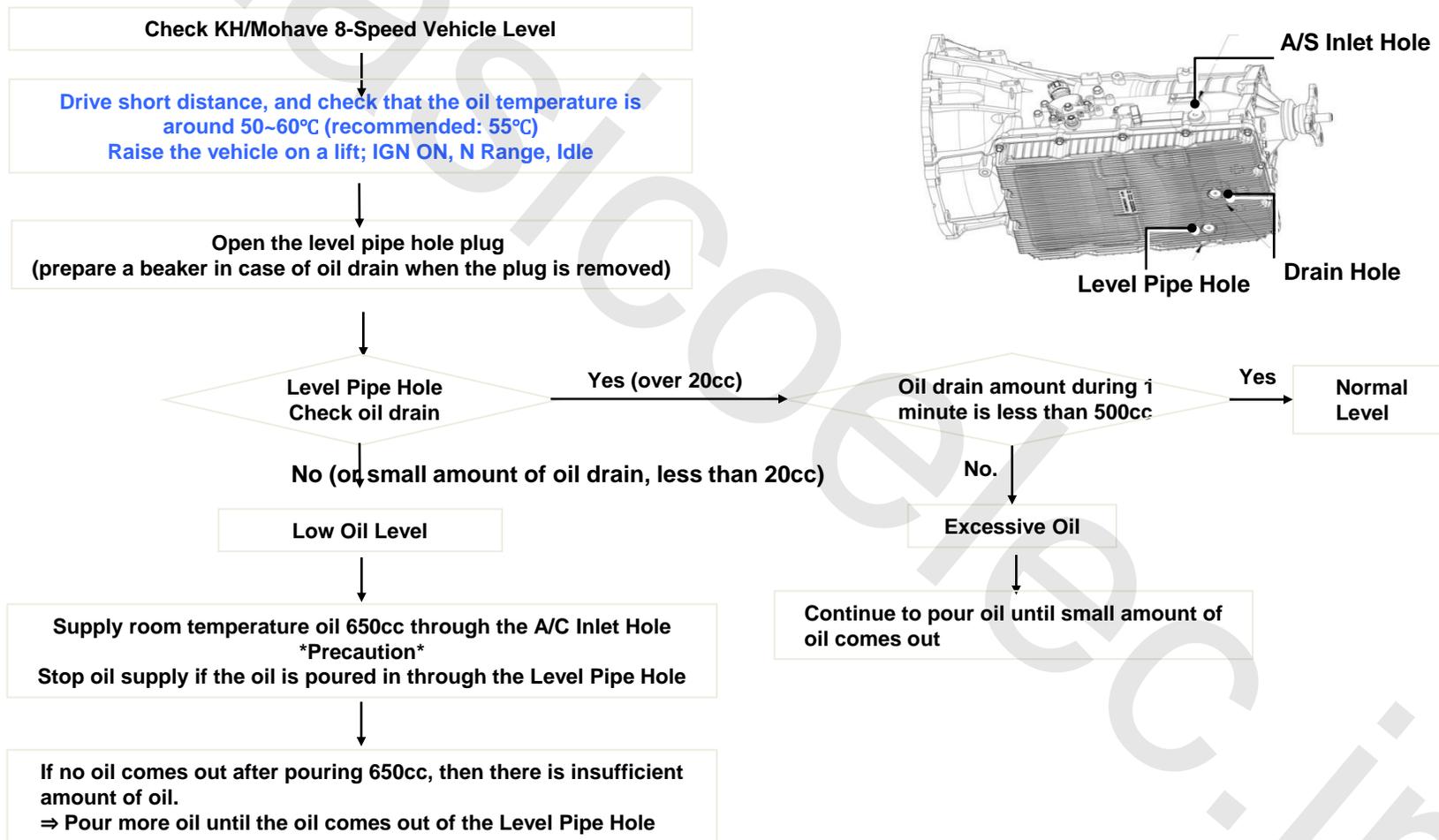
- Used on the snow or icy road driving
- **2nd gear take off and 2nd gear stop**, improves drive traction by reducing the torque
- SNOW Mode is engaged when selected, regardless of current drive mode

## 2nd Gear Take Off



- ① **Normal ECO Mode:** The first take off after shifting P/R/N→D is in the 1st gear. If the gear goes into 2nd gear at least once, and comes to stop, the transmission stops at the 2nd gear, and then any take off after starts in the 2nd gear.
  - ➔ However, in case of APS 70% or higher, or on a certain degree or higher incline road, the gear is down shifted from 2nd to 1st gear and then take off starts to improve acceleration.
- ② **Sport Mode:** Takes off and stops on the 1st gear to provide sporty drive feeling
- ③ **Snow Mode:** Takes off and stops on the 2nd gear to prevent slippage on snow and icy road.

## Oil Level Check Procedure

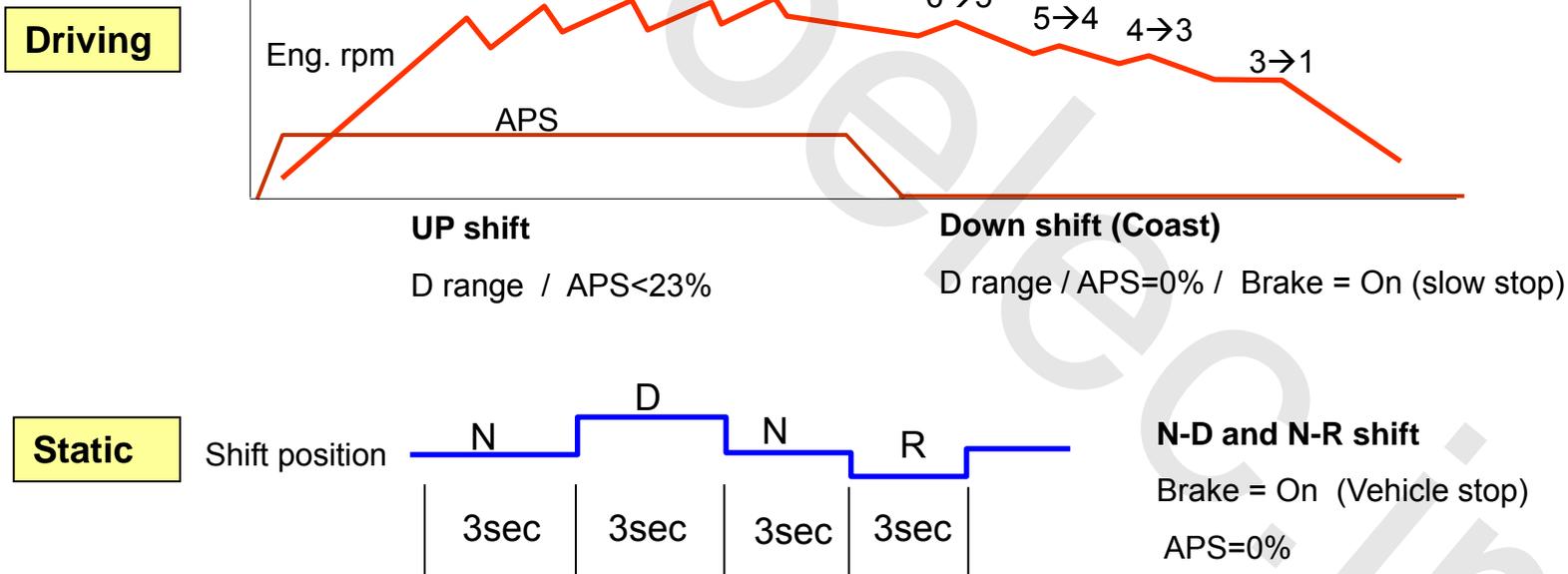


# 8 Speed AT (A8LR1) with SBW

## TCM learning



- 1) ATF temperature: 60 ~ 95°C
- 2) APS must be constant while up-shift (10% ~ 25%)
- 3) Repeat following driving pattern 3 times at least until the shift becomes stable.



# 8 Speed AT (A8LR1) with SBW

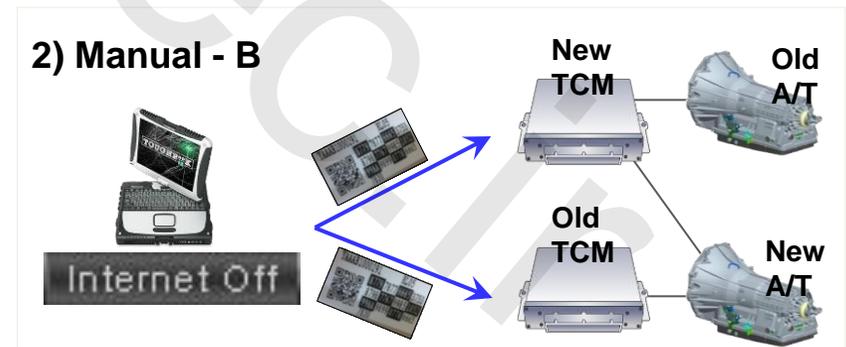
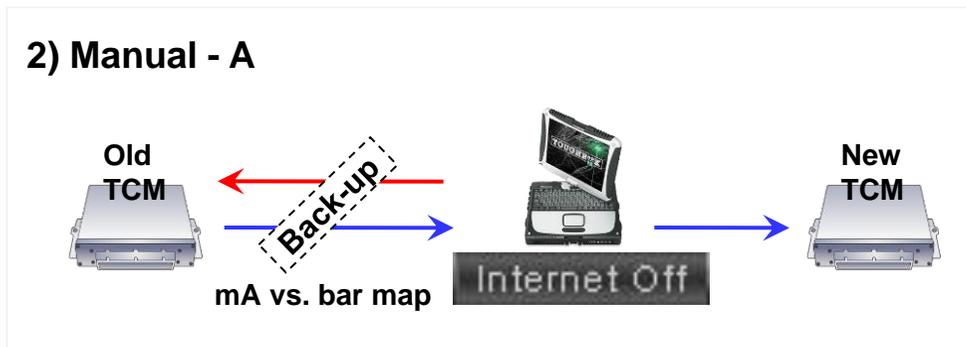
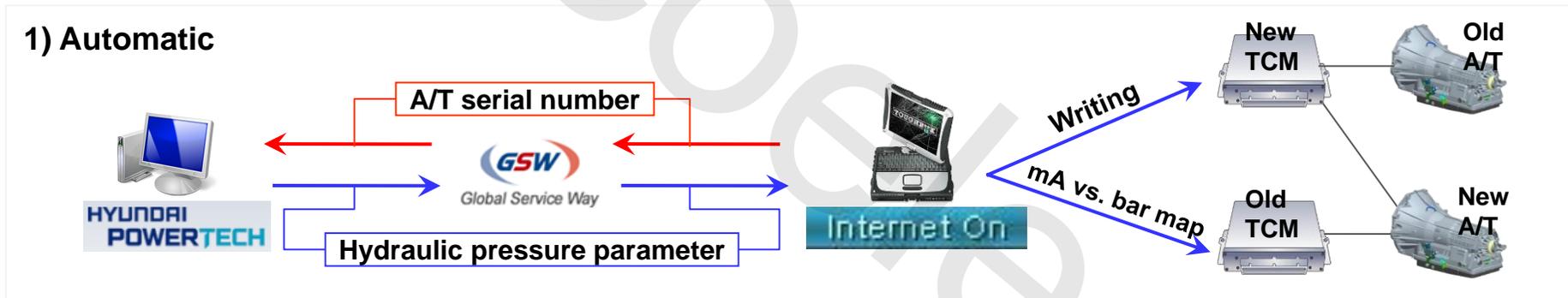
## How to input hydraulic pressure parameter



A/T Serial number  
(12 digits)

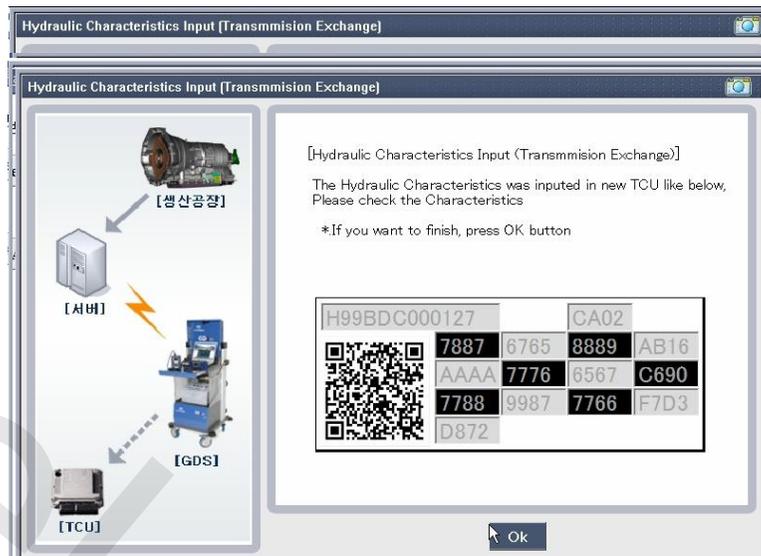


Bar-code sticker  
(68 digits)

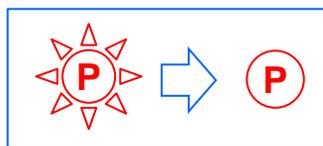
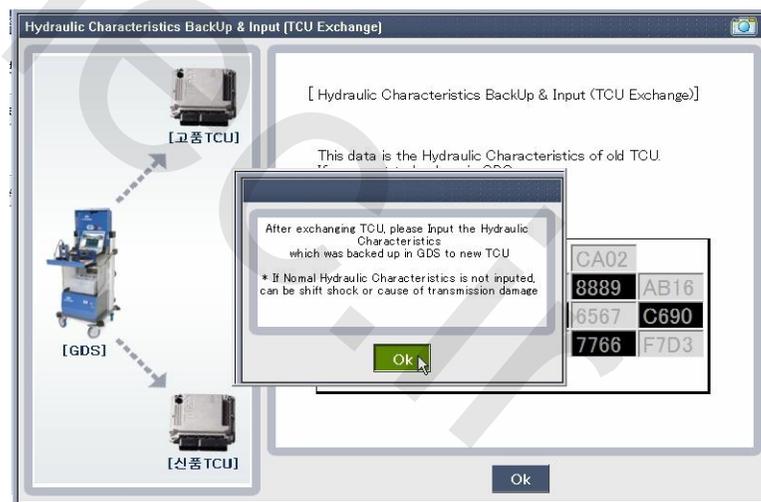
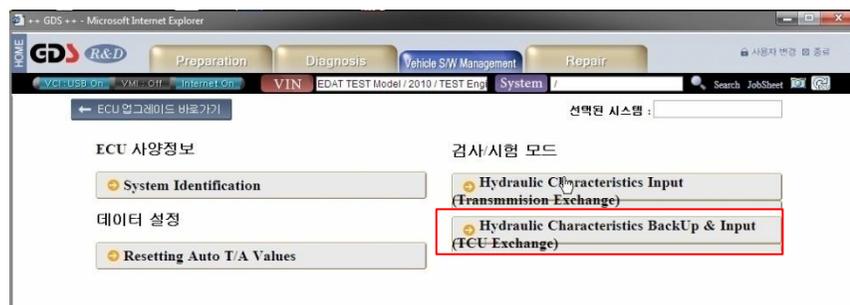


## How to input hydraulic pressure parameter

### 1) After replacing new A/T assembly



### 2) After replacing new TCM



## Sensor Output - Transmission

Category	Sensor output																																																																														
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<input type="checkbox"/> ON/OFF Solenoid C(Parking)	OFF	-																																																																													