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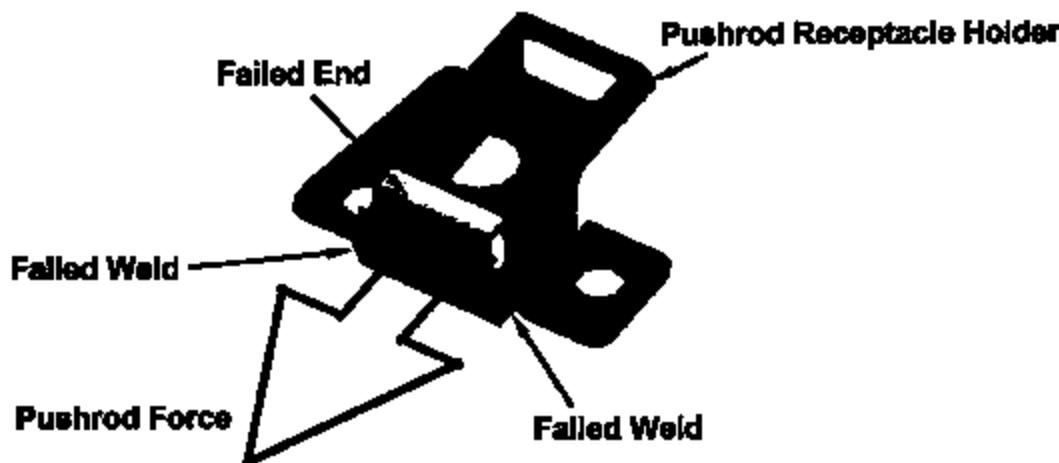
May 14, 2005

U.S. Department of Transportation
 National Highway Traffic Safety Administration
 Office of Defects Investigation
 NVS-210, 400 7th Street SW
 Washington, DC 20590

Investigator,

Enclosed, for your examination and analysis, is the clutch pedal assembly of my 1996 Volkswagen Passat that failed last month (April 2005) on a morning commute. I'm submitting this part and this information because I feel that the failure was caused by a design and/or manufacturing defect and that other owners may be at risk of experiencing the same safety-related failure.

Failed Part Description: Near the pivot end of the enclosed clutch pedal assembly, you'll see a formed sheet metal box I'm calling the "pushrod receptacle holder" (see Figure below). The spherical end of the clutch pushrod operates on a plastic receptacle (not shown) which, in turn, pushes against the back end of the holder (the yellow end in the Figure) when the pedal is pressed. Because the holder is a thin gage, bent-up sheet design, most of the pushrod force is reacted by the two small welds (shown in red in the Figure) that are intended to secure the yellow end.



Failure Analysis: If you examine the failed welds closely you'll see (even with the naked eye) that there is very little weld penetration evident. This pedal is poorly designed because it's too dependent on weld process quality. I assume that Volkswagen engineers evaluated and tested this design before they approved it for production, but in my opinion (as a mechanical engineer) it has the following multiple defects: 1) The design relies on the strength of welds rather than on the strength of parent material (as in a conventional clevis/shear pin design, for example). 2) The critical welds are cheaply small and

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therefore, more highly loaded than necessary. 3) The critical welds are loaded in fatigue-vulnerable bending rather than in shear. 4) There is no provision for a graceful failure as might be provided by using heavier gage "holder" material, for example.

As long as the pedal manufacturing process creates an adequate weld on *both* sides of the "holder", the clutch pedal is functional. But, in my opinion, this design is too marginal for use on a safety-related part and my unfortunate experience proves the point.

Vehicle Description: 1996 Volkswagen Passat TDI with 5-speed manual transmission. Manufactured in Germany, 03/1996. VIN: WVWHG83A1 [REDACTED]

Discussion: My clutch pedal failure occurred at a low road speed shift (attempt) to 3rd gear in the righthand-most lane of a morning-congested freeway. When the pedal went to the floor, I shifted to neutral and easily coasted to a stop on the shoulder. But, had the failure occurred in a higher gear in one of the fast lanes, the hazard would have been much greater. I may have come to a stop in a lane of free flowing traffic or I may have put others at risk in trying to get to the shoulder before the in-gear transmission stalled the engine. While it's possible to drive a car without using the clutch, most drivers lack this skill.

I assume the 5-speed in my car is identical to those used in thousands of other vehicles, including the Volkswagen Golf, Jetta and New Beetle models and possibly the Audi TT. The mileage on my car is high at 178,000, so there may be adequate time to notify others owners of this issue.

Unfortunately, the dealer-installed replacement clutch pedal is of the same poor design. I'm not taking the chance that the welds on this pedal assembly are of equally poor quality. I've designed and installed an angle bracket that will prevent the "holder" from failing in the future. I may not own this car nine years from now, but if it's still on the road, at least the clutch pedal will work reliably.

Consumer Information:

[REDACTED]
Downey, CA 90242
[REDACTED]