OPERATOR'S MANUAL

TW5 DISC SERIES

Tufline®

www.monroetufline.com

TO THE DEALER:

Assembly and proper installation of this product is the responsibility of the Tufline dealer. Read manual instructions and safety rules. Make sure all items on the Dealer's Pre-Delivery and Delivery Check Lists in the Owner's/Operator's Manual are completed before releasing equipment to the owner.

The dealer must complete the Warranty Registration located on page 24 and mail to Tufline

TO THE OWNER:

Read this manual before operating your Tufline equipment. The information presented will prepare you to do a better and safer job. Keep this manual handy for ready reference. Require all operators to read this manual carefully and become acquainted with all the adjustment and operating procedures before attempting to operate. Replacement manuals can be obtained from your selling dealer.

The equipment you have purchased has been carefully engineered and manufactured to provide dependable and satisfactory use. Like all mechanical products, it will require cleaning and upkeep. Lubricate the unit as specified. Observe all safety information in this manual and safety decals on the equipment.

For service, your authorized Tufline dealer has trained mechanics, genuine Tufline service parts, and the necessary tools and equipment to handle all your needs.

Use only genuine Tufline service parts. Substitute parts will void the warranty and may not meet standards required for safe and satisfactory operation. Record the model number and serial number of your equipment in the spaces provided:

Model:_____ **Date of Purchase:**_____

Serial Number: (see Safety Decal section for location)_____

Provide this information to your dealer to obtain correct repair parts.

Throughout this manual, the term **IMPORTANT** is used to indicate that failure to observe can cause damage to equipment. The terms **CAUTION**, **WARNING** and **DANGER** are used in conjunction with the Safety-Alert Symbol, (a triangle with an exclamation mark), to indicate the degree of hazard for items of personal safety.

This Safety-Alert Symbol indicates a hazard and means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

DANGER Indicates an imminently 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, and includes hazards that are exposed when guards are removed.

CAUTION Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury.

IMPORTANT Indicates that failure to observe can cause damage to equipment.

NOTE Indicates helpful information.

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SPECIFICATIONS

Model #	Frame Width	Width of Cut	Blades	Blade Spacing	Approx. HSP	Weight
TW72420	61”	8’	24-20”	7 1/2”	35-55	1815#
TW92020	61”	8’	20-20”	9”	35-55	1705#
TW92022	61”	8’	20-22”	9”	35-55	1785#
TW972220	61”	8’	22-20”	9 - 7 1/2”	35-55	1740#
TW972222	61”	8’	22-22”	9 - 7 1/2”	35-55	1850#
TW92420	61”	9’ 6”	24-20”	9”	40-65	1825#
TW92422	61”	9’ 6”	24-22”	9”	40-65	1910#
TW972620	61”	9’ 6”	26-20”	9 - 7 1/2”	40-65	1865#
TW972622	61”	9’ 6”	26-22”	9 - 7 1/2”	40-65	1970#
TW72820	61”	9’ 6”	28-20”	7 1/2”	40-65	1895#
TW72822	61”	9’ 6”	28-22”	7 1/2”	40-65	2008#
TW72420	61”	8’	24-20”	7 1/2”	35-55	1815#
TW92020	61”	8’	20-20”	9”	35-55	1705#
TW92022	61”	8’	20-22”	9”	35-55	1785#
TW972220	61”	8’	22-20”	9 - 7 1/2”	35-55	1740#
TW972222	61”	8’	22-22”	9 - 7 1/2”	35-55	1850#
TW92420	61”	9’ 6”	24-20”	9”	40-65	1825#
TW92422	61”	9’ 6”	24-22”	9”	40-65	1910#
TW972620	61”	9’ 6”	26-20”	9 - 7 1/2”	40-65	1865#
TW972622	61”	9’ 6”	26-22”	9 - 7 1/2”	40-65	1970#
TW72820	61”	9’ 6”	28-20”	7 1/2”	40-65	1895#
TW72822	61”	9’ 6”	28-22”	7 1/2”	40-65	2008#
TW92820	91”	10’ 6”	28-20”	9”	50-75	2270#
TW92822	91”	10’ 6”	28-22”	9”	50-75	2400#
TW973020	91”	10’ 6”	30-20”	9 - 7 1/2”	50-75	2310#
TW973022	91”	10’ 6”	30-22”	9 - 7 1/2”	50-75	2450#
TW73220	91”	10’ 6”	32-20”	7 1/2”	50-75	2350#
TW93220	91”	12’	32-20”	9”	60-80	2800#
TW93222	91”	12’	32-22”	9”	60-80	2910#
TW973420	91”	12’	34-20”	9 - 7 1/2”	60-80	2850#
TW973422	91”	12’	34-22”	9 - 7 1/2”	60-80	2952#
TW73620	91”	12’	36-20”	7 1/2”	60-80	2890#
TW73622	91”	12’	36-22”	7 1/2”	60-80	3142#
TW93620	111”	13’ 4”	36-20”	9”	65-85	2868#
TW93622	111”	13’ 4”	36-22”	9”	65-85	3058#
TW74020	111”	13” 4”	40-20”	7 1/2”	65-85	3140#
TW74022	111”	13’ 4”	40-22”	7 1/2”	65-85	3230#
TW973820	111”	13’ 4”	38-30”	9 - 7 1/2”	65-85	3080#
TW973822	111”	13’ 4”	38-22”	9 - 7 1/2”	65-85	3188#
TW74420	111”	14”	44-20”	7 1/2”	70-85	3190#
TW74422	111”	14”	44-22”	7 1/2”	70-85	3412#
TW974220	111”	14”	42-20”	9 - 7 1/2”	70-85	3180#
TW974222	111”	14”	42-22”	9 - 7 1/2”	70-85	3325#
TW94020	111”	15”	40-20”	9”	70-85	3240#
TW94022	111”	15”	40-22”	9”	70-85	3345#

SAFETY & INSTRUCTIONAL DECALS

ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN SERIOUS INJURY OR DEATH

Replace Decals Immediately If Damaged!

1
15194C

2
15194B

Check that all saftey decals are installed and in good condition. Replace if decals are worn or damaged. Replacement part numbers are listed here.

3
15194D

4
15194A

SAFETY RULES

ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

Safety is a primary concern in the design and manufacture of our products. Unfortunately, our efforts to provide safe equipment can be wiped out by an operator's single careless act.

In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, judgement, and proper training of personnel involved in the operation, transport, maintenance and storage of equipment.

It has been said "The best safety device is an informed, careful operator."We ask you to be that kind of operator.

TRAINING

• Safety instructions are important! Read all attachment and power unit manuals; follow all safety rules and safety decal information. (Replacement manuals are available from selling dealer.) Failure to follow instructions or safety rules can result in serious injury or death.

• If you do not understand any part of this manual and need assistance, see your dealer.

• Operators must be instructed in and be capable of the safe operation of the equipment, its attachments, and all controls. Do not allow anyone to operate this equipment without proper instructions.

• Never allow children or untrained persons to operate equipment.

• Train all new personnel and review instruction's frequently with existing workers. A person who has not read and understood all operating and safety instructions is not qualified to operate the machine. An untrained operator exposes himself and bystanders to possible serious injury or death.

PREPARATION

• Always wear relatively tight and belted clothing to avoid getting caught in moving parts.Wear sturdy, rough-soled work shoes and protective equipment for eyes, hair, hands, hearing, and head; and respirator or filter mask where appropriate.

• Make sure attachment is properly secured, adjusted, and in good operating condition.

• Power unit must be equipped with ROPS or ROPS cab and seat belt. Keep seat belt securely fastened. Falling off power unit can result in death from being run over or crushed. Keep foldable ROPS system in "locked up" position at all times.

• A minimum 20% of tractor and equipment weight must be on the tractor front wheels when attachments are in transport position. Without this weight, tractor could tip over, causing personal injury or death. The weight may be attained with a loader, front wheel weights, ballast in tires or front tractor weights. Weigh the tractor and equipment. Do not estimate.

TRANSPORTATION

• Always comply with all state and local laws governing highway safety and lighting and marking requirements.

• Never allow riders on power unit or attachment.

• Do not operate or transport on steep slopes.

• Use extreme care and reduce ground speed on slopes and rough terrain.

• Do not operate or transport equipment while under the influence of alcohol or drugs. Consult your doctor about operating this machine while taking prescription medications.

OPERATION

• Never go underneath equipment (lowered to the ground or raised) unless it is properly blocked and secured. Never place any part of the body underneath equipment or between

OPERATION (cont'd)

moveable parts even when the engine has been turned off. Hydraulic system leak down, hydraulic system failures, mechanical failures, or movement of control levers can cause equipment to drop or rotate unexpectedly and cause severe injury or death.

SAFETY RULES

ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

• Always comply with all state and local laws governing highway safety and lighting and marking requirements.

• Operate only in daylight or good artificial light.

• Keep bystanders away from equipment.

• Keep hands, feet, hair, and clothing away from equipment while engine is running. Stay clear of all moving parts.

• Power unit must be equipped with ROPS or ROPS cab and seat belt. Keep seat belt securely fastened. Falling off power unit can result in death from being run over or crushed. Keep foldable ROPS system in “locked up” position at all times.

• Never allow riders on power unit or attachment.

• Always sit in power unit seat when operating controls or starting engine. Securely fasten seat belt, place transmission in neutral, engage brake, and ensure all other controls are disengaged before starting power unit engine.

• Look down and to the rear and make sure area is clear before operating in reverse.

• Use extreme care when working close to fences, ditches, other obstructions, or on hillsides.

• Do not operate or transport on steep slopes.

• Do not stop, start, or change directions suddenly on slopes. Always operate down slopes; never across the face.

• Use extreme care and reduce ground speed on slopes and rough terrain.

• Keep alert and watch the front as well as the rear when operating.

• When making gang adjustments, be careful to keep hands and feet clear of sliding parts and possible pinch points.

• Stop power unit and equipment immediately upon striking an obstruction. Turn off engine, remove key, inspect, and repair any damage before resuming operation.

• Before leaving operator’s seat, lower lift arms and put attachment on the ground. Engage brake, stop engine, remove key, and remove seat belt.

MAINTENANCE

• Always wear relatively tight and belted clothing to avoid getting caught in moving parts. Wear sturdy, rough-soled work shoes and protective equipment for eyes, hair, hands, hearing, and head; and respirator or filter mask where appropriate.

• Never go underneath equipment (lowered to the ground or raised) unless it is properly blocked and secured. Never place any part of the body underneath equipment or between moveable parts even when the engine has been turned off. Hydraulic system leak down, hydraulic system failures, mechanical failures, or movement of control levers can cause equipment to drop or rotate unexpectedly and cause severe injury or death.

• When performing maintenance or repairs make sure the equipment is in the lowered position and both the mainframe and gangs are properly blocked and secured to prevent rolling. Failure to do so can cause serious injury or death.

• Make sure attachment is properly secured, adjusted, and in good operating condition.

Before leaving operator’s seat, lower lift arms and put attachment on the ground.

SAFETY RULES

ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

MAINTENANCE(cont'd)

- Engage brake, stop engine, remove key, and remove seat belt.
- Never perform service or maintance with engine running .
- Keep hands and body away from pressur ized lines. Use paper or cardboard, not hands or other body parts to check for leaks. Wear safety googles. Hydraulic fluid under pressure can easily penetrate skin and will cause seri ous injury or death.
- Air in hydraudlic systems can cause erratic operation and allow loads or equipment components to drop unexpectly. When conec ing equipment or hoses or performing any air in the hydraulic system by operating all hydrau lic functions several times. Do this before put- ting into service or allowing anyone to approach the equipment.
- Route hydraulic hoses carefully to prevent damage. Hoses must not be twisted, bent sharply, kinked, frayed, pinched, or come into contact with any moving parts. Oper- ate movable components through full oper- ational range to check clearances. Replace any damaged hose immediately.
- Do not connect a low pressure hydraulic into a high pressure system. It will burst the hose. Do not use a high-pressure hose in place of a low pressure - hose - it is possible to rupture the value.
- Make sure that all operating service per- sonnel know that if hydraulic fluid penetrates skin, it must be surgically removed as soon as possible by a doctor fimilar with the form of injury or gang grene, serious injury, or death will result.

CONTACT A PHYSICIAN IMMEDIATELY FLUID ENTERS SKIN OR EYES. DO NOT DELAY.

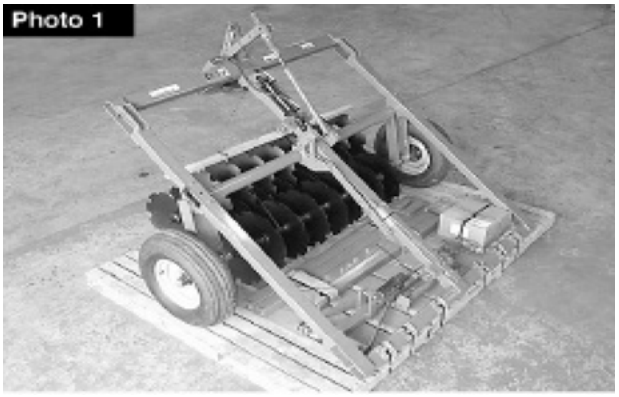
- Keep all persons away from operator control area while preforming adjust- ments , service, or maintance.
- Thighten all bolts, nuts, and screws on torque chart(page 36). Check that all co- tter pins are installed securely to insure equipment is in a safe condition before putting into service.

STORAGE

- Block Equipment securely for storage in lowered positions/
- Keep children, and bystanders away from storage area.

Pre-Assembly

The TW5 is shipped from the factory partially assembled as in **Photo 1.**



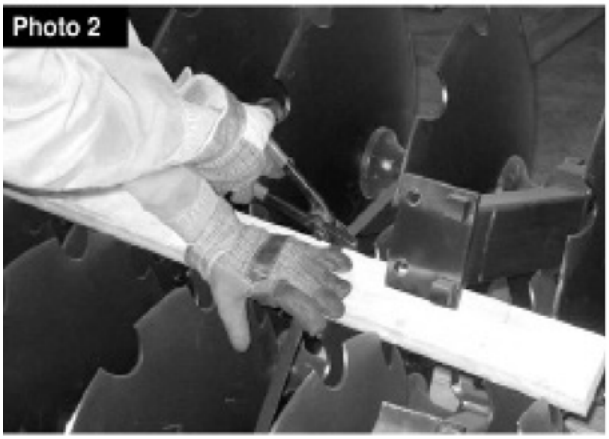
Move the union til a suitable open, flat location for complete assembly .

CAUTION

When completing this portion of the assembly process be careful handling large parts. They are heavy and dropping them could lead to moderate to serious injury.

Before cutting the bands holding the gang assemblies make sure there hasn't been any shifting during shipping and that they are securely chocked.

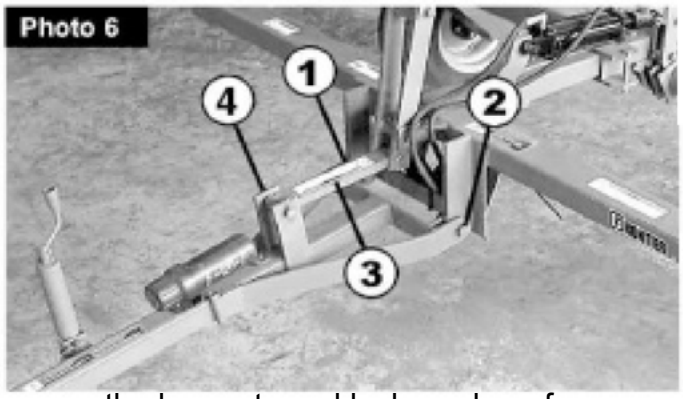
Once the gangs are secure cut the bands holding the gang assemblies to the oallet being careful to block the bands to avoid backlash(**Photo 2.)**



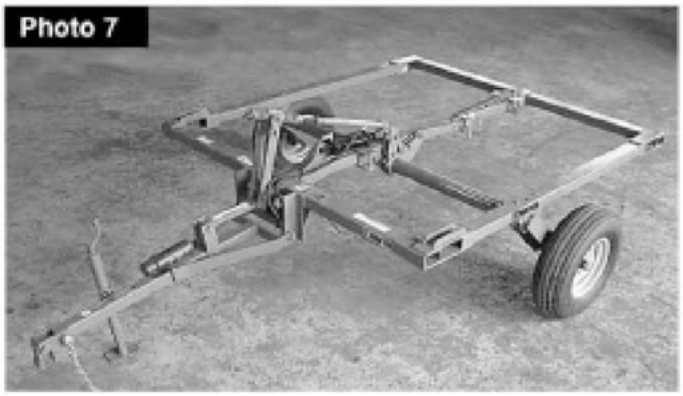
With a forklift carefully remove the gang assembilies one at a time and place on a flat surface **(Photo3).**

Use the forklift to support the front of the main frame**(Photo 4)** before cutting the bands holding the rear of the maintance to the pallet. The mainframe is front heavy and needs to be supported until attaching the tongue assembly.

After cutting the bands lower the forklift and roll the mainframe on the supports to attach the



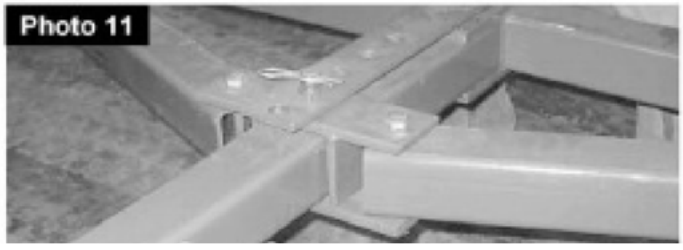
Remove the hex nuts and lock washers from the 1" x 3 1/2" hex bolts, Ref.1 and 2(Photo 6) Remove the bolts. Pull the hair clip pin from 7/8" X 5" pin, Ref.4, on the rocker arm, Ref 3. Remove the pin. Place the tongue assembly in place the tongue assembly in place and replace the hex bolts, lock washers, and hex nuts. Line the rocker arm up with the hole in the tongue assembly, Ref. 4 , and replace the pin and hair clip pin. Thighten the hex nuts. Please see Bolt Torque Chart(Page 36)



You are now ready to attach the gang beams to the mainfraime (Photo 7).
Remove the 4-5/8" x 5" bolts from the front and rear side plates(Photo 8) to accomodate the gang beams.
Slide the front gang beams through the slot in the mainframe(Photo 9) til thry meet the slide plates.

Repeat this procedure for the rear gang beams. Insert the 5/8" x 3 1/16" bushing into the hole at the inside end of the gang beam and drive down flush with the surface of the gang beam (Photo 10). Repear on the remaining gang beams.

Reinsert the 5/8" x 5" bolt downward through the hole in the slide bar and through the brushing in the gang beam and attach the 5/8" lock washer and 5/8" hex nut and tighten (Photo 11). Please see Bolt Torque Chart (page 35) for proper torque information. Repeat on the remaining gang beams.



You are now ready to attach the gang assemblies.

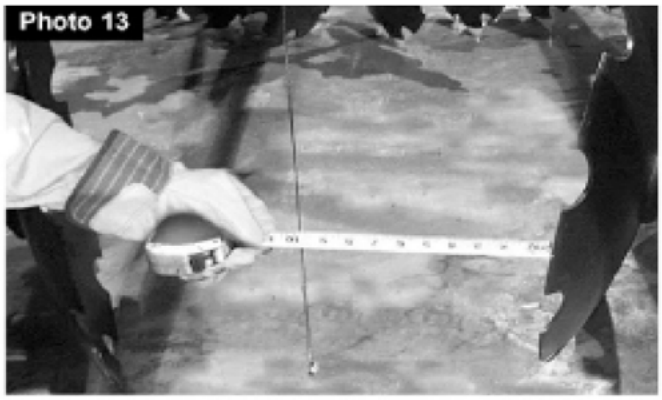
⚠ WARNING

When completing this portion of the assembly process be careful handling large parts. They are heavy and dropping them could lead to moderate to serious injury.

Photo 12

Roll a gang assembly under its corresponding gang beam. Gangs assembled with an outrigger washer should be placed on the rear gang beams with washer to the outside. Gangs with regreasable bearings should be placed with the grease fitting pointing to the rear. Lift a gang hanger into place under the gang beam and

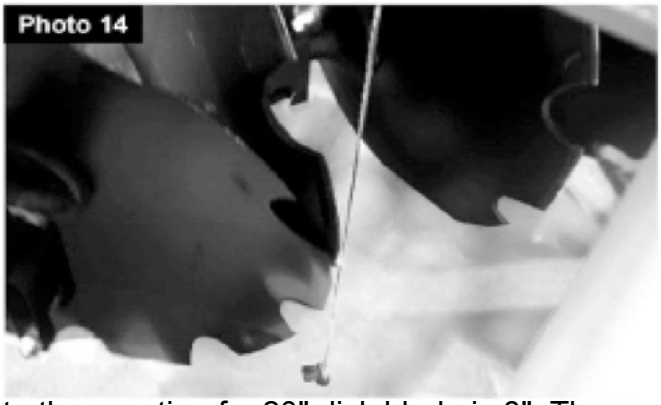
Photo 13



a u-bolt downward through the gang hanger. Attach a 3/4" lock washer, and a 3/4" hex nut and hand tighten(Photo 12). Repeat on the other gang hanger. Repeat this proccess for the remaining gang assemblies.

With the gang hanger u-bolts only hand tightened you can adjust the spacing between the gang assemblies.
To correctly adjust the spacing between the rear gang assemblies drop a plumb bob from the rear of the maintence directly under the center of the center beam(Photo13). The proper distance from the center of the beam

Photo 14



to the rear tip of a 20" disk blade is 8". The proper distance from the center of the center beam to the rear tip of 22" disk blade is 10".
To correctly adjust the spacing between the front gang assemblies drop a plumb bob from the center beam (Photo 14). Adjust the gang assemblies so that the front of the disk blades of each gang assemblies are just touching. Thighten all the u-bolts holding the gang assemblies making sure that the gang hangers

Photo 16

are flat against the gang beams (Photo 16). Please see Bolt Torque Chart (page 35) for proper torque informtion.

(Dealer's Responsibility)

Inspect the equipment thoroughly after assembly to be certain it is set up properly before delivering it to the customer.The following check list is a reminder of points to inspect.

Check off each item if it is found satisfactory or after proper adjustment is made.

___ Check that all safety decals are installed and in good condition. Replace if damaged.

___ Check all bolts to be sure they are tight.

___ Check that all cotter pins and safety pins are properly installed.

___ Show customer the safe, proper procedures to be used when mounting, dismounting, and storing equipment.

___ Inform the customer on the correct use and safety precautions for hydraulic components.

___ Air in hydraulic systems can cause erratic operation and allows loads or equipment components to drop unexpectedly. When connecting equipment or hoses or performing any hydraulic maintenance purge any air in hydraulic system by operating all hydraulic functions several times. Do this before putting into service ot allowing anyone to approach the equipment.

___ show customers how to make adjustments.

___ Present Owner's/ Operators Manual and request that customer and all operators read it before operating equipment. Point out the manual safety rules, explain their meanings and emphazise the increase safety hazards that exist when safety rules are not followed.

___ Point out the safety decals. Explain their meaning and the need to keep them in place, and in good condition. Emphazise the increase safety hazards when instructions are not followed.

___ Explain to the customer the potential crushing hazards of going underneath raised equipment. Instruct customer that service work does not require going underneath unit and never to do so.

___ Complete the Warranty Registration located on the Tufline website.

OPERATION

- Safety is a primary concern in the design and manufacture of our products. Unfourtunately, out efforts to provide safe equipment can be wiped out by operator's single careless act,

- In addition to the design and configuration of equipment hazard control and accident prevention are dependent upon awareness, concern, judgement, and proper traunung of a personnel involed in the operation, transport, maintenance and storage of equipment.

- It has been said" The best safety device is an informed careful operator." We ask you to be that kind of operator,

- The operator is responsible for safe operation of this equipment. The operator must be properly trained. Operators should be familar with the equipment, tractor, and all safety pratices before starting operations and safety decal on pages 2-6.

- Owner should check and tighten all hardware after the first hour operation of this equipment. The break in stage of your new TW5 can cause minimal loosening of disk gangs and other hardware as the new pant wears. Please she bolt chart on page(34) for proper technique.

⚠ WARNING

- Power unit must be equipped with ROPS or ROPS cab and seat belt. Keep seat belt securely fastened. Falling off power unit can result in death from being run over or crushed. Keep foldable ROPS system in " locked up" position at all times.

- Never allow children or untrained persons to operate equipment

- Air in hydraulic systems can cause erratic operation and allows loads or equipment components to drop unexpectedly. When connecting equipment or hoses or performing any hydraulic maintenance, purge any air in hydraulic system by operating all hydraulic functions several times. Do this before putting into service or allowing anyone to approach the equipment.

- Keep children and bystanders away from storage area.

- Never go underneath equipment (lowered to the ground or raised) unless it is properly blocked and secured. Never place any part of the body underneath equipment or between moveable parts even when the engine has been turned off. Hydraulic sys tem leak down, hydraulic system failures mechanical failures, or movement of control levers can cause equipment to drop or rotate unexpectedly and cause severe injury or death.

- Service work does not require going under.

- Read manual for service instructions or have service performed by a qualified dealer.

- Stop tractor and implement immediately upon striking an obstruction. Turn off engine, remove key, inspect, and repair any damage before resuming operation.

- Always wear relatively tight, and bold clothing to avoid

Owner/Operater Pre-Operation Check List

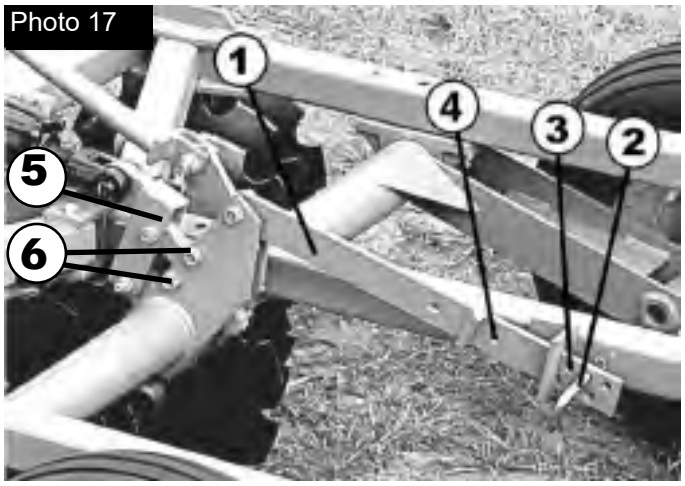
___ Review and follow all safety rules and safety decals on page 7.
____ Check that equipment is properly and securely attached to tractor.
____ Check that ALL safety decals are installed and in good condition. Replace if damaged.
____ Check that all hardware is installed properly and secured.
____ Do not allow riders

____ Make sure tractor ROPS or ROPS CAB and seat belt are in good condition. Keep seat belt securely fasten during operation.

Depth Control

All TW5 models are provided with depth control. A floating cylinder latch(Ref. 2, Photo 17) is used to allow the depth control bar(Ref. 1) to hold the wheels at different operating depths. To set depth control stop the tractor with the disk clear

Photo 17



of the ground. Lower the disk to the ground. Remove the pin(Ref.2) from the depth control bar. Disengage the parking brake on the tractor and engage the tractor and begin pulling disk to desired depth. Disengage the tractor and engage the parking brake before dismounting the tractor. Replace the pin(Ref. 2) in the depth control bar through the nearest hole(Ref. 3) to the depth control bar stop. You are now ready to begin disking. To raise wheels off the ground loosen bolts #6 in photo 17. Push wheel lift bar #5 against wheel carriage link retighten bolts #6 so the wheel carriage wheel not float.

Leveling System

This leveling system automatically controls the harrow from full depth penetration all the way up to transport height. Once it is set for a particular tractor drawbar height, only minor adjustments will ever be required. The springs also allow pressure controlled flexibility when obstructions and/or uneven terrain are encountered.

Most operating problems are caused by unequal pressure and penetration of the front and rear gangs.

Photo 18

Adjust the leveling system to obtain equal penetration by the front and rear gangs and stabilize the direction and side shift of the disk.
To adjust the leveling system use the handle welded to the leveling arm (Ref. 1, Photo 18). Turning clockwise will lower the rear and counter-clockwise will raise the rear. It is recommended to re-adjust the levelness when unit is at actual working depth to prevent ridging.

⚠ CAUTION

Adjusting Gang Angles

When making gang adjustments, be careful to keep hands and feet clear of sliding parts and possible pinch points.

The gang angles on the TW5 series disk are adjustable. The unit should be lifted two to three inches off the ground with the tractor hydraulic system for an easier adjustment.

Each trial run should be made with the tractor in the same gear and approximately the same RPM. Keep in mind that many variables affect the operation of your disk. These include, but are not limited to penetration, speed, soil conditions, etc. Any changes in any one of these could cause a requirement for further adjustments.

Observe the soil behind the disk. It should be level and smooth. If the disk leaves a water furrow in the center, it would indicated that the front gangs are more aggressive than the rear gangs.

Adjusting Gang Angles(cont'd.)

To correct this, either decrease the angle of the rear gangs or increase the angle of the front gangs.

To adjust the front or rear gang angles remove the angle adjusting lever (Ref. 2, Photo 19A) from the hose holder (Ref. 1, Photo 19A) which is located on the tongue assembly. Remove the gang adjusting bar (Ref. 1, Photo 19B) from slide plate stud (Ref. 2, Photo 19B). Place hole in angle adjusting lever (Ref. 3, Photo 19B) over slide plate stud (Ref. 2, Photo 19B). Insert angle adjusting lever stud (Ref. 4, Photo 19B) into proper hole in gang adjusting bar. This will provide leverage to shift the slide plate (Ref. 5, Photo 19B) whichever direction you desire for the gang angle needed. Once desired gang angle is set, position the gang adjusting bar over the stud on slide plate. Use hair pin clips to secure. Hang the angle adjusting lever back on hose holder until further adjustments are needed.

Photo 19A

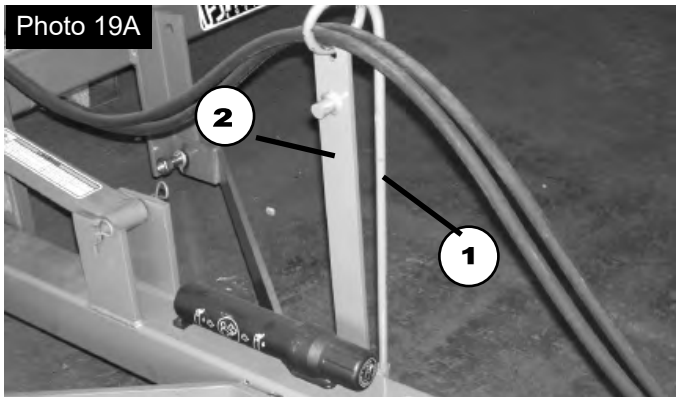
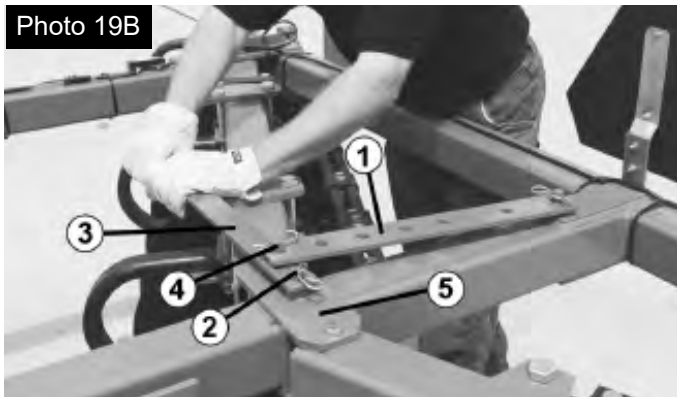


Photo 19B



Gang Adjustment Trouble Shooting

1. Unit not tracking or is fishtailing	A. Adjust top link to increase weight on the rear of the disc B. Disc assembled incorrectly. Refer to assembly instructions.
2. Unit not tracking: skipping, jumping, and fishtailing(in untilled, hard soil	A. Insure equal cut or depth on front and rear. B. Reduce speed. C. Reduce gang angle. D. Reduce depth of cut by carrying on 3 point lift discing shallow the first time over. NOTE: Some experimentation may be required by trial and error to arrive at proper solution.
3. Unit leaving water furrow in center.	A. Increase speed. B. Increase angle on rear gangs. C. Decrease angle on front gangs. D. Disc not level. Lower rear gangs or raise front gangs. E. Any combination of the above.
4. Unit ridging or leaving behind a high spot in center of machine.	A. Decrease speed. B. Decrease angle on rear gangs C. Increase angle on front gangs. D. Disc not level. Raise rear gangs or lower front gangs. E. Any combination of the above.
5. Unit leaving water furrows on outside of each rear gang.	A. Add optional T-703-18 outrigger attachments with a round disc blade about 4” smaller than stock blades.
6. Blades plugging with soil or trash.	A. Add optional heavy scraper kit(Page 25). If already equipped, re-adjust them. B. Soil conditions not suitable for discing due to excessive moisture.
7. Unit leaving a balk between front inside gangs	A. Add optional 11476 center sweep balkbreaker assembly(Page 28).

⚠ WARNING

- Never go underneath equipment (lowered to the ground or raised) unless it is properly blocked and secured. Never place any part of the body underneath equipment or between moveable parts even when the engine has been turned off. Hydraulic sys tem leak down, hydraulic system failures mechanical failures, or movement of control levers can cause equipment to drop or rotate unexpectedly and cause severe injury or death.
- Service work does not require going under.
- Read manual for service instructions or have service performed by a qualified dealer.

⚠ WARNING

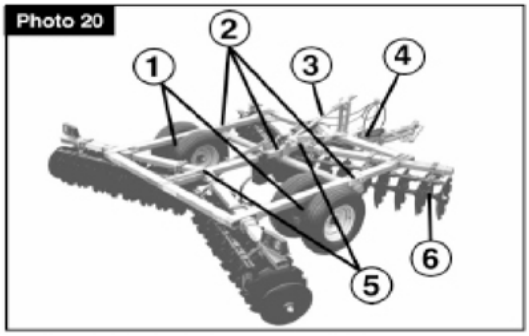
- The information in this section is written for operators who possess basic mechanical skills. If you need help, your dealer has trained service technicians available. For your protection, read and follow the safety information in this manual.
- Keep all persons away from operator control area while performing adjustments, service, or maintenance.
- Before dismounting power unit or performing any service or maintenance, follow these steps: disengage power to equipment, lower the 3 point hitch and all raised components to the ground, operate valve levers to release any hydraulic pressure, set parking brake, stop engine, remove key, and unfasten seat belt.

⚠ CAUTION

- Always wear relatively tight and belted clothing to avoid entanglement in moving parts. Wear sturdy, rough-soled work shoes and protective equipment for eyes, hair, hands, hearing, and head.
- Air in hydraulic systems can cause erratic operations and allow loads or equipment to drop unexpectedly. Why connecting the equipment or hoses or performing any hydraulic maintenance , purge any air in hydraulic system by operating all hydraulic functions serval times. Do this before putting into service or allowing anyone to approach equipment.
- Route hydraulic hoses carefully to prevent damage.Hoses must not be twisted, bent sharply, kinked, frayed, pinched, or come into contact with any moving parts. Operate movable components through full operational range to check clearances. Replace any damaged hose immediately.
- Do not connect a low-pressure hydraulic hose into a high-pressure system -it will burst the hose. Do not use a high pressure hose in place of a low pressure hose it will posibily burst the valve.

Lubrication

Photo 20



Lubricate the following every 50 hours or annually:

- Wheel hubs (Ref.1 , photo 20), one on each hub.
- Wheel carriage bearings(Ref.2). One on each wheel carriage bracket.
- Leveling tube(ref.3)
- Leveling rocket pivot (Ref.4), 2 at bottom of a rocker pivot

Lubercate the following every 25 hours:

- Optional regreasable gang bearings (Ref.6) with lithum based pressure gun grease. One on each gang bearing.
- If gang angles are hard to slide on the mainframe where the gang angle turnbuckles side.

Lubrication(cont'd)

Lubricate the following at the end of each use period

* Transport wheel bearings. Pack with heavy wheel bearing grease.

Check all gang axle nuts for proper torque periodically. Please see Bolt Torque Chart (page 35) for proper torque information.

Gang Assembly for Maintenance

⚠ WARNING

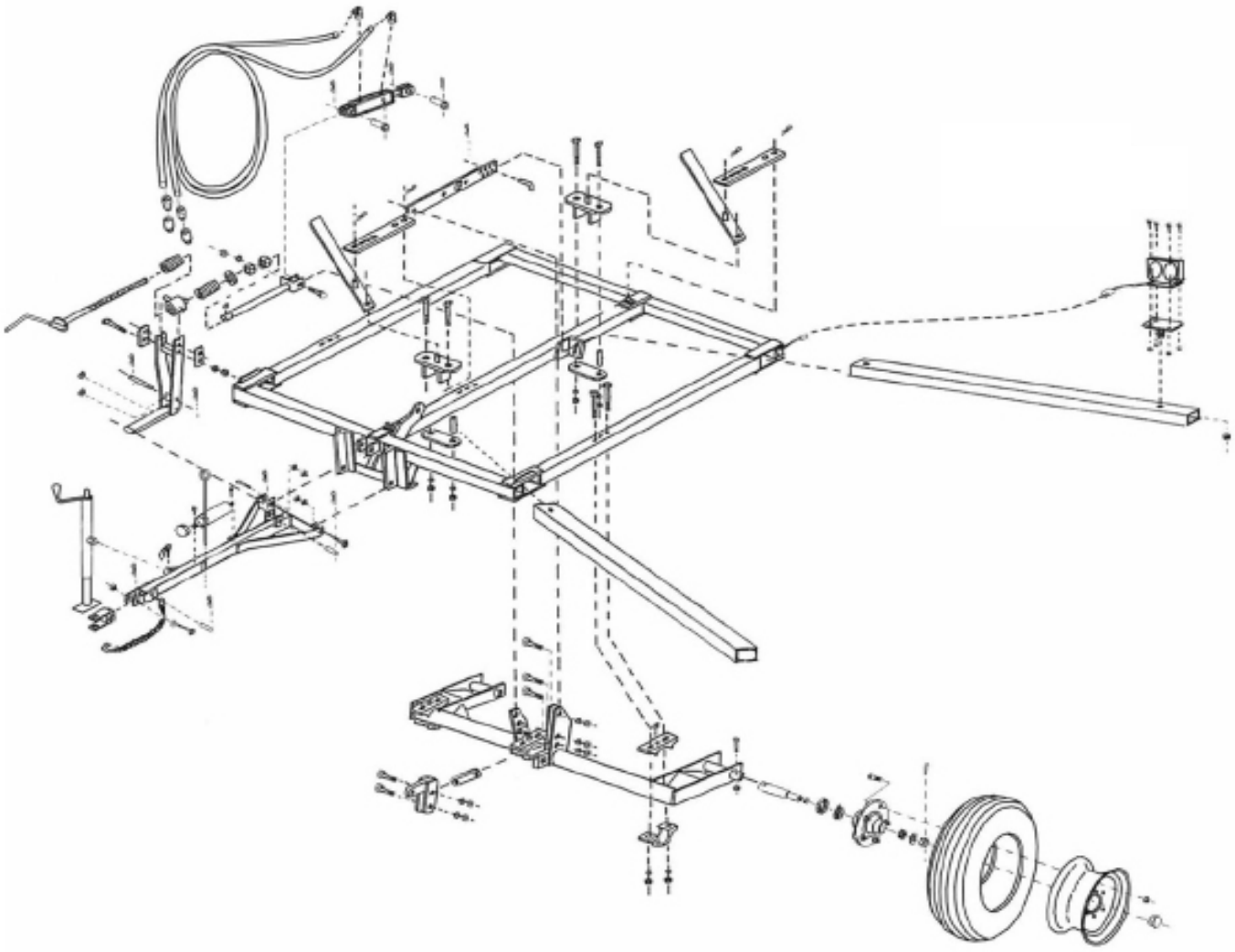
- When performing maintenance or repairs make sure the equipment is in the lowered position and both the mainframe and gangs are properly blocked and secured to prevent rolling. Failure to do so can cause serious injury or death.

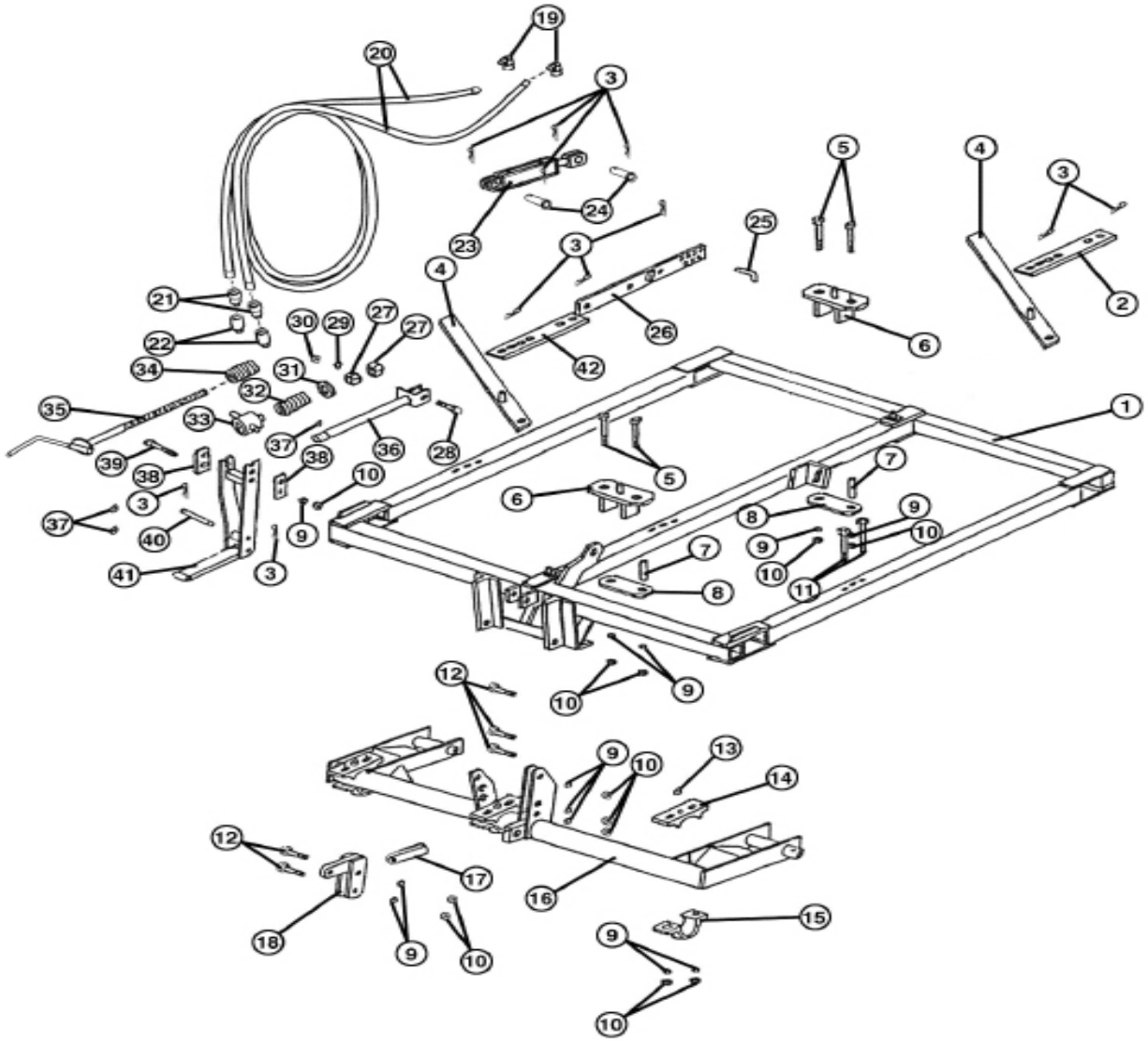
When gang cimponent replacement is required carefullu observe all safety issues. Place unit on level ground prior to gang drop. Also make sure that gangs are blocked to keep them rolling in either direction. After unit is lowered to ground and gangs are secure, loosen nuts on all u-bolts holding hangers to main frame. Observe the sequence and location of each gang component and refer to the gang diagrams on Pages for removal and replacement of the desired component. After replacement is completed reinstall gang parts in proper order as shown on gang diagran on Figure 1. Make sure that the gang nut or the gang axle is properly tightened after replacements are made. Refer to Bolt Tightening Torque chart on (Page 35) for proper technique information.

Storage

Lower unit for storage on level ground with gangs resting on plyboard or other sheet material to keep components out of the ground.

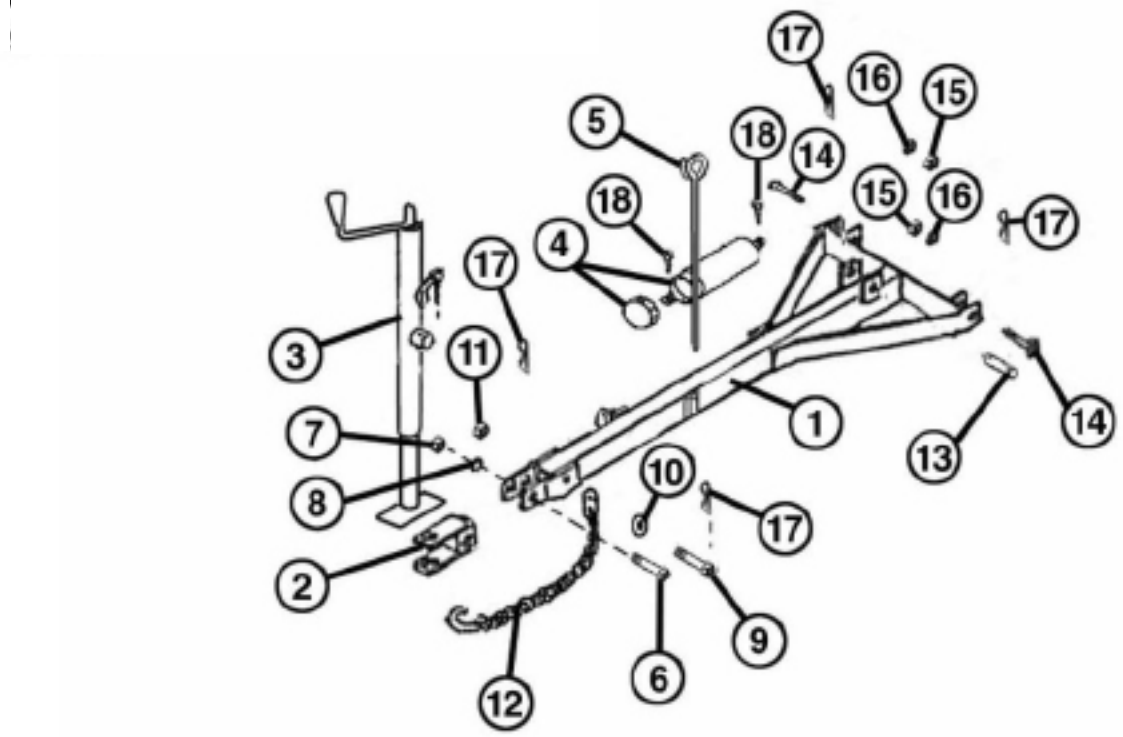
Figure 3





1	11423 15353	MAIN FRAME MAIN FRAME	1 1
2	12419	GANG ANGLE ADJUSTMENT BAR, REAR, 15 3/4”	1
	12413	GANG ANGLE ADJUSTMENT BAR, REAR, 17 3/4”	1
3	9979	HAIR PIN CLIP	5
4	12034	ANGLE ADJUSTING LEVER	1
5	T-745	HEX BOLT, 5/8” X 5”, GR.2	4

6	12055 12026	SLIDE PLATE TOP, 3X3 SLIDE PLATE TOP, 4X3	2 2
7	T-56	BUSHING, 5/8”X3 1/16”	4
8	T-70 T-7041	SLIDE PLATE BOTTOM, 3X3 SLIDE PLATE BOTTOM, 4X3	2 2
9	T-24	LOCKWASHER, 5/8”	16
10	T-22	HEX NUT, 5/8”	16
11	T-746	HEX BOLT, 5/8” X 5 1/2”, GR.2”	6
12	9651	HEX BOLT, 5/8”X 3, GR. 2	5
13	12511	1/8” X 1 3/4” STRAIGHT GREASE FITTING	3
14	T-58	WHEEL CARRIAGE BEARING TOP	3
15	T-57	WHEEL CARRIAGE BEARING BOTTOM	3
16	9694 15354	WHEEL CARRIAGE, 63” WHEEL CARRIAGE , 93”	1 1
17	9893	WHEEL LIFT BAR WELDMENT	1
18	9892	CYLINDER LATCH WELDMENT	1
19	15540	3/4” ORB MALE- 3/8” FEMALE SWIVEL ELBOW	2
20	HOS150	150” HYDRAULIC HOSE	2
21	15367	1/2” MALE- 3/8” FEMALE REDUCER	2
22	15368	HYDRAULIC QUICK COUPLER	2
23	11743	3X8 CYLINDER	1
24	15374	CYLINDER PINS 1” X 3 1/2”	2
25	9690	ADJUSTING PIN	1
26	9470	DEPTH CONTROL BAR WELDMENT	1
27	T-18	HEX NUT, 1 1/8”	2
28	T-763	HEX BOLT, 3/4” X 3”. GR.5	1
29	T-31	LOCKWASHER, 3/4”	*MS
30	T-27	HEX NUT, 3/4”	*MS
31	T-698	FLATWASHER, 1 1/8”	*MS
32	T- 511	ADJUSTING SPRING, 4 1/2”	1
33	T-510	SPRING HOUSING	1
34	T-509	ADJUSTING SPRING, 8 1/2”	1
35	9011	ADJUSTING ROD	1
36	9464 11991	ADJUSTING TUBE WELDMENT ADJUSTING TUBE WELDMENT	1 1
37	T-9	1/4” GREASE FITTING	3
38	9006	RETAINER STRAP	2
39	9661	HEX BOLT, 5/8”X 6 1/2”, GR.2	1
40	T-918	PIN, 7/8” X 6”	1
41	10527	ROCKER ARM & LINK BAR	1
42	12411	GANG ANGLE ADJUSTING BAR, FRONT, 14 3/4”	1
	12413	GANG ANGLE ADJUSTING BAR, FRONT, 17 3/4”	1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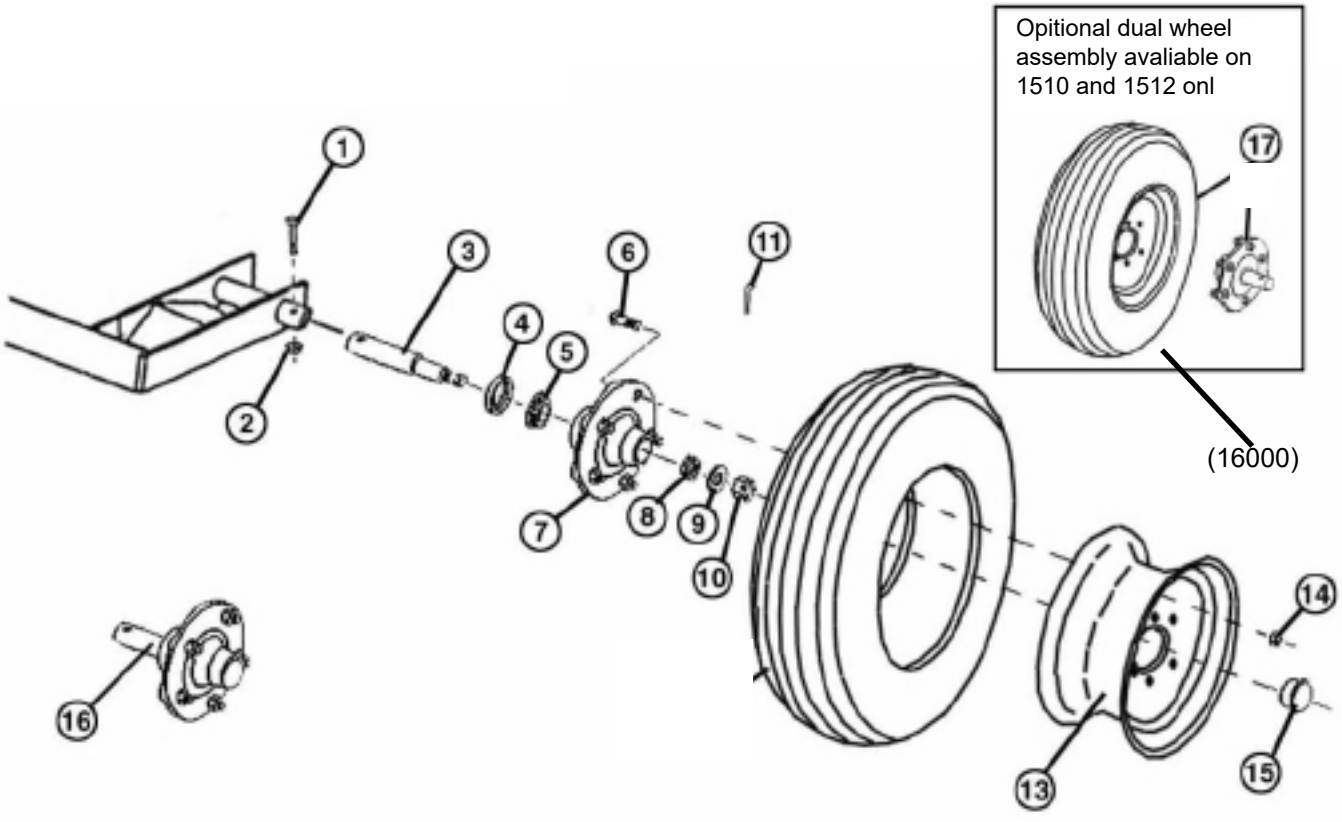
Opitional dual wheel assembly avaliable on 1510 and 1512 onl
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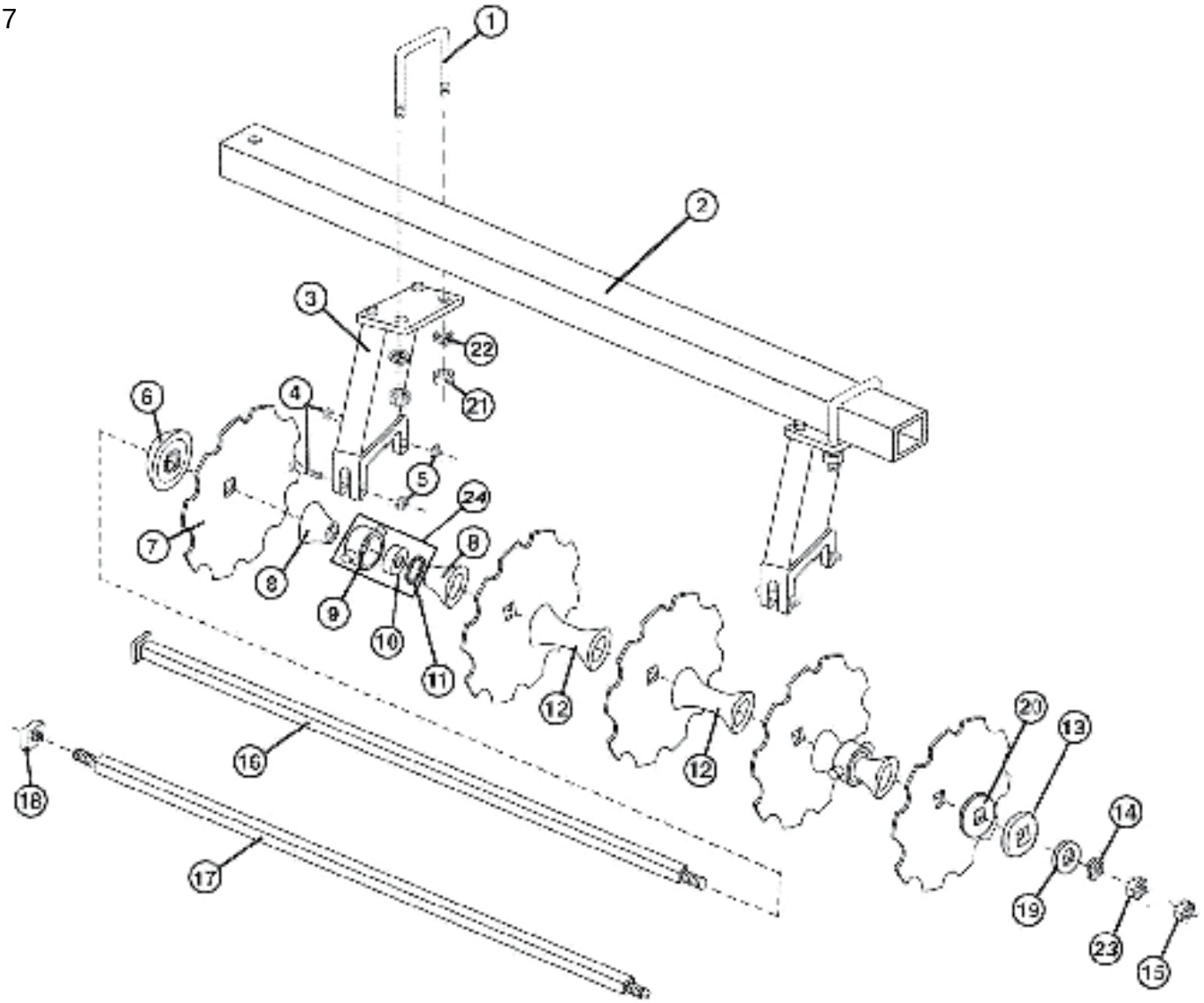
TW5 Drawbar Parts List

Ref.#	Part #	Description	Qty.
1	9034	TONGUE	1
2	T-2665	TONGUE CLEVIS	1
3	T-933	TONGUE JACK	1
4	15189	ASSEMBLY MANUAL TUBE AND CAP	1
5	T-465	HOSE HOLDER	1
6	T-772	HEX BOLT, 7/8” X 5”, GR.5	1
7	T-19	HEX NUT, 7/8”	1
8	T-21	LOCKWASHER, 7/8”	1
9	15349	HEX BOLT, 1” X 6”, GR.5	1
10	T-606	FLATWASHER, 1”	1
11	10332	LOCKNUT, 1”	1
12	15186	SAFTEY CHAIN	1
13	15183	PIN, 7/8” X 5”	1
14	T-780	HEX BOLT, 1” X 3 1/2”, GR.5	2
15	T- 28	HEX NUT, 1”	2
16	T-34	LOCKWASHER, 1”	2
17	9979	HAIR PIN CLIP	4
18	15348	SELF TAPPING SCREW, 5/16” X 1”	2

TW5 Wheel Parts List

Ref.#	Part #	Description	Qty.
1	T-892	HEX BOLT, 3/8” X 3”, GR.5	*MS
2	12899	FLANGE LOCK NUT, 3/8”	*MS
3	T-564	SPINDLE, 1 5/8”	2
4	T-576	SEAL, 1 1/2”	2
5	T-575	WHEEL BEARING, 1 1/4”	2
6	T-562	LUG STUD, 1/2” X 1 1/2”	10
7	T-572	5- BOLT HUB ASSEMBLY	2
8	T-574	WHEEL BEARING, 3/4	2
9	T-603	SPINDLE WASHER, 3/4”	2
10	T-567	SLOTTED NUT, 3/4”	2
11	T-342	COTTER PIN, 5/32” X 1 1/4”	2
13	T-612	15” X 6”X 5-HOLE WHEEL	2
14	T-23	LUG NUT, 1/2”	10
15	T-577	HUB CAP	2
16	13630	5 BOLT HUB & SPINDLE ASSY.	*MS
17	13160	DUAL WHEEL ASSEMBLY OPTION,DH1510,DH1512 Only	1
	16000	TIRE AND RIM ASSEMBLY	1
N/S	T-582	OUTER WHEEL BEARING CUP	2

TW5 Front Gang Parts Schematic
Figure 7



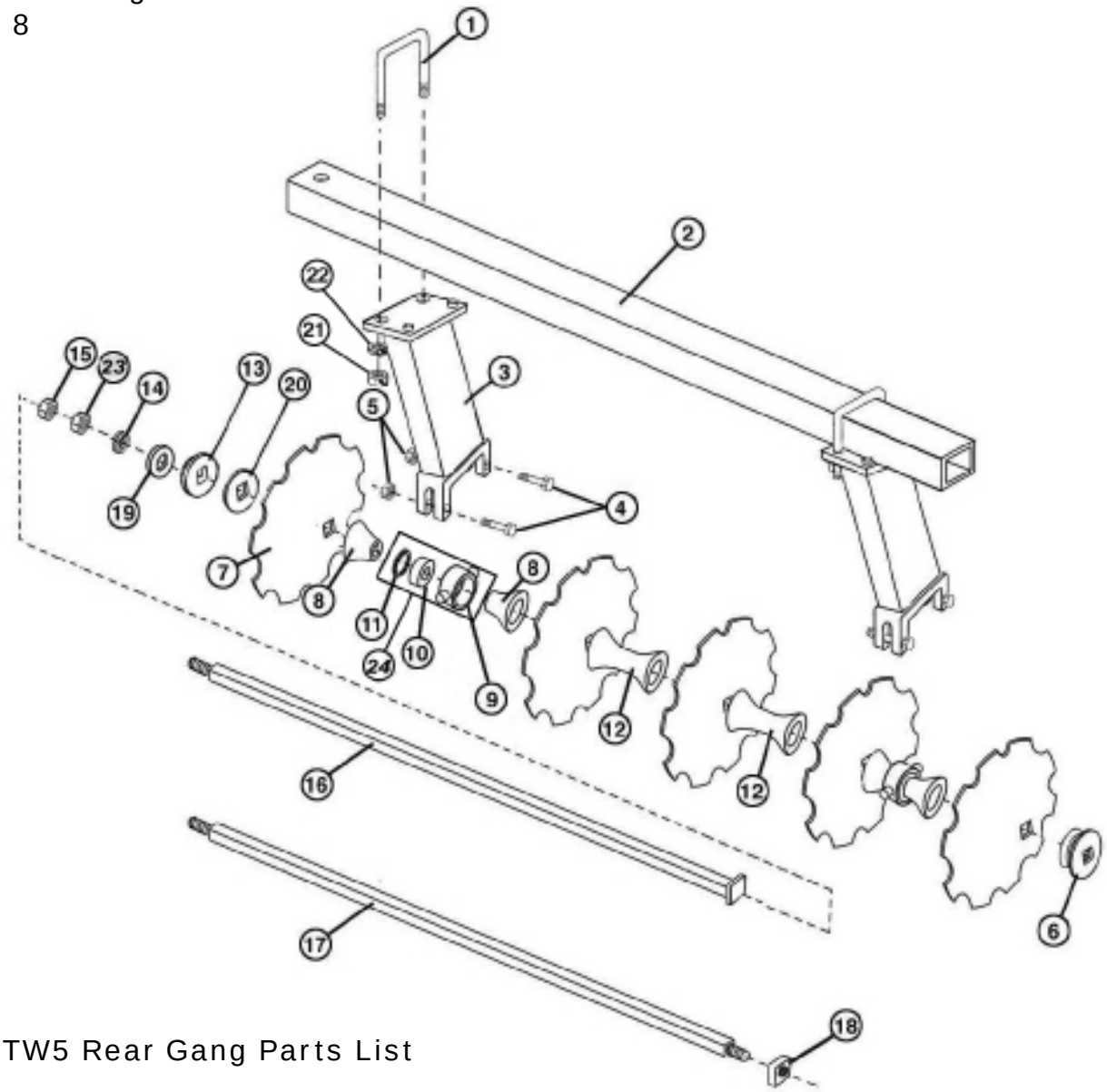
TW5 Front Gang Parts List

Ref.#	Part #	Description	Qty.
1	12029 11972	3/4” U- BOLT FOR 3X3 BEAM 3/4” U- BOLT FOR 4X3 BEAM	8 *MS
2	12292	3” X 3” X 41” GANG BEAM	2
	T-635	3” X 3” X 48” GANG BEAM	2
	12297	4” X 3” X 56” GANG BEAM	2
	12299	4” X 3” X 62” GANG BEAM	2
	12300	4” x 3” x 66” GANG BEAM	2

TW5 Front Gang Parts List (cont'd)

Ref.#	Part #	Description	Qty.
3	12102	TUBLAR GANG HANGER FOR 3X3 BEAM	8
	12021	TUBLAR GANG HANGER FOR 4X3 BEAM	*MS
4	T-892	HEX BOLT, 3/8" X 3", GR.5	*MS
5	12899	FLANGE LOCK NUT, 3/8"	*MS
6	T-2	BUMPER WASHER, 1 1/8" SQ, FRONT GANG	4
7	2201381 2201382 2221571 2221572	DISK BLADE, 20"X 1 1/8" PLAIN DISK BLADE, 20" X 1/1/8" NOTCHED DISK BLADE, 22" X 1 1/8" PLAIN DISK BLADE. 22" X 1 1/8" NOTCHED	*MS *MS *MS *MS
8	T-47	END SPACER, 1 1/8" SQ X 3" (FOR 7 1/2" BLADE SPACING)	*MS
	T-49	END SPACER, 1 1/8" X 3 3/4" (FOR 9" BLADE SPACING)	*MS
9	TMB	TRUNNION BEARING HOUSING	*MS
	TMBR	RELUBE TRUNNION BEARING HOUSING	*MS
10	T-602	SEALED BEARING, 1 1/8"	*MS
	T-602R	RELUBE BEARING, 1 1/8"	*MS
11	T-722	SNAP RING, 3 1/2"	*MS
12	T-91	SPACER SPOOL, 1 1/8" X 7 1/2"	*MS
	T-3	SPACER SPOOL 1 1/8" X 9"	*MS
13	T-1	END WASHER, 1 1/8"	4
14	T-20	LOCK WASHER, 1 1/8"	4
15	T-18A	LOCK NUT, 1 1/8"	4
16	T-14	AXLE 1 1/8" SQ X 40 5/8"	4
	T-141	AXLE 1 1/8"SQ X 42 3/8"	4
	T-142	AXLE 1 1/8"SQ X 49 7/8"	4
17	11323	AXLE 1 1/8"SQ X 58 1/2"	*MS
	11330	AXLE 1 1/8"SQ X 59 3/4"	*MS
	11324	AXLE 1 1/8"SQ X 66"	*MS
	11331	AXLE 1 1/8" SQ X 69"	*MS
18	11398	SQ AXLE NUT, 1 1/8"	*MS
19	T-698	1 1/8" FLAT WASHER	1
20	11170	1 1/8" SPACER WASHER (IF NEEDED)	*MS
21	T-27	HEX NUT, 3/4"	*MS
22	T-31	LOCKWASHER, 3/4"	*MS
23	9401	JAM NUT 1 1/8"	4
24	TMBT602	TRUNNION HOUSING, BEARING, & SNAP RING	*MS
	TMBRT602R	RELUBE TRUNNION HOUSING, BEARING, & SNAP RING	*MS

TW5 Rear Gang Parts Schematic
Figure 8



TW5 Rear Gang Parts List

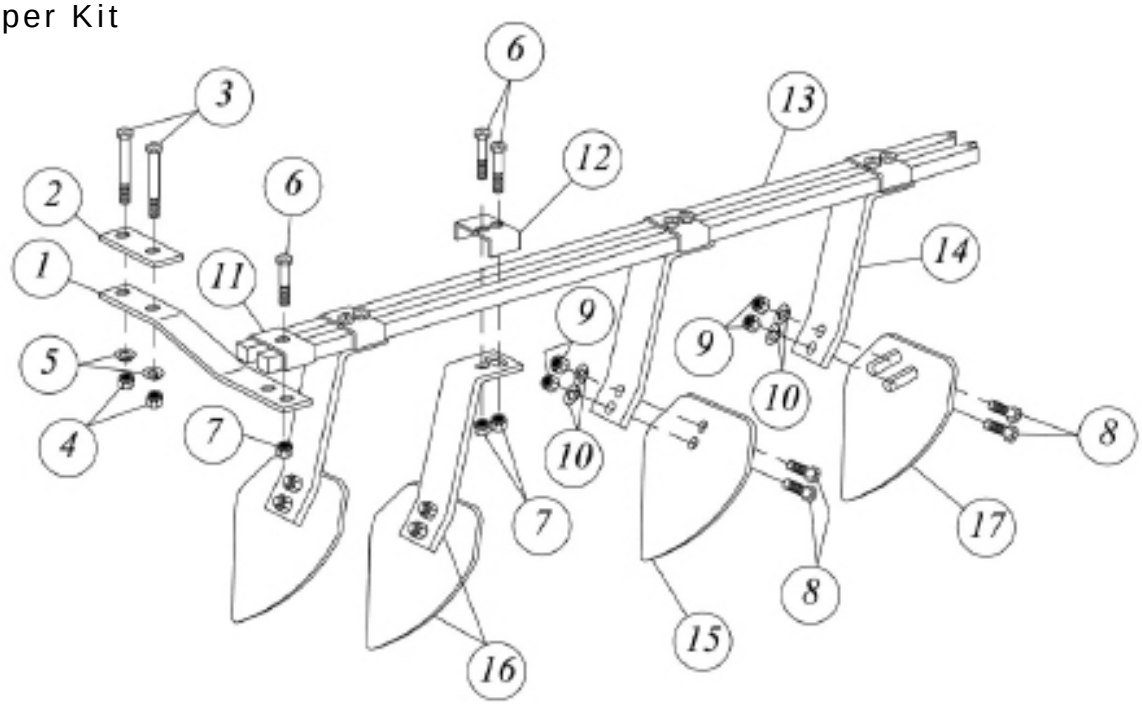
Ref.#	Part #	Description	Qty.
1	12029 11972	3/4” U- BOLT FOR 3X3 BEAM, 3/4” U- BOLT FOR 4X3 BEAM,	8 *MS
2	12295	3” X 3” X 51” GANG BEAM	2
	12296	3” X 3” X 58” GANG BEAM	2
	12300	4” X 3” X 66” GANG BEAM	2
	15355	4” X 3” X 74” GANG BEAM	2
	15356	4” X 3” X 77” GANG BEAM	2

TW5 Rear Gang Parts List (cont'd)

Ref.#	Part #	Description	Qty.
3	12102	TUBLAR GANG HANGER FOR 3X3 BEAM	8
	12021	TUBLAR GANG HANGER FOR 4X3 BEAM	*MS
4	T-892	HEX BOLT, 3/8" X 3", GR.5	*MS
5	12899	FLANGE LOCK NUT, 3/8"	*MS
6	TOR1	OUTRIGGER WASHER, 1 1/8"	4
7	2201382 2221571 2221572	DISK BLADE, 20"X 1 1/8" PLAIN DISK BLADE, 20" X 1/1/8" NOTCHED DISK BLADE, 22" X 1 1/8" PLAIN DISK BLADE. 22" X 1 1/8" NOTCHED	*MS *MS *MS *MS
8	T-47	END SPACER, 1 1/8" SQ X 3" (FOR 7 1/2" BLADE SPACING)	*MS
	T-49	END SPACER, 1 1/8" X 3 3/4" (FOR 9" BLADE SPACING)	*MS
9	TMB	TRUNNION BEARING HOUSING	*MS
	TMBR	RELUBE TRUNNION BEARING HOUSING	*MS
10	T-602	SEALED BEARING, 1 1/8"	*MS
	T-602R	RELUBE BEARING, 1 1/8"	*MS
11	T-722	SNAP RING, 3 1/2"	*MS
12	T-91	SPACER SPOOL, 1 1/8" X 7 1/2"	*MS
	T-3	SPACER SPOOL 1 1/8" X 9"	*MS
13	T-1	END WASHER, 1 1/8"	4
14	T-20	LOCK WASHER, 1 1/8"	4
15	T-18A	LOCK NUT, 1 1/8"	4
16	T-14	AXLE 1 1/8" SQ X 40 5/8"	4
	T-141	AXLE 1 1/8"SQ X 42 3/8"	4
	T-142	AXLE 1 1/8"SQ X 49 7/8"	4
17	11323	AXLE 1 1/8"SQ X 58 1/2"	*MS
	11330	AXLE 1 1/8"SQ X 59 3/4"	*MS
	11324	AXLE 1 1/8"SQ X 66"	*MS
	11331	AXLE 1 1/8" SQ X 69"	*MS
18	11398	SQ AXLE NUT, 1 1/8"	*MS
19	T-698	1 1/8" FLAT WASHER	1
20	11170	1 1/8" SPACER WASHER (IF NEEDED)	*MS
21	T-27	HEX NUT, 3/4"	*MS
22	T-31	LOCKWASHER, 3/4"	*MS
23	9401	JAM NUT 1 1/8"	4
24	TMBT602	TRUNNION HOUSING, BEARING, & SNAP RING	*MS
	TMBRT602R	RELUBE TRUNNION HOUSING, BEARING, & SNAP RING	*MS

Optional Equipment

Heavy Scraper Kit
Figure 10
TW5 Series



TW5 Series Heavy Scraper Kit Model Numbers

SK9205 for the TW928

SK7245 for the TW9730

SK97225 for the TW732

SK9245 for the TW932

SK7285 for the TW9734

SK97265 for the TW736

SK9285 for the TW936

SK7325 for the TW740

SK97305 for the TW9738

SK9325 for the TW744

SK7365 for the TW9742

SK97345 for the TW940

Heavy Scraper Kit Parts List

Ref.#	Part #	Description	Qty.
1	12892	SCRAPER MOUNT BRACKET (3X3)	8
	12891	SCRAPER MOUNT BRACKET (4X3)	8
2	12090	SCRAPER BAR TOP PLATE (3X3)	8
	12894	SCRAPER BAR TOP PLATE (4X3)	8
3	T-745	HEX BOLT, 5/8" X 5" GR. 2	16
4	T-22	HEX NUT, 5/8"	16
5	T-24	LOCK WASHER, 5/8"	16
6	11082	HEX BOLT, 1/2" X 2 1/2" GR. 2	*MS
7	9226	FLANGE LOCK NUT, 1/2"	*MS
8	T-733	HEX BOLT, 1/2" X 1 1/2" GR. 2	*MS
9	T-26	HEX NUT, 1/2"	*MS
10	T-25	LOCK WASHER, 1/2"	*MS
11	T-803	SCRAPER BAR CLAMP, "U" CLAMP – 1 HOLE	8
12	9356	2-HOLE CLAMP	*MS
13	12338	HEAVY SCAPER BAR, 37" FRONT	2
	11729	HEAVY SCRAPER BAR, 45" REAR	2
	T-2551	HEAVY SCRAPER BAR, 43"	2
	11739	HEAVY SCRAPER BAR, 48"	2
	T-2571	HEAVY SCRAPER BAR, 51"	2
	12344	HEAVY SCRAPER BAR, 55"	2
	T-2621	HEAVY SCRAPER BAR, 58"	2
	T-2531	HEAVY SCRAPER BAR, 66"	2
	T-2561	HEAVY SCRAPER BAR, 69"	2
14	10151	SCRAPER ARM	*MS
15	11081	UNIVERSAL SCRAPER BLADE	*MS
16	11027 or	ARM & BLADE ASSEMBLY FOR RIGHT FRONT OR LEFT REAR	*MS
	11028	ARM & BLADE ASSEMBLY FOR LEFT FRONT OR RIGHT REAR	*MS
17	11065	FURROW FILLER BLADE	2

** M/S - Model Specific*

Heavy Scraper Kit Mount Instructions

* NOTE- When attaching heavy scraper kit, do NOT tighten any hardware until stated in directions. Adjustments need to be made .

**NOTE- When mounting outrigger scraper blades make sure the rear scraper bar is mounted as far to the outside as possible. This allows outrigger scraper blade to reach outriger disc blade.

Reference Figure 10

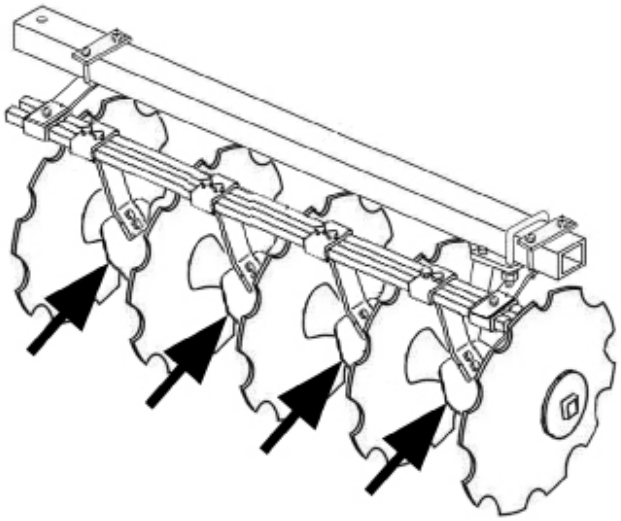
To attach heavy scraper disk, place scraper bar to plate(Ref #2) on top of gang beam and scraper mount bracket (Ref. #1) on bottom of gang beam . Using 5/8" x 5" gr.2 bolts (Ref.#3) fasten both pieces together around gang beam with 5/8" lock washer hex nut (ref.#4&#5). There should be two scraper mount bracket assemblies for each gang beam with the placement being close to each gang hanger. Some asjustments may need to be made when mounting scraper arm & blade assemblies (Ref. #16). Take heavy scraper bar (Ref.#13) and mount on top of scraper bracket assembly with 1-hole scraper bar clamp (Ref.#11). Use a 1/2" x 2 1/2" Gr.2 bolt (Ref. #6) and a 1/2" flange locknut (Ref. #7) to fasten. Scraper arm & blade assemblies (Ref.#16) are now mounted on the bottom of scraper bar (Ref.#13). There are two different sides of scraper arm & blade assemblies (Ref. #16). One side fits the right front and left rear, the other side fist the left front, and right rear. When mounting scraper arm & blade assemblies(Ref. #16) to thr bottom of the scrapper bar (Ref. #13), use 2-hole clam[(Ref,#12) on top of the scraper bar (Ref. #13) and fasten together with 1/2" x 2 1/2 GR. 2 bolt(Ref. #6) and 1/2" flange lock nut (Ref #7). Scraper arm & assemblies are not provided for outside front and inside rear blades! Once all scraper arm & blades assemblies(Ref. #16) have been mounted, now is the time to make adjustments to scraper mount bracket assemblies, if needed. When adjustments are made, tighten scraper mount bracket assemblies, if needed. When adjustments are made, tighten scraper mount bracket assemblies to gang beam and tighten scraper bar (Ref. #13) to scraper mount bracket using 1-hole scraper bar clamp (Ref.#11) and hardware(Ref. #6 & #7). Scraper arm blade assemblies(Ref. #16) should then be positioned as close to the disc blade as possible without touching it.

Turning thr gang after mounting each scraper arm & blade assembly (Ref. #16) will help determine the correct mounting postion of each one. This is recommended to prevent dragging or binding of the gang.

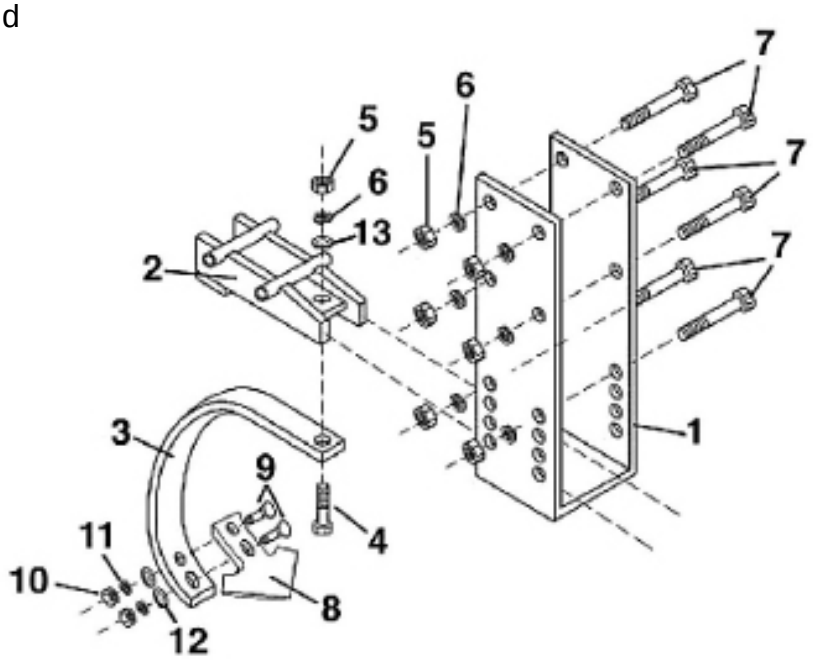
*Note-Tighten all fasteners after setting and and adjustments are made. Please see Bolt Torque Chart(page 35) for proper torque infornation.

*NOTE- Retighten all fastners after first operational use. See Bolt Torque Chart(page 35) for proper torque information.

Regardless of model or configuration, scrapers are only located between two disk blades(Refer to the diagram to the right). There is no need for a scraper on the far outside blades on the front gangs or the far inside blades on the rear gangs.



Center Sweep Kit
Figure 11
TW5-1 FRAME



Ref.#	Part #	Description	Qty.
1	15375	SHANK BRACKET 3" BEAM	1
	10388	SHANK BRACKET 4" BEAM	1
2	10599	SHANK HOLDER 3" BEAM	1
	9175	SHANK HOLDER 4" BEAM	1
3	10602	BALK BREAKER SHANK	1
4	9192	HEX BOLT, 5/8" X 2 1/2", GR. 5	1
5	T-22	HEX NUT, 5/8"	7
6	T-24	LOCK WASHER, 5/8"	7
7	T-744	HEX BOLT, 5/8" X 4 1/2", GR. 2	6
	T-746	HEX BOLT, 5/8" X 5 1/2", GR. 2	6
8	13614	4" SWEEP POINT	1
9	14984	PLOW BOLT, 7/16" X 1 1/2"	2
10	14986	HEX NUT, 7/16"	2
11	14987	LOCK WASHER, 7/16"	2
12	14985	FLAT WASHER, 7/16"	2
13	9354	FLAT WASHER, 5/8"	1

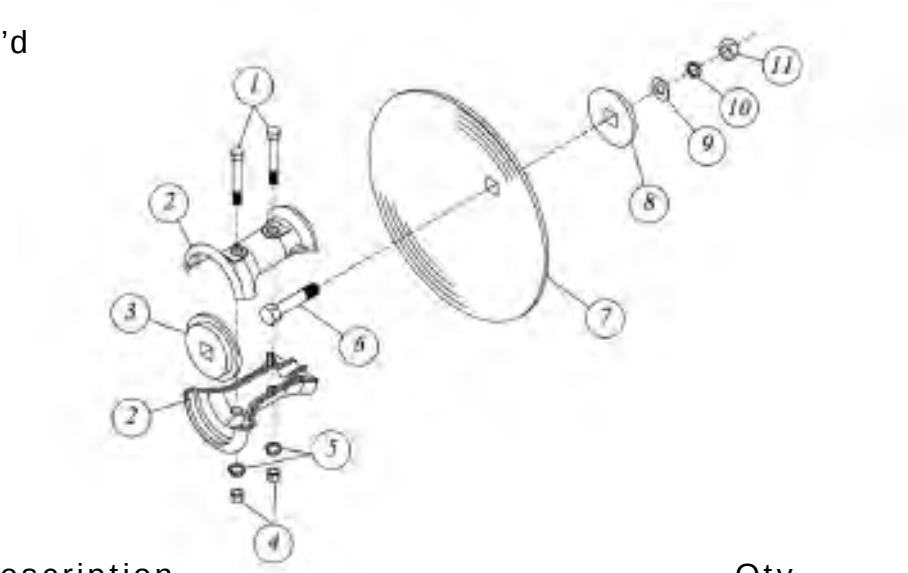
Center Sweep Kit Mounting Instructions Reference Figure 11

To attach balk breaker to disk, remove the two top bolts from ref. #1 (shank bracket) and slide on to center tube of frame, between the wheel carriage and depth control bracket. Insert top bolts back in ref. #1 and apply lock washer and hex nut. DO NOT TIGHTEN! Attach ref. #3 (balk breaker shank) to ref. #2 (shank holder) with hardware supplied, then tighten this bolt only. Ref. #2 can be adjusted for different depths. Normal operational depth is the same as the disk blade depth. Depth adjustments can be made by putting disk on the ground, and adjusting bolts in ref. #2 up or down. Once depth has been set, tighten all bolts and balk breaker is ready for operation.Please see Bolt Torque Chart (page 34) for proper torque information.

*NOTE- Retighten all fasteners after first operational use.Please see Bolt Torque Chart (page 34) for proper torque information.

Optional Equipment Cont'd

Outrigger Kit
Figure 12



Ref.#	Part #	Description	Qty.
1	12163	HEX BOLT, 1/2" X 3 1/2" GR. 5	4
2	T-OR2	OUTRIGGER HALF	4
3*	T-OR1	OUTRIGGER WASHER, 1 1/8"	*Note
4	T-26	HEX NUT, 1/2"	4
5	T-25	LOCK WASHER, 1/2"	4
6	T-760	HEX BOLT, 3/4" X 3 1/2" GR. 5	2
7	5181381	DISK BLADE, 18" X 1" PLAIN for 22"	*MS
8	T-1	END WASHER, 1 1/8"	2
9	T-723	FLAT WASHER, 3/4"	2
10	T-31	LOCK WASHER, 3/4"	2
11	T-27	HEX NUT, 3/4"	2

*Note: Item #3, Part# T-OR1 is not included with this assembly. The T-OR1 is standard equipment on the rear gangs of the TW5 series.

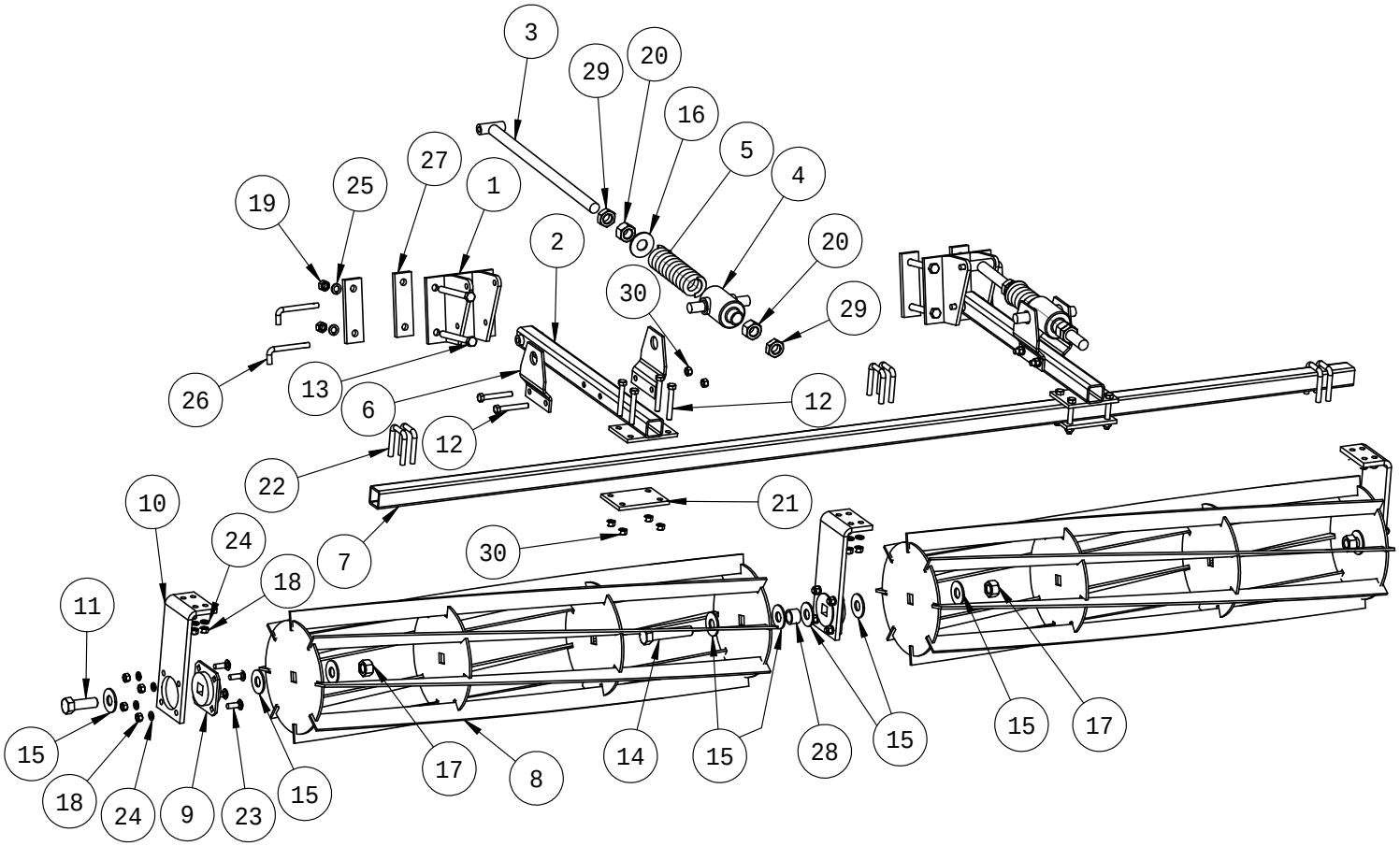
Outrigger Kit Mounting Instructions

Outrigger kits only attach to rear gang with outrigger washers (ref. #3). Outrigger washers DO NOT come with kit. They are standard equipment on rear gangs of the TW5 series. To attach outriggers, remove cast iron end washer (ref. #8), 3/4" flat washer (ref. #9), 3/4" lock washer (ref. #10), and 3/4" hex nut (ref. #11) from 3/4" x 3 1/2" Gr. 5 bolt (ref. #6). Remove 1/2" hex nuts & lock washers (ref. #4 & #5) from 1/2" x 3 1/2" Gr. 5 bolts (ref. #1). Take outrigger halves (ref. #2) and pull apart wide enough to clamp over outrigger washer (ref. #3) on gang assembly. Re-apply the 1/2" hex nuts & lock washers (ref. #4 & #5) to 1/2" x 3 1/2" Gr. 5 bolt (ref. #1) and tighten. Make sure the 3/4" x 3 1/2" Gr. 5 bolt (ref. #6) is pulled out as far as possible before tightening. Once tightened, apply the outrigger disk blade (ref. #7) on the 3/4" x 3 1/2" Gr. 5 bolt (ref. #6), followed by the cast iron end washer (ref. #8), 3/4" flat washer (ref. #9), 3/4" lock washer (ref. #10), and 3/4" hex nut (ref. #11). Tighten and outrigger is ready for operation. Please see Bolt Torque Chart (page 34) for proper torque information.

*NOTE- TW5 models use 16" outrigger blades for 20" disk baldes and 18" outrigger blades for 22" disk blades.

*NOTE- Retighten all fasteners after first operational use. Please see Bolt Torque Chart (page 35) for proper torque information.

TW5 Roller Basket Schematic



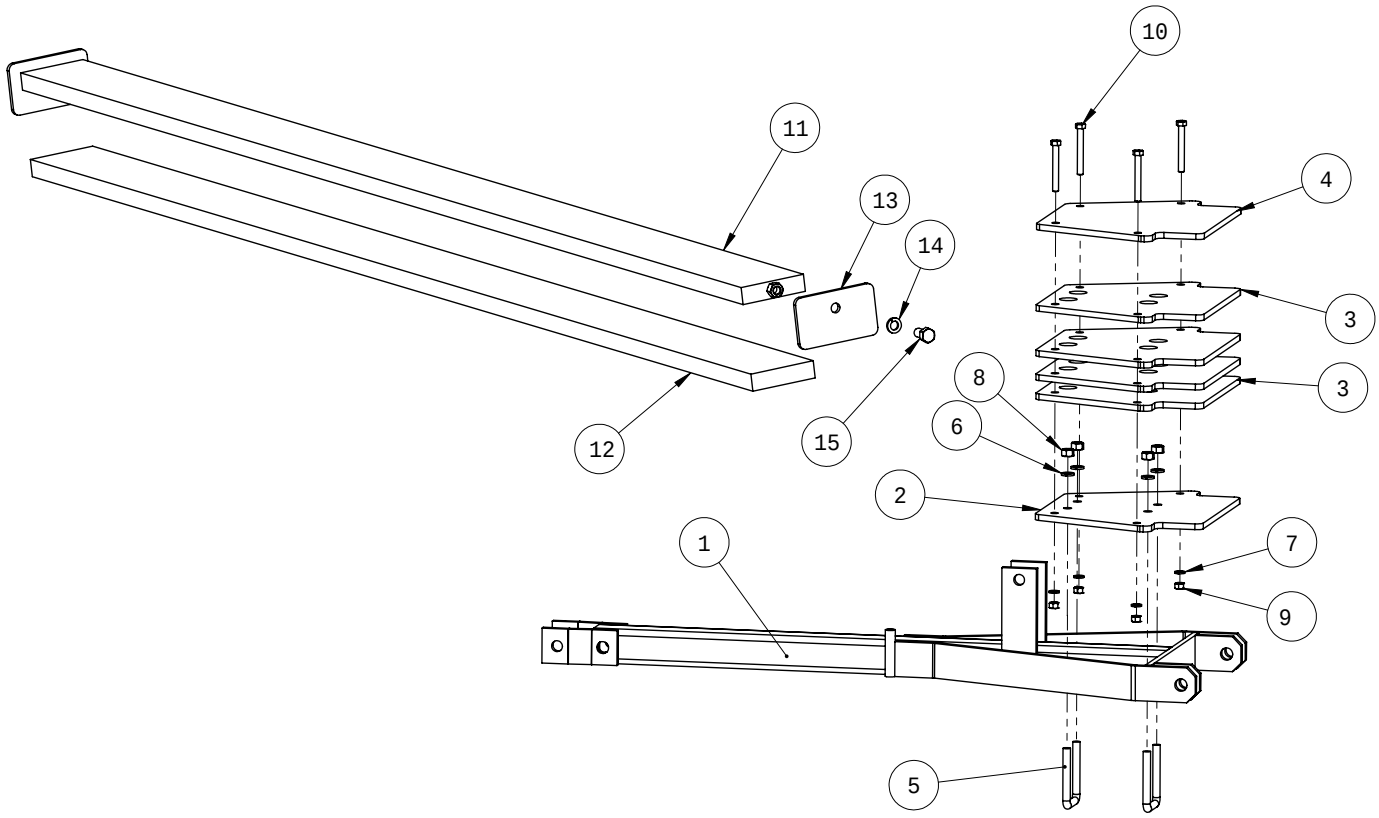
TW5 Roller Basket Parts List

Ref.#	Part #	Description	Qty.
1	16070	MOUNT WELDMENT	2
2	16076	ARM WELDMENT	2
3	16080	SPRING ROD WELDMENT	2
4	T-510	SPRING HOUSING	2
5	T-509	ADJUSTING SPRING 8 1/2"	2
6	16082	PIVOT PLATE	4
7	16084	TOOL BAR 117"	1
	16085	TOOL BAR 129"	1
	16086	TOOL BAR 141"	1
	16087	TOOL BAR 165"	1
8	16089	BASKET WELDMENT, 54",	2
	16090	BASKET WELDMENT, 60",	2
	16091	BASKET WELDMENT, 66"	2
	16092	BASKET WELDMENT, 78"	2
9	13689	1" BALL FLANGE BEARING	3
10	15095	GANG HANGER	3
11	T-780	HEX BOLT, 1" X 3 1/2"	2

TW5 Roller Basket Parts List (cont'd)

Ref.#	Part #	Description	Qty.
12	12163	HEX BOLT, 1/2" X 3 1/2"	12
13	T-748	HEX BOLT, 5/8" X 6" GR.5	4
14	16166	HEX BOLT, 1" X 5" GR. 5	1
15	T-606	FLAT WASHER, 1"	11
16	T-698	FLAT WASHER, 1 1/8"	2
17	10332	LOCK NUT, 1"	3
18	T-26	HEX NUT, 1/2"	12
19	T-22	HEX NUT, 5/8	4
20	T-18	HEX NUT, 1 1/8"	4
21	16079	ARM TOOLBAR MOUNT PLATE	2
22	11138	2" X 2" U-BOLT	6
23	T-804	CARRIAGE BOLT, 1/2" X 1 1/2"	12
24	T-25	LOCK WASHER, 1/2"	12
25	T-24	LOCK WASHER, 5/8	4
26	9406	MOUNT PIN	4
27	12894	MOUNTING STRAP	4
28	16167	SPACER	1
29	9401	JAM NUT, 1 1/8"	4
30	16104	LOCK NUT, 1/2"	12

TW5 Roller Basket Weight Kit



Ref.#	Part #	Description	Qty.
1	9034	TONGUE WELDMENT (NOT INCLUDED IN KIT)	1
2	16235	BOTTOM WEIGHT PLATE	1
3	16236	MIDDLE WEIGHT PLATE	4
4	16237	TOP WEIGHT PLATE	1
5	11139	U-BOLT, 3" X 3"	2
6	T-24	LOCK WASHER, 5/8"	4
7	T-728	LOCK WASHER, 1/2"	4
8	T-22	HEX NUT, 5/8"	4
9	T-26	HEX NUT, 1/2"	4
10	T-734	HEX BOLT, 1/2" X 4" GR. 2	4
11	16266	FRAME WEIGHT WELDMENT	1
	16239	FRAME WEIGHT WELDMENT	1
12	16263	FRAME WEIGHT BAR	1
	16238	FRAME WEIGHT BAR	1
13	16240	END CAP	2
14	T-728	LOCK WASHER, 1/2"	2
15	16256	HEX BOLT, 1/2" X 1" GR. 5	2

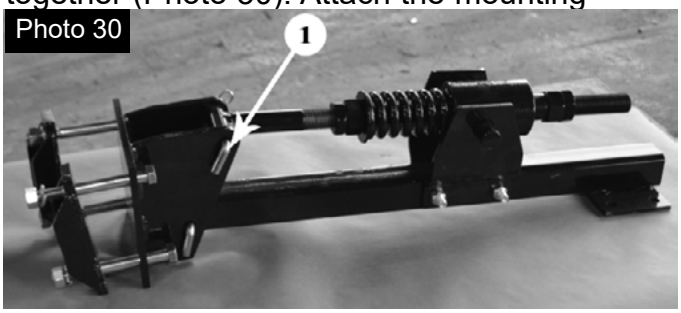
NOTE: Ref. numbers 11-15 are to be installed into the front cross tube on the main frame.

Assembly

⚠ WARNING

Mounting bracket, straps, arm, spring rod assembly and hardware are assembled together (Photo 30). Attach the mounting

Photo 30

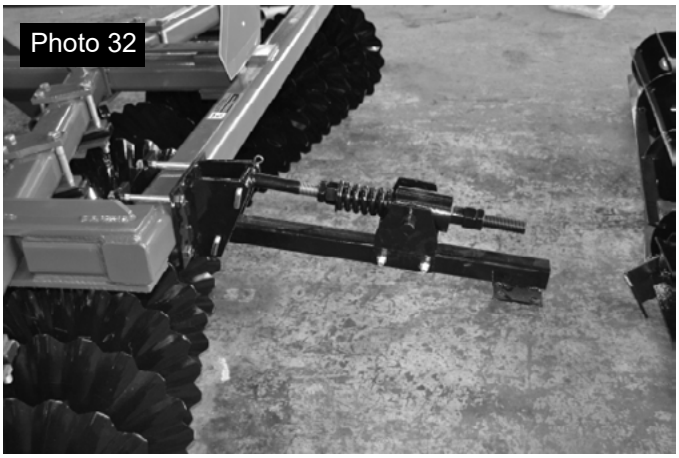


bracket to the rear of the frame, with the mounting straps, using the 5/8" x 6" bolts, lock washers and nuts. Bracket should be 1/2" from the inside wall of frame (Photo 31). Tighten the

Photo 31

top and bottom bolts evenly during this step. Failure to do so will not allow the bracket to

Photo 32

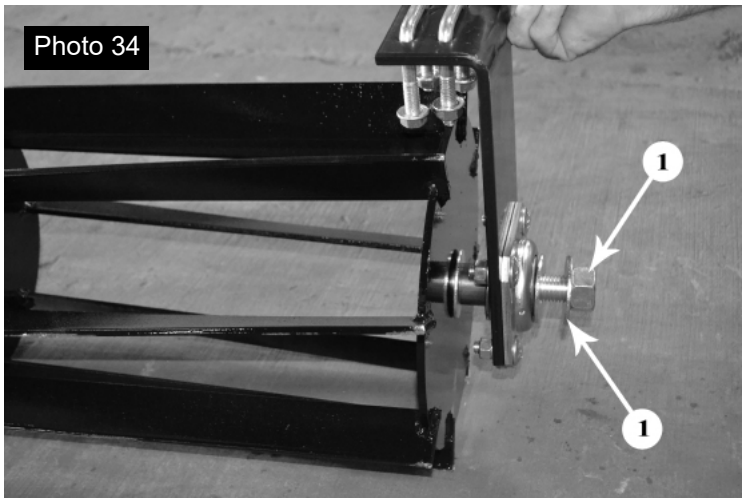


mount properly. Next attach the arm and spring rod assembly using the two mount pins (Photo 32). After both sides have been mounted start assembling the roller baskets together. Outer hangers are pre assembled onto the outer end of the roller basket (Photo 33). The inner hanger or hangers are

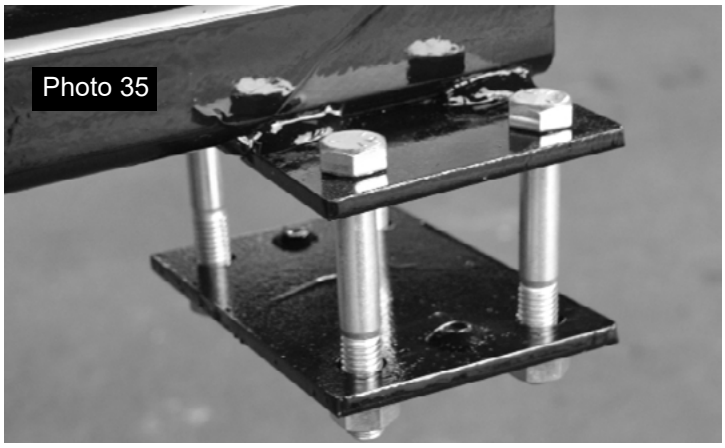
Photo 33

loosly attached to the inner end of the roller basket (Photo 34). Attach the inner ends of the roller bas-

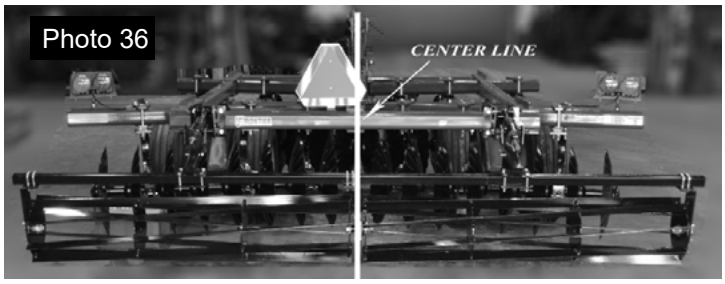
Photo 34



kets together. Do this by removing the 1" lock nut and one 1" flat washer (Photo 34, Ref. 1). Slide baskets together and insert end of bolt into hole in the roller basket. Put flat washer and lock nut back onto bolt. Tighten bolt and lock nut to torq specs (Page 35). Place tool bar onto hanger assembly. Use 2" sq. u-bolts located on the hanger. Adjust tool bar to the center. Roughly 2" of tool bar should extend past outer hangers. Attach tool bar to arms. Remove arm toolbar mount plate from arm



assembly (Photo 35). Place roller assembly under arms. Position roller assembly to the center of vertical tillage unit left to right (Photo 36). Remove pin (Photo 30, Ref 1) from arm and spring rod assembly. This will let the arms easily lay on top

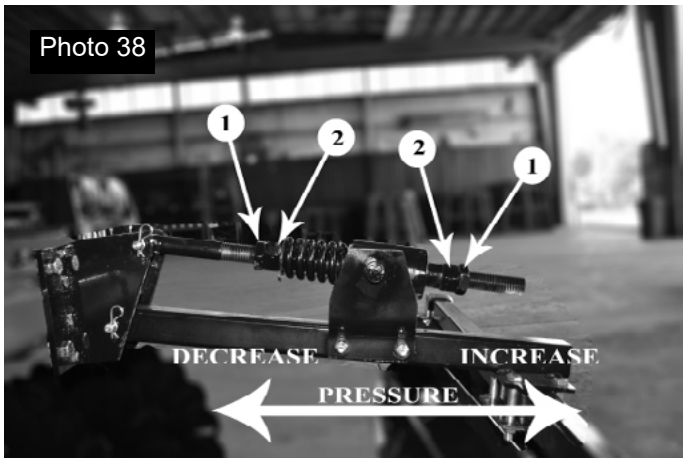


of the tool bar. Place the four 1/2" x 3 1/2" bolts thru the plate welded to the arm. Place the arm mount plate under the tool bar with four 1/2" lock nuts (Photo 37). Check to make sure the roller basket assembly is centered to the vertical tillage unit (Photo 36). Tighten bolts and lock nuts in an

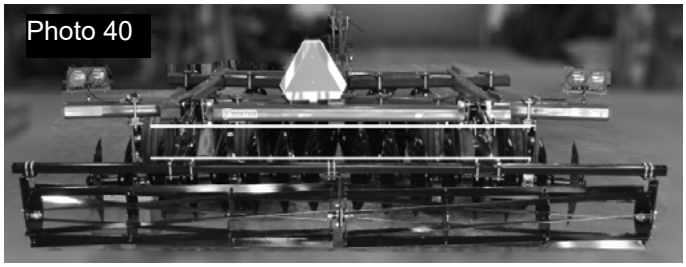
alternating pattern to ensure even pressure to torq specs (Page 35). Raise roller basket assembly with hoist to reinsert top pin.

Adjusting Roller Basket

Loosen jam nuts (Photo 38, Ref. 1) and hex nuts (Photo 38, Ref. 2) on both ends of each spring rod assembly. Adjust the rear facing hex nut on spring rod assemblies to desired height.

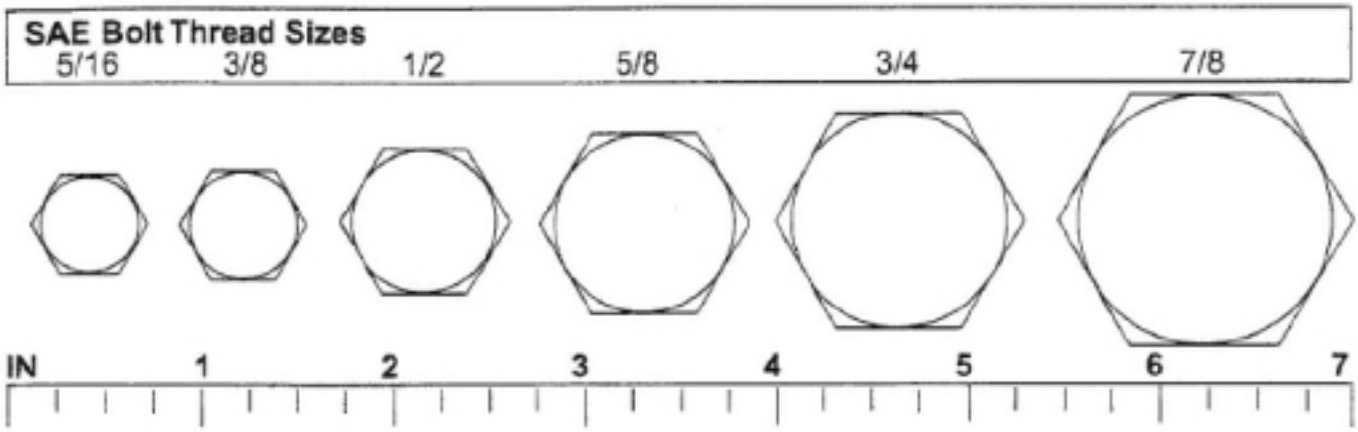


Tighten the jam nut on each side against the hex nut to create a lock. Tighten the forward facing hex nut on the front of each spring rod assembly to apply pressure on the spring (Photo 39). Once desired pressure is applied tighten the jam nut to create the lock. Make sure the roller basket assembly is level horizontatily with the vertical tillage unit (Photo 40).

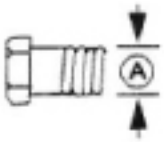


Bolt Size Chart

NOTE: Chart shows bolt thread sizes and corresponding head (wrench) sizes for standard SAE and metric bolts.



SAE Torque Chart



SAE SERIES TORQUE CHART

SAE Grade 2 (No Dashes)

SAE Bolt Head Identification

SAE Grade 5 (3 Radial Dashes)

SAE Grade 8 (6 Radial Dashes)

(A) Diameter (Inches)	Wrench Size	MARKING ON HEAD					
		SAE 2		SAE 5		SAE 8	
		lbs-ft	N-m	lbs-ft	N-m	lbs-ft	N-m
1/4"	7/16"	6	8	10	13	14	18
5/16"	1/2"	12	17	19	26	27	37
3/8"	9/16"	23	31	35	47	49	67
7/16"	5/8"	36	48	55	75	78	106
1/2"	3/4"	55	75	85	115	120	163
9/16"	13/16"	78	106	121	164	171	232
5/8"	15/16"	110	149	170	230	240	325
3/4"	1-1/8"	192	261	297	403	420	569
7/8"	1-5/16"	306	416	474	642	669	907
1"	1-1/2"	467	634	722	979	1020	1383

Notes

PART NO.
16260