COMPARISON OF EFFICIENCY OF WORM GEAR MECHANISM AND BALL WORM GEAR MECHANISM

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Abstract— Worm gear mechanisms have much lower efficiency compared to other gear mechanisms. They have wear and overheating problems for sliding force transmission further. In this study, the efficiency of worm gear mechanism and ball worm gear mechanism designed to eliminate disadvantages of the worm gear mechanism have been compared experimentally. Both mechanisms have the same gear ratio and distance between the axes. In this test, which is carried out in gear efficiency determination test setup, both mechanisms are operated at different revolution under constant motor power and constant braking torque. In addition, the efficiency of the worm gear mechanism is calculated theoretically. The efficiency of both mechanisms increased with increasing braking torque. The ball-worm mechanism at the highest braking torque has shown higher efficiency in all revolution speed compared to the worm gear mechanism.

Index Terms—Worm gear mechanism, ball worm gear mechanism, gear efficiency.