

# **DARF**

## **HAY RAKES**

### **OWNER'S AND PARTS MANUAL**



## **Model 1017L**

Manufactured by  
**NIKKEL IRON WORKS CORP.**  
Shafter, California



*Read, Follow, and Understand this  
manual that provides information  
and procedures to safely operate  
and maintain the hay rake.*



Revised November 2021



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# Introduction

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## **WARNING**

**To prevent personal injury or even death, be sure you read, understand, and follow all of the instructions in this manual and other related OEM equipment manuals! The rake, if not used and maintained properly, can be dangerous to users unfamiliar with its operation. Do not allow operating, maintaining, adjusting, or cleaning of this rake until the user has developed a thorough understanding of the safety precautions and functions of the unit.**

**This rake is designed for the specific purpose of raking hay and other forage crops. DO NOT modify or use this rake for any application other than that for which it was designed.**

**Rakes maintained or operated improperly or by untrained personnel can be dangerous; exposing the user and bystanders to severe injury or even death.**

## **Engineered For Long Life**

Thank you for purchasing a DARF 1017L Hay Rake. We hope it will provide you with many years of productive use. The rake is designed to be pulled by a properly sized tractor with a Roll-Over Protective Structure (ROPS) or a pickup truck (refer to the Specifications section in this manual for additional details). The intended purpose of this rake (unit) is to windrow forage for harvesting. Do not use this unit for any other purpose than its intended design. All product users must read, understand, and follow the information provided in this manual, and other related equipment manuals, before using the unit. This manual is considered an essential part of safe operation and should be stored in the "manual storage tube" attached to the frame for easy reference. Do not allow anyone to operate or maintain this unit that has not read and fully comprehend the processes and procedures contained within this manual. Failure to follow the recommended procedures may result in equipment damage, personal injury, or even death to the user or bystanders.

The intent of this manual is to provide general guidelines that cover the proper use of the unit. The information contained in this manual also helps to assist you in avoiding equipment damage which may lead to an accident or injury. This information is designed to help owners and operators obtain the safest and most efficient results from your investment in the 1017L Hay Rake. The life of any unit depends largely on proper, scheduled maintenance of the unit (refer to the Maintenance section for additional information). If for any reason you do not understand the instructions or safety requirements for operating this unit, please contact your authorized dealer.

There may be times when circumstances occur that are not covered in this manual. At those times it is best to use common sense. Make sure the procedure or process you choose is safe for the user, operator, or possible bystanders. If you are in doubt of anything which could lead to damage to the unit or personal injury, contact your authorized dealer.

Some photographs, diagrams, or illustrations in this manual may show guards or shields removed to aid in clarity and understanding of a particular procedure. All guards, shields, or safety devices must be in their proper position and working order before operation.

Left-hand and right-hand sides are viewed from the rear, as if you were sitting in the driver seat of the tractor.

We urge you to make safety your top priority when using and maintaining this unit. Read, understand, and follow the information in this manual before operating or maintaining your 1017L DARF Hay Rake.



## Serial Number Location

The serial number is located under the right side of the overhead main frame.



Serial Number: \_\_\_\_\_

Model Information: \_\_\_\_\_

Date Purchased: \_\_\_\_\_

## Dealer Contact Information

Name: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## Factory Contact Information

NIKKEL IRON WORKS CORP.  
17045 Central Valley Highway  
Shafter, CA 93263

661.746.4904 or 800.342.9222 (Phone)  
661.746.4905 (Fax)

sales@nikkelironworks.com  
www.nikkelironworks.com

## Disposal of Equipment at End of Useful Life

This unit has been designed for the specific purpose of raking hay and other forage crops. When this unit is no longer capable of doing its designed purpose, it should be dismantled and scrapped. Do not use any materials or components from this unit for any other purpose.

# Safety

## General

Safety of the operator and any bystanders is one of the key objectives in designing and developing a new piece of equipment. Designers and manufacturers integrate as many safety features as possible. However, every year, many accidents occur which could have been avoided by a few seconds of thought and a more careful approach to handling the situation.

Most work-related accidents are caused by failure to observe basic safety rules or precautions. An accident can often be avoided by recognizing potentially hazardous situations before an accident occurs. As you operate and maintain the unit you must be alert to potential hazards and have the necessary training, skills, and tools to perform any required tasks.

Improper operation or maintenance of this unit could cause a dangerous situation that results in injury or death.

Do not use this unit until you read and understand the information contained in this manual. Do not use the unit for anything other than its intended purpose.

 **WARNING**  Do not use the unit until you read and understand the information contained in this manual.

Safety precautions and warnings are provided in this manual and on the unit. If these warnings are not followed, bodily injury or death could occur to you or other persons.

Nikkel Iron Works cannot anticipate every possible circumstance that might involve a potential hazard. The warnings in this manual and on the product are, therefore, not all-inclusive. If a method of operation not specifically recommended by us is used, you must satisfy yourself that it is safe for you and others. You should also ensure that the unit will not be damaged or be made unsafe by the methods that you choose.

The information, specifications, and illustrations in this manual are based on the information that was available at the time this material was written and can change at any time.

## Safety Alert Symbol



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.


This manual may contain content for DANGER, WARNING, CAUTION, IMPORTANT NOTICE, and SAFETY INSTRUCTION references which must be followed to prevent the possibility of improper service, damage to the equipment, personal injury, or death. The following key words call the readers attention to potential hazards.

Hazards are identified by the "Safety Alert Symbol" and followed by a signal word such as "DANGER", "WARNING", or "CAUTION".

 **DANGER** Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is limited to the most extreme situations.

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

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

 **NOTICE** Indicates that equipment or property damage can result if instructions are not followed.

 **SAFETY INSTRUCTIONS** Safety instructions (or equivalent) signs indicate specific safety-related instructions or procedures.

*Note: Contains additional information important to a procedure.*

## Safety Icons Nomenclature

This manual and the equipment have numerous safety symbols. These safety symbols indicate important information about personal injury hazards.







### Personal Protection / Important Information

-  Read the manual
-  Maintenance procedure
-  Eye protection
-  Hand protection
-  Install transport lock
-  Use proper tools
-  Warning decal alert
-  Stop machine engine
-  Remove key
-  Roll Over Protection
-  Stop engine
-  Set parking brake
-  Think safety reminder

### Hazard Avoidance

-  Safety alert symbol
-  Crushing hazard
-  Hose damage hazard
-  High pressure fluid hazard
-  Zero pressure
-  Defective or broken part
-  Maintain safe distance
-  Pinch point hazard
-  Explosive force hazard
-  Zero pressure
-  Roll over hazard
-  Roll over hazard

### Prohibited Actions

-  Do not
-  No alcohol
-  No drugs
-  No riders
-  No children
-  Do not weld

## Safety Sign And Decal Locations


**⚠ WARNING**  To prevent serious injury or death from not following posted safety instructions, make sure all decals are attached to the unit and are legible at all times.

Safety decals provide a vital role in helping to reduce injuries and/or possibly even death. To ensure the greatest level of safety, all decals must be in place and legible at all times. Remember, it is the user's responsibility to maintain these decals.


All decals must be in place and legible or all warranties are void. If safety signs or decals have been damaged, new ones must be applied. Contact your authorized dealer for replacements.

<b>⚠ WARNING</b>	
<b>CRUSH HAZARD</b>	
	<p>To prevent serious injury or death:</p> <ul style="list-style-type: none"> <li>• Do not stand between implement and moving tractor.</li> <li>• Stop engine and set parking brake before installing hitch pin.</li> </ul>

The crush hazard decal is located on the jack side of the tongue near the hitch.

<b>⚠ WARNING</b>	
Escaping hydraulic fluid under pressure, even a pinhole size leak, can penetrate body tissue, causing serious injury or possible death. If fluid is injected into your skin, it must be treated immediately by a doctor familiar with this type of injury.	
	<ul style="list-style-type: none"> <li>• Check or tighten all connections BEFORE applying pressure.</li> <li>• Release all pressure before removing a hose, fitting, or valve by:               <ol style="list-style-type: none"> <li>a. Stopping the engine.</li> <li>b. Moving all hydraulic control levers into a float position.</li> </ol> </li> <li>• DO NOT use your bare hand to check for potential leaks. Always use a board or cardboard when checking for a leak.</li> </ul>

The high-pressure fluid decal is located on both raking frames near the lift cylinders, on the tongue near the hitch, and near the valve manifold cover.

<b>⚠ WARNING</b>	
	<p>To prevent serious injury or death:</p> <ul style="list-style-type: none"> <li>• Install cylinder locks whenever implement is in a transport configuration.</li> <li>• Do not transport implement with cylinder locks removed.</li> </ul>

The cylinder lock decal is located on both raking frames ahead of the leg strut, near the swing cylinders.

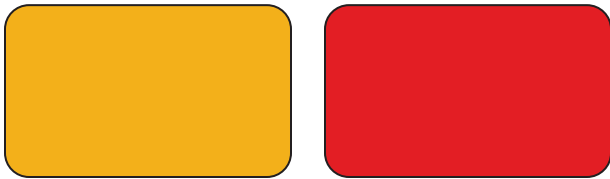




SMV (slow moving vehicle) emblem located on the rear of the rake.



California Proposition 65 sticker located on various items.



Amber and red reflective decals are located on the ends of the raking frames.

## General Safety Guidelines



Do not operate or maintain this unit under the influence of drugs or alcohol. Consult your doctor before using this wheel rake while taking prescription medications.



Do not read, eat, drink, talk, text, or use a cell phone while using this equipment. Never use alcohol or drugs when operating this piece of equipment.



Stay clear of moving parts such as rake wheels, cylinders, couplings, and universal joints. Review the safety instructions and precautions annually.

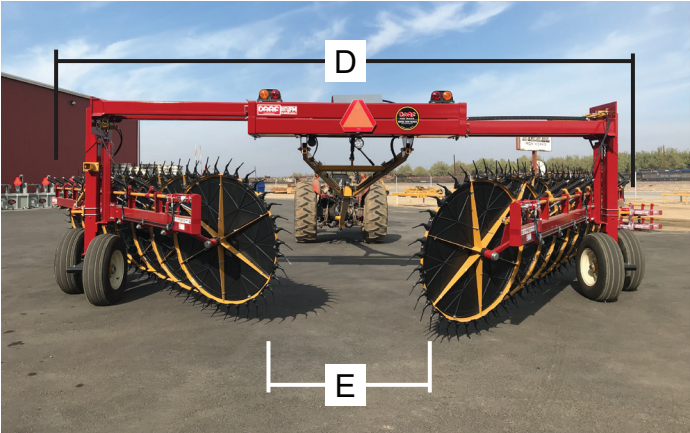
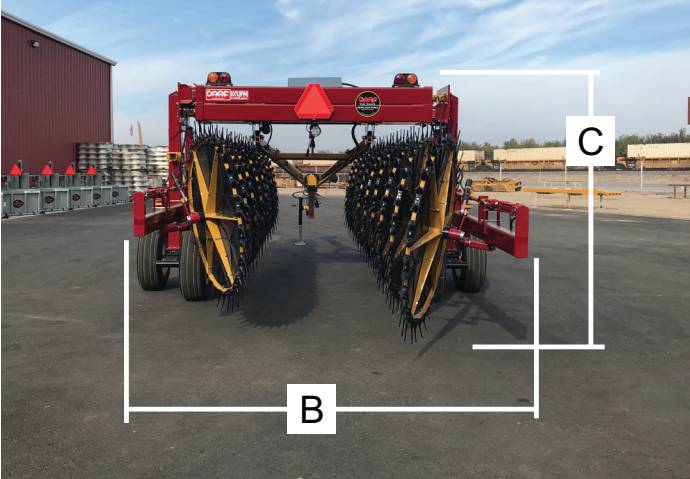
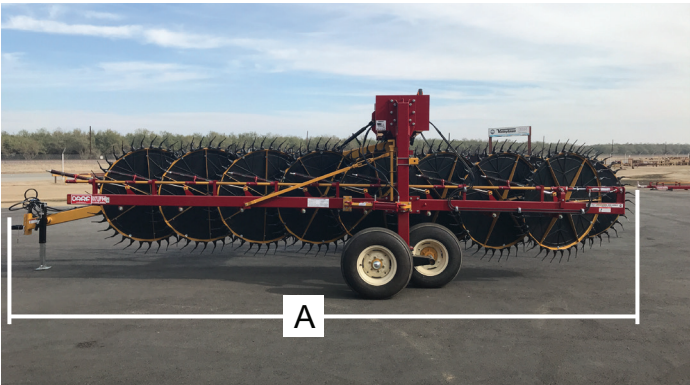
### **WARNING**

It is the responsibility of the owner to know the lighting and marking requirements of the local highway authorities and to install and maintain the equipment to provide compliance with the regulations. Add extra lights when transporting at night or during periods of limited visibility.

# Specifications

## 1017L Model Dimensions

Item	Dimension
A	Rake Length — 25'
B	Transport Width — 12' 4"
C	Rake Height — 7' 10"
D	Raking Width, Standard — 24' Raking Width, Wide — 29'
E	Windrow Width — 5'
—	Rake Weight: — 5980 lbs
—	Tongue Weight: — 750 lbs



## 1017L Model Identification Chart

This Owner’s Manual contains ALL 1017L Model information including:

Model Number	Description
1017LAB	Standard overhead frame with standard hydraulics and ball hitch
1017LAC	Standard overhead frame with standard hydraulics and clevis hitch
1017LWAB	Wide overhead frame with standard hydraulics and ball hitch
1017LWAC	Wide overhead frame with standard hydraulics and clevis hitch
1017LFMAB	Standard overhead frame with full hydraulics and ball hitch
1017LFMAC	Standard overhead frame with full hydraulics and clevis hitch
1017LFMWAB	Wide overhead frame with full hydraulics and ball hitch
1017LFMWAC	Wide overhead frame with full hydraulics and clevis hitch

## 1017L Model Specification Chart

	1017LAB	1017LAC	1017LWAB	1017LWAC	1017LFMAB	1017LFMAC	1017LFMWAB	1017LFMWAB
Seventeen-Wheel, Wide Raking Width 29'			•	•			•	•
Seventeen-Wheel, Standard Raking Width 24'	•	•			•	•		
Heavy Duty Overhead Frame	•	•	•	•	•	•	•	•
Seven-Function Electro/Hydraulic Manifold					•	•	•	•
5' Rephasing Cylinders			•	•				
4' Rephasing Cylinders	•	•						
Super Duty Walking Beam Axle with 2" Spindles	•	•	•	•	•	•	•	•
8" Wide Wheels	•	•	•	•	•	•	•	•
Heavy Duty Hub	•	•	•	•	•	•	•	•
Taper Bearings in Rake Wheel Cranks	•	•	•	•	•	•	•	•
Rubber Mounted Tines	•	•	•	•	•	•	•	•
DUR-ADJUST Spring and Rod	•	•	•	•	•	•	•	•
Standard 2-5/16" Adjustable Ball Hitch	•		•		•		•	
Standard Adjustable Clevis Hitch		•		•		•		•
Requires One Hydraulic Circuit and 12 Volt Access					•	•	•	•
Requires Two Hydraulic Circuits	•	•	•	•				

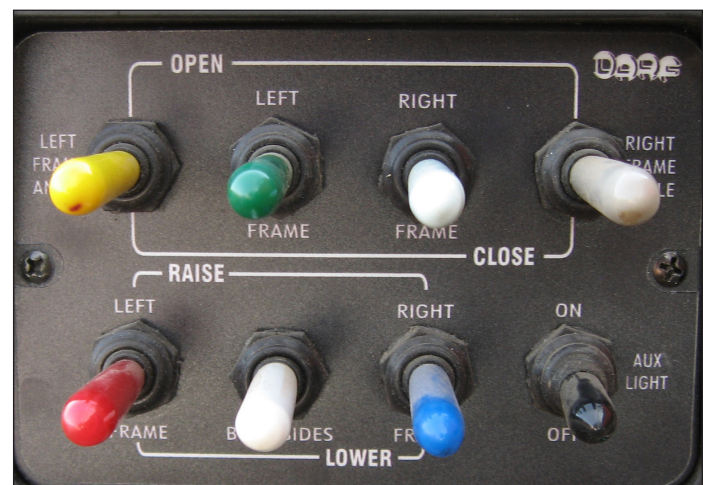
## Nomenclature

### Hydraulic Manifold and Control Box Locations (FM Models)

The hydraulic manifold for the DARF 1017LFM Rake is configured for a Closed Center Hydraulic system. Reconfiguration of the manifold is required for OPEN CENTER HYDRAULIC systems.



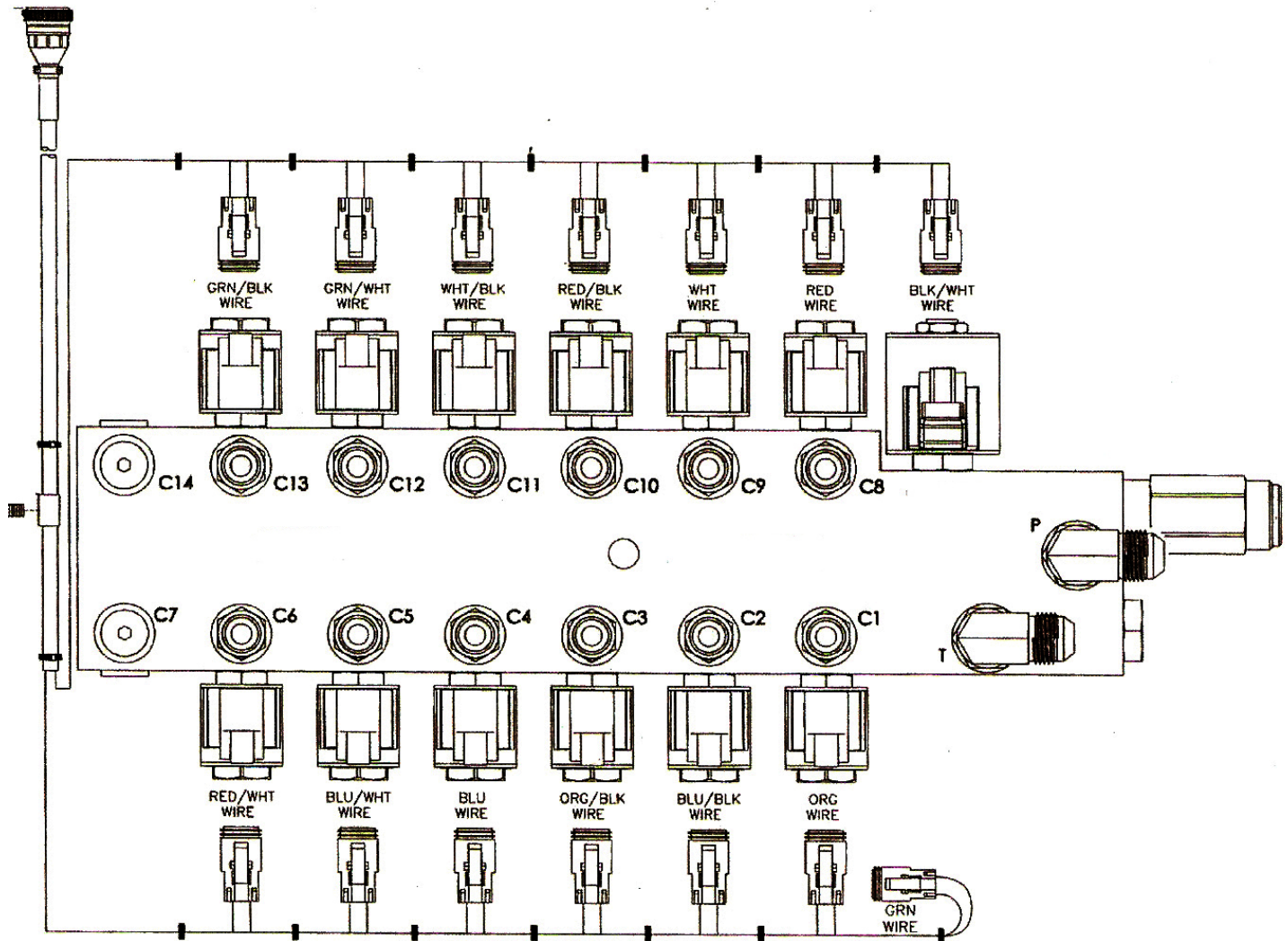
Hydraulic Manifold



Control Box Monitor



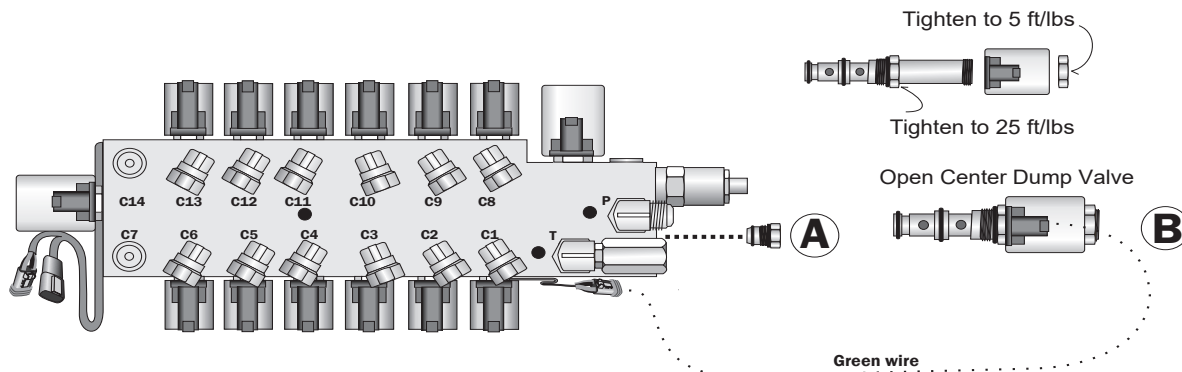
## 7-Function Manifold Identification



Valve Port	Cylinder	Function	Connection
C-1	Right Angle	Close	Rod End
C-8	Right Angle	Open	Piston
C-2	Right Overhead	Open	Piston
C-9	Right Overhead	Close	Rod End
C-3	Right Lift	Open	Piston
C-10	Right Lift	Close	Rod End
C-4	Left Angle	Close	Rod End
C-11	Left Angle	Open	Piston
C-5	Left Overhead	Open	Piston
C-12	Left Overhead	Close	Rod End
C-6	Left Lift	Open	Piston
C-13	Left Lift	Closed	Rod End
C-7	N/A	N/A	N/A
C-14	N/A	N/A	N/A

# Assembly and Start-Up

## Closed Center to Open Center Conversion



1. Remove cavity plug A.
2. Install Open Center Dump Valve B.
  - a. Tighten valve body to 25 ft.lbs.
  - b. Tighten solenoid nut to 25 ft.lbs.
3. Install cavity plug A where the Open Center Dump valve was removed.
4. Attach green wire on dump valve to green plug on manifold wiring harness.

**Note:** Cavity plug (A) and the Open Center Dump Valve and Solenoid (B) exchange places when creating an open center valve body.

### SAFETY INSTRUCTIONS

**The correct start-up is the responsibility of the dealer and/or the owner! Please follow directions.**

5. Install correct quick disconnect couplings on the hydraulic hoses route them down the tongue.
6. FM Models: Locate the hydraulic hose from port "P" on the manifold valve and attach it to one of the remote valve couplings.

**Note:** Do not insert the return line at this time.

7. Operate the control valve on the tractor to determine which position supplies oil to the pressure hose.

**Note:** A detent in the valve may allow the valve to remain in this position, or you may have to hold the valve handle open.

8. Return the valve to neutral and install the return hose in the return coupler.

**Note:** Full Hydraulic Models such as 1017LFM and 1017LWFM are connected to the tractor using two hoses.

**Note:** Partial Hydraulic Models such as 1017L and 1017LW are connected to the tractor using four hoses requiring two double-acting valves. One to open and close the main frame and one to raise and lower the rake wheels.





## Assembly

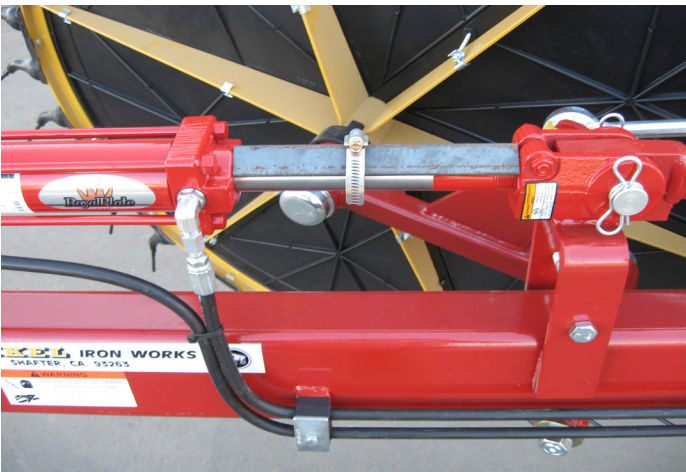
1. Remove the two safety chains before starting the tractor. The chains are located under the main frame and on the side of the leg strut.



2. FM Models: Remove the two cylinder stops, one on each side of the leg strut.



3. Remove the two cylinder stops, one on the rear of each raking frame.

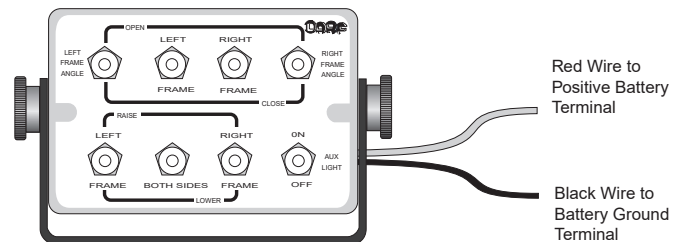


4. FM Models: Locate the Control Box Monitor in a secure location with easy access for the operator.



5. FM Models: Attach the RED wire to the positive lead and attach the BLACK wire to the negative lead.

**NOTICE** The control box only operates with a 12-Volt DC Negative Ground electrical system. Any other Voltage will damage the unit.





# Highway Transport

## Safety

REMEMBER! Your best insurance against accidents is being a careful and responsible operator. If there is any portion of this manual or the unit's operation you do not understand, contact your local authorized dealer for clarification.

## Prior to Transporting the Unit

**CAUTION** The following safety instructions are provided to help prevent potential injury. Not following these instructions may lead to injury.

- Comply with all state and local laws governing highway safety and movement of farm machinery on public roads.
- Visually inspect the unit for any missing or loose parts.
- Always visually check for loose or missing mounting hardware before each operation. Correct any problems before operating the unit.
- Plan your route in advance to avoid heavy traffic!

## Obstacles and Other Hazards

**WARNING** Failure to follow these safety instructions could result in serious injury and possibly even death if they are not understood and followed.

- Avoid overhead power lines, electrical cables, or other electrified objects. Contact with electrical power could cause serious injury or death.
- Watch for overhead obstructions as well as objects to either side of the unit while transporting.

## Lighting and Other Hazard Devices



Light kits are available from your dealer.

**WARNING** It is the responsibility of the owner to know the lighting and marking requirements of the local highway authorities and to install and maintain the unit to provide compliance with the regulations. Add extra lights, if required, when transporting at night or during periods of limited visibility.

**SAFETY INSTRUCTIONS** The following safety instructions are provided to help prevent injury or limit equipment damage.

*Note: If the unit is going to be transported on a public highway always follow all local and state regulations regarding auxiliary lighting when towing. Lights and signs should be clearly visible by oncoming traffic when the unit is towed.*

- When transporting the unit on the road or highway under 20 mph, make sure the (SMV) identification emblem is clearly visible. If appropriate, use flashing amber lights.
- The use of flashing amber lights is acceptable in most localities; however, some localities prohibit their use. Local laws should be checked for all highway lighting and marking requirements.
- Use all appropriate accessory lighting, flags, or other necessary warning devices to protect the operators of other vehicles during daytime or nighttime transport.

*Note: Safety lights and devices are available from your dealer.*

## Transporting the Unit on Roadways

### **WARNING**

Failure to follow these safety instructions

could result in serious injury and possibly even death if they are not understood and followed.

- Securely attach the unit to the tractor with a high strength, appropriately sized hitch pin with a mechanical retainer.
- Do not drive under the influence of drugs or alcohol.
- Always drive at a safe speed relative to local conditions. Keep your speed to a minimum.
- Ensure your speed is slow enough for a safe and secure emergency stop.

### **CAUTION**

The following safety instructions are

provided to help prevent potential injury. Not following these instructions may lead to injury.

- Keep the brake pedals latched together at all times. Never use independent braking when towing the unit, as loss of control or upset of the unit may result.
- Always keep the tractor or towing vehicle in gear to provide engine braking when going downhill, do not coast.
- Be a safe and courteous driver. Always yield to oncoming traffic in all situations, including narrow bridges, intersections, etc.
- Be observant of bridge loading ratings. Do not cross bridges rated lower than the gross weight at which you are operating.

## Safety Chains

### **WARNING**

Safety chains must be attached by crossing

the chains under the tongue and secure them to the drawbar cage, hitch, or tractor frame.

**Note:** *It is the owner's responsibility to provide safety chains. If the unit is going to be transported on a public highway safety chains are required. Always follow all local and state regulations regarding safety chains.*

## Operation

Before operating the unit, also review and follow all safety recommendations in the towing and Maintenance sections before operating the unit.

**Note:** The term “tractor” refers to any standard industry approved and acceptable type of vehicle used to pull the unit.

### General Safety

**WARNING** Failure to follow these safety instructions could result in serious injury and possibly even death if they are not understood and followed.



It is the unit's owner's responsibility to make sure any person using this unit, especially if it is loaned or rented, has been thoroughly trained on its proper and safe use.

- Before operating this unit, the user should carefully review and understand the material in this manual and be familiar with these operating instructions and the operation of the tractor.
- Do not allow an unqualified person or anyone under the influence of medication or intoxicating substances to operate the tractor.



Never allow children to operate the unit.



Operate the unit only from the operator's seat. Whenever leaving the

tractor's operator seat for any reason:

1. Shut off the engine and remove the ignition key.
2. Set the parking brakes.
3. Relieve hydraulic fluid pressure.
4. If parking the unit, make sure the jack stand is lowered and retaining pin is installed.



The weight of the tractor, plus the unit, if it rolls onto a person, could cause serious crushing injury or death.



The tractor should be equipped with a Roll Over Protective Structure (ROPS) and a seat belt. A crushing hazard could occur if the driver is ejected from the seat while the tractor is in motion. Fasten the seat belt whenever the tractor is moving.



Do not allow anyone to stand between the tongue or hitch and the tractor when backing up to the unit.

### SAFETY INSTRUCTIONS

The following safety instructions are provided to help prevent injury or limit equipment damage.

- Be certain only physically-able persons will operate the unit.
- If the elderly are assisting with the work, their physical limitations need to be recognized and accommodated.

### Inspect Unit Before Each Use

### SAFETY INSTRUCTIONS

The following safety instructions are provided to help prevent injury or limit equipment damage.

- Inspect your unit for any loose bolts, worn parts, hydraulic leaks, frayed hoses, cracked welds, etc. Make necessary repairs before starting.
- Keep wheel lug nuts or bolts tightened to correct torque.
- Be sure all the hydraulic lines do not conflict with moving parts and lubricate all fittings/joints as needed or required.
- Make sure the unit's tires are properly inflated.
- Be sure no tools lying on or near the unit.
- Make sure all shields and guards are in place and securely fastened.
- Make sure the wings are locked into position whenever they are opened from the transport position.



## Inspect Work Area Before Each Use

### **CAUTION**

The following safety instructions are provided to help prevent potential injury. Not following these instructions may lead to injury.

- Watch for holes, rocks, or other hidden hazards. Always inspect the area prior to operation.
- Do not use the unit until you are sure the area is clear, especially of children and animals.
- Always look around to make sure it is safe to start the engine of the tractor. This is particularly important in areas of higher noise levels and quiet cabs, as you may not hear people shouting.

## Safety During Operation

### **WARNING**

Failure to follow these safety instructions could result in serious injury and possibly even death if they are not understood and followed.

- Never allow anyone to stand alongside the unit with the tractor's engine running.
- Do not operate the unit with someone standing alongside it.
- Rake teeth can cause injury. Use special caution when lowering and raising the rake arms because the floating rake wheels can drop down unexpectedly.
- No passengers are allowed at any time on or in the tractor or the unit unless it is required for operation.
- To avoid the risk of overturning, reduce speed prior to turns and avoid sudden uphill turns on steep slopes.
- Keep hands and feet clear of moving parts.
- Do not try to clean, remove debris, lubricate, or adjust the unit while it is operating.

### **CAUTION**

The following safety instructions are provided to help prevent potential injury. Not following these instructions may lead to injury.

- Always operate the unit in a configuration that provides maximum visibility at all times.
- Make allowances for the increased length and weight of the unit when making turns, stopping, or other related operations.
- Depending on the surrounding conditions, always pull the unit at a reasonable speed to maintain control.
- Shift the tractor to a lower gear before going down steep downgrades, thus using the engine as a retarding force.
- Keep the tractor in gear at all times, and slow down for corners and rough terrain.
- Use extra caution when working on inclines.
- Operate up and down (not across) intermediate slopes and avoid sudden starts and stops.
- Do not operate near the edge of drop-offs or banks.
- Do not operate on steep slopes or inclines as the unit may overturn.

### **NOTICE**

*These recommendations indicate that equipment or property damage can result if instructions are not followed.*

- *Do not back up with the rake wheels lowered to the raking position as damage will result.*
- *Avoid areas with loose-fill, rocks, or holes; these can be dangerous for equipment operation or movement.*

## Operation

1. Connect the rake to the tractor.
2. Adjust hitch height to ensure the leg struts are vertical and rake is level front to rear
3. For leveling of the rake front to rear adjust main link.



4. For fine leveling of raking frames adjust turnbuckles.



5. FM Models: Connect the Control Box cable connections from rake to towing vehicle. Make sure the cable is routed around, and will not be damaged, by any moving parts or pinch points



6. FM Models: It is highly recommended that both Angle Swing Cylinders be removed from the rod end of the raking frame.
7. FM Models: Carefully remove the 1 inch pin and clip. Swing the cylinders out of way to avoid contact with any object.

### **WARNING**



**Stay Clear  
Until the**

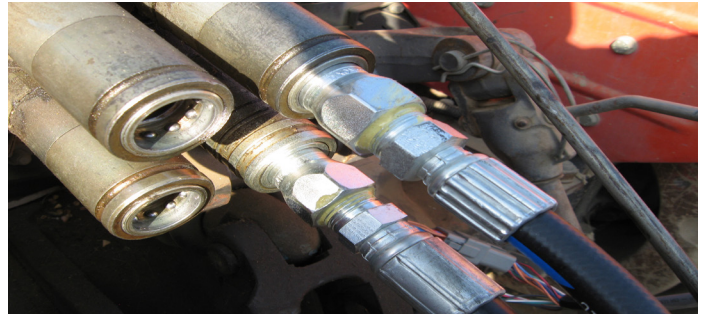
**hydraulic system is completely purged of trapped air there is a chance the raking frame could swing open without warning.**

### **SAFETY INSTRUCTIONS**

**Never loosen a fitting to bleed off trapped air from the system, this is very dangerous.**

8. Install correct quick disconnect couplings on the hydraulic hoses and route them down the tongue.
9. FM Models: Locate the hydraulic hose from port "P" on the manifold valve and attach it to one of the remote valve couplings.

**Note:** Do not insert the return line at this time.



10. Operate the control valve on the tractor to determine which position supplies oil to the pressure hose.

**Note:** A detent in the valve may allow the valve to remain in this position, or you may have to hold the valve handle open.

11. Return the valve to neutral and install the return hose in the return coupler.

**Note:** Full Hydraulic Models such as 1017LFM and 1017LWFM are connected to the tractor using two hoses.

**Note:** Partial Hydraulic Models such as 1017L and 1017LW are connected to the tractor using four hoses requiring two double-acting valves. One to open and close the main frame and one to raise and lower the rake wheels.

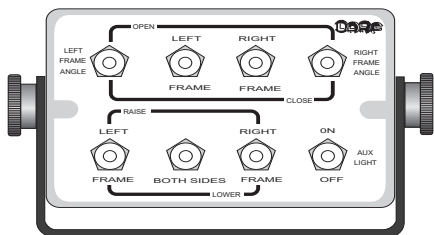
12. Purge the air on 1017L and 1017LW models which have rephasing cylinders.
  - a. Make sure tractor RPM is moderate (not to exceed 800 RPM) so the hydraulic pump is at near capacity.
  - b. Operate control lever for opening main frame cylinders (note that one side will extend first until the cylinders are fully purged).
  - c. During initial start-up the seals in the cylinders may need a few cycles to seat themselves for a good seal. Patience is the key and air is the worst enemy.

### **NOTICE**

**Always open main frame while the unit is moving!**

13. With the tractor moving, operate the tractor valve control handle to supply oil to the pressure hose.  
**DO NOT OPEN FRAME WHILE STATIONARY**
14. FM Models: Operate the "OPEN FRAME" toggle switch on the control box for either left or right side. Open fully.  
**DO NOT OPEN FRAME WHILE STATIONARY**





15. FM Models: Operate the remaining toggle switches; frame angle open and close, and raise/lower rake frame.
  16. On occasion, it is necessary to extend and retract the overhead frame two to three times in order for the hydraulic hoses to “set” and so they will fold as intended.
- Note:** If the hydraulics are erratic during start-up, AIR is likely the cause. Be sure to thoroughly purge the system completely
17. Check the tractor hydraulic fluid after the engine is off. Four to five gallons may be required to replenish the system.
  18. FM Models: If Angle Swing Cylinders were removed to purge the system of air, reinstall them now.
  19. Adjust the raking width and raking windrow size by opening and closing the main frame and by swinging the raking frames to desired angles.
  20. Adjust springs on each raking wheel so the crop drives the wheel not the ground.



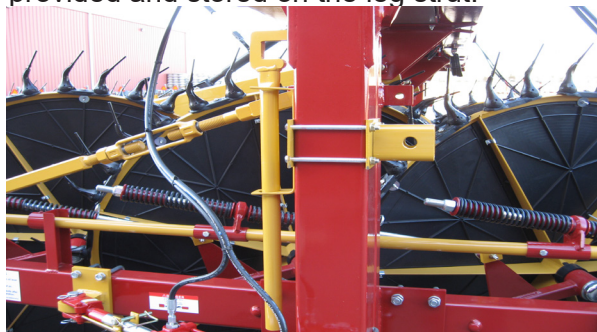
21. Find the desired level by placing the hairpin clip in different locations.



22. Fine-tune adjustments are done by increasing or decreasing the 7/8 inch nylon nut on top of the spring and rod assembly.



23. A special tool for raising the rake wheel is provided and stored on the leg strut.



## Pre-Operation Checklist

Checklist	
✓	Inspection Item
	Level rake using hitch adjustments
	Adjust raking wheel spring tension to assure clean raking without excessive ground contact.
	Check hydraulic oil level.
	Bleed all air in hoses.
	Re-tighten all bolts after the first day of operation.
	Keeping the rake cleaned and painted will help to prolong the value of this product.
	Failure to check rake teeth height routinely may cause excessive wear or missed pick-up of forage.
	When opening the overhead main frame, the rake must be moving forward so as not to damage the transport tires.
	When not attached to the tractor, chock the wheels and ensure that the jack is securely planted. Park this rake in a level area whenever possible and with a cover.
	When stopped or parked, do not leave the raking teeth in contact with the ground fully supporting the weight of the raking frame. This will result in permanent damage to the rake teeth.
	Grease the Zerk fittings on the leg struts as needed.
	Check tire air pressure prior to highway transport and increase to 30 PSI.
	Inspect for hydraulic leaks frequently.

# Maintenance

Proper and timely servicing and adjustments are key to the long life of this unit. With careful inspection and routine maintenance, costly downtime and repairs can be avoided.

If the unit is altered or modified from the original design, or if genuine replacement parts or teeth are not used and properly installed, NIKKEL IRON WORKS, CORP. does not assume any responsibility or liability for injury or warranty.

## General Safety



**Failure to follow these safety**

**instructions could result in serious injury and possibly even death if they are not understood and followed.**



**It the tractor must be connected to the unit during a maintenance**

**procedure:**

1. **Shut off the engine and remove the ignition key.**
2. **Set the parking brakes.**
3. **Relieve hydraulic fluid pressure.**
4. **If parking the unit, make sure the jack stand is lowered and retaining pin is installed.**

- **Make sure there is adequate ventilation.**

If the tractor must be running to work on the hydraulic system, make sure there is plenty of ventilation. Never operate the tractor inside a closed building as the exhaust fumes may cause asphyxiation.

- **Always use lifting equipment that is adequately rated to do the job.**

Some parts and assemblies are quite heavy. Before attempting to detach any part or assembly, arrange to support it using a hoist, by blocking it up, or by use of an adequate arrangement to keep it from falling, tipping, swinging, or moving in any manner which may hurt somebody or damage the equipment.



**Wear personal protective equipment such as gloves and safety glasses when mechanically servicing the unit or working with the hydraulic system.**

- **Always use safety support blocks when the unit is raised off the ground.**

- **Make sure the transfer locks in place and engaged when working on the unit.**
- **When the wheels are in contact with the ground, chock them to prevent unexpected movement.**
- **Never use a jack to fully support the weight of the unit.**
- **Securely support the unit when raised off the ground.**

Always secure equipment with solid supports before working on or under it. Never work under equipment supported by hydraulics, they can drop equipment if controls are actuated or hydraulic lines burst or pressure is lost while disconnecting lines. Either situation can drop machinery instantly even when power to hydraulics is off.

- **Do not attempt to disconnect a hydraulic cylinder or hose while the system is under pressure.**

## SAFETY INSTRUCTIONS

The following safety instructions are provided to help prevent injury or limit equipment damage.

- **Use proper tools or equipment for the job at hand.**
- **After maintenance, be sure all tools, parts, and service equipment are removed.**

## Tire Safety



**Tire mounting or repair should be done using a professional service provider. Never attempt to mount a tire unless you have the proper equipment and experience to safely do the job.**



**Failure to follow proper procedures when mounting a tire on a wheel can produce an explosive force which will result in serious injury or even death. Always use a tire cage when inflating unmounted tires.**

**Whenever inflating a tire, use a clip-on air hose and stand at a safe distance as the tire inflates. Only trained personnel should be allowed to inflate tires.**



## **⚠ WARNING**

To prevent possible loss of control when moving the unit, always order and install tires and wheels with appropriate capacity to meet or exceed the anticipated weight to be placed on the equipment.

## **NOTICE**

*Be sure you have proper tire pressure and the lug nuts are properly tightened. Check wheel bearings on a regular basis and grease semiannually.*

### Periodic Maintenance

## **NOTICE**

*These recommendations indicate that equipment or property damage can result if instructions are not followed.*

- Check mounting hardware on the unit following every 100 hours of operation. Correct any problems and follow the maintenance safety procedures.
- Always use the proper tools or equipment for the job. Never replace hex bolts with less than Grade 5 bolts, unless specified by Nikkel Iron Works.

### Hydraulic System Safety

## **⚠ WARNING**

Only adequately trained and qualified persons should work on hydraulic systems. The possibility exists that someone could be severely injured or killed by being crushed under the unit.



#### High-Pressure Fluid

Keep all hydraulic lines, fittings, and couplers tightly secured and free of leaks.

Do not make any temporary repairs to the hydraulic lines, fittings, or hoses using tape, clamps, or cement. The hydraulic system operates under extremely high pressure and temporary repairs may fail suddenly and create a hazardous/dangerous situation.

**DO NOT** use your bare hand to check for potential leaks. Always use a board or cardboard when checking for a leak.

Escaping hydraulic fluid under pressure, even a pinhole size leak, can penetrate body tissue, causing serious injury and possible death. If fluid is injected into your skin, it must be treated immediately by a doctor familiar with this type of injury. Any fluid injected into the skin or eyes must be treated within a few hours or gangrene could result.

- Release all hydraulic pressure before disconnecting lines or performing work on the hydraulic system.
- Hydraulic system components and oil can be very hot and cause burns. Before working on any system, wait until the oil has cooled.

## **⚠ CAUTION**

The following safety instructions are provided to help prevent potential injury. Not following these instructions may lead to injury.

- Use extreme caution when making pressure adjustments.
- Check hydraulic hoses and fittings frequently for leaks or wear.
- Remove any buildup of debris that may damage hoses and fittings.
- Visually inspect and maintain the unit daily. Loose, broken, and missing components may cause the unit to not perform properly and may result in bodily injury or death.

## Maintenance Chart

Item	Interval
Make sure ground wheel hubs are tight	Before transporting
Make sure safety lights work	Before transporting
Check tire pressure	Before transporting or operating
Check hydraulic hoses and connections for leaks	Before operating
Grease ball hitch	Monthly
Lubricate male slides (plastics)	Monthly
Lubricate spring and rod slides	Monthly
Check that bearing cranks are tight	Monthly
Grease ground wheel hubs	Monthly
Check tires for uneven wear - adjust toe-in 1/8"	Monthly
Grease wheel bearings	Two times per year
Check all electrical connections	Seasonally
Grease leg strut fittings	Seasonally
Rotate HD walking beam bearing (#1002A) 90 degrees	Seasonally
Review safety instructions	Annually
Clean or replace safety decals	As needed

## Storage (After Operation)

### After Operation Safety

**CAUTION** The following safety instructions are provided to help prevent potential injury. Not following these instructions may lead to injury.



Before leaving the tractor's operator seat to unhook the unit:

1. Shut off the engine and remove the ignition key.
2. Set the parking brake.
3. Relieve all hydraulic fluid pressure.
4. Lower the jack stand and insert the retaining pin.

- Store the unit in an area away from human activity.
- Do not permit children to play on or around the stored unit.
- Do not store the unit where it will be exposed to livestock. Damage to the unit or injury to livestock may result.

### SAFETY INSTRUCTIONS

The following safety instructions are provided to help prevent injury or limit equipment damage.

- Clear the rake wheels and frame of hay or other materials to prevent a build-up of dry, flammable material.
- Make sure the unit is parked on a hard, level surface, and engage all safety devices.
- Use wheel chocks to prevent the unit from rolling.

## Troubleshooting

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### Troubleshooting Chart

Problem	Possible Cause	Solution
Rake will not open or close	Open center tractor	Change valve to open center
	Low hydraulic fluid	Check and add if low
	Hoses incorrectly located	Review hose charts and correct
	Air in hydraulic system	Operate cylinders until air is removed
	Bad coupling / leak	Check for leaks and replace
	Hydraulic oil volume too high	Relieve pressure and adjust to 4-6 GPM
Unable to level rake	Overhead main frame not adjusted	Correct with ratchet jack
	Raking frame(s) not square / level	Square and level raking frame to overhead frame
Not raking properly	Raking wheels not adjusted	Adjust each rake wheel properly
	"	Adjust front wheels deeper than rear
Rake skipping product	Transport tires too firm	Adjust tire pressure
Hay wraps rear wheels	Raking angle too severe	Adjust for less angle
	Heavy crop	Raise wheels slightly
Uneven rake teeth wear	Raking wheels not adjusted	Adjust each rake wheel properly

## Warranty

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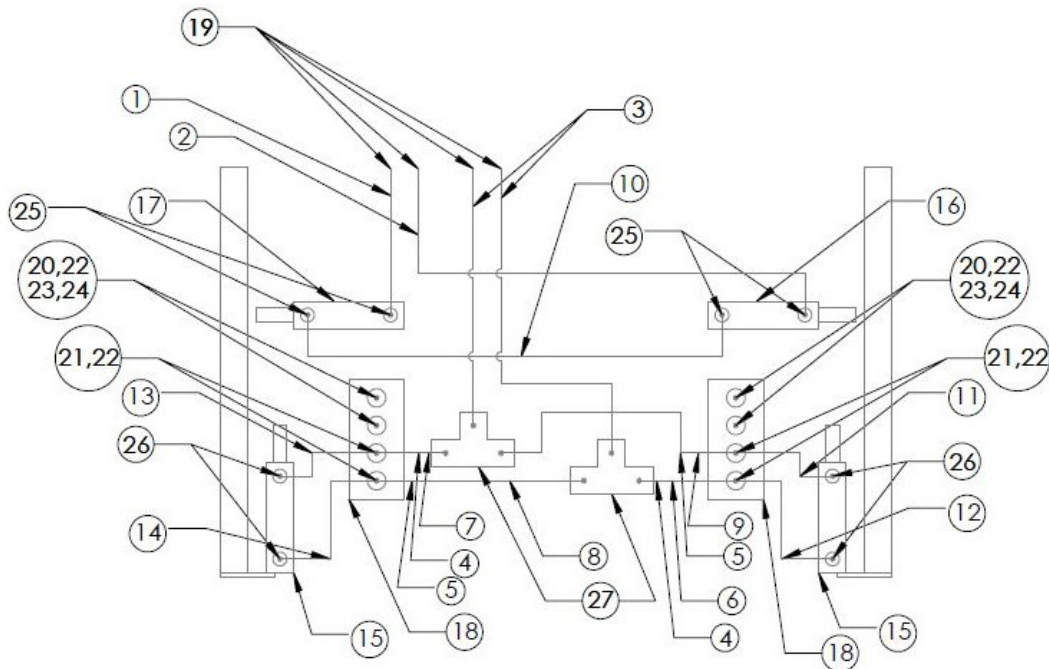
### Warranty Information

Rake must be registered within 30 days of purchase.

Nikkel Iron Works has manufactured DARF hay rakes for over 30 years and has an excellent reputation for quality and workmanship. Please contact your dealer if you feel a component has not lasted to your expectation. These concerns will be handled on a case-by-case basis. Contact your dealer for replacement parts.

# Parts

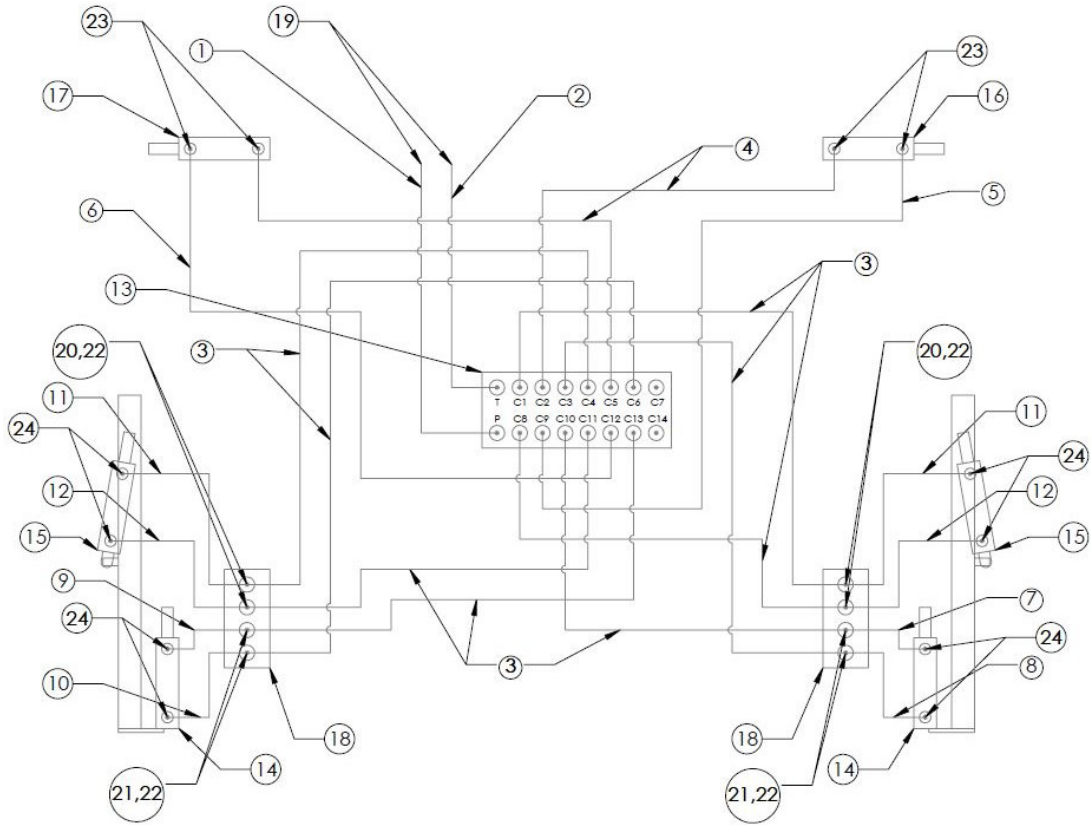
## 1017L and 1017LW Hydraulic Layout



ITEM	PN	DESCRIPTION	QTY	1017LAB	1017LAC	1017LWAB	1017LWAC
1	06X4452X08J	3/8" HOSE ASSEMBLY X 297" 3/8 - 1/2 JIC & 3/8 - 1/2 NPT ENDS	1	•	•		
1	06X4944X08J	3/8" HOSE ASSEMBLY X 309" 3/8 - 1/2 JIC & 3/8 - 1/2 NPT ENDS	1			•	•
2	06X4608X08J	3/8" HOSE ASSEMBLY X 288" 1/2 - 1/2 JIC & 1/2 - 1/2 NPT ENDS	1	•	•	•	•
3	04X4352X04J	1/4" HOSE ASSEMBLY X 272" 1/4 - 1/4 JIC & 1/4 - 1/2 NPT ENDS	2	•	•	•	•
4	04X1584X04(J)	1/4" HOSE ASSEMBLY X 99" 1/4 - 1/4 (SPECIFY JIC OR NPT)	2	•	•		
5	04X2160X04(J)	1/4" HOSE ASSEMBLY X 135" 1/4 - 1/4 (SPECIFY JIC OR NPT)	2	•	•		
6	04X1744X04(J)	1/4" HOSE ASSEMBLY X 109" 1/4 - 1/4 (SPECIFY JIC OR NPT)	1			•	•
7	04X1824X04(J)	1/4" HOSE ASSEMBLY X 114" 1/4 - 1/4 (SPECIFY JIC OR NPT)	1			•	•
8	04X2352X04(J)	1/4" HOSE ASSEMBLY X 147" 1/4 - 1/4 (SPECIFY JIC OR NPT)	1			•	•
9	04X2432X04(J)	1/4" HOSE ASSEMBLY X 152" 1/4 - 1/4 (SPECIFY JIC OR NPT)	1			•	•
10	06X544X06(J)	3/8" HOSE ASSEMBLY X 34" 3/8 - 3/8 (SPECIFY JIC OR NPT)	1	•	•		
10	06X384X06(J)	3/8" HOSE ASSEMBLY X 24" 3/8 - 3/8 (SPECIFY JIC OR NPT)	1			•	•
11	04X2640X04(J)	1/4" HOSE ASSEMBLY X 165" 1/4 - 1/4 (SPECIFY JIC OR NPT)	1	•	•	•	•
12	04X2464X04(J)	1/4" HOSE ASSEMBLY X 154" 1/4 - 1/4 (SPECIFY JIC OR NPT)	1	•	•	•	•
13	04X1920X04(J)	1/4" HOSE ASSEMBLY X 120" 1/4 - 1/4 (SPECIFY JIC OR NPT)	1	•	•	•	•
14	04X2064X04(J)	1/4" HOSE ASSEMBLY X 129" 1/4 - 1/4 (SPECIFY JIC OR NPT)	1	•	•	•	•
15	N201028	2 X 8 ASAE HYDRAULIC CYLINDER	2	•	•	•	•
16	N325349	3-1/4X60 RE-PHRASING SLAVE CYL	1			•	•
16	N325277	3-1/4X48 SLAVE CYL	1	•	•		•
17	N353249	3-1/2X60RE-PHRASING CYL	1			•	•
17	N353177	3-1/2X48 MASTER CYL	1	•	•		
18	9018J	FOUR HOSE COUPLER-JIC BULKHEAD	2	•	•	•	•
19	H-AG4F4	DIXON MALE TIP	4	•	•	•	•
20	HMJMJH0404	1/4" JIC TO 1/4" JIC BULKHEAD	4	•	•	•	•
21	HMJMJH900404	1/4JIC 1/4JIC 90BULKHEAD EL	4	•	•	•	•
22	HHN04	1/4" BULKHEAD NUT	8	•	•	•	•
23	H181	1/4 PLASTIC HOSE PLUG	4	•	•	•	•
24	H204	1/2" PLASTIC CAPS-#208	4	•	•	•	•
25	HMBMJ9086	O-RING 90 ADAPTER 1/2TO3/8 JIC	4	•	•	•	•
26	HMBMJ9064	O-RING 90 ADAPTER 3/8TO1/4 JIC	4	•	•	•	•
27	HMJT4	1/4 FEMALE HYD TEE JIC	2	•	•	•	•

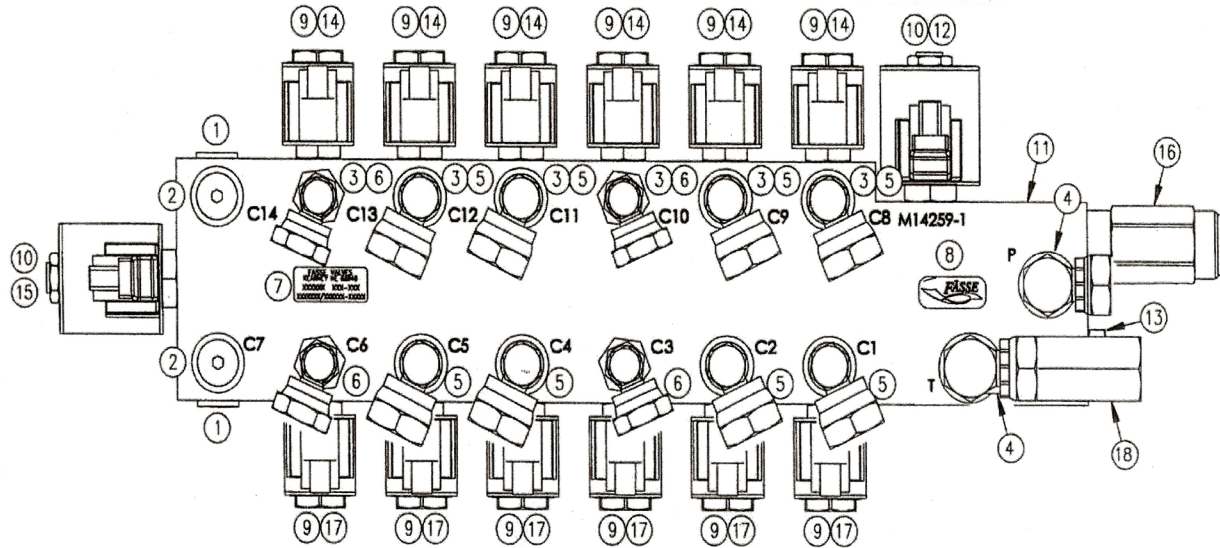


## 1017LFM and 1017LWFM Hydraulic Layout



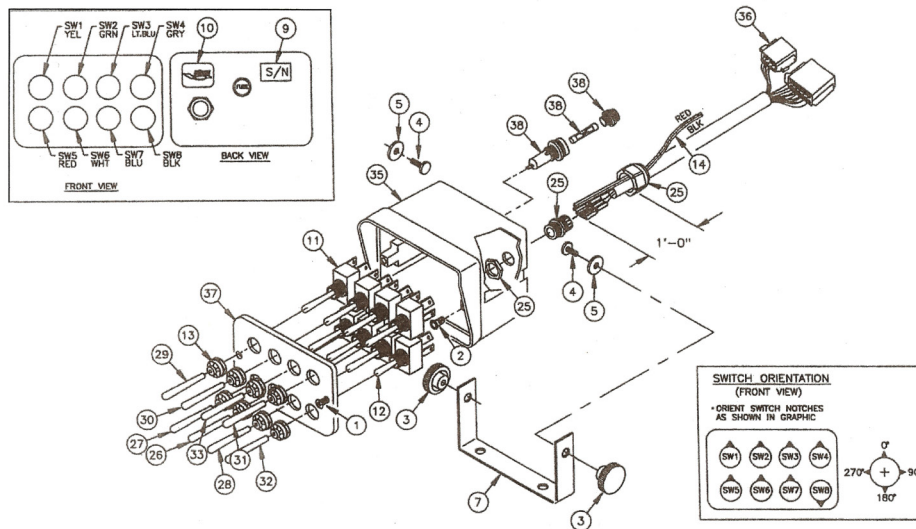
ITEM	PN	DESCRIPTION	QTY	1017LFMAB	1017LFMAC	1017LFMWAB	1017LFMWAC
1	06X4608X08	3/8" HOSE ASSEMBLY X 288" 3/8 - 1/2 JIC & 3/8 - 1/2 NPT ENDS	1	•	•	•	•
2	08X4608X08	1/2" HOSE ASSEMBLY X 288" 1/2 - 1/2 JIC & 1/2 - 1/2 NPT ENDS	1	•	•	•	•
3	04X2272X04(J)	1/4" HOSE ASSEMBLY X 142" 1/4 - 1/4 ENDS (SPECIFY JIC OR NPT)	8	•	•		
3	04X2464X04(J)	1/4" HOSE ASSEMBLY X 154" 1/4 - 1/4 ENDS (SPECIFY JIC OR NPT)	8			•	•
4	06X480X06(J)	3/8" HOSE ASSEMBLY X 30" 3/8 - 3/8 ENDS (SPECIFY JIC OR NPT)	2	•	•		
4	06X544X06(J)	3/8" HOSE ASSEMBLY X 34" 3/8 - 3/8 ENDS (SPECIFY JIC OR NPT)	2			•	•
5	06X800X06(J)	3/8" HOSE ASSEMBLY X 50" 3/8 - 3/8 ENDS (SPECIFY JIC OR NPT)	1	•	•	•	•
6	06X720X06(J)	3/8" HOSE ASSEMBLY X 45" 3/8 - 3/8 ENDS (SPECIFY JIC OR NPT)	1	•	•	•	•
7	04X2640X04(J)	1/4" HOSE ASSEMBLY X 165" 1/4 - 1/4 ENDS (SPECIFY JIC OR NPT)	1	•	•	•	•
8	04X2464X04(J)	1/4" HOSE ASSEMBLY X 154" 1/4 - 1/4 ENDS (SPECIFY JIC OR NPT)	1	•	•	•	•
9	04X1920X04(J)	1/4" HOSE ASSEMBLY X 120" 1/4 - 1/4 ENDS (SPECIFY JIC OR NPT)	1	•	•	•	•
10	04X2064X04(J)	1/4" HOSE ASSEMBLY X 129" 1/4 - 1/4 ENDS (SPECIFY JIC OR NPT)	1	•	•	•	•
11	04X960X06(J)	1/4" HOSE ASSEMBLY X 60" 1/4 - 1/4 ENDS (SPECIFY JIC OR NPT)	2	•	•	•	•
12	04X800X04(J)	1/4" HOSE ASSEMBLY X 50" 1/4 - 1/4 ENDS (SPECIFY JIC OR NPT)	2	•	•		
12	04X864X04(J)	1/4" HOSE ASSEMBLY X 54" 1/4 - 1/4 ENDS (SPECIFY JIC OR NPT)	2			•	•
13	700-0806-4006J	7FUNCTION, ELEC-HYD 700-0806-4006 W/JIC FITTINGS	1	•	•	•	•
14	N201028	2 X 8 ASAE HYDRAULIC CYLINDER	2	•	•	•	•
15	N301060	3 X 8 ASAE HYD. CYLINDER	2	•	•	•	•
16	N325349	3-1/4X60 RE-PHRASING SLAVE CYL	1			•	•
16	N325277	3-1/4X48 SLAVE CYL	1	•	•		
17	N353249	3-1/2X60RE-PHRASING CYL	1			•	•
17	N353177	3-1/2X48 MASTER CYL	1	•	•		
18	9018J	FOUR HOSE COUPLER-JIC BULKHEAD	2	•	•	•	•
19	H-AG4F4	DIXON MALE TIP	2	•	•	•	•
20	HMJMJH0404	1/4" JIC TO 1/4" JIC BULKHEAD	4	•	•	•	•
21	HMJMJH900404	1/4JIC 1/4JIC 90BULKHEAD EL	4	•	•	•	•
22	HHN04	1/4" BULKHEAD NUT	8	•	•	•	•
23	HMBMJ9086	O-RING 90 ADAPTER 1/2TO3/8 JIC	4	•	•	•	•
24	HMBMJ9064	O-RING 90 ADAPTER 3/8TO1/4 JIC	8	•	•	•	•

## Hyd. Manifold (FM Models)



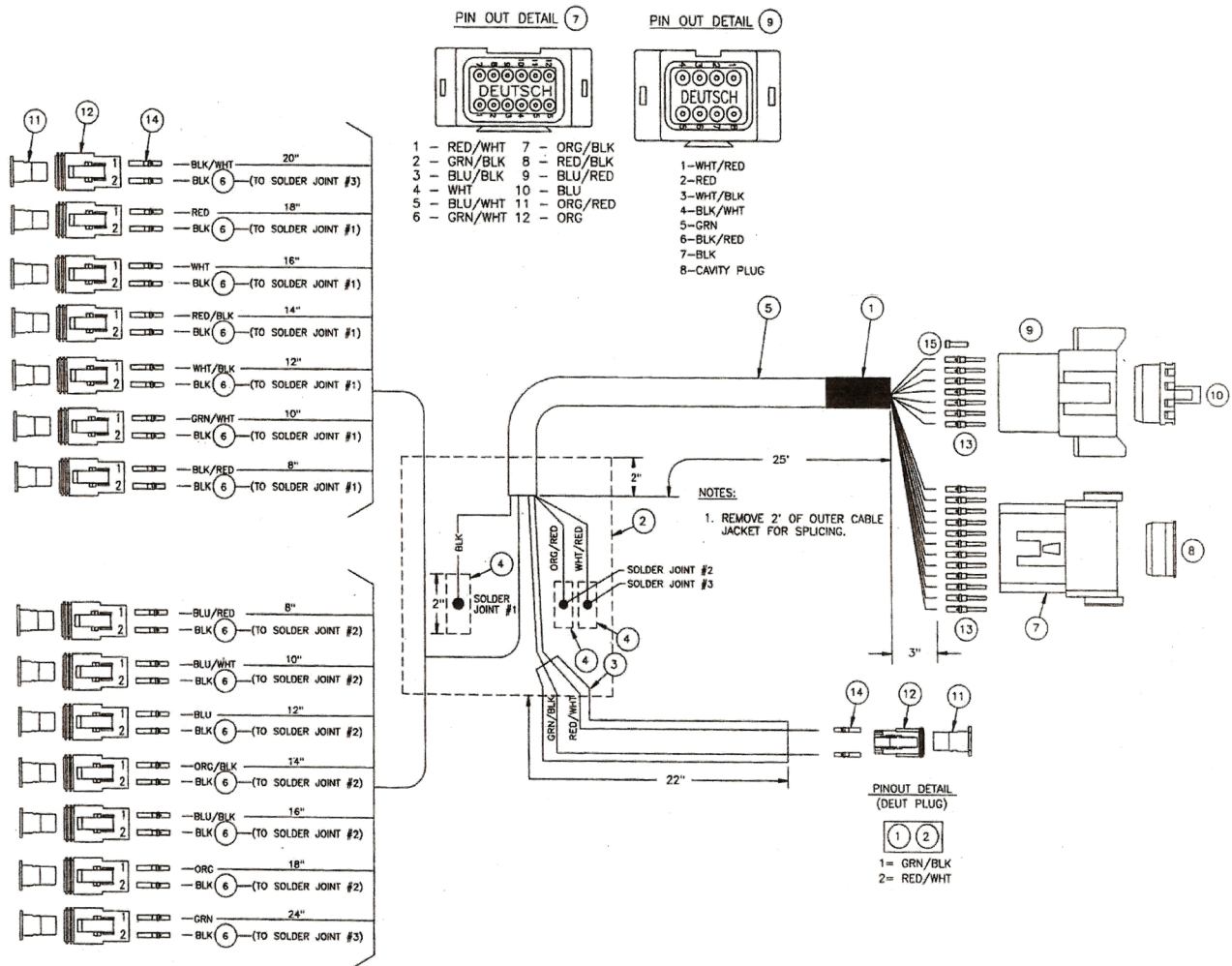
ITEM	PN	DESCRIPTION	QTY
1	210-038	FTG 6408-HHP-8/HOLL HEX PLUG MO	2
2	210-127	FTG 6408-HHP-6/HOLL HEX PLUG MO	2
3	210-151	FTG 6410-6-6/S-MO-FO	6
4	210-166	FTG 6901-8-6/E-MO-FPSW	2
5	210-189	FTG 6901-6-4/E-MO-FPSW	8
6	210-229	FTG 6901-6-6/E-MO-FPSW	4
7	232-050	S/N DECAL (SILVER)	2
8	232-058	DECAL (BLACK/GOLD)	1
9	253-590	COIL M/F 4304012 E-8 12V DIODE	12
10	253-593	COIL M/F 4304112E-10 12V DIODE	2
11	270-011	MANI S14259-1 7 CIR AL	1
12	273-008	CART H/F SV10-40-0-N-00 SPL 4W 2P	1
13	273-012	CART H/F CP10-20-N PLUG 2W	1
14	273-016	CART SV06-24-0-N-00	6
15	273-017	CART SV10-21-0-N-00	1
16	273-078	CART H/F RV10-22H-0-N-35 REL DIFF AREA POP 3000PSI	1
17	273-500	CART H/F SV08-28-0-N-00 2P POP NC BI-DIR	6
18	279-008	CHECK VALVE 10301-503	1

## Hyd. Control Box Parts (FM Models)



ITEM	PN	DESCRIPTION	QTY
1	212-184	SCREW 6-32X3/8" OVAL HEAD BK	2
2	212-202	BRASS INSERT 6-32X3/8"	2
3	212-215	KNOB 1/4-20 FEMALE	2
4	212-231	WELDED SCREW 1/4-20X.500	2
5	213-335	NYLON WASHER	2
6	214-004	CABLE TIE BLACK 7"	14
7	219-300	BRKT HSNQ MONITOR	1
8	230-057	POLY BAG, 2MIL	1
9	232-050	DECAL S/N (SILVER)	2
10	232-056	DECAL (BLACK/GOLD)	1
11	250-013	SW TOG OPDT 3P MOM LONG	7
12	250-020	SW TOG SPST 2P STAT SHORT	1
13	250-023	SW TOG BOOT OPN GRY	8
14	252-021	WIRE, RED/BLACK 16G ZIP	7'
15	252-058	WIRE 18GA BLACK	1'
16	252-059	WIRE 18GA RED	1'
17	252-060	WIRE 18GA GREEN	1'
18	254-001	DIODE D116A2 6AMP	1
19	255-002	TRM PO T-TAP F 18-14GA	31
20	255-006	TRM PO F NON INS 20/18GA	8
21	255-030	TRM SPLICE CLOSED END	2
22	255-070	TRM PO M/F	4
23	255-119	TRM PO F INS 16-14GA	5
24	255-265	TRM SPLICE CLOSED END LRF 14-16GA	1
25	255-710	STRAIN RLF HEYCO .45"-.705"ID	1
26	259-004	SW TOG GRIP VNYL WHT .187	1
27	259-005	SW TOG GRIP VNYL RED .187	1
28	259-015	SW TOG GRIP VNYL BLU .187	1
29	259-022	GRIP TOG VNYL YEL .187"	1
30	259-023	SW TOG GRIP VNYL GRN .187	1
31	259-027	SW TOG GRIP VNYL GRY .187	1
32	259-031	GRIP TOG VNYL BLK .187"	1
33	259-044	GRIP TOG VNYL LT BLU .187"	1
34	300-327	DIODE ASSY 6A05/1/INTERNAL	2
35	304-400	ENCL DRL MNTR W/FUSEHOLDER	1
36	312-082	HRN 19CON 18GA DTP 12P	1
37	312-083	ENCL FP DRILL MNTR NIKKEL IRON	1
38	319-769	FUSEHOLDER PM ASSY 10A	1

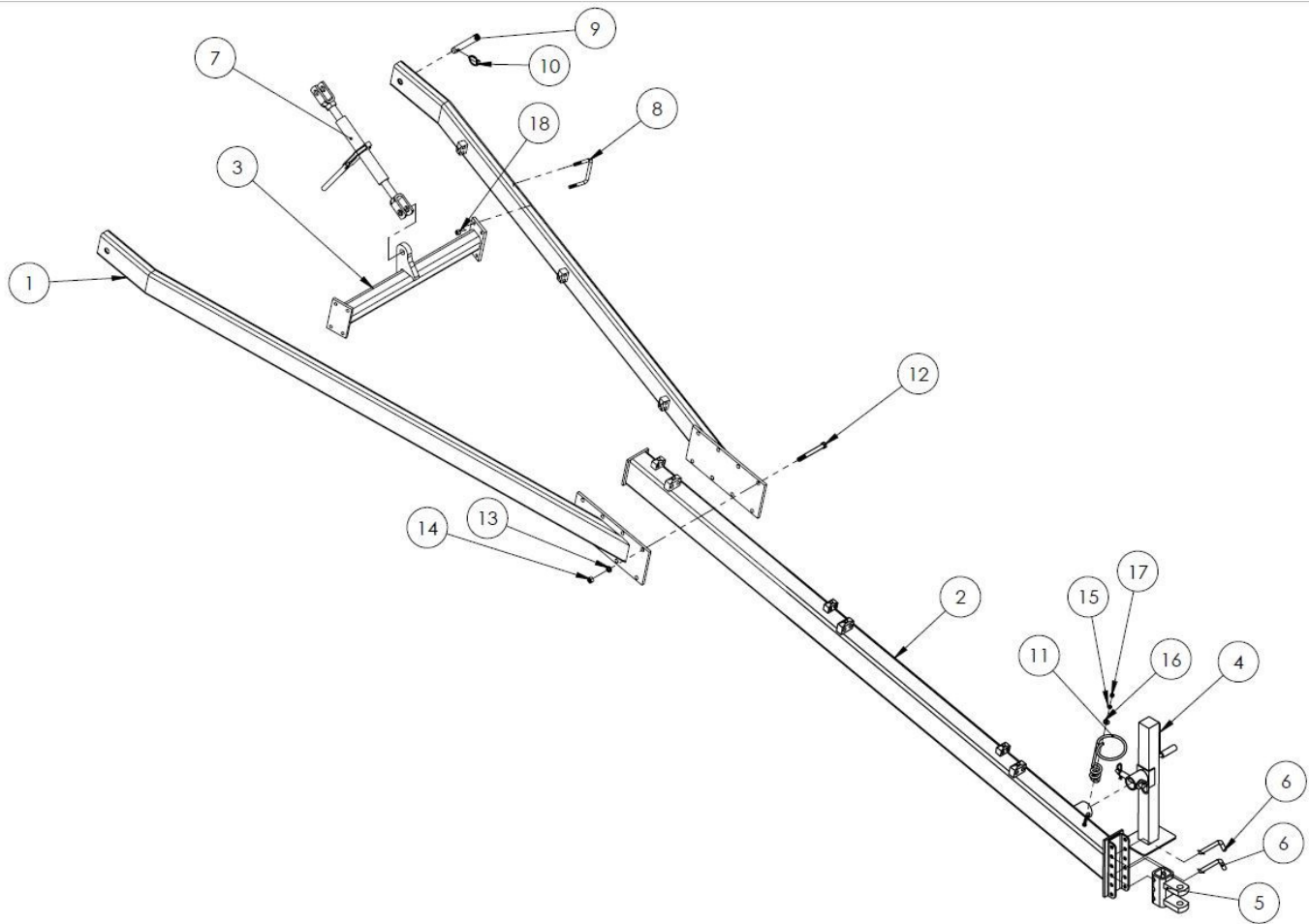
# Hyd. Manifold Wiring Harness (FM Models)



ITEM	PN	DESCRIPTION	QTY
1	231-007	SHRINKTUBING .625	2"
2	231-008	SHRINKTUBING .750	4"
3	231-187	SHRINKTUBING .187 BLK	23"
4	231-313	SHRINKTUBING .313	6"
5	252-004	CABLE 19CON 19GA PVC GRY	27'
6	252-058	WIRE 18GA BLK	17"
7	252-212	CONN DEUT DT RCPT 12PIN	1
8	255-214	CONN DEUT LOCKWEDGE 12PIN DTR GRN	1
9	255-218	CNTR DEUTSCH 8PIN RCPT DT	1
10	255-220	CNTR DEUTSCH LOCKWEDGE 8PIN DTR	1
11	255-505	CNTR DEUTSCH LOCKWEDGE 2PIN DTP	15
12	255-801	CNTR DEUTSCH 2PIN PLUG DT	15
13	255-977	TRM PIN DEUTSCH SOCKET 16/18GA	19
14	255-978	CNTR DEUTSCH SOCKET 16/18GA	30
15	255-979	CONT DEUT CAVITY PLUG	1

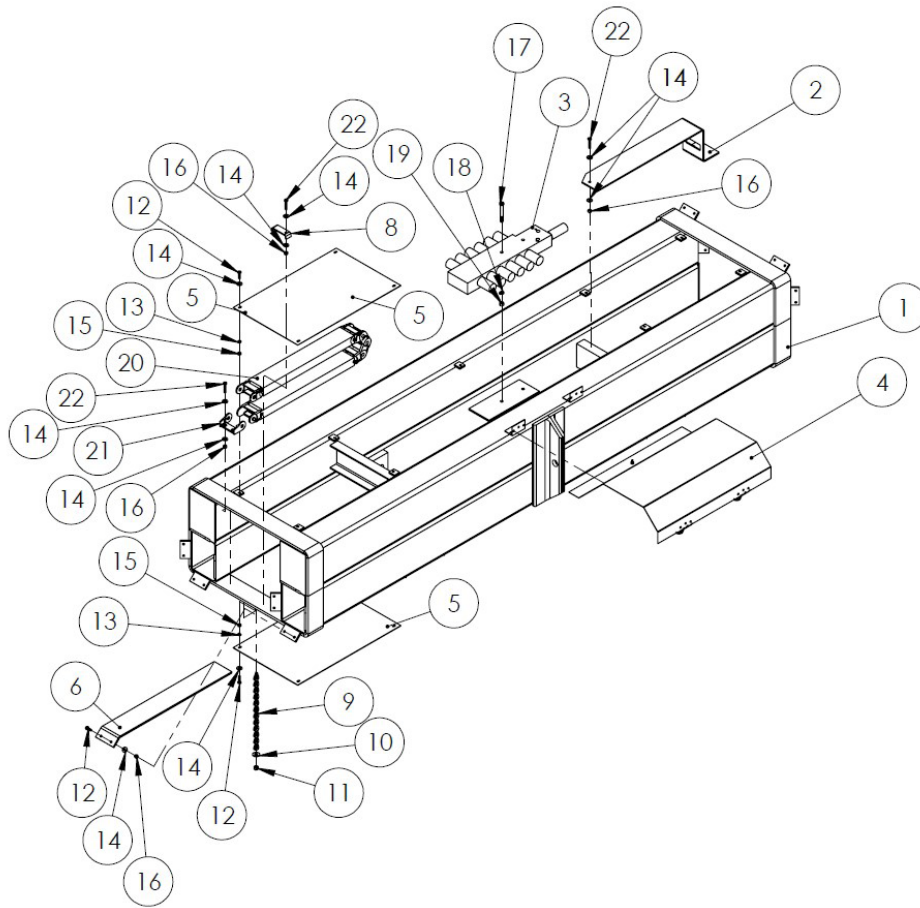


## Tongue



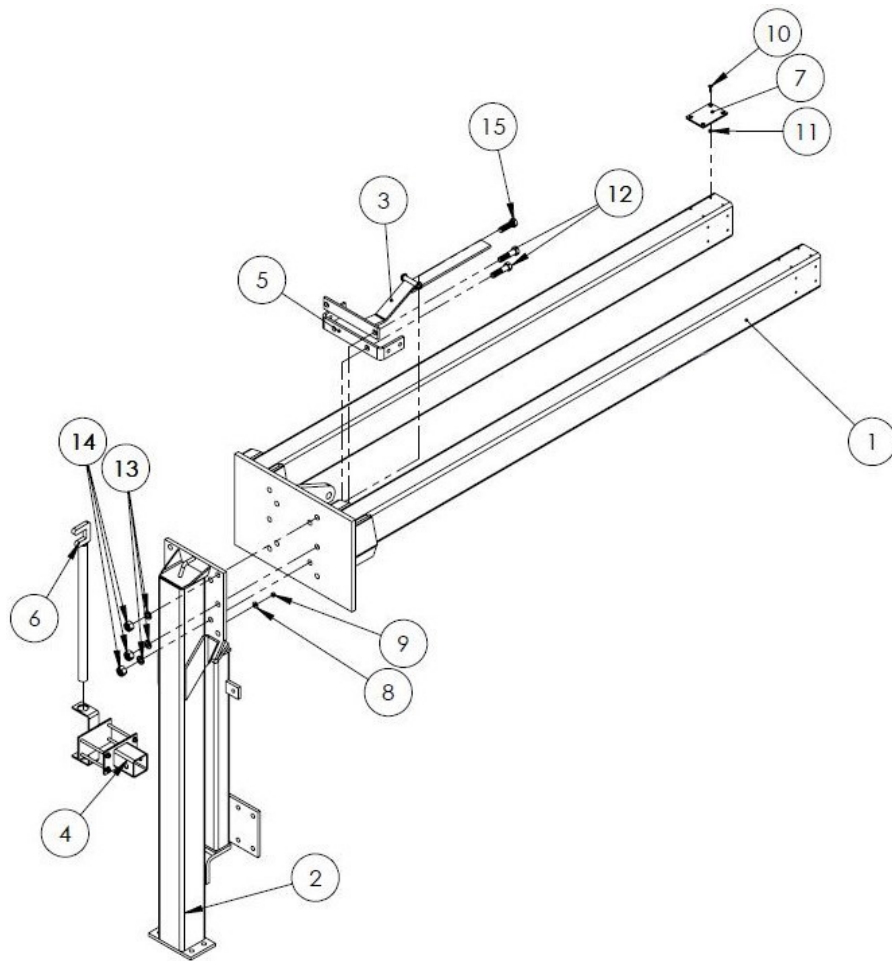
ITEM	PN	DESCRIPTION	QTY	1017L-AB	1017L-AC	1017L-WAB	1017L-WAC	1017L-FMAB	1017L-FMAC	1017L-FMWAB	1017L-FMWAC
1	91796	TOP YOKE TUBE FOR 9179200 BUN 2 REQ'D PER TONGUE/RAKE	2	*	*	*	*	*	*	*	*
2	101794	TONGUE,DRAW BAR,LOWER,ADJUSTBL	1	*	*	*	*	*	*	*	*
3	9107A	RE-ENFORCED CROSS BAR 57092 SINGLE	1	*	*	*	*	*	*	*	*
4	BE-700M	JACK, TONGUE, RAKE, SIDE WIND	1	*	*	*	*	*	*	*	*
5	CL44	CLEVIS, ADJUSTABLE, 3 HOLE	1		*		*		*		*
5	CTA-290	COUPLER, 2 5/16", ADJUST, CAST 12.5K	1	*		*		*		*	
6	BP722	PIN, BENT, 5/8" X 4" USABLE	2	*	*	*	*	*	*	*	*
7	RJ22590	RATCHET JACK W/PINS	1	*	*	*	*	*	*	*	*
8	9032	U-BOLT FOR CROSS BAR TONGUE	4	*	*	*	*	*	*	*	*
9	P774	TOP LINK PIN 1 X 4-3/8 USABLE	2	*	*	*	*	*	*	*	*
10	P791	7/16 LYNCH PIN	2	*	*	*	*	*	*	*	*
11	91798A	HYDRAULIC HOSE HOLDER	1	*	*	*	*	*	*	*	*
12	CSNC10X96	5/8X6 GR.5 NC CAP SCREW	8	*	*	*	*	*	*	*	*
13	LW10SP	5/8" SPLIT LOCK WASHER PLTD	8	*	*	*	*	*	*	*	*
14	NUT10NC	5/8 N.C. STD NUT PLTD	8	*	*	*	*	*	*	*	*
15	LW06SP	3/8" SPLIT LOCK WASHER PLTD	1	*	*	*	*	*	*	*	*
16	FLTWA06	3/8 USS FLAT WASHER PLTD	1	*	*	*	*	*	*	*	*
17	NUT06NC	3/8 N.C. STD NUT PLTD	1	*	*	*	*	*	*	*	*
18	NUT08NCLK	1/2" LOCK NUT N.C. STD PLTD	8	*	*	*	*	*	*	*	*

## Main Frame



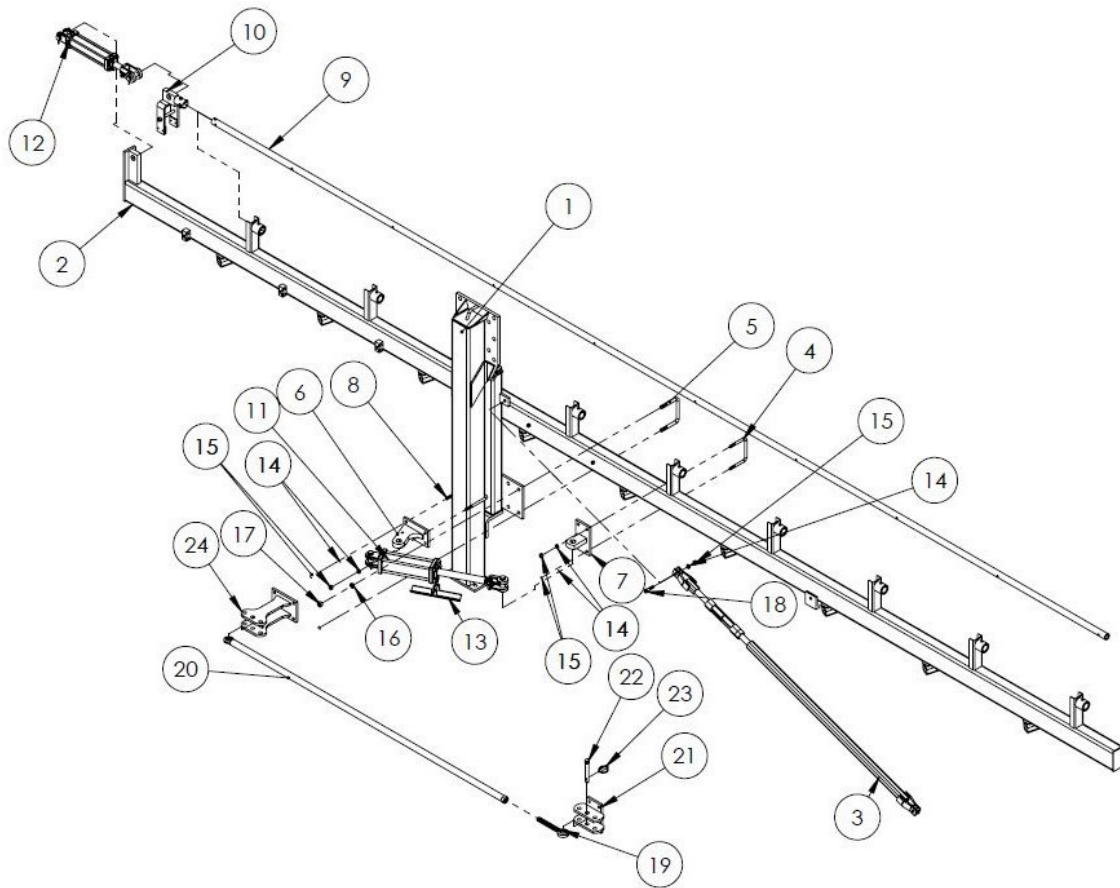
ITEM	PN	DESCRIPTION	QTY	1017L-AB	1017L-AC	1017L-WAB	1017L-WAC	1017L-FMAB	1017L-FMAC	1017L-FMWAB	1017L-FMWAC
1	9070	WIDE MAIN FRAME	1			*	*			*	*
1	93286	MAIN FRAME SECTION STD	1	*	*			*	*		
2	101788	E-TRACK SUPPORT	1	*	*	*	*	*	*	*	*
3	700-0806-4006J	7FUNCTION, ELEC-HYD 700-0806-4006 W/JIC FITTINGS	1					*	*	*	*
4	7007COVER	COVER FOR FASSE VALVE ON OVRHD 7 FUNCTION VALVE	1					*	*	*	*
5	93288	COVER PLATES GALV.	4	*	*	*	*	*	*	*	*
6	92283A	FORMED UHMW BEARING PLATE 1/4	16	*	*	*	*	*	*	*	*
7	92284A	FORMED UHMW BEARING PLATE 3/16	16	*	*	*	*	*	*	*	*
8	9110	HOSE CLAMP USED ALL RAKES 6/01	1	*	*	*	*	*	*	*	*
9	09PCHAIN12	29 LINKS 3/16 PROOF COIL CHAIN USED 2000 917, 950	2	*	*	*	*	*	*	*	*
10	FLTWA06	3/8 USS FLAT WASHER PLTD	2	*	*	*	*	*	*	*	*
11	NUT06NCLK	3/8 N.C. LOCK BUT ALL STEEL GRADE C	2	*	*	*	*	*	*	*	*
12	CSNC04X16	1/4x1 GR.5 NC CAP SCREW	48	*	*	*	*	*	*	*	*
13	LW04SP	1/4" SPLIT LOCK WASHER PLTD	16	*	*	*	*	*	*	*	*
14	FLTWA04	1/4 USS FLAT WASHER PLTD	60	*	*	*	*	*	*	*	*
15	NUT04NC	1/4 N.C. STD NUT PLTD	16	*	*	*	*	*	*	*	*
16	NUT04NCNYL	1/4 N.C. NYLON LOCK NUT	38	*	*	*	*	*	*	*	*
17	CSNC06X48	3/8x3 GR.5 NC CAP SCREW	2	*	*	*	*	*	*	*	*
18	LW06SP	3/8" SPLIT LOCK WASHER PLTD	2	*	*	*	*	*	*	*	*
19	NUT06NC	3/8 N.C. STD NUT PLTD	2	*	*	*	*	*	*	*	*
20	KS225-54	CABLE TRACK - 12" ON RAKES S/N: 60942 - 70474	2	*	*	*	*	*	*	*	*
20	2500-05-055-0	CABLE TRACK - 12" ON RAKES S/N: 70475 & LATER	2	*	*	*	*	*	*	*	*
21	KS225BR	BRACKET CABLE TRACK, SS ON RAKES S/N: 60942 - 70474	2	*	*	*	*	*	*	*	*
21	2050-3PZ	BRACKET PIVOT W/BORE; E-TRACK ON RAKES S/N: 70475 & LATER	2	*	*	*	*	*	*	*	*
22	CSNC04X24	1/4x1-1/2 GR.5 NC CAP SCREW	6	*	*	*	*	*	*	*	*

## Leg & Extension



ITEM	PN	DESCRIPTION	QTY	1017L- AB	1017L- AC	1017L- WAB	1017L- WAC	1017L- FMAB	1017L- FMAC	1017L- FMWAB	1017L- FMWAC
1	9071	WIDE MALE SLIDE	1			*	*			*	*
1	93285	STD MALE EXTEN TUBE	1	*	*			*	*		
2	92581L	LEG STRUT OVERHEAD	1	*	*	*	*	*	*	*	*
3	101787L	E-TRACK GUIDE/ATTACHMENT-LEFT WIDE ONLY	1			*	*			*	*
3	101787R	E-TRACK GUIDE/ATTACHMENT-RIGHT WIDE ONLY	1			*	*			*	*
3	101787	E-TRACK GUIDE/ATTACHMENT STD WIDTH ONLY-BOTH SIDES	2	*	*			*	*		
4	901200	JACK STORAGE BRKT. BUNDLE	1	*	*	*	*	*	*	*	*
5	9018J	FOUR HOSE COUPLER-JIC BULKHEAD	1	*	*	*	*	*	*	*	*
6	9229930	WHEEL ADJ LEVER 1 PER RAKE	1	*	*	*	*	*	*	*	*
7	93101	BEARING PLATE 1/4X6	8	*	*	*	*	*	*	*	*
7	93100	BEARING PLATE 3/16X6	8	*	*	*	*	*	*	*	*
8	FLTWA06	3/8 USS FLAT WASHER PLTD	1	*	*	*	*	*	*	*	*
9	NUT06NCLK	3/8 N.C. LOCK BUT ALL STEEL GRADE C	1	*	*	*	*	*	*	*	*
10	PHMS04X16	1/4X1 FLAT HEAD PHILLIPS HD	32	*	*	*	*	*	*	*	*
11	NUT04NCNYL	1/4 N.C. NYLON LOCK NUT	32	*	*	*	*	*	*	*	*
12	CSNC12X48	3/4X3 GR.5 NC CAP SCREW	4	*	*	*	*	*	*	*	*
13	LW12SP	3/4" SPLIT LOCK WASHER PLTD	10	*	*	*	*	*	*	*	*
14	NUT12NC	3/4 N.C. STD NUT PLTD	10	*	*	*	*	*	*	*	*
15	CSNC12X40	3/4X2-1/2 GR.5 NC CAP SCREW	6	*	*	*	*	*	*	*	*

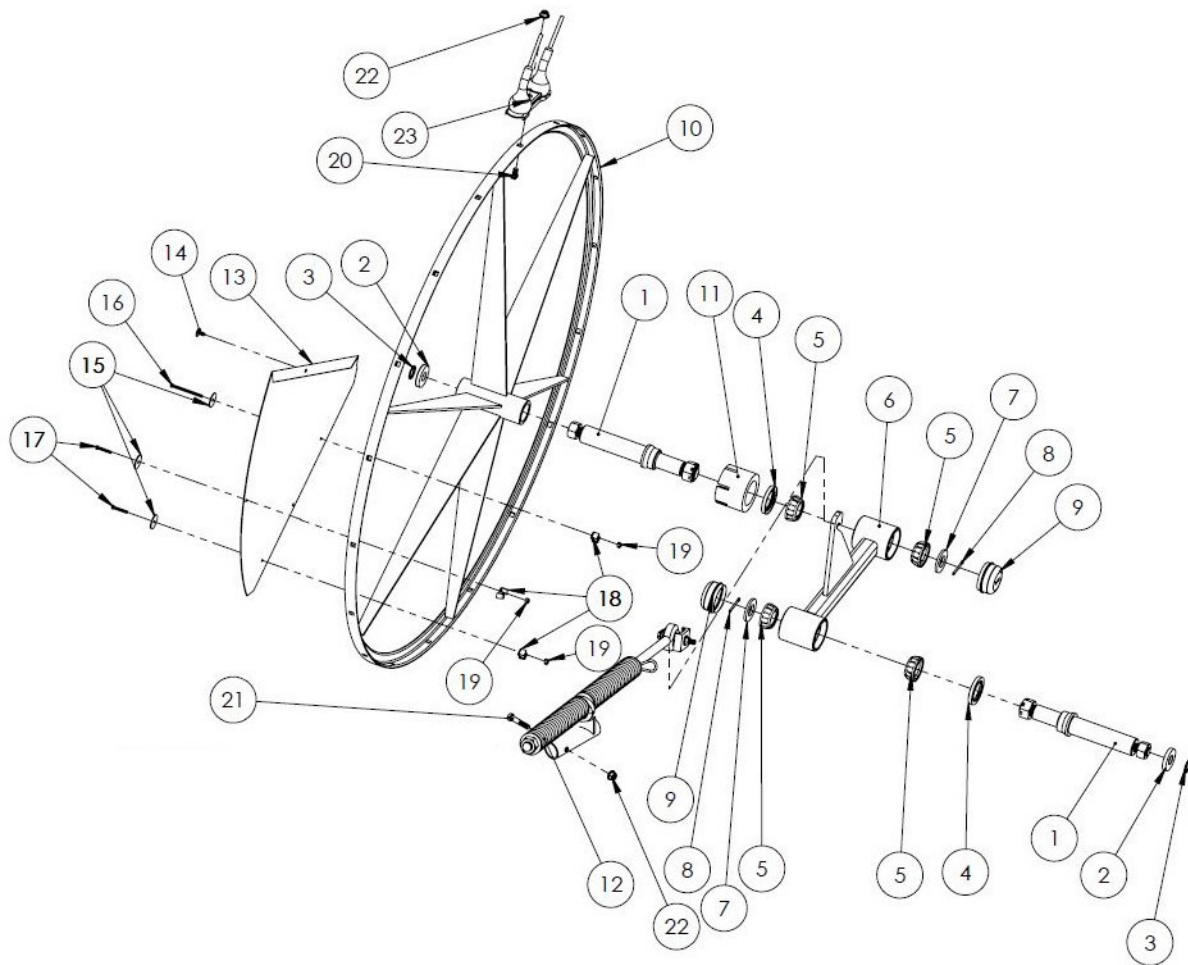
## Raking Frame



ITEM	PN	DESCRIPTION	QTY	1017L-AB	1017L-AC	1017L-WAB	1017L-WAC	1017L-FMAB	1017L-FMAC	1017L-FMWAB	1017L-FMWAC
1	92581L	LEG STRUT OVERHEAD	1	*	*	*	*	*	*	*	*
2	101793	RAKING FRAME - RIGHT	1	*	*	*	*	*	*	*	*
2	101792	RAKING FRAME - LEFT	1	*	*	*	*	*	*	*	*
3	9099	ADJ FRONT BRACE ALL RAKES	1	*	*	*	*	*	*	*	*
4	9027	U-BOLT TO FRAME BRACKETS 1/2"	2	*	*	*	*	*	*	*	*
5	9028-8	U-BOLT LEG STRUT/FRAME 5/8SIZE GRADE 8 - FOUR PER LEG STRUT	4	*	*	*	*	*	*	*	*
6	9173	FD LEG STRUT HYD.CYL BKT.	1					*	*	*	*
7	922990	HYD CYL BRACKET FRAME END	1					*	*	*	*
8	9029	U-BOLT LEG STRUT ANGLE BRKT FOR STANDARD AND FULL HYD MOD.	2	*	*	*	*	*	*	*	*
9	91791	9 WHEEL LIFT TUBE (10holes) RIGHT	1	*	*	*	*	*	*	*	*
9	91790	8 WHEEL LIFT TUBE (9holes) LEFT	1	*	*	*	*	*	*	*	*
10	92193A	LIFT ROD HYD.CLEVIS SOCKET	1	*	*	*	*	*	*	*	*
11	N301060	3 X 8 ASAE HYD. CYLINDER	1					*	*	*	*
12	N201028	2 X 8 ASAE HYD. CYLINDER	1	*	*	*	*	*	*	*	*
13	9189	HYD. CYL STOP FD SERIES ONLY FRAME SWING	1					*	*	*	*
14	LW08SP	1/2" SPLIT LOCK WASHER PLTD	10	*	*	*	*	*	*	*	*
15	NUT08NC	1/2" STD N.C. PLTD NUT	10	*	*	*	*	*	*	*	*
16	LW10SP	5/8" SPLIT LOCK WASHER PLTD	8	*	*	*	*	*	*	*	*
17	NUT10NC	5/8 N.C. STD NUT PLTD	8	*	*	*	*	*	*	*	*
18	CSNC08X32	1/2X2 GR.5 NC CAP SCREW	2	*	*	*	*	*	*	*	*
19	9171	MANUAL ADJUST THREADED END	1	*	*	*	*				
20	9172	MANUAL ADJUST TUBE	1	*	*	*	*				
21	922994	THREE HOLE LINK MAN ADJ BKT	1	*	*	*	*				
22	P772	CAT.1 TOP LINK 3-5/8 USABLE	2	*	*	*	*				
23	P791	7/16 LYNCH PIN	2	*	*	*	*				
24	922996	LEG STRUT ADJ.BRKT	1	*	*	*	*				

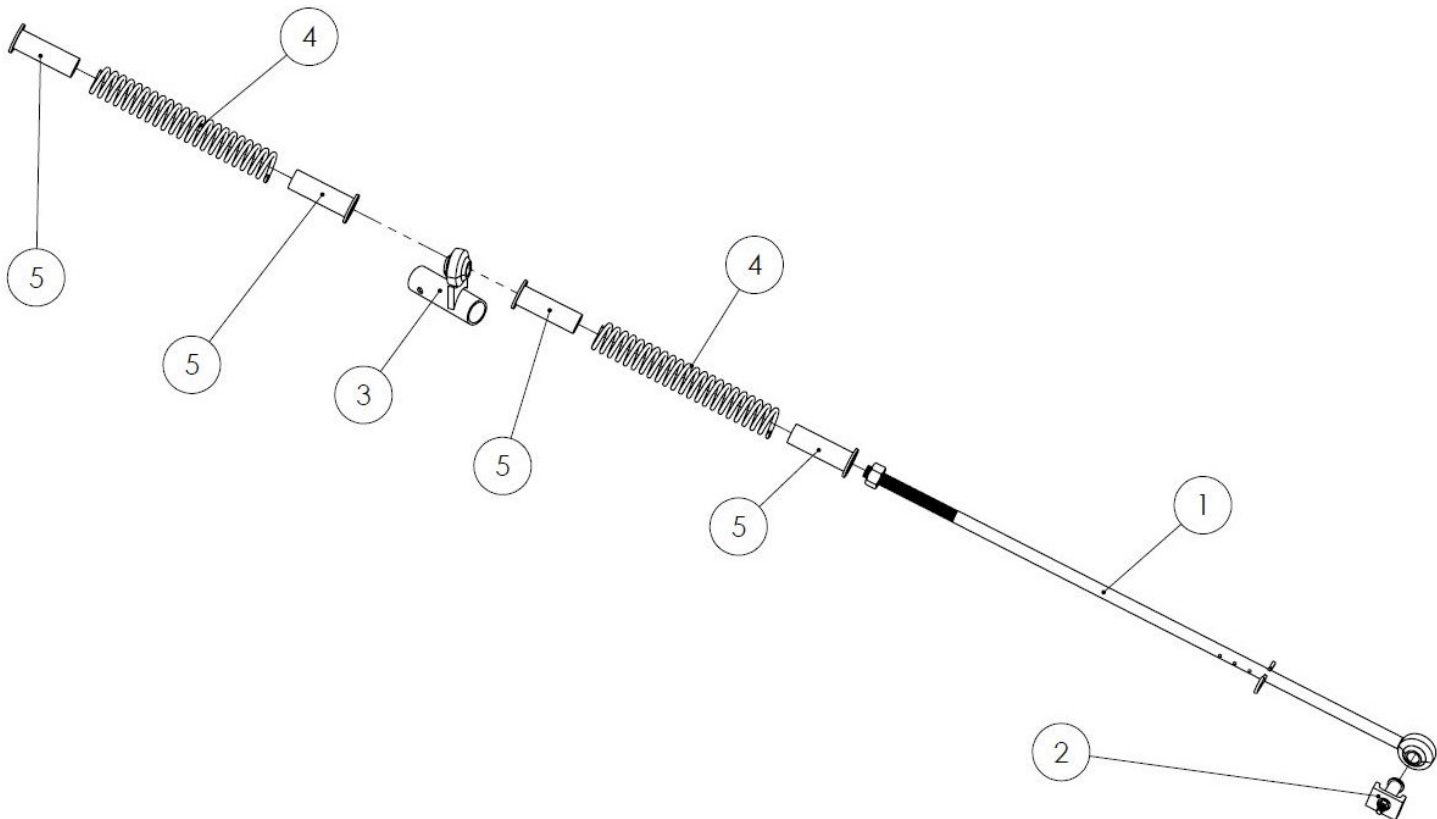


## Raking Wheel



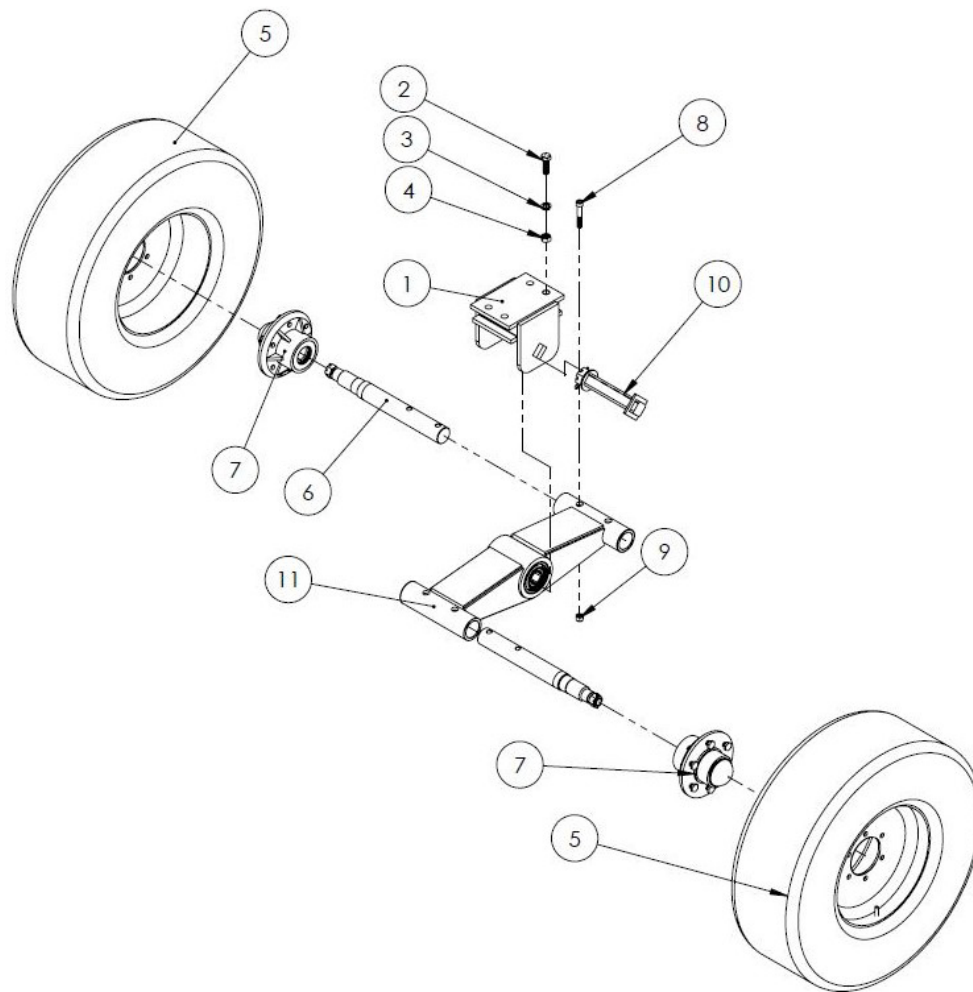
ITEM	PN	DESCRIPTION	QTY	1017L-AB	1017L-AC	1017L-WAB	1017L-WAC	1017L-FMAB	1017L-FMAC	1017L-FMWAB	1017L-FMWAC
1	95019	SPINDLE 2"STOCK W/NUTS	2	*	*	*	*	*	*	*	*
2	95045	RETAINER FOR 95019 SPIN. GOLD	2	*	*	*	*	*	*	*	*
3	95046	SPRING LOCK WASHER 3/4" REPLACES 95044	2	*	*	*	*	*	*	*	*
4	95022	SEAL FOR 95019 SPINDLE SE175-243-31TB /471504	2	*	*	*	*	*	*	*	*
5	9220	TAPER BEARING CONE, 15123	4	*	*	*	*	*	*	*	*
6	92219H	CRANK SUPPORT SECTION W/CUPS	1	*	*	*	*	*	*	*	*
7	95043	2"o.d. X 1i.d.x 9 SPINDLE WASH	2	*	*	*	*	*	*	*	*
8	COT32P	COTTER PIN, 2"	2	*	*	*	*	*	*	*	*
9	9041	GREASE CAP NIW EMBOSS	2	*	*	*	*	*	*	*	*
10	92114	RAKING WHEEL	1	*	*	*	*	*	*	*	*
10	102114	RAKING WHEEL, HD	1	*	*	*	*	*	*	*	*
11	92114AWS	ANTI-WRAP SHIELD FOR WHEELS	1	*	*	*	*	*	*	*	*
12	SRUNIT2-LH	SPRING/ROD ASSY-LH PER WHEEL	1	*	*	*	*	*	*	*	*
12	SRUNIT2-RH	SPRING/ROD ASSY-RH PER WHEEL	1	*	*	*	*	*	*	*	*
13	92155-6	WIND SHIELD SECTION FOR 92155	6	*	*	*	*	*	*	*	*
14	92155-T	TREE FASTENER FOR POLY SHILED	6	*	*	*	*	*	*	*	*
15	92175-04	RETAINER WASHER FOR 92154C	18	*	*	*	*	*	*	*	*
16	92175-03	10/24X2.75HEX HD. MACHINE SCRW FOR 92175A FASTNER ASSY.	6	*	*	*	*	*	*	*	*
17	92175-02	10/24X1.25HEX HD. MACHINE SCRW FOR 92175 FASTNER ASSY.	12	*	*	*	*	*	*	*	*
18	92175-01	CLIP FOR 92175&92175A ONLY	18	*	*	*	*	*	*	*	*
19	NUT10/24NYL	10/24 NYLON LOCK NUT	18	*	*	*	*	*	*	*	*
20	92133-01	SPECIAL TOOTH BOLT ONLY	18	*	*	*	*	*	*	*	*
21	CSNC06X32	3/8X2 GR.5 NC CAP SCREW	1	*	*	*	*	*	*	*	*
22	NUT06FLCLK	3/8-16 N.C.LOCK NUT Z/Y/W GRADE F	19	*	*	*	*	*	*	*	*
23	92117RL	RUBBER MOUNTED TOOTH, R&L	18	*	*	*	*	*	*	*	*

Dur-Adjust






ITEM	PN	DESCRIPTION	QTY	1017L- AB	1017L- AC	1017L- WAB	1017L- WAC	1017L- FMAB	1017L- FMAC	1017L- FMWAB	1017L- FMWAC
1	SR100	SPRING ADJUSTMENT ROD	1	*	*	*	*	*	*	*	*
2	SR200	SPRING ROD MTG. CLIP BUNDLE	1	*	*	*	*	*	*	*	*
3	SR600L	SUPPORT LIFT TUBE - LH BALL JOINT	1	*	*	*	*	*	*	*	*
3	SR600R	SUPPORT LIFT TUBE - RH BALL JOINT	1	*	*	*	*	*	*	*	*
4	92221	COMPRESSION SPRING	2	*	*	*	*	*	*	*	*
5	SR700	SPRING SLIDE W/BUSHING	4	*	*	*	*	*	*	*	*

## Super Duty Walking Beam & Cradle



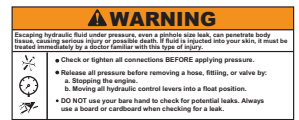
ITEM	PN	DESCRIPTION	QTY	1017L-AB	1017L-AC	1017L-WAB	1017L-WAC	1017L-FMAB	1017L-FMAC	1017L-FMWAB	1017L-FMWAC
1	1079	WALKING BEAM CRADLE/SUPER DUTY	1	*	*	*	*	*	*	*	*
2	CSNC10X32	5/8x2 GR.5 NC CAP SCREW	4	*	*	*	*	*	*	*	*
3	LW10SP	5/8" SPLIT LOCK WASHER PLTD	4	*	*	*	*	*	*	*	*
4	NUT10NC	5/8 N.C. STD NUT PLTD	4	*	*	*	*	*	*	*	*
5	SG11LX15-M	STUBBLEGUARD TIRES - MOUNTED	2	*	*	*	*	*	*	*	*
6	90801	2 X 18.0" SPINDLE FOR #4910HUB W/NUT,LESS WASHER	2	*	*	*	*	*	*	*	*
7	9080300	4910#HUB GROUP W/BRGS.SEAL,CAP WHEEL BOLTS	2	*	*	*	*	*	*	*	*
8	SOCKHD08X48	1/2x3 SOCKET HEAD CAP SCREW	4	*	*	*	*	*	*	*	*
9	NUT08NCLK	1/2" LOCK NUT N.C. STD PLTD	4	*	*	*	*	*	*	*	*
10	1082	SD WALKING BEAM PIN (KIT)	1	*	*	*	*	*	*	*	*
11	1078	WELDMENT, WALKING BEAM, SUPER DUTY, LESS SPINDLES	1	*	*	*	*	*	*	*	*

## Torque Chart

Tightening Torque							
Bolt Diameter	Wrench Size						
		SAE Grade 2		SAE Grade 5		SAE Grade 8	
		lb-ft	N-m	lb-ft	N-m	lb-ft	N-m
1/4"	7/16"	5	7	8	11	12	16
5/16"	1/2"	11	15	17	23	25	34
3/8"	9/16"	20	27	31	42	44	60
7/16"	5/8"	32	43	49	66	70	95
1/2"	3/4"	49	66	75	102	107	145
9/16"	13/16"	70	95	109	148	154	209
5/8"	15/16"	97	132	150	203	212	287
3/4"	1-1/8"	173	235	266	361	376	510
7/8"	1-5/16"	166	225	429	582	606	822
1"	1-1/2"	250	339	644	873	909	1232
1-1/8"	1-11/16"	354	480	794	1077	1287	1745
1-1/4"	1-7/8"	500	678	1120	1519	1875	2542
1-3/8"	2-1/16"	655	888	1469	1992	2382	3230
1-1/2"	2-1/4"	870	1180	1950	2644	3161	4286



## Decals



OPERATING INSTRUCTIONS	
1. Level rake using hitch adjustments.	4. Check hydraulic oil level in tractor.
2. Set tire pressure 15psi	5. Bleed all lines of air.
3. Adjust raking wheel spring tension to assure clean raking without excessive ground contact.	6. Re-tighten all bolts after first day of operation.



ITEM	PN	DESCRIPTION	QTY	1017L-AB	1017L-AC	1017L-WAB	1017L-WAC	1017L-FMAB	1017L-FMAC	1017L-FMWAB	1017L-FMWAC
1	DECALCRUSH	CRUSH DECAL	1	*	*	*	*	*	*	*	*
2	DECALFLUID	HIGH PRESSURE DECAL	4	*	*	*	*	*	*	*	*
3	DECALTRANS	TRANSPORT BLOCK DECAL	4	*	*	*	*	*	*	*	*
4	1017TRTWTW	WEST WAS WON DECAL	1	*	*	*	*	*	*	*	*
5	1017ROUND	9"ROUND DARF DECAL (STD. FRAME)	1	*	*	*	*	*	*	*	*
6	1017WROUND	11"ROUND DARF DECAL (WIDE FRAME)	1	*	*	*	*	*	*	*	*
7	DARFDEC	DARF WITH WEBSITE DECAL	3	*	*	*	*	*	*	*	*
8	NIWDEC15X16	NIKKEL IRON WORKS DECAL	3	*	*	*	*	*	*	*	*
9	1017LSERIES	1017L SERIES DECAL (STD. FRAME)	3	*	*	*	*	*	*	*	*
10	1017L-WSERIES	1017L W-SERIES DECAL (WIDE FRAME)	3	*	*	*	*	*	*	*	*
11	FMMODEL	FM MODEL DECAL	3	*	*	*	*	*	*	*	*
12	DEMADEC	FEMA DECAL	3	*	*	*	*	*	*	*	*
13	DECALPMITUSA	PROUDLY MADE IN USA DECAL	4	*	*	*	*	*	*	*	*
14	NIWDEC4X10	OPERATING INSTRUCTIONS DECAL	2	*	*	*	*	*	*	*	*
15	B489A	AMBER REFLECTOR DECAL	2	*	*	*	*	*	*	*	*
16	B489R	RED REFLECTOR DECAL	2	*	*	*	*	*	*	*	*
17	SMV1	SLOW MOVING VEHICLE DECAL	1	*	*	*	*	*	*	*	*
18	DECAL65	CA PROPOSITION 65 WARNING DECAL	1	*	*	*	*	*	*	*	*

# NOTES



# NOTES





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Revised November 2021