Tips for Buying a Used Tractor
Michigan State University
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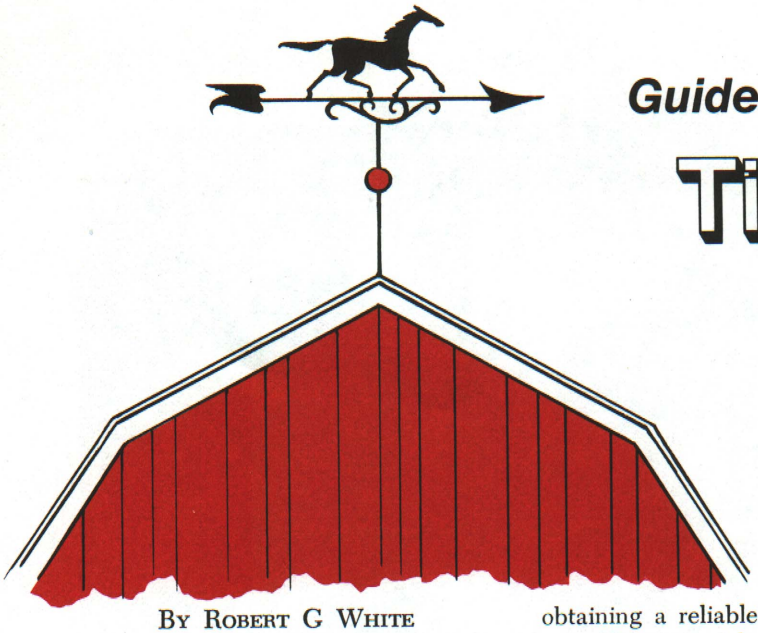

FARMING KNOW-HOW
Guidelines to Better Family Farming

Tips for Buying a Used Tractor

COOPERATIVE EXTENSION SERVICE
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BUYING A USED TRACTOR may be the most economical and practical method of obtaining adequate power for the small farm or part-time farm. It may also be a logical approach to obtaining supplemental power for medium-sized and large-scale farming operations.

A tractor becomes "used" as soon as it is put into service and becomes subjected to wear and deterioration. Proper maintenance and timely repair, however, can keep it in good operating condition for many years. On the other hand, a tractor subjected to abuse and neglect can soon become a poor risk. "Condition," then, becomes an important factor for the prospective buyer to look into when entering the used tractor market.

There is no way of being absolutely certain of the condition or dependability of a used tractor. One important factor is to attempt to determine why the unit is for sale. A used tractor is usually put on the market for one of two reasons: (1) it no longer has the dependability required by the owner; or (2) it no longer fits into the pattern of operation required by the owner, even though it may be reasonably dependable. The degree to which the first reason is present signals caution. Genuinely good buys are more apt to occur when the tractor is being sold for the second reason.

Basically, there are four common sources of used tractors. Obviously, some afford a better opportunity for obtaining a reliable tractor than others. No potential source, however, should be overlooked. The principal sources are:

1. a local farm machinery dealer;
2. a friend or neighbor;
3. a farm auction or dispersal sale; or
4. a commercial farm machinery auction.

For the inexperienced buyer, dealing through a reputable local farm machinery dealer is undoubtedly the safest route. The dealer may have two or more units to choose from, will frequently have some knowledge of the history of the tractor, and will have the facilities for assisting in checking it out and for giving it any presale or postsale servicing or reconditioning that may be needed or agreed upon. He is also always there in the community to back up any guarantee or warranty given.

Buying from a friend or neighbor is usually not a high-risk undertaking. In most cases the buyer will have some prior knowledge of, and some degree of confidence in, the integrity of the seller. Here again, much information relative to the history of the machine can be obtained from the seller.

Good buys can sometimes be picked up at farm auctions or dispersal sales. Unfortunately, there is usually little opportunity to more than casually inspect the tractor prior to the auction, and sales are usually "final," and on an "as is" basis. If you are seriously considering bidding on a tractor advertised for a farm sale, plan to visit the sale site a day or two in advance and thoroughly inspect the tractor while there is less rush and confusion. This can greatly reduce the probability of overlooking a potential problem.

Buying at a commercial farm machinery auction is probably the most hazardous of all. Commercial auctions are designed for high-speed, high-volume selling, and most of them are geared more specifically to the needs of dealers and wholesalers. It is a rather fast pace for the occasional buyer to step into.

PINPOINTING REQUIREMENTS

Before starting to look for a used tractor, take time to pinpoint the requirements you expect the machine to fulfill. This will save time, will help to avoid misunderstandings between the buyer and seller, and should quickly eliminate unsuitable units from consideration. Some of the more important points to consider are:

1. **Price limitations:** Are you in a position to pay several thousand dollars for a late-model tractor, or is there a limit to the amount you can spend?
2. **Dependability:** Is "like new" dependability really needed, or would an older but reasonably dependable unit be satisfactory? A high degree of dependability and low price do not normally go hand-in-hand.
3. **Hitching system:** Is the tractor hitching system compatible with the implements already on the farm? Will the tractor be used primarily with pull-type, fully mounted, or semimounted implements? If fully mounted, or semimounted, is a category I, II, or III hitch needed? Remember, there *may* be some difficulty en-

countered when attempting to hitch one make of fully mounted equipment to another make of tractor, particularly with older models.

4. **Tractor size:** How large a tractor do you really need? Two-plow? Three-plow? Four-plow? Could a slightly larger but older tractor be satisfactorily substituted, thereby somewhat offsetting less dependability with more size?
5. **Horsepower:** Don't be confused by "horsepower" terminology. A "100-horsepower" tractor means that 100 pto horsepower is available at the power-takeoff outlet. This in no way represents the drawbar horsepower available for operating pull-type or tractor-mounted implements. Roughly speaking, you should never expect to use more than 65 to 70 percent of the maximum observed pto horsepower for continuous drawbar application. Try to match tractor power to the power requirements of implements already on the farm.
6. **Brand name preference:** If you have strong preferences for certain brand names, go to those dealers first. You should not, however, be overly committed to one brand name when looking for a used tractor.

EVALUATING A USED TRACTOR

In evaluating a used tractor, follow an organized procedure to be sure you overlook nothing important. It is a good policy to divide evaluation into two stages: (a) external evaluation, and (b) internal evaluation.

Any evaluation will, at best, be on a relative basis. Higher standards must obviously be used for evaluating a late-model tractor than would be used for an older unit.

External Evaluation

First, give the tractor a quick overall visual inspection, making mental notes of items that should have further examination. Then make a detailed inspection, including at least the following items:

1. **Grease or oil leaks:** Check all shafts, bearings, seals, gaskets, etc., for evidence of external leaks. If any are present, try to determine if they are major or minor. Dust accumulations over old grease spots generally are not indicative of a major problem. Fresh grease spots, particularly larger ones, and grease spots on the floor under the tractor justify detailed investigation (Figure 1).
2. **Engine block and cylinder head:** Examine the engine block and cylinder head for external cracks or freezing damage. Many minor cracks can be repaired and will cause no further trouble. Major damage is difficult to repair, and always affords the opportunity for future trouble. There is also always the possibility that internal damage may have occurred.
3. **Cooling system:** Examine the cooling system for evidence of leakage or overheating. Also, look for evidence of repair to the radiator core. Metal surfaces will usually show signs of stains caused by coolant leakage. Look for evidence of engine overheating. Stains around the radiator fill cap or overflow tube are indicators. Also, check air passages through the radiator core for blockage with trash, bugs, etc. This contributes to overheating, and may be difficult to remove. Remove the radiator cap and look for excessive mineral deposits inside the top tank. This may indicate the need for a complete commercial radiator flushing and cleaning.
4. **Frame and castings:** Examine the transmission and final drive housings and other tractor frame components for evidence of cracks, welds, etc. Welds in major casting or frame components indicate that the tractor has had some rough treatment.
5. **Tires:** Tires wear with use and eventually have to be replaced. As tire wear increases, slippage also increases when the tractor is under load. Examine tires carefully for cuts, bruises, sidewall or radial cracks, etc. Cuts or cracks that expose tire cords can cause rapid tire deterioration.
6. **Wheels:** Examine wheels, hubs, and rims for evidence of damage. Inspect wheel tread adjustment systems to be sure they are in working condition. Stand behind the tractor as it is being driven

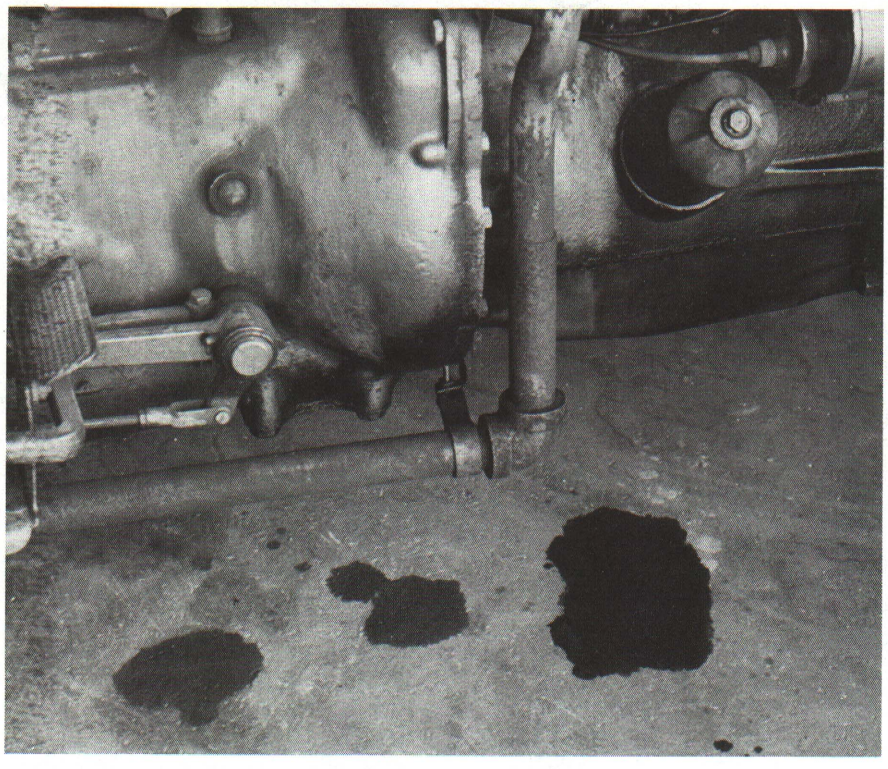

Fig. 1 — Don't overlook fresh grease spots on the floor under the tractor. They could be a trouble symptom.

away from you, and watch for wheel wobble. Wheel wobble strongly suggests a sprung wheel, rim, or axle.

7. **Protective shields and guards:** For your own protection and the protection of others, be sure that all protective shields and guards are in place and in good operating condition. Check in particular to see that the master shield for the pto stub is in place. Also, be sure that all decals that include operating instructions and safety warnings are present and ligible.
8. **Rollover protection:** Protective cabs or rollover frames and seat belts are always desirable, particularly if the tractor is to be operated by inexperienced people or hired help. With very few exceptions, all tractors manufactured *after October 25, 1976,* are required by OSHA regulations to be equipped with rollover protective devices *IF* the tractor is to be operated by hired help. (This is not mandatory if the tractor is operated exclusively by the owner or his immediate family.) See MSU Department of Agricultural Engineering publication AEIS No. 288, "OSHA Standard on Rollover Protective Structures for Farm Tractors," or later publications as they may become available.
9. **Paint:** A good paint job with new identifying decals will enhance the general appearance and sale of most used tractors. The paint job alone, however, adds nothing to the dependability of the tractor. A sloppy paint job or indications of poor preparation for repainting might be taken as a warning signal.
10. **General:** Make a second inspection of the general appearance of the tractor. Do the ignition system and electrical system wiring harness appear to be intact and in good shape? Do the hours of use, as shown on the tractor hourmeter, appear to agree reasonably with the stated age and the general appearance of the tractor? Does there appear to be any reason to question the stated age of the tractor? If so, check the tractor serial number against the manufacturer's list of serial numbers by year of manufacture. All reputable dealers will have this listing, at least for their own line of tractors.

Internal Evaluation

Detailed internal evaluation of a used tractor is difficult, and at best can only give indications of actual internal conditions. A number of checks, however, can be made which will provide a prospective buyer with some means of making an educated guess as to the actual internal condition of the several component parts. The checks and tests discussed in the following paragraphs should preferably be investigated in the order listed.

1. **Thermostat:** The function of the thermostat is to prevent the cooling liquid from circulating through the radiator until the engine block has become completely warmed up. To check the thermostat, start the engine when cold, and run at a fast idle. Immediately remove the radiator cap and look for turbulence in the cooling liquid. If cooling liquid is being pumped directly to the top of the radiator when the engine is cold, it is indicative that the thermostat is stuck open, or has been removed. An open thermostat will cause slow engine warmup, excessive engine wear, and higher fuel consumption. If the thermostat has been removed, it may indicate a history of engine overheating.
2. **Transmission lube contaminants:** Transmission lubricants slowly become contaminated with metal particles worn from transmission gears and bearings. To check this, remove the transmission drain plug and drain approximately one-half pint of lubricant into a clean glass container. Add about a quart of diesel fuel or petroleum solvent to the sample and stir until thoroughly mixed. Then place a magnet in the diluted mixture and stir for 15 to 20 seconds. A small amount of metal particles adhering to the magnet is reasonably normal. **A large amount indicates transmission wear and probably a need for a drain and refill.** The presence of metal chips and broken particles (Figure 2) indicates the possibility of chipped or broken gear teeth or damaged bearings. This could be serious.

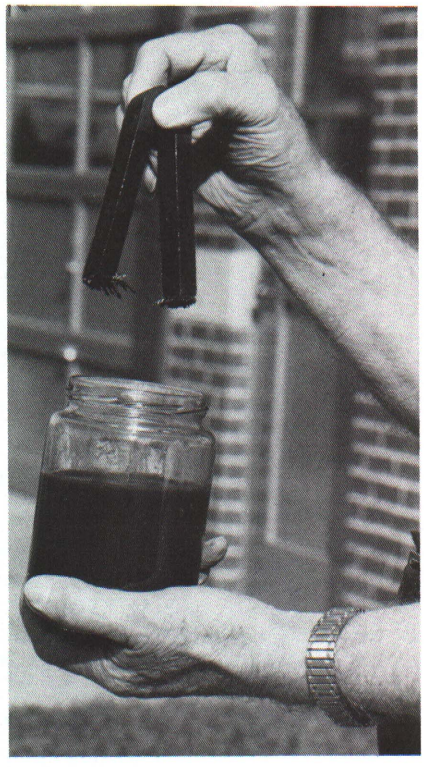

Fig. 2 — There may be a serious problem if a magnet pulls metal chips and particles from a sample of transmission lubricant.

3. **Engine and transmission noises:** Start the tractor engine and let it warm up thoroughly. Listen for knocking or other unusual sounds at idle speed. Accelerate the engine rapidly to full throttle several times. Is acceleration smooth and positive? Let the engine operate at full governed rpm briefly. Again, listen for unusual engine sounds. Remember, diesel engines are noisier than spark ignition engines and may tend to knock on acceleration.

   Check clutch operation, and operate the tractor in an open area, shifting through each gear. Shifting should be smooth and easy. Be sure to follow instructions in the *Operator's Manual.*

Many manual tractor transmissions are *NOT* designed to shift on-the-go.

4. **Exhaust smoke:** Look for blue or black smoke, both when starting up and accelerating the engine. Blue smoke indicates oil burning, while black smoke indicates an overrich operating mixture for a spark-ignition engine, and possibly faulty combustion for a diesel engine.
5. **Batteries:** Tractor batteries, like car batteries, do not normally last the life of the tractor. Larger tractors, particularly diesels, may have two or more 12-volt batteries. Have a dealer service representative check the specific gravity and voltage of each battery cell. The specific gravity reading will indicate the degree of charge in each cell, and a low voltage reading will indicate a weak or possibly dead cell.
6. **Air cleaner:** Many older tractors will be equipped with oil-bath air cleaners, while more recent models will probably have dry-type cleaners. With the oil-bath cleaner, remove the oil cup and examine its contents. A low oil level or more than a quarter of an inch of dirt and sediment in the bottom indicate service neglect. With the dry-type cleaner, excessive dust and dirt in the filtering element also indicate service neglect. Obvious neglect of the air cleaning system is indicative of poor tractor maintenance.
7. **Engine compression test:** The engine compression test is not infallible, but is a relatively quick method of obtaining considerable information about the internal condition of the engine. Most farm machinery dealers are equipped to run the compression test on spark-ignition engines, but some may not have this equipment for diesels. If a compression test is desired, ask the dealer to have his service representative or mechanic run it for you. A **complete** compression test involves two steps: (1) measuring the compression pressure built up inside the combustion chamber of each cylinder as the engine is being turned over by the starter at normal cranking speed; and (2) adding two to three tablespoons of motor oil (preferably SAE-40) to each cylinder, and then repeating the test. For those not particularly familiar with motor mechanics, a dealer or competent mechanic should be relied upon to interpret test results. The following are some of the factors which may be indicated by an engine compression test:
   a. The relationship between the compression pressures of the engine as tested as compared to the compression pressure specifications for a new engine.
   b. The uniformity, or lack of uniformity, of compression pressures between the individual cylinders of the engine as tested.
   c. A general picture of the wear to cylinder walls, pistons, and/or rings for the engine tested.
   d. The possibility of a burned or damaged valve in one or more cylinders.
   e. The possibility of a blown cylinder head gasket, either between a combustion chamber and the cooling medium or between two adjacent combustion changers.

   Rely on a competent mechanic for an interpretation of compression test results, but remember, only a complete engine teardown can positively substantiate any diagnosis. As a general statement, an engine compression test is more important and more meaningful with a late-model tractor than for very old models.
8. **Dynamometer test:** Most farm machinery dealer shops are equipped with a pto dynamometer for measuring the total pto horsepower output of a tractor. This is an excellent way to determine how nearly a used tractor can come to delivering its original horsepower output. Here again, this test is probably more significant for late-model tractors than for older ones.

SUMMARY

Buying a used tractor is always a somewhat hazardous undertaking, and older tractors are, at best, likely to be less reliable than newer ones. These hazards, however, can be held to a minimum by observing the following recommendations:

1. Buy from a reputable source.
2. The best indication of the condition of a tractor is its history. Find out all you can about its service, performance, and repair history.
3. Don't overrate a new coat of paint. Try to see what it is covering.
4. Check the tractor over carefully. Start the engine and drive it around.
5. Look at more than one tractor, and contact more than one source, if at all possible.
6. Don't be forced into panic buying. Plan ahead, so you have time to shop around.
7. Try to arrange to use the tractor for a few days on a trial basis, with the option of buying it if you are satisfied with its performance.
8. The older the tractor, the less reliability you can expect. Attempt to buy at or near the reliability level you really need.
9. Be cautious of strangers offering a late-model or new tractor at a bargain price — particularly if the deal is for cash. It could be a stolen tractor.
10. Whatever you buy, insist on receiving a copy of the *Owner's Manual* with the tractor. Then be sure to read it!
11. Get any promised warranty or guarantee in writing.

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