# **Operating Manual**





H4A

# Hydraulic Winch

This manual must be with the vehicle on which this winch is installed.

Please check the Allied Systems website regularly for updates to this manual. www.alliedsystems.com





Winch Model H4A

\_\_\_\_\_

Date Delivered

Serial Number

Date Installed

Special Equipment or Attachments



A Product of Allied Systems Company Sherwood, Oregon U.S.A.



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### Foreword

The safe and efficient operation of a winch requires skill and alertness on the part of the operator. To develop the skills required, the operator must:

- Receive training in the proper operation of the winch and the machine on which it is mounted.
- Understand the capabilities and limitations of the winch and the machine on which it is mounted.
- Become familiar with the winch and the machine on which it is mounted and see that they are maintained in good condition.
- Read and understand the SAFETY SUMMARY and OPERATING PROCEDURES contained in this Operating Manual.

In addition, a qualified person experienced in the operation of the winch must guide a new operator through several load handling applications before the new operator attempts to operate the equipment alone. It is the employer's responsibility to make sure that the operator can see, hear, and has the physical and mental ability to operate the equipment safely. This Operating Manual contains basic information necessary for the operation and maintenance of a winch. Optional equipment is sometimes installed that can change the characteristics described in this manual. Make sure the necessary instructions are available and understood before operating the winch.

Some of the components described in this Operating Manual will NOT be installed on your winch. If you have questions about any item on your winch or described in this Operating Manual, contact your local winch dealer, or contact Allied Systems Company:

> Allied Systems Company 21433 SW Oregon Street Sherwood, OR 97140 USA

Phone: 503-625-2560 Fax: 503-625-7269 E-Mail: marketing@alliedsystems.com

Also visit our website, www.alliedsystems.com, where the most current copy of this manual is always available.



> Note: For repairs and overhaul, contact your Allied winch dealer. If you maintain your own equipment, a service manual is available for your specific winch.

Note: This publication may be translated to different languages for sole purpose of easy reference in non-English speaking locations. Should there be differences in interpretations to the text, please refer to the English language edition published by Allied Systems Company as the controlling document.

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### Safety Summary

#### **General Safety Notices**

The following pages contain general safety warnings which supplement specific warnings and cautions appearing elsewhere in this manual. All electrical and hydraulic equipment is dangerous. You must thoroughly review and understand the Safety Summary before attempting to operate, troubleshoot or service this winch.

The following symbols/terms are used to emphasize safety precautions and notices in this manual:

## ▲ DANGER

The "DANGER" symbol indicates a hazardous situation which, if not avoided, will result in death or serious injury. Carefully read the message that follows to prevent serious injury or death.

## **WARNING**

The "WARNING" symbol appears wherever incorrect operating procedures or practices could cause serious injury or death. Carefully read the message that follows to prevent serious injury or death.

## **⚠ CAUTION**

The "CAUTION" symbol appears where a hazardous situation which, if not avoided, could result in minor to moderate injury and equipment damage.





## NOTICE

This signal word alerts to a situation that is not related to personal injury but may cause equipment damage.

### NOTE: ...

The term "NOTE" highlights operating procedures or practices that may improve equipment reliability and/or personnel performance.

### **Safety Regulations**

Each country has its own safety legislation. It is in the operator's own interest to be conversant with these regulations and to comply with them in full. This also applies to local bylaws and regulations in force on a particular worksite.

Should the recommendations in this manual deviate from those in the user's country, the national regulations should be followed.

NOTE: All possible safety hazards cannot be foreseen so as to be included in this manual. Therefore, you must always be alert to potential hazards that could endanger personnel and/or damage the equipment.

## **WARNING**

The winch shall not be used for hoisting.

## **WARNING**

Use hearing protection when operating winches.



## **Safety Summary**

**Operation, Inspection, and Maintenance Warnings** 



Obey the following cautions and warnings before using your winch to avoid equipment damage, personal injury or death.

- Do not operate the winch unless you are authorized and trained to do so.
- Do not operate the winch unless the vehicle is equipped with a screen to protect the operator if the wire rope breaks.
- Read, understand, and follow the operating, inspection, and maintenance instructions in this Operating Manual.
- Do not use the control levers for hand holds when entering or leaving the vehicle.
- Do not permit other people near the control area when you inspect or repair a machine.

- Never inspect, repair, or perform maintenance on a machine that is in motion.
- Inspect the winch before each use:
  - » Make sure that the controls and instruments operate correctly.
  - » Report the need for repairs immediately.
  - » Do not work with a damaged or worn wire rope.
  - » Do not use a winch that needs repairs.
  - If the wire rope and ferrule must be removed from the drum, make sure the end of the wire rope and ferrule are controlled when the ferrule is released. The end of the wire rope can suddenly move from the drum like a compressed spring when the ferrule is released and cause an injury.
- Stay in the operator's seat when operating the winch.
- Do not stand on the vehicle when operating the winch.
- Avoid winch operation near people or other machines.





- Never stand nor permit others to stand in the bight (loop) of a wire rope.
- Do not stand nor permit others to be near the winch or wire rope when there is tension on the wire rope.
- Observe jobsite rules.
- Be in complete control at all times.
- Do not use the control levers as hangers for clothes, water bags, grease guns, lunch pails, etc.
- Do not leave the vehicle when the winch wire rope is under tension.
- Do not permit riders on the vehicle or load.
- Do not use the winch as an anchor for a double or two-part line.
- Do not pull the hook through the throat or over the drum, which will cause damage.
- When the winch is not in use, make sure the control lever is in **BRAKE-ON** position and the winch brake is applied.

Do not use winch as a hoist. Dozer and skidder mounted winches are designed for towing.



- Always inspect wire rope, tail chain and other rigging components for wear, damage, broken strands or abuse before use.
- Never use wire rope, tail chain or other rigging that is worn-out, damaged or abused.
- Never overload wire rope, tail chain or rigging.



## **Safety Summary**

• Wire rope and tail chain will fail if worn-out, overloaded, misused, damaged, improperly maintained or abused. Wire rope or tail chain failure may cause serious injury or death!





- Do not terminate wire rope to tail chain by the use of a knot.
- Do not handle wire rope if the hook end is not free. A load could break away, suddenly tensioning the wire rope, resulting in serious injury or death.

- Stay clear of wire rope entry areas (fairlead or arch rollers, winch drum etc).
- Make sure that ground personnel are in plain view of the operator, and at a distance of at least 1½ times the working length of the wire rope.
- Make sure that any hand signals used by ground personnel are clearly defined and understood by everyone involved.
- Do not attempt to "jerk" or "shock" a load free. Doing so can cause loads in excess of the rated capacity of the wire rope, winch, or mounting hardware.
- Replace any parts only with genuine Allied Winch parts. Refer to parts manual 599015W.
- Maintain a minimum of three (3) complete wraps of wire rope on the drum for normal operation. It may help to paint the last five (5) wraps of wire rope a contrasting color, to serve as a visual indicator.
- Do not handle wire rope with bare hands. Wear leather gloves at all times.





- Align the dozer with the load to prevent side loading the winch, and to maintain even spooling of the wire rope.
- If applying tension to the wire rope manually during spooling:
  - » ensure that the operator is winching in slowly,
  - » keep your hands and clothing well clear of any rollers or the winch drum,
  - » do not maintain tension by letting the wire rope to slip through your hands,
  - » use a hand-over-hand technique to maintain tension.
- Be aware of the ground conditions, and make sure the ground and dozer are stable enough to pull the intended load.
- Do not attempt to pull loads in excess of the rated capacity of the winch.

- Keep yourself informed of any applicable codes, regulations and standards for the job.
- Your winch may have temperature shut-off system for protection of dozer and winch. Manual override of high temperature shut-off will cause damage to dozer and winch.
- This winch is neither intended, designed, nor rated for any application involved in the lifting or moving of personnel.
- Use only the lubricants listed in the Recommended Oil List. See Figure 17 on Page 29.
- Do not weld on any part of the winch. Contact Allied Systems if weld repairs are needed.
- The hydraulic system must be kept clean and free of contamination at all times.



- Be aware of the hazards of pressurized hydraulics:
  - » Wear personal protective equipment, such as gloves and safety glasses, whenever servicing or checking a hydraulic system.
  - » Assume that all hydraulic hoses and components are pressurized. Relieve all hydraulic pressure before disconnecting any hydraulic line.
  - » Never try to stop or check for a hydraulic leak with any part of your body; use a piece of cardboard to check for hydraulic leaks.
  - » Small hydraulic hose leaks are extremely dangerous, and can inject hydraulic oil under the skin, even through gloves.
  - » Infection and gangrene are possible when hydraulic oil penetrates the skin. See a doctor immediately to prevent loss of limb or death.

## 

Maximum permissible pressure and flow:

	Pres	sure	Flow	
winch type	(psi)	kPa	(gpm)	l/min
Standard (H4AT)	3,980	27,440	25	95
High Performance (H4AH)	5,000	34,475	30	114







Notes



### General

### Introduction

This Operating Manual contains basic information necessary for the operation and maintenance of the H4A winch.

### **Operating Principles of the Winch**

A winch is normally installed on a skidder or a dozer to:

- increase the pulling power of the skidder or dozer,
- reach into an area where a skidder or dozer cannot go,
- make lift functions available when special attachments are installed.

The H4A is a hydraulic winch with a maximum line pull of 46,200 lbs (20,956 kg) on the first layer of wire rope. The winch is powered by an internal hydraulic motor utilizing either dozer supplied hydraulic flow or a dedicated winch pump driven by the dozer engine. Motor torque is transmitted through a holding brake and three gear reductions to turn the winch drum. Hydraulic supply to the winch motor comes from one of the following configurations:

**Standard Winch** - The standard winch (serial numbers starting with **H4AT**\*\*)., use the dozer implement pump and ripper controls to supply hydraulic power to operate the winch motor. Winch speed and direction are controlled by the ripper control lever.

**High-Performance Winch** - The high-performance winch, (serial numbers starting with **H4AH\*Y**) is a hydrostatic winch using a dozer mounted pump connected directly to the winch motor. The winch shares hydraulic oil and cooling with the dozer's circuit. Winch speed and direction are controlled by a console mounted, hydraulic control lever supplied with the winch.

**High-Performance, Self Contained Hydraulics (SCH) Winch** - The SCH winch (serial numbers starting with H4AH\*R) is a high-performance winch with the hydrostatic pump contained inside the winch and is driven by a PTO shaft connected to the dozer.





### Nameplate

Each winch is shipped from the factory with a nameplate as shown in Figure 1. The nameplate is stamped with:

- winch model
- winch serial number
- maximum bare drum line pull
- maximum wire rope diameter

DO NOT operate the winch with larger diameter wire rope. If the nameplate is missing, DO NOT operate the winch until its capacity is known.

The serial number for the winch is also stamped into the frame next to the nameplate.



Figure 1 Nameplate



### Wire Rope Selection

Each winch model can have a variety of wire rope sizes, lengths, or grades installed by the user. The maximum wire rope size is shown on the nameplate. The maximum rated line pull stamped into the nameplate is based on the maximum wire rope size, EEIPS grade. When a smaller diameter wire rope, or a different grade is installed, the line pull is limited by the capacity of the wire rope.

See Figure 2 for approved wire rope sizes, drum capacities and maximum rated line pulls. When a larger diameter wire rope is used, the length of wire rope installed on the drum will be shorter. Be aware that the winch can create a tension in the wire rope that is greater than the strength of the wire rope. The user must be careful to select a wire rope that has enough strength and length for the job.

## **WARNING**

Load loss hazard.

A wire rope that breaks under high tension can suddenly whip back towards the winch, causing injury or product damage.

Be sure the operator knows the capacity of the wire rope and the winch.

## **WARNING**

Load loss hazard.

A loaded wire rope with fewer than three complete wraps on the drum could disengage from the ferrule pocket, causing load loss and possible injury.

Paint the last five wraps of wire rope a contrasting color to alert the operator that end of the wire rope has been reached.





Wire Rope Diameter in (mm)	Capacity for Full Drum Fill ft (m)	Capacity for 2/3 Drum Fill ft (m)	EIPS Maximum Rated Line Pull Lbs (N)	EEIPS Maximum Rated Line Pull Lbs (N)
1/2 (13)	422 (129)	279 (85)	19,000 (84,500)	20,800 (92,500)
5/8 (16)	277 (84)	183 (56)	29,400 (130,700)	32,400 (144,100)
3/4 (19)4	195 (59)	129 (39)	42,000 (186,800)	46,200 (205,500)

NOTE:

1. Loosely or unevenly spooled line will reduce capacities.

2. Use flexible wire rope with independent wire rope center.

3. Ferrule size: 1.5 inches diameter, 2 inches long.

4. If your winch is equipped with the optional arch, the largest wire rope diameter approved for use is 5/8 inch.

Figure 2 Wire Rope Sizes and Capacities



## General

### Wire Rope Reel

When the wire rope is transferred from a reel to the drum, or from the drum back onto a reel, it must go from "top to top" for overwind winches, or "bottom to bottom" for underwind winches, as shown in Figure 3, to avoid putting a reverse bend into the wire rope.



Figure 3 Transferring Wire Rope from or to Reel





### Wire Rope Installation

## 

Gloves should be worn when working with or near wire rope to prevent cuts and abrasions.

NOTE: The illustrations in this section show a winch with an "overwind" configuration, which is standard. Some winches are configured for "underwind", with the wire rope spooling onto the bottom of the drum instead of the top. The procedures for installation are the same.

Seat the ferrule on the drum end of the wire rope in the ferrule pocket in the drum. See Figure 4. Use the keeper and related hardware to secure the ferrule. Torque the capscrew to 28-29 ft-lbs.

Once the ferrule is properly secured in the pocket, the wire rope may be spooled slowly onto the drum. Apply enough tension to the wire rope as it is being spooled to ensure that it spools neatly and tightly on the drum.

Tension may be created by a variety of methods. The methods described here are not exclusive.



#### Figure 4 Secure Ferrule in Pocket with Keeper



## General



Figure 5 First Layer, Overwind Configuration

Another method is to use the tines of a forklift to bear against the reel flange(s). Again, the friction generated between the tines and the flange(s) will create tension in the wire rope.

Finally, the end of the wire rope may be fastened to a forklift. The forklift may be driven away from the winch drum as the wire rope is paid out, and the forklift operator may use the brake on the forklift to provide tension on wire rope as the wire rope is spooled back onto the winch drum. The movement of the forklift and the paying out or spooling back onto the winch drum shall be coordinated to prevent the wire rope from contacting the ground.

One method is to create a wooden plank lever, as shown in Figure 6 to apply pressure to the reel flange(s). The friction between the wooden plank and the reel flange(s) will create resistance to rotation of the reel, which will create tension in the wire rope as it is slowly spooled onto the winch drum.



Apply pressure to reel flange(s).

Figure 6 Create Tension





### **Winch Descriptions**



Figure 7 H4A Standard Winch and External Pump, High-Performance Winch Configuration



## General



Figure 8 H4A High-Performance Winch, Self-Contained Hydraulics (SCH) Configuration

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### Controls

The following winch functions are controlled at operator console:

**BRAKE-ON** - at rest condition, holding brake is automatically applied.

**LINE-IN** - releases holding brake and rotates drum to reel wire rope onto the drum.

**LINE-OUT** - releases holding brake and rotates drum to reel wire rope off of the drum.

**FREESPOOL** - mechanically disconnects to allow pulling wire rope off of the drum by hand,

**BRAKE-ON**, **LINE-IN** and **LINE-OUT** are controlled by a control lever located on the dozer console. **FREESPOOL** is also controlled by the control lever on early production winches or by a rocker switch on later production winches. See Figure 9, Figure 10, and Figure 11, illustrating various control configurations.



## General



Figure 9 Controls (S/N Code B & E; S/N H4A-1000 thru 1014)

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Figure 10 Controls (Vehicle Codes: C16, C17, C18, K12; S/N H4A-1015 through H4A-1161. R15 All Serial Numbers)



General



Figure 11 Single Axis Control Lever (Vehicle Codes: C17, C18, C19, C20, C201, K13, K14, R16 & R17; S/N H4A-1162 & Up)





### **Recommended Oil List**

<b>Recommended Oils* - General Conditions</b>							
Monufacturor		Ambient Temperature Range					
Manufacturer	On Type	°F	°C				
ExxonMobil	Mobil Fluid 424 (Factory fill)	-13 to 104	-25 to 40				
Caterpillar	Caterpillar Multipurpose Tractor Oil (MTO) -13 to 104 -25 to 40						
Recommended Oils* - Low Temperature Conditions							
Monufacturer	Ambient Temperature Range						
wanulacturer	On Type	°F	۵°				
ExxonMobil	Mobil Fluid LT	-40 to 86	-40 to 30				

\* Note: Use of a non-recommended oil may void warranty.

\*\* Recommended oil is used only in the winch gear case.

Figure 12 Recommended Oil List

### **Oil Capacity**

SCH Winch		Non-SCH Winch		
Capacity	20 gallons	4 gallons		

Figure 13 Oil Capacity



## Maintenance

### Serial Number Codes





### Figure 14 Dozer Identification and Winch Gear Ratios

C O D E	A New Holland & Fiat	<b>C</b> Caterpillar	E John Deere	H Dressta	K Komatsu	R Case	U Shantui
12					KOMSTAT D31/37/39 E-21 & E21-A ② ③		
13					D31/37/39 E-22		SD-10 ④
14					D37/39 E-23 ② ③		
15			450-650J ①②③	TD7S, TD8S ④		650/750/850K, 750/850L ①②③	
16		HYSTAT D3/4/5C ① ② ③	550-650К ①②③	td9S ④		650L ①②③④	
17		D3/4/5G *a ①②③				750/850M ①②③④	

Allied Systems



## General

о D	A New Holland	C Caterpillar	L John Deere	H Dressta	<b>K</b> Komatsu	R Case	U Shantui
E	& Fiat						
10		D4/5G *b					
18		123					
		D3/4/5K					
19		1234					
101		D3/4/5K2 T4f *c					
191		1234					
		D5K & D5K2 T4i					
20		1234					
		D5K2 With					
201		Fireplow					
		1234					
20			700H/J				
39			123				
201			700K				
391			123				
302			700L				
392			3				
*a D3/4/5G with dozer s/n prefix CFC, CKA, CFF, CLB, CFN, FDC, FDH, CLF, FDW, CLW, JMH, ZDN, BYR, CXT							
*c With dozer s/n prefix D3K2: FT3, JPJ, KF2, KL2, LT3 D4K2: KM2, KR2, MT3, RT3 D5K2: KW2, KY2, RRE, WT3, YT3							

Figure 14 Dozer Identification and Winch Gear Ratio (continued)





### **Optional Equipment**

The H4A winch may be equipped with the following options:

- Integral Arch\*
- Four-Roller fairlead Assembly
- Standard Drawbar
- Heavy Duty Drawbar

\* When winch is fitted with an arch, wire rope diameter shall be reduced one size from maximum recommended wire rope diameter.

## NOTE: Not all optional equipment listed is available for each model of dozer.



Figure 15 H4A Hydrostatic Winch Optional Equipment



### Operation

### **Checks before Operation**

- Check that the wire rope and hook are not worn or damaged.
- Check the oil level. Check for oil leaks if level is down. If oil level is too high on model with external pump, check for internal leaks in the winch.
- Clean dirt and debris away from breather.
- Lubricate the rollers on the arch or fairlead every 50 hours, if equipped.
- Check the hourmeter to see if the winch is due for periodic inspection and maintenance. See the Maintenance Schedule later in this manual.
- Check the control lever for proper motion prior to startup.
- After winch has warmed up, check the oil filter bypass light.

## Filter Bypass Warning Light (High Performance Winches)

The high-performance winches have a red LED mounted on the console that illuminates to indicate that hydraulic oil is bypassing the filter. Figure 16 shows three styles of the filter bypass LED. A bypass condition means that either the oil is too thick or the filter is restricted and should be replaced. if the oil is too thick, it is either cold oil or an incorrect viscosity grade is being used.

To heat cold oil, operate the dozer at low to mid-throttle setting. The winch is ready for operation when the filter indicator light is not illuminated. See Figure 12, Oil Selection Chart, for the correct viscosity oil for ambient temperature.





(For E15, E16, E39, E391, R15, R16 & R17)



Figure 16 Filter Bypass Warning Lights





### **Operating Procedures**

## **WARNING**

A minimum of 3 wraps of wire rope must be maintained on the winch drum. Do not handle loads with less than 3 wraps, as injury or damage to equipment may result. Coloring the last 5 wraps of wire rope will allow the operator to see when he should stop removing wire rope.

## **WARNING**

Do not operate the winch with loads that exceed the maximum rated bare drum line pull (see the nameplate for rated load). If excessive loads are encountered use a multi-part line and sheave blocks. When using a multipart line, the hook must be connected directly to the frame or blade of the dozer. DO NOT attach the hook to the winch drawbar; the force generated could exceed the holding capacity of the winch mounting. To operate the winch, the dozer must be running and the auxiliary hydraulic function switch (or lever) must be in the "ON" or "UNLOCKED" position. Through the operator controls, hydraulic power from the dozer is sent to the winch motor to control direction and speed of the winch drum rotation.

**BRAKE-ON** - The control lever, at rest, is spring loaded to the center position. The automatic holding brake is applied preventing drum rotation.

**LINE-IN** - Pulling the control lever towards the operator releases the brake and begins the drum turning to reel wire rope onto the drum. Releasing the lever causes it to return to the **BRAKE-ON** position, which stops drum rotation and applies the holding brake.

Moving the lever a small amount produces slow drum rotation for inching. As the control lever is moved farther, more flow is sent to the motor thus increasing line speed. At full control lever stroke, the winch automatically reduces displacement of the winch motor and produces the greatest line speed. (Note: early winches employed a four-axis control lever with a distinct **HI-SPEED** position. By moving the control lever to the left, the winch is placed in **HI-SPEED** mode.)



**HI-SPEED** operation is achieved at the expense of winch pulling force. While pulling at high speed, if the load increases, the winch will automatically adjust the motor to maximum displacement to increase pulling force. The operator will notice the line speed slowing down but the winch will continue pulling.

**LINE-OUT** - Pushing the control lever away from the operator releases the brake and reels wire rope off the drum. Releasing the lever causes it to return to the **BRAKE-ON** position, which stops drum rotation and applies the holding brake. Moving the control lever a small amount produces slow drum rotation for inching. Line speed increases proportionally to maximum speed as the lever is moved farther. **HI-SPEED** operation is the same as **LINE-IN**.

**FREESPOOL** - When the operator selects **FREESPOOL** mode, hydraulic pressure releases a mechanical clutch on the intermediate shaft. This allows the drum, the drum gear and the drum pinion to rotate freely permitting wire rope to be pulled from the drum. An adjustable, spring-applied wear pad bearing against the drum flange provides resistance to drum rotation in **FREESPOOL**.

**FREESPOOL** is controlled by a console mounted rocker

switch with a yellow LED indicator. To operate the switch, slide the locking tab, then push the rocker switch. The winch remains in **FREESPOOL** mode until the switch is turned off.

Note: On early production winches, FREESPOOL is selected by moving the control lever sideways to a detented position. The winch remains in FREESPOOL mode until the control lever is returned to the BRAKE-ON position.

## **WARNING**

FREESPOOL should not be used if there is a load on the wire rope. An uncontrolled release of the load will occur. Loss of the load can result in injury and/or equipment damage.

**BRAKE-OFF** - a few early winches incorporate a **BRAKE-OFF** feature to allow wire rope to be pulled off of the drum as the dozer drives away from a towed load. **BRAKE-OFF** is achieved by moving the control lever sideways to a detented position which releases a hydraulic clutch and allows the drum and gear train to rotate. The winch remains





in **BRAKE-OFF** mode until the control lever is returned to the centered position.

## **WARNING**

BRAKE-OFF should not be used to lower a suspended load or a load that can slide down a slope.

## **WARNING**

Activating FREESPOOL or BRAKE-OFF will result in an uncontrolled release of the load. Loss of load can result in injury and damage.

## **WARNING**

During LINE-OUT, FREESPOOL or BRAKE-OFF operation, it is possible for the wire rope to be spooled out completely to the end. If this occurs, the wire rope ferrule (knob) may release suddenly from the winch like a compressed spring, and cause an injury.

## 

When deactivating FREESPOOL, do not move the control lever into the LINE-IN position until the drum has stopped rotating. Possible winch damage may occur.

### **Operational Adjustments**

**FREESPOOL Drag Adjustment**: A wear pad pressing against the drum flange controls the resistance to drum rotation during **FREESPOOL** operation. A knob located on the right side of the winch is used to adjust the drum drag. Clockwise rotation of the knob increases the drag. Refer to Figure 7 and Figure 8 for the location of the freespool drag adjust.

**Arch Adjustments:** The arch for the H4A has two adjustments for the main roller position. The arch can be pivoted about the rear mounting ears by relocating the support arm bolts in the arch frame. See Figure 17.



## Operation

This shifts the main roller towards the front of the winch, therefore providing better balance for light dozers. The main roller also has two mounting heights. The upper height is used for lighter line pulls to raise the end of the load higher off the ground. For heavier line pulls, use the lower roller height for better dozer stability.









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### Maintenance

### General

## **WARNING**

The temperature of the oil and winch may reach 220°F (105°C). Let the winch cool down before performing maintenance. Severe burns can occur from hot oil.

As with any hydraulic system, cleanliness is extremely important. Ensure all surfaces are clean before performing maintenance tasks to prevent contamination.

A filter bypass indicator light is used with the H4A. Some winches are supplied with the indicator light, and others utilize the dozer indicator light. The indicator light will illuminate when the filter becomes too dirty or if the oil viscosity is too thick. If the light is illuminated because the oil viscosity is too high, it will go out when the oil has reached a high enough temperature. Operate winches only at low mid RPM to warm oil. Use oil with the proper viscosity for the operating temperature to avoid the filter bypass condition. See Figure 12 for the Oil Selection Chart.

## 

Operating the winch with the filter indicator light illuminated may cause pump and motor damage.

Hydraulic pumps and motors are relatively lowmaintenance. The only regular maintenance tasks are oil and filter element changes. Both of these measures promote system cleanliness. Monitoring and periodic maintenance of the systems can prevent premature breakdowns and repairs. Under normal application conditions, the following maintenance intervals are suggested. Under dusty conditions or in situations with severe temperature fluctuations, the oil change interval should be shortened accordingly.



### **Maintenance Points**



SCH WINCH

### EXTERNAL PUMP WINCH

Figure 18 H4A Maintenance Points



### **Maintenance Schedule**

INTERVAL	PROCEDURE	SPECIFICATION & QUANTITY			
Daily	Clean the area around the breather.				
	Check the oil level.	See Figure 12 for approved oils.			
	Check the oil filter warning light.	Change filter if light remains lit after warming-up period.			
50 Hours or Weekly	Lubricate the arch and fairlead rollers.	Use multi-purpose grease.			
500 hours or when filter indicator	Change oil filter.	See Parts Manual for appropriate filter.			
shows element needs changing	Check freespool drag pad.	Replace pad if worn.			
	Lubricate driveline (if so equipped)	Mobilith SHC 220 Grease			
2000 hours or yearly	Change hydraulic oil.*	See Figure 12 for approved oils.			
	Clean magnet and strainer.	SCH winch needs approximately 20 gallons (76 liters) of oil. External pump winch needs approximately 4-5 gallons (15-19 liters) of oil. See Figure 12 for approved oils. Change oil more frequently if the winch runs above 180°F or if there are large fluctuations in ambient temperature.			
	Clean reservoir of dirt and sludge.				
	Check filter bypass indicator light.	See Service Manual for check procedure.			
* Change oil more frequently for extreme-duty applications such as continuous high line pull.					

Figure 19 Maintenance Schedule





### Troubleshooting

Winch problems generally fall into one of three categories: controls, hydraulic system, or mechanical system. Follow the troubleshooting steps below to isolate the probable location of the malfunction, then refer to Figure 20, Troubleshooting Chart.

- 1. Make sure the control lever is functioning properly, with a full range of motion. See the operation instructions earlier in this manual for correct control lever operation.
- 2. Check the oil level and type. Ensure the operating temperature range for the oil is suitable for the conditions. Check the filter indicator.
- 3. Check winch hydraulic pressures. Start with control pressures, then check main system pressures.
- 4. Inspect the winch gear train for problems.

## **A CAUTION**

The winch oil should never exceed the maximum operating temperature of 239°F (115°C), as overheating will cause winch damage.



## Maintenance

PROBLEM	POSSIBLE CAUSE	CORRECTION	
Winch gets very hot (H4A will operate at 180°F)	Low oil level.	Add oil; refer to Figure 12, Oil Selection Chart.	
	Improper oil viscosity.	Use correct oil grade; refer to Figure 12, Oil Selection Chart.	
	Winch coated with dirt.	Clean winch.	
	Clogged filter or strainer.	Replace filter and/or clean strainer.	
	Charge pressure too high.	See Service Manual.	
	Winch usage very high.	Add oil cooler and additional 3 gallons (11 L) of oil.	
Will not <b>LINE-IN</b> or <b>LINE-OUT</b>	<ul> <li>Pump not stroking, or brake not releasing, due to:</li> <li>1. Low charge pressure.</li> <li>2. Leak in charge circuit.</li> <li>3. Low oil level.</li> <li>4. Clogged filter.</li> <li>5. Wrong oil.</li> </ul>	<ol> <li>See Service Manual.</li> <li>Fix leak in system.</li> <li>Add oil; refer to Figure 12, Oil Selection Chart.</li> <li>Replace filter.</li> <li>Use correct oil grade; refer to Figure 12, Oil Selection Chart.</li> </ol>	
	BRAKE-OFF clutch slipping.	Repair <b>BRAKE-OFF</b> clutch; see Service Manual.	
	Stuck in FREESPOOL.	Repair FREESPOOL; see Service Manual.	

Figure 20 Troubleshooting Chart





PROBLEM	POSSIBLE CAUSE	CORRECTION	
Operation is rough	Low oil level.	Add oil; refer to Figure 12.	
	Low charge pressure.	See Service Manual.	
	Motor hunting between high and low speed.	Motor speed orifice too large. See Service Manual for further information.	
Drum continues to rotate after lever is returned to <b>BRAKE-ON</b>	Pump staying on stroke too long.	<ol> <li>Cold oil. Refer to warm-up procedure in the Operating Procedures section of the Operation chapter.</li> <li>Wrong pump stroking orifice. Use larger size.</li> </ol>	
Lever won't stay in <b>BRAKE-OFF</b> or <b>FREESPOOL</b>	Low detent force.	Screw in ball plunger to increase force; see Service Manual for details.	
Winch case oil level too high	Too much oil added.	Drain oil down to oil level plug.	
	Internal oil leak in winch (external pump models only)	Repair leak (see Service Manual).	

Figure 20 Troubleshooting Chart (continued)



## **Operating Techniques**

### **Operating Techniques**

### **Dozer or Skidder Operation**



**Step 1**. The dozer or skidder is moved to an area where a load will be connected. The operator moves the control lever to the **LINE-OUT**, **HIGH SPEED LINE-OUT** or **FREESPOOL** position so that the wire rope can be pulled from the winch drum. **Step 2**. A load (logs) is connected to the wire rope. The operator moves the control lever to the **BRAKE-ON** position.



**-** 





**Step 3.** The operator can move the control lever to the **LINE- IN** or **HIGH SPEED LINE-IN** position. If the load is less than approximately 75% of the maximum line pull, the operator can begin traveling with the vehicle at the same time. The winch will wind the load toward the vehicle as it travels. If the load is nearly the capacity of the line pull, the operator must move the load close to the vehicle before beginning to travel.



**Step 4.** If the dozer or skidder must travel through an area with bad traction conditions and the winch is equipped with the **BRAKE-OFF** option, the operator can move the control lever to the **BRAKE-OFF** position. This allows the vehicle to move through the bad traction area without pulling the load at the same time. (Note: **BRAKE-OFF** option was last used on serial number H4A-1014.)



## **Operating Techniques**



**Step 5.** When the vehicle is on firm ground, the operator can move the control lever to **LINE-IN** or **HIGH SPEED LINE-IN** to pull the load toward the vehicle.



**Step 6.** When the operator wants to disconnect from the load, the vehicle is stopped and the control lever is moved to the **LINE-OUT** position to loosen the wire rope. If the winch is equipped with the **BRAKE-OFF** option, the **BRAKE-OFF** function may be used instead. The wire rope is then disconnected from the load.





### How to Move a Disabled Vehicle

**A.** A dozer or skidder often travels in areas where traction conditions are bad. A vehicle equipped with a winch can be used to remove itself from mud or other areas where it cannot move using only the drive wheels or tracks. See Figure 21. Use the following procedure:

- 1. Fasten the winch wire rope to a structure, tow bar of another vehicle, or a tree that has enough strength for the line pull. The wire rope must be in a direction that is approximately parallel (preferably slightly upward) to the direction of travel of the vehicle.
- 2. Use the throttle to set the engine speed at a power level to operate both the winch and the tracks or drive wheels. (Operator experience is required, because the winch can use most of the engine power in some vehicles.)
- 3. Put the control lever in the **LINE-IN** position to tighten the winch wire rope. When the winch wire rope is tight, put the vehicle transmission in reverse\* and engage the tracks or drive wheels. With the winch still in **LINE-IN**, use the power from the engine to the winch and tracks together to remove the vehicle from the bad area.

4. If the vehicle travels faster than the winch winds the wire rope, disengage the transmission until the winch wire rope is tightened again.

\*NOTE: If the vehicle uses a PTO from the transmission case and the tracks or drive wheels on the vehicle stop turning, it is possible the torque converter in the transmission has stalled and the winch will stop also. If this happens, put the vehicle in neutral to operate the winch.



Figure 21 Moving a Disabled Vehicle (Step A)



## **Operating Techniques**

**B.** A dozer or skidder equipped with a winch can be used to pull another vehicle from mud or other areas where it cannot move using only the drive wheels or tracks. See Figure 22. Use the following procedure:

## **WARNING**

Use extra care if the traction conditions are bad or if the vehicles are on a slope. Bad traction conditions can cause the disabled vehicle or the dozer to slide. A slope can require additional distance to stop the vehicles.

Make sure the wire rope and tow chain have the capacity to do the job. If the disabled vehicle does not have a tow pin or other equipment for towing, carefully fasten the tow chain around the axle of the disabled vehicle. Make sure the tow chain is fastened so that the chain will not cause injury to people or damage to the vehicle.

An operator must be on the disabled vehicle to operate the steering and brakes when it is towed.

- Fasten the winch wire rope to the tow bar of the other vehicle. The wire rope must be in a direction that is approximately parallel to the direction of travel of the vehicle. Apply the brakes on the dozer or skidder. Use the throttle to set the engine speed at a power level to operate the winch. (Operator experience is required, because the winch can use most of the engine power in some vehicles.)
- 2. Put the control lever in **LINE-IN** to tighten the winch wire rope. When the winch wire rope is tight, use the power from the engine to the winch to pull the vehicle from the bad area. If the disabled vehicle moves under its own power, keep the towing wire rope tight so that the wire rope does not pass under the drive wheels or tracks of the vehicle being towed.







### Working on a Steep Slope

## **WARNING**

The winch and the dozer must be in good condition for the following procedures. Make sure that the required maintenance has been done on the dozer and winch. Use only a wire rope that is in good condition. Make sure the wire rope and winch have enough capacity for the load. Make sure the anchor for the wire rope has enough capacity for the load. A failure of the dozer, winch, or wire rope while working on a steep slope can cause death or injury and loss of equipment.

### Dozer is Down the Slope (See Figure 23).

Sometimes a dozer must work on a steep slope and can use a winch to give assistance when moving on the slope. Fasten the winch wire rope to the drawbar of another dozer, a structure or a tree that has enough strength to hold the dozer on the slope.

### A. Moving down the slope:

- 1. Set the throttle on the dozer for the required engine speed.
- 2. Put the dozer in **FORWARD.** At the same time, move the winch control lever to **LINE-OUT** slightly to control the speed of the dozer down the slope.



Figure 23 Working on a Steep Slope



- **B.** Moving up the slope:
- 1. Set the throttle on the dozer for the required engine speed.
- 2. Put the control lever in **LINE-IN** to tighten the winch wire rope. When the winch wire rope is tight, put the dozer transmission in the FIRST speed range and REVERSE and engage the tracks or drive wheels. At the same time, move the control lever to **LINE-IN**.
- 3. Use the steering on the dozer to keep the travel of the dozer in line with the winch wire rope.
- 4. Fully engage **LINE-IN** as necessary. Do not permit the winch wire rope to loosen and pass under the drive wheels or tracks of the dozer.

### Other Equipment is Down the Slope (See Figure 24).

In this operation, the dozer and winch are on stable ground and other equipment is working on a steep slope. The winch is used to give additional control to the equipment working on the steep slope. A winch with a fairlead option is recommended for this operation if alignment of the other equipment with the winch and dozer is a problem.

## **WARNING**

The H4A is a towing winch and should not be used for hoisting. Down slope vehicles should never be completely supported by the winch wire rope. Always check the wire rope condition and wire rope manufacturer's working load limit before attempting any down the slope assistance.

Make sure the dozer and winch are on stable ground and will not slide when the load is applied. Align the dozer and winch with the load. Apply the parking brake on the dozer.





**A.** Lowering the equipment on the slope:

- 1. Set the throttle on the dozer for the required engine speed.
- Keep the winch wire rope tightened between the dozer and the equipment being lowered down the slope. Put the control lever in the LINE-OUT position to control the lowering of the equipment down the slope.



Figure 24 Other Equipment on a Steep Slope

- B. Raising the equipment on the slope:
- 1. Set the throttle on the dozer for the required engine speed. Operator experience is required for this operation so that the load is carefully controlled.
- 2. Keep the winch wire rope tightened between the dozer and the equipment being lowered down the slope. Use **LINE-IN** to control the raising of the equipment down the slope.
- 3. Keep the equipment being raised in alignment with the winch and dozer. Do not permit the winch wire rope to loosen and pass under the drive wheels or tracks of the dozer.



### Notes





Notes



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