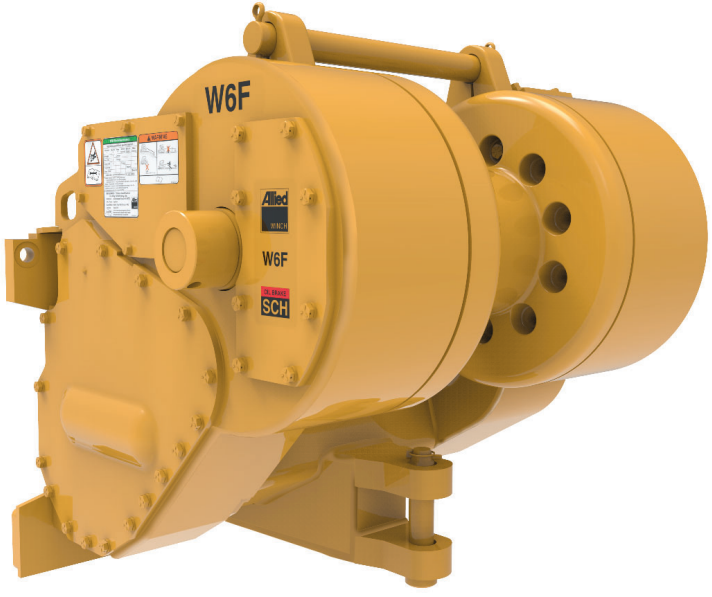
Operating Manual



W6F

Towing 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

A Product of
Allied Systems COMPANY
Sherwood, OR USA

P/N 599031W Printed in U.S.A. 06/06/2024

Winch Model W6F

Serial Number _____

Date Delivered _____

Date Installed _____

Special Equipment or Attachments

_____

_____

_____

_____

_____

_____

_____

Allied Systems COMPANY

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

Allied WINCH

06/06/2024
Printed in U.S.A.

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
U.S.A.

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' 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.

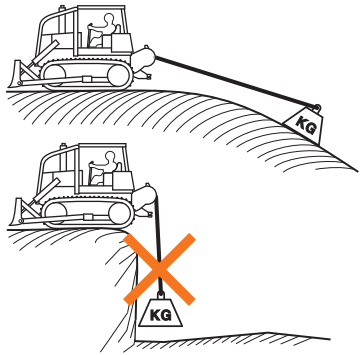
Operation, Inspection, and Maintenance Warnings

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 that 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.

- 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 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 W6F Parts Manual (P/N 599750W).
- 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 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 Page 10.
- 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.

Product Modifications

- Any alterations to the winch that have not been approved by Allied Systems Company, or use of any non-OEM replacement parts, will void the warranty, and may introduce serious safety hazards.
- Any non-OEM parts used, or any alterations made are done so at your own risk to personnel safety. This includes the addition of accessories and attachments not manufactured or approved by Allied Systems Company.

Notes

General

Introduction

How the Winch Operates

A winch is normally installed on a skidder or 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 winch has hydraulic clutches that are similar to a hydraulic (powershift) transmission. Most dozers and skidders have a **PTO** (Power Take-Off) that is used to connect the power from the engine to the winch. The **SCH** (Self Contained Hydraulics) on the winch label indicates that the hydraulic system for control of the winch is inside of the winch case. When the PTO is operating, a hydraulic pump in the winch case takes hydraulic oil from the winch sump and sends it to the hydraulic control valve. The hydraulic control valve controls the operation of the winch. Removable covers on the winch case allow access for repairs and adjustments. The design of the winch cases permits a variation in the arrangement of PTO assemblies to fit the different dozers and skidders that use these winches.

The PTO is connected to the pinion assembly in the winch. When the pinion rotates, a spur gear turns the hydraulic pump and the pinion turns the ring gear (bevel gear). The bevel gear is connected to an oil clutch for the **LINE-IN** (power forward) operation and another oil clutch for the **LINE-OUT** (power reverse) direction.

The power through the winch to the wire rope drum is controlled by a **LINE-IN** and a **LINE-OUT** clutch. When the **LINE-IN** clutch is applied, the drum rotates to pull the wire rope into the winch. When the **LINE-OUT** clutch is applied, the drum rotates to unwind the wire rope from the winch at the speed controlled by the PTO rpm.

When the control lever is in the **BRAKE-ON** position, an oil brake is automatically applied by a spring to hold the drum in its position. If the control lever is moved to apply one of the clutches, the brake is released by the same oil pressure that applies the clutch. In the event that hydraulic power is lost, the brake remains applied and the winch will not turn.

W6F Winch Description

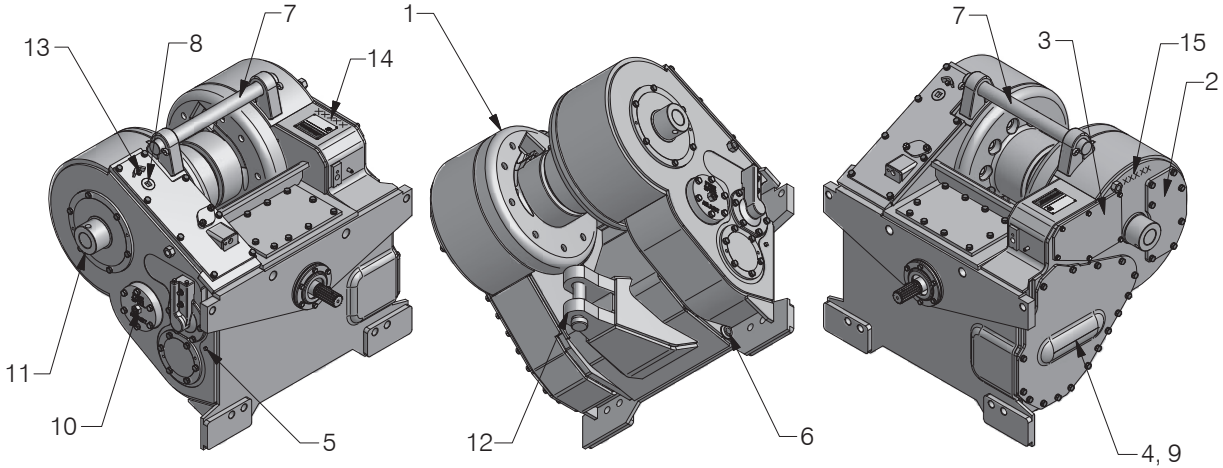
The W6F is a power forward (**LINE-IN**) and power reverse (**LINE-OUT**) winch used on dozers with a unidirectional PTO.

On most of the available gear ratios, the **LINE-IN** function has a greater gear reduction to provide more power for the line pull. The **LINE-OUT** function has less gear reduction so the cable can be unwound from the drum at a faster rate.

The W6F winch can be equipped with an optional **FREESPOOL** function. **FREESPOOL** disengages the winch drum from the winch drive gears, which allows a person to pull the wire rope from the drum by hand.

The W6F winch has a rated line pull capacity of 266,880 N (60,000 lbf) when there is one layer or less of wire rope on the drum.

Loads applied to the drawbar are transmitted to the bolts holding the winch to the dozer. The standard integral drawbars are designed to handle pulls of 66% of winch rated capacity.



1. Drum
2. Access Cover for Filter
3. Access Cover to Hydraulic Valve
4. Access Cover to Hydraulic System
5. Plug to Check Oil Level
6. Plug to Drain Oil
7. Tie Rod
8. Fill Plug
9. Cover for Oil Brake
10. Intermediate Shaft Bearing Retainer & Freespool Adjuster *
11. Drum Shaft Bearing Retainer
12. Drawbar
13. Breather
14. Serial Number Stamped (New)
15. Serial Number Stamped (Old)

*** NOTE**: Exterior freespool adjust mechanism available as standard only on AW6F-4062 and above. Older winches may be fitted with the exterior adjustment mechanism as well.

Figure 1 W6F Towing Winch

Nameplate

Each winch is shipped from the factory with a nameplate as shown in Figure 2. The nameplate is stamped with:

- winch model
- winch serial number
- maximum rated 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.

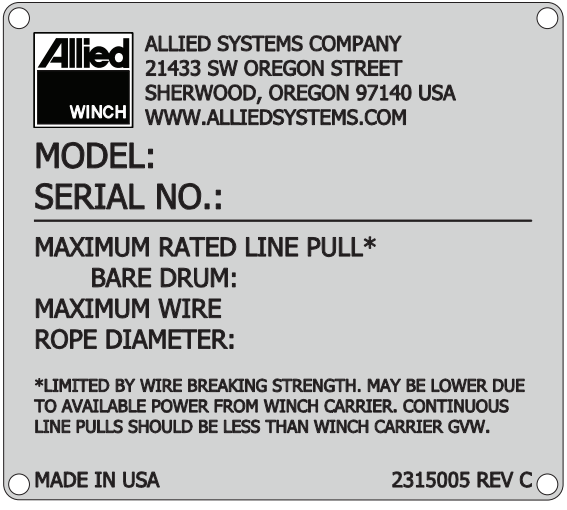


Figure 2 Nameplate

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 3 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.

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)
3/4 (19)	399 (122)	263 (80)	42,000 (186,800)	46,200 (205,500)
7/8 (22)	287 (87)	189 (58)	56,800 (252,600)	62,500 (278,000)
1 (25)[*4]	223 (68)	147 (45)	73,800 (328,200)	81,200 (361,100)

NOTE:
1. Loosely or unevenly spooled line will reduce capacities.
2. Use flexible wire rope with independent wire rope center.
3. Ferule size: 2 inches diameter, 2 1/4 inches long.
4. If your winch is equipped with the optional arch, the largest wire rope diameter approved for use is 7/8 inch.

Figure 3 Wire Rope Sizes and Capacities

⚠ 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 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 4, to avoid putting a reverse bend into the wire rope.

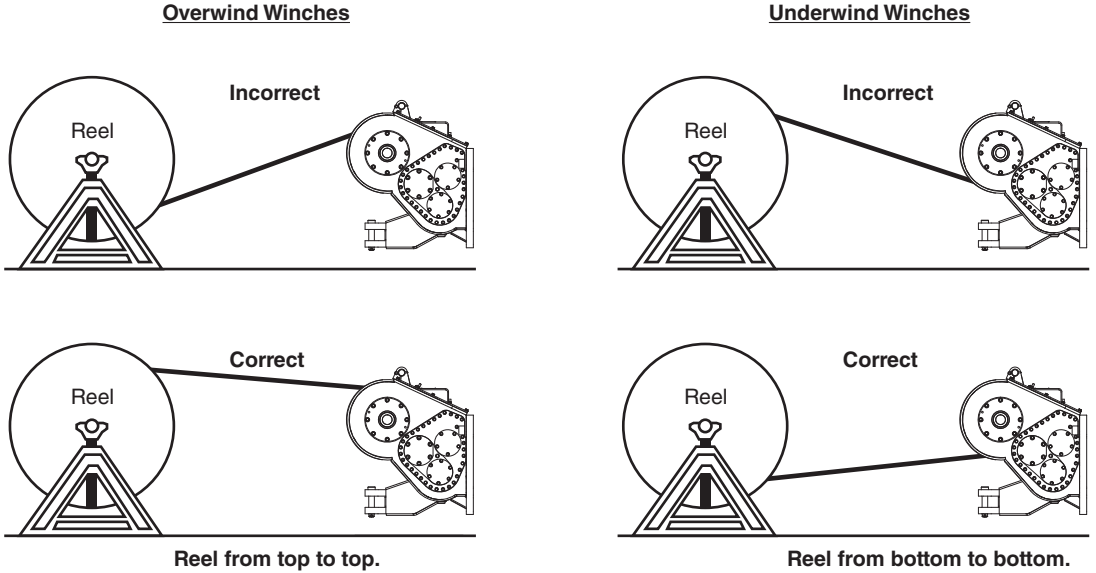


Figure 4 Transferring Wire Rope from or to Reel

Wire Rope Installation

⚠ WARNING

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 5. Use the keeper and related hardware to secure the ferrule. Torque the capscrew to 68 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.

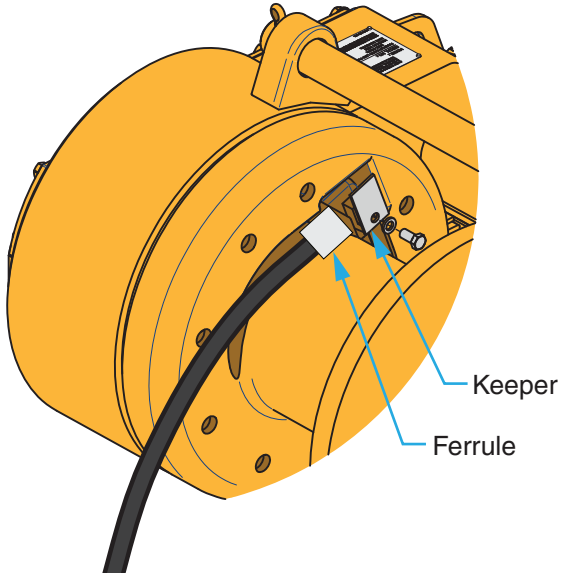


Figure 5 Secure Ferrule in Pocket with Keeper

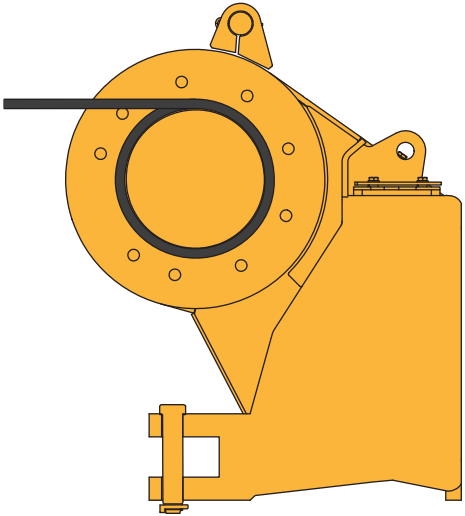


Figure 6 First Layer, Overwind Configuration

One method is to create a wooden plank lever, as shown in Figure 7 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.

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.

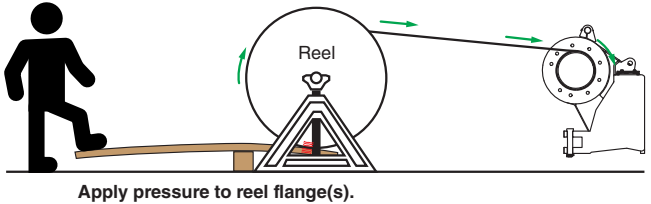


Figure 7 Create Tension

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Recommended Oil List and Oil Capacity

The type of oil used in Allied winches affects the line control. Use the following oils in the W6F winch:

Recommended Oils* - General Conditions			
Manufacturer	**Oil Type**	**Ambient Temperature Range**	
		°F	**°C**
ExxonMobil	Mobil Fluid 424 (Factory fill)	-13 to 104	-25 to 40
John Deere	Hy-Gard™	-13 to 122	-25 to 50
Chevron	1000 THF	-13 to 104	-25 to 40
Caterpillar	Multipurpose Tractor Oil (MTO)	-13 to 104	-25 to 40
Case	Hy-Tran Ultra	-20 to 122	-29 to 50
Recommended Oils* - Low Temperature Conditions			
Manufacturer	**Oil Type**	**Ambient Temperature Range**	
		°F	**°C**
ExxonMobil	Mobil Fluid LT	-40 to 86	-40 to 30
John Deere	Low Viscosity Hy-Gard	-40 to 86	-40 to 30
Chevron	THF W	-40 to 86	-40 to 30

* Note: Use of non-recommended oils may void warranty.

Figure 8 Recommended Oil List

Winch Model	Oil Capacity
W6FP - Standard	16.5 Gal (62.5L)
W6FP - with Dropbox	17 Gal (64.5L)

Figure 9 Oil Capacity

Optional Equipment

The W6F winch may be equipped with the following options:

- integral arch
- fairlead assembly
- alternate gear ratio
- **FREESPOOL**
- heavy duty and extended drawbar

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

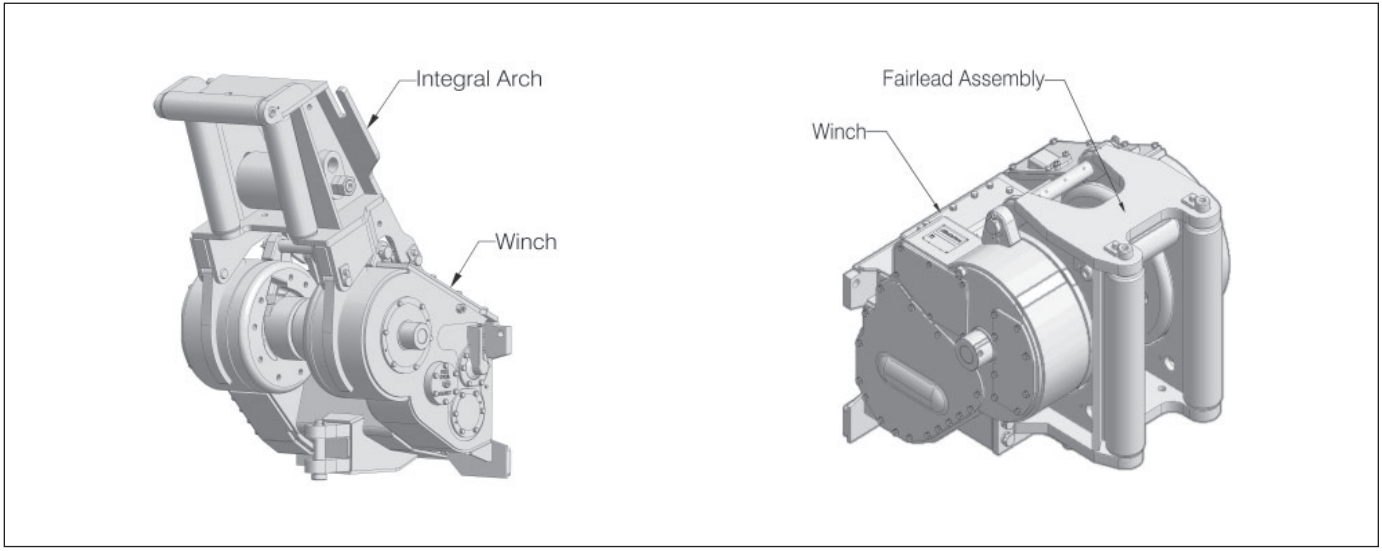


Figure 10 Optional Equipment

Unit Identification

Allied Winch S/N Nameplate Data For Dozer Mountings

A W6F P 1 N 1501 C71

Manufactured By

A = Allied Systems Company
(no "A" = Hyster Company)

Winch Model

W6F = Standard
K6F or KW6F = Special Product Engineering Design

Drive Type

P = Power Controlled
X = Direct Drive

Gear Ratio Code

Gear Code = Forward Ratio / Reverse Ratio

1 = 45.14:1 / 19.47:1 (Komatsu PS 81.69:1 / 35.24:1)
2 = 56.36:1 / 24.31:1 (Komatsu PS 101.99:1 / 43.99:1)
3 = 64.90:1 / 28.10:1
4 = 81.00:1 / 35.00:1
5 = 44.00:1 / 19.00:1
6 = 106.36:1 / 45.88:1
7 = 27.90:1 / 12.10:1
8 = 85.19:1 / 36.75:1
9 = 55.61:1 / 45.88:1

Vehicle Code

See Figure 11

Sequence Number

Internal Options

M = Horizontal Control Lever, Non-FREESPOOL
(For Direct Drive Only)
F = FREESPOOL
N = Vertical Control Lever, Non-FREESPOOL
U = Underwind Drum

NOTES: 1. In Addition to the serial number plate, the serial number is stamped on to the left hand side of the frame.

2. Circled numbers in Figure 11 indicate possible gear ratios.

Figure 11 Dozer Identification and Gear Ratios

Dozer Make Model and Starting Dozer Serial Number Where Applicable											
CODE	A New Holland/ Fiat-Hitachi	C Caterpillar	E John Deere	H International, Dresser, Dressta	K Komatsu	L Liebherr	M MF	N Zoomlion	R JI Case	U Shantui	X Xuanhua
32			750/750B, 755 W/CAB ③④⑥⑧								
40		527 ①② ⑥⑧⑨				732B ⑥⑧					
41	11B PS ①	D5B 24X 25X D5E PS 95J 96J ①②④	750/750B, 755 W/O CAB ③④⑥⑧	TD15B/C PS, 175C ①②④ ⑥⑧⑨	D60E-6, D60E-8, D60LE-8, D70LE ②③ ④⑥⑧		D600C/D ①		1550 ②③④ ⑥⑧⑨		T150F ①② ⑥⑧
42	11B DD ①	D5B D53-DD 22X 23X 26X ①②④	850/850B W/ CAB ⑥⑧⑨	TD15BG DD, 501 ①②④	D65A/E6 D65E-7 ①②④						
43	12G ①	D6D PS 3X 4X 5X 10X 76A, D6E PS ①②④ ⑥⑧⑨	850/850B W/O CAB ②③④ ⑥⑧⑨	250C/E ①②④ ⑥⑧⑨	D65S-6 ①						

(Continued on next page)

Figure 11 Dozer Identification and Gear Ratios

Dozer Make Model and Starting Dozer Serial Number Where Applicable											
CODE	A New Holland/ Fiat-Hitachi	C Caterpillar	E John Deere	H International, Dresser, Dressta	K Komatsu	L Liebherr	M MF	N Zoomlion	R JI Case	U Shantui	X Xuanhua
44	FL 14B, 14B PS, 14C ①	D6D DD 3X 5X 74A 99J, D6E DD ①② ④⑥⑧	855 ①	TD15E PS ①②④ ⑥⑧⑨	D75S-3 ①						
45	14B 14C DD FD14 ①②③	977 ①②④ ⑥⑧⑨	750C, 750C II ⑥⑧	TD15E DD ①② ④⑥⑧	D65-8, D65E-8 D68-1 ①②						
46	F/H14C FD14 ①②③ ⑥⑧⑨	977L ①②④	850C 850C II PS ②⑥ ⑧⑨	TD15H ⑥⑨	D65E-12 D65EX-12 D65EX-15 D65PX-12 D65PX-15 ①②			ZD160 ⑨		SD16 ①	
462			850J & K ⑥⑧⑨								
464			750J & K ⑥⑧⑨								
47	F/H10C F/H10C PS ①②③ ⑥⑧⑨			TD15H-TIER II, TD15M ⑥⑨	D61EX-12 ①②						

(Continued on next page)

Figure 11 Dozer Identification and Gear Ratios

Dozer Make Model and Starting Dozer Serial Number Where Applicable											
CODE	A New Holland/ Fiat-Hitachi	C Caterpillar	E John Deere	H International, Dresser, Dressta	K Komatsu	L Liebherr	M MF	N Zoomlion	R JI Case	U Shantui	X Xuanhua
470		D5R2 ①②④ ⑥⑧⑨									
48	FD14E, FD175, DX175, DX195L ①② ⑥⑧⑨	D6H*, D6R* ①②④ ⑥⑧⑨									
480		D6H* D6R PS ①②④ ⑥⑧⑨									
481		D6H DD ①②④ ⑥⑧⑨									
49	New Holland DC-180 ⑥⑧⑨								1850K ⑥⑧⑨		

(Continued on next page)

Figure 11 Dozer Identification and Gear Ratios

Dozer Make Model and Starting Dozer Serial Number Where Applicable											
CODE	A New Holland/ Fiat-Hitachi	C Caterpillar	E John Deere	H International, Dresser, Dressta	K Komatsu	L Liebherr	M MF	N Zoomlion	R JI Case	U Shantui	X Xuanhua
50		D6R* ⑥⑧⑨									
71		D6R II, III; ⑥⑧⑨									
711		D6R2 ⑥⑧⑨ S/N's PPP, SSS, TTT									
715		D6GC ⑨									
73		D6G ⑥⑧⑨									
81		D5R, D6N ⑨ W/Diff-Steer After 09/2005**									
82		D6G2 ⑥⑧⑨									

* D6H and D6R have separate dozer codes after winch serial number AW6F-4442.
See Dozer code C71 for D6R Series II.

**C81 effective with dozer S/N's: Tier II: AKM01794, ALY02066
Tier III: DJA-----, DJY-----, GHS, MLW, LJR

Operation

Checks Before Operation

Check that the cable and hook are not worn or damaged. Check that the periodic inspection and maintenance have been done at the recommended operating hours. See Figure 16, Maintenance Schedule.

Checks During Operation

The Troubleshooting Chart, Figure 14, can be used by the operator to identify a problem with the winch operation. A trained service person is needed for additional troubleshooting and repair that requires disassembly of parts of the winch.

Operating Procedures

The control lever assembly has a power control lever for the winch control. If the winch has the **FREESPOOL** function, a second control lever is added. Both control levers are connected to the winch through control cables. The power control lever is connected to the spool in the control valve and is used to select one of the following operations:

- **BRAKE-OFF**
- **LINE-OUT**
- **BRAKE-ON**
- **LINE-IN**

When using **LINE-IN** or **LINE-OUT**, the power control lever will return to **BRAKE-ON** position when released. **BRAKE-OFF** is a detent position, the power control lever must be pulled back to the **BRAKE-ON** (Neutral) position.

The **BRAKE-ON** position is a neutral position. No hydraulic pressure is applied to the brake or the clutches. Springs apply the brake so that the winch drum will not rotate.

The **BRAKE-OFF** position has a detent, and neither clutch is applied. Hydraulic pressure is applied to release the brake. The winch will not rotate easily because of friction in the clutches, brake and gear train. Wire rope cannot be pulled from the winch by hand. The **BRAKE-OFF** function can be used to move the dozer away from a stationary load (not suspended), at a speed set by the dozer, and keep the wire rope tight. If a winch is equipped with the optional **FREESPOOL** function, the **BRAKE-OFF** position is different from the **FREESPOOL** position where the drum is disengaged from the gear train.

A second control lever engages and disengages a sliding sleeve to control the optional **FREESPOOL** operation. The **FREESPOOL** control lever has two positions: **NORMAL OPERATION** and **FREESPOOL**. The **FREESPOOL** control lever disengages the gear train so the wire rope can be pulled from the winch by hand. **NORMAL OPERATION** is used for **LINE-IN** and **LINE-OUT**.

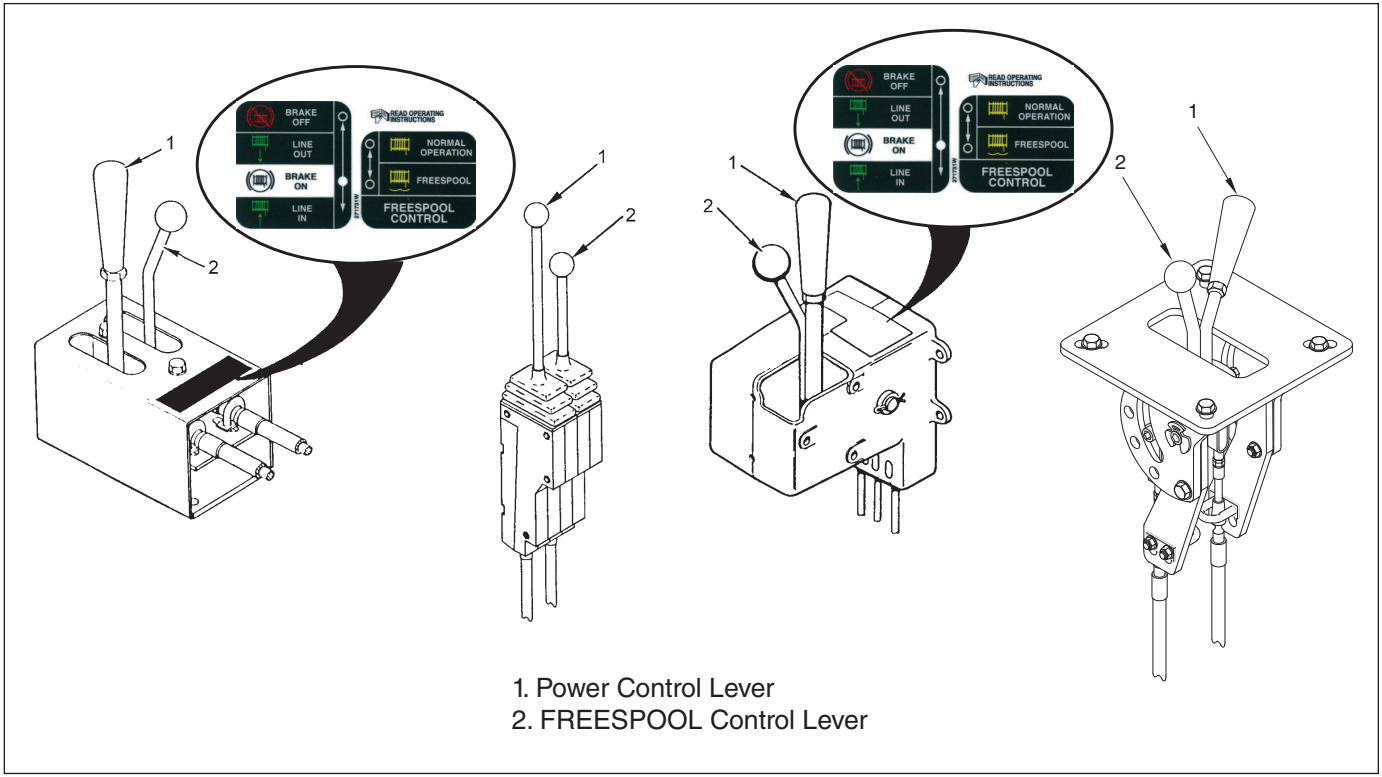
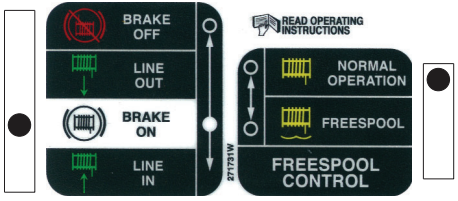
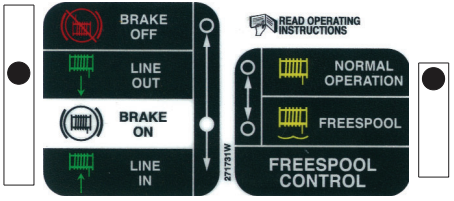


Figure 12 W6F Winch Operator Controls

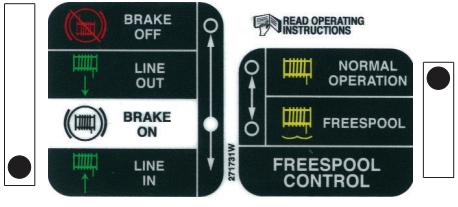
Power Operation



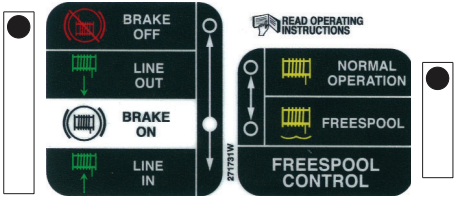
BRAKE-ON position is a neutral position. Neither clutch is applied. The brake is fully applied.



LINE-OUT position applies the **LINE-OUT** clutch, and releases the brake. The winch will unwind the wire rope at a speed controlled by the PTO speed of the dozer and the weight of the load.



LINE-IN position applies the **LINE-IN** clutch, and releases the brake. The winch will wind the wire rope at a speed controlled by the PTO speed of the dozer.



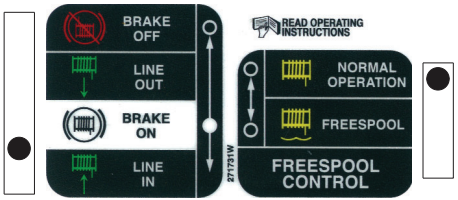
BRAKE-OFF position is a detent position. The clutches are released, and the oil pressure has released the brake. This position will permit the wire rope to unwind from the winch against the friction of the clutches, brake, and gear train as the dozer moves away from the load.

⚠ WARNING

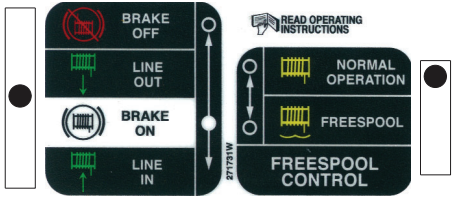
Do not use this function (BRAKE-OFF) to lower a load. Uncontrolled load movement may occur.

Inching is used for fine control of the winch speed. When the power control lever is slowly moved to a position between **BRAKE-ON** and **LINE-IN** or between **BRAKE-ON** and **LINE-OUT**, inching occurs. The normal adjustment of inching for **LINE-IN** is different from the adjustment for **LINE-OUT**. These adjustments can be modified by changing the overlap pressures of the modulator valves. This change is necessary for some customer operations. The following paragraphs describe the normal operation for inching.

NOTE: Inching will rapidly add heat and accelerate clutch & brake wear. Inching for more than a few seconds should be followed by several minutes of cooling recovery



Inching (LINE-IN). This operation is used to slowly move a load toward the dozer. The control valve will cause the oil pressure to slowly release the brake and slowly apply the **LINE-IN** clutch. As the brake is released, the clutch takes control and begins to move the load.

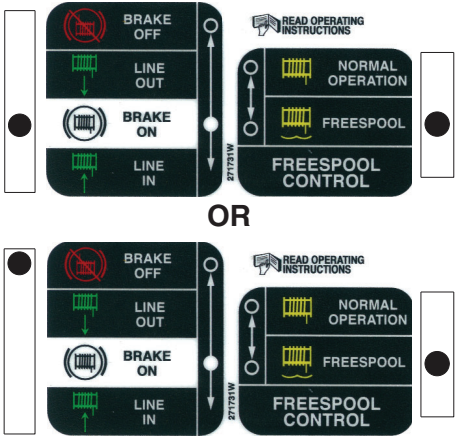


Inching (LINE-OUT). This operation will release the brake before the **LINE-OUT** clutch is applied. This permits the weight of the load to unwind wire rope from the winch drum against the resistance of the brake. The operator controls the resistance of the brake by the position of the power control lever. The **LINE-OUT** clutch is applied when the operator moves the power control lever more toward the **LINE-OUT** position. When the power control lever is moved so that the **LINE-OUT** clutch is engaged, the speed that the drum unwinds is controlled by the rpm of the dozer PTO.

FREESPOOL Operation

⚠ WARNING

The control lever normally cannot be moved to the FREESPOOL position if there is a load on the wire rope. If enough force is used to disengage the gear train for the FREESPOOL operation, an uncontrolled release of the load will occur. Loss of the load can result in injury and damage.



The power control lever must be in the **BRAKE-ON** or **BRAKE-OFF** position to operate the **FREESPOOL** control lever. When the **FREESPOOL** control lever is moved to the **FREESPOOL** position, the winch drum is disengaged from the gear train. The **FREESPOOL** operation permits the wire rope to be pulled from the winch drum by hand.

If the **FREESPOOL** control lever cannot be moved to engage the gear train for power operation, apply a clutch to move the gear train a small amount. This action will align the splines in the sliding sleeve so that the intermediate gear can be engaged.

FREESPOOL Drag Adjustment for AW6F-4061 and below without Exterior Drag Adjust

The preload on the bearings of the intermediate shaft controls the resistance to rotation of the drum during the **FREESPOOL** operation. The resistance to rotation is correct when the drum can be rotated by hand, but the drum will not rotate more than one-half revolution freely.

The addition or removal of shims for the preload on the bearings of the intermediate shaft requires the removal of the cover for the intermediate shaft. This adjustment is normally only necessary if the winch has had an overhaul. See the Service Manual if this adjustment is required.

FREESPOOL Drag Adjustment for AW6F-4062 and above with Exterior Drag Adjust

The preload on the bearings of the intermediate shaft controls the resistance to rotation of the drum during the **FREESPOOL** operation. The resistance to rotation is correct when the drum can be rotated by hand, but the drum will not rotate more than one-half revolution freely.

On W6F winches with S/N 4062 and above, an adjusting screw is located in the center of the bearing retainer for the intermediate shaft; please refer to Figure 13. This screw can be tightened or loosened to adjust the preload on the intermediate shaft. The jam nut will maintain the **FREESPOOL** setting.

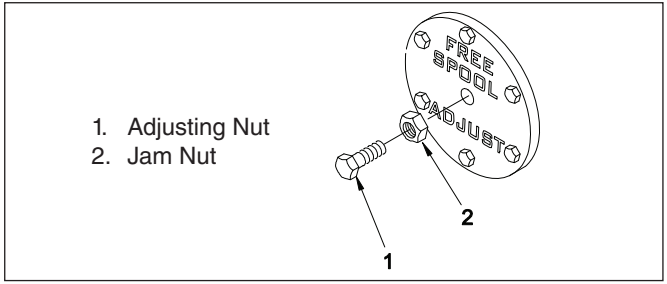


Figure 13 FREESPOOL Adjustments

⚠ CAUTION

Setting the preload on the intermediate shaft too tight will cause bearing overload. Setting the preload too loose will allow shaft to not be parallel. Use caution when adjusting. Determine the correct preload by starting with the preload too loose, and gradually increase the preload until the correct resistance to rotation is achieved (see Page 22). Increase the preload by turning the adjusting screw by a maximum of 1/6 rotation (60 degrees), and striking the housing with a mallet to make sure the bearing is sliding. Check resistance to rotation after each adjustment.

Figure 14 Troubleshooting Analysis Chart

PROBLEM	POSSIBLE CAUSE	CORRECTION
Overheating	Plugged pressure filter.	Replace filter.
	Plugged suction filter.	Remove suction filter, clean and replace.
	One or both clutches dragging.	Check by placing control lever in **BRAKE-OFF**. Normally drum will rotate slowly in the **LINE-IN** direction. If the reverse clutch is dragging, the drum will rotate in the **LINE-OUT** direction. If forward clutch is dragging, the drum will rotate positively in the **LINE-IN** direction and it will take more than 100 lbs of line pull to prevent drum rotation.
	Low pressure.	Check for leaks, then adjust accordingly.
	Bevel shaft bearings set too tight.	Adjust accordingly. (Clutch shaft bearings hot)
	Control cable binding causing winch valve to not return to **BRAKE-ON**.	Make sure that there are no tight bends in the control cable (minimum bend redii 5.00”), or replace cable.
	Winch control left in **BRAKE-OFF.**	Return lever to **BRAKE-ON**.
	Excessive inching.	Avoid continuous operation in the inching zone.

(Continued on next page)

Figure 14 Troubleshooting Analysis Chart

PROBLEM	POSSIBLE CAUSE	CORRECTION
Operation is rough	Hydraulic oil is too cold.	Put the control lever in the **BRAKE-OFF** position. Run the engine at 1000 rpm to warm the oil before operating the winch.
	Low oil level.	Add hydraulic oil to the correct level.
	Low system pressure.	See item on troubleshooting low oil pressure directly below.
	Wrong oil.	Drain oil and replace with correct grade. Refer to Figure 8, the Recommended Oil List.
	Accumulator malfunction.	Check accumulator and recharge/replace as necessary.
	Dozer engine idling too low, or PTO stalled.	Increase dozer engine speed.
	Hydraulic system suction leaks. Observe oil exiting lube valve while dozer is operating. Suction leaks will cause oil to foam.	Check the following for air leaks: 1. Suction hose to pump connection 2. Pump shaft seal 3. Suction filter cover and gasket 4. Suction hose for cracks or collapsed sections.
	Control lever/Control cables need adjustment.	Check for correct adjustment as outlined in Subsection of Service Manual. Make sure the ends of the cables are fastened correctly. Double-check push-pull cable housing to ensure it is securely anchored on both ends. Be sure control lever has full movement and is not hitting lever housing or cab.

Figure 14 Troubleshooting Analysis Chart

PROBLEM	POSSIBLE CAUSE	CORRECTION
Low oil pressure	Leaking pressure hoses and fittings.	Check for leaks and replace components where necessary. Be sure hoses are not rubbing on any gears or winch components.
	Defective or improperly adjusted oil relief valve; poppet may be stuck open.	Clean relief valve if no pressure, then adjust. Check relief valve with pressure gauge. Replace if defective.
	Clogged suction filter.	Check and clean or replace suction filter.
	Oil brake leaking internally (indicated by low brake pressure).	Repair as required.
	Defective hydraulic pump.	Check pump pressure output only after all other checks have been made. Worn pump indicated by pressure variation with engine RPM. If pump is at fault, replace.
	Valve spool is not moving far enough	Check to verify the control valve spool travel (refer to Control Valve Spool Travel Check in Service Manual).

(Continued on next page)

Figure 14 Troubleshooting Analysis Chart

PROBLEM	POSSIBLE CAUSE	CORRECTION
Brake does not release or winch stalls during low RPM shift.	Low oil pressure.	Refer to “Low Oil Pressure” troubleshooting item above.
	Pressure modulator set too low.	Turn modulator screw IN for earlier brake release. Increase sequence differential.
	Accumulator system malfunction.	Check for: 1. Correct leakdown time as described in Figure 3-8 of Service Manual. 2. Leaking accumulator valve. 3. Leak in accumulator lines. 4. Damaged or defective accumulators.
	Damaged brake piston, piston housing or seal rings.	Check piston and piston housing cavity for damage. Replace if scored or broken. Always replace both seals when brake is repaired.
	Low clutch pressure or low oil pump volume.	Refer to “Low Forward or Reverse Clutch Pressure” troubleshooting item below.

(Continued on next page)

Figure 14 Troubleshooting Analysis Chart

PROBLEM	POSSIBLE CAUSE	CORRECTION
Oil brake slipping or drum backspin on fast shift from neutral to forward.	Worn brake plates.	Check the required pressure to release the brake. Replace friction discs and separator plates if pressure is too low.
	Broken belleville spring.	Replace. Refer to Section 4 of Service Manual.
Brake releases before forward clutch engagement	Modulator valve in control valve not functioning.	Check forward modulator valve.
	Low brake release pressure (same as the above).	See “Oil Brake Slipping” troubleshooting item above.
Brake releases before reverse clutch engagement	Modulator valve in control valve not functioning.	Check reverse modulator valve. Adjust or replace as necessary.

(Continued on next page)

Figure 14 Troubleshooting Analysis Chart

PROBLEM	POSSIBLE CAUSE	CORRECTION
Low forward or reverse clutch pressure	Leak in hydraulic system, or loose hydraulic connections.	Visually inspect winch for leaks, and ensure hydraulic connections are secure.
	Leaky clutch circuit.	Perform clutch bleed-down test on clutch circuit.
	Broken or worn seal rings on the bevel gear shaft.	Replace seal rings. **NOTE**: A broken seal ring is the most common cause of a pressure differential between the two clutches. Check preload on clutch/brake shaft and adjust it if necessary to prevent additional breakage of seal rings; refer to Section 4 in Service Manual.
	Damaged bevel gear shaft seal ring grooves.	Check grooves for taper, scoring and rust. Replace or rebuild shaft if surfaces between the inner side of groove and seal ring are not flat.
	Damaged bevel gear shaft bearing retainers.	Check retainer for grooves. Replace retainer if defective, or re-sleeve.
	Damaged clutch piston, piston retainer or O-rings.	Check piston and piston retainer cavity for damage. Always replace both O-rings when clutch is repaired. Refer to Section 4 in Service Manual.
	Reverse pressure hose damaged by bevel gear.	Remove cover and inspect.

(Continued on next page)

Figure 14 Troubleshooting Analysis Chart

PROBLEM	POSSIBLE CAUSE	CORRECTION
Winch will not operate while tracks are turning.	Accumulator system malfunction.	Check for: 1. Proper leakdown time as described in Figure 3-8 of Service Manual. 2. Leaking accumulator valve. 3. Leak in accumulator lines. 4. Damaged or defective accumulators.
	Low oil pressure.	Refer to “Low Oil Pressure” troubleshooting item above.
	Defective PTO shaft.	Inspect PTO shaft and coupling, clutch shaft bevel ring gear and PTO shaft pinion gear for wear or damage. Inspect magnetic suction screen.
Forward or reverse oil clutch not engaging.	Low oil pressure.	See “Low Oil Pressure” troubleshooting item above.
	Low forward or reverse clutch pressure.	See troubleshooting for “Low Forward or Reverse Clutch Pressure” item above.
	Inadequate piston travel.	Remove the access cover and place the winch in gear while visually checking the clutch for piston movement.
	Worn friction discs and separator plates.	Replace the friction discs and separator plates if too thin, scored or distorted. Refer to Section 4 of Service Manual.

(Continued on next page)

Figure 14 Troubleshooting Analysis Chart

PROBLEM	POSSIBLE CAUSE	CORRECTION
Forward or reverse oil clutch not releasing.	Broken or weak release springs.	Check springs and replace as necessary.
	Warped frictions or separators.	Replace as necessary.
	Lube pressure high.	Test and re-set cooling oil relief valve.
Forward clutch engaging or releasing slowly.	Improper orientation of forward clutch and clutch shaft.	Remove and reinstall shaft with proper alignment, see Section 4 of Service Manual.

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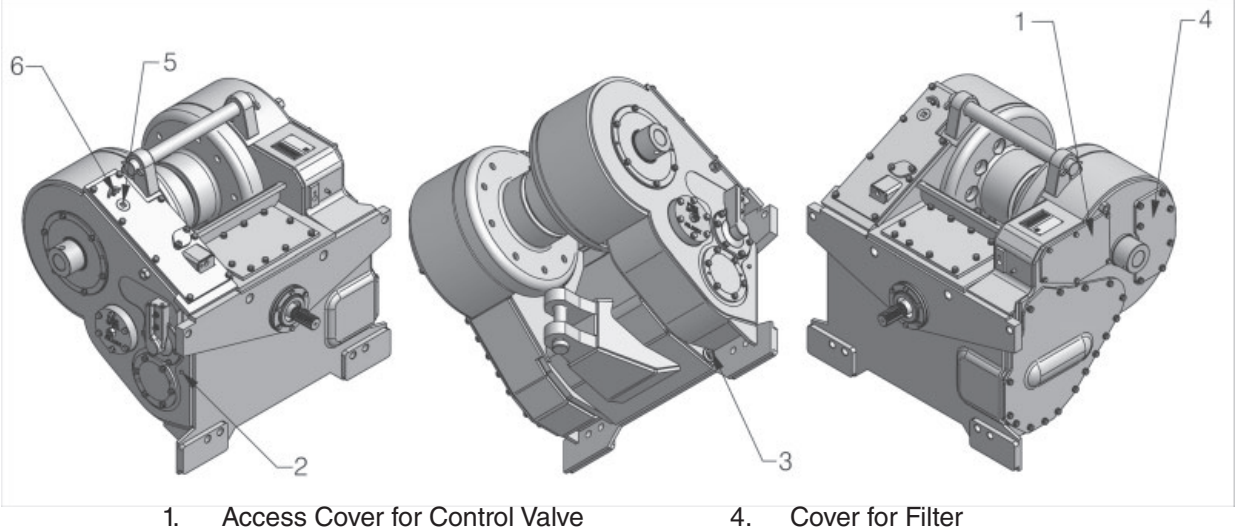
Maintenance

The Maintenance Schedule is a program that includes periodic inspection and lubrication. Use the operating time on the hour meter of the dozer to find the maintenance time for the winch.



1. Access Cover for Control Valve
2. Plug to Check Oil Level
3. Plug to Drain Oil
4. Cover for Filter
5. Fill Plug
6. Breather

Figure 15 Maintenance Points

INTERVAL	PROCEDURE OR QUANTITY	SPECIFICATION
50 hours or weekly	Check oil level at plug (item 2). Add oil as necessary through fill plug (item 5). **Check winch oil level with engine off and dozer on level ground.**	See Figure 8, Recommended Oil List.
	Check winch control lever (cable controls). See Figure 18, Figure 19, and Figure 20.	Use SAE 30 oil on the linkage if needed. Check that the control cable and control housing are fastened correctly. Tighten U-bolts if required.
	Clean the breather (item 6).	Remove debris around breather.
	Lubricate the rollers on the fairlead assembly, if the winch is so equipped.	Use multi-purpose grease with 2-4% molybdenum disulfide.
250 hours or monthly	There may be a gear box fastened to the front of the winch which has a separate oil reservoir. If this gear box lowers the Input shaft of the winch, then the oil level in this gear box must be checked and filled independently of the main winch.	Fill to proper level if low. If oil level cannot be checked, add 1/2 quart. See Figure 17 for details.
500 hours or every 3 months	Clean the oil suction screen and magnets.*	Use a new gasket between the cover and the suction tube.
	Clean the breather.	Remove debris around breather.
	Replace the filter.*	See the Parts Manual for filter element and cover gasket. When replacing, be sure to lubricate filter seal ring between element and filter head.

Figure 16 Maintenance Schedule

(Continued on next page)

INTERVAL	PROCEDURE OR QUANTITY	SPECIFICATION
1000 hours or every 6 months	Change the hydraulic oil. Drain oil from plug (item 3). Clean the oil strainer. Through fill plug (item 5), add 17 gallons (62 liters)†. Check the oil level at item 2.	See Figure 8, Recommended Oil List.
* NOTE: Clean the oil strainer screen and change the oil filter after the first 250 hours on new and rebuilt winches. † Amount of oil may vary slightly with dozer.		

Figure 16 Maintenance Schedule

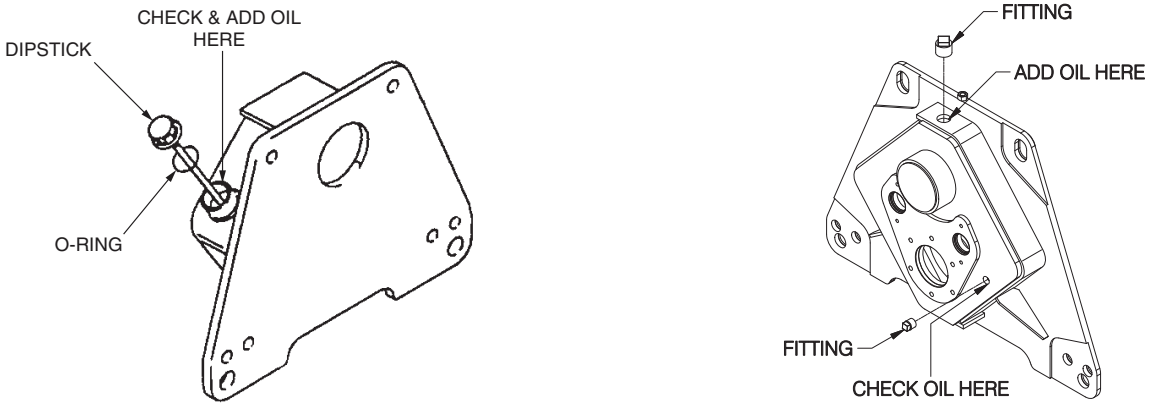


Figure 17 Oil Checking/Adding Points

Control Cable Adjustment

There are three configurations of operator controls normally used on the W6F winch. Check the operation of the power control lever to make sure it moves smoothly and will return to the **BRAKE-ON** position. The power control lever will stay in **BRAKE-OFF** when pushed into **DETENT** position. **Make sure the control lever does not hit the housing at the end of its travel**.

A. See Figure 18. Make sure the positions of the power control lever (Item 2) are the same as the position indicators on the control housing. Remove the two capscrews and raise the cover. Loosen the U-bolt (Item 4) that holds the power control cable (Item 5) in the housing to adjust the power control lever.

Check that the positions of the **FREESPOOL** control lever (Item 1) are the same as the position indicators on the control housing. Loosen the U-Bolt (Item 4) that holds the freespool control cable (Item 3) in the housing to adjust the freespool control lever. The linkage and cable must be adjusted so that the **FREESPOOL** shifter mechanism will slide the drum pinion gear to both positions. Both positions have a detent.

Install the cover when the adjustments are complete.

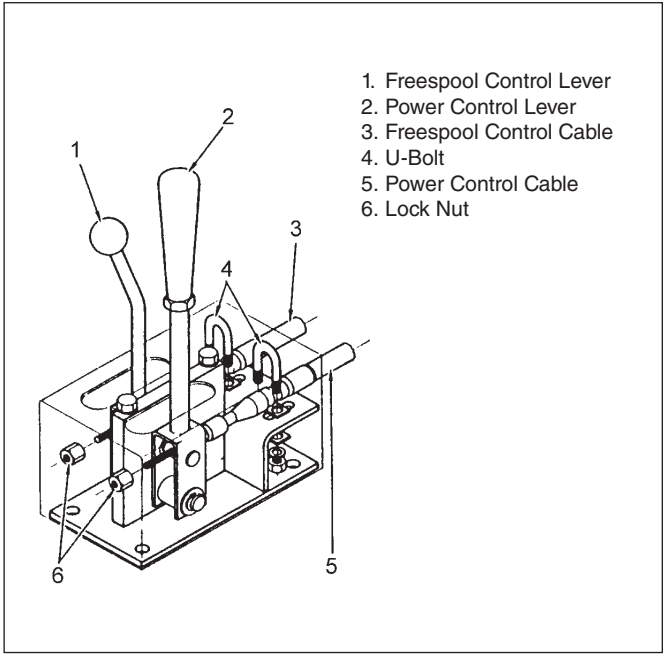
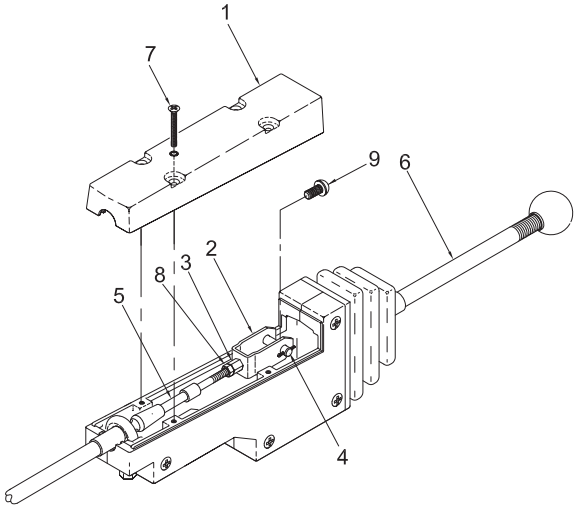


Figure 18 Control Cable Adjustments

B. See Figure 19. Make sure the positions of the power control lever are the same as the position indicators on the decal. Remove the access cover (Item 1) on the housing to make adjustments. Loosen the jam nut (Item 8) that keeps the tall nut (Item 3) from turning. Remove the cotter pin and link pin (Item 4) from the clevis (Item 2). Turn the tall nut and clevis to adjust the length of the control cable (Item 5). Use the link pin and cotter pin to connect the clevis to the control handle again and check the operation. When the adjustment is complete, tighten the jam nut and install the access cover.

Check that the positions of the **FREESPOOL** control lever are the same as the position indicators on the decal. Remove the access cover on the housing. Loosen the nut that keeps the tall nut from turning. Remove the cotter pin and link pin from the clevis. Turn the tall nut and clevis to adjust the length of the control cable. Use the link pin and cotter pin to connect the clevis to the control handle again and check the operation. The linkage and cable must be adjusted so that the **FREESPOOL** shifter mechanism will slide the drum pinion gear to both positions. Both positions have a detent. When the adjustment is complete, tighten the jam nuts and install the cover.



1. Access Cover
2. Clevis
3. Tall Nut
4. Cotter Pin and Link Pin
5. Control Cable
6. Control Lever
7. Screw
8. Jam Nut
9. Button Head Capscrew

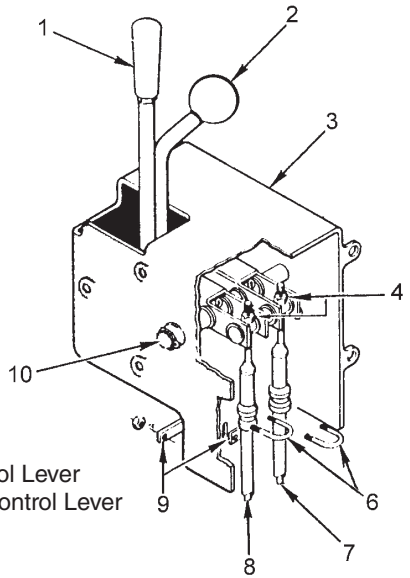
Figure 19 Control Cable Adjustments

C. See Figure 20. This configuration was last used during 1993.

Check the operation of the power control lever (Item 1) to make sure it moves smoothly and will return to the **BRAKE-ON** position. The power control lever will stay in the **BRAKE-OFF** position when pushed into the detent position.

Check that the positions of the power control lever are the same as the position indicators on the control housing (Item 3). Loosen the U-bolt (Item 6) that holds the power control cable (Item 8) in the housing to adjust the control lever. **Make sure the control lever does not hit the housing at the end of its travel.** Check the operation of the **FREESPOOL** lever (Item 2) for smooth operation. Each of the two positions has detent.

Make sure the positions of the **FREESPOOL** lever are the same as the position indicators on the control housing. Loosen the U-bolt that holds the freespool control cable (Item 7) in the housing to adjust the control lever. The linkage and cable must be adjusted so that the **FREESPOOL** shifter mechanism will slide the drum pinion gear to both positions. Both positions have a detent.



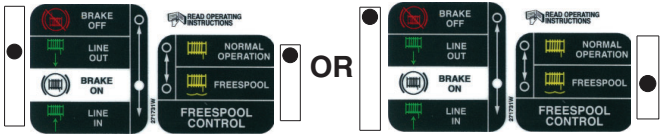
1. Power Control Lever
2. Freespool Control Lever
3. Housing
4. Locknut
6. U-Bolt
7. Freespool Control Cable
8. Power Control Cable
9. Spacer
10. Pivot Pin

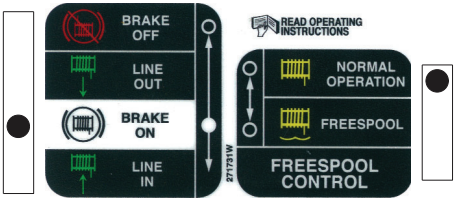
Figure 20 Control Cable Adjustments

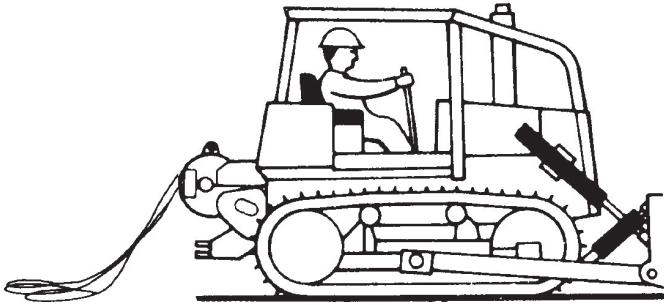
Operating Techniques

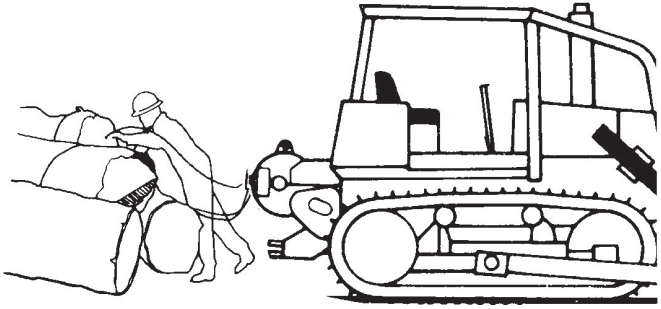
Dozer or Skidder Operation

Note: Black dots indicate the position of the control levers.



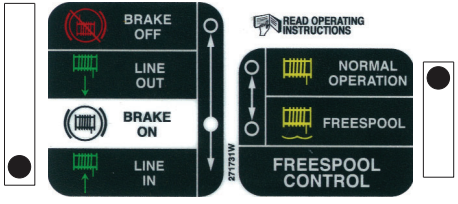


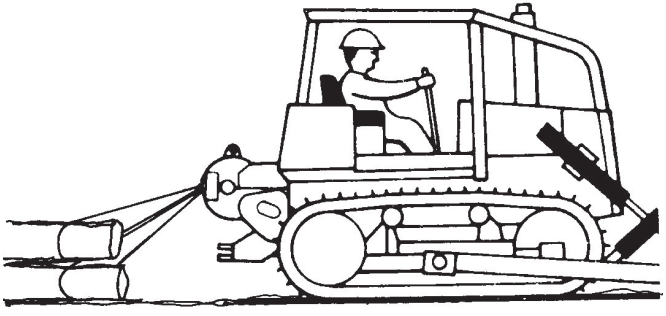




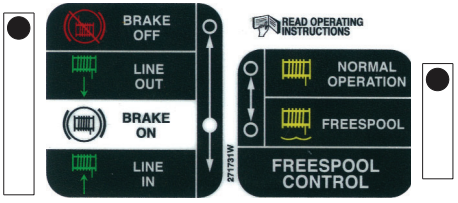
Step 1. The dozer or skidder is moved to an area where a load will be connected. The operator moves the power control lever to the **LINE-OUT** or the **FREESPOOL** control lever into **FREESPOOL** position so that the wire rope can be pulled from the winch drum.

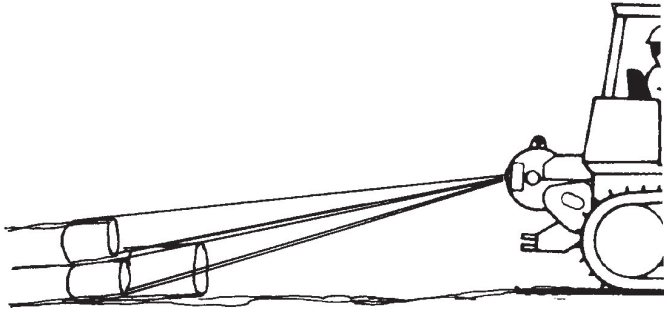
Step 2. A load (logs) is connected to the wire rope. The operator moves the **FREESPOOL** control lever to the **NORMAL OPERATION** position.



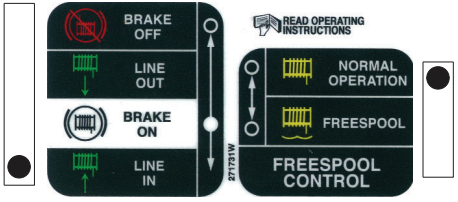


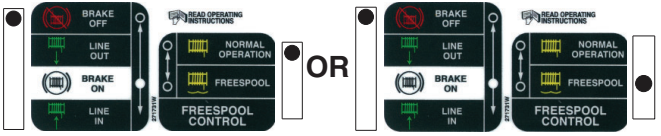
Step 3. The operator can move the control lever to the **LINE-IN** position. If the load is less than approximately 75% of the maximum line pull, the operator can begin traveling with the vehicle at the same time. The winch will wind the load toward the vehicle as it travels. If the load is nearly the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

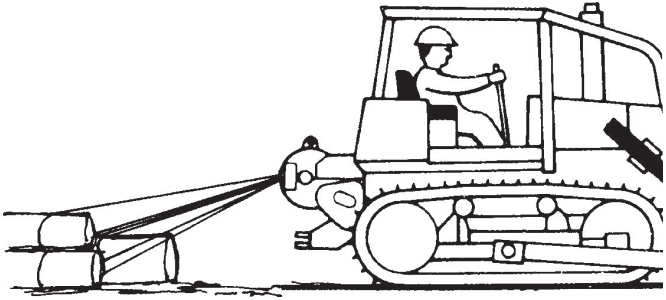




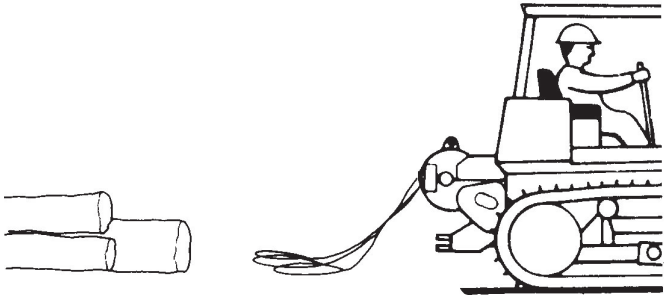
Step 4. If the dozer or skidder must travel through an area with bad traction conditions, the operator can move the control lever to the **BRAKE-OFF** (DETENT) position. This procedure will permit the vehicle to move through the bad traction area without pulling the load at the same time.







Step 5. When the vehicle is on firm ground, the operator can move the control lever to **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 levers are moved to the **BRAKE-OFF** (DETENT) or **FREESPOOL** positions to loosen the wire rope. 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 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. Use the **LINE-IN** control lever 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. 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 tracks or drive wheels on the vehicle stop turning, 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.**

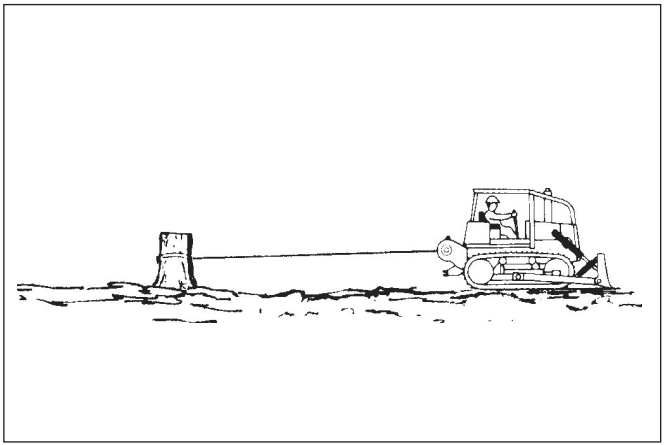


Figure 21 Moving a Disabled Vehicle (Step A)

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 a suitable pulling location 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.

1. 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. Use the **LINE-IN** control lever 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.

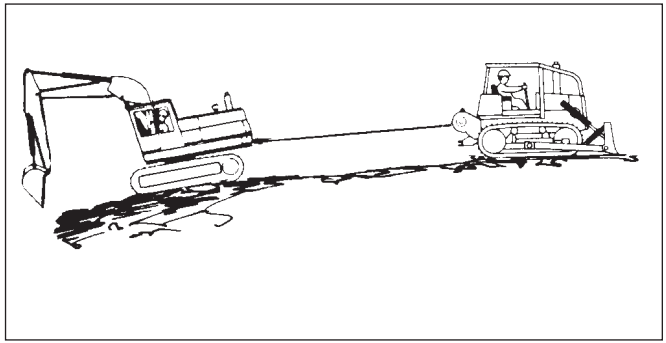


Figure 22 Moving a Disabled Vehicle (Step B)

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 the 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 a position between **BRAKE-ON** and **LINE-OUT** to control the speed of the dozer down the slope.

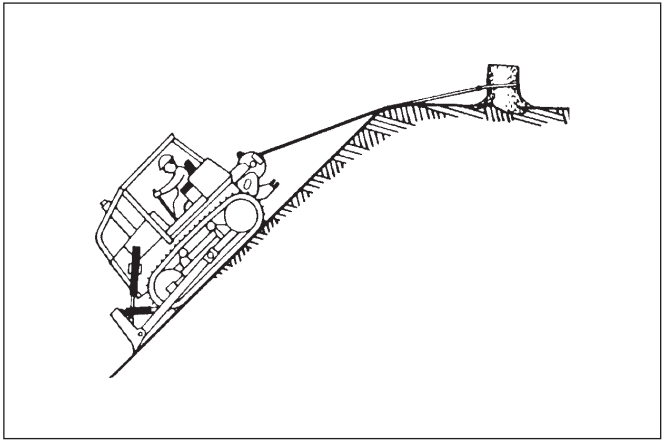


Figure 23 Working on a Steep Slope

B. Moving up the slope:

1. Set the throttle on the dozer for the required engine speed.

2. Use the **LINE-IN** control lever 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 on the winch 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 the **LINE-IN** clutch as necessary and use minimal inching to prevent additional heat and wear. 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.

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.

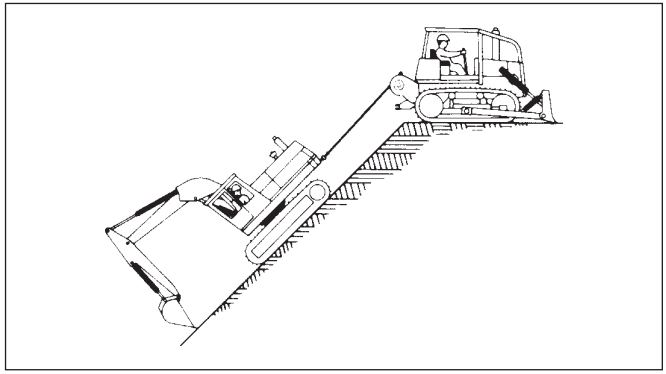


Figure 24 Other Equipment on a Steep Slope

A. Lowering 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 the power control lever in the **LINE-OUT** position to control the lowering of the equipment down the slope.

3. Move the power control lever between **LINE-OUT** and **BRAKE-ON** if inching is required. Use minimum inching to prevent additional heat and wear.

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 the power control lever in the **LINE-IN** position to control the raising of the equipment down the slope.

3. Move the power control lever between **LINE-IN** and **BRAKE-ON** if inching is required. Use minimal inching to prevent additional heat and wear.

4. 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.

Operational Differences, Optional Equipment

Integral Arch

When using an integral arch, the wire rope is routed over a raised horizontal roller and through a set of smaller vertical side rollers and an upper horizontal roller. This enables the winch to pull upwards versus horizontally on loads. In this way, the load can be lifted slightly to reduce drag due to ground contact. The side and top rollers act as fairleads to protect the wire rope from damage and from damaging the frame.

Because the line of action of the wire rope is higher than normal, the tipping moment applied to the dozer is increased, and the dozer will tip backwards at significantly lower line pulls. The operator must exercise care to not pull more than the dozer can handle stably, especially on side slopes.

Line pulls through the arch also exert higher loads on the fasteners holding the winch to the dozer. For this reason, the wire rope diameter is limited. See page 5 for detail.

Fairlead

A fairlead consists of a set of top and bottom horizontal rollers and side rollers that the wire rope is fed through. With this attachment, if the direction of line pull is not within the small window of the fairlead, then the wire rope is pulled across one of the fairlead rollers instead of across the frame, thus protecting both the frame and the wire rope from excessive wear.

Stability of the dozer is affected somewhat by the fact that the fairlead rollers are more rearward than the drum, thus putting slightly more moment on the dozer during side pulls. The operator must take care to assure stability on slopes.

Optional Gear Ratios

Lower speed ratios allow better operator control of line speed. They may also allow the winch to pull in excess of wire rope or winch rated capacity. They do not increase the durability or damaging load limit of the winch. Line pulls in excess of rated capacity will dramatically reduce the life of winch components.

FREESPOOL

For winches equipped with the **FREESPOOL** option, a sliding sleeve with splines engages the drum pinion gear and the intermediate gear. When the control lever is in the **FREESPOOL** position, the sliding sleeve disengages the drum pinion gear from the intermediate gear. The gear train is disengaged from the clutch and brake shaft so that the wire rope can be pulled from the drum by hand. Only the drum and drum pinion gear rotate when the wire rope is pulled from the drum during a **FREESPOOL** operation.

⚠ CAUTION

Shifting to FREESPOOL with a suspended load on the wire rope will cause the load to fall uncontrollably.

Extended Heavy Duty Drawbar

Optional extended heavy duty drawbars are available which increase the capacity of the drawbar and/or move the pin farther back so it is not under the winch drum.

⚠ CAUTION

Do not used the drawbar as an anchor point for a multipart line from the winch.

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