COLUMBIA

WINCHES & HOISTS

Manufactured by Allied Power Products, Inc.

DAVIT
OWNER'S MANUAL
Installation and Operating Instructions

Model:

Serial Number:

ALLIED POWER PRODUCTS, INC.

THE WINCH & HOIST SPECIALISTS

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(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.

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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.

Contents

Overview

The intention of this document is to provide a list of safety precautions and operating guidelines that will cover the majority of situations a user of this piece of equipment will encounter, since unforeseen circumstances and situations may be encountered when using this davit, it is the responsibility of the operator to ensure their own safety, the safety of other persons in the affected area and of other property.

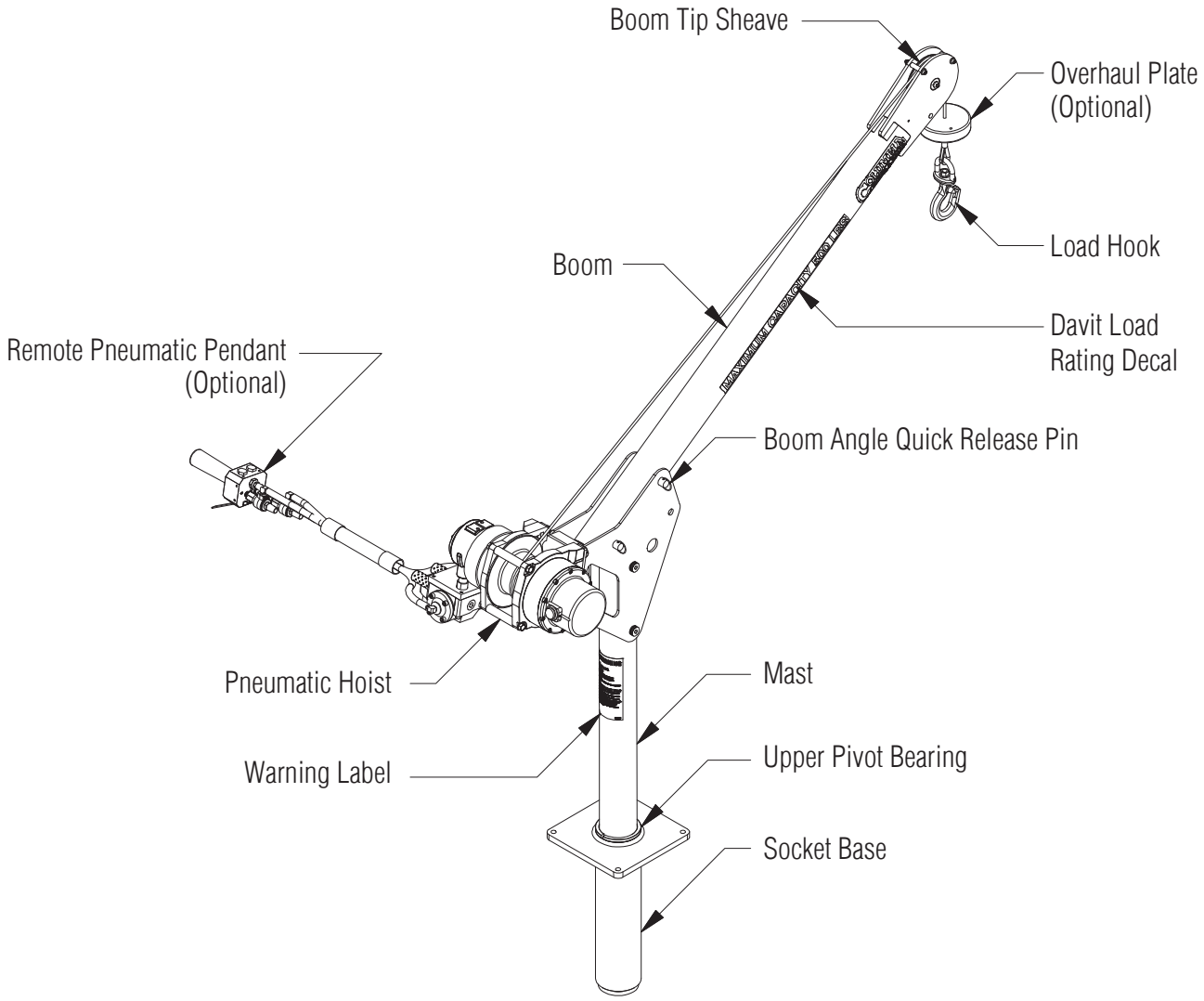
The following information has been compiled to act as a guide to ensure the operation of the davit crane is as safe as possible. Since compliance with these and other industry acceptable guidelines and precautions is the ultimate responsibility of the operator, it is of the utmost importance that all operators are well trained, qualified, mentally/physically able, and authorized to use this piece of equipment.

The safe operation of this product is directly dependent on the operator's skill, knowledge and judgment, therefore, any person who operates this davit must understand that when they do so they are accepting full responsibility for conducting a safe hoisting operation.

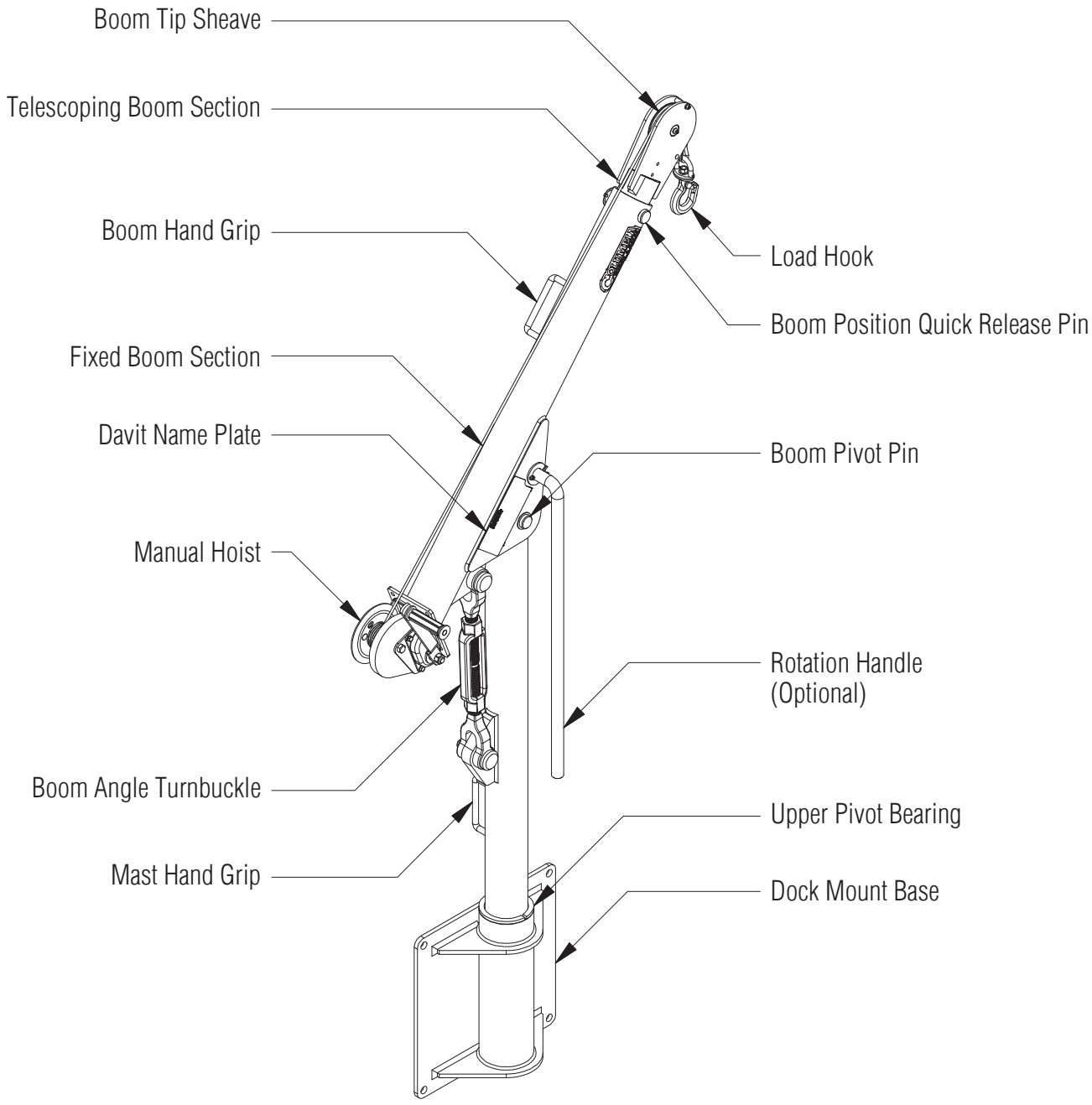
General Assembly

The APPI series of portable davit cranes are designed for general material handling purposes and to be able to lift and move a load about a singular pivot point. As a standard all APPI davits have the ability to pair with electric, pneumatic, hydraulic, or manual hoists to provide a complete material handling solution. While individual load ratings and feature may vary from davit model to davit model, the major components are the same. All Davit models have the ability to be lifted from the base and the major assembly collapses for easy transportation and storage, see the assembly drawing provided with the unit for more information.

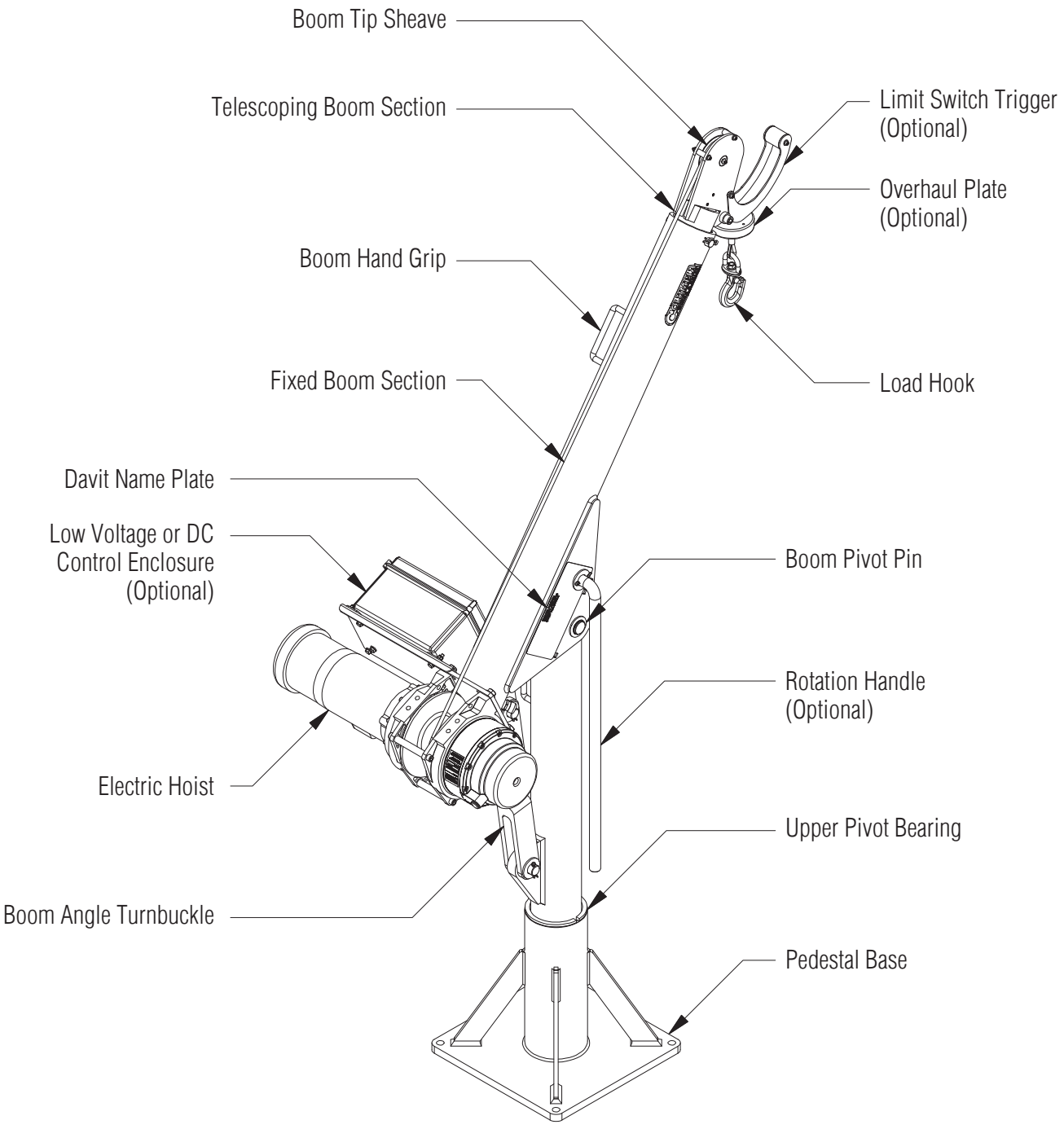
500 lb. Davit Assembly



1000 lb. Davit Assembly



2000 lb. Davit Assembly



Mounting
The Spine Plate of the spooler needs to be mounted vertically within ±1° to prevent the swing arm from gravitating to one side when there is inadequate tension on the line. A drawing providing the location of the mounting holes will be provided with the unit. Ensure all mounting holes are used to secure the AALS in position. Failure to use all of the mounting hold could result in the unit coming free from its mounting or unexpected stresses developing within the frame structure that could lead to premature failure.

Line Installation
Reeve the AALS per instructions given in the AALS Reeving Procedure section. Once the line is properly reeved, install line as tightly as possible on the first layer of the drum. It is very important to guide the line around the drum and into position to ensure that each wrap lies tightly against the previous wrap for the first 5 dead wraps. Once the dead wraps have been established, maintain tension on the line at all times while spooling the line onto the drum. The AALS function is dependent on maintaining a proper line tension of 3% to 5% of the ultimate breaking strength of the line; this loading will generally provide satisfactory results in all conditions.

Proper Line Spooling
If at any time there has been slack on the line prior to initiating a pull or lift, check the line on the drum to ensure the line is properly spooled.

System Overload
If it is determined that the system has been overloaded, the use of the AALS must be suspended. Contact Allied Power Products Inc. and they will help assess the state of the AALS and make a determination as to whether or not the unit can be returned to service.

Optional Equipment

In order to accommodate some of the more common customer needs, APPI provides several standard options that may be provided with a davit, some examples are as follows:

Rotation Handle
The rotation handle is useful for applications that require a large rotational angle of the loaded davit. The handle puts a lever at a location that is more convenient to exert a force against to rotate the davit as an alternative to rotating the davit by exerting a force against the boom. When use of the rotation handle is desired, it can be lifted to the horizontal position and put into use, when use is complete, the handle will hang vertically and out of the way alongside the davit mast.

Overhaul Plate
For most applications an overhaul plate (headache ball) is recommended, especially when the davit will be lowering an unloaded hook. The overhaul plate will keep a predetermined amount of tension on the hoist line and ensure that the line is always spooled under tension. When the davit is equipped with an upper travel limit switch, an overhaul plate will come as standard equipment as the overhaul plate will also function as a trigger for the limit switch.

Limit Switch
FThe upper limit switch is located inside the boom tip. A “paddle” mounted to the boom tip activates it. The limit switch must be tested as described in Section 10.C. of this manual. The limit switch is specifically designed to stop the hook assembly from being damaged or severed by pulling it into the boom tip sheave.

Davits may alternately be equipped with a rotary limit switch, if so, refer to the accompanying hoist manual or APPI for information about this option.

Remote Pendant Controls

The hand-held remote control is used to "power in" and "power out" the rope. Depressing the "UP" button will cause cable to wind on the drum and depressing the "DOWN" will cause cable 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. When a pneumatic hoist is used with the davit, the green button will raise the load and conversely the red button lowers the load.

Davit/Hoist Capacity Rating and Usage

This davit was designed specifically for material handling on a fixed platform and is not to be used to lift people or loads over people. The davit load rating represents the maximum load that can be placed on a new unit. The maximum capacity rating of this davit varies by model and is clearly labeled on the boom and/or name plate. This maximum capacity includes the weight of any rigging required to secure a load. In some cases, the hoist and davit may not have the same load ratings, while in most cases the davit will have the lesser load rating, in some cases the hoist rating may be the limiting factor, so it is imperative that the operator be familiar with all facets of their lifting system.

Operators of the davit must not attempt to lift loads greater than rated capacity. In all but a severely overloaded case, the davit and accompanying hoist may be able to lift the load initially; however, undetectable damage may occur as the davit/hoist is overloaded. Subsequent to this type of event, a failure of the davit structure or mounting foundation can occur at any time, even at a time when the hoist is used within its rated capacity.

Some models of davit are equipped with a turnbuckle that is used to adjust the boom angle; the turnbuckle is not to be adjusted while the system is under load. The turnbuckle is provided as a simple means to adjust boom angle and not an additional way to supplement the movement of a load while it is being hoisted or lowered.

It is important to note that the load rating of the davit will change as result of an adjustment in boom angle. When the boom is lowered to horizontal position the load rating is decreases, as the boom is raised, the rated capacity is increased. Similarly, units equipped with a telescoping boom also see changes in load rating. As the boom is extended the load rating decreases, as the boom is retracted the load rating increases, therefore maximum lifting capacity is determined with the boom at maximum elevation and fully retracted. Conversely when the boom is fully extended and in the horizontal position the davit will lift minimum load. Taking the above into consideration, it is imperative that the operator be fully aware of the limits of the davit as it pertains to this lifting system and to ensure that the lifted load including the weight of the rigging are within the limits of the davit.

Usage in a Marine Environment

As previously mentioned, this davit was designed specifically for material handling on a fixed platform and has not been designed with consideration toward the dynamic loading conditions typically found on floating apparatus. While davits are historically used on seagoing vessels, APPI makes no claim toward such functionality of the models of davit referred to in this manual. Any use of this equipment on a mobile marine platform is solely at the risk of the user and voids the warrantees of both the davit and accompanying hoist.

The use of this davit for any purpose, or in any manner, outside of the guidelines presented in this manual creates the potential for an unsafe situation in which life or property may be damaged, as such; liability for all malfeasant actions taken with this piece of equipment is solely the responsibility of the operating entity.

Setup and Installation

Assembly of the davit structure is done per the assembly drawings included with each unit. It is imperative that assembly is done per the drawing the instructions adhered to explicitly. All davits are assembled and tested for functionality prior to shipment, as such will assemble without issue. Should problems arise during installation where the unit does not go together smoothly and without force cease assembly, confirm use of proper components at the appropriate location, inspect all components at the assembly location, if any damage is noticed, discontinue assembly of the davit immediately and contact APPI to discuss the steps necessary to proceed.

Under no circumstances may the davit to be modified without written permission of APPI. Any modification to the davit, such the welding or drilling of new/existing holes will weaken the davit and may result in the weakening of the structure and possibly structural failure.

The davit base must be mounted to a structurally sound location. The mounting location must be level and/or plum depending on the type of mounting base used failure to do so may result in unexpected/difficult rotation of the davit.

Due to the vast number of mounting possibilities and regulations, making recommendations and giving guidance is beyond the scope of this manual, however, it is strongly recommended that a structural engineer is consulted and that the installation is in adherence with all pertinent codes. As a convenience a table of applicable loadings for standard davits and various base mounting options is provided below.

Davit Capacity	Mount Type	Base Moment Loading	Maximum Axial Bolt Reaction	Maximum Shear Reaction	Recommended Fastener Size
500 lb.	Socket Mount	22,575 in-lb	2,280 lb	N/A	3/8”
	Pedestal Mount	22,575 in-lb	2,280 lb	N/A	3/8”
	Dock Mount	22,575 in-lb	2,150 lb	1,030 lb	3/8”
1000 lb.	Socket Mount	36,000 in-lb	1,760 lb	N/A	3/8”
	Pedestal Mount	36,000 in-lb	1,760 lb	N/A	5/8”
	Dock Mount	36,000 in-lb	2,370 lb	920 lb	5/8”
2000 lb.	Socket Mount	90,000 in-lb	4,390 lb	N/A	5/8”
	Pedestal Mount	90,000 in-lb	4,390 lb	N/A	5/8”
	Dock Mount	90,000 in-lb	5,910 lb	2,230 lb	5/8”

Maximum Axial Bolt Reaction

This number does not include any fastener preload. The fasteners and fastening method should be selected to ensure that mounting substructure is adequate and that the base plate and mounting surfaces remain loaded and in contact at all times.

Maximum Shear Reaction

This number (for the force acting across the axis of the fasteners) is provided as a reference only and is based on all fasteners sharing the shear load equally which is not typically the case in practice.

All fasteners / fastening methods used must apply an adequate preload to the mounting plate to avoid the possibility of the fasteners being put into a shear condition. The determination of an appropriate preload and bolt torque falls upon the end user as variables such as mounting procedure, materials used, surface finish and composition, etc. all fall beyond the control of APPI.

Recommended Fastener Size / Specification

This is the nominal size of the fastener to be use and is based on using Grade 5 or equivalent Class 8.8 steel fasteners with similar washer. All fasteners are to be of the same size, length, grade (Class) and thread percentage.

Securing and Rigging a Load

An instruction of proper rigging and securing a load is beyond the scope of this manual, it is the assumed that the operator has knowledge of the best industry approved rigging practices, however, as a general guide:

- It is the responsibility of the operator to ensure that all loads to be lifted are properly secured and attached to the hook.
- The operator must inspect slings and rigging devices before use and ensure that defective, damaged or faulty rigging equipment is not used.
- Only slings or other rigging devices properly rated for the job are used and they must ensure they are used properly.
- The hoist cable must never wrap around a load.
- The davit rope assembly must not come into contact with an electrical source during a lifting/lowering operation.

Basic Guidelines for Operation

- It is the responsibility of the operator to determine if it is safe to conduct a lifting operation.
- The operator must stop the use of the davit/hoist if weather or lighting conditions make it unsafe to use the davit/hoist.
- The operator must keep themselves and all other personnel away from all moving parts on the davit as all pinch points are impossible to eliminate due to the layout of the system.
- The operator must be positioned with a clear view of the load when the davit is being used.
- The operator is responsible for properly securing the load and attaching it properly to the hook at the ground for loads being hoisted.
- The operator is responsible for properly securing the load and attaching it properly to the hook for loads being lowered.
- The operator must ensure there is nothing that will be lifted that is not properly secured to the load and/or the hook.
- The operator must ensure that the hoist line is vertical before starting a lift, as the davit/hoist cannot be subjected to side loading.
- The operator must ensure the load does not make contact with any part of the structure while a load is being lifted or lowered.
- The operator must watch the load at all times. The lift operation must stop if the operator loses sight of the load.
- The davit is not to be used to pull items as it is only rated to handle a freely suspended load.
- The davit is not rated to lift people or loads over peoples, as such; the operator must never allow anyone to be lifted by the davit or allow anyone to be under the hook/boom of the davit with or without a load on it.
- When lowering the load, the operator must never allow the line on the hoist to spool out beyond 5 tailing (dead) wraps of rope on the hoist drum.
- The operator must ensure no one touches the line while it is moving.
- The operator must ensure no one pushes or pulls on the line to move or position a load.
- The operator must never leave the davit unattended with a suspended load.
- The operator must immediately report any and all damage, defects and deficiencies to the appropriate manager/supervisor.

Routine Service and Safety Checks

Hoist Assembly

Davits may be equipped with a variety of different hoists with various power options and line types, refer to the accompanying hoist manual provided with your particular system for the service and maintenance of the hoist unit.

Basic Guidelines for Maintenance and Repairs

In the event that problems should arise with the operation of the davit, the operator should immediately determine the cause of any change in performance or sound during operation and take proper corrective action prior to continuing use of the davit. If a problem with the davit system is identified that cannot be resolved by inspection or through the use of the troubleshooting section found at the end of this manual, contact APPI for further assistance. To expedite assistance please be prepared to provide the model and serial number of both the davit and hoist.

General Maintenance

This davit is designed to be relatively maintenance free; however, the useful life of the system can be extended by adhering to a general regimen of inspections and routine care. Keep all components on the davit, line, and remote control free from contaminants. Use a clean rag or towel to remove any dirt and/or debris. Unless authorized and approved by APPI, do not make any repairs, modifications alterations or changes to the davit/hoist as doing so will invalidate all warranties.

Daily Inspection

- It is recommended to conduct the following inspection each day prior to the first use of the davit/hoist.
- Inspect overall condition of davit look for details such as loose/missing/modified hardware, damage to paint/surface which may indicate a collision or unapproved modification has taken place, etc.
- Confirm the limit switch “paddle” (if equipped) moves up and down freely and triggers stopping of an ascending hoist.
- Examine the davit/crane mast, boom and boom tip assembly including the sheave to ensure there are no indications of damage or overloading such as cracks in welds or bent, deformed or worn components. Examine the entire davit/hoist assembly for signs of corrosion or rust.
- Confirm the mounting pins between the davit/hoist mast and boom are properly locked into position.
- Confirm the operation of the hoist assembly and function of system braking.
- Inspect the rope for signs of wear or damage.
- Confirm the end of boom sheave rotates freely and shows no signs of wear.

Monthly Inspection

It is recommended to conduct the following inspection on a monthly basis regardless of the number of times the davit/hoist has been used.

- With a properly adjusted/calibrated torque wrench, confirm the four (4) hoist mounting bolts are torqued to specification.
- While properly supporting the boom of the davit/hoist, remove each of the mounting pins one at a time and inspect them for wear and cracks. Properly replace the mounting pins after they are inspected.

Annual Inspection

It is recommended the hoist be removed from service on an annual basis for a thorough motor/brake/gear train/structural inspection by a qualified person or agency.

Basic Guidelines for Greasing the Mounting Socket

While not required for standard models, greasing of the mounting socket can be done to reduce the effort of rotating the davit assembly within its mounting base. If greasing the mounting socket is desired, when required, the davit/hoist assembly should be removed from the socket. With the davit removed from the socket, a coating of any standard heavy-duty grease should be applied to the portion of the davit mast that extends into the mounting socket where it contacts the bearing surfaces. If there is grease that was previously applied that has been pushed out of the areas of bearing between the mounting socket and mast it is acceptable to redistribute the existing grease around the mast. If the old grease is dirty, degraded, or has become contaminated in any other way, it is recommended that all old grease be wiped off and replaced with fresh grease of a similar specification. Greasing of the mounting socket is to be done purely at the discretion of the operator and the operator assumes all liability for changes to the system resulting from the use of such.

Basic Guidelines for Wire Rope Inspection

If the davit is equipped with wire rope (as opposed to synthetic rope) the life of the wire rope is directly related to the use and care 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
- Kinks
- Heat damage
- An apparent reduction of wire rope diameter

If any of these defects are found in the wire rope, the wire rope must be replaced prior to use of the davit.

The wire rope anchor, which attaches the wire rope to the drum, is not designed to hold rated loads by itself. Keep a minimum of five (5) wraps of wire rope on the drum at all times to achieve rated load.

Wire rope is to be installed under tension to ensure that the rope does not draw into the inner layers of the drum when loaded. The amount of tension used depends on a number of factors. As a general rule, the minimum load applied should be .2% to 1% of the breaking strength of the wire rope.

Troubleshooting Guide

Symptom	Potential Problem	Proposed Solution List
Davit mast does not rotate smoothly.	1. Contaminated socket	Remove Davit from socket and inspect/clean davit to socket interface
	2. Socket bearing failure	A. Inspect bearings and replace polymer bearings if damaged
		B. Inspect mating bearing surfaces on davit, if damages, the mast may need to be replaced
		C. This is a very abnormal failure, as such, the causes leading up to the failure should be diagnosed and corrected

Symptom	Potential Problem	Proposed Solution List
Davit is loose in its base.	1. Normal	Due to manufacturing tolerances, some degree of play or movement at the mast to socket
	2. Socket bearing failure	A. Inspect bearings and replace polymer bearings if damaged
		B. Inspect mating bearing surfaces on davit, if damages, the mast may need to be replaced
		C. This is a very abnormal failure, as such, the causes leading up to the failure should be diagnosed and corrected
Limit switch does not stop load.	1. Switch(s) are out of adjustment	A. Inspect limit switch adjustment.
		B. Verify all limit switch triggers are in-place and contact the switch as expected.
	2. Faulty electrical (pneumatic) connection	Verify that all electrical (pneumatic) connections are intact; if necessary this troubleshooting may require the assistance of an electrician.
	3. Electric switch has reached the end of its serviceable life	With multi-meter probes in contact with the limit switch leads manually trigger the limit switch. Determine if continuity is made and then broken as the switch moves from neutral to activated position, if the switch does not pass the above test, replace switch.
	4. Pneumatic valve has reached the end of its serviceable live	Plumb a known good air supply to the “In” port on the pneumatic valve and trigger the valve. Determine if the flow starts and stops predictably with actuation of the valve. If the valve does not pass the above test, replace the valve
Hoist does not lift/lower load when commanded.	1. Faulty electrical or pneumatic connections	Determine if all electrical/pneumatic connections (power to motor, power to motor brake (if equipped) control pendant connections) are intact, if necessary this troubleshooting may require the assistance of an electrician.
	2. Hoist motor has reached the end of it serviceable life or requires repair	Have the motor inspected by someone qualified to assess its condition and serviceability
	3. Other	See accompanying hoist manual or contact APPI for additional troubleshooting assistance.

NOTES

NOTES

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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