Two different types of 'TRINNI' events ('tail reconnection during IMF-northward, non-substorm intervals'), observed with the SuperDARN radars, are described. In the first case IMF By was significant, while in the second case the IMF was almost purely northward. Clear evidence is presented to show that these were non-substorm intervals, yet large ionospheric flow velocities were observed. The results are discussed in terms of tail reconnection mechanisms, and it is argued that while the accepted mechanism may be valid in the first case, some other configuration must be responsible when there is no significant By component.