

ABSTRACT

The prototype electric road sweeper is an electric-powered garbage sweeper. The existence of this garbage sweeper vehicle is intended to clean up garbage in the city streets quickly and efficiently. Actually there are many road sweeper vehicles circulating in Indonesia but still many are using expensive fossil fuels and are not environmentally friendly. So made an electric road sweeper that has a level of environmental friendliness is very good, because, the absence of exhaust gas out of the machine. So the electric road sweeper can help to keep the environment.

The design of hydraulic system prototype electric road sweeper consists of making electric road sweeper design using solidwork software, making drawing of hydraulic component layout, making hydraulic circuit using Fluidsim software, and calculation of cylinder specification, hydraulic pump, and electric motor.

The results of this study obtained the hydraulic system design specifications that can be paired in the unit. The series of hydraulic system contains external gear pump components with displacement of 1.16 cc / rev and 110 watts of power, electric motor with 550 watt and speed 1200 RPM, Cylinder Sweeper & Arm using 12mm diameter inside size, 8mm rod, 200mm stroke. Cylinder Vessel uses 40 mm diameter inside size, 22 mm rod, 500 mm stroke. Cylinder Vessel door using diameter inside diameter 16 mm, rod 10 mm, stroke 500 mm, tank capacity 16 liter, control valve 4/3 way, and solenoid. The sweeper control system uses lever and dump vessel using the keypad.

Keyword : prototype electric road sweeper, cylinder, hydraulic pump, control system

INTISARI

Prototype electric road sweeper merupakan kendaraan penyapu sampah bertenaga listrik. Adanya kendaraan penyapu sampah ini untuk membersihkan sampah yang berada di jalan kota secara cepat dan efisien. Sebenarnya sudah banyak kendaraan road sweeper yang beredar di Indonesia namun masih banyak yang menggunakan bahan bakar fosil mahal dan tidak ramah lingkungan. *Electric road sweeper* merupakan terobosan baru yang memiliki tingkat keramahan lingkungan yang sangat baik, sebab, tidak adanya gas buang yang keluar dari mesin. Sehingga *electric road sweeper* dapat membantu untuk menjaga lingkungan.

Perancangan sistem hidrolik *prototype electric road sweeper* berisikan tentang pembuatan desain *electric road sweeper* menggunakan software solidwork, Pembuatan gambar tata letak komponen hidrolik, pembuatan sirkuit hidrolik menggunakan software *Fluidsim*, Serta perhitungan spesifikasi cylinder, pompa hidrolik, dan motor listrik.

Hasil penelitian ini didapat spesifikasi perancangan sistem hidrolik yang dapat dipasangkan di unit. Rangkaian sistem hidrolik berisi komponen *external gear pump* dengan *displacement* 1,16 cc/rev dan daya 110 watt, motor listrik dengan 550 watt dan *speed* 1200 RPM, *Cylinder Sweeper & Arm* menggunakan ukuran *inside diameter* 12mm, *rod* 8mm, *stroke* 200 mm. *Cylinder Vessel* menggunakan ukuran *inside diameter* 40 mm, *rod* 22 mm, *stroke* 500 mm. *Cylinder Vessel door* menggunakan ukuran *inside diameter* 16 mm, *rod* 10 mm, *stroke* 500 mm, *tank* kapasitas 16 liter, *control valve* 4/3 way, dan *solenoid*. Sistem kontrol *sweeper* menggunakan lever dan dump vessel menggunakan tombol.

Kata Kunci : *prototype electric road sweeper, cylinder, hydraulic pump, sistem kontrol.*