Podium Newsletter

February 2011

Welcome to the Podium Club!
The information found at www.antiquetractorpullguide.com is like no other information out there. The tips, tricks and secrets of successful tractor pulling are designed to improve your performance at the next tractor pull, while having more fun at the same time.

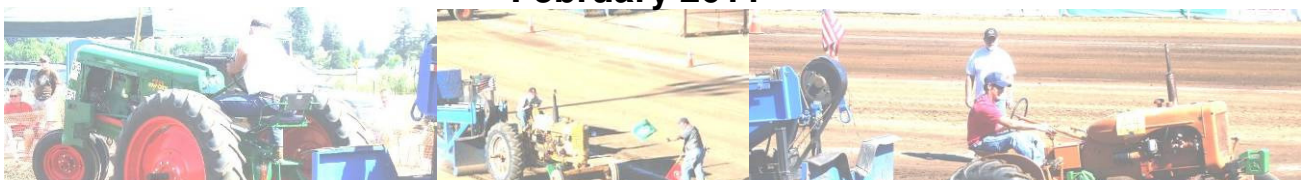
The Cost Effective Radiator

One of the more expensive things to rebuild on an antique tractor is the radiator. Many times original radiators are corroded, leak, or for other reasons do not cool at their full potential. When building a tractor specifically for pulling it is very important to have good engine cooling. Tractor pulling puts the engine under high loads and the engine can heat up quickly on the track, especially at higher rpm.

To ensure proper radiator function, the original radiator can be taken to a radiator shop for cleaning, pressure testing, or to have a new core installed all together. When having a core installed, the top and bottom tanks are separated from the core, then soldered to a new core. The replacement core itself can be quite expensive, plus the cost of labor to install it. When building the Minneapolis Moline ZA, the new radiator core alone was $300. With the top and bottom tanks cast iron, it had to be assembled on the tractor itself and sealed properly in the process. This took time and patience to do, but turned out well.

With the case of the Massey Harris Mustang, the original radiator leaked upon reinstallation. Massey Harris and the engine manufacturer, Continental, were smart to use an automotive style radiator. The radiator fits neatly under the hood but the problem is there aren't too many aftermarket versions available. Rebuilding or re-coring the radiator could be somewhat expensive too.

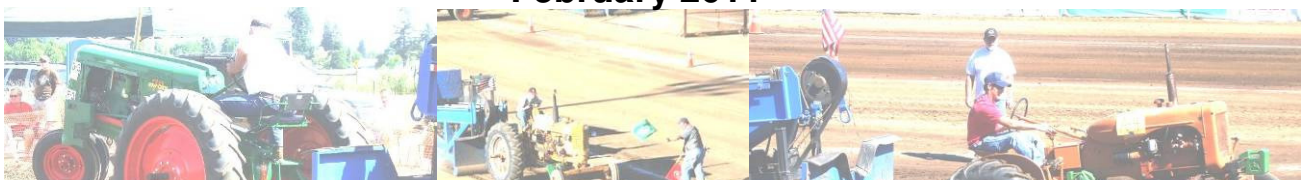
So where is the key phrase to the above description?…the radiator fits neatly under the hood. What if another radiator were available that were about the same size at a fraction of the cost? The good news is that there is…and lots of them.



The Cost Effective Radiator (cont)

The below pictures show an **aluminum radiator** as the replacement for the Mustang's original radiator. It happens to be a radiator for a '93-97 Honda Civic and is widely available. This particular radiator was bought on Ebay, costing only $85, which included shipping and a 12" electric fan. It's hard to beat a deal like this and the core size of the radiator is similar to the Mustang's original.

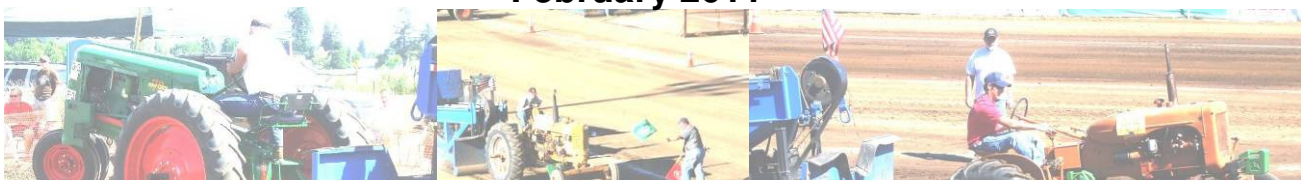
One clear advantage of an aluminum radiator is weight. Newer radiators such as this one have also been designed to cool more efficiently. When tucked up underneath the sheet metal of the Mustang, it will be hard to tell it's not original (especially if painted black). The electric fan is an added bonus. With a light class tractor that needs all the horsepower it can get, an electric fan will help.



The Cost Effective Radiator (cont)

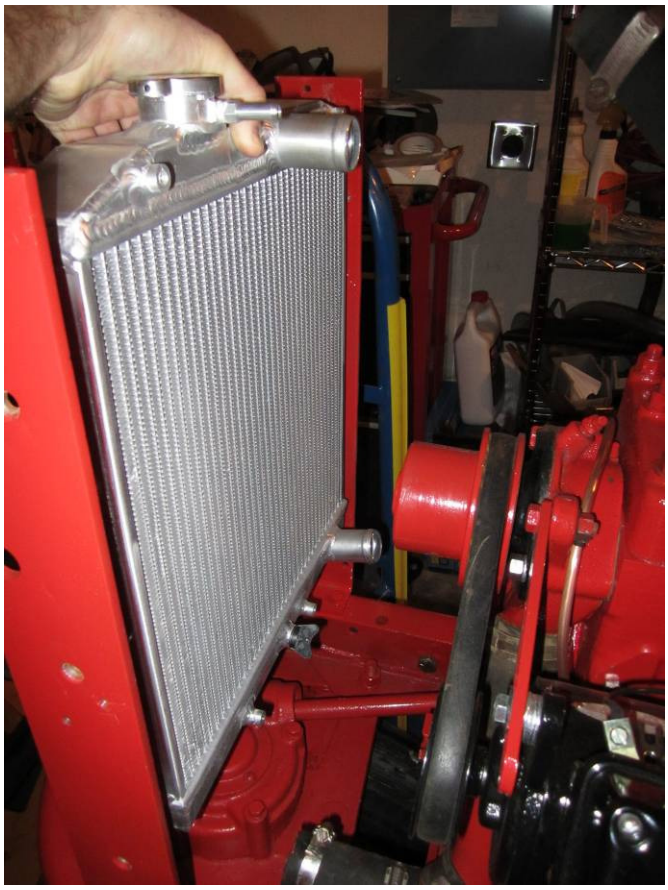
With the new radiator's thin profile, it makes mounting and clearance easy.

This is what the electric fan looks like. Note the slim profile.

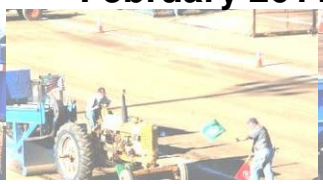


The Cost Effective Radiator (cont)

Here is what the radiator looks like inside the Mustang's mounting frame. Notice the original mechanical fan is removed and the amount of clearance.



So how could this type of radiator help other tractors? Going into the Massey Harris 101 project, radiator clearance with the longer 265 flathead engine was a known concern. Some folks say the original radiator will fit, but very tightly with a mechanical fan. Ah, but here's another opportunity to make the installation easier, plus save a little weight in the process.

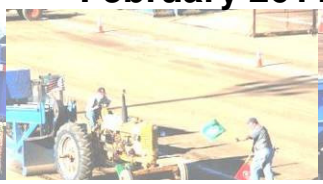




The Cost Effective Radiator (cont)

Below is a picture of the new radiator for the Massey Harris 101 Twin Power. Amazingly, it is 5" thinner than the original radiator with all of its shroud. This will make an easier installation for the 265 engine, plus alleviate any problems using an old radiator. So what is this radiator intended for? It's a 1965 Ford Mustang or Falcon radiator meant for a 260 or 289 V8. When choosing a radiator for this tractor, the physical size was the first concern, then the cooling capacity. Since the radiator is designed to cool up to 289 cubes, it should easily handle the 265 Chrysler.


Cost for this radiator was around $120 including shipping. With the 101's full skirt sheet metal, cosmetics are unaffected. To keep with the slim profile, a separately purchased 14" electric fan will be installed. This will ultimately solve any clearance problems for the 265 engine retrofit. Also, this radiator is 20lbs lighter than the original!

One possible problem using a radiator like this is access to the cap once the sheet metal is in place. Make sure coolant is filled prior to sheet metal installation!

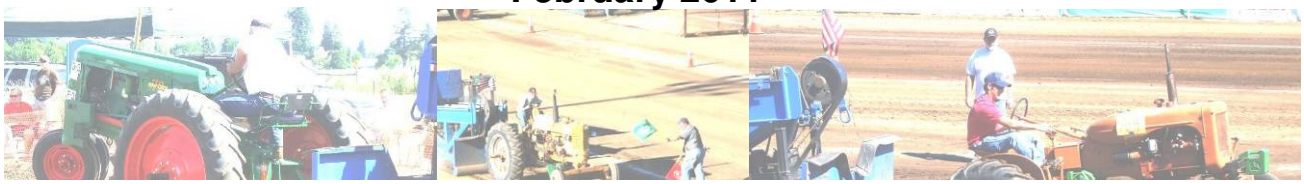




The Cost Effective Radiator (cont)

Here are some recommended steps to take to find a suitable aluminum radiator for your tractor:

- Measure the old radiator and look for an aluminum radiator that will physically fit first.
- Look for a radiator that is sized for a similar size engine
- Consider the location and size (diameter) of the inlet and outlet. This may affect mounting and hose length.
- Look at mounting brackets and holes on the aluminum radiator to ensure easy mounting
- Consider an electric fan, and one that is appropriately sized for the radiator
- Sit back and enjoy the fact that money is saved and efficiency is increased!

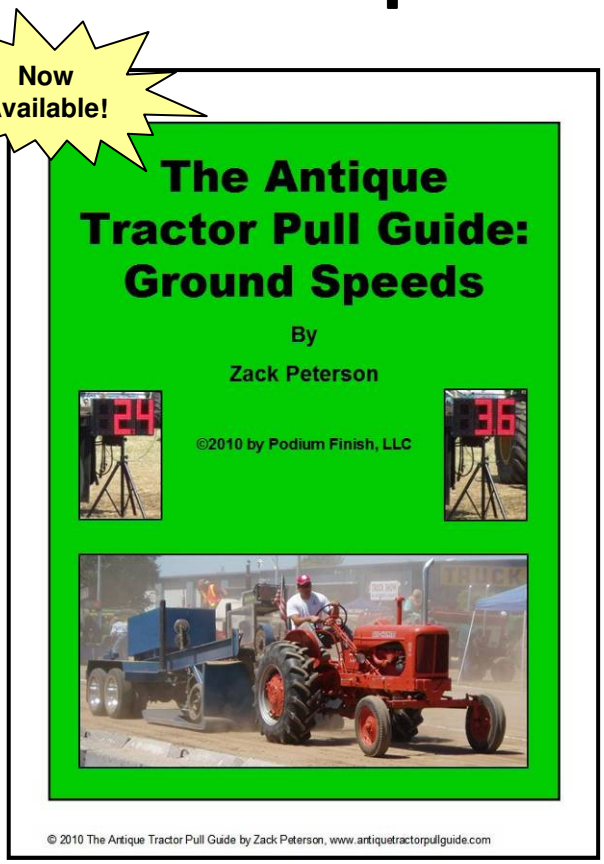
Stay tuned next month for detailed radiator installation, including electric fan hook up and wiring diagram!



The Antique Tractor Pull Guide: Ground Speeds

What's inside:

- Ground speeds for most makes and models featured in The Antique Tractor Pull Guide.
- Ground speeds shown with respect to different RPM and different tire sizes.
- Ground speeds shown in every gear from near idle to full RPM, including USAP and NATPA allowed RPM's.
- How to figure ground speeds for any tractor at any RPM, allowing for cut tires & lower tire pressures.
- Ground speeds for gearing variations including creeper gears, ring & pinion changes, M&W 9 Speed transmissions, Sherman transmissions and more!



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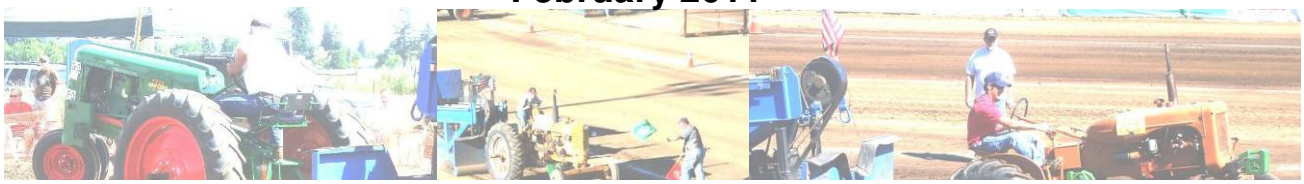
The most anticipated action guide that EVERY PULLER should have!

Special Bonus! The following page shows an inside look at the type of data charts found in the Ground Speeds guide. This chart shows the John Deere 435 GM Diesel factory gearing. Special thanks goes to Victor Simpson of Barnhill, IL for requesting this chart. If you haven't seen Vic's 435 in action (one of the top tractors in the country), it can be found on YouTube using the keyword search "Deere 435 Tunica".



The Antique Tractor Pull Guide: Ground Speeds

John Deere 435

GM Diesel

Factory Gearing

Tire Size ↓	RPM → / Gear ↓	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1850 G	2025 S	2228 1	2430 2	2633 3	2800	3000
13.6-28	1st	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.9	2.0	2.2	2.4	2.6	2.9	3.0	3.3
	2nd	1.7	1.9	2.1	2.3	2.6	2.8	3.0	3.2	3.4	3.6	3.9	4.3	4.8	5.2	5.6	6.0	6.4
	3rd	2.3	2.6	2.9	3.1	3.4	3.7	4.0	4.3	4.6	4.8	5.3	5.8	6.4	6.9	7.5	8.0	8.6
	4th	3.0	3.3	3.7	4.1	4.4	4.8	5.2	5.6	5.9	6.3	6.9	7.5	8.3	9.0	9.8	10.4	11.1
	5th	5.6	6.3	7.0	7.7	8.4	9.1	9.8	10.5	11.2	11.9	13.0	14.2	15.6	17.1	18.5	19.6	21.1
14.9-28	1st	0.9	1.0	1.1	1.2	1.4	1.5	1.6	1.7	1.8	1.9	2.1	2.3	2.5	2.7	3.0	3.2	3.4
	2nd	1.8	2.0	2.2	2.4	2.7	2.9	3.1	3.3	3.5	3.8	4.1	4.5	4.9	5.4	5.8	6.2	6.6
	3rd	2.4	2.7	3.0	3.3	3.6	3.8	4.1	4.4	4.7	5.0	5.5	6.0	6.6	7.2	7.8	8.3	8.9
	4th	3.1	3.5	3.8	4.2	4.6	5.0	5.4	5.8	6.2	6.5	7.1	7.8	8.6	9.3	10.1	10.8	11.5
	5th	5.8	6.6	7.3	8.0	8.7	9.5	10.2	10.9	11.7	12.4	13.5	14.8	16.2	17.7	19.2	20.4	21.9
13.6-38 15.5-38 16.9-34	1st	1.0	1.2	1.3	1.4	1.6	1.7	1.8	2.0	2.1	2.2	2.4	2.7	2.9	3.2	3.5	3.7	3.9
	2nd	2.1	2.3	2.6	2.8	3.1	3.3	3.6	3.9	4.1	4.4	4.7	5.2	5.7	6.2	6.8	7.2	7.7
	3rd	2.7	3.1	3.4	3.8	4.1	4.5	4.8	5.1	5.5	5.8	6.3	6.9	7.6	8.3	9.0	9.6	10.3
	4th	3.6	4.0	4.5	4.9	5.3	5.8	6.2	6.7	7.1	7.6	8.2	9.0	9.9	10.8	11.7	12.5	13.4
	5th	6.8	7.6	8.4	9.3	10.1	11.0	11.8	12.7	13.5	14.4	15.6	17.1	18.8	20.5	22.2	23.6	25.3
14.9-38 18.4-34	1st	1.1	1.2	1.4	1.5	1.6	1.8	1.9	2.0	2.2	2.3	2.5	2.8	3.0	3.3	3.6	3.8	4.1
	2nd	2.1	2.4	2.7	2.9	3.2	3.5	3.7	4.0	4.3	4.5	4.9	5.4	5.9	6.5	7.0	7.5	8.0
	3rd	2.9	3.2	3.6	3.9	4.3	4.6	5.0	5.3	5.7	6.1	6.6	7.2	7.9	8.7	9.4	10.0	10.7
	4th	3.7	4.2	4.6	5.1	5.6	6.0	6.5	6.9	7.4	7.9	8.6	9.4	10.3	11.2	12.2	13.0	13.9
	5th	7.0	7.9	8.8	9.6	10.5	11.4	12.3	13.2	14.0	14.9	16.2	17.8	19.5	21.3	23.1	24.6	26.3
16.9-38	1st	1.1	1.3	1.4	1.5	1.7	1.8	2.0	2.1	2.2	2.4	2.6	2.8	3.1	3.4	3.7	3.9	4.2
	2nd	2.2	2.5	2.7	3.0	3.3	3.6	3.8	4.1	4.4	4.7	5.1	5.6	6.1	6.7	7.2	7.7	8.2
	3rd	2.9	3.3	3.7	4.0	4.4	4.8	5.1	5.5	5.9	6.2	6.8	7.4	8.2	8.9	9.7	10.3	11.0
	4th	3.8	4.3	4.8	5.2	5.7	6.2	6.7	7.2	7.6	8.1	8.8	9.7	10.6	11.6	12.6	13.4	14.3
	5th	7.2	8.1	9.0	9.9	10.8	11.8	12.7	13.6	14.5	15.4	16.7	18.3	20.1	22.0	23.8	25.3	27.1

To figure speed for a different RPM or Tire Size: Measure the Load Radius (LR) of the tire in inches, that is from the center of the rear axle to the ground, vertically. This will also take into account tire pressure, wear and/or cutting. Then use the formulas below:

1st gear: LR x RPM ÷ 21657 = speed in mph
2nd gear: LR x RPM ÷ 11057 = speed in mph
3rd gear: LR x RPM ÷ 8274 = speed in mph
4th gear: LR x RPM ÷ 6370 = speed in mph
5th gear: LR x RPM ÷ 3361 = speed in mph

Example: 2nd gear: 25" x 3000rpm ÷ 11057 = 6.8 mph

G – Factory Governed RPM
S – Standard RPM (USAP/NATPA)
1 – 10% over Standard RPM
2 – 20% over Standard RPM
3 – 30% over Standard RPM

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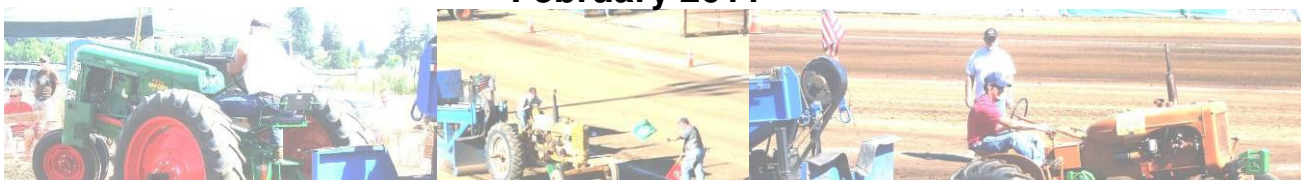


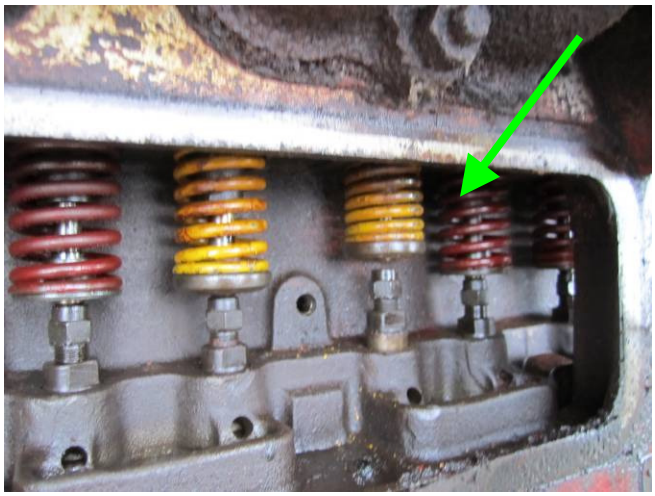
Winter Project update – The Engine Swap

The Chrysler 201 power plant was removed from the Massey Harris 101 Twin Power. As previously mentioned, it is to be replaced by a 265 Chrysler from a Massey Ferguson Combine.

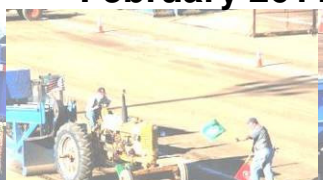
Lifting out the Chrysler 201

The remaining empty frame

The Chrysler 265 in the engine stand



Yikes, a stuck valve! Par for the course on a flathead engine. We'll deal with that later


Winter Project update – The Engine Swap

One of the fun parts about fixing old tractors is getting certain parts rebuilt. It's amazing that a tractor built in the early part of the last century used common parts that are still found today.

At right is the coupling spider for the 101. The old spider is made of paper fibers, just like a laminated belt pulley. The spider on the right is brand new and made of Hytrel, a high strength plastic. Interestingly, this is used in a 3-3/4" diameter coupler, which is still a standard size today. How do we know a Hytrel plastic coupler will withstand the torque of the 265 engine? Hytrel was chosen for its higher working torque of 3708 in-lbs (309 ft-lbs).

Drive shaft coupling spider

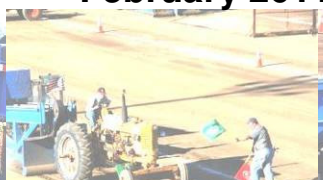
The 265 is rated for around 60hp at 1900 rpm. Sadly, this is also about where the peak torque is on a flathead engine (This ain't no John Deere). Using a simple torque-hp equation:

Torque = Horsepower x 5252 ÷ RPM

In this case: Torque = 60hp x 5252 ÷ 1900rpm = 166 ft-lbs

This shows that the Hytrel coupling spider will withstand nearly twice the required load. This is important however, since Hytrel is rated nearly 3 times stronger than a rubber coupling spider.

Fits like a glove in the original 1938 coupler!

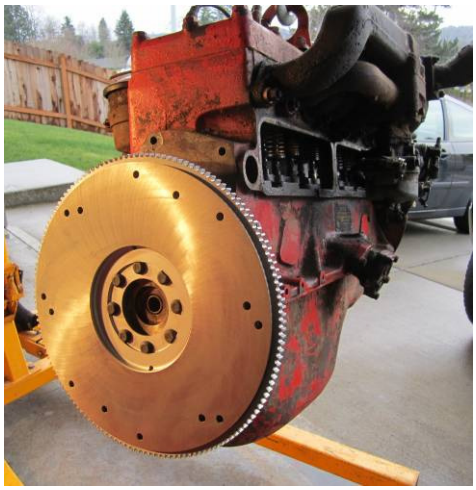




Winter Project update – The Engine Swap

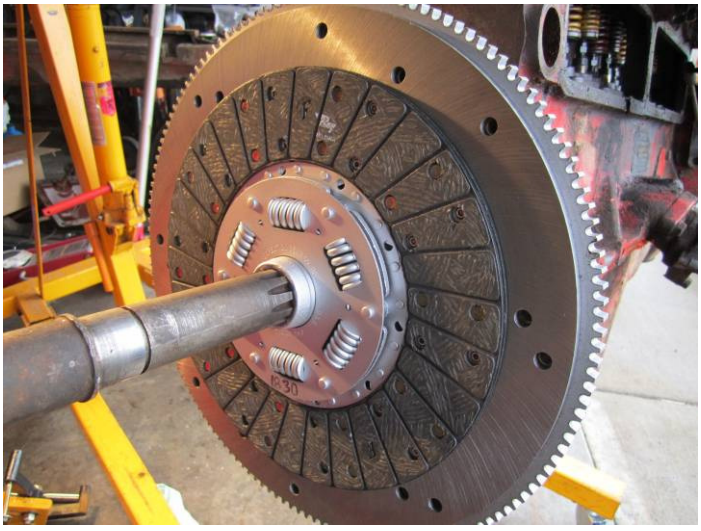
The clutch. This is one of the most important pieces of any tractor that *always* should be rebuilt any time things are taken apart. Any good friction shop will rebuild the pressure plate, reline the disc and surface (true) the flywheel. The 101's clutch was serviced by Ott's Friction Supply in Portland, Oregon for a cost of $139. This included heavier clutch springs. That's a small investment for piece of mind and no problems with a slipping clutch.

Clutch Pressure Plate

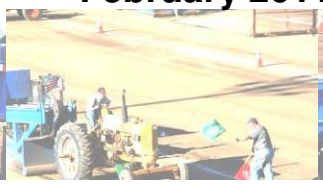
The same pressure plate after rebuild



Refaced flywheel on the 265



Relined disc

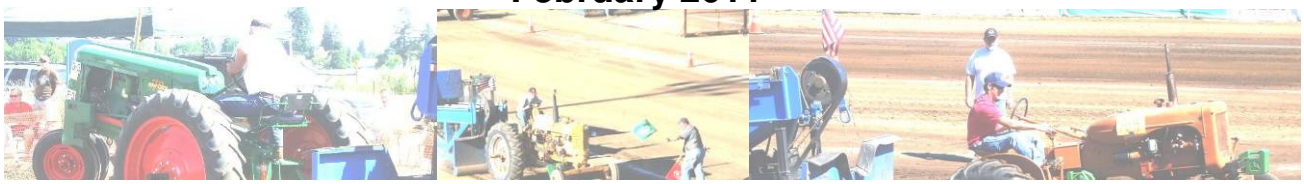

Winter Project update – The Engine Swap

Interestingly, the original clutch from the 201 was a direct bolt on to the 265 flywheel. Also, when things are apart, it's a good idea to replace the pilot bushing in the flywheel (or sometimes in the end of the crankshaft). The pilot bushing locates the clutch shaft and will wear over time. When reassembling the clutch, if possible use the clutch shaft to align the disc splines with the pilot bushing. This makes things much easier when putting two halves of a tractor back together, or in this case, when bolting on the bell housing. A new clutch release bearing (throwout bearing) should also be installed.

Using the clutch shaft to align the disc

The 265 with bell housing installed

February 2011



Winter Project update – The Engine Swap

And here it is…the Chrysler 265 landing in the Massey Harris 101's frame. Since the same bell housing was used from the Chrysler 201 engine, the added length of the new engine is all forward. This means a custom front motor mount was fabricated to accommodate the fit.

The 265 sitting in the frame

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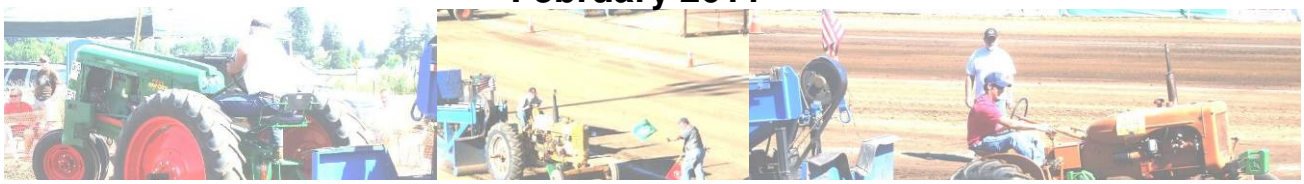

Looking Ahead – The First Pull of the Year

For those of us who are working on winter projects, spring is just around the corner and that means the first tractor pull of the year is not far off. This also means that time is running short to complete our projects on time for that all important first hook. Below are a few tips to ensure completion on time.

- Find the date on the calendar of the target first pull.
- From that date, begin to schedule milestones *backwards,* that is from the final details to the current state of the project.
- Create weekly milestones, writing them on the calendar. Spread out the work into smaller tasks to avoid an "all nighter before the pull".
- Check off items as they are completed.

This does three things – keeps a project on track for completion, prevents burnout, and also creates an ongoing sense of accomplishment to stay motivated.

Did you know?

The Podium Newsletter reaches almost 400 subscribers (and increasing fast) every month? Do you have a product or service to offer? If so, advertising in the Podium Newsletter may benefit you or your business.

For more information, contact Zack at zack@antiquetractorpullguide.com

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October 2010

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Turnbuckle Style Hitch Adjustment – Advantage or Myth?

Probably since the beginning of competitive tractor pulling there has always been a debate over hitch design. Most notably, the turnbuckle style hitch, or hitches with support points attached higher than the centerline of the rear axle have always fallen under scrutiny as possibly allowing an "unfair advantage". Folks are worried about the "added force" that could be applied to the upper attachment points of the turnbuckle. The hitch appears to be pulling from way up high, but is it really? The real question is…..does this yield an unfair advantage?

See below examples of turnbuckle style hitches:

Notice in each of these examples, the hook point is supported from above.

Also note the height of each hitch is adjustable using screw threads.

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Podium Newsletter

February 2011

Coming next month…

- Radiator & Electric fan Installation
- Winter project update
- How to organize a tractor pull
- And more…

March issue will be available 3/30/11

I want to hear from you! If you have feedback, requests or information you would like featured, please send an email to: zack@antiquetractorpullguide.com.

February 12th, 2011 Tractor Pull at the Sahuaro Ranch in Glendale, AZ
Yes, that is a John Deere H!