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JULY 18, 2010

## SHIFTY BUSINESS: INSIDE FERRARI'S DUAL-CLUTCH TRANSMISSION

by Ferrari in Cars (<http://www.enevsferrari.com/category/blog/cars/>)

The Dual Clutch Transmission (DCT)

([http://www.ferrari.com/English/GT\\_Sport%20Cars/CurrentRange/FerrariCalifornia/Innovation\\_Technologies/Pages/Article\\_081202\\_California\\_Gearbo](http://www.ferrari.com/English/GT_Sport%20Cars/CurrentRange/FerrariCalifornia/Innovation_Technologies/Pages/Article_081202_California_Gearbo)) another significant leap in performance as well as driving excitement and comfort for Ferrari road cars. It is one of the key factors in the blazing acceleration performance of both the California and 458 Italia (*Road & Track Magazine* recorded zero-to-60 in just 3.5 seconds in the California using the Launch Control feature). Here's how the DCT works:

Whether shifted manually with the aluminum paddle shifters or kept in Automatic mode, the DCT can execute lightning-quick upshifts with no drop-off in engine torque. (A longer downshift interval allows the engine control module to “blip” the throttle to match engine and transmission speeds.) The rifle shot-like “pop” sound through the exhaust punctuating upshifts is one side effect proving popular with drivers. In Automatic mode, with the manettino switched to the Comfort setting, DCT shifts are quick and seamless, but still with enough feel to not completely mask the driving experience.

Like Ferrari's single-clutch F1 transmission, the DCT relies on advanced high-speed electro-hydraulic controls. The DCT differs from the F1, however, in that it essentially operates like two manual transmissions linked together: odd-number gears are on one shaft, connected by one of the two wet multi-plate clutches; even-number gears are on a second shaft, operated by the second clutch.

As one gear is engaged, the next gear is preselected. At the upshift, clutch #1 disengages while clutch #2 engages; the “clutch swap” executes the gearchange. Simultaneously, 3rd gear is preselected in the same manner, and so on. The “handoff” from one clutch to the other means that there is always a clutch engaged, and therefore always torque going through the transmission,

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