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Surface modification of clutch plates to reduce disengaged drag torque[1] CHINAR R. APHALE, WILLIAM W. SCHULTZ, STEVEN L. CECCIO, University of Michigan — Viscous drag torque in disengaged clutches is a significant source of power loss in modern transportation. The main way to reduce this drag torque is to introduce air between the plates when disengaged without reducing the transmission fluid flow eventually needed for reengagement. Six different groove patterns are tested experimentally to determine which have the lowest drag characteristics. Our computations using Fluent showed that the contact angle made by oil with the stationary plate is critical in determining aeration initiation. Experiments coating the stationary plate with an oleophobic substance like Teflon, confirmed these simulations. We will show torque comparisons and visualization through a quartz disk acting as one of the clutch plates.

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