



ER8/ER10/ER12

Econo V-Rake

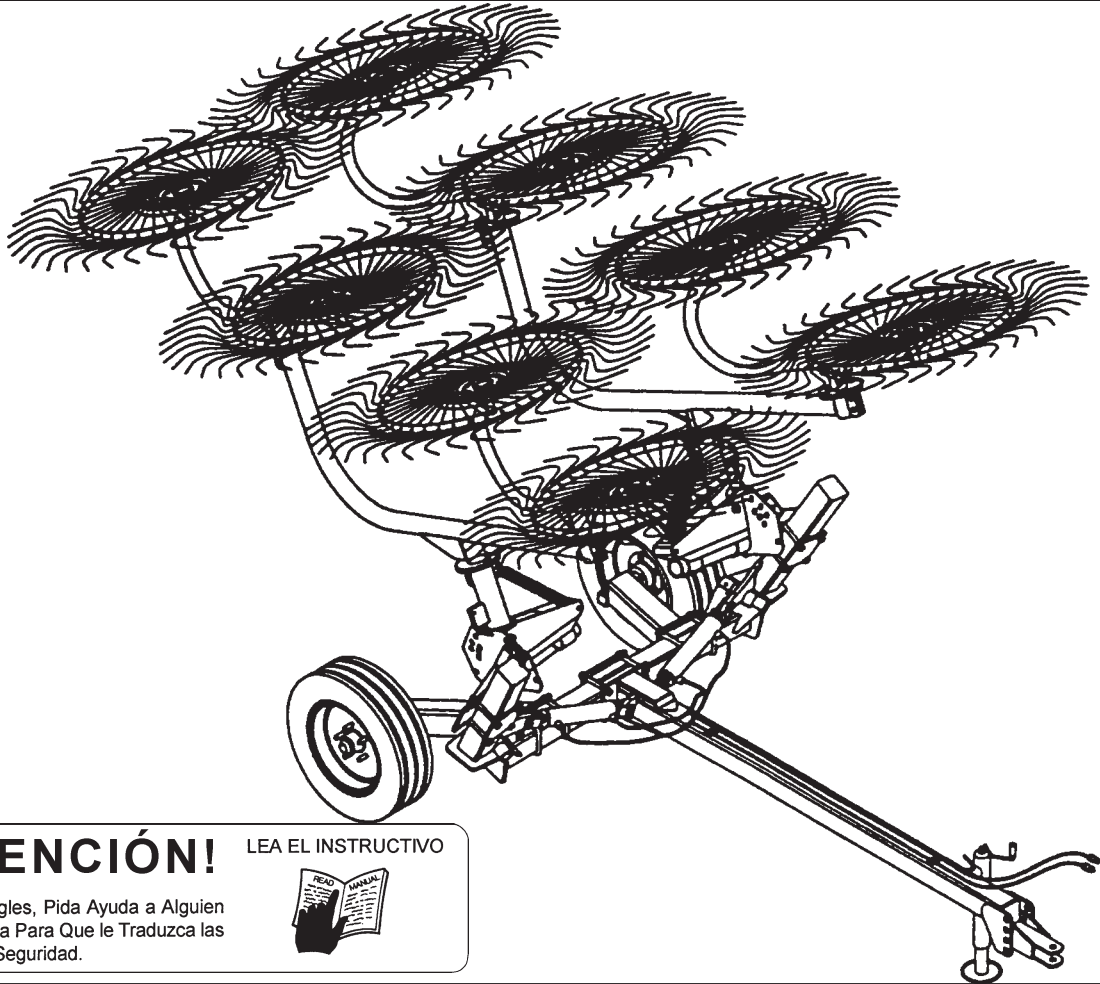
Published 03/07

4929WC

OPERATOR'S MANUAL



This Operator's Manual is an integral part of the safe operation of this machine and must be maintained with the unit at all times. **READ, UNDERSTAND, and FOLLOW** the Safety and Operation Instructions contained in this manual before operating the equipment.



ATENCIÓN!

LEA EL INSTRUCTIVO

Si No Lee Ingles, Pida Ayuda a Alguien
Que Si Lo Lea Para Que le Traduzca las
Medidas de Seguridad.



M&W®

1020 South Sangamon Ave.
Gibson City, Illinois 60936
217-784-4261



TO THE OWNER/OPERATOR/DEALER

All implements with moving parts are potentially hazardous. There is no substitute for a cautious, safe-minded operator who recognizes the potential hazards and follows reasonable safety practices. The manufacturer has designed this implement to be used with all its safety equipment properly attached to minimize the chance of accidents.

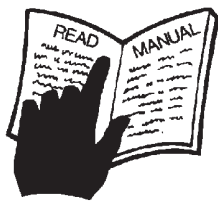
BEFORE YOU START!! Read the safety messages on the implement and shown in your manual. Observe the rules of safety and common sense!



DANGER

FAILING TO FOLLOW SAFETY MESSAGES AND OPERATING INSTRUCTIONS CAN CAUSE SERIOUS BODILY INJURY OR EVEN DEATH TO OPERATOR AND OTHERS IN THE AREA.

1.



2. NO RIDERS, NO CHILDREN OPERATORS



3. USE SAFETY SHOES, HARD HAT, SAFETY GLASSES, SEATBELTS, & ROPS



4. BLOCK UP SECURELY BEFORE WORKING UNDER.



1. Study and understand Operator's Manuals, Safety Signs, and Instructional Decals for tractor & flail mower to prevent misuse, abuse, & accidents. Practice before operating mower in a confined area or near passersby.

- Learn how to stop engine suddenly in an emergency. Be alert for passersby and especially children.
- 2. Allow no children on or near implement or tractor. Allow no riders on tractor or implement. Falling off can cause serious injury or death from being runover by tractor or mower or contact with Flail Mower Blades.
- 3. Operate only with tractor having Roll-Over Protective Structure (ROPS) and with seatbelt fastened securely and snugly to prevent injury and possible death from falling off or tractor overturn. Personal Protective Equipment such as Hard Hat, Safety Glasses, Safety Shoes, and Ear Plugs are recommended.
- 4. Block up or support raised machine and all lifted components securely before putting hands or feet under or working underneath any lifted component to prevent crushing injury or death from sudden dropping or inadvertent operation of controls. Make certain that area is clear before lowering or folding.
- 5. Before transporting, put Lift Lever in detent or full-lift position. Install Transport Safety Devices securely on folding implements. Slow down when turning and on hillsides.
 - Install **Restrictor in folding circuit to slow down lowering and unfolding if action is faster than is desirable.
- 6. Make certain that SMV sign, Warning Lights, and Reflectors are clearly visible. Follow local traffic codes.
- 7. Never operate with Flail Mower or Folding Section raised if passersby, bystanders or traffic are in the area to reduce possibility of injury or death from objects thrown by Blades under Shields or implement structure.
- 8. Before dismounting, secure flail mower in transport position or lower to ground.
 - Put tractor in park or set brake, disengage PTO, stop engine, remove key, and wait until noise of rotation has ceased to prevent entanglement in rotating parts which may cause injury or death.
 - Never mount or dismount a moving vehicle. Crushing from runover may cause injury or death.

5. TRANSPORT SAFELY, LOCK UP.



6. USE SMV, LIGHTS, & REFLECTORS.



7. DO NOT OPERATE WITH MOWER OR WING RAISED.



8. DO NOT MOUNT OR DISMOUNT WHILE MOVING.



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WARRANTY INFORMATION:

Read and understand the complete Warranty Statement found in this manual. Fill out the Warranty Registration Form in full and return it within 30 Days. Make certain the Serial Number of the machine is recorded on the Warranty Card and on the Warranty Form that you retain. The use of "will-fit" parts will void your warranty and can cause catastrophic failure with possible injury or death.

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Important

This service manual is presented to you for assistance in the operation and maintenance of your M&W Equipment. There will be a charge for manuals requested after the original issue on purchased or leased equipment. Contact your M&W dealer for replacement parts. Requests for additional manuals should be directed to:

M&W
1020 South Sangamon Avenue
Gibson City, IL 60936

When ordering parts for this manual be sure that orders for replacement parts include the following information:

1. Name of machine
2. Machine model number
3. Machine serial number (The serial number plate is located on the front of the 3-point frame)
4. Quantity of part required
5. M&W part number (from manual)
6. Description of part

M&W, whose policy it is to continuously improve its products, reserve the right to discontinue or change specification, models or design without notice and without incurring obligation.

Record the following information for future reference:

Model No.: _____

Serial No.: _____

Date of Purchase: _____

SAFETY SECTION

SAFETY

A safe and careful operator is the best operator. Safety is of primary importance to the manufacturer and should be to the owner/operator. Most accidents can be avoided by being aware of your equipment, your surroundings, and observing certain precautions. The first section of this manual includes a list of Safety Messages that, if followed, will help protect the operator and bystanders from injury or death. Read and understand these Safety Messages before assembling, operating or servicing this mower. This equipment should only be operated by those persons who have read the Manual, who are responsible and trained, and who know how to do so safely and responsibly.

The Safety Alert Symbol combined with a Signal Word, as seen below, is used throughout this manual and on decals which are attached to the equipment. The Safety Alert Symbol means: **“ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!”** The Symbol and Signal Word are intended to warn the owner/operator of impending hazards and the degree of possible injury faced when operating this equipment.

Practice all usual and customary safe working precautions and above all---remember safety is up to YOU. Only YOU can prevent serious injury or death from unsafe practices.

CAUTION!



The lowest level of Safety Message; warns of possible injury. Decals located on the Equipment with this Signal Word are Black and Yellow.

WARNING!



Serious injury or possible death! Decals are Black and Orange.

DANGER!



Imminent death/critical injury. Decals are Red and White. (SG-1)

SAFETY

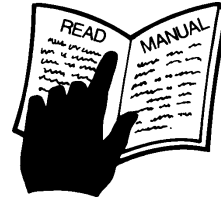
READ, UNDERSTAND, and FOLLOW the following Safety Messages. Serious injury or death may occur unless care is taken to follow the warnings and instructions stated in the Safety Messages. Always use good common sense to avoid hazards.

SAFETY INSTRUCTIONS



(SG-2)

¡LEA EL INSTRUCTIVO!



PELIGRO!

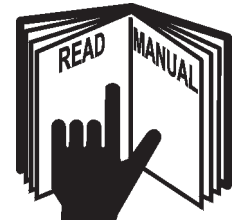


Si no lee Ingles, pida ayuda a alguien que si lo lea para que le traduzca las medidas de seguridad. (SG-3)

DANGER!



Never operate the Tractor or Implement until you have read and completely understand this Manual, the Tractor Operator's Manual, and each of the Safety Messages found in the Manual or on the Tractor and Implement. Learn how to stop the tractor engine suddenly in an emergency. Never allow inexperienced or untrained personnel too operate the Tractor and Implement without supervision. Make sure the operator has fully read and understood the manuals prior to operation. (SG-4)



WARNING!



Always maintain the safety decals in good readable condition. If the decals are missing, damaged, or unreadable, obtain and install replacement decals immediately. (SG-5)

WARNING!



Make certain that the "Slow Moving Vehicle" (SMV) sign is installed in such a way as to be clearly visible and legible. When transporting the Equipment use the Tractor flashing warning lights and follow all local traffic regulations. (SG-6)



WARNING!



Operate this Equipment only with a Tractor equipped with an approved roll-over-protective system (ROPS). Always wear seat belts. Serious injury or even death could result from falling off the tractor--particularly during a turnover when the operator could be pinned under the ROPS. (SG-7)



WARNING!

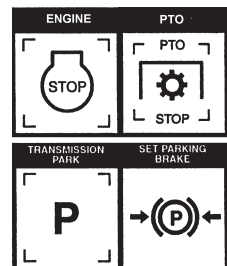


Do not modify or alter this Implement. Do not permit anyone to modify or alter this Implement, any of its components or any Implement function. (SG-8)

DANGER!



BEFORE leaving the tractor seat, always engage the brake and/or set the tractor transmission in parking gear, disengage the PTO, stop the engine, remove the key, and wait for all moving parts to stop. Place the tractor shift lever into a low range or parking gear to prevent the tractor from rolling. Never dismount a Tractor that is moving or while the engine is running. Operate the Tractor controls from the tractor seat only. (SG-9)



DANGER!



Never allow children or other persons to ride on the Tractor or Implement. Falling off can result in serious injury or death. (SG-10)



SAFETY

DANGER!



Never allow children to operate or ride on the Tractor or Implement. (SGM-11)



WARNING!



Do not mount the Tractor while the tractor is moving. Mount the Tractor only when the Tractor and all moving parts are completely stopped. (SG-12)



DANGER!



Start tractor only when properly seated in the Tractor seat. Starting a tractor in gear can result in injury or death. Read the Tractor operators manual for proper starting instructions. (SG-13)



DANGER!



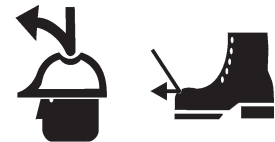
Never work under the Implement, the framework, or any lifted component unless the Implement is securely supported or blocked up to prevent sudden or inadvertent falling which could cause serious injury or even death. (SG-14)



WARNING!



The operator and all support personnel should wear hard hats, safety shoes, safety glasses, and proper hearing protection at all times for protection from injury including injury from items thrown by the equipment. (SG-16)



DANGER!



Do not operate this Equipment with hydraulic oil leaking. Oil is expensive and its presence could present a hazard. Do not check for leaks with your hand! Use a piece of heavy paper or cardboard. High-pressure oil streams from breaks in the line could penetrate the skin and cause tissue damage including gangrene. If oil does penetrate the skin, have the injury treated immediately by a physician knowledgeable and skilled in this procedure. (SG-15)



SAFETY

CAUTION!



PROLONGED EXPOSURE TO LOUD NOISE MAY CAUSE PERMANENT HEARING LOSS!

Tractors with or without an Implement attached can often be noisy enough to cause permanent hearing loss. We recommend that you always wear hearing protection if the noise in the Operator's position exceeds 80db. Noise over 85db over an extended period of time will cause severe hearing loss. Noise over 90db adjacent to the Operator over an extended period of time will cause permanent or total hearing loss. *Note:* Hearing loss from loud noise [from tractors, chain saws, radios, and other such sources close to the ear] is cumulative over a lifetime without hope of natural recovery. (SG-17)



WARNING!



Transport only at safe speeds. Serious accidents and injuries can result from operating this equipment at unsafe speeds. Understand the Tractor and Implement and how it handles before transporting on streets and highways. Make sure the Tractor steering and brakes are in good condition and operate properly.



Before transporting the Tractor and Implement, determine the safe transport speeds for you and the equipment. Make sure you abide by the following rules:

1. Test the tractor at a slow speed and increase the speed slowly. Apply the Brakes smoothly to determine the stopping characteristics of the Tractor and Implement. As you increase the speed of the Tractor the stopping distance increases. Determine the maximum safe transport speed for you and this Equipment.
2. Test the equipment at a slow speed in turns. Increase the speed through the turn only after you determine that it is safe to operate at a higher speed. Use extreme care and reduce your speed when turning sharply to prevent the tractor and implement from turning over. Determine the maximum safe turning speed for you and this equipment before operating on roads or uneven ground.
3. Only transport the Tractor and Implement at the speeds that you have determined are safe and which allow you to properly control the equipment.



Be aware of the operating conditions. Do not operate the Tractor with weak or faulty brakes. When operating down a hill or on wet or rain slick roads, the braking distance increases: use extreme care and reduce your speed. When operating in traffic always use the Tractor's flashing warning lights and reduce your speed. Be aware of traffic around you and watch out for the other guy. (SG-19)

WARNING!



Never attempt to lubricate, adjust, or remove material from the Implement while it is in motion or while tractor engine is running. Make sure the tractor engine is off before working on the Implement. (SG-20)

WARNING!



Always read carefully and comply fully with the manufacturers instructions when handling oil, solvents, cleansers, and any other chemical agent. (SG-22)



SAFETY

WARNING!



Periodically inspect all moving parts for wear and replace when necessary with authorized service parts. Look for loose fasteners, worn or broken parts, and leaky or loose fittings. Make sure all pins have cotter pins and washers. Serious injury may occur from not maintaining this machine in good working order. (SG-21)



DANGER!



Never run the tractor engine or mower engine in a closed building or without adequate ventilation. The exhaust fumes can be hazardous to your health. (SG-23)

DANGER!



KEEP AWAY FROM ROTATING ELEMENTS to prevent entanglement and possible serious injury or death. (SG-24)



DANGER!



Never allow children to play on or around Tractor or Implement. Children can slip or fall off the Equipment and be injured or killed. Children can cause the Implement to shift or fall crushing themselves or others. (SG-25)

DANGER!



NEVER use drugs or alcohol immediately before or while operating the Tractor and Implement. Drugs and alcohol will affect an operator's alertness and coordination and therefore affect the operator's ability to operate the equipment safely. Before operating the Tractor or Implement, an operator on prescription or over-the-counter medication must consult a medical professional regarding any side effects of the medication that would hinder their ability to operate the Equipment safely. **NEVER** knowingly allow anyone to operate this equipment when their alertness or coordination is impaired. Serious injury or death to the operator or others could result if the operator is under the influence of drugs or alcohol. (SG-27)



DANGER!



Operate the Tractor and/or Implement controls only while properly seated in the Tractor seat with the seat belt securely fastened around you. Inadvertent movement of the Tractor or Implement may cause serious injury or death. (SG-29)

DANGER!



Be particularly careful when transporting the Implement using the tractor. Turn curves or go up or down hills only at a low speed and at a gradual steering angle. Make certain that at least 20% of the tractor's weight is on the front wheels to maintain safe steering. Slow down on rough or uneven surfaces. (STI-1)

SAFETY

WARNING!



Never leave Tractor and Implemented unattended while the implement is in the lifted position. Accidental operation of lifting lever or a hydraulic failure may cause sudden drop of unit with injury or death by crushing. To properly park the implement when disconnecting it from the tractor, lower the stand and put the retaining pin securely in place, or put a secure support under the A-Frame. Lower the implement carefully to the ground. Do not put hands or feet under lifted components. (S3PT-1)

WARNING!



Be particularly careful when transporting the Implement with the Tractor. Turn curves or go up hills only at a low speed and using a gradual steering angle. Rear mounted implements move the center of gravity to the rear and remove weight from the front wheels. Make certain, by adding front ballast, that at least 20% of the tractor's weight is on the front wheels to prevent rearing up, loss of steering control or Tractor tip-over. Slow down on rough or uneven surfaces to prevent loss of steering control which could result in property damage or possible injury. Do not transport unless 3-Point lift lever is fully raised and in the latched transport position. Dropping implement in transport can cause serious damage to the tractor and/or Implement and possibly cause the operator or others to be injured or killed. (S3PT-2)

DANGER!



A rear Implement can fall if not properly supported. Always use the stand on the front hitch (if equipped) or block up securely to prevent falling and possible crushing injury and/or other injury from holding or lifting heavy components. Use the stand to stabilize the implement during storage. (S3PT-3)

CAUTION!



Do not back up with this implement. Backing could damage the machine or its components (S3PT-4)

WARNING!



Use extreme care when lowering or unfolding the implement's wings. Make sure no bystanders are close by or underneath the wings. Allow ample clearance around the implement when folding or unfolding the wings. Use extreme caution around buildings or overhead power lines. (S3PT-5)

WARNING!



Relieve hydraulic pressure prior to doing any maintenance or repair work on the Implement. Place the Implement on the ground or securely blocked up, disengage the PTO, and turn off the tractor engine. Push and pull the Remote Cylinder lever in and out several times prior to starting any maintenance or repair work. (S3PT-9)



DANGER!



This Implement is wider than the Tractor. Be careful when operating or transporting this equipment to prevent the Implement from running into or striking sign posts, guard rails, concrete abutments or other solid objects. Such an impact could cause the Implement and Tractor to pivot violently resulting in loss of steering control, serious injury, or even death. Never allow the Implement to contact obstacles. (S3PT-12)

DANGER!



When the Wings are folded for transport, the center of gravity is raised and the possibility of overturn is increased. Drive slowly and use extreme caution when turning on hillsides. Overturning the Implement could cause the Implement to overturn the Tractor and vice versa resulting in serious injury or even death. Never fold wings on a hillside...the Implement may overturn. (STI-2)

SAFETY

DANGER!



DO NOT allow any person under a folded wing unless wing is securely locked up or supported. **DO NOT** approach the Implement unless the Tractor is turned off and all motion has ceased. Never work under the frame work, or any lifted component unless the implement is securely supported or blocked up. A sudden or inadvertent fall by any of these components could cause serious injury or even death. (STI-3)



WARNING!



Never unhitch without using the Tongue Jack. The Tongue is very heavy. Attempting to lift the Tongue without using the Tongue Jack could cause **strains or other injury**. Allowing the tongue to fall **suddenly and unexpectedly** could result in **crushing injury**. Use the Tongue Jack for **lifting the mower only**. Overloading the Tongue Jack can cause failure with possible **serious bodily injury or even death**. (STI-4)

CAUTION!



On a fully-assembled unit, do not remove the Wing Retaining Strap until hoses are attached to the tractor and the Wing Cylinders are filled with oil. Lower the Wings slowly and carefully. Keep bystanders away during operations. (STI-5)

DANGER!



Do not operate the implement while wearing loose fitting clothing. Entanglement of the clothing with the rotating elements can result in serious injury or even death. Stay clear of all rotating elements at all times. (SSP-3)

DANGER!



There are obvious and hidden potential hazards in the operation of this Rake as in all power-driven or pulled equipment. **REMEMBER!** This machine is often operated in rough conditions and terrain that could include tall grass, weeds, gullies, holes, slopes, hidden obstructions and the like. Serious injury or even death may occur unless care is taken to assure the safety of the operator and bystanders in the area. Do not operate this machine with anyone in the immediate area. Stop raking if anyone comes within 25 feet of the equipment. (SSP-5)

WARNING!



Only tow the Implement behind a properly sized and equipped Tractor which exceeds the weight of the Implement by at least 20%. **DO NOT** tow the Implement behind a truck or other type of vehicle. Never tow the Implement and another Implement connected in tandem. Never tow the Implement at speeds over 20 MPH. (STI-6)

In addition to the design and configuration of this Implement, including Safety Signs and Safety Equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence, and proper training of personnel involved in the operation, transport, maintenance, and storage of the machine. Refer also to Safety Messages and operation instruction in each of the appropriate sections of the Tractor and Equipment Manuals. Pay close attention to the Safety Signs affixed to the Tractor and Equipment. (SG-18)

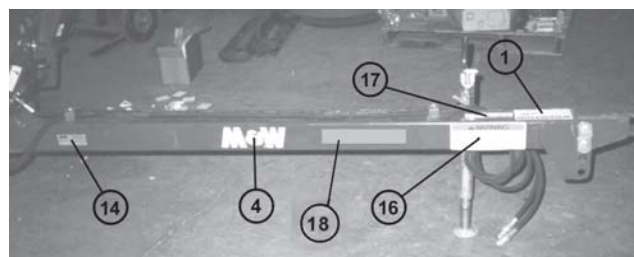
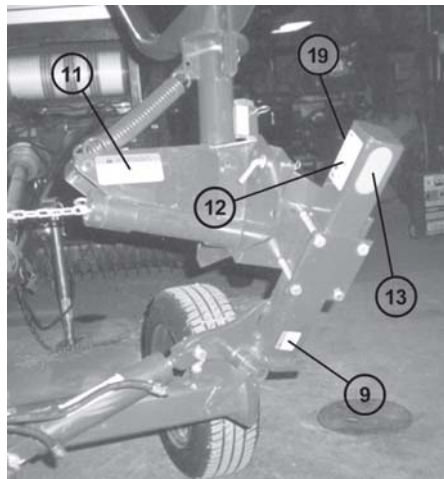
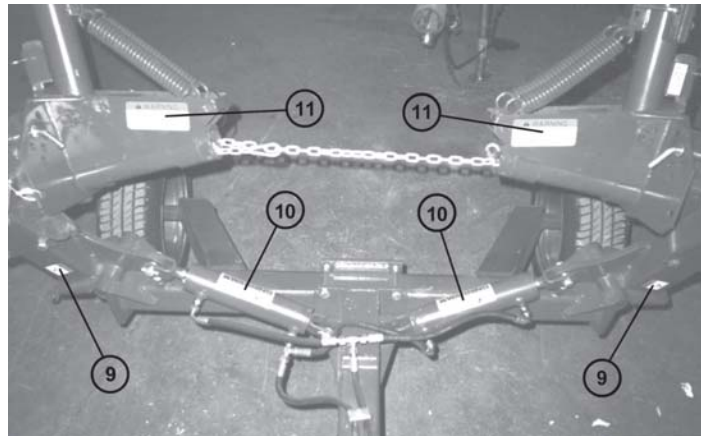
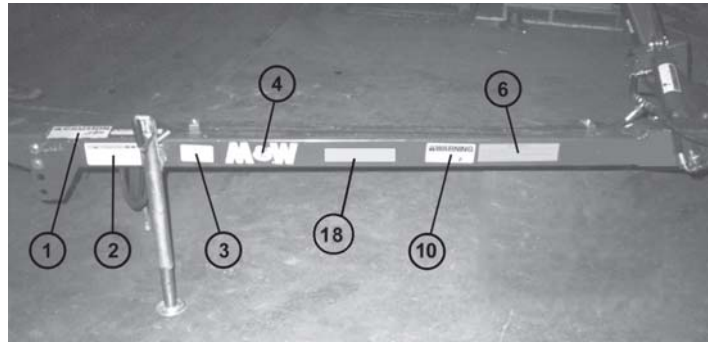
PARTS INFORMATION

M&W implement use matched system components for blades, hangers, rollers, and bearings. These parts are made and tested to M&W specifications. Non-genuine "will fit" parts do not consistently meet these specifications. The use of "will fit" parts may reduce implements performance, void warranties, and present a safety hazard. Use genuine M&W mower parts for economy and safety. (SPMW-1)

SEE YOUR M&W DEALER

NOTES

SAFETY



NOTE: M&W supplies safety decals on this product to promote safe operation. Damage to the decals may occur while in shipping, use, or reconditioning. M&W cares about the safety of its customers, operators, and bystanders, and will replace the safety decals on this product in the field, free of charge (Some shipping and handling charges may apply). Contact your M&W dealer to order replacement decals.

SAFETY

ITEM	PART NO.	QTY.	DESCRIPTION
1	999001	1	Decal, Caution
2	00771039	1	Decal, Use Genuine M&W Parts
3	00763977	1	Decal, Notice to Owner
4	1438311	2	Decal, M&W
6	5W119	1	Decal, Warning - Speed
7	1828300	*	SMV Reflector
9	02962764	4	Decal, Pinch Point
10	00756059	3	Decal, Warning - Oil Leak
11	3668308	2	Decal, Warning Transport
12	02962765	2	Decal, Multiple Hazard
13	2738333	4	Decal, Yellow Oblong Reflector
14	NA	1	Serial Number Plate
16	999200	1	Decal, Warning
17	00725746	1	Decal, Peligro
18	3668309	2	Decal, Model ER8
	3668310	2	Decal, Model ER10
	3668319	2	Decal, Model ER12
19	2738332	2	Decal, Red Oblong Reflector



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* Provided by Tractor Manufacturer

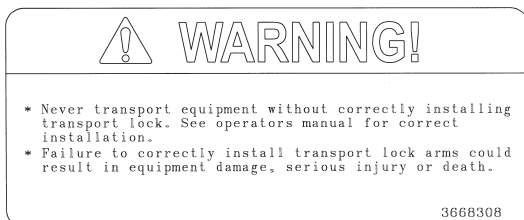
WARNING

TO AVOID SERIOUS INJURY OR DEATH:

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. READ AND UNDERSTAND OPERATOR'S MANUAL. 2. TRACTOR MUST BE EQUIPPED WITH ROLL-OVER PROTECTION (ROPS) AND SWAY CHAINS. 3. ALWAYS WEAR SAFETY GLASSES, SAFETY SHOES, AND SEAT BELT FASTENED TIGHTLY. 4. STOP TRACTOR, LOCK BRAKES, AND BLOCK UP OR SUPPORT IMPLEMENT SECURELY BEFORE WORKING UNDER RAISED COMPONENTS. 5. ALLOW NO RIDERS AT ANY TIME ON TRACTOR OR IMPLEMENT. FALLING OFF CAN KILL. | <ol style="list-style-type: none"> 6. KEEP BYSTANDERS CLEAR OF MOVING PARTS AND WORKING AREA. KEEP CHILDREN AWAY! 7. DO NOT LIFT, LOWER, OR OPERATE UNLESS EVERYONE IS CLEAR OF IMPLEMENT. 8. USE INCREASED CAUTION ON SLOPES & NEAR BANKS AND DITCHES TO PREVENT OVERTURN. 9. LOCK LIFT LEVER UP FOR TRANSPORT. HAVE SMV SIGN VISIBLE. FOLLOW LOCAL LAWS. 10. USE PARKING STAND OR BLOCK UP WHEN UNHITCHING FROM TRACTOR. |
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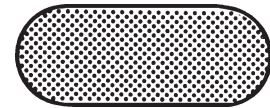


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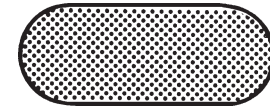
SAFETY



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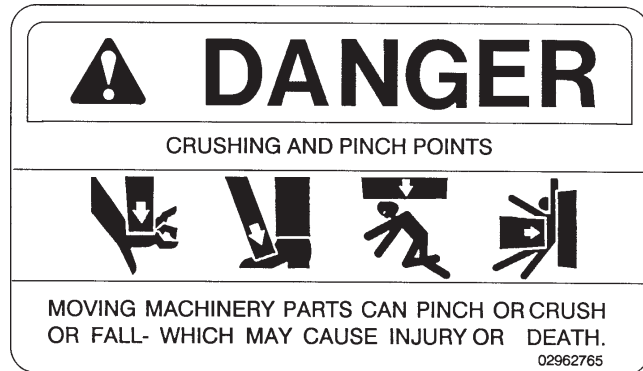
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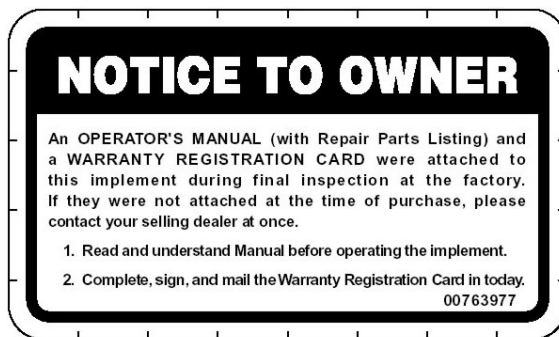
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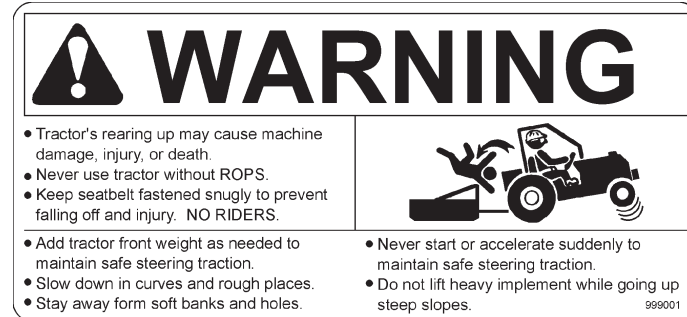


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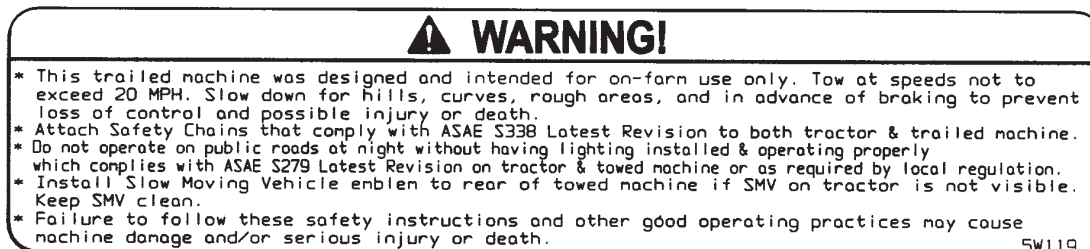
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SAFETY

FEDERAL LAWS AND REGULATIONS

This section is intended to explain in broad terms the concept and effect of federal laws and regulations concerning employer and employee equipment operators. This section is not intended as a legal interpretation of the law and should not be considered as such.

Employer-Employee Operator Regulations

U.S. Public Law 91-596 (The Williams-Steiger Occupational and Health Act of 1970) OSHA

This Act Seeks:

"...to assure so far as possible every working man and woman in the nation safe and healthful working conditions and to preserve our human resources..."

DUTIES

Sec. 5 (a) Each employer-

- (1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;
- (2) shall comply with occupational safety and health standards promulgated under this Act.
- (b) Each employee shall comply with occupational safety and health standards and all rules, regulations and orders issued pursuant to this Act which are applicable to his own actions and conduct.

OSHA Regulations

OSHA regulations state in part: "At the time of initial assignment and at least annually thereafter, the employer shall instruct every employee in the safe operation and servicing of all equipment with which the employee is, or will be involved."

Employer Responsibilities:

To ensure employee safety during Tractor and Implement operation, it is the employer's responsibility to:

1. Train the employee in the proper and safe operation of the Tractor and Implement.
2. Require that the employee read and fully understand the Tractor and Implement Operator's manual.
3. Permit only qualified and properly trained employees to operate the Tractor and Implement.
4. Maintain the Tractor and Implement in a safe operational condition and maintain all shields and guards on the equipment.
5. Ensure the Tractor is equipped with a functional ROPS and seat belt and require that the employee operator securely fasten the safety belt and operate with the ROPS in the raised position at all times.
6. Forbid the employee operator to carry additional riders on the Tractor or Implement.
7. Provide the required tools to maintain the Tractor and Implement in a good safe working condition and provide the necessary support devices to secure the equipment safely while performing repairs and service.
8. Require that the employee operator stop mowing if bystanders or passerbys come within 100 yards.

Child Labor Under 16 Years of Age

Some regulations specify that no one under the age of 16 may operate power machinery. It is your responsibility to know what these regulations are in your own area or situation. (Refer to U.S. Dept. of Labor, Employment Standard Administration, Wage & Home Division, Child Labor Bulletin #102.)

INTRODUCTION SECTION

INTRODUCTION

This Rake is designed with care and built with quality materials by skilled workers. Proper assembly, maintenance, and operating practices, as described in this manual, will help the owner/operator get years of satisfactory service from the machine.

The purpose of this manual is to familiarize, instruct, and train. The Safety Section is a **MUST READ** section prior to any use of the rake. The Assembly Section instructs the owner/operator in the correct assembly of the Rake using standard and optional equipment. Careful use and timely service saves extensive repairs and costly downtime losses. The Operation Section informs the owner/operator how to work the rake and explains proper procedures and safe practices prior to and during the operation of the rake. The Trouble-Shooting Guide helps diagnose difficulties with the rake and offers solutions to the problems. The Maintenance Section instructs the owner/operator of all the necessary inspection, lubrication, general maintenance needed to insure long life and trouble free operation of your rake. The Parts Listing section is designed to familiarize the owner/operator with replaceable parts on the Rake.

Safety is of primary importance to the owner/operator and to the manufacturer. The first section of this manual includes a list of Safety Messages, that, if followed, will help protect the operator and bystanders from injury or death. Many of the Safety Messages will be repeated throughout the manual. The owner/operator/dealer should know these Safety Messages before assembly and be aware of the hazards of operating this rake during assembly, use, and maintenance. The Safety Alert Symbol combined with a Signal Word, as seen below, is intended to warn the owner/operator of impending hazards and the degree of possible injury faced when operating this machine.

CAUTION!

The lowest level of Safety Message; warns of possible minor injury. Decals located on the Mower with this Signal Word are Black and Yellow.



WARNING!

Serious injury or possible death! Decals are Black and Orange.



DANGER!

Imminent death/critical injury. Red and White Decals.



ATTENTION OWNER/OPERATOR

BEFORE OPERATING THIS MACHINE:

1. Carefully read the Operator's Manual, completely understand the Safety Messages and instructions, and know how to operate correctly, both the tractor and Rake.

2. Fill out the Warranty Card in full, and mail promptly. Be sure to answer all questions, including the Serial Number of the Rake.

NOTE: Warranties are honored only if completed "Owner Registration and Warranty" cards are received by Alamo Group within thirty days of delivery of the Rake.

3. Record the Rake Model and Serial Number on the Warranty card at the front of the Operator's Manual. Keep this as part of the permanent maintenance file for the Rake.

ASSEMBLY SECTION

ASSEMBLY

Assembly must be done carefully and accurately, for the safety of the person(s) doing the assembling and to ensure proper machine operation. Assembly should be done on a flat, solid surface, using the proper tools and wearing suitable clothing, making sure that all people not involved in the assembly be kept at a safe distance. Assemblers must provide suitable lifting mechanisms and supports for stabilizing the partially assembled units, so as to prevent them from falling and causing damage or injury. The steps for assembly are illustrated in following. Depending on the experience of the assemblers and the tools available, it is not necessary that the instructions be followed in the exact order given here, but the safety precautions described above must always be followed carefully and scrupulously.

IMPORTANT: THESE SIGNS AND SYMBOLS GIVE INFORMATION TO THE OPERATOR ON HOW TO MAKE THE BEST USE OF THE MACHINE SO AS TO PROLONG LIFE, AVOID DAMAGE, OPTIMIZE WORK AND, ABOVE ALL, TO AVOID INJURY TO THE OPERATOR AND ANYONE WITHIN RANGE OF THE MACHINE.



1. Before beginning operations, read the instruction manual carefully.
2. Before doing any maintenance or repair work, stop the machine at a suitable spot. Turn off the tractor engine, apply the brake, remove the key from the ignition and consult this manual.
3. This is a warning to use proper accident protection when carrying out maintenance and repairs.
4. Indicates an impending dangerous situation which, if not avoided, will cause death or severe personal injury.
5. Indicates a potentially dangerous situation which, if not avoided, could cause death or severe personal injury, including dangers which are present when protection is removed.
6. Indicates a potentially dangerous situation which, if not avoided, can provoke less severe or minor injuries.

WARNING

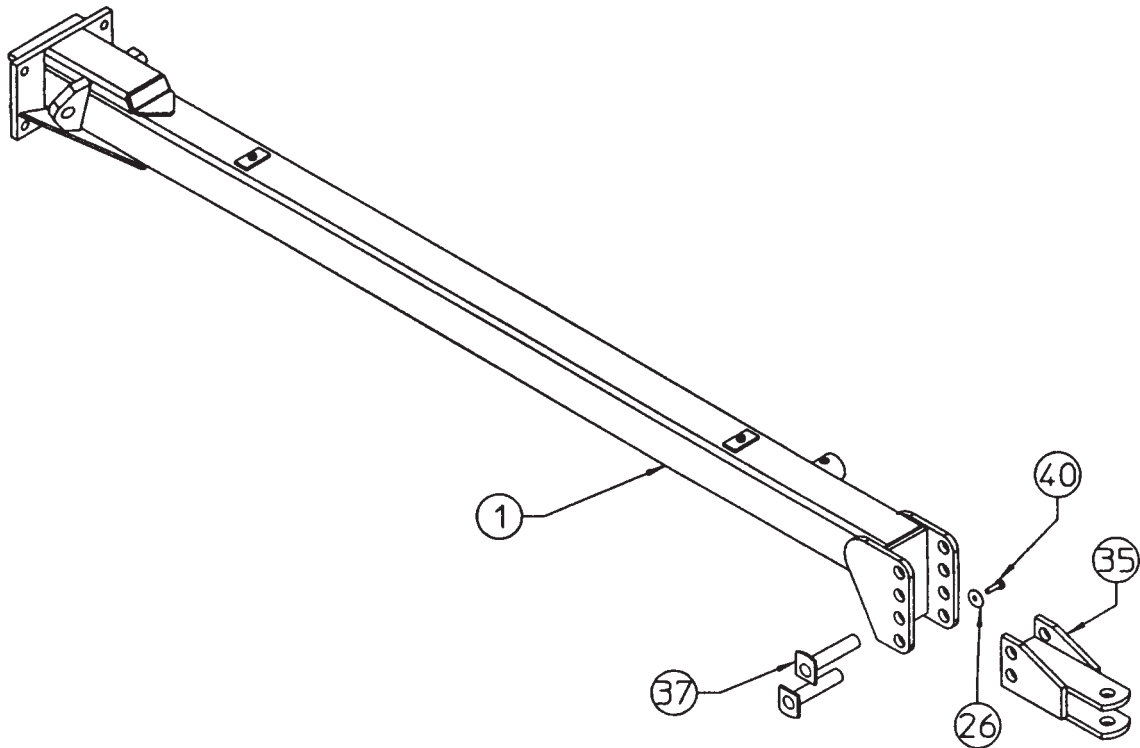
TO AVOID SERIOUS INJURY OR DEATH:

1. READ AND UNDERSTAND OPERATOR'S MANUAL.
2. TRACTOR MUST BE EQUIPPED WITH ROLL-OVER PROTECTION (ROPS) AND SWAY CHAINS.
3. ALWAYS WEAR SAFETY GLASSES, SAFETY SHOES, AND SEAT BELT FASTENED TIGHTLY.
4. STOP TRACTOR, LOCK BRAKES, AND BLOCK UP OR SUPPORT IMPLEMENT SECURELY BEFORE WORKING UNDER RAISED COMPONENTS.
5. ALLOW NO RIDERS AT ANY TIME ON TRACTOR OR IMPLEMENT. FALLING OFF CAN KILL.
6. KEEP BYSTANDERS CLEAR OF MOVING PARTS AND WORKING AREA. KEEP CHILDREN AWAY!
7. DO NOT LIFT, LOWER, OR OPERATE UNLESS EVERYONE IS CLEAR OF IMPLEMENT.
8. USE INCREASED CAUTION ON SLOPES & NEAR BANKS AND DITCHES TO PREVENT OVERTURN.
9. LOCK LIFT LEVER UP FOR TRANSPORT. HAVE SMV SIGN VISIBLE. FOLLOW LOCAL LAWS.
10. USE PARKING STAND OR BLOCK UP WHEN UNHITCHING FROM TRACTOR.

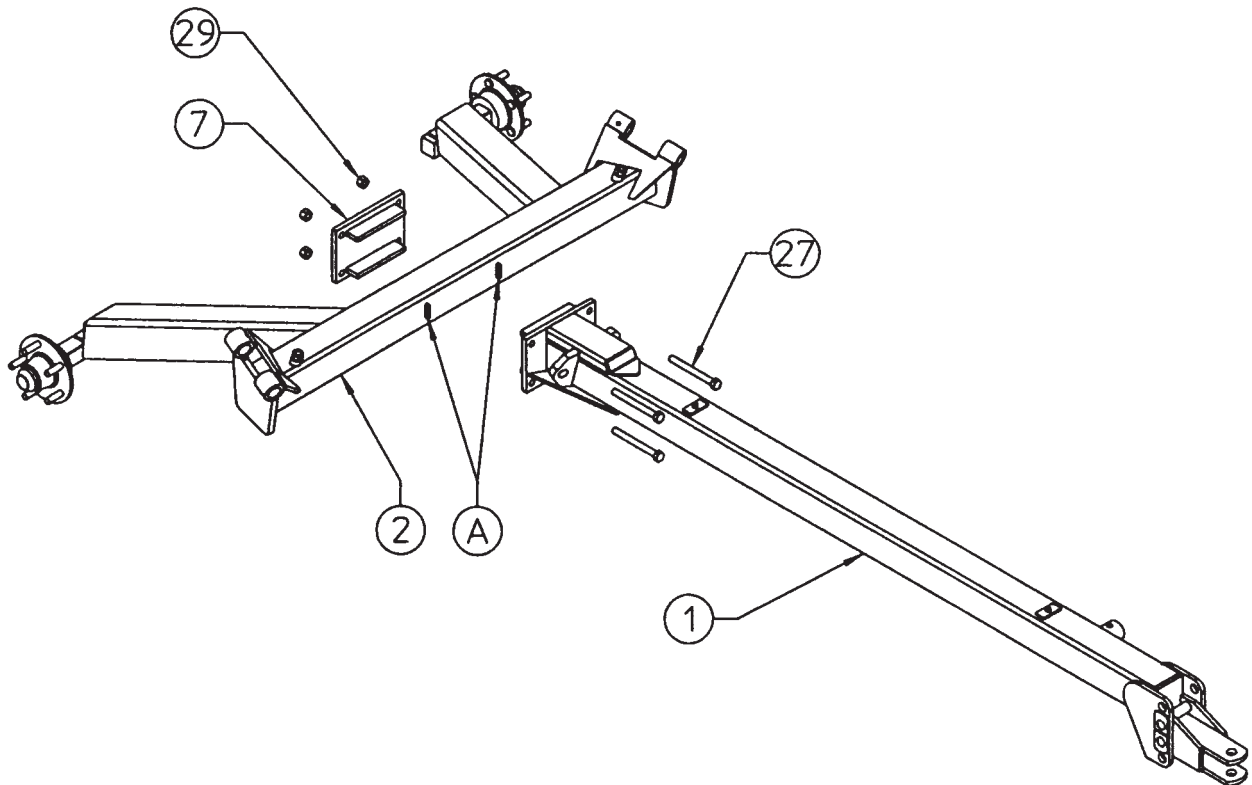
999200

ASSEMBLY

1. Attach the tractor hitch (35) to the drawbar (1) using the two pins (37), fastening with the 12mm x 20mm bolts (40) and washers (26).

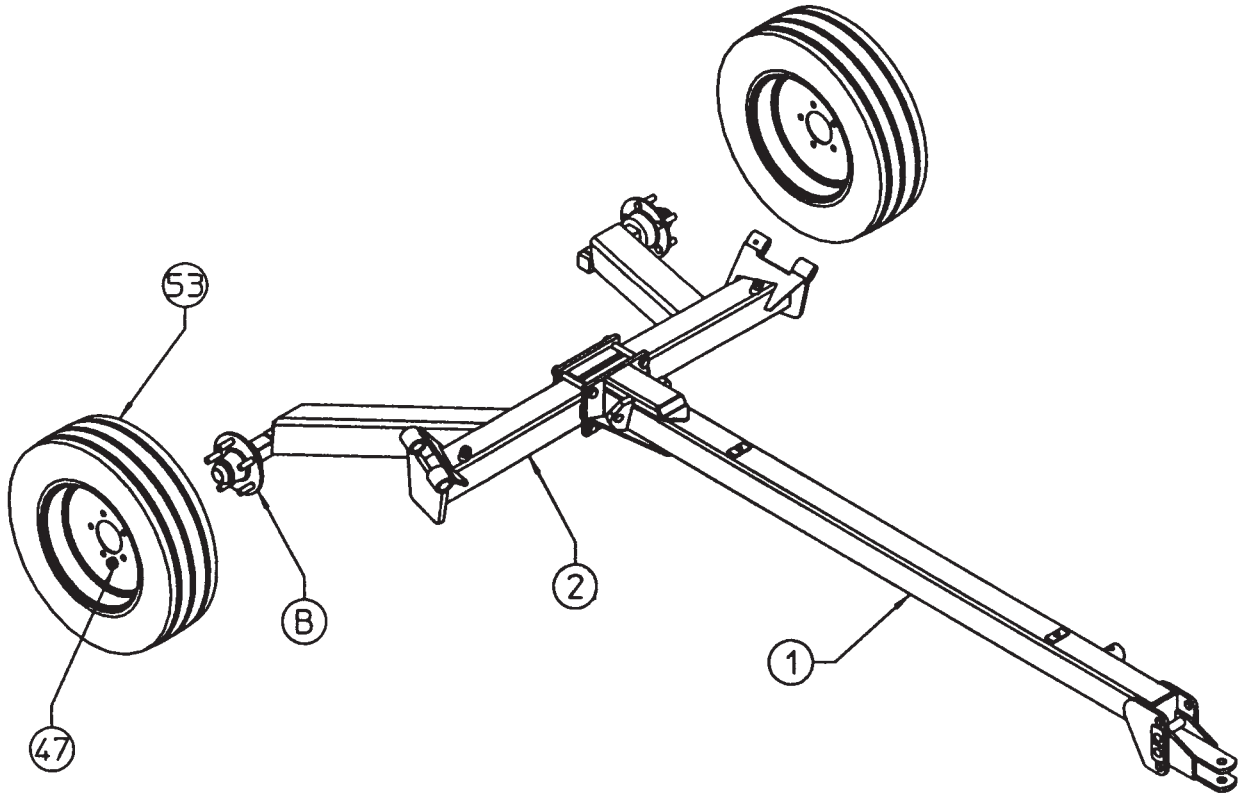


2. Attach the drawbar (1) to the frame (2) centering it between plates (A) and fastening it with the plate (7), 16mm x 150mm bolts (27), and nuts (29).

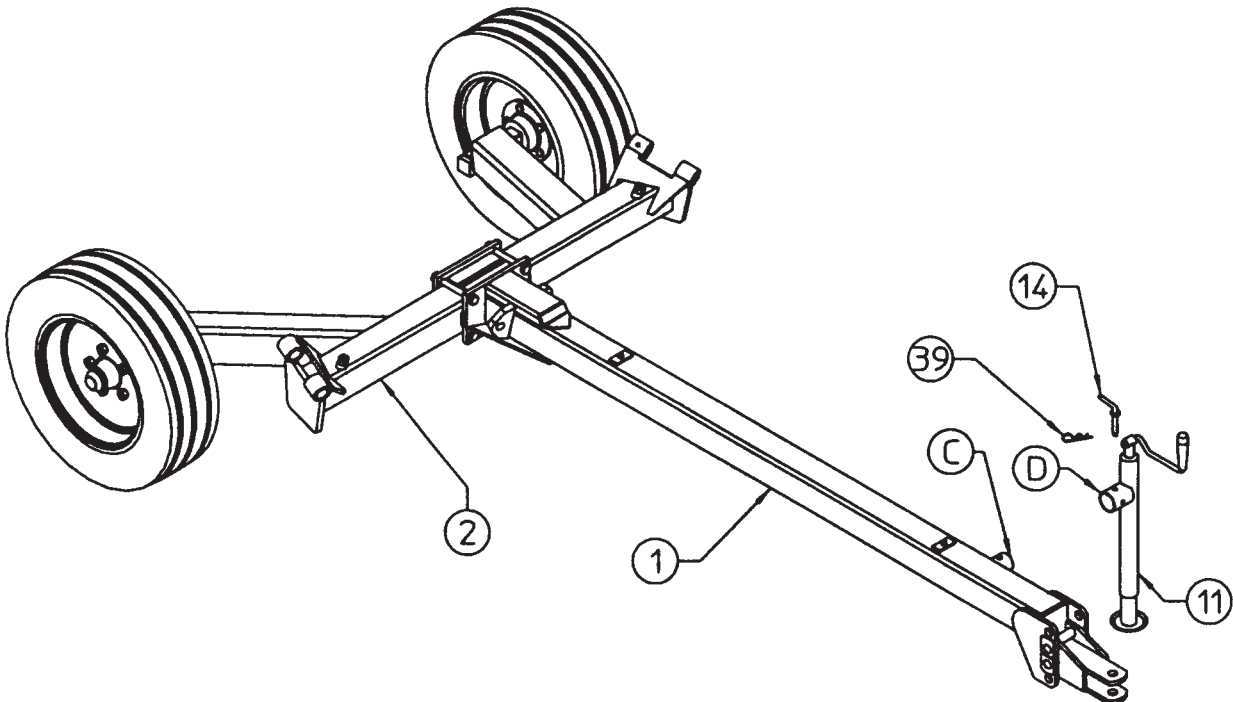


ASSEMBLY

3. Mount wheels (53) to hubs (B) on frame (2) using 16mm nuts (47).

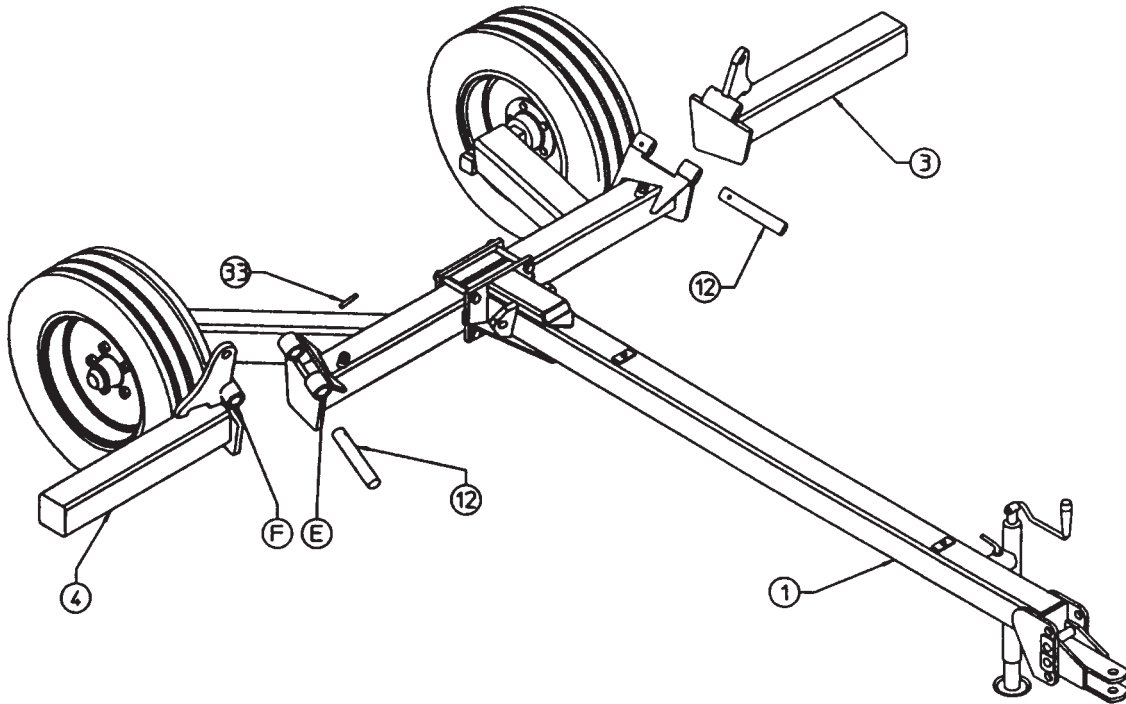


4. Attach mount (D) of the drawbar parking stand (11) to pin (C) on drawbar (1) and fasten with pins (14) & (39).

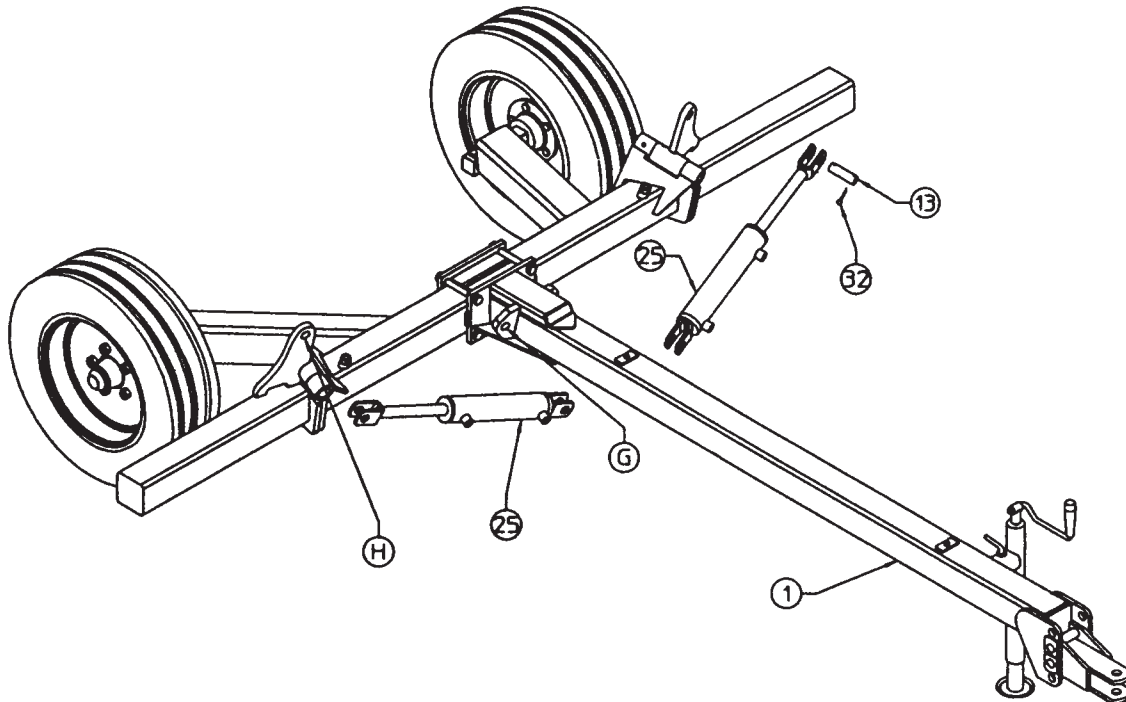


ASSEMBLY

5. Insert pins (12) into holes (E) on the cart and holes (F) on the arms (3) & (4), so that arms (3) & (4) are hinged to the cart. Fasten pins (12) with pins (33).



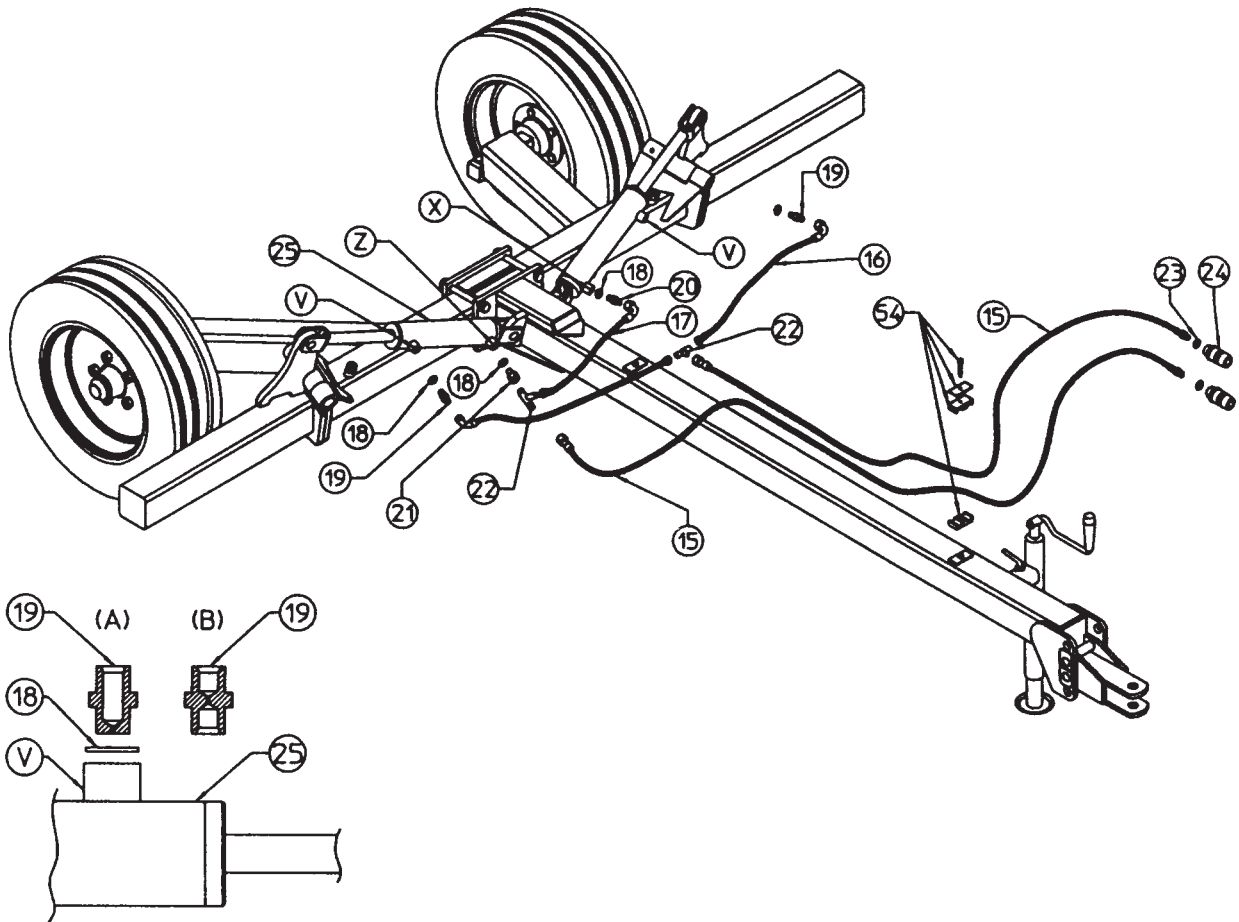
6. Attach the cylinders (25) to the lugs (G) and (H) using pins (13) and pins (32).



ASSEMBLY

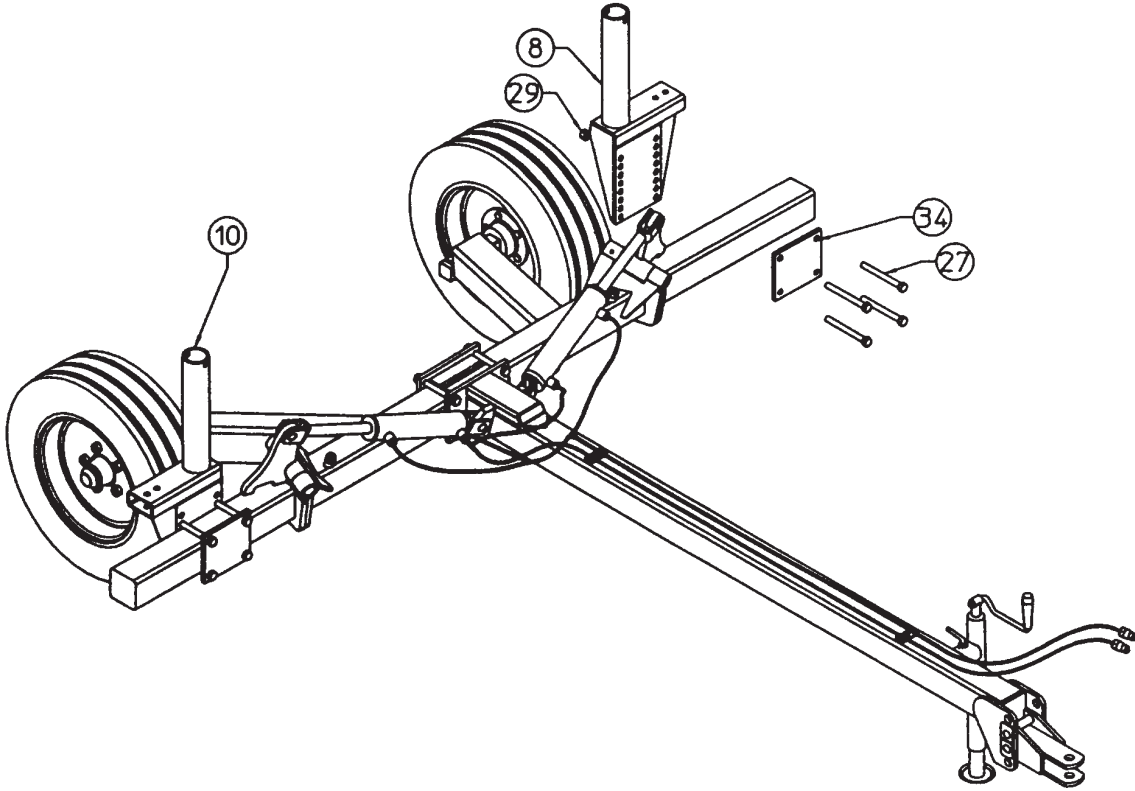
7. Hydraulic System Assembly

- A) Attach washers (18) and the restrictor fitting (19) at ports V on cylinders (25). If the restrictor fitting (19) is an "A" type, attach the side with the restrictor hole towards port V on cylinders (25). If fitting (19) is a "B" type, either side can be connected.
- B) Attach 90° hose end (16) to the reducer fittings (19) and join them at the center with Tee fitting (22).
- C) Attach washer (18) and adapter fitting (20) at holes X on cylinder (25).
- D) Attach washer (18), swivel adapter (21), and adapter (22), to hole (Z) on the other cylinder.
- E) Connect 90° hose end (17) to fitting (20), and the straight end to adapter (22).
- F) Connect the swivel ends of hoses (15) to adapter (22).
- G) Place washers (23) and connect the quick release coupling (24) to the straight male ends of hoses (15).
- H) Check to make sure that all connections are correctly fastened.
- I) Attach the hose collar (54) to the lugs on drawbar, fastening on, correctly position (see step 9).

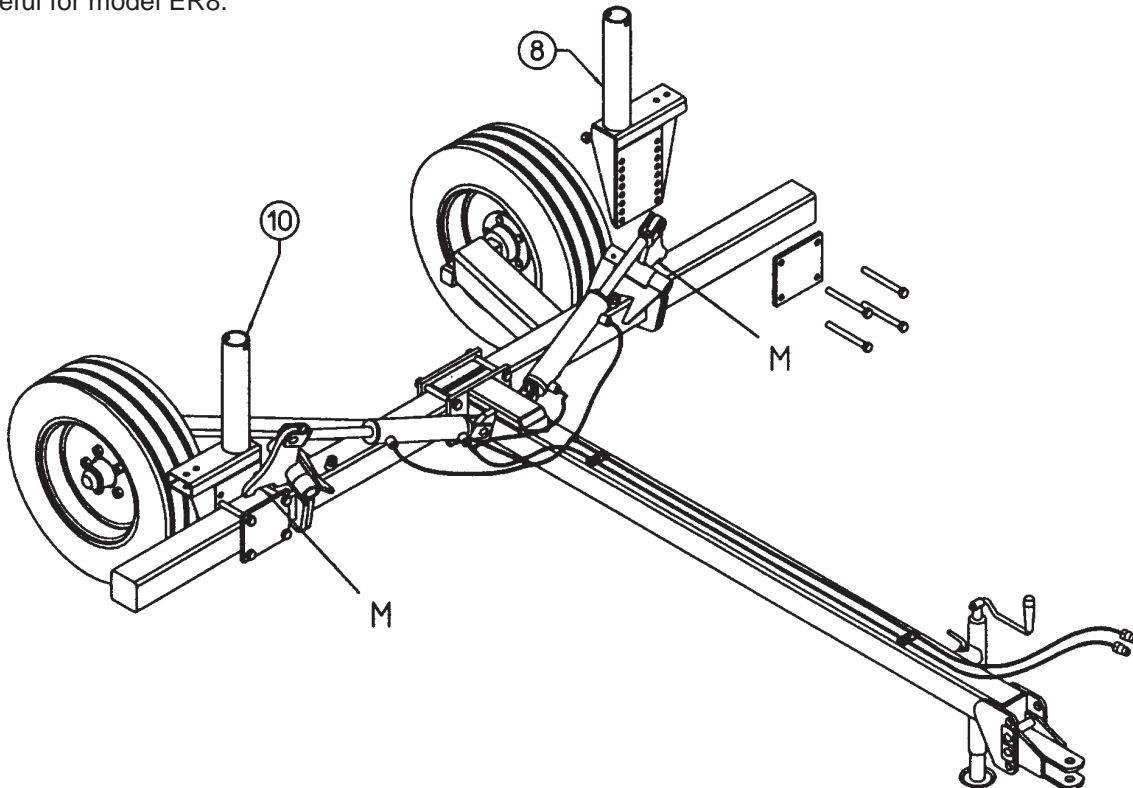


ASSEMBLY

8A. Fasten supports (8) and (10) to the frame using plates (34), 16x150mm (27), and nuts (29).

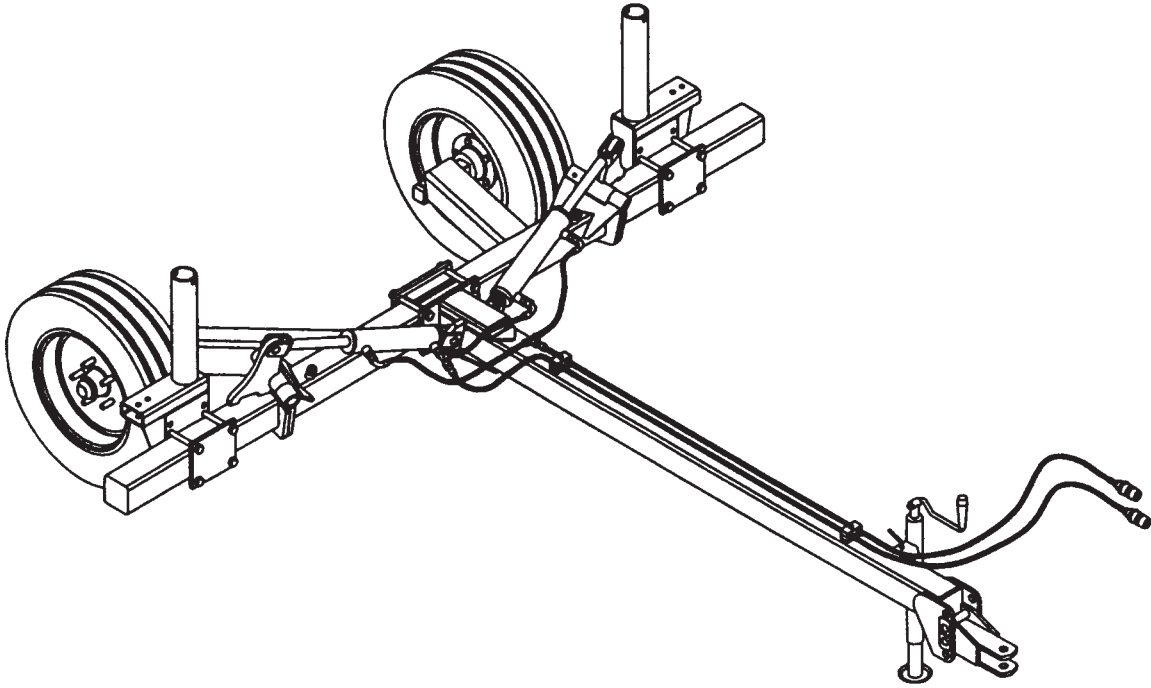


8B. Supports (8) and (10) can also be attached by passing the bolts through slot (M). This position is particularly useful for model ER8.

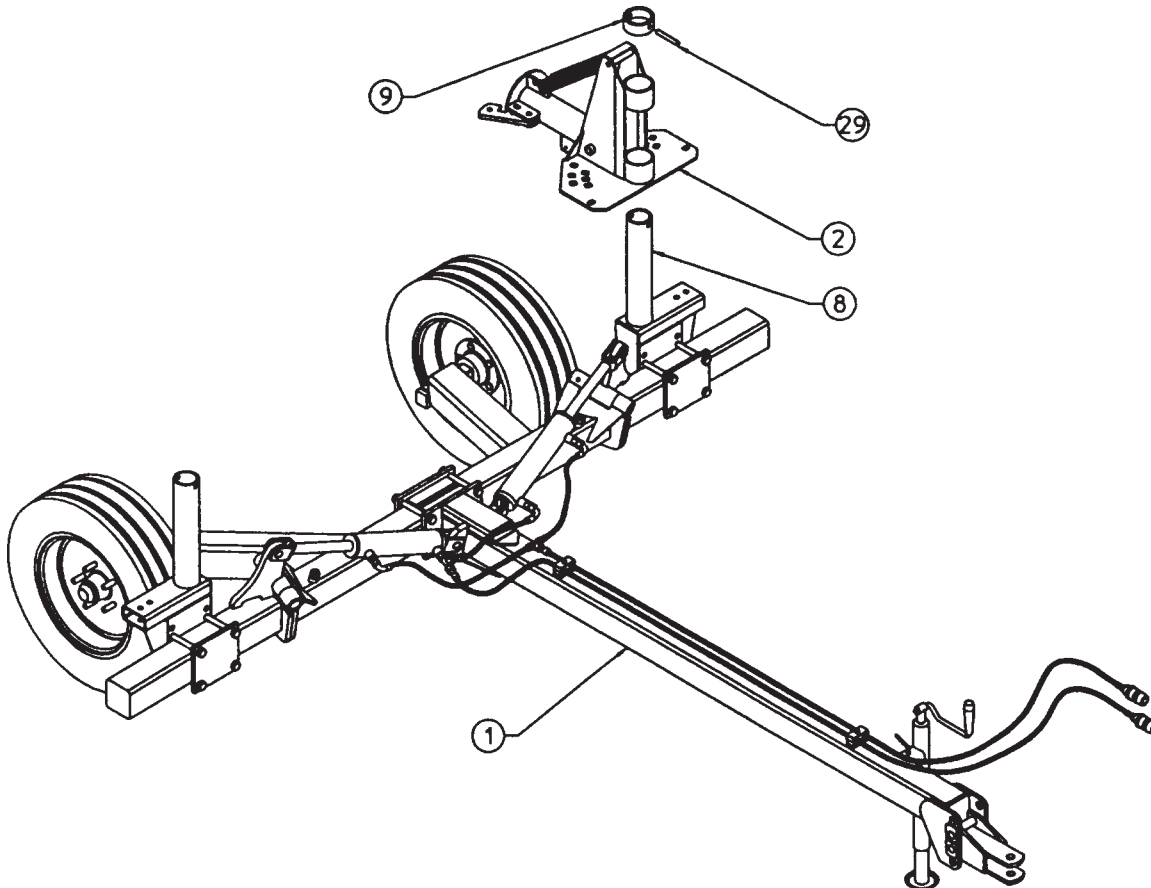


ASSEMBLY

9. The cart is now completely assembled and we can begin the assembly of the hay rakes.

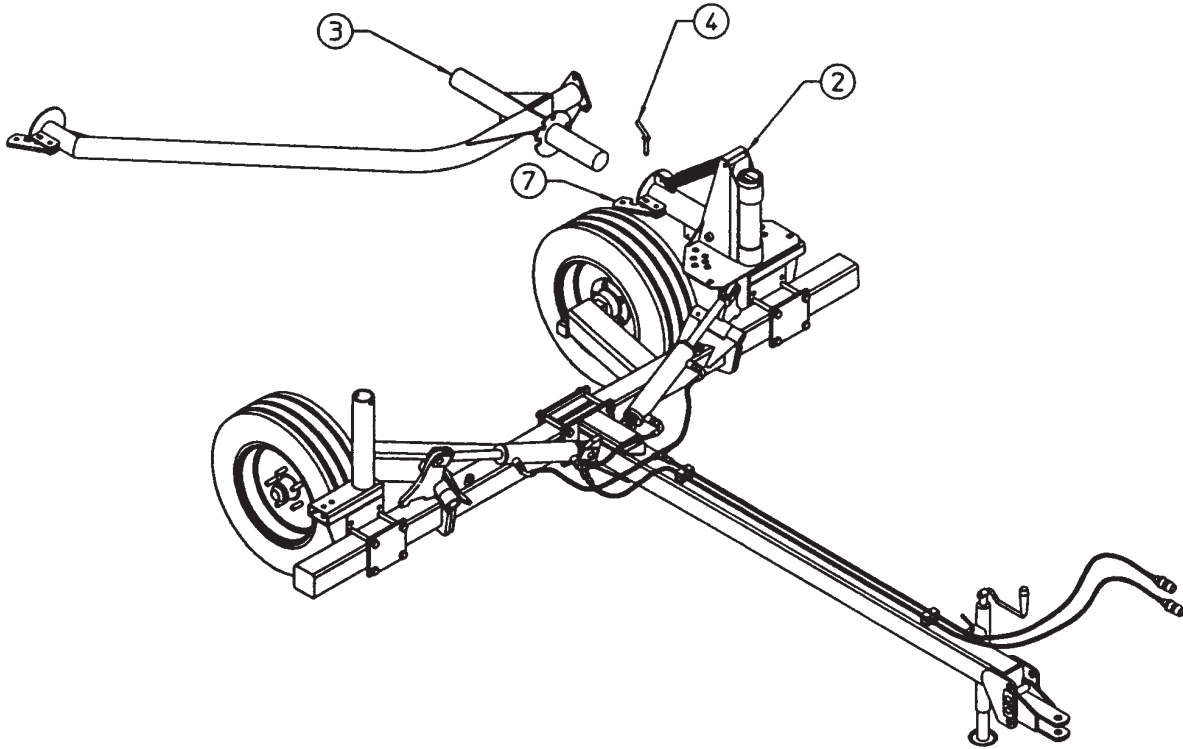


10. Place the pivoting bracket (2) over support (8), fastening it with the bushing (9) and 12mm roll pin (29).

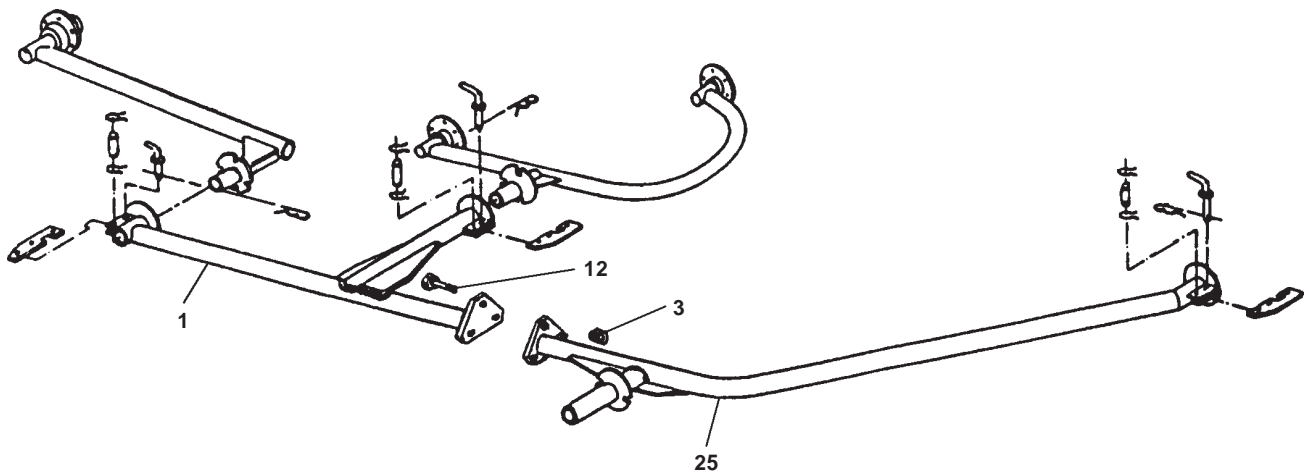


ASSEMBLY

11. Attach arm (3) to the pivoting bracket (2) and fasten with lever (7) and pin (4). Shown in the illustration is the ER10 Hay Rake. The same procedure applies to the ER8 and ER12.

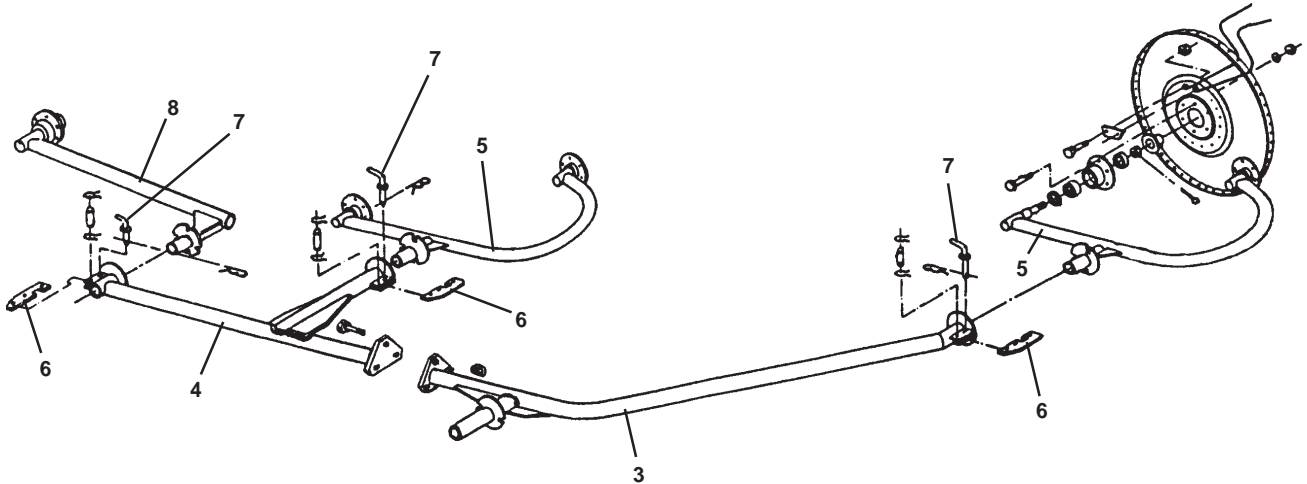


12. Attach arm (1) to arm (25) using M14x40mm bolts (12) and nuts (3). (ER10 & ER12)

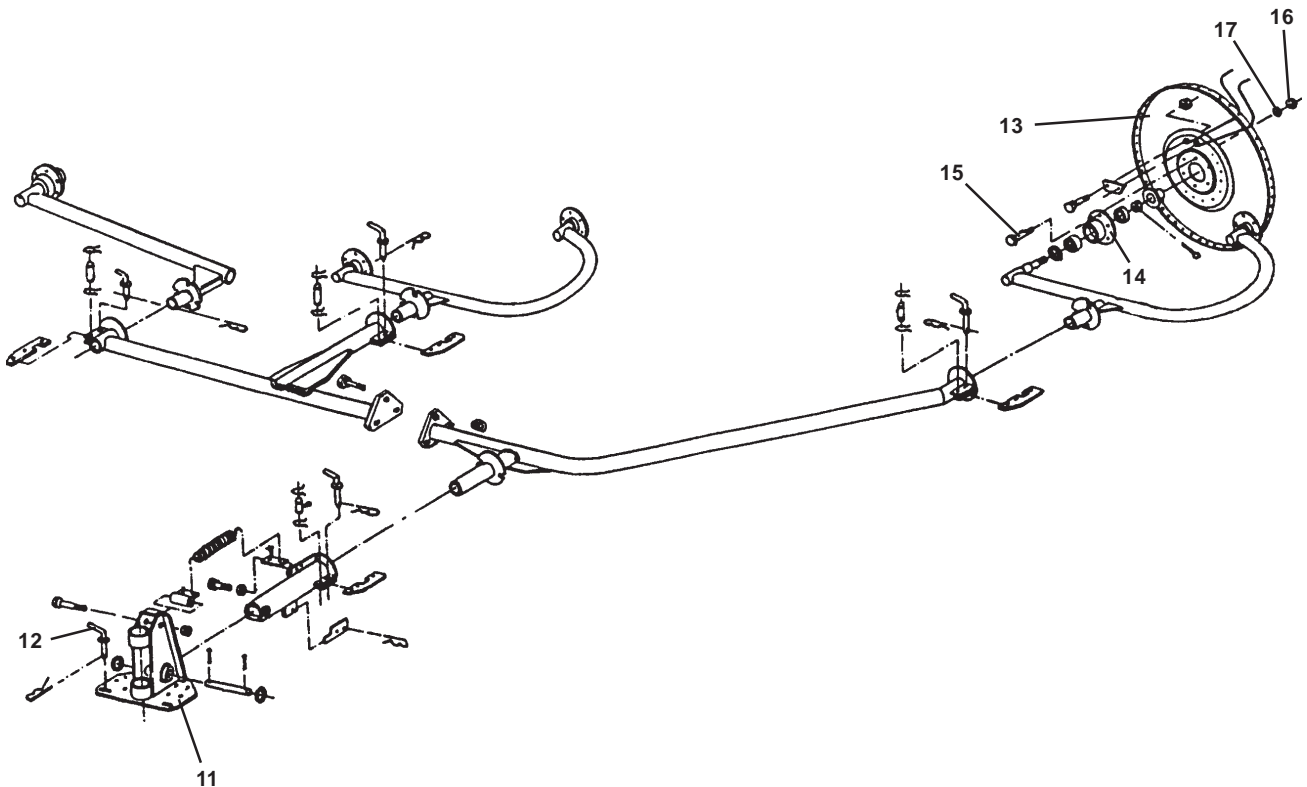


ASSEMBLY

13. Attach brackets (5) to arms (3) and (4), fastening with levers (6) and pin (7).

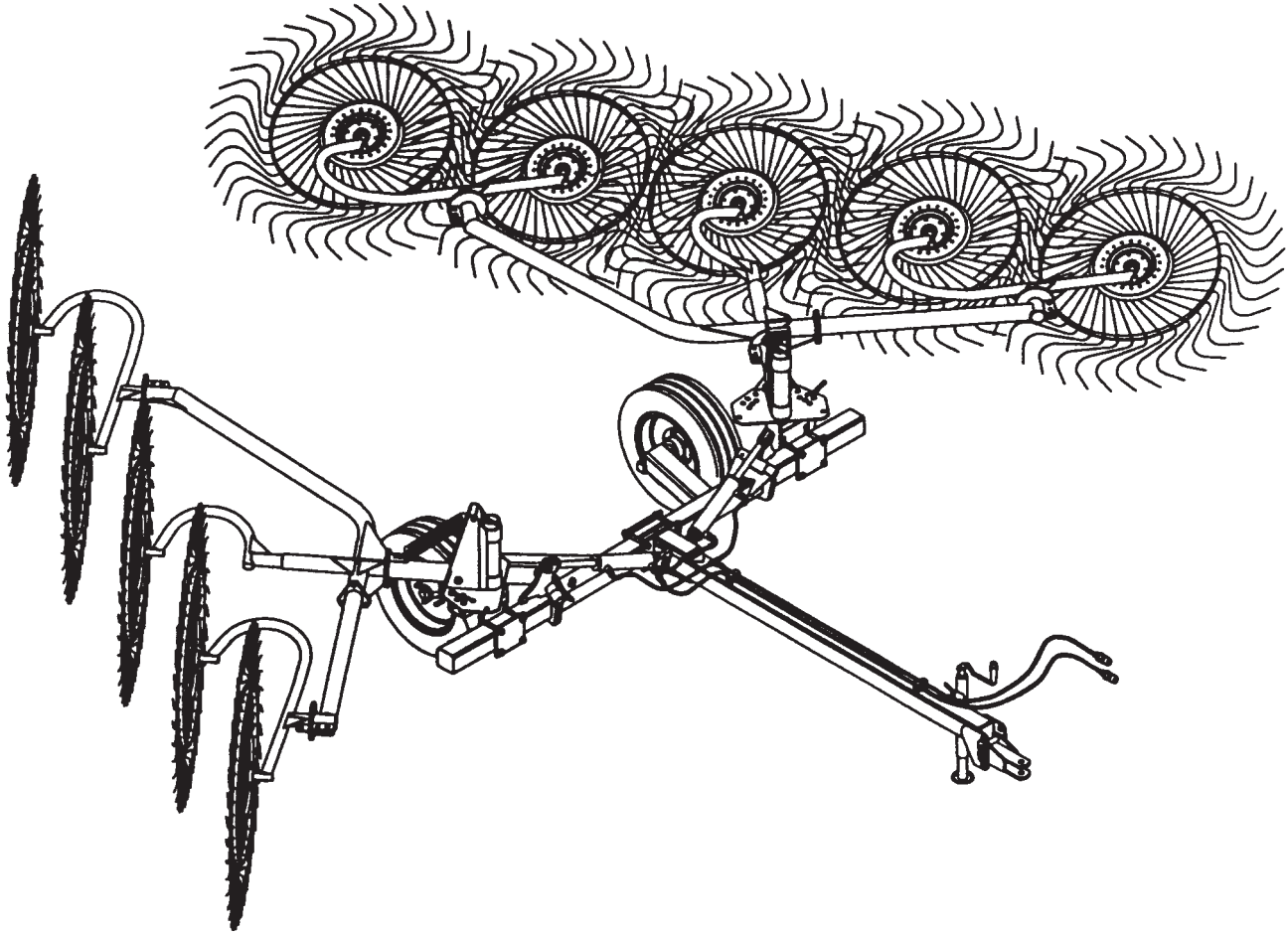


14. Position the hay rake arm so that pin (12) can be inserted in one of the holes on the quadrant (11), then attach the rake wheels (13) as shown in Part Section Pages 6-6 - 6-9 #48 & 49 to the hubs (14) using M10x25 bolts (15), washers (17), and nuts (16).



ASSEMBLY

15. Repeat the procedures for steps 10-14 on the right side of the machine to complete the cart. Shown in the illustration is the ER10 model.



OPERATION SECTION

OPERATION

1. Adjustments For Machine Use

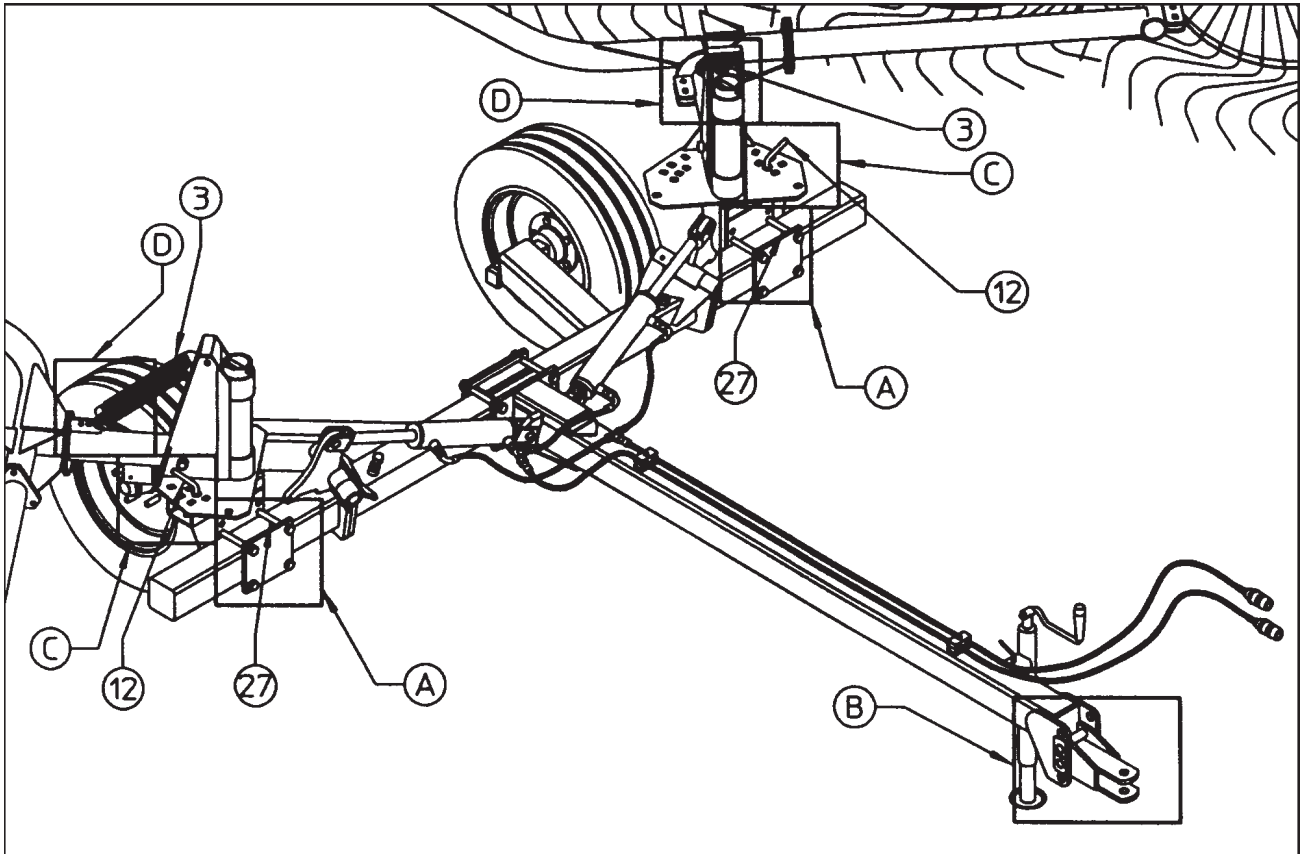
The machine must be adjusted according to the specific work requirements. Thus the various adjustment possibilities will be described, so you can choose that which best suits your work requirements.

A) The hay rake supports can be adjusted vertically and horizontally by inserting the M16 bolts (27) into the different holes on the support and by sliding the support lengthwise along the frame.

B) The tractor hitch must be adapted to the drawbar on the tractor and adjusted according to the pressure of the rake wheels on the ground.

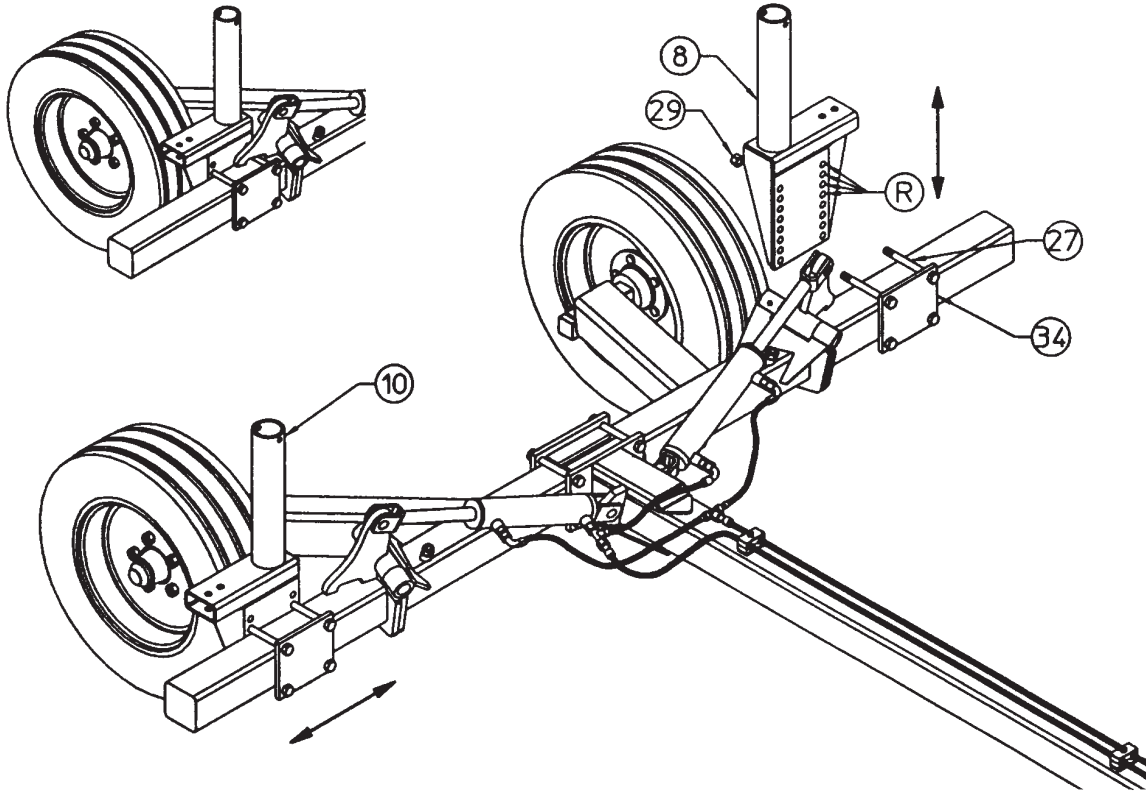
C) The hay rake arms can be pivoted and locked into different positions using pin (12).

D) The pressure of the rake wheels on the ground can be regulated also by means of the suspension springs (3), which can be set in different positions.

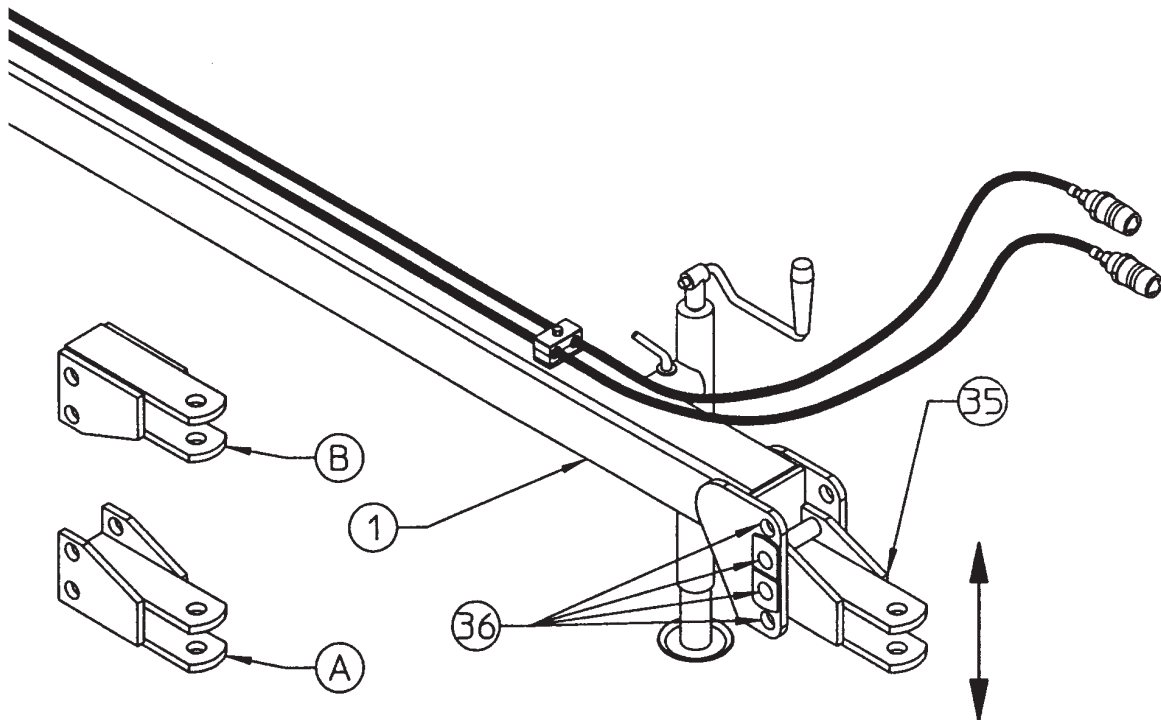


OPERATION

2. The support arms (8) and (10) can be adjusted in height by placing the M16 bolts (27) in the different holes (R) and in width by sliding the support along the frame before tightening the bolts. The narrowest position is with the bolts passing through the slot. The adjustments depend on the pressure of the rake wheels on the ground and the desired swath width. For the ER8 it is best to set all supports at the low position.

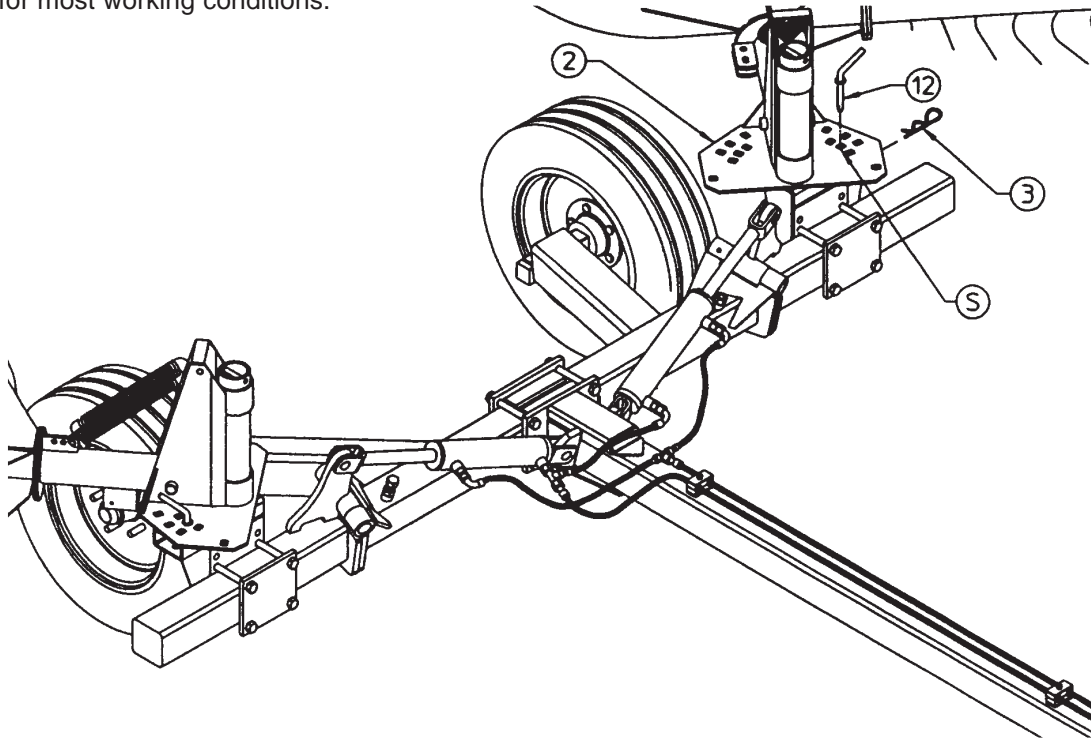


3. The tractor hitch (35) can be set in different positions, using holes (36), to allow coupling to all tractor types. By turning the hitch upside-down from (A) to (B), additional settings are available.

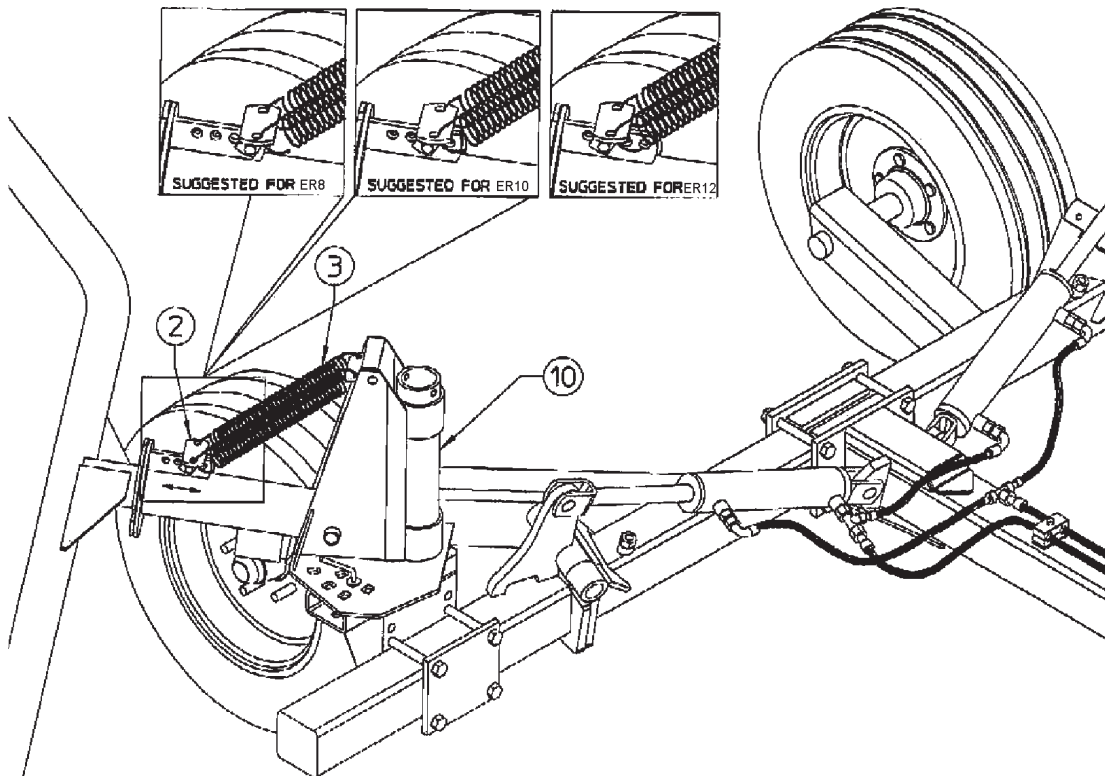


OPERATION

4. The hay rake arm can be pivoted to obtain a different working angle and further variation of the swath. Pin (12) is inserted in the different holes in quadrant plate (2) and fastened with the clip (3). The central position is the best for most working conditions.



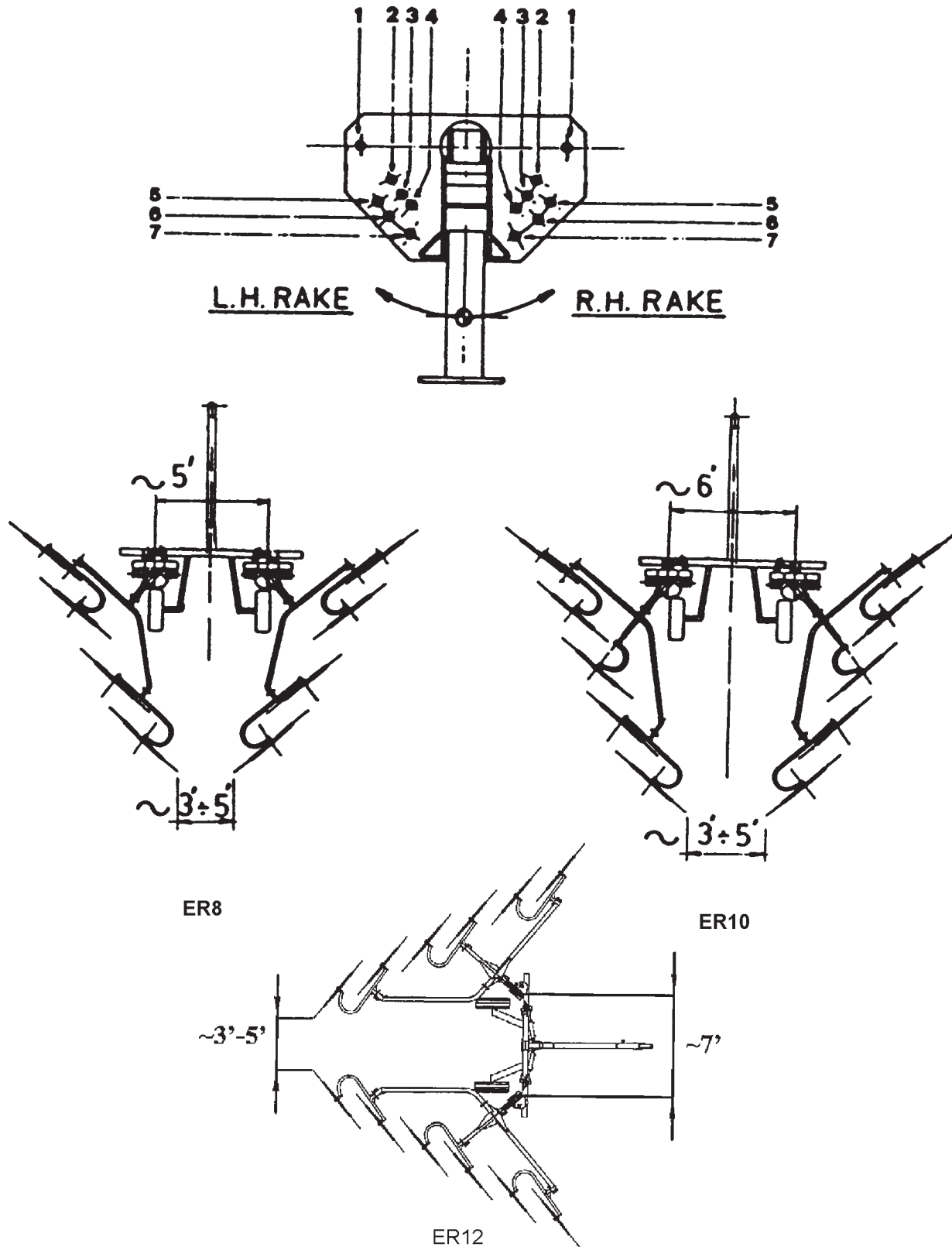
5. The springs (3) should normally be attached as shown in the large illustration and in the detail at the upper left (attached at the central hole). They can be attached to the other two holes to obtain a different rake wheel pressure on the ground.



OPERATION

6. The following illustration indicates the approximate measurements for the assembly of the ER8, ER10 & ER12, and the corresponding swath sizes.

These swath measurements correspond to positioning at holes 3-5 on the movable part of the hay rake body.



OPERATION

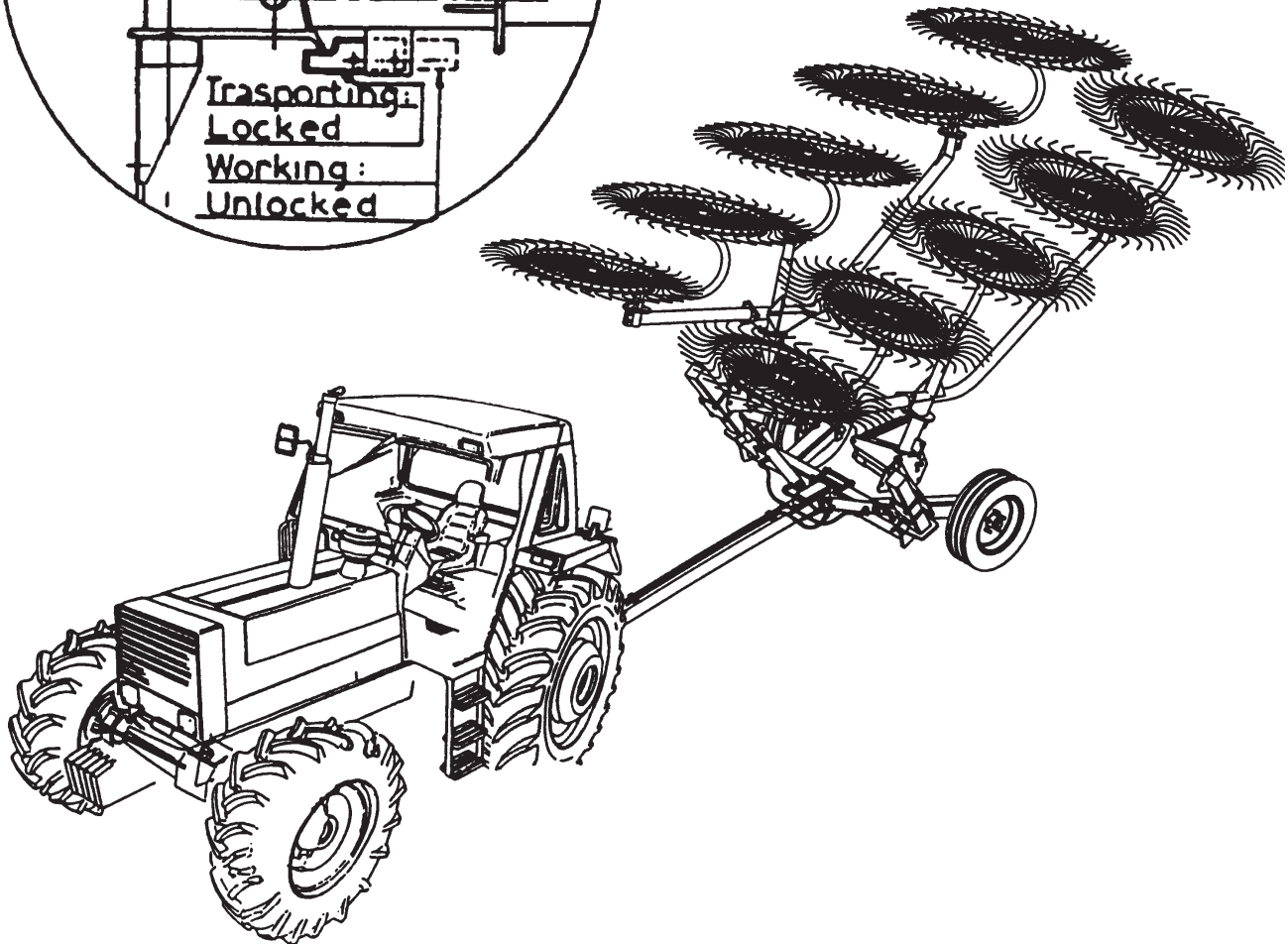
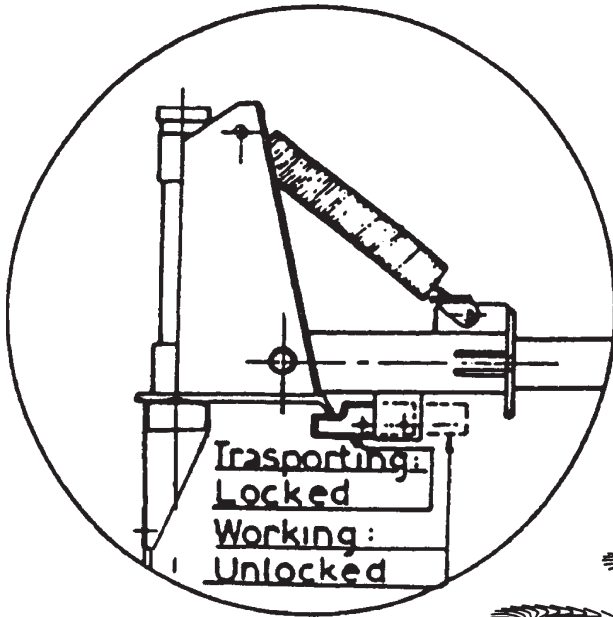
7. Transporting

To transport the machine, it is necessary to raise the hay rakes, which can be done from the tractor using the hydraulic lever. It is not necessary to move the hay rakes from the working position in order to raise them.

When moving a short distance in the field, it is not necessary to lock the hay rakes; however, when leaving the field, the safety locks must be used.

WARNING!

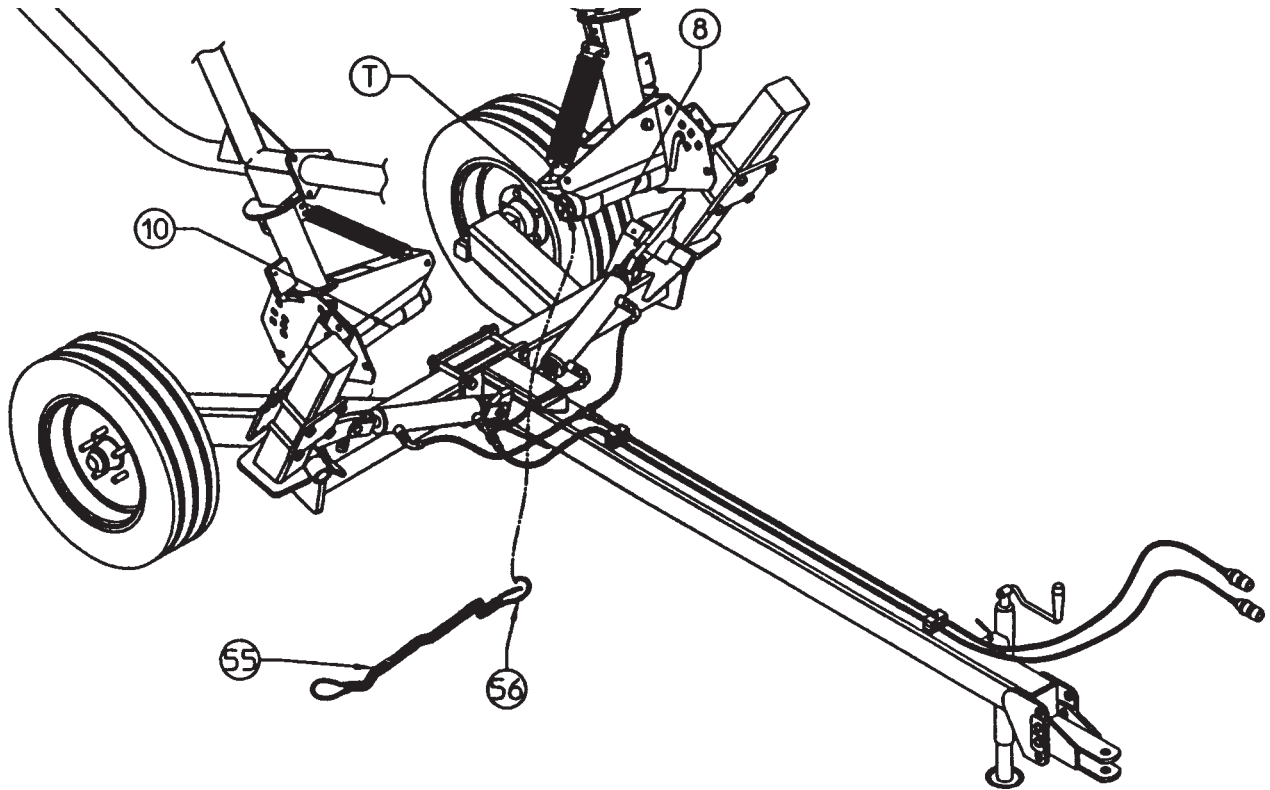
While transporting the machine, the safety locks must always be locked, and while working, the safety locks must always be unlocked.



OPERATION

8. For safety reasons, after raising the side arms, attach the chain (55) to the two supports (8) and (10) by connecting the hooks (56) to pins (T).

WARNING! The chain must be removed before putting the arms back into the working position.



OPERATION

TROUBLESHOOTING

PROBLEM	PROBABLE CAUSE	SOLUTION
Hay carrying over on the wheels.	Teeth not polished.	Operate rake on gravel surface for a short distance.
	Mud collected on tine ends.	Dew on hay, wait until dry. Do not run in soft, wet ground.
Tooth Breakage.	Backing with teeth in contact with ground.	Avoid backing with teeth on ground.
	Too much of rake weight on wheels.	Raise the 3-point hitch slightly.
	Corrosion in storage.	Coat teeth with grease or oil during storage.
Rake missing hay.	Wheels running too fast.	Adjust angle at sector plate.
	Wheels not pitched back enough.	Pitch wheels back by adjusting 3-point top link.
	Teeth missing or worn.	Replace teeth. It is best to replace all teeth at the same time to maintain uniform tine height.
Rake wheels bounce excessively.	Wheels have too little ground weight.	Lower 3-point hitch.
Bent teeth.	Backing with wheels down.	Avoid backing with teeth down.
	Excessive speed on rough terrain.	Reduce speed.
	Narrow or deep ditches or furrows, rocky ground.	Avoid or cross slowly.
	Too much weight on wheels.	Raise 3-point slightly.

MAINTENANCE SECTION

MAINTENANCE

CAUTION!



ANY REPAIR WORK MUST BE CARRIED OUT WITH THE MACHINE AT REST AND DISCONNECTED FROM THE TRACTOR.

DO NOT CARRY OUT WELDING WITHOUT AUTHORIZATION AND INSTRUCTION FROM THE MANUFACTURER.

DISCONNECT THE MACHINE FROM THE TRACTOR BEFORE ANY WELDING WORK. DAMAGE TO BATTERY COULD RESULT.

DANGER!



ALWAYS USE A PROTECTIVE MASK, GOGGLES AND GLOVES WHEN WELDING, SANDING OR GRINDING OR WHEN USING A HAMMER OR DRILL.

ALWAYS WORK ON THE MACHINE OUT OF DOORS. IF YOU HAVE TO OPERATE THE MACHINE WHEN CONNECTED TO THE TRACTOR IN AN ENCLOSED AREA (WHEN TESTING AFTER REPAIR OR MAINTENANCE), ENSURE THAT THERE IS SUFFICIENT VENTILATION SO AS TO PREVENT NOXIOUS EXHAUST GASES FROM ACCUMULATING.

CAUTION!



DO NOT USE GASOLINE, SOLVENTS OR OTHER FLAMMABLE LIQUIDS AS DETERGENTS.

USE COMMERCIAL NON-FLAMMABLE AND NON-TOXIC SOLVENTS.

DO NOT USE COMPRESSED AIR OR WATER AT HIGH PRESSURE TO CLEAN THE MACHINE. IF THIS IS UNAVOIDABLE, THEN WEAR GOGGLES WITH SIDE PROTECTION AND LIMIT THE PRESSURE AS MUCH AS POSSIBLE. WHEN THE WORK IS FINISHED, AND WITH THE MACHINE DISCONNECTED FROM THE TRACTOR, INSPECT AND CHECK THE MACHINE COMPLETELY.

The following should be noted if the machine is scrapped:

The machine consists mainly of ferrous material which must be disposed of according to the regulations in force in the country concerned.

There is also a small amount of plastic which must be disposed of according to the regulations in force in the country concerned.

MAINTENANCE

Storage

To prepare your Rake for storage:

1. Clean the rake following instructions and allow it to dry.
2. Thoroughly tighten all screws and bolts.
3. Store the rake on a clean, dry surface in the down (working) position.
4. Grease the machine thoroughly and then cover it completely and store in a dry place.
5. Lubricate all points and slides before storage. This prevents corrosion.

NOTE: Now would be a good time to replace all damaged or worn parts, and have a machine in perfect condition ready for use the next season.

IMPORTANT: During extended periods of inactivity it is necessary to close the cylinders completely. This must be done in is such a way as to protect the rods from weather effects.

The rods remaining outside the cylinder (whatever reason may be) must be carefully protected with a grease layer.

Bolt Torque Values

Because of the severe operating conditions, correct bolt torque is very important. An improperly torqued bolt can be easily shaken loose or broken by the vibrations. When replacing bolts, always use the same grade of bolt as used originally. Use this chart as a guide to tightening all bolts. Torque values listed are for general use only.

SAE HEAD MARKINGS



Grade 2

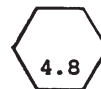


Grade 5



Grade 8

METRIC HEAD MARKINGS



Class 4.8



Class 8



Class 10.9

RECOMMENDED TORQUE IN FOOT POUNDS

Size (IN)	SAE Grade 2	SAE Grade 5	SAE Grade 8	Size (MM)	Class 4.8	Class 8.8	Class 10.9
1/4	6	8	12	M6	5	7	10
5/16	10	15	22	M8	11	20	25
3/8	20	30	40	M10	20	40	58
7/16	30	48	75	M12	37	70	105
1/2	47	70	105	M14	60	100	140
9/16	63	100	156	M16	92	155	200
5/8	87	140	200	M18	118	216	280
3/4	147	240	350	M20	160	270	355
7/8	180	375	560	M22	215	330	430
1	275	550	850	M24	285	500	700
1 1/8	375	850	1200	M27	450	875	1000
1 1/4	530	1200	1800	M30	600	1200	1700
1 3/8	700	1550	2350	M33	800	1600	2300
1 1/2	900	2100	3000	M36	900	2100	3000

M&W
LIMITED WARRANTY

1. LIMITED WARRANTIES

- 1.01. M&W warrants for one year from the purchase date to the original non-commercial, governmental, or municipal purchaser ("Purchaser") and warrants for six months to the original commercial or industrial purchaser ("Purchaser") that the goods purchased are free from defects in material or workmanship.
- 1.02. Manufacturer will replace for the Purchaser any part or parts found, upon examination at one of its factories, to be defective under normal use and service due to defects in material or workmanship.
- 1.03. This limited warranty does not apply to any part of the goods which has been subjected to improper or abnormal use, negligence, alteration, modification, or accident, damaged due to lack of maintenance or use of wrong fuel, oil, or lubricants, or which has served its normal life. This limited warranty does not apply to any part of any internal combustion engine, or expendable items such as blades, shields, guards, or pneumatic tires except as specifically found in your Operator's Manual.
- 1.04. Except as provided herein, no employee, agent, Dealer, or other person is authorized to give any warranties of any nature on behalf of Manufacturer.

2. REMEDIES AND PROCEDURES.

- 2.01. This limited warranty is not effective unless the Purchaser returns the Registration and Warranty Form to Manufacturer within 30 days of purchase.
- 2.02. Purchaser claims must be made in writing to the Authorized Dealer ("Dealer") from whom Purchaser purchased the goods or an approved Authorized Dealer ("Dealer") within 30 days after Purchaser learns of the facts on which the claim is based.
- 2.03. Purchaser is responsible for returning the goods in question to the Dealer.
- 2.04. If after examining the goods and/or parts in question, Manufacturer finds them to be defective under normal use and service due to defects in material or workmanship, Manufacturer will:
 - (a) Repair or replace the defective goods or part(s) or
 - (b) Reimburse Purchaser for the cost of the part(s) and reasonable labor charges (as determined by Manufacturer) if Purchaser paid for the repair and/or replacement prior to the final determination of applicability of the warranty by Manufacturer.The choice of remedy shall belong to Manufacturer.
- 2.05. Purchaser is responsible for any labor charges exceeding a reasonable amount as determined by Manufacturer and for returning the goods to the Dealer, whether or not the claim is approved. Purchaser is responsible for the transportation cost for the goods or part(s) from the Dealer to the designated factory.

3. LIMITATION OF LIABILITY.

- 3.01. MANUFACTURER DISCLAIMS ANY EXPRESS (EXCEPT AS SET FORTH HEREIN) AND IMPLIED WARRANTIES WITH RESPECT TO THE GOODS INCLUDING, BUT NOT LIMITED TO, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.
- 3.02. MANUFACTURER MAKES NO WARRANTY AS TO THE DESIGN, CAPABILITY, CAPACITY, OR SUITABILITY FOR USE OF THE GOODS.
- 3.03. EXCEPT AS PROVIDED HEREIN, MANUFACTURER SHALL HAVE NO LIABILITY OR RESPONSIBILITY TO PURCHASER OR ANY OTHER PERSON OR ENTITY WITH RESPECT TO ANY LIABILITY, LOSS, OR DAMAGE CAUSED OR ALLEGED TO BE CAUSED DIRECTLY OR INDIRECTLY BY THE GOODS INCLUDING, BUT NOT LIMITED TO, ANY INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES RESULTING FROM THE USE OR OPERATION OF THE GOODS OR ANY BREACH OF THIS WARRANTY. NOTWITHSTANDING THE ABOVE LIMITATIONS AND WARRANTIES, MANUFACTURER'S LIABILITY HEREUNDER FOR DAMAGES INCURRED BY PURCHASER OR OTHERS SHALL NOT EXCEED THE PRICE OF THE GOODS.
- 3.04. NO ACTION ARISING OUT OF ANY CLAIMED BREACH OF THIS WARRANTY OR TRANSACTIONS UNDER THIS WARRANTY MAY BE BROUGHT MORE THAN TWO (2) YEARS AFTER THE CAUSE OF ACTION HAS OCCURRED.

4. MISCELLANEOUS.

- 4.01. Proper Venue for any lawsuits arising from or related to this limited warranty shall be only in Guadalupe County, Texas.
- 4.02. Manufacturer may waive compliance with any of the terms of this limited warranty, but no waiver of any terms shall be deemed to be a waiver of any other term.
- 4.03. If any provision of this limited warranty shall violate any applicable law and is held to be unenforceable, then the invalidity of such provision shall not invalidate any other provisions herein.
- 4.04. Applicable law may provide rights and benefits to purchaser in addition to those provided herein.

KEEP FOR YOUR RECORDS

ATTENTION: Purchaser should fill in the blanks below for his reference when buying repair parts and/or for proper machine identification when applying for warranty.

M&W Implement Model _____ Serial Number _____

Date Purchased _____ Dealer _____

ATTENTION:
READ YOUR OPERATOR'S MANUAL

M&W

An **Alamo Group** Company
1020 South Sangamon Ave.
Gibson City, Illinois 60936
217-784-4261





TO THE OWNER/OPERATOR/DEALER

To keep your implement running efficiently and safely, read your manual thoroughly and follow these directions and the Safety Messages in this Manual. The Table of Contents clearly identifies each section where you can easily find the information you need.

The OCCUPATIONAL SAFETY AND HEALTH ACT (1928.51 Subpart C) makes these minimum safety requirements of tractor operators:

REQUIRED OF THE OWNER:

1. Provide a Roll-Over-Protective Structure that meets the requirements of this Standard; and
2. Provide Seatbelts that meet the requirements of this paragraph of this Standard and SAE J4C; and
3. Ensure that each employee uses such Seatbelt while the tractor is moving; and
4. Ensure that each employee tightens the Seatbelt sufficiently to confine the employee to the protected area provided by the ROPS.

REQUIRED OF THE OPERATOR

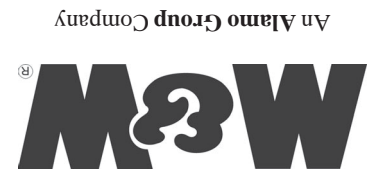
1. Securely fasten seatbelt if the tractor has a ROPS.
2. Where possible, avoid operating the tractor near ditches, embankments, and holes.
3. Reduce speed when turning, crossing slopes, and on rough, slick, or muddy surfaces.
4. Stay off slopes too steep for safe operation.
5. Watch where you are going - especially at row ends, on roads, and around trees.
6. Do not permit others to ride.
7. Operate the tractor smoothly - no jerky turns, starts, or stops.
8. Hitch only to the drawbar and hitch points recommended by the tractor manufacturer.
9. When the tractor is stopped, set brakes securely and use park lock, if available.

Keep children away from danger all day, every day...

Equip tractors with rollover protection (ROPS) and keep all machinery guards in place...

Please work, drive, play and live each day with care and concern for your safety and that of your family and fellow citizens.





An Alamo Group Company

M&W®

1020 S. Sangamon Ave.
Gibson City, IL 60936-9907

Please fold (do not tear), tape, and drop in any mailbox.

PLEASE FILL OUT OWNER WARRANTY REGISTRATION INFORMATION
SIGN, AND DROP LAST COPY IN ANY MAILBOX.

IMPORTANT!

TO PLACE THIS WARRANTY IN EFFECT,
THIS WARRANTY REGISTRATION MUST BE
FILLED OUT, SIGNED, AND MAILED WITHIN 30
DAYS OF DELIVERY DATE OF THIS MACHINE.
DEALER AND PURCHASER MUST SIGN.

ATTENTION: ANY CLAIM SUBMITTED TO SERVIS-RHINO®
WILL BE REFUSED UNTIL COMPLETED, SIGNED
WARRANTY REGISTRATION CARD IS ON FILE.

