



## Technical Service Bulletin

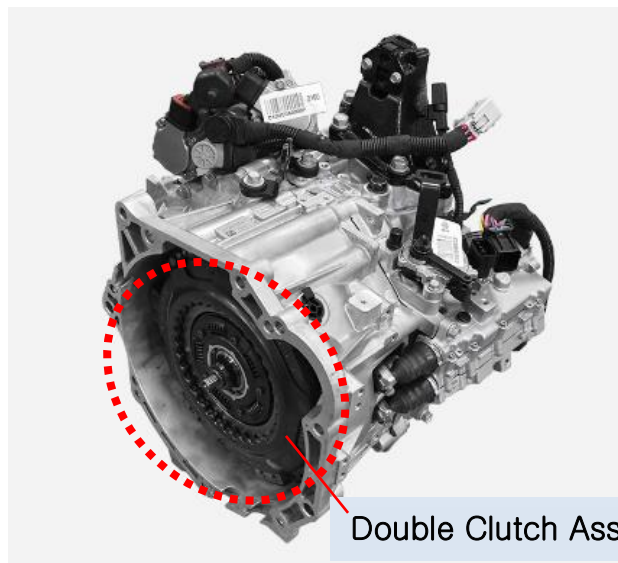
GROUP	NUMBER
GENERAL	16-GI-001
DATE	MODEL(S)
SEPTEMBER 2016	Elantra Eco (AD), Sonata Eco (LF), Tucson (TL), Veloster Turbo (FS)

**SUBJECT:** INTRODUCTION TO DRY-TYPE DUAL CLUTCH TRANSMISSION

**Description:** This bulletin provides information on components, attributes, and precautions of the 7-speed dry-type dual clutch transmission (DCT).

**Applicable Vehicles:** All vehicles equipped with 7-speed Dual Clutch Transmission (DCT)

### Characteristics of dual clutch transmission system:



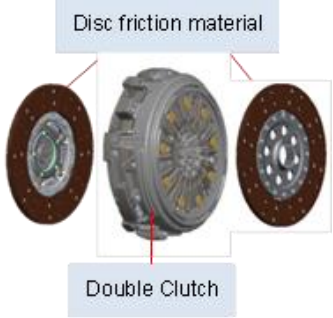
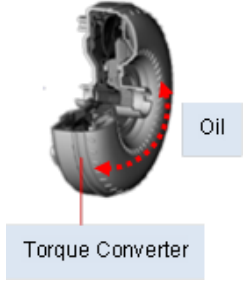
The dual clutch transmission has the driving feel of a manual transmission. It has one clutch for the odd gears, and one clutch for the even gears including reverse. During shifting, the clutches are engaged and disengaged automatically. Unlike a traditional automatic transmission, the gear shifting can be felt and heard.

**- Think of it as an automatically shifting manual transmission**

### NOTICE

When turning the engine on and off, you may hear clicking or humming sounds from the shift and clutch actuators as the system goes through a self-test. This is a normal characteristic of the dual clutch transmission.

**Differences between dual clutch transmission and automatic transmission**

Item	Dual Clutch Transmission (Dry-type)	Automatic Transmission
Picture	 <p>Disc friction material</p> <p>Double Clutch</p>	 <p>Oil</p> <p>Torque Converter</p>
Method of power transfer	Direct friction between clutch cover and disc	Fluid Coupling
Transmission Efficiency	High	Low
Acceleration performance	Excellent	Good
Gear Shift	Dynamic	Smooth

**NOTICE**

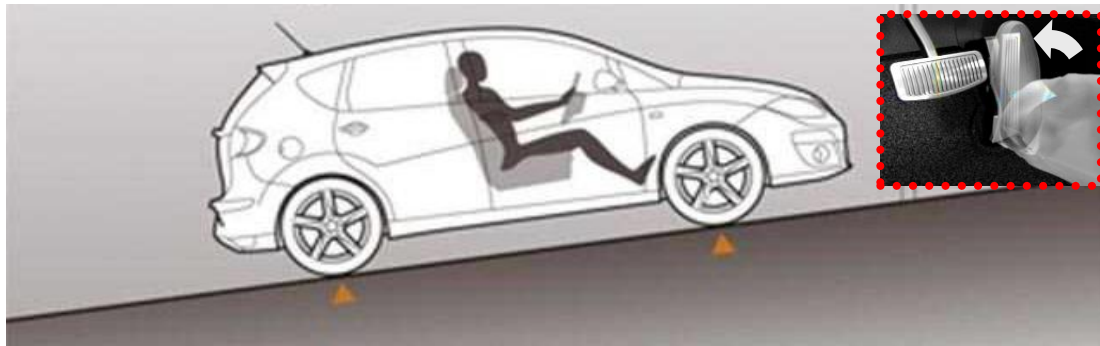
The dry-type clutch provides a direct driving feeling which may feel different than automatic transmission. This may be more noticeable when starting from a stop or at low vehicle speed.

**Common Conditions That May Cause Clutch Overheating and Warning Message**

1. Holding the vehicle at a stop on a steep hill by applying the accelerator pedal instead of using the foot brake or the parking brake (Throttle Hill Hold).
2. Repeated stop and go driving up hills and slow speeds (under 6 MPH).
3. Repeated up and down shifting for a prolonged period of time under heavy loads (heavy stop-and-go traffic).

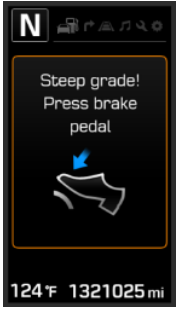

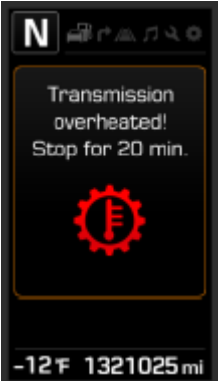
■ Throttle Hill Hold:

When a vehicle is held by applying the accelerator pedal instead of the brake on a hill.








**Clutch Overheating Warning Messaging**

Since the dry-type DCT transfers power using friction between the clutch cover and disc, it has the potential to overheat. Therefore the transmission system has both visual and audible warning message (LCD cluster & chime) when the clutches are above normal operating temperatures.





Stage		Condition	Warning			Functional Restriction
			LCD	Sound	Blinking LCD	
<b>Hill Hold</b>		Slope greater than 5%, brake off, accelerator applied, and speed under 3MPH		3 times	-	Vehicle shuddering after 1~2 sec
<b>Self-Protection Mode</b>	<b>1st stage</b>	High temperature detected		3 times	3 times	-
	<b>2nd stage</b>	Temperature increased after 1 <sup>st</sup> stage		Repeat of 1 <sup>st</sup> stage	Repeat of 1 <sup>st</sup> stage	-
	<b>3rd stage</b>	Temperature increased after 2 <sup>nd</sup> stage		Repeat of 1 <sup>st</sup> stage	Repeat of 1 <sup>st</sup> stage	Single clutch control
	<b>4th stage</b>	When both clutches get to the 3 <sup>rd</sup> stage			Repeat of 1 <sup>st</sup> stage	Repeat of 1 <sup>st</sup> stage

If the clutch becomes overheated, stop the vehicle as soon as safely possible and allow the transmission to cool with the engine running. When the warning message is no longer present in the LCD cluster, it is safe to resume normal driving.

**Recommended driving tips to prevent clutch overheating**

Hill Condition	Traffic Condition	Rapid Acceleration Condition
<p>Use the foot brake or the parking brake to hold the vehicle on a hill.</p>	<p>When the vehicle is continuously driven under 6 MPH because of traffic, occasionally leave a larger distance to the vehicle in front and drive over 6 MPH. Stop the vehicle using the brake pedal when it is necessary.</p>	<p>Depress the accelerator pedal smoothly and avoid rapid acceleration.</p>
	<p>1) Depress the brake pedal and leave a larger distance to the vehicle in front.</p>  <p>2) When the distance is large enough drive faster than 6 MPH.</p> <p>6 MPH ↑</p>  <p>3) Stop and repeat steps 1 and 2.</p> 	

**Reference material**

Reference Material	Description
	<p>When the vehicle is purchased, there's a hang-tag with information regarding Dual Clutch Transmission (DCT).</p>
	<p>The owner's manual can be referred to for additional information on the overheating warning messages.</p>
 <p><a href="https://www.youtube.com/watch?v=W42zsFYjZvM&amp;index=2&amp;list=PLHmJCvAgQYIrlzUmdb88Ncc6WaUXdSFZr">https://www.youtube.com/watch?v=W42zsFYjZvM&amp;index=2&amp;list=PLHmJCvAgQYIrlzUmdb88Ncc6WaUXdSFZr</a></p>	<p>Links to Hyundai videos referencing Dual Clutch Transmission (DCT) operation and good practices.</p>
 <p><a href="https://www.youtube.com/watch?v=C1B_lb6vOgQ">https://www.youtube.com/watch?v=C1B_lb6vOgQ</a></p>	