

GROUP	NUMBER
AUTOMATIC TRANSMISSION	18-AT-003
DATE	MODEL
APRIL, 2018	SONATA (LFA)

SUBJECT:

8-SPEED AUTOMATIC TRANSMISSION HARSH AND/OR DELAYED SHIFTS – GDS ANALYSIS

Description: If you are servicing a vehicle with a harsh and/or delayed shift, use the GDS as shown in the Service Procedure to measure shift engagement time.

Applicable Vehicles: 2018~ Sonata 2.0T with 8-speed Front-Wheel Drive transmission

WARRANTY INFORMATION: Normal warranty applies

SERVICE PROCEDURE:

- 1. Attach the GDS and check for Diagnostic Trouble Codes in both the "Engine" and "Automatic Transaxle" menu. If DTCs are found, repair according to the appropriate TSB or shop manual.
- Check the ATF level when the engine is idling in "P" and the ATF is 122°~140°F (50°~60°C) according to the 2018 Sonata 2.0T Shop Manual. Adjust the ATF level as needed using SP4-M ATF.



Ask an assistant to drive the vehicle as you monitor the GDS.

- 3. Attach the GDS.
 - From the home screen, select Flight Record. Select the VIN and A/T menu. Select OK.
 - Select the following parameters and select Next.

도 Flight Record								
Please choose the items you want to record and press the [Next] button.								
= Item List	All		Selected Item List	Clear				
Please enter the sea	rch word,	>>	Sensor Name					
Engine Torque	Engine Torque		Engine RPM					
Shift Lever Switch			Current Gear	=				
Next Gear Position			Shift Control Solenoid	-				
Torque Converter Clutch Control State			Shift Control Solenoid Valve (46/C)	=				
Sports Mode Select			Shift Control Solenoid Valve (OD&LR)	=				
Sports Mode Swit	Sports Mode Switch Up		Shift Control Solenoid Valve (28/B)	=				
Sports Mode Switch Down			Shift Control Solenoid	_				
Number of DTC			vare (0/100)					
Malfunction Indic	ator Lamp On							

- Select 10 minutes recording time and **Manual Trigger**. Insert the trigger and select **VCI Record**. Select **OK**.
- When the trigger shows steady green, select **Close** and begin the test drive.
- Accelerate the vehicle in **Manual Mode** through gears 1-2-3-4-5-6-7-8. Hold each gear 3~4 seconds.
- Press the trigger at the end of the test drive. The trigger will flash green for a few seconds and then show steady green.
- Remove the trigger.
- To copy the data from the VCI to the tablet, go to the home screen and select **Recorded Data**. Select the VIN and the GDS data file. Select **Data Copy**.
- Select **Copy to SD card**, give the file a name and select **Save**. The VCI will copy the data to the SD card.
- 4 After the data has been recorded, you can review the data in two ways:
 - 1. Review the data on the tablet:
 - Select **Recorded Data**, select the VIN and GDS file and view the recorded data.
 - 2. Save the data to a PC:
 - After the data is recorded, connect the GDS to a PC using the charging cord.
 - Select Windows Explorer, Computer and SM-P600.
 - Double click on Card, Android, Data, gitauto.GDSM, files, mcidata and record.
 - Select VIN and the GDS data file and save the data file to your PC.
 - Open GDS in your PC to view the recorded files.

P-R SHIFT DIAGNOSIS:

- Select the data file on your PC and select the vehicle and A/T menu.
- Select **Data Review** and select the file. Select **Open** to view the file.
- Click the "+" or "-" buttons to choose 0.9 sec/Div or less.
- View the **37R/C** solenoid graph and locate the shift.
- Move the cursor to the start of the shift and "Left click".
- Move the cursor to the end of the shift and "Right click".
- Read the **37R/C** solenoid elapsed time at the top right of the screen. If the P-R shift requires more than 2.8 seconds, refer to TSB 16-AT-001-2, "Reset and Relearn Adaptive Values":
 - If the shift is less than 0.5 seconds, exchange a PCM from another vehicle and retest.
 - If the shift time is more than 2.8 seconds, compare to a similar model and year vehicle. Replace the transmission if the shift time is longer than a comparison vehicle.

Data Review	SONATA(LFA)_A	T_180319-145634.GSR		Two cursor: 2.4sec	
	🗆 0.5sec/Div. 🛞 Reco	ord Start : 14:46:44	Cursor Time : 14	4:46:46 🕐 Recor	d End : 14:56:44
	Text	CRESET Min.Max	Go to Trig	File Info	Items List
16383	Engine RPM			MAX: 7	61 RPM 🔀
					663 RPM 💽
, , , , , , , , , , , , , , , , , , , 				MIN: 66	1 RPM
	Current Gear			MAX: R	×
					P/N
	┦			MIN: P/N	
-1275		alve (UR/S)		MAX: 11	70 mA 🗙
		¥ *			1140 mA 💽
0				MIN: 103	30 mA
1275	Shift Control Solenoid V	alve (46/C)		MAX: 1	10 mA 🗙
					50 mA 💽
					īmA
1275	Shift Control Solenoid V	alve (28/B)		MAX: 1	10 m.A.
					50 mA 🚺
- ~ ~ ~ ~				Mbb 40	
1275	Shift Control Solenoid Ve		<u> </u>		0 mA
1213			\neg	meye is	50 mā
	~~~~/		$\sim$		50 IIIA 💟
- <del>8,</del> , , , , , , , , , , , , , , , , , ,			<u> ~</u>	<u>~,~~,</u> MIN: 45	5mA
1275	Shift Control Solenoid Val	ve (OD&LR)		MAX: 1	15 MA
	Δ				55 mA 💽
$\neg \bullet \downarrow \neg $	-	$\sim \sim $			mA

# N-D SHIFT DIAGNOSIS:

- Select the data file on your PC. Select the vehicle and A/T menu.
- Select Data Review and select the file. Select Open to view the file.
- Click the "+" or "-" buttons to choose 0.9 sec/Div or less.
- View the **UD/C** solenoid graph and locate the shift.
- Move the cursor to the start of the shift and "Left click".
- Move the cursor to the end of the shift and "Right click".
- Read the **UD/C** solenoid elapsed time at the top right of the screen. If the N-D shift requires more than 2.8 seconds, refer to TSB 16-AT-001-2, "Reset and Relearn Adaptive Values":
  - > If the shift is less than 0.5 seconds, exchange a PCM from another vehicle and retest.
  - If the shift time is more than 2.8 seconds, compare to a similar model and year vehicle. Replace the transmission if the shift time is longer than a comparison vehicle.

Data Review	SONATA	SONATA(LFA)_AT_180319-145634.GSR Two cursor							
	LI 0.5sec/Div.	) Record S	Start : 14:48:44 📀	Cursor Time :	14:48:57 💮 Rec	ord End : 14:58:44	4		
		⊺ext ≎	Reset Min.Max	Go to Trig	File Info	Items List			
16383	Eng	ine RPM			MAX:	733 RPM	X		
						653 RPM	л 🔁		
0, , , , ,		· · · · · · ·	· · · · ·		MIN:	653 RPM			
	Curr	ent Gea <mark>r</mark>			MAX:	1	×		
						P/N	N		
					MIN: P	N			
	Shift Control So	lenoid Valve (I	UD/C)		MAX:	1110 mA	X		
	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	$\sim$ $^{-1}$				1110 m/	Δ		
		$-\lambda$			A dist.	70 - 4			
0, , , , ,		, , <u>, , , , , , , , , , , , , , , , , </u>	40400	<u> </u>		70 mA			
12/5	Shift Control So	ienola valve (46/C)		MAA.	TIOMA			
						55 m/	4		
		، _ ب _ ب	~~~~	$ \sim \sim$		15 mA			
1275	Shift Control So	lenoid V <mark>alve (</mark>	28/8)		MAX:	315 mA	×		
						55 m/	A 💽		
~ <u>~~</u> ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~ <u>,</u> ~~,~~,~~,	<u>`</u> ~~	~~~~~	$\sim \sim $		15 mA			
1275	Shift Control Sol	enoid V <mark>a</mark> lve (3	37R/C)		MAX:	110 mA	X		
						55 m/	A 💽		
~~~~~		~		$\sim \sim \sim \sim$		15 m A	_		
	Shift Control Sole	noid Valva (O		<u> </u>	MAX:	115 mA			
1213	Shine Control Sole		-Doerty	~~~~~	~~~~~ ^{max}	70	. 🚔		
	Α					70 m/	A 🚺		
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	مبتبتهم	بحبحب			MIN:	5 mA			

1-2 UPSHIFT DIAGNOSIS:

- Select the data file on your PC. Select the vehicle and A/T menu.
- Select **Data Review** and select the file. Select **Open** to view the file.
- Click the "+" or "-" buttons to choose 0.9 sec/Div or less.
- View the **28/B** solenoid graph and locate the shift.
- Move the cursor to the start of the shift and "Left click".
- Move the cursor to the end of the shift and "Right click".
- Read the **28/B** solenoid elapsed time at the top right of the screen. If the 1-2 shift requires more than 2.8 seconds, refer to TSB 16-AT-001-2, "Reset and Relearn Adaptive Values":
 - > If the shift is less than 0.5 seconds, exchange a PCM from another vehicle and retest.
 - If the shift time is more than 2.8 seconds, compare to a similar model and year vehicle. Replace the transmission if the shift time is longer than a comparison vehicle.



2-3 UPSHIFT DIAGNOSIS:

- Select the data file on your PC. Select the vehicle and A/T menu.
- Select **Data Review** and select the file. Select **Open** to view the file.
- Click the "+" or "-" buttons to choose 0.9 sec/Div or less.
- View the **37R/C** solenoid graph and locate the shift.
- Move the cursor to the start of the shift and "Left click".
- Move the cursor to the end of the shift and "Right click".
- Read the **37R/C** solenoid elapsed time at the top right of the screen. If the 2-3 shift requires more than 2.8 seconds, refer to TSB 16-AT-001-2, "Reset and Relearn Adaptive Values":
 - > If the shift is less than 0.5 seconds, exchange a PCM from another vehicle and retest.
 - If the shift time is more than 2.8 seconds, compare to a similar model and year vehicle. Replace the transmission if the shift time is longer than a comparison vehicle.



3-4 UPSHIFT DIAGNOSIS:

- Select the data file on your PC. Select the vehicle and A/T menu.
- Select Data Review and select the file. Select Open to view the file.
- Click the "+" or "-" buttons to choose 0.9 sec/Div or less.
- View the 46/C solenoid graph and locate the shift.
- Move the cursor to the start of the shift and "Left click".
- Move the cursor to the end of the shift and "Right click".
- Read the <u>46/C</u> solenoid elapsed time at the top right of the screen. If the 3-4 shift requires more than 2.8 seconds, refer to TSB 16-AT-001-2, "Reset and Relearn Adaptive Values":
 - > If the shift is less than 0.5 seconds, exchange a PCM from another vehicle and retest.
 - If the shift time is more than 2.8 seconds, compare to a similar model and year vehicle. Replace the transmission if the shift time is longer than a comparison vehicle.

Data Review	so	NATA(LFA)_AT_180	0319-145634.GSR		Two cursor: 1.8sec				
	LI 0.5sec/Div.	🕓 Record S	tart : 14:46:44	🕂 Cursor Time :	: 14:49:13 🛛 🕐 Rec	ord End : 14:56:44			
	00	Text 💲	Reset Min.Max	Go to Trig	File Info	Items List			
16383		Engine RPM			MAX:	3071 RPM 🛛 🗙			
						3029 RPM 💽			
0, , , ,		~			MIN: 2	370 RPM			
		Current Gear			MAX: •	4 🔀			
						3			
1275	Shift Contr	ol Solenoid Valve (יייי. גענו		MAX:	110 mA			
		, and the second s				110 mA			
~ ° ,~,~,~,~,~,	┈┈┈╌			<u> </u>		5 mA			
1275	Shift Contr	rol Solenoid Valve (\$8C)~~~~~~	·····	MAX:	1165 mA			
		~~~~~~				70 mA 💽			
للمبدب	<u>-</u>	$\sim$			MIN:	55 mA			
1275	Shift Contr	rol Solenoid Valve (	28 <b>/</b> B)		MAX:	110 mA 🗙			
						110 mA 🚺			
					MINI	10 - 1			
	Chiff Contra	al Calancial Value (2		<u>~,~,~ ,~ ,</u>		10 MA			
140		u Sulehuld Valve (3	artac)		MAA.				
						1130 mA 🔛			
0, , , , ,		~~`^~~	$\sim$	$\sim \sim $		15 mA			
_1275	Shift_Cordro	l Solenoid Valve (S	D&LFN	·	AAX:	1170 mA 🛛 🗙			
		Ň.	· · · · · · · · · · · · · · · · · · ·			1170 mA 💽			
0	A				MIN: 1	395 mA			

#### 4-5 UPSHIFT DIAGNOSIS:

- Select the data file on your PC. Select the vehicle and A/T menu.
- Select **Data Review** and select the file. Select **Open** to view the file.
- Click the "+" or "-" buttons to choose 0.9 sec/Div or less.
- View the **OD&LR** solenoid graph and locate the shift.
- Move the cursor to the start of the shift and "Left click".
- Move the cursor to the end of the shift and "Right click".
- Read the **OD&LR** solenoid elapsed time at the top right of the screen. If the 4-5 shift requires more than 2.8 seconds, refer to TSB 16-AT-001-2, "Reset and Relearn Adaptive Values":
  - > If the shift is less than 0.5 seconds, exchange a PCM from another vehicle and retest.
  - If the shift time is more than 2.8 seconds, compare to a similar model and year vehicle. Replace the transmission if the shift time is longer than a comparison vehicle.

Data Review	SONATA(LFA)_AT_	180319-145634.GSR	(	Two cursor: 1.7sec	
L	🗆 0.5sec/Div. 🛛 🕓 Record	d Start : 14:46:44 📀 -	Cursor Time : 14	4:47:34 🕖 Record	End : 14:56:44
	🕽 🗖 🛛 Text 🔅	CReset Min.Max	Go to Trig	File Info	Items List
16383	Engine RPM			MAX: 2459	RPM 🗙
					2444 RPM 💽
0, , , , ,				MIN: 2124	RPM
	Current Gear			MAX: 5	×
					4
				MIN: 4	
1275	Shift Control Solenoid Valv	e (UD/C)		MAX: 110	mA 🗙
			I		5 mA 💽
			/	1005 C	
4075	Chiff Control Coloradid Mak		<u></u>	MIN: 5 m.	A ) m ()
	- Saint Lintroi Solenoid Vaiv	(40/C)		MAA. TTA	
	h			~~	1140 mA 💽
0, , , , ,	~.~	$\sim$	$\sim \sim $	MIN: 20 m	A
1275	Shift Control Solenoid Valv	/e (28/B)		MAX: 110	mA 🗙
					50 mA 💽
لهجمج		ليميميها	~~~ <u>~</u> ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	MIN: 10 m	A
1275	Shift Control Solenoid Valv	e (37R/C)		MAX: 110	mA 🗙
					55 mA 💽
			~		
- <del>s</del> ú-ú-ú-ú-ú-ú-	$\sim$				
12/5	-Shift Control Solenoid Valve			MAX: 1170	J mA
					1115 mA 💽
0	· · · · · · · · ·	Yenner and the second s	<u> </u>		A

## 5-6 UPSHIFT DIAGNOSIS:

- Select the data file on your PC. Select the vehicle and A/T menu.
- Select Data Review and select the file. Select Open to view the file.
- Click the "+" or "-" buttons to choose 0.9 sec/Div or less.
- View the 46/C solenoid graph and locate the shift.
- Move the cursor to the start of the shift and "Left click".
- Move the cursor to the end of the shift and "Right click".
- Read the **46/C** solenoid elapsed time at the top right of the screen. If the 5-6 shift requires more than 2.8 seconds, refer to TSB 16-AT-001-2, "Reset and Relearn Adaptive Values":
  - > If the shift is less than 0.5 seconds, exchange a PCM from another vehicle and retest.
  - If the shift time is more than 2.8 seconds, compare to a similar model and year vehicle. Replace the transmission if the shift time is longer than a comparison vehicle.

Data Review	SONATA	FA) AT 18	0319-145634.GSR	(	Two cursor: 2.0se	-c	
Data Reflett	U 0.5sec/Div.	Record S	tart : 14:46:44	Cursor Time : 1	4:49.24 (D. R.C.	ord End : 14:56	3:44
		ext 🗘	Reset Min.Max	Go to Trig	File Info	Items Lis	st
16383	Engin	e RPM			MAX:	2321 RPM	X
						2316 RF	PM 🗈
0,,,,,					MIN:	1899 RPM	
	Curren	t Gear			MAX:	6	X
							5
				<u></u>	MIN: 6	5	
1275	Shift Control Sole	ooid Valva (1	<del>R9</del> ~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		1170 mA	×
						70 1	mA 主
~ <del>~</del> ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	<u></u>				, , MIN:	55 mA	
1275	Shift Control Sole	noid Valve (	<b>89</b>	~~~~~~		1170 mA	X
						70 1	mA 💽
		~~			MIN:	45 mA	
1275	Shift Control Sole	noid Valve (:	28/8)		MAX:	110 mA	X
						70 1	mA 💽
~ <del>~</del> ,~,~,~,~,~,~	<u></u>	~ <u>~</u> ~~	~ <u>~~</u> ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	<u> </u>		10 mA	
1275	Shift Control Soler	noid Valve (3	(R/C)		MAX:	310 mA	X
						55 (	mA 💽
	<u>-</u> ^-^^	~~~~~	منصبحه	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		15 mA	
1275	Shift Control Solen	oid Valve (O	D&LR)		MAX:	110 mA	×
~						70 1	mA 主
o. Yrry			مب ب	<u> </u>		5 mA	

#### 6-7 UPSHIFT DIAGNOSIS:

- Select the data file on your PC. Select the vehicle and A/T menu.
- Select Data Review and select the file. Select Open to view the file.
- Click the "+" or "-" buttons to choose 0.9 sec/Div or less.
- View the 37R/C solenoid graph and locate the shift.
- Move the cursor to the start of the shift and "Left click".
- Move the cursor to the end of the shift and "Right click".
- Read the **37R/C** solenoid elapsed time at the top right of the screen. If the 6-7 shift requires more than 2.8 seconds, refer to TSB 16-AT-001-2, "Reset and Relearn Adaptive Values":
  - > If the shift is less than 0.5 seconds, exchange a PCM from another vehicle and retest.
  - If the shift time is more than 2.8 seconds, compare to a similar model and year vehicle. Replace the transmission if the shift time is longer than a comparison vehicle.

Data Review	SONATA(LFA)_AT_180319-145834.GSR							: 1.8sec		
	LI 0.5sec/Div. (	🚯 Record S	start :	14:46:44	- Curso	r Time : r	14:49:50	Record E	nd : 14:56:44	
$\bigcirc \bigcirc $	00	Text 🗘	Res	et Min.Max	Go t	o Trig	File Ir	nfo	Items List	
16383	Eng	jine RPM						MAX: 1974 F	RPM	X
									1967 RPM	ŧ
0, , , , ,								MIN: 1579 R	PM	
	Cun	ent Gear						MAX: 7		×
									6	
								MINE C		
4075	Shift Control St	Japaid Valua (						MAX: 1170 /	nA	
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~				$\sim\sim\sim$	~~~~	~~~	~~~~	MAX: THO		
									905 mA	•
0, , , , ,								MIN: 905 mA	A Contraction of the second se	
1275		lenoid Valve (46/C)					MAX: 1170 r	nA	X
~~		\							1025 mA	÷
		5		~ ~~	~~		<u>~~-</u>	MINE 4.0 mm 0		_
U, , , , ,	elité control el	i i i i i i i i i i i i i i i i i i i	20.00				·	MAV: 245 m	. û	
1275	Shift Control Si	pienoia vaive (28/8)					WAA, SIST	IA	Ě
									35 mA	
~ه ب_ب	<u> </u>	$\sim \sim $	\searrow	\sim	<u>~~~</u>	_ <u></u>	<u>~~~/</u>	MIN: 10 mA		
1275	Shift Control So	lenoid Valve (3	37R/C),	~~~~	~~~~	_~~~	~~~-1	MAX: 1135 r	nA	X
							\		30 mA	
~ ~~		$\sim \sim \sim$	/				L			
				- 1				MIN: 25 mA		_
1275	Shift Control Sol	enoid Valve (C	D&LR)					MAX: 110 m	A	×
									35 mA	
		A	~~-	<u> </u>			~~~~	MIN: 5 mA		

7-8 UPSHIFT DIAGNOSIS:

- Select the data file on your PC. Select the vehicle and A/T menu.
- Select Data Review and select the file. Select Open to view the file.
- Click the "+" or "-" buttons to choose 0.9 sec/Div or less.
- View the **28/B** solenoid graph and locate the shift.
- Move the cursor to the start of the shift and "Left click".
- Move the cursor to the end of the shift and "Right click".
- Read the **28/B** solenoid elapsed time at the top right of the screen. If the 7-8 shift requires more than 2.8 seconds, refer to TSB 16-AT-001-2, "Reset and Relearn Adaptive Values":
 - > If the shift is less than 0.5 seconds, exchange a PCM from another vehicle and retest.
 - If the shift time is more than 2.8 seconds, compare to a similar model and year vehicle. Replace the transmission if the shift time is longer than a comparison vehicle.

