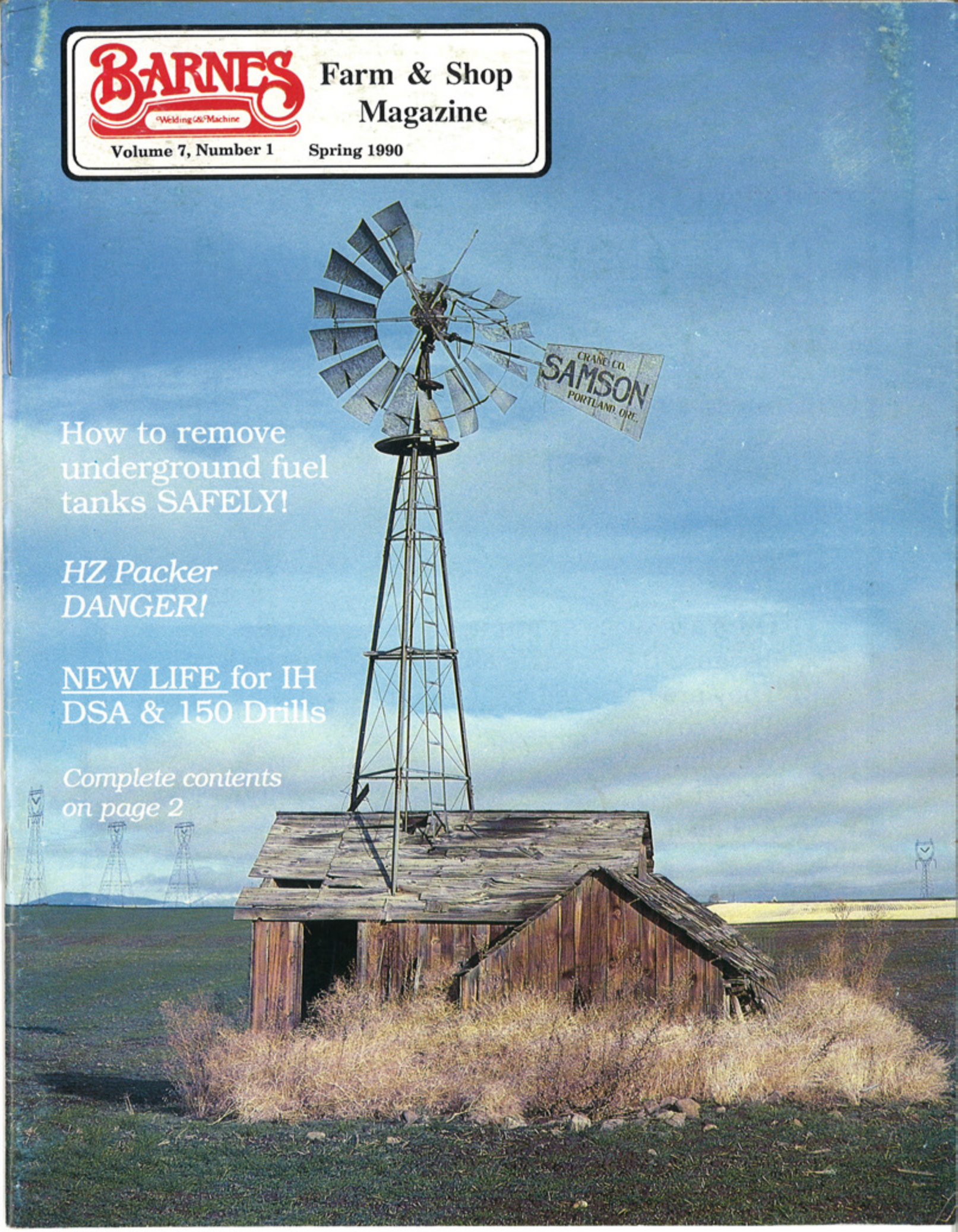
BARNES Welding & Machine

Farm & Shop Magazine

Volume 7, Number 1 Spring 1990



How to remove underground fuel tanks SAFELY!

HZ Packer DANGER!

NEW LIFE for IH DSA & 150 Drills

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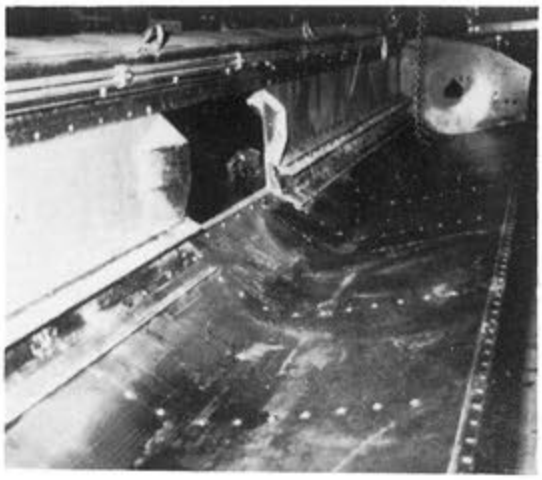
Rebuilt and/or Manufactured

HEADER BOTTOMS



ROCK GUARDS

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BARNES Welding & Machine

Farm & Shop Magazine

(509) 745-8588 PO Box 614, Waterville, WA 98858

Published by Dave Barnes **Editorial Consultant Shirley Phillips**
Typesetting Douglas County EMPIRE PRESS **Circulation Director Geri Creel**
Cover Photography courtesy of Marianne Hanson, Tigard, Oregon

INTERVIEWERS WANTED

As we expand our coverage of grain growing activity in Washington, Oregon, Idaho, Montana and mid-western grain growing states, we need more people to interview farmers about local farming practices. When you request them, we'll supply you with interview questions. Your job will be to tape record what an excellent farmer in your area says and then type it into a transcript. A photo of the farmer would be appreciated--perhaps a shot of him working on his favorite implement or project (for example, if he talks a lot about a spray rig modification, take a shot of him/her with it).

Include the farmer's name and a description of his farming circumstances: rainfall, crops, soil conditions, etc.. Tell the farmer that we'll contact him or her at a later date to clarify any ideas that need it. Include the farmer's phone number and the best time to call.

We'll pay you $10 for a usable photograph and $25 for 3 - 6 pages of typed copy.

Appreciation: Show yours today!

by Dave Barnes

"We don't appreciate what we have until it's gone."

I have heard the above all of my life, but until it affected me personally, I didn't really understand the impact of it.

If you would just have a little patience with me, I'm sure that you will see what I mean.

You may be wondering why you did not receive your last annual edition (1989) of Barnes Farm and Shop Magazine. I am sorry to report that we no longer have the services of a very talented editor that we had become so dependent on.

Charlie Herring. author and friend, has moved on to greener pastures in Seattle. Charlie had been the backbone of every issue that we put out and I'm sorry to say, that without his expertise, I literally floundered for over a year. I knew what I wanted in the way of articles and the sharing of valuable information but I didn't have the faintest idea of how to put it all together in printed form.

That is where Charlie became the life blood of the magazine. This is a classic case of "not appreciating what I had until it was gone. Please bear with us as we bumble our way through this edition that has been a very painful and humbling experience.

I ask you to please let us know what glaring errors or omissions that we might have committed in the bliss of ignorance.

At one time we had a John Deere dealership with Jim

GLADYS & WELDON BARNES. 1985

Jess Implements here at Waterville. I took for granted that we could go down and buy chain, bolts, and have John Deere equipment repaired locally.

When Waterville Auto Company was in business, they sold a different type of combine and tractor. Ted Finkbeiner was a General Motors dealer in Waterville. The people of Waterville had a choice when these businesses were here.

When there are choices to be made there is competition, therefore making purchases by the customer, hopefully, more reasonable.

I remember taking Ted for granted and thinking there would always be a car dealership in Waterville. After he left, I looked at Waterville Auto in a different light. Waterville Auto also handled Melroe Spray Coupe parts and equipment. Purchases were only minutes away. Now that they are gone, Allis-Chalmers parts come from greater distances and the convenience of driving downtown for parts is gone.

I feel fortunate that we still have a dealer in town. Loomis Tractor sells International equipment and has picked up some of the slack the other dealers have left. I hope that he will remain in our area because I appreciate what he can do for us and the community.

I'm delighted that Waterville has enterprising people who can take over where others have left off.

We now have two independent people who are capable of repairing cars in town.

I count it a privilege to have Waterville Parts and Service who has offered John Deere and Allis-Chalmers parts for those farmers who do not want to waste their day driving for parts. They are capable of repairing trucks and all types of equipment and I feel they are a great asset to the community.

At one time there was up to six different service stations in Waterville and everyone took this service and choices for different makes of fuel for granted.

Because of the EPA regulations on fuel tanks, many towns have nowhere locally to buy fuel. I'm proud of Chris' Fuel in Waterville as

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Chance use of new fertilizer produces amazing results

Dwaine Klein was born and raised three miles southwest of Edwall on the same farm he is currently farming. He has been active in farming for thirty-three years, and raises wheat and barley in a fifteen inch rainfall area. Dwaine's academic achievements include a B.A. degree from Northwest College, B.S. degree from Eastern Washington State College, and a Masters Degree in Biology and Chemistry from EWSU.

DWAINE KLEIN

Q. How did you become aware of this new Urea, Ammonium Sulfate and Phosphorus fertilizer?

DWAINE: It's kind of interesting. A fertilizer company representative called me and said, "I have some new fertilizer here and want you to try it."

I said, "Oh no, I'm about done seeding and don't want to mess with it. My neighbor, Gary Wollweber, has a few days left. Give him a call. Maybe he will try a load of it."

Gary did agree to try a load. Later, he was told, by a different source, that this fertilizer could damage his wheat if placed beneath the seed. He quickly tried to cancel the load but was too late as the load was already on its way.

Thank God, it was!

With only ten acres remaining to seed, I ran out of fertilizer. Gary heard me call on the radio asking my wife to order enough fertilizer to finish. Gary came over the radio asking me to use some of thc load he had coming. So, I agreed to clean up my rig and finish with the new mix. Two weeks later I realized that there was a very significant difference between what I had used for years and the last ten acres with the new mix.

Q. How did you apply this Fertilizer?

DWAINE: We used stock factory HZ drills to apply the fertilizer below the seed by 1 7/8 of an inch with the use of after market chrome points for the past few years. We had Barnes Welding modify the packers with their notches and increased spacing. We pull a tank cart behind the tractor, then the drills are hooked to the cart. The reason this works so good is that the HZ drills are more accurate than any other drill I've tried. The seed is placed between the packers and the moist dirt is firmed around the seed at the same depth everywhere in the field. A computer monitors the fertilizer.

Q. How do you feel about the packer modifications?

DWAINE: We've gotten the best stand of wheat we have ever had in our life with these packer and axle modifications. With the increased spacing, we put less dirt over the seed in dry conditions. Especially on the side hills, the dry dirt that fell back into the row did not cover the seed. Because of the notches with the spacing, there was even less dirt than before over the seed. Plus, we have a dam every three and one-half feet in every row. These dams are enabling us to conserve more moisture. They have filled with water several times this year and there are no ditches in the field.

Q. Will this fertilizer process work for all crops?

DWAINE: We use this fertilizer application method in both the spring and fall crops. The key to any fertilizer success is the placement directly below the seed. In fact, we probably would never have found this out if we weren't fertilizing this way.

Q. What was the noticeable difference with the new fertilizer?

DWAINE: We went back to check on the wheat and then we noticed a tremendous difference with the new fertilizer.

The difference was a field with 99% emergence versus a field with 40% emergence. Using the same depth, seed, and speed, the only difference was fifteen minutes of fill time for the fertilizer.

Q. What was the difference between the two fields fertilized?

DWAINE: The field with 40% emergence was Solution 32, Thiosol (sulfur), and Phosphorus. The new fertilizer was Urea, Ammonium Sulfate, and the same Phosphorus. So we had two variables to contend with.

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MYRON BUTCHER SHOWS OBVIOUS INCREASE IN GROWTH

What you need to know about Fuel Tank Compliance

Q What is the main purpose of fuel tank compliance?

The main purpose of the Federal Fuel Compliance is to record the location of underground storage tanks in order to monitor them for possible leakage. Leaking tanks can contaminate the soil and can also contaminate the groundwater.

Q What determines an underground tank?

Any tank that is 10% or more underground, including the piping to the pumps, is considered an underground tank.

Q Who does the fuel tank compliance affect?

Actually it effects anyone with underground fuel storage tanks. However, there are the following exceptions as it pertains to the farming community. Per the following:

1). 1,100 gallons or less capacity for non-commercial use.

2). Tanks storing heating oil for consumption on the premises where its stored.

3). Storage tanks situated on or above the floors, such as in a basement or a cellar are considered "above ground" tanks and do not apply to these regulations.

Q What can I do to be in compliance?

The age of your tank will determine how soon action must be taken. If your tank is not exempt and has been in the ground over 25 years and is larger than 110 gallons, then by December 22, 1989 the tank must have a leak detection devise installed to periodically record fuel usage and leakage, if any. By December, 1988 cathotic protection and an overfill system must also be installed to prevent electrolysis from further damaging the tank. If you meet these requirements then you will be in compliance.

Q How do I find out if my tank is "liquid tight"?

There are companies in your area who are able to test your tank to see if it is "liquid tight" without removing the tank from the ground. This test may need to repeated annually in conjunction with monthly monitoring, depending on the age of your tank.

Q Are these tank testing people approved by the Department of Ecology?

As of now the D.O.E. does not certify tank testers. The D.O.E. expects to have their certification program in effect in the near future. In the meantime a list of tank testers is available from the Department of Ecology, upon request.

Q You said something about registering my tank. What happens if I haven't registered my tank with the DOE?

If a person knowingly has a tank and does not register it with the D.O.E. he could be fined up to $10,000 for his negligence. However, we do not want the fear of a possible fine to keep persons from contacting the D.O.E. as this defeats the whole program. We want everyone with questions to contact us and we will be willing to work with them.

Sue Simms was born in Washington and raised in Alaska until she married. She returned to Olympia in 1972. She has an Associate of Arts degree in Science. She started working in ecology for the State of Washington in 1981 in the Air Program. She then moved to the Department of Remedial Action, which eventually was changed to the Clean Up Program, where she was a field inspector.

She became a Regulatory Specialist for Underground Storage Tanks (UST) with the Department of Ecology in September 1989.

Deadlines for compliance depends on the age of your tank. The age groups are as follows:

TANK AGE	COMPLIANCE DATE
20-24 yrs old	December 22, 1990
15-19 yrs old	December 22, 1991
10-14 yrs old	December 22, 1992
Less than 10 yrs old	December 22, 1993

Additional information is available upon request.

Q If I decide not to use my tank anymore, what must I do?

There are two ways that you can decommission your tank and comply with the program. They are as follows:

1.Remove the tank from the ground according to the Federal regulations, or

2.)You may fill the tank with an inert substance such as Bentonite, concrete slurry, or sand; providing that leaving the tank in the ground is acceptable with your area ordinances and local Fire Marshall.

Q May I use my underground tank above ground and save some costs?

Yes, you may use your tank above ground if your local authority allows this. A tank monitoring system is not necessary under these regulations, nor is there a tank tightness test. If an underground storage tank is relocated above ground it is no longer subject to these regulations. All the piping if any will also need to be above ground. But again, since above ground tanks are not regulated by the D.O.E., this means there would be no tank fees.

The restrictions, if any; would come from your local Fire Marshall. Please get in contact with your Fire Marshall and reread the "Uniform Fire Code" which pertains to everyone, and which says no tank above ground for any use other than at a fuel bulk plant. (No dispensation into motor vehicles.)

Q Is there anything that you would like to stress?

The main thing I would really like to stress is, if the farmers have any questions concerning these regulations, please call us and ask questions. We will do our best to assist them. We are really not "The Big Bad Wolf". Please feel free to call our toll free number 1-800-826-7716.

Q Will there be any policing on this compliance?

I would suspect that after the first of the year (1990), there will be random inspections to check on individuals to see if they are in compliance.

Tank Compliance Concerns
What your neighbors say!

GORDON & NORMAN KING, MABTON, WA.

GORDON: "I'm glad someone has taken the concern for our environment! However, in the dry land farming area I don't believe the concern is so threatening."

NORMAN: "I feel bad for the small operator, for the expense he has of complying with standards. I know many small stations that will not have the money and the only other choice is to close down the service stations. I also believe that if someone does not become assertive to control the possible environmental hazard now, it might get to be too late to do any good."

GORDON AND NORMAN KING

LARRY TANNEBERG: COULEE CITY, WA.

"Obviously, there has been a problem with tanks leaking otherwise this would have never come up! They have dug up tanks that have been leaking and this control over old tanks is the value side of the program. It seems that there could have been some less severe methods of enforcing the tank compliance. After all of the initial emotional feelings disappear then we will all be grateful that this has come about."

TOM HEER: EPHRATA

"I think that it is something that needed to be addressed, especially,in the city environment where water tables are very shallow and leaking tanks could damage their drinking water. Some of the tanks that are being removed might be older than twenty years and could very well be rusted. Out in our area, where water is scarce, we probably need someone to remind us that someday this could become a hazard."

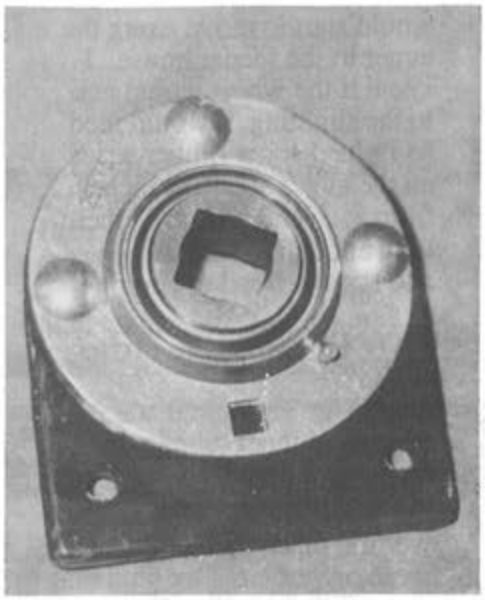
New Life for old IH drills

About five years ago many customers were asking us about revisions on the IH 150 drills and bearings. The old bearings are what we call, "spool and block", and sometimes they last many years. The two parts of the spool and block are a fine grained, hard cast iron, designed to be wear resistant.

Over the years John Deere and International have had many worry free seasons with this combination. Even though they are designed for many years of use, it is always relative to the number of hours used per season and how well they are maintained. We have had testimonials that some farmers do not even grease them and seem to get almost as many hours (years) use as those who religiously grease them, at least three times a day!

Since the material has a close grain structure it is understandable that non-greased bearings could last as long because greasing with worn out side washers would attract dirt, dust, and hold the abrasive particles in the bearing. where the most wear would occur. Whereas, with no grease. the fine particles in the form of dust would have no attraction to bearings unless forced there by other means. such as, build up of weeds, heavy straw, or wind.

At this point in 1984 we came up with a bearing housing that would adapt right to the original mounting holes, offering the same height from axle to bracket as the old bearings and provide a cost efficient replacement that would be better in the long run. Because of the complexity of the two castings, obviously the price would be considerably higher. Original replacement costs for both pieces which include two washers, a spool, and one block, would be over $70.00 for each bearing if purchased from International Harvester.



IH BEARING ASSEMBLY

These assemblies, with tube spacers, sell for $44.95 for each bearing. Depending on row spacing, you will need a minimum of four bearings per drill, or could be as many as six bearings per drill.

In our bearings we use a non-standard ball bearing which is immersed in grease at all times and sealed by three special rubber seals on each side of the bearing. As you probably know, most bearings only have one seal per side. The bearing is held in place by heavy self-aligning flanges which are bolted to the mounting bracket.

At one time we offered the package with a regreasable bearing or one that was permanently sealed. We never sold one assembly that was sealed so now the re-lubeable bearings is all we stock.

Since the new bearing is narrower in over all width we have put together a package of special rolled tubing to bridge the gap. Keep in mind that you no longer need a spool, block, or both thrust washers. We need to know the spacing on the packer wheels so we can offer the correct tube kit to go with the bearing. We are using a heavier wall tubing that fits over the square axle perfectly and will give the axle assembly more strength than the regular split-formed tube that comes with the drill. This tubing is available in different lengths or in bars up to twenty feet long for replacing the spacers throughout the whole drill.

When we first started production we used a typical cutting torch that followed a pattern, then the Plasma Cutting Systems were introduced. We used plasma for the remainder of the time until January 1990. Now all new housings will be done by a very sophisticated machine called a "LASER".

All three machines cut the material very well, however, as we move up the scale of equipment used the quality of cuts and tolerance are drastically improved.

"Grain Grabbers"
New Invention for better feeding

MIKE HEER

Mike Heer farms, with his brother, Tom, on a farm Northwest of Ephrata in an area called, Sage Brush Flats.

Mike and Tom are in the process of taking over the farm from their father. They farm 1,500 acres per year on a rotational (summer fallow) basis with wheat being the main crop. Their annual rainfall is 9 to 10 inches.

We talked to Mike about an idea that helps any platform auger on a combine pull in and start to feed very short grain! Tom calls his idea and installation on the auger the "Grain Grabbers". Sometimes the simplest concept works out to give the perfect performance.

Q How did you come up with the idea?

MIKE: I was halfway through harvest, setting in the combine, watching the short wheat get cut off at the sickle and just set there until there was enough to push the wheat into the auger flighting then it would start to move along the auger to the feeder house. I knew if the wheat would get to the flighting, it would feed so I glued some rubber strips on the auger about 24 inches from each end and made them long enough to slap the wheat and start the feed operation.

Q How are the strips made?

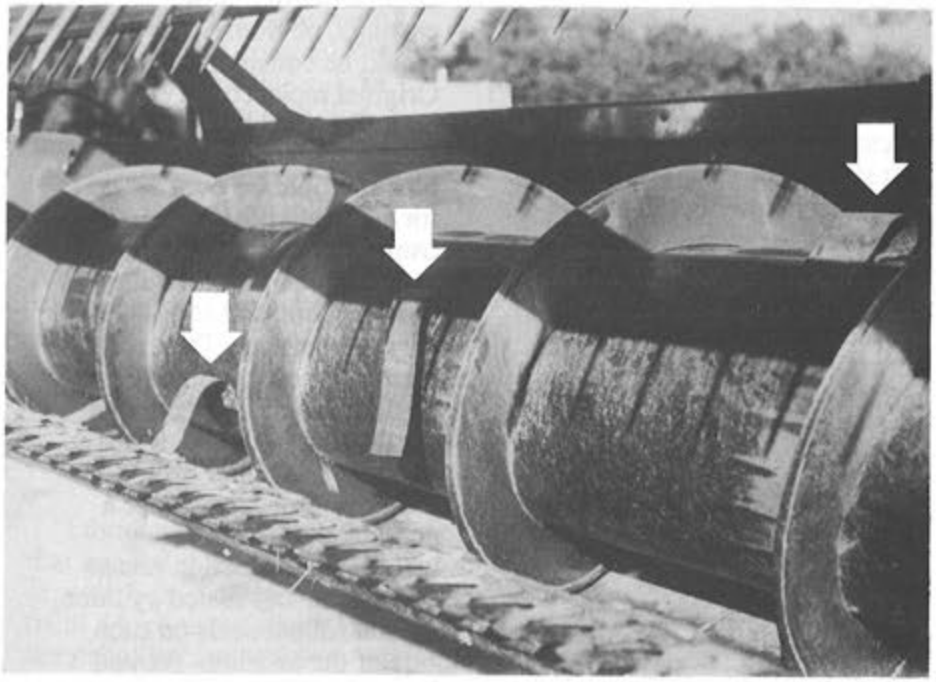
MIKE: They are made from used inner tubes cut three inches wide and twelve to thirteen inches long. When we first made them, we glued them on but, now we find that a piece of angle three inches long drilled for one 1/4 inch bolt works the best. We used 1 1/4 inch by 1/8 inch angle and bolt them to the auger with the flat of the angle facing the tube. We drilled and tapped the auger tube to accept the quarter inch bolts. Flat bar works good also.

Q How many do you need on an auger?

MIKE: We started out with five strips installed on an angle starting twenty-three inches from the ends but, now we are only using four strips, off set seven inches to each other. There are others that are only using two strips opposite each other.

Q On normal or heavy wheat, does this hurt feeding?

MIKE: No. This has no affect on any heavy wheat where feeding is okay. The real improvement comes from very short wheat.



"GRAIN GRABBERS' IN PLACE ON AUGER

Q Can these be installed on a large (16") tube auger and a small tube (12") auger?

MIKE: The tube size has nothing to do with how it works. All strips are thirteen inches long and auger flighting regardless of the tube size is four inches, so the performance is equal.

Q Have you done any other modifications to your header besides the Grabber?

MIKE: No. The headers are factory with original bottoms and original auger. Unfortunately, our headers have a frown in them and before the strips, feeding was very poor.

Q If your header is straight, do you think they would work as well?

MIKE: I think they will help all headers, but, the straighter the header, the better it feeds anyway and there would not be any LOW ends where the wheat would gather.

Q How long does it take to install?

MIKE: We can make all the pieces and install flaps on one auger in less than two hours. They are very easy to install and they last for a long time. What wears out is the ends of the rubber flaps.

Continued from page 5

Q How did you pinpoint the differences?

DWAINE: Well, we still had time in the fall to experiment and eliminate the variables. We tried several test plots with different combinations of fertilizer. We isolated the Thiosol form of Sulphur and found 100% consistency in our trial plots with Thiosol being the material that showed the damage. Then, we replicated the same tests in the spring with a 33% increase yield differential at harvest time.

In the spring we put in a test plot that had no fertilizer and did just as well as a test where we used 50 pounds of Nitrogen and Thiosol in the form of Sulphur.

Q Do you think Thiosol may be harmful?

DWAINE: Absolutely! We know that Thiosol inhibits the bacteria that convert the nitrites to nitrates. Nitrite is very toxic to the plant. Therefore, we have a build up of nitrite which, in its toxicity, inhibits the germination and growth of the plant

Q. Is this a planned reduction element by the chemical manufacturers, used to sell more Nitrogen

DWAINE: No, I honestly think that very few knew how much damage the wrong form of Sulfur did. If WSU knew, the information was not disseminated in a way that the fertilizer companies, or the farmers, could take advantage of it. It is known that Thiosol does create a problem, but, if you shank Thiosol on with conventional fertilizer machines (like almost everybody has done in the last thirty years or so), then when you cross those shank marks with your drills, you'll have more dead wheat wherever you cross the marks. The damage was not observed because no one would think they had cause to look.

Q. How do I know if what I am using now is harmful to my wheat?

DWAINE: First thing, go ask your fertilizer dealer what form of sulphur he has been selling you. If it has an "SOL" in it, like Thiosol or Nitrosol, then you should watch carefully for damage. It will be easily detected if you put the fertilizer below the seed. If you shank the fertilizer in, it will take more careful observation.

Q What is the acceptable form of fertilizer?

DWAINE: The only acceptable Sulphur form is Ammonium Sulphate. The form of Nitrogen is not so critical.

Q. What is your recommendation for the most ideal fertilizer combination?

DWAINE: For the nitrogen, use Urea, plus Sulphur (ammonium sulphate), and Phosphorus, if desired.

Q Why Urea instead of Solution 32 or NH3?

DWAINE: Urea is easier on the plant. The real advantage is that it takes one more reaction to convert it to the nitrate form. Until the fertilizer is in the nitrate form it will not leach away from the plant. This means that in the spring you may have more available fertilizer for plant growth.

Q With this information, can I save on chemical costs?

DWAINE: I believe you will raise more wheat with this combination at 50 pounds

Amomonium Sulphate on the left, Thiosol on the right.

of Nitrogen placed below the seed, than you can with 80 pounds of Nitrogen (with Thiosol) shanked in with conventional methods

Q From an environmental standpoint, it sounds as though Urea with Ammonium Sulphate is best for us all. Is that right?

DWAINE: Yes, it is! Not only does it not leach as fast, but it is much safer to handle than any other chemical that you could work with. It has no odor. You can get the chemical on you and not be harmed. It is much safer for our environment than any other on the market.

Q Where and how can I get this fertilizer for myself?

DWAINE: First thing I would do is ask my supplier if he can supply this mix. Edwall Chemical has already expanded their facility to supply their customers with Urea and Ammonium Sulfate.

Q Are there any final comments you would like to make?

DWAINE: I realize that every farmer has a vast amount of information he has gleaned over the years, and I am anxious for them to share that with me. If this little bit of knowledge can benefit my friends and neighbors in any way, I will be thankful. Many of you readers have certainly taught me a great deal, and I can only say a big "Thank You" to all of you.

How to remove underground fuel tanks **SAFELY!**

Not too many years ago we weren't faced with such worries as the leaching of fertilizer into our ground water, and the contamination of our atmosphere with unburned hydrocarbons from our vehicles.

Many of us, even now, are still surprised that all of us are contributors, when we talk about the "Greenhouse Effect".

In the middle of winter, as you put more wood in your home shop stove, are you even thinking that you are effecting our fresh air?

If you are like the majority of people, so fortunate to toil under the sun stirring up dust all day, then these worries are just not uppermost in your mind!

We people called farmers, live in an area removed from the busy cities where the large number of people are the major contributors to all the pollution problems we've mentioned. Even though there isn't people for miles around, we contribute to the world's rising pollution problem.

One of the ways in which we may have contributed to environental problems is through our use of underground storage tanks.

The new EPA requirements on underground storage tanks, have put many farmers under pressure to remove their tanks or pursue measures to keep them in compliance with the new laws. One simple way is to remove the tank from the ground and not have any underground storage.

Some of the steps you will read here will be of no surprise to the safety conscious person. Please keep in mind, above all, personal safety should be your number one concern!

STEPS:

The first step is to write EPA thirty days in advance about your plans to remove a tank. While you're waiting for their approval, notify your utility companies of your plans in case of phone or power cables.

1. Locate tank (usually under fill tube, but not in all cases).

2. Determine how much fuel is left in tank with measuring stick. The Fire Marshal recommends that there be less than one inch of fluid left in tank. CAUTION: FUEL TANKS ARE MUCH MORE DANGEROUS EMPTY THAN FULL BECAUSE OF AIR/FUEL MIXTURE. (VAPORS ARE EXPLOSIVE, LIQUID IS NOT).

3. Next step is to make sure all outlets (fittings that go to the tank) are capped off. Then start digging with a backhoe to locate the ends and sides of the tank. Dig carefully until you are sure of the physical location of the tank top.

4. Now we need to neutralize the tank with Nitrogen. This process, if done properly, will eliminate the chance of explosion as we are filling the tank with an inert gas. This means we are

STEP 3

STEP 4

taking away the oxygen in the tank which is one of the three factors of a fire triangle. The other two factors are fuel and heat. Do not flow the gas more than five pounds per square inch as we may excessively expand the tank! With

the Fire Marshall present, he can "sniff" the tank to see if oxygen level is below minimum for safety. A rule of thumb is approximately fifty cubic feet of Nitrogen per five hundred gallon tank.

We use Nitrogen with a rubber hose that has a ground wire from tank to bottle,to eliminate static electricity. The bottom line-**WE WANT TO ELIMINATE ALL CHANCES OF SPARKS!!**

5. After the tank is properly neutralized and capped off, the remainder of the excavation may continue. NOTE:the Nitrogen remains in the tank for safety.

In this particular instance, we ran into much piping that was not expected, including a sewer pipe. Make sure the utilities have been notified before any digging has been done!

Notice unexpected piping

6. With sides and ends exposed, dig down below the center line of the tank so that a slight bit of pressure on the ends will pull the tank from its resting position. Then load on an appropriate truck for removal from job site.

7. While the Fire Marshall is there, now is when he will make a visual inspection of the hole for over flow or leakage. Usually a person can tell by the odor of the ground.

If there is a smell of gas then a person needs to dig out the dirt in the hole until the odor is gone, then replace non-contaminated soil and fill up the hole where the tank was. After all the back filling is done, then we need to fill out the tank closure form that came from Sue Simms when we requested for tank removal approval. After completed, send the form back to Sue and then this completes our voluntary tank removal process.

This "How To" was written in cooperation with Rob Robinson of Building Dynamics of Walla Walla, Wa. Rob was referred to us by EPA as being an aggressive and safety conscious contractor that has performed many UST removals in the past year. His phone number is: 509-525-1708.

See related regulatory story page 6

ROB ROBINSON

Appreciation

Continued from page 3

they recently spent many thousands of dollars to upgrade their facility just so they could provide gas, diesel, and lubricants to us. We are very fortunate to have them in town.

People need to be most thankful for all the services that are offered to them. If we could just be content with what we have lest we loose it and it's gone from us forever.

This gratefulness could be as elementary as the people you work with or even your parents in the fact that they are still with you to learn from and enjoy their company.

I would like to enjoy what I have in people and services while it's here at my disposal and appreciate it better, lest this opportunity will be removed forever.

It seems that the one thing that we don't put a price on, is our convenience. One convenience that comes to mind is the ordering of fertilizer. Ken-Kem delivers right to our fields, and when we are done, they come and pick up the equipment.

There are areas now where you need your own equipment to haul fertilizer and your tillage equipment will need to be modified to inject the fertilizer in the ground if you want to fertilize.

We need to commend people for investing their lives in a small community to provide services to others.

I had this story on tape by the end of December 1989 and felt a real need to never take my folks and others for granted.

In the past I have always dedicated this magazine to my Father, Weldon Barnes. But, this year I wanted to honor my Mom as she has always been most encouraging in my endeavors in life. She had been a great support!!

Well, the first part of January 1990 she decided to go for open heart surgery to replace a valve and strengthen her heart. This magazine was supposed to be done and mailed by January 13, 1990. She died three days before the surgery on January 6, 1990 and never had a chance or even an inkling that this magazine was going to be dedicated to her.

With some regrets and the fact that I took it for granted that she would live longer to read this, I dedicate from the bottom of my heart, this magazine to my Mother, Gladys Barnes, and to my Father, as always.

Move all your drills at once

Early in the year 1986, John Deere decided to quit production on the HZ drill and at this time offered a split packer drill to fill its place. It had staggered boots to enable it to go through more thrash and was a direct competitor to the IH 7100 drills.

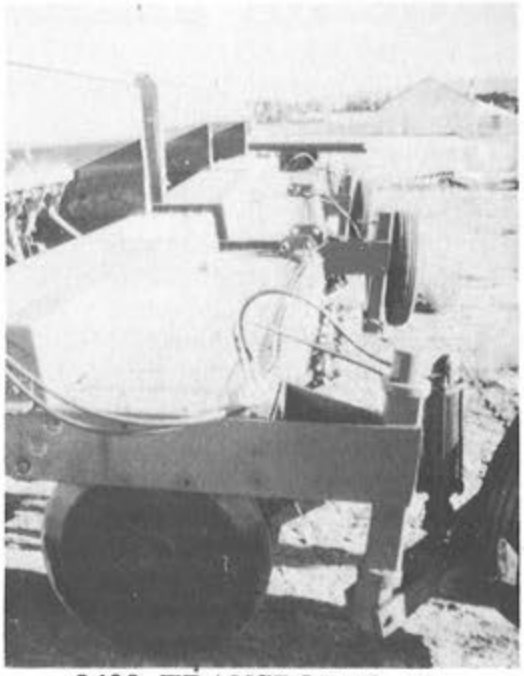
Many of our customers have to move from one field to another and pulling three to five drills, made it impossible to move as one unit.

We have fulfilled the need by offering frame installed transports that with a pull of a lever can have all drills up in the air ready to move any distance to any field by pulling the drills end ways!

These drills are very heavy compared to the HZ's and stronger redesigned mounting brackets had to be used at the corners of the drills. We lift between each drill and have another bracket assembly at the front end of the drills. On a three drill set-up, the front and rear brackets would swivel and allow the drill to be turned around a corner but not let the whole assembly slide sideways on a side hill. as the two ridged assemblies in the middle are the only stationary wheels on the complete drill unit.

The mounting kits come complete with an end tow bar which needs two holes drilled on the drill and all the necessary brackets, tires, and hydraulic hose to make a complete unit.

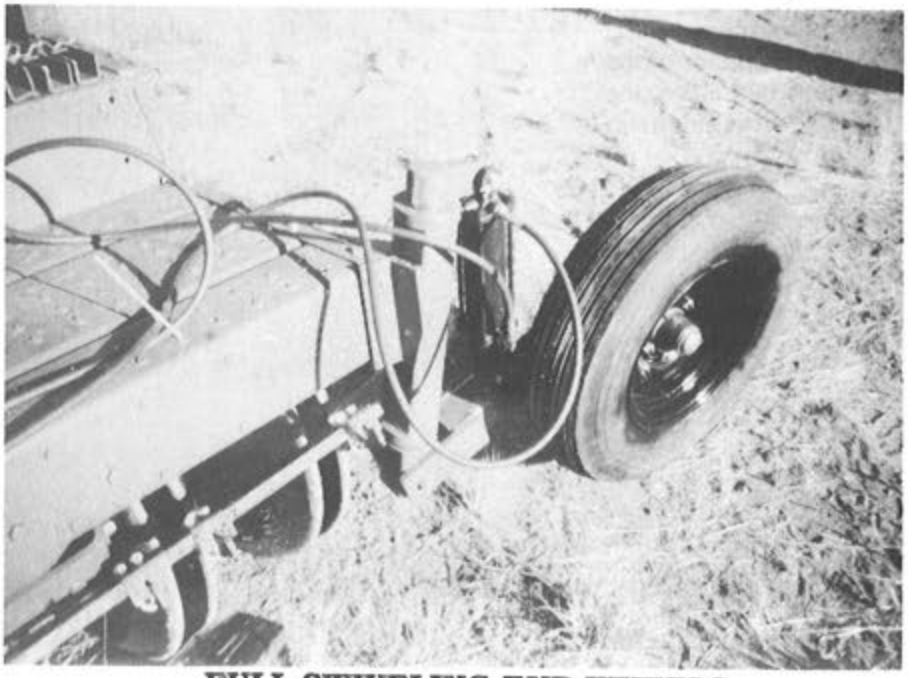
One nice feature, is that both end wheels will swivel allowing the operator to seed next to a fence row on each side of the drills! Both left side and right side of the drills.



9400 TRANSPORTS IN FIELD POSITION

We have also built in safety systems. If the hydraulic hose happens to break in transport there are stops that are installed on the cylinders. When you are in the seeding configuration, there are safety chains that keep the wheels up in the air if something happens to the hydraulic pressure of the system.

One other great advantage about this unit is the distance away from the platform. Most farmers use hydraulic drill fills, to fill the hoppers on the drills. On the 9400 drill you are about 18" further forward with the bulk tank from the back edge of the packers than it's brother the 9300 series. In using our transports you are adding only 12" from back of drill to the outer most part of the transport still allowing the use of your hydraulic drill fill! Assembly time on a three drill set would take about a day from start to finish. These units are available at most dealers in your area or direct from Barnes Welding.



FULL SWIVELING END WHEELS

Greatly improves feeding!

Pitch Change for platform augers

One of the best inventions to ever help the movement of grain for the last thirteen centuries was the introduction of the platform auger in our conventional header. Before this idea was the dependable draper, which was subject to many conditions where weather was the main worry.

The platform auger gave us many advantages. The most important and appreciated benefit was the fact of less maintenance per hour of operation.

Many changes to the auger have taken place since they were first introduced.

The majority of these changes came from the operator of the combine, as do most good ideas, the farmer.

Original tube sizes were 12" and only 12". We have found that increasing the tube size enabled the auger to move the grain to the feeder house quicker and much better. Since the diameter of the auger was increased, the auger RPM did not have to be altered much.

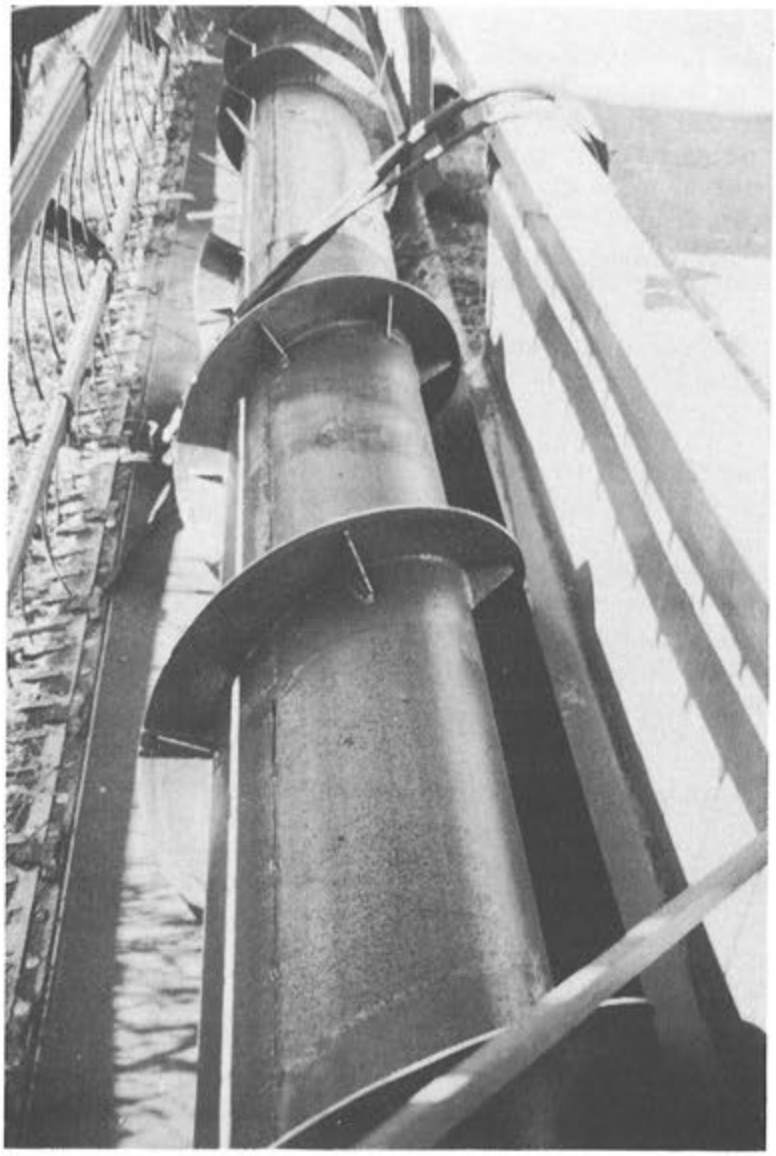
Since the advent of Rotary Combines, the machine can thrash more wheat than the auger could feed it even if it was a larger tubed assembly.

There has always been problems of making the auger feed fast, evenly and correctly.

The first thing to look at on your auger, is the angle of flighting in relationship to the tube. The desirable setting is to have the flighting 90 degrees to the tube at its worst condition and preferably have the top of the flighting leaning towards the feeder house by as much as 3/8". (Measure at the base of the flighting with a square **off** the tube).

The next thing to look at is the condition of the flighting edge---is it jagged and rough from wear or is it smooth? Of course, smooth is what we want.

Lastly, is the need for correct hardface procedures and placement. On the older combines, where auger RPM'S and flighting is spaced closer together, our recommendation was a tungsten powder on the leading edge with a 3% back rake on



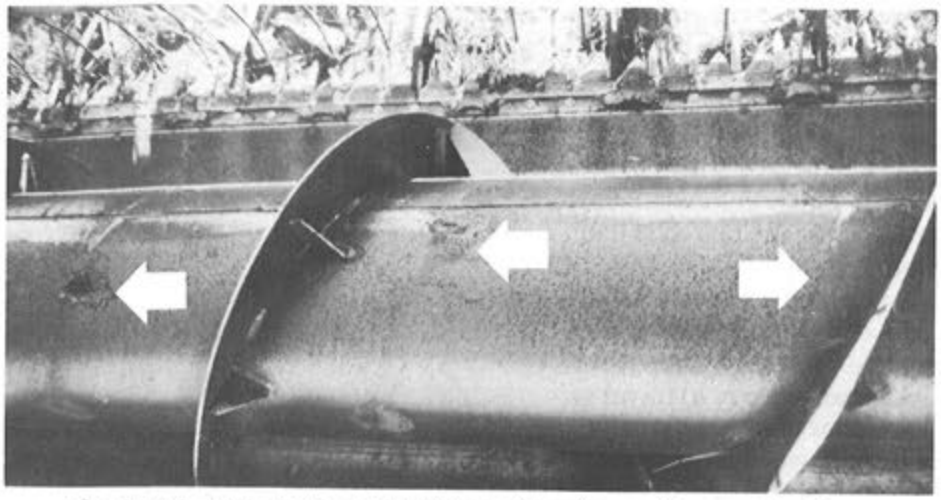
NEW FLIGHTING ON EXISTING AUGER TUBE

top.

Now, flighting (spiral wraps of steel on the tube) has always been made where the pitch (the distance between each spiral) and the outside diameter of the flighting were equal. EXAMPLE: 6" of auger would have a 6" pitch. Obviously, when we change the pitch we will change the flow speed of the wheat.

For some time now, there has been a gentleman in Southern Washington that could always see ways to improve the function of any man made machine. Next to Ray Stuckle, John Rea is tops in my book when it comes to solving problems in the farming arena!

One of his good ideas was to keep the auger the same speed, but get more grain to the feeder house quicker, as the main limiting factor for thrashing speed was the header. (The machine could thrash more than the header would allow.)



Observe the arrows pointing to where the orginal flighting was welded.

The solution was simple. Increase the pitch so that the grain will move to the feeder house quicker.

In the photo you will notice the faint wear marks where the original factory flighting was in relationship to the new heavier flighting we've installed.

The new flighting is heavier and the pitch is increased by six inches. Thus, speeding up the feeding by as much as 25 % without changing anything else on the header.

We appreciate John's ideas and his support as we do the auger modifications to any platform auger. This simple and cost effective measure works even on swather augers!

Consumer Alert

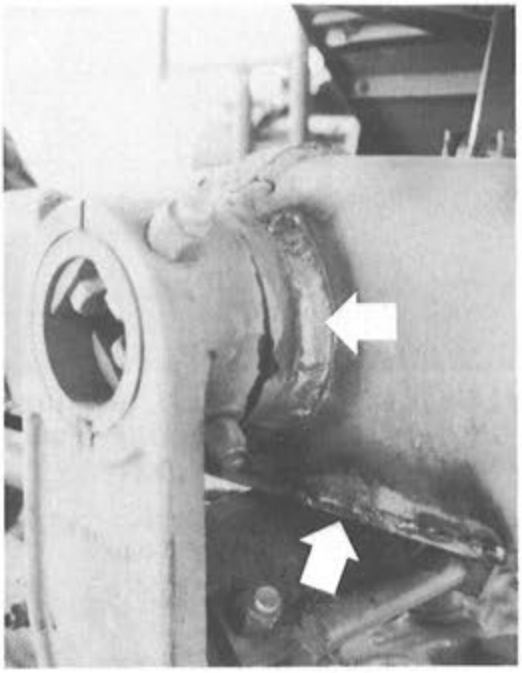
Potential combine rear axle breakage

Our customer from Davenport called us about a broken axle on a John Deere combine. His combine was a 6602 where the rear axle had broken away from the tube that allows the axle assembly to pivot with the uneven terrain.

We were happy to travel to Davenport with our portable shop to repair this problem in the field. Due to the excessive loads on this portion of the axle, the factory weld usually cracks from the bottom of the tube towards the top of the tube. (See Picture) Factory welds are done with the highest quality in mind, but production time is always a factor. So appearance and quick welds are the main concern. (True with all production runs on manufactured equipment.) Weld strength is determined by three main circumstances:

1. What is the weld joint preparation? This means how the two pieces are shaped that are to be welded. Was the inner tube ground to a "vee.? Was the mating axle opening ground to a "vee". to allow more weld metal in the weld zone?

2. Is the filler material compatible with the parent metal to allow the same or greater strength when the weld is completed? For obvious reasons, if we use a weld that will give us less strength than the axle and tube then we have defeated or automatically cut down the longevity of the finished part. On the other hand, if we select a high strength (tensile) for the same part, then we loose the ability of elongation in the weld zone which would make the weld weak just outside of the weld. When we increase weld strength, we make the finished weld a tighter grain structure, therefore a greater tendency to be brittle.



Combine rear axle breakage point

3. The position of the weld is an important consideration. Is it flat, vertical or overhead? In a factory situation the weld most likely will be done in the flat position. Welding flat gives all welders the advantage of a good appearing weld, but flat offers us the least amount of penetration for that weld area. Overhead and vertical would, of course, give us the most penetration. Now, most welders won't purposely put the part over their heads to weld, to make it stronger. As we have mentioned, factory welds are done flat and in a hurry. Sadly to say, this is why most normal welds fail; not because they weren't done well, merely because they were fighting a deadline for time and quantity of pieces to be produced hourly. Therefore, FLAT AND FAST!!

When we are called to a job we have all the advantages to overcome this problem. The first thing we notice is the failure to prepare the weld zone correctly. As we prepare the area to be welded, we are making the area for our weld acceptable for new material. On this particular combine, all the Welds well be vertical. This is great! The part is already in the position we want and we don't even have to turn the combine over! After the part is prepared for welding we then start at the bottom of the broken area and start to weld up, trying to keep equal heat on each side of the tube. We will make repeated passes until the weld is complete. Now this is a weld much stronger than the original, but we would like to be sure of enough strength so we will reinforce under the axle to give the tube area more rigidity to help eliminate further breakage elsewhere on the axle. The last step is to be sure there are no rough areas where we have welded. After it has cooled then we will eliminate rusting by covering the burned area with paint.

This particular job went very well. Before we were done we repaired six John Deere combine axles and a Calkins free float torque tube bracket, all within two days!

Washington Farmers

Good news for tank reinsurance

JAMES M. SIMS

Jim was born and raised in Tacoma. He graduated from St. Martins College in Olympia with a B.A. degree.

He got his M.B.A. from George Washington University in Washington D.C. His major was Financial Management.

Jim enlisted in the Marine Corps in 1962 and retired as a colonel after 26 years in 1988.

Jim was hired by the State of Washington as the Administrator of the Pollution Liability Insurance Agency in September, 1989.

Q With the new tank compliance mandate, what is the state of Washington doing to help those who have tanks and are receiving exorbitant reinsurance liability quotes?

Washington is the only state that is initiating a reinsurance program to help tank owners and operators satisfy their EPA mandated financial responsibility requirements.

The program involves a state financial guarantee that will lower the financial risk of the insurance companies. That lower risk will help tank owners receive required liability coverage at affordable premium rates. The program looks very promising and is currently being reviewed by the Legislature.

The legislature must formally approve the program before we can enter into contracts with the insurance companies.

1 Million Liability coverage per occurrence

- $875,000.00 guaranteed by State of Washington
- $100,000.00 from Insurance Co.
- $25,000.00 deductible

Q. How will this program work?

Maybe this chart will help: The left side of the chart represents the maximum liability requirement of $1 million per occurrence ($500,000 for non-marketers) protection. The right side represents how a claim would be covered under the program.

1. The first level would be the owner's deductible. The example shows $25,000. It could also be $10,000 or $15,000 -- to be negotiated by the owner and the insurance company.

2. Then the insurance company would be responsible for the next $100,000. (It could also be $75,000 -- we will negotiate that with the insurance companies.)

3. If more money was needed to cover the clean-up, the remainder would come from the state reinsurance agreement. A fund set up by the state would pay up to $875,000 or $900,000 to make up a total of $1 Million of insurance coverage.

The key to lower premiums for owners is the state reinsurance which lowers the risk to the insurance companies' assets.

In the examples above, if the cost of clean up is over $125,000 or $100,000, the insurance company is "home free" and the state fund covers the rest of the clean up.

Q. Why is the new insurance premium so high?

Insurance companies base rates and premiums on actuarial data from track records of incidents and experience.

There is no long record of incidents of leaking underground storage tanks on which insurance companies can base an estimate of risks...like on our life expectancy for life insurance, or on our driving records. Therefore the insurance com-

Continued on page 24

HZ Packer **DANGER**

Over the past three years, because of the innovation of the notches in the packer wheels, we have become more aware of the problems that picker teeth on the packer wheels presents to the overall function of the HZ drill.

The problem has always been there, but we have never had a workable solution to solve the drill handling residue, yet not change or damage the original design and function of the drill.

I remember about six years ago we used a ten horse power lathe in its lowest gearing for the greatest torque to try to straighten a John Deere HZ square axle. It had been unusually twisted like a drill bit, the whole length of the axle. We also wondered why all the packers and bearings would not come off the axle.

Our lathe exerts amazing torque as we put ten horse power through two transmissions and then that power is belted to a step pulley and then through the head stock gearing in the "back gear". This means the ratio is reduced by at least 20:1 at this point, at the lathe chuck.

We managed to straighten four axles, but in the process of reversing the twist of the axles we have altered the grain structure of the axle to the point where premature fatigue will occur. (Reason: the axle was twisted on the drill; because of picker teeth; in one direction at least 90 degrees and some cases up to 120 degrees, then we reversed the twist by ninety degrees to return the axle to the original shape.) Thus, we have exerted 180 degrees of rotational movement in a material that was designed and manufactured to stay rigid in its rolled form from the mill shape.

In the beginning of the many designs to help the HZ to go through more residue, was the small wedges that Barnes Welding developed into a very effective addition to the wheels.

If installed like the original idea, with the wedges pointed up towards the circumference of the wheel, the wedge provided two things:

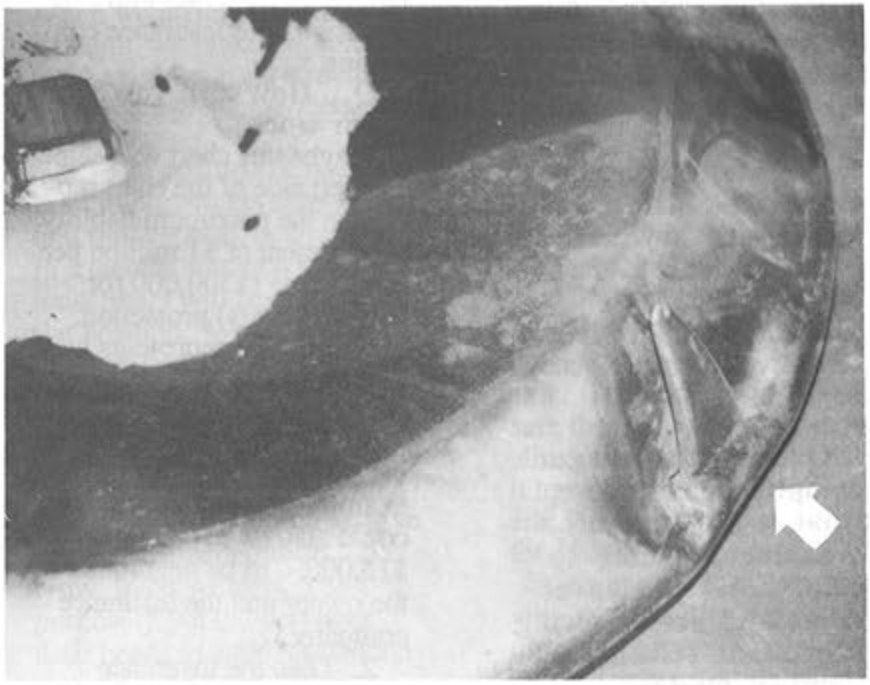
1). It made the drill work in some straw;

2). It offered no harm to packers, axles or bearings.

From that original, excellent idea, many designs have evolved. In our experience with wheels, we have seen everything from these wedges to rebar welded on the circumference of the wheel. This is where "if a little bit is good, then a whole lot is better" theory, enters the picture. That theory is the downfall of the HZ drill and packers.

If money, time and production is no factor in farming then do not listen to what we are trying to say.

Just recently, one of our customers, from Oregon, brought his HZ packers up to have them rebanded and rebuilt after the gruesome loads that very large picker teeth exerted to the wheels and axles.



MAJOR damaged to packer

The axles were so bad that out of six drills, four drill axles had to be cut apart just to get the packers off the axle! When this occurred, a few of the packers own tube axles were damaged in the process.

Unseen damage that happens to the remainder of the drill are, excessive loads on the bearings, and excessive vibration which then shows up as damage to the drill boxes.

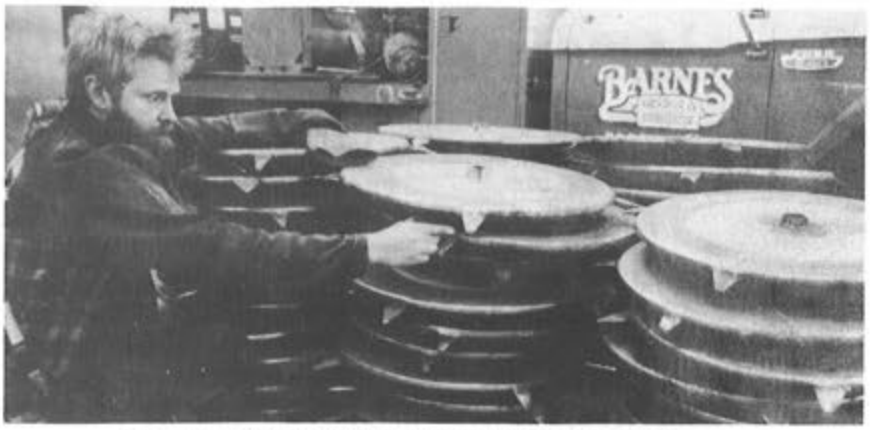
What really happens: when the picker teeth are installed past the circumference of the packer wheel, then in shallow soil, ridges or in crossing roads, the teeth are the only thing that is touching the hard ground.

No matter how you have the teeth spaced, or how many you put on the wheels, the drill actually falls to the ground from one tooth to another. The sudden jolt of the fall is what causes everything to break and fall apart.

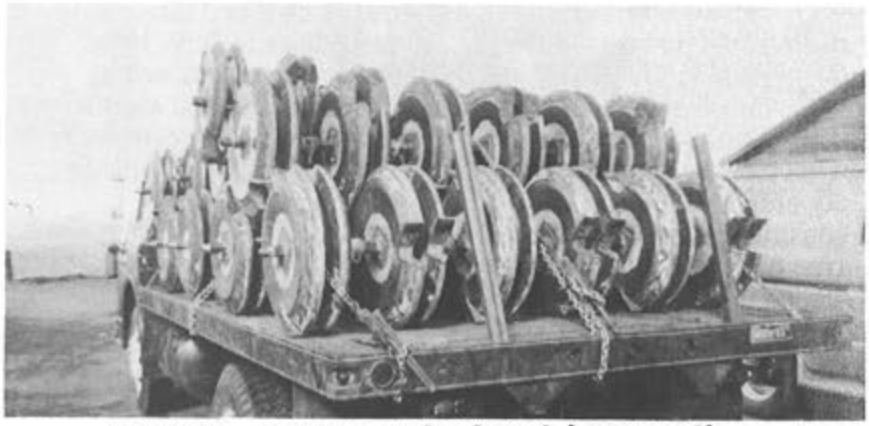
The HZ drills axles are eight feet long and solid. This is great if you never have to turn your drills to go in another direction. If you need to turn, as all people do, then on a turn, the outer wheels will have to slip in the dirt.

I do not know if John Deere's engineers knew that by making smooth packers, they would never have bearing, axle or packer problems. We will give them the credit for this excellent idea.

When someone puts long picker teeth on the wheels, then the idea of the outside packers slipping quits! These teeth on the packers act like cleats on a crawler tractor. Thus, giving the packer wheels more traction! Now,



Cause of MAJOR damaged to packer



MAJOR problems solved and improved!

when you turn the drill ninety degrees or one hundred eighty degrees, or any turn the packers cannot slip anymore, then something else has to give. In most cases the axle itself is the weakest point making the axle twist in turn looking like a drill bit.

This process does not happen overnight, but is the culmination of many turns which cause permanent damage to the solid axle.

Enter, the HZ Notches. Designed by the man that knows the HZ better than anyone.

Bob Zimmerman realized these problems and solved the residue handling problem and complimented the original design by not putting any extra stress on the axles,bearings, or packers.

The Notch is designed to allow the wheels to slip on corners, thus, eliminating twisted axles. The Notch is able to step on the straw and make it pull through the drill better than any other means.

Another benefit is that it makes you conserve moisture by carefully installing dams every three and a half feet along the drill rows. If you have sixteen inch spacing, for every acre you are building 9,334 dams! Assuming that each dam can hold three and a half gallons of water (all depends on the height of the dam) then you are able to hold 32,670 gallons of water on your land after allowing us to install them on your drill.

Tank reinsurance Continued from page 21

panies are pricing their coverage to absorb the worst scenario.

If the customer follows the federal tank technical requirements and the insurance companies have the state financial backing, then the insurance company has reduced its financial risk and premium rates will be much lower for the end user; the customer.

Q. How could I reduce my rates for my tank?

Insurance premiums for underground storage tanks will be based on a wide variety of factors: the age and construction of the tank. the type of monitoring system installed or, in effect, the location of the tank (how much threat is there to wells or the neighbor's property, what type of soil is the tank in?) etc.

If we compare a tank in Ritzville vs. Everett that is the same age and construction, the one in Ritzville will be insured for a lower premium. Since there is less rainfall and different soil conditions, there is less risk of corrosion; there is a lower water table so there is less risk of polluting the water systems by a leak.

There are at least 15 or so factors such as these, that the insurance company will compare. A "bottom line" for the insurance companies is the monitoring systems installed; the better the systems, the lower the premium.

Some other suggestions that would help put the insurance company at ease as to the degree of risk, would be to have the tank registered with the state of Washington, make sure the tank was in compliance with federal requirements, and offer a drawing of the location of the tank as it is on your property and is in relation to wells, your neighbor's property, etc.

Q. How soon will the state start selling insurance?

We should enter into a contract with 2 or 3 insurance companies in July, 1990. They should start writing policies in August and owners will be able to meet their October 16, 1990 deadline of coverage.

Q. What would the new insurance cost?

We won't have exact rate figures until we negotiate with the insurance companies. However, we had an actuarial study done to support a report to the Legislature.

The study showed premium rates that would be approximately 40% to 50% less than owners pay today for less coverage.

For example, if you have a steel, single wall tank that is 10 years old, the study estimated the premium for $1 Million liability coverage to be approximately $400 a year. A tank 16-20 years old could be as high as $1,000 per year for the same coverage.

Q. What if I experience a spill?

This is something no one wants, however, the possibility is definitely there. The area must be cleaned up by proper procedures and the ground restored to acceptable condition.

There is one good note about this -- if there is a spill before the reinsurance program takes effect, and if there is financial hardship, then there is, under the Model Toxic Control Act, state funds available for clean up costs.

If this problem does arise, be sure to call or see me about a solution.

Q. Where is the $875,000 from the state insurance package derived from?

The funds are generated from a "Petroleum Products Tax" which is 1/2 of 1% or .005% tax. The end users of petroleum usually do not see the tax as it is paid to the state after initial refining, or on first entry into the state. The tax is based on the wholesale value of petroleum products.

Q. What is the main issue with insurance coverage?

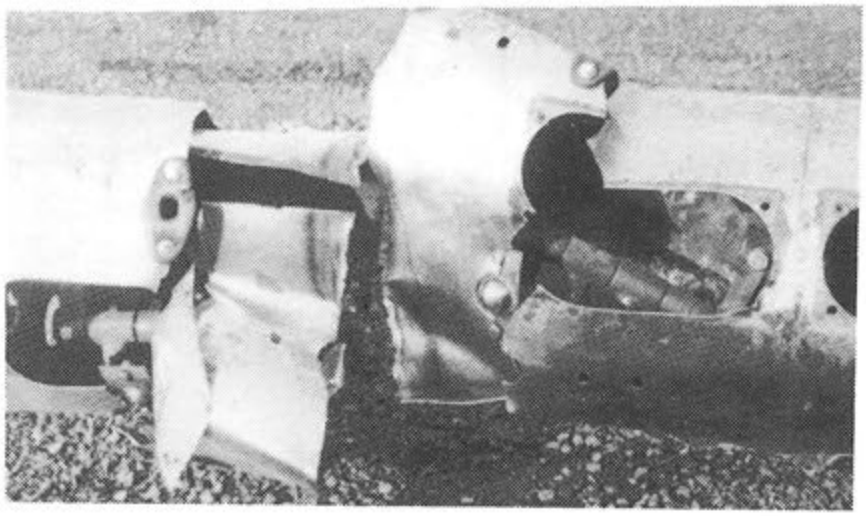
The main issue is: is the tank and its contents a threat to the water system?

Federal law requires that tank owners prove liability coverage for future leaks that may damage the environment, and also cause extensive property damage to you or your surrounding area.

Our program was designed to enable the tank owner to comply with the federal financial responsibility requirements and also allow the owner to make sound business decisions, instead of reach emotional decisions which may have never been necessary in the first place.

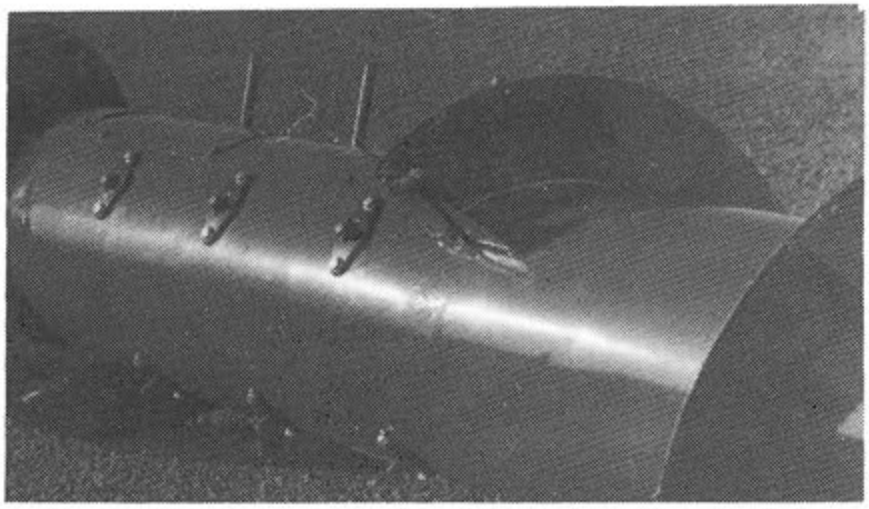
Don't Let A Damaged Finger Section Cost An Arm & A Leg

Damaged Finger Section>



New Auger Cost: $1500 - $2500

Rebuilt Finger Section with 60% heavier tubing for added strength>



Rebuilt Auger Cost: $475 - $575

"We can straighten any auger to within 1/8th inch runout at our shop or in your combine."

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