

OPERATOR'S MANUAL

HI CAPACITY BI-FOLD RAKE

| WR1212

| WR1214

| WR1216



HSMFG0412 Rev. 7

5HPOMR3

FRONTIER WR1212/WR1214/WR1216

PARTS AND OPERATOR'S MANUAL

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WARRANTY:

Warranty coverage is provided by John Deere according to the terms of the Agricultural/Commercial & Consumer Equipment Warranty Statement. Carefully read the warranty statement on the back of your original purchase order for details on coverage and limitations of this warranty.

NOTES

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FRONTIER DEALER PRE-DELIVERY CHECK LIST

AFTER COMPLETION, DEALER SHOULD REMOVE AND RETAIN FOR RECORDS

After the rake has been completely set-up, check to be certain it is in correct operating order before delivering to the customer. The following is a list of points to inspect. Check off each item as you have made the proper adjustments and found the item operating satisfactorily.

- Rake was not damaged in shipment. Check for dents and loose or missing parts. Report damage immediately to Frontier.
- Rake has been correctly assembled according to instructions in this manual. Wheel nuts and all other fasteners are tightly secured.
- All bolts and fasteners are tight.
- All grease fittings have been lubricated. See Lubrication Chapter of this manual for details.
- Hoses and fittings are properly attached and there are no visible leaks.
- All mechanisms are operating trouble free.
- Rake wheels touch ground in unison when lowered into position. (Rake setting level)
- Wheels are properly mounted.
- Tires are inflated to correct pressure.
- Decals are in place and legible.

Model Number _____

Serial Number _____

Dealer's Name _____

Inspection Date _____

Signature of Pre-Delivery Inspector _____

(Remove Dealers File Copy At Perforation)

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FRONTIER DEALER DELIVERY CHECK LIST

AFTER COMPLETION, DEALER SHOULD REMOVE AND RETAIN FOR RECORDS

This check list that follows is an important reminder of valuable information that should be passed on to the customer at the time this Rake is delivered.

Check off each item as you explain it to the customer.

This delivery check list, when properly filled out and signed assures the customer that the Pre-delivery service was satisfactorily performed.

- Explain to the customer that the pre-delivery inspection was made.
- Explain to the customer all the safety precautions they must exercise when operating this unit.
- Explain raking and windrow width adjustments.
- Explain to customer that regular lubrication is required for proper operation and long life of machine.
- Show customer the lubrication section of Owner's Manual.
- Give the customer Owner's Manual and make sure they read and understand all operating and service instructions.
- Record Serial Number on page 24 of this Manual.

Date Delivered _____

Dealer's Name _____

By _____

Signature of Original Buyer _____

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FRONTIER MODEL WR1212, WR1214 & WR1216 HI CAPACITY BI-FOLD RAKE

Your Frontier Hi-Capacity Rake has been manufactured of the finest quality materials and components. The performance you get from your machine is largely dependent upon how well you read and understand this manual and apply this knowledge. There is a right and a wrong way to do everything. Please do not assume that you know how to operate and maintain your Hi-Capacity Rake before reading this manual carefully. Keep this manual available for ready reference.

SPECIFICATIONS

	<u>WR1212</u>	<u>WR1214</u>	<u>WR1216</u>
Overall Width - Transport.....	96"	97"	97"
Overall Length - Transport.....	24'6"	27'4"	30'1"
Weight.....	3500 lbs.	3800 lbs.	4200 lbs.
Number of Rake Wheels.....	12.	14.	16
Number of Teeth per Rake Wheel.....	40.	40.	40
Overall Diameter of Rake Wheel.....	55"	55"	55"
Rake Tooth Diameter.....	7mm.	7mm.	7mm
Raking Widths.....	0' to 24'	0' to 28'	0'to 31'6"
Windrow Widths.....	38" to 58"	38" to 58"	38" to 58"
Swing Away Jack w/Storage Position.....	Standard.	Standard.	Standard
Center Kicker Wheel.....	Optional.	Optional.	Optional
Tire Size.....	.6.70x15" 6ply w/Stubble Guard.....		

Note:

Determine right and left side of Hi-Capacity Rake by viewing it from the rear. If instructions or parts lists call for hardened bolts see page 6 to identify.

SAFETY INFORMATION



**BE
ALERT!**

**YOUR SAFETY
IS INVOLVED.**

THIS SYMBOL IS USED THROUGHOUT THIS BOOK WHENEVER YOUR PERSONAL SAFETY IS INVOLVED. TAKE TIME TO BE CAREFUL. REMEMBER: THE CAREFUL OPERATOR IS THE BEST OPERATOR. MOST ACCIDENTS ARE CAUSED BY HUMAN ERROR. CERTAIN PRECAUTIONS MUST BE OBSERVED TO PREVENT THE POSSIBILITY OF INJURY OR DAMAGE.

TRACTORS

This operator's manual uses the term "Tractor" when identifying the power source for towing and lifting rake.

SAFETY INFORMATION

RECOGNIZE SAFETY INFORMATION

This is the safety-alert symbol. When you see this symbol on your machine or in this manual, be alert to the potential for personal injury.

Follow recommended precautions and safe operating practices.



UNDERSTAND SIGNAL WORDS

A signal word- DANGER, WARNING, or CAUTION - is used with the safety-alert symbol. DANGER identifies the most serious hazards.

Safety signs with signal word DANGER or WARNING are typically near specific hazards.

General precautions are listed on CAUTION safety signs.



FOLLOW SAFETY INSTRUCTIONS

Carefully read all safety messages in this manual, and all safety signs on your machine. Follow all recommended precautions and safe operating procedures.

Keep signs in good condition. Immediately replace any missing or damaged signs.



OBSERVE MAXIMUM TRANSPORT SPEED

The maximum transport speed for this implement is 32 km/h (20 mph).

Some tractors are capable of operating at speeds that exceed the maximum transport speed of this implement. Regardless of the maximum speed capability of the tractor being used to tow this implement, do not exceed the implement's maximum transport speed.

Exceeding the implements maximum transport speed can result in:

- Loss of control of the tractor/implement combination
- Reduced or no ability to stop during braking
- Implement tire failure
- Damage to the implement structure or its components

Use additional caution and reduce speed when towing under adverse surface conditions, when turning, and when on inclines.

Do not attempt transport if the fully loaded implement weighs more than 1.5 times the weight of the tractor.



TRACTORS

This operators manual uses the term “Tractor” when identifying the power source for towing and lifting rake.



WARNING

TO PREVENT SERIOUS INJURY OR DEATH

BEFORE YOU ATTEMPT TO OPERATE THIS EQUIPMENT, READ AND STUDY THE FOLLOWING INFORMATION. IN ADDITION, MAKE SURE THAT EVERY INDIVIDUAL WHO OPERATES OR WORKS WITH THIS EQUIPMENT, WHETHER FAMILY MEMBER OR EMPLOYEE, IS FAMILIAR WITH THESE SAFETY PRECAUTIONS.

DO NOT attempt to perform maintenance or repair with tractor running.

DO NOT step up on machine at any time.

DO NOT allow minors to operate or be near the machine.

DO NOT ALLOW PERSONNEL OTHER THAN THE QUALIFIED OPERATOR NEAR THE MACHINE.

Loose or floppy clothing should not be worn by the operator.

Stop the tractor engine, remove ignition key, and allow all mechanisms to stop before cleaning, working, or adjusting on machine.

Stay clear of hydraulic lines, they may be under extreme pressure or heat.

Stay clear of rake when opening or closing main rake arm beams, or raising or lowering rake wheels.

For transport, always make sure that the hair pin at the rear of the lift pipes, and the transport lock pipes with safety clip pins, are securely locked in place.

To reduce stress on rake arms, lift pipe, springs and spring brackets, reduce oil flow from tractor to lift cylinders whenever possible.

Be sure to raise rake wheels before closing to transport position.

Frontier always takes the operator and their safety into consideration and guards exposed moving parts for their protection. However, some areas cannot be guarded or shielded in order to assure proper operation. In addition, the operators manual and decals on the machine itself warn you of further danger and should be read and observed closely.


Study The Above Safety Rules
ATTENTION - BE ALERT - YOUR SAFETY IS INVOLVED

SAFETY INFORMATION


	<p style="text-align: center;">⚠ DANGER</p> <p style="text-align: center;">STAY CLEAR OF RAKE WHEN OPENING OR CLOSING.</p> <p style="text-align: center;">FAILURE TO HEED THIS WARNING MAY RESULT IN PERSONAL INJURY OR DEATH.</p> <p style="text-align: center;">KEEP CLOTHING, YOURSELF AND OTHERS WELL CLEAR.</p>
11694A	

	<p style="text-align: center;">⚠ WARNING</p> <p style="text-align: center;">DO NOT GO NEAR LEAKS</p> <ul style="list-style-type: none"> • High pressure oil easily punctures skin causing serious injury, gangrene or death. • If injured, seek emergency medical help. Immediate surgery is required to remove oil. • Do not use finger or skin to check for leaks. • Lower load or relieve hydraulic pressure before loosening fittings.
11599	

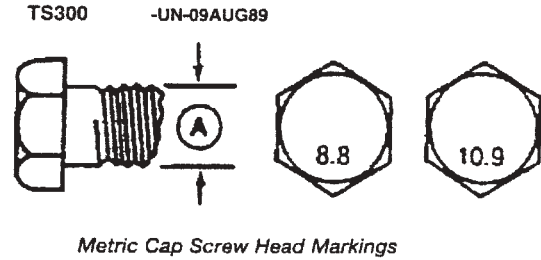
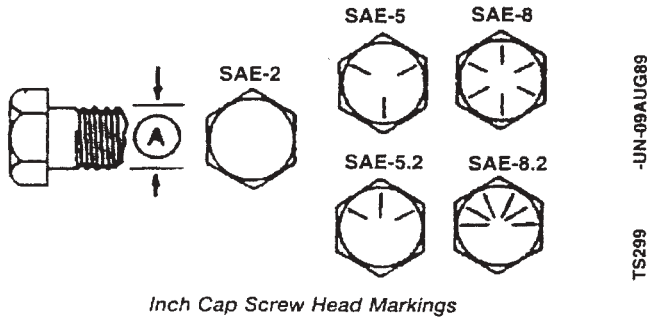
<p style="font-size: 2em; margin: 0;">⚠ WARNING</p> <p style="font-size: 1.5em; margin: 0;">HELP AVOID INJURY</p>
<ul style="list-style-type: none"> • READ & UNDERSTAND THE OPERATORS MANUAL PROVIDED WITH THIS MACHINE. IF MISPLACED CALL H & S MANUFACTURING AT 715-387-3414 WITH MODEL AND SERIAL NUMBER. • UNDERSTAND ALL SAFETY WARNINGS AND FUNCTION OF CONTROLS. • KEEP SAFETY DEVICES IN PLACE AND WORKING. • KEEP YOURSELF AND OTHERS WELL CLEAR OF MOVING PARTS. • DISCONNECT ALL POWER BEFORE SERVICING OR CLEANING THIS MACHINE. • DO NOT EXCEED 20 MPH
72203A

	<p style="text-align: center;">⚠ WARNING</p> <p style="text-align: center;">STAY CLEAR OF RAKE WHEN RAISING OR LOWERING RAKE WHEELS.</p> <p style="text-align: center;">FAILURE TO HEED THIS WARNING MAY RESULT IN PERSONAL INJURY OR DEATH.</p> <p style="text-align: center;">KEEP CLOTHING, YOURSELF AND OTHERS WELL CLEAR.</p>
2185	

<p style="font-size: 1.5em; margin: 0;">⚠ DANGER</p>	
	<p style="text-align: center;">STAY CLEAR OF RAKE WHEN OPENING OR CLOSING.</p> <p style="text-align: center;">FAILURE TO HEED THIS WARNING MAY RESULT IN PERSONAL INJURY OR DEATH. KEEP CLOTHING, YOURSELF AND OTHERS WELL CLEAR.</p>
11694B	

<p style="font-size: 1.5em; margin: 0;">⚠ WARNING</p>	
	<p>Do not exceed this implement's maximum transport speed of 32 km/h (20 mph). Exceeding this speed may result in loss of control during transport or braking and serious injury or death.</p> <p>Transport only with a properly ballasted tractor and a properly attached safety tow chain. Do not transport with a motor vehicle. Reduce speed and use additional caution when on inclines, towing under adverse surface conditions, and turning.</p>

CAP SCREW TORQUE VALUES



INCH CAP SCREW TORQUE VALUES

METRIC CAP SCREW TORQUE VALUES

Bolt Diameter (A)	Wrench Size	Cap Screw Grade					
		SAE 2		SAE 5		SAE 8	
		N-m	lb.-ft	N-m	lb.-ft	N-m	lb.-ft
1/4"	7/16"	7	(5)	11	(8)	16	(12)
5/16"	1/2"	14	(10)	23	(17)	33	(24)
3/8"	9/16"	24	(18)	41	(30)	54	(40)
7/16"	5/8"	41	(30)	68	(50)	95	(70)
1/2"	3/4"	61	(45)	102	(75)	142	(105)
9/16"	13/16"	88	(65)	142	(105)	203	(150)
5/8"	15/16"	122	(90)	197	(145)	278	(205)
3/4"	1-1/8"	217	(160)	353	(260)	495	(365)
7/8"	1-5/16"	224	(165)	563	(415)	800	(590)
1"	1-1/2"	332	(245)	848	(625)	1193	(880)
1-1/4"	1-7/8"	665	(490)	1492	(1100)	2393	(1765)

Bolt Diameter (A)	Wrench Size	Markings on Cap Screw Heads			
		8.8		10.9	
		N-m	lb.-ft	N-m	lb.-ft
5 mm	8 mm	6	(4.5)	9	(6.5)
6 mm	10 mm	10	(7.5)	15	(11)
8 mm	13 mm	25	(18)	35	(26)
10 mm	16 mm	50	(37)	75	(55)
12 mm	18 mm	85	(63)	130	(97)
16 mm	24 mm	215	(159)	315	(232)
20 mm	30 mm	435	(321)	620	(457)
24 mm	36 mm	750	(553)	1070	(789)
30 mm	46 mm	1495	(1103)	2130	(1571)



CAUTION: Use only metric tools on metric hardware. Other tools may not fit properly. They may slip and cause injury.

DO NOT use these values if a different torque value tightening procedure is listed for a specific application. Torque values listed are for general use only. Check tightness of cap screws periodically.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical grade. Fasteners should be replaced with the same or higher grade. If higher grade fasteners are used, these should only be tightened to the strength of the original.

Make sure fastener threads are clean and you properly start thread engagement. This will prevent them from failing when tightening.

Tighten plastic insert or crimped steel-type lock nuts to approximately 50 percent of amount shown in chart. Tighten toothed or serrated-type lock nuts to full torque value.

SET-UP & ASSEMBLY

NOTE: Determine right or left side of the wheel rake by viewing it from the rear. If instructions or parts lists call for hardened bolts, refer to bolt torque chart.

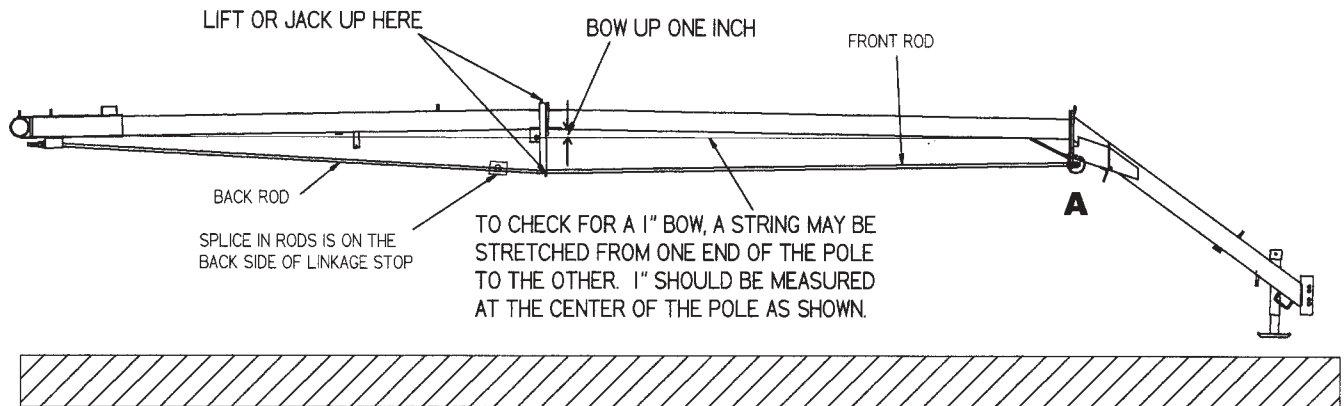
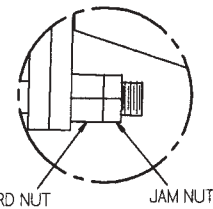
1. Assemble the rake or check the rake for proper assembly and adjustment. Make sure that all bolts are tightened.
2. Attach the wheels with tires, using the lug nuts furnished and torque the mounting hardware to 95 ft./lbs. of torque. Check wheel bolts periodically thereafter.
3. Check tires and inflate to the recommended pressure. (6.70 x 15 to 36 pounds)
4. Lubricate the rake completely (See Lubrication Chapter in this Manual).
5. Tooth bolts must be torqued to 40 ft./lbs. to help prevent excessive tooth breakage.
Re-torque rake tooth bolts after the first 100 acres. Check periodically thereafter.

12 Wheel Hi-Capacity ONLY

IMPORTANT

PERIODICALLY CHECK THE RAKE FOR A 1" BOW IN THE CENTER OF THE POLE. FAILURE TO MAINTAIN A 1" BOW WILL CAUSE PRE-MATURE FAILURE OF THE TRUSS RODS AND POLE.

DETAIL A



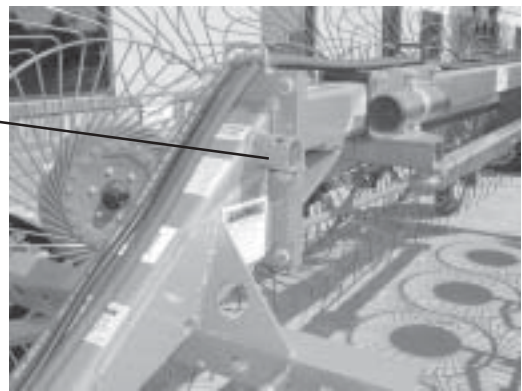
IF NUTS CANNOT BE TIGHTENED ENOUGH TO ACHIEVE A 1" BOW, THE POLE SHOULD BE LIFTED OR JACKED UP IN THE CENTER UNTIL THE FRONT GROUND JACK IS SLIGHTLY OFF THE GROUND. THIS WILL "PRE-BOW" THE POLE ENOUGH TO TIGHTEN THE NUTS.

PREPARING FOR OPERATION

1. Adjust the tractor hitch (13 to 17 inches above ground) and attach rake to tractor with a **hitch pin with a safety locking device**.
2. There are ten different positions to adjust the hitch on your new Hi-Capacity Rake. Hitch should be adjusted so main frame of the rake is level or parallel to the ground.



3. Remove weight from lift jack. Remove jack from pipe and place on convenient storage mount located on the front top of pole.



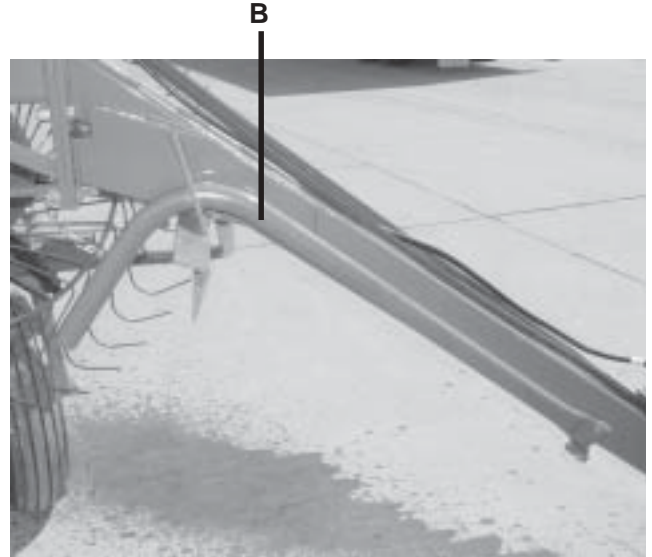
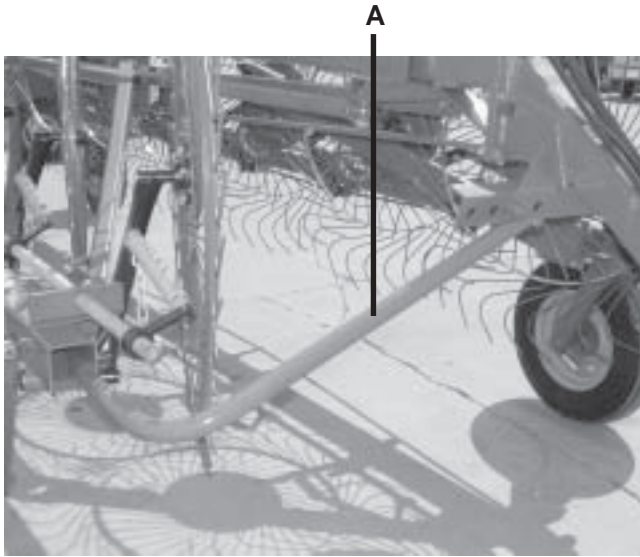
4. Connect hydraulic hose for raising and lowering rake wheels from rake to a double acting valve on the tractor.
5. Connect hydraulic hoses for opening and closing the rake to a double acting valve on the tractor.
6. Connect 7-pin electrical connector to tractor (If equipped with optional lighting).

TRANSPORTING

TRANSPORT LOCKS

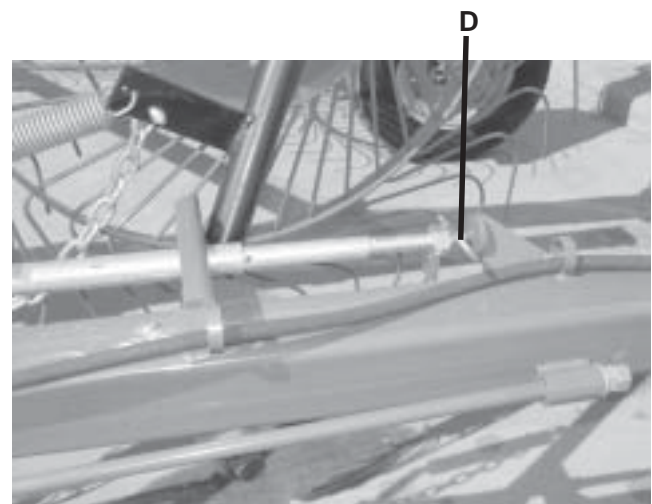
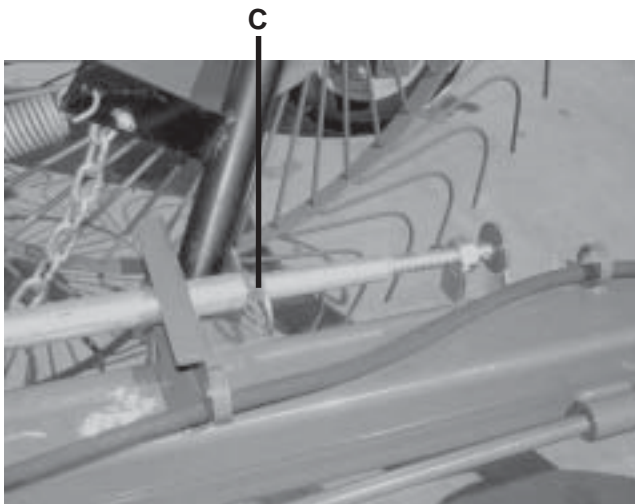
Rake Beam Locks

Transport locks are mounted to the front of the pole. (A) Shows the rake locked into transport position. (B) Shows the transport locks in the convenient storage position, to be used when in the raking mode.



Rake Wheel Locks

Located at the rear of the lift pipe, is a hair pin which is used to secure the rake wheels in the up position for transport (C). When in the down, or raking position, place the locking hair pin in the convenient storage position as shown (D).



TOWING ON HIGHWAY

Follow state and local regulations when towing farm equipment on public highways. Never tow the rake on a public highway at a speed greater than 20 mph (32 kph).

REFLECTORS

Red and Amber reflective safety decals are on the rake for safety. Refer to the [Decal Placement Chapter](#) for location.

OPERATION & ADJUSTMENTS

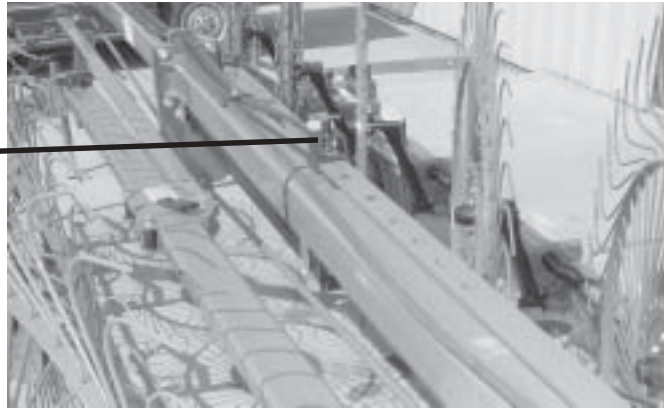
EMERGENCY SHUTDOWN

Stop the tractor engine, remove ignition key, and allow all mechanisms to stop before cleaning or working on the machine.

WR1212 PICTURED

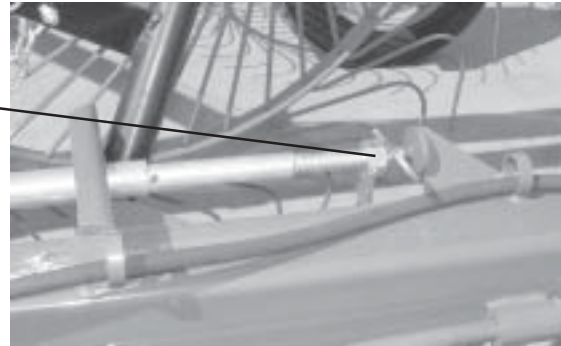
RAKING WIDTH

Raking width is determined by setting the spring loaded stop, located above the rear pole section as shown.



GROUND PRESSURE

Rake wheel to ground pressure is adjusted by turning the threaded rod while the rake wheels are in the raised position. This allows the tab nut to stay stationary while the threaded rod rotates, thus decreasing pressure, or increasing pressure. The further forward that the nut is on the threaded rod, the lesser the amount of rake wheel ground pressure. The further back that the nut is on the threaded rod, the greater the amount of rake wheel ground pressure.



WINDROW WIDTH

Windrow width is adjustable from 38" to 58". Adjustment is made by turning crank, located on the left of the rear of the rake as shown.



OPERATION & ADJUSTMENTS

GAUGE WHEELS

Outboard gauge wheels are located on the forward section of each rake beam. These gauge wheels support the rake beams to allow the rake wheels to better follow the contour of the ground. Located on the gauge wheel pivot spindle is an adjustable brake assembly. Adjust brake by tightening bolt. The brake should have enough tension to prevent zig-zag motion, but still allow the wheel to pivot when making corners.

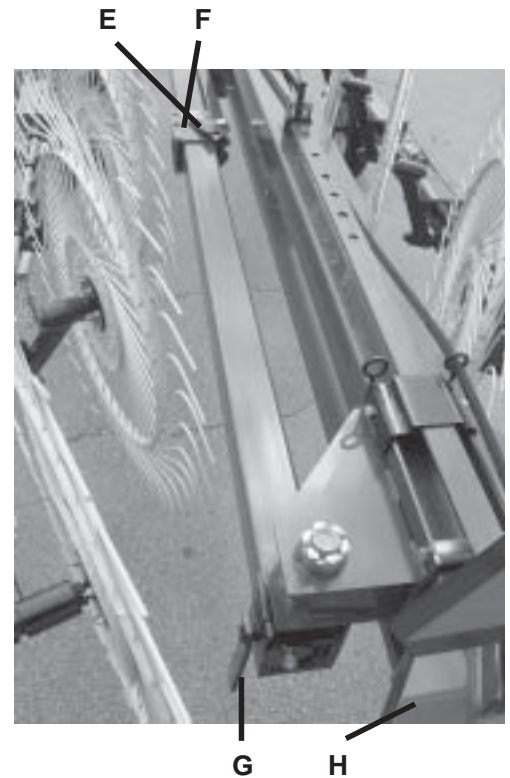


Adjustable
Brake
Assembly

ONE SIDED RAKING

Raking with one side only can be accomplished by first locking the left side of the rake into transport position utilizing both the front and rear transport locks. Next, remove Pin (E) attaching front linkage arm to main linkage arm, and place in storage hole (F). Also remove Pin (G) at the rear of the main linkage arm and place in the storage position (H) located in hitch attachment gusset at the rear of the rake (Lowering of rake wheels will aid in removal/installation of pins. Be sure rear transport lock is in transport position prior to raking with one side.). The right side can now be opened, and used to rake.

NOTE: Only the right side of your Hi-Capacity Rake can be used in this manner as shown below.



OPTIONAL EQUIPMENT

OPTIONAL CENTER KICKER WHEEL

There are two optional center kicker wheel assemblies available for the Hi-Capacity Rakes. If the hay is laying out flat, these extra wheels allow you to raise the hay laying in the center of the rake out of the stubble for faster drying, and easier pick-up. A separate cylinder controls the kicker wheel assembly. It raises and lowers with the rake wheels.

2-Wheel Center Kicker Wheel

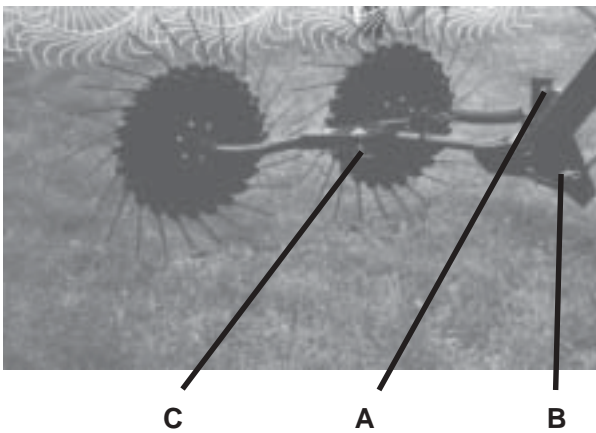
To engage center kicker wheels, hydraulically open rake to desired raking width. Remove Locking Pin (C), swivel kicker wheel assembly to the desired raking angle. Re-insert the locking pin. Next, remove Locking Pin (A) from transport lock position, and insert into convenient Storage Position (B). Lower rake wheels to begin raking.

To return to transport position, PRIOR TO CLOSING RAKE, raise rake wheels. (This will also raise the center kicker wheel assembly). Remove Locking Pin (C), Swivel kicker wheel assembly so that it is in line with the hitch pole. Re-insert Pin (C). Remove locking pin from Storage Position (B), and insert to lock the unit into the up, or Transport Position (A). Rake beams may now be closed for transport.

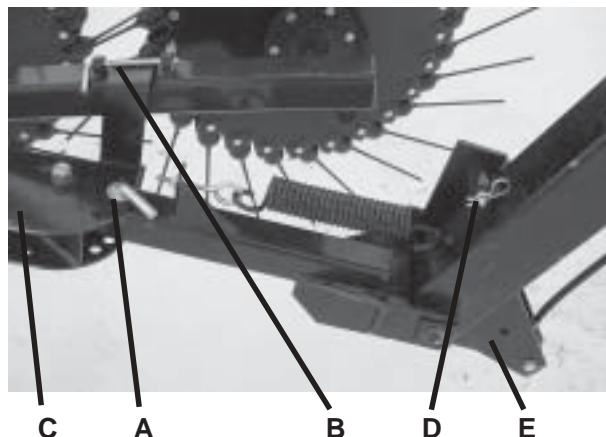
3-Wheel Center Kicker Wheel

To engage center kicker wheels, hydraulically open rake to desired raking width. Remove Locking Pin (A), swivel kicker wheel assembly to the desired raking angle. Re-insert the Locking Pin. Next, remove Locking Pin (B) from the oscillation lock position, and insert into the convenient storage position (C). Next remove the transport lock pin (D) and insert into the convenient storage position (E). Lower rake wheels to begin raking.

To return to transport position, PRIOR TO CLOSING RAKE, raise rake wheels. (This will also raise the center kicker wheel assembly). Remove Locking Pin (A), Swivel kicker wheel assembly so that it is in line with the hitch pole. Re-insert Pin (A). Remove locking pin from Storage Position (C), and re-insert pin (B) into the oscillation lock position. Next remove lock pin (D) from storage position (E) and insert to lock the unit into the up, or Transport Position. Rake beams may now be closed for transport.



2-WHEEL KICKER WHEEL



LUBRICATION GUIDE

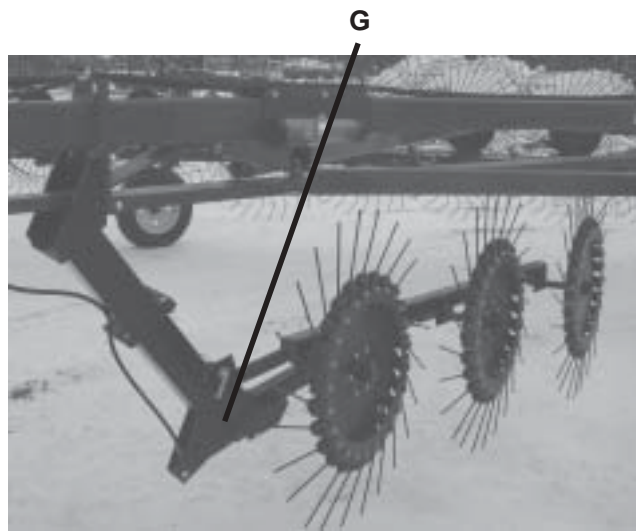
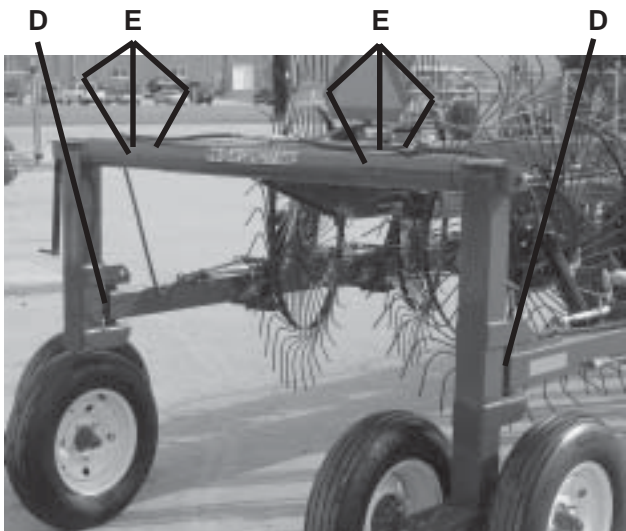
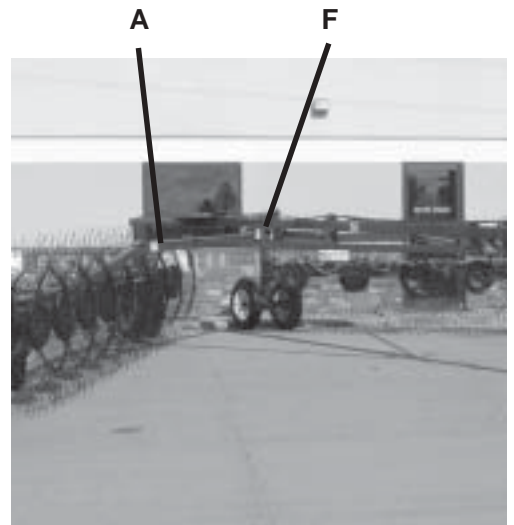
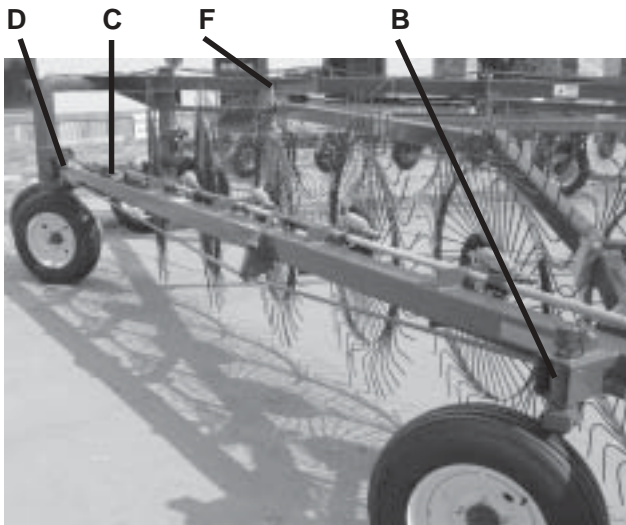
GREASE FITTINGS

There are 34 on 12 wheel and 24 on 14 wheel grease fittings on the Hi-Capacity Rakes. If equipped with a center kicker wheel, there will be one more on the pivot point. If lubricated properly and often enough, it will prolong the life of your Hi-Capacity Rake. Grease daily during normal use and **before and after storage and after power washing**. Use a good grade of high quality grease. Make sure that grease comes out around the shaft on sleeve type bearings. Wipe off excessive grease to prevent accumulation of chaff or grit around the bearing.

LOCATION

Listed and shown are the description of location and number of grease fittings.

- A. (2) Top Opening Arm Front Pivot
- B. (2) One on Each Gauge Wheel
- C. (2) One on Each Lift Cylinder Mounting Bracket
- D. (2) One on Each Rake Beam Pivot
- E. (6) Top Rear Windrow Width Adjustment
- F. (4) Top Opening Arm Rear Pivot
- G. (1) Center Kicker Wheel Pivots (If Equipped)
- (4) One on Each Transport Wheel Hub (4 on 12 Wheel and 6 on 14 Wheel)
- (12) One on Each Rake Arm Hub (12 Wheel Only)



DECAL LOCATION

Your Frontier Hi-Capacity Rake was manufactured with operator safety in mind. Located on the Hi-Capacity Rake are various decals to aid in operation, and warn of danger or caution areas. Pay close attention to all the decals.

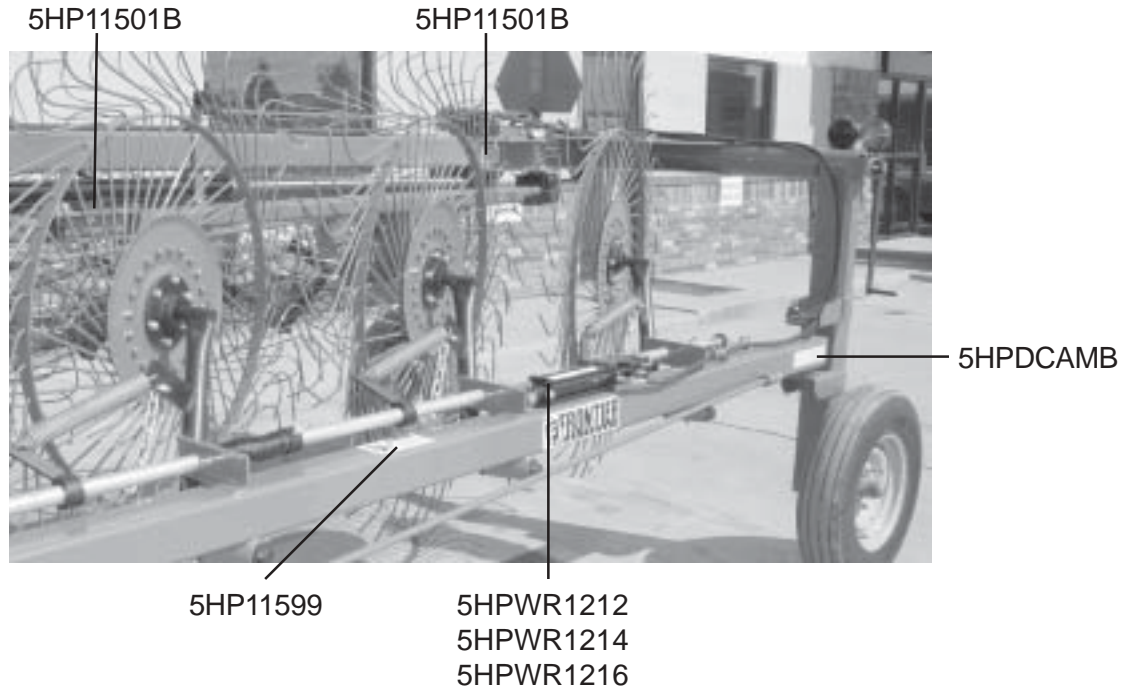
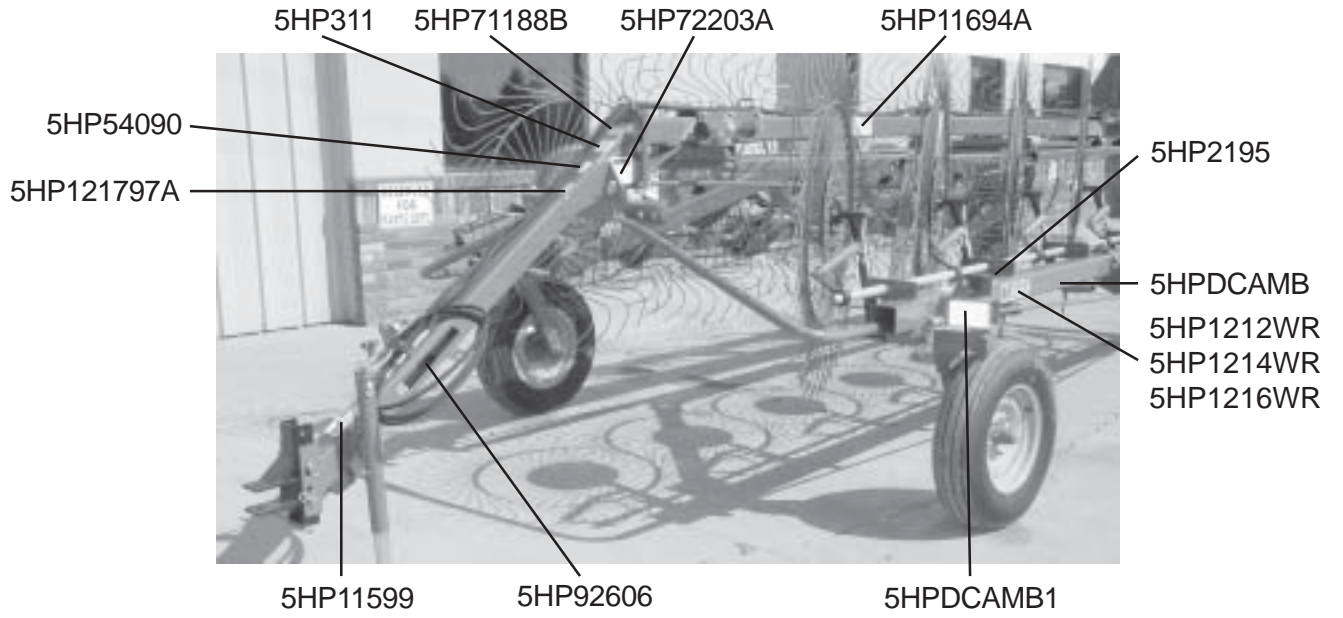


DO NOT REMOVE ANY OF THESE DECALS. IF DECALS ARE LOST, DAMAGED, OR IF THE HI-CAPACITY RAKE IS REPAINTED, REPLACE DECALS. REMEMBER: DECALS ARE FOR YOUR PROTECTION AND INFORMATION.

Listed below are the decals on your Frontier Hi-Capacity Rake. These decals may be ordered individually by part number or by ordering complete set.

<u>PART</u>	<u>QUANTITY</u>	<u>DESCRIPTION</u>
5HP311	1	Patent Numbers
5HP2195	4	WARNING - Stay Clear of Rake
5HP1212WR	2	Frontier Model Decals WR1212
5HP1214WR	2	Frontier Model Decals WR1214
5HP1216WR	2	Frontier Model Decals WR1216
5HP11102	1	ATTENTION: Adjust Flange Nut
5HP11501B	2	ATTENTION: Remove Both Pins
5HP11599	3	WARNING - Do Not Go Near Leaks
5HP11694A	6/WR1212 - 8/WR1214	DANGER - Stay Clear of Rake
5HP11694B	2	DANGER - Stay Clear (12 Wheel Only)
5HP54090	1	Made in the USA
5HP71188B	1	Jack Storage Position
5HP72203A	1	WARNING - Help Avoid Injury
5HP121797A	1	Attention: Raise Rake Wheels
5HPDCAMB	4	Amber Reflector - 2" x 9" (2 On Each Main Rake Beam)
5HPDCAMB1	2	Amber Reflector - 3-1/4" x 5-5/8"
5HPDCRED	2	Red Reflectors
	1	Model/Serial Number
5HPBFR723	1	SMV Sign Kit
5HP10120112	1	Complete Set of Decals-WR1212
5HP10120114	1	Complete Set of Decals-WR1214
5HP10120116	1	Complete Set of Decals-WR1216

DECAL LOCATION



DECAL LOCATION

5HP11694B

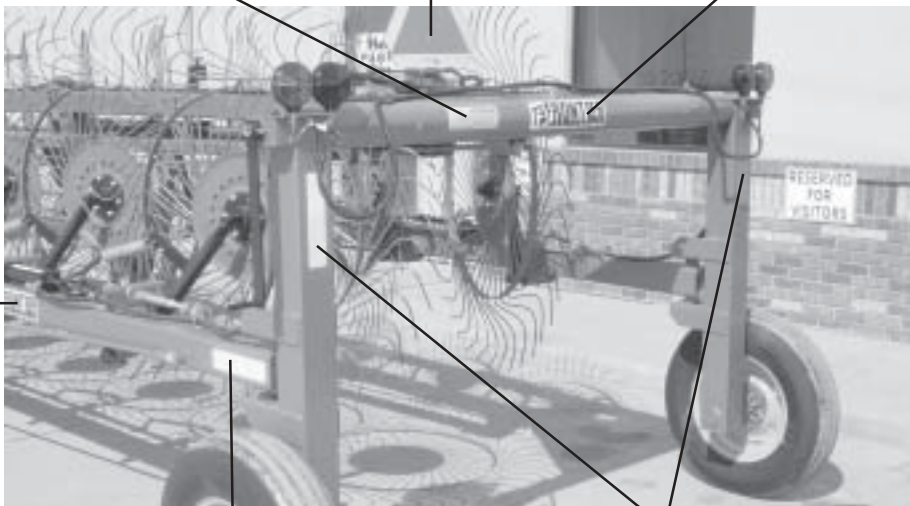


5HP1212WR
5HP1214WR
5HP1216WR

5HP11102

5HPBFR723

5HP1212WR
5HP1214WR
5HP1216WR



5HPDCAMB

5HPDCRED

TROUBLE SHOOTING



WARNING

MAKE SURE THAT THE TRACTOR IS SHUT OFF AND THE RAKE CAN NOT MOVE BEFORE SERVICING THE HI CAPACITY RAKE. MAINTENANCE AND REPAIR SERVICE WORK TO BE PERFORMED BY A QUALIFIED SERVICE PERSON ONLY.

<u>TROUBLE...</u>	<u>POSSIBLE CAUSE...</u>	<u>POSSIBLE REMEDY...</u>
Rake Will Not open	Rake Locked In Transport Position	Remove Transport Locks And Return To Storage Position (See Page#12)
	Hydraulic Couplers Not Coupled To Tractor Properly	Couple Hydraulic Hoses To Tractor
	Hydraulic Hoses Mixed Up With Rake Wheel Lift Hose	Sort Hoses Correctly And Re-couple To Tractor
	Tractor Hydraulics Do Not Have Sufficient Pressure	Tractor Should Have At Least 1500 PSI To Operate Rake NOTE: If Tractor Has Low PSI Drive Forward Slowly And Open Rake At The Same Time
Rake Will Not Close	Tractor Hydraulics Do Not Have Sufficient Pressure	Tractor Should Have At Least 1500 PSI To Operate Rake NOTE: If Tractor Has Low PSI Back-up Slowly And Close Rake At The Same Time
Rake Wheels Will Not Lower	Rake Wheels Locked In Transport Position	Remove Hair Pin From Adjuster, Place In Storage Position (See Page#12)
	Lift Pipe Binding	Check Lift Pipe Make Sure It Is Free Moving
	Tractor Hydraulics Not Able To Operate Single Acting Cylinder	Consult Your Tractor Dealer On How This Can Be Accomplished

INSTRUCTIONS FOR ORDERING PARTS

All service parts should be ordered through your authorized Frontier dealer. They will be able to give you faster service if you will provide them with the following:

1. Model & Serial Number - Both can be located on the left, rear main frame of your unit.
2. All references to left or right apply to the machine as viewed from the rear.
3. Parts should not be ordered from illustration only. Please order complete part number.
4. If your dealer has to order parts - give shipping instructions:
VIA truck - large pieces (please specify local truck lines)
VIA United Parcel Service (include full address)



PLEASE RECORD NUMBERS FOR YOUR UNIT FOR QUICK REFERENCE

ABOUT IMPROVEMENTS

FRONTIER IS CONTINUALLY STRIVING TO IMPROVE IT'S PRODUCTS

We must therefore, reserve the right to make improvements or changes whenever it becomes practical to do so, without incurring any obligation to make changes or additions to the equipment previously sold.

FIGURE 1
FRONTIER MODLE W1212 MAIN FRAME



FIGURE 1

FRONTIER MODLE W1212 MAIN FRAME

<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	5HPBFR754	RIGHT AXLE UPRIGHT
2	5HPBFR498	REAR PIVOT ASSEMBLY
3	5HPBFR755	LEFT AXLE UPRIGHT
4	5HPBFR756	BEAM PIVOT SHAFT
5	5HPBFR423	WIDTH ADJUSTMENT HANDLE
6	5HPBFR485	REAR WIDTH ADJUSTMENT TUBE
7	5HPBFR420	REAR WIDTH ADJUSTMENT ROD
8	5HPBFR649	SMV BRACKET
9	5HPBFR611	WIDTH ADJUSTMENT BAR
10	5HPBFR422	WIDTH ADJUSTMENT COLLAR
11	5HPBFR523	POLY WASHER
12	5HPBFR613	WIDTH ADJUSTMENT STOP
13	5HPBFR239	SLEEVE ADJUSTABLE LOCK
14	5HPBFR240	SPRING
15	5HPBFR241	ADJUSTMENT HANDLE
16	5HP23N67	HOSE HOLDER
17	5HPBFR449	SPINDLE
18	5HPBFR57	SEAL
19	5HP17G145	INNER BEARING
20	5HP17G146	INNER RACE
21	5HPBFR60	HUB
22	5HPBFR61	OUTER RACE
23	5HPBFR62	OUTER BEARING
*	5HPBFR75	COMPLETE GROUND WHEEL HUB
24	5HPYWFL24005	WASHER, FLAT, 3/4" USS
25	5HPYNL24010	HEX NUT, SLOTTED, 3/4"-16
26	5HPYPCT05010	COTTER PIN, 5/32" X 1-1/2"
27	5HPBFR66	HUB CAP
28	5HPYBSD16005	STUD BOLT, 1/2"-20 UNF X 1-7/8" (3/8" SHOULDER)
29	5HPYNWL16005	WHEEL NUT, 1/2"-20 UNF
30	5HPBFR67	WHEEL 5 X 15
31	5HPYPEX12025	EXPANSION PIN, 3/8" X 2-3/4"
32	5HPYBHH20110	BOLT, 5/8" X 8" GR. 5
33	5HPYNHX20005	HEX NUT, 5/8"-11 PLATED
34	5HPYBHH16010	BOLT, 1/2" X 1" GR. 5
35	5HPYNAC24005	HEX NUT, ACME, 3/4"-6
36	5HPYBHH20085	BOLT, 5/8" X 5" GR. 5
37	5HPYBHH12090	BOLT, 3/8" X 2-1/2" GR. 5
38	5HPBFR642	WIDTH ADJUSTMENT SPACER
39	5HPYSHW10010	5/16"-18 X 1-1/4" HEX WASHER SLOT TYPE F ZINC THREAD CUTTING SCREW

NOTE: * (MEANS NOT SHOWN)

**TANDEM OPTIONS: BFR509 RH TANDEM AXLE
BFR510 LH TANDEM AXLE**

FIGURE 2
FRONTIER MODEL WR1212
MAIN FRAME POLE AND LINKAGE

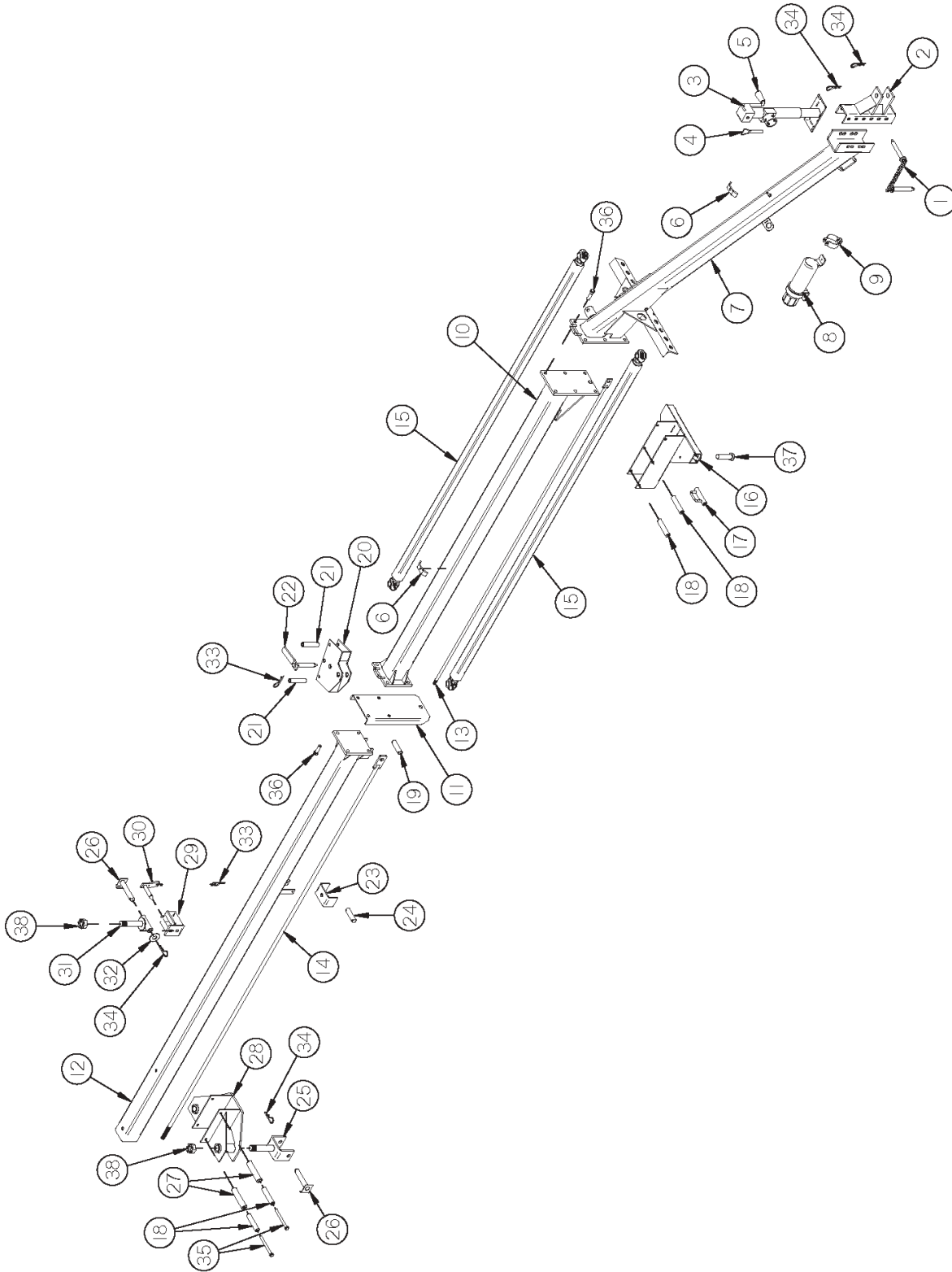


FIGURE 2
FRONTIER MODEL WR1212
MAIN FRAME POLE AND LINKAGE

<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	5HPBFR450	HITCH PIN
2	5HPBFR157	HITCH
3	5HPBFR753	JACK
4	5HP12N117	JACK PIN & CHAIN
5	5HP5N78	JACK HANDLE
*	5HP12N118	REPLACEMENT BEARING
6	5HPHE42	HOSE HOLDER
7	5HPBFR660	POLE
8	5HPS522	MANUAL HOLDER
9	5HPS23	MANUAL CLAMP - LARGE
10	5HPBFR385	CENTER POLE SECTION
11	5HPBFR399	LINKAGE STOP
12	5HPBFR397	BACK POLE SECTION
13	5HPBFR502	FRONT ROD
14	5HPBFR503	BACK ROD
15	5HPBFR390	FRONT LINKAGE
16	5HPBFR387	FRONT LINKAGE SLIDER
17	5HPBFR388	HOSE GUIDE SPACER
18	5HPBFR389	SLIDER SPACER
19	5HPBFR396	CYLINDER PIN
20	5HPBFR398	CENTER SLIDER
21	5HPBFR400	CENTER SLIDER SPACER
22	5HPBFR401	CENTER SLIDER PIN
23	5HPBFR402	HOSE GUIDE
24	5HPBFR634	CYLINDER PIN
25	5HPBFR410	BACK LINKAGE YOKE RH
26	5HPBFR413	PIVOT YOKE SHAFT PIN
27	5HPBFR404	BACK SLIDER ROLLER
28	5HPBFR440	BACK LINKAGE SLIDER
29	5HPBFR411	BACK LINKAGE YOKE LH
30	5HPBFR412	BACK LINKAGE YOKE PIN
31	5HPBFR414	LEFT PIVOT YOKE SHAFT
32	5HPBFR441	STOP WASHER
33	5HPYPHR02010	HAIR PIN, #21-07
34	5HPYPHR06040	HAIR PIN, 3/16" X 3-3/4"
35	5HPYBHH16160	BOLT, 1/2" X 5-1/2" GR. 5
36	5HPYBHH20025	BOLT, 5/8" X 2" GR. 5
37	5HPYBHH32010	BOLT, 1"-8 X 3-1/2" GR. 5
38	5HPYNSL36005	HEX NUT, SLOTTED, 1-1/4"-12

NOTE: * (MEANS NOT SHOWN)

FIGURE 3
FRONTIER MODEL WR1212
RAKE BEAMS AND ARMS

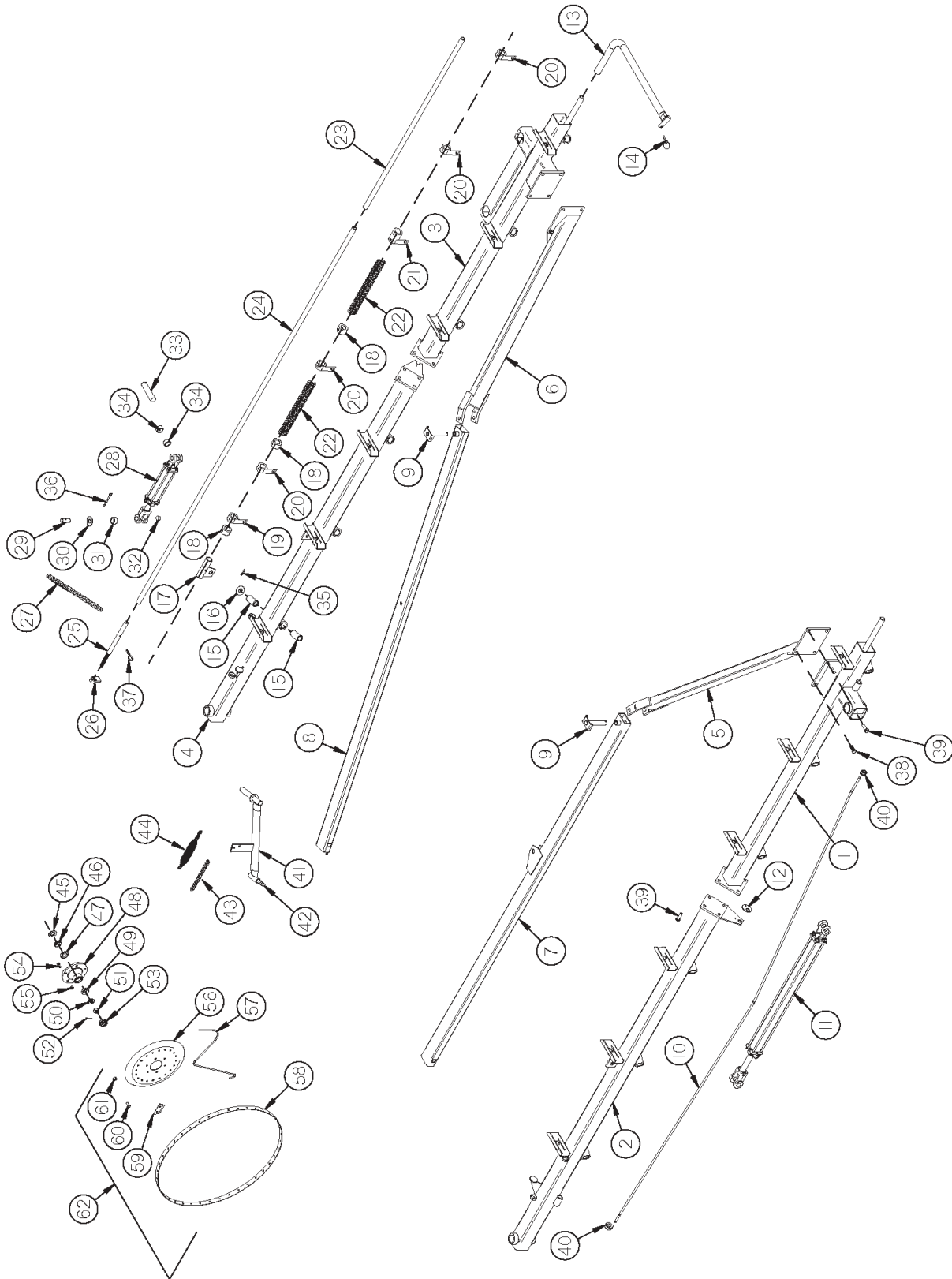


FIGURE 3
FRONTIER MODEL WR1212
RAKE BEAMS AND ARMS

<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	5HPBFR472	FRONT RAKE BEAM RH
2	5HPBFR760	BACK RAKE BEAM RH
3	5HPBFR473	FRONT RAKE BEAM LH
4	5HPBFR757	BACK RAKE BEAM LH
5	5HPBFR744	RAKE BEAM ARM RH
6	5HPBFR745	RAKE BEAM ARM LH
7	5HPBFR462	RIGHT REAR LINKAGE
8	5HPBFR463	LEFT REAR LINKAGE
9	5HPBFR461	RAKE BEAM ARM PIN
10	5HPBFR612	SIDE ARM STABILIZER ROD
11	5HPBFR653	HYDRAULIC CYLINDER
12	5HPDF22	WASHER
13	5HPBFR452	TRANSPORT LOCK PIPE LH
*	5HPBFR492	TRANSPORT LOCK PIPE RH
14	5HPBFR443	LYNCH PIN
15	5HPBFR425	RAKE ARM BUSHING W/ FLANGE
16	5HPBFR229	RAKE ARM WASHER
17	5HPBFR530	HYDRAULIC CYLINDER END SLIDE LH
*	5HPBFR531	HYDRAULIC CYLINDER END SLIDE RH
18	5HPBFR82	PIPE CLAMPS
19	5HPBFR622	SPRING BRACKET (2 HOLE)
20	5HPBFR431	LH SPRING BRACKET
*	5HPBFR430	RH SPRING BRACKET
21	5HPBFR432	LH LIFTING PIPE CONNECTOR
*	5HPBFR433	RH LIFTING PIPE CONNECTOR
22	5HPBFR84	COMPRESSION SPRING
23	5HPBFR520	LIFTING PIPE FRONT
24	5HPBFR521	LIFTING PIPE BACK
25	5HPBFR427	RAKE ARM LOCK-UP SHAFT
26	5HPBFR426	RAKE PRESSURE HANDLE
27	5HPBFR111	BACK RAKE ARM ADJUSTMENT CHAIN
28	5HP16SV171	HYDRAULIC LIFT CYLINDER
29	5HPBFR517	CYLINDER PIN
30	5HP16SV136	WASHER
31	5HPK106	CYLINDER SPACER

NOTE: * MEANS NOT SHOWN

FIGURE 4
FRONTIER MODEL WR1212
RAKE BEAMS AND ARMS

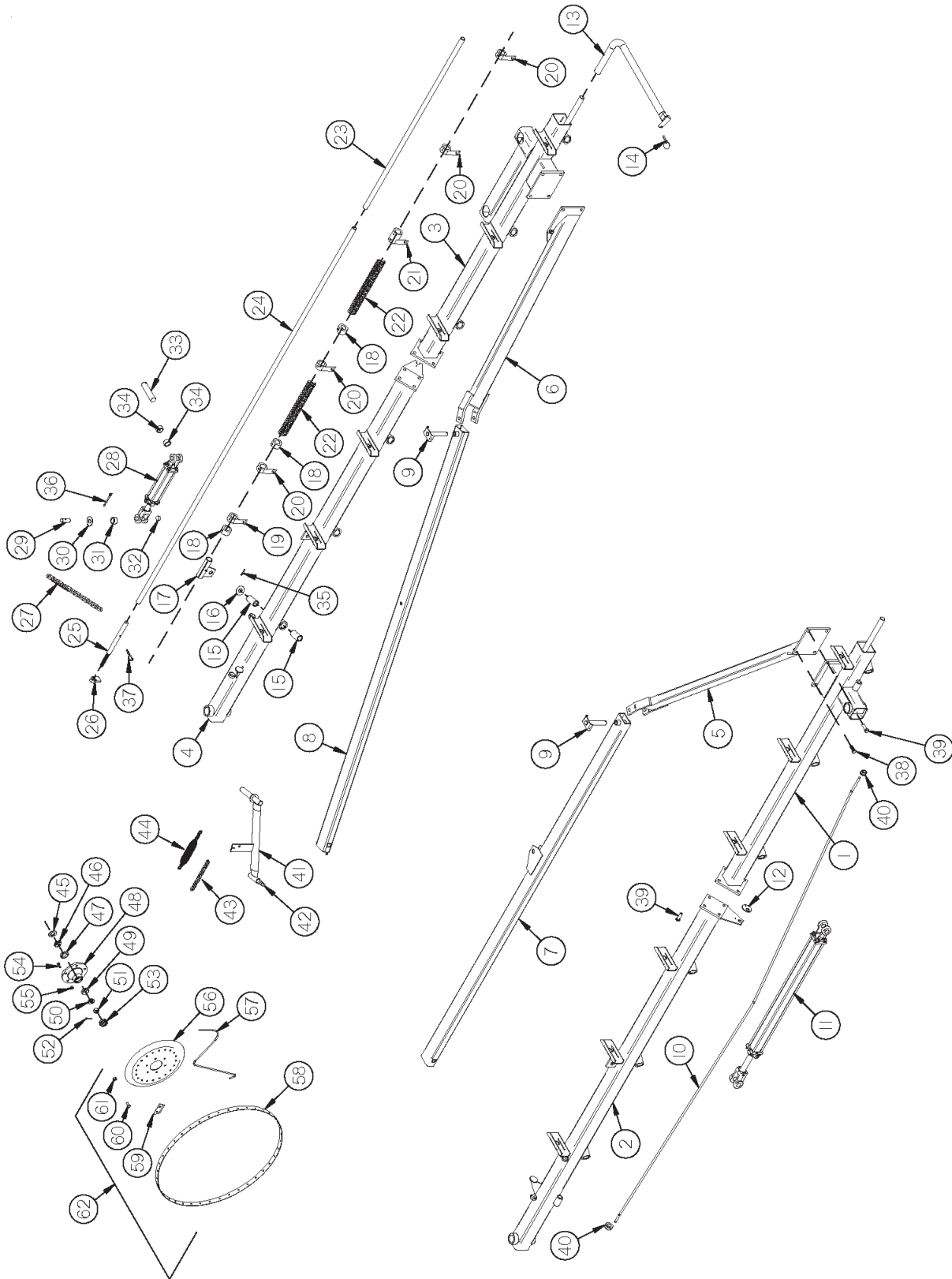


FIGURE 4
FRONTIER MODEL WR1212
RAKE BEAMS AND ARMS

<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>
32	5HPBFR506	NYLON WEAR BLOCK
33	5HPT143	CYLINDER PIN
34	5HPX94	CYLINDER SPACERS
35	5HPYPEX10015	EXPANSION PIN, 5/16" X 1-3/4"
36	5HPYPCT07005	COTTER PIN, 7/32" X 2 "
37	5HPYPHR08040	HAIR PIN, 1/4" X 5"
38	5HPYBHH20020	BOLT, 5/8" X 1-3/4" GR. 5
39	5HPYBHH20025	BOLT, 5/8" X 2" GR. 6
40	5HPYNFG24005	HEX NUT, FLANGED-LOCK, 3/4"-10
41	5HPBFR436	RAKE ARM LH
*	5HPBFR437	RAKE ARM RH
42	5HPBFR36	RAKE ARM SPINDLE
43	5HPBFR140	RAKE ARM ADJUSTMENT CHAIN
44	5HPBFR138	RAKE ARM SPRING
45	5HPT163	SEAL
46	5HPT164	INNER BEARING
47	5HPT171	OUTER RACE
48	5HPBFR32	RAKE WHEEL HUB
*	5HPBFR76	COMPLETE RAKE WHEEL HUB
49	5HPT165	INNER RACE
50	5HPT170	OUTER BEARING
51	5HPYNLSL24010	HEX NUT, SLOTTED, 3/4"-16
52	5HPYPCT05010	COTTER PIN, 5/32" X 1-1/2"
53	5HPT173	HUB CAP
*	5HPBFR76	COMPLETE HUB FOR RAKE WHEEL
54	5HPYBHH76005	BOLT, 10MM X 25MM
55	5HPYNHX76015	HEX NUT, 10MM
56	5HPT179	RAKE WHEEL CENTER
57	5HPT176	RAKE WHEEL TOOTH
58	5HPT177	OUTER RING
59	5HPT178	RAKE TOOTH CLIP
60	5HPYBCR76005	CARR. BOLT, 10MM X 25MM
61	5HPYNCL76005	10MM TOP LOCK NUT
62	5HPT174	COMPLETE RAKE WHEEL LH
*	5HPBFR31	COMPLETE RAKE WHEEL RH

NOTE: * MEANS NOT SHOWN

FIGURE 4
FRONTIER MODEL WR1212/WR1214
GAUGE WHEEL

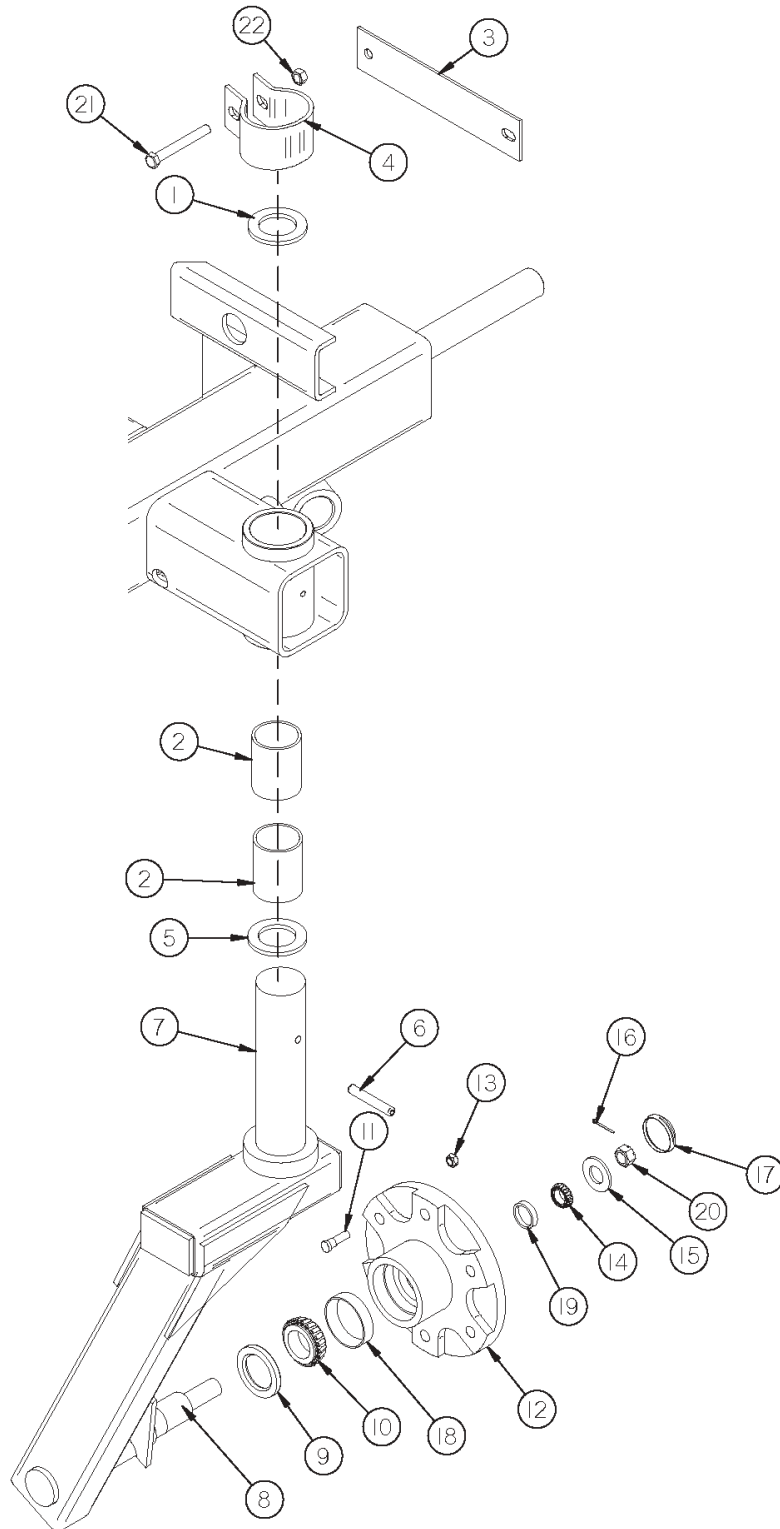


FIGURE 4
FRONTIER MODEL WR1212/WR1214
GAUGE WHEEL

<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	5HPBFR309	GAUGE WHEEL WASHER
2	5HPRG26	BRONZE BUSHING
3	5HPBFR310	BRAKE PAD (2)
4	5HPBFR311	BRAKE COLLAR
5	5HPRG24	BRONZE WASHER
6	5HPYPEX10025	EXPANSION PIN, 5/16" X 2-3/4"
7	5HPBFR312	COMPLETE FORK RH
*	5HPBFR316	COMPLETE FORK LH
8	5HPBFR56	SPINDLE
9	5HPBFR57	SEAL
10	5HPBFR58	INNER BEARING
11	5HPYBSD16005	STUD BOLT, 1/2"-20 UNF X 1-7/8" (3/8" SHOULDER)
12	5HPBFR60	HUB
13	5HPYNWL16005	WHEEL NUT, 1/2"-20 UNF
14	5HPBFR62	OUTER BEARING
15	5HPYWFL24005	WASHER, FLAT, 3/4" USS
16	5HPYPCT05010	COTTER PIN, 5/32" X 1-1/2"
17	5HPBFR66	HUB CAP
18	5HPBFR59	INNER RACE
19	5HPBFR61	OUTER RACE
20	5HPYNLSL24010	HEX NUT, SLOTTED, 3/4"-16
*	5HPBFR75	COMPLETE HUB FOR GROUND WHEEL
21	5HPYBHH12125	BOLT, 3/8" X 3" GR. 5 FULL THREAD
22	5HPYNHX12005	HEX NUT, 3/8"-16
*	5HPBFR67	WHEEL 5 X 15
*	5HPBFR128	6.70 X 15 TIRE

NOTE: * (MEANS NOT SHOWN)

FIGURE 5
FRONTIER MODEL WR1212
HYDRAULICS

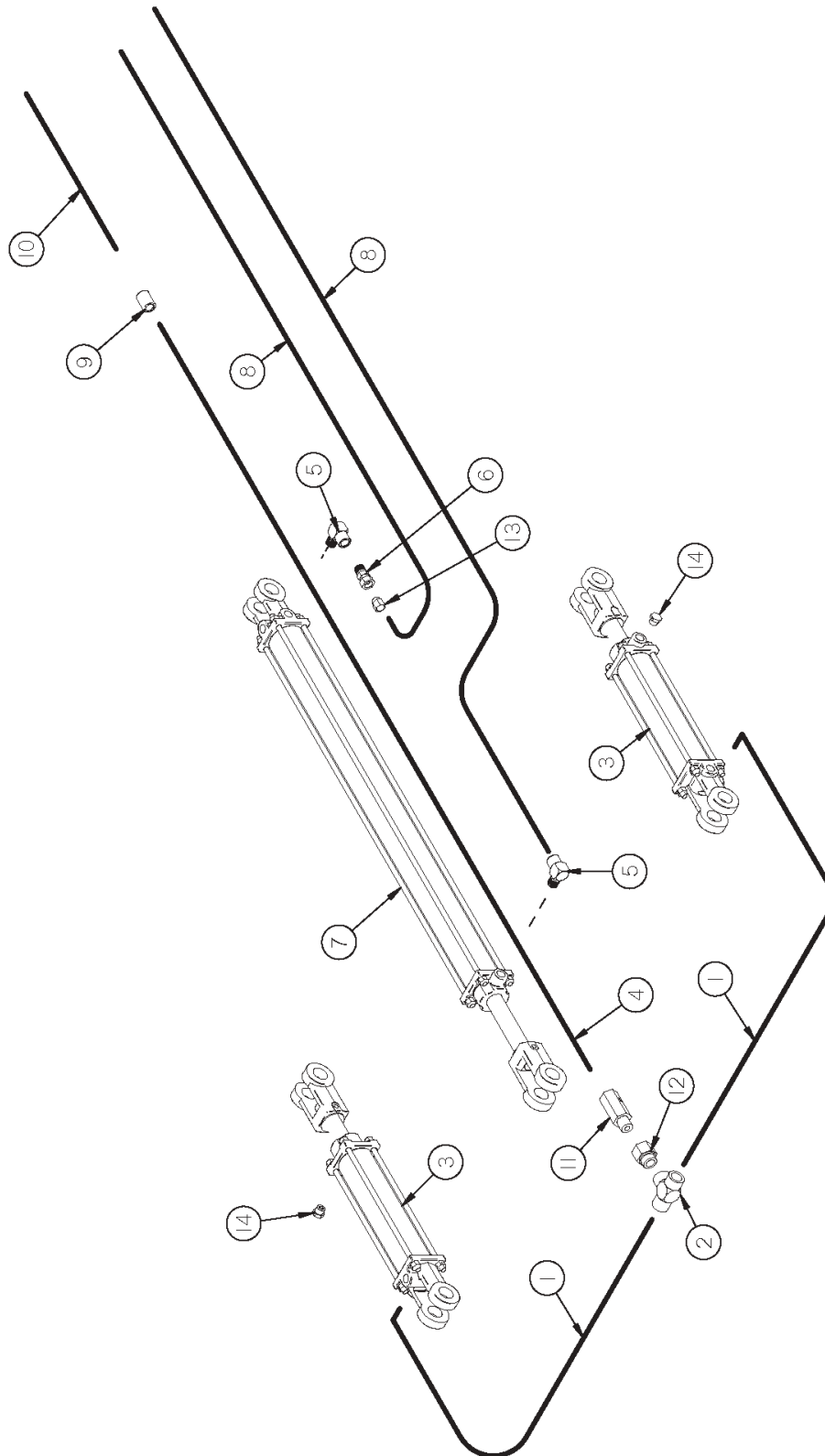
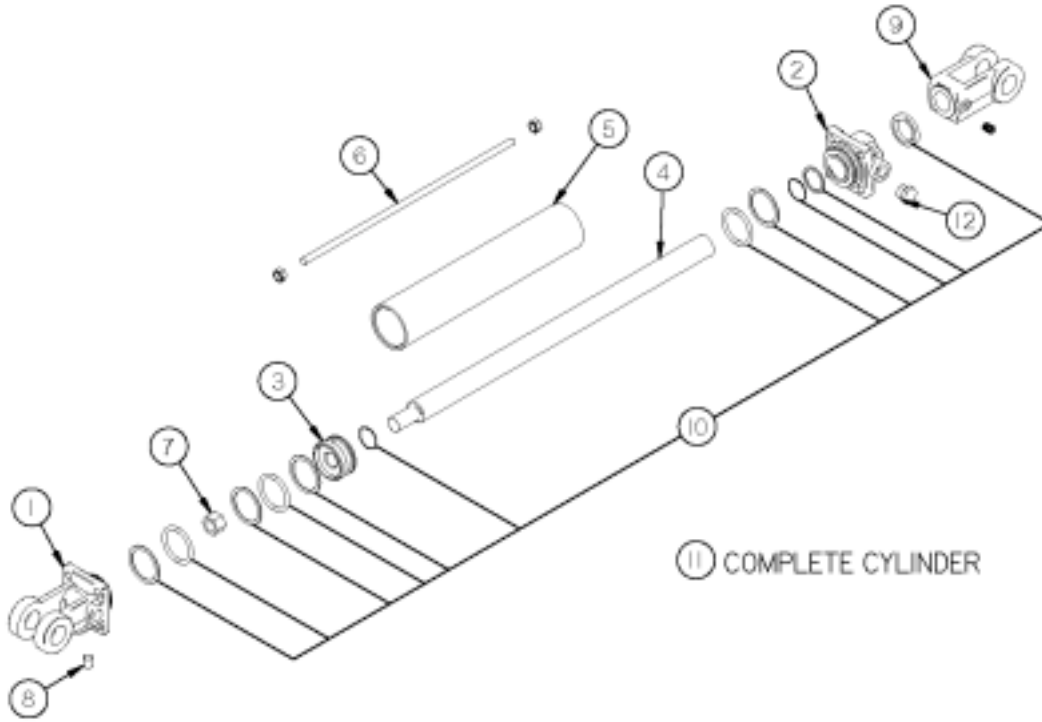


FIGURE 5
FRONTIER MODEL WR1212
HYDRAULICS

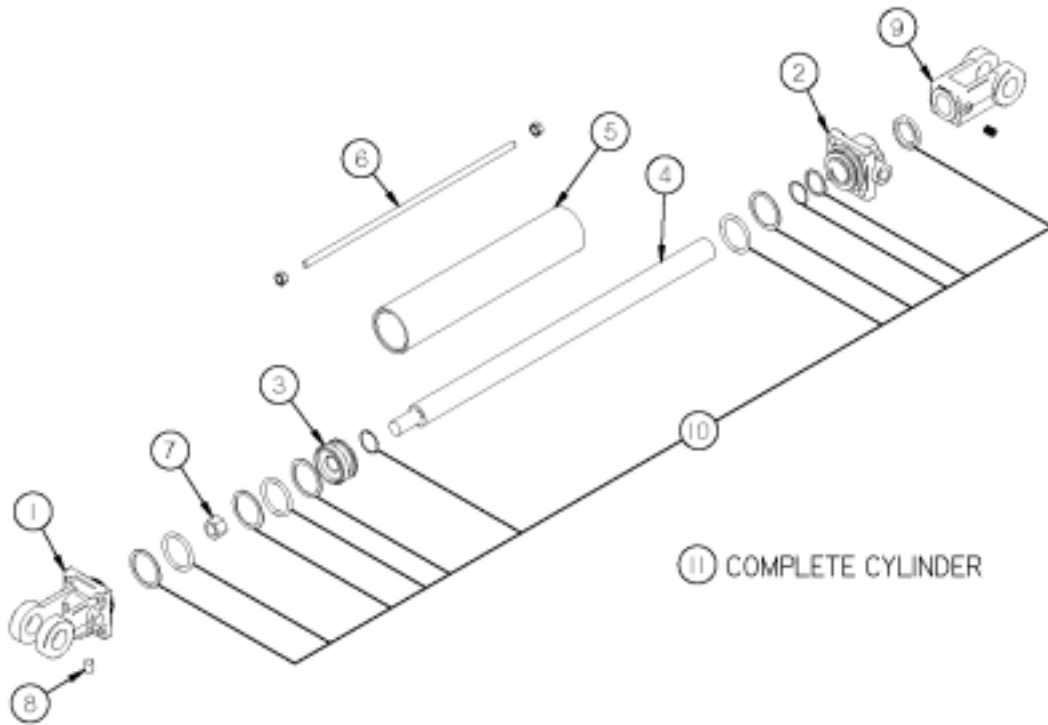
<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	5HP37N60	108" HOSE
2	5HPBFR74	3/8" FEMALE TEE
3	5HPBFR69A	HYDRAULIC LIFT CYLINDERS
4	5HP23N302	264" HOSE
5	5HP23N234	3/8" STREET ELBOW
6	5HPBFR617	MALE ADAPTER UNION W/ ORIFICE
7	5HPBFR653	HYDRAULIC OPEN CYLINDER
8	5HPBFR621	256" HOSE
9	5HPHE60	3/8" PIPE COUPLER
10	5HPBFR448	66" HOSE
12	5HPBFR554	FLOW VALVE
13	5HPBFR555	ADAPTER
14	5HPBFR747	PIPE EXP. PLUG

FIGURE 6
FRONTIER MODEL WR1212
HYDRAULIC LIFT CYLINDER



<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	5HP23N142A	CLEVIS CAP
2	5HP23N143A	ROD CAP
3	5HP23N144	PISTON
4	5HPT184A	ROD
5	5HPBFR68	CYLINDER TUBE
6	5HPT186	TIE ROD
7	5HP23N148	PISTON NUT
8	5HP23N149	PLUG
9	5HP23N150A	ROD CLEVIS
10	5HP23N151	SEAL KIT
11	5HPBFR69A	COMPLETE CYLINDER
12	5HPBFR70	VENT PLUG

FIGURE 7
FRONTIER MODEL WR1212/WR1214
OPENING CYLINDER



<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	5HP23N142A	CLEVIS CAP
2	5HP23N143A	ROD CAP
3	5HP23N144	PISTON
4	5HPBFR654	ROD
5	5HPBFR655	CYLINDER TUBE
6	5HPBFR656	TIE ROD
7	5HP23N148	PISTON NUT
8	5HP23N149	PLUG
9	5HP23N150A	ROD CLEVIS
10	5HP23N151	SEAL KIT
11	5HPBFR653	COMPLETE CYLINDER

FIGURE 8
FRONTIER MODEL WR1214/WR1216
MAIN FRAME REAR

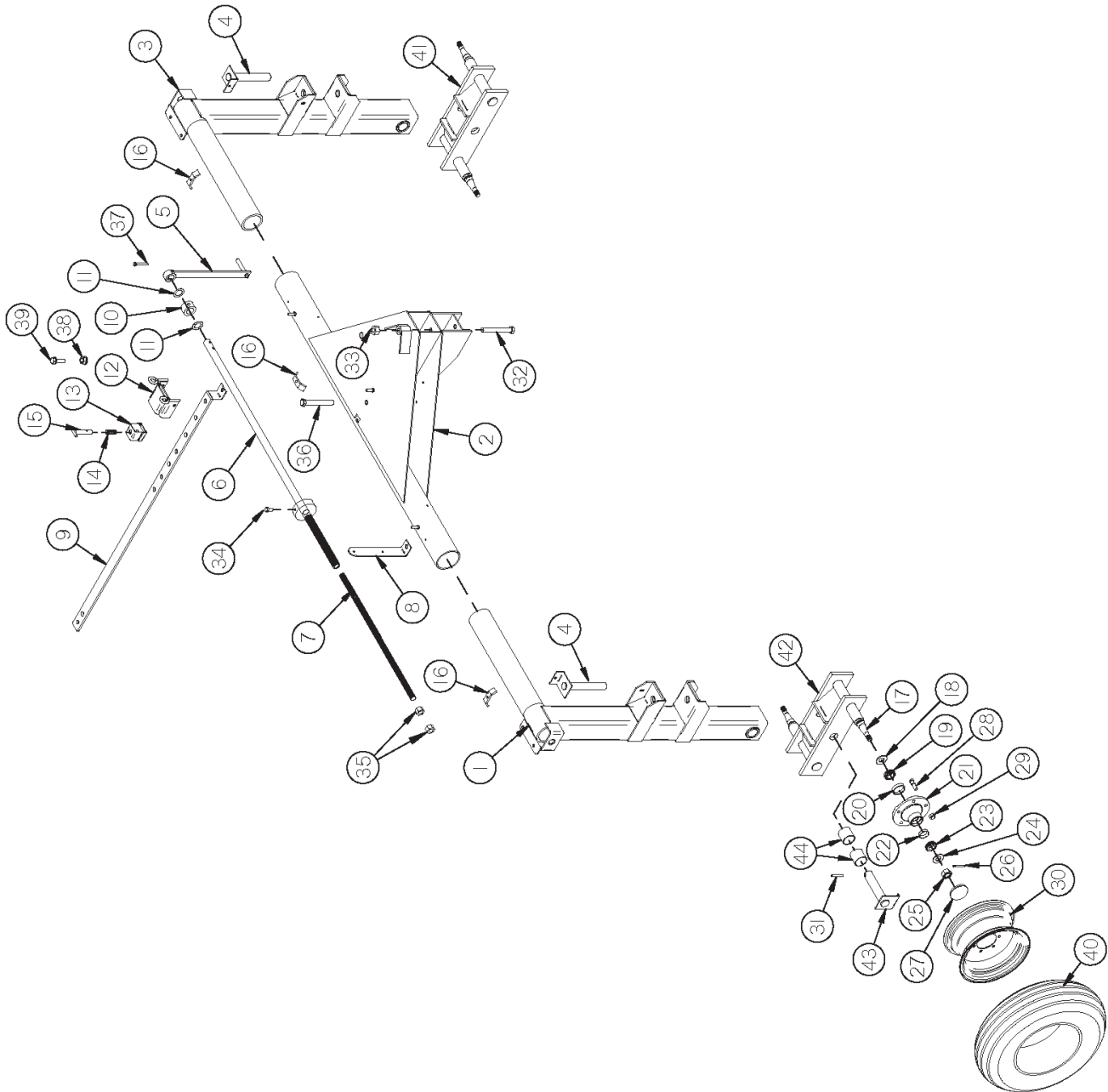


FIGURE 8

FRONTIER MODEL WR1214/WR1216 MAIN FRAME REAR

<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	5HPBFR754	RIGHT AXLE UPRIGHT
2	5HPBFR709	REAR PIVOT ASSEMBLY
3	5HPBFR755	LEFT AXLE UPRIGHT
4	5HPBFR756	BEAM PIVOT SHAFT
5	5HPBFR423	WIDTH ADJUSTMENT HANDLE
6	5HPBFR485	REAR WIDTH ADJUSTMENT TUBE
7	5HPBFR420	REAR WIDTH ADJUSTMENT ROD
8	5HPBFR649	SMV BRACKET
9	5HPBFR611	WIDTH ADJUSTMENT BAR
10	5HPBFR422	WIDTH ADJUSTMENT COLLAR
11	5HPBFR523	POLY WASHER
12	5HPBFR616	WIDTH ADJUSTMENT STOP
13	5HPBFR239	SLEEVE ADJUSTABLE LOCK
14	5HPBFR240	SPRING
15	5HPBFR241	ADJUSTMENT HANDLE
16	5HP23N67	HOSE HOLDER
17	5HPBFR522	SPINDLE
18	5HPBFR57	SEAL
19	5HP17G145	INNER BEARING
20	5HP17G146	INNER RACE
21	5HPBFR60	HUB
22	5HPBFR61	OUTER RACE
23	5HPBFR62	OUTER BEARING
24	5HPYWFL24005	WASHER, FLAT, 3/4" USS
25	5HPYNL24010	HEX NUT, SLOTTED, 3/4"-16
26	5HPYPCT05010	COTTER PIN, 5/32" X 1-1/2"
27	5HPBFR66	HUB CAP
28	5HPYBSD16005	STUD BOLT, 1/2"-20 UNF X 1-7/8" (3/8" SHOULDER)
29	5HPYNWL16005	WHEEL NUT, 1/2"-20 UNF
*	5HPBFR75	COMPLETE HUB FOR GROUND WHEEL
30	5HPBFR67	WHEEL 5 X 15
31	5HPYPEX12025	EXPANSION PIN, 3/8" X 2-3/4"
32	5HPYBHH24115	BOLT, 3/4" X 8-1/2" GR. 5
33	5HPYNHX24010	HEX NUT, 3/4"-16
34	5HPYBHH16010	BOLT, 1/2" X 1" GR. 5
35	5HPYNAC24005	HEX NUT, ACME, 3/4"-6
36	5HPYBHH24090	BOLT, 3/4" X 6" GR. 5
37	5HPYBHH12090	BOLT, 3/8" X 2-1/2" GR. 5
38	5HPBFR642	WIDTH ADJUSTMENT SPACER
39	5HPYSHW10010	5/16"-18 X 1-1/4" HEX WASHER SLOT TYPE F ZINC THREAD CUTTING SCREW
40	5HPBFR128	TIRE (6.70 X 15)
41	5HPBFR510	LH TANDEM AXLE
42	5HPBFR509	RH TANDEM AXLE
43	5HPBFR524	TANDEM PIN
44	5HPBFR625	BUSHING

NOTE: * (MEANS NOT SHOWN)

FIGURE 9
FRONTIER MODEL WR1214/WR1216
MAIN FRAME POLE AND LINKAGE

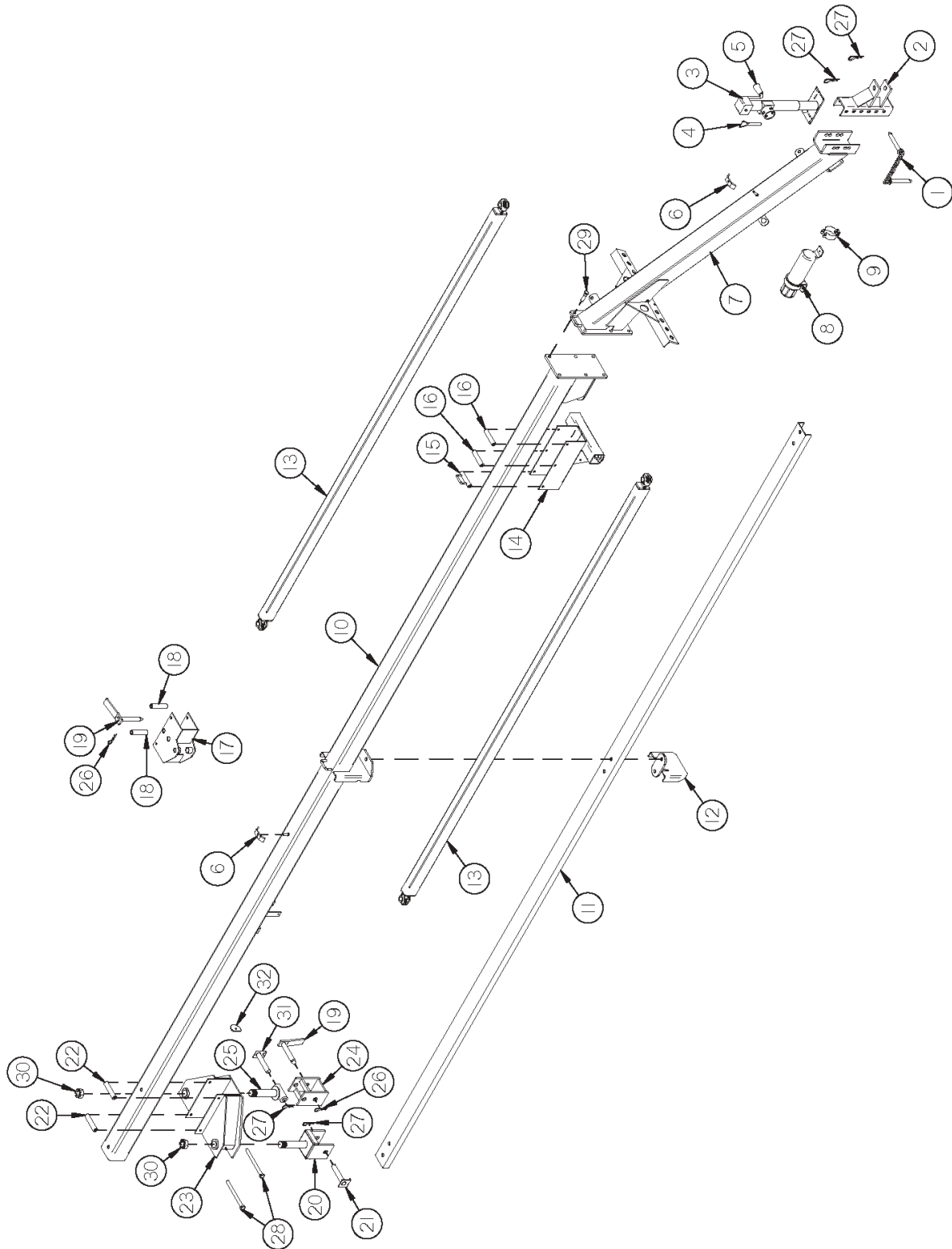


FIGURE 9

FRONTIER MODEL WR1214/WR1216 MAIN FRAME POLE AND LINKAGE

<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	5HPBFR450	HITCH PIN
2	5HPBFR157	HITCH
3	5HPBFR753	JACK
4	5HP12N117	JACK PIN & CHAIN
5	5HP5N78	JACK HANDLE
*	5HP12N118	REPLACEMENT BEARING
6	5HPHE42	HOSE HOLDER
7	5HPBFR663	POLE
8	5HPS522	MANUAL HOLDER
9	5HPS523	MANUAL CLAMP - LARGE
10	5HP14DWE81	POLE(STARTING SERIAL #0212123 FOR WR1214 STARTING SERIAL #0213033 FOR WR1216 AND FOWARD)
*	5HPBFR714	CENTER POLE(WR1214 SERIAL #0212121 AND WR1216 SERIAL #0213032 AND PRIOR)
*	5HPBFR715	BACK POLE(WR1214 Serial#0212122 AND WR1216 Serial#0213032 AND PRIOR)
11	5HP14DCH07	POLE CHANNEL(Starting Serial#0212123 FOR WR1214) STARTING SERIAL #0213033 FOR WR1216 AND FOWARD)
*	5HPBFR711	CENTER POLE BRACE(SERIAL #0212122 FOR WR1214 SERIAL #0213032 FOR WR1216 AND PRIOR)
*	5HPBFR710	BACK POLE BRACE(SERIAL #02120122 FOR WR1214 SERIAL #0213032 FOR WR1216 AND PRIOR)
12	5HP14DWE83	MIDDLE LINKAGE STOP BOTTOM(STARITING SERIAL #0212123 FOR WR1214 AND STARTING SERIAL #0213033 AND FOWARD)
*	5HPBFR712	MIDDLE LINKAGE STOP(SERIAL #0212122 FOR WR1214 SERAIL #0213032 FOR WR1216 AND PRIOR)
13	5HPBFR458	FRONT LINKAGE
14	5HPBFR455	FRONT LINKAGE SLIDER
15	5HPBFR456	HOSE GUIDE SPACER
16	5HPBFR457	SLIDER SPACER
17	5HPBFR465	CENTER SLIDER
18	5HPBFR467	CENTER SLIDER SPACER
19	5HPBFR468	LINKAGE PIN
20	5HPBFR476	BACK LINKAGE YOKE RH
21	5HPBFR479	PIVOT YOKE SHAFT PIN RH
22	5HPBFR471	BACK SLIDER ROLLER
23	5HPBFR491	BACK LINKAGE SLIDER
24	5HPBFR477	BACK LINKAGE YOKE LH
25	5HPBFR480	LEFT PIVOT YOKE SHAFT
26	5HPYPHR02010	HAIR PIN, #21-07
27	5HPYPHR06040	HAIR PIN, 3/16" X 3-3/4"
28	5HPYBHH16165	BOLT, 1/2" X 6" GR. 5
29	5HPYBHH20025	BOLT, 5/8" X 2" GR. 5
30	5HPYNLSL40005	HEX NUT, SLOTTED, 1-1/2"-12
31	5HPBFR505	PIVOT YOKE SHAFT PIN LH
32	5HPBFR693	STOP WASHER

NOTE: * (MEANS NOT SHOWN)

FIGURE 10
FRONTIER MODEL WR1214/WR1216
RAKE BEAMS AND ARMS

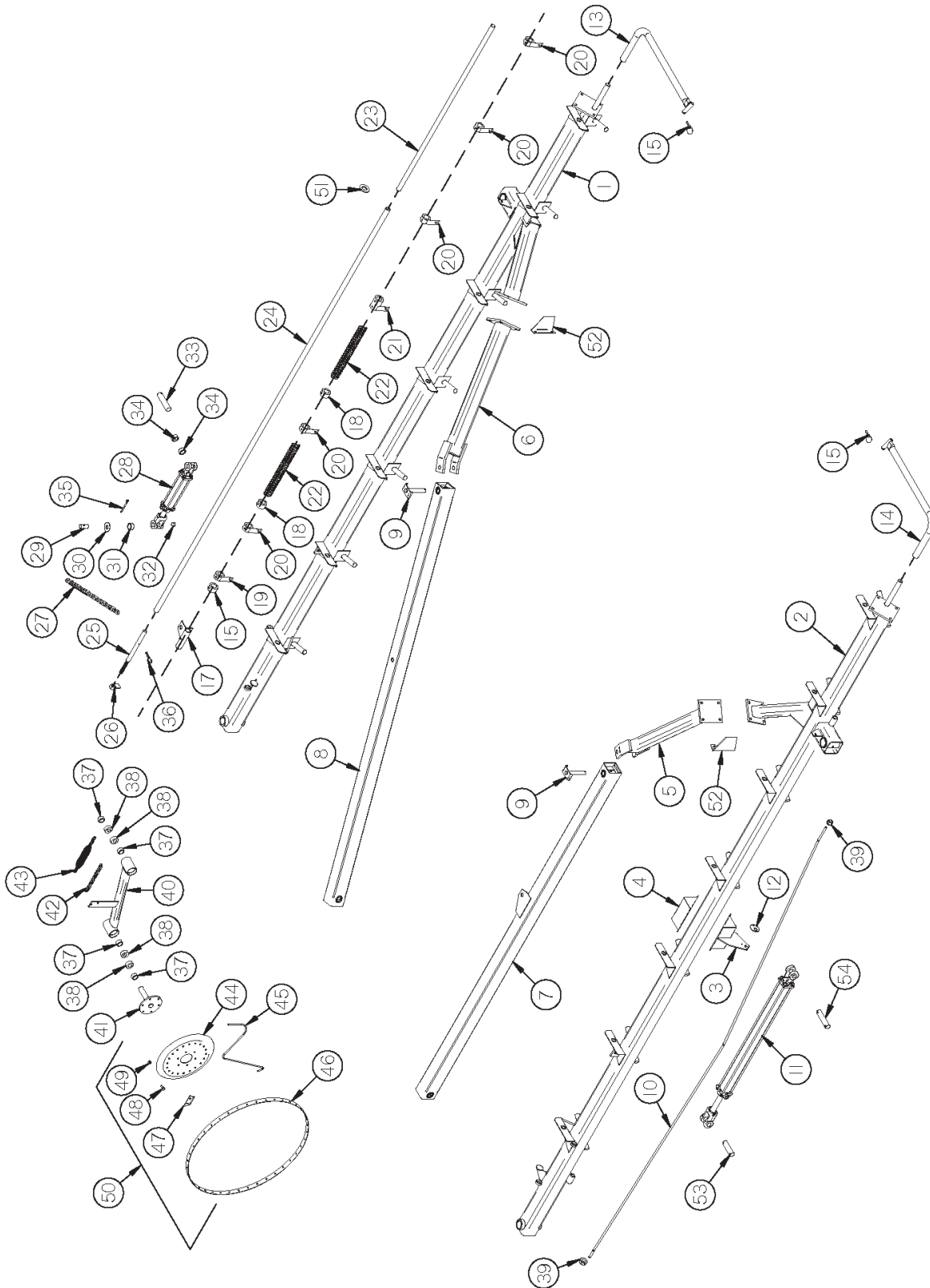


FIGURE 10

FRONTIER MODEL WR1214/WR1216 **RAKE BEAMS AND ARMS**

<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	5HP14DWE86	RAKE BEAM LEFT
2	5HP14DWE89	RAKE BEAM RIGHT
3	5HP14DWE85	ROD STAND-OFF
4	5HP14D3G18	ROD STAND-OFF BRACKET
5	5HPBFR744	RAKE BEAM ARM RH
6	5HPBFR745	RAKE BEAM ARM LH
7	5HPBFR462	RIGHT REAR LINKAGE
8	5HPBFR463	LEFT REAR LINKAGE
9	5HPBFR461	RAKE BEAM ARM PIN
10	5HPBFR612	SIDE ARM STABILIZER ROD
11	5HPBFR653	HYDRAULIC CYLINDER
12	5HPDF22	WASHER
13	5HPBFR452	TRANSPORT LOCK PIPE LH
14	5HPBFR492	TRANSPORT LOCK PIPE RH
15	5HPBFR443	LYNCH PIN
16	5HPBFR83	PIPE CLAMP (2 HOLES)
17	5HPBFR530	HYDRAULIC CYLINDER END SLIDE LH
*	5HPBFR531	HYDRAULIC CYLINDER END SLIDE RH
18	5HPBFR82	PIPE CLAMPS
19	5HPBFR622	SPRING BRACKET (2 HOLE)
20	5HPBFR431	LH SPRING BRACKET
*	5HPBFR430	RH SPRING BRACKET
21	5HPBFR749	RH LONG LIFT PIPE CONNECTOR
*	5HPBFR750	LH LONG LIFT PIPE CONNECTOR
22	5HPBFR84	COMPRESSION SPRING
23	5HPBFR520	LIFTING PIPE FRONT
24	5HPBFR521	LIFTING PIPE BACK
25	5HPBFR486	RAKE ARM LOCK-UP SHAFT
26	5HPBFR426	RAKE PRESSURE HANDLE
27	5HPBFR111	BACK RAKE ARM ADJUSTMENT CHAIN

NOTE: * MEANS NOT SHOWN

FIGURE 10
FRONTIER MODEL WR1214/WR1216
RAKE BEAMS AND ARMS

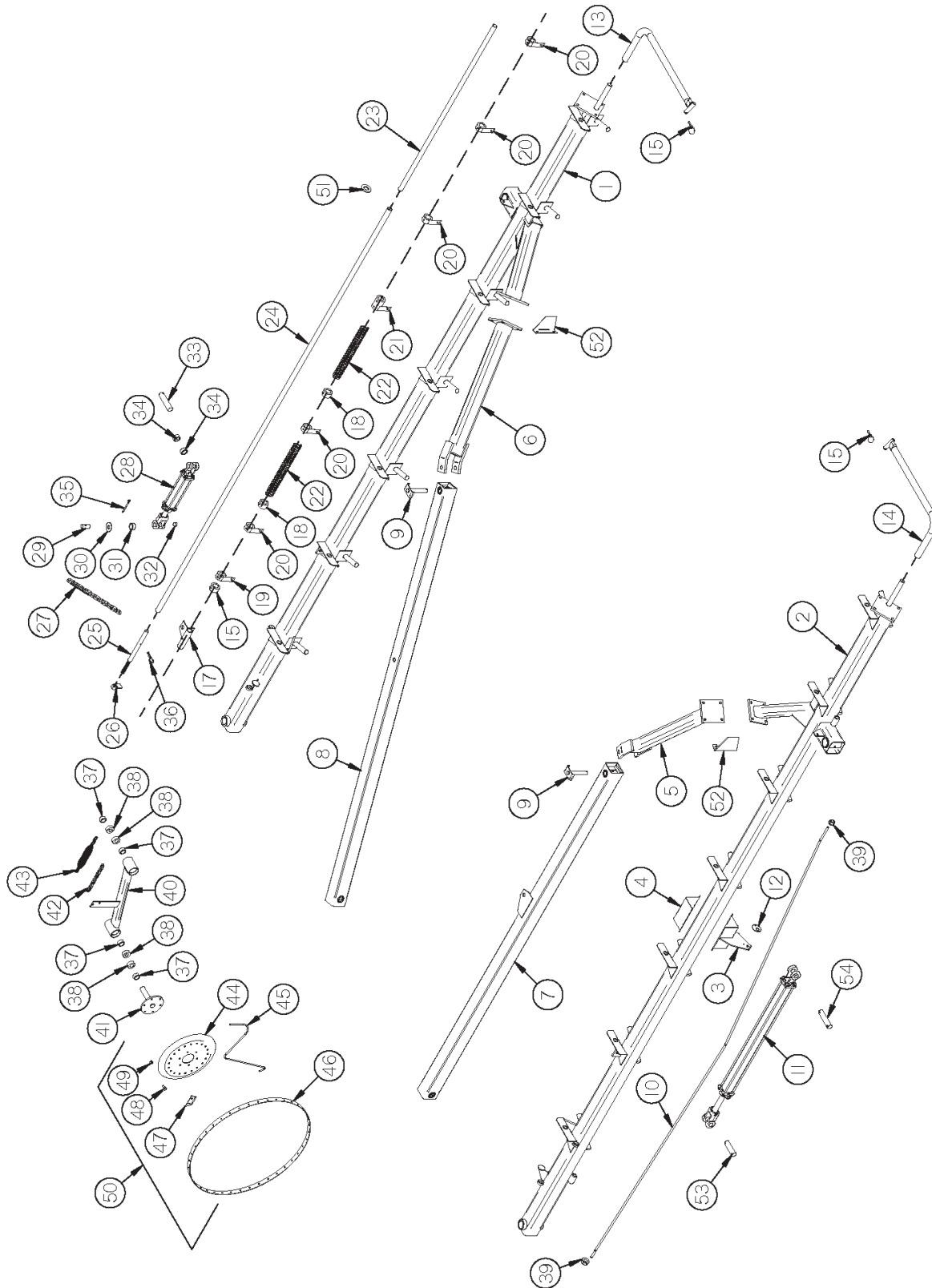


FIGURE 10
FRONTIER MODEL WR1214/WR1216
RAKE BEAMS AND ARMS

<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>
28	5HP16SV171	HYDRAULIC LIFT CYLINDER
29	5HPBFR517	CYLINDER PIN
30	5HP16SV136	WASHER
31	5HPK106	CYLINDER SPACER
32	5HPBFR506	NYLON WEAR BLOCK
33	5HPT143	CYLINDER PIN
34	5HPX94	CYLINDER SPACERS
35	5HPYPCT07005	COTTER PIN, 7/32" X 2 "
36	5HPYPHR08040	HAIR PIN, 1/4" X 5"
37	5HPF16	LOCK COLLAR
38	5HPBFR525	BEARING
39	5HPYNFG24005	HEX NUT, FLANGED-LOCK, 3/4"-10
40	5HPBFR489	RAKE ARM LH
*	5HPBFR490	RAKE ARM RH
41	5HPBFR657	RAKE WHEEL HUB
42	5HPBFR140	RAKE ARM ADJUSTMENT CHAIN
43	5HPBFR138	RAKE ARM SPRING
44	5HPT179	RAKE WHEEL CENTER
45	5HPT176	RAKE WHEEL TOOTH
46	5HPT177	OUTER RING
47	5HPT178	RAKE TOOTH CLIP
48	5HPYBCR76005	CARR. BOLT, 10MM X 25MM
49	5HPYNCL76005	10MM TOP LOCK NUT
50	5HPT174	RAKE WHEEL LH
*	5HPBFR31	RAKE WHEEL RH
51	5HPBFR641	WASHER
52	5HPBFR549	TOOTH DEFLECTOR
53	5HPBFR634	FRONT WIDTH CYLINDER PIN
54	5HPBFR396	CYLINDER PIN

NOTE: * MEANS NOT SHOWN

FIGURE 11
FRONTIER MODEL WR1214/WR1216
HYDRAULICS

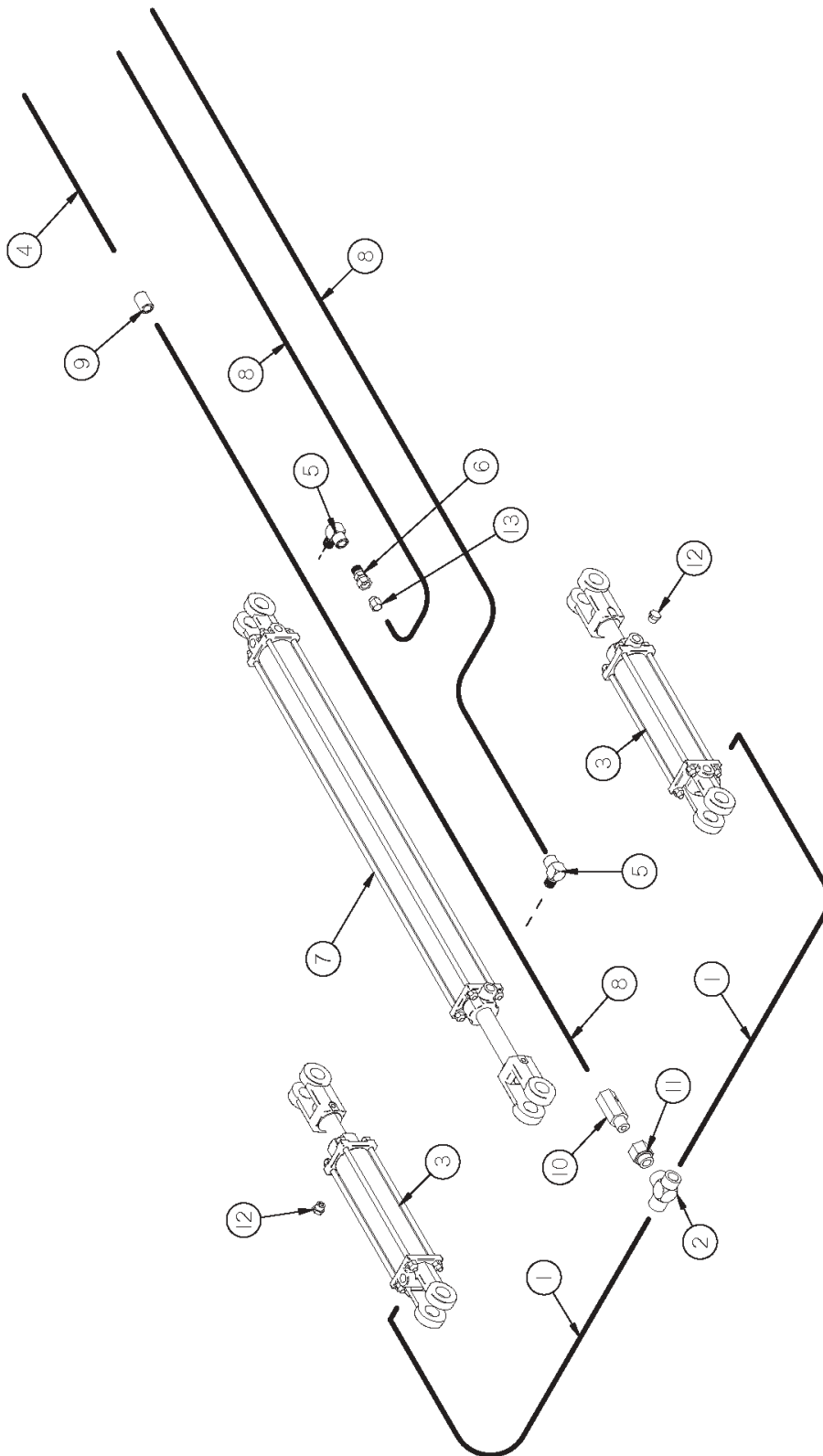


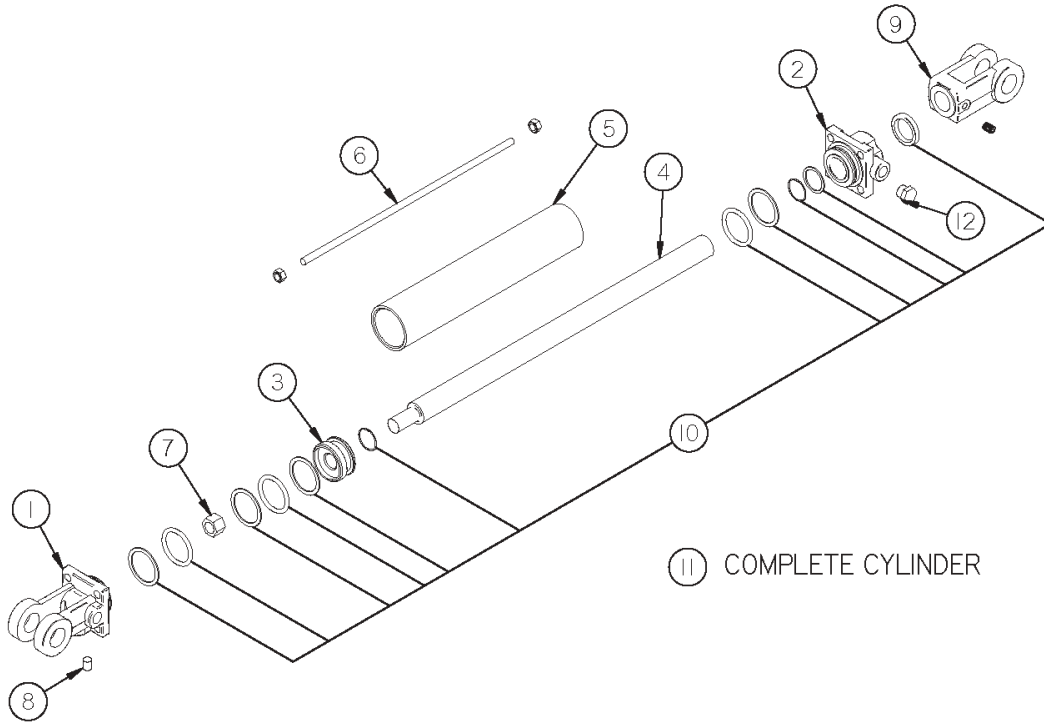
FIGURE 11

FRONTIER MODEL WR1214/WR1216 HYDRAULICS

<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	5HP37N60	108" HOSE
2	5HPBFR74	3/8" FEMALE TEE
3	5HP16SV171A	HYDRAULIC LIFT CYLINDERS
4	5HPBFR448	66" HOSE
5	5HP23N234	3/8" STREET ELBOW
6	5HPBFR122	MALE ADAPTER UNION
*	5HPBFR617	MALE ADAPTER UNION W/ OFIRICE
7	5HPBFR653	HYDRAULIC OPEN CYLINDER
8	5HP27N45	288" HOSE
9	5HPHE60	3/8" PIPE COUPLER
10	5HPBFR554	FLOW VALVE
11	5HPBFR555	ADAPTER
12	5HPBFR120	ORIFICE (.062)
13	5HPBFR747	PIPE EXPANSION COUPLING

NOTE: * (MEANS NOT SHOWN)

FIGURE 12
FRONTIER MODEL WR1214/WR1216
HYDRAULIC LIFT CYLINDER



<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	5HP23N142A	CLEVIS CAP
2	5HP23N143A	ROD CAP
3	5HP23N144	PISTON
4	5HP16SV168A	ROD
5	5HP16SV169	CYLINDER TUBE
6	5HP16SV170	TIE ROD
7	5HP23N148	PISTON NUT
8	5HP23N149	PLUG
9	5HP23N150A	ROD CLEVIS
10	5HP23N151	SEAL KIT
11	5HP16SV171A	COMPLETE CYLINDER
12	5HPBFR70	VENT PLUG

FIGURE 13
FRONTIER MODEL WR1214/WR1216
OPTIONAL 15" GAUGE WHEEL

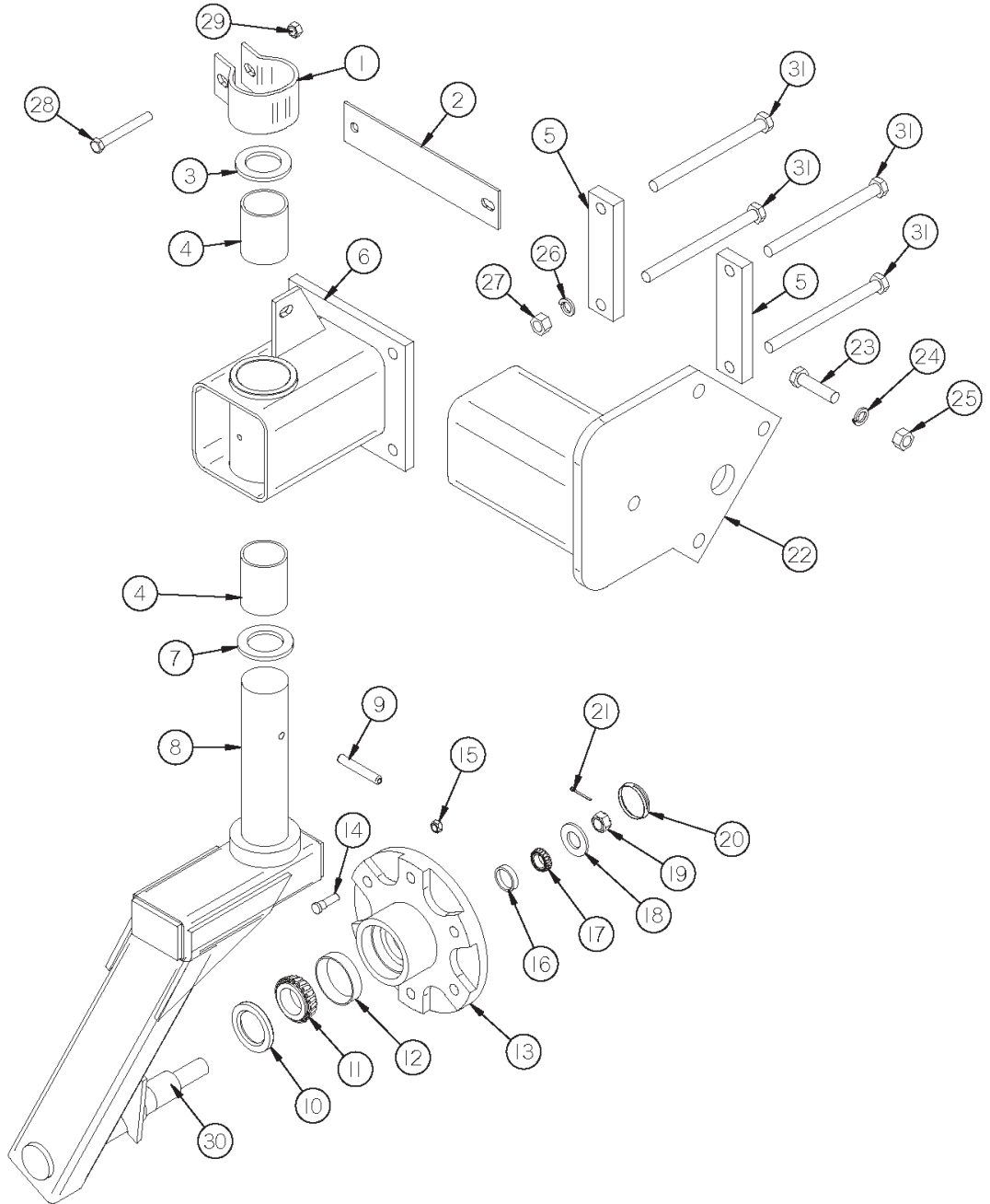


FIGURE 13

FRONTIER MODEL WR1214/WR1216 **OPTIONAL 15" GAUGE WHEEL**

<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	5HPBFR311	BRAKE COLLAR
2	5HPBFR310	BRAKE PAD (2)
3	5HPBFR309	GAUGE WHEEL WASHER
4	5HPRG26	BRONZE BUSHING
5	5HPBFR725	MOUNTING STRAP
6	5HPBFR643	GAUGE WHEEL MOUNT
7	5HPRG24	BRONZE WASHER
8	5HPBFR316	COMPLETE FORK LH
*	5HPBFR312	COMPLETE FORK RH
9	5HPYPEX10025	EXPANSION PIN, 5/16" X 2-3/4"
10	5HPBFR57	SEAL
11	5HPBFR58	INNER BEARING
12	5HPBFR59	INNER RACE
13	5HPBFR60	HUB
14	5HPYBSD16005	STUD BOLT, 1/2"-20 UNF X 1-7/8" (3/8" SHOULDER)
15	5HPYNWL16005	WHEEL NUT, 1/2"-20 UNF
16	5HPBFR61	OUTER RACE
17	5HPBFR62	OUTER BEARING
18	5HPYWFL24005	WASHER, FLAT, 3/4" USS
19	5HPYNL24010	HEX NUT, SLOTTED, 3/4"-16
20	5HPBFR66	HUB CAP
21	5HPYPCT05010	COTTER PIN, 5/32" X 1-1/2"
*	5HPBFR75	COMPLETE GROUND WHEEL HUB
22	5HPBFR644	GAUGE WHEEL EXTENSION LEFT
*	5HPBFR645	GAUGE WHEEL EXTENSION RIGHT
23	5HPYBHH20025	BOLT, 5/8" X 2" GR. 5
24	5HPYWLO20005	WASHER, LOCK, 5/8"
25	5HPYNHX20005	HEX NUT, 5/8"-11 PLATED
26	5HPYWLO16005	WASHER, LOCK, 1/2"
27	5HPYNHX16005	HEX NUT, 1/2"
28	5HPYBHH12125	BOLT, 3/8" X 3" GR. 5 FULL THREAD
29	5HPYNHX12005	HEX NUT, 3/8"-16
30	5HPBFR56	SPINDLE
*	5HPBFR67	15 X 5 WHEEL
*	5HPBFR128	6.70 X 15 TIRE
31	5HPYBHH16175	BOLT, 1/2" X 6-1/2" GR. 5

NOTE: * (MEANS NOT SHOWN)

FIGURE 14
FRONTIER MODEL WR1214/WR1216
14 TO 16 WHEEL EXPANSION KIT

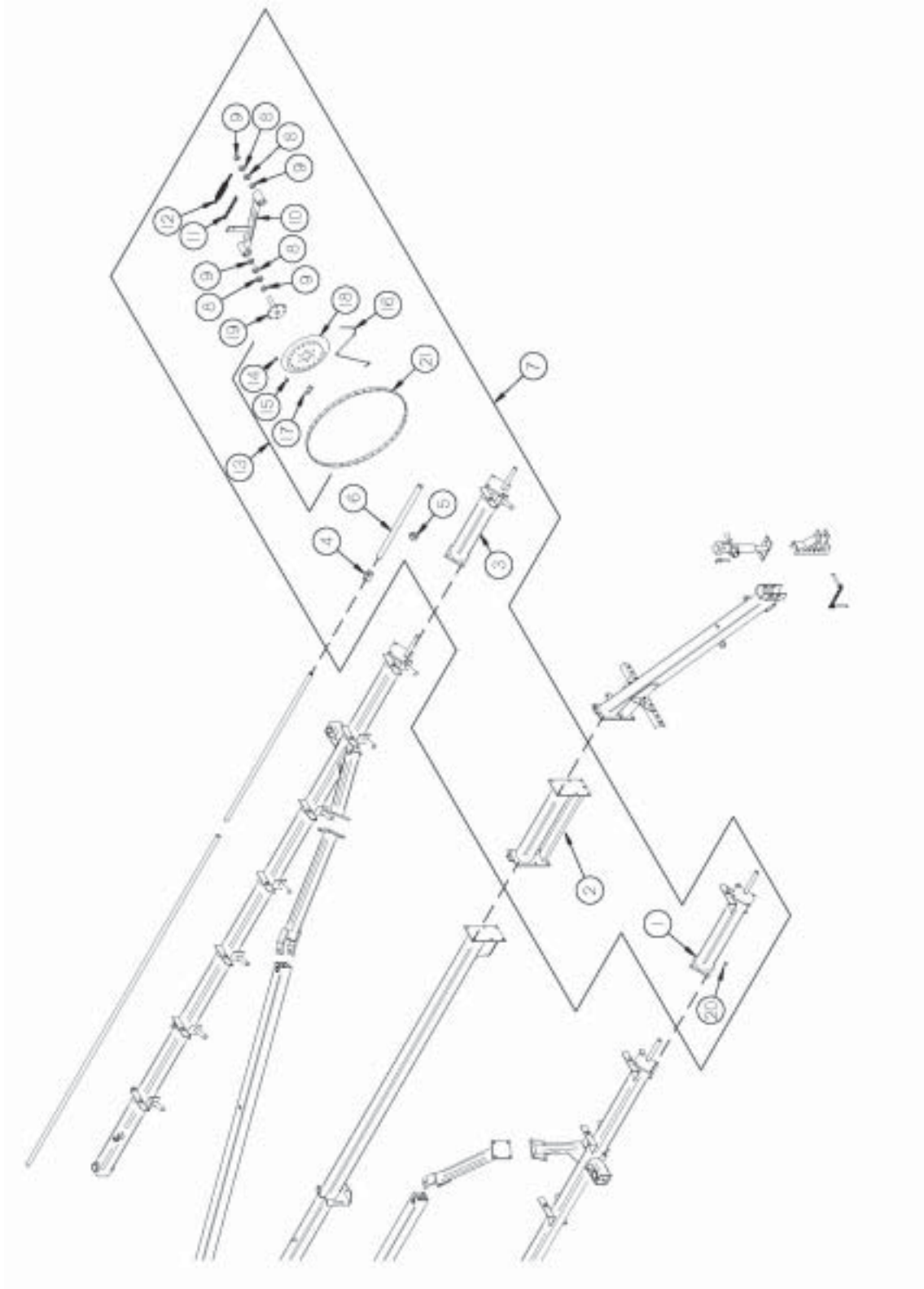


FIGURE 14

FRONTIER MODEL WR1214/WR1216 14 TO 16 WHEEL EXPANSION KIT

ITEM	PART #	DESCRIPTION
1	5HPBFR733	RH RAKE BEAM EXTENSION
2	5HP031WE04	POLE EXTENSION
3	5HPBFR734	LH RAKE BEAM EXTENSION
4	5HPBFR537	LIFTING PIPE CONNECTOR
5	5HPBFR431	LH SPRING CLAMP
*	5HPBFR430	RH SPRING CLAMP
6	5HPBFR536	LIFTING PIPE EXTENSION
7	5HPBFR535	COMPLETE EXPANSION KIT
8	5HPBFR525	BEARING
9	5HPPF16	LOCK COLLAR
10	5HPBFR489	RAKE ARM LH
*	5HPBFR490	RAKE ARM RH
11	5HPBFR140	RAKE ARM ADJUSTMENT CHAIN
12	5HPBFR138	SPRING
13	5HPT174	RAKE WHEEL LH
*	5HPBFR31	RAKE WHEEL RH
14	5HPYNCL76005	10MM TOP LOCK NUT
15	5HPYBCR76005	CARR. BOLT, 10MM X 25MM
16	5HPT176	RAKE WHEEL TOOTH
17	5HPT178	RAKE TOOTH CLIP
18	5HPT179	RAKE WHEEL CENTER
19	5HPBFR657	RAKE WHEEL HUB
20	5HPYBHH20025	BOLT, 5/8" X 2" GR. 5
21	5HPT177	OUTER RING
*	5HPBFR635	HOSE 1/2" FP X 1/2" MP X 33" (3)
*	5HPBFR555	ADAPTER
*	5HPJB82	1/2 TO 3/8 BUSHING

NOTE: * (MEANS NOT SHOWN)

FIGURE 15

FRONTIER MODEL WR1212/WR1214/WR1216 OPTIONAL 2 WHEEL CENTER KICKER WHEEL

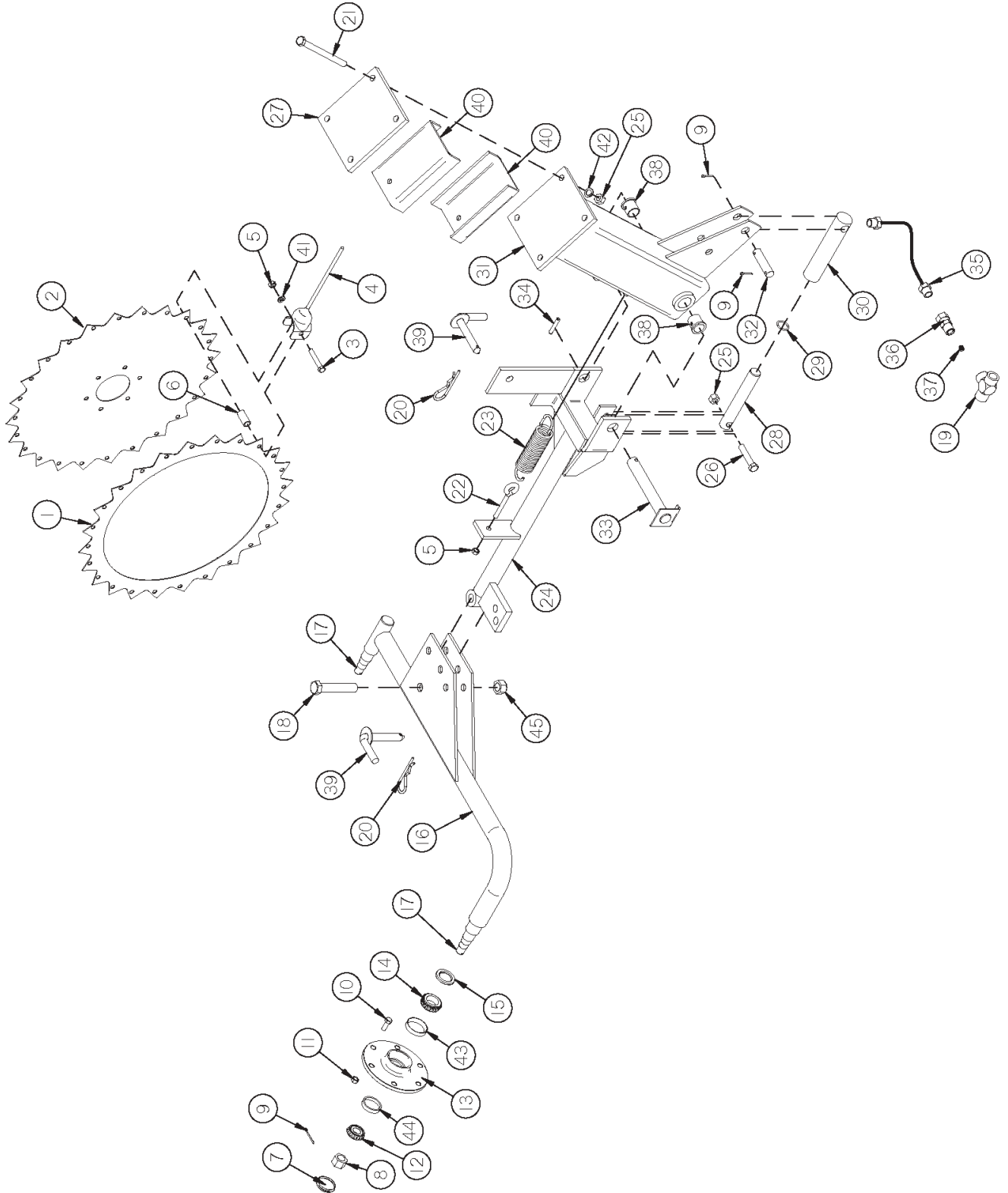


FIGURE 15

FRONTIER MODEL WR1212/WR1214/WR1216 OPTIONAL 2 WHEEL CENTER KICKER WHEEL

ITEM	PART #	DESCRIPTION
1	5HPBFR369	RAKE WHEEL RING
2	5HPBFR370	RAKE WHEEL CENTER
*	5HPBFR748	COMPLETE WHEEL ASSEMBLY
3	5HPYBHH12100	BOLT, 3/8" X 2-1/4" GR. 5
4	5HPT82	RAKE WHEEL TOOTH
5	5HPYNTL12005	HEX NUT, TOP LOCK, 3/8"-16
6	5HPBFR371	RAKE WHEEL SPACER
7	5HPT173	HUB CAP
8	5HPYNSL24010	HEX NUT, SLOTTED, 3/4"-16
9	5HPYPCT05010	COTTER PIN, 5/32" X 1-1/2"
10	5HPYBHH76005	BOLT, 10MM X 25MM
11	5HPYNHX76015	HEX NUT, 10MM
12	5HPT170	OUTER BEARING
13	5HPBFR32	RAKE WHEEL HUB
*	5HPBFR76	COMPLETE RAKE WHEEL HUB
14	5HPT164	INNER BEARING
15	5HPT163	SEAL
16	5HPBFR511	CENTER KICKER WHEEL ARM
17	5HPBFR36	SPINDLE
18	5HPYBHH24050	BOLT, 3/4" X 3" GR. 5
19	5HPBFR74	3/8" PIPE TEE
20	5HPYPHR02010	HAIR PIN, #21-07
21	5HPYBHH16175	BOLT, 1/2" X 6-1/2" GR. 5
22	5HPYBTE12025	TURNT EYE BOLT, 3/8" X 3" FULL THREAD
23	5HPBR62	SPRING
24	5HPBFR512	CENTER KICKER WHEEL PIVOT
25	5HPYNTL16005	HEX NUT, TOP LOCK, 1/2"-13
26	5HPYBHH16080	BOLT, 1/2" X 2-1/2" GR. 5
27	5HPBFR513	KICKER WHEEL MOUNT
28	5HPBFR114	PISTON
29	5HPBFR115	O-RING
30	5HPBFR116	HYDRAULIC CYLINDER
31	5HPBFR514	KICKER WHEEL OFFSET
32	5HPBFR515	CYLINDER PIN
33	5HPBFR379	AXLE SHAFT
34	5HPYPEX10015	EXPANSION PIN, 5/16" X 1-3/4"
35	5HPBFR121	HOSE
36	5HPBFR122	UNION ADAPTER W/ ORIFICE
*	5HPBFR529	ADAPTER UNION W/ ORIFICE
37	5HPBFR380	ORIFICE
38	5HPBFR27	BUSHING
39	5HPBFR197	LOCKING PIN
40	5HPBFR516	FILLER PLATE
41	5HPYWLO12005	WASHER, LOCK, 3/8"
42	5HPYWLO16005	WASHER, LOCK, 1/2"
43	5HPT165	INNER RACE
44	5HPT171	OUTER RACE
45	5HPYNTL24005	HEX NUT, TOP LOCK, 3/4"-10

NOTE: * MEANS NOT SHOWN

FIGURE 16

FRONTIER MODEL WR1212/WR1214/WR1216 OPTIONAL 3 WHEEL CENTER KICKER WHEEL

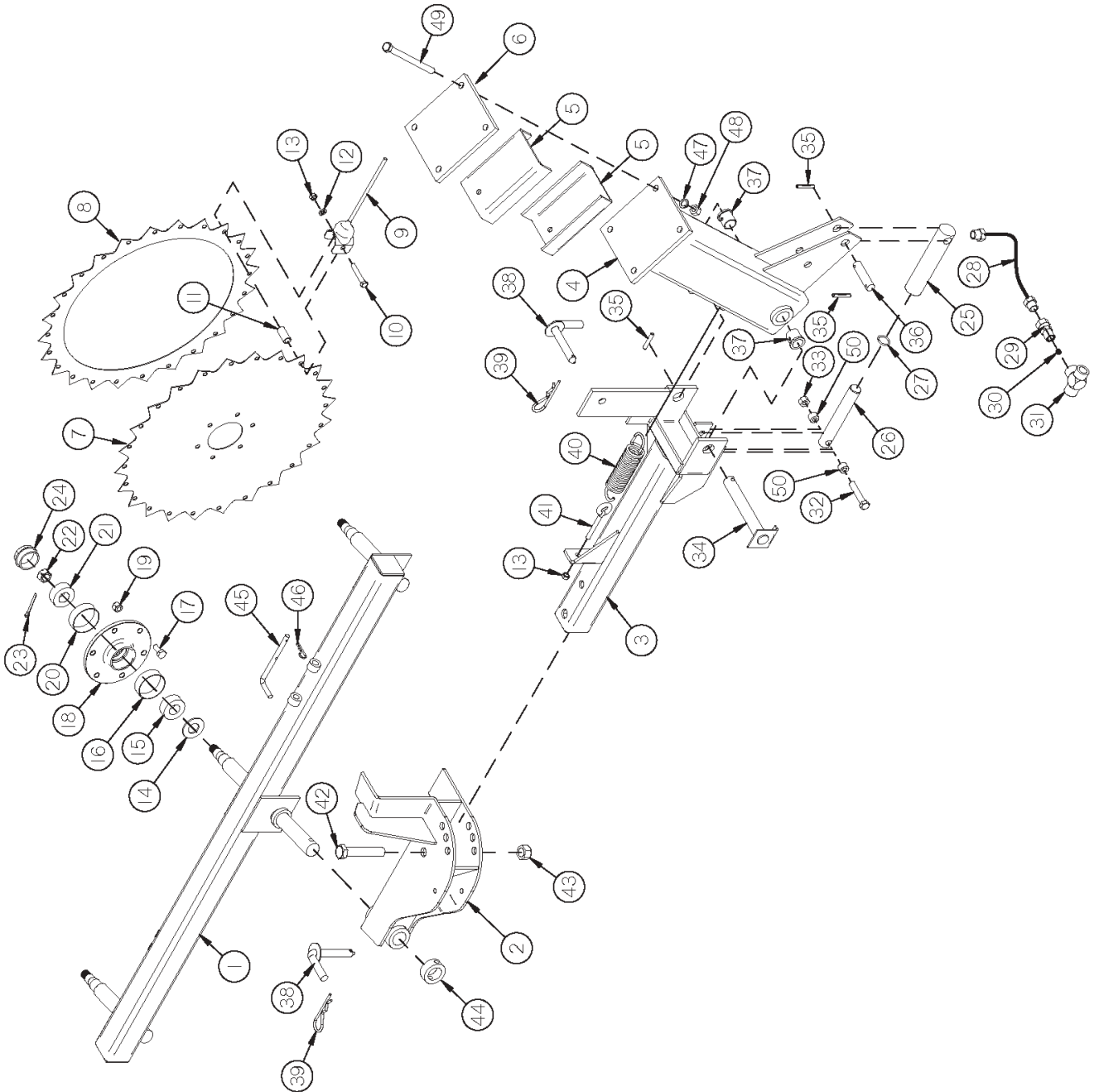


FIGURE 16

FRONTIER MODEL WR1212/WR1214/WR1216 OPTIONAL 3 WHEEL CENTER KICKER WHEEL

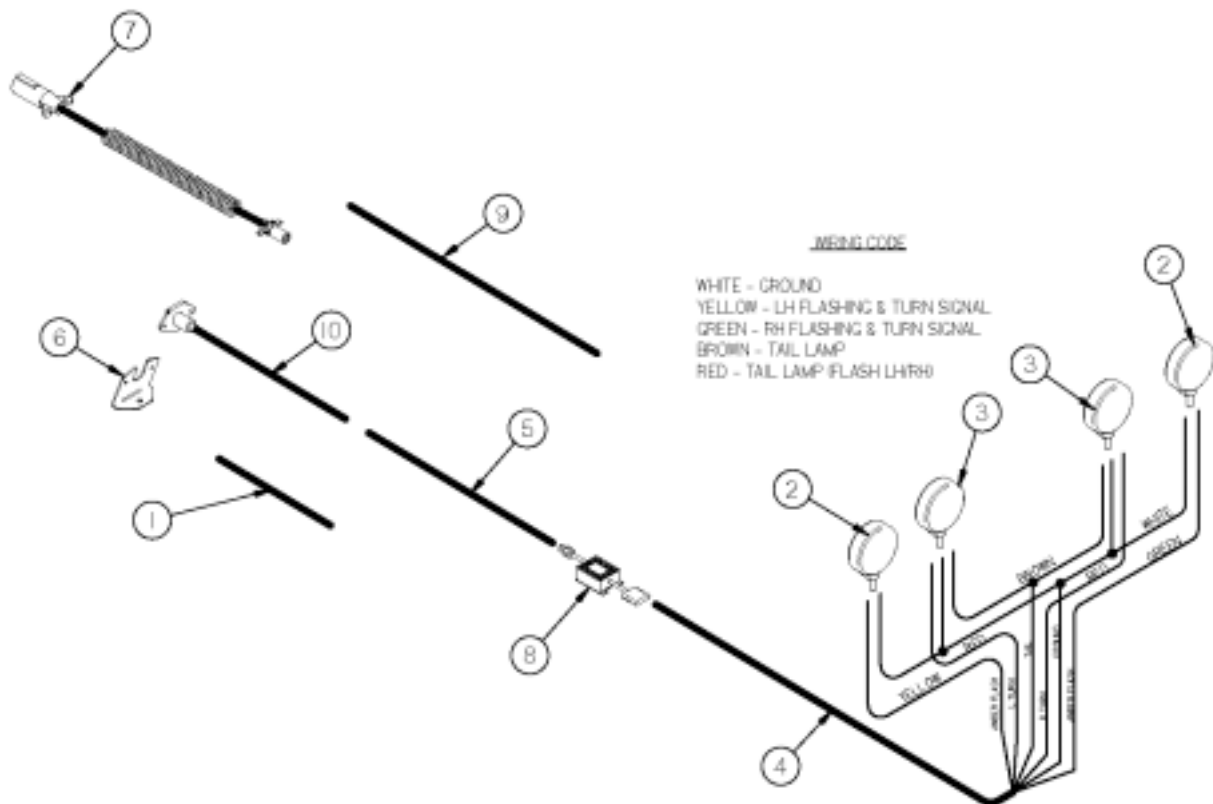
<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	5HPBFR717	KICKER RAKE BEAM
2	5HPBFR718	PIVOT
3	5HPBFR719	SQUARE RAKE ARM
4	5HPBFR514	KICKER WHEEL OFFSET
5	5HPBFR516	FILLER PLATE
6	5HPBFR513	KICKER WHEEL MOUNT
7	5HPBFR370	RAKE WHEEL CENTER
8	5HPBFR369	RAKE WHEEL RING
9	5HPT82	RAKE WHEEL TOOTH
*	5HPBFR748	COMPLETE WHEEL ASSEMBLY
10	5HPYBHH12100	BOLT, 3/8" X 2-1/4" GR. 5
11	5HPBFR371	RAKE WHEEL SPACER
12	5HPYWLO12005	WASHER, LOCK, 3/8"
13	5HPYNTL12005	HEX NUT, TOP LOCK, 3/8"-16
14	5HPT163	SEAL
15	5HPT164	INNER BEARING
16	5HPT165	INNER RACE
17	5NPYBHH76005	BOLT, 10MM X 25MM
18	5HPBFR32	RAKE WHEEL HUB
*	5HPBFR76	COMPLETE RAKE WHEEL HUB
19	5HPYNHX76015	HEX NUT, 10MM
20	5HPT171	OUTER RACE
21	5HPT170	OUTER BEARING
22	5HPYNLSL24010	HEX NUT, SLOTTED, 3/4"-16
23	5HPYPCT05010	COTTER PIN, 5/32" X 1-1/2"
24	5HPT173	HUB CAP
25	5HPBFR116	HYDRAULIC CYLINDER
26	5HPBFR114	PISTON
27	5HPBFR115	O-RING
28	5HPBFR121	HOSE
29	5HPBFR122	3/8" UNION ADAPTER
30	5HPBFR380	ORIFICE
31	5HPBFR74	3/8" PIPE TEE
32	5HPYBHH16115	BOLT, 1/2" X 3-1/2" GR. 5
33	5HPYNTL16005	HEX NUT, TOP LOCK, 1/2"-13
34	5HPBFR379	AXLE SHAFT
35	5HPYPEX10015	EXPANSION PIN, 5/16" X 1-3/4"
36	5HPBFR515	CYLINDER PIN
37	5HPBFR27	BUSHING
38	5HPBFR197	LOCKING PIN
39	5HPYPHR02010	HAIR PIN, #21-07
40	5HPBR62	SPRING
41	5HPYBTE12025	TURNED EYE BOLT, 3/8" X 3" FULL THREAD
42	5HPYBHH24070	BOLT, 3/4-10" X 4" GR. 5
43	5HPYNTL24005	HEX NUT, TOP LOCK, 3/4"-10
44	5HPBFR720	PIVOT LOCK COLLAR
45	5HPBFR721	BEAM LOCK PIN
46	5HPYPHR02005	HAIR PIN, #21-05 (1-7/8" LONG, 3/8-7/16" SHAFT)
47	5HPYWLO16005	WASHER, LOCK, 1/2"
48	5HPYNTL16005	HEX NUT, TOP LOCK, 1/2"-13
49	5HPYBHH16175	BOLT, 1/2" X 6-1/2" GR. 5
50	5HPBFR722	LIFT CYLINDER SPACER

NOTE: * MEANS NOT SHOWN

FIGURE 17

FRONTIER MODEL WR1212/WR1214/WR1216

OPTIONAL LIGHTS



<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	5HPBFR666	16 WHEEL EXT. LIGHT HARNESS
2	5HPDWM129	AMBER LIGHT
3	5HPBFR675	RED LIGHT
4	5HPBFR667	LIGHT HARNESS (6 WIRE)
5	5HPBFR705	14 WHEEL LIGHT HARNESS
6	5HPBFR659	MOUNTING BRACKET
7	5HPSTLPC	TRACTOR CORD (OPTIONAL)
8	5HPS441	LIGHT MODULE
9	5HPBFR668	12 WHEEL LIGHT HARNESS
10	5HPBFR706	FRONT PIGTAIL
*	5HPBFR671	12 WHEEL COMP. LIGHT HARNESS LESS OPTIONAL CORD
*	5HPBFR707	14 WHEEL COMP. LIGHT HARNESS LESS OPTIONAL CORD
*	5HPBFR708	16 WHEEL COMP. LIGHT HARNESS LESS OPTIONAL CORD

NOTE: * (MEANS NOT SHOWN)

