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We report the discovery of a transiting, Neptune-sized circumbinary planet (CBP) orbiting a K+M Kepler Eclipsing Binary (EB) system. The two stars orbit each every 10 days, and the CBP revolves around them in 65 days. The orbital plane of the EB is slightly inclined to the line of sight, while that of the CBP is nearly edge-on. Orbital precession of $\sim 4000$ days causes the inclination of the latter to the sky plane to continuously change. As a result, the planet often fails to transit the primary star at inferior conjunction, causing stretches of hundreds of days with no transits (corresponding to multiple orbital periods of the CBP). We predict that the next expected transit will occur in nearly two thousand days. The orbital configuration of the system places the planet outside, but close to the extended habitable zone. Additionally, the CBP experiences Cassini-like states under the influence of the EB, in which the planet's obliquity precesses with a rate comparable to its orbital precession.

