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OPERATION MANUAL

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RAM WINCH HOIST™

Instructions, Parts and Maintenance Manual

AIR WINCH

MODEL K6UL – K6UL35WF

Warning!

Review* "WINCH OPERATING PRACTICES" *Prior to use.

Always operate, inspect and maintain this winch in accordance with American National Standards Institute Safety Code (ANSI B30.7) and any other applicable safety codes and regulations.

This winch is only a component of the lifting system, which must be designed by qualified personnel.

14603 CHRISMAN HOUSTON, TEXAS 77039 (281) 999-8665 FAX: (281) 999-8666 or (888) 726-5438

TABLE OF CONTENTS

WARNING TAG

Read the latest edition of ASME B30.7. Comply with all Federal, State and local rules.

It is the customer's responsibility to use this winch with adequate factors of safety for the rated load, plus the weight of the winch and attached equipment.

A registered structural engineer should review handling procedures.

! WARNING !

Failure to follow these warnings may result in death, severe injury or property damage:

- *Do not operate this winch before reading the operation and maintenance manual.*
- *Do not lift more than rated load.*
- *Do not allow less than three wraps of wire rope to remain on drum at all times. Operator must stay in view of the winch drum at all times to ensure this.*
- *Do not operate a damaged or malfunctioning winch.*
- *Do not remove or obscure warning labels.*
- *Any labels that become obscured or removed should be replaced as soon as possible.*

GENERAL GUIDELINES FOR SAFE OPERATION

The following warnings and precautions should be taken to ensure safe operating conditions.

Failure to remain alert and keep equipment in good operating condition could result in personal injury or death. To avoid such please read and understand this manual as well as all applicable laws and requirements for safe operation.

Keep a copy of this manual with the equipment at all times.

Be certain all operators of the equipment have been properly trained in the use of the equipment and have read the owners manual thoroughly.

!!WARNING!!

Keep hands, feet and any loose clothing away from rotating or moving parts. Never operate the equipment with any guards or safety equipment removed from winch. Failure to do so may result in injury or death.

When maintaining the equipment be sure to tag *Out of Service* on power supply to prevent accidental operation or activation.

Do not alter or modify the equipment in any way without first contacting **RAM Winch & Hoist** Engineering Department as to the alteration type or extent. Failure to do so could result in damage to the equipment or injury to personnel.

WINCH OPERATING PRACTICES

1. Read the manufacturer's instructions before operating the winch.
2. Always inspect, test maintain and operate this winch in accordance with American National Standards Institute Safety Standards B30.7.
3. Never lift a load greater than the rated line pull of the winch.
4. Use the recommended size wire rope for load to be handled.
5. Never use the wire rope as a sling.
6. Always stand clear of the load.
7. Unless the winch is designed for personnel handling, never use this winch for lifting or lowering people, and never stand on a suspended load.
8. Never carry loads over people.
9. Never disengage the clutch with a load applied to the winch.
10. Never engage the clutch with the winch motor running.
11. Always rig the winch properly and carefully; making certain the wire rope is properly anchored to the drum.
12. Before each shift, check the winch for wear or damage. Check the brakes, wire rope, hooks, guides, mounting bolts, etc. Lift a capacity load or a near capacity load a few inches off the floor and check the ability of the braking system to stop and hold the load without excessive drift, if the winch is being used for lifting.
13. Never operate a winch with a twisted, kinked or damaged wire rope.
14. Periodically inspect the winch thoroughly and replace worn or damaged parts. Keep accurate records of all inspections and repairs.
15. Follow the lubrication instructions provided by the manufacturer.
16. Do not attempt to repair the wire rope or hooks. Replace hooks when there is a 15% increase in the throat opening or when there is a 10% bend as shown by inspection records.
17. Keep the rope clean and well lubricated. Replace wire rope that is frayed.
18. Ease the slack out of the wire rope when starting. Do not jerk the winch.
19. If the drum is exposed to personnel walkways, place a guard over the drum.
20. Do not use your hands to guide the rope onto the drum when winding in the wire rope.
21. Be certain there are no objects in the way of the load or hook when operating the winch.
22. Do not use higher air pressure than recommended by the manufacturer.
23. Use compressed air carefully. Be sure the hose couplings are secure, and make certain a safety chain is provided to avoid hose whip if the coupling fails.
24. Wear proper clothing to avoid entanglement in rotating machinery.
25. Be certain the air supply is shut off before performing maintenance on the winch.
26. Properly secure a winch before leaving it unattended.
27. Do not leave a load suspended for any extended period of time. Never leave a suspended load unattended.
28. Do not allow unqualified personnel to operate a winch.
29. Do not operate a winch if you are not physically fit to do so.
30. Do not divert your attention from the load while operating a winch.
31. Be certain the load is properly seated in the saddle of the hook. Do not tip load the hook as this leads to spreading and eventual failure of the hook.
32. Do not force a hook into place by hammering.
33. Never operate a winch beyond the point where less than four wraps of wire rope remain on the drum.
34. Do not use the wire rope as a ground for welding. Do not attach a welding electrode to a winch or sling.
35. Never operate a winch that makes excessive mechanical noise. Report the problem immediately.

Post at Operating Station

1.0 General Information

1.1 User Responsibility and Safety Precautions

This equipment will perform in conformity with the description thereof, contained in this manual, its accompanying labels and/or inserts when it is installed, operated, maintained and repaired according to the instructions provided. This equipment must be checked periodically.

Deficient equipment should not be used. Parts that are broken, missing, plainly worn, distorted or contaminated should be replaced immediately. Should such repair or replacement become necessary, we recommend that a telephone or written request for service be made to **RAM Winch & Hoist**.

This equipment or any of its parts should not be altered without prior written approval of **RAM Winch & Hoist.** The user of this equipment shall have the sole responsibility for any malfunction that results from improper use, faulty maintenance, damage, improper repairs or alterations made by anyone other than **RAM Winch & Hoist**.

1.2 Introduction

1.2.1 Purpose

The purpose of this manual is to provide operating instructions and maintenance procedures for your **RAM Winch & Hoist** Air Winch.

1.2.2 Model Number, Serial Number and Options

This manual covers the winch built by **RAM Winch & Hoist** for your particular unit.
The model number and serial number are listed on the nameplate attached to the unit.

1.2.3 Warranty

See standard warranty certificate.

1.3 Equipment Description

1.3.1 Capabilities and Limitations

The winch is an air, planetary driven cable-handling unit with manual release and auto release band brake designed for use in the marine or industrial environment.

1.3.2 Specification and Descriptive Data

Working Line Pull	10,000 lbs. SWL full drum at 90 psig(utility rating).
	!! WARNING !! ***Exceeding recommended operating pressure of 90 psig might result in damage to winch and severe injury or death to personnel.***
Cable Capacity	842 ft. of ¾" wire rope.
Line Speed	The line speed is variable from creep to full speed of 70 feet per minute at full drum.
Construction	All steel with steel hardware.
Finish	Sandblasted to near white metal. Primer coated with inorganic zinc to 2-3 mils DFT. Top coated with Carboline marine coating system.
Bearings	See winch parts list and illustration drawing.
Drive System	A piston-type air motor, coupled to a planetary gear reducer.
Controls	Integral to air motor. (See winch parts illustration drawing.)
Braking System	Manually operated band brake type or spring applied pressure release auto band brake.
	!! WARNING !! ***Do not leave loads suspended on winch without operator present. Do not manually release the brake if a load is held suspended by the winch without operator or trained personnel present.***
Performance	Bare drum rating as indicated on winch nameplate is the maximum allowable load.

2.0 Functional Description

2.1 Major Assemblies

The winch consists of the following major assemblies:

a. Drive assembly
b. Frame and drum assembly

2.1.1 Drive Assemblies

The drive assemblies consist of:

a. Air motor to gear reducer assembly
b. Gear reducer to drum assembly

3.0 Installation Instructions

3.1 Site Selection

The winch should be installed in a location that meets the following requirements:

⇒ Firm foundation that allows the unit to be welded or bolted down to withstand a minimum of 5 times the maximum winch line pull.

⇒ Accessibility for the operator.

⇒ Protection from heavy falling objects.

⇒ Near an adequate air supply source.

⇒ As far as possible from the first turn sheave.

⇒ Out of the way of other operations.

3.2 Handling

Lifting the unit on the topside of the frame side plate (via lifting eyes) or under the frame structure will accommodate standard lifts.

**** CAUTION ****

DO NOT LIFT WINCH BY CABLE DRUM - DAMAGE TO CABLE AND/OR BRAKE ASSEMBLY MAY RESULT

3.3 Installation Procedures

3.3.1 Welding / Bolting Down

When the winch is at or near the desired location, remove the shipping protection and position it exactly. If the winch is to be welded down, a qualified welder should be used. All exposed metal surfaces should be painted immediately after welding to inhibit rust.

You must have a qualified engineer determine the amount of weld required to securely hold the winch. If the unit is bolted down, be sure to use the proper size and a minimum of Grade 5 bolts and torque to the proper setting.

7/8-9 UNC Diameter SAE Grade 5 Bolts (Quantity 6)

Torque Values	
Dry Threads	**Lubricated Threads**
430 ft-lbs	260 ft-lbs

These specifications are the recommended assembly torque for grade 5 threaded fasteners with the following qualifications:

1. The torque values shown are for turning the NUT while holding the head of the bolt with a wrench. If the application demands tightening by the bolt head, increase the value shown by 20% (multiple by 1.20). This will allow for the natural torsional twist of the bolt shank.
2. Torque values are calculated at 75% of proof load. This provides a safety factor.
3. All dry torque values are based on the use of through hardened flat washers.
4. Lubricated torque values are calculated based on applying Anti-Seize Compound to the threads before assembly.

The above specifications are referenced from the following organizations: SAE, ASTM, General Motors, Military and Federal Standards.

**** CAUTION ****

Extreme care should be taken to ensure the center of the winch drum exactly perpendicular to the cable running to the first sheave. This can be done by average sightings along the flat surface of the winch sidewall, drum flanges or with the help of a square to find the true perpendicular centerline. If it is not properly aligned, cable-laying problems may create difficulties and possibly damage the cable, winch and/or personnel.

3.3.2 Requirements Prior to Start Up

Fill air motor to proper level with oil. Be certain all hoses and fittings are tightened and not leaking. *See Section 5.0 Preventative Maintenance for Lubrication Schedule.* Check lubricator on air supply line for proper oil level. If low, then fill with 30-wt. oil.

3.4 Installation Checkout

3.4.1 Phase 1 - Installation Inspection

⇒ Check all bolts and fasteners to ensure that they are tightened properly.

⇒ Grease all bearings.

⇒ Test manual brake release / set with no load on the drum to ensure operating properly.

3.4.2 Phase 2 - Start Up and Preliminary Tests

⇒ Leaks - All fittings and hoses have been inspected for leaks at the factory prior to shipment. If leakage is noticed, tighten or replace as required to correct.

⇒ Using correct valve, operate unit to rotate drum and inspect for automatic brake release and free movement of the drum.

3.5 Cable Installation

3.5.1 Cable Termination on Drum

A cable lead-in hole is in the drum to allow termination in the drum. There are two (2) set screws placed in the drum feed thru hole to constrain the cable.

**** CAUTION ****

The set screws are not intended to take a full line pull on the cable. Three or more full wraps of cable must remain on the drum at all times and at any load case.

3.5.2 Spooling Cable onto Drum

Bring the cable under/over the drum and through the slot in the drum wall. Position the cable through the hole and secure the set screws. Handling and wrapping cable on the drum must be attended by a gloved operator to make certain that the cables lie on the drum properly.

The cable must not stack up above the drum flanges or it will fall off the side of the drum and possibly damage the cable. Whenever the equipment is being raised, the winch operator must watch for the end of the cable markings or the equipment itself. Before the equipment gets near the sheave, the operator should stop the winch.

**** CAUTION ****

Spooling of the cable must be done very carefully. To prevent injury, keep hands, clothing and anything that could catch on or get caught in the cable clear when the drum is rotating. This would pull the item or person into the cable spooling on the drum. Since spooling of the cable requires at least two people, an operator and someone to guide and control the cable, they must stay alert and maintain visual contact with each other at all times. We strongly recommend qualified and experienced personnel complete this procedure.

For units with Levelwind, refer to spooling device instructions.

4.0 Operating Instructions

4.1 Operator Start Up

⇒ Ensure the control valve handle is in mid position.

⇒ Check that the air supply is on and functioning properly.

⇒ Open the band brake if the unit has one. If brake is automatic then normal operation of control handle will operate brake.

⇒ Move the control valve handle in the direction of desired operation (payout/retrieve).

When lifting loads, the band brake should be used to help secure the load after lifting.

When lowering the load, the control valve should be operated in the payout direction slightly while loosening the band brake. The band brake will help control the descent rate by the amount of drag allowed.

4.2 Shutdown / Turn Off

⇒ Release winch control handle (The valve handle should return to center or neutral positions.)

⇒ Shut off air supply.

⇒ Tighten band brake.

⇒ Do not shut the unit down with a suspended load that relies on the winch as the only support.

4.3 Brake Release Valve (If Auto Band Brake is supplied)

The brake release valve operates from the Reverse Valve Spool (48). When the control valve handle is shift off center, pilot air is allowed to flow out to the brake for release. When the handle is returned to neutral or center position, pilot air is shut off and allows pilot release pressure to dump or exhaust, allowing the brake to set.

There is a bleeder valve adjustment on the side of the housing that holds the release valve. The valve is set at the factory, but after time and with continuous use, the valve may require some adjustment. This bleeder valve sets the rate at which the brake is released. This gives the winch precise spotting control in the payout mode with rated load.

When the valve handle is in the center position, there should be no air coming out of the release valve to the brake. If there is even a small amount going to the brake, this will prevent the quick exhaust from exhausting the brake air and allowing the brake to set. Adjustment is trial and error and should be done in small increments. If it is adjusted too far, the brake will not release or will release too fast.

5.0 Preventative Maintenance

5.1 Introduction

This section gives necessary information for periodic and preventive maintenance, and for some repairs or replacements. For further information, service assistance or problems, call **RAM Winch & Hoist** Service Department.

5.2 Maintenance Plan

5.2.1 Lubrication Schedule

Under normal operating conditions on a permanent installation, the following lubrication schedule is recommended:

1. The gear reducer is filled with grease (Citgo Lithoplex RT-NLGI No.2 or equal) at the factory. After 500 hours of operation, remove 1 ¼" plug on gear case and check. If unit needs more grease then add thru this hole.

2. Lubricate the bearings with Citgo Lithoplex RT-NLGI No.2 or equal at 50 hour intervals.

3. **WARNING: *Lubricate the motor before operating the winch*. To avoid leakage during shipment the oil is drained from the motor.** A sufficient quantity of oil for filling each unit is packed with the winch. Make certain the proper lubricant is used for each unit. Make certain the oil level plugs and drain plugs are securely threaded in place. Remove the vent cap and oil level plug. Pour the recommended oil into the motor case until it starts to come out the level plug hole. Replace the level plug and vent cap.

Motor Lubrication

Check oil daily and maintain level with opening in the side of the motor case. If the winch is being used more than four (4) hours per day, it may be necessary to check the level more often.

When the winch is subject to temperatures above freezing: After the winch has been idle for several hours or overnight, loosen the drain plug located at the bottom of the motor case and allow the accumulated water to drain out. After draining the water, tighten the plug in the bottom and remove a similar plug on the side of the motor case.

Unscrew the vent cap and pour a sufficient quantity of the recommended oil through this opening to bring the oil level up to the side opening.

When the winch is subject to freezing temperatures: Allow the winch to remain idle long enough for the water content in the motor case to separate from the oil, but not long enough for it to freeze. Drain the water and replenish the oil as above. Should this procedure be impractical, drain the entire contents for the motor case immediately after operation ceases, and pour the oil back into the motor case before resuming operation. If not drained, a sufficient quantity of water will eventually accumulate and the oil splasher will freeze fast.
For temperatures 30° to 80°F (-1.1° to 26.6°C) use SAE 20 or 20W motor oil.
For temperatures below 30°F (-1.1°C) use SAE 10 or 10W motor oil.
For temperatures above 80°F (26.6°C) use SAE 30 motor oil.

**** CAUTION ****
DO NOT LUBRICATE WHILE UNIT IS OPERATING

4. Check the air supply lubricator prior to running and during operation. Do not operate without oil in the lubricator as this may damage the air motor. The lubricator should be set at about 10-15 drops per minute.

LUBRICATION SCHEDULE

LOCATION	TYPE OF LUBRICANT	REPLACEMENT SCHEDULE
Gear Reducer	(Citgo Lithoplex RT-NLGI No.2 or equal)	Once per Year
Air Motor	Oil SAE 30 Wt	As required by usage
Outboard Drum Bearing	(Citgo Lithoplex RT-NLGI No.2 or equal)	Every 200 hours of operation
Air Motor Lubricator	Oil SAE 10 Wt	Daily or as required for heavy use

5.2.2 Cleaning

The winch will last longer and easier to maintain if it is kept relatively free of oil, dirt and rust. Rinsing as often as possible with fresh water will help minimize corrosion.

5.2.3 Cables and Hoses

All hose assemblies in service should be checked periodically for leaks, abrasions, kinks, cover blister or other damage. Assemblies showing signs of wear or damage must be replaced before they cause failure or create a hazard.

5.2.4 Brake Adjustment

To adjust the brake, rotate the Brake Adjusting Nut (127). Threading the nut further down the Brake Adjusting Screw (126) tightens the brake; backing the nut off loosens the brake.

When replacing a Planet Gear Shaft (76), press the damaged shaft from the Rope Drum (72) by inserting a suitable rod through the cored hole in the small-seal end of the rope drum. Press in the new shaft, wide-beveled end first, until the trailing face of the shaft is 2 49/64" from the face of the shaft boss in the rope drum.

When installing any needle-type Bearing (75, 79 or 85), always press the stamped end of the bearing shell.

5.2.5 General Inspection

Frequent inspections should be conducted if the winch is in consistent service. This should be done by operators or personnel trained or qualified to conduct safety, operation and maintenance inspections on the equipment. The equipment should be inspected quarterly for the following:

Fasteners

Check all bolts, nuts, springs, pins, screws, etc. Replace if worn, corroded or broken. Torque all bolts or nuts to proper values according to ASME standards.

Frames, Drum, Bracket and Base

The frames, drums, brackets and base should be inspected for deformation, cracks, corrosion, damage or wear. It may be necessary to disassemble the unit to find additional damage if there is deformation of the frames, base, drum, or flanges of the drum. Replace any of the above items if excessive wear is noticed.

Brakes

Replace the brake band if the lining is worn down to the head of the rivets. Failure to do so could result in a malfunction of the brake and possible damage to the winch, to personnel or to equipment.

Wire Rope

The wire rope should be inspected after each use. Inspect and replace according to the wire rope manufacturer's guidelines.

5.2.6 Bushing Replacement

To replace a Reverse Valve Bushing (42) or a Rotary Valve Bushing (40) use the following instructions:

1. Remove the Valve Chest Cover Cap Screws (58), Valve Chest Cap Screws (60) and Throttle Valve Cap (55).

2. Withdraw the Throttle Valve (50) and Throttle Ball (49). The Throttle Ball may be lifted out with a quantity of sticky grease placed on the end of a rod.

3. Withdraw the Reverse Valve (48) and Rotary Valve (44). A bolt can be threaded into the tapped hole in the valve face to serve as a handle. The Reserve Valve is tapped 1/2" - 13 thread. The Rotary Valve is tapped 5/8" - 11 thread.

4. Thread a HU-932 Valve Chest Jack Bolt, or any 5/8" - 11 thread bolt having at least 4" of thread into the tapped hole in the lug on each side of the Valve Chest (37). Thread the bolt until it contacts the Motor Case (1). Tighten each bolt a fraction of a turn at a time, until the Valve Chest is removed from the Motor Case.

5. Support the face of the Valve Chest that contacts the Motor Case; using an arbor that will clear the Bushings Keys (41), press out the old bushings.

6. Turn the Valve Chest over so that the face that contacts the Motor Case is up.

7. Align the groove in the new Reverse Valve Bushing with the Bushing Key that protrudes into the small bore of the Valve Chest, press in the new Bushing until its leading face is flush with the supported face of the Valve Chest.

8. Align the groove in the new Reserve Valve Bushing with the Bushing Key that protrudes into the large bore of the Valve Chest, press in the new Bushing until its leading face is flush with the supported face of the Valve Chest.

9. Insert the No. 49265 Throttle Valve Stem Reamer or a .627" diameter reamer into the throttle valve chamber and ream the hole through the bushing wall where the Throttle Valve Ball (49) operates.

10. Check the fit of the Reverse Valve (48) in the Reverse Valve Bushing. If tight, ream the Bushing 2.250". **Caution:** ***The Reverse Valve is chrome plated; do not lap.***

11. Check the fit of the Rotary Valve in the Rotary Valve Bushing. If the Valve is tighter than a good fit, lap it in with a mild, fine-grain lapping compound. If the Valve is too tight to lap, ream the Bushing to 2.875".

12. Align the cam groove on the Reverse Valve with the hole through the wall of the Bushing where the Throttle Valve Ball operates.

13. Apply a few drops of light oil to the Throttle Valve Ball and to the stem of the Throttle Valve. Insert the Ball, Valve and Throttle Valve Spring (54) into the valve chamber and retain them with the Throttle Valve Cap (55).

14. Place the Throttle Lever Spring (13) on the Control Arm (15) so that the coil encircles the protruding hub. Rotate the Spring until its lower leg contacts the Throttle Spring Stop Pin (16) which projects from the Control Arm.

15. Install the Throttle Control Arm so that its square socket slides over the square shank of the Reverse Valve, and the Spring legs are on opposite sides of the Stop Pin on the Valve Chest.

6.0 Component Removal / Replacement

Maintenance of the winch consists of determining the defective part and removing and repairing or replacing that component. All work should be done only after the air supply is shut off and tagged *Out of Service*. If needed, consult with **RAM Winch & Hoist** or its nearest trained representative for service.