4000M / 4500M
Hard Hose Drag Reel

OPERATOR'S PARTS and MAINTENANCE MANUAL
2006 EDITION

Cadman
POWER EQUIPMENT
Limited
AGRICULTURAL MACHINERY & IRRIGATION EQUIPMENT
BOX 100, COURTLAND, ONT. CAN. N0J 1E0
Phone (519) 688-2222 Fax (519) 688-2100

TR-MAN-4500M

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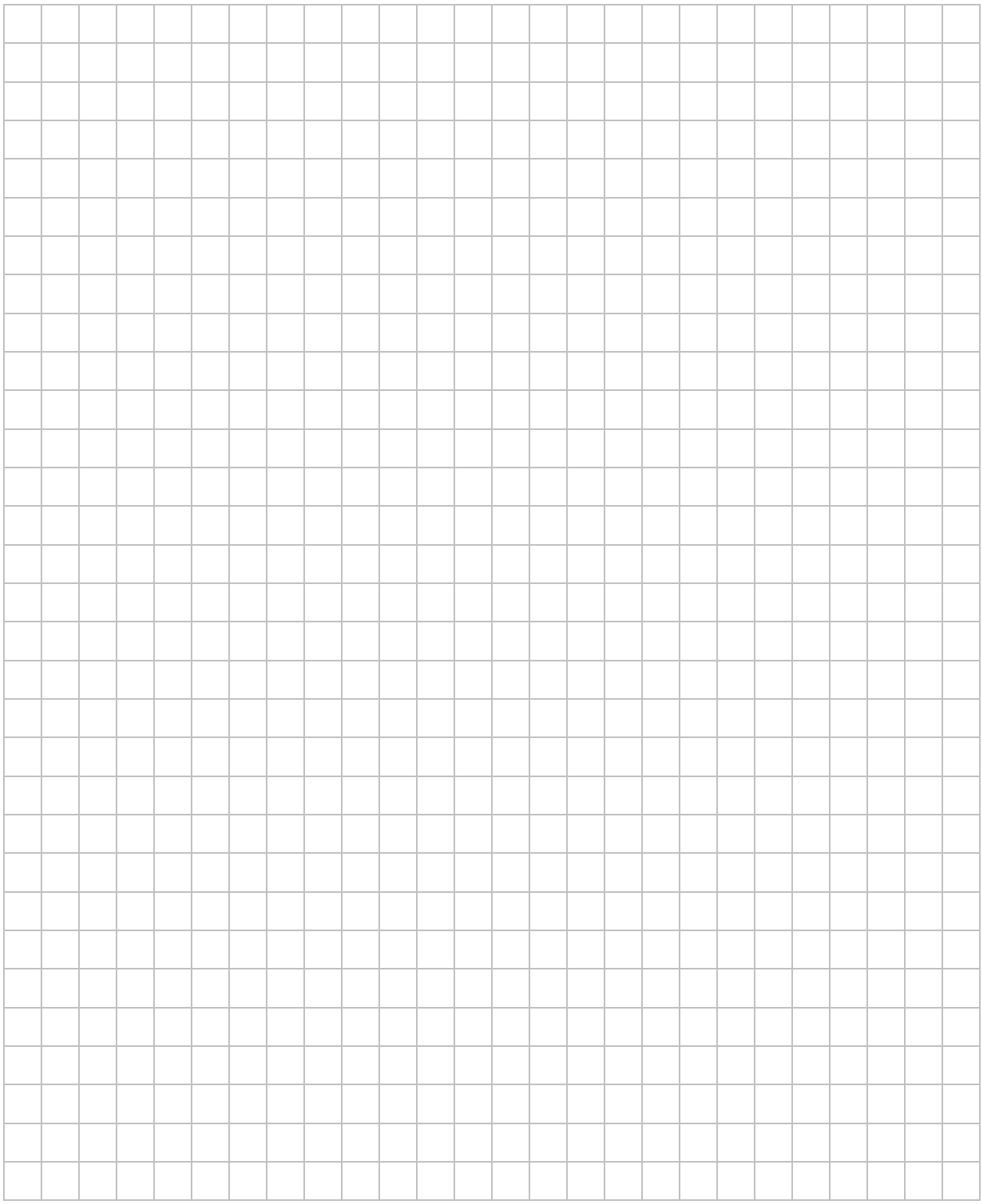

Hard Hose Drag Reel

We would like to thank you for purchasing your new **Cadman Hard Hose Drag Reel**. You have purchased a product of superior quality that will serve your needs for a long time provided you follow this manual and safety procedures.

Figure 1 – 1400 Cadman Traveller

img-00202.png

BEFORE operating your new **Cadman Hard Hose Drag Reel**, inspect the machine for any damage or parts which may have come loose during shipping. **REPORT ANY DAMAGE TO CADMAN POWER EQUIPMENT LIMITED OR YOUR LOCAL DEALER IMMEDIATELY!**

Warranty Policy

CADMAN POWER EQUIPMENT LIMITED warrants that each machine it manufactures shall be free from defects in materials and workmanship. The terms of this warranty are as follows:

- All components manufactured by **CADMAN POWER EQUIPMENT LIMITED** shall be warranted for a period of one (1) year from the date of delivery, except the frame and hose drum structures which shall be warranted for a period of three (3) years.

- The polyethylene hose used on **CADMAN HARD HOSE DRAG REELS** will be warranted for a period of five (5) years from the date of delivery, on a pro-rata basis. The schedule for the polyethylene hose warranty is as follows:

  1st to **10th** month from the date of delivery is **100%**

  11th to **60th** month from the date of delivery, the warranty shall diminish from **100%** to **0%** at a rate of **2%** per month.

- **CADMAN POWER EQUIPMENT LIMITED** makes no warranty whatsoever in regard to tires, engines, and other trade accessories used on its equipment. The customer shall rely solely on the warranties offered (if any) by the respective manufacturer of these trade accessories.

The sole obligation to **CADMAN POWER EQUIPMENT LIMITED** under this warranty is limited to the repair or replacement of any part it manufactured, which, in the judgment of **CADMAN POWER EQUIPMENT LIMITED**, failed under normal and proper use and maintenance due to defective materials or workmanship. All freight charges incurred shall be the sole responsibility of the customer.

CADMAN POWER EQUIPMENT LIMITED and its dealers **(who are neither authorized nor qualified to undertake any obligations on behalf of CADMAN POWER EQUIPMENT LIMITED) DO NOT**, under any circumstances, accept any responsibility for any losses or costs incurred due to parts failure and/or delays during the parts replacement process.

This warranty will be considered void if any alterations or modifications have been made to the machine without the express written consent of **CADMAN POWER EQUIPMENT LIMITED** outlining the nature and the extent of such modifications.

CADMAN POWER EQUIPMENT LIMITED, whose policy is one of continuous improvement, reserves the right to change specifications and designs without notice or incurring obligation.

The warranties expressed herein are non-transferable and replace any other warranties, either written or verbal, which may have been given or implied.

When Applying Liquid Manure

Environmental concerns seem to be driving legislative agendas in many agricultural areas across the continent. Current and pending laws in many agricultural regions of North America are changing the ways in which the agricultural community is expected to manage their liquid animal waste products.

The changes in legislation typically target two main issues; run-off prevention during and after application and soil nutrient loading.

Run-off seems to be the largest concern with nutrient application. Run-off may result from several different factors, most of which are controllable. These factors include; exceeding the soil intake rate; nutrient application on steep grades; high application amounts; leaking mainline fittings and seals; sudden rainfall during or immediately after application; ground frost; etc. Constant watch must be kept and immediate action taken when necessary to prevent run-off from occurring.

Soil nutrient loading depends on many variables. Some of these variables (but certainly not all) are soil type, type of crop being grown in the irrigated area, application timing, nutrient value of the material being applied (nutrient value should be assessed at the time of application as it can change throughout the year), etc.

Soil type will determine the intake rate at which liquid may be applied. Cultivation of the field just prior to application can improve the intake rate of some soils.

Great potential benefit lies in using the nutritional value of the nutrient being applied to replace some or all of the traditional chemical fertilizer used. Application timing and amount are important considerations. Soil analysis taken prior to planting and during the growth periods of the crop will help determine if there is room for further application amounts to be added prior to crop maturity. A total management plan should include provisions to end the crop season without surplus nutrients left as residual. These excess nutrients typically end up in the ground water supply. Local colleges, universities and agricultural extension services are usually a good source of information. They can usually help you determine an application program that prevents soil nutrient overload due to excess application.

Cadman Power Equipment Limited cannot possibly provide up-to-date recommendations with regard to the legal obligations you must deal with in your particular area. However, as a manufacturer of equipment used in nutrient application (liquid manure, milk house run-off, etc.), we feel it necessary to make you aware that the municipal, regional and state governing bodies in your area may have recently enacted new legislation or revised existing legislation with regard to nutrient handling practices and procedures.

It is your responsibility to make yourself aware of and abide by the current legislation in your area. Please take the time to contact your local agricultural representative to obtain the latest information regarding legal handling and application of nutrient.

Safety Precautions

Please take the time to read and **understand** this manual so that unnecessary errors and risks are avoided. If you have any questions or concerns, please contact **Cadman Power Equipment Ltd.** or your local dealer/distributor.

- **DO NOT** move or operate this machine until you have read and understand these instructions in this manual.
- **NEVER** allow untrained persons to operate this machine.
- **DO NOT** attempt to service this machine while it is in operation.
- **MAKE CERTAIN** all mechanical and hydraulic tension has been released before attempting any service on the machine.
- **CHECK** all fasteners (nuts and bolts) regularly for tightness.
- **PERFORM REQUIRED MAINTENANCE** as prescribed or as necessary to keep this machine in safe operating condition.

OPERATOR NOTE

Safety is just a word until put into practice.

Safety must be the first thing on your mind when operating any piece of machinery.

Failure to follow all safety instructions can result in serious injury or death to you or any spectators.

Remember…

SAFETY FIRST!

- **KEEP ALL SPECTATORS** at a safe distance.
- **STAY CLEAR of high pressure supply lines, especially when first pressurizing the system.**
- **DO NOT** remove or alter any shielding on this machine.
- **BE CERTAIN** that the machine is securely anchored (using stabilizer legs) before unwinding the hose.
- **KEEP CLEAR** of all moving parts.
- **NEVER** tow this machine at speeds greater than **10 mph / 16 km/h** and be certain the tow vehicle has adequate braking capacity to maintain safe control at all times.
- **REGULAR INSPECTION** of your pipe couplings, tubing and gaskets should be a part of your regular set-up routine. Any defective parts **MUST** be replaced or repaired before the machine is put into service.

This symbol, the safety-alert symbol, indicates a hazard. When you come across this safety-alert symbol in this manual, make certain you fully understand and abide by the given instructions or warnings.

Safety Decals

The safety decals on this machine are intended to warn the operator of potential hazards. It is important that these decals are properly maintained.

- keep all safety decals legible (remove dirt or debris)
- replace any damaged or illegible decals
- replace any missing decals
- if applicable, include the current safety decal specified by **Cadman Power Equipment Limited** on any components installed during repair

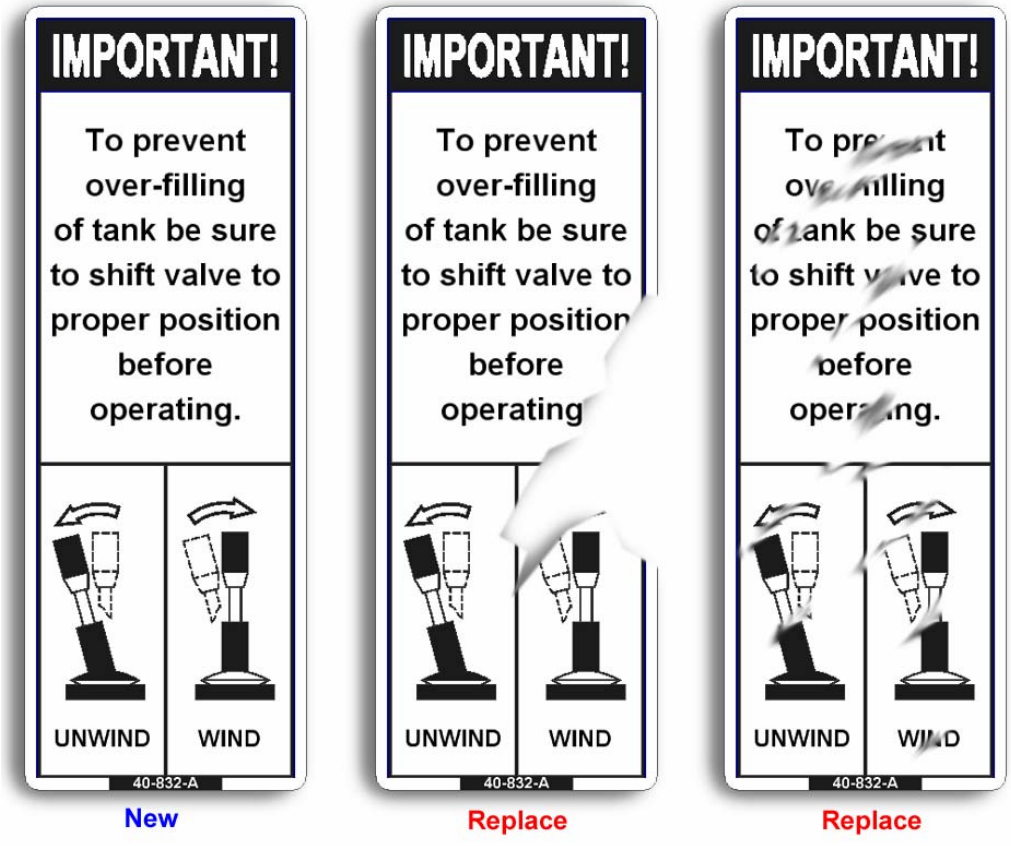

Figure 2 - Replace Decal

img-00131.png

To obtain the required replacement safety decals contact **Cadman Power Equipment Limited**. Re-install all decals in the proper location on the machine. For part numbers and locations please refer to the Decal Assembly drawing of this manual on page ???.

Planning Your Application

You will benefit from having an accurate plan to follow before you set-up or operate your equipment. When creating your plan, remember that a properly planned field layout will cover the most area with the least amount of set-up time.

Using the chart below you can:

1. **Divide your field into the least number of sections to obtain complete coverage.** If the area you plan to cover is larger than the maximum area that your **Cadman Hard Hose Drag Reel** will cover (see chart below), you will need to have at least two (2) sections.
2. **Determine the best position for your reel in each section.** It is usually best to position your reel near the center of each section and use a zigzag pattern (see the section "**Beginning Your Application**" on page 13). This will allow the hose to be pulled to the furthest point during your first pull.

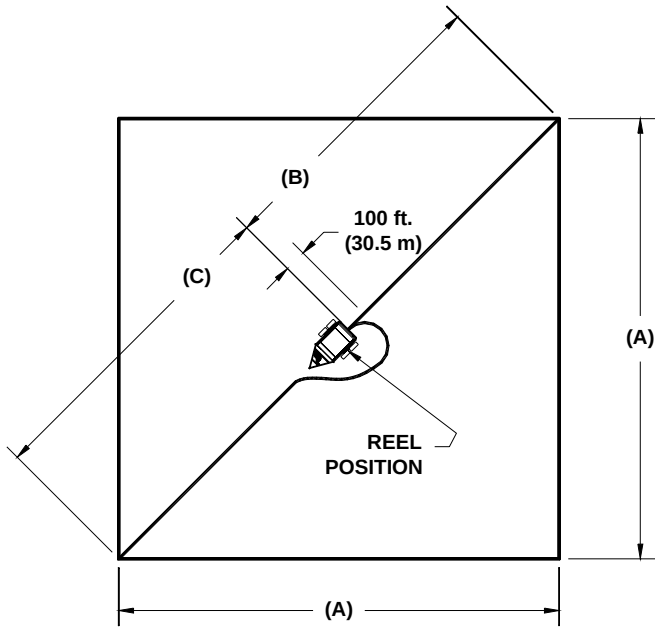

Figure 3 - Reel Position

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Maximum	4000M	4500M
Application Area (per set-up)	99 acres	70 acres
(A)	2078 ft.	1753 ft.
(B) Usable Hose Length.	1520 ft.	1290 ft.
(C)	1420 ft.	1190 ft.

You MUST leave a MINIMUM of 50 ft (15.25 m) of hose at the rear of the machine at all times. This will help reduce the risk of kinking the hose behind the reel.

You MUST leave as a MINIMUM one (1) coil of hose on the drum at all times. Failure to do so WILL result in hose damage.

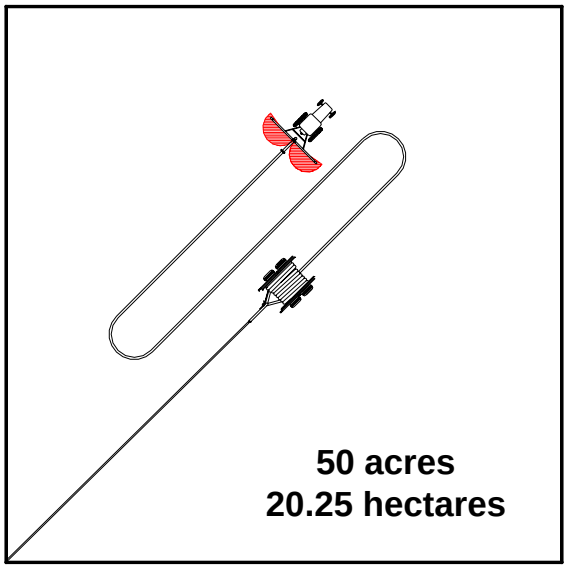

Figure 4 - One Set-up

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- Reel is positioned approximately in the center of the field
- Complete coverage, one set-up

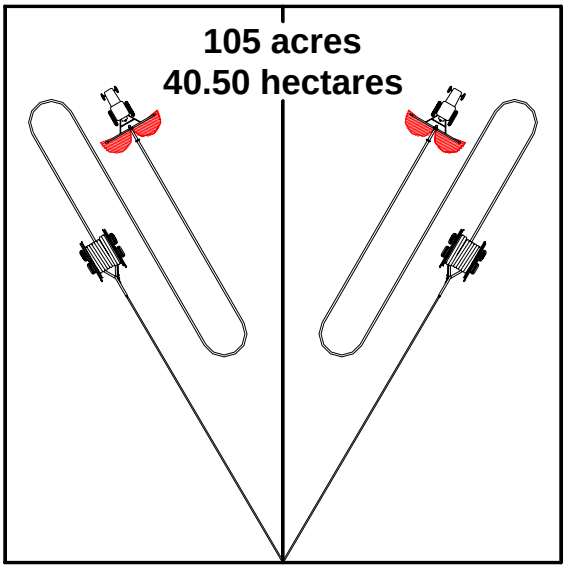

Figure 5 - Two Set-ups

img-00122.wmf

- Square field, larger than maximum application area
- Field has been split into two (2) sections
- Complete coverage, two set-ups

Equipment Set-up

Step 1

Following your plan, tow the machine to the first section.

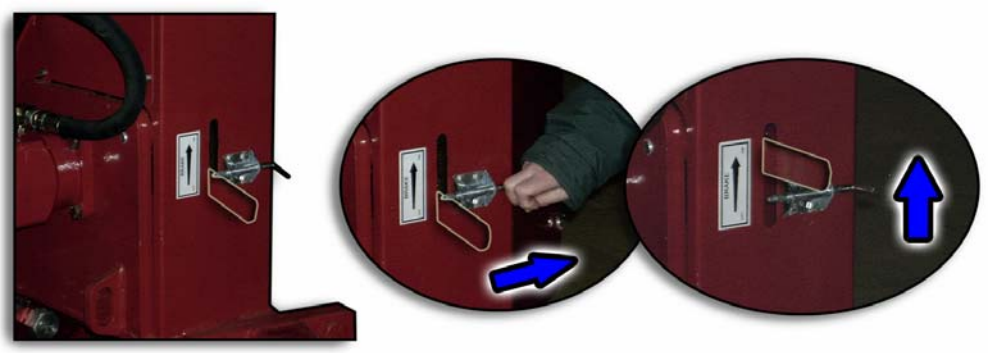

Figure 6 - Engage Brake Prior to Transport

img-00126.png

It is important to verify that the drum brake is engaged prior to moving your Cadman Hard Hose Drag Reel. Failure to do so can result in equipment damage.

Step 2

Park the reel approximately 100 ft. (30.5m) from the center of the field. (Refer to Figure 3 on page 8.) Face the hose end of the machine toward the furthest corner.

Keep the chassis of the machine on firm and level ground. A **Cadman Hard Hose Drag Reel** has a high center of gravity.

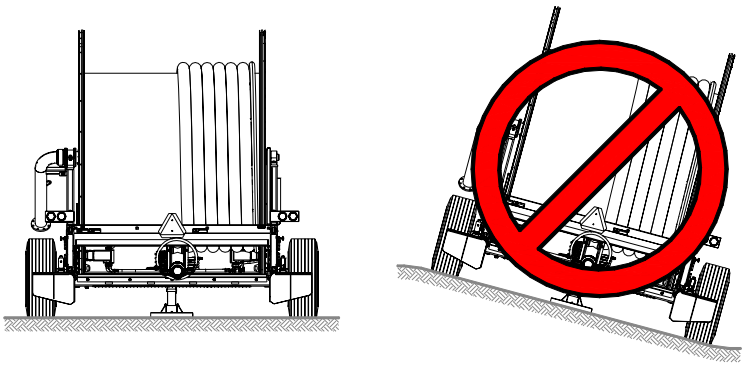

Figure 7 - Work on firm and level ground (image exaggerated)

img-00119.wmf

It is essential that it be operated from a stable position to prevent roll over.

Step 3

Stabilize your reel by fully extending the hydraulic stabilizer legs.

Step 4

Level your machine using the tongue jack.

Step 5

Connect the main supply line to your reel.

Step 6

Disconnect the hydraulic hosing and unhitch your tractor. Position your tractor, (with the applicator attached) at the rear of the reel.

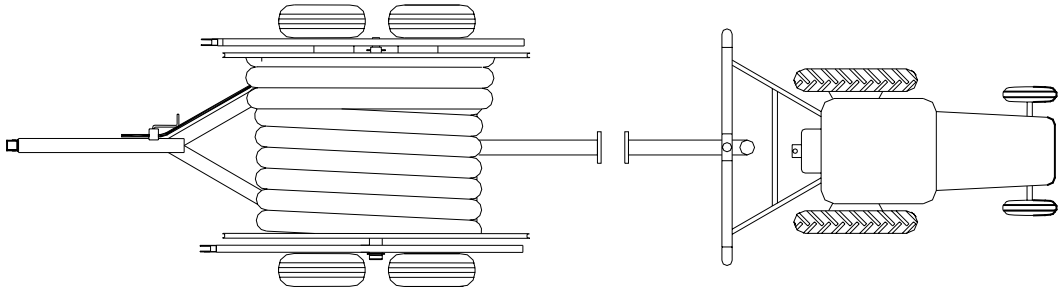

Figure 8 - Position Tractor

img-00043.wmf

Step 7

Remove the hose flag from the hose end.

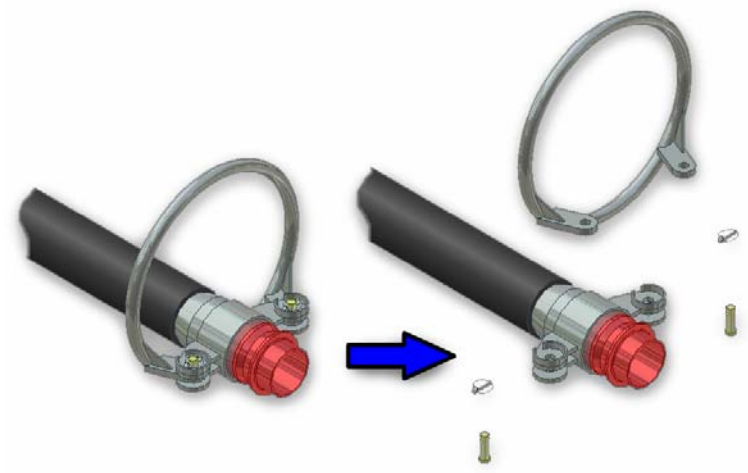

Figure 9 - Remove Hose Flag

img-00123.png

Step 8

Connect the soft hose from your reel, using the ringlock clamp, to the hose elbow on drawbar of your tractor. Secure both tow chains. When properly set, the hose should not be stressed during operation.

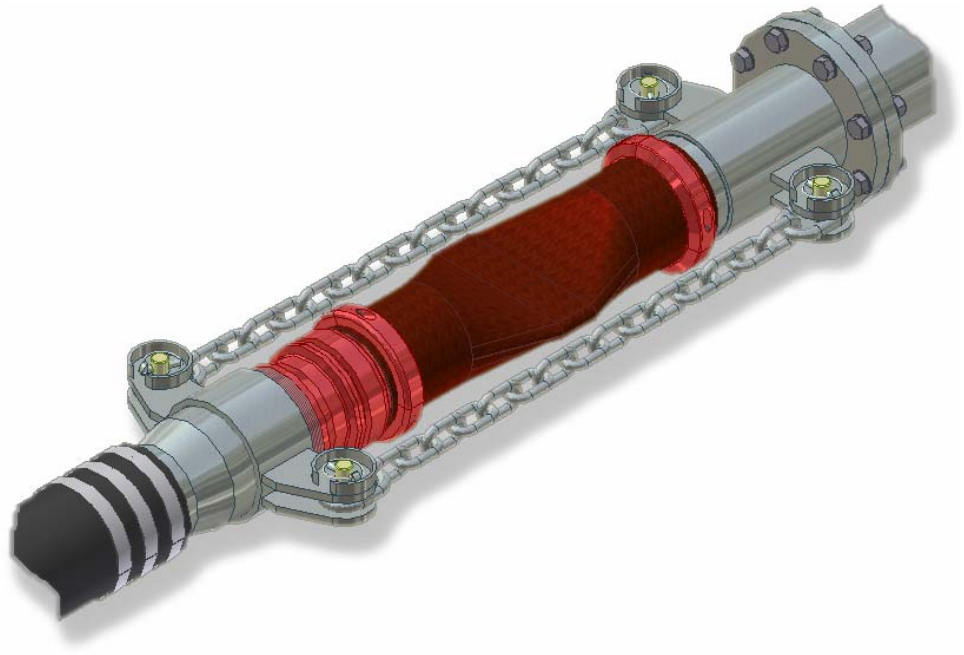

Figure 10 - Connect Chains

img-00144.png

Beginning Your Application

Once you have set-up your **Cadman Hard Hose Drag Reel** you can start the application process. It is important to complete the following steps…

Step 1

Release the brake to allow the drum to rotate during hose pull-out.

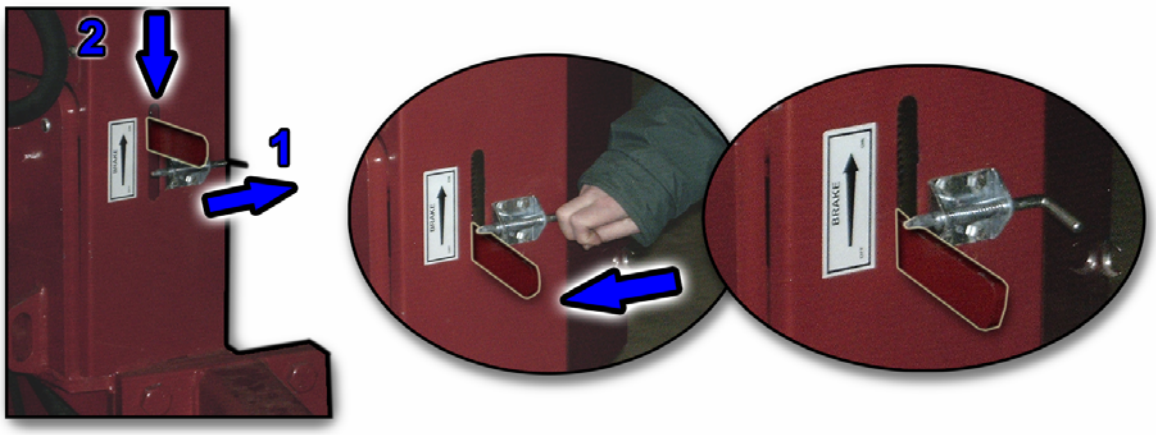

Figure 11 - Disengage Drum Brake

img-00127.png

Step 2

Raise the stop bar located at the rear of the machine. Ensure that the latch is fully engaged.

Figure 12 - Raise Stop Bar

img-00129.png

Step 3

Switch the cooling system valve to the unwind position.

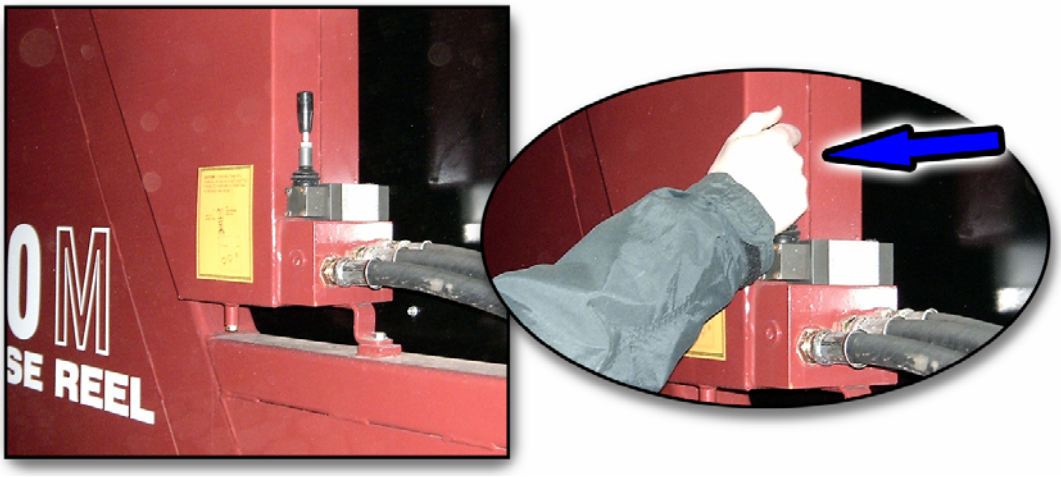

Figure 13 - Set Valve to Unwind Position

img-00128.png

Step 4

Pull out the hose toward the furthest corner as laid out in your plan (refer to section “Planning Your Application” found on page 8). As you approach the corner look at the reel to see how much hose remains. As a minimum you require one (1) coil of hose to remain on the drum at all times. Once you have determined there is enough hose, continue to the corner and make your first turn.

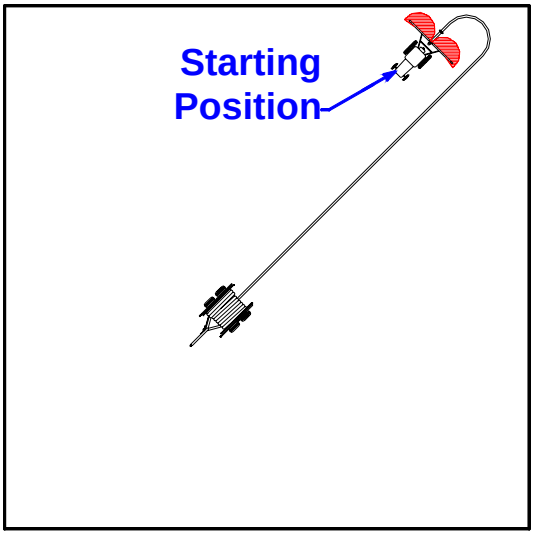

Figure 14 - Starting Position

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Step 5

Now engage the brake so that the drum will no longer rotate. By locking the drum you will prevent the hose from being pulled off the drum connection. Obstacles (hills, rocks, etc.) in the field can cause the hose to pull out if the drum is not locked.

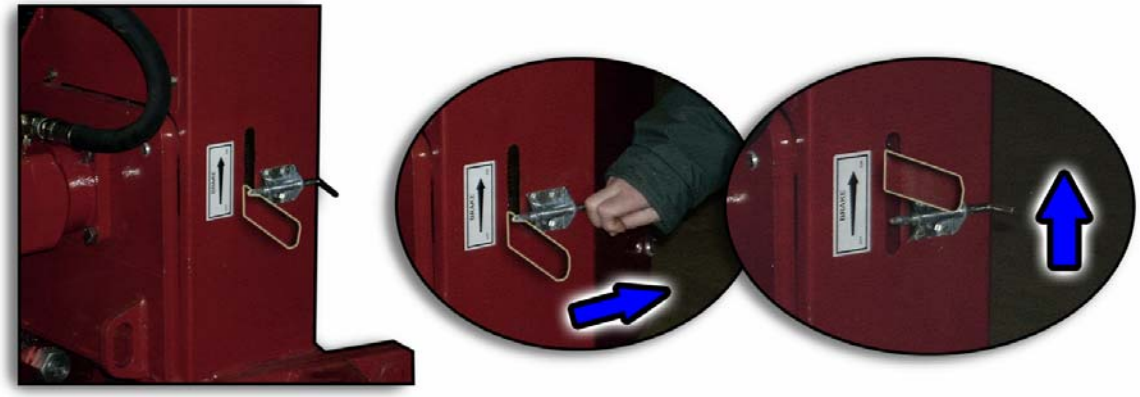


Figure 15 - Engage Brake Prior to Transport

img-00127.png

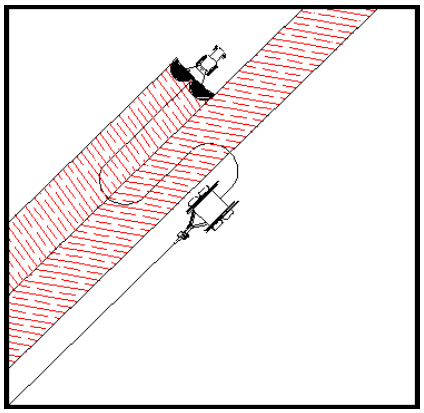
Step 6

Begin pumping the liquid slowly. You must allow the system to purge the air within the hose before raising the system to the desired operating pressure. Once the liquid reaches the applicator, the driver should start moving to distribute the liquid. At this point you can increase the pump rpm raising the operating pressure to the desired level.

Pressurizing your Cadman Hard Hose Drag Reel must be done slowly and cautiously to purge all the air from the system. Air must be purged before bringing the system up to full operating pressure.

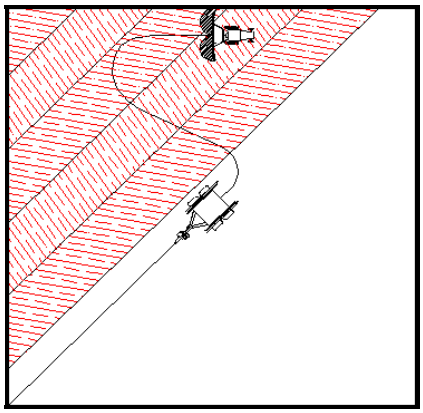
Application Pattern

There are a number of hose drag patterns that can be used during your application. **Cadman Power Equipment Limited** has found the zigzag pattern to be one of the best methods. Although we recommend this method, you are not limited to using it. Follow the instructions below if you are going to use the zigzag method.



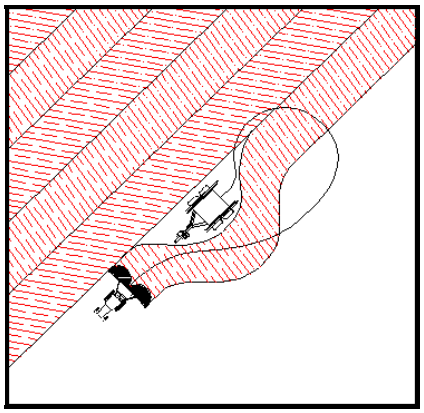
img-00035.gif

1. Using a zigzag pattern cover the first half of your section while working away from the reel.



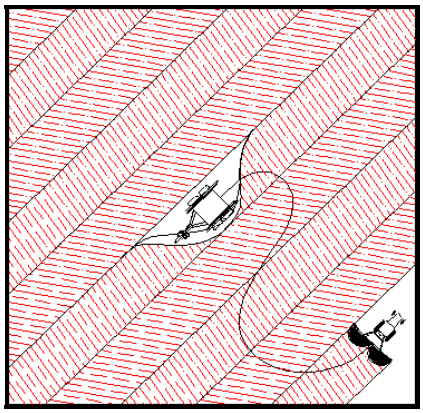
img-00036.gif

2. When you have completed the first half, drive along the outside to the second half.



img-00037.gif

3. Cover the second half in a similar fashion, using a zigzag pattern and working away from the reel.



img-00038.gif

4. Finish covering the entire section. Signal the pump operator when you are finished applying.

OPERATOR NOTE

Where field conditions permit, always attempt to pull the hose either up or down sloping terrain instead of operating across a side hill.

Always turn away from the reel. Failure to do this could cause you to get “trapped” by the drag hose.

Be aware of obstacles in the field. Proper application planning should take into consideration any obstacles that could hinder your application.

Keeping your **Cadman Hard Hose Drag Reel** clean will dramatically prolong its life.

Cleaning of the hose, as well as cleaning the exterior of the **Hard Hose Drag Reel** is highly recommended after each use.

Finishing an Application

Step 1

When you are nearing complete coverage of a section, signal the operator to shut down the pump. Start the hose blow out procedure. Continue to move the applicator through the field until flow to the applicator has stopped.

The hose is a high volume "Receiver Tank" containing a large amount of fluid. Be sure to allow enough spreading area to properly apply the hose content.

- Ø 6" hose contains approximately 1 ½ US Gallons per foot
- Ø 8" hose contains approximately 2 ⅔ US Gallons per foot

	660	1320	1980	2640	3300	3960	4620	5280	5940	6600	*Feet*
Ø 6"	969	1939	2908	3877	4847	5816	6785	7755	8724	9693	*US Gal*
Ø 8"	1723	3447	5170	6893	8616	10340	12063	13786	15509	17233	*US Gal*

Failure to compensate for the remaining fluid can result in over application of fluid.

Step 2

Drag the hard hose so that it is back at the original start position. Disconnect the applicator from the hard hose by uncoupling the ringlock fitting.

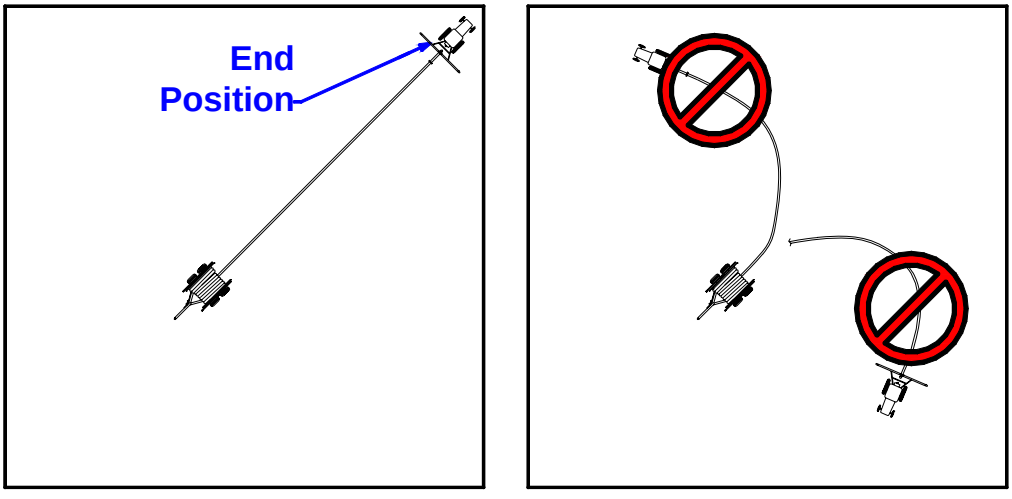


Figure 16 - Return to End Position

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Step 3

Re-install hose flag to hose end.

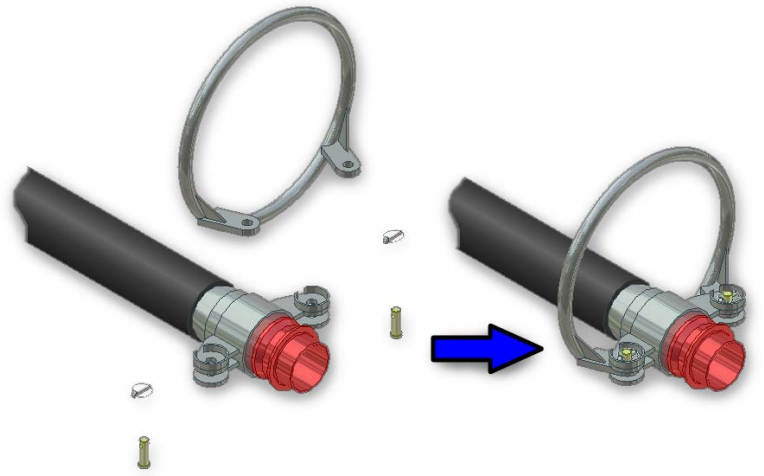

Figure 17 - Re-install Hose Flag

img-00124.png

<u>DO NOT</u> under any circumstances rewind the hose without the flag installed. Rewinding the hose without the flag installed will cause extensive damage to your machine.

Step 4

Move the tractor to the front and re-hitch the machine. Connect the hydraulic line to the tractors hydraulic supply.

Step 5

Fully release the drum brake and secure with the spring latch to prevent the brake from being re-applied.

Figure 18 - Release Drum Brake

img-00127.png

Step 6

Start the retrieve cycle. Immediately check to see that the shut-off mechanism is working properly.

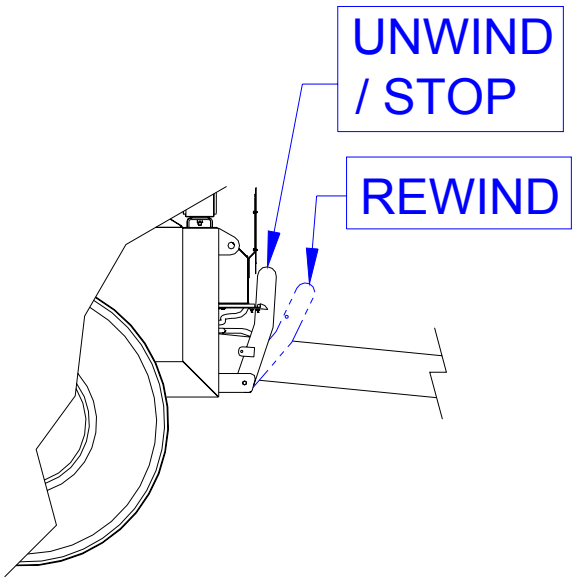

Figure 19 - Shut-off Bar Detail

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- Manually lower the shut-off bar from unwind position (vertical) to the rewind position (angled).
- Engage the tractor hydraulics to begin the hose rewind.
- Raise the shut-off bar to the STOP (vertical) position. This should stop the rotation of the drum.
- **If the drum does not stop, immediately stop the rewind cycle** by disengaging the tractors hydraulic system. Check the valve adjustment as shown on page 42.
- If valve adjustment was required, re-test the retrieve cycle.

If for any reason the shut-off system failed, major damage could result. Check the automatic shut-off system before every retrieve cycle. Never operate the machine if you discover a problem.

Step 7

With the shut-off system working properly, check the hose indexing system. The hose should be tightly wound together. If the hose is improperly indexing, you will notice the hose trying to climb up on itself or leave large gaps. If this happens, check the indexer adjustment as shown on page 43.

Step 8

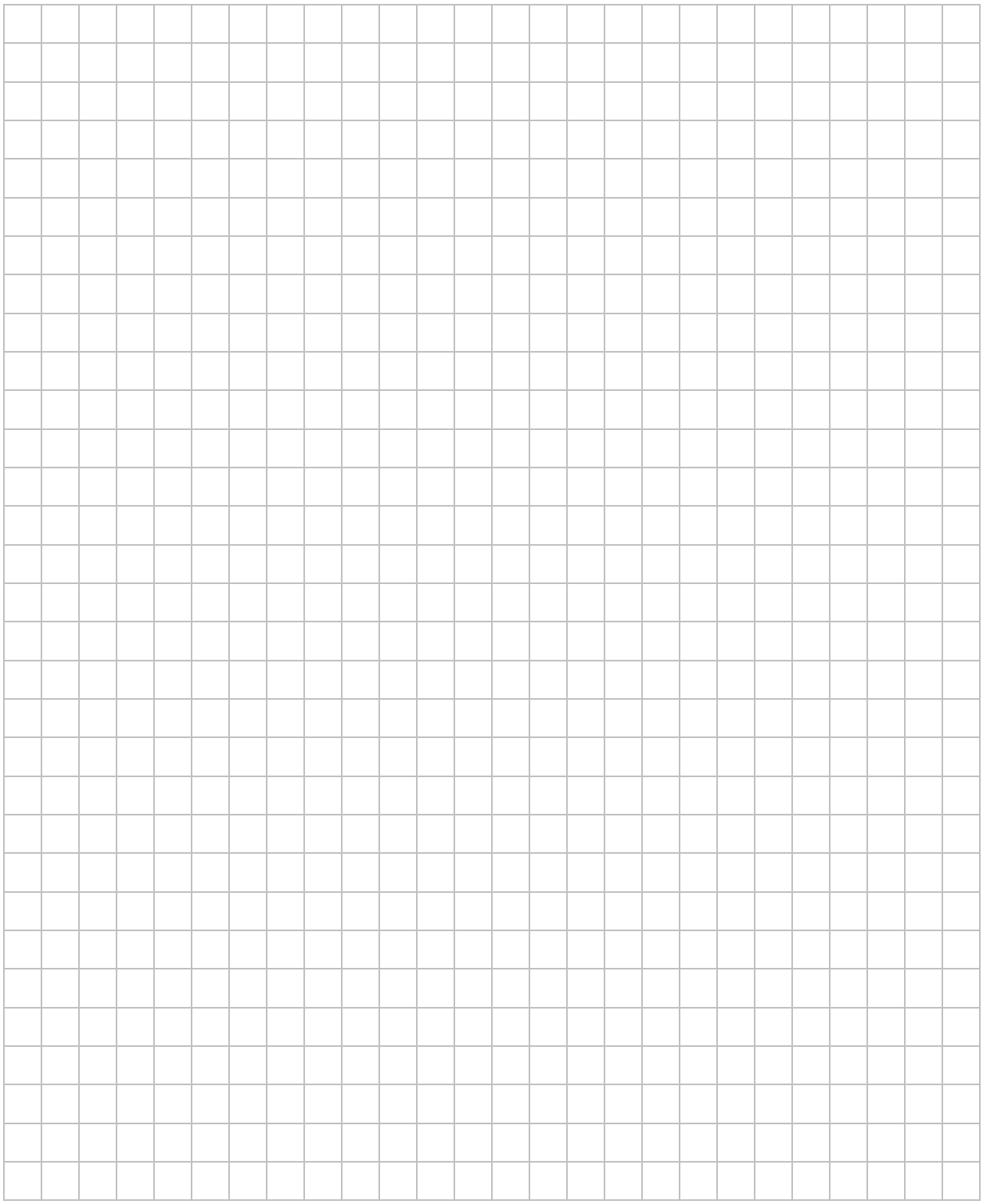
Disconnect the supply line from your machine.

Step 9

When the hose is fully recoiled, set the drum brake, lift the hydraulic stabilizer legs, disengage the tractor hydraulics and raise the tongue jack.

Step 10

Tow the reel to the next set-up location and reconnect the supply line as required.



Parts Section

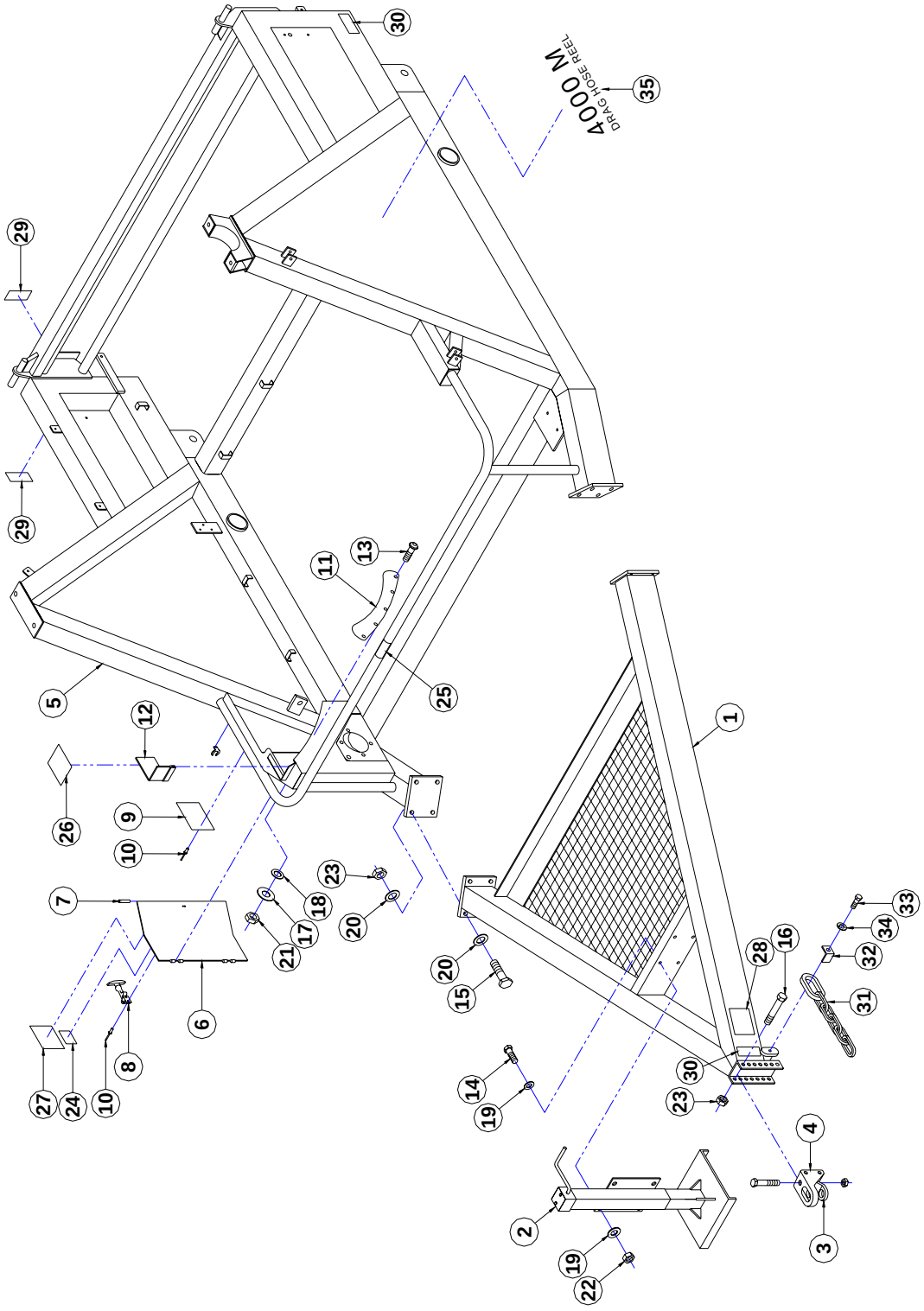
From Serial Number:

00101044000M155 - 4000M/4500M

* All assemblies marked with an asterisk apply to all model serial numbers.

Frame Assembly – Front

4000M - 4500M

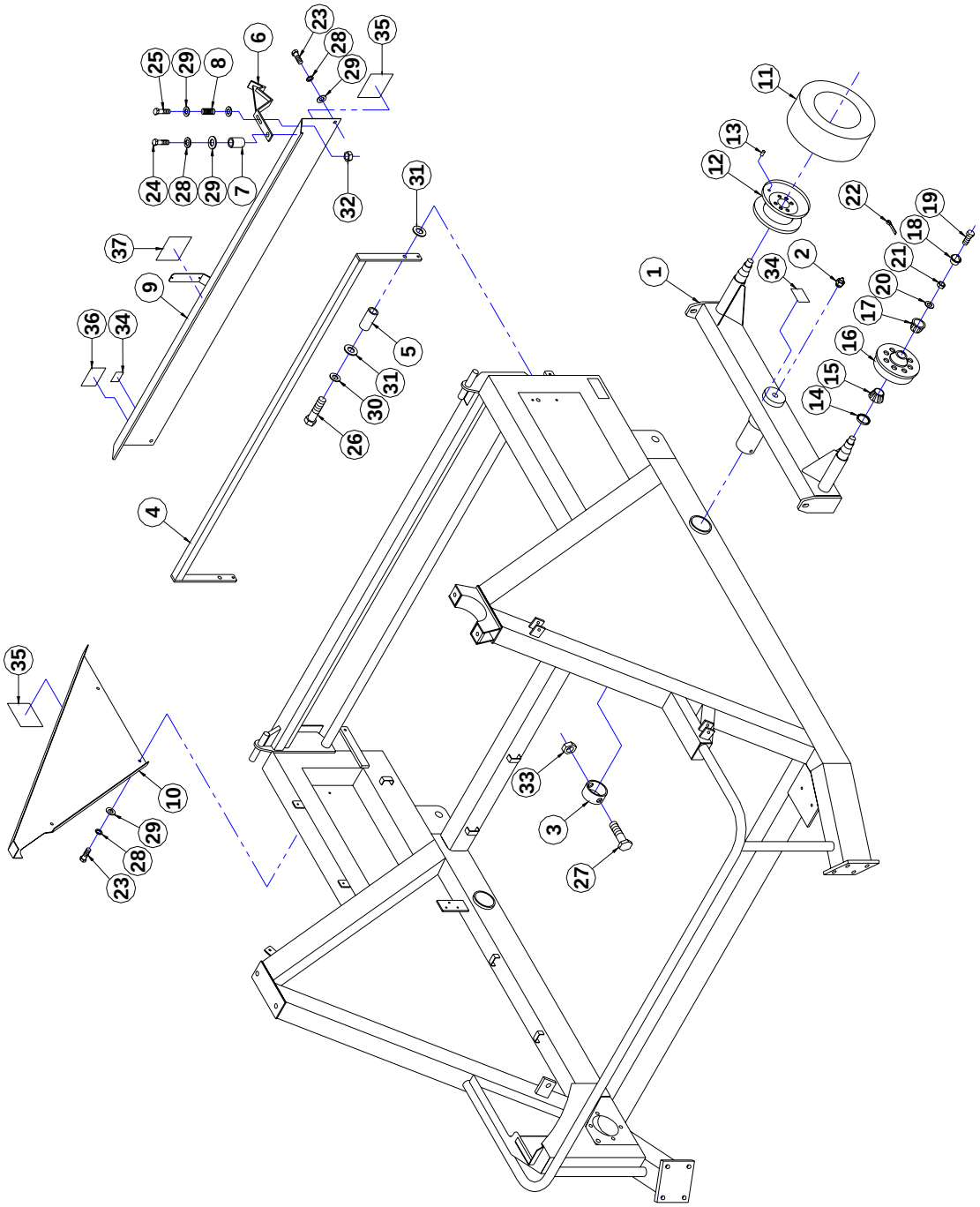


Frame Assembly – Front *4000M - 4500M*

Item	Description	Part Number	Qty
1	Tongue	16-100	1
2	Tongue Jack	16-609	1
3	Hitch	40-402	1
4	Clevis Kit (w/ nut & bolt)	40-403	1
5	Frame	16-400	1
6	Drive Cover Door	16-613	1
7	Brass Hinge Pin, 3/16" x 3 in.	40-200-C	2
8	Rubber Latch Kit	40-217	1
9	Cadman Serial Number Tag	40-238	1
10	Rivet, 3/16" x 3/8" Lg.	90-RIV-019X038	10
11	Plastic Guard	16-634	1
12	Rubber Guard	----	1
13	Carriage Bolt, 1/4"	90-BLT-CG02520X150	5
14	Bolt, 1/2" - 13 x 1 1/2" Lg.	90-BLT-05013X150	4
15	Bolt, 3/4" - 10 x 3" Lg.	90-BLT-07510X300	8
16	Bolt, 3/4" - 10 x 6" Lg. (GR. 8)	90-BLT-07510X500	2
17	Flat Washer, 1/4"	90-WSR-FLT025	5
18	SAE Flat Washer, 1/4"	90-WSR-SAE025	20
19	SAE Flat Washer, 1/2"	90-WSR-SAE050	8
20	SAE Flat Washer, 3/4"	90-WSR-SAE075	16
21	Locknut, 1/4" - 20	90-NUT-LOC025-20	5
22	Locknut, 1/2" - 13	90-NUT-LOC050-13	4
23	Locknut, 3/4" - 10	90-NUT-LOC075-10	10
24	Decal, "Grease Point"	40-041	1
25	Decal, "Danger! - Rotating Drum"	40-287	1
26	Decal, "Warning! - Pinch Point"	40-289	1
27	Decal, "Warning! - Moving Part ..."	40-290	1
28	Decal, "Caution - 10 MPH Max. …"	40-291	1
29	Red Wide Angle Reflector	40-599	4
30	Amber Wide Angle Reflector	40-598	4
31	Safety Chain	40-622	1
32	Safety Chain Retainer	17-213	1
33	Bolt, 1/2" - 13 x 3/4" Lg.	88-BLT-05013X075	1
34	Lock Washer, 1/2"	88-WSR-LOC050	1
35	Decal, 4000M Panel	40-530-4000M	2

Frame Assembly – Rear

4000M - 4500M

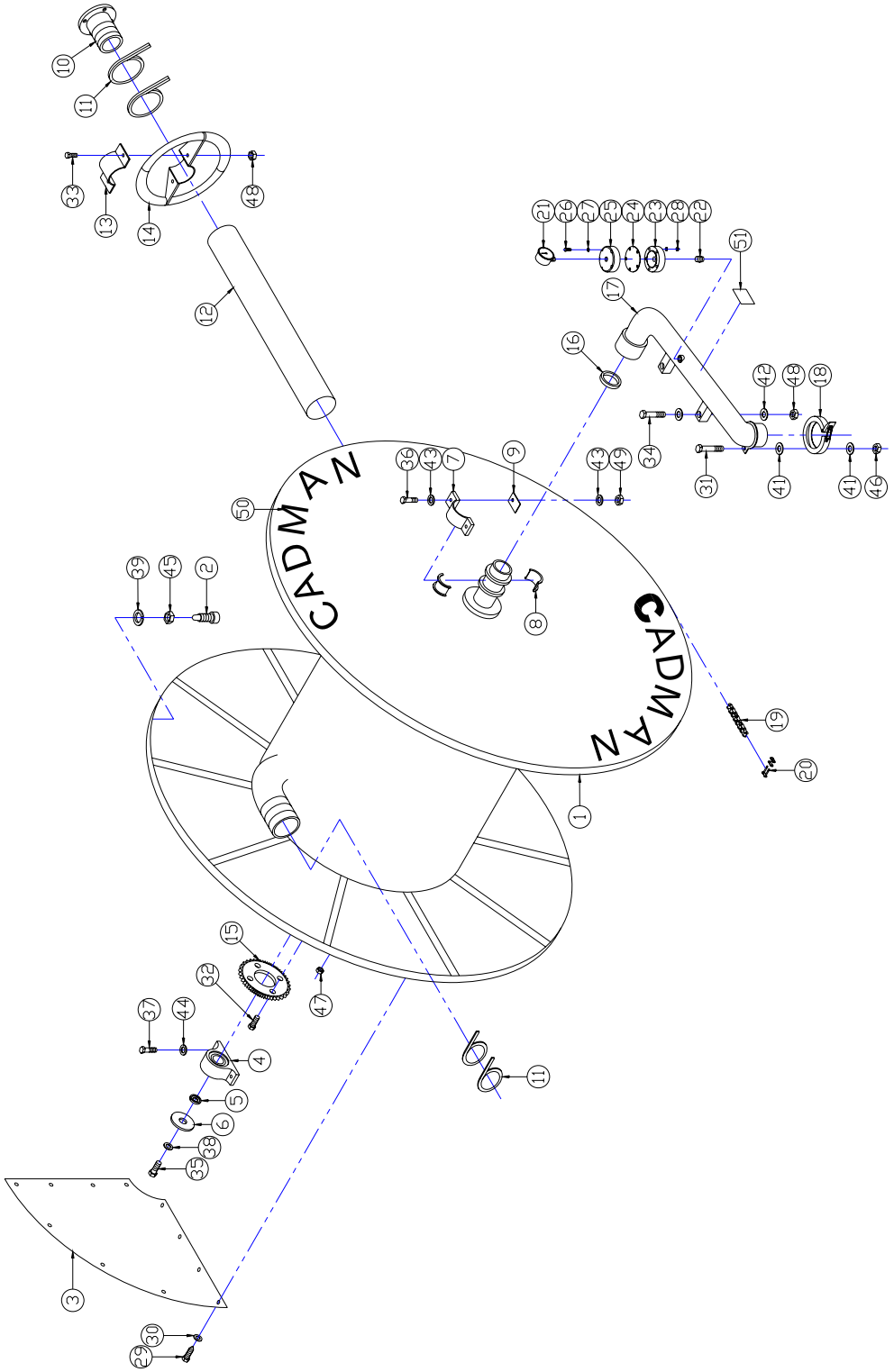


Frame Assembly – Rear *4000M - 4500M*

Item	Description	Part Number	Qty
1	Walking Beam Axle	16-602	2
2	Grease Fitting, 1/8 NPT	40-001	2
3	Rocker Axle Collar	16-606	2
4	Shut Off Bar	16-601	1
5	Shut Off Bar Bushing	16-727	2
6	Shut Off Bar Latch	16-622-A	1
7	Spacer	16-757	1
8	Safety Latch Spring	40-624	1
9	Indexer Shield	16-607-A	1
10	Idler Shield	16-614	1
	Tandem Axle Wheel Ass'y consisting of:	55-077	4
11	Tire, 16.5L - 16.1		1
12	Wheel		1
13	Valve Stem		1
	8 Bolt Hub Ass' Consisting of:	55-070	4
14	Grease Seal		1
15	Bearing Cone, Inner		1
	Bearing Cup, Inner (Not Shown)		1
16	Wheel Hub, 8 Bolt	55-070-A	1
	Bearing Cup, Outer (Not Shown)		1
17	Bearing Cone, Outer		1
18	Dust Cap		1
19	Wheel Bolt, 9/16"	55-032	8
20	Spindle Washer		1
21	Spindle Nut		1
22	Cotter Pin		1
23	Bolt, 5/16" - 18 x 3/4" Lg.	90-BLT-03118X075	6
24	Bolt, 5/16" - 18 x 1" Lg.	90-BLT-03118X100	1
25	Bolt, 5/16" - 18 x 2" Lg.	90-BLT-03118X200	1
26	Bolt, 3/8" - 16 x 1 1/4" Lg.	90-BLT-03816X125	2
27	Bolt, 3/4" - 10 x 5" Lg.	90-BLT-07510X500	2
28	Lock Washer, 5/16"	90-WSR-LOC031	7
29	SAE Flat Washer, 5/16"	90-WSR-SAE031	8
30	SAE Flat Washer, 3/8"	90-WSR-SAE038	2
31	SAE Flat Washer, 1/2"	90-WSR-SAE050	4
32	Locknut, 5/16" - 18	90-NUT-LOC031-18	1
33	Locknut, 3/4" - 10	90-NUT-LOC075-10	2
34	Decal, "Grease Point"	40-041	3
35	Decal, "Do Not Operate w/o Guards"	40-051	2
36	Decal, "Important - Grease Indexer…"	40-115	1
37	Decal, "Danger! - Rotating Drum"	40-287	1

Drum Assembly

4000M - 4500M



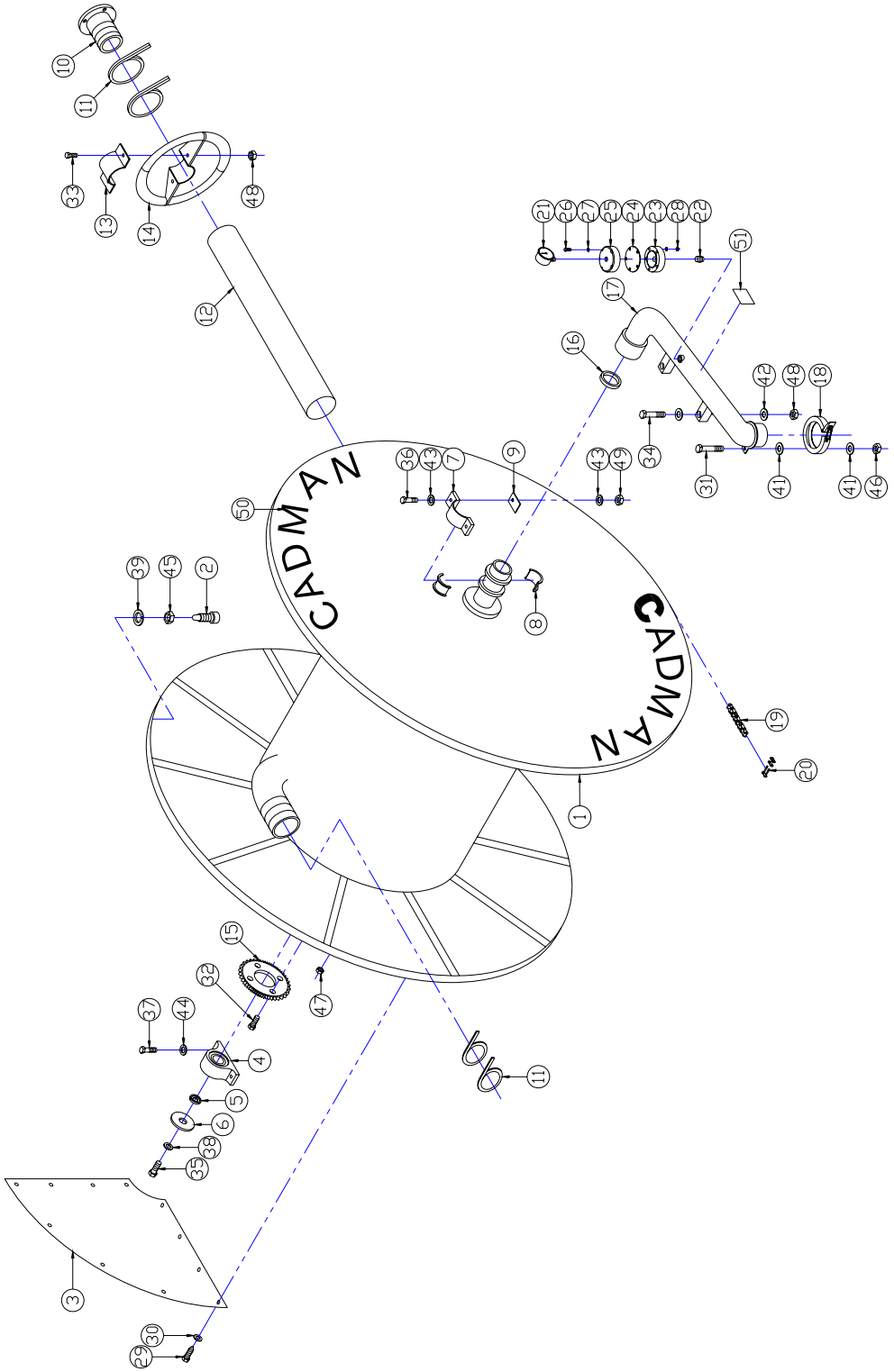
Drum Assembly *4000M - 4500M*

Item	Description	Part Number	Qty
1	Drum	16-500	1
2	Spool Drive Lug	15-040-A	20
3	Removable Solid Drum Skin	06-517-A	1
4	Pillow Block Bearing	40-410	1
5	Lock Collar		
6	Bearing Retainer Plate	05-622	1
7	Bearing Cap	05-617	1
8	Drum Bearing, 5 1/2"	40-335	1
9	Anti-Rotation Plate	05-621	1
10	Flanged Hose End	06-626-A	1
11	5" Stainless Band-It® Clamp	50-017	4
12	PE Hose, 4.00" ID x 1550 ft.	50-062-1550	1
13	Marker Clamp, 4" (4000 only)	16-627	1
—	Marker Clamp, 4.5" (4500 only)	16-628	1
14	Shut Off Wheel, 4" (4000 only)	16-625	1
—	Shut Off Wheel, 4.5" (4500 only)	16-626	1
15	Sprocket, 50A48 x 6.5 PB (4000 only)	10-086	1
—	Sprocket, 50A50 (4500 only)	10-060	1
16	Inlet Elbow Seal, 5 1/2"	40-404	1
17	Inlet Elbow	16-608	1
18	Ringlock Fitting Clamp, 5 in.	IR-FCL-5	1
19	Super Roller Chain, #80	10-CHN-80S372	372
20	Connecting Link, #80	10-LNK-80CONN	1
21	Gauge, 0-160 PSI Wet	45-017	1
22	Galvanized Close Nipple, 3/4" NPT	40-NPT-NPLC075G	1
	Gauge Protector Kit Consisting of;	IR-GAU-PROTECT-KIT	1
23	Gauge Protector Body, 3/4 NPT	15-082-075	1
24	Gauge Protector Diaphragm	15-083	1
25	Gauge Protector Body, 1/4 NPT	15-082-025	1
26	Bolt, 5/16" x 2 3/4" Lg.	90-BLT-03118X275	5
27	SAE Flat Washer, 5/16"	90-WSR-FLT031	10
28	Locknut, 5/16" - 18	90-NUT-LOC031	5
29	Tek Screw, 1/4" x 1.00" Lg.	90-SCR-TEK025X100	12
30	Nylon Flat Washer	90-WSR-FLT025NYLON	12
31	Bolt, 1/4" - 20 x 2" Lg.	90-BLT-02520X200	1
32	Bolt, 3/8" - 16 x 1 1/4" Lg.	90-BLT-03816X125	4
33	Bolt, 1/2" - 13 x 1 1/2" Lg.	90-BLT-05013X150	2
34	Bolt, 1/2" - 13 x 4" Lg.	90-BLT-05013X400	2
35	Bolt, 5/8" - 11 x 1 1/2" Lg.	90-BLT-06311X150	1
36	Bolt, 5/8" - 11 x 2 1/4" Lg.	90-BLT-06311X225	2
37	Bolt, 7/8" - 9 x 2 1/2" Lg. (GR. 8)	90-BLT-08809X250	2
38	Lock Washer, 5/8"	90-WSR-LOC063	1
39	Lock Washer, 1/2"	90-WSR-LOC050	20

Continued

Drum Assembly

4000M - 4500M



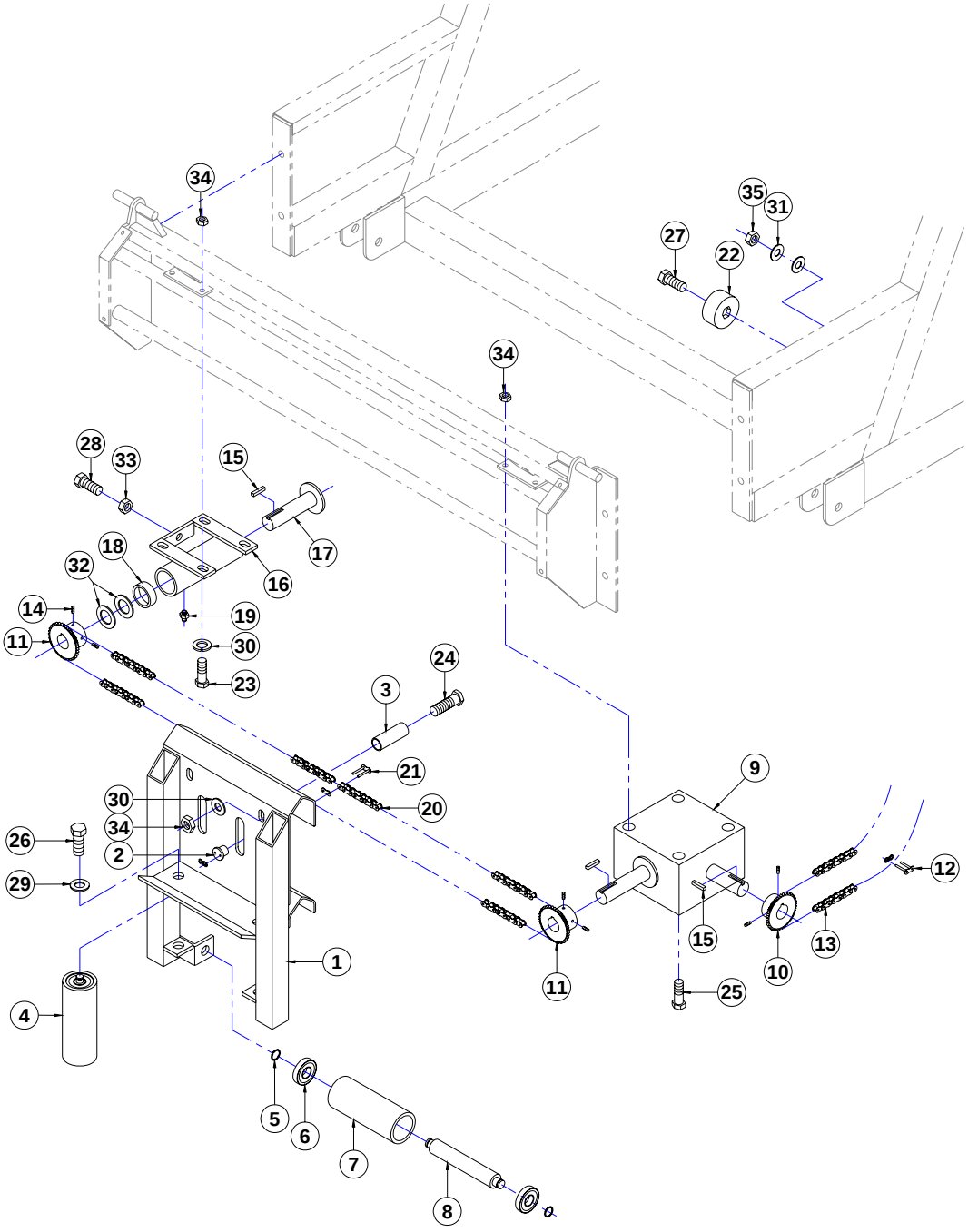
Drum Assembly

4000M - 4500M

Item	Description	Part Number	Qty
41	SAE Flat Washer, 1/4"	90-WSR-SAE025	2
42	SAE Flat Washer, 1/2"	90-WSR-SAE050	4
43	SAE Flat Washer, 5/8"	90-WSR-SAE063	4
44	SAE Flat Washer, 7/8"	90-WSR-SAE088	2
45	Jam Nut, 1/2"	90-NUT-JAM05013	20
46	Locknut, 1/4" - 20	90-NUT-LOC025-20	1
47	Locknut, 3/8" - 16	90-NUT-LOC038-16	4
48	Locknut, 1/2" - 13	90-NUT-LOC050-13	4
49	Locknut, 5/8" - 11	90-NUT-LOC063-11	2
50	Decal, "CADMAN"	40-307	4
51	Decal, "Max. Pressure"	40-049	1

Indexing System

4000M - 4500M



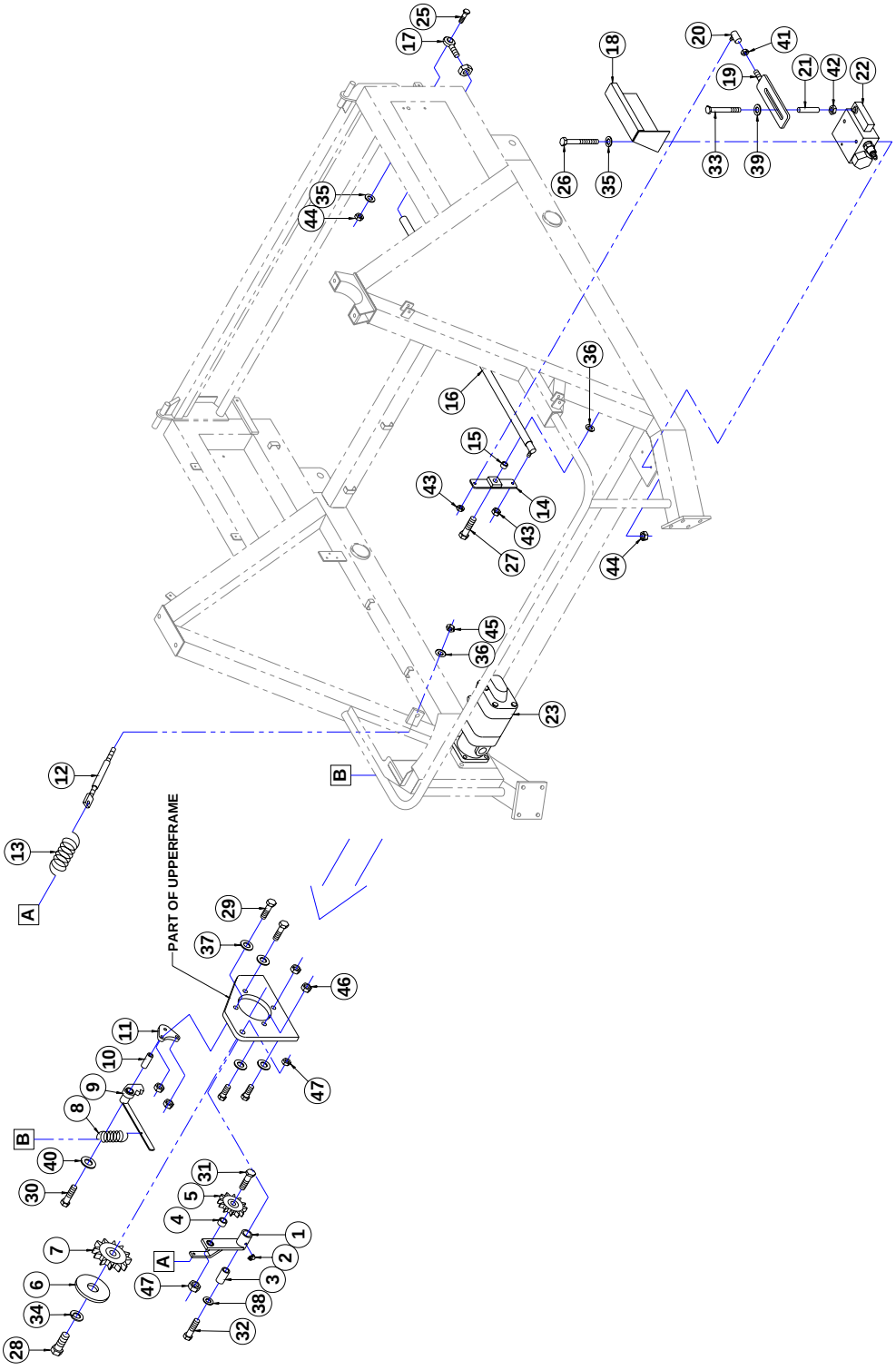
Indexing System

4000M - 4500M

Item	Description	Part Number	Qty
1	Hose Guide	06-622-C	1
2	Indexer Drive Button, #60	15-041	1
3	Spacer, 3/8" x 1 1/2" Lg.	40-108-A	2
4	**6" Hose Guide Roller Ass'y Consisting of:**	15-019	3
5	Snap Ring, 5/8" External	15-018-D	2
6	6203 Bearing	15-018-C	2
7	Roller Body, 6"	15-019-G	1
8	Roller Shaft, 6"	15-019-F	1
9	Right Angle Gearbox	40-084	1
10	Sprocket, 50B30 x 1.00	10-SPT-50B30X100	1
11	Sprocket, 60B12 x 1.00	10-SPT-60B12X100	2
12	Connecting Link, #50	10-LNK-50CONN	1
13	#50 Roller Chain	10-CHN-50-1RIV	250
14	Set Screw		
15	Key, 1/4" x 1 1/4" Lg.	91-BAR-CRSQ025	3
16	Indexer Idler Block	16-617	1
17	Indexer Idler Shaft	15-017	1
18	Oilite Bushing, 1" ID	15-016-B	2
19	Grease Fitting, 1/8" NPT	40-001	1
20	#60 Roller Chain	10-CHN-60-1RIV	178
21	Connecting Link, #60	10-LNK-60CONN	1
22	Idler Wheel - Rub Block	08-653	1
23	Bolt, 3/8" x 1 3/4" Lg.	90-BLT-03816X175	4
24	Bolt, 3/8" x 2 3/4" Lg.	90-BLT-03816X275	2
25	Bolt, 3/8" x 4 1/2" Lg.	90-BLT-03816X450	4
26	Bolt, 1/2" x 1 1/4" Lg.	90-BLT-05013X125	6
27	Bolt, 1/2" x 2 1/2" Lg.	90-BLT-05013X250	1
28	Bolt, 1/2" x 2 1/2" Lg. (Full Thread)	90-BLT-FT05013X250	1
29	Lock Washer, 1/2"	90-WSR-LOC050	6
30	Flat Washer, 3/8"	90-WSR-FLT038	6
31	SAE Flat Washer, 1/2"	90-WSR-SAE050	2
32	SAE Flat Washer, 1"	90-WSR-SAE100	2
33	Jam Nut, 1/2 - 13	90-NUT-JAM050-13	1
34	Locknut, 3/8" - 16	90-NUT-LOC038-16	10
35	Locknut, 1/2" - 13	90-NUT-LOC050-13	1

Drive Assembly

4000M - 4500M



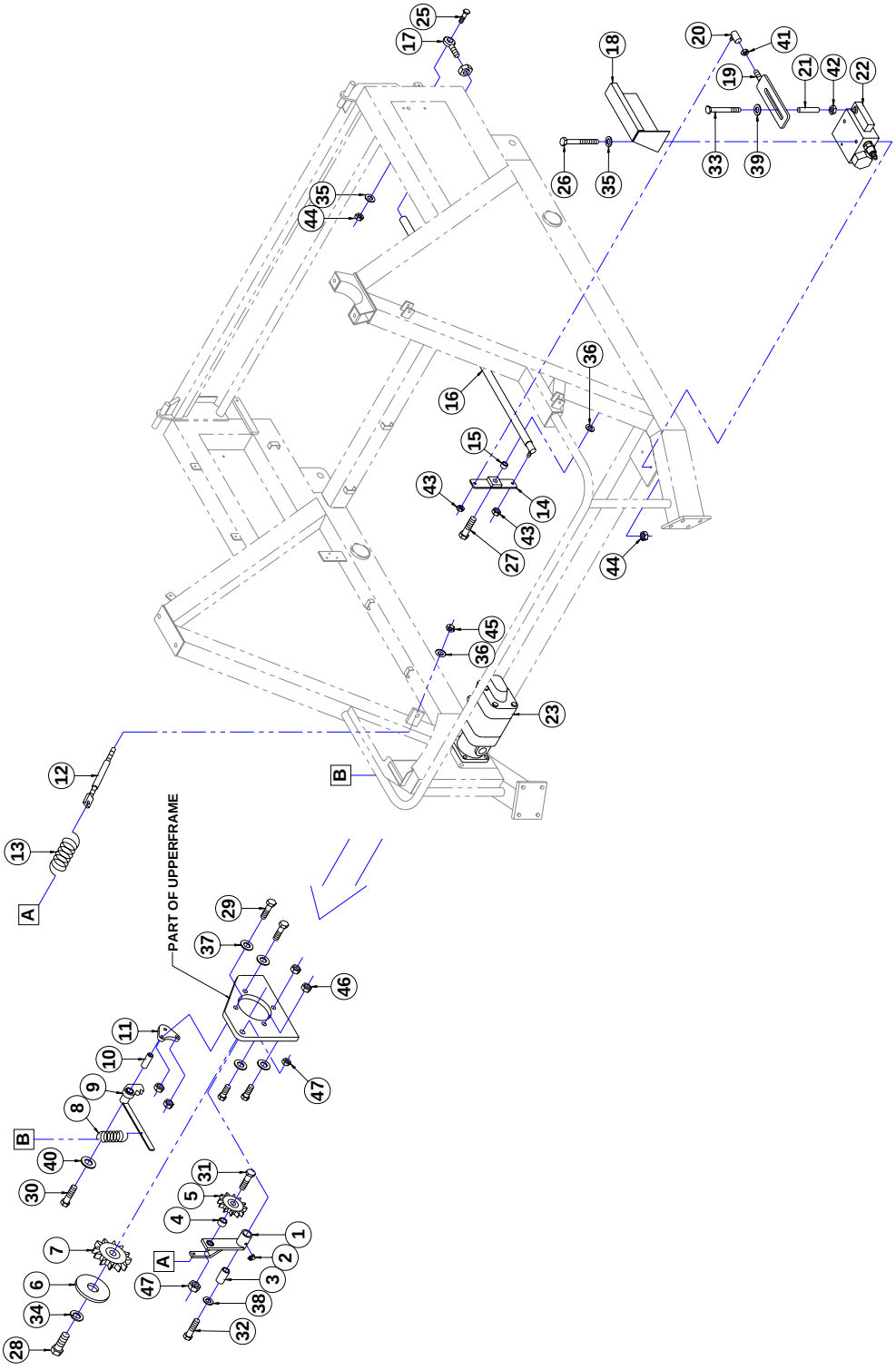
Drive Assembly *4000M - 4500M*

Item	Description	Part Number	Qty
1	Idler Arm	16-610	1
2	90 Deg. Grease Fitting, 1/8 NPT	40-011-90	1
3	Idler Arm Bushing, 1 1/4" x 3" Lg.	16-611-A	1
4	Spacer, 3/4" ID x 1/2" Lg.	40-110	1
5	Idler Sprocket, #80-12 x 3/4"	10-SPT-80-12IDLER	1
6	Sprocket Retaining Plate	01-314-B	1
7	Sprocket, 80B15 w / QD Bushing	10-SPT-80B15QD	1
	QD Bushing, 2 1/4" x 1/2"	10-BUS-QD225	1
8	Spring	40-229	1
9	Drum Lock	16-624-C	1
10	Bushing	16-640	1
11	Drum Lock Mount	16-739	1
12	Spring Adjusting Rod	06-658-A	1
13	Extension Spring, 1 3/4" x 5" Lg.	40-056	1
14	Push Rod Bracket	16-619	1
15	Push Rod Bracket Spacer	16-723	1
16	Push Rod	16-618	1
17	Rod End, 3/8"	40-510	1
18	Valve Cover	16-747	1
19	Valve Actuator	16-631	1
20	Throttle Ball Joint	04-655	1
21	Valve Actuator Spacer	16-751	1
22	Manifold Valve	40-565-A	1
23	Hydraulic Motor, 10000 series	40-526	1
24	Spring Latch	40-608	1
25	Bolt, 3/8" - 16 x 1 1/4" Lg.	90-BLT-03816X125	1
26	Bolt, 3/8" - 16 x 4" Lg.	90-BLT-03816X400	2
27	Bolt, 1/2" - 13 x 1 1/4" Lg.	90-BLT-05013X125	1
28	Bolt, 1/2" - 20 x 1 1/2" Lg.	90-BLT-05020X150	1
29	Bolt, 5/8" - 11 x 2 1/2" Lg.	90-BLT-06311X250	4
30	Bolt, 5/8"- 11 x 4 1/2" Lg.	90-BLT-06311X450	1
31	Bolt, 3/4" - 10 x 2 1/2" Lg.	90-BLT-07510X250	1
32	Bolt, 3/4" - 10 x 5" Lg.	90-BLT-07510X500	1
33	Bolt, M8-1.25 x 100mm Lg.	90-BLT-M8125X100	1
34	Lock Washer, 1/2"	90-WSR-LOC050	1
35	SAE Flat Washer, 3/8"	90-WSR-SAE038	3
36	SAE Flat Washer, 1/2"	90-WSR-SAE050	2
37	SAE Flat Washer, 5/8"	90-WSR-SAE063	4
38	Flat Washer, 3/4"	90-WSR-FLT075	1
39	Flat Washer, 8mm	90-WSR-FLTM08	1

Continued

Drive Assembly

4000M - 4500M



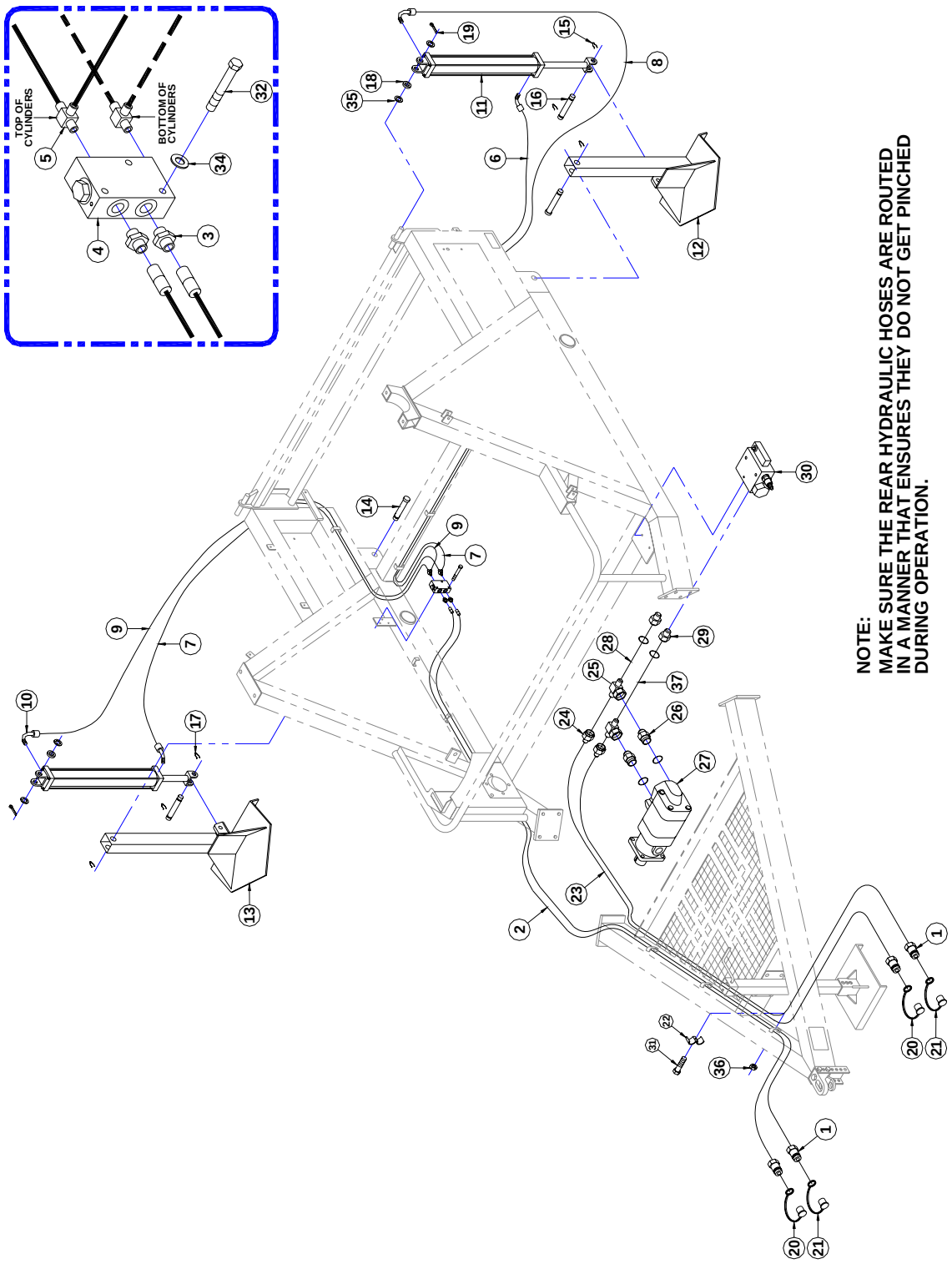
Drive Assembly

4000M - 4500M

Item	Description	Part Number	Qty
41	Jam Nut, 5/16"	90-NUT-JAM031-24	1
42	Jam Nut, M8 - 1.25	90-NUT-JAMM8125	1
43	Locknut, 5/16" - 24	90-NUT-LOC031-24	2
44	Locknut, 3/8" - 16	90-NUT-LOC038-16	3
45	Locknut, 1/2" - 13	90-NUT-LOC050-13	1
46	Locknut, 5/8" - 11	90-NUT-LOC063-11	4
47	Locknut, 3/4" - 10	90-NUT-LOC075-10	2

Hydraulic System

4000M - 4500M



Hydraulic System

4000M - 4500M

Item	Description	Part Number	Qty
1	Hydraulic Coupler Tip	40-563	4
2	Hydraulic Hose, 3/8" x 230" Lg.	40-558	2
3	SAE O-Ring Adapter	25-WHD-5315X6	2
4	Pilot Operated Check Valve	40-399	1
5	SAE O-Ring Run Tee 6 JIC x 3/8"	25-WHD-5716X6	2
6	Hydraulic Hose, 3/8" x 125" Lg.	40-559	1
7	Hydraulic Hose, 3/8" x 45" Lg.	40-560	1
8	Hydraulic Hose, 3/8" x 140" Lg.	40-420	1
9	Hydraulic Hose, 3/8" x 59" Lg.	40-561	1
10	90 Deg. Elbow, 6 JIC x 3/8 NPT-M	25-WHD-5405X6X6	4
11	Hydraulic Cylinder, 2 1/2 x 14 in.	40-525	2
12	Stabilizer-Left	16-604	1
13	Stabilizer-Right	16-605	1
14	Clevis Pin, 1" x 4 1/4" Useable	40-401	2
15	Hair Pin Clip	90-PIN-HP019X375	2
16	Pin	Part of 40-525	-
17	Hair Pin Clip	Part of 40-525	-
18	Jack Spacer	05-625	2
19	Cotter Pin, 3/16" x 2" Lg.	90-PIN-CT019X200	2
20	Hydraulic Coupler Dust Cap - Black	40-562-B	2
21	Hydraulic Coupler Dust Cap - Red	40-562-R	2
22	Hose Holder	16-632	3
23	Hydraulic Hose, 3/4 x 168 in. Lg.	40-564	2
24	Connector, 16 SAE x 20 JIC	25-WHD-5315X20X16	2
25	Swivel Branch Tee, 20 JIC	25-WHD-5707X20	2
26	Connector, 20 SAE x 20 JIC	25-WHD-5315X20	2
27	Hydraulic Motor, 10000 series	40-526	1
28	Hydraulic Hose, 1 1/4 x 51 in. Lg.	40-541	1
29	Reducer, 20 JIC x 16 JIC	25-WHD-5015X20X16	2
30	Manifold Valve w/ Handle Kit	40-568	1
31	Bolt, 1/4" - 20 x 1 1/2" Lg.	90-BLT-02520X150	3
32	Bolt, 1/4" - 20 x 2" Lg.	90-BLT-02520X200	3
34	SAE Flat Washer, 1/4"	90-WSR-SAE025	3
35	SAE Flat Washer, 1"	90-WSR-SAE100	4
36	Locknut, 1/4" - 20	90-NUT-LOC025-20	5
37	Hydraulic Hose, 1 1/4 x 54 in. Lg.	40-566	1

Required Maintenance

Prevention of mechanical failure is the goal of any good maintenance schedule. The secret to preventing unwanted down time is to adhere to a maintenance schedule suited to the way you use the equipment. Your maintenance schedule should include the following minimum requirements:

Maintenance must be done ONLY when the machine is shut down and is in a non-loaded condition. This means that no fluid is being pumped through the reel and all mechanical and hydraulic tension has been released from the hose rewind system and stabilizers.

Each Use

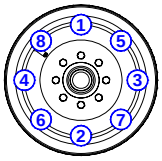
Maintenance Item	Figure	Procedure
Visually inspect equipment	N / A	Walk around the unit and inspect for loose, missing or damaged items. Check the condition of the indexer drive button, chains and connecting links. Replace missing or damaged items and tighten loosened items.
Maintain the tire pressure at 36-40 psi (248-276 kPa)	N / A	Using a tire pressure gauge, check the pressure of each tire and add or remove air to achieve the desired pressure. **DO NOT LOWER TIRE PRESSURE BELOW THE RECOMMENDED LEVEL. A lower pressure than the recommended pressure will result in the tire separating from the rim.**
Tighten all wheel bolts	 img-00132.wmf	Before moving the unit, verify that the wheel bolts are tight. When tightening the lug nuts use the star pattern with your torque wrench set at 110 ft/lbs (150 N.m).
Adjust, if necessary, the alignment and tension of the drive chains	Figure 22	The drive chains (around the drum) are properly tensioned when it has no visible slack and is seating properly onto the drive pegs when the drum rotates. Adjustments are made by turning the locknut (3/4" wrench) on the spring adjustment rod.
Check the oil level in the indexer gearbox	Figure 21	Remove the oil plug (hex plug) on the side of the gearbox. The oil should be level with the bottom of the plug hole. (refill capacity = 350mL (12 oz.) approximately)
Lubricate the indexer drive button and slide rails	Figure 20	Liberally apply acceptable grease along the length of the slide rail and around the drive button. (See Lubricants)
Lubricate all grease fittings	Figure 23	Using a grease gun, lubricate each grease fitting with an appropriate amount of acceptable grease. (See Lubricants)

Table 1 - Required Maintenance - Each Use

Figure 20 - Grease Indexer Rail and Button

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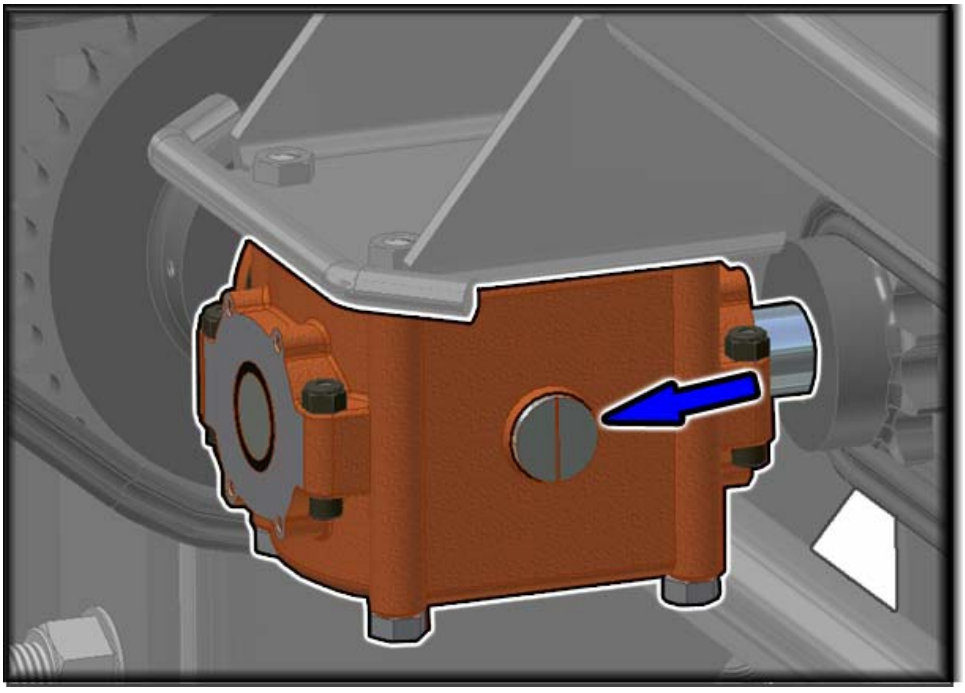

Figure 21 - Indexer Gearbox Oil Filling

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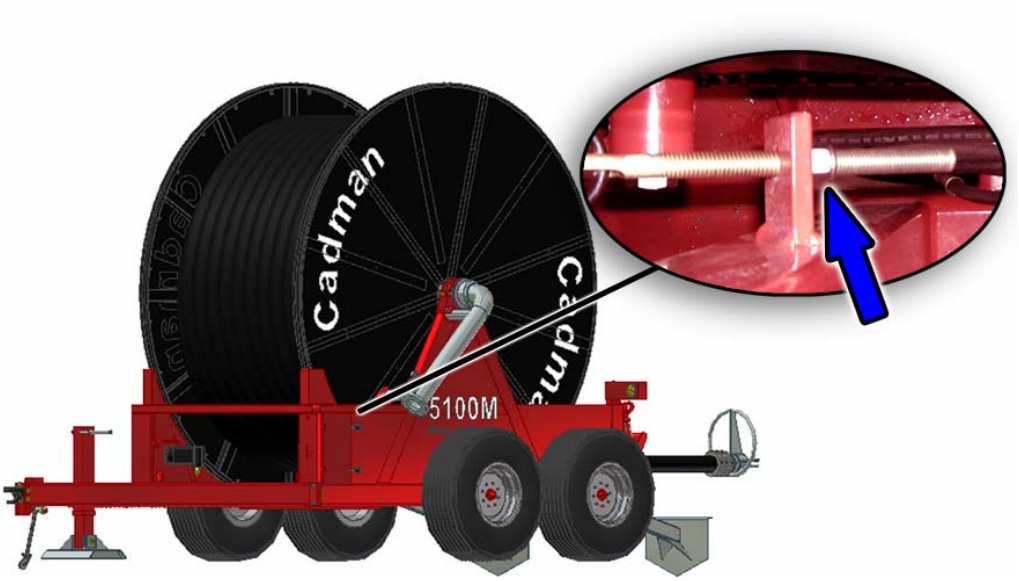

Figure 22 - Drive Chain Adjuster (both sides)

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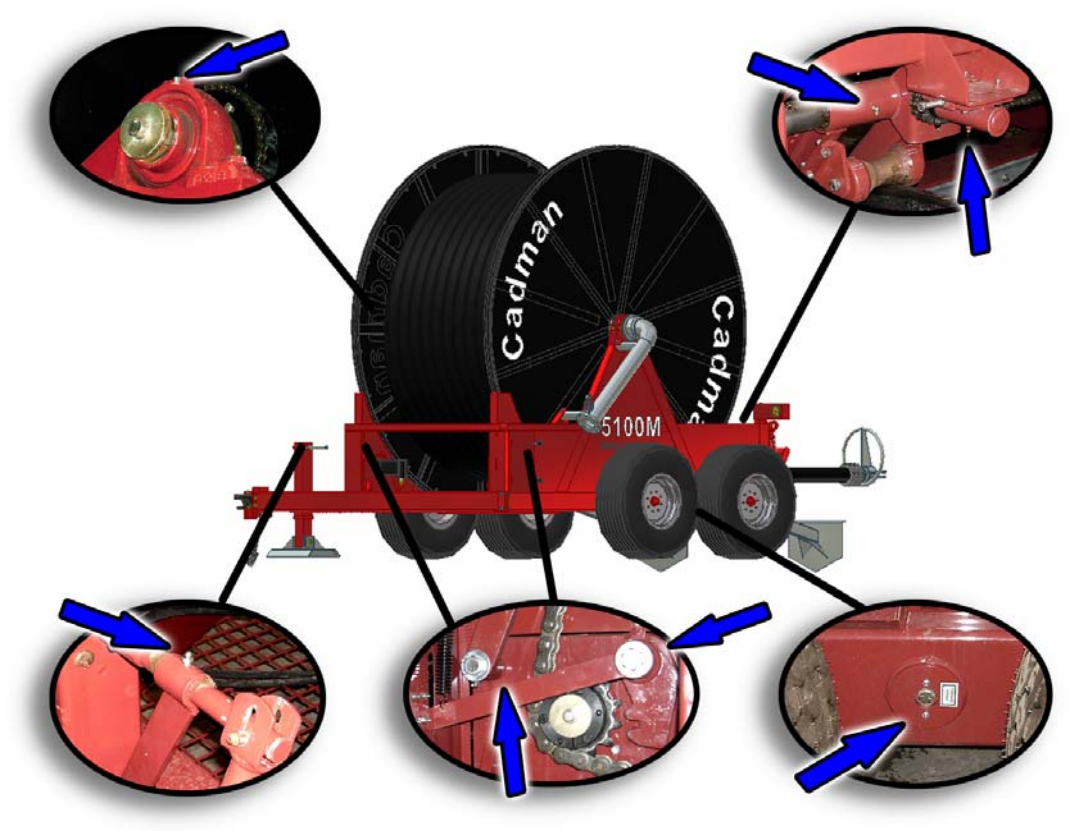


Figure 23 - Grease Points

img-00139.png

Before Storing

You MUST properly empty and flush your Hard Hose Drag System before storing the machine for more than one day. Failure to properly clean out the hose could result in the hose being plugged with sediment.

Maintenance Item	Figure	Procedure
Drain and clean out the hose.	N / A	Use a clean-out ball (sold separately) following the instructions provided with the unit. **OR** Flush with water (minimum of 2000 gallons (7600 liters)) to completely purge the hose.
Clean, inspect and repack the main chassis wheel bearing.	N / A	See Walking Beam Assembly on page **Error! Bookmark not defined.**. Replace the seals as required
Lubricate all chains	N / A	Brush each chain with acceptable grease. (see "Lubricants")
Check the oil in the indexer gearbox	Figure 21	Remove the oil plug. Top off or replace the oil as required. The oil should be level with the bottom of the plug hole. (refill capacity = 350mL (12 oz.) approximately)

Table 2 – Required Maintenance - Before Storing

Lubricants

Grease: Any good grade multi-purpose, waterproof grease is compatible with the greasing requirements of your **Cadman Hard Hose Reel**.

Gearbox: SAE 80W or 90W gear oil.

Hydraulic Oil HYDREX AW-32 HYDRAULIC OIL (p/n 85-LUB-OILAW32)

Hydraulic Control Valve Adjustment

The 4000M / 4500M model drag hose reels are equipped with a single hydraulic valve to control the drive system. This valve provides two (2) operating positions and is actuated by a push-rod-bell crank system driven by the shut-off bar (at the rear of the machine). The shut-off bar remains in the up (latched) position to pull out the hose and is lowered down to retrieve the hose. When the tractor hydraulic system is engaged, the drum will rotate to retrieve the hose.

If the hydraulic system does not function as described above, adjustment of the valve arm push-rod should restore proper function. (see Drive System parts drawing on page 32 for terminology)

- pull out approximately 100-200 feet of hose
- couple the hydraulic hoses to the tractor
- disconnect the adjusting pushrod from the shut-off bar
- move the shut-off bar to the 'down' position, resting on the stop blocks
- manually rotate the control valve arm rearward (clockwise) until the valve handle travel limit is reached (see Figure 24)
- adjust the length of the adjusting pushrod to allow the ball joint stud to be inserted squarely in the hole on the shut-off bar

CAUTION – DO NOT adjust the pushrod assembly too short. If too much pressure is applied to the valve stem, irreparable damage will occur, requiring replacement of the valve.

- after completing the adjustment, raise the shut-off bar to the latched position
- engage the tractor hydraulics
- lower the shut-off bar to test the adjustment, fine tune as required
- drum should stop rotating as the shut-off bar is raised

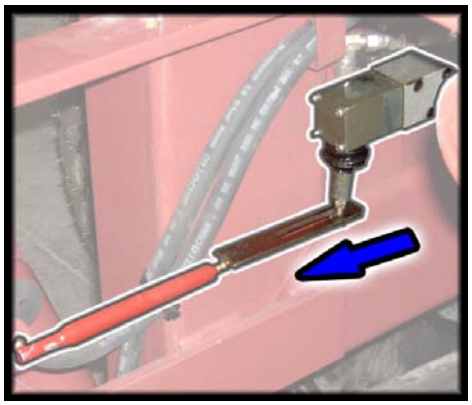


Figure 24 - Valve in Rewind Position
img-00133.png

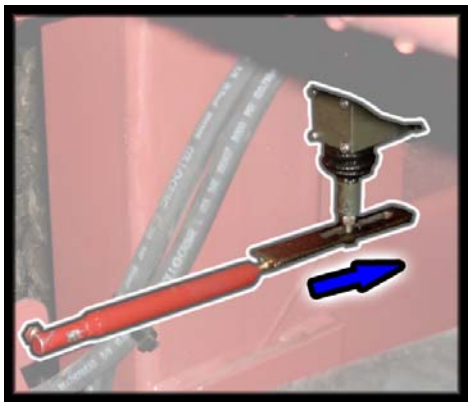
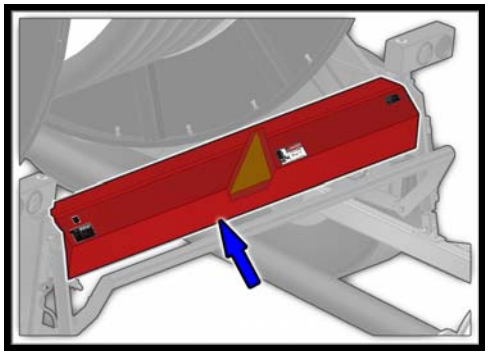


Figure 25 - Valve in STOP Position
Img-00134.png

Indexing System Adjustment

The indexing should ONLY be checked when only the base layer of hose is remaining on the drum. The hose connection should be in the 6 o'clock position (closest to the ground). If gaps exist between the coils of the hose, set the drum brake and manually push the coils together. If the hose does not travel straight off the drum and through the hose guide it must be adjusted using the instructions below.

If safety shields are removed you MUST properly re-install them before operating the machine

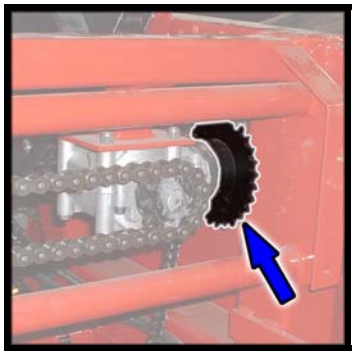


img-00135.png

With the brake set and the hose connection (barb on drum) at 6 o'clock, remove the indexer shield.

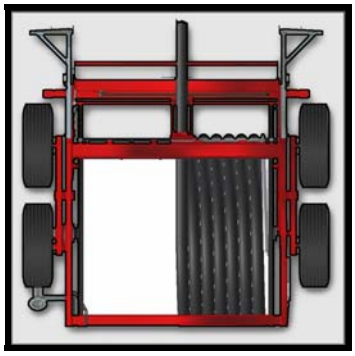
img-00184.png

Loosen the top idler wheel, and then remove the chain from the sprocket on the gear box.



Img-00137.png

Adjust the position of the hose guide by rotating the sprocket.



img-00138.wmf

The hose guide is properly aligned when the hose travels in a straight line through the hose guide and lays flush against the drum elbow or previous coil of hose.

When re-installing the chain, hold pressure on the idler wheel by pushing with a wrench on the inside nut. Make sure all the slack from the lower portion of the chain is taken up. Tighten the idler wheel bolt while holding pressure. **Properly re-install all safety shields.**

Useful Information

LENGTH

1 FOOT	= 12	Inches	**1 METER**	= 39.37	Inches
1 ROD	= 0.3048	Meter	**1 MILE**	= 3.2808	Feet

AREA

1 SQUARE FOOT	= 144	Square Inches
	= 0.0929	Square Meters
1 SQUARE YARD	= 1296	Square Inches
	= 0.8361	Square Meters
1 SQUARE METER	= 1549.4	Square Inches
	= 10.764	Square Feet
1 ACRE	= 43560	Square Feet
	= 4047	Square Meters
	= 0.4047	Hectare
1 HECTARE	= 107642.62	Square Feet
	= 10000	Square Meters
	= 2.47105	Acres
1 SQUARE MILE	= 640	Acres
	= 259	Hectares

VOLUME

1 GALLON (US)	= 0.8327	Imperial Gallons
	= 231	Cubic Inches
	= 0.1337	Cubic Feet
	= 8.345	Pounds
1 CUBIC FOOT	= 1728	Cubic Inches
	= 7.48	Gallons (US)
	= 62.4	Pounds
	= 28.32	Liters
1 ACRE INCH	= 27154	Gallons (US)
	= 254	Cubic Meters / Hectare

AREA OF A CIRCLE = Diameter x Diameter x 0.7854

CYLINDER VOLUME (US GAL.) = Diameter (ft.) x Diameter (ft.) x Length (ft.) x 5.8748