



TMM-140A

AIR MANIPULATOR HOIST

AIR POWERED



Follow all instructions and warnings for inspecting, maintaining and operating this hoist.

The use of any hoist presents some risk of personal injury or property damage. That risk is greatly increased if proper instructions and warnings are not followed. Before using this hoist, each operator should become thoroughly familiar with all warnings, instructions, and recommendations in this manual. Retain this manual for future reference and use.

Forward this manual to the hoist operator.
Failure to operate the equipment as directed in the manual may cause injury.

Before using the hoist, fill in the information below:

Model No. _____

Serial No. _____

Purchase Date _____

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SAFETY PRECAUTIONS

Each TMM-140A Air Manipulator Hoist is built in accordance with the specifications contained herein and at the time of manufacture complies with our interpretation of applicable sections of American Society of Mechanical Engineers Code *(ASME) B30.16 "Overhead Hoists," the National Electrical Code (ANSI/NFPA 70) and the Occupational Safety and Health Act (OSHA). Since OSHA states the National Electrical Code applies to all electric hoists, installers are required to provide current overload protection and grounding on the branch circuit section in keeping with the code. Check each installation for compliance with the application, operation and maintenance sections of these articles.

The safety laws for elevators and for dumbwaiters specify construction details that are not incorporated in our industrial hoists. For such applications, refer to the requirements of applicable state and local codes, and the American National Safety Code for elevators, dumbwaiters, escalators and moving walks *(ASME A17.1). We recommend the use of equipment that meets state and national safety codes for such use. We cannot be responsible for applications other than those for which the equipment is recommended.

*Copies of this Standard can be obtained from ASME Order Department, 22 Law Drive, Box 2300, Fairfield, NJ 07007-2300, U.S.A.

16. **NOT** apply load if bearing prevents equal loading on all load supporting ropes.
17. **NOT** operate beyond the limits of the load wire rope travel.
18. **NOT** leave load supported by the hoist unattended unless specific precautions have been taken.
19. **NOT** allow the load wire rope or hook to be used as an electrical or welding ground.
20. **NOT** allow the load wire rope or hook to be touched by a live welding electrode.
21. **NOT** remove or obscure the warnings on the hoist.
22. **NOT** operate a hoist on which the safety placards or decals are missing or illegible.
23. **NOT** operate a hoist unless it has been securely attached to a suitable support.
24. **NOT** operate a hoist unless load slings or other approved single attachments are properly sized and seated in the hook saddle.
25. Take up slack carefully - make sure load is balanced and load holding action is secure before continuing.
26. Shut down a hoist that malfunctions or performs unusually and report such malfunction.
27. Warn personnel of an approaching load.

WARNING

Improper operation of a hoist can create a potentially hazardous situation which, if not avoided, could result in death or serious injury. To avoid such a potentially hazardous situation, the operator shall:

1. **NOT** operate a damaged, malfunctioning or unusually performing hoist.
2. **NOT** operate the hoist until you have thoroughly read and understood the manufacturer's Operating and Maintenance Instructions or Manuals.
3. **NOT** operate a hoist which has been modified without the manufacturer's approval or without certification that it is in conformity with ANSI/AMSE B30 volumes.
4. **NOT** lift more than rated load for the hoist.
5. **NOT** use hoist with twisted, kinked, broken strands, damaged, or worn wire rope.
6. **NOT** use the hoist to lift, support, or transport people.
7. **NOT** lift loads over people.
8. **NOT** operate a hoist unless all persons are and remain clear of the supported load.
9. **NOT** operate unless load is centered under hoist.
10. **NOT** attempt to lengthen the load wire rope or repair damaged load wire rope.
11. Protect the hoist's load wire rope from weld splatter or other damaging contaminants.
12. **NOT** operate hoist when it is restricted from forming a straight line from hook to hook in the direction of loading.
13. **NOT** use load wire rope as a sling, or wrap wire rope around load.
14. **NOT** apply the load to the tip of the hook or to the hook latch.
15. **NOT** apply load unless load wire rope is properly seated in its groove.

CAUTION

Improper operation of a hoist can create a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. To avoid such a potentially hazardous situation, the operator shall:

1. Maintain firm footing or be otherwise secured when operating the hoist.
2. Check brake function by tensioning the hoist prior to each lift operation.
3. Use hook latches. Latches are to retain slings, chains, etc. under slack conditions only.
4. Make sure the hook latches are closed and not supporting any parts of the load.
5. Make sure the load is free to move and will clear all obstructions.
6. Avoid swinging the load or hook.
7. Make sure hook travel is in the same direction as shown on the controls.
8. Inspect the hoist regularly, replace damaged or worn parts, and keep appropriate records of maintenance.
9. Use the hoist manufacturer's recommended parts when repairing the unit.
10. Lubricate load wire rope per hoist manufacturer's recommendations.
11. **NOT** use the hoist load limiting or warning device to measure load.
12. **NOT** use end travel stops as routine operating stops unless allowed by manufacturer. They are emergency devices only.
13. **NOT** allow your attention to be diverted from operating the hoist.
14. **NOT** allow the hoist to be subjected to sharp contact with other hoists, structures, or objects through misuse.
15. **NOT** adjust or repair the hoist unless qualified to perform such adjustments or repairs.



HOIST SPECIFICATIONS

TMM-140A Air Manipulator Hoists are rugged units, yet compact and lightweight. They are designed primarily for work station applications and are capable of lifting loads up to 300 lbs (140 kg). Precise and infinite speed control allows smooth and accurate load spotting. The handle mounted pendant control permits the operator to have one hand free for easily guiding the load. The disc braking system provides positive load control.

Additional features include rotary vane motor, top and bottom swivel hooks, and self-storing, corrosion-resistant lifting cable.

TMM-140A hoists are designed and tested in accordance with our interpretation of the applicable sections of the American Standard of Mechanical Engineers Code B30.16, "Safety Standard for Overhead Hoists."

WARNING

To safeguard against the possibility of personal injury or property damage, follow the recommendations and instructions of this manual. This manual contains important information for the correct installation, operation and maintenance of this equipment. All persons involved in the installation, operation and maintenance of this equipment should be thoroughly familiar with the contents of this manual. Keep this manual for reference and further use.

HOIST DIMENSIONS

Below is a list of basic dimensions of the TMM-140A series hoist. Refer to Figure 1 for additional information.

Model Number	TMM-140A
Hoist Capacity (lbs)	300
Hoist Capacity (kg)	140
Standard Lift	6' 6"
Lifting Speeds: (fpm)	
Full Load (up)	36
Full Load (down)	59
No Load (up)	49
No Load (down)	39
Air Consumption:	
m ³ /min	0.6
CFM	21.2
Maximum Air Pressure (psi)	95
Minimum Air Pressure (psi)	60
Headroom (in)	22 ⁹ / ₁₆
Housing Dimensions (in):	
Depth	8 ³ / ₁₆
Width	8 ⁷ / ₈
Length	23 ³ / ₄
Net Weight (lbs)	18.7

WARNING

To prevent personal injury, do not use the equipment shown in this manual to lift, support, or otherwise transport people, or to suspend unattended loads over people.

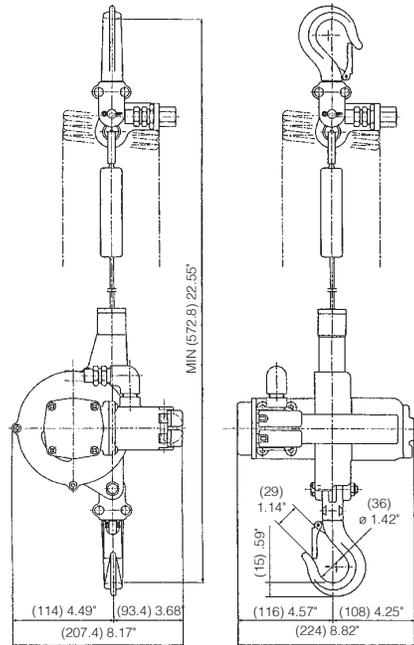


Figure 1 - Hoist Specifications

NOTE: Dimensions in parentheses are in millimeters; other dimensions are in inches. Top and bottom hook dimensions are the same.

GENERAL SAFETY INFORMATION

- The load limit for the air manipulator hoist is 300 lbs (140 kg).
- Do not extend the cable more than 6½ ft (2m).
- Precautions in mounting:
 - Suspend in secure spot using the top hook.
 - Select a safe and rigid area for hanging.
 - Hang directly above the load to be lifted. Inclined lifting exceeding an angle of more than 30 degrees should be avoided.
 - Make sure all supporting structures and attaching devices are strong enough to hold intended loads.
- The installation area must provide safe operating conditions for the operator including sufficient room for the operator and other personnel to stand clear of the load at all times.
- To avoid personal injury, always wear approved eye protection and gloves.
- When the machine is idle for a long time, suspend where moisture is minimal, and do not expose the machine to rain or dew.
- Use only OEM replacement parts when repairing unit.

FOR SAFE OPERATION OF AIR MANIPULATOR HOIST: DO NOT

- Lift more than 300 lbs (140 kg).
- Operate the hoist when load is not centered under hoist.
- Operate the hoist with twisted, kinked, or damaged cable.
- Operate damaged or malfunctioning hoist.
- Lift people or loads over people.
- Exceed the maximum rated air pressure.

- g. Extend the lifting cable beyond red marking.
- h. Operate if the hook travel does not agree with the control direction.
- i. Operate the hoist in a horizontal or inverted position.
- j. Operate the hoist with slack cable. The weight of the hoist is required for correct winding of cable or drum.

DO READ

- a. Operating and maintenance instructions.
- b. ASME B30.16 Safety Standard for Overhead Hoists.

OPERATION

Like all air tools and hoists, the air manipulator should be used with clean dry compressed air within the recommended air pressure ranges. A 3/8" NPT hose attachment is required.

RECOMMENDED AIR HOSE

The air manipulator requires a supply hose with a minimum inside diameter of 3/8" (9.5 mm). If the supply hose is longer than 33' (10 m), it is recommended to increase the hose diameter by one size.

AIR COMPRESSOR

The air manipulator may be operated with a standard 5 HP compressor. Drain air daily. Leaving the tank undrained might result in damage of the unit.

RECOMMENDED AIR PRESSURE

Use the hoist with an air pressure of 70-95 psi. Operating the air manipulator with a higher pressure for an extended period will shorten the unit life and possibly create safety hazards.

DRAIN LINE AND HOSE

Even after draining air from compressor tank, some moisture might remain in the plumbing and hose. Therefore, release air momentarily from the air hose before mounting unit to the hose.

AUTO-STOP VALVE

An auto-stop valve is equipped in this hoist. When the "Down" button is pushed and the hoist lowers to its full extent, the auto-stop valve will activate, stopping the hoist from lowering any further. In order to deactivate the auto-stop valve, push the "Up" button.

If the hoist moves in the up direction when the down button is pushed, immediately advise your dealer or distributor. Using the auto-stop valve frequently to stop the hoist in the downward direction may lead to damage of the hoist and should be avoided.

CHECK FOR MOISTURE AND DIRTY AIR

A moist air supply can wash away lubricants on functioning parts in the unit. Interior grit development will affect performance of the unit by seeping into closely fitted parts. Use of an air filter, regulator, and lubricator is recommended.

AIR LEAKAGE

Often times, loss of power is due to leakage of air from hose connections. Check connections to make sure there are no leaks.

Air supply is an important factor for usage of an air manipulator. These recommended procedures should be followed so that maximum efficiency can be obtained. To maintain proper air pressure, it is recommended to use an air filter, regulator, and lubricator.

MAINTENANCE

VANE WEAR

Excessive wear on the motor vanes or cylinder wall can cause poor performance. In such a case, the vane must be replaced.

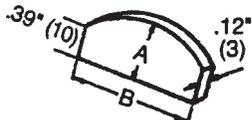
VANE INSPECTION

Refer to Figure 2 and Table 1.

1. Remove the brake case cover (See Ref. No. 50).
2. Remove the brake cover components (See Figure 2).
3. Remove the plate (See Ref. No. 43). This will provide access to vanes.

Table 1 - Vane

Type	Dimension A	Dimension B	Standard Size (In/mm)
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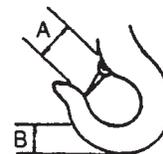
TMM140A	.54" 13.8 mm	1.18" 30 mm	
Wear Limit	.43" 10.9 mm	1.17" 29.7 mm	

HOOKS

See Table 2.

Inspect hooks once daily for cracking, extreme wear, or spreading. Replace hooks showing any of these signs. If throat openings are spread wider than maximum permissible increase listed here, the hooks have been overstressed and must be replaced. Refer to Replacement Parts List and Figure 2.

Table 2 - Displacement of Hook



Opening A (In/mm)		Thickness B (In/mm)		
Std. Size	Allowable Limit	Std. Size w/ Latch	Std. Size	Allowable Limit
1.14" 29 mm	+.02" 0.5 mm	.93" 23.5 mm	.59" 15 mm	.55" 14 mm

BRAKE ADJUSTMENT

The brake is self-adjusting and requires little maintenance. If the brake does not hold the load, follow the directions under Brake Inspection.

BRAKE INSPECTION

See Figure 2.

1. Remove the brake case cover (See Ref. No. 50).
2. Inspect the brake spring (See Ref. No. 49) for deformation. Replace if necessary.
3. Inspect the brake wheel (See Ref. No. 46) for excessive wear. Replace if necessary.



CABLE

Replace cable if inspection reveals any broken strands, rust, deterioration, cuts, deformation, severe bends, kinks, or if the diameter of the cable becomes less than .146" (3.72 mm). Note that the original cable diameter is .157" (4 mm).

CABLE REPLACEMENT

See Figure 2.

1. Disconnect and remove the coiled air hose and bottom hook.
2. Remove the four hex head screws and the control handle assembly.
3. Remove the four hex head screws from the motor case and open the case.
4. Remove the four hex head screws from the gear case, turn the hoist so that the cable wheel is facing up and press the load gear shaft (#65) through the cable wheel.
5. Remove the cable wheel assembly and the hex head bolts in the motor side wheel.
6. Remove the set-screw (#85C) from the gear side wheel and remove the wheel shaft.
7. Unwind and remove the old cable, Note retain the brass colored knock pin.
8. Insert the new cable through the top of the housing, slide the knock pin onto the cable and insert the cable into the gear side wheel.
9. Rap the cable twice inside the gear side wheel and insert the cable end into the notched area.
10. Reinstall the wheel shaft so that the notch for the set-screw is correctly oriented, this will align the bolt-holes and tighten the set-screw.
11. Reinstall the knock pin into the oval groove in the gear side wheel with the long tip up.
12. Reinstall the motor side wheel, insert the knock pin tip through the oval groove, orient the spring pin (#74) correctly so the bolt-holes are aligned.
13. Reinstall the four hex head screws and reinstall the cable wheel assembly with the knock pin facing up.
14. Insert key (#76) into slot in the cable wheel assembly, insert the load gear assembly through the cable wheel and reinstall the gear cover screws.
15. Align the drive pinion (#54) so that it correctly fits into the motor shaft, reinstall the motor housing and four screws.
16. Reinstall the control handle assembly and four screws and reattach the bottom hook.
17. Remove top hook and air inlet from the old cable assemble and reinstall on the hook plate of the new cable assembly and reinstall coiled air hose.

NOTES: To wind up new cable, hang hoist vertically from the top hook and attach the airline. Hold TMM-140A so that the cable is straight and taught. Press the UP button and wind the cable. **Be sure not to press the "DOWN" button, as this will reverse wind the cable and damage the hoist.**

WARNING

If the hoist shows air leakage or does not operate properly, immediately stop operating the hoist and stop the air flow to the hoist. Reperform the above procedure as stated above. If the hoist still does not operate correctly contact your dealer or distributor.

HANDLE ADJUSTMENT PROCEDURE (LEFT HANDED OPERATION)

The TMM-140A Air Hoist is built to operate with a right handed operator, however the hoists' handle is interchangeable. Follow these directions to change the handle to fit the operators needs.

1. Remove the hoist from its hanging position and disconnect the air supply. Push the operating buttons to confirm that the hoist does not operate.
2. Remove the M5 x 14 hex screws which hold the handle in place. Make sure the springs do not spring from under the handle when the hex screws are removed.
3. Remove the hose nipple from the top of the handle and plug (3/8 - 18) from the bottom of the handle.
4. Reassemble the hose nipple and hex taper plug (3/8 - 18) as instructed in section 3 above. Assemble the handle onto the hoist.
5. Assemble the 4 hex screws (M5 x 14) in section 2 into the handle and onto the hoist. At this time, make sure the valves close properly.
6. Apply air to the hoist and check for air leakage.
7. Hang the hoist in position and slowly check the up and down movement of the hoist.

LUBRICATION

Daily, before using and at the end of each shift, disconnect the air hose from the air inlet and pour 10 cc's of recommended oil (turbine oil 140#) into the air inlet, reconnect and then operate to fully lubricate the air manipulator.

The line lubricator is recommended to be installed as closely as possible to required area, preferably between the air pipe and the hose leading to the unit. This procedure will guarantee a constant and adequate supply or lubrication to all functioning parts.

A sufficient amount of grease is required in the reduction gear at all times. The reduction mechanism is formed of a specially designed differential reduction gear system. It consists of inner gears with 3-planet gears engaged within a single driving gear. The reduction ratio for the air manipulator is 1:62. Remove the gear case cover to inspect for grease.

Keep the cable lubricated with a light oil or commercial wire rope lubricant. This will enhance the cable life.

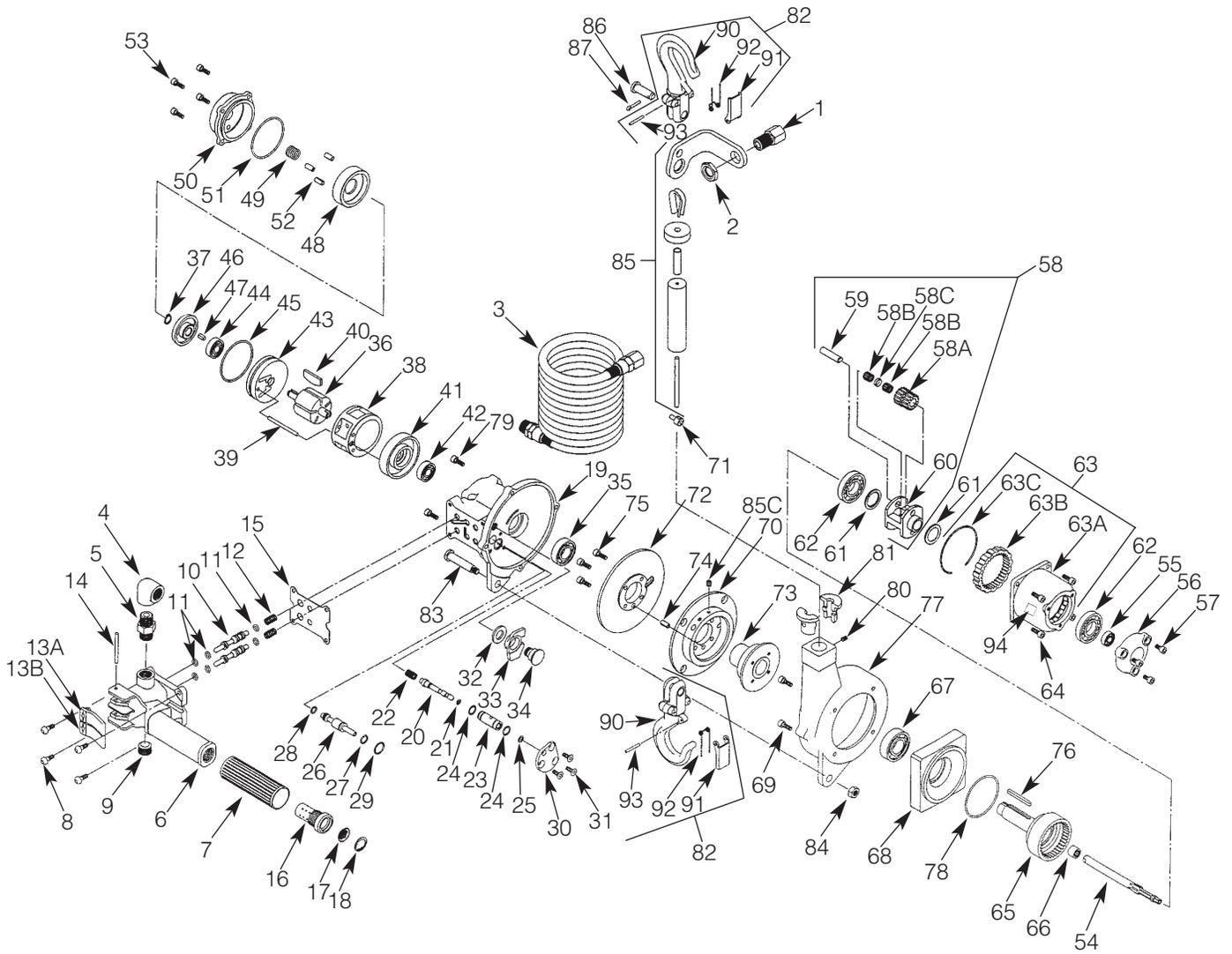
Table 3 - Recommended Oil

Maker	Esso Standard	Mobil Oil	Shell Oil
Turbin Oil No. 2140	Turbin No. 2	Red Horse Turbin Oil No. 2	140 Turbin Oil

Table 4 - Recommended Grease

Maker	Esso Standard	Mobil Oil	Shell Oil
Grease	Beacon No. 2	Mobilplex 46	RETINAX CD

Figure 2 - Air Manipulator Hoist



Parts List for Air Manipulator Hoist

Ref No.	Description	Part No.	Qty	Ref No.	Description	Part No.	Qty
1*	Air Inlet	420982WAO	1	55*	Bearing 607	130101007	1
2*	Air Inlet Lock Nut	420982WBO	1	56*	Gear Case Cover	420982FKO	1
3*	Coil HC - 9X3.7M	137201006	1	57*	Hex Bolt M5 X 10	131705011	3
4*	Elbow 3/8"	135101003	1	58*	Idle Gear Assembly	420982FLC	2
5*	Round Nipple 3/8"	135004003	1		(Includes items 58A, 58B, and 58C)		
6	Throttle Valve Body Assembly	420985ACB	1	58A*	Idle Gear	420982FLO	1
7	Throttle Valve Body Grip	136608140	1	58B*	Needle Bearing Kt-81110	130170012	2
8*	Hex Screw M5 X 14	131905014	4	58C*	Idle Gear Ring	420982FFPO	1
9	GDL Plug 3/8NPTF	134903003	1	59*	Idle Gear Shaft	420982FN1	2
10	Throttle Valve	420985AAO	2	60*	Idle Gear Shaft	420982FU1	1
11*	O-Ring P-6	131108004	6	61*	Idle Gear Frame Spacer	420982FWO	2
12*	Throttle Valve Spring	130802076	2	62*	Bearing 16004	130116004	2
13A	Throttle Valve Lever A	420985UYO	1	63*	Gear Case Assembly	420982FJA	1
13B	Throttle Valve Lever B	420985UZO	1		(Includes items 63A, 63B and 63C)		
14*	Lever Pin 4 X 46	130402030	1	63A*	Gear Case	420982FJO	1
15	Throttle Body Packing	136102079	1	63B*	Internal Gear	420982GHO	1
16*	Muffler	420982BLO	1	63C*	Internal Gear Ring	130802103	1
17*	3/4" Nipple Screen	136801001	1	64	Hex Screw M5 X 14	131905014	4
18*	Snap Ring H-20	130301020	1	65	Load Gear	420985CLO	1
19	Motor Case	420985BGO	1	66*	Needle Bearing TLA-1010	130151010	1
20	Stop Valve Pin	420985850	1	67*	Bearing 6004ZZ	130106005	1
21	O-Ring S-4	131103002	1	68	Gear Case Adapter	420985990	1
22	Stop Valve Spring	130802073	1	69	Hex Bolt M X 14	131705014	4
23	Stop Valve Pin Bushing	420985780	1	70	Gear Side Wheel	420985WDO	1
24	O-Ring S-10	131103008	2	71	Knock Pin	420985L10	1
25	O-Ring S-6	131103004	1	72	Motor Side Wheel	420985WEO	1
26	Stop Valve	420985W30	1	73	Wheel Shaft	420985600	1
27	O-Ring S-9	131103007	1	74	Spring Pin 6 X 12	130606012	1
28	O-Ring S-7	131103005	1	75	Hex Bolt M5 X 14	131705014	4
29	O-Ring S-14	131103012	1	76	Gear Side Wheel Key	130408067	1
30	Stop Valve Cover Plate	420985980	1	77	Wheel Cover	420985WGO	1
31	Hex Screw M5 X 10	132805010	3	78*	O-Ring S-56	131103042	1
32	Washer M12	131309012	1	79	Hex Bolt M5 X 14	131705014	4
33	Cam	420985740	1	80*	Hex Screw M5 X 8	132305008	1
34	Cam Shaft	420985970	1	81*	Rope Guide Bushing	136302027	2
35*	Bearing 6003ZZ	130106004	1	82*	Hook Assembly	420982PAB	2
36*	Rotor	420982BP1	1		(Includes items 90, 91 92 and 93)		
37*	Snap Ring S-10	130302010	1	83*	Under Hook Bolt	420982QEO	1
38*	Cylinder	420982BT1	1	84*	U-Nut M8	134501008	1
39*	Cylinder Knock Pin 4X52.5	130402031	1	85	Upper Hook Plate Assembly with Wire Rope	420985SAC	1
40*	Vane	137102013	5	86*	Under Hook Shaft	420601QVO	1
41	Front Plate	420985170	1	87*	Split Pin 3 X 20	130703020	1
42*	Bearing 6000ZZ	130106001	1	88*	Hose Stem 3/8 X 1/2	134803040	1
43	Rear Plate	420985180	1	89*	Plug 3/8	136503003	1
44*	Bearing 6000	130104001	1	90*	Hook	420982PFO	2
45*	O-Ring S-55	131103041	1	91*	Hook Safety Claw	420620P10	2
46*	Brake Wheel	420982E1O	1	92*	Spring Pin 3 X 24	130603024	2
47*	Brake Wheel Key	130408062	1	93*	Spring Ring	130802046	2
48*	Brake Piston	420982EF2	1	94	Warning Decal	687J4	1
49*	Brake Spring (14.6 X 11)	130802105	1	95	Max Air Pressure Decal	687J5	1
50*	Brake Case	420982KAO	1		(Not Shown)		
51*	O-Ring S-55	131103041	1				
52*	Spring Pin 6 X 12	130606012	3				
53*	Hex Screw M5 X 14	131905014	4				
54	Drive Pinion	420985GKO	1				

* Indicates that these are common parts among the TMM-140 and the TMM-140A Series Hoist.

TROUBLE SHOOTING

— Probable Cause —

— Remedy —

Air manipulator does not start

- | | |
|---|---|
| <ol style="list-style-type: none">1. Dust or other obstacles in pipe penetrating into rotor.2. Control valve not opening.3. Vane wear.4. Vane not sliding properly in rotor groove due to grease or humidity.5. Brake not fully loosened.6. Bearing wear on both sides of rotor will cause seizure of rotor and faulty rotation. | <ol style="list-style-type: none">1. Clear air hose.2. Check for obstacles or broken valve spring.3. Lubricate properly, See Tables 3 and 4.4. Clean rotor grooves and inspect vanes per noted instructions.5. Inspect brake per noted instructions. Refer to BRAKE ADJUSTMENT, page 6.6. Replace worn bearing, refer to Figure 2 for disassembly. |
|---|---|

High temperature on surface of body

- | | |
|--|--|
| <ol style="list-style-type: none">1. Lubricant oil not sufficient.2. Extraordinary wear of gears or bearings. | <ol style="list-style-type: none">1. Lubricate properly and sufficiently, See Tables 3 and 4.2. Check for sufficient level of grease. |
|--|--|

Poor lifting performance

- | | |
|--|---|
| <ol style="list-style-type: none">1. Lack of air pressure.2. Hose size too small.3. Brake is not opening fully.4. Lack of lubrication.5. Wearing of vanes. | <ol style="list-style-type: none">1. Check air pressure and consumption.2. Confirm air hose size.3. Check with dealer.4. Lubricate properly, See Tables 3 and 4.5. Check with dealer. |
|--|---|

Air is leaking

- | | |
|--|---|
| <ol style="list-style-type: none">1. Damage to the packing or O-rings. | <ol style="list-style-type: none">1. Have parts replaced by dealer. |
|--|---|

Disassembly by an Authorized Repair Center may be required for maintenance procedures.

WARNING

Overloading and Improper Use Can Result In Injury

TO AVOID INJURY:

- Do not exceed working load limit, load rating, or capacity.
- Do not use equipment to lift people or loads over people.
- Use only alloy chain and attachments for overhead lifting.
- Read and follow all instructions.

WARRANTY

Standard Columbus McKinnon Lifetime Warranty against defective workmanship or material applies.



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