

8 Speed AT (A8LR1) with SBW

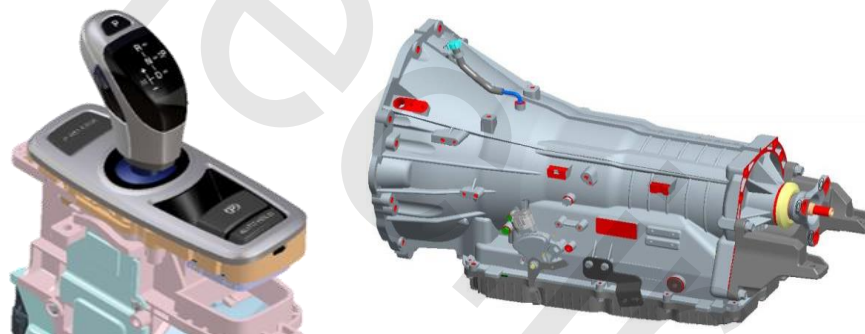


8 Speed AT (A8LR1) with SBW

Spec Comparison

Category	New Opirus (GH)	KH	Remarks
Automatic Transmission	Front Wheel Drive 6 Speed	Rear-Wheel 8-Speed AT + SBW	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.



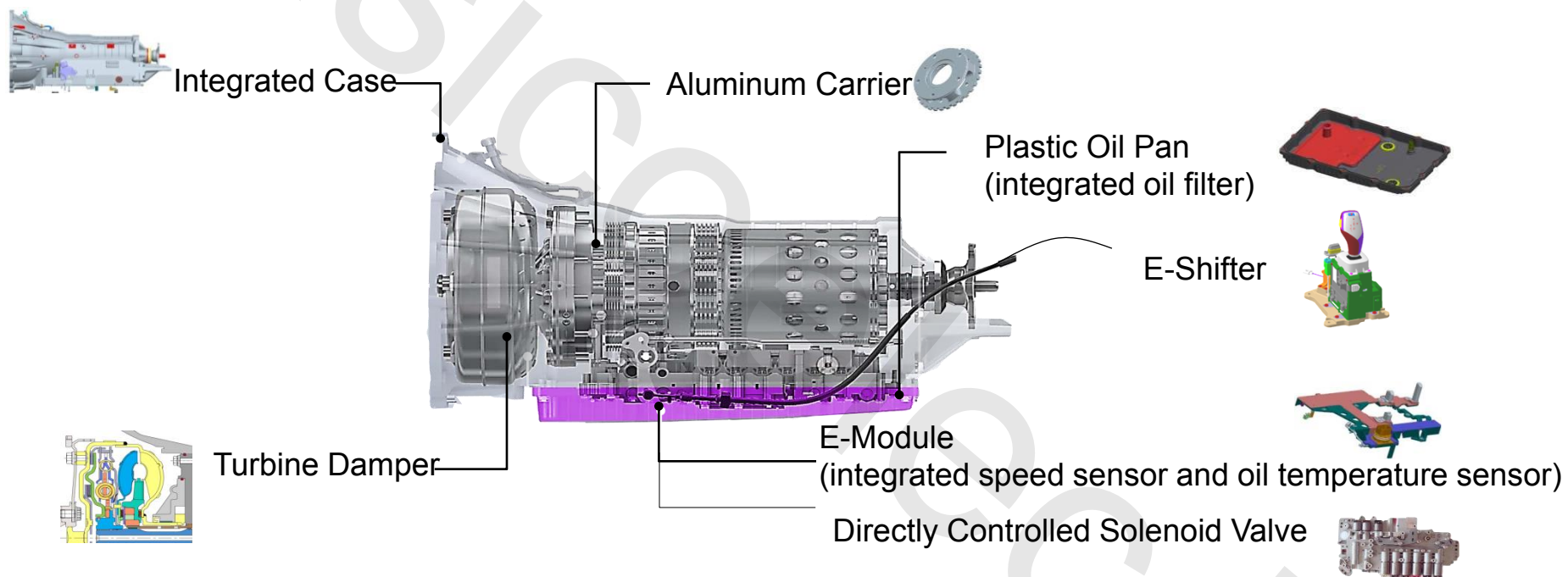
8 Speed AT (A8LR1) with SBW

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	Applied
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 ON/OFF : 3
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

8 Speed AT (A8LR1) with SBW

Main Features



8 Speed AT (A8LR1) with SBW

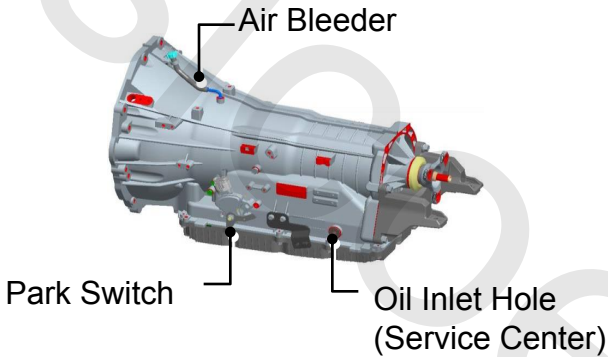
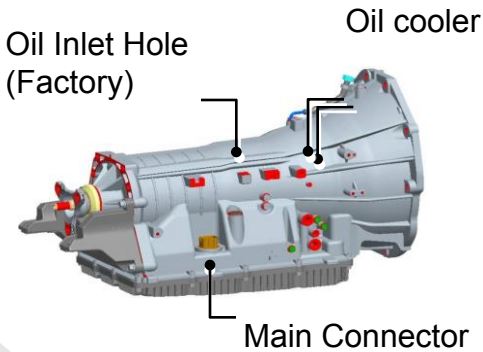
Directly Controlled Solenoid Valve

Category	Previous Model: Indirect control type	KH: Direct control type
Image	<p>Clutch/Brake</p> <p>Pressure Control Valve</p> <p>Sol Control Pressure</p> <p>Line Pressure</p> <p>Sol Feed Pressure</p>	<p>Clutch/Brake</p> <p>Control Pressure</p> <p>Line Pressure</p> <p>Direct Control Sol Valve</p>

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

8 Speed AT (A8LR1) with SBW

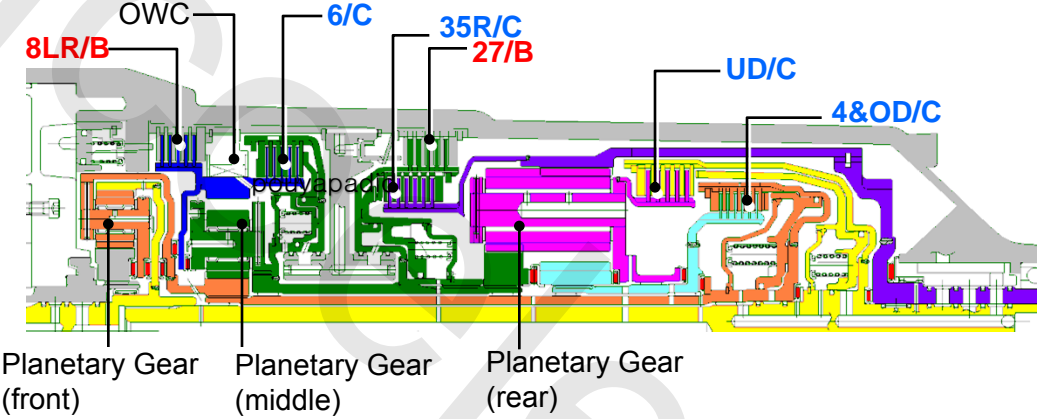
External Structure

Category	Right Side	Left Side
Image	 <p>Air Bleeder</p> <p>Park Switch</p> <p>Oil Inlet Hole (Service Center)</p>	 <p>Oil Inlet Hole (Factory)</p> <p>Oil cooler</p> <p>Main Connector</p>

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

8 Speed AT (A8LR1) with SBW

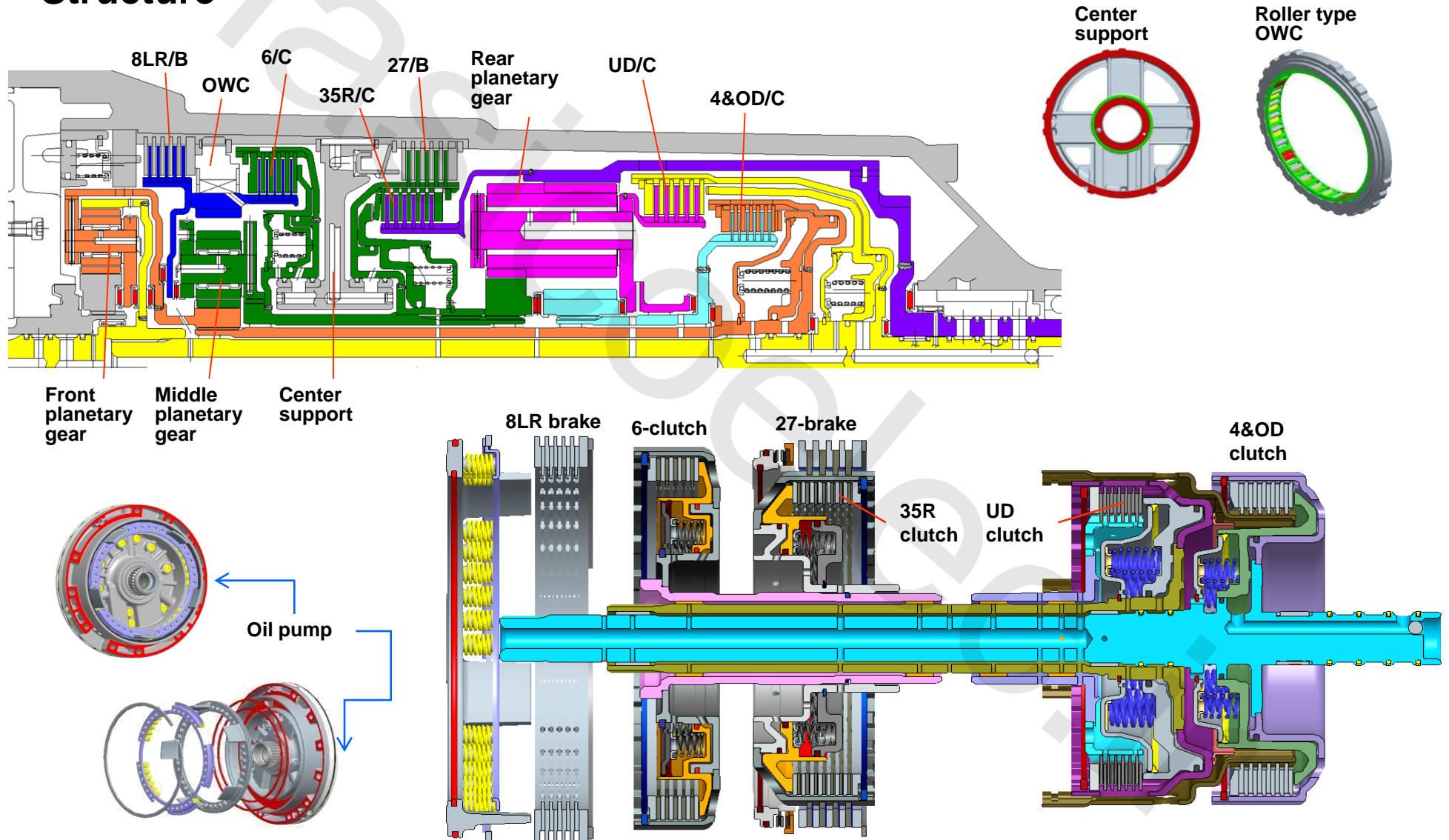
Internal Structure

Category	Interior Side
Image	

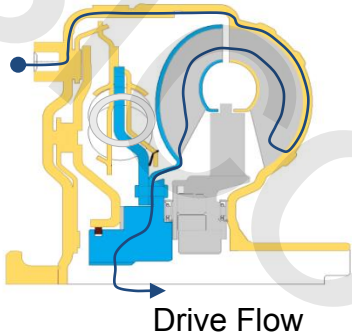
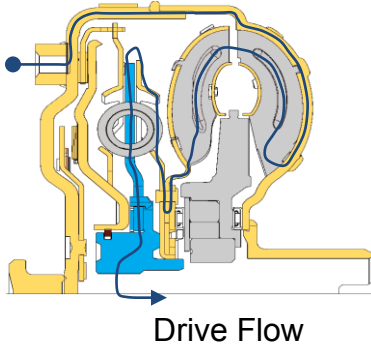
- Composed of 4 clutches and 2 brakes
- 2 simple and 1 complex planetary gear system

8 Speed AT (A8LR1) with SBW

Structure



Torque Converter

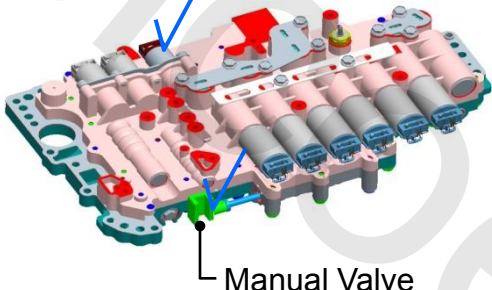
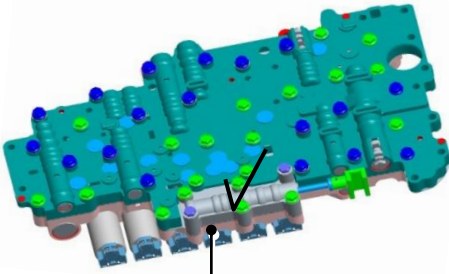
Category	Conventional Damper	Turbine Damper
Image	 <p>Drive Flow</p>	 <p>Drive Flow</p>

- 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

8 Speed AT (A8LR1) with SBW

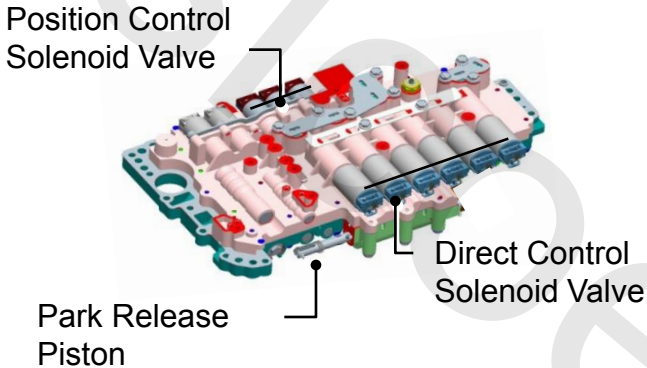
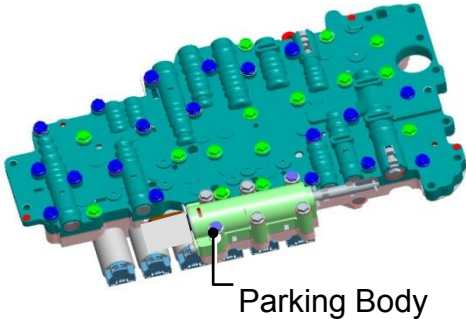
Valve Body (SBC)

Category	Upper	Lower
Image	<p>8LR F/S Valve ON/OFF SOL</p>  <p>Manual Valve</p>	 <p>Manual Body</p>

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

8 Speed AT (A8LR1) with SBW

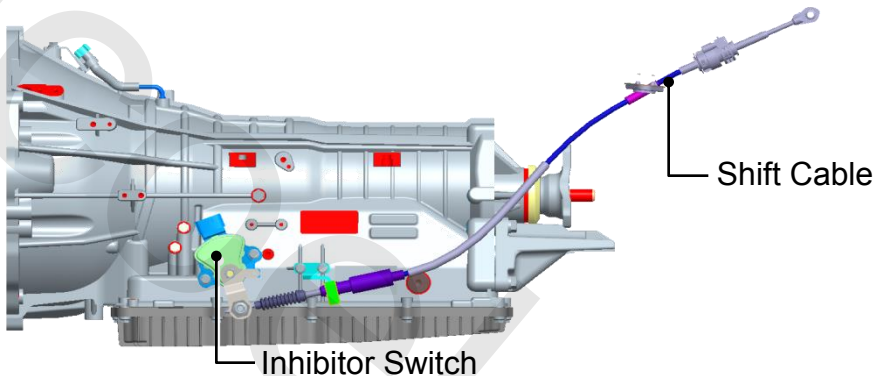
Valve Body (SBW)

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>

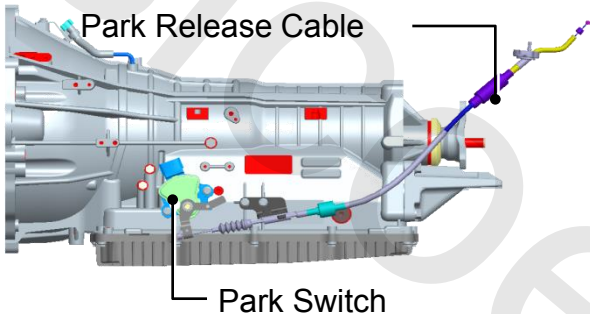
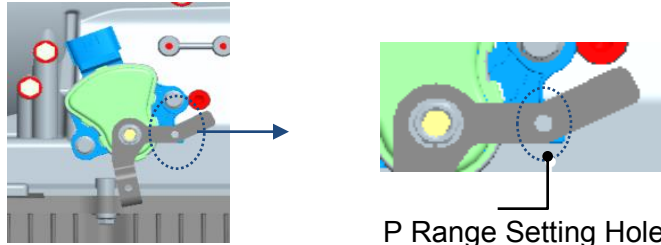
- 2 solenoid valves and park body is additional installed and hydraulic circuit is changed compared to Mohave 8-Speed AT

8 Speed AT (A8LR1) with SBW

Inhibitor Switch (SBC)

Category	Inhibitor Switch
Image	 <p>The diagram illustrates the Inhibitor Switch (SBC) assembly on the 8 Speed AT (A8LR1) with SBW. The assembly is shown in a side view, highlighting the shift cable and the inhibitor switch mechanism. The shift cable is connected to the shift lever and the inhibitor switch. The inhibitor switch is a mechanical component that prevents the vehicle from being shifted out of Park or Neutral when the brake is not applied. The diagram includes labels for the 'Shift Cable' and the 'Inhibitor Switch'.</p>

Park Switch (SBW)

Category	Park Switch	P Range Setting Procedure
Image	 <p>Diagram illustrating the Park Switch assembly. The Park Release Cable is connected to the Park Switch. The Park Switch is mounted on the transmission housing.</p>	 <p>Diagram illustrating the P Range Setting Hole. The shift lever is shown in the P Range position. The P Range Setting Hole is located on the shift lever.</p> <ul style="list-style-type: none"> - Shift Lever at P Range (N in previous model) - Assemble Park Switch - P Range Setting Hole Alignment (important) - Tighten Park Switch Mounting Bolt - Tighten Lever Nut

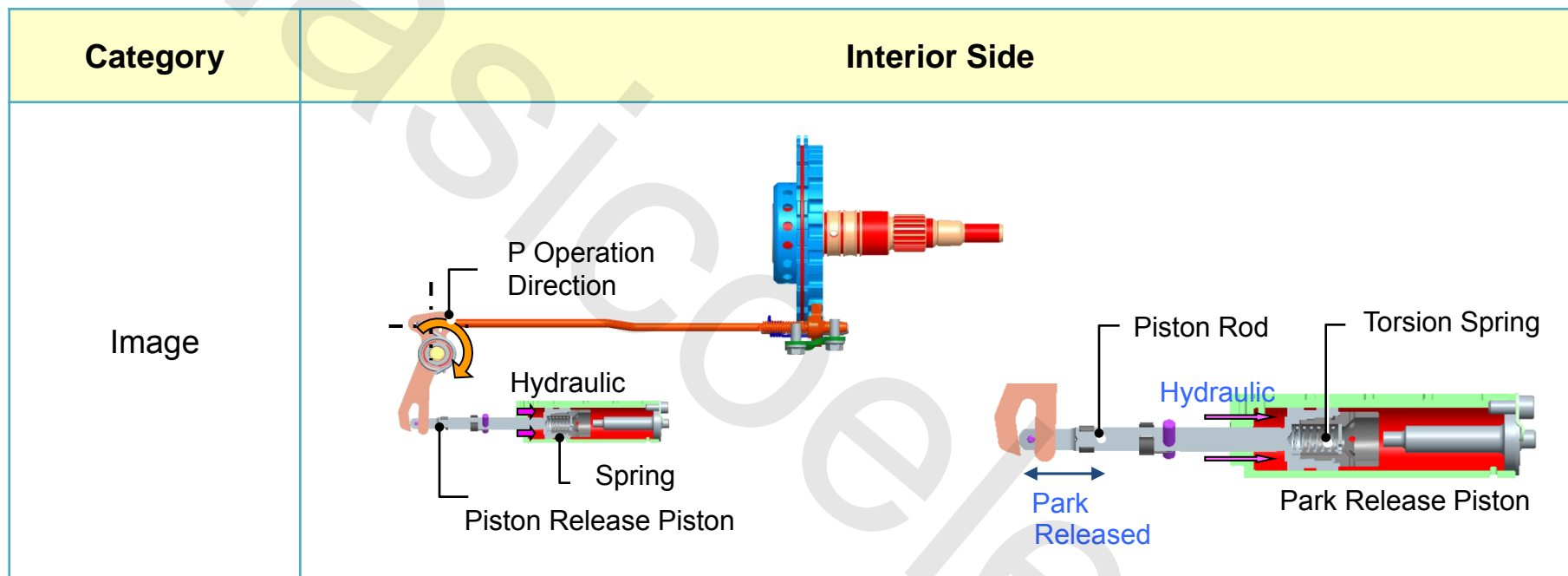
- Detect whether or not Park is engaged
- It is very important to set the P range after servicing relevant components (similar to N range setting in previous model)

Parking Mechanism (SBC)

Category	Interior Side
Image	

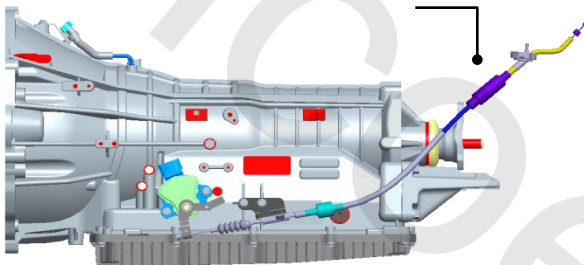
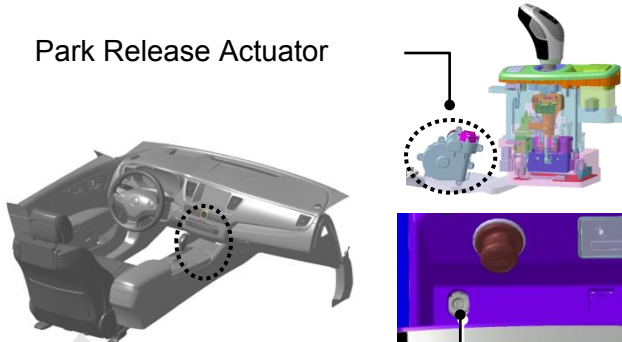
- Cam Type

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.

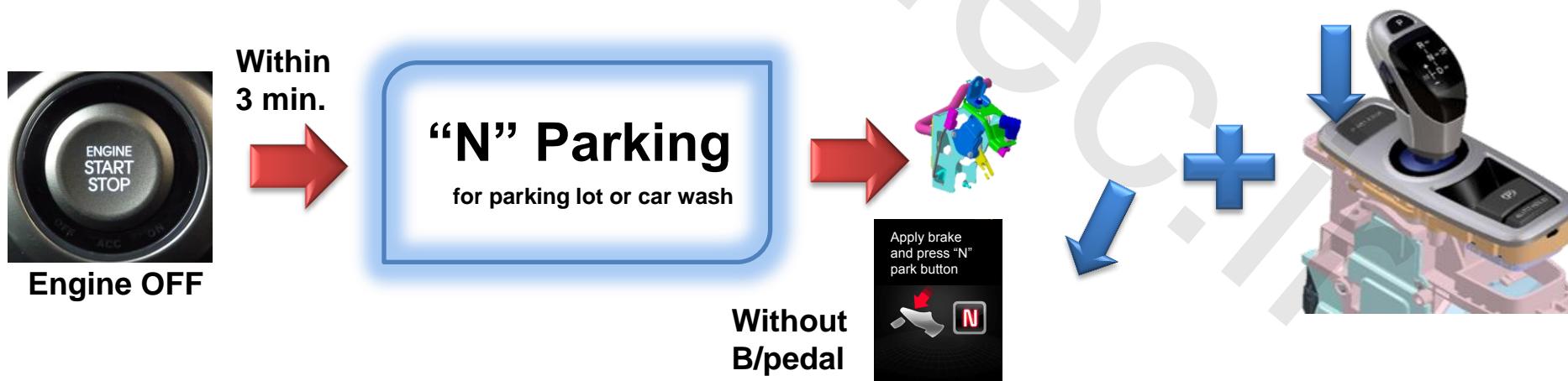
Parking release Actuator

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	 <p>The diagram shows a 3D cutaway view of the gear shifter assembly. Labels with leader lines point to the following components: E-Shifter (the main gear selector lever), P-Release Switch (a small button on the side of the shifter base), and EPB switch (a larger rectangular button on the front of the shifter base).</p>



8 Speed AT (A8LR1) with SBW

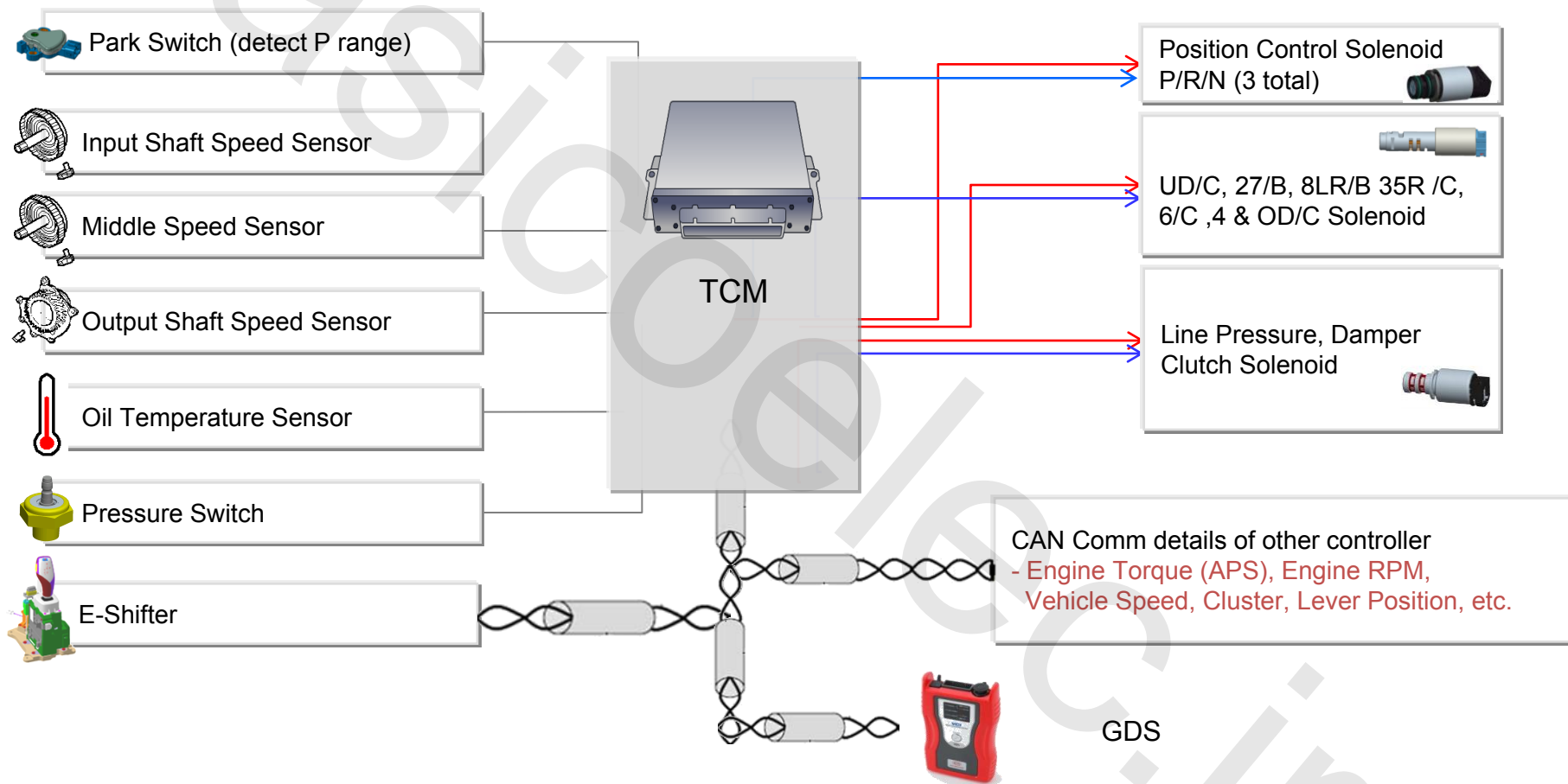
Clutch & Brake Operation Table

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 st	3.665	3.795	●				○		●
2 nd	2.396	2.473	●					●	
3 rd	1.610	1.613	●			●			
4 th	1.190	1.177	●		●				
5 th	1.000	1.000			●	●			
6 th	0.826	0.831		●	●				
7 th	0.643	0.652			●			●	
8 th	0.556	0.571			●		●		

○ : operates at low speed only

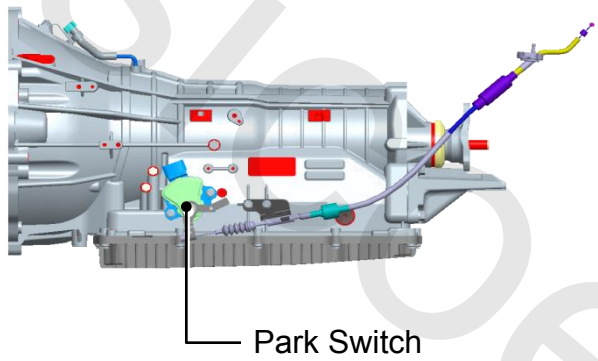
8 Speed AT (A8LR1) with SBW

In/Output Factors



8 Speed AT (A8LR1) with SBW

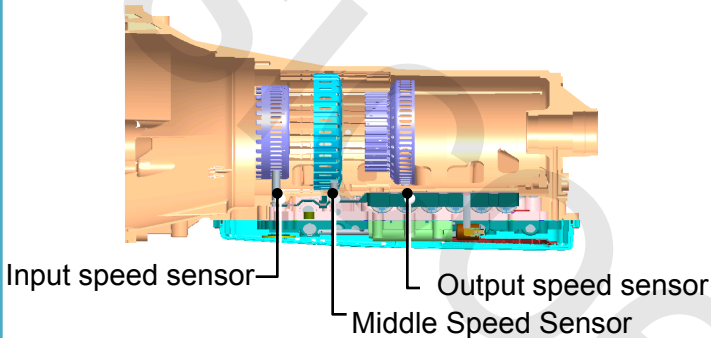
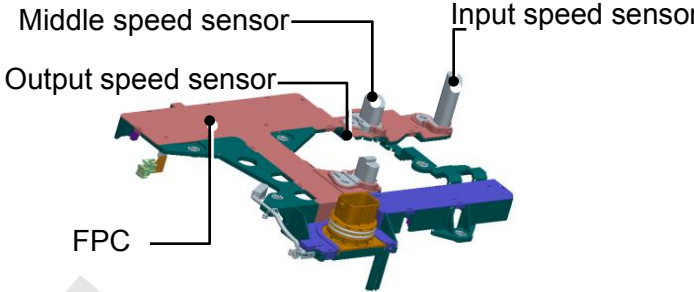
Park Switch

Category	Park Switch	Output Signal									
Image		<table> <tr> <th>Category</th><th>Signal1</th><th>Signal2</th></tr> <tr> <td>P</td><td>1</td><td>0</td></tr> <tr> <td>Not P</td><td>0</td><td>1</td></tr> </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

8 Speed AT (A8LR1) with SBW

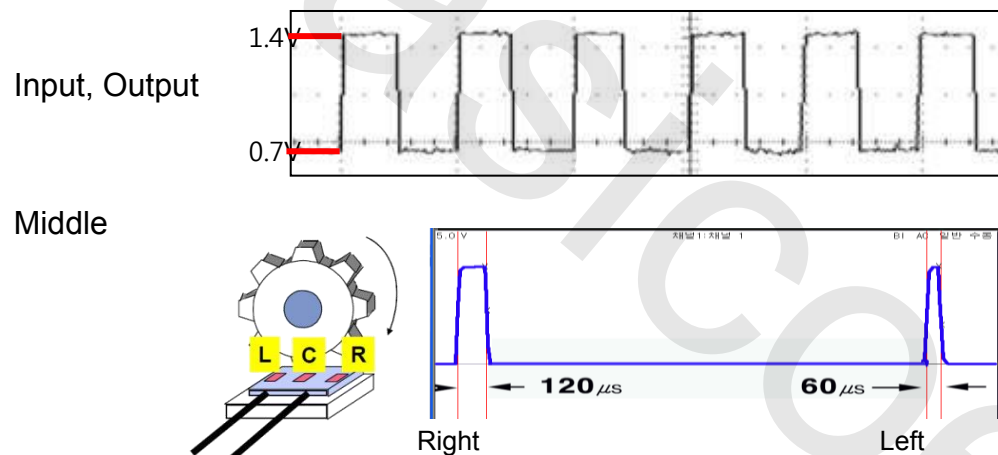
Speed Sensor

Category	Mounting Location-1	Mounting Location-2
Image	 <p>Input speed sensor</p> <p>Output speed sensor</p> <p>Middle Speed Sensor</p>	 <p>Middle speed sensor</p> <p>Output speed sensor</p> <p>Input speed sensor</p> <p>FPC</p>

- 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

8 Speed AT (A8LR1) with SBW

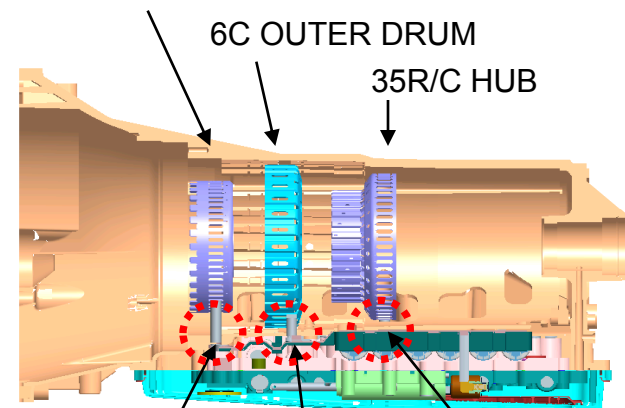
Speed sensors



MID SUN CONN. PLATE

6C OUTER DRUM

35R/C HUB

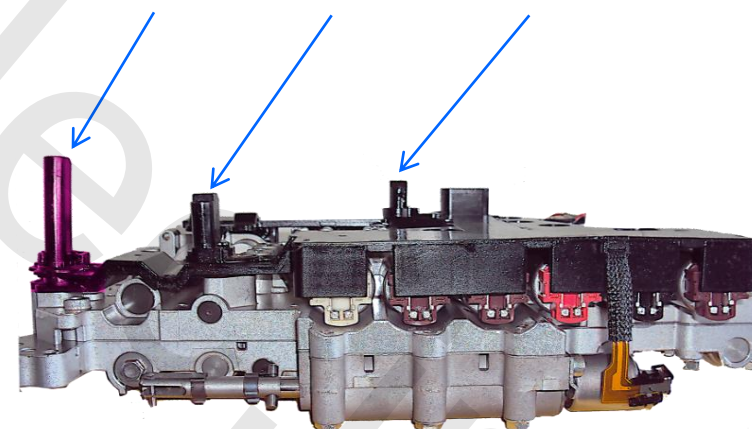


Input s/sensor

Middle s/sensor

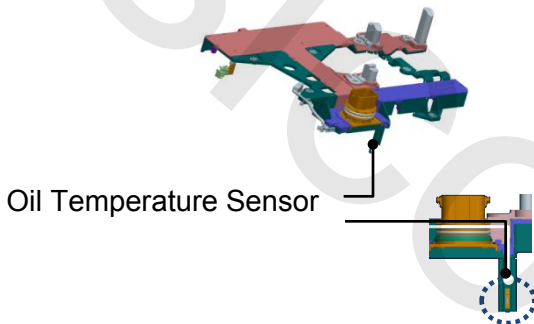
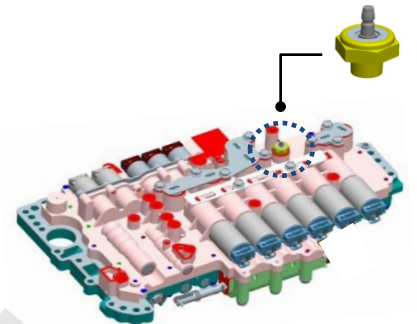
Output s/sensor

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



8 Speed AT (A8LR1) with SBW

Oil Temp Sensor / Pressure Switch

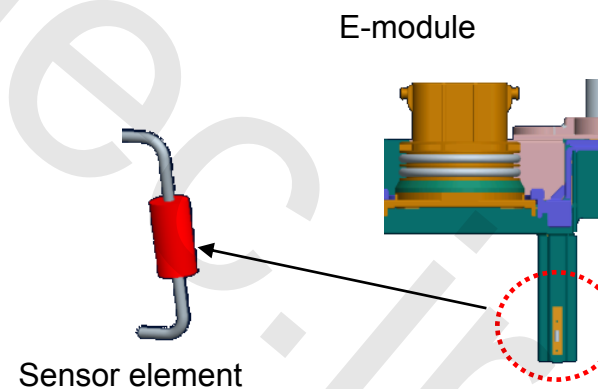
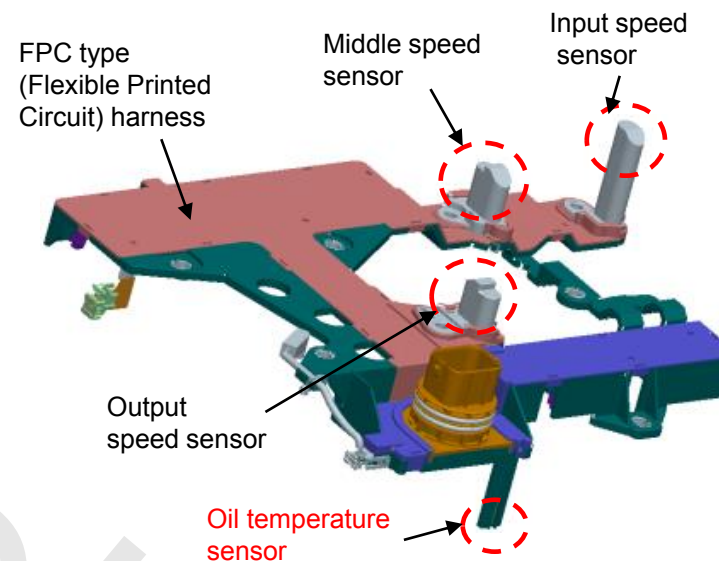
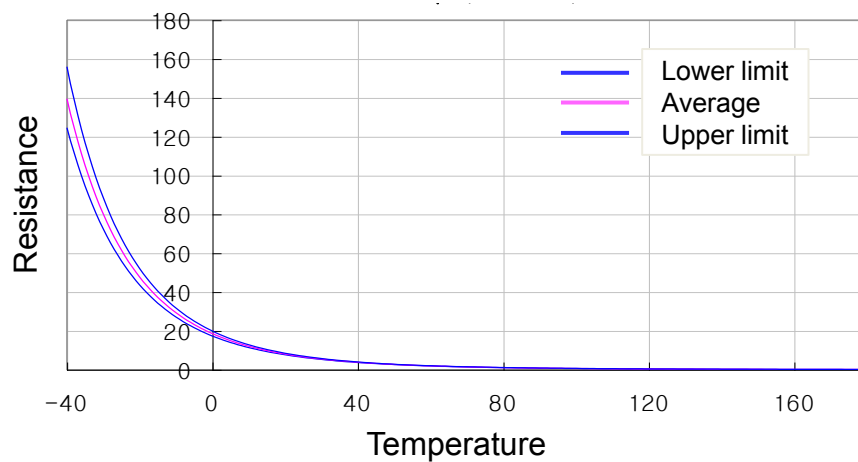
Category	Oil Temperature Sensor	pressure switch
Image	 <p>Oil Temperature Sensor</p>	 <p>pressure switch</p>

- 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

8 Speed AT (A8LR1) with SBW

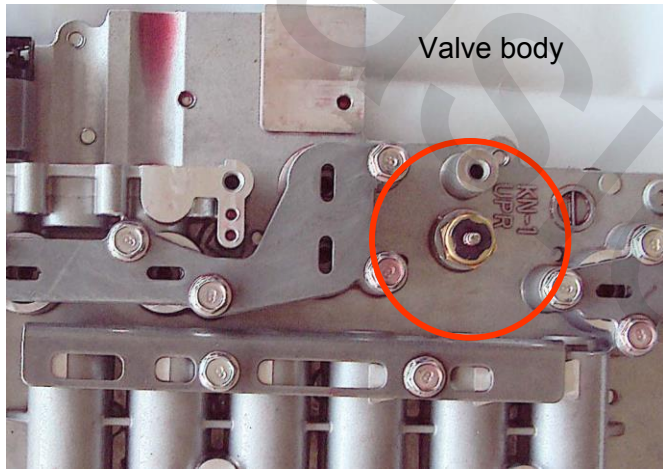
Oil temperature sensor

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



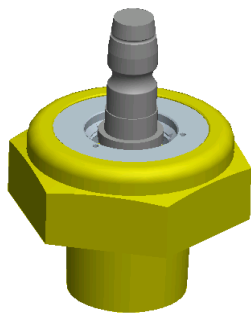
8 Speed AT (A8LR1) with SBW

Pressure switch

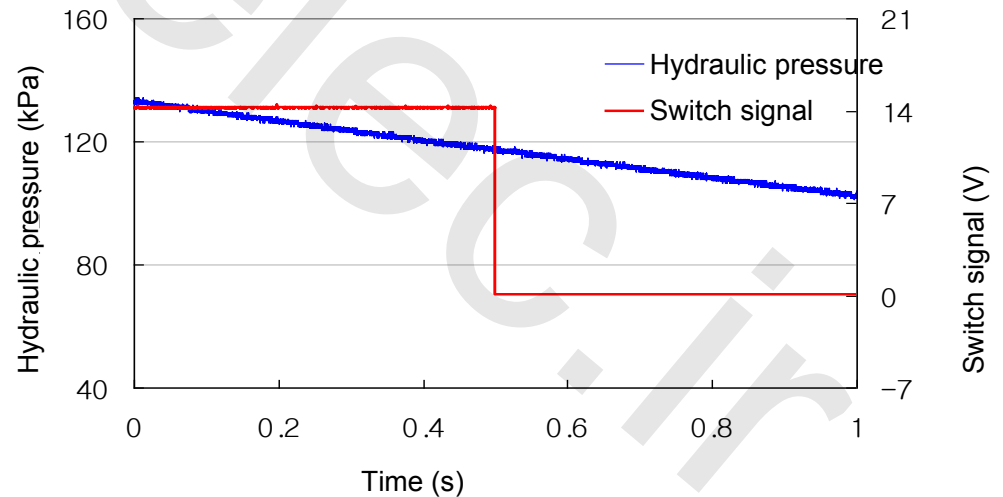


Function:
it detects the abnormal hydraulic pressure
in 35R clutch.

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

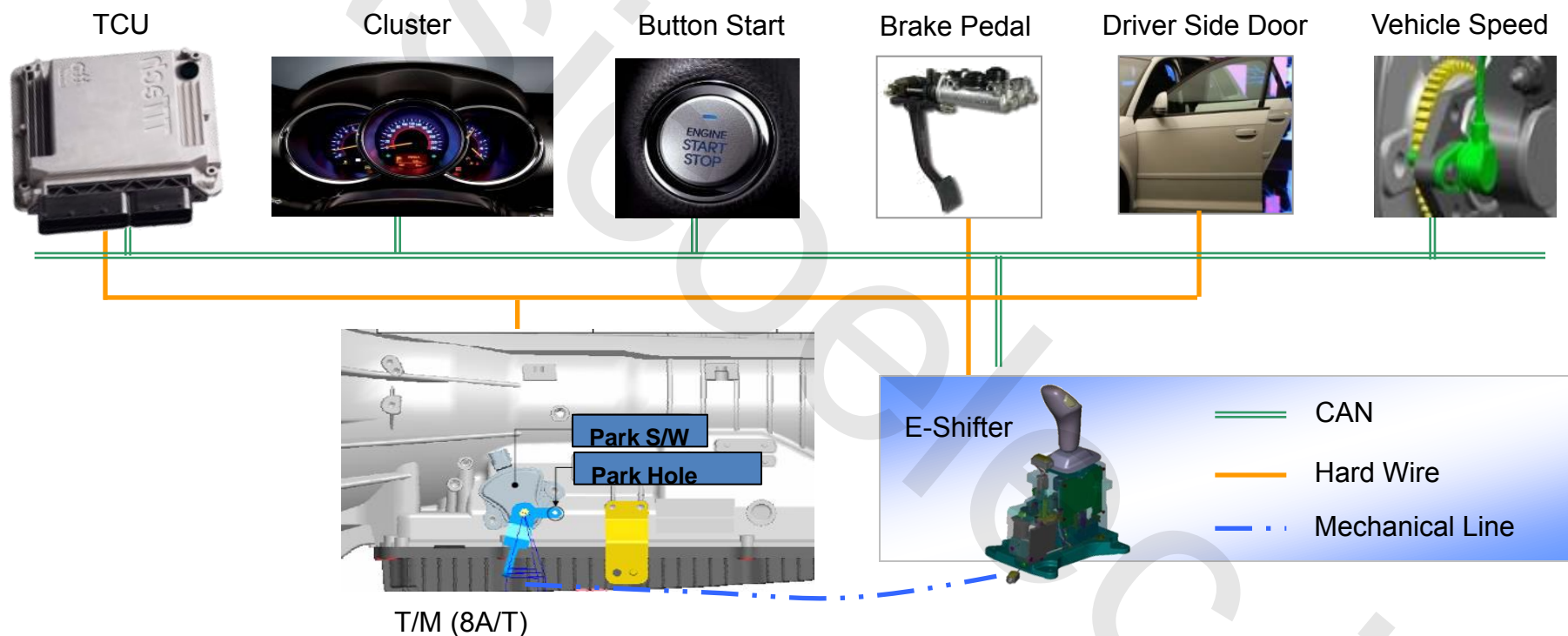


Pressure switch


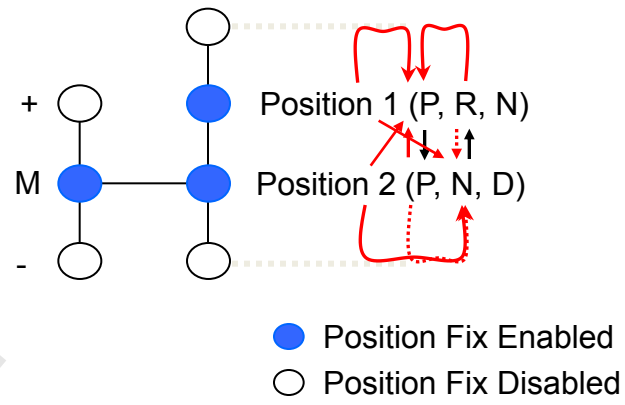


8 Speed AT (A8LR1) with SBW

E-Shifter Layout



E-Shifter

Category	E-Shifter	Transmission pattern
Image		 <p>Position 1 (P, R, N)</p> <p>Position 2 (P, N, D)</p> <p>● Position Fix Enabled ○ Position Fix Disabled</p>

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)

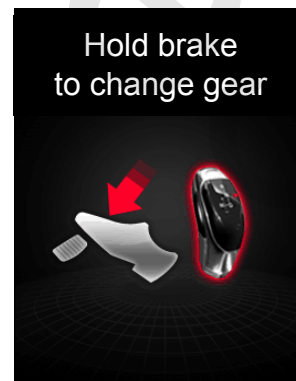
A. P→R, P→D

- 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

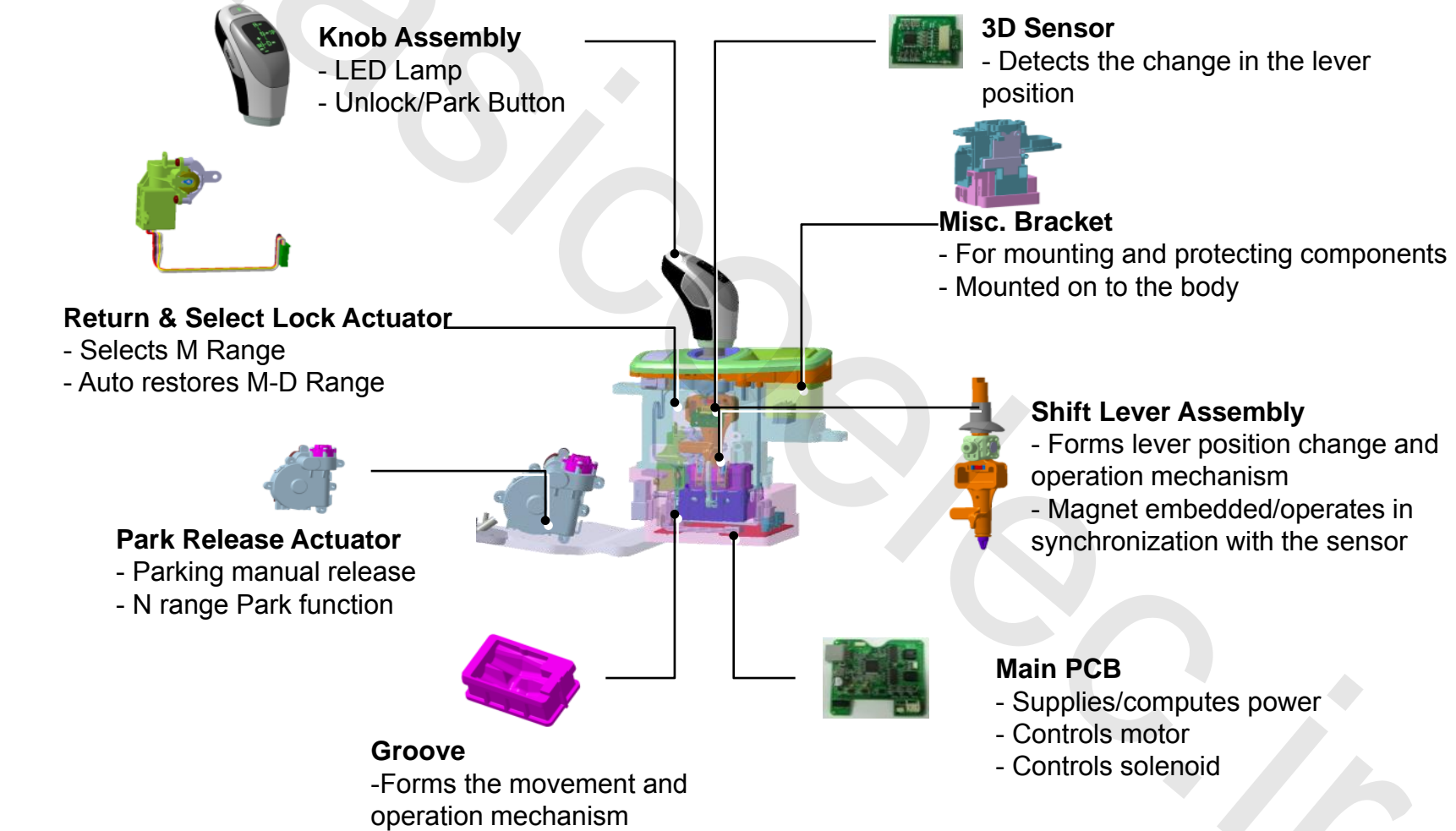
F. P range is automatically engaged: If the conditions: in any of D/R/M range seat belt OFF, accel & brake pedal OFF, door opened, vehicle speed less than 2km/h are satisfied.

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**

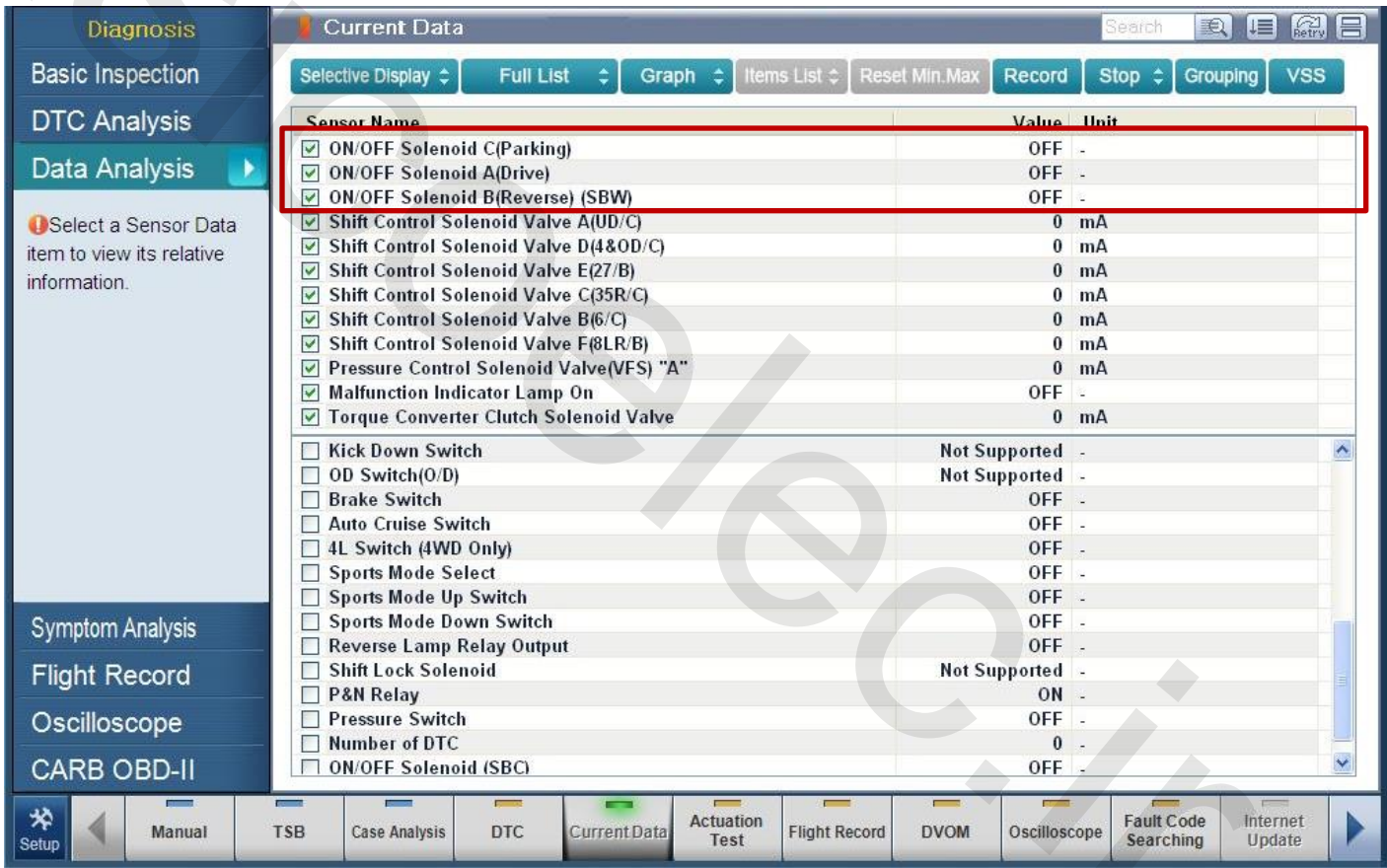
E-Shifter Configuration



- Shift Knob cannot be changed separately

8 Speed AT (A8LR1) with SBW

Sensor Output-SBW

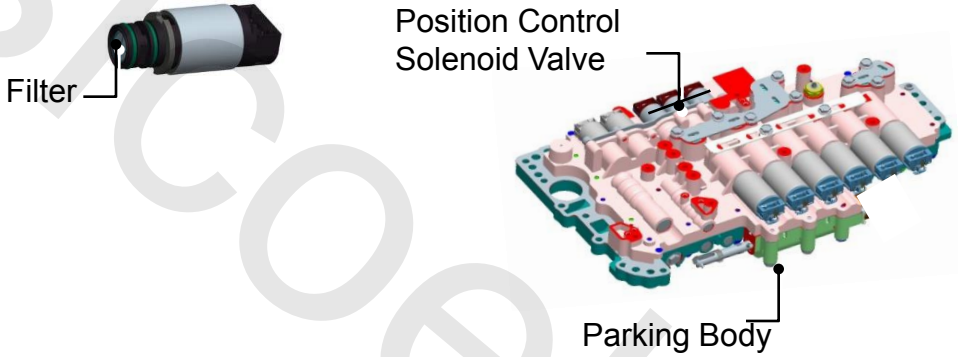
Category	Sensor Output																																																																																	
Image	 <p>The screenshot displays the 'Current Data' screen of a diagnostic tool. On the left, a sidebar menu includes 'Diagnosis', 'Basic Inspection', 'DTC Analysis', 'Data Analysis' (highlighted), 'Symptom Analysis', 'Flight Record', 'Oscilloscope', and 'CARB OBD-II'. Below 'Data Analysis' is a note: 'Select a Sensor Data item to view its relative information.' The main area shows a list of sensors with checkboxes, names, values, and units. A red box highlights the 'ON/OFF Solenoid B(Reverse) (SBW)' sensor, which has a value of 'OFF'. Other sensors include 'ON/OFF Solenoid C(Parking)', 'ON/OFF Solenoid A(Drive)', various 'Shift Control Solenoid Valve' items, 'Pressure Control Solenoid Valve(VFS) "A"', 'Malfunction Indicator Lamp On', 'Torque Converter Clutch Solenoid Valve', and several switches like 'Kick Down Switch', 'OD Switch(O/D)', 'Brake Switch', etc. The bottom of the screen features a navigation bar with icons 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> <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&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&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	-
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	-																																																																																

Actuation Test - SBW

Category	Actuation Test																																	
Image	<p>The screenshot shows the KIA diagnostic tool interface. On the left is a navigation menu with options: Diagnosis, Basic Inspection, DTC Analysis, Data Analysis (selected), Symptom Analysis, Flight Record, Oscilloscope, and CARB OBD-II. The main area is titled 'Actuation Test' and contains two sections: 'Current Data' and 'Actuation Test'.</p> <p>Current Data Section:</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&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 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> <p>Actuation Test Section:</p> <p>Test Items:</p> <ul style="list-style-type: none"> 3rd Gear Lamp 4th Gear Lamp 5th Gear Lamp 6th Gear Lamp 7th Gear Lamp 8th Gear Lamp ON/OFF Solenoid A(Drive) (highlighted) ON/OFF Solenoid B(Reverse) (SBW) ON/OFF Solenoid (SBC) ON/OFF Solenoid A(Parking) ON/OFF Solenoid A(DRH) <p>Test Parameters:</p> <ul style="list-style-type: none"> Duration: 3 Sec Conditions: IG. ON, ENG OFF, 'P' RANGE, NO DTC Result: Activation <p>Buttons: Start, Stop</p> <p>Bottom Navigation Bar: Setup, Manual, TSB, Case Analysis, DTC, Current Data, Actuation Test (highlighted), 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&OD/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	-
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&OD/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	-																																

8 Speed AT (A8LR1) with SBW

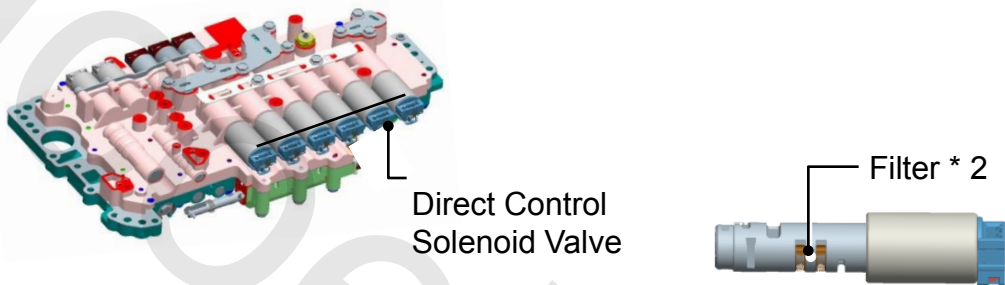
P/R/D Position Control Sol Valve (ON/OFF Type)

Category	Valve Body
Image	 <p>Filter</p> <p>Position Control Solenoid Valve</p> <p>Parking Body</p>

- 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

8 Speed AT (A8LR1) with SBW


Direct Control Sol Valve (VFS Type)

Category	Valve body
Image	

- 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

8 Speed AT (A8LR1) with SBW

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

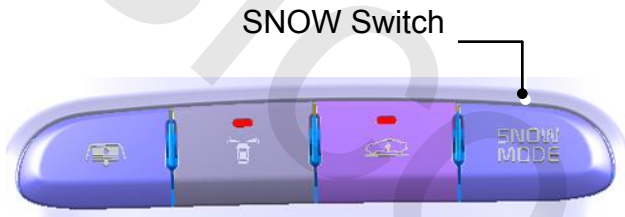

8 Speed AT (A8LR1) with SBW

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

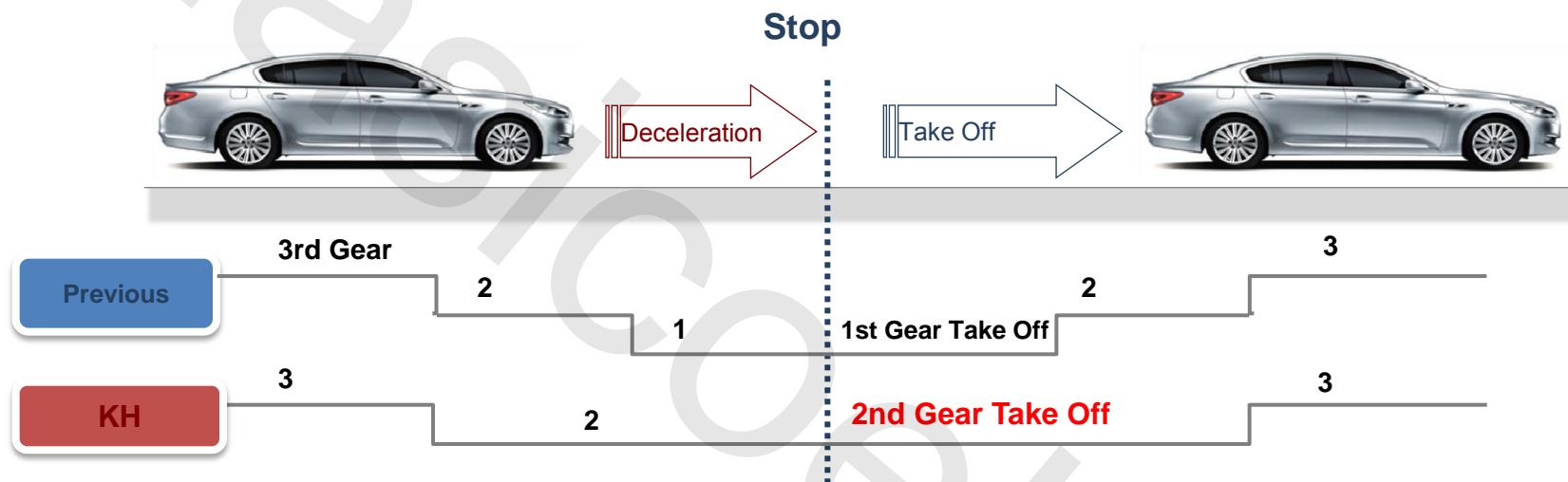
SNOW-Mode Control

Category	Switch Image	Cluster Indication Lamp
Image	 <p>SNOW Switch</p> <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

8 Speed AT (A8LR1) with SBW

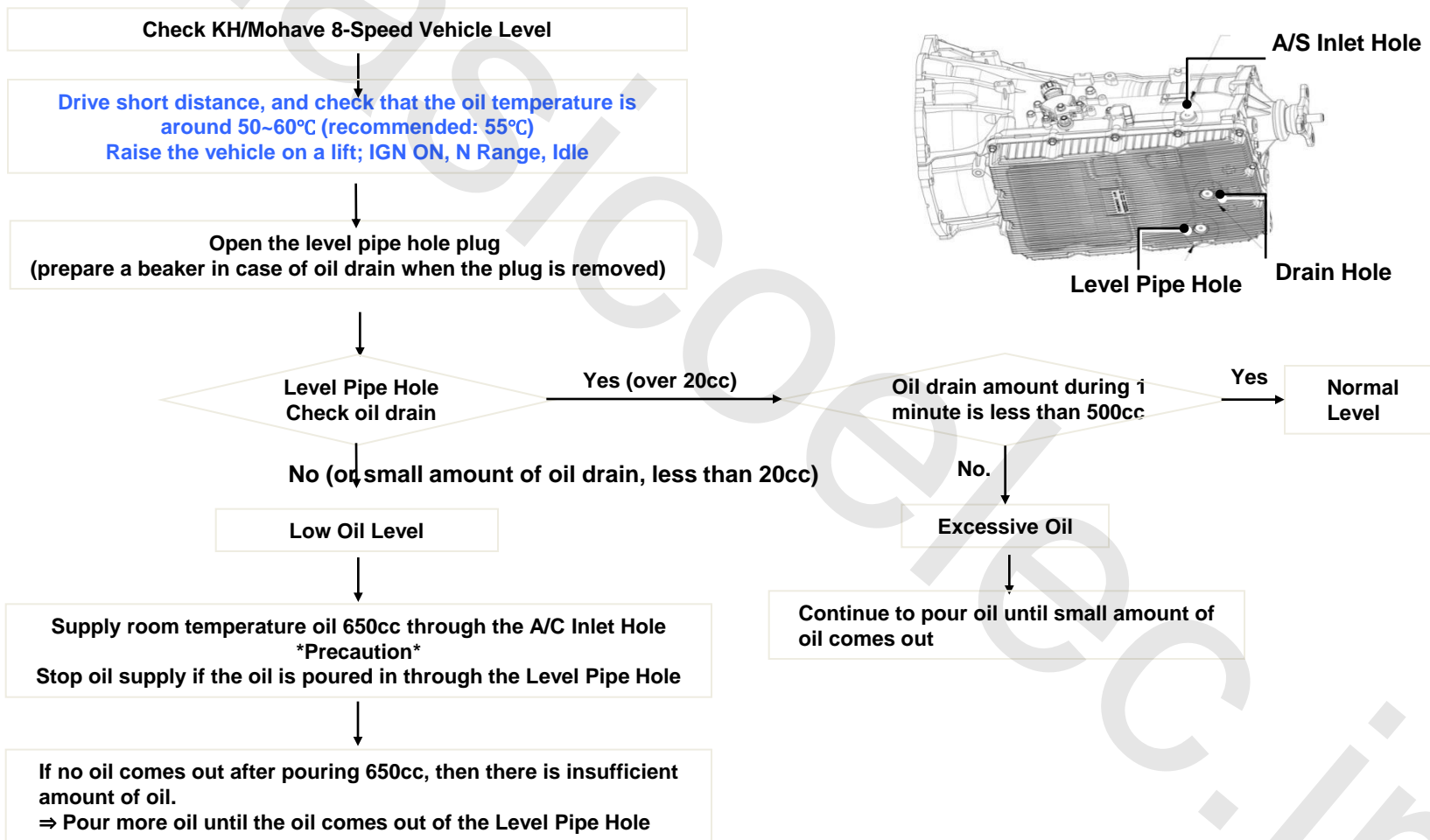
2nd Gear Take Off



- 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.

8 Speed AT (A8LR1) with SBW

Oil Level Check Procedure



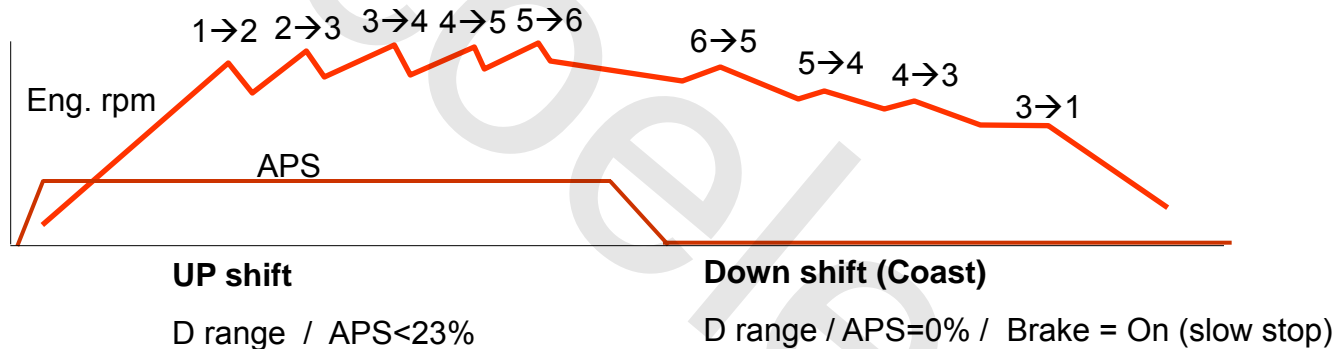
8 Speed AT (A8LR1) with SBW

TCM learning

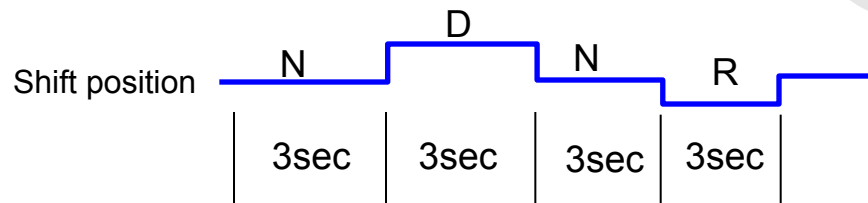


- 1) ATF temperature: 60 ~ 95°C
- 2) APS must be constant while up-shift (10% ~ 25%)
- 3) Repeat following driving pattern 3 times at least until the shift becomes stable.

Driving



Static



N-D and N-R shift

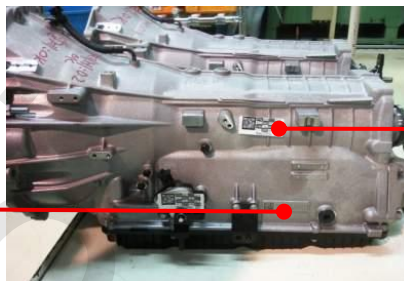
Brake = On (Vehicle stop)
APS=0%

8 Speed AT (A8LR1) with SBW

How to input hydraulic pressure parameter

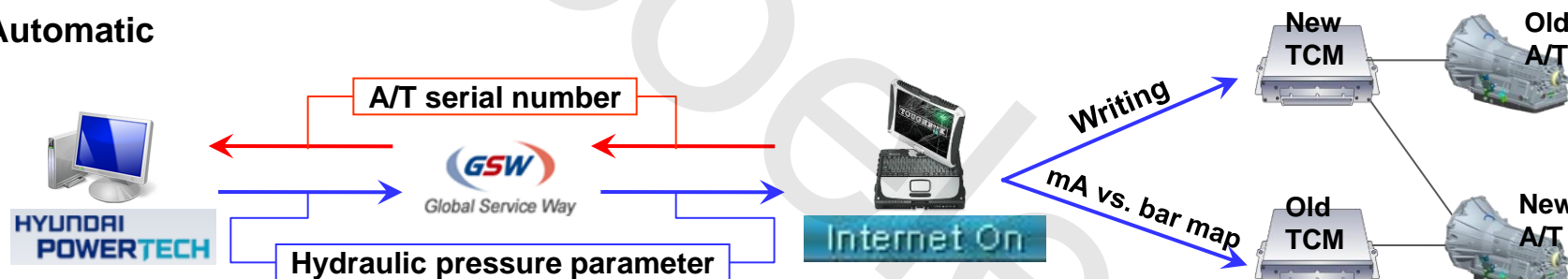


A/T Serial number
(12 digits)

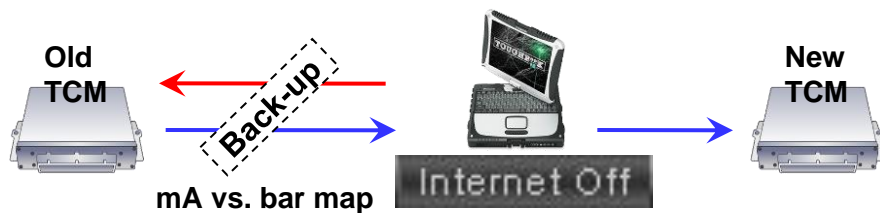


Bar-code sticker
(68 digits)

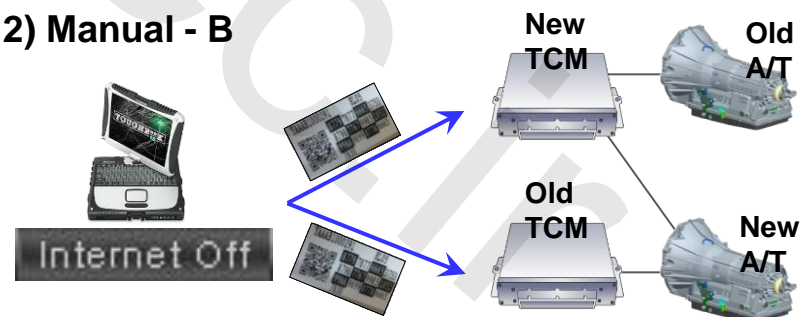
1) Automatic



2) Manual - A



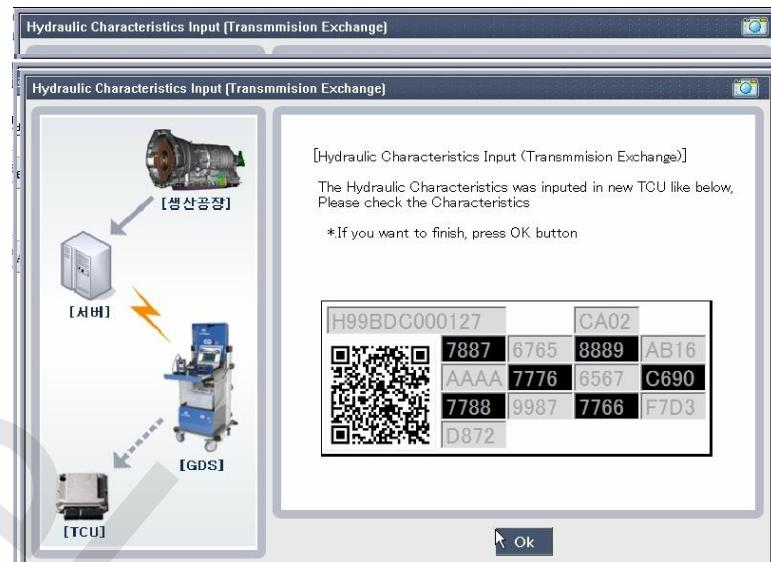
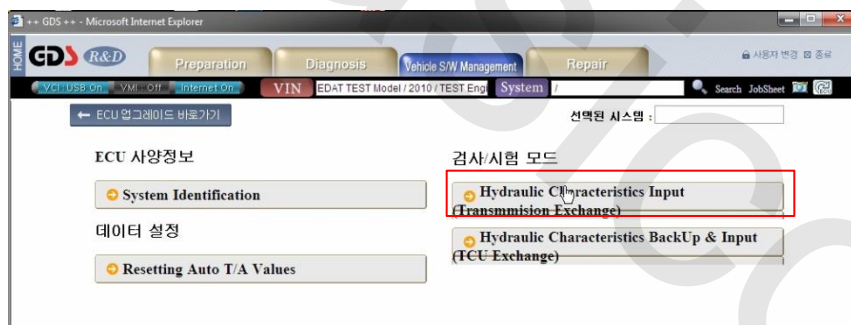
2) Manual - B



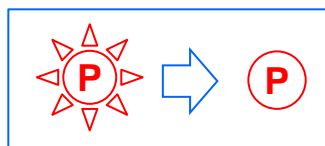
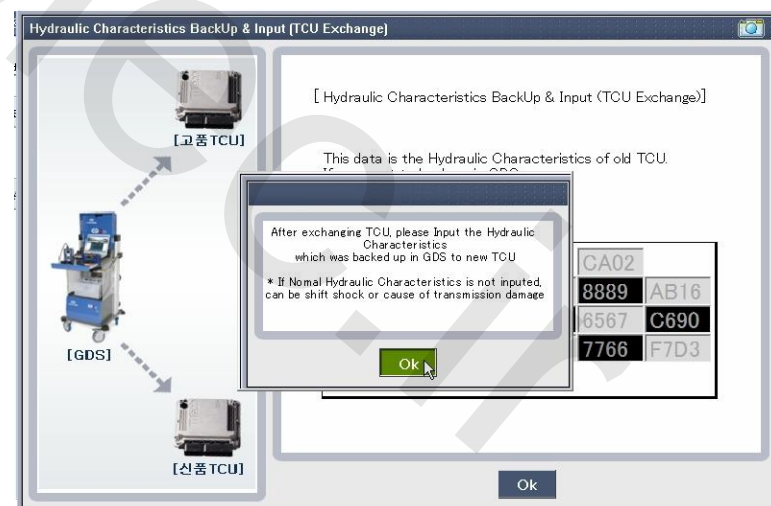
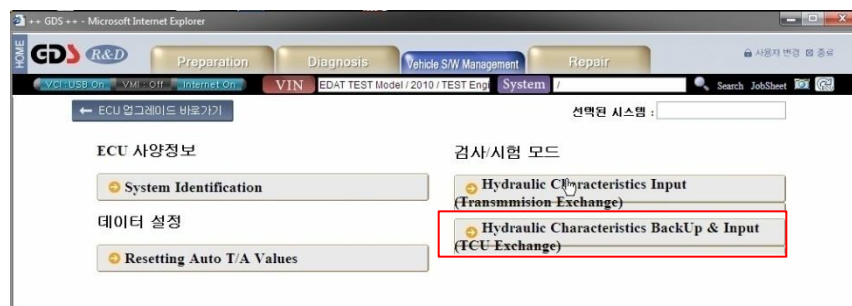
8 Speed AT (A8LR1) with SBW

How to input hydraulic pressure parameter

1) After replacing new A/T assembly



2) After replacing new TCM



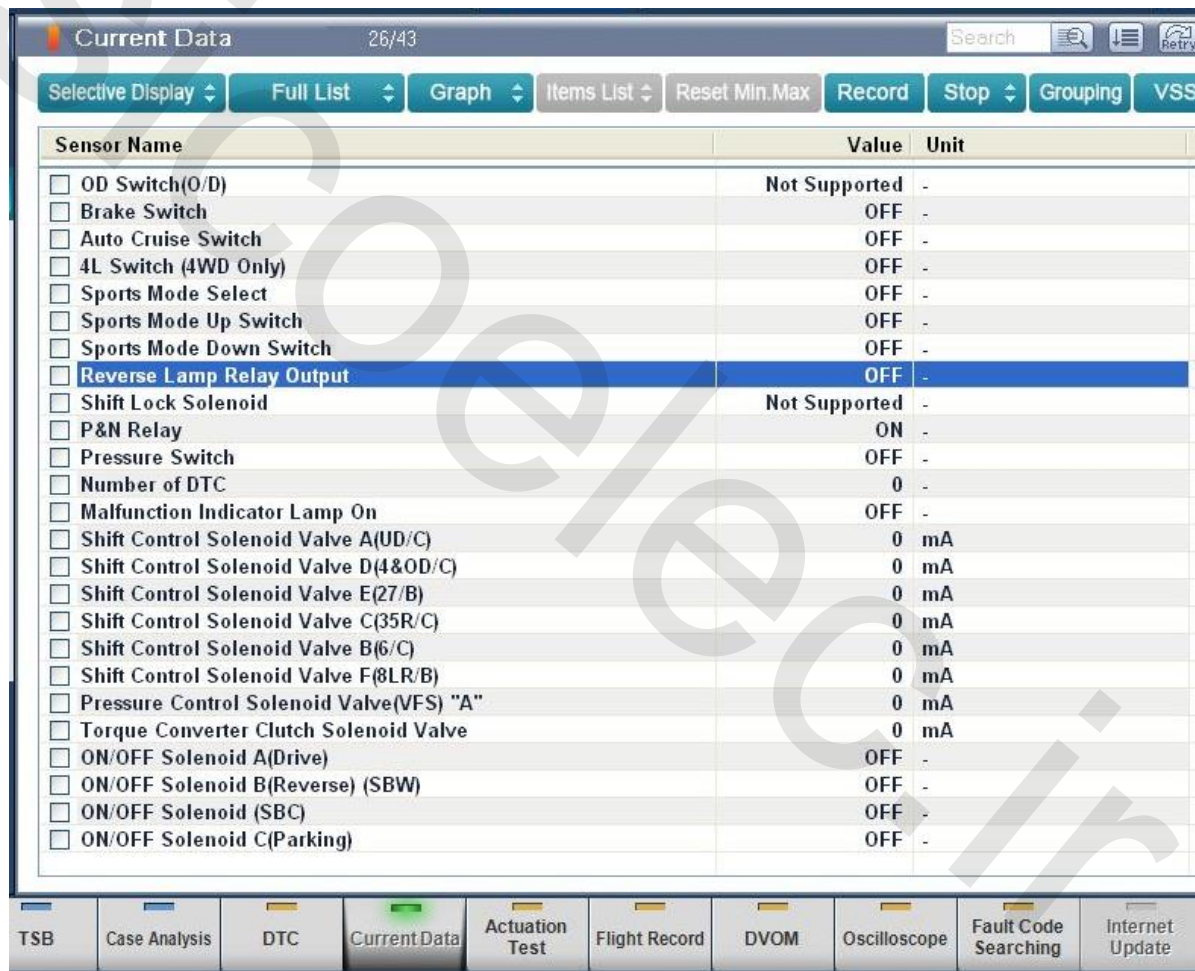
8 Speed AT (A8LR1) with SBW

Sensor Output - Transmission

Category

Sensor output

Image



The screenshot shows the 'Current Data' window of a diagnostic tool. The window title is 'Current Data' with a sub-header '26/43'. There are search and navigation icons at the top right. Below the title bar, there are several buttons: 'Selective Display', 'Full List', 'Graph', 'Items List', 'Reset Min.Max', 'Record', 'Stop', 'Grouping', and 'VSS'. The main area is a table with three columns: 'Sensor Name', 'Value', and 'Unit'. The table lists various sensors, including switches, solenoids, and relays. The 'Reverse Lamp Relay Output' is highlighted in blue. The bottom of the window shows a row of icons for different diagnostic functions: TSB, Case Analysis, DTC, Current Data (active), Actuation Test, Flight Record, DVOM, Oscilloscope, Fault Code Searching, and Internet Update.

Sensor Name	Value	Unit
<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"/> Malfunction Indicator Lamp On	OFF	-
<input type="checkbox"/> Shift Control Solenoid Valve A(UD/C)	0	mA
<input type="checkbox"/> Shift Control Solenoid Valve D(4&OD/C)	0	mA
<input type="checkbox"/> Shift Control Solenoid Valve E(27/B)	0	mA
<input type="checkbox"/> Shift Control Solenoid Valve C(35R/C)	0	mA
<input type="checkbox"/> Shift Control Solenoid Valve B(6/C)	0	mA
<input type="checkbox"/> Shift Control Solenoid Valve F(8LR/B)	0	mA
<input type="checkbox"/> Pressure Control Solenoid Valve(VFS) "A"	0	mA
<input type="checkbox"/> Torque Converter Clutch Solenoid Valve	0	mA
<input type="checkbox"/> ON/OFF Solenoid A(Drive)	OFF	-
<input type="checkbox"/> ON/OFF Solenoid B(Reverse) (SBW)	OFF	-
<input type="checkbox"/> ON/OFF Solenoid (SBC)	OFF	-
<input type="checkbox"/> ON/OFF Solenoid C(Parking)	OFF	-