



Made in U.S.A.

Paratill®

Operator's & Repair Parts Manual

Shear Bolt	907-562	907-575T	Mechanical	907-302	907-306T
Models:	907-564	907-576	Trip Models:	907-303	907-308
	907-566	907-577		907-304	907-308T
	907-568	907-578		907-304T	907-318
	907-574	907-580		907-306	
	907-574L	907-582			

Includes TerraTill® Information



Do Not Use or Operate this Equipment

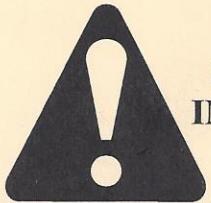


Until you have Read and Understood this Manual

The purpose of this manual is to explain maintenance requirements and adjustments which are necessary for the most efficient operation of the machine. Read this manual thoroughly and completely before using your machine. Keep this manual handy for reference when questions arise.

Should you have questions or difficulties which your dealer or representative are unable to answer, please call or write:

Bigham Brothers, Inc. 705 E. Slaton Rd. P.O. Box 3338 Lubbock, TX 79452
Telephone: (806) 745-0384 Fax: (806) 745-1082



SAFETY FIRST
PREVENT ACCIDENTS BY "THINKING SAFETY"
IN UNLOADING, SETTING UP, MOVING, STORAGE
AND OPERATING ALL EQUIPMENT.

BB BIGHAM BROTHERS, INC.
806-745-0384 • 705 E. Slaton Road • P.O. Box 3338 • Lubbock, Texas 79452

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\$7.00 U.S. P/N B09-1PT Revised 9-30-2009. Printed in the U.S.A. Specifications and design subject to change without notice.

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A MESSAGE TO THE OWNER AND OPERATOR:

This machine was carefully designed and manufactured to give you dependable service. To keep it running efficiently, read the instructions in this Operator's Manual. Check each item and acquaint yourself with the adjustments required to obtain efficient operation and maximum performance. Remember, the machines performance depends on how you operate and care for it.

After the operating season, thoroughly clean your machine and inspect it. Preventive maintenance saves time and pays dividends. Your dealer has original equipment parts which assure proper fit and best performance. Record the model number, serial number and date of purchase in the space provided on this page. Your dealer needs this information to give you efficient service when you order parts or attachments. The model number and serial number appear on the identification plate on the front left side of the tool bar mast.

The Warranty on your machine is included with this manual. Your dealer will review both this manual and the warranty with you when you take delivery of your machine.

WARRANTY

Bigham Brothers, Inc. warrants all products of its manufacture to be free from defects in materials and workmanship for a period of six months from date of delivery to the retail purchaser. Parts assumed to be defective must be returned F.O.B. Lubbock, Texas for our inspection or inspected in the field by our authorized representative. Our obligation under this warranty is limited to replacement or repair of the defective part and does not cover other damages to persons or property. Other than the aforesaid, no warranties of merchantability or fitness for a particular purpose will apply. We do not assume liability for altered or remanufactured components or machines or applications beyond their intended use. Some states do not allow limitation of how long an implied warranty lasts, or exclusions of, or limitations on relief such as incidental or consequential damages, so the above limitations or exclusion may not apply to you. This warranty gives you specific legal rights and you may have other rights which vary from state to state.

Warranty does not cover damage due to abuse, neglect, collision, towing, pulling, normal wear and tear or any other factor beyond the control of the manufacturer. Tool bars that are bent, bowed or that have been welded on or modified in any way are specifically excluded from any warranties.

LIMITED LIFETIME WARRANTY ON TOOL BAR CLAMPS

Bigham Brothers, Inc. will replace any ductile iron clamp body that breaks or cracks under normal use for as long as the original purchaser owns them. This includes all replaceable bolt ductile iron clamps sold by Bigham Brothers, Inc. after December 31, 1987.

Clamps that fail should be returned to Bigham Brothers, Inc. freight prepaid along with caps, bolts, set screws and nuts for evaluation. If found to have failed under normal operating conditions, a new clamp body will be returned along with your old caps, bolts, set screws and nuts. Only clamps that have been used with Grade 2 bolts of the proper size will be replaced. All other provisions of the above warranty apply.

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Be alert when you see this symbol in the instructions.

It warns of a hazard which might lead to injury.

It means: "Attention! Become alert! Your Safety Is Involved!"

Before Use: DO NOT operate this equipment until this manual has been read and understood.

- * Assure operators have read and are familiar with the instructions contained in the Operator's Manual
- * If working on the Paratill, make sure it is level and stable. Proper stands should be lowered and secured. Use support blocks when necessary. The work area should be on a level, load bearing surface, e.g. concrete floor. NEVER, NEVER work under a Paratill while it is supported by only the tractor's hydraulics.
- * Consult the "Tractor Manufacturers Manual" for instructions on safe mounting of implements and operating methods.
- * Never stand between the Paratill and tractor with engine running.

During Use:

- * Check and tighten all bolts after 30 minutes of initial operation and after adjustments have been made.
- * Assure the Paratill is correctly attached to the tractor.
- * Be alert to underground obstructions, e.g. large stones, tree roots, cables, pipe lines, etc. Should an obstruction be encountered, **STOP IMMEDIATELY AND INVESTIGATE.**

NOTIFY THE APPROPRIATE AUTHORITY IF BURIED CABLES OR PIPELINES ARE SUSPECTED.

Non-hazardous obstructions should be removed before continuing operation.

- * Keep operating speeds at a safe level.
- * Never allow anyone to ride on the Paratill during operation.
- * Never travel in reverse with the Paratill in the operating position.
- * Never carry out adjustments or repairs to a mounted Paratill unless the tractor engine is stopped and the Paratill is firmly supported or lowered to the ground.
- * Inspect the Paratill for wear or damage on a regular basis.
- * Check all nuts, bolts and other fasteners for tightness on a regular basis. Replace worn fasteners as needed.
- * Carry out maintenance and lubrication procedures as detailed in this manual.
- * When disconnecting the Paratill do so on a level, hard surface. Assure it is left in a stable position with proper stands in the correct position.

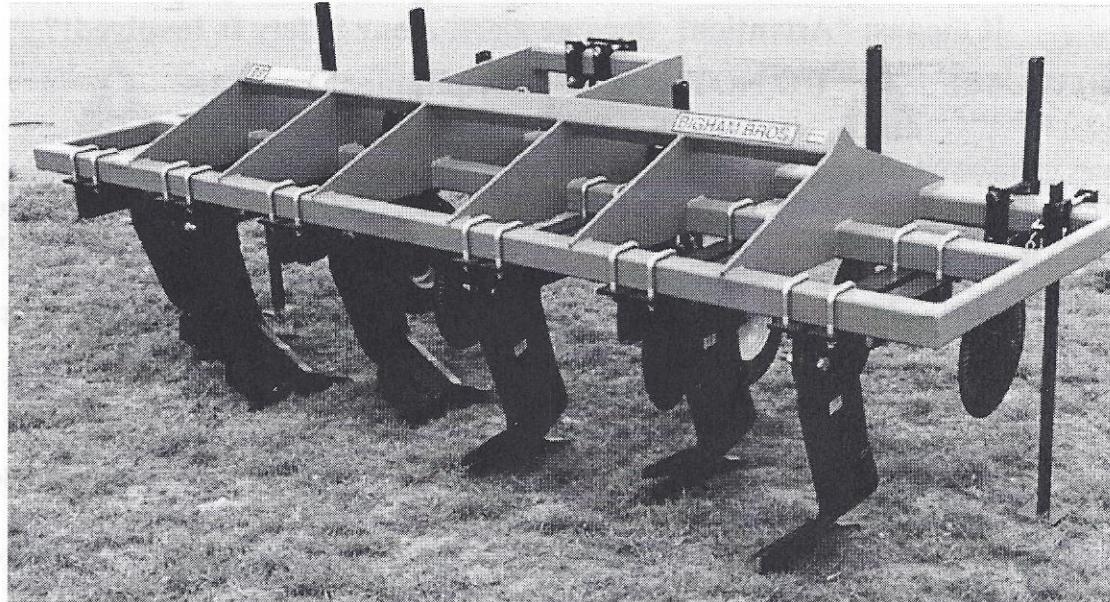
Always:

- * Wear gloves and safety footwear when handling worn parts with sharp edges.
- * Assure the Paratill is not operated by untrained persons.
- * Use the Paratill only for the purpose for which it was designed and tested, and always according to the instructions contained in this manual.
- * Reduce speed when transporting over uneven or rough terrain.
- * Place a "Slow Moving Vehicle" emblem on the rear of the unit before driving on open roads.
- * Keep hands, feet and clothing away from all moving parts.
- * Exercise care when adjusting legs, leg spacings, disc coulters or rear bedding tools.. The assemblies are heavy and may have sharp edges.

"Left" and "Right" of the machine refers to the side when standing behind the Paratill and facing the tractor. Left and right leg refers to direction of foot offset when standing behind the unit; not on which side it is located.

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**BE A SAFE OPERATOR, THINK BEFORE OPERATING.
READ ALL INSTRUCTIONS BEFORE
ASSEMBLY OR OPERATION OF THE PARATILL!**



Picture 1- Six Leg Paratill P/N 907-575T

INTRODUCTION:

Soil compaction and hardpan can quickly become a limiting factor to crop yields. These conditions can be created by many factors including field traffic, livestock and working fields that are too wet. As soil density increases, a physical barrier develops which seriously inhibits plant root development and water movement through the soil.

The Bigham Brothers Paratill® is a unique soil loosener that reduces soil compaction in a single pass. The patented angled leg design lifts and "bends" or fractures the soil, then allows it to settle in a loosened state. Surface residue remains on the surface for erosion control. Deep placement of fertilizer may also be accomplished by installing delivery tubes to the rear of each leg. The Paratill® should not be operated in wet soils nor in actively growing crops. It should be operated only in dry soil conditions, prior to planting, and prior to Fall and Winter precipitation. This will allow maximum absorption and storage of water for future use.

P/N	Description	Usable Tool Bar Length	Qty. Rear Shanks	Qty Coulters	Approx. Ship Wt.
907-562	Paratill®, 2 Leg with Coulters	8'4"	-	2	1475 Lbs.
907-564	Paratill®, 4 Leg with Coulters	14'6"	-	4	3300 Lbs.
907-574	Paratill®, 4 Leg with Coulters	14' 6"	5	4	3730 Lbs.
907-574L	Paratill®, 4 Leg with Coulters	14' 6"	5	-	3350 Lbs.
907-575T	Paratill®, 6 Leg with Coulters	14' 6"	-	6	3930 Lbs.
907-566	Paratill®, 6 Leg with Coulters	20'8"	-	6	4300 Lbs.
907-576	Paratill®, 6 Leg with Coulters	20' 8"	7	6	4900 Lbs.
907-577	Paratill®, 6 Leg Skip with Coulters	27' 6"	9	8	6020 Lbs.
907-568	Paratill®, 8 Leg with Coulters	27'6"	-	8	6020 Lbs.
907-578	Paratill®, 8 Leg with Coulters	27' 6"	9	8	6990 Lbs.
907-580	Paratill®, 10 Leg with Coulters	27' 6"	-	10	7420 Lbs.
907-582	Paratill®, 12 Leg with Coulters	27' 6"	-	12	7770 Lbs.

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P.O. Box 3338

Lubbock, TX 79452

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Form # B06-1PT

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The BIGHAM BROTHERS PARATILL is equipped with an equal number of "right hand" and "left hand" legs. The PARATILL is designed to operate at a 14" to 16" working depth. Each leg loosens a zone of soil 20" to 26" wide, depending on soil conditions and leg spacing. **NOTE:** It is strongly advised that the depth of the soil problem be identified and the working depth of the PARATILL set to operate below the problem. Research shows that most compaction is within 14" of the surface of the soil. Working deeper than 16" rarely has any economic response. Operating deeper than 16" drastically increases power consumption.

Center of the Loosened Zone (CLZ)

Because of the unique design of the Paratill Leg, the zone of loosened soil is not centered over the point, but rather is away from the point in the direction of the leg angle, see Figure 1.

Each Paratill leg loosens an area of soil above and beyond the angled portion of the leg and wear point. The center of this loosened area on the soil surface is called the "Center of the Loosened Zone" or CLZ. The CLZ should correspond to desired row spacing, **but will not match** Leg or point spacings.

The factory uses a theoretical CLZ to calculate the initial location of each leg on the tool bar. The leg locations for various row spacings are listed in Figures 2,3,4,5, 6 & 7. Note: Leg or point measurements will not correlate to conventional row spacing measurements. The theoretical CLZ is estimated to be 2" beyond the wear point (10-1/4" from the vertical portion of the leg). If the points were set to operate in the center of a bed, ridge or row, the normal uplifting of the soil up and over the leg and point would physically move the row approximately 2" away from the point.

The distance from the leg or point to the CLZ is not a constant. Soil profile, type, condition and moisture may affect this distance, as well as operating speed and condition of the wear surfaces and points of the Paratill. Important: In most cases this theoretical CLZ has proven satisfactory, but if the CLZ in actual field operation is not at the desired location, the legs must be repositioned.

Checking Performance and Loosening

The degree and extent of loosening may be checked by several methods.

A. Probe: A penetrometer can be purchased which will

provide a reading in #/in required to push the unit into the ground.

One can make a probe from a piece of 48" x 3/8" round rod. Sharpen one end as you would a pencil, and bend the opposite end to form an "L-shaped" handle. Although no readings can be taken, one can easily determine the amount of force required to push the probe into the soil and if compaction has been eliminated.

Another indicator of how complete and uniform the soil is being loosened is for the tractor operator to observe the uniformity of the soil flowing over the legs as the unit is being operated. Uneven flow could indicate a leg spacing that is too wide.

Total soil loosening performance may also be checked by observing the soil finish behind the Paratill. The surface should be uniform. If the surface has mounds and valleys, generally this indicates the leg spacing is too wide and total loosening is not being accomplished between the legs.

One can also dig a pit or trench and inspect the degree and extent of loosening across the working width of the unit.

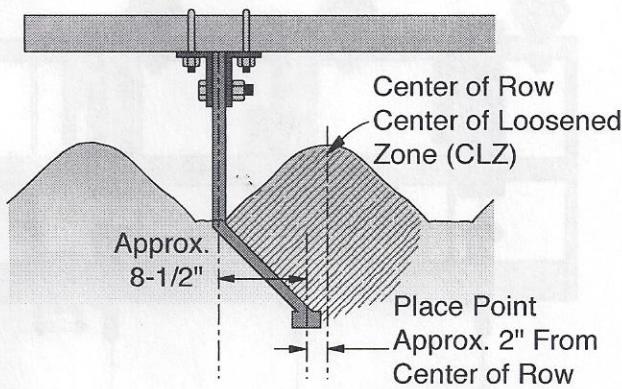


Figure 1

Zone Loosening

Each Paratill leg produces a zone of loose soil where the crop is to be planted and an unloosened area between the zones to support field traffic without putting compaction back into the crop growing area. See Figure 1.

Right-hand and left-hand legs can be mounted on the tool bar in many different layouts to suit particular crops, growing systems, prevailing soil conditions and the desired loosening effect. The more common layouts for leg spacings are shown in Figures 2,3,4,5, 6 & 7.

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Total Loosening

A row spacing of 24" to 26" is recommended for total loosening. This spacing will vary with different soil conditions. In some extreme cases a spacing as narrow as 22" or as wide as 28" may be required. It is important to remember that prevailing soil conditions determine the optimum leg spacing to achieve the maximum desired effect.

Changing Row Spacing

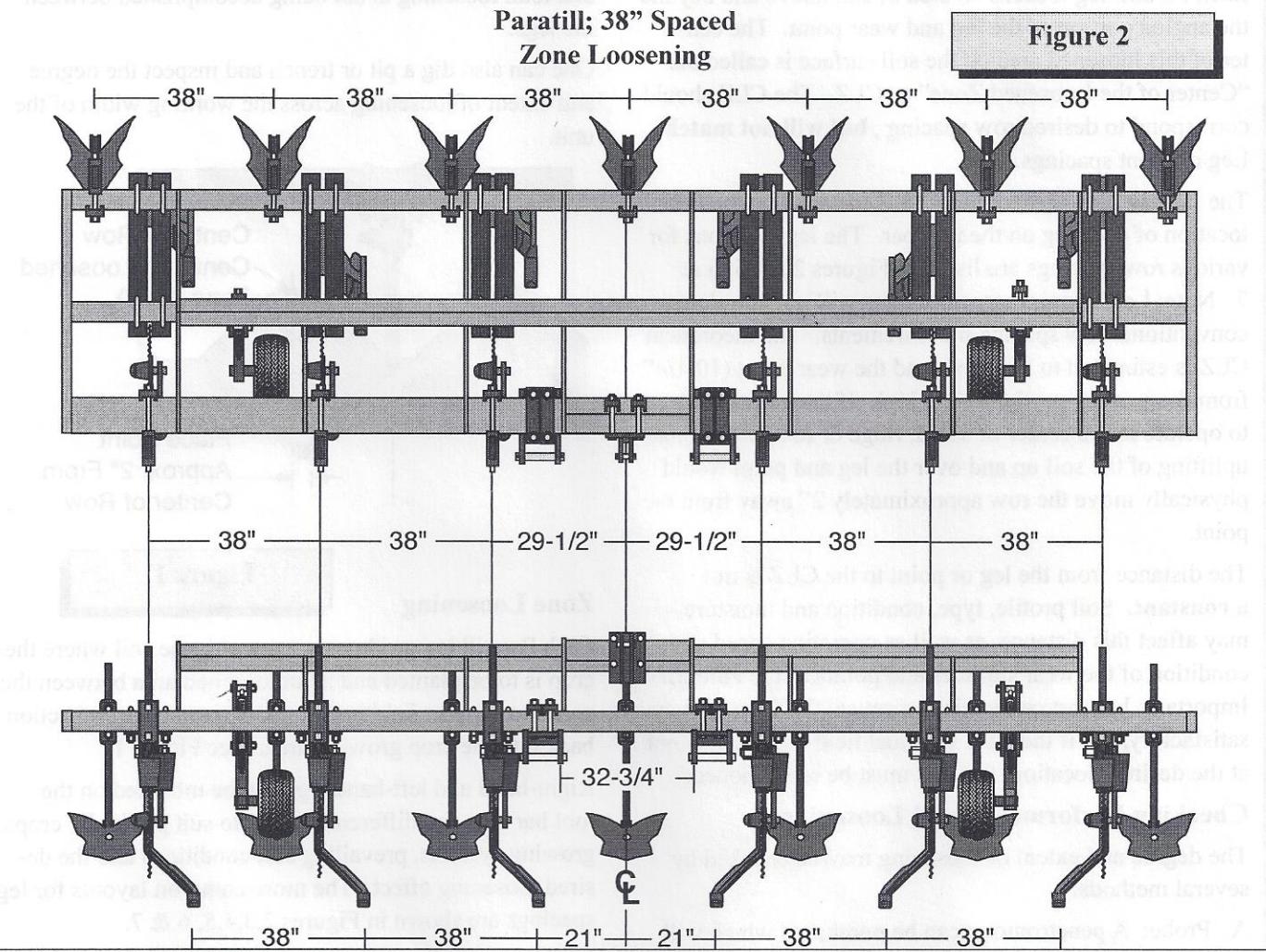
Refer to Figures 2,3,4,5, 6 & 7 for leg locations for desired row spacing. Leg spacings can be changed, but require considerable loosening and tightening of bolts; therefore an air or electric wrench is recommended. See Figure 8, page 13 for additional set-up information.

CAUTION: The legs and brackets are heavy, so if possible; utilize two men and do not rush.

The four U-Bolts that attach each leg to the tool bar must be loosened before the leg position can be changed. Loosen the nuts on each U-Bolt to allow the clamp to slide laterally along the tool bar. Leg position can be changed easily this way unless the desired leg position will 'jump' across a tool bar stringer (brace). Start with the center two legs and work to the outside. Be sure to align coulter in front of each leg to insure proper performance. When adjustments have been made be sure all bolts and nuts are tight. After leg repositioning, inspect all bolts after placing the unit back into service for about 15 minutes. Retighten bolts if necessary. Note: Placement of legs for Total Loosening requires a split hitch or offset coulters for proper coulter blade placement. Some row spacings may also require the use of a shank offset kit for proper furrow cleanout placement. If you feel that these spacings will be needed please indicate at time of order or before placing unit into service so substitutions can be made.

Paratill; 38" Spaced Zone Loosening

Figure 2

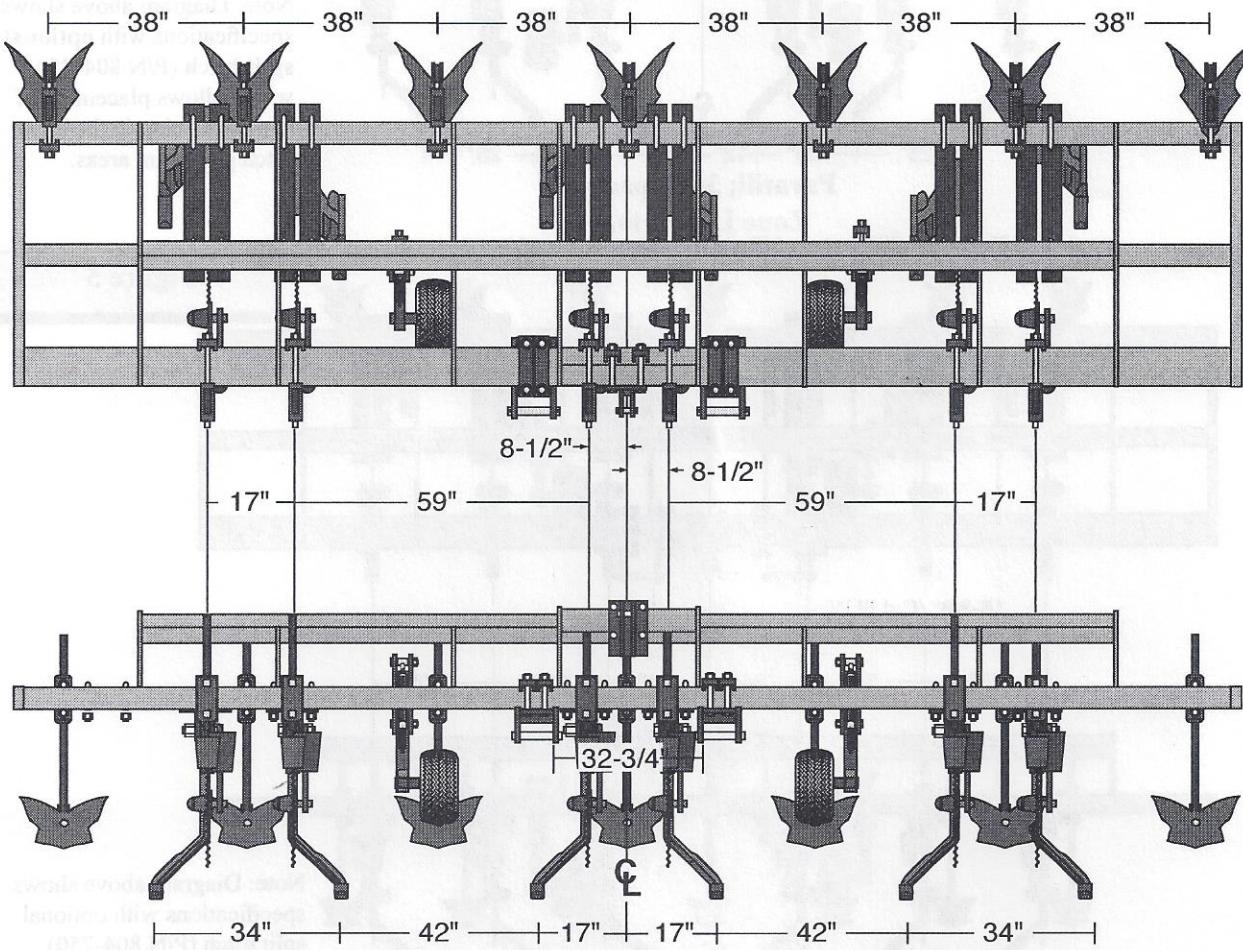


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When hard dry soil conditions are present the traditional standard leg spacing (with all legs set to the center of the plow) has caused clodding in the tractor wheel furrows in some instances. After experimentation we have found that the spacing diagram below reflects an alternative leg pattern that will help to relieve this clodding problem. We recommend this pattern if you are forced to operate under these types of soil conditions.

Figure 3

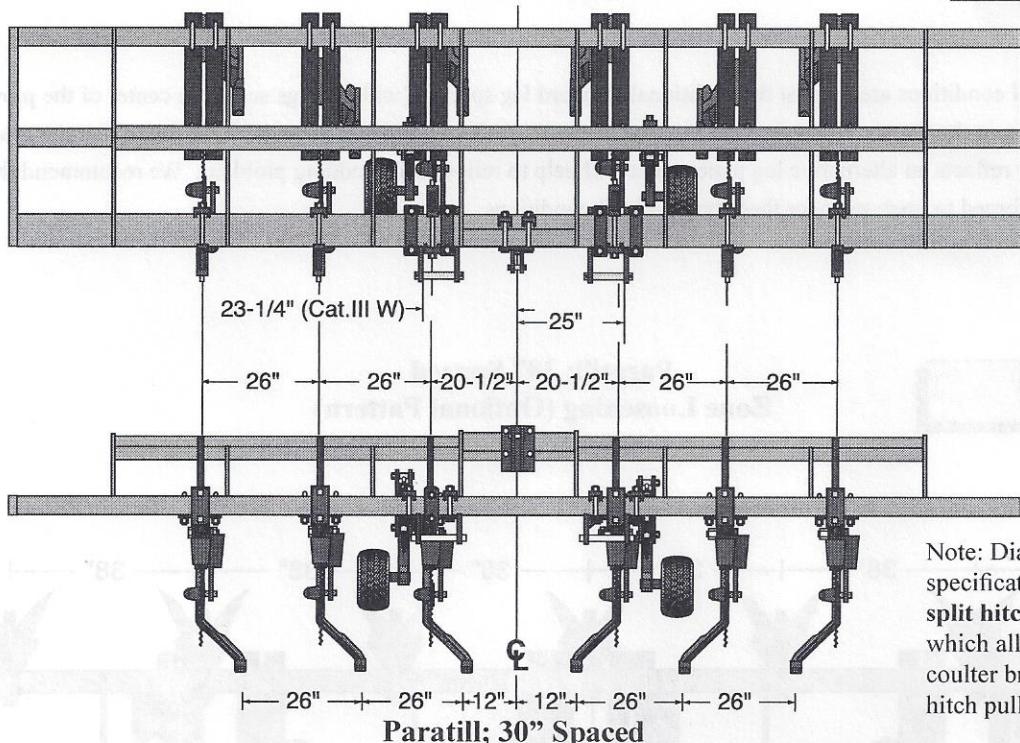
Paratill; 38" Spaced Zone Loosening (Optional Pattern)



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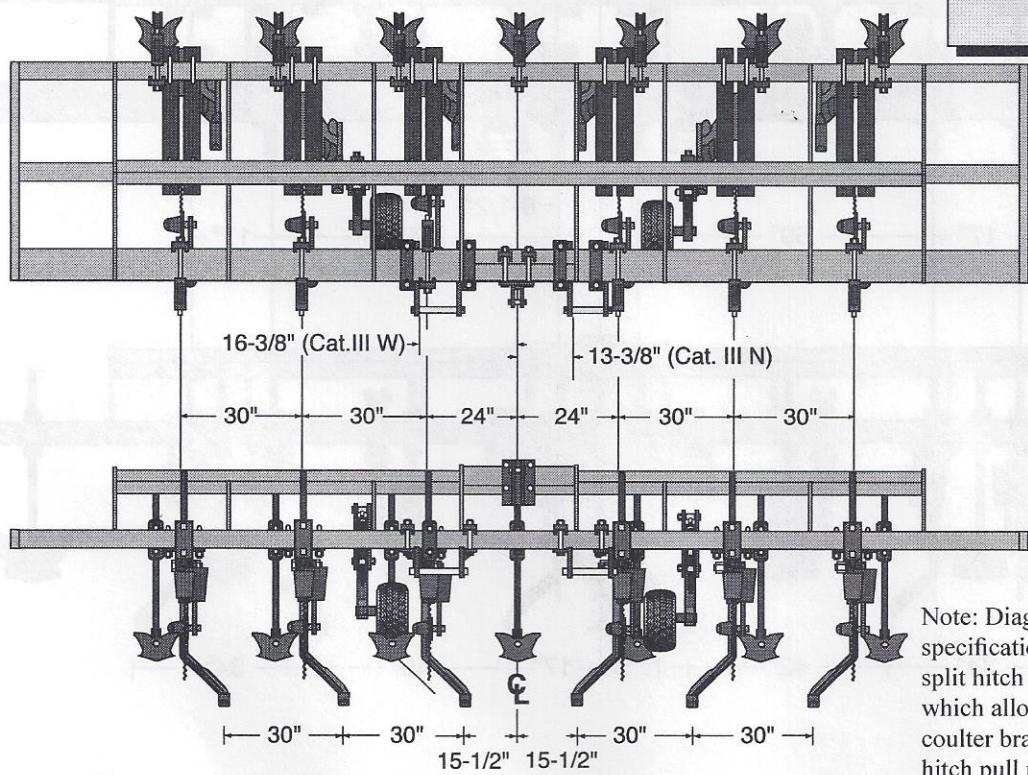
Paratill; 26" Spaced Total Loosening

Figure 4



Note: Diagram above shows specifications with optional split hitch (P/N 804-750) which allows placement of coulter bracket in the lower hitch pull point areas.

Figure 5



Note: Diagram above shows specifications with optional split hitch (P/N 804-750) which allows placement of coulter bracket in the lower hitch pull point areas.

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Figure 6

Paratill; 36" Spaced Zone Loosening

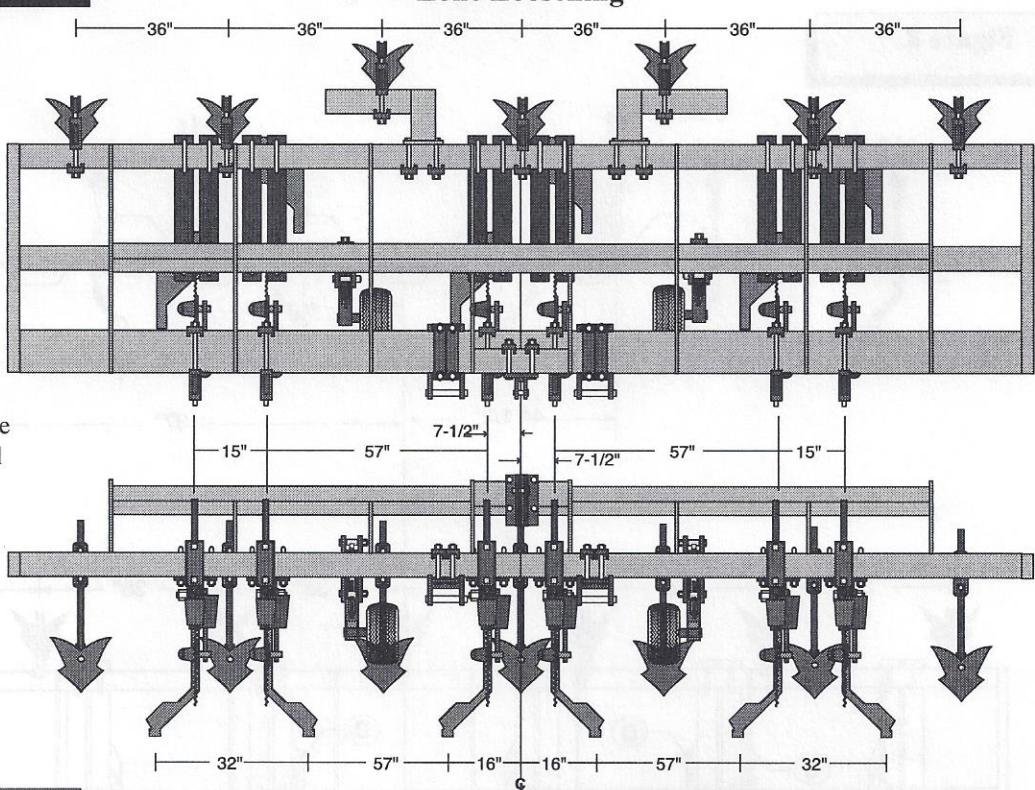
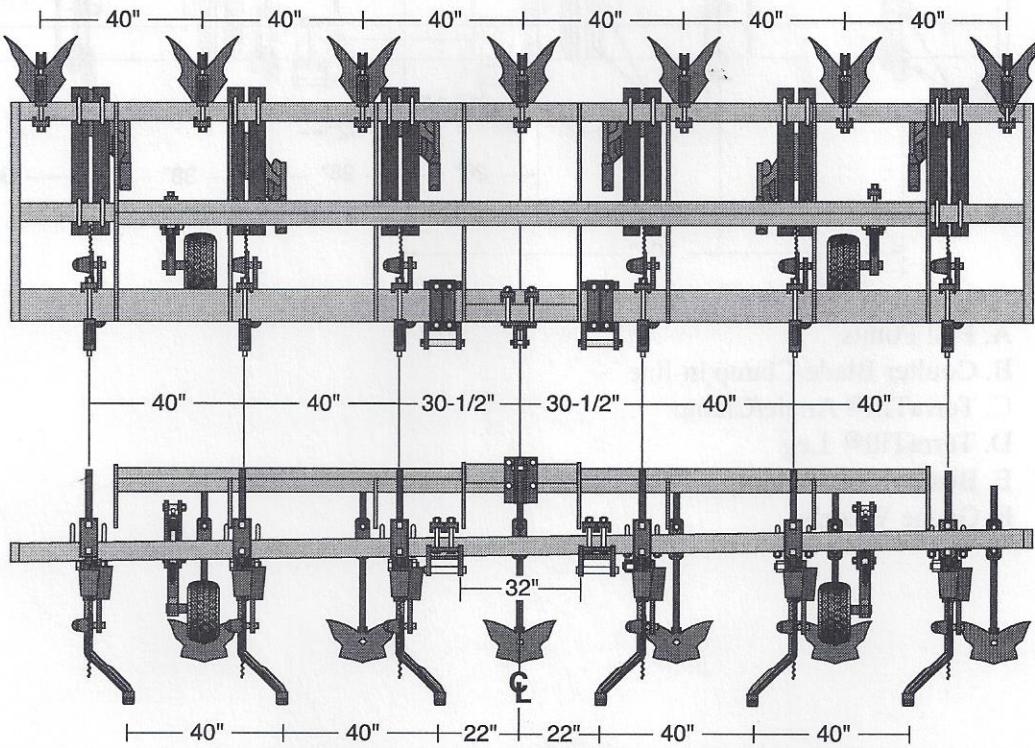


Figure 7

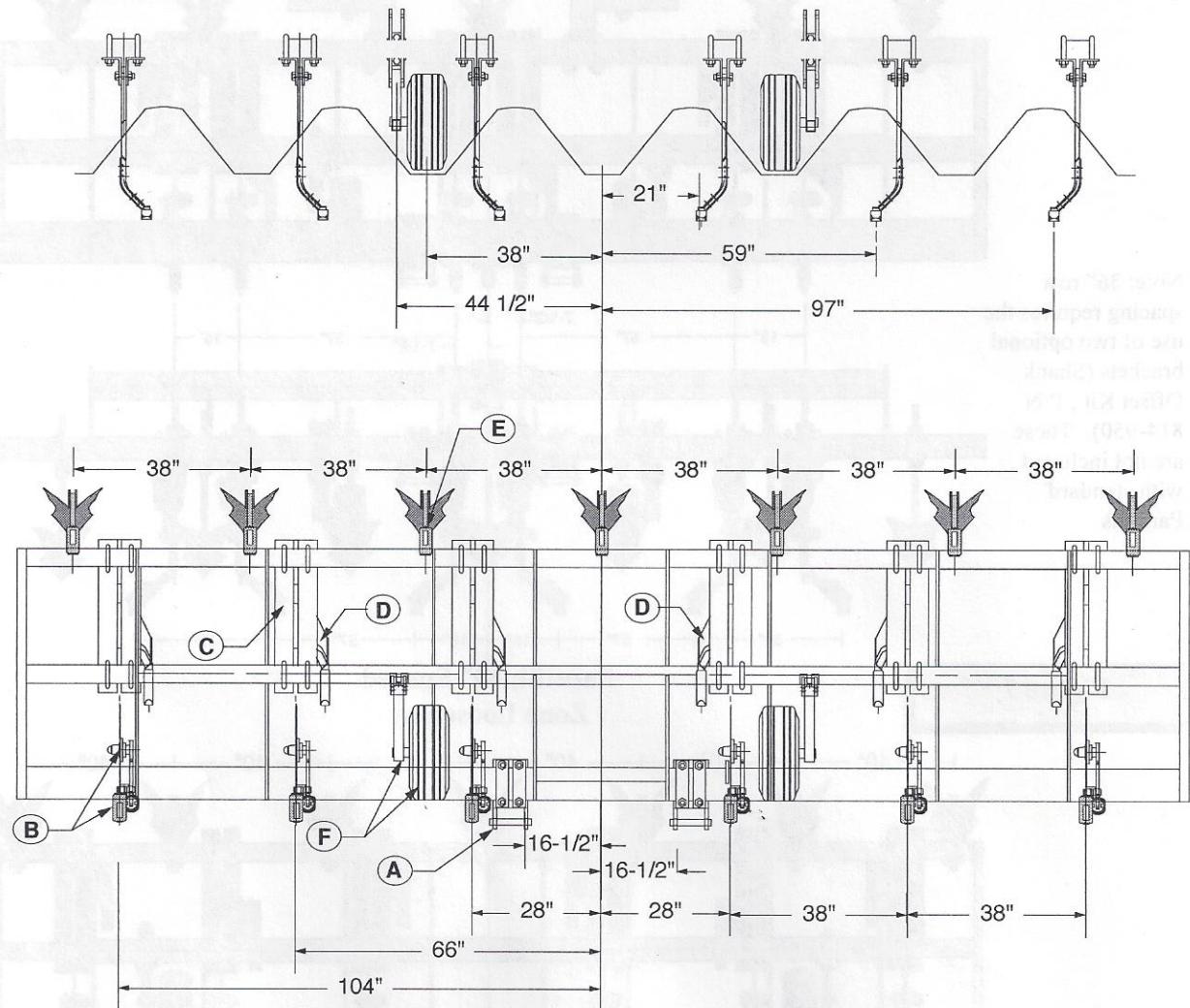
Paratill; 40" Spaced Zone Loosening



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TerraTill; 6-Leg, 38" Spaced Zone Loosening

Figure 8



- A. Pull Points
- B. Coulter Blade/Clamp in-line
- C. TerraTill® Angle/Clamp
- D. TerraTill® Leg
- E. Buster/Shank/Clamp
- F. Gauge Wheels

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Leg: Shear Bolt

1. Each of the legs is protected by a shear bolt in the front hole attaching the leg to the clamp. The shear bolt is designed to break at a pre-set level that will prevent damage to other PARATILL components.

Use of a higher grade bolt without the special machined cuts could result in breakage or failure of machine components and will void the warranty. When replacing a shear bolt,

carefully line up the holes before inserting the replacement bolt. (P/N 610-1822Z).

2. A Grade 5 bolt (P/N 602-1822Z) is placed in the rear of the clamp

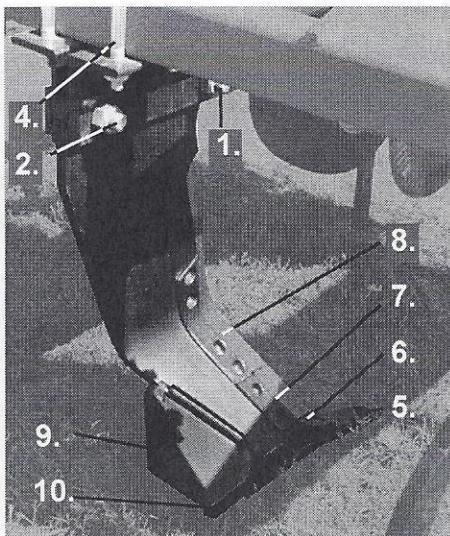
to provide a pivot in the event of shear bolt breakage. Do not place a shear bolt in the rear of the clamp.

3. The clamp is designed to allow the leg to be set in three different positions from front to back. If coulters are used on the front bar, the middle or back positions should be used.

4. U-Bolts that attach the clamp to the tool bar should be kept tight, particularly after adjustments have been made. When making adjustments, U-Bolts may be loosened but not removed to allow the clamp and leg to slide along the tool bar.

Leg Wear Parts

Each leg is protected by six high quality, replaceable wear parts: 5. Point, 6. Instep, 7. Lower Shin, 8. Upper Shin, 9. Shatter Plate, and 10. Landside.



Picture 2



Insure all leg wearing parts are changed before damage occurs to the Leg (or Foot).

Each part should be replaced as it becomes worn. Failure to replace worn parts could result in permanent Leg damage. See Parts Diagram on Page 14.

There are two Wear Shins per Leg; The right-hand Shins are different from the left-hand Shins. The Lower Shins are shorter than the Upper ones, and they usually require replacement more often due to their location in a greater wear area than the upper ones.

The Landside (P/N 681-006) is made of a hardened alloy material and is designed to support the rear of the point.

The Wear Point is reversible and self-sharpening and should be rotated or turned over before the Point has become pointed on the end or worn excessively. Another indication that the Points need to be turned or replaced is when the Paratill unit fails to penetrate the soil properly. To rotate the Point, remove the Roll Pin, remove the Point, turn and replace it insuring the Instep is secured into place. Then replace the Roll Pin.

There are two replaceable Points available. The ductile cast alloy Point (P/N 681-002) is recommended for low abrasion soils containing rocks and stones. The Chromium Carbide Alloy Point (P/N 681-002HF) is much harder and more brittle, and is recommended for high abrasion soils and will provide much longer wear.

⚠ Do not hit the chromium carbide points with a hammer or breakage may occur.

The Shatter Plate is hinged on the rear of the Paratill leg and held onto the Leg by two tabs. When removing an old Shatter Plate, the two tabs (top and bottom) must be bent to allow the old Shatter Plate to be removed. Likewise, when the new one is installed, the tabs must be bent to secure it to the Leg. The Shatter Plate may be used on the right or left Leg by locating the hexagon wedge, which is bolted to the rear side of the Plate, in the appropriate threaded hole.

The Shatter plate position is adjustable to increase the soil loosening effect. When the Paratill is operated in heavy soils or highly compacted soils, the Shatter plate angle should be increased by adjusting the position of the hexagon wedge behind the Shatter Plate. A greater Shatter Plate angle will result in an increased wear rate on the Shatter Plate.

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Disc Coulters:

Heavy duty spring loaded swivel coulters are for use when operating in heavy residue conditions or when surface vegetation is present. Do not operate the disc coulter too deep. Only the rippled part of the coulter need be in the ground.

Operating depth is adjusted by placement of the top portion of the coulter shank in the clamp body.

The disc coulter blade should be replaced when the ripples are worn off.

1. Grease pivot point on the hinge every week of operation or more often under extreme conditions. Grease fittings are located in the front and the rear of the hinge casting.
2. Repack wheel bearings at least once every operating season or more often under extreme conditions. Inspect internal parts and replace worn parts if needed.
3. Inspect bolts on the clamp body periodically and tighten if necessary. Use bolts of the proper size and grade if replacement is necessary. Keep set screws tight to keep coulter at proper operating depth. Always check bolts and set screws after 30 minutes of operation when any adjustments are made.

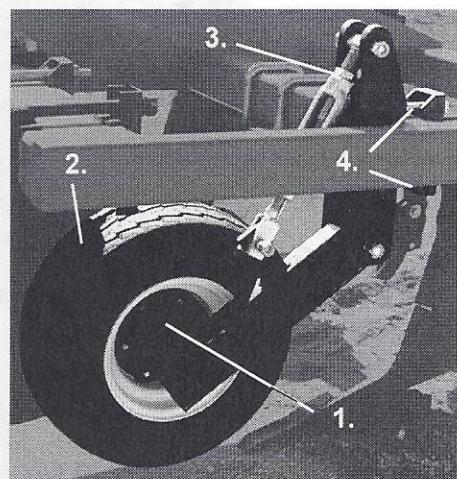
⚠ Coulter Blades are sharp and capable of causing severe cuts.



Picture 3

Gauge Wheels:

Working depth of the PARA-TILL is partially controlled by raising or lowering the wheels by adjustment of the screw jack. Do not operate the gauge wheels in previously loosened soil as recompaction will occur.



Picture 4

The wheel can be placed in many different positions along the tool bar. For total loosening, gauge wheels can be placed at virtually any position for desired results. In a zone loosening configuration it is usually best to place the wheel in the center of a furrow for stability. **Note:** Side to side travel of disc coulters must be taken into consideration for placement of gauge wheels. Allow ample spacing so that the coulter disc blade will not cut the tire.

The tractors three-point hitch should always be set to carry part of the PARATILL load:

- A. To effect weight transfer to the tractor and increase traction.
- B. To prevent overload and possible damage to the gauge wheels.

1. Repack wheel bearings at least once every operating season or more often under extreme conditions. Inspect internal parts and replace worn parts if needed.
2. **Inflate and keep tire pressure at 70 psi.**
3. Keep jam nut tight when screw jack is at proper adjustment.
4. Check bolts on the mount assembly and screw jack lug periodically and tighten if necessary. Use bolts of the proper size and grade if replacement is necessary. Always check bolts after 30 minutes of operation when adjustments have been made.

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Leg: Shear Bolt

1. Each of the legs is protected by a shear bolt in the front hole attaching the leg to the clamp. The shear bolt is designed to break at a pre-set level that will prevent damage to other PARATILL components.

Use of a higher grade bolt without the special machined cuts could result in breakage or failure of machine components and will void the warranty. When replacing a shear bolt,

carefully line up the holes before inserting the replacement bolt. (P/N 610-1822Z).

2. A Grade 5 bolt (P/N 602-1822Z) is placed in the rear of the clamp

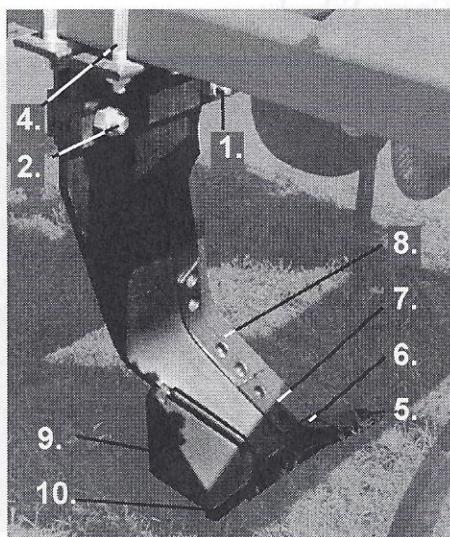
to provide a pivot in the event of shear bolt breakage. Do not place a shear bolt in the rear of the clamp.

3. The clamp is designed to allow the leg to be set in three different positions from front to back. If coulters are used on the front bar, the middle or back positions should be used.

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The Shatter plate position is adjustable to increase the soil loosening effect. When the Paratill is operated in heavy soils or highly compacted soils, the Shatter plate angle should be increased by adjusting the position of the hexagon wedge behind the Shatter Plate. A greater Shatter Plate angle will result in an increased wear rate on the Shatter Plate.

Attaching Tractor to PARATILL

Choosing the proper tractor:

1. It is extremely important to utilize a tractor with sufficient horsepower and traction. Soil conditions will effect horsepower requirements, but allow 30-40 hp. per leg, i.e., 4 legs requires a 120 - 160 hp. tractor.
2. The PARATILL is equipped with high clearance trash legs. The three-point linkage of the tractor must allow 36 inches between the ground and the lower hitch points in the "fully raised" position to provide adequate transport clearance.
3. Insure that both the right and left lift arms are identical in length, and the tool bar is level (right to left). They must be equal to achieve uniform operating depth and transport clearance.
4. The three-point lift linkage should be locked into the fixed position, not the float position.
5. Sway blocks or stabilizing chains should be adjusted to minimize lateral movement.
6. Insure tractor has sufficient front end weight to permit constant positive steering at all times.
7. Traction and horsepower are the two most limiting factors effecting Paratill tractor operation.



CAUTION



NEVER STAND BETWEEN TRACTOR AND PARATILL WITH THE TRACTOR ENGINE RUNNING.

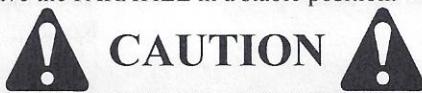
A. Tractors Equipped With Quick Hitches:

1. Attach quick hitch to the PARATILL and make sure lower pin locks are secured.
2. Raise the parking stand into the clamp body or remove to allow the PARATILL into a working position.
3. When disconnecting the PARATILL adjust stands to leave the Tool Bar tilted slightly forward. This will permit easier disconnecting and reattaching.

WARNING: Never Work under the PARATILL When it is in the raised position. Always lower the unit to the ground before making any adjustments.

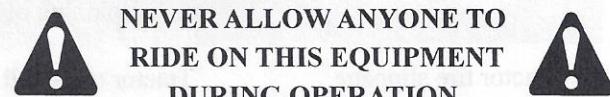
Tractors Without Quick Hitch:

1. Attach lower lift arms of the tractor to the PARATILL utilizing appropriate pins. Standard equipment for all units is a Category III wide hitch with 1-7/16" Lower and 1-1/4" Upper Pin diameters.
2. Attach top link after connecting lower lift arms. Raise parking stands into clamps or remove. When disconnecting, place stand to leave the PARATILL in a stable position.



**DO NOT MOVE TRACTOR WITHOUT
MAKING SURE TOP HITCH IS
CONNECTED TO TRACTOR.**

Field Use and Adjustments



1. Maximum operating speed 4 - 6 mph. If obstructions are present, lower operating speed to a safe level. This will help minimize damage.
2. Working depth of 14"-16". Check the working depth by the position of the soil surface on the back of the leg. The top bolt attaching the upper shin represents approximately a 16" working depth; the next lower bolt approximately 14". Therefore, while the unit is operating, the soil flow should be between these two bolts. Adjust the depth by raising or lowering the depth control wheels.
3. **The frame must be horizontal (level) front to back when in use.** Adjust by lengthening or shortening the tractor's top link.
4. Check and adjust if necessary the coulter position in relation to the leg coulter working depth. The coulter should run directly in front of the leg with the coulter cutting a track directly in front of the sharpened edge of the upper shin.
5. Raise the shatter plate position if additional loosening is required.
6. Never reverse the tractor when the PARATILL is in the ground. Loss of the shatter plates will result.
7. Do not raise the PARATILL out of the ground unless the tractor is moving forward.
8. Do not make sharp turns when the PARATILL is in the ground.

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SYMPTOM	CAUSE	SOLUTION
Cloddy	Shatter plate too high Operating too shallow Wire or foreign object on leg or foot Soils too dry	Lower shatter plate Raise gauge wheels Lower hydraulic lever setting Remove wire or object Wait for moisture
Shearing bolts	Too much load, Rocks	Reduce operating depth
Trash dragging on leg	Coulter not aligned Coulter not low enough Soil too wet causing hairpinning of residue	Check coulter alignment on front bar Lower coulter shank in clamp body Let soil dry
Tractor tire slippage	Tractor too small Third link too short Insufficient traction Soil too wet	Lengthen third link Add weight; lock axles (if tractor is equipped) Adjust tractor's draft control Let Soil Dry
Tractor will not pull PARATILL	Insufficient horsepower Insufficient traction	Larger, heavier tractor Set Paratill to operate at shallower depth Remove two (2) legs
Beds or rows relocated	Uplifting and movement of soil	Relocate leg closer or further from desired row or ridge
Losing shatter plates	Backing with unit in the ground	Raise unit before backing
Wear on leg	Wear surfaces worn	Replace wear surfaces
Loss of instep	Excess point wear Improper mounting	Replace point Insure position locked by point
Not going into ground	Points dull Unit not level	Replace points Level Unit
“Mole hole” where point operates	Soil too wet	Allow ground to dry
Unit does not pull straight	Points are not uniform	Replace points
Uneven surface	Incorrect leg position Shatter plate too high Operating too shallow	Reposition leg Adjust hexagon wedge Lower operating depth

Paratill General Set-Up Notes (Zone Loosening)

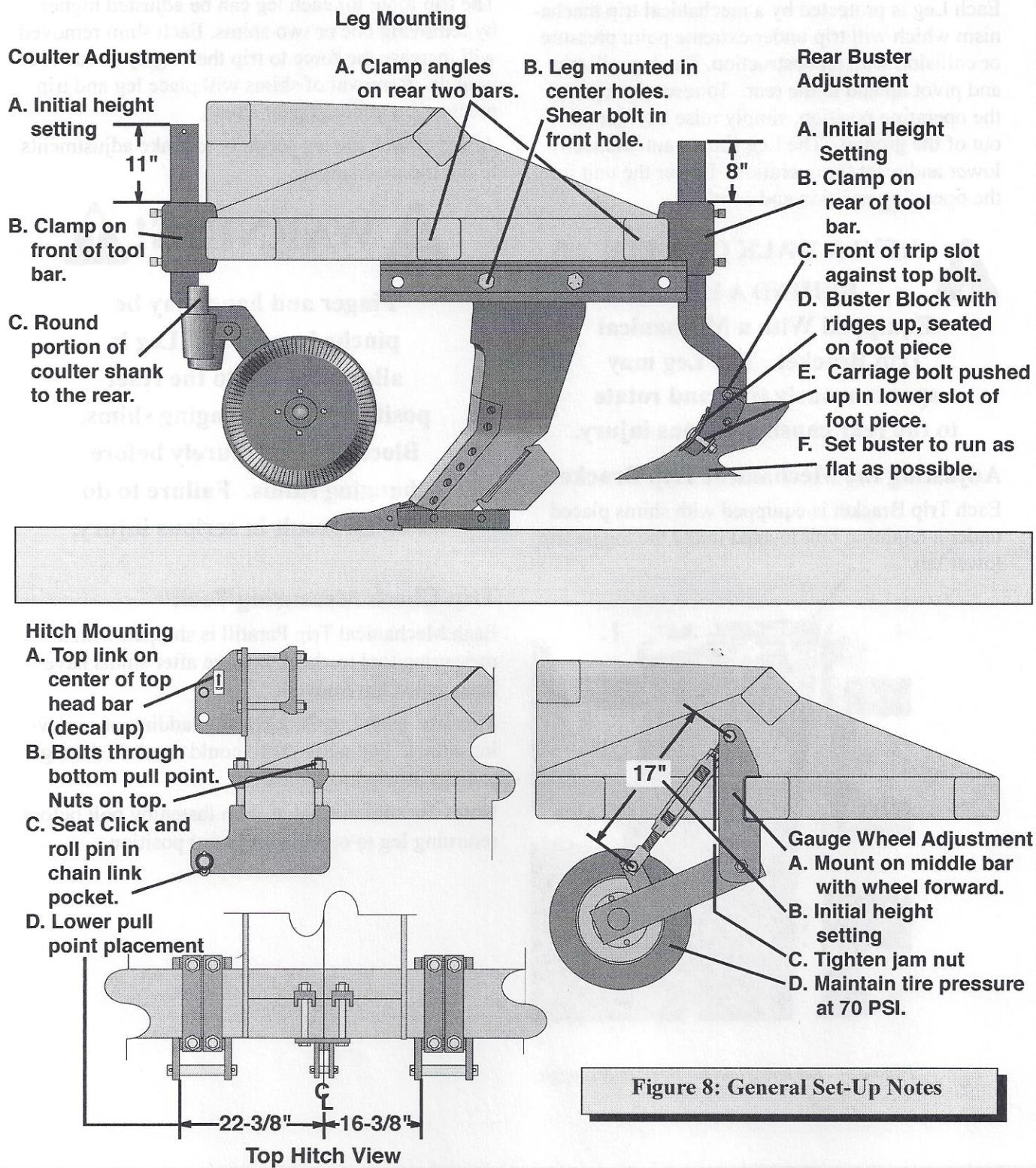


Figure 8: General Set-Up Notes

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Mechanical Trip Leg Assembly: Operation and Maintenance Instructions.

Each Leg is protected by a mechanical trip mechanism which will trip under extreme point pressure or collision with an obstruction. The leg will trip and pivot up and to the rear. To reset the leg into the operating position, simply raise the Paratill out of the ground. The Leg should automatically lower and reset for operation. Lower the unit into the operating position and continue.



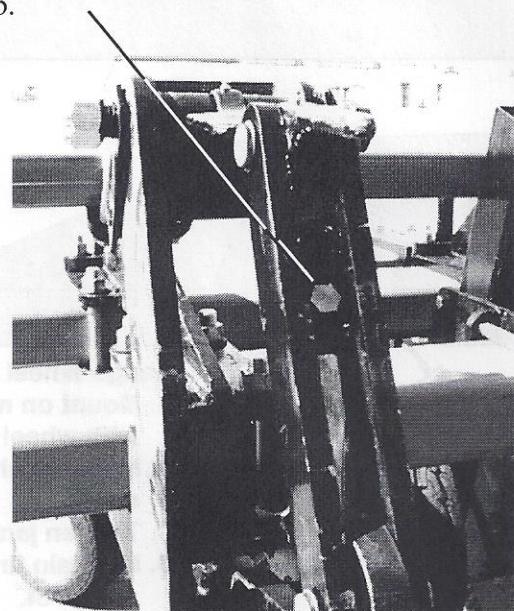
NEVER WALK CLOSELY BEHIND A LEG



**Equipped With a Mechanical
Trip Bracket. The Leg may
spontaneously trip and rotate
to the rear causing serious injury.**

Adjusting the Mechanical Trip Bracket:

Each Trip Bracket is equipped with shims placed under a retaining bolt located under the toggle trip lower tab.



Picture 5: Retaining bolt for shims under toggle.

The trip force for each leg can be adjusted higher by removing one or two shims. Each shim removed will increase the force to trip the Leg by about 400 pounds. Removal of shims will place leg and trip mechanism under greater stress.

Always block the leg securely to make adjustments to the trip mechanism.

WARNING!

**Finger and hand may be
pinched severely if Leg is
allowed to fall to the reset
position while changing shims.**

**Block the leg securely before
changing shims. Failure to do
so could result in serious injury.**

Trip Check Measuring Tool:

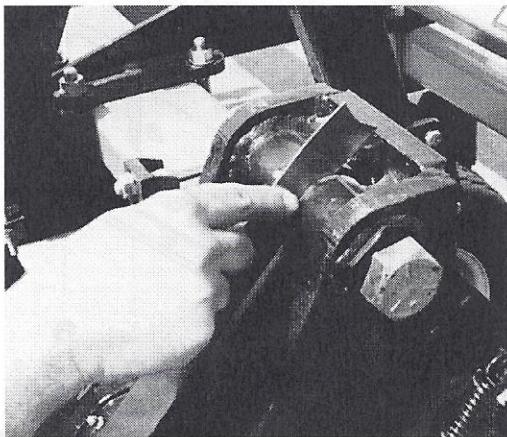
Each Mechanical Trip Paratill is shipped with a measuring tool to check linkage after shims have been added or removed.

Measure each Leg Bracket after adding or removing shims. Failure to do so could result in damage to Legs or trip mechanism.

Note: Be sure to tighten shim fastening bolt before returning leg to operating (down) position.

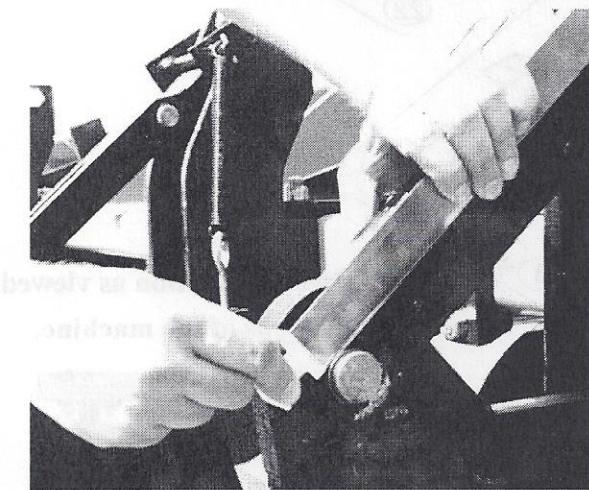
Measuring Procedure:

1. Rotate the top spring fastening bracket to the front part of the trip bracket. Removal of lower nut from eye bolt may be necessary.
2. Seat the measuring tool down to the top bolt in the groove closest to the toggle retaining spring. (Picture 6)



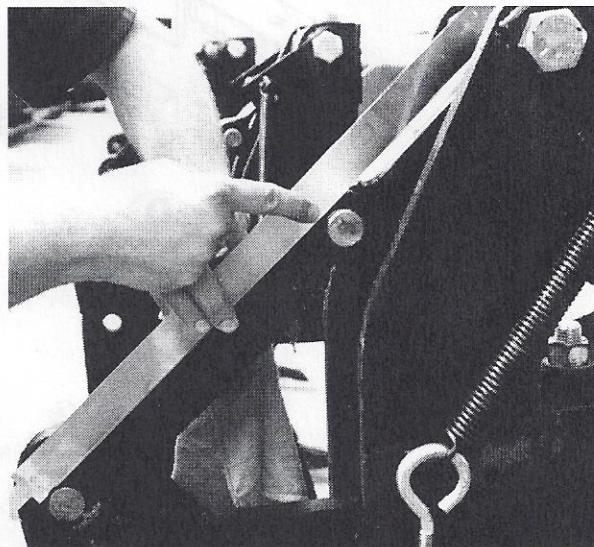
Picture 6: Seat measuring tool on top pivot bolt.

3. Seat the lower part of the measuring tool on the lower linkage pin (**not on the snap ring**). (Picture 7)



Picture 7: Seat lower portion of measuring tool on lower pin.

4. Measure the distance between the lower edge of the measuring tool and the upper edge of the pin. (Picture 8)



Picture 8: Measure distance between measuring tool and pin.

The following specifications must be maintained after changing shims.

Measure the distance between the bottom of the measuring tool and the top of the pin.

Maximum distance: 3/8"

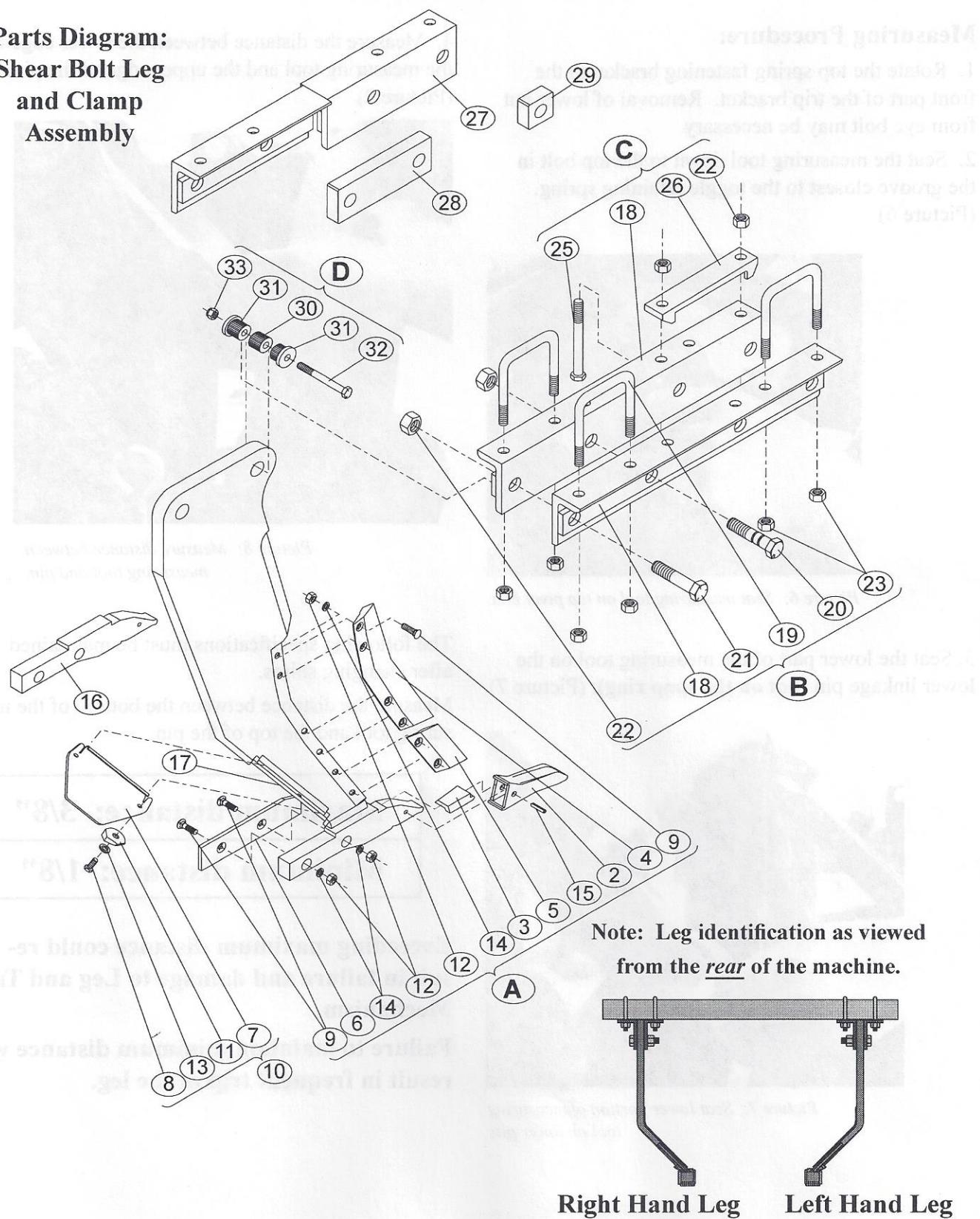
Minimum distance: 1/8"

Exceeding maximum distance could result in failure and damage to Leg and Trip Mechanism.

Failure to maintain minimum distance will result in frequent trip of the leg.

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Parts Diagram: Shear Bolt Leg and Clamp Assembly

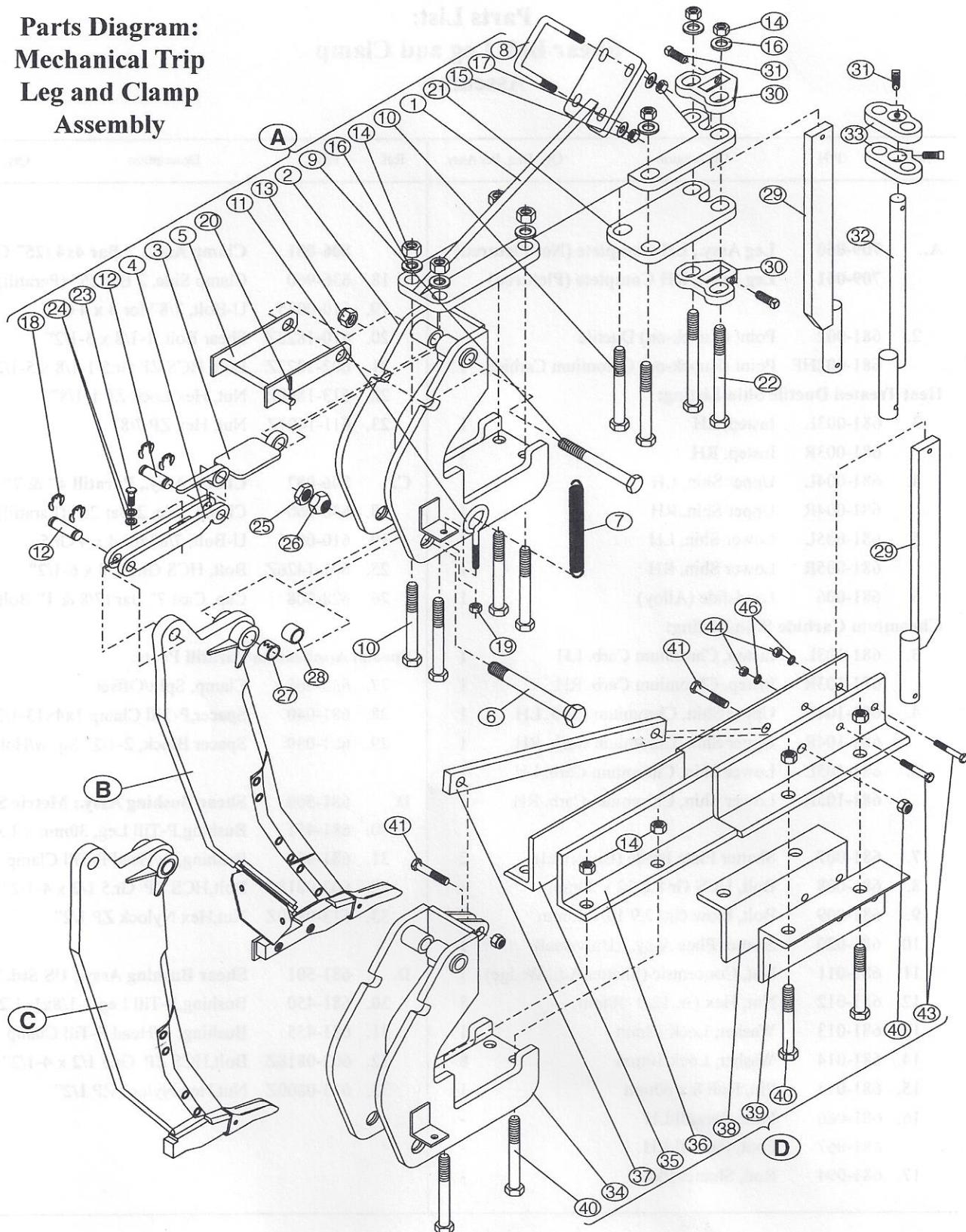


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Parts List: Shear Bolt Leg and Clamp Assembly

Ref.	P/N	Description	Qty. Req. Per Assy.	Ref.	P/N	Description	Qty. Req. Per Assy.
A. 709-060		Leg Assy., LH Complete (Not Pictured)		B. 806-081		Clamp Assy., 2 Bar 4x4 (25" Centers)	
709-061		Leg Assy., RH Complete (Pictured)		18. 636-960		Clamp Side, 2 Bar 25" (Paratill)	2
2. 681-002		Point (Knock-on) Ductile	-	19. 610-0035		U-Bolt, 7/8" for 4 x 4 Gr.5	4
681-002HF		Point (Knock-on) Chromium Carbide	1	20. 610-1822Z		Shear Bolt, 1-1/8 x 5-1/2"	1
Heat Treated Ductile Shin Listing:				21. 602-1822Z		Bolt, HCS ZP Gr.5 1-1/8 x 5-1/2"	1
3. 681-003L		Instep, LH	1	22. 613-1800Z		Nut, Hex Lock ZP 1-1/8"	2
681-003R		Instep, RH	1	23. 611-1401Z		Nut, Hex ZP 7/8"	8
4. 681-004L		Upper Shin, LH	1	C. 806-087		Clamp Assy., Paratill 4" & 7" Bars	
681-004R		Upper Shin, RH	1	18. 636-960		Clamp Side, 2 Bar 25" (Paratill)	2
5. 681-005L		Lower Shin, LH	1	19. 610-0035		U-Bolt, 7/8" for 4 x 4 Gr.5	2
681-005R		Lower Shin, RH	1	25. 601-1426Z		Bolt, HCS Gr.2 7/8 x 6-1/2"	4
6. 681-006		Landslide (Alloy)	1	26. 628-308		Cap, Cast 7" Bar (7/8 & 1" Bolts)	2
Chromium Carbide Shin Listing:				Special Application Paratill Parts:			
3. 681-103L		Instep, Chromium Carb. LH	1	27. 636-965		Clamp, Split/Offset	
681-103R		Instep, Chromium Carb. RH	1	28. 681-040		Spacer, P-Till Clamp 1x4x13-1/2"	-
4. 681-104L		Upper Shin, Chromium Carb. LH	1	29. 681-039		Spacer Block, 2-1/2" Sq. w/Hole	-
681-104R		Upper Shin, Chromium Carb. RH	1	D. 681-500		Shear Bushing Assy.; Metric Sizing	
5. 681-105L		Lower Shin, Chromium Carb. LH	1	30. 681-451		Bushing, P-Till Leg, 30mm x 1 x 1/2"	
681-105R		Lower Shin, Chromium Carb. RH	1	31. 681-455		Bushing, w/Head P-Till Clamp	
7. 681-007		Shatter Plate Blade (Universal)	2	32. 602-0818Z		Bolt, HCS ZP Gr.5 1/2 x 4-1/2"	
8. 681-008		Bolt, HCS Gr.8.8 12 x 20mm	1	33. 613-0800Z		Nut, Hex Nylock ZP 1/2"	
9. 681-009		Bolt, Plow Gr.12.9 10 x 35mm	8	D. 681-501		Shear Bushing Assy.; US Std. Sizing	
10. 681-020		Shatter Plate Assy., (Universal)	1	30. 681-450		Bushing, P-Till Leg 1-1/8x1x1/2"	
11. 681-011		Nut, Concentric (Shatter Adj. Wedge)	1	31. 681-455		Bushing, w/Head P-Till Clamp	
12. 681-012		Nut, Hex Gr. 12.9 10mm	8	32. 602-0818Z		Bolt, HCS ZP Gr.5 1/2 x 4-1/2"	
13. 681-013		Washer, Lock 12mm	1	33. 613-0800Z		Nut, Hex Nylock ZP 1/2"	
14. 681-014		Washer, Lock 10mm	8				
15. 681-015		Pin, Roll 8 x 60mm	1				
16. 681-066		Foot, Paratill LH	-				
681-067		Foot, Paratill RH	-				
17. 681-094		Rod, Shatter Plate	-				

**Parts Diagram:
Mechanical Trip
Leg and Clamp
Assembly**



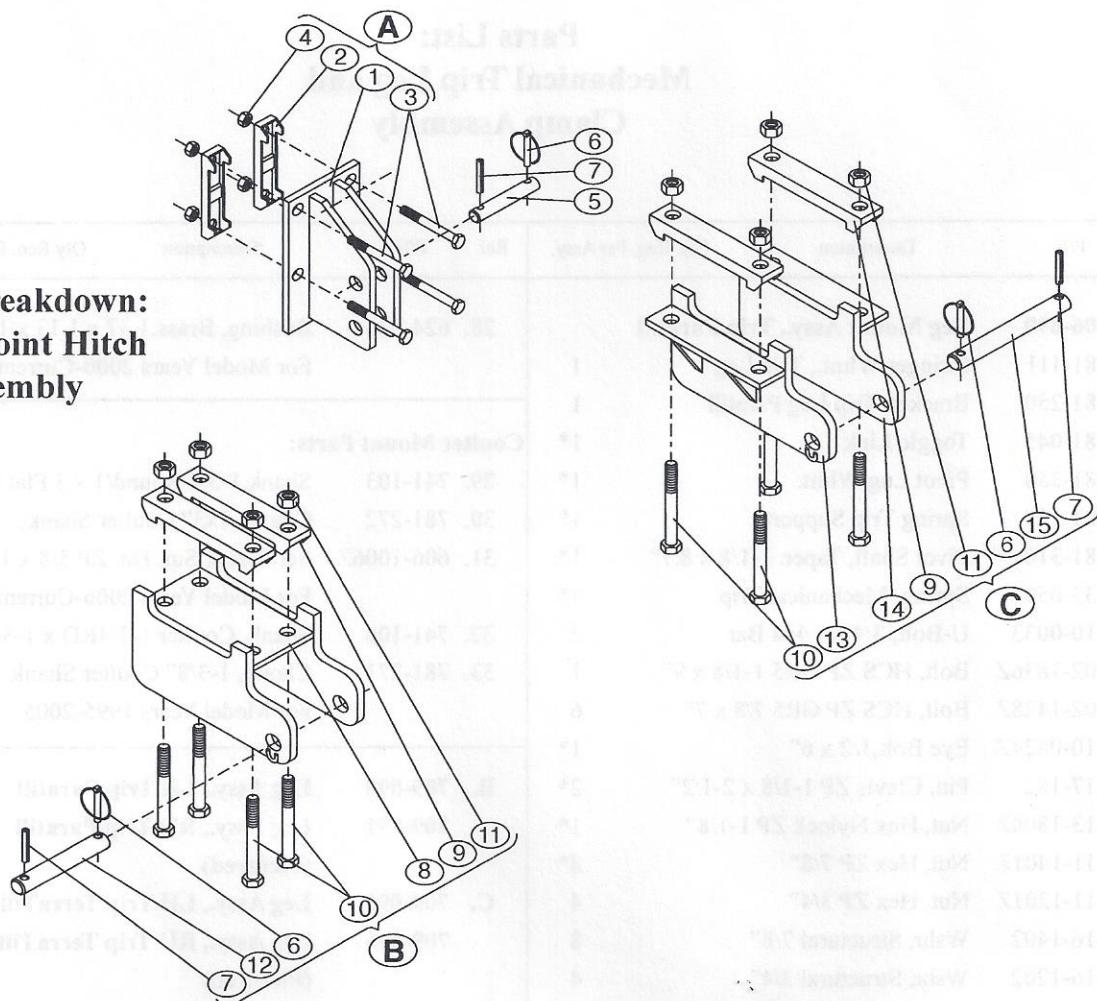
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Parts List: Mechanical Trip Leg and Clamp Assembly

Ref.	P/N	Description	Qty. Req. Per Assy.	Ref.	P/N	Description	Qty Req. Per Assy.
A. 806-090		Leg Mount Assy., Trip Paratill		28.	624-026	Bushing, Brass, 1.37 x 1.13 x 1.375" 2	
1.	781-111	Stringer Wlmt., Trip Leg	1			For Model Years 2000-Current	
2.	681-250	Bracket, Trip Leg Paratill	1				
3.	681-045	Toggle Link	1*				
4.	781-350	Pivot Lug Wlmt.	1*	29.	741-103	Shank, 1-3/4 Round/1 x 3 Flat (26") 1	
5.	781-135	Spring Trip Support	1*	30.	781-272	Clamp, 1x3" Coulter Shank 2	
6.	681-310	Pivot Shaft, Taper. 1-1/8 x 8.7"	1*	31.	606-1006Z	Set Screw, Sq. Hd. ZP 5/8 x 1-1/2" 2	
7.	633-050	Spring, Mechanical Trip	1*			For Model Years 2006-Current	
8.	610-0033	U-Bolt, 3/4 for 4x4 Bar	2	32.	741-106	Shank, Coulter 1-3/4RD x 1-3/8RD 1	
9.	602-1836Z	Bolt, HCS ZP GR5 1-1/8 x 9"	1	33.	781-271	Clamp, 1-3/8" Coulter Shank 2	
10.	602-1428Z	Bolt, HCS ZP GR5 7/8 x 7"	6			For Model Years 1995-2005	
11.	610-0824Z	Eye Bolt, 1/2 x 6"	1*				
12.	617-182	Pin, Clevis ZP 1-1/8 x 2-1/2"	2*	B. 709-090		Leg Assy., LH Trip Paratill	
13.	613-1800Z	Nut, Hex Nylock ZP 1-1/8"	1*	709-091		Leg Assy., RH Trip Paratill	
14.	611-1401Z	Nut, Hex ZP 7/8"	8*			(Pictured)	
15.	611-1201Z	Nut, Hex ZP 3/4"	4	C. 709-095		Leg Assy., LH Trip TerraTill	
16.	616-1402	Wshr, Structural 7/8"	8	709-096		Leg Assy., RH Trip TerraTill	
17.	616-1202	Wshr, Structural 3/4"	4			(Pictured)	
18.	627-025	Snap Ring, 1" Rotor Clip	4*	D. 806-095		Leg Mount Assy., Trip P-Till (Wing)	
19.	613-0800Z	Nut, Hex Nylock ZP 1/2"	1*	34.	681-260	Bracket, Trip Leg P-Till Mount 1	
20.	617-060	Pin, Roll ZP 1/4 x 1-1/2"	1*	35.	636-904	Clamp Angle, LH Mech Trip P-Till 1	
21.	681-270	Bolt Plate, Front Bar 7"	1	36.	636-905	Clamp Angle, RH Mech Trip P-Till 1	
22.	602-1437Z	Bolt, HCS ZP GR5 7/8 x 9"	2	37.	636-908	Support Strap, Mech. Trip Bkt. 1	
23.	781-355	Shim Bolt, 1/2 x 1 x .270"	1*	38.	636-906	Clamp Angle, LH Lower Mech. PT 1	
24.	616-0800	Bushing, Machine, 18 Ga.	5*	39.	636-907	Clamp Angle, RH Lower Mech. PT 1	
25.	611-1808	Nut, Hex Jam, 1-1/8"-12UNF	1*	40.	602-1426Z	Bolt, HCS ZP GR5 7/8 x 6-1/2" 8	
26.	681-308	Nut, Hex Tapered 1-1/8"-12UNF	1*	41.	602-1212Z	Bolt, HCS ZP GR5 3/4 x 3" 2	
27.	624-025	Bushing, Sp. Steel. 1.37 x 1.13 x 2" 2		42.	602-0812Z	Bolt, HCS ZP GR5 1/2 x 3" 4	
		For Model Years 1996-1999		43.	613-1200Z	Nut, Hex Nylock ZP 3/4" 2	
				44.	611-0801Z	Nut, Hex ZP 1/2" 4	
				45.	615-0800Z	Washer, Lock ZP 1/2" 4	

Note: Quantities designated with an asterisk (*) are common to both **806-090** and **806-095** mounting assemblies.

**Parts Breakdown:
Three Point Hitch
Assembly**



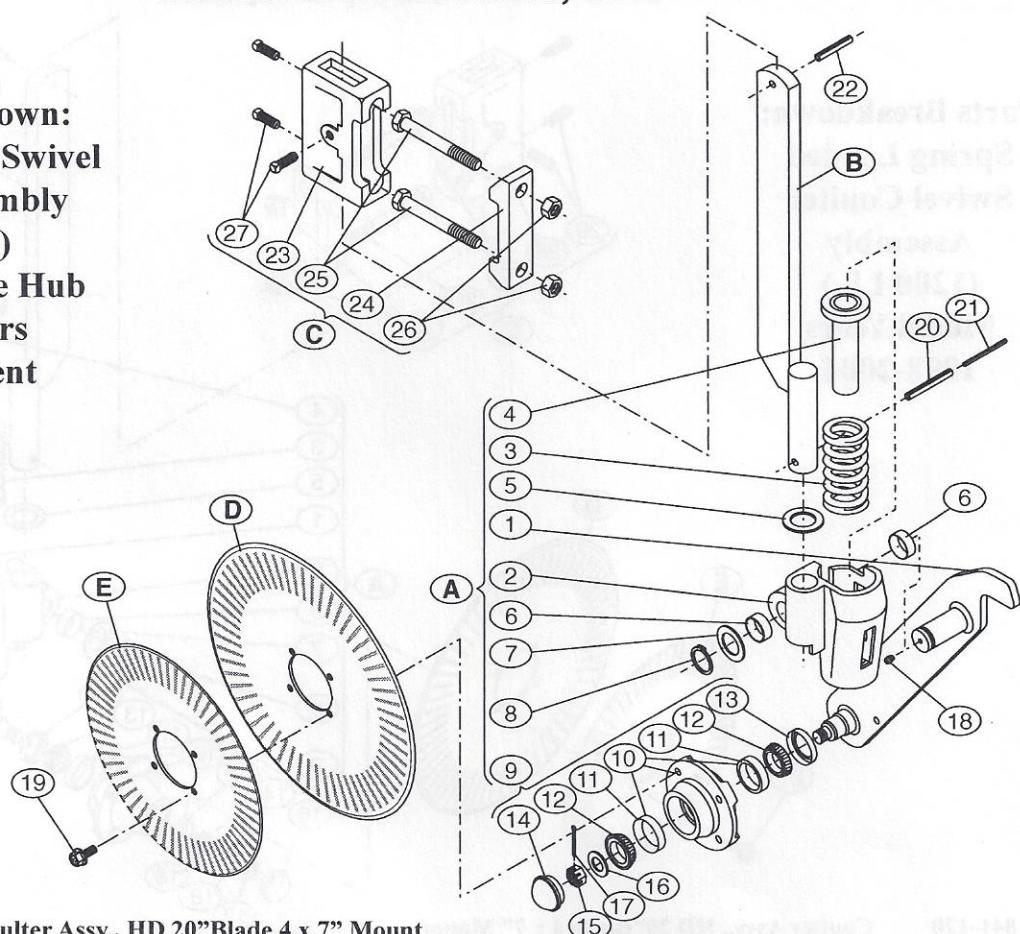
804-748 Hitch Assy., Cat. III 4 x 7" Bar (4" Drop)

804-750 Hitch Assy., Split Cat. III 4 x 7" Bar (4" Drop)

Ref.	P/N	Description	Qty Req. Per Hitch	Ref.	P/N	Description	Qty Req. Per Hitch
A	804-304	Top Link Assy, 4"x4" Bar; 4" Drop		7.	617-053	Pin, Roll 7/16"x2-1/4"	3
1.	704-304	Bracket, Top Link Cat III 4" Drop	1	8.	704-750	Bkt. Pull Point Cat.III 7" (4" Drop)	2
2.	628-400	Cap, 4" 7/8" & 1" Bolt Holes	2	9.	628-308	Cap, Cast 7" HD	4
3.	602-1426Z	Bolt, HCS ZP GR5 7/8" x 6-1/2"	4	10.	602-1626Z	Bolt, HCS ZP GR5 1 x 6-1/2"	4
4.	611-1401Z	Nut, Hex ZP 7/8"	4	11.	611-1601Z	Nut, Hex ZP 1"	4
Top Link Pin							
5.	617-190	Pin, Clevis Cat III Top	1	12.	617-196	Pin, Clevis ZP Cat. III Wide Pull Point	2
6.	617-053	Pin, Roll 7/16"x2-1/4"	3				
7.	617-105	Klik Pin, 7/16" x 2"	3				
B.	804-510	Pull Point Assy., Cat.III 4 x 7 (4" Drop)		C.	804-734	Pull Pt.Assy.,4 x 7 Split 4" Drop Cat .III	
6.	617-105	Klik Pin, 7/16" x2"	3	13.	704-715	Bkt,Split RH 7" (Cat. III) 4" Drop	2
				14.	704-714	Bkt,Split LH 7" (Cat. III) 4" Drop	2
				15.	617-197	Pin, Clevis ZP Cat. III (9-1/2" Usbl.)	2

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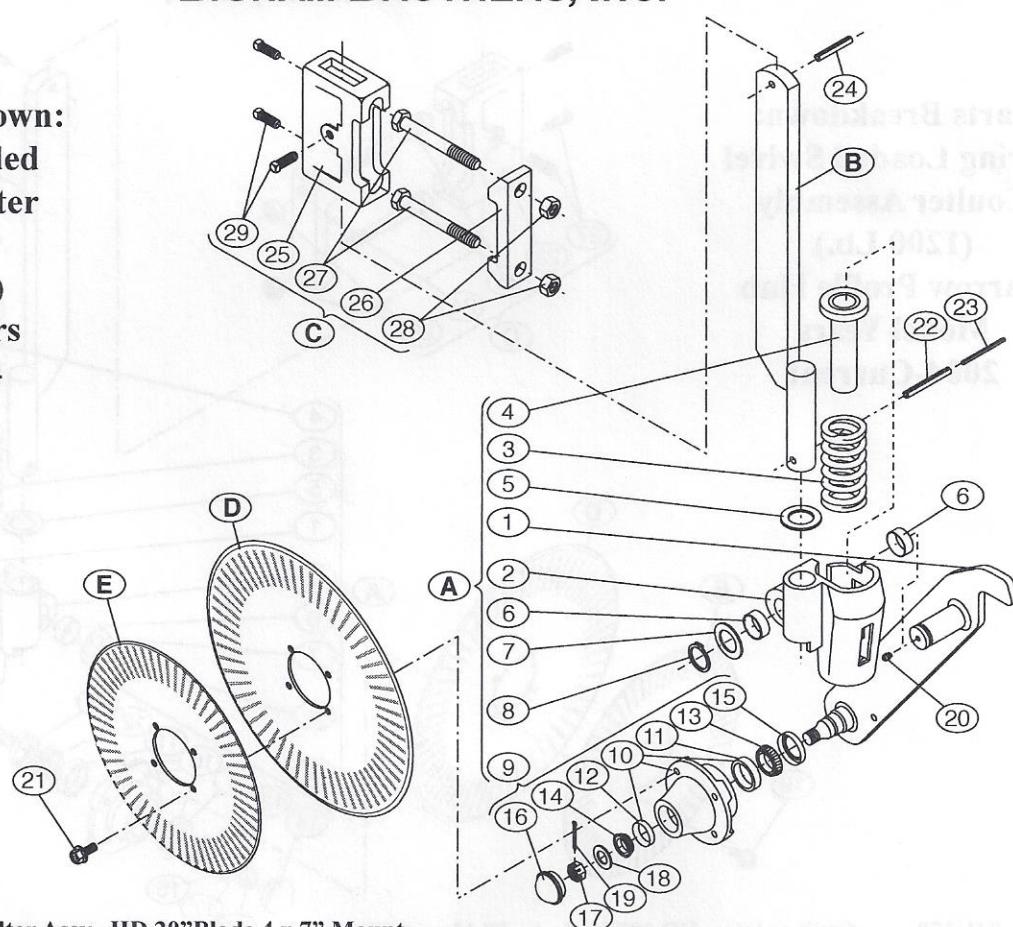
Parts Breakdown:
Spring Loaded Swivel
Coulter Assembly
(1200 Lb.)
Narrow Profile Hub
Model Years
2004-Current



841-170 Coulter Assy., HD 20" Blade 4 x 7" Mount

Ref.	A	Ref. P/N	Description	Qty Req. Per Assy.	Ref. P/N	Description	Qty Req. Per Assy.	
A.	741-312	Arm, Hub, Hinge, And Spring Assy.			16.	616-1400	Bushing, Mach. 2"OD x.165 Thick	1
1.	741-112	Arm And Spindle XHD/Nrw Hub	1		17.	617-020	Pin, Cotter 5/32x1-1/2"	1
2.	628-307	Hinge Casting, XHD	1		18.	617-009	Fitting, Grease 1/4"-28 UNF	1
3.	633-035	Spring, XHD	1		19.	607-0805	Bolt, Flange 1/2x1-1/4" 3/4 Hd. N.F.	4
4.	628-309	Spring Cap, XHD	1		B.	741-103	Shank, 1-3/4" Rnd; 1x3 Flat (26")	1
5.	616-1990	Bushing, Mach. 1/8"x1-3/4" (I.D.)	1		20.	617-059	Pin, Roll ZP 3/8x2-1/2"	1
6.	624-107	Bushing, 1-3/8" I.D.x 1"	2		21.	617-057	Pin, Roll ZP 7/32x2-1/2"	1
7.	616-1985	Bushing, Mach. 1/8"x1-3/8" (I.D.)	1		22.	617-052	Pin, Roll ZP 3/8x2"	1
8.	622-853	Snap Ring, External 1-3/8"	1		C.	806-473	Clamp Assy., 4x7" for 1x3" Shank	
9.	627-146	Hub Assy., 4 Hole Narrow Profile	-		23.	628-700	Clamp Body, 4" for 1x3"	1
10.	627-145	Hub/Cups, HD Narr. Profile 4-Hole	1		24.	628-400	Cap, Cast 4" H.D.	1
11.	622-006	Cup, 67010 for 67048 Bearing	-		25.	609-1438Z	Bolt, HMB ZP 7/8x9-1/2"	2
12.	622-007	Bearing Cone, 67048	2		26.	611-1410Z	Nut, Hex ZP 7/8"	2
13.	623-001DL	Seal, 152357B Q633 Hub (Dbl. Lip)	1		27.	606-1006Z	Set Screw, Sq. Hd. ZP 5/8x1-1/2"	3
14.	627-543	Dust Cap 4 Hole Nrw Prof. Hub	1		D.	630-012	Blade, (20" Fluted)	1
15.	614-1405	Nut, Hex Slotted 7/8" NF	1		E.	630-009	Blade, (17" Fluted)	-

Parts Breakdown:
Spring Loaded
Swivel Coulter
Assembly
(1200 Lb.)
Model Years
1998-2004

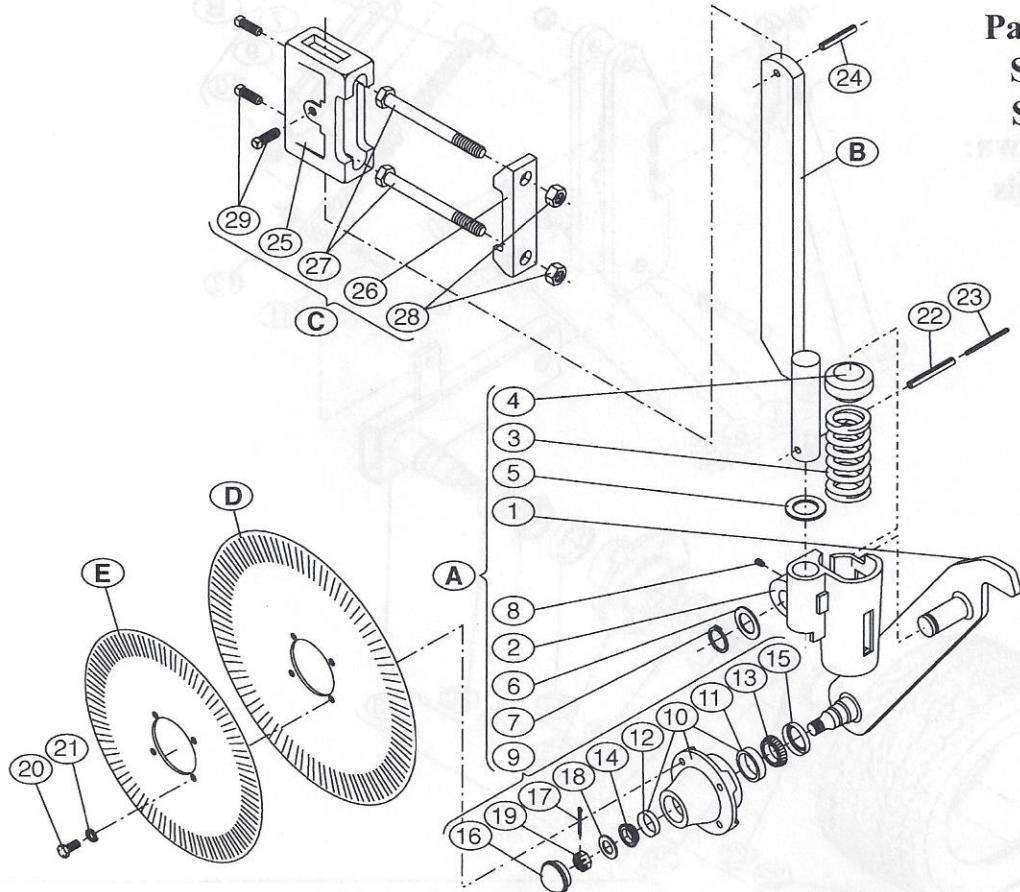


841-170 Coulter Assy., HD 20"Blade 4 x 7" Mount

Ref.	P/N	Description	Qty Req. Per Assy.	Ref.	P/N	Description	Qty Req. Per Assy.
A.	741-300	Arm, Hub, Hinge, And Spring Assy.		17.	614-1207C	Nut, Hex Slotted 3/4" N.F.	1
1.	741-107	Arm And Spindle XHD	1	18.	616-1200	Bushing, Mach. 10 Ga. 3/4"	1
2.	628-307	Hinge Casting, XHD	1	19.	617-020	Pin, Cotter 5/32x1-1/2"	1
3.	633-035	Spring, XHD	1	20.	617-009	Fitting, Grease 1/4"-28 UNF	1
4.	628-309	Spring Cap, XHD	1	21.	607-0805	Bolt, Flange 1/2x1-1/4" 3/4 Hd. N.F.	4
5.	616-1990	Bushing, Mach. 1/8"x1-3/4" (I.D.)	1	B.	741-103	Shank, 1-3/4" Rnd; 1x3 Flat (26")	1
6.	624-107	Bushing, 1-3/8" I.D.x 1"	2	22.	617-059	Pin, Roll ZP 3/8x2-1/2"	1
7.	616-1985	Bushing, Mach. 1/8"x1-3/8" (I.D.)	1	23.	617-057	Pin, Roll ZP 7/32x2-1/2"	1
8.	622-853	Snap Ring, External 1-3/8"	1	24.	617-052	Pin, Roll ZP 3/8x2"	1
9.	627-142	Hub Assy, 4 Hole Q633	-	C.	806-473	Clamp Assy., 4x7" for 1x3" Shank	
10.	627-141	Hub/Cups 4 Hole Q633 2805010	1	25.	628-700	Clamp Body, 4" for 1x3"	1
11.	622-006	Cup, 67010 for 67048 Bearing	-	26.	628-400	Cap, Cast 4" H.D.	1
12.	622-002	Cup, 11910 for 11949 Bearing	-	27.	609-1438Z	Bolt, HMB ZP 7/8x9-1/2"	2
13.	622-007	Bearing Cone, 67048	1	28.	611-1410Z	Nut, Hex ZP 7/8"	2
14.	622-001	Bearing Cone, 11949	1	29.	606-1006Z	Set Screw, Sq. Hd. ZP 5/8x1-1/2"	3
15.	623-001DL	Seal, 152357B Q633 Hub (Dbl. Lip)	1	D.	630-012	Blade, (20" Fluted)	1
16.	627-540	Dust Cap 4 Hole Q633 9099111	1	E.	630-009	Blade, (17" Fluted)	-

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Parts Breakdown:
Spring Loaded
Swivel Coulter
Assembly
(900 Lb.)
Model Years
1989-1997

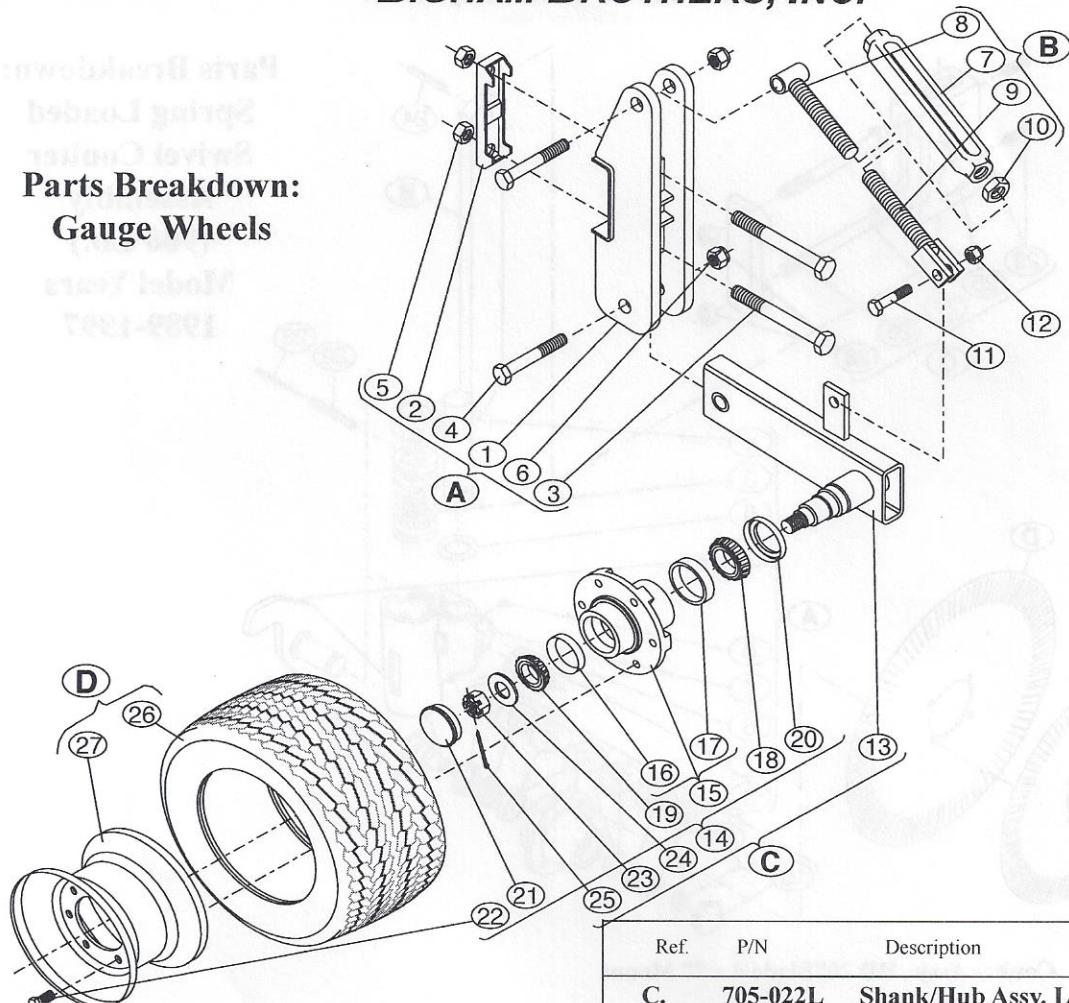


841-100 Coulter Assy., HD 20"Blade 4 x 7" Mount

Ref.	P/N	Description	Qty Req. Per Assy.	Ref.	P/N	Description	Qty Req. Per Assy.
A.	741-200	Arm, Hub and Hinge Assy.	-	17.	617-020	Pin, Cotter 5/32 x 1-1/2"	1
1.	741-102	Arm and Spindle	1	18.	616-1200	Bushing, Mach. 10 Ga 3/4"	1
2.	628-306	Hinge Casting	1	19.	614-1207C	Nut, Hex Slotted 3/4" N.F.	1
3.	633-033	Spring	1	20.	602-0804F	Bolt, HCS ZP Gr 5 1/2 x 1" N.F.	4
4.	628-305	Spring Cap	1	21.	615-0800Z	Washer, Lock ZP 1/2"	4
5.	616-1990	Bushing, Mach. 1/8 x 1-3/4" (I.D.)	1	22.	617-059	Pin, Roll ZP 3/8 X 2-1/2"	1
6.	616-1980	Bushing, Mach. 1/8 x 1-1/4"	1	23.	617-057	Pin, Roll ZP 7/32 x 2-1/2"	1
7.	622-850	Snap Ring, External 1-1/4"	1	24.	617-052	Pin, Roll ZP 3/8 X 2"	1
8.	617-009	Zerk, 1/4" Threaded	1	B.	741-103	Shank, 1-3/4 Round/1 x 3 Flat (26")	1
9.	627-142	Hub Assy., 4 Hole Q633	-	C.	806-473	Clamp Assy., 4x7" for 1x3" Shank	-
10.	627-141	Hub/Cups, 4 Hole Q633	1	25.	628-700	Clamp Body. 4" for 1 x 3 Shank	1
11.	622-006	Cup, 67010 for 67048 Bearing	1	26.	628-400	Cap, Cast 4" HD	1
12.	622-002	Cup, 11910 for 11949 Bearing	1	27.	609-1438Z	Bolt, HMB ZP 7/8 x 9-1/2"	2
13.	622-007	Bearing Cone, 67048	1	28.	611-1401Z	Nut, Hex ZP 7/8"	2
14.	622-001	Bearing Cone, 11949	1	29.	606-1006Z	Set Screw, Sq. Hd. 5/8 x 1-1/2"	3
15.	623-001DL	Seal, 152357B Q633 Hub(Dbl.Lip)	1	D.	630-012	Blade, 20" Fluted	1
16.	627-540	Cap, Dirt Q633 Hub	1	E.	630-009	Blade, 17" Fluted	-

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Parts Breakdown: Gauge Wheels

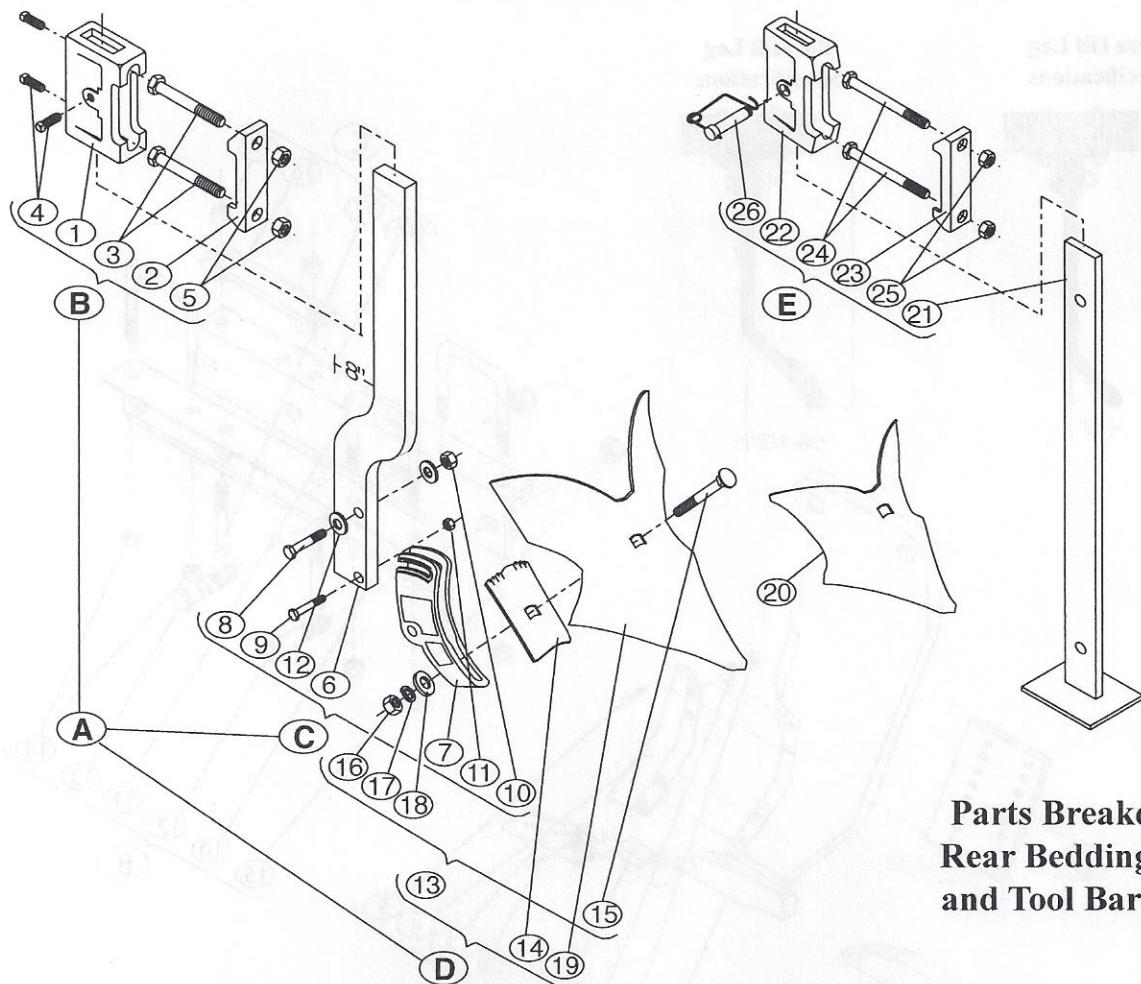


805-205 **Gauge Wheels, Paratill 4x4" Mount**
 805-207 **Gauge Wheels, Paratill 4x7" Mount**

Ref.	P/N	Description	Qty Req. Per Set
A.	805-104	Mount Assy., 4 x 4"	-
1.	705-047	Mount Bkt., 4"	2
2.	628-400	Cap, Cast 4" HD	2
3.	601-1428Z	Bolt, HCS ZP 7/8 x 7"	4
4.	601-1218Z	Bolt, HCS ZP 3/4 x 4-1/2"	4
5.	611-1401Z	Nut, Hex ZP 7/8"	4
6.	613-1200Z	Nut, Hex Nylock ZP 3/4"	4
B.	705-087	Turnbuckle, 1 x 6" G.W.	-
7.	617-094	Stud, 1 x 5-3/4" LH w/Bushing ZP	2
8.	617-095	Stud, 1 x 5-3/4" RH w/Ears ZP	2
9.	301-350	Body, Turnbuckle 1 x 6" ZP	2
10.	614-1601Z	Nut, Hex Jam 1" ZP	2
11.	601-1011Z	Bolt, HCS ZP 5/8 x 2-3/4"	2
12.	613-1005Z	Nut, Hex Nylock ZP 5/8"	2

Ref.	P/N	Description	Qty Req. Per Set
C.	705-022L	Shank/Hub Assy. LH	1
	705-022R	Shank/Hub Assy. RH (Pictured)	1
13.	705-021L	Shank/Spindle, LH	
	705-021R	Shank/Spindle, RH (Pictured)	
14.	627-160	Hub Assy., 6 Hole Q888	
15.	627-159	Hub/Cups., 6 Hole Q888	
16.	622-006	Cup, 67010	
17.	622-008	Cup, 69310	
18.	622-009	Bearing Cone, 69349	
19.	622-007	Bearing Cone, 67048	
20.	623-002	Seal, Q888 Hub (16289)	
21.	627-560	Cap, Dirt Q888 Hub	
22.	607-0805Z	Bolt, Lug ZP 1/2 X 1-1/4"	
23.	614-1407	Nut, Hex Slotted 7/8" N.F.	
24.	616-1400	Bushing, Mach. 7/8" X 14 Ga.	
25.	617-020	Pin, Cotter 5/32 X 1-1/2"	
D.	705-006	Wheel & Tire, 20.5 x 8.0-10	2
	25.	627-575	Tire, 20.5x8.0-10 Ply
	26.	627-480	Wheel, 6 Hole 10x6"

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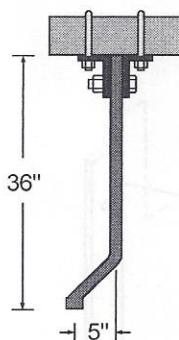


Parts Breakdown: Rear Bedding Tools and Tool Bar Stand

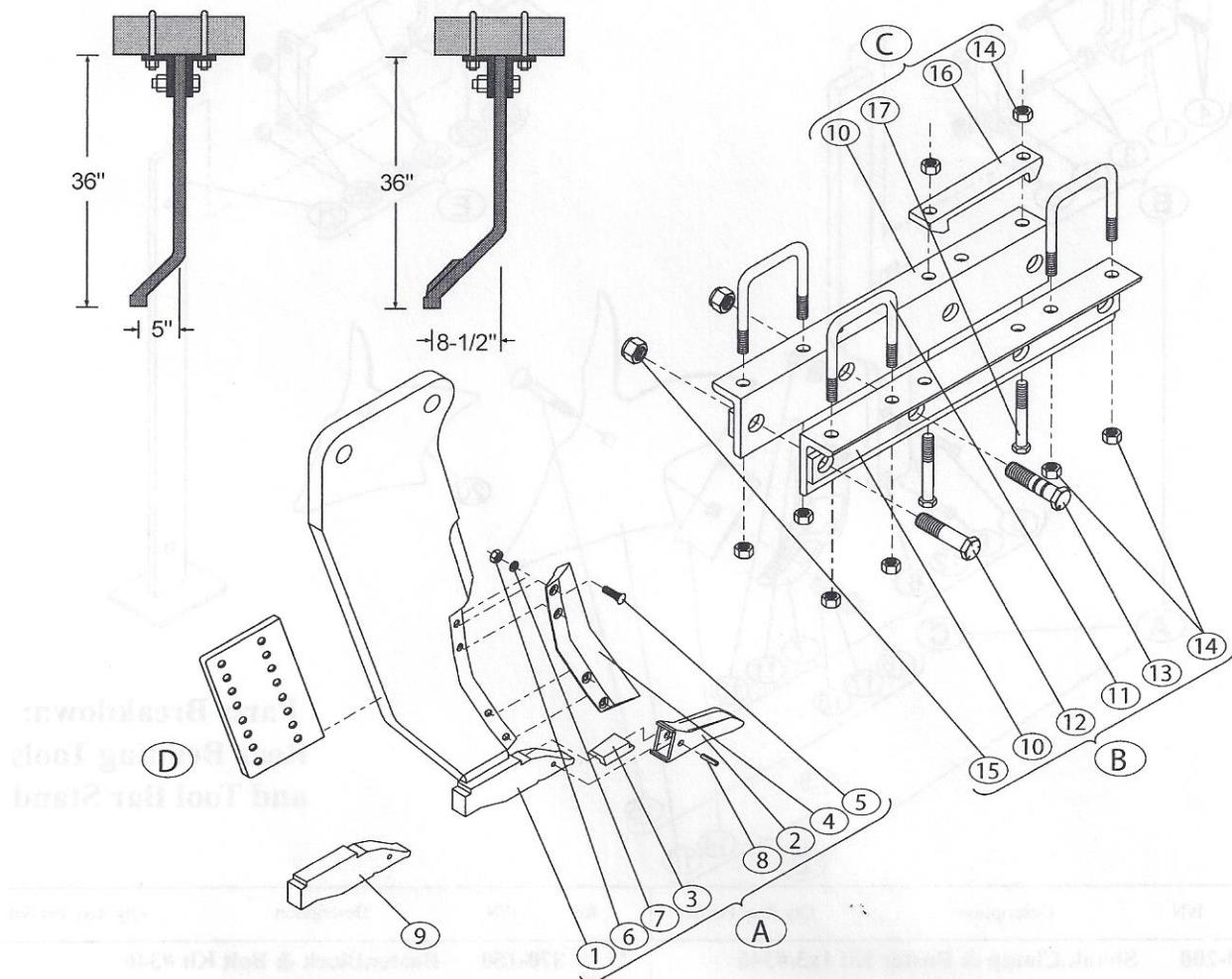
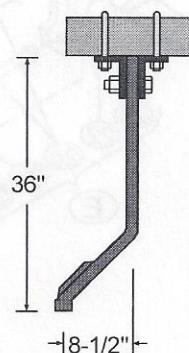
Ref.	P/N	Description	Qty Req. Per Set	Ref.	P/N	Description	Qty Req. Per Set
A.	870-200	Shank,Clamp & Buster Kit 1x3/#346		D.	870-150	Buster,Block & Bolt Kit #346	
B.	806-403	Clamp,4x4 For 1x3 Shank		13.	638-350	Bolt,Nut & Washer Pack for 346	1
1.	628-700	Body, Clamp 4" 1x3 Shank	1	14.	636-995	Block, Buster for #346	1
2.	628-400	Cap, 4" 7/8 & 1" Bolt Holes	1	15.	604-1220Z	Bolt,Crg 3/4 x 5" (GR5) ZP	1
3.	601-1426Z	Bolt,HMB 7/8"x6-1/2" (GR2) ZP	2	16.	611-1201Z	Nut,Hex ZP 3/4"	1
4.	606-1006Z	Set Scrw, SQR HD ZP 5/8x1-1/2"	3	17.	616-1202Z	Washer, Flat ZP (Heavy) 3/4"	1
5.	611-1401Z	Nut,Hex ZP 7/8"	2	18.	615-1200Z	Wshr., Lock ZP 3/4"	
C.	705-303	Shank Assy,1x3 Rear Offset		19.	638-346	Lister Bottom, # 346	
6.	631-303	Shank, 1x3 Rear Offset	1	638-348	Buster, 15" Bigham Hi-Wing		
7.	628-003	Foot Piece, For 1x3 Shank	1	20.	638-111	Lister Bottom, # 11W	
8.	602-1012Z	Bolt,HCS 5/8 x 3" (GR5) ZP	1	E.	814-974	Stand Assy. 4 x 4" Bar- 3/4" Stand	
9.	602-0811Z	Bolt,HCS 1/2 x 2-3/4" (GR5) ZP	1	21.	636-975	Stand, 3/4 x 2-1/2 x 44"	1
10.	611-1001Z	Nut,Hex ZP 5/8"	1	22.	636-980	Clamp Body, 4" for 3/4"Shank	1
11.	611-0801Z	Nut,Hex ZP 1/2"	1	23.	628-400	Cap, 4" 7/8 & 1" Bolt Holes (Cast)	1
12.	616-1002Z	Wshr., Flat Heavy ZP 5/8"	2	24.	609-1438Z	Bolt, HMB 7/8 x 9-1/2" (GR2) ZP	2
				25.	611-1401Z	Nut,Hex ZP 7/8"	2
				26.	617-129	Pin, Loxall 3/4 x 3-1/2" Usbl.	1

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TerraTill Leg Specifications

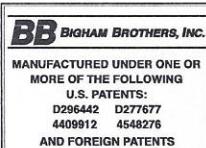


Paratill Leg Specifications

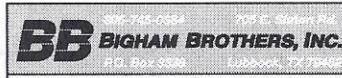


REF#	PART#	DESCRIPTION	QTY. REQ. PER ASSY.		REF#	PART#	DESCRIPTION	QTY. REQ. PER ASSY.	
			*	LH or RH				*	4" or 7" front mount
A.	709-085	LEG ASSY., LH TERRATILL H.C. 36"	-		B.	806-081	CLAMP ASSY; 2 BAR 25" SHEAR BOLT	-	
	709-086	LEG ASSY., RH TERRATILL H.C. 36"	-		10.	636-960	CLAMP ANGLE, 2 BAR 25"	2	
	(Pictured)				11.	610-0035	U-BOLT, 7/8" FOR 4 x 4 BAR GR5	2/4	
2.	681-002HF	POINT, CHROMIUM CARBIDE	1		12.	602-1822Z	BOLT, HCS ZP GR5 1-1/8 x 5-1/2"	1	
	681-002R	POINT, PARATILL ROCK POINT (Opt.)	-		13.	610-1822Z	SHEAR BOLT, ZP 1-1/8 x 5-1/2"	1	
3.	681-003L	INSTEP, LH	1*		14.	611-1401Z	NUT, HEX ZP 7/8"	8	
	681-003R	INSTEP, RH	1*		15.	613-1800Z	NUT, HEX LOCK ZP 1-1/8"	2	
4.	681-004L	UPPER SHIN, LH	1*		C.	806-087	CLAMP ASSY; 2 BAR 4" & 7" SHEAR BOLT	-	
	681-004R	UPPER SHIN, RH	1*		16.	628-308	CAP, CAST 7" BAR	2*	
5.	681-009	BOLT, PLOW GR 12.9 10 x 35MM	4		17.	602-1426Z	BOLT, HCS ZP GR5 7/8 x 6-1/2"	4*	
6.	681-012	NUT, HEX GR 12.9 x 10MM	4						
7.	681-014	WASHER, LOCK 10MM	4						
8.	681-015	PIN, ROLL 8 x 60MM	1						
9.	681-070	FOOT, TERRATILL (UNIV.)	-		D.	310-111	KNIFE PLATE FOR TERRATILL	-	

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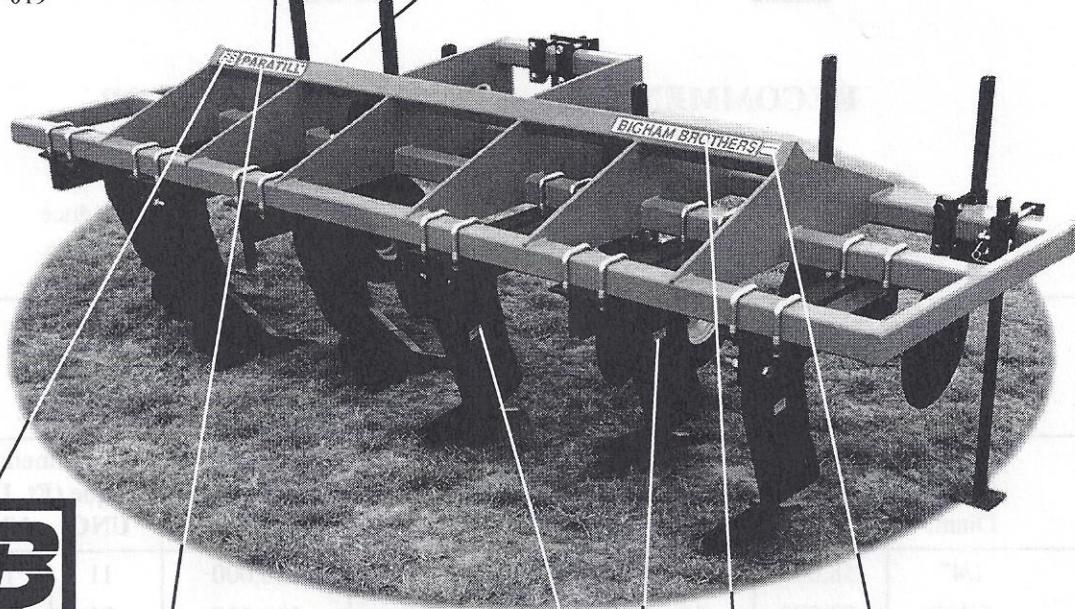
P/N 399-019



Front of Tool Bar Mast

Made In U.S.A.

P/N 399-011



P/N 399-012

PARATILL®

P/N 399-024



P/N 399-021

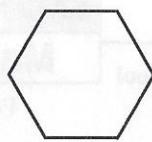


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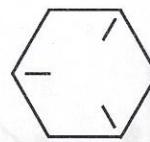
BIGHAM BROTHERS

P/N 399-010

BIGHAM BROTHERS, INC.



GRADE 2
No Marks



GRADE 5
3 Lines on
Bolt Head

RECOMMENDED ASSEMBLY TORQUES FOR HEXAGON HEAD CAP SCREWS

Based on dry assembly. Variables such as lubrication, plating etc. may reduce the values listed below as much as 20%, and must be taken into consideration.

		Bright Cap Screws 1018 <u>Grade 2</u>				Heat Treated 1038 Hexagon Head Cap Screws, <u>SAE Grade 5</u>			
Cap Screw Diam.	Yield Strength PSI Min.	Recommended Torque (Ft. Lbs.)		Yield Strength PSI Min.	Tensile Strength PSI Min.	Recommended Torque (Ft. Lbs.)			
		UNC	UNF			UNC	UNF		
1/4"	58,000	6	7	90,000	120,000	11	13		
5/16"	58,000	13	14	90,000	120,000	21	23		
3/8"	58,000	23	26	90,000	120,000	38	40		
7/16"	58,000	37	41	90,000	120,000	55	60		
1/2"	58,000	57	64	90,000	120,000	85	95		
5/8"	55,000	111	128	90,000	120,000	175	210		
3/4"	55,000	200	223	90,000	120,000	300	330		
7/8"	55,000	315	340	81,000	115,000	450	490		
1"	50,000	400	460	81,000	115,000	680	715		
1-1/8"	50,000	570	635	77,000	105,000	885	990		

General Formula for calculating Torque is as follows:

Torque in Inch Lbs. = .2 x Nominal Diameter of Screw x Load in Lbs., where Load = 80% of Yield Strength, expressed in Lbs., not pounds per square inch.

The tension induced in a cap screw may be checked by measuring overall length before torquing and then under torque load. The screw stretches .001" per inch of screw length for each 30,000# P.S.I. induced tension. Applies only to loads below the yield point.

BIGHAM BROTHERS, INC.

Notes: _____

(806) 745-0384

705 E. Slaton Rd.

P.O. Box 3338

Lubbock, TX 79452