



Operator's Manual

Table of Contents

Conventions Used In This Manual.....	3
Cautions and Warnings	3
Recognize Safety Information	4
Follow Safety Instructions	4
Use a Safety Chain	4
Avoid Power Lines	4
Dig Safely.....	5
Avoid Power Lines	5
Remove Paint Before Welding or Heating	5
Store Attachments Safely.....	6
Avoid High-Pressure Fluids.....	6
Check Hoses for Damage.....	6
Observe Maximum Transport Speed	6
Use a Signal Person	7
Pull-Type Plow.....	7
3-Point Plow	8
Hydraulic Valves.....	8
Serial Number.....	9
Tractor Selection	9
3-Point ZD Plow Hookup and Geometry	11
Draft Control Settings	11
Quick Hitch	11
Hydraulics.....	12
Water Level	12
Boot Removal.....	13
Shear Wear	14
Tile Feeder (Optional).....	14
Pull-Type Plow.....	15
Switchbox.....	15
Hydraulic Pressure.....	15
Starting From a hole.....	16
Starting from surface.....	16
Raising Plow	18
Drawbar Placement.....	18
3-Point Plow	18
Starting.....	18
Starting from Hole.....	18
Starting from Surface.....	19
Ending	19
Raising Plow Out of the Ground	19
Using the Gold Digger in the Field.....	19
Incorporating a Second Pull Tractor	20
Pre-Ripping:.....	20
Manual Grade Control:	20
Intellislope GPS Control System:	20

Designing Tile Systems:	21
Frequently Asked Questions.....	23
Down Pressure Manifold Electrical Schematics.....	24
Automatic Grade Control Plow Hydraulic Schematics	25
Manual Grade Control Plow Hydraulic Schematics	26

CONVENTIONS USED IN THIS MANUAL

CAUTIONS AND WARNINGS

The operators manual uses the following text formatting schemes to call attention to information related to simplifying system operation and proper operating practices to prevent accidental data loss. If in doubt about the results of performing an action or deleting an item from the system, back up all system files to the USB external drive prior to proceeding with the action.



DANGER: Indicates an immediate hazardous situation that, if not avoided, will result in death or serious injury.



WARNING: Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury.



CAUTION: Indicates a potentially hazardous situation that, if not avoided, may result in injury. It may also be used to alert against unsafe practices.

CAUTION: Indicates specific instructions to avoid accidental loss of data, system configurations settings, or property damage.

IMPORTANT: Indicates specific settings, calibrations, and procedures that must be followed for proper system performance and operation.

Note: Provides informative tips to assist with system setup, calibration, and operation.



Before using the Gold Digger drainage plow, call (888) 258-0808 (the toll-free national call before you dig number). You need to have a determination made as to whether or not any underground gas lines, electrical lines, fiber optic or normal phone lines, or any other underground object or condition exist in the area you will be running the plow. Have these thoroughly marked and maintain the recommended distance from these areas.

Soil-Max is not liable for any damages or injury which may result from contact with any above ground or underground object.

CALL (888) 258-0808 BEFORE YOU DIG!

RECOGNIZE SAFETY INFORMATION



- This is a safety-alert symbol. When you see this symbol on your machine or in this manual, be alert to the potential for personal injury.
- Follow recommended precautions and safe operating practices.

FOLLOW SAFETY INSTRUCTIONS



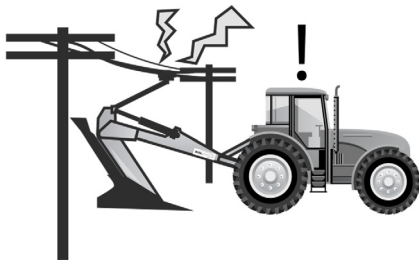
- Carefully read all safety messages in this manual and on your machine safety signs. Keep safety signs in good condition. Replace missing or damaged safety signs. Be sure new equipment components and repair parts include the current safety signs. Replacement safety signs are available from your dealer.
- Learn how to operate the machine and how to use controls properly. Do not let anyone operate without instruction.
- Keep your machine in proper working condition. Unauthorized modifications to the machine may impair the function and/or safety and affect machine life.
- If you do not understand any part of this manual and need assistance, contact your dealer.

USE A SAFETY CHAIN



- A safety tow chain will help control tile plow should it accidentally separate from the vehicle.
- Using the appropriate adapter parts, attach the chain to the anchor location. Provide only enough slack in the chain to permit turning.

AVOID POWER LINES



- Serious injury or death can result if tractor, loader, or plow contacts electric lines.
- Check height clearance before raising plow.
- Do not leave the operator's seat if any part of the plow contacts power lines.

DIG SAFELY

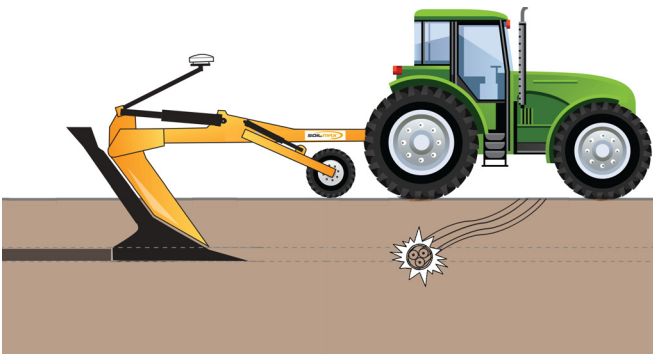
CALL (888) 258-0808 BEFORE YOU DIG!



- Before digging, check location of cables, gas lines, and water mains.
- Do not leave the operator's seat if any part of the plow contacts cables.

AVOID POWER LINES

CALL (888) 258-0808 BEFORE YOU DIG!



- Running the tile plow through gas, electric, or water lines can cause serious injury or death to you or others. Always contact local utility companies to mark off gas, electric and water lines prior to tiling a field.
- Locate Pipes And Cables Before Tiling.

REMOVE PAINT BEFORE WELDING OR HEATING



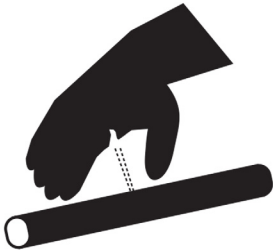
- Avoid potentially toxic fumes and dust.
 - Hazardous fumes can be generated when paint is heated by welding, soldering, or using a torch.
 - Remove paint before heating:
 - Remove paint a minimum of 100 mm (4 in.) from area to be affected by heating. If paint cannot be removed, wear an approved respirator before heating or welding.
-
- If you sand or grind paint, avoid breathing the dust. Wear an approved respirator.
 - If you use solvent or paint stripper, remove stripper with soap and water before welding. Remove solvent or paint stripper containers and other flammable material from area. Allow fumes to disperse at least 15 minutes before welding or heating.
 - Do not use a chlorinated solvent in areas where welding will take place.
 - Do all work in an area that is well ventilated to carry toxic fumes and dust away.
 - Dispose of paint and solvent properly.

STORE ATTACHMENTS SAFELY



- Stored attachments can fall and cause serious injury or death.
- Securely store attachments to prevent falling. Keep playing children and bystanders away from storage area.

AVOID HIGH-PRESSURE FLUIDS

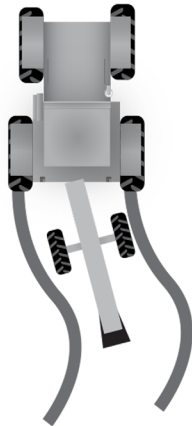
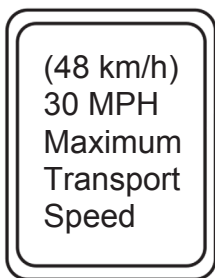


- Escaping fluid under pressure can penetrate the skin causing serious injury.
 - Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure.
 - Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.
- If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A.

CHECK HOSES FOR DAMAGE

- Hydraulic hoses can fail due to physical damage, kinks, age and exposure.
- Check hoses regularly.
- Replace damaged hoses.

OBSERVE MAXIMUM TRANSPORT SPEED



- The maximum transport speed for the tile plow is 48 km/h (30 mph). Some tractors are capable of operating at speeds that exceed the maximum transport speed of the tile plow. Regardless of the maximum speed capability of the tractor being used, do not exceed the implement's maximum transport speed.

Exceeding the plow's maximum transport speed can result in:

- Loss of control of the tractor/implement combination
- Reduced or no ability to stop during braking
- Implement tire failure
- Damage to the plow's structure or its components

Use additional caution and reduce speed when towing under adverse surface conditions, when turning, and when on inclines.

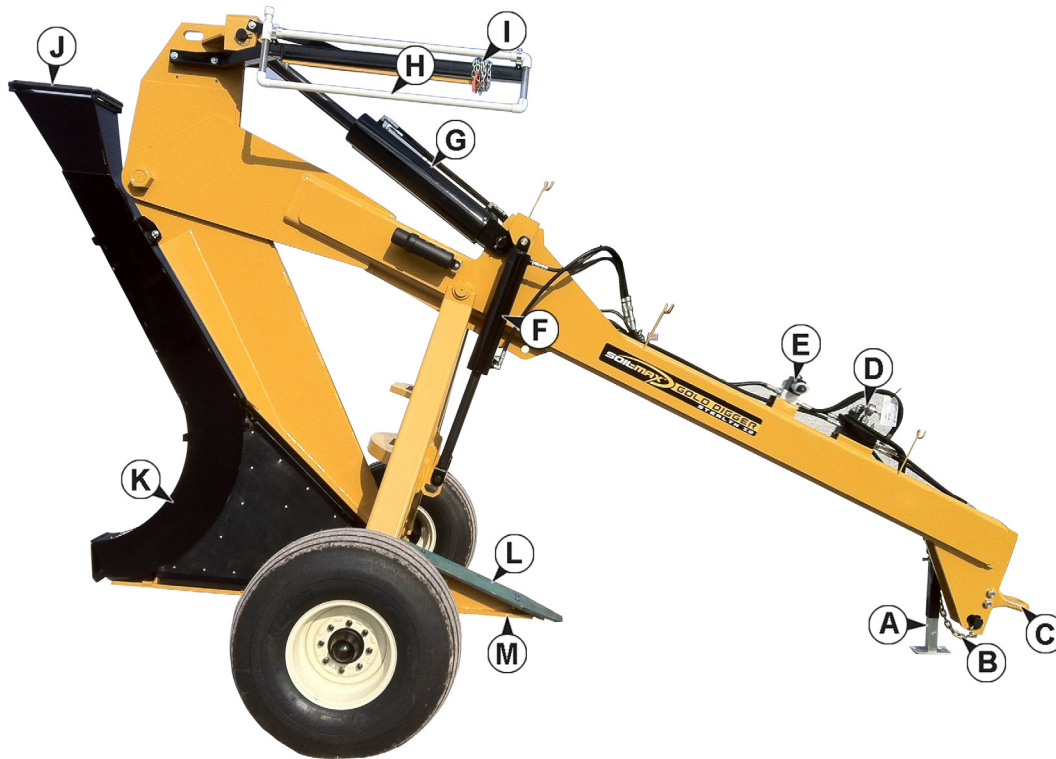
Do not transport the plow with a vehicle weighing less than 2/3 the weight of the plow. Only tow with a properly ballasted vehicle.

USE A SIGNAL PERSON



- Use a signal person to direct movement of the tractor/fertilizer cart combination, whenever the tractor operator's view is obstructed.
- Designate one individual as THE signal person. Always have signal person stand in clear view. Be sure signal person stays a safe distance away from the machine when it is moving.
- Prior to starting the tractor, discuss hand signals and what each signal means to avoid misunderstandings and confusion which could result in a serious injury or fatal accident for someone.
- Keep all bystanders away whenever the machine is moved.

PULL-TYPE PLOW



- A. Jack
- B. Tractor Assist Pull Pin
- C. Hitch
- D. Down Pressure Manifold
- E. Proportional Valve
- F. Lift Cylinders
- G. Pitch Cylinders
- H. Water Level
- I. Depth Chain
- J. Tile boot rollers
- K. Removable Boot
- L. Shear
- M. Heel

Plow Shear Sizes and Dimensions

Plow Shear Size	Length (inches)	Width (inches)
4	38	7.5
6	38	9.5
8	38	12
10	38	14

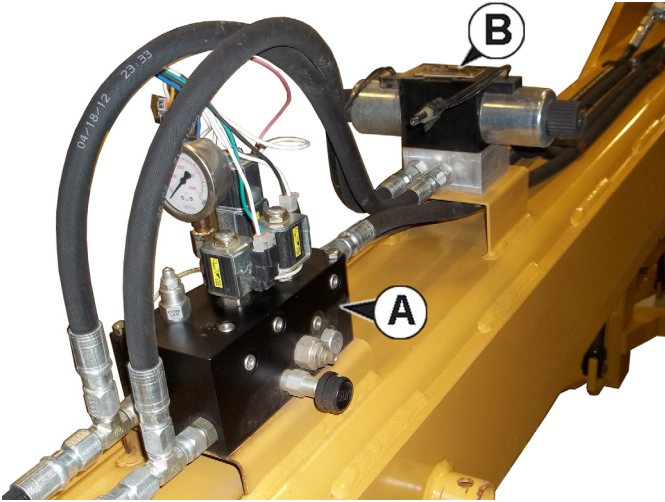
- Note: use 4" shear to install 3" tile

3-POINT PLOW



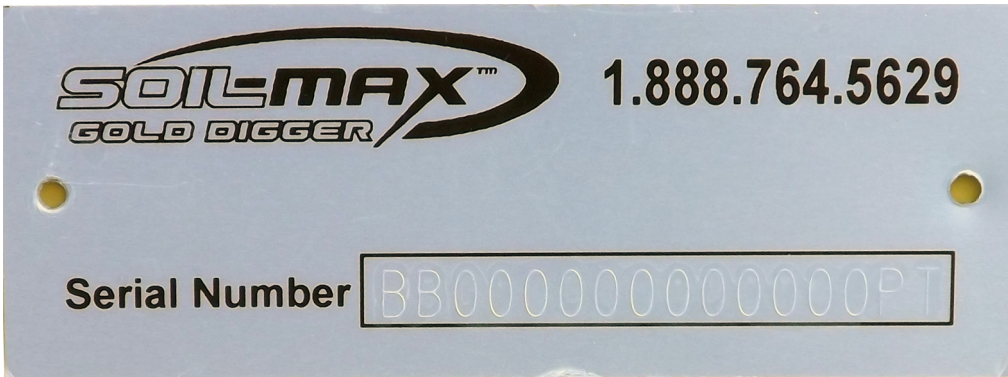
- A. Stands
- B. Proportional Valve
- C. Pitch Cylinder
- D. Depth Chain
- E. Water Level
- F. Tile Boot Rollers
- G. Removable Boot
- H. Shear
- I. Heel

HYDRAULIC VALVES



- A. Down Pressure Manifold
(Pull Type Plows Only)
Controls Plow Wheels
- B. Proportional Control Valve
Controls Plow Shank Pitch

SERIAL NUMBER



My Serial Number: _____

TRACTOR SELECTION

Horsepower is not the only thing to consider when selecting a tractor for the plow. - a lower horsepower tractor, properly weighted, may be able to do the job to your satisfaction. Generally, a tractor weighted to 24,000 lbs. or more can pull the plow very well in good soil conditions. You must also consider:

- weight of the tractor
- tire wear
- type of tire (radial or bias)
- height of the tires

If you are using the plow in good, dry soil conditions, it may be best to pull the plow without duals on the tractor. This will allow all of the weight of the tractor to be transferred to a smaller surface area. However, in less than ideal conditions, where the surface of the ground is slick or sticky, duals may enhance traction. We do not recommend pulling the plow in very muddy conditions as this will probably make your tiling job very frustrating and may cause compaction problems.

The chart below will help you decide what tractor to choose based on the depth you want to pull. The depths are based on a 4 in boot. Every boot size increase such as 4 in to 6 in will reduce these numbers by roughly 20%

Typical Tile Plow Depths 4in Boot (Normal Conditions)

Tractor Weight (Lbs.)	Plow Depth 1 Pass	Plow Depth 2 Pass
20000	3.5 to 4 ft	4 to 4.5 ft
24000	4 to 4.5 ft	4.5 to 5 ft
30000	4.5 to 5 ft	5.5 to 6 ft
36000	5.5 to 6 ft	6 to 6.5 ft
40000	6.5 to 7 ft	7 ft

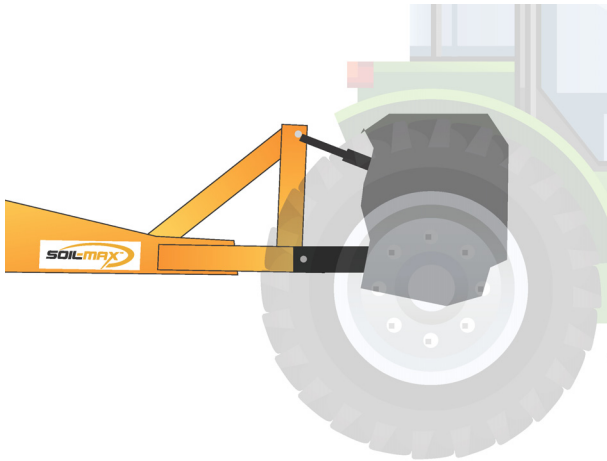
Depth Factors	Rating	Comments
Radial Tires	Increase 5%	
Tall 42" or 46" Tires	Increase 10%	Tall Helps
Tire Pressure	Increase 5%	Keep Under 15 lbs
Tire Lug Type	Increase 5%	We like big Lugs!

3-POINT ZD PLOW HOOKUP AND GEOMETRY

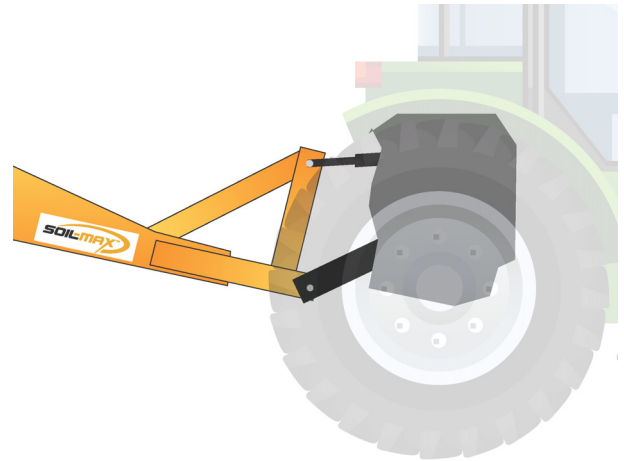
3-point plow hookup is a Category III or IV attachment. Attachment to a Category IV 3-Point hitch is possible with the use of CAT III to CAT IV bushings. All pins and hardware come with the plow.

Adjusting the top link is very important. The ideal appearance of the 3-point arms should be as shown.

Correct



Incorrect



Attach the top link to the bottom or lowest mounting hole on your tractor and the highest hole you can reach on the plow. Keeping an upward angle on the top link is critical.

Please use the top hole on the plow for attaching the top link if possible.

CAUTION: Be careful when lifting the plow the first time. On some tractors the top link may be too short and may actually hit part of the tractor when the plow is raised.

We offer John Deere Top Link Spacers for John Deere 30 to 60 series tractors that may have this issue. The spacers extend the top link out 3" farther from the tractor. The top link must be adjusted so that the shoe of the plow does not drag the ground when the plow is lifted. However, it is important that the bottom of the shoe is not any higher than 12 inches from the ground when the plow is completely lifted.

A Top Link Adapter is available for Case tractors with the knuckle on the top link.

You may also need to adjust the top link when you drop the plow into the first tiling run if the 3 point arms do not allow it to go deep enough. You will want to make sure the two lower arms are locked so that they do not float within the lift arm.

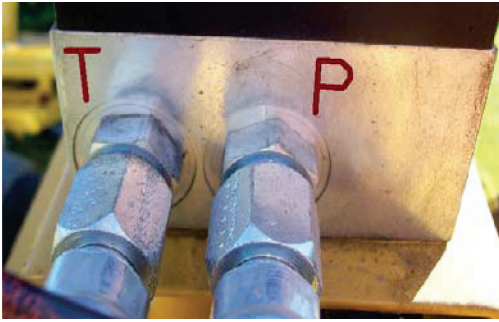
DRAFT CONTROL SETTINGS

The 3-point hitch needs to float for the plow to work properly. Refer to your tractor's owner's manual or dealer for instructions.

QUICK HITCH

IMPORTANT: DO NOT Use a Quick Hitch with the Gold Digger ZD 3-Point Hitch Model Tile Plow unless the Quick Hitch Adapter (available through Soil-Max) is installed on the quick hitch. Without the Quick Hitch Adapter, the geometry needed for the plow to be lifted out of the ground and go down far enough to reach the plow's potential is not achievable with a quick hitch.

HYDRAULICS



The plow will come standard with pioneer hydraulic fittings. You will only need one set of hydraulic outlets. Make sure you connect to the tractor's primary hydraulic remote. This remote will need to have its hydraulic flow (speed) turned up all the way if possible.



Hydraulic fluid direction is important. In the front of each of the valve bodies is the letters "P" and "T". "P" is for Pressure and "T" is for Tank. Note: If the fluid is in the wrong direction, the valves will not work correctly.

Tie up all hydraulic hoses and take care to remove any dirt from tractor remote connections and pioneer fittings prior to connection with tractor remotes. Valve tolerances are very tight and debris can cause malfunction of valves.

WATER LEVEL



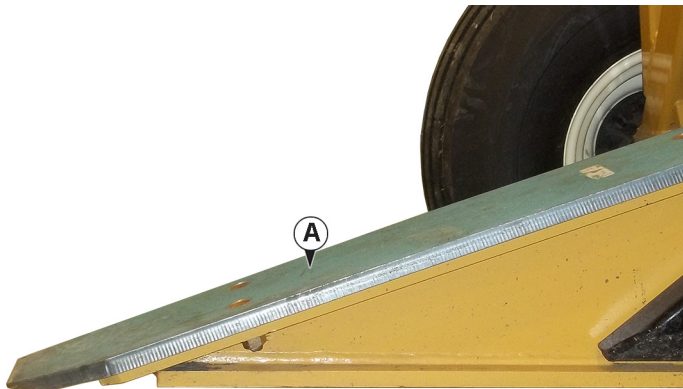
Once you have the plow attached, lower it onto a flat surface. Using a level placed alongside the shoe of the plow, adjust the pitch/angle of the plow until the bottom of the shoe is level.

Once the plow has been leveled, fill the Pitch Gauge with anti-freeze to the thick graduation where the red and green marks meet. This mark represents the shoe being level (0% slope). You will need to check this again in one hour or so as the baffle in the water level may soak up some amount of anti-freeze.

BOOT REMOVAL



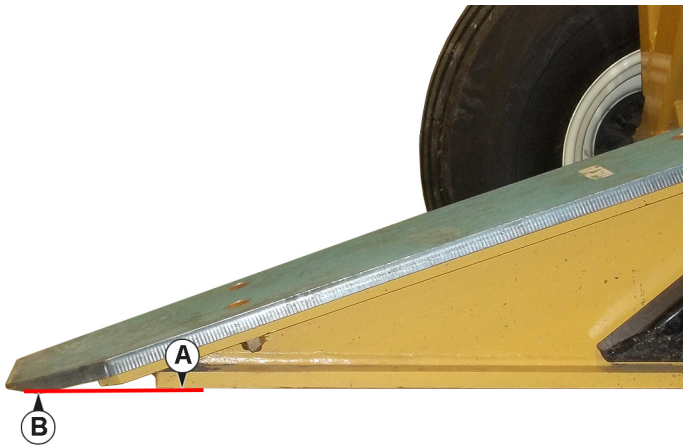
1. Properly support funnel (B).
2. Remove bolt (A) and remove the funnel (B).
3. Remove bolt (C) and the poly shields (D) on either side of the plow.



4. Each size of boot has a corresponding shear (A). Remove and replace with the proper size shear.

Installation is the reverse of removal.

SHEAR WEAR



Over time, the shear will wear on the cutting edge. Gauge wear by placing a straight edge on the bottom of the cutting edge (A) of the plow. The shear (B) should be 1/8-1/4 inch below the heel (A). If it is less, replace the shear. Failure to replace the shear could result in adverse effects to the grading of the plow and excessive wear to the heel/bottom of the plow.

TILE FEEDER (OPTIONAL)



The optional tile feeder is a great addition to any plow. It is not required but is a great reassurance of tile quality. The tile feeder simply pushes on the tile to ensure no stretch is occurring.

Hydraulic fluid direction is important to correct operation. Take note of the direction the wheel turns; the wheel should turn toward the plow. If reverse direction, change the direction of the fluid detent.



The hydraulic flow to the feeder should be slowed to reduce torque. When the plow stops, the feeder should stop. The feeder is for assistance only not to rub and harm tile. If it's not possible to adjust or slow the hydraulic flow, user should be ready to change the switch from "on" to "off" to stop the feeder. See the picture below of the control box. Turn the dial to adjust the speed and move the switch for on/off of the feeder.

The tile feeder mounting brackets have three adjustments. Adjust the feeder to give just enough tension on the spring to keep the tile in the wheel without the tire. The hinge points of the tile feeder should be adjusted to an easy entry for the tile. Once adjusted, tighten to restrict movement.

PULL-TYPE PLOW

The wheels will not operate correctly if the tractor remote is detented (engaged) in the wrong direction. The down pressure manifold has TANK and PUMP marked on the ports in the front of the valve. The hose connected to the PUMP port should be stiff with pressure when detented (engaged) correctly. Hydraulic Flow Only Goes One Way

SWITCHBOX

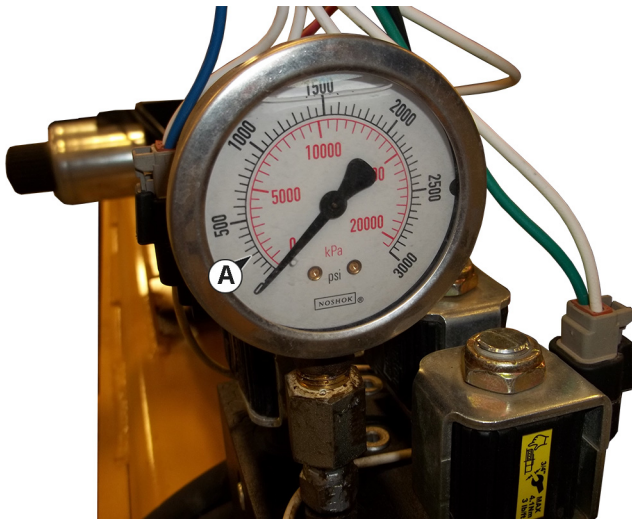


The instructions in this section pertain to how you operate the wheels on a pull-type Gold Digger plow. The wheels are operated by the black switchbox.

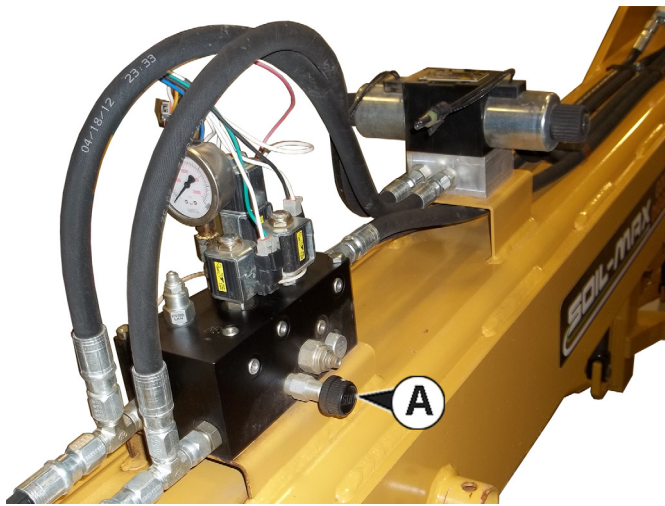
The switch marked "PLOW" operates the wheels. When tiling this switch is only used to lower the plow into the start position and pick the plow up after it has been steered to the top of the ground with the 6" grade control cylinders.

The plow must be brought to the surface of the ground by pitching it UP with the 6" cylinders BEFORE it can be raised up off the ground with the wheels.

HYDRAULIC PRESSURE

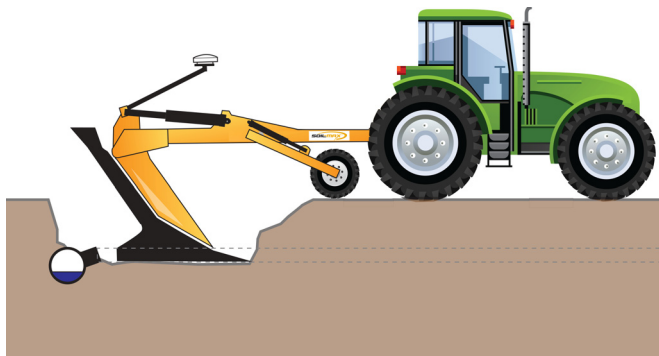


The "float" switch lowers the hydraulic pressure to the tires to around 200 psi.

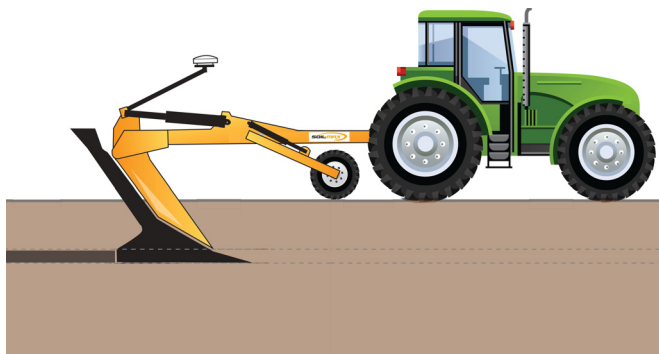


If you have more than 200 psi, turn the round knob (A) on the left side of the down pressure manifold as shown in the illustration counterclockwise to lower pressure. The float switch must be on to adjust the pressure. If you need more pressure on the wheels turn the round knob clockwise. The plow must have enough pressure to provide vertical stability for the plow, without so much pressure that the tires pull the plow off grade when going over humps.

STARTING FROM A HOLE



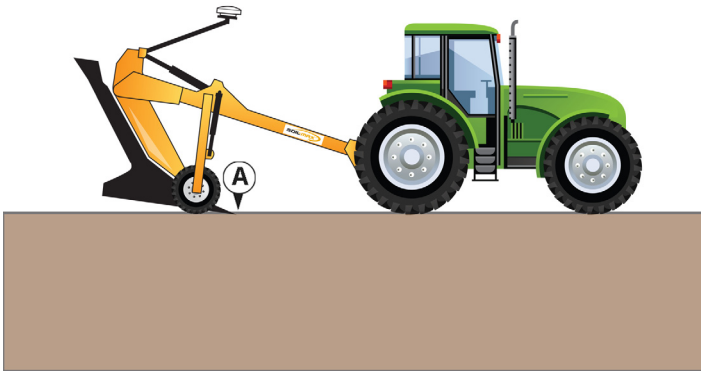
1. With float mode off, lower plow into starting hole with plow switch.
2. Pull the shear into the soil about 2 feet, turn on the float switch, pressure gauge should drop to 200 psi.



3. Install tile with float switch on.

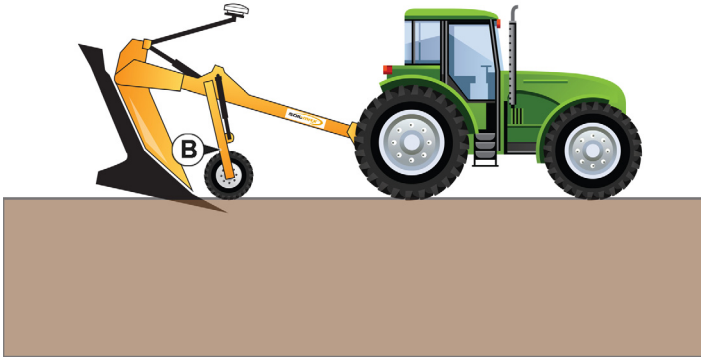
STARTING FROM SURFACE

If using the plow in conjunction with the Intellislope, or Ag Leader Integra control system, use the manual up/down settings to pitch Up or Down for processes below. When at the end of a tile installation, you will need to end the installation to get access to the controls needed. Refer to Operators manual for more instructions.



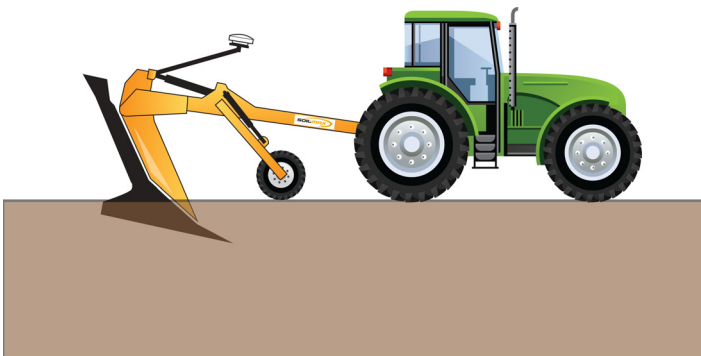
1. With float mode off, lower plow to the surface of the soil with plow switch.

(A) Tip is being lowered to soil surface (wheels still in transport mode)

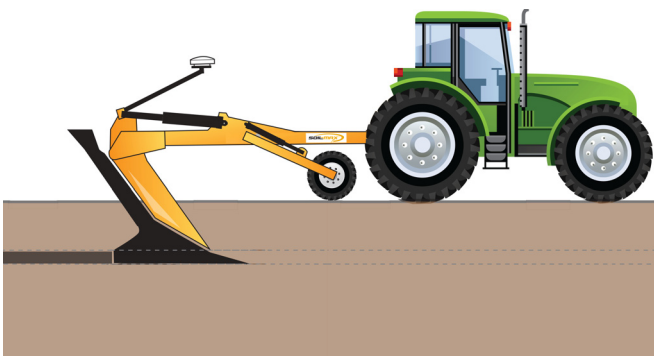


2. Pull the shear into the soil about 2 feet, turn on the float switch, pressure gauge should drop to 200 psi.

(B) wheels are being pulled forward to allow the plow to sink into the ground

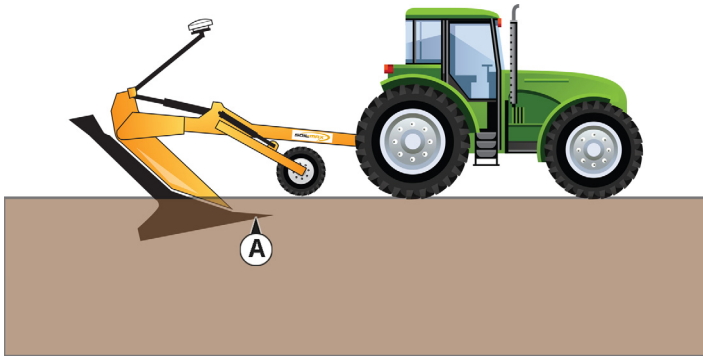


3. Allow plow to work its way to proper depth using the pitch/angle of the plow to draw it into the soil.



4. Install tile with float switch on.

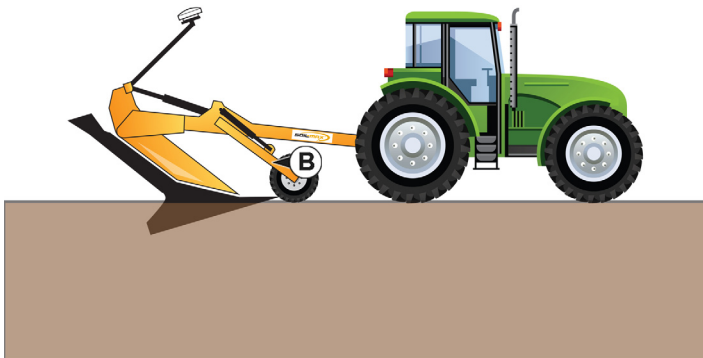
RAISING PLOW



1. When done installing, pitch the plow up with the large 6" cylinders on top.

(A) plow shank is angled up

Warning!!! DO NOT use the wheel lift to try and raise the plow out of the ground until the tip is nearly out of the ground.



2. Pull forward 6 to 8 feet

3. Turn Float Switch off and raise the plow with the PLOW switch.

(B) wheels going back to transport position

Caution: if plow emerges completely and the wheels are still in float, plow may become unstable. It is recommended as the tip of the plow emerges, to use the wheel lift to raise the rest of the way out of the ground

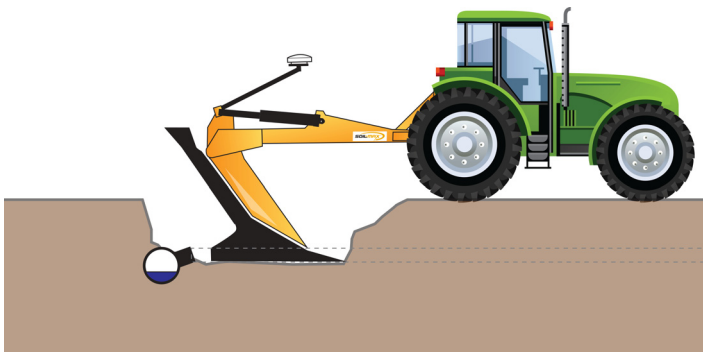
IMPORTANT: Do not attempt to raise plow out of the ground using the wheels. Using the wheels to raise the plow out of the ground creates excessive stress on the frame and can damage plow. Plow must be raised out of the soil by pitching the plow and allowing the plow to work its way to the surface.

DRAWBAR PLACEMENT

When attaching a Gold Digger Pro Pull-Type plow to your tractor's drawbar, please be sure that the drawbar is pulled in as close to the tractor as possible to avoid breaking or damaging the drawbar. This is especially important on smaller front wheel assist tractors.

3-POINT PLOW

STARTING



Starting from Hole

Lower plow into starting hole with 3-point hitch.

Pull the shear into the soil.

Once the plow is in the soil, 3-point hitch should be set to float. When installing tile, the depth of the plow is determined by the plow's pitch which is set by the plow's 6" cylinders.



Starting from Surface

Nose into the ground and slowly pull forward.

As you pull forward and the plow engages the soil, place the 3-point into "float" on the tractor to allow the plow to sink into the ground."

The depth of the plow is determined by the plow's pitch which is set by the plow's 6" cylinders.

ENDING



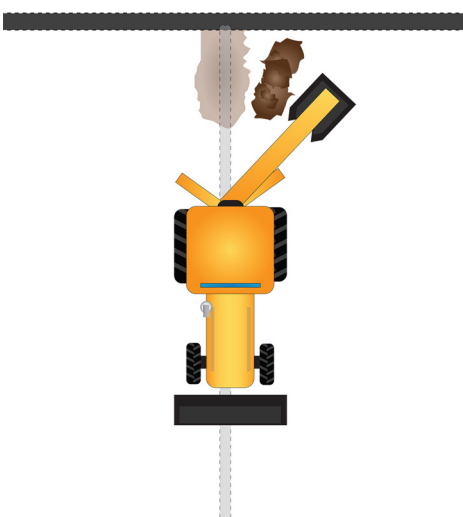
Raising Plow Out of the Ground

After the tile has exited the back of the boot, pitch the plow up to come out of the ground, and pull forward.

When the tip of the plow starts to emerge from the ground, take the 3-point out of float and raise the 3-point to lift the plow to transport position.

WARNING: DO NOT use the 3-point to try to lift plow when in the ground!!! Using the 3-point to raise the plow out of the ground creates excessive stress on the frame and can damage plow or tractor. Plow must be raised out of the soil by pitching the plow and allowing the plow to work its way to the surface.

USING THE GOLD DIGGER IN THE FIELD



Tile runs will need to be started at the desired tile depth in a "start hole" or if possible from a drainage ditch. You will usually install the tile up slope from the start hole. The hole must be long enough to accommodate the whole plow shoe and make a connection if needed. Lower the plow down into the hole resting on the bottom. Insert the tile into the boot and feed it through and out the backside. You can make any connection to an existing tile or main now or after the tile has been installed. Either lower the 3-point arms all the way down or swing the wheels forward on a pull-type so that the full weight of the plow is resting on the shoe (again make sure the 3-point draft control is turned off). Someone (or something) will need to stand on the end of the tile until the plow has installed 10-15 feet of tile. In most cases you will want to travel at a speed of about 1 – 1.5 mph when installing tile depending on the depth and soil conditions. You will need to give the ground time to up heave as you are moving forward. You will actually have

better pulling efficiency at slower speeds. Your tractor may only need to be at half or two-thirds (1000-1500 rpm) throttle in first or second gear.

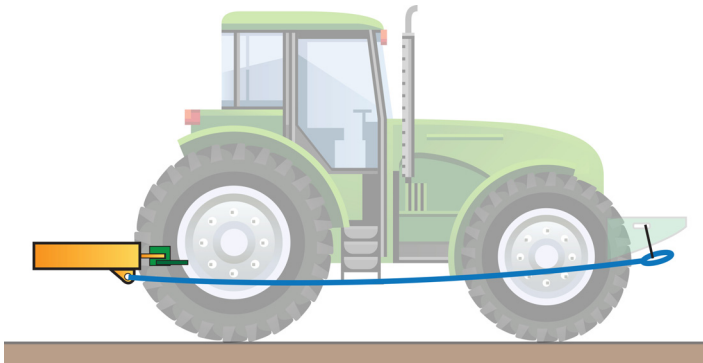
WARNING: Never use 3 point hitch or wheels to pull directly out of the ground. Damage may occur to tractor or plow.

INCORPORATING A SECOND PULL TRACTOR



At times, due to field conditions, there will be need for a second pull tractor.

When using a second tractor, it's important to have the tow rope or cable placed in the correct position. Always pull the plow from the built-in pull hooks.



Failure to pull from the correct position could result in tractor damage. Permanently install cable/tow rope under the tractor and hook to front weights for easy use and availability.

PRE-RIPPING:

Depending on the soil conditions and tractor weight (traction), you may need to pre-rip once through with the plow at approximately one-half to two thirds the desired installation depth. This is very helpful in rocky conditions as you will discover many rocks before installing tile. Digging the rocks is much easier without tile in the way. This would be a dry run to loosen up some of the soil so the plow can be pulled easier when the tile is being installed. You may be able to pre-rip at 3 or 3.5 MPH. the maximum pre-rip depth should be at least 12 or more inches above your desired installation depth.

MANUAL GRADE CONTROL:

This method is most commonly used where there is sufficient slope (usually >1% and no humps or valleys) and a control system would not necessarily be needed. Once you have started the tile run, you will need to make sure the water level is in the green graduated area. This means you are tiling at a positive slope. At the same time you can determine the depth of the shoe by looking at the depth chain. The cow tag on the chain is set at approximately 3 ft. (36") of depth. Watch the chain and keep a consistent depth and you will be installing tile at the slope of the land at the tile run. Between the water level and the depth chain, you should be able to do a satisfactory job on grades with sufficient slope. Once the tile has run through the boot, extend the cylinders all the way out to run the plow to the top of the ground and lift with the 3-point or the wheels of a pull-type plow.

INTELLISLOPE GPS CONTROL SYSTEM:

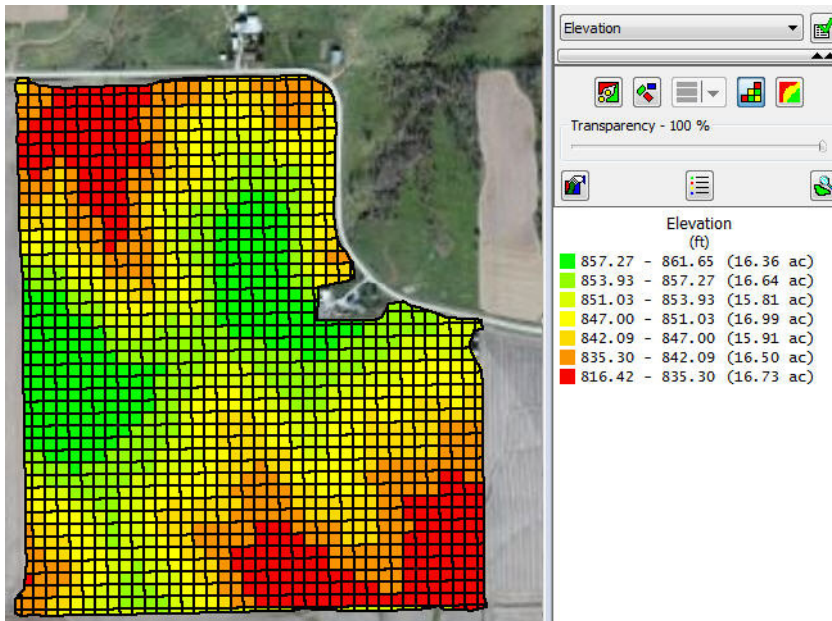
If you purchased the Intellislope GPS plow control system please refer to that system's manual.

DESIGNING TILE SYSTEMS:

Designing your tile system may be the most difficult part of tiling. The general layout may not be difficult but, you will need to make sure you are able to put the entire tile in at a depth where you have sufficient coverage everywhere and not have to go too deep to keep good coverage everywhere.

If you are installing a whole drainage system, you will need to make sure you have sufficient coverage of the main and the laterals. It is common that one main carry all of the water from a field to a drainage ditch, creek, or river (but this is not a necessity). The tile plow will install up to 10 inch tile; however, you may want to install multiple mains to drain a whole field. This may actually save you money as two 6 inch tile may be cheaper than one 8 inch and give you nearly the same capacity. The main should be the deepest run on average in a system. This usually means that the main would be installed in the lowest part of the field. The slope of the main is very important as this determines the rate at which water flows.

The permeability of the soil and the size of the area to be drained also play equally important roles in designing your drainage system. All of these factors play a circular role in the design. For example, a very flat field to be drained may not allow for much grade on the main. This reduces the amount of flow rate and possibly increases the size of the tile needed to adequately drain that area.



Obtain or make a map of the area to be drained. The latest option for mapping the field is to own an Intellislope that will quickly create a topo map as seen in the illustration. Another option is, to use a yield monitor and you are collecting GPS data with yields, you might be able to create a topography map that would help design your system. USGS topography maps are also helpful. Take your map out with you to the field to make a rough design of the system. Once you sketched the design, use your laser or your Intellislope to determine the grade of each run and make sure you have the desired depth for the entire tile in the system. You may decide to change

the grade of a tile run after you have taken your laser shots.

The spacing of laterals within a tile system is also very important. You will want to space laterals so that your return on investment is optimum. One large advantage of owning a Gold Digger ZD is that you are able to install tile economically, your optimum return on investment is not as large of a concern as it would be if you were paying a contractor to install tile. You may want to install some tile test plots, so you can monitor the benefit of different spacing on your own soil types. A yield monitor on your combine works great for this. Obviously, we have only scratched the surface in explaining the design of tile systems. Please feel free to call us.

We would be glad to try to answer any questions you might have or refer you to someone who could answer your questions. Many States also have drainage guides available at extension offices that explain in detail subsurface drainage along with tables of drainage coefficients, recommended tile sizes, grades, and spacing of drainage systems. Below is a chart taken from a drainage guide for tile sizes and the amount of acres they will drain at different grades.

Tile Size in Acres Drained (3/8" Coefficient)

Grade (%)	3"	4"	5"	6"	8"	10"
0.05	1.1	3	4	8	19	31
0.1	2	3.7	7	12	25	42
0.15	2.2	4.7	8.2	14	29	55
0.2	2.5	5.5	9.8	16	35	60
0.25	2.75	6.5	11	17.5	37.5	70
0.3	3.1	7	12.5	20	41	77
0.4	3.7	7.5	14	23	49	87
0.5	4	8	15.5	26	54	100
0.6	4.4	9	17.5	27.5	59	110
0.7	4.75	10	18	31	64	115
0.8	4.9	11	20	33	70	120
0.9	5.2	12	21	34	72	130
1	6	13	23	35	78	140
2	8	17	31	50	110	190
3	9	20	37	60	130	240
4	10	24	41	70	150	270
5	13	26	48	77	160	300

FREQUENTLY ASKED QUESTIONS

Question: How do I know when I need to replace my shear?

Solution: To avoid damage or wear to the front of the heel, the shear should be replaced when the shear sticks down below the heel less than an 1/8". To determine this measurement, hold a straight edge along the bottom of the heel and butt the end up against the shear to determine how far the shear point sticks below the heel.

Question: When should I replace the heel on my plow?

Solution: The heel should be replaced when there is about 1/4" of thickness left on the back end of the heel. See "*Shear Wear*" on page 14.

Question: When should I replace the poly sides on my plow?

Solution: When tiling, it is normal to hit rocks and debris in the ground that can cause damage to the poly on the boots. If contact with debris cuts or tears poly completely through, or if the poly becomes so thin that the bolt heads pull through, it should be replaced.

Question: How deep of a frost layer can I tile through with my Gold Digger Stealth ZD tile plow?

Solution: Soil-Max does not recommend tiling in anymore than 4" of frozen top soil. When the topsoil is frozen it can damage boots and it decreases the amount of topsoil cover that falls in on top of your tile.

Question: Can I use a "Quick Hitch" with my Gold Digger Stealth ZD?

Solution: **DO NOT Use a Quick Hitch** with the Gold Digger ZD 3-Point Hitch Model Tile Plow **unless** the Quick Hitch Adapter (available through Soil-Max) is installed on the quick hitch. Without the Quick Hitch Adapter, the geometry needed for the plow to be lifted out of the ground and go down far enough to reach the plow's potential is not achievable with a quick hitch.

Question: What does the "T" stand for on the hydraulic valves?

Solution: "T" stands for TANK. This is how the oil gets back to the hydraulic oil reservoir.

Question: What does the "P" stand for on the hydraulic valves?

Solution: "P" stands for PUMP or PRESSURE. This is how pressurized hydraulic oil gets to the cylinders and wheels.

Question: What does "detent" mean?

Solution: "Detent" is defined as follows: A spring device which maintains the spool of a directional control valve in position. Example: holding a lever in position to keep full hydraulic pressure.

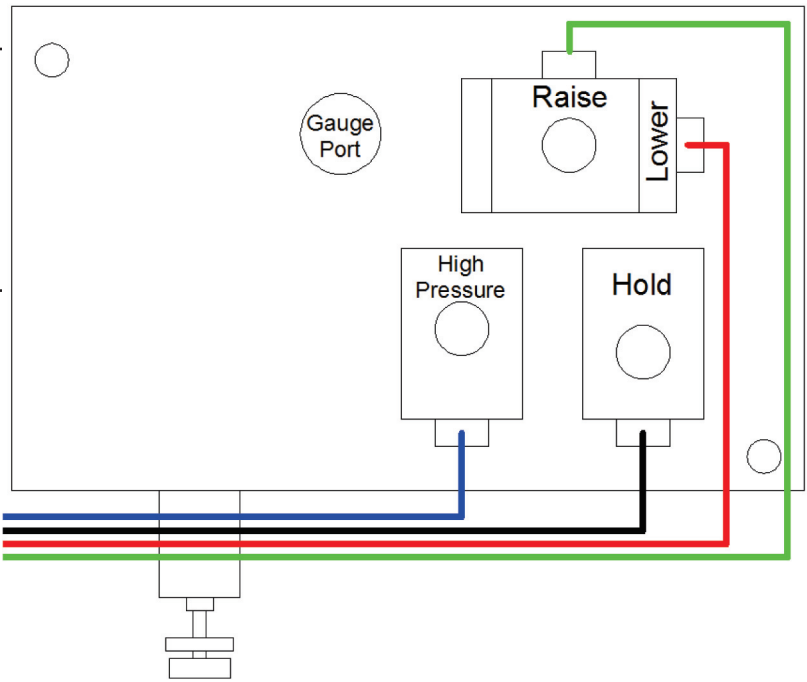
Question: Plow has been parked a year and will not pitch. What do I do?

Solution: On the sides of the Parker Proportional valve are black knobs. On the end of the black knobs, in the center, is a recessed button. Place a screw driver there and press hard. If the valve does not freely move, tap the screw driver with a hammer. If still not moving, turn off the tractor and release hydraulic pressure. Then unthread the black knob, then unthread the barrel, and remove spool. Clean of debris and lightly clean with steel wool. Assembly reverse of removal.

Question: My Pull Type plow will not lift or lower.

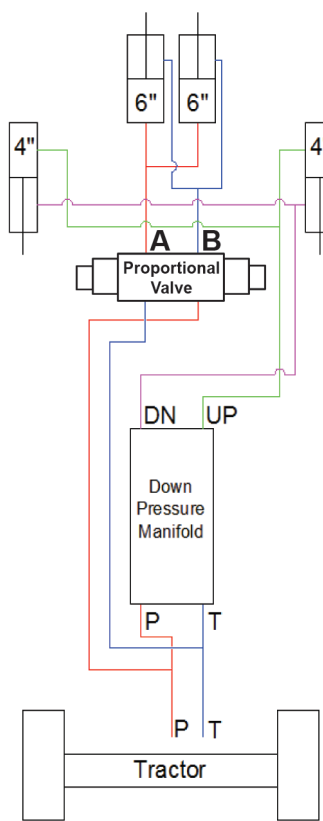
Solution: Check both hydraulic hoses and ensure correct connections to Pressure and Tank. Check power connection and for pinched wires.

DOWN PRESSURE MANIFOLD ELECTRICAL SCHEMATICS



Note: The position of the wires to the solenoids on the Down Pressure Manifold is very important. With incorrect wire placement, malfunction of the manifold will occur and potential injury. Please take care when removing, cleaning, or replacing wire connections.

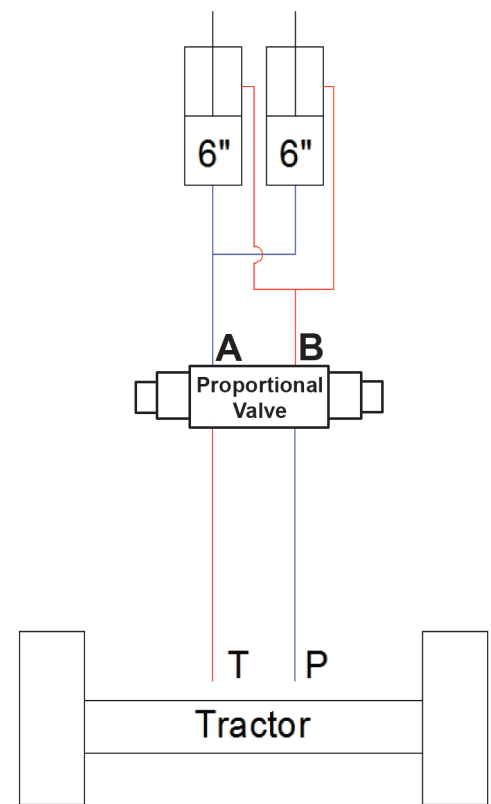
AUTOMATIC GRADE CONTROL PLOW HYDRAULIC SCHEMATICS



Pull Type

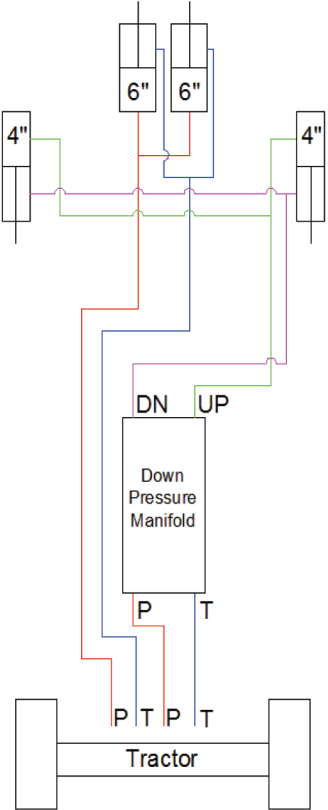
“T” Stands for “TANK”. This is the port through which oil returns to the reservoir.

“P” Stands for “PRESSURE” or “PUMP”. This is the port through which pressurized oil is sent to the plow.



3-Point

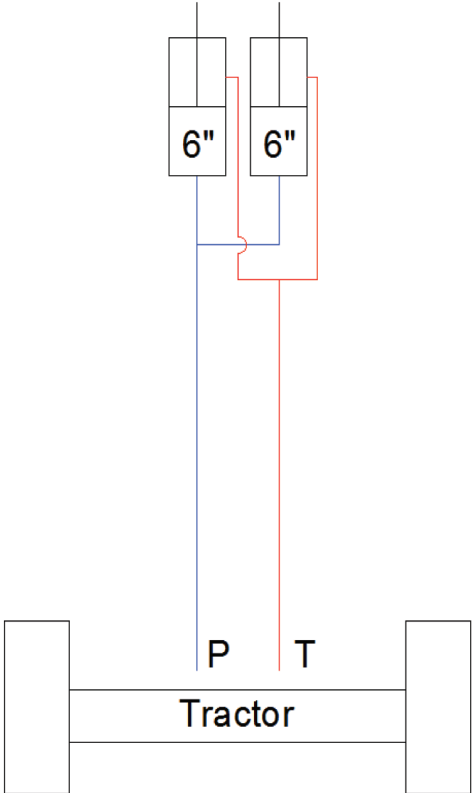
MANUAL GRADE CONTROL PLOW HYDRAULIC SCHEMATICS



Pull Type

“T” Stands for “TANK”. This is the port through which oil returns to the reservoir.

“P” Stands for “PRESSURE” or “PUMP”. This is the port thorough which pressurized oil is sent to the plow.



3-Point

Index

Numerics

3-point 11

B

Boot Removal 13

D

detent 23

Down Pressure Manifold 24

Down-Pressure Manifold 8

duals 10

E

Electronics Hookup 15

F

float mode 16, 17

frost layer 23

frozen top soil 23

H

heel 23

hookup 11

horsepower 9

hydraulic fittings 12

I

Intellislope 20

M

Manual Grade Control 20, 26

P

Plow Depth 7, 10

Pre-Ripping 20

PRESSURE 25

Pressure 12

Proportional Control Valve 8

Proportional valve 23

pull hooks 20

Q

Quick Hitch 11, 23

R

replace the poly sides 23

S

second tractor 20

Shear Wear 14

slope 20

soil condition 10

switchbox 15

T

TANK 25

Tank 12

Tile Feeder 14

Toplink Cylinder 11

tractor weight 9

W

Water Level 12

