

COLUMBIA

WINCHES & HOISTS

Manufactured by Allied Power Products, Inc.

AC Electric WK Series Owner's Manual

Installation and Operating Instructions

Model:

Serial Number:

VAC

Ø

Hz

ALLIED POWER PRODUCTS, INC.

THE WINCH & HOIST SPECIALISTS

6590 SW Fallbrook Place, Beaverton, OR 97008

(503) 626-0654 Fax (503) 646-1996

www.alliedpower.com

CAUTION

The final determination as to the suitability of this product for any purpose is solely that of the user.
Columbia products are not to be used to lift people or to lift anything over people.

READ THIS FIRST.

The information in this manual is intended to help ensure your Columbia product is properly installed, operated and maintained.

Although every effort has been made to make this manual complete and understandable, it is not a definitive guide to every possible situation or circumstance.

The proper installation, operation and maintenance of this product is solely the responsibility of the owner.

Safe operation of this product is directly dependent on the operator's skill, knowledge and judgment before, during and after the use of the product.

To avoid hazardous situations, every operator must be knowledgeable about appropriate safety guidelines, codes and regulations related to rigging, wire rope, and winch / hoist usage. Remember that an uninformed or careless operator can make the operation of any equipment dangerous.

Ultimately, the owner / operator must make the final decision as to how this product will be used and whether that intended use is safe.

If, after reading this manual, you have any questions regarding the installation or use of this Columbia product, contact your dealer or the Customer Service Manager of Allied Power Products, Inc. for an answer to your question.

Replacement manuals are available free of charge by writing:

**Allied Power Products, Inc.
6590 SW Fallbrook Place
Beaverton, OR 97008**

THIS MANUAL CONTAINS EXTREMELY IMPORTANT INFORMATION ABOUT THE INSTALLATION AND OPERATION OF YOUR COLUMBIA PRODUCT. FOR YOUR OWN SAFETY, READ THIS MANUAL COMPLETELY PRIOR TO PRODUCT INSTALLATION AND / OR OPERATION.



⚠ WARNING

COLUMBIA PRODUCTS ARE NOT TO BE USED FOR LIFTING PEOPLE OR THINGS OVER PEOPLE.

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Limited Warranty	

Sample Model Number

WK17000-4A12-L-01

A B C D E F G

Model Number Information

When instructions in this manual refer to specific specifications on different models, identify your unit by referring to the model number as shown on the unit nameplate and the front of this manual.

A	H = Hoist, rated for hoisting	W = Winch, rated for pulling
B	Model Series	
C	Model Specification	
D	2A = 230VAC 3Ø 4A = 460VAC 3Ø	
E	12 = 1200 RPM motor speed	
F	L = Low-voltage control model X = Unit supplied without controls	
G	F & G Series -01 = 8" drum -02 = 10" drum -03 = 12.5" drum -23 = Strap drum	
	00 = Custom Drum Configuration	

General Information

Columbia AC winch and hoist assemblies consist of a frame with motor, drum, and controls.

Motor

Standard motors are Totally Enclosed Fan Cooled (TEFC). Duty ratings differ for each model; see 'Operating Instructions' for more information about your unit's duty cycle.

Drum

The drum is attached to the motor through planetary gear reductions to deliver the required pulling capacity and performance.

Low-Voltage Controls

Low-voltage control models include a control box which converts AC input power to a lower voltage for the remote pendant control. The control box and remote pendant control are rated NEMA 4X for indoor or outdoor use.

Ratings and Suitability

Columbia winches and hoists are not to be used to lift, pull, support or otherwise transport people or loads over people. Line pull ratings represent the maximum load that can be placed on a new unit. This load rating varies with the amount of wire rope wound on the drum and is affected by the age and condition of the unit.

WARNING

DO NOT ATTEMPT TO MOVE LOADS GREATER THAN THE RATED CAPACITY.

Even if the unit appears to be able to handle the load, it can cause the unit to fail or create undetectable damage that could cause the unit to fail while using the unit within its rated capacity.

Factors of Operation

Harsh environments decrease the load rating of the unit and make it more susceptible to damage. Avoid installation in extreme temperatures, dirty surroundings and wet environments.

Improper installation can create excessive wear or failure of any of the component parts or fasteners in the unit. Be sure that the unit is properly installed, the fasteners checked for tightness and the mounting inspected for damage on a periodic basis. Use of the unit will create wear in the components. The more frequently it is used and the heavier the load, the greater the strain and wear on the components. This may result in damage that causes a failure over a period of time. Periodic inspection of the unit is the only way to ensure its continued operating capability.

CAUTION

The amount of wire rope on the drum affects the performance of the unit. Line-pull decreases with each additional layer of wire rope wound on the drum. Line-speed increases with each additional layer of wire rope wound on the drum.

Installation Guidelines

The safe installation of this product is solely dependent upon the owner and/or operator's skill, knowledge and judgment. Installation must be done only by those qualified and familiar with all operating guidelines, safety codes and regulations related to rigging, wire rope and winch and/or hoist usage. The determination of suitability for this product for any specific use is the responsibility of the owner and/or operator.

The following guidelines are to be used only as a reference.

Location

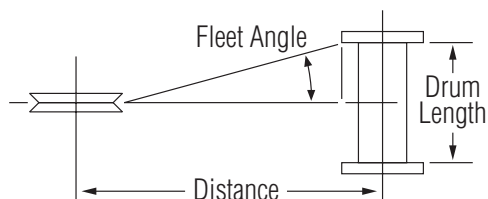
When selecting a location for the unit, the following guidelines must be met:

1. An unobstructed area that keeps the operator and others out of the path of the unit and the path of broken wire rope. Broken wire rope can snap back and cause serious injury to personnel and machinery.
2. A location where it will not interfere with or be damaged by other objects or machinery.
3. A location with adequate lighting and heat for both the operator and unit. Although the unit is rated for operation in temperatures ranging from -50° to $+125^{\circ}$ Fahrenheit, extremes in temperature will affect the performance of the unit.
4. A position near an appropriate power source. Do not install the unit in any area defined as hazardous by the National Electric Code.
5. A location that permits proper fleet angle. Maintaining proper fleet angle allows the wire rope to spool uniformly onto the drum and prevents damage to the wire rope.

Fleet Angle

Proper fleet angle is less than $1\text{-}1/2^{\circ}$ measured as illustrated below (Diagram 1). As a "rule of thumb", the absolute minimum distance from the drum to a fixed sheave should be equal in feet to the drum length in inches. For example, with a drum width of 10 inches, the minimum distance to a fixed sheave should be 10 feet.

Diagram 1



Mounting

The unit must be attached to a rigid and level foundation or support structure that is adequate to support the unit and its load under all load conditions, including shock-loads, without flexing. Three different mounting positions are shown.

⚠ WARNING

Do not attach the unit to wood, sheet rock, or similar type materials.

Compression-Type Mount

If possible, a compression-type mount (unit on top of the mounting plate) should be used. This is the strongest and safest type of mount. There must be adequate clearance for the wire rope to pass without touching the mounting plate.

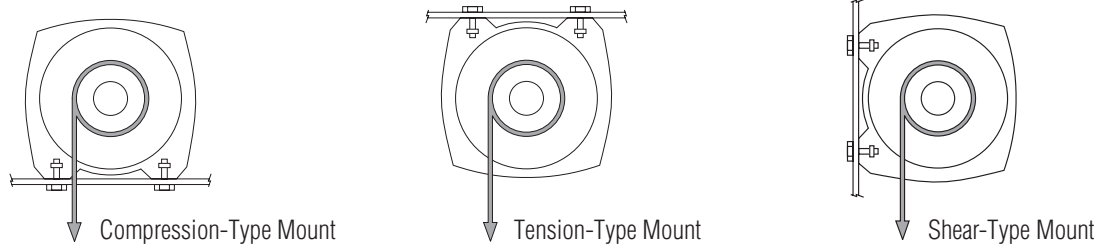
Tension-Type Mount

Use a tension type mount (unit below the mounting plate) when a compression mount is not possible. This is the second best mounting method.

Shear-Type Mount

A shear type mount (unit in front of the plate) is the least desirable. While the strength of this mount exceeds the unit's rated capacity, it has far less tolerance to shock loads that exceed the rated capacity.

Diagram 2



⚠ CAUTION

When using a shear-type mount, an underwound configuration (wire spooling from the underside of the drum) must be utilized.

Regardless of mounting position, the wire rope must be spooled on the drum according to the "Direction of Rotation". Failure to spool wire rope properly on the drum can result in catastrophic failure of the unit.

Tie Rods

Tie rods may be moved to alternate locations for wire rope clearance. At least three tie rods must be used at all times.

Mounting Holes

The mounting hole pattern is of critical importance to the strength of the unit. Mounting holes **must** match the template and/or drawings supplied with this owner's manual. Any deviation from the mounting dimensions or instructions can cause the drum supports to break under load. This can create an unsafe working condition, causing serious injury or property damage.

The unit base **must** be flat in all directions within + 0.020 inches. An uneven base can cause binding, twisting, excessive wear or catastrophic failure of the gear train and ultimately the unit. If necessary, use shim stock to ensure even mounting.

Standard mounting hardware provided is to be used for mounting the unit to fixtures that are 0.5" to 0.625" thick. For mounting to fixtures that fall outside of this thickness increase/decrease the length of the fastener accordingly. Fasteners must meet metric Class 8.8 standards or better and are sized M12 x 1.75. Tighten all mounting hardware to 37 ft-lb [50 N-m].

⚠ WARNING

Do not weld any fastener used for attaching the unit or mounting plate. Welding makes the fasteners brittle and subject to failure even in a no-load situation.

Electrical Guidelines

This Columbia unit is driven by AC power. Input voltage is listed on the front of this manual.

⚠ WARNING

Make sure all electrical power is off before making any electrical connections to existing power sources. Use a qualified electrician for all electrical work.

Make all electrical connections according to the supplied wiring diagram. All applicable local codes and regulations must be followed during installation of the unit. These units are shipped pre-wired to the AC motor and the low-voltage pendant control.

General Safety Precautions

1. Never put any type of cutoff device between the motor and controls. This could result in equipment failure or severe personal injury.
2. Install proper branch circuits, disconnect devices, protection and grounding in accordance with all applicable electric codes and regulations. Amperage and voltage information is listed on the motor name plate.
3. A power shut-off switch must be visible, clearly marked and within 25 feet of the operator. If the unit is permanently wired into a junction box the installation of a master power shut-off is required.
4. Never open the control box with electrical power on or manually operate the relays inside the box. This could cause equipment failure or serious personal injury.
5. Never put any type of cutoff device between the motor, control box and/or pendant control. This could result in equipment failure or severe personal injury.
6. The use of extension cords may adversely affect the function of the unit.

Wire Rope

The wire rope must be spooled on the drum according to the direction or rotation label on the unit or the drum brake will not function.

The wire rope anchor, which attaches the first wrap of the wire rope to the drum, is not designed to hold rated loads. Keep a minimum of five wraps of wire rope on the drum at all times to achieve rated load.

⚠ WARNING

Wire rope must be spooled on under tension before initial use of this unit.
Factory installed wire rope is not spooled on under load.

To correctly spool the wire rope, it is necessary to unwind the wire rope and then rewind the wire rope under load. It is recommended that during the initial tensioning of the wire rope a load of approximately 15% of the rated first layer line pull be used. In the event that tension is taken off the line, the wire rope must be re-tensioned according to the above guidelines.

Operating Instructions

The safe operation of this product is solely dependent upon the owner and/or operator's skill, knowledge and judgment. Only those qualified and familiar with all operating guidelines, safety codes and regulations related to rigging, wire rope and winch and/or hoist usage should operate this unit.

The determination of suitability for this product for any specific use is the responsibility of the owner and/or operator. The following guidelines are to be used only as a reference.

Preparing for Operation

Inspect the condition of all components, including mounting bolts, electrical connections, sheaves, wire rope, hook, rigging, etc.

Verify the line pull required to move your desired load and make sure you do not exceed the load rating of the unit.

Test for proper forward and reverse operation without a load.

Operating the Unit

Ensure that the load is free of objects around it.

Connect the load to hook with a sling or other approved device. Never hook the wire rope around a load and onto itself.

Use the control switch on the pendant intermittently to take up wire rope slack to avoid shock loads, which can momentarily exceed the unit and wire rope rating. Move the load slowly at first to make sure the load is securely attached to the hook.

Do not allow the hook to be any closer than two feet from the drum to prevent damage to the unit and wire rope.

Always inspect and carefully rewind the wire rope after each use. Improperly spooled, kinked or tangled wire rope will damage and shorten the life of the wire rope.

Remote Control Pendant

The remote pendant control is used to "power in" and "power out" the wire rope. Depressing the power in button will cause wire rope to wind on the drum and depressing the power out button will cause wire rope to wind off the drum. Each button is spring-loaded and will automatically return to the 'OFF' position when released. Do not attempt to push both buttons at the same time. If the buttons do not work properly, ***stop using the unit immediately*** and contact your dealer. ***Do not operate the unit*** until the problem is corrected.

Duty Cycle

Do not use these units continuously under any circumstances. Recommended use is 15 minutes out of each hour on an intermittent basis. Continuous duty usage can cause undetectable damage and lead to failure of the brake and motor.

Factors such as altitude, ambient temperature, air quality, fluctuations in voltage, motor cleanliness and the frequency of start/stop cycles all affect the duty cycle.

Braking System

Any time the winch is stopped, the drum brake will automatically engage against the load. Never leave any load unattended without properly securing it.

Free-spool Control

The free-spooling control allows wire rope to be pulled off the drum manually.

DO NOT attempt to disengage the freespool control when there is a load on the wire rope.

DO NOT use the load to assist in pulling cable off the drum.

DO NOT attempt to re-engage the freespool control while the drum is turning.

DO NOT attempt to use the freespool control to stop the drum from turning.

Any of these actions can cause severe damage to or failure of the unit.

Operating Safety Precautions

1. Never touch the wire rope or rigging while another person is at the control switch or at anytime while operating the unit.
2. Never attempt to pull a load with less than five wraps of wire rope around the drum. Fewer wraps could cause the wire rope anchor to break and release the wire rope and load.
3. Keep the operator, assistants and spectators at a safe distance from the wire rope and rigging and out of the path of the load during the lifting operation. If the wire rope breaks or pulls loose under load, it can lash back with enough force to cause property damage, injury or even death.
4. Keep hands away from wire rope and hook while operating the unit. Never let the wire rope slide through your hands. Always wear heavy leather gloves when handling wire rope.
5. Never touch the wire rope or hook while they are under load.

Maintenance

Maintenance of this product is the sole responsibility of the owner and/or operator.

The determination of suitability for this product for any specific use is the responsibility of the owner and/or operator. The following guidelines are to be used only as a reference.

Periodically inspect the unit for general wear and tear. Immediately determine the cause of any change in performance or sound during operation and take corrective action as required.

Keep unit, wire rope and remote control free from contaminants. Use a clean rag or towel to remove any dirt and debris. If necessary, unwind the unit completely, wipe clean, and rewind properly before storage.

Inspect the remote control and/or pendant for damage. Store remote control and/or pendant in a protected, clean, dry area whenever possible.

This unit is of sealed construction. No internal lubrication by the owner is needed for the life of the unit.

Wire Rope

Inspect the wire rope before and after each operation. The life of the wire rope is directly related to the care and use it receives. Wire rope must be replaced when it has one or more of the following defects as defined in the American National Standards Industry Handbook A10.5 or as defined by OSHA:

- Corrosion
- Frayed or broken wire
- Abrasions
- Kinking
- Heat damage
- Any apparent reduction of wire rope diameter

STOP USING THE UNIT AND REPLACE THE WIRE ROPE if any of the defects listed above are discovered.

Using light oil on the wire rope and hook can keep rust and corrosion from forming.

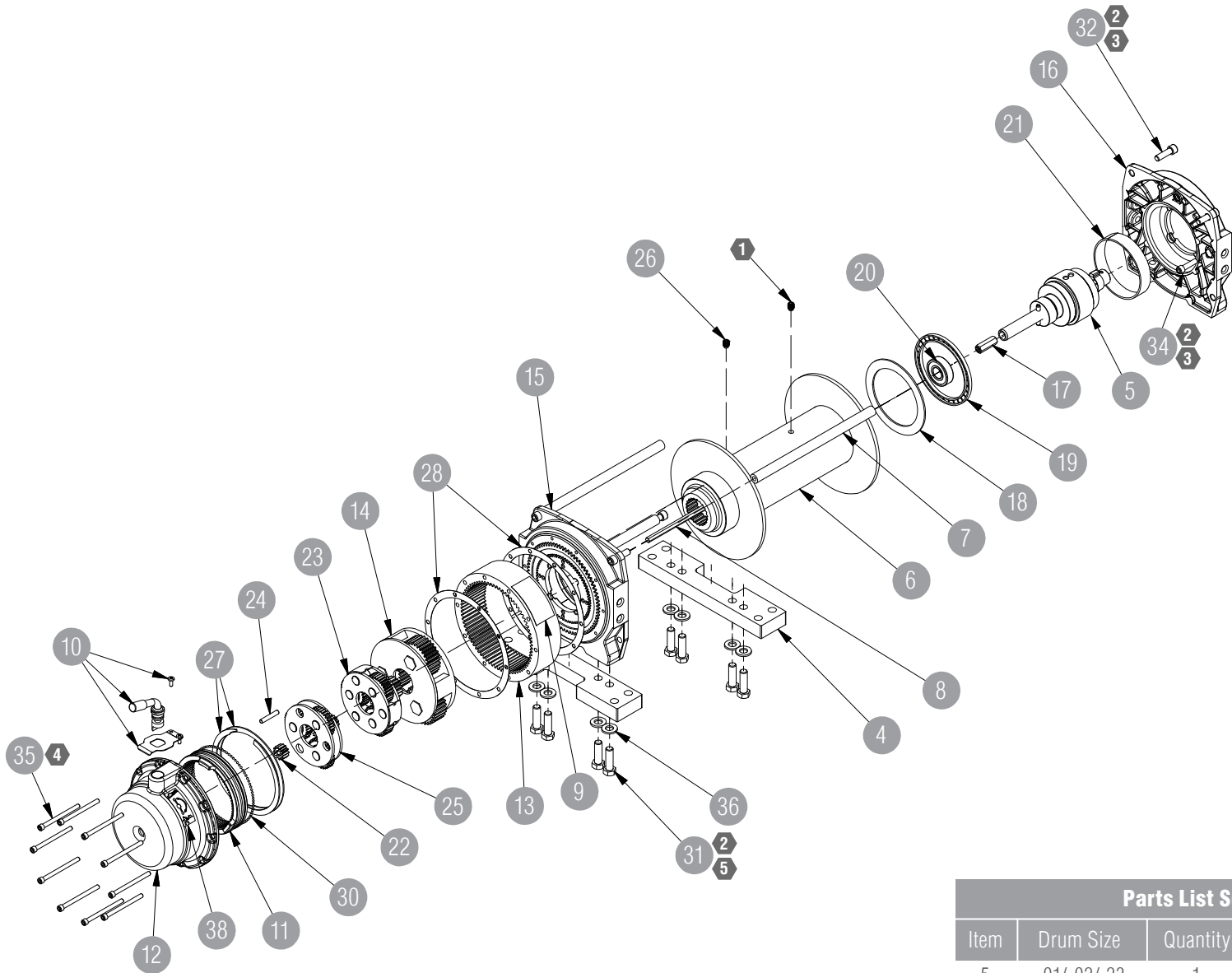
Troubleshooting Guide

General Symptom	Potential Cause
Unit will not produce line pull/line speed as listed.	1. Unit is mounted to an uneven surface.
	2. Cable sheaves or block purchase not turning freely.
	3. Load is constrained.
	4. Inadequate voltage.
Unit overheats prematurely.	1. Environmental factors (altitude, ambient temperature, air quality, fluctuations in voltage, motor cleanliness).
	2. Start/stop cycles too frequent to allow proper spool-up of unit.
	3. Load beyond rated capacity.
Unit does not respond to control input.	1. Limit switch contacts are OPEN.
	2. Unit is not correctly connected to power source.
Drum brake does not hold.	Wire rope wound onto the drum in the wrong direction.
Line stacks against flanges.	1. Unit is not level.
	2. Line leads to a point not in line with the drum.
	3. Distance to cable sheaves, block purchase or load inadequate for proper fleet angle.
Line spools poorly.	1. Line tension was lost.
	2. Wire rope not installed properly.
	3. Tension not adequate to spool wire rope on tightly.
	4. Distance to cable sheaves, block purchase or load inadequate for proper fleet angle.
Unit will lower load, but will not raise load.	1. Load is beyond rated capacity.
	2. Load is constrained.
	3. Upper limit switch contact is OPEN.

COLUMBIA

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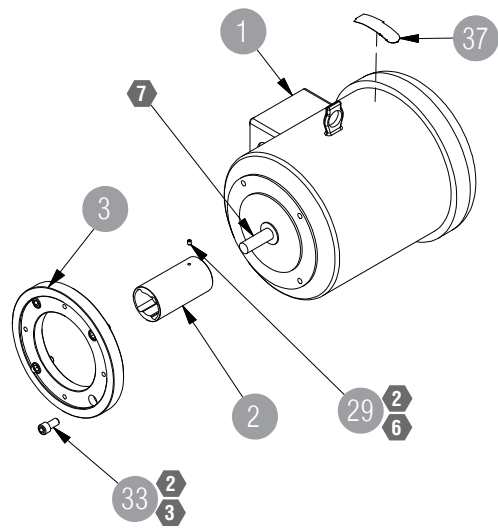


NOTE:

- 1 Included with drum: Install with Loctite 271 (Red) high strength thread locker or equivalent
- 2 Install with Loctite 242 (Blue) medium strength thread locker or equivalent
- 3 Torque to 168 IN-LBS
- 4 Torque to 62 IN-LBS
- 5 Torque to 37 FT-LB
- 6 Snug tight
- 7 Install key supplied with motor with key end flush with shaft end and seated against coupler
- 8 Grease all gears, bearings and drum journals with Aeroshell 33 MS grease

Parts List Sel		
Item	Drum Size	Quantity
5	-01/-02/-23	1
5	-03	1
6	-01	1
6	-02	1
6	-03	1
6	-23	1
7	-01	3
7	-02/-23	3
7	-03	3
8	-01	1
8	-02/-03/-23	1

AC Electric Winch Assembly



Parts List

Item	Quantity	Part Number	Description
1	1		Motor, AC, 3HP, 56C, 1200 RPM
2	1	2A17894R0	Coupler Assembly, Ø5/8 KB, Brake, XFG
3	1	2A18623R0	Adapter, 56-145 SPL, XFG
4	2	2A8499R5	Bracket, Quick Mount, XFG
5	1	See Chart	Assembly, Drum Brake, XFG
6	1	See Chart	Weldment, Drum, XFG
7	3	See Chart	Tie Rod, XFG
8	1	See Chart	Hex Shaft
9	1	2A16154R0	Label, Columbia Unit
10	1	03-39928	Clutch Lever Assembly, CCW, XFG
11	1	03-92247	Gear, Winch Clutch, XFG
12	1	03-34987	Gear End Housing, WK
13	1	03-65936	Ring Gear, XG
14	1	03-65933	Assembly, Carrier (6.00:1)
15	1	03-31675	Drum Support, XFG
16	1	2A18620R0	Drum Support, Ø5.75 BC, XFG
17	1	03-30329	Adapter, 1/2 Hex to 5/16 Hex
18	2	03-30277	Washer, Thrust, XFG
19	2	03-30275	Seal, Drum, XFG
20	1	03-31672	Ball Bearing with Tolerance Ring, XFG
21	2	03-30274	Bushing, Drum, XFG
22	1	03-32437	Sun Gear, 12T, WK
23	1	03-61738	Carrier Assy Stage 2
24	1	03-16086	FS Retainer, XG
25	1	03-61739	Carrier Assy Stage 1
26	1	03-36974	Set Screw - Ext Point, M10-1.5x12
27	2	03-15581	Retaining Ring
28	2	03-14964	Gasket, XFG
29	1	91375A238	Set Screw - Cup Point, #10-24x1/4, B0
30	1	03-22350	Steel Balls, 85x
31	8		HHCS, M12-1.75x40, PLTD
32	6		SHCS, 3/8-16x1-1/4, PLTD
33	4		SHCS, 3/8-16x3/4, PLTD
34	4		SHCS, 5/16-18X1-1/4, PLTD
35	10		SHCS, 1/4-20X3-1/4, PLTD
36	8		FW, M12, PLTD
37	1	2A14472R0	Decal, 3", Columbia Winches & Hoists
38	1	2A16145R0	Label, Clutch, Columbia

Selection Based On Drum Size

Part Number	Description
03-31683	Assembly, Drum Brake, XFG-02
2A16189R0	Assembly, Drum Brake, XFG-03
2A6493R4	Weldment, Drum, XFG-01
03-31671	Weldment, Drum, XFG-02
2A6265R5	Weldment, Drum, XFG-03
2A9174R2	Weldment, Drum, XFG-04
03-30338	Tie Rod, XFG-01
03-30268	Tie Rod, XFG-02
03-31288	Tie Rod, XFG-03
2A17813R0	Hex Shaft, 5/16x4.908", 12L14
2A11529R0	Hex Shaft, 5/16x6.908", 12L14

LIMITED WARRANTY

Allied Power Products, Inc. (APPI) warrants the products it manufactures to be free from defects in material and workmanship to the original buyer for a period of 24 MONTHS from the date of shipment from APPI. All warranties for products sold but not manufactured by APPI are solely that of the manufacturer.

This warranty and liability of APPI is limited to the replacement or repair of any product manufactured by APPI if the product is found – upon examination at our facility – defective due to materials or workmanship. All freight, removal and/or installation charges shall be borne by the Buyer.

This warranty does not cover failures or malfunctions found by APPI to result from:

- Improper installation, operation and/or maintenance of the product.
- Replacements, repairs and/or alterations made by or on behalf of the buyer without written approval from APPI.
- Use of accessories and/or other components in conjunction with the product without written approval from APPI.

APPI SHALL NOT IN ANY EVENT BE HELD LIABLE FOR ANY CONSEQUENTIAL OR INCIDENTAL DAMAGE OR FOR EXPENSES OR DELAY CAUSED BY DEFECTIVE MATERIAL OR WORKMANSHIP.

Except for the above warranty, APPI makes no other express or implied warranties and NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

This warranty shall be governed by and construed in accordance with the laws of the State of Oregon and enforced in Oregon courts. If any portion of this limited warranty and limitation on damages is determined to be invalid or unenforceable, the remainder of the warranty shall remain in full force and effect.

All warranty claims must be submitted to APPI in writing to:

Allied Power Products, Inc.
6590 SW Fallbrook Place
Beaverton, OR 97008



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