

TO DETERMINE SPROCKET AND PUMP SPEED

Find the diameter of the cart wheel in inches

Divide the inches by 12 to get diameter in feet

Next find the circumference of the wheel ... $C = 3.14 \times \text{diameter} = x$ number of feet

Next find how many revolutions the wheel turns per minute ...

miles per hour $\times 5280 \text{ ft} = x$ number of feet / C in feet / 60 minutes = x rev per minute

EXAMPLE:

Cart wheel measures 61.5 inches in diameter. Divide by 12 inches = 5.12 feet in diameter

Circumference then is $3.14 \times 5.12 = 16$ feet

If you are traveling at 5.5 mph, the revolutions of the wheel per minute is:

$5.5 \times 5280 \text{ ft} = 29040 \text{ ft}$ traveled in 1 hour / C of the wheel (16 ft) = 1815 rev per hour / 60 min = **30 rev/min**

To determine the sprocket needed to drive the pump at 350 to 450 rev/min you need to:

EXAMPLE:

You have a 48 tooth sprocket attached to the inside of the cart wheel.

It drops down to a 12 tooth sprocket to drive the seeding mechanism, therefore, the shaft on this part is turning ... 4 times faster than the wheel sprocket ($30 \text{ rev/min} \times 48 \text{ tooth} / 12 \text{ tooth}$) = 120 rev/min

We need to be around 400 rpm for the Alpine pump so we need it to be $400 / 120$ or about 3.3 times faster

Since the sprocket on the pump is a 10 tooth, we would need to add a **35 tooth (#40) sprocket**. Adding this size sprocket would then drive the pump at $120 \text{ rev/min} \times 35 \text{ tooth} / 10 \text{ tooth} = \mathbf{420 \text{ rev/min}}$