



## Limited Warranty

Align Production Systems (APS) warrants all of its products to be free of defects in material and workmanship for a period of one (1) year from date of shipment to the original purchaser or 2,000 operating hours, whichever comes first, provided purchaser gives APS prompt notice of the alleged defect(s) and, if requested by APS, returns the defective items, freight prepaid (F.O.B. APS's plant in Decatur, Illinois).

THE WARRANTIES SET FORTH HEREIN ARE IN LIEU OF ALL OTHER WARRANTIES, WHETHER EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, FITNESS FOR A PARTICULAR PURPOSE AND MERCHANTABILITY, ALL OF WHICH ARE EXPRESSLY DISCLAIMED.

For any claim under warranty, APS may elect to repair or replace the defective component or components. All claims for warranty must be accompanied by a Return Goods Authorization number, which may be obtained from APS. This warranty does not cover, and APS is not responsible for, any labor or other expense for inspections, removal or reinstallation of components or products.

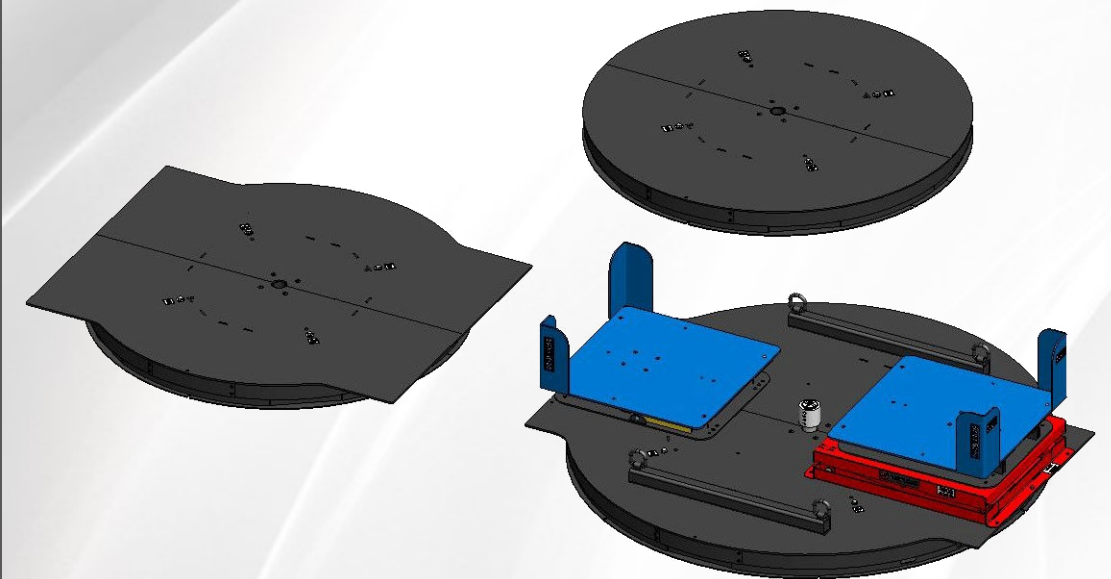
This warranty does not cover, among other things, damages resulting from foreign matter or water, negligence, accident, unreasonable use, abuse or misuse, alterations not authorized by APS, failure to provide reasonable and necessary maintenance or failure to follow operating instructions or load limits.

IN ADDITION, IN NO EVENT SHALL APS BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL, CONSEQUENTIAL OR CONTINGENT DAMAGES, WHETHER OR NOT IT HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

APS makes no representation that the product complies with local, state or federal safety/product standards codes. If the product fails to comply in any way with those codes, it shall not be considered a defect in materials or workmanship, and APS shall not be liable for any damages resulting from noncompliance. This limited warranty is provided to the original purchaser (meaning the original end user) and is nontransferable. This limited warranty constitutes the complete and final agreement regarding APS warranty obligations for the product.



## Standard Operating Manual AX040, AX041 & AX042 Air Caster Turntables



### ADDRESS

2230 Brush College Road

Decatur, IL 62526

Phone: 217-423-6001

Fax: 217-422-1049

E-mail: sales@alignprod.com

[www.alignproductionsystems.com](http://www.alignproductionsystems.com)

Phone: 217-423-6001

Fax: 217-422-1049

E-mail: sales@alignprod.com

[WWW.ALIGNPRODUCTIONSYSTEMS.COM](http://WWW.ALIGNPRODUCTIONSYSTEMS.COM)

## IX. Reference Drawings

DRAWING #	DESCRIPTION
AX040-0084	Ø84" REGULAR DUTY ROUND TURNTABLE 4X Ø17" AIR CASTER
AX040-0096	Ø96" REGULAR DUTY ROUND TURNTABLE 5X Ø17" AIR CASTERS
AX040-0108	Ø108" REGULAR DUTY ROUND TURNTABLE 6X Ø17" AIR CASTERS
AX040-0120	Ø120" REGULAR DUTY ROUND TURNTABLE 6X Ø17" AIR CASTERS
AX040-0132	Ø132" REGULAR DUTY ROUND TURNTABLE 6X Ø17" AIR CASTERS
AX040-0144	Ø144" REGULAR DUTY ROUND TURNTABLE 6X Ø17" AIR CASTERS
AX041-090xxx	Ø84" TURNTABLE SQUARE TOP 90 X xx WITH 4X Ø17" AIR CASTERS
AX041-102xxx	Ø96" TURNTABLE SQUARE TOP 102 X xx WITH 5X Ø17" AIR CASTERS
AX041-114xxx	Ø108" TURNTABLE SQUARE TOP 114 X xx WITH 6X Ø17" AIR CASTERS
AX041-126xxx	Ø120" TURNTABLE SQUARE TOP 126 X xx WITH 6X Ø17" AIR CASTERS
AX041-138xxx	Ø138" TURNTABLE SQUARE TOP 138 X xx WITH 6X Ø17" AIR CASTERS
AX041-xxxyyy	Ø144" TURNTABLE SQUARE TOP xxx X yyy WITH 6X Ø17" AIR CASTERS
AX042-126062	Ø120" TURNTABLE SQUARE TOP 126 X 62 WITH HOISTING & MOUNTING LIFT AND/OR TILT
AX5010-0050	AUTO SHUTOFF ASSEMBLY 2 POSITION KIT
AX5020-0010	AX SERIES PNEUMATIC DRIVE ASSEMBLY
AX5020-0020	AX SERIES INTERNAL ELECTRIC DRIVE ASSEMBLY
AX5030-0010	AX SERIES TURNTABLE BUMPER STOP ASSEMBLY KIT
AX5030-0020	AX SERIES TURNTABLE SHOCK STOP ASSEMBLY KIT
AX5030-0021	AX SERIES TURNTABLE SHOCK STOP WITH PROX SENSOR ASSEMBLY KIT
AX5030-0030	AX SERIES SLIDE OUT SHOT PIN ASSEMBLY KIT
AX5060-0010	AX SERIES TURNTABLE 6" RISER BASE PILLAR FRAME KIT
IST0215	AX04_ SERIES TURNTABLE BASE INSTALLATION INSTRUCTIONS
	AX SERIES PNEUMATIC SCHEMATIC
	AX SERIES ELECTRICAL SCHEMATIC
APS5010-XXXX	STANDARD HAND CONTROL STAND ASSEMBLY
APS5020-XXXX	STANDARD FOOT CONTROL STAND ASSEMBLY
K17-0010	AX SERIES Ø17" AIR CASTER TRAY ASSEMBLY

To reorder a part, please call **1-800-888-0018** and ask for the Parts Department. If possible, please have your serial number handy for reference.

## VIII. Spare Parts

Spare Part Parent Assembly #	QTY	Part #	Description
AX04_-XXXX	1	BRFHB56001	TURNTABLE CENTER PIVOT FLANGE
	2	K17-0010	AX SERIES Ø17" AIR CASTER TRAY ASSEM-
AX5010-0050	1	VSM0024	AUTO SHUT-OFF PNEUMATIC LIMIT
AX5020-0010	1	AMT0003	AIR MOTOR
	1	WHA0033	DRIVE WHEEL ASSEMBLY
	1	BRG0020	DRIVE FLANGE BEARING
	1	ASPF7731	DRIVE AIR SPRING
AX5020-0020	1	SRDBA0001	ELECTRIC MOTOR
	1	WHA0033	DRIVE WHEEL ASSEMBLY
	1	BRG0020	DRIVE FLANGE BEARING
	1	ASPF7731	DRIVE AIR SPRING
AX5030-0010	1	BAR5981	BUMPER
AX5030-0021	1	SHK0019	SHOCK STOP HYDRAULIC CYLINDER
	1	EPRXEF0025	SHOCK STOP PROXIMITY SWITCH
	1	EC-	SHOCK STOP M12 CABLE
AX5030-0030	1	PIN0397	ROUND SHOT PIN
	1	CLABM200030002	SHOT PIN CYLINDER
	1	EPRXEF0025	SHOT PIN PROXIMITY SWITCH
	1	EC-	SHOT PIN M12 CABLE
	1	VSD4005	SHOT PIN FLOW CONTROL
ST010-SERIES			SEE ST01_ LIFT MANUAL FOR
ST020-SERIES			SEE ST02_ TILT MANUAL FOR

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## I. IMPORTANT PRECAUTIONS



Read the following safety precautions before operating or servicing your Align Production Systems Industrial Turntable.

**BEFORE any service or maintenance is performed to this equipment,** actuate the lockout valve to exhaust the air from the system and lockout at the lockout valve. Follow correct lockout/tagout procedures.

Prevent personnel from leaning on equipment and containers or placing their arms, hands, legs or any bodily member in pinch-point areas throughout the system.

Instruct personnel on the proper placement of product on the turntable. Failure to place containers or loads in the engineered locations may hinder the operation of the turntable or cause structural damage.

Place stop barriers at the fork truck loading area(s) to prevent damage to turntable.

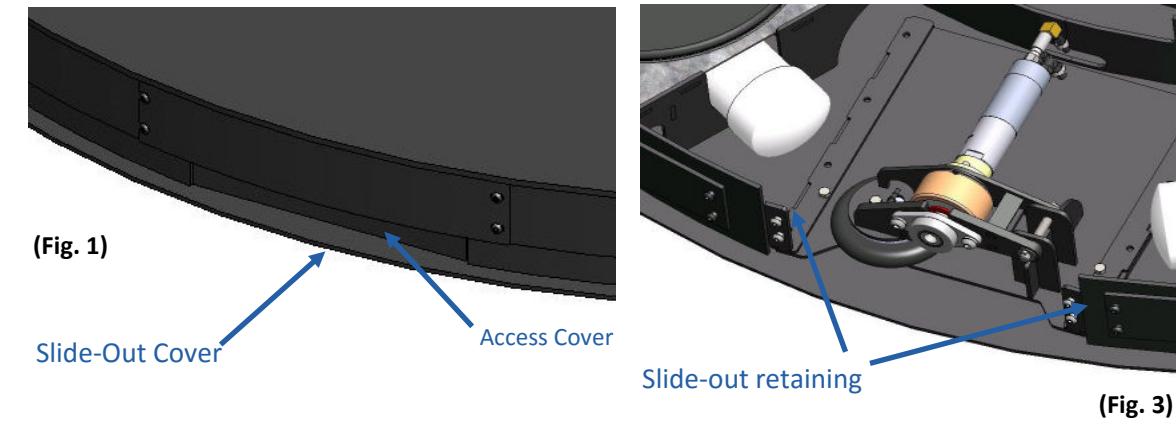
Never operate the turntable without the provided covers and guards properly installed.

Never walk or climb into or onto the turntable while it is in motion.

Never restore power or air pressure to the control system without first clearing the turntable of personnel, tools or other obstructions.

Never alter the equipment in any way unless authorized by a qualified employee of Align Production Systems.

## VII. Service & Maintenance (Continued)



Remove the covers when the turntable is in position. There are two 3/8" bolts which secure the slide out equipment. (See Figure 3) Loosen this hardware enough to slide out the equipment. *(In Figure 3, the covers and top plate have been hidden for clarity. You will not need to remove the turntable top in order to service slide-out equipment.)*

Slide the equipment out toward the perimeter of the turntable.

The slide-out equipment has been provided with extra hose and cable length. The equipment can be slid out of the turntable mounting locations without having to disconnect the equipment.

When replacing the optional equipment, be sure to reinstall the slide-out retaining hardware as well as the slide-out access covers.

For Service and Maintenance of Lift or Tilt, see ST010-Manual or ST020-Manual.

Interval	Inspection	Corrective Action
1 month	Check the Pre-filter sight gauge for condensation build-up. The drip leg should be periodically purged.	If equipped, empty the dirt leg of contaminants.
1-3 months	If equipped, remove the drive and inspect the drive wheel for wear.	Replace drive wheel if worn to within 1/8" of steel.
3 months	Periodically check the air casters and inspect for tears or areas that are excessively worn	Replace any damaged air casters (see replacing air casters)
Yearly	Check the center pivot bearing. Ensure all bolts are tight. Lube with a general purpose grease.	Lube the center bearing with a general purpose grease (example: Dow Corning, Molykote BR-2 Plus)

## VII. Service & Maintenance

### Access Covers (One on Each Side, 180° Apart)



1. Locate the access covers on the side of the turntable top wrapper plate. (See Figure 1)
2. Actuate the air casters and rotate turntable until the access cover is centered over the lagdown location in the base of the turntable. (See Figure 2)
3. Remove the cover when the turntable is in position.

### Air caster Tray Removal

To service or inspect the air casters, remove access cover when it is centered over the lagdown location. You will see a cutout toward the top of the turntable base to remove the tray mounted air caster. Shut-off air supply to the turntable, use Standard Lock-out/Tag-out procedures. Swing the air caster tray handles out away from the turntable. Lift up and pull on the handles to release the air caster tray from its mounting frame. The air caster tray assembly is equipped with an inlet seal which makes the air connection when the air caster tray is in position.

(see reference drawings for air caster tray assembly)

See our training video “Air Skid Training: Replacing as Air caster” at [vide-os.alignproductionsystems.com](https://www.alignproductionsystems.com) for more information.

### Air caster Tray Replacement

To replace the air caster tray, slide the assembly back into the mounting frame. Hold up on the handles while sliding the tray back into position, ensuring the handle bold does not get caught up on the outer ring of the turntable. The bolts which hold the handles on the air caster tray need to be seated in the mounting frame holes to ensure inlet seal alignment. Swing air caster tray handles back into position and replace the turntable access cover.

### Optional Equipment Removal

1. The turntables can be equipped with slide out drives, shock and bumper stops, auto shut-off systems and shot pin assemblies.
2. Actuate the air casters and rotate turntable until the access cover is centered over the slide out cover location in the base of the turntable.

## II. Installation and turntable commissioning

**1) Initial Inspection:** Inspect the equipment for possible damage in shipment or unpacking. Please contact Align Production Systems if there is any damage to the unit that may hinder the operation.

a. Before lifting the turntable, ensure that the shipping bolts are in place and securely tightened. There are four (4X) shipping bolts that bolt down from the top of the turntable surface to the base of the turntable. (see Reference Drawings for your application)

b. The turntable is equipped with four ¾ -10 UNC lifting locations on the turntable top surface. Use these lifting locations with suitable swivel hoist rings sized for the load along with a four-point sling or chain arrangement. (see Reference Drawings for your application)

c. Sweep the final floor area to remove dirt and debris

**2) Positioning your table:** Line up Side A & Side B on top and bottom before removing top. STOP: Do not lag turntable to floor until testing.

a. The floor must be level and flat within  $\pm 1/8$ " over a 10' span. Floor undulations outside this specification may impact the operation of the turntable and should be remedied. See [Flooring Issues](#) for more information. The floor must be a concrete surface or equivalent that is capable of supporting the load of the turntable plus the load of the product.

**NOTE: If the table was tilted during installation, all air casters must be checked to make sure they are fully slid back into their cradle so they will seat correctly.**

The turntable must be lagged down with concrete anchors or similar fasteners, to the floor insuring the turntable level once it is secured to the floor. (See Reference *Installation drawing IST0215* for more information)

Once the turntable has been lagged to the floor, remove the four shipping bolts that are located on the top of the turntable. The shipping bolts connect the turntable top to the turntable base, and must be reinstalled to lift the entire turntable.

**NOTE: DO NOT ATTEMPT TO INFLATE AIR CASTER WITH SHIPPING BOLTS INSTALLED, DAMAGE TO THE TURNTABLE AND/OR AIR CASTER WITH OCCUR.**

It is important that an adequate volume of clean and dry air be supplied to the turntable. Refer to the attached drawings for the specific air requirements for each piece of equipment. It is recommended that a dirt leg, regulator and filter/separator be installed on the air supply to the turntable to remove any contaminants in the air system. Not using a dirt leg, regulator and filter can void warranty.

Connect the air supply to the inlet supply of the turntable controls. Before operating the turntable, verify the shipping bolts have been removed. The air supply must have approximately 70-90 PSI and 32-85 SCFM depending on which optional equipment you may have equipped on your turntable.

### III. DESCRIPTION OF EQUIPMENT

The AX04 series turntables are equipped with slide-out air casters.

The slide-out air caster feature allows for service and maintainability of the air casters without removal of the top rotating structure (see Section VII for additional information). The AX040 series turntables consists of a range of round turntables. The AX041 series turntables consists of a range of square top turntables. The AX042 series turntables are provided with hoisting and mounting provisions for lifts and/or tilts mounted to the turntable surface. The AX04 series turntables are also designed to incorporate multiple optional equipment as described below.

#### Description of optional equipment



**AX5010-0050—Pneumatic Auto shut-off assembly 2 position kit**

This slide out option is applied to the turntable if the customer would like to rotate the turntable to two set locations at 0° and 180°. The user will energize the system and the air casters will inflate for 3 to 5 seconds before the drive (AX5020-0010 or AX5020-0020) will start to rotate the turntable to the next position. The system will de-energize to a resting state. The stopping position is repeatable to ± 4”.



**AX5020-0010—AX Series Pneumatic turntable drive**

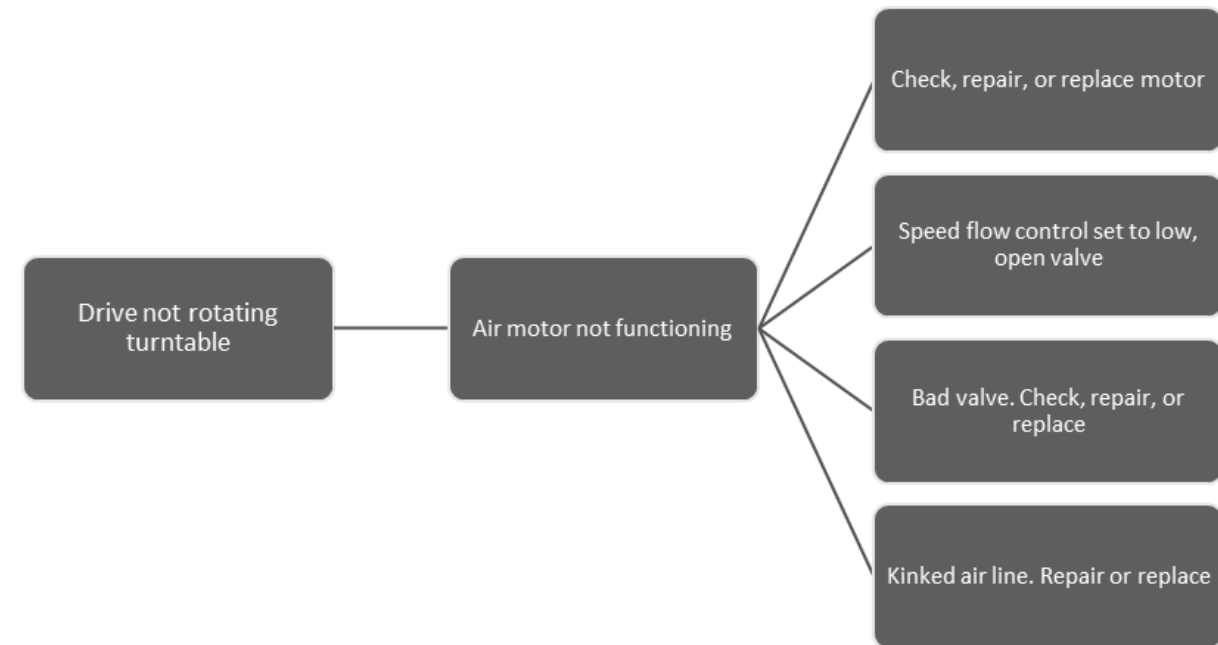
This slide out option is applied to the turntable if the customer would like to rotate the turntable pneumatically.



**AX5020-0020—AX Series Electric turntable drive**

This slide out option is applied to the turntable if the customer would like to rotate the turntable electrically possibly with a PLC controlled system.

### V. TROUBLESHOOTING

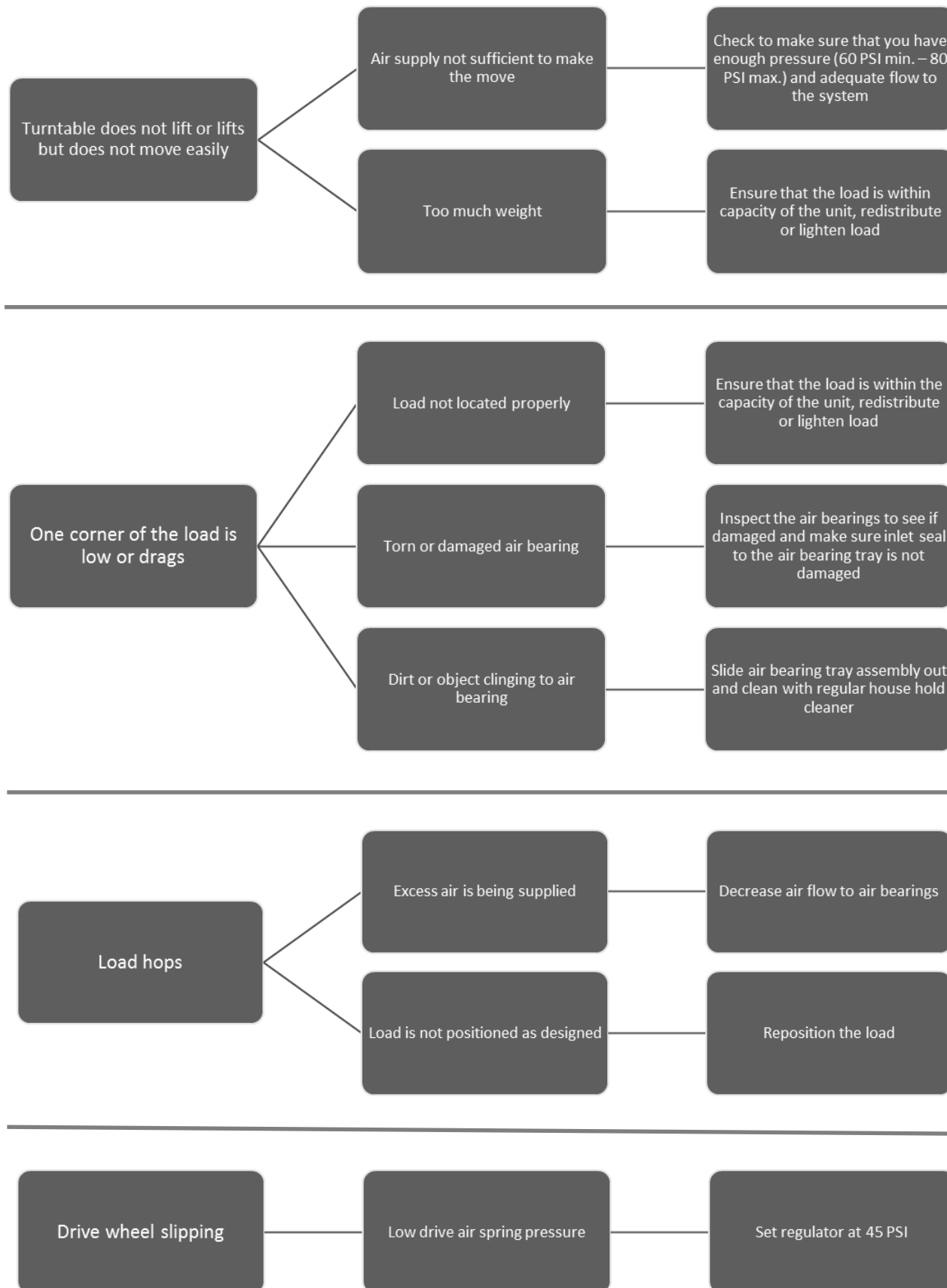


### Vi. Specifications

Model Number	Diameter	Height	Capacity	Average Flow
AX040-0084	84 in. (2,134 mm)	7 in. (178mm)	12,000 lbs. (5,455 mm)	32 CFM 15.1 L/s
AX040-0096	96 in. (2,438 mm)	7 in. (178 mm)	16,000 lbs. (7,273 mm)	40 CFM 18.9 L/s
AX040-0108	108 in. (2,743 mm)	7 in. (178 mm)	16,000 lbs. (7,273 mm)	48 CFM 22.7 L/s
AX040-0120	120 in. (3,048 mm)	7 in. (178 mm)	16,000 lbs. (7,273 mm)	48 CFM 22.7 L/s
AX040-0132	132 in. (3,353 mm)	7 in. (178 mm)	16,000 lbs. (7,273 mm)	48 CFM 22.7 L/s
AX040-0144	144 in. (3,658 mm)	7 in. (178 mm)	16,000 lbs. (7,273 mm)	48 CFM 22.7 L/s

For a complete list of specifications, refer to the Reference Drawings supplied with this manual.

## V. TROUBLESHOOTING



## III. DESCRIPTION OF EQUIPMENT (CONTINUED)

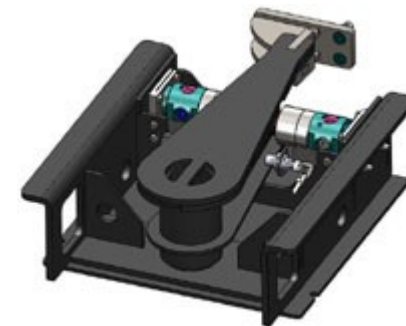
### **AX5030-0010**—AX Series turntable bumper stop assembly kit

This slide out option is applied to the turntable if the customer would like to manually rotate the turntable to a set location 0° and 180°.



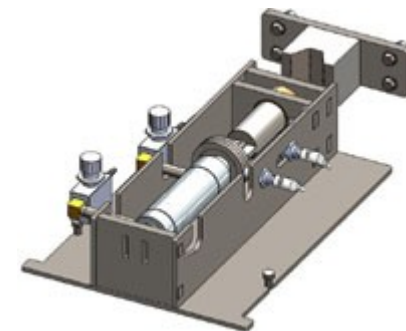
### **AX5030-0021**—AX Series turntable shock stop with proximity sensors assembly kit

This slide out option is applied to the turntable if the customer would like to rotate the turntable to two set locations at 0° and 180°. The user will energize the system and the air casters will inflate for 3 to 5 seconds before the drive (AX5020-0010 or AX5020-0020) will start to rotate the turntable. The turntable will rotate until the turntable top stop hits the shock stop (AX5030-0021) . The shock stop can be used in conjunction with the shot pin (AX5030-0030) and a turntable drive. Once the shock stop sensor is sensed the shot pin extends locking the turntable into position which will de-energize the system. Stopping position is repeatable to ± 1/16”.



### **AX5030-0030**—AX Series slide out shot pin assembly kit

The slide out shot pin is a precision locator with a dual acting pneumatic cylinder and two alignment receivers. There are two proximity sensors which provides a signal on whether the pin has fully extended or retracted.



### **AX5060-0010**—AX Series turntable 6” riser base pillar frame kit.

The riser base pillar is added to the turntable base under each air caster as well as under the center of the turntable. The risers adjust the height of the turntable for a more ergonomic height for the operator.



### III. DESCRIPTION OF EQUIPMENT (CONTINUED)

#### AX5050-XXXX—Turntable Center Divider

The turntable can be equipped with a center divider to partition the turntable into two separate loading locations. The center divider is 8 inches tall.

#### AX5051-XXXX—Turntable Divider Screen

The turntable can be equipped with a divider screen that is mounted to the turntable center divider (AX5050-XXXX). This screen provides a 60 inch tall partition separating the two loading locations.

#### AX5052-XXXX—Turntable Lead-ins

The turntable can be equipped with lead-ins that can be added to the turntable top plate. These lead-ins are typically used in conjunction with the center divider (AX5050-XXXX). The lead-ins provide a guide for the operator who is loading the turntable.

#### AX5070-0010—Turntable Corner Angles

The turntable can be equipped with corner angles. Corner angles are typically applied to square top turntables to assist fork truck operators position their load on the turntable.

#### AX5070-0020—Conical Locator Kit

Conical locators can be mounted to the turntable top surface if the customer requires precision container placement. This option is typically used in conjunction with both the shock stop (AX5030-0021) and the shot pin (AX5030-0030).

#### AX5070-0030—Rack Present Sensors

Rack present sensors are typically used when an operator or robot is removing parts from a tote/container. When the rack present sensors detect that the tote/container is empty the turntable will rotate.

### IV. Control Scenarios / Operating Instructions

#### Turntable “no drive”

##### AX040 & AX041 Series

1. The operator will actuate the detent valve and the air casters inflate.
2. The operator will need to manually rotate the turntable.
3. Once the turntable is in position, deactivate detent valve.  
(see **Bold** reference drawing below)

1. No controls / customer supplied controls
2. **APS5010-0200** Hand controls (detent valve) WO dirt leg
3. **APS5010-0600** Hand controls (detent valve W dirt leg
4. **APS5020-0200** Foot controls (detent valve) WO dirt leg
5. **APS5020-0200** Foot controls (detent valve) WO dirt leg & **APS5010-1100** W dirt leg & stand

### IV. Control Scenarios / Op Instructions (cont.)

#### Turntable with pneumatic drive “operator manual stop”

##### AX040 & AX041 Series with AX5020-0010

1. The operator will actuate the spring center valve and the air casters will inflate for 3-5 seconds before drive starts rotating.
2. Once the turntable has made the desired move, release the valve and the turntable will de-energize.  
(see **Bold** reference drawing below)

1. **APS5010-0100** hand control (spring center) WO dirt leg
2. **APS5010-0500** hand control (spring center) W dirt leg
3. **APS5020-0100** foot control (spring center) WO dirt leg
4. **APS5020-0100** hand control (spring center) WO dirt leg & **APS5010-1100** W dirt leg & stand

#### Turntable with bumper stop 0°-180° manual rotate

##### AX040 & AX041 Series with AX5030-0010

The operator will actuate the detent valve and the air casters inflate. The operator will need to manually rotate the turntable to the bumper stop (**AX5030-0010**) at either 0° or 180°. Once the turntable is in position, deactivate the detent valve.  
(see **Bold** reference drawing below)

1. **APS5010-0100** hand control (spring center) WO dirt leg
2. **APS5010-0500** hand control (spring center) W dirt leg
3. **APS5020-0100** foot control (spring center) WO dirt leg
4. **APS5020-0100** hand control (spring center) WO dirt leg & **APS5010-1100** W dirt leg & stand

#### Turntable with shock stop with shot pin 0°-180°

##### AX040 & AX041 Series with AX5030-0021 & AX5030-0030 (PLC controlled)

The operator will actuate the start button and the air casters will inflate for 3-5 seconds before drive starts rotating. The turntable will rotate until the shock stop (**AX5030-0021**) stops the rotation. Once the shock stop (**AX5030-0021**) sensor detects that the turntable has stopped rotating, the shot pin (**AX5030-0030**) will extend, locking the turntable into position. When the shot pin (**AX5030-0030**) sensors detect full extension the signal de-energize the air casters and the drive.  
(see **Bold** reference drawing below)

#### Turntable with electric drive with electrical auto-shutoff

##### AX040 & AX041 Series with AX5020-0020 & AX5010-0060 (PLC controlled)

The operator will actuate the rotate button and the air casters will inflate for 3-5 seconds before drive starts rotating. The turntable will rotate to the next shut-off location and the turntable will de-energize.  
(see **Bold** reference drawing below)

#### Turntable with Robotic Interface Stand

##### AX040 & AX041 Series with AX5010-0040 (PLC controlled)

1. Customize and configure for customer control interface
2. Various scenarios