

# Picking on the poor transmission ...or External forces

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External forces can influence your daily living if you don't watch out. You're walking around town, minding your own business, bustin' off some musical Coney Island dog farts and POW!?! Sergeant Dave shatters your eye socket with a sucker punch from nowhere. External forces (his fist) hit your face and affect the way your face functions and feels. What the hell Sergeant Dave? Methane bombs are nothing to get pissed about! Then he reminds you he just got back from his 2nd tour in Iraq and his wife is pregnant with twins. But they're not *his*, they're *yours*. Oops, good point.

The function and durability of a transmission can be greatly compromised by the external forces from adjacent components. Unlike our hero above, a transmission does not do anything to warrant external forces that might hinder performance or durability.

Ease of finding neutral and overall shift quality are greatly influenced by the clutch and clutch actuator. *Actuator* (cable type) is defined as the clutch lever, perch, cable, and ball ramps (inside the transmission side cover.) The clutch engages and disengages the power flow between the engine and the mainshaft (input shaft) of the transmission. If the clutch does not disengage completely, high shift efforts will result along with difficulty in finding neutral. It is generally recognized that .070" of pressure plate travel is required to completely disengage the clutch. The pressure plate travel is measured by taking the derby cover off the outer primary and locating a universal dial indicator in the derby opening with the dial indicator plunger moving parallel (as close as possible) to the mainshaft. Pull the clutch lever all the way in and observe the reading on the dial indicator.

There are those who use numbers as low as .050". In a perfect world with a new clutch and clutch actuator, that might work for a while. It can take as little as .045-.050" to disengage most wet 8 or 9 plate clutches, wet 10 and 12 plate clutches require more. Dry clutches may require a little less than wet clutches because the primary fluid adds a coupling/decoupling effect between the plates.

Any time I set up a bike with a new clutch and/or actuator system, I shoot for .070" of pressure plate travel just to avoid having any disengagement problems

down the road. What kind of problems you ask? Over time, heat can cause the steel plates to warp, which will increase the travel required to fully disengage the clutch. As the cable strands of the clutch cable core seat/grind their way into the cable liner, the cable assembly will get sloppy and yield less travel at the ball ramps. A hydraulic actuator consisting of clutch lever, master cylinder, line, and slave cylinder, loses efficiency when hot. A loss in efficiency translates to a loss in travel at the slave cylinder piston, which translates, into reduced pressure plate travel. Routing of the hydraulic line away from the exhaust pipe is a necessity. Same goes for the cable.

Nobody, except Sergeant Dave because he's all tough and shit, wants a high effort clutch lever. A number of makers offer low effort ball ramp sets that do as advertised; give lower clutch lever efforts. Unfortunately they also reduce pressure plate travel and you know what that does. Low effort ball ramps work great if they achieve an adequate

amount of pressure plate travel. We have a lot of customers who install low effort ball ramp sets and later complain of difficulty finding neutral or high shift effort going into gear. When they put their original ball ramp set back in, their problems go away.

Over time, shifting with sub-par pressure plate travel will wear the shift forks and degrade the overall shift quality. The fork material fragments will make their way into the bearings and greatly decrease the life of the transmission.

BAKER transmissions use a redundant neutral detent to increase the ease of finding neutral under normal conditions and help those who may be operating with less than .070" travel. It is not a cure-all for sick clutch systems, it just helps mask the symptoms a little.

The moral to the story is, keep your pants zipped up when Sergeant Dave is out of town and keep your clutch actuator and clutch healthy. It will greatly increase the life of your transmission and avoid your being one of those people at the stoplight that sits there with the clutch lever pulled in because they can't find neutral with a sick clutch system. Now about those Coney Island dog farts.... **IW**

