Allied® WINCH

OPERATION, PARTS & MAINTENANCE MANUAL

For Allied Hydraulic Winch

Lantec Models

200
540
750

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CUSTOMER EDITION

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Safety Precautions

Read, understand and observe the precautions on the following pages to prevent injury to personnel and damage to equipment.

Winch serial number _____

Date put into service _____

LANTEC MODEL 200 · 540 · 750

WINCH

OPERATION

&

MAINTENANCE MANUAL

Model No. _____
Serial No. _____
Assembly No. _____
Installation No. _____
Date Shipped _____

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Some descriptions or illustrations in this manual may show details or attachments that are different from your winch.

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1. INTRODUCTION

To supplement the following descriptions, consult the Winch Assembly Drawing.

1.1. Winch Components

This Allied Winch consists of the following components:

1. Motor – Standard: Special winch gear motor (modified by Allied 12.3 in^3/rev.)
2. Clutch – Sprag (Cam) type one way
3. Brake – wet multi-disc type
4. Planetary gear reductions – optional ratios available
5. Drive Shaft
6. Winch Drum
7. Winch Housing

This winch is "power in/power out" with equal speed in both directions.

1.2. Winch Specifications

Model	Primary Ratio	Secondary Ratio	Final Ratio	Total Ratio	Drum Speed (rpm)*	Drum Torque (lbf-in)
200	8.00:1		6.00:1	48.00:1	33	194,818
201	6.00:1		6.00:1	36.00:1	44	146,114
202	4.18:1		6.00:1	25.09:1	97	101,837
540	8.00:1	4.17:1	4.17:1	139.37:1	11.5	543,052
541	6.00:1	4.17:1	4.17:1	104.53:1	15	407,289
542	4.18:1	4.17:1	4.17:1	72.85:1	22	283,486
750	8.00:1	6.00:1	4.00:1	192.00:1	8	748,105
751	6.00:1	6.00:1	4.00:1	144.00:1	11	561,078
752	4.18:1	6.00:1	4.00:1	100.36:1	16	391,055

Note : *Above performance based on standard WM76-3 hydraulic motor.*
**Drum speed based on 100 gpm.*
Drum torque based on a pressure of 2500 psi.
All speeds can be increased by 33% with flows up to 120 gpm.

2. WINCH OPERATION

The Allied Hydraulic Winch is made up of these basic assemblies:

1. Primary drive: motor mount, spring applied/hydraulically released fail-safe brake, primary planetary reduction
2. Final reduction: 1 or 2 planetary reductions
3. Drum group: winch drum, winch housing, drive shaft

The hydraulic motor drives the sun gear of the primary planetary reduction. The output of this reduction is transmitted by the drive shaft that passes through the center of the winch drum to the sun gear of the final planetary reduction in the final drive gear housing. The output from the final planetary reduction is transmitted directly to the winch drum by a spline connecting the final drive planet hub to the winch drum.

The primary drive also contains a wet multi-disc type brake that runs in hydraulic oil. The brake is connected to the sun gear of the primary planetary reduction by a cam-type overrunning clutch. The brake is held engaged by springs and is released by an annular hydraulic piston. This brake piston is connected to the motor port, which is pressurized during reverse (lowering) rotation, and becomes the exhaust port during forward (hoisting) rotation. In this way the brake is held engaged at all times until the winch is powered in reverse (lowering).

The brake hub forms the outer race of the cam-type overrunning clutch. The shaft of the primary sun gear forms the inner race for the overrunning clutch. When the winch is powered in forward (hoisting) rotation, the overrunning clutch permits the sun gear to run free and the full power from the hydraulic motor is transmitted to the winch drum. When hydraulic oil is supplied to the motor for reverse (lowering) rotation, the overrunning clutch will "lock up" and the motor will not rotate until the pressure builds up and releases the brake sufficiently to permit the primary sun gear and brake plates to rotate together.

The winch can be used to lower any load (up to the designed maximum load) with smooth acceleration and deceleration. This is achieved by the special design of the self-regulating friction brake. When a load is applied to the cable on the winch drum it causes the overrunning clutch to "lock up" and the load is held entirely by the friction brake. In order to lower the load, hydraulic pressure is applied to the reversing side of the motor. The brake piston also senses this pressure, and, when the pressure becomes high enough, the brake releases sufficiently to allow itself to slip. If the load on the winch drum tries to drive the motor faster than the supply of oil will permit (i.e., if the motor tries to act as a pump), the hydraulic pressure will decrease in the brake piston, causing an increase in braking effort. In this way a balanced pressure is supplied to the brake piston according to the load on the winch drum. The speed of the winch in either direction is purely dependent on the volume of oil supplied to the motor through the control valve.

3. INSTALLATION

3.1. Winch Mounting

Allied recommends that the mounting and installation of the winch be carried out by a qualified millwright.

The winch foundation is extremely important for proper winch operation. This foundation must be planar and completely flat, and must be rigid and unyielding under full winch load.

It is important to note that Allied machines and line bores its winch housings, including the winch mounting pads. This is to ensure that the winch mounting pads are planar and parallel to the axial alignment of the winch drum bearings. Therefore, the winch housing must be installed onto a foundation that is within the tolerances specified or the winch drum bearings will become misaligned, causing premature failure.

One method to mount the winch is described below:

1. Sling the winch on its drum and carefully lower it until three of the four winch base pads just contact the foundation.
2. Install mounting bolts, Grade 5 minimum, on the three pads in contact with the foundation and torque them to their correct value. (Refer to a torque chart to determine torque values, which depend on hardware grade, size and pitch.)
   Note: *Hardened flat washers must be used under the bolt heads. DO NOT USE LOCKWASHERS.*
3. Measure any gap between the fourth pad and the foundation with a feeler gauge.
   Note: *The maximum allowed misalignment is 0.002"/ft. from mounting hole to mounting hole on either end of the winch, measuring perpendicular to the drum.*
4. If the misalignment is outside of tolerance then the gap between foundation and the fourth pad must be shimmed to correct this.
5. Once the correct shims are in place, the remaining bolts can be installed and torqued to their correct value.

WARNING

DO NOT WELD TO ANY PART OF THE WINCH.

WARNING

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3.2. Gear Cavity Lubrication

The pour point of the oil should be lower than the lowest expected starting temperature.

The following table gives the recommended viscosity in relation to speed and ambient temperature:

Drum Speed (See Page 1)	**Ambient Temperature**		
	-10° to +15° C +14° to +59° F	0 to +30°C 32 to +86°F	+10° to +50° C +50° to +122° F
Greater than 100 rpm	AGMA 2EP ISO VG68 68 cSt at 40°C	AGMA 4EP ISO VG150 150 cSt at 40°C	AGMA 5EP ISO VG220 220 cSt at 40°C
Less than 100 rpm	AGMA 3EP ISO VG100 100 cSt at 40°C	AGMA 5EP ISO VG220 220 cSt at 40°C	AGMA 6EP ISO VG320 320 cSt at 40°C

Note: *cSt is the same as mm^2/s.*
For special conditions consult factory for recommendations.

The recommended working temperature of the sump should be between 50 and 70 C (122 to 158 F).

The intermittent peak temperature of the sump should be no greater than 95 C (203 F).

The winch gear cavities are filled via the filler plug (fill port "S" in Figure 1). Fill with gear oil until it reaches the filler/level plug. **DO NOT OVERFILL** as this may cause the gear reductions to overheat. Use 85W-140 gear oils containing EP additives, which increase the oil film load carrying capacity of the oil.

The winch gear cavity is supplied with a **VENT** (shown on the right end of Figure 1). It is necessary that the oil sump be vented at the highest possible point above the oil level. If the winch base is mounted non-horizontally, it may be necessary to remove the gear reduction opposite the motor and rotate it to position the vent at the highest point possible.

3.3. Lubrication For Storage

Allied routinely ships winches with a small amount of vaporizing storage oil (oxidization inhibitor) in the drive compartments to protect the components during shipping. This protection is sufficient for temporary storage indoors of up to two weeks prior to startup.

For storage up to *two years indoors* or up to *six months outdoors* the following must be done (refer to Figure 1 for locations of plugs and vents):

If stored outdoors, protect unit from any direct exposure to weather.

Replace vent and any plastic plugs with appropriate metal plugs and O-Rings.

Fill gear cavity to approximately 25% capacity (5 US gallons total) with **Shell VSI circulating oil 68** (or equivalent rust inhibiting vaporizing oil).

Fill brake completely via vent port "Q" with **hydraulic oil.**

Fill brake piston cavity completely via the bleed port with **hydraulic oil.**

Seal off motor ports with steel blanking plates that have gaskets.

Prior to Operation:

- Replace metal plugs with appropriate fittings, including vent.
- Drain gear cavity of rust inhibiting oil and fill with gear oil as per section ***3.2. Lubrication***.

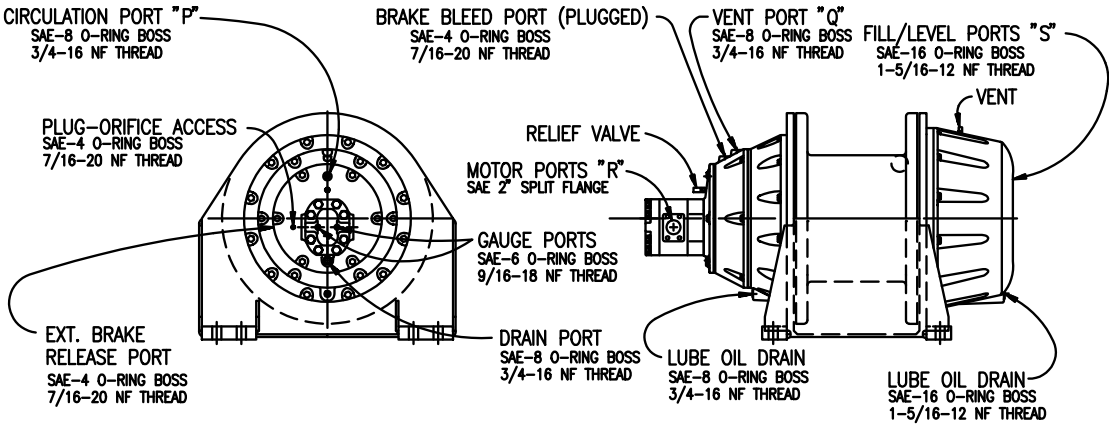

Figure 1

4. HYDRAULIC COMPONENTS

The basic components to be used with the winch (not supplied by Allied Hydraulic Winch) are:

4.1. Pump

The pump used with the winch should be capable of producing the volume of oil at the pressures shown for each model in section ***1.1. Winch Specifications***.

4.2. Control Valve

The control valve used to operate this winch should be a four-way, spring return to neutral, open center valve having a motor spool, with all work ports open to the reservoir when the valve spool is in the neutral position. This control valve should have good metering characteristics in order to provide smooth winch control and have a built-in relief valve suitable for the maximum operating pressure. When the winch control valve is to be installed between the pump and an existing control valve, it will be necessary to use a control valve for the winch that has a "high pressure carryover" or "power beyond" port.

4.3. Hoses

Special consideration should be given to hose size and length depending on the oil flow characteristics to the winch. Following is a table that outlines the requirements:

Hose Requirements		
Oil Flow	**Pressure Lines Inside Diameter**	**Return Lines Inside Diameter**
95-140 gpm (360-530 l/min)	2.00″ (51mm)	2.25″ (57mm)
70-94 gpm (265-359 l/min)	1.50″ (38mm)	1.75″ (44mm)
45-69 gpm (170-264 l/min)	1.25″ (32mm)	1.50″ (38mm)

Note: *The sizes shown in the table are to be used as a guide only. If trouble is experienced due to excessively long hoses, it will be necessary to use hoses one size larger than listed above.*

The line from port "Q" should have a hose with an inner diameter of at least ¾″ (19mm) (see Figure 1).

4.4. Filter

When these winches are installed with their own hydraulic system or when there is no filter in the existing circuit, a partial flow micro-filter should be installed between the control valve and the reservoir. This should trap particles over 10 microns in size.

4.5. Hydraulic Oils

Allied Hydraulic Winch makes the following recommendations concerning hydraulic oils:

1. Anti-wear type hydraulic oils. These oils are generally developed and evaluated on the basis of pump wear tests such as ASTM-D2882. These oils offer superior protection against pump and motor wear. They also provide good demulsibility as well as protection against rust.

2. Automotive type engine oils having letter designation "SC," "SD" or "SE." These oils in the 10W viscosity range are excellent for severe hydraulic service where the ambient air has low humidity.

4.6. Hydraulic Circuit

In order to cool the brake and remove contaminants, oil is normally circulated through the brake housing by means of internal circulation that leaves from port "Q." The hose from port "Q" may be a low pressure hose with "push on" fittings and must go directly to the reservoir.

Note: *Port "Q" should be located within 15 degrees of vertical, to ensure that the housing is filled with hydraulic oil at all times. If the winch base is mounted non-horizontally, it may be necessary to remove the brake and rotate it to position the vent within 15 degrees of the vertical.*

The basic hydraulic schematic illustrated in Figure 2 is for all applications. Review section ***4.7. LOWERING APPLICATIONS*** to determine whether external oil circulation is required for your installation.

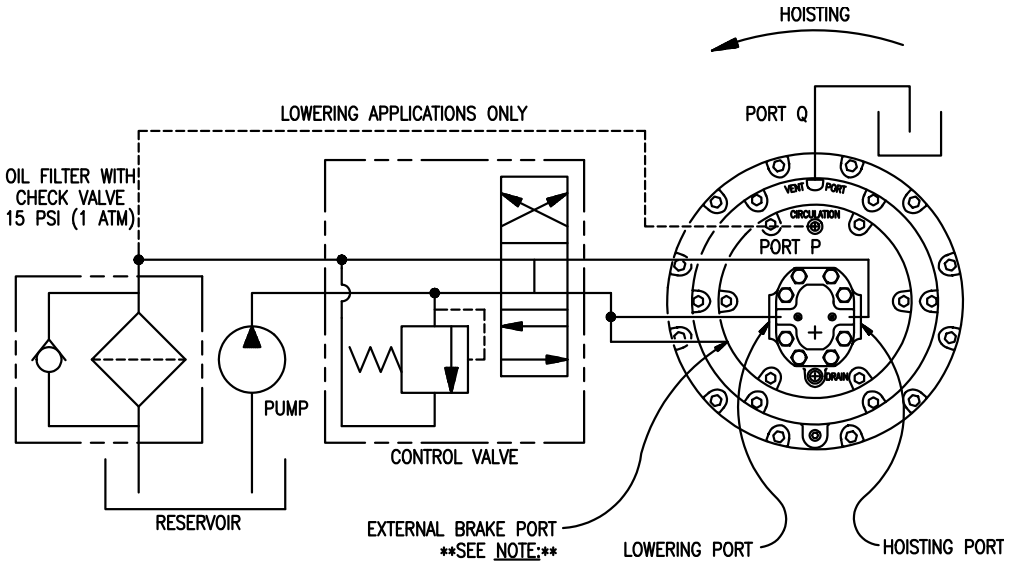

Figure 2

Note: *Configuration of external brake port shown above on Figure 2 coincides with Trouble Shooting in Section 8. Brake port is not connected externally with standard motor. For any other brake release configurations, parts of Section 8* ***may not*** *apply.*

The hydraulic schematic in Figure 2 shows a partial flow micro-filter being used to both filter the oil and create backpressure to cause circulation through the brake housing.

The filter should be installed close to the reservoir and the circulating line to port "P" should be connected from a point close to the oil filter as shown. Port "Q" should be connected directly to the reservoir as shown (below the oil level).

4.7. Lowering Applications

A candidate for external oil circulation is an application that requires lowering of a load for a period of more than five minutes. If you require assistance in determining the amount of oil required for circulation, contact the factory.

The oil should be circulated through the brake housing via the circulation port marked "P" and out through the vent port marked "Q" (refer to Figure 1).

Note: *Raised cast letters have been used to clearly identify these two ports on the winch*.

The hoses used for these two lines can be "push on" type low-pressure hoses.

CAUTION

THE PRESSURE IN THE BRAKE HOUSING DUE TO CIRCULATING OIL MUST NOT EXCEED 10 PSI (0.7 ATM). EXCESSIVE PRESSURES WILL DAMAGE THE OIL SEALS.

Once the hydraulic circuit has been completed, bleed all air from the brake housing before running the drive (refer to ***6.1. Bleeding Brake System*** for instructions).

For installations where the amount of heat absorbed by the oil is greater than the cooling capacity of the reservoir and the other components, it is necessary to install a heat exchanger. The temperature of oil at any point in the system must not be allowed to exceed 180° F (82° C). It is recommended that the pump inlet temperature be limited to 130° F (54° C). Definite operational advantages will be obtained by operating below 130° F (54° C).

In order to obtain smooth control during low speed lowering, it is recommended that the hydraulic pump be operated at maximum speed.

5. START-UP PROCEDURE

DO NOT operate the winch until all conditions in previous sections have been completed.

- Disconnect hoses at motor ports and fill with oil to ensure lubrication while motor first turns over. Reconnect hoses.
- Set main relief valve to approximate 1000 psi (70 atm) to avoid chance of immediate danger to motor and system in case of incorrect hook-up.
- Run motor for 2 to 3 minutes in hoisting direction with no load to check that everything is functioning correctly. The pressure at the hoisting port of the motor should be approximately 30-180 psi (2-12atm)
- Operate motor for 2 to 3 minutes in lowering direction with no load. The pressure at the lowering port of the motor should be approximately 700-800 psi (48-54 atm).
- Bleed brake piston of air (refer to ***6.1. Bleeding Brake System*** for instructions).
- Check that oil circulation flow from port "P" is between 2 and 3 gpm and that the pressure at port "P" (refer to Figure 1) is less than 10 psi (0.7 atm).
- Check that when the control valve is placed in the neutral position after operating in the lowering direction, the pressure at either motor port returns immediately to zero (i.e., oil returns to tank and brake is applied).
- Set the main relief valve at to the design relief pressure.

WARNING

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6. SERVICE AND GENERAL MAINTENANCE

Once per week the following tasks should be performed:

- Check gear cavity lubricant level; fill as required.
- Check for leaks.
- Check the gear cavity vent periodically for cleanliness, especially in dirty or dusty conditions.

6.1. Bleeding Brake System (Removing Air)

Bleeding the brake system is to be performed as required by the startup or service procedures given in this manual.

Bleed the pressure release circuit of the brake by pressurizing it, then cracking open the top port fitting, allowing air to escape. Repeat until all air has been removed.

6.2. Gear Lubrication Schedule

The first gear oil change is to be done after **300 hours** of operation. Subsequently, the oil should be replaced every 500 hours of operation or annually, depending on working conditions.

It is recommended to have an oil analysis performed every six months to evaluate the oil's condition. Retain analysis statements for warranty records.

When operating the winch continuously at high temperatures and/or in dusty or dirty atmospheres, oil analyses should be performed frequently as directed by the lubricant manufacturer.

If oil analysis indicates a potential problem, it is recommended that the winch be disassembled, inspected and reassembled as described in ***Section 7. DISASSEMBLY/ASSEMBLY.***

6.3. Maintenance Schedule

Allied recommends the following maintenance be carried out every 12 months or after 500 hours of actual operation, whichever occurs first:

- Disconnect all hydraulic hoses and wire rope. Remove the winch from its base, taking note of its position and any shims used.
- Disassemble the winch per the instructions in ***Section 7***.
- Inspect and replace any worn parts.
- Assemble the winch per instructions in ***Section 7***.
- Refill with **NEW** Lubricating Oil.
- Mount the winch on its foundation, making certain to install any shims in their original position.
- Reconnect hydraulic hoses and wire rope.
- Follow start-up instructions in ***Section 5. START-UP PROCEDURE***.

7. DISASSEMBLY / ASSEMBLY

General Procedure Before Starting

- A clean work area, with dust- and grit-free work bench, should be available.
- Thoroughly clean all parts in a good quality, clean solvent, and air dry.
- Discard all disassembled O-Rings, Oil Seals, Motor Ring Seals, Teflon Seals, Gasket Seals, and replace with new, well-greased parts.
- See Winch Assembly drawing for Seal Kit part number.

7.1. Removal Of Motor Assembly

- Drain oil from Brake Housing

CAUTION

PART IS UNDER SPRING LOAD.

- Unless the Motor has been diagnosed as requiring service or repair, remove the Motor complete with Motor Adapter as instructed in the following:
  - Unscrew the 6 hex head capscrews one or two turns at a time in sequence, until the load on the brake springs is removed.
  - Remove capscrews and washers and discard O-Rings.

- Scribe a straight diagonal line across the three different sections of the motor to ensure correct alignment of parts during reassembly. Alternatively, stamp the different sections of the motor adjacent to the joint. The markings should be the same on either side of the joint, but different for each section. Refer to Figure 3.

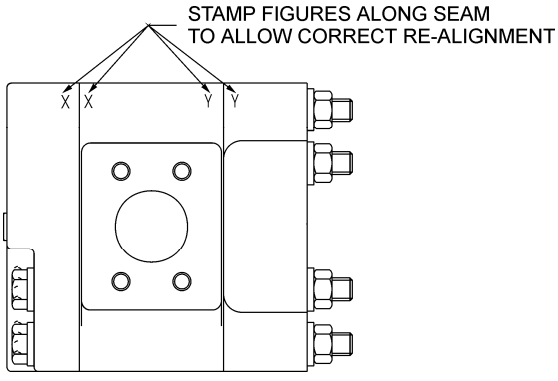

Figure 3

7.2. Disassembly Of Standard Motor

Following removal of Motor, proceed as follows:

Note: *Be sure scribed diagonal line or stamped marks are visible on all motor sections before proceeding. Restamp parts, if required, to ensure correct alignment of parts on assembly.*

- Remove the hex head capscrews along with their hardened steel washers from the motor.
- Pry loose and remove the Port End Cover along with the Bearings and Ring Seal, being careful not to damage the machined surfaces. Leave the Dowel Pins in whichever part they remain.

  Pry loose and remove the Gear Housing. Remove the Drive and Driven Gears. The Gears must be kept together because they are a "Matched Set".
  Note: *For nonstandard motor consult nearest dealer*.

7.3. Assembly Of Motor

- Check for any burrs that may have resulted from the disassembly of the motor. Stone off surfaces with a medium grit carborundum stone, then thoroughly clean each surface.
- Insert new Ring Seal and Bearing into Shaft End Cover. Next install Teflon Seal and Thrust Plate.
- Insert the Matched Gear Set, making sure they are assembled the same way as they were disassembled.
- Insert the new greased Gasket Seals into the grooves on both sides of the Gear Housing.
- Slide the Gear Housing over the Gear Set and tap gently into position with a soft hammer. Double-check "Index Stamped Numbers" for correct alignment.
- Insert new Ring Seal, Bearings, Teflon Seals and Thrust Plate into Port End Cover and tap lightly into place, using a soft hammer.
- Finally thread the 8 Capscrews (with hardened washers) into the Motor Adapter and snug up in diagonally opposite sequence. Rotate the Winch Shaft with a 6" wrench to make sure there is no binding in the motor.
- After the fasteners are tight and you are sure there is no internal binding, torque diagonally opposite Fasteners to 200 lb. ft. (270 Nm). Repeat this until all fasteners have the proper torque.

7.4. Disassembly Of Brake

Following removal of the Brake, proceed as follows:

- Remove Sun Gear Shaft complete with Ball Bearing, Brake Hub and Sprag Assembly.
  Note: *Three 1/2-13NC tapped holes are provided in the Brake Piston to facilitate easy removal.*
- Friction and Divider Plates and Spacer Ring can now be removed from the Housing.
  Note: *Be sure to note orientation of Sprag Clutch prior to disassembly. This is determined by the direction of relative rotation between the Brake Hub and Sun Gear Shaft, which causes either freewheel action or lock-up of the two parts.*

- To remove the Brake Hub, Sprag Clutch Assembly and the two Sprag Bearings from the Sun Gear Shaft, the Retaining Ring must first be removed. The Ball Bearing can now be removed if required.

7.5. Assembly Of Brake

- Inspect the sun gear shaft and brake hub in the region where the Sprag clutch runs. If there are any visible signs of wear, indentations or damage (max 0.001" [0.25mm]) they must be replaced. If the sprag clutch is damaged all three pieces must be replaced. Service kits which include the sprag clutch, shaft, hub, spacers, snap rings and bearing will be supplied if the sprag is ordered. Winch model number must be used when ordering a sprag clutch to get the correct shaft with the kit. Drawing 2312552 can be ordered to help identify the kit you may need.

- Reassemble following the reverse procedure of Disassembly and Removal using care to install sprag so that freewheeling occurs in the correct direction.

7.6. Disassembly Of Gear Reductions

Following the removal of Gear Reductions proceed as follows (see Figure 4 below):

- For Primary and Intermediate Reductions, remove Sun Gears, Thrust Bearing Washers, and Spacers, as appropriate.

- Straighten Tabs on Lockwasher, loosen and remove Locknut and Lockwasher on three Planet Pins. Lightly tap Planet Pins out of Hub and remove Planet Gears complete with Bearing Assemblies and Spacers.

- Pull Bearings if required. Note which spacers fit between Bearings and which fit between Hub and Bearing.

  Note: *The disassembly procedure is identical for all Gear Reductions.*

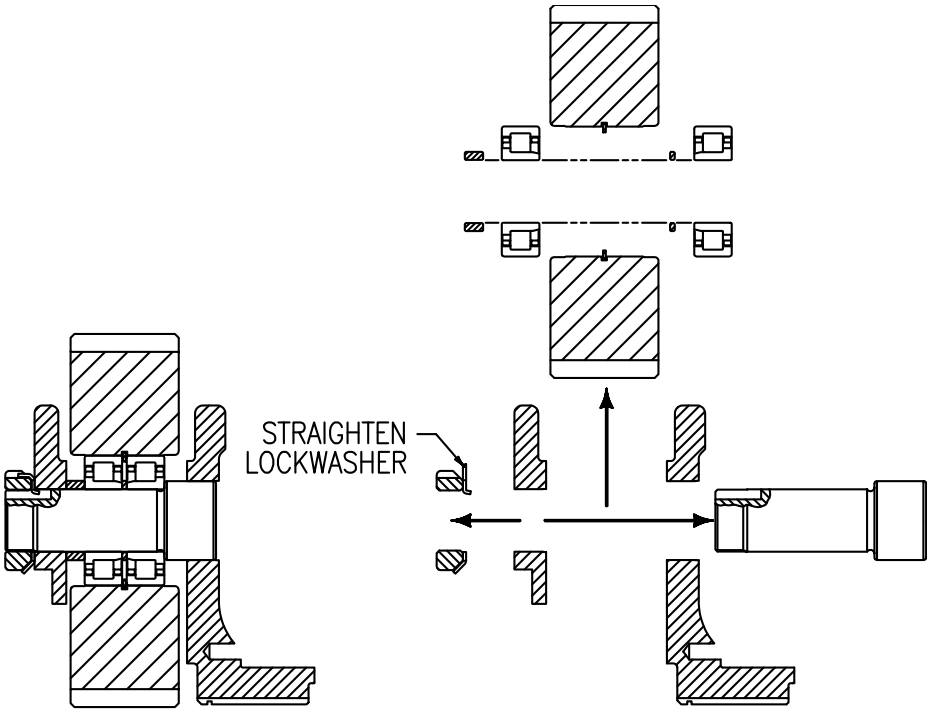

Figure 4

7.7. Adjustment of Drum Bearings

Tighten Adjustment Nut to remove all end play in the Bearings, then loosen Adjustment Nut 1/4 turn. This will give the required 0.020″-0.030″ bearing end play.

8. TROUBLE SHOOTING

8.1 Winch Will Not Pull Load

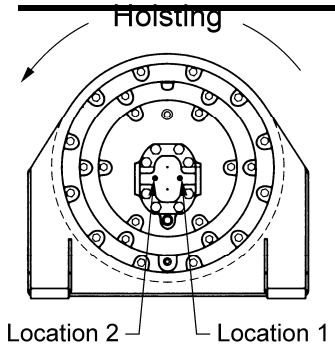

Figure 5

	PROBABLE CAUSE	REMEDY
1.	Relief valve may be set too low.	Install a pressure gauge in location 1 and apply a stall pull on the winch. If pressure is low, increase relief valve setting until recommended pressure is obtained.
2.	Leaky seals in motor.	Repair motor.
3.	If this trouble occurs suddenly after working at maximum pull, a particle of dirt may be lodged under the relief valve, holding it partially open. If this is the cause, a considerable loss in line speed may be noticed as the load on the cable increases.	Remove relief valve, disassemble and clean parts thoroughly in a suitable solvent. Reassemble and install relief valve. Reset pressure according to remedy under Trouble 8.1, Cause 1.
4.	If the pump is belt driven, the belts may be slipping.	Check belts when pump is at full pressure (stall pull on winch). Tighten belts if they are found to be slipping.
5.	The oil level in the reservoir may be too low. The suction line may be restricted or have an air leak causing cavitation at the inlet port. This will cause the pump to make a whining noise.	Check oil level in the reservoir. Check the suction line for damage externally and internally. Replace suction line if necessary.
6.	After all the causes listed above have been investigated and it is found that the winch will stall at maximum pressure without developing the maximum pull on the bare drum, the trouble may be in the winch.	Install a pressure gauge in Location 1 (refer to Figure 5), and apply a stall pull on the winch. If the pressure is up to a maximum and the bare drum line pull is less than the specified line pull, the trouble will be in the winch. Disassemble winch according to disassembly instructions and inspect. Check that all gears turn freely for "winching in" rotation. If gears are found to be satisfactory, inspect the hydraulic motor, according to the service instructions for the hydraulic motor.

8.2 Considerable Reduction In Line Speed

	PROBABLE CAUSE	REMEDY
1.	Same as 8.1, Cause 3.	Same as Remedy 3 of 8.1.
2.	Same as 8.1, Cause 5.	Same as Remedy 5 of 8.1.
3.	If this trouble has increased gradually, the hydraulic pump or winch motor may be worn.	Remove and inspect pump. If satisfactory, consult the disassembly instructions for the winch and remove and inspect the motor according to the service instructions for the hydraulic motor.

8.3 Reverse Speed Is Slower Than Forward Speed

	PROBABLE CAUSE	REMEDY
1.	Control valve may be restricted in its travel.	Check the travel of the control valve spool. The spool travel should be the same in both directions.
2.	Same as 8.1, Cause 1.	Same as Remedy 1 of 8.1.
3.	Hydraulic oil in Brake Housing may be too thick causing a high resistance to rotation at the brake plates and causing the relief valve to by-pass.	Change to a lighter weight oil in the Hydraulic System (and therefore Brake Housing). Check the flow of oil from the vent line of the winch while the winch is run at full speed reverse for 2 or 3 minutes with the outlet circulating line removed. If the flow continues, remove the motor as per disassembly instructions. Disassemble and inspect O-Rings in the brake cylinder according to the service instructions for the hydraulic motor.

8.4 Brake Will Not Hold In Neutral When Pulling a Load

	PROBABLE CAUSE	REMEDY
1.	Control valve is not correct type. The correct control valve must have all ports open to tank when the spool is returned to neutral. See section ***4.2. Control Valve***.	Remove hose lines from control valve and with the spool in neutral, blow air through the cylinder or motor ports. The air should escape through the return port on the valve. If the motor ports in the valve are blocked by the spool when the spool is in neutral, remove the valve and replace with correct valve.
2.	There is excessive back pressure acting on the reverse port of the winch motor. This back pressure is usually caused by the use of a control valve and hoses that are too small. It can also be caused by a restriction in the return line from the control valve to the reservoir.	Install a pressure gauge in Location 2 (refer to Figure 5). Run the pump at its maximum RPM and with the control valve in neutral position, read the pressure gauge. If the pressure is greater than 95 psi (6.5 atm), it is too high. Consult sections ***4.2. Control Valve*** and ***4.3. Hoses*** for the recommended control valve and hose size, and install the correct size if necessary. If the hose and control valve are as recommended, check for restriction in the return line from the control valve to the reservoir.

8.5 Brake Will Not Control Or Stop Load When Lowering

	PROBABLE CAUSE	REMEDY
1.	Same as 8.4, Cause 1 or Cause 2.	Same as Remedy 1 or 2 of 8.4.
2.	Winch is being overloaded.	Install a pressure gauge in Location 1 (refer to Figure 5) and apply a stall pull on the winch. If the pressure is higher than the maximum specified, reduce the pressure.
3.	After the causes listed above have been investigated and found to be satisfactory, the trouble may be found in the winch.	Disassemble the winch assembly according to the disassembly instructions. Inspect the brake springs, brake plate and brake hub assembly. Check that the brake hub assembly will "lock up" in the required direction of rotation.

8.6 Brake Vibrates When Lowering A Load

	PROBABLE CAUSE	REMEDY
1.	Hydraulic pump RPMs too slow.	Operate hydraulic pump at maximum RPM.
2.	Control valve handle being operated too quickly.	Operate the valve smoothly when starting and stopping a load.
3.	Primary and final end assemblies are misaligned.	See section ***3.1. Installation*** for required alignment.
4.	Control valve does not have good metering characteristics.	See section ***4.2. Control Valve*** for control valve specifications.
5.	No oil circulating through the brake housing.	See section ***4.7. Lowering Application*** and ***Section 5, Start-up Procedure***.
6.	Air in the brake housing or brake piston.	See section ***4.7. Lowering Application***.

Notes

Notes

To find a dealer in your area,
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