

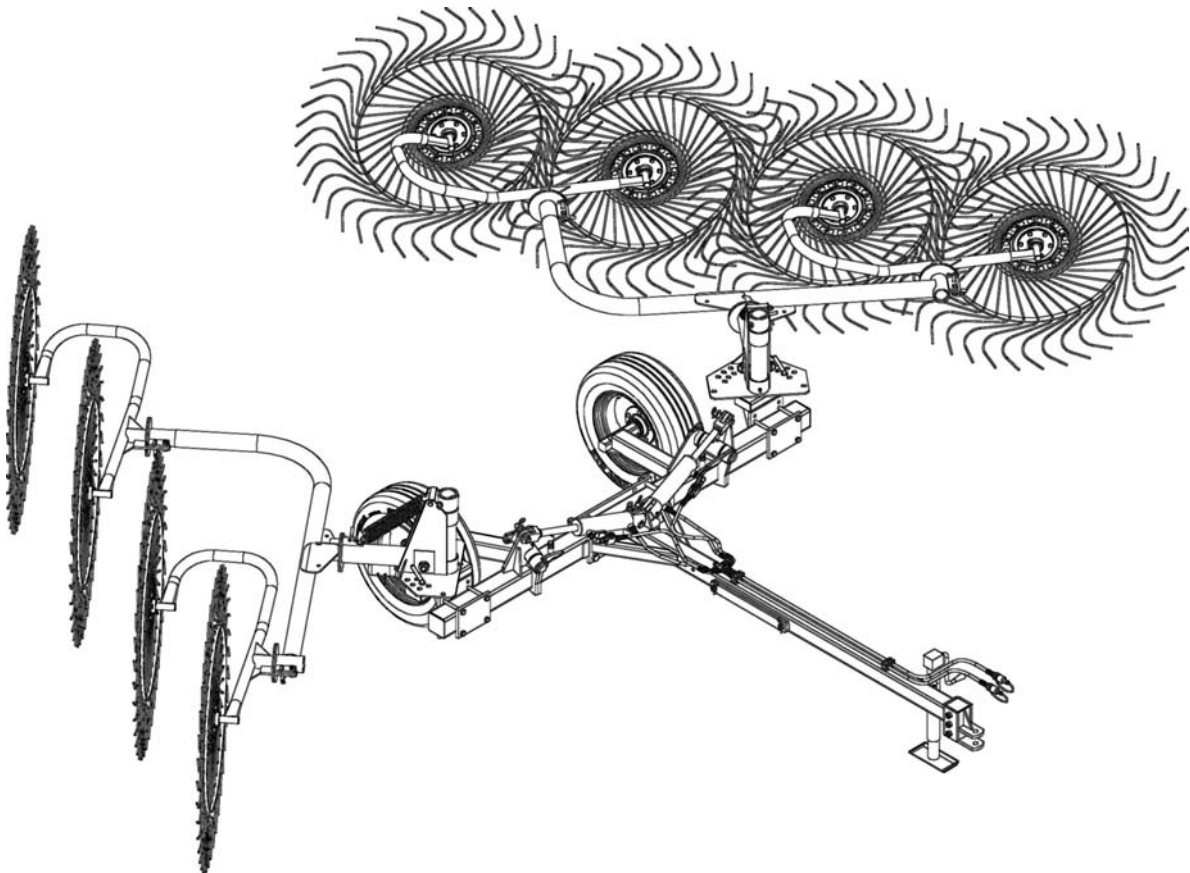
BEFCO[®]

Operator's Manual

HAY EQUIPMENT

“V” Rakes

HRC-08V, HRC-10V, HRC-12V



The operator's manual is a technical service guide and must always accompany the machine.

Manual 960-393B

October 2019

SAFETY

Take note! This safety alert symbol found throughout this manual is used to call your attention to instructions involving your personal safety and the safety of others. Failure to follow these instructions can result in injury or death.



*This symbol means:
ATTENTION!
BECOME ALERT!
YOUR SAFETY IS INVOLVED!*

Signal Words

Note the use of the signal words DANGER, WARNING and CAUTION with the safety messages. The appropriate signal words for each have been selected using the following guidelines:



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. It may also be used to alert against unsafe practices.



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

INDEX

| | |
|---|----|
| 1 - GENERAL INFORMATION | 4 |
| 1.01 - General | 4 |
| 1.02 - Warranty Information | 4 |
| 1.03 - Model and Serial Number ID | 5 |
| 2 - SAFETY PRECAUTIONS | 6 |
| 2.01 - Preparation | 6 |
| 2.02 - Starting and Stopping | 7 |
| 2.03 - Messages and Signs | 7 |
| 3 - OPERATION | 9 |
| 3.01 - Operational Safety | 9 |
| 3.02 - Setup | 11 |
| 3.03 - Assembly Instructions | 11 |
| 3.04 - Pre-Operational Check | 18 |
| 3.05 - Attaching to the Tractor | 18 |
| 3.06 - Startup | 20 |
| 3.07 - Working Speed | 21 |
| 3.08 - Operating Techniques | 21 |
| 3.09 - Raking a Single Windrow | 26 |
| 3.10 - Optional Center Kicker Wheel | 27 |
| 3.11 - Uneven Terrain | 28 |
| 3.12 - Removing Hay Rake from the Tractor | 28 |
| 3.13 - Transport | 29 |
| 4 - MAINTENANCE | 31 |
| 4.01 - Maintenance Safety | 31 |
| 4.02 - Service | 32 |
| 5 - REPAIR PROCEDURES | 34 |
| 5.01 - Rake Teeth Replacement | 34 |
| 5.02 - Repacking Transport Wheel Hubs | 35 |
| 5.03 - Suggested Spare Parts | 35 |
| 5.04 - Storage | 36 |
| 6 - TROUBLESHOOTING | 37 |
| 7 - PRE-DELIVERY CHECKLIST | 39 |
| 8 - WARRANTY | 40 |

1 - GENERAL INFORMATION

Thank you and congratulations for having chosen our implement. Your new hay rake is a technologically advanced machine constructed of high quality, sturdy components that will fulfill your working expectations. Read this manual carefully. It will instruct you on how to operate and service your implement safely and correctly. Failure to do so could result in personal injury and/or in equipment damage.

1.01 - General



CAUTION: Some hardware used on the implement may be metric. Use only metric tools on metric hardware. Other tools that do not fit properly can slip and cause injury.



CAUTION: Right hand and left hand sides of the implement are determined by facing in the direction the implement will travel when going forward (see fig. 2).

1.02 - Warranty Information

Carefully read the Warranty section¹, detailing coverage and limitations of this warranty. **Warranty** is provided for customers who operate and maintain their equipment as described in this manual. Warranty registration is accomplished by the dealer by completing and forwarding the **Warranty Registration** form to the Company, along with a copy of the dealer's invoice. It is in your best interest to insure that this has been done.

Warranty does not cover the following:

1. Cleaning, transporting, mailing and service call charges.
2. Normal wear items such as rake teeth, etc.
3. Depreciation or damage caused by normal wear, accidents, improper maintenance, improper protection or improper use.
4. The use of non-original spare parts and accessories.

Your Authorized Company Dealer has genuine parts in stock. Only these approved replacement parts should be used.

This limited warranty covers defective material and workmanship. The cost of normal maintenance or repairs for accidents or improper use and related labor will be borne by the owner.

¹ See Chapter 8 - Warranty.

1.03 - Model and Serial Number ID

Attached to the frame is an ID plate showing the model and the serial number. Record your implement model and serial number in the space provided below. Your dealer needs this information to give you prompt, efficient service when you order parts.

| | |
|-----------------|---|
| BEFCO | 1781 S. Wesleyan Blvd. – P.O. Box 6036 Rocky Mount, N.C. 27802 – U.S.A. Tel: 1.252.977.9920 Fax: 1.252.977.9718 |
| MODEL: | |
| SERIAL: | |
| VERSION: | |

2 - SAFETY PRECAUTIONS

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

In addition to the design and configuration of 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 equipment. It is the operator's responsibility to read and understand all safety and operating instructions in the manual and to follow these.

Allow only properly trained personnel to operate the implement. Working with unfamiliar equipment can lead to careless injuries. Read this manual, and the manual for your tractor, before assembly or operation, to acquaint yourself with the machines. It is the owner's responsibility, if this machine is used by any person other than yourself, is loaned or rented, to make certain that the operator, prior to operating, reads and understands the operator's manuals and is instructed in safe and proper use.

2.01 - Preparation



1. Before operating equipment read and understand the operator's manual and the safety signs (**see fig. 2**).
2. Thoroughly inspect the implement before initial operation to assure that all packaging materials, i.e., wires, bands, and tape have been removed.
3. Personal protection equipment including hard hat, safety glasses, hearing protection, safety shoes, and gloves are recommended during assembly, installation, operation, adjustment, maintaining and/or repairing the implement.
4. Operate the implement only with a tractor equipped with an approved Roll-Over-Protective-System (ROPS). Always wear your seat belt. Serious injury or even death could result from falling off the tractor.
5. Clear area to be worked of stones, branches or other debris that might be thrown, causing injury or damage.
6. Before beginning operation, contact local utility companies to make certain there are no bundled gas lines, electrical cables, etc., in the work area.
7. Operate only in daylight or good artificial light.
8. Ensure implement is properly mounted, adjusted and in good operating condition.
9. Ensure that all safety decals are properly installed and in good condition.

2.02 - Starting and Stopping



1. Be sure that no one is near the machine prior to engaging or while the machine is working.
2. Be sure the tractor is in "Neutral" before starting engine.
3. Equipment operating power is ground driven. Know how to stop the tractor quickly in case of an emergency.
4. After striking an obstacle, shut the tractor off, remove key and thoroughly inspect for damage before restarting.

2.03 - Messages and Signs



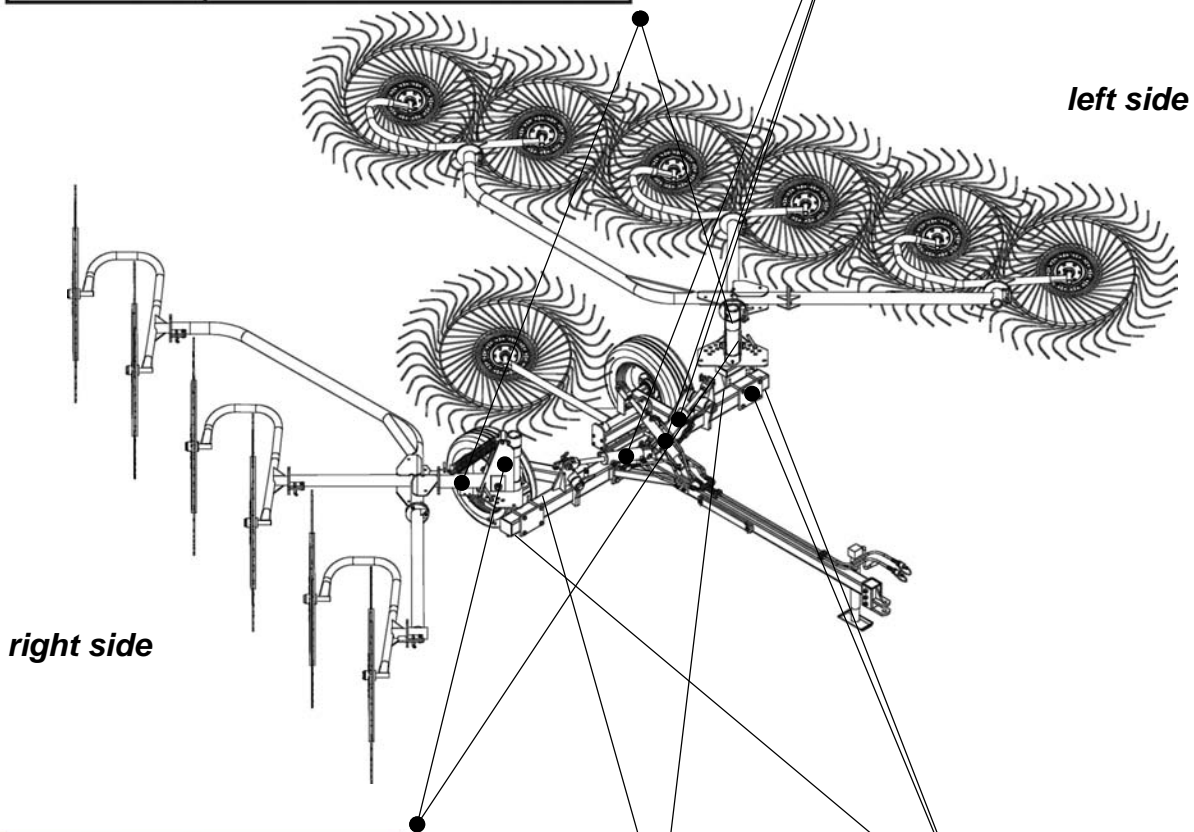
1. Read and adhere to all safety and operating decals on this machine (**see fig. 2**).
2. Before dismounting tractor: Allow moving parts to stop, stop engine, set brake and remove the key of unattended equipment.
3. Keep safety decals in place and in good condition.
4. Do not use with bystanders in area.
5. Allow no riders on tractor or implement.
6. Allow moving parts to stop before repair.
7. Securely support implement before working underneath.

Additional warning and operating decals are available at no extra charge. Please specify model and serial number when ordering.

Fig. 2 - Safety decals - implement; replace immediately if damaged

| | |
|--|---|
| | ⚠ WARNING |
| | High-pressure hydraulic oil leaks can penetrate skin resulting in serious injury, gangrene or death. <ul style="list-style-type: none"> • Check for leaks with cardboard; never use hand. • Before loosening fittings: lower load, release pressure, and be sure oil is cool. • Consult physician immediately if skin penetration occurs. <p style="text-align: right; font-size: small;">950-4029</p> |

| | |
|--|---|
| | ⚠ WARNING |
| | Crushing hazard <ul style="list-style-type: none"> • Keep away. Do not go underneath. • When raised, ensure that transport safety locks are fully engaged. Failure to follow these instructions could result in serious injury or death. <p style="text-align: right; font-size: small;">950-4938</p> |



| |
|---|
| ⚠ CAUTION |
| To avoid serious injury: <ul style="list-style-type: none"> • Read Operator's Manual before operating, servicing or repairing equipment. Follow all safety rules and instructions. (Manuals are available from your selling dealer.) • Never allow riders. • Keep bystanders away from equipment during operation. • Operate from tractor seat only. • Keep all shields in place and in good condition. • Lower equipment to ground, stop engine, remove key and set brake before dismounting tractor. • Never allow children or untrained persons to operate equipment. • If equipped, parking stands must be functional, kept in good repair, and stored on the unit. Park and store on a hard, level surface. <p style="text-align: right; font-size: small;">950-417B</p> |



Red reflective decal



Yellow reflective decal

3 - OPERATION

You have purchased a ground driven hay rake which will provide you with high quality raking results with overall very low costs of ownership and maintenance.

As the tractor moves forward, the wheels on BEFCO's hay rakes gently turn the hay towards the back of the unit leaving all the hay raked in fluffy windrows suitable to form a compact and even bale. Tines are made of flexible steel for a more gentle and clean contact with the forage. The greasable wheel hubs on BEFCO's rakes are made of cast steel and contain tapered roller bearings that ensure the maximum possible lifetime of the wheel hub. Bearings are protected by dust caps.

With working widths ranging from 17' to 25' and working speeds of up to 14 mph there is no doubt that BEFCO offers the ideal rake for all your raking needs.

3.01 - Operational Safety



CAUTION: Our ground driven hay rakes are designed considering safety as the most important aspect and are the safest available in today's market. Unfortunately, human carelessness can override the safety features built into our machines. Injury prevention and work safety, aside from the features on our hay rakes, are very much due to the responsible use of the equipment. It must always be operated prudently following with great care, the safety instructions laid out in this manual.



1. The use of this equipment is subject to certain hazards which cannot be prevented by mechanical means or product design. All operators of this equipment must read and understand this entire manual, paying particular attention to safety and operating instructions, prior to using.
2. Do not operate the tractor and implement when you are tired, sick or when using medication.
3. Keep all helpers and bystanders at least 100 feet from the implement. Only properly trained people should operate this machine.
4. Accidents are most likely to occur with machines that are loaned or rented to someone who has not read the operator's manual and is not familiar with the implement.
5. Always stop the tractor, set brake, shut off the tractor engine, remove the ignition key and lower implement to the ground before dismounting tractor. Never leave equipment unattended with the tractor running.
6. Never place hands or feet under implement with tractor engine running or before you are sure all motion has stopped. Stay clear of all moving parts.

7. Do not reach or place yourself under equipment until it is blocked securely.
8. Do not allow riders on the implement or tractor at any time. There is no safe place for riders.
9. Before backing up, look behind carefully.
10. Never operate tractor and implement under trees with low hanging limbs. Operators can be knocked off the tractor and then run over by the implement.
11. The parts of this machine have been designed and tested for rugged use. However, they could fail upon impact with heavy, solid objects such as steel guard rails and concrete abutments. Such impact could cause the broken objects to be thrown outward at very high velocities. To reduce the possibility of property damage, serious injury, or even death, never allow the machine to contact such obstacles.
12. Frequently check rake teeth. They should be free of nicks and cracks and securely fastened.
13. Stop implement immediately upon striking an obstruction. Turn engine off, remove key, inspect and repair any damage before resuming operation.
14. Stay alert for holes, rocks and roots in the terrain and other hidden hazards. Keep away from drop-offs.
15. Use extreme care and maintain minimum ground speed when transporting on hillside, over rough ground and when operating close to ditches or fences. Be careful when turning sharp corners.
16. Before beginning operation, contact local utility companies to make certain there are no bundled gas lines, electrical cables, etc., in the work area.
17. Reduce speed on slopes and sharp turns to minimize tipping or loss of control. Be careful when changing directions on slopes. Do not start or stop suddenly on slopes. Avoid operation on steep slopes.
18. When using a unit, a minimum 20% of tractor and equipment weight must be on tractor front wheels. Without this weight, tractor could tip over, causing personal injury or death. The weight may be attained with a front end loader, front wheel weights, ballast in tires or front tractor weights. When attaining a minimum 20% of tractor and equipment weight on the front wheels, you must not exceed the ROPS weight certification. Weigh the tractor and equipment. Do not guess or estimate!
19. Inspect the entire machine periodically². Look for loose fasteners, worn or broken parts, and leaky or loose fittings.
20. Pass diagonally through sharp dips and avoid sharp drops to prevent "hanging up" tractor and implement.
21. Avoid sudden starts and stops while traveling up or downhill.
22. Always operate down slopes; never across the face. Avoid operation on steep slopes. Slow down on sharp turns and slopes to prevent tipping and/or loss of control.
23. A safety chain (not supplied with unit) will help control drawn equipment should it accidentally separate from the tractor drawbar. Do not use safety chain for towing.
24. Comply with all federal, state and local laws during transport on roads.
25. Before parking the machine, lower the support stand and secure it with the lock pins.

² See Chapter 4 - Maintenance.

3.02 - Setup

Notice to dealer: Pre-delivery setup and service including lubrication is the responsibility of the authorized dealer. It is up to him to assure that the machine is in perfect condition and ready to be used. It is his responsibility to ensure that the customer is aware of all safety aspects and operational procedures for the implement. He must also fill out the Pre-Delivery Checklist³ prior to delivering the implement.

3.03 - Assembly Instructions



CAUTION: Stand clear of bands when cutting as they could be under sufficient tension to cause them to fly loose. Take care in removing bands and wire. They often have extremely sharp edges and cut very easily.



CAUTION: Improper setup of hydraulic cylinders can result in implement failure.

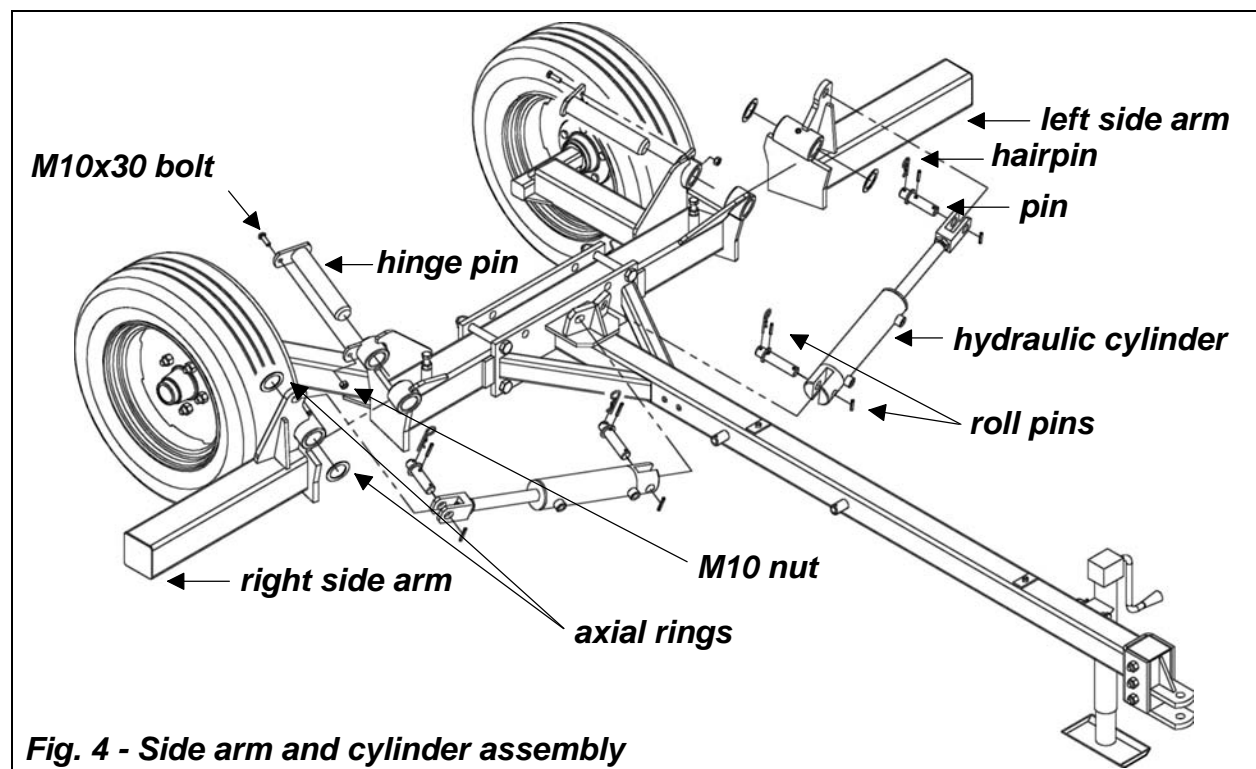
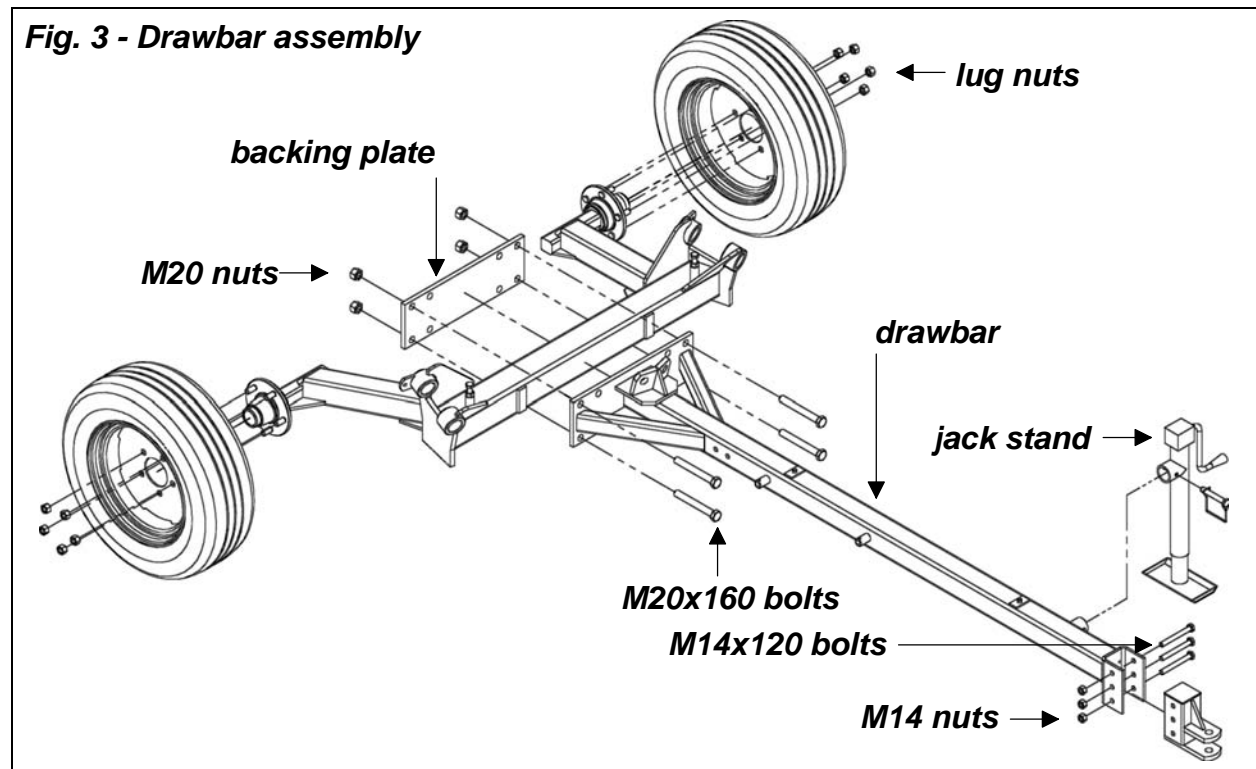
All hardware needed for assembly will be found in the crate and the hardware bag of the machine. Assembly will be easier if all parts are loosely assembled before tightening the hardware.

| Each HRC pull-type "V" rake is shipped as a kit that consists of the following: | | | |
|--|---------------------|---------------------|---------------------|
| Description | HRC-08V Qty. | HRC-10V Qty. | HRC-12V Qty. |
| Main frame | 1 | 1 | 1 |
| Drawbar with hitch and backing plate | 1 | 1 | 1 |
| Jack stand with pin | 1 | 1 | 1 |
| Support with collar and backing plate, right | 1 | 1 | 1 |
| Support with collar and backing plate, left | 1 | 1 | 1 |
| Side arm, right | 1 | 1 | 1 |
| Side arm, left | 1 | 1 | 1 |
| Hydraulic cylinder with pins | 2 | 2 | 2 |
| Hydraulic pressure line hose assembly | 1 | 1 | 1 |
| Hydraulic return line hose assembly | 1 | 1 | 1 |
| Wheel with tire | 2 | 2 | 2 |
| Support arm, 4 wheel | 2 | - | - |
| Support arm, 5 wheel | - | 2 | - |
| Support arm front section, 6 wheel | - | - | 2 |
| Support arm rear section, 6 wheel | - | - | 2 |
| Arm with hub right, 2 wheel (with hardware bag) | 2 | 2 | 3 |
| Arm with hub left, 2 wheel (with hardware bag) | 2 | 2 | 3 |
| Arm with hub, 1 wheel (with hardware) | - | 2 | - |
| Rake wheel, left | 4 | 5 | 6 |
| Rake wheel, right | 4 | 5 | 6 |

³ See Chapter 7 - Pre-Delivery Checklist.

To assemble the hay rake carts do the following:

1. Assemble the drawbar to the main frame using the backing plate and securing it with the supplied M20x160 bolts and M20 nuts (see fig. 3).



2. Assemble wheels to the hubs using the lug nuts.
3. Install jack stand on drawbar and secure it with the pin (**see fig. 3**).
4. Assemble the front hitch to the drawbar using the M14x120 bolts and the M14 elastic stop nuts.
5. Assemble the left and right side arms to the main frame using the large hinge pins making sure to insert the axial rings on both ends of the tube on the side arms (**see fig. 4**). Secure the hinge pin in place using the M10x30 bolts and M10 nuts.

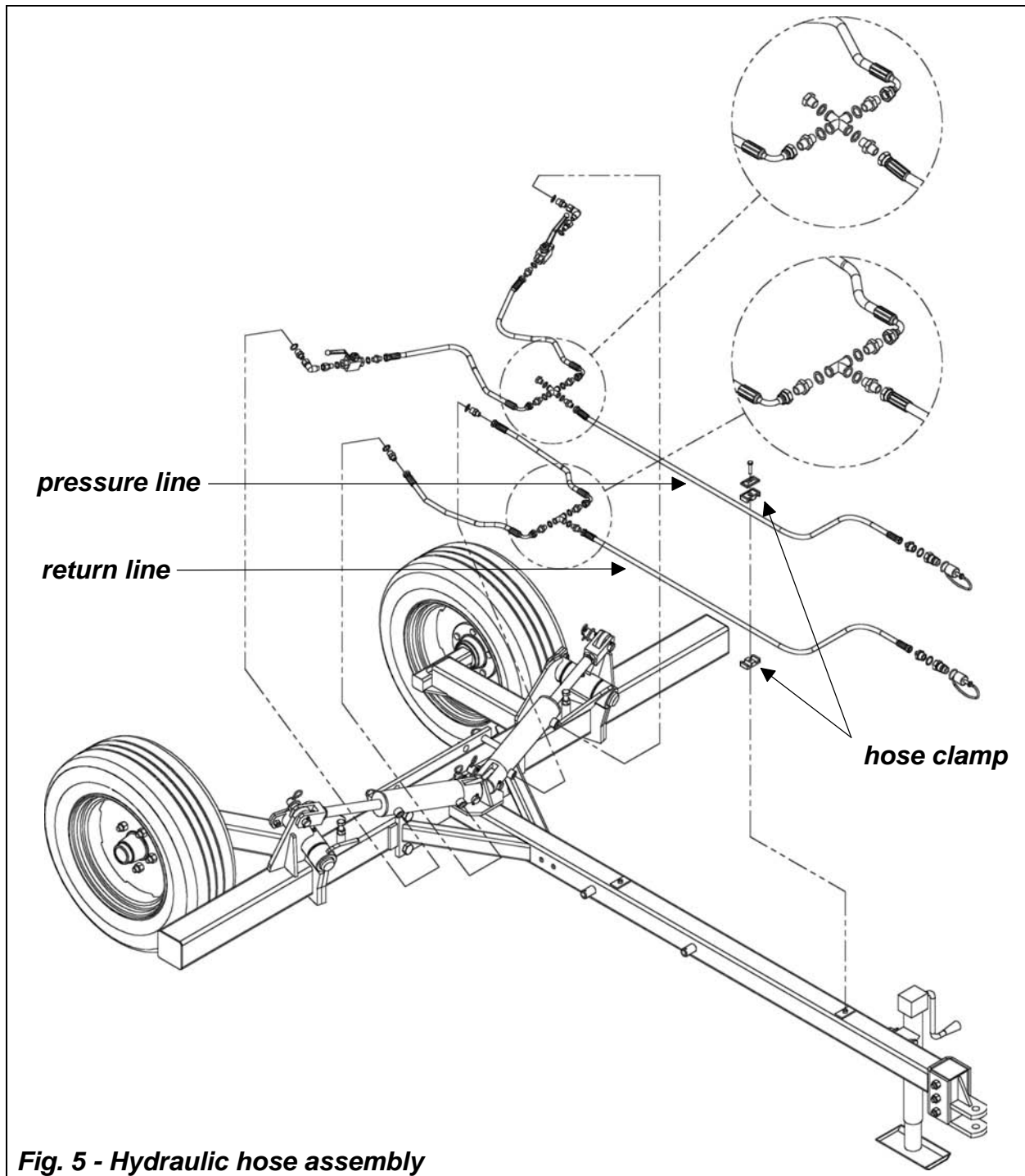


Fig. 5 - Hydraulic hose assembly

6. Assemble the hydraulic cylinders making sure the piston side is mounted towards the tire. Secure the cylinders to the drawbar and side arms using the pins and $\text{\O}6\times40$ roll pins (**see fig. 4**). When assembling the pin, make sure to keep the side with the welded washer towards the back of the rake.
7. Assemble the pressure line towards the piston side of the hydraulic cylinder using the 3/8" to 1/4" adaptor and the copper washers between the fittings (**see fig. 5**).
8. Assemble the return line towards the bottom of the housing of the hydraulic cylinder using the 3/8" to 1/4" adaptor and the copper washers between the fittings (**see fig. 5**).
9. Neatly run both the pressure line and the return line over the drawbar of the rake and secure them using the hose clamps.
10. Assemble the left and right frame hitch support using the M14x150 bolts, the backing plate and the M14 nuts (**see fig. 6**). The frame hitch support may also be slid outwards or inwards to increase or decrease the raking width (**see fig. 15**).
Note: The frame hitch support has several holes that allow the operator to adjust the height of the rake. Raising the height will increase the raking clearance but may reduce the pressure applied by the teeth on the rake wheels to the ground⁴.
11. Assemble the safety locking plates to the side of the drawbar using the $\text{\O}4$ hairpin cotters.

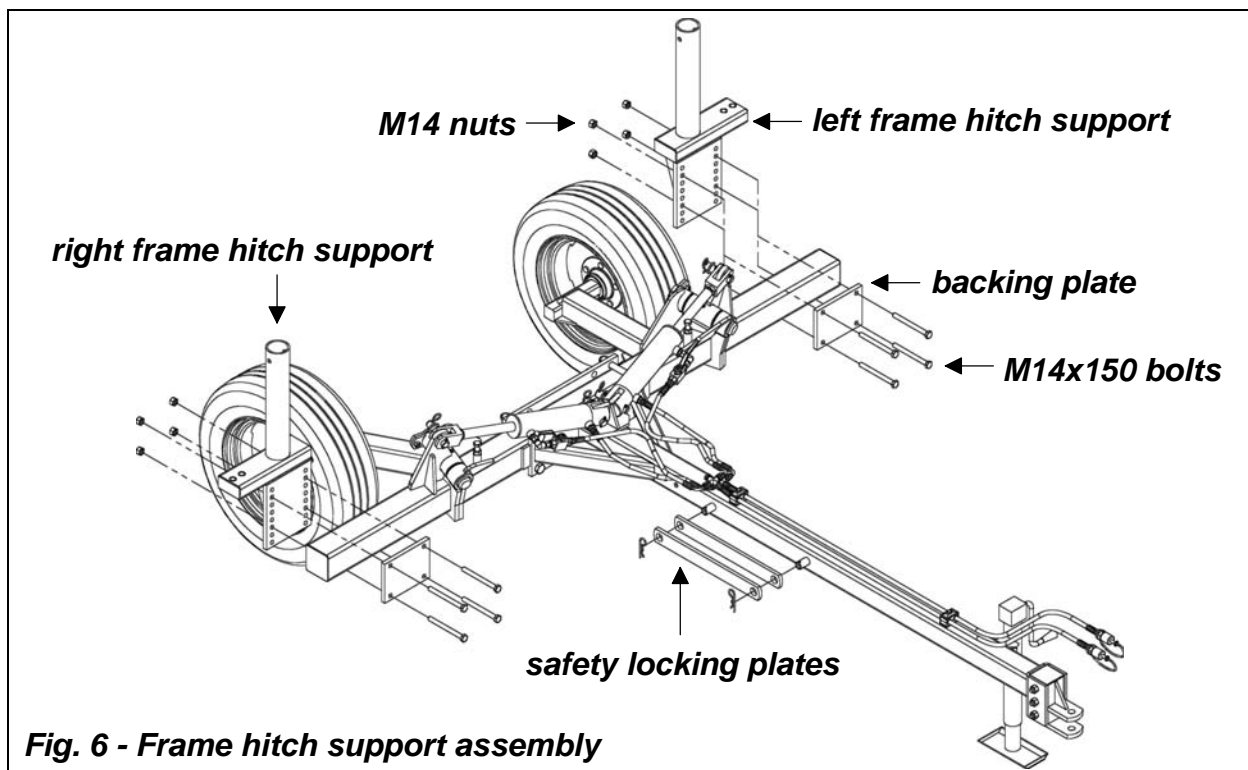
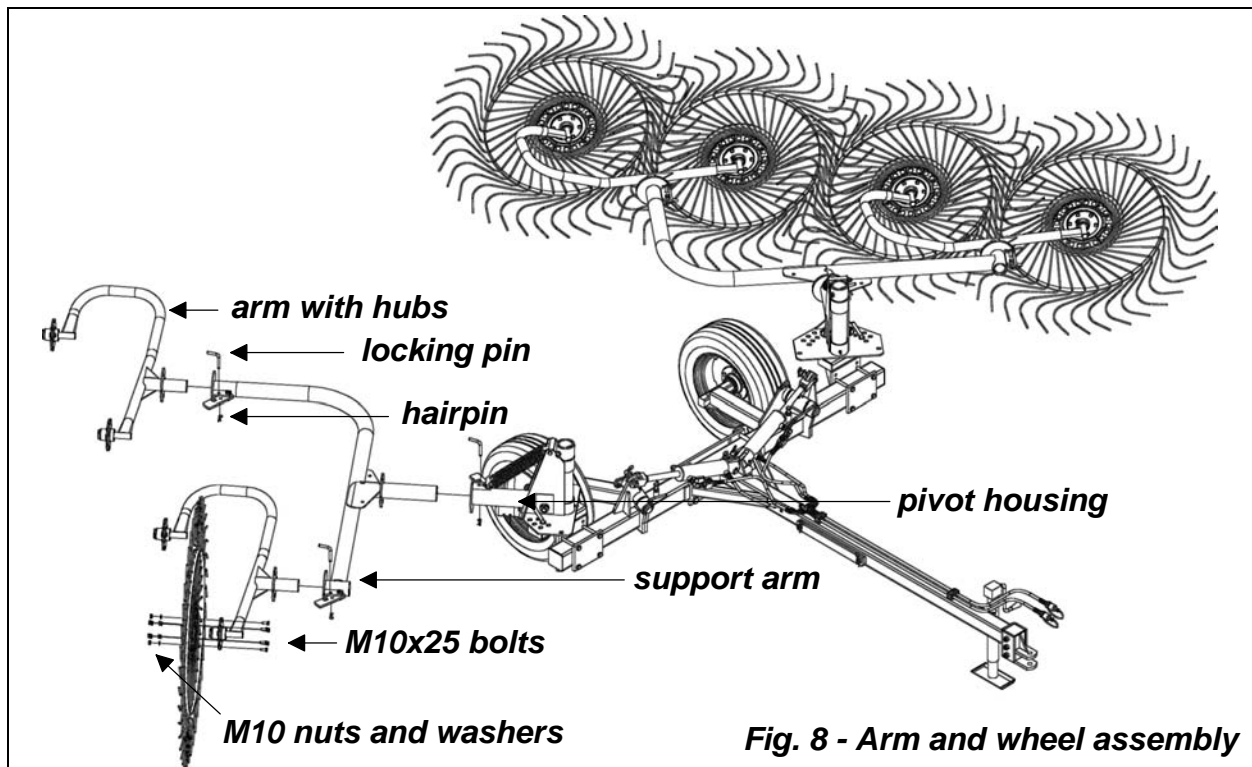
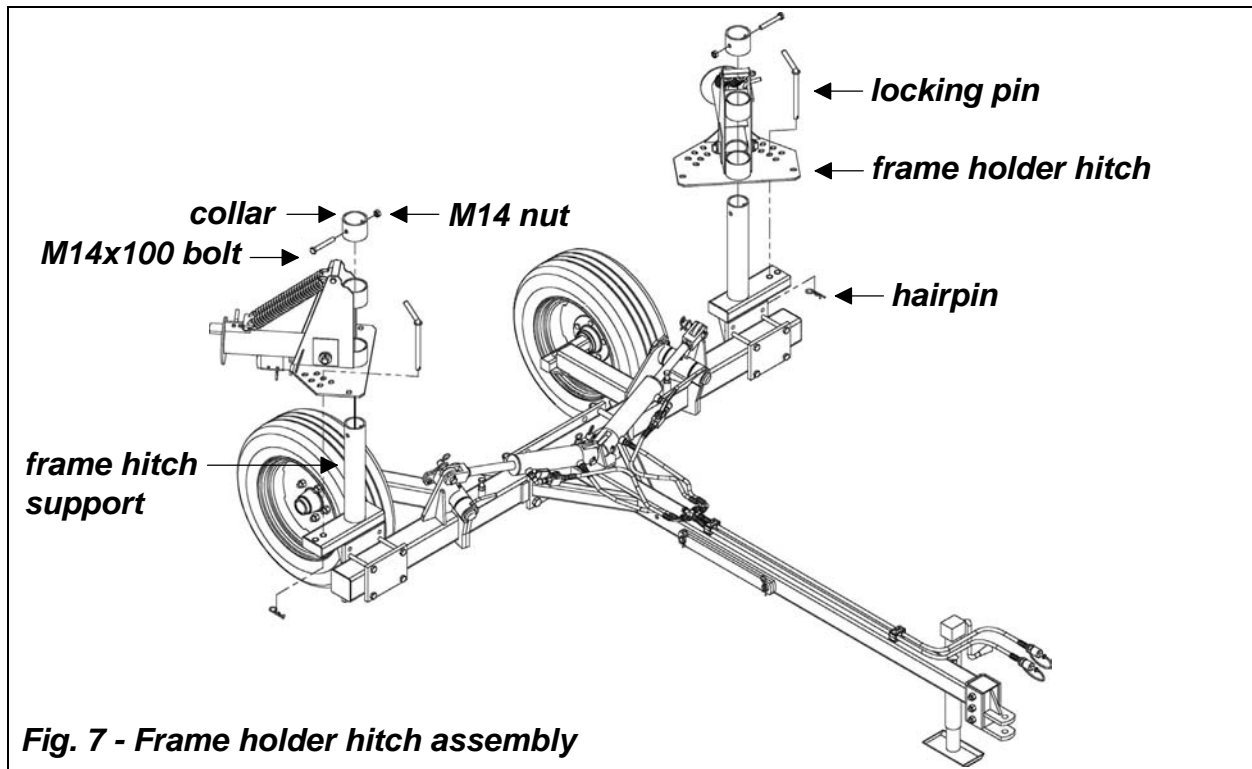


Fig. 6 - Frame hitch support assembly

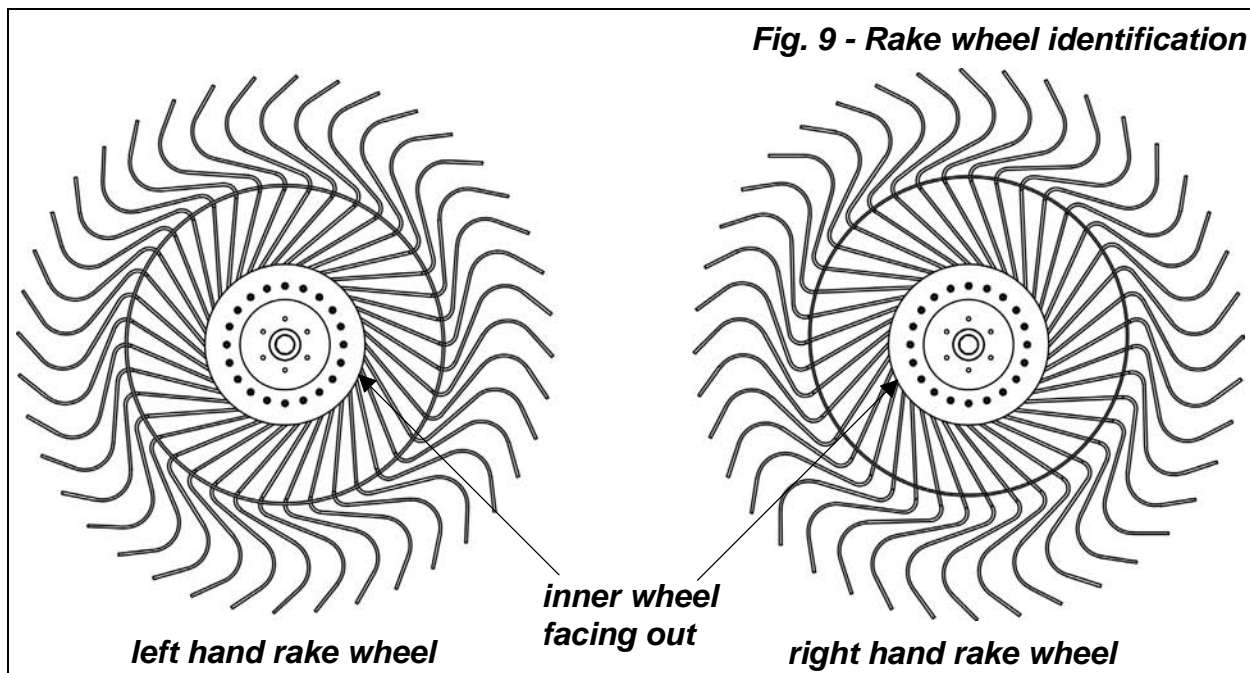
12. Slide a rake frame holder hitch into each frame hitch support on the rake cart and install the collar over the frame hitch support. Lock in place using the supplied M14x100 bolts and M14 nuts (**see fig. 7**).

⁴ See Section 3.08 - Operating Techniques.

13. Lock the frame holder hitch to the support by inserting the locking pin through one of the adjustment holes on the frame holder hitch and secure it using the Ø4 hairpin cotter (see fig. 7).



14. Slide the support arm of the rake into the large hole in the pivot housing until the flanges on both pieces are bumped up to one another (**see fig. 8**). Secure the support arm with the locking lever then secure the lever with the Ø12x56 locking pin and the Ø3 hairpin cotter.
15. Slide each arm with hubs in the holes at each end of the support arm until the flanges on both pieces are bumped up to one another. Secure the arm with the locking lever then secure the lever with the Ø12x56 locking pin and the Ø3 hairpin cotter. On hay rake cart model HRC-10V only, assemble the single wheel arm with hub in the center hole of the support arm and secure it using the M14x100 bolt, the lock washer and the M14 nut.
Note: When installing the arms with hubs, always make sure to assemble them to the support arm with the bend facing upwards. This will allow for better clearance from the ground and therefore more hay to be raked.
16. Assemble the rake wheels making sure the inner wheel is facing away from the tractor (**see fig. 9**). Make sure to assemble the left rake wheels on the left side of the rake and the right rake wheels on the right side of the rake for your machine to work properly.
17. Secure each wheel by inserting the supplied M10x25 bolts on the hub side and the Ø10 external lock washers and M10 nuts on the inner wheel side.
18. Tighten all hardware securely⁵.

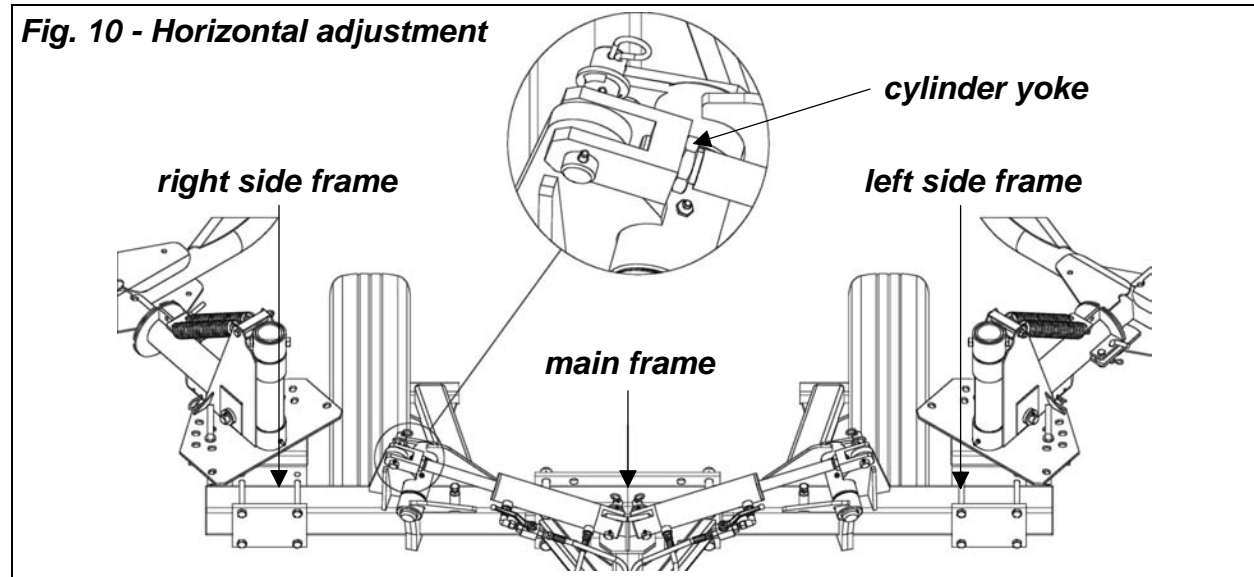


To identify right hand and left hand rake wheels, set the rake wheels up against a wall with the tine clips facing the wall and the inner wheel facing away from the wall. On a right hand wheel the rake teeth touching the ground will bend towards the right. On a left hand rake the rake teeth touching the ground will bend towards the left (**see fig. 9**).

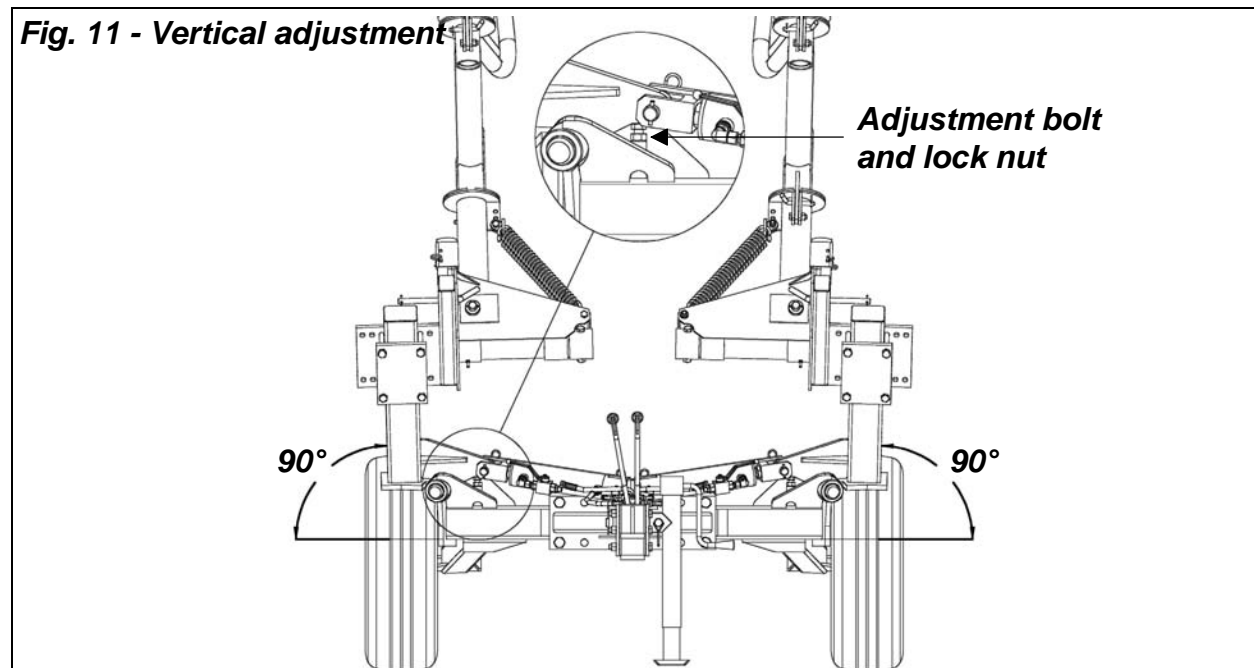
⁵ Refer to Table 2 - Torque Specifications, page 33.

Vertical and horizontal adjustment of the rake cart frame:

The purpose of these adjustments is to ensure the rake is perfectly level while operating and at 90° when raised in transport position. To do this the cylinder stroke (horizontal adjustment) and/or the adjustment bolt (vertical adjustment) may need to be adjusted as follows:



Place the rake cart on a level surface with sides lowered in the working position. Verify that the beams of the side frames are resting level on the central frame (**see fig. 10**). If one or both of the side frames are not completely down, you will need to loosen the lock nut and unscrew the yoke on the cylinder by a half a turn at a time to allow for more travel on the side arm. When both sides are properly adjusted, remember to re-tighten the lock nuts.



Now that the side arms are sitting level with the main frame, raise the rake in the transport position. Verify that the side arms are raised to a 90° position (**see fig. 11**). If one or both of the side arms fold up over the 90° position, loosen the lock nuts and unscrew the adjustment bolts until the side arms are in the proper position. If on the other hand the one or both of the side arms do not reach the 90° position, loosen the lock nuts and tighten the bolts. When the correct angle is set, remember to re-tighten the lock nuts.

IMPORTANT: Always remember to engage the lock plate (see fig. 14) and reposition the safety locking plates (see fig. 23) on the cylinders before transporting the hay rake⁶.

3.04 - Pre-Operational Check

IMPORTANT: Check each of the following, carefully, prior to engaging the equipment:

1. No wrappings or foreign objects are around the implement.
2. The teeth are properly installed and the bolts properly torqued⁷.
3. All hardware is tight.
4. No people or animals are in the work area.

3.05 - Attaching to the Tractor

Models HRC-08V, HRC-10V, HRC-12V, may be used on tractors ranging from 30 to 80 HP.



DANGER: Never allow anyone to stand between the hay rake and tractor during hookup operations.



DANGER: Failure to ensure a secure coupling of the implement to the tractor can cause injury and damage to the implement or tractor. If necessary, wheel weights, front tractor weights and/or tire ballast should be used to improve stability. Be sure that the tractor tire pressure is correct. It is important to strictly follow the safety guidelines and instructions laid out in the tractor's operator's manual.



WARNING: High pressure hydraulic oil leaks can penetrate skin resulting in injury, gangrene or death. Be sure to relieve any hydraulic oil pressure before disconnecting any lines or pipes between rake and tractor hydraulic system. Check for oil leaks using a cardboard, never use hands.

⁶ See Section 3.13 - Transport.

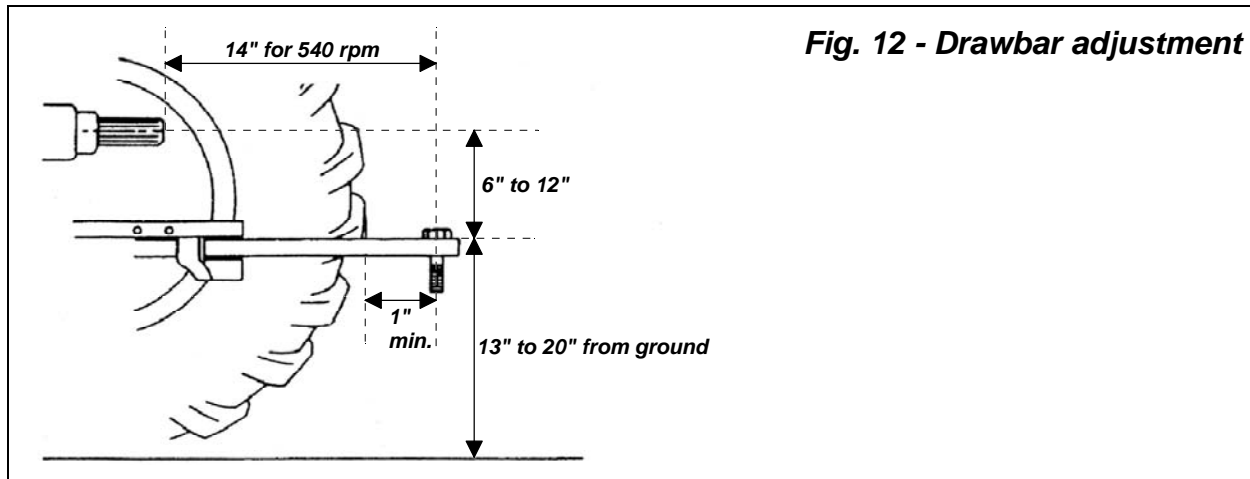
⁷ Refer to Table 2 - Torque Specifications, page 33.



CAUTION: Never attempt to attach the hay rake to the tractor or make any adjustments to it without first turning the tractor off.

To attach hay rake carts to the tractor do the following:

1. Position the tractor drawbar (**see fig. 12**). Remove the hitch pin. Back up the tractor to the rake. Align hitch pin holes in tractor drawbar and rake. **Turn off tractor engine.** Install hitch pin and fasten it with a hairpin cotter.
2. Raise the jack stand until the weight of the rake is on the tractor drawbar. Turn the jack stand 90° and secure it with a pin.
3. Place tractor SCV lever in float position. Connect the hydraulic lines to the tractor remote ports. Push tractor SCV lever in neutral position. Engage the tractor hydraulics to raise rake arms.



Always make sure to adjust the tractor drawbar as specified to ASAE standards to prevent failures (**see fig. 12**).

The drawbar should be centered under the PTO shaft and secured so it cannot swing in either direction.

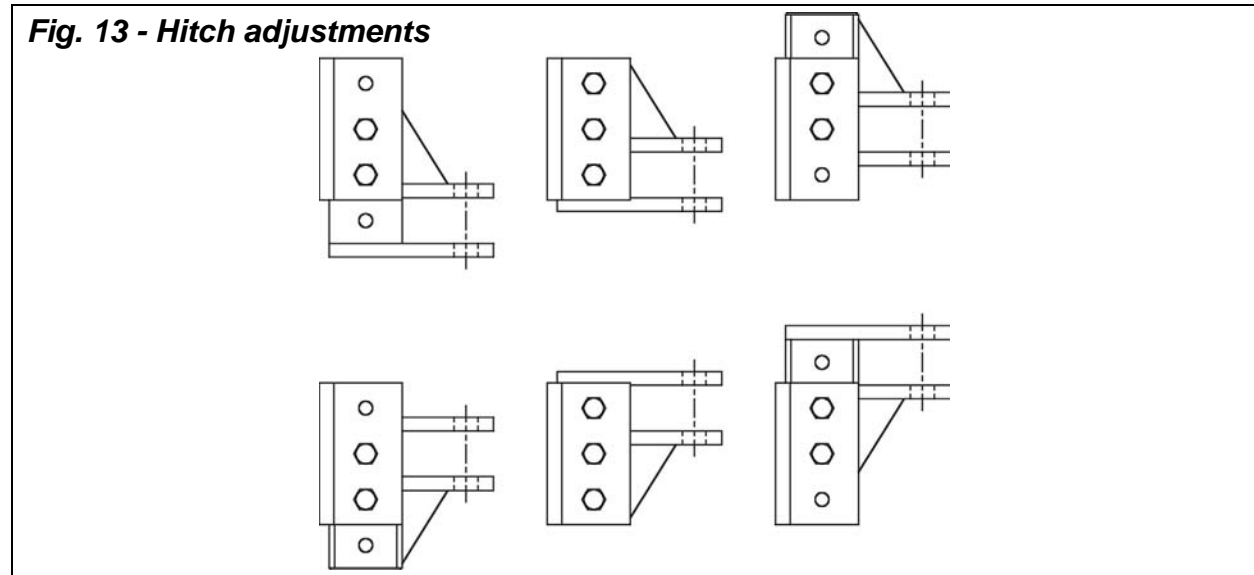


CAUTION: Failure to conform to ASAE standards for drawbar PTO setup dimensions can result in implement failure.



CAUTION: A safety chain (not supplied with implement) will help control drawn equipment should it accidentally separate from the tractor drawbar. A runaway machine could cause severe injury or death. Leave only enough slack in the chain to permit turning. Do not use safety chain for towing.

For proper operation, it is important that when the rake cart is attached to the tractor it sits level from front to back. For this reason our rake carts come standard with an adjustable hitch that allows the operator to adjust the hitch height to the height of the drawbar on the tractor (**see fig. 13**).



3.06 - Startup



DANGER: Never allow anyone around the implement when it is in operation.



CAUTION: For emergency reasons, learn how to stop the tractor and implement quickly.

Before starting to work, never forget that the **operator is responsible** for the following:

1. Safe and correct driving of the tractor and implement.
2. To learn precise safe operating procedures for both the tractor and the implement.
3. To ensure all maintenance and lubrication has been performed on the implement.
4. To have read and understood all safety aspects for the implement in the operator's manual.
5. To have read and understood all safety decals on the implement.
6. To have contacted the local utility companies to make certain there are no bundled gas lines, electrical cables, etc., in the work area.
7. Checking the overall condition of the machine.
8. Checking to see if front weights need to be added to the tractor in order to maintain balance.

9. Checking the tractor tires for the proper pressure in accordance with the tractor operator's manual.
10. Making sure the proper attire is worn. Avoiding loose fitting clothing which can become entangled. Wearing sturdy, tough-soled work shoes and protective equipment for eyes, hands, ears and head. Never operate tractor or implements in bare feet, sandals or sneakers.
11. Checking area for stones, branches and other debris that might be thrown.
12. Ensuring proper lighting is available, sunlight or good artificial lighting.

3.07 - Working Speed

Ground speed is determined by the field condition and tractor power. Simple experimentation will determine the best speed for the desired results, usually 8 to 14 mph.

3.08 - Operating Techniques

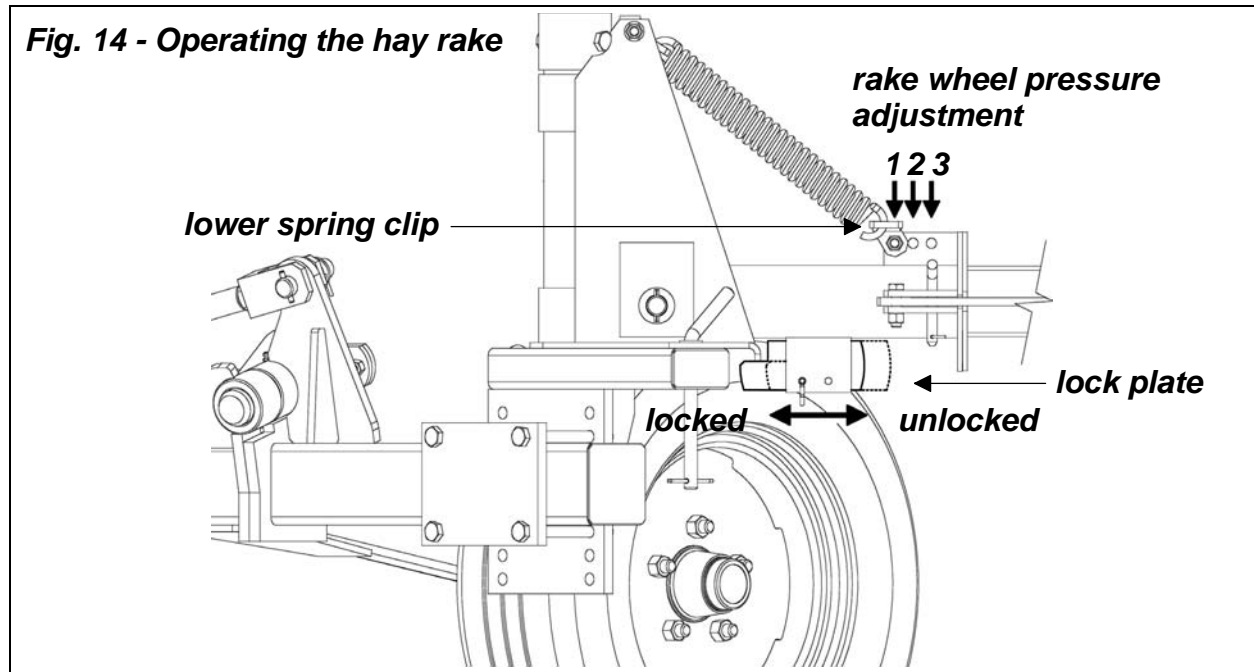
Rakes can be set to windrow widths from 1' to 12' 8", however, normal windrows range from 3' to 5' in width. Adjusting the windrow width properly will allow for more uniform hay bales. Ideally the width of the windrow should be approximately the same as the width of the bale chamber of the baler being used.

When working, rake wheels should slightly touch the ground. This gives the individual wheels and teeth maximum flexibility to insure clean raking on any terrain. The correct pressure will always depend on field conditions, quantity and type of forage being windrowed. For heavy crops, more down pressure may be needed. Too much pressure may cause dirt and debris to be rolled into the windrow. The ideal setting allows rake to float smoothly across ground contour while moving crop cleanly into a row.

If the crop was mowed with a sickle bar mower, operate the rake in the same direction the crop was mowed, while if the crop was mowed with a rotary mower, best results are normally obtained by operating the rake in the opposite direction the crop was mowed.

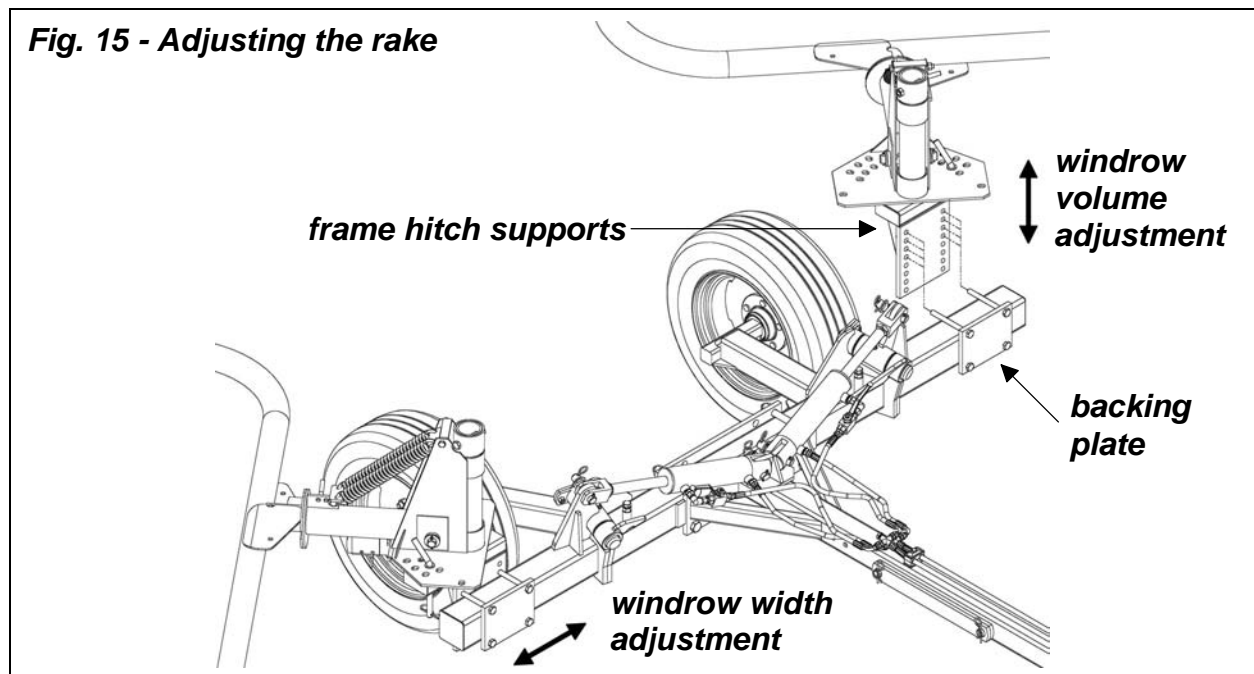
To set ground pressure do the following:

1. Lower rake so that wheels are slightly touching the ground.
2. Slide the lock plate (**see fig. 14**) in the unlocked position and secure it with the Ø5 hairpin cotter. This will allow the rake to float evenly across the surface even when raking over uneven terrain and prolong the life of the rake's teeth.
3. Assemble the spring clip in the desired position. The pressure that the rake wheel applies on the ground can be adjusted by bolting the lower spring clip to one of the other two holes available on the pivot housing tube (**see fig. 14**). Moving the lower spring clip to one of the holes further away from the springs will cause the spring tension to increase and therefore decrease the amount of pressure that the rake wheels will apply on the ground. As a general rule, in standard working conditions use the first hole for HRC-08V rake (**see #1, fig. 14**) and the second hole for HRC-10V, HRC-12V rakes (**see #2, fig. 14**). Setting the rake with the least amount of pressure will help to keep the finger wheels cleaner and therefore keep dirt off the forage.



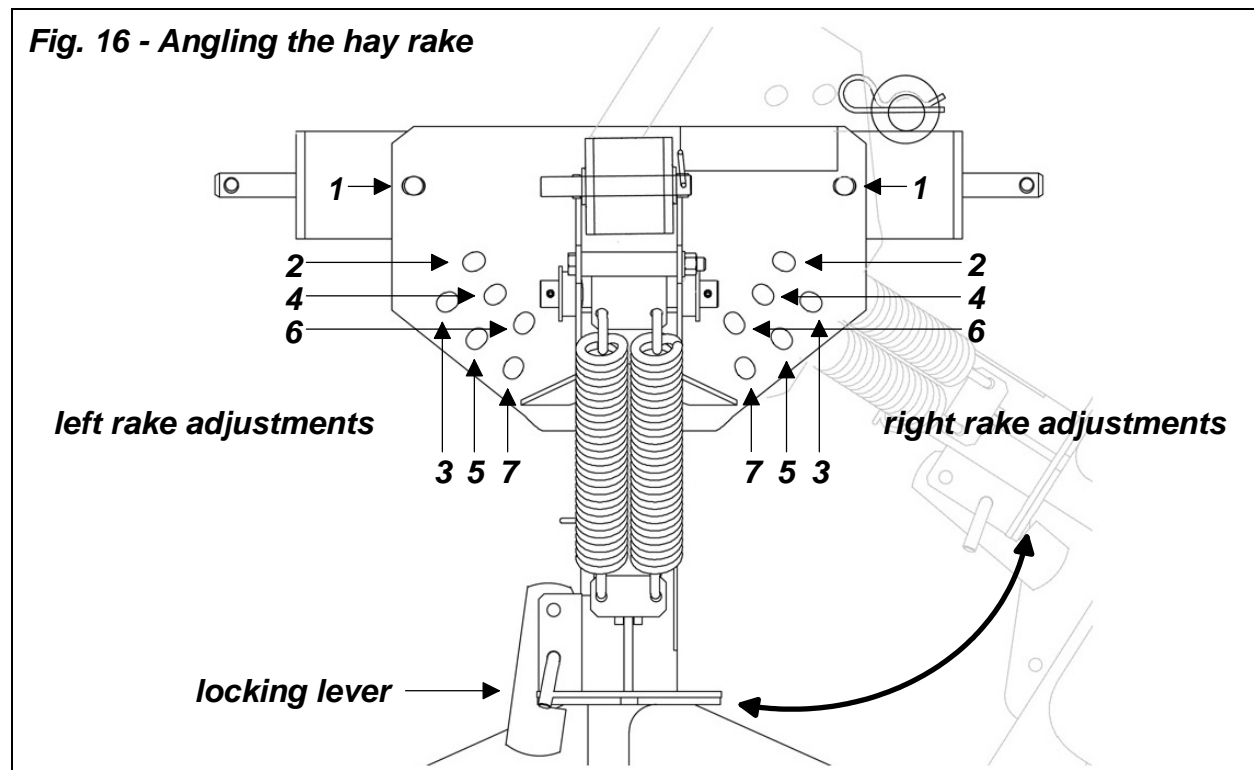
Setting the windrow width:

The windrow width is the width measured between the back rake wheels (see #1, fig. 17). Adjusting the windrow width will also affect the working width of the rake (see #2, fig. 17). There are two ways to adjust the windrowing width on the hay rake carts. The main adjustment is done through the frame hitch supports bolted on the side arms. Assembling the frame hitch supports further apart will widen the windrow width, while assembling them closer together will narrow the windrow width (see fig. 15).



The frame hitch supports on our hay rake carts are also designed to be assembled at several heights. The lower the frame hitch supports are assembled on the frame, the greater the pressure the rake wheels will apply to the ground. The higher the frame hitch supports are assembled, the greater the clearance of the support arms from the ground which will therefore improve the flow of the hay through the rake (**see fig. 15**). Only a test run will determine the best position for your use but as a rule of thumb assemble the smaller rakes in the lower positions.

Once the frame hitch supports are adjusted to the desired width, finer adjustments of the windrowing width will be made through the holes on the frame holder hitch (**see fig. 16**).



BEFCO's hay rakes offer six different angling positions that allow the operator to fine tune the unit to obtain the best raking results (**see fig. 16**).

The holes on the right of the frame holder hitch are the ones used on the right hand rake while the holes on the left of the frame holder hitch are the ones used on the left hand rake. Under normal working conditions a hole position between 4 and 6 should work best (**see fig. 16**). Remove the locking pin from the transport position hole (**see #1, fig. 16**) on the frame holder hitch and select one of the six raking angle adjustments available (**see #2-7, fig. 16**). Once the desired raking angle is selected insert the locking pin through the hole and secure it with the Ø4 hairpin cotter. Adjusting the rake angle will adjust the windrowing width. Lower the rake to the ground so that the rake wheels are carrying the weight at the back of the unit. Select the desired working speed and begin raking.

Note: Depending on the windrow width adjustment of your rake cart, some hole positions may not be used since these will cause rear rake wheels to come in contact with one another.

IMPORTANT: Always make sure the locking lever is engaged and secured with the locking pin before operating the hay rake (see fig. 16).

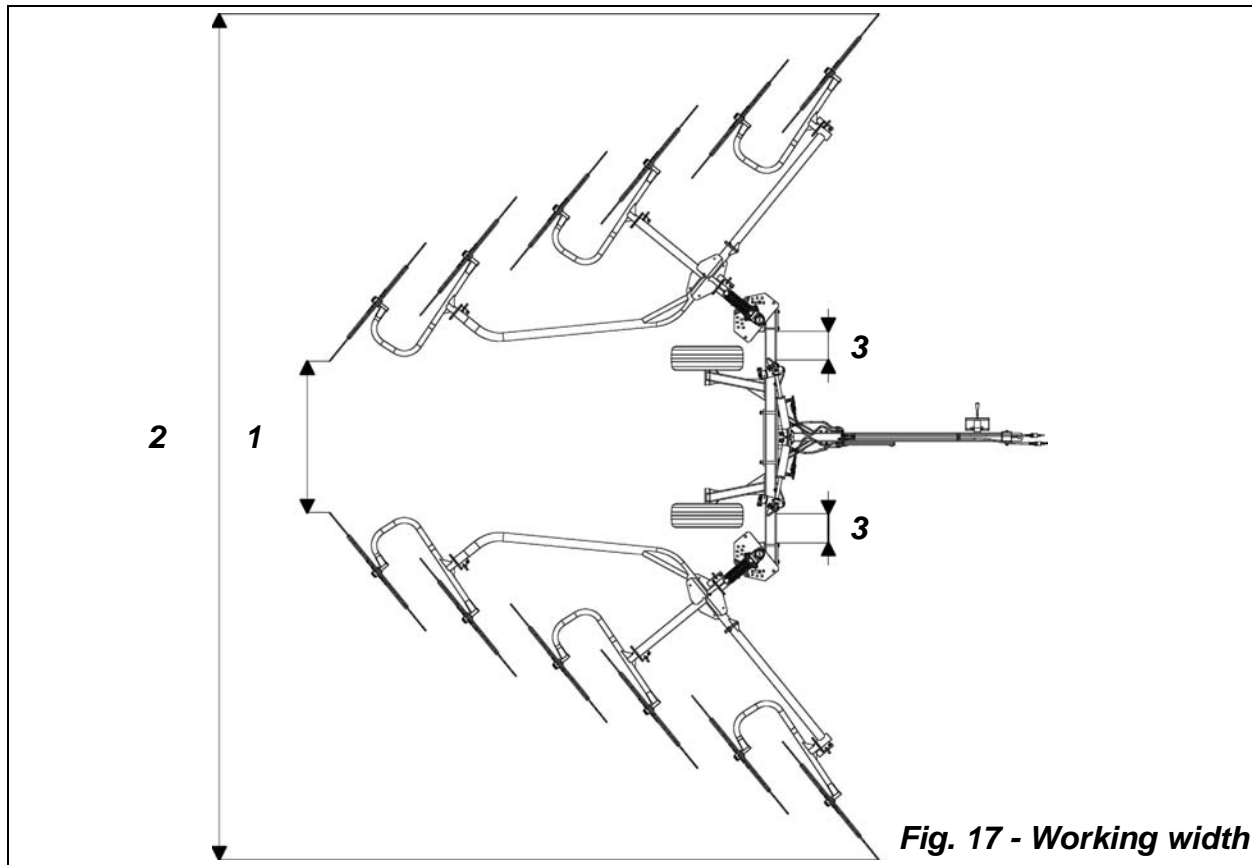


Fig. 17 - Working width

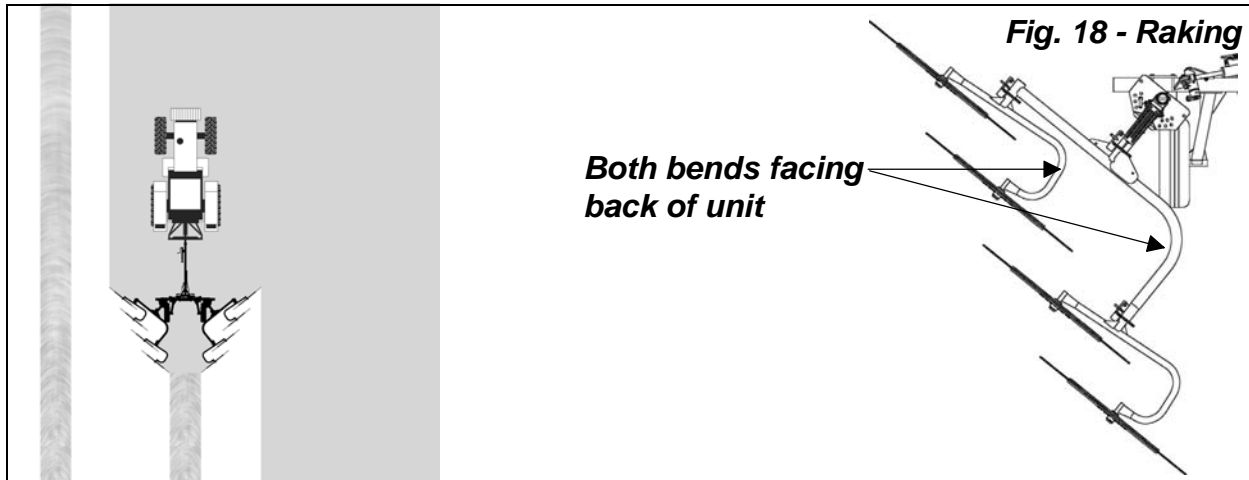
TABLE 1 - WINDROW WIDTHS

| Minimum and maximum working width adjustments | | | |
|---|-------------------|-------------------|----------------------|
| Model | Windrow width (1) | Working width (2) | Adjustable width (3) |
| HRC-08V | | | |
| Minimum adjustable width | 1" | 17'3" | 21" (10.5" per side) |
| Maximum adjustable width | 11'7" | 21'4" | 21" (10.5" per side) |
| HRC-10V | | | |
| Minimum adjustable width | 1" | 18'5" | 21" (10.5" per side) |
| Maximum adjustable width | 11'11" | 23'4" | 21" (10.5" per side) |
| HRC-12V | | | |
| Minimum adjustable width | 1" | 20' | 21" (10.5" per side) |
| Maximum adjustable width | 12'8" | 25'7" | 21" (10.5" per side) |

Note: Working and windrowing widths are approximate.

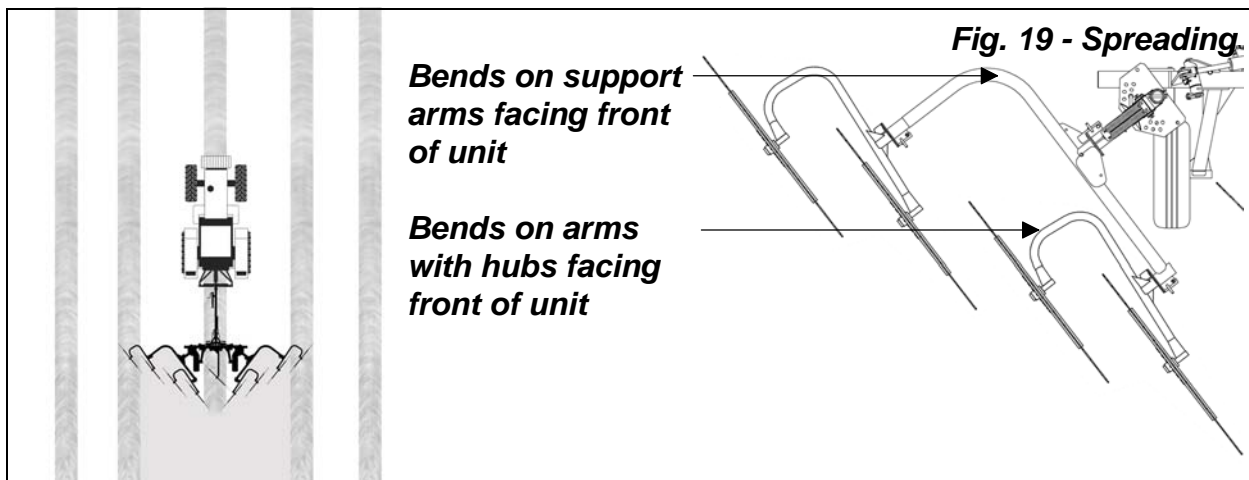
Raking (all models)

In the raking position, the rake wheels overlap front to back moving the crop to the center (**see fig. 18**). Proper raking is obtained by positioning the bends, on both the support arms and the arms with hubs, towards the back of the unit.



Spreading (models HRC-08V, HRC-12V only)

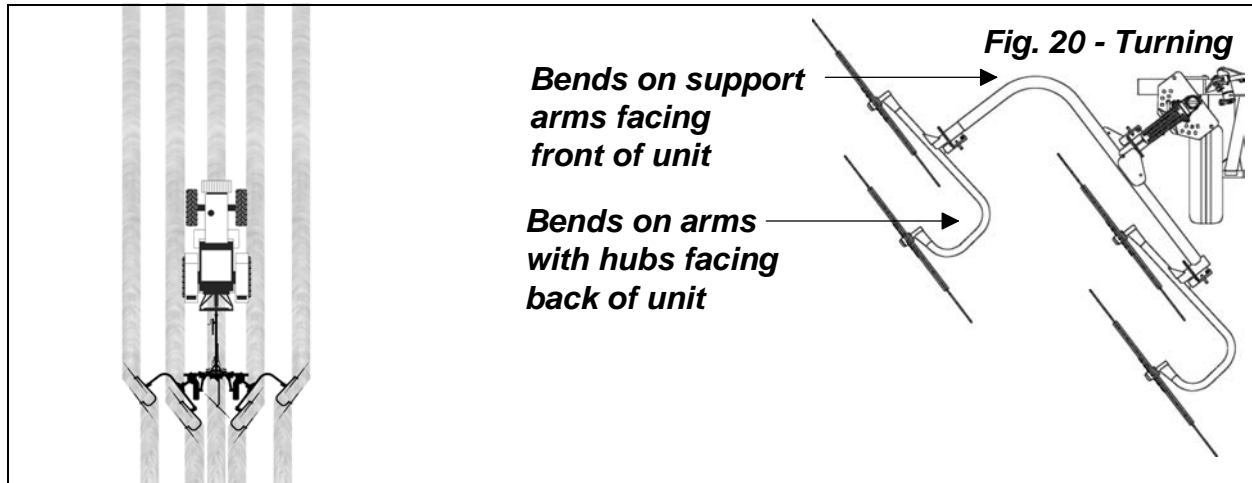
Hay rakes can be used to spread hay that has already been windrowed. This is normally done to help wet hay dry faster. If the machine is assembled in the spreading position, all rake wheels will be aligned causing them to spread the hay across the width of the machine. Proper spreading is obtained by positioning the bend on the support arms and the bends on the arms with hubs towards the tractor, i.e. front of the unit (**see fig. 19**).



Turning (models HRC-08V, HRC-12V only)

In the turning position, each pair of rake wheels overlap front to back turning the forage crop and allowing it to dry faster. In the turning position, the finger wheels are set to work in pairs turning two windrows in each pass. Proper turning is obtained by

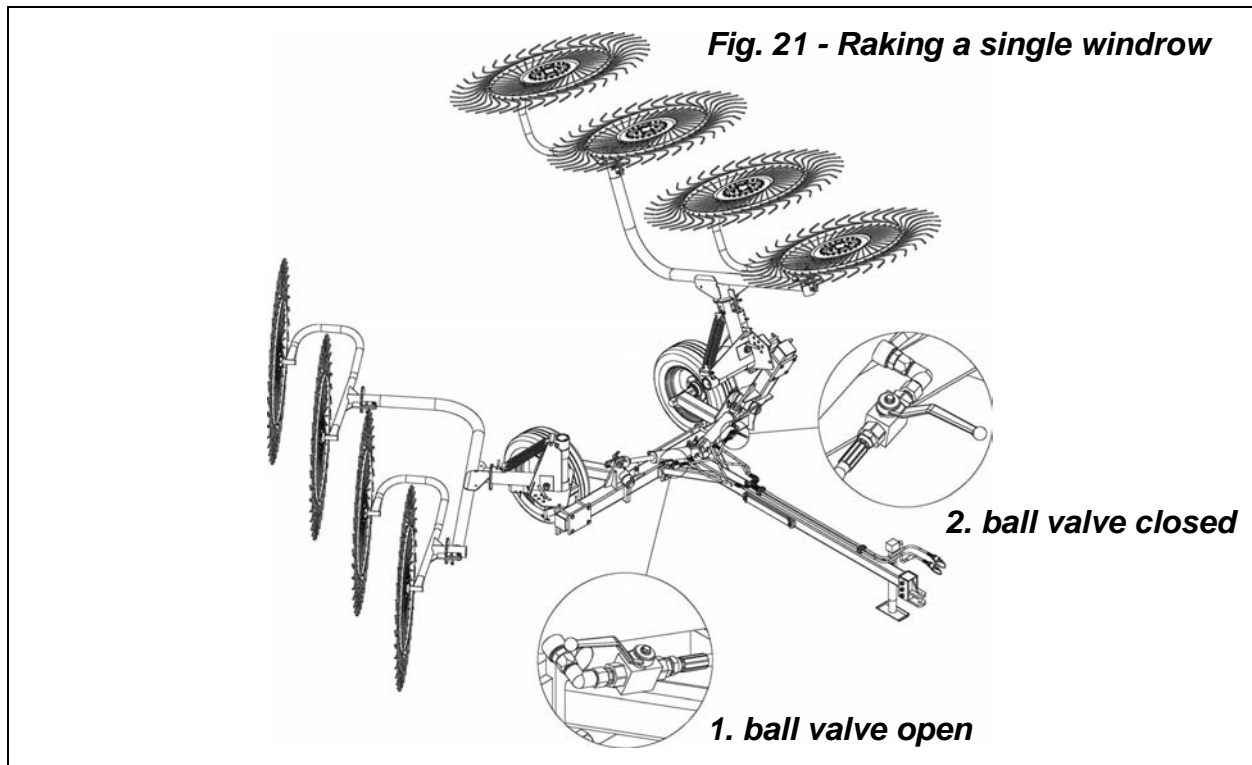
positioning the bend on the support arms towards the tractor and bends on the arms with hubs towards the back of the unit (see fig. 20).



3.09 - Raking a Single Windrow

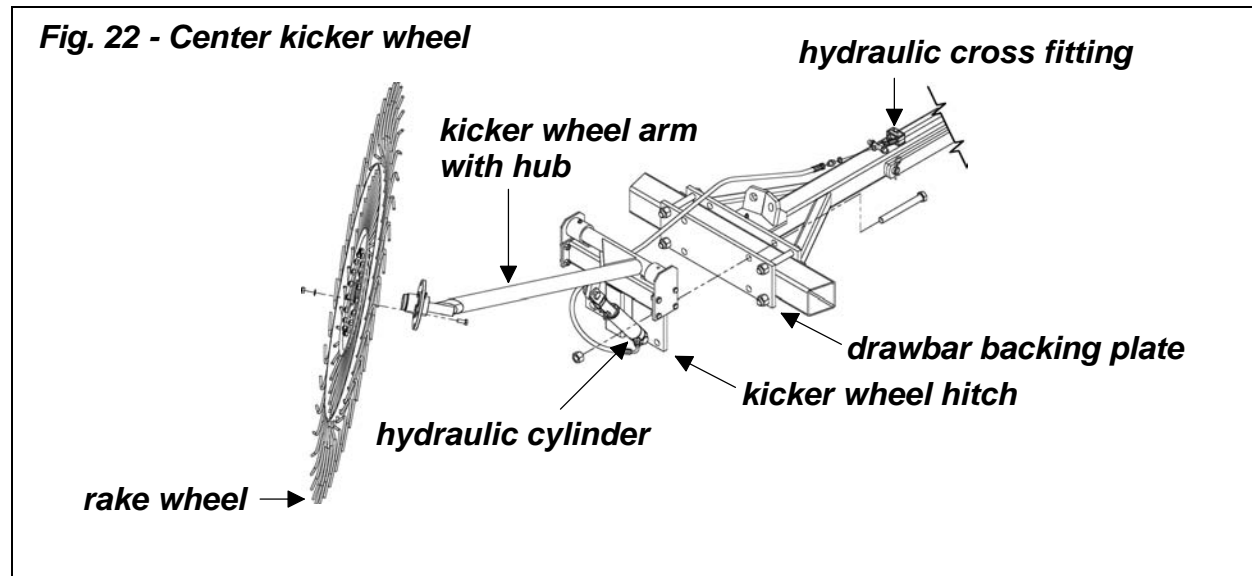
BEFCO hay rake carts can be operated using only the left or right hay rake at one time. With the rake cart in the transport position:

1. Each side of the rake is equipped with a ball valve. Turn the ball valve for the side of the rake that you do not want to use to the closed position (see #2, fig. 21). Leave the ball valve on the other side in the open position (see #1, fig. 21).
2. Push tractor SCV lever to lower desired rake wheels and begin raking.



3.10 - Optional Center Kicker Wheel

The optional center kicker wheel available for our hay rakes, will turn and fluff up the forage in the center of the unit allowing it to dry faster.



To assemble the kicker wheel do the following (see fig. 22):

1. Position the kicker wheel hitch behind the drawbar backing plate, line up the holes and secure it using the M20x180 bolts and M20 nuts.
2. Assemble the hydraulic cylinder with the piston side facing the back of the rake. Attach the cylinder body to the kicker wheel hitch and secure it using the M16 nut. Attach the cylinder yoke to the kicker wheel arm and secure it using the M14x50 bolt and M14 nut.
3. Remove the cap that is on the hydraulic cross fitting of the pressure line and attach the hydraulic hose from the kicker wheel to the cross fitting using the ¼" adaptor and the copper washers between the fittings.
4. Assemble the rake wheel to the hub on the kicker wheel arm with the inner wheel facing the back of the machine and secure it in place using the supplied M10x25 bolts, Ø10 external lock washers and the M10 nuts.
5. Tighten all hardware securely⁸.

IMPORTANT: The hydraulic cylinder comes with a cylinder stop bracket that is used to keep the kicker wheel raised when the rake is being transported. Remember to remove the cylinder stop before operating the rake.



WARNING: High pressure hydraulic oil leaks can penetrate skin resulting in injury, gangrene or death. Be sure to relieve any hydraulic oil pressure before

⁸ Refer to Table 2 - Torque Specifications, page 33.

disconnecting any lines or pipes between rake and tractor hydraulic system. Check for oil leaks using a cardboard, never use hands.

3.11 - Uneven Terrain



DANGER: Be careful of rollover when operating tractor and implement over uneven ground.

The following precautions should always be observed when working on uneven terrain:

1. In extremely uneven terrain rear wheel weights, front tractor weights, and/or tire ballast should be used to improve stability.
2. Observe the type of terrain and develop a safe working pattern.
3. Operate the implement up and down steep slopes, not across slopes, to prevent the tractor from tipping. Avoid sudden stops and starts, and slow down before changing directions on a slope.
4. Pass diagonally through sharp dips and avoid sharp drops to prevent hanging up the tractor and implement.
5. Slow down on sharp turns and slopes to prevent tipping or loss of control.
6. Watch for holes, roots or other hidden objects. Do not use near the edge of a gully, ditch or stream bank.

3.12 - Removing Hay Rake from the Tractor



CAUTION: Set parking brake. Stop engine and remove key from ignition. Disconnect drawbar and carefully drive tractor away from rake.

1. Park hay rake on level and solid ground.
2. Make sure all parts have come to a complete stop.
3. Set parking brake and place transmission in "Park".
4. Stop engine and remove key from ignition.
5. If rake wheels are raised, place safety locking plates (**see fig. 23**) on both hydraulic cylinders and secure them with the hairpin cotters.
6. If the rake cart is equipped with a kicker wheel, place the cylinder stop bracket on the cylinder.
7. Disconnect the hydraulic hose to the tractor remote port and place tractor SCV lever in neutral position. Place jack stand in storage position and secure it with a pin.
8. Remove the hitch pin and safety chain then carefully drive tractor away from rake.

3.13 - Transport



CAUTION: Comply with state and local laws governing safety and movement of farm machinery on public roads. When driving the tractor and equipment on the road under 20 mph, at night or during the day, use flashing amber warning lights and a Slow Moving Vehicle (SMV) identification emblem (not supplied with unit). Do not exceed 20 mph. Reduce speed on rough roads and surfaces. Always install safety locking plates before transporting the hay rake. Drive tractor and rake safely. Do not drink and drive.



CAUTION: Do not tow tractor and implement behind other vehicles. Use a properly equipped trailer with heavy tie-downs for towing operations.

1. Always select a safe ground speed that is appropriate for the terrain. Never travel faster than 20 mph.
2. Beware of traffic on public roads. Install a SMV (Slow Moving Vehicle) sign when traveling on roads or streets. Comply with all federal, state and local laws.
3. Reduce ground speed when turning and take care that the implement does not strike obstacles such as trees, fences or buildings.

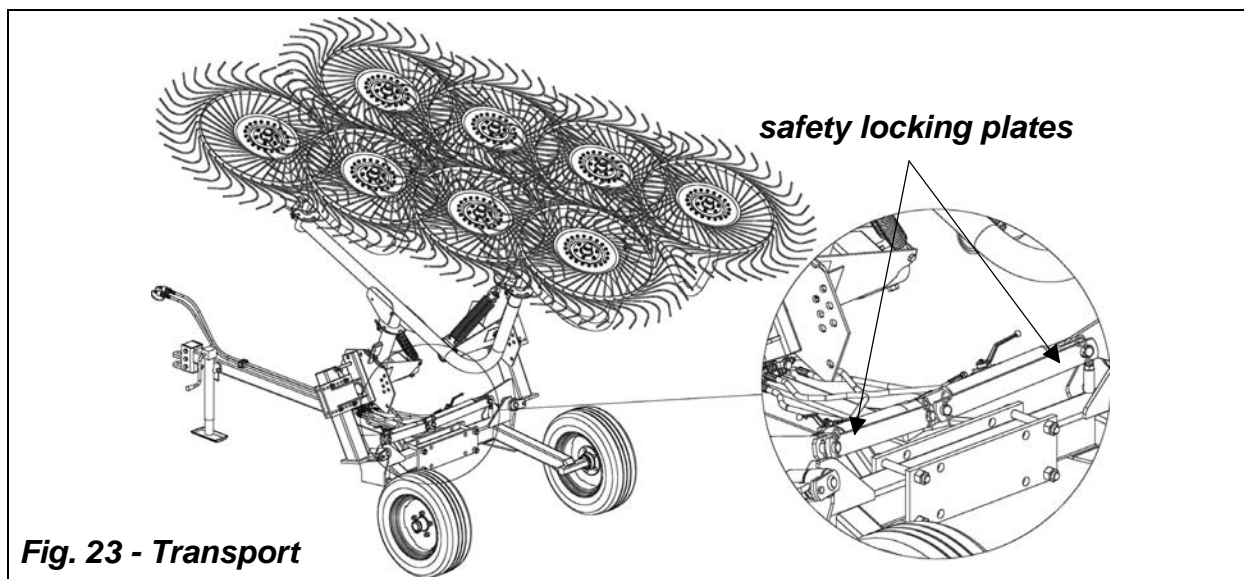


Fig. 23 - Transport

To transport “V” rakes do the following:

1. Use the hydraulic remote to raise rake wheels so that they are barely off the ground.
2. Engage frame lock plates on frame holder hitch and secure them with pins (**see fig. 14**).
3. Use the hydraulic remote to raise the rake in transport position.

4. Turn the ball valves on each side of the rake to the closed position (**see #2, fig. 21**).
5. Place safety locking plates in transport position behind the hydraulic cylinders and secure them with Ø4 hairpin cotters (**see fig. 23**).
6. If the rake cart is equipped with a kicker wheel, place the cylinder stop bracket on the cylinder.
7. When transporting rake on public roads, make sure safety chain and SMV sign are installed. Leave only enough slack in the chain to permit turning. Do not use safety chain for towing.
8. Place jack stand in transport position and secure it with pin.



CAUTION: A safety chain (not supplied with unit) will help control drawn equipment should it accidentally separate from the tractor drawbar. A runaway machine could cause severe injury or death. Leave only enough slack in the chain to permit turning. Do not use safety chain for towing.



DANGER: To avoid bodily injury or death, make sure bystanders are clear of machine when raising or lowering rake wheels. Always install safety locking plates to prevent rake arms from accidentally falling during transport (see fig. 23).

4 - MAINTENANCE



DANGER: Stop engine, lock parking brake and remove key before performing any service or maintenance.

Never rely on the tractor lift system. Install blocks or stands under the implement to prevent it from falling.

Always use personal protection devices, such as glasses or gloves when performing maintenance.

Keep fingers out of slots to prevent injury.

4.01 - Maintenance Safety



1. Good maintenance is your responsibility.
2. Keep service area clean and dry. Be sure electrical outlets and tools are properly grounded. Use adequate light for the job at hand.
3. Make sure there is plenty of ventilation. Never operate the engine of the towing vehicle in a closed building. The exhaust fumes may cause asphyxiation.
4. Make no repair or adjustments with the tractor engine running. Before working on the machine, shut off the engine, set the brakes, and remove the ignition key.
5. Be certain all moving parts have come to a complete stop before attempting to perform maintenance.
6. Never work under equipment unless it is blocked securely.
7. Always use personal protection devices such as eye, hand and hearing protectors, when performing any service or maintenance.
8. Frequently check teeth. They should be free of nicks and cracks and securely fastened.
9. Periodically tighten all bolts, nuts and screws and check that all cotter pins are properly installed to ensure unit is in a safe condition.
10. After servicing, be sure all tools, parts and service equipment are removed.
11. Never replace hex bolts with less than grade five bolts (or class eight for metric bolts) unless otherwise specified, i.e. shear bolts⁹.
12. Where replacement parts are necessary for periodic maintenance and servicing, genuine replacement parts must be used to restore your equipment to original specifications. The Company will not claim responsibility for use of unapproved parts and/or accessories and other damages as a result of their use.

⁹ Refer to Table 2 - Torque Specifications, page 33.

13. Unauthorized modifications to the machine may impair the function and/or safety of the machine and reduce its life. If equipment has been altered in any way from original design, the manufacturer does not accept any liability for injury or warranty.

4.02 - Service

Before each use:

1. Check machine condition, particularly the rake wheels. Check for any loose teeth, bolts or missing hardware.
2. Replace any damaged or worn tooth.
3. Check tire pressure. If necessary inflate tires to tire manufacturer's recommended pressure.

Hourly or whenever an obstacle is hit:

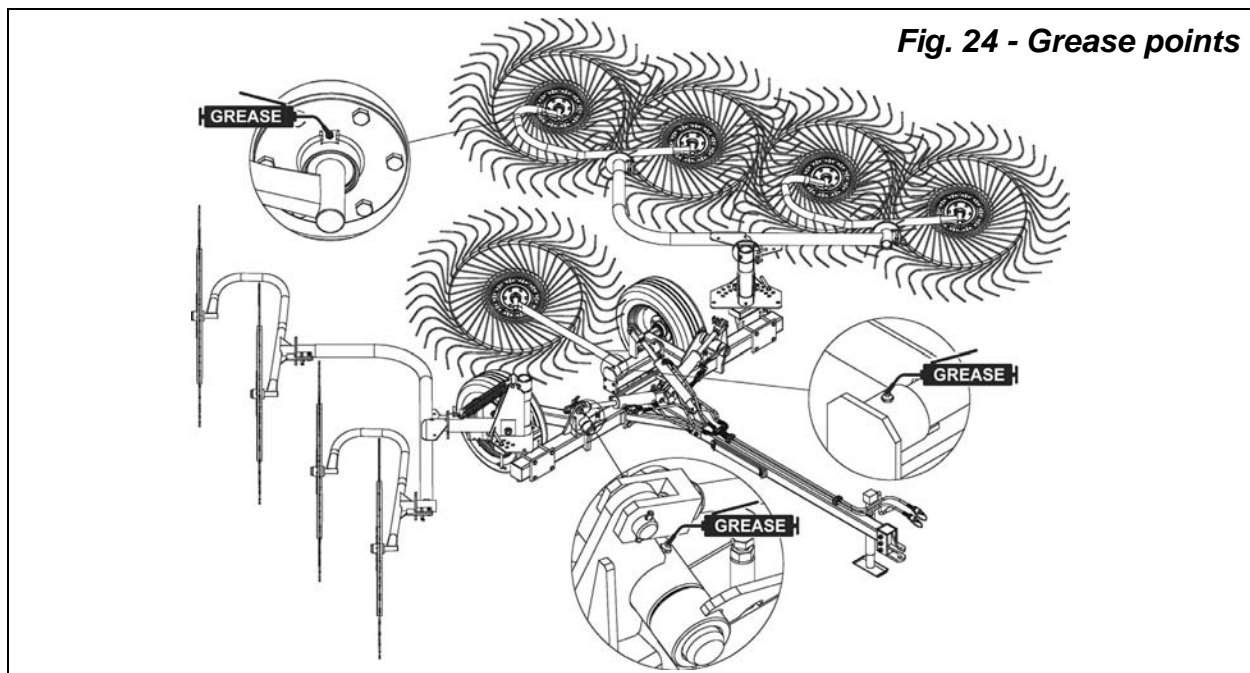
1. Check machine condition, particularly the rake wheel teeth.
2. Replace any damaged or worn tooth.
3. Remove any wrapping (stalks, weeds, trash, etc.) from implement.

Every 8 hours (see fig. 24):

1. Grease fittings on wheel hubs.
2. Grease the two fittings located on each side of the side arms.
3. Grease fittings on kicker wheel (if equipped).







Every 25 hours:

1. Check lug nuts on wheels. If necessary, torque to 90-120 ft./lbs.
2. Check hardware tightness; vibration can loosen bolts¹⁰.



¹⁰ Refer to Table 2 - Torque Specifications, page 33.

TABLE 2 - TORQUE SPECIFICATIONS

| Metric (ISO) treaded bolts head marking |  Class 5.8 |  Class 8.8 |  Class 10.9 | Inch (SAE) treaded bolts head marking |  Grade 2 |  Grade 5 |  Grade 8 | Bolt size | | Thread | | N.m | | ft-lb | |
|--|--|--|---|--|---|--|--|-----------|----|--------|------|------|-------|-------|-------|
| | | | | | | | | mm | mm | inch | inch | mm | ft-lb | mm | ft-lb |
| M5 | 0.8 | 4 | 3 | 6 | 4 | 9 | 7 | 1/4" | 20 | 7 | 5 | 11 | 8 | 16 | 12 |
| M6 | 1 | 6 | 4 | 10 | 7 | 15 | 11 | 1/4" | 28 | 8 | 6 | 13 | 10 | 19 | 14 |
| M8 | 1.25 | 16 | 12 | 25 | 18 | 36 | 27 | 5/16" | 18 | 15 | 11 | 24 | 17 | 33 | 25 |
| M8 | 1 | 17 | 13 | 26 | 19 | 38 | 28 | 5/16" | 24 | 17 | 13 | 26 | 19 | 37 | 27 |
| M10 | 1.5 | 31 | 23 | 48 | 35 | 71 | 52 | 3/8" | 16 | 27 | 20 | 42 | 31 | 59 | 44 |
| M10 | 1.25 | 33 | 24 | 51 | 38 | 75 | 55 | 3/8" | 24 | 31 | 23 | 47 | 35 | 67 | 49 |
| M10 | 1 | 35 | 26 | 53 | 39 | 78 | 58 | 7/16" | 14 | 43 | 32 | 67 | 49 | 95 | 70 |
| M12 | 1.75 | 54 | 40 | 84 | 62 | 123 | 91 | 7/16" | 20 | 48 | 36 | 75 | 55 | 106 | 78 |
| M12 | 1.5 | 56 | 41 | 87 | 64 | 128 | 94 | 1/2" | 13 | 66 | 48 | 102 | 75 | 144 | 106 |
| M12 | 1.25 | 59 | 44 | 90 | 66 | 133 | 98 | 1/2" | 20 | 75 | 55 | 115 | 85 | 163 | 120 |
| M14 | 2 | 84 | 62 | 133 | 98 | 195 | 144 | 9/16" | 12 | 95 | 70 | 147 | 109 | 208 | 154 |
| M14 | 1.5 | 94 | 69 | 142 | 105 | 209 | 154 | 9/16" | 18 | 106 | 79 | 164 | 121 | 232 | 171 |
| M16 | 2 | 131 | 97 | 206 | 152 | 302 | 223 | 5/8" | 11 | 132 | 97 | 203 | 150 | 287 | 212 |
| M16 | 1.5 | 141 | 104 | 218 | 161 | 320 | 236 | 5/8" | 18 | 149 | 110 | 230 | 170 | 325 | 240 |
| M18 | 2.5 | 181 | 133 | 295 | 218 | 421 | 310 | 3/4" | 10 | 233 | 172 | 361 | 266 | 509 | 376 |
| M18 | 2 | 196 | 145 | 311 | 229 | 443 | 327 | 3/4" | 16 | 261 | 192 | 403 | 297 | 569 | 420 |
| M18 | 1.5 | 203 | 150 | 327 | 241 | 465 | 343 | 7/8" | 9 | 226 | 167 | 582 | 430 | 822 | 606 |
| M20 | 2.5 | 256 | 189 | 415 | 306 | 592 | 437 | 7/8" | 14 | 249 | 184 | 642 | 473 | 906 | 668 |
| M20 | 1.5 | 288 | 212 | 454 | 335 | 646 | 476 | 1" | 8 | 339 | 250 | 873 | 644 | 1232 | 909 |
| M22 | 2.5 | 344 | 254 | 567 | 418 | 807 | 595 | 1" | 12 | 371 | 273 | 955 | 704 | 1348 | 995 |
| M22 | 1.5 | 381 | 281 | 613 | 452 | 873 | 644 | 1-1/8" | 7 | 480 | 354 | 1077 | 794 | 1746 | 1288 |
| M24 | 3 | 444 | 327 | 714 | 526 | 1017 | 750 | 1-1/8" | 12 | 539 | 397 | 1208 | 891 | 1958 | 1445 |
| M24 | 2 | 488 | 360 | 769 | 567 | 1095 | 808 | 1-1/4" | 7 | 677 | 500 | 1519 | 1120 | 2463 | 1817 |
| M27 | 3 | 656 | 484 | 1050 | 774 | 1496 | 1103 | 1-1/4" | 12 | 750 | 553 | 1682 | 1241 | 2728 | 2012 |
| M27 | 2 | 719 | 530 | 1119 | 825 | 1594 | 1176 | 1-3/8" | 6 | 888 | 655 | 1992 | 1469 | 3230 | 2382 |
| M30 | 3.5 | 906 | 668 | 1420 | 1047 | 2033 | 1499 | 1-3/8" | 12 | 1011 | 746 | 2268 | 1673 | 3677 | 2712 |
| M30 | 2 | 1000 | 738 | 1600 | 1180 | 2250 | 1659 | 1-1/2" | 6 | 1179 | 869 | 2643 | 1949 | 4286 | 3161 |
| M36 | 4 | 1534 | 1131 | 2482 | 1830 | 3535 | 2607 | 1-1/2" | 12 | 1326 | 978 | 2974 | 2194 | 4823 | 3557 |

When using lock washers with nuts, increase torque values by 5%.

TABLE 3 - "V" HAY RAKES - TECHNICAL FEATURES

| Pull-type "V" Hay Rakes for tractors up to 80 HP | | | | | | | | | | |
|--|-------|------------------|----------------|-----------------|----------------|---------------|-----------------|------------------|---------------|------------|
| Model | HP | Number of wheels | Wheel diameter | Teeth per wheel | Teeth diameter | Working width | Transport width | Transport height | Working speed | Weight lb. |
| HRC-08V | 30-80 | 8 | 56" | 40 | 9/32" | 21'4" | 8' | 8'10" | 14 mph | 1290 |
| HRC-10V | 30-80 | 10 | 56" | 40 | 9/32" | 23'4" | 8' | 10' | 14 mph | 1457 |
| HRC-12V | 30-80 | 12 | 56" | 40 | 9/32" | 25'7" | 8' | 12'1" | 14 mph | 1623 |

5 - REPAIR PROCEDURES



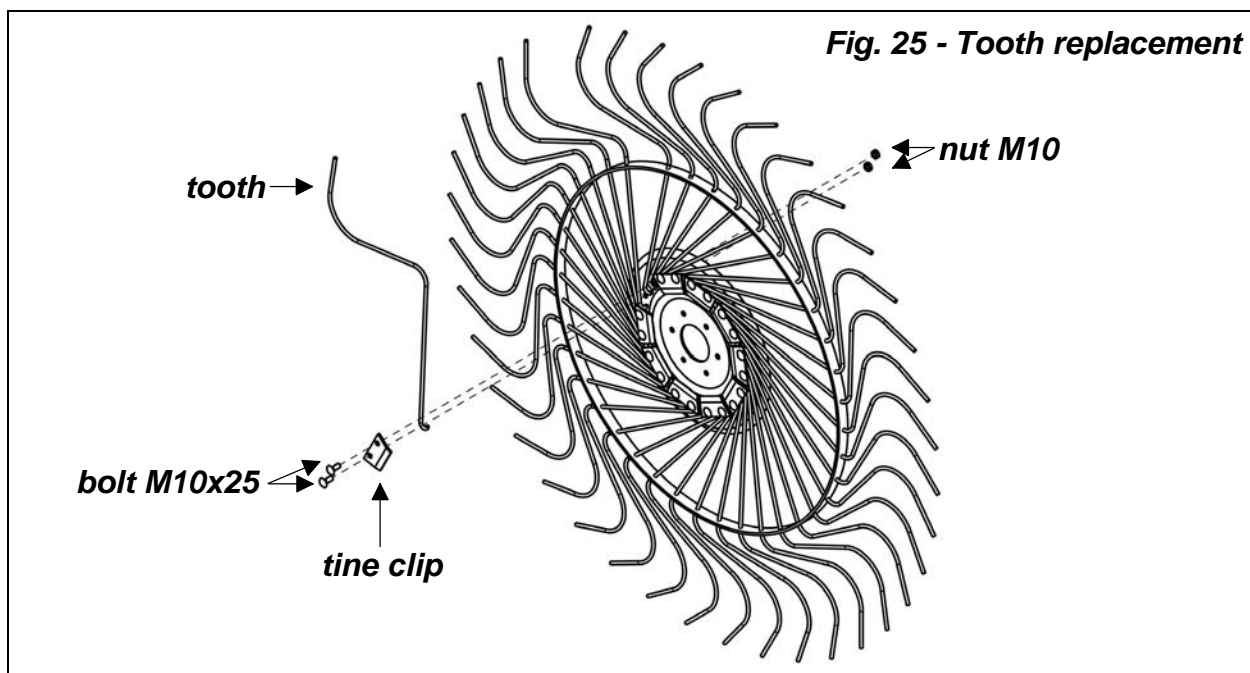
CAUTION: All repair procedures must be done by authorized dealerships. It is not recommended that untrained individuals perform any repair work. The following operations are detailed for qualified personnel only. Never work under the implement without properly blocking the unit.

5.01 - Rake Teeth Replacement

Teeth replacement is part of the regular maintenance that the operator will have to perform when using a hay rake. Rake teeth should be replaced when they are damaged, have lost their original shape or when they are worn to a point that forage is not being raked properly anymore.

To replace individual teeth do the following (see fig. 25):

1. Loosen the M10 nuts and remove the two M10x25 carriage bolts on the tine clip securing the damaged or worn tooth.
2. Slide the damaged tooth out of the wheel rake outer wheel frame and replace it with a new tooth.
3. Reassemble the tine clip using the M10x25 carriage bolts and secure it with the M10 nuts.

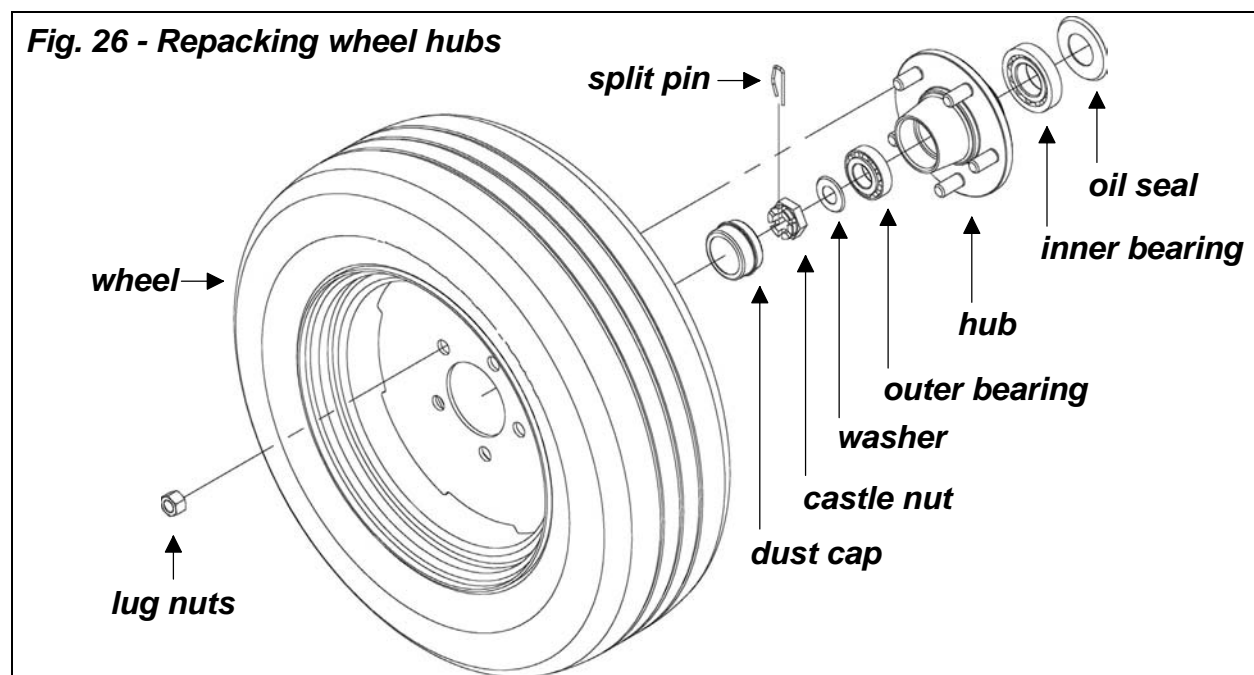


5.02 - Repacking Transport Wheel Hubs

Before storing the machine at the end of a work season, make sure to repack grease inside the wheel hubs. This will allow for bearings to remain properly greased while in storage and prevent rusting and premature failures.

To repack grease in transport wheel hubs do the following (see fig. 26):

1. Disassemble wheel and hub and remove inner bearing.
2. Remove and inspect the seal. Replace any bearing or seal that appears to be damaged.
3. Clean all parts in solvent and allow them to dry, then pack wheel bearings with SAE multipurpose grease. Reassemble wheel bearings and wheel hubs on machine.
4. Install seal and inner bearing into hub and mount on spindle.
5. Install outer bearing, washer and castle nut. Tighten the castle nut until the wheel drags a little when turned. Back off nut $\frac{1}{4}$ of a turn or until first slot on nut lines up with hole in spindle then install split pin.
6. Install dust cap and wheel. Torque lug nuts to 90-120 ft./lbs.



5.03 - Suggested Spare Parts

It is suggested that the following spare parts be kept on hand for the implement at all times to prevent a minor problem from delaying work.

| Description | Quantity |
|------------------------------|----------|
| Teeth | 20 |
| Carriage bolts M10x25 & nuts | 10 |

5.04 - Storage

After seasonal use it is important to perform the following for prolonged storage:

1. Wash the implement carefully.
2. Inspect the implement and replace worn or damaged parts.
3. Tighten all hardware¹¹.
4. Grease all areas indicated under Maintenance¹².
5. Touch up scratches by sanding the area and applying a light coat of primer and paint to prevent rust from forming.
6. Apply a layer of grease to exposed part of hydraulic cylinder rods to prevent rusting.
7. Apply a thin layer of grease to rake teeth to prevent them from rusting.
8. Repack all grease in transport wheel hubs¹³.
9. Check hydraulic hoses for deterioration and replace them if necessary.
10. Paint exposed metal to inhibit rusting.
11. Replace damaged or missing safety decals.
12. Cover the implement from the elements in order to have it in perfect condition for the start of the next season.

| Touch up paint available: | |
|----------------------------------|---|
| Part # | Description |
| 7300007 | Primer, gray - aerosol spray can |
| 7300008 | Paint, Befco orange - aerosol spray can |
| 7300010 | Paint, Befco black - aerosol spray can |



WARNING: Be sure to store the implement on a hard level surface and away from people especially children.

¹¹ Refer to Table 2 - Torque Specifications, page 33.

¹² See Chapter 4 - Maintenance.

¹³ See Section 5.02 - Repacking Transport Wheel Hubs.

6 - TROUBLESHOOTING



WARNING: Be sure tractor engine is off, parking brake is locked, and key is removed before making any adjustments.

| PROBLEM | POSSIBLE CAUSE | SOLUTION |
|----------------------------------|---|---|
| Hydraulic system not working. | Hydraulic oil level too low in tractor. Quick coupler not connected. Remote outlet valve not activated. | Check tractor's operator manual for correct level and refill if necessary. Connect quick coupler to tractor's remote. Open remote hydraulic outlet valve. |
| Wheel does not unload hay. | New teeth. Wet hay. Mud on teeth ends. | Run rake wheels on gravel road for a short distance. Allow hay to dry. Adjust rake so teeth do not run so heavy on the ground. |
| Rake is missing hay. | Rake wheels too high. Rake wheel turning too straight. Teeth missing or heavily worn. Excessive ground pressure. | Adjust rake wheels lower to ground. Adjust angle of rake (see fig. 16). Replace teeth so all are same length. Bolt lower spring clip to hole further away from springs to reduce ground pressure (see fig. 14). Assemble frame holder hitch to a higher position (see fig. 15). |
| Hay bunching. | Incorrect ground speed. Wheels are stalling. Very light, fluffy hay, hay getting caught in wheel supports. | Adjust ground speed. Level drawbar. Run at an angle to the hay or early in the morning when hay is damp. |
| Individual wheel is not turning. | Insufficient lubrication. Bearing failure. Excessive ground pressure. | Grease rake wheel. Replace bearing. Bolt lower spring clip to hole further away from springs to reduce ground pressure (see fig. 14). Assemble frame holder hitch to a higher position (see fig. 15). |

| PROBLEM | POSSIBLE CAUSE | SOLUTION |
|----------------------------|--|--|
| Teeth breaking. | Backing up with teeth on the ground. Teeth have become corroded. Excessive ground speed. Excessive ground pressure. | Raise rake before backing up. Protect teeth from weather or treat with rust retardant. Reduce ground speed. Bolt lower spring clip to hole further away from springs to reduce ground pressure (see fig. 14). Assemble frame holder hitch to a higher position (see fig. 15). |
| Teeth bending. | Backing up with teeth on the ground. Excessive speed on rough terrain. | Raise rake before backing up. Reduce speed. |
| Rake outer wheel breaking. | Excessive ground speed. Excessive ground pressure. | Reduce ground speed. Bolt lower spring clip to hole further away from springs to reduce ground pressure (see fig. 14). Assemble frame holder hitch to a higher position (see fig. 15). |

7 - PRE-DELIVERY CHECKLIST

To the dealer: Inspect the machine thoroughly after assembly to assure it is functioning properly before delivering it to the customer. The following checklist is a reminder of points to cover. Check off each item as it is found satisfactory or after proper adjustment is made.

- Guards and shield properly fastened.
- Lubrication of grease fittings.
- All hardware properly tightened.
- All decals properly located and readable (**see fig. 2**).
- Tines properly installed, bolts and nuts tightened.
- Overall condition (touch up scratches, clean and polish).
- Test run, check for excessive vibration or overheating of bearings.
- Operator's Manual.

Review the Operator's Manual with the customer. Explain the following:

- Warranty.
- Safe operation and service.
- Correct machine installation and operation.
- Daily and periodic lubrication, maintenance and inspections.
- Troubleshooting.
- Operational procedures and storage.
- Parts and service.
- Fill out the Pre-Delivery Checklist and Warranty Registration form.
- Give customer the Operator's Manual and encourage the customer to read the manual carefully.

IMPORTANT: Warranty is not valid unless Pre-Delivery Checklist and Warranty Registration form in Operator's Manual is completed in detail and mailed to the Company.

Model Number: _____

Serial Number: _____

Delivery Date: _____

Dealer's Signature: _____

8 - WARRANTY

BEFCO's responsibility will be limited to substitution of the acknowledged defective merchandise to the same place of delivery as the previous one was supplied.

1. LIMITED WARRANTY

BEFCO, Inc. herein referred to as the Company, warrants its machines and related accessories, hereafter referred to as the Machine, to be free from defects in material and workmanship, for a period of twelve (12) months from the date of invoice to the first registered owner; this limited warranty does not apply to common wear items and excludes belts, shear pins, oil, grease, tires, tubes, hydraulic hoses, knives and PTO shafts.

Labor will be reimbursed at \$40.00 per hour based on BEFCO's time schedule.

Cost of transport to the servicing dealer is the responsibility of the customer.

Warranty coverage shall not be transferable from the first owner to any subsequent owner.

2. DISCLAIMER OF ALL OTHER WARRANTIES AND REMEDIES

Neither the Company nor any company affiliated with the Company makes any warranties, representations or promises, expressed or implied, as to the quality, performance or application of its products other than those set forth herein and does not make any implied warranty of merchantability or fitness.

The only remedies the purchaser has in connection with the breach, or performance of any warranty on the Company's Machine are those set forth herein. In no event will the dealer, the Company, or any company affiliated with the Company, be liable for:

- a. Injuries or damages of any kind or nature, direct, consequential or contingent to person or property.
- b. Any expenses incurred by the owner to repair, replace or rework any allegedly defective item.
- c. Any loss, cost, forfeiture or damages (including loss of profits; loss of crops; loss because of delay in field operations; any expenses or loss incurred for labor, supplies, substitute machine rental; liabilities of the owner to its customers or third persons; and all other consequential damages, losses, liabilities or damages for any other reasons) whether direct or indirect, and whether or not resulting from or contributed to by the default or negligence of the Company, its agents, employees and subcontractors which might be claimed as a result of the use or failure of the equipment delivered.

The Company's liability based on this limited warranty or any other applicable laws shall be limited to replacement or refund of the purchase price of the product.

The limited warranty extended herein gives you specific rights and you may also have other rights which vary from state to state. Neither the dealer nor the Company personnel has the authority to make any representation or to modify the terms and limitations of this warranty in any way.

Other than the limited warranty extended hereby there is no other expressed warranty in connection with the design, safety or use of any of the Company's products except as to title. All implied warranties are expressly disclaimed pursuant to the terms of this warranty.

3. CUSTOM WORK

If the Machine is used for commercial purposes such as custom work, the period warranted for the Machine is limited to six (6) months from the date of delivery to the first registered owner and does not cover any labor charges incurred.

4. RENTAL

If the Machine is used for rental purposes the period warranted for the Machine is limited to thirty (30) days from the date of delivery to the first registered owner and does not cover any labor charges incurred.

5. REGISTRATION

In order to qualify for coverage on this limited warranty, the product and name of the original purchaser must be registered with the Company by a completed Machine Pre-Delivery Checklist and Warranty Registration along with a copy of the dealer's invoice to the first registered owner to the Company within fourteen (14) days after the date of delivery to the original purchaser.

6. WARRANTY SERVICE

Warranty Service must be performed by a dealer authorized by BEFCO. If the warranty service requested is approved, the owner shall pay only for labor beyond the rate allowed, for overtime labor, and for any mileage charge for transporting the equipment to and from the dealer's shop. It is assumed that the dealer has the appropriate general and special tools to service the machine. Time required for replacement of knives, oil, grease and to remove excessive dirt from the Machine is not subject to reimbursement by the Company. The owner is required to clean the Machine before presenting it to the dealer for service work. The Machine must be delivered within thirty (30) days after failure date by the owner to the dealer to be eligible for warranty consideration.

7. UNAPPROVED SERVICE OR MODIFICATION

All obligations of the Company under this limited warranty shall be terminated if:

- a. Proper service and operation instructions as outlined in the Operator's Manual and on the instruction sticker on the Machine, are not followed.
- b. The Machine is modified or altered in any way not approved by the Company.
- c. The Company does not receive a copy of the dealers invoice to the first registered owner within fourteen (14) days from the date of delivery.
- d. The Company has not been paid in full, by the dealer, for the Machine.

8. ACCIDENTS AND NORMAL MAINTENANCE

This limited warranty covers defective material and workmanship. It does not cover depreciation or damage caused by normal wear, accidents, improper maintenance, improper protection or improper use. The costs of normal maintenance or repairs for accidents or improper use, and related labor will be borne by the owner.

9. REPLACEMENT PARTS

BEFCO, Inc. warrants replacement parts to be free from defect in material and workmanship for a period of thirty (30) days from the date of delivery to the original purchaser.

WARRANTY REGISTRATION

BEFCO, Inc.
P.O. Box 6036
Rocky Mount, NC 27802-6036

Tel: (252) 977.9920 - Fax: (252) 977.9718

| | |
|---|---|
| Dealer _____ Acct. # _____ | Retail Customer _____ |
| Street _____ Country _____ | Street _____ |
| Town _____ State _____ Zip _____ | Town _____ State _____ Zip _____ |
| Date of delivery _____ Invoice # _____ | Phone _____ |
| Model # _____ Serial # _____ | |
| <p>Pre-Delivery Checklist:</p> <p><input type="checkbox"/> Greased fittings.</p> <p><input type="checkbox"/> Safety guards in place.</p> <p><input type="checkbox"/> All hardware tight.</p> <p><input type="checkbox"/> Bolts torqued correctly.</p> <p><input type="checkbox"/> Attached unit to tractor. Yes/No.</p> <p><input type="checkbox"/> Field adjusted. Yes/No.</p> <p><input type="checkbox"/> Test run. Dry/Infield.</p> <p><input type="checkbox"/> Safety decals.</p> <p><input type="checkbox"/> Operator's Manual.</p> <p>The machine described above, had been prepared for delivery according to the Pre-Delivery Checklist and the Customer has been instructed in its care and operation and the condition of warranty.</p> | <p>Tractor make: _____</p> <p>Model: _____; HP _____</p> <p>Type of operation: Private homeowner, Landscaping, Commercial maintenance, Golf Course, Municipality, Turf Farm, others: _____</p> <p>Approximate number of acres machine will be used on annually: _____</p> <p>I hereby acknowledge that: I have received and accepted delivery of the machine described. The equipment was checked thoroughly for loose or missing parts and has been adjusted in accordance with the Pre-Delivery Checklist. I have read and understand the nature and extent of the warranty and understand clearly that there were and are no other representations of warranties either expressed or implied, made by anyone. I have been advised on proper operation, maintenance and lubrication procedure of this equipment. I have been instructed on and do understand the application, limitation and capacities this equipment was designed and recommended for, all as described in the Operator's Manual and literature published by the Company.</p> |
| Inspected by: _____ | |
| Date: _____ | Date: _____ |
| Dealer's Signature: _____ | Customer's Signature: _____ |

This registration along with a copy of the invoice must be sent to BEFCO, Inc. within 14 days of date of purchase.

Sender:

Fold here

*Place stamp
here*

BEFCO, Inc.

Warranty Department

P.O. Box 6036

Rocky Mount, NC 27802-6036

Cut along this line



Use only original spare parts

All rights reserved. It is unlawful to copy, reprint or use any of the information or details in this manual without the expressed written permission of the Company. Technical information provided in this manual is approximate, the Company reserves the right to modify or improve the models shown for technical or commercial purposes. Pictures in this manual do not necessarily show the machine as delivered.

BEFCO[®]

P.O. Box 6036
Rocky Mount, NC 27802-6036
Tel.: 252.977.9920 - Fax: 252.977.9718
www.befco.com

