



# ASK ALBERT!

Albert Roberts, Pine Stump Farms, Omak

## DIY PTO System

Dear Albert,

We are building a strip tillage rotovator on a three-set toolbar opening with a set of coulters. The second toolbar has shanks. The third toolbar is a rotovator. Our problem is getting power to the rotovator—the third toolbar. What do you know about this configuration?

- Three Toolbars Out

Dear Toolbars,

If the 3-point, the front toolbar, and the PTO driveline at the same time—and the laws of the Fourth Dimension become riled. You have several options to bring the universe back into order.

### Option 1:

One suggestion sometimes given is to split the front toolbar. However, weakness allows flex in the machine and the toolbar (or other parts) become very prone to breakage.

### Option 2:

Bolt a bearing tower on number one toolbar with a fixed driveline from the bearing to the rotovator and then have a conventional telescoping slip driveline from the PTO to the pilot bearing. The downside is the distance between the PTO and the pilot bearing. When you raise the 3-point, the angle becomes too great and there will be bind on the driveline at the yokes—you will break u-joints and yokes. Possibly, cv joints might work.

### Option 3: Go hydraulic

The rotovator will be driven hydraulically. There are two options within this concept.

#### 3a: Utilize the tractor's internal hydraulic system

Your hydraulic pump will slip onto the PTO shaft of the tractor. For this system, go back to the rotovator requirements of RPM and horsepower. Select a hydraulic motor that meets those requirements with 1 3/8" 10-spline output shaft with the rotovator. Then select a pump that will hang on the PTO shaft on the tractor and install a hydraulic reservoir on your toolbars. The system will have a hydraulic tank, suction filter, hose filter to pump, hose pump to motor, hose motor to tank to complete the circuit. Slide the pump onto the PTO, put an anchor chain on and you'll be ready to go.

This has the advantage of having the entire toolbar set for functioning as a stand-alone piece of equipment. One could use different tractors to operate the equipment. While slightly more expensive, this is more than offset by its versatility. I roughly calculate the your costs would be a tank and filter (\$100), hoses

(\$100), and pump and motor (\$250 each), for a total of sum of around \$700.

#### 3b: Make a self-contained hydraulic system

The newer and larger the tractor, the more liable you will be to have sufficient capacity for hydraulic drive. For this, you will need to do some investigating regarding pressure output and gallons per minute (flow rate) of hydraulic fluid to determine if the tractor is up to it. Once you figure out your tractor's rating, go to the power requirement of your rotovator and order a pump that will utilize your tractor's hydraulic system and deliver the required horsepower to run the rotovator.

Many of these hydraulic motors come with 1 3/8" 10-spline output shafts which would couple directly onto your rotovator input. Get hydraulic hoses from the remotes to your motor (when it's raised up, because it will be at its farthest away, adding a bit to give slack) and order hoses accordingly.

#### Matching to a specific tractor

The pump may be more expensive due to specific match up with a tractor. You are then limited to that tractor or other tractors with the same flow rates.

Options 3a or 3b will need a bit of welding for the bracket to hold the motor and hydraulic tank. This is something any farm shop should be able to do.

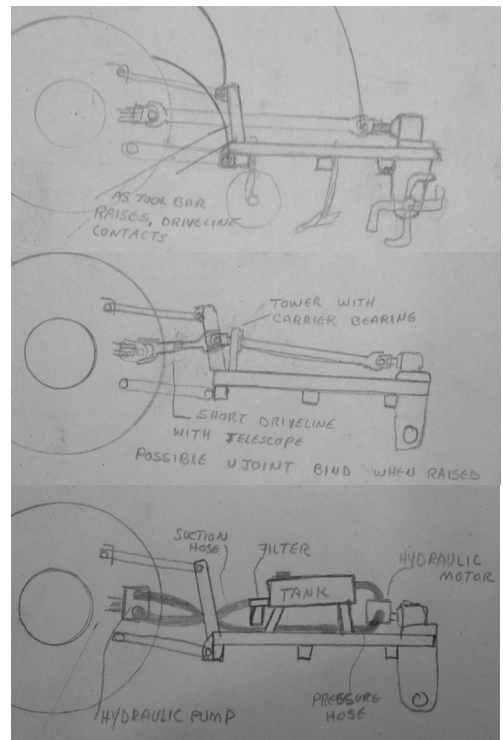
Option 2 will need a pilot bearing stand, and drivelines require machine shop work to cut, time, and balance drivelines. Drivelines have to be timed so that the yokes will be aligned; otherwise you end up with vibration and breakage.

I would say that options 3a and 3b give you the potential to run two strips simultaneously because you can add (if the tractor is big enough and the bar is wide enough) another rotovator.

Happy rotovating,

Albert

Albert Roberts was raised on a fourth-generation grain and cattle operation in North Dakota. Albert has ranched in the Okanogan for twenty-eight years with his partner Carey Hunter. He is keeping busy cutting carbonized pine trees as a result of last summer's forest fires. [albert\\_roberts@hotmail.com](mailto:albert_roberts@hotmail.com)



Author sketches of the PTO issue.