

UJC

Operating, Maintenance & Parts Manual

Concert Series

1/2 Ton (454 kg)

UJC1016

UJC1032

1 Ton (907 kg)

UJC2016

2 Ton (1,814 kg)

UJC4008



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

The use of any lifting motor 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 lifting motor, 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 lifting motor operator. Failure to operate the equipment as directed in the manual may cause injury.

Should you have any questions or have problems with this product, please call Coffing Hoists at **(800) 477-5003**.

Before using the lifting motor, fill in the information below:

Model No. _____

Serial No. _____

Purchase Date _____

COFFING[®] HOISTS

Lifting Motor

SAFETY PRECAUTIONS

Each UJC Lifting Motor 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 lifting motors, 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.

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

WARNING

Improper operation of a lifting motor 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 lifting motor.
2. **NOT** operate the lifting motor until you have thoroughly read and understood the manufacturer's Operating and Maintenance Instructions or Manuals.
3. **NOT** operate a lifting motor which has been modified without the manufacturer's approval or without certification that it is in conformity with ANSI/ASME B30 volumes.
4. **NOT** lift more than rated load for the lifting motor.
5. **NOT** use lifting motor with twisted, kinked, damaged, or worn load chain.
6. **NOT** use the lifting motor to lift, support, or transport people.
7. **NOT** stand beneath a moving load! Do not move a load in such a manner as to endanger personnel.
8. **NOT** operate a lifting motor unless all persons are and remain clear of the supported load.
9. **NOT** operate unless load is centered under lifting motor.
10. **NOT** attempt to lengthen the load chain or repair damaged load chain.
11. Protect the lifting motor's load chain from weld splatter or other damaging contaminants.
12. **NOT** operate lifting motor when it is restricted from forming a straight line from hook to hook in the direction of loading.
13. **NOT** use load chain as a sling, or wrap chain around load.
14. **NOT** apply the load to the tip of the hook or to the hook latch.
15. **NOT** apply load unless load chain is properly seated in the chain sprocket(s).
16. **NOT** apply load if bearing prevents equal loading on all load supporting chains.
17. **NOT** operate beyond the limits of the load chain travel.
18. **NOT** leave load supported by the lifting motor unattended unless specific precautions have been taken.

CAUTION

Improper operation of a lifting motor 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 lifting motor.
2. Check brake function by tensioning the lifting motor 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 lifting motor regularly, replace damaged or worn parts, and keep appropriate records of maintenance.
9. Use factory recommended parts when repairing the unit.
10. Lubricate load chain per lifting motor manufacturer's recommendations.
11. **NOT** use the lifting motor's overload limiting clutch to measure load.
12. **NOT** use limit switches as routine operating stops. They are emergency devices only.
13. **NOT** allow your attention to be diverted from operating the lifting motor.
14. **NOT** allow the lifting motor to be subjected to sharp contact with other lifting motors, structures, or objects through misuse.
15. **NOT** adjust or repair the lifting motor unless qualified to perform such adjustments or repairs.

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LIFTING MOTOR SPECIFICATIONS

The UJC is a rugged and portable lifting motor designed for the demands of rigging applications. With its compact construction and ability to operate inverted, the UJC allows for greater flexibility in mounting the unit as required by each application. The light weight and high strength of the aluminum alloy housings are a plus when the lifting motor is moved from site to site. The UJC's oil filled gearbox provides smooth and reliable operation, while its magnetic disc brake provides the sure stopping and secure holding of loads that is expected in rigging applications. The lifting motor's travel is regulated by adjustable up and down limit switches. As a standard, all UJC hooks are equipped with hook latches.

APPLICATION INFORMATION

The UJC is intended for professional use in rigging applications to lift and support material loads within its rated capacity. It is designed as a component to be integrated into a rigging system. The user is responsible for ensuring the adequacy and reliability of their controller and power supply. Coffing Hoists can not be held responsible for applications other than those for which the UJC is intended. Prior to installation and operation, we caution the user to review his application for abnormal environmental or handling conditions and to observe the applicable recommendations as follows:

Table 1 - Lifting Motor Specifications

Model	Capacity (tons)	Lifting Speed		HP	Approximate Motor Amperage at Full Load					
		fpm	m/min		1-Phase		3-Phase			
					115/230V	230/460V	208V	380V	415V	575V
UJC1016	1/2	16	4.1	1/2	7.6/3.8	2/1	2.3	1.2	1.1	.76
UJC1032	1/2	32	8.2	1	14/7	3.2/1.6	3.6	1.9	1.8	1.2
UJC2016	1	16	4.1	1	14/7	3.2/1.6	3.6	1.9	1.8	1.2
UJC4008	2	8	2	1	14/7	3.2/1.6	3.6	1.9	1.8	1.2

Note: The 1HP, 115/230V models must have a dedicated power circuit rated for at least 20A, 125V when they are wired for 115V. As a load is lifted, the lifting motors will experience an initial current surge of up to three times the values listed.

ADVERSE ENVIRONMENTAL CONDITIONS

Do not use the lifting motor in areas containing flammable vapors, liquids, gases or any combustible dusts or fibers. Refer to Article 500 of the National Electrical Code. Do not use this lifting motor in highly corrosive, abrasive or wet environments. Do not use this lifting motor in applications involving extended exposure to ambient temperatures below -10°F or above 130°F.

LIFTING OF HAZARDOUS LOADS

This lifting motor is not recommended for use in lifting or transporting hazardous loads or materials which could cause widespread damage if dropped. The lifting of loads which could explode or create chemical or radioactive contamination if dropped requires fail-safe redundant supporting devices which are not incorporated into this lifting motor.

LIFTING OF GUIDED LOADS

This lifting motor is recommended only for lifting freely suspended loads and is not for use in the lifting of guided loads, including dumbwaiters and elevators. Such applications require additional protective devices which are not incorporated into this lifting motor. 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).

WARNING

Failure to comply with safety precautions outlined throughout this manual can result in serious injuries or death. Before using this lifting motor, each operator should become thoroughly familiar with all warnings, instructions and recommendations in this manual.

SUSPENDING LOADS OVER PEOPLE

The suspension of loads over people demands the highest level of rigging knowledge, equipment, and equipment maintenance. The UJC must be installed and used in accordance to rigorous rigging standards required when suspending loads over people. These include the following important precautions.

1. It is preferred that the load always be tied off with auxiliary chains or cables before access to the area beneath the load is permitted. As an alternative, the system may be designed such that malfunction or failure of one lifting motor's load bearing components does not cause load loss and/or overloading of any other lifting motors in the system. Note that in such a system, lifting motor performance and function must be monitored visually or with the use of load cells.
2. **Never operate the lifting motor while people are under the load.**

SAFETY INFORMATION

1. Follow all local electrical and safety codes, as well as the National Electrical Code (NEC) and the Occupational Safety and Health Act (OSHA) in the United States.
2. The lifting motor must be securely and adequately grounded. The power pigtail includes a green lead for grounding.
3. Be careful when touching the exterior of an operating motor; it may be hot enough to be painful or cause injury. With modern motors this condition is normal if operated at rated load and voltage (modern motors are built to operate at higher temperatures).

WARNING

Always disconnect the power source before working on or near a lifting motor or its connected load. If the power disconnect point is out of sight, lock it in the open position and tag to prevent unexpected application of power.

4. Protect the power and control cables from coming in contact with sharp objects.
5. Do not kink the electrical cables and never allow them to come in contact with oil, grease, hot surfaces, or chemicals.
6. Make certain that the power source conforms to the requirements of your equipment.
7. Inspect the unit daily before operating lifting motor.
8. Cluttered areas and benches invite accidents.
9. The operator should not engage in any practice which will divert his attention while operating the lifting motor.
10. Before using the lifting motor, the operator should be certain that all personnel are clear.
11. Do not operate lifting motor with loads exceeding its rated capacity.
12. Supporting frames or beams used as a lifting motor hanger must have a greater load capacity than the lifting motor.
13. Do not attempt to operate lifting motor beyond normal maximum lift range.

14. Align lifting motor for a straight line pull. Avoid side pull or end pull.
15. Do not operate lifting motor with twisted or damaged chain.
16. Do not operate a damaged or malfunctioning lifting motor until necessary adjustments or repairs have been made.
17. Do not use lifting motor to lift people or to carry loads over people.
18. Do not leave a load suspended in the air unattended.
19. Always remove load before making repairs.
20. Do not remove or obscure capacity or warning decals.

INSTALLATION

POWER & CONTROL SYSTEM REQUIREMENTS

The UJC must be connected to a power and control system that is properly designed to operate the lifting motor and to handle the power consumption of the motor. Note the motor amperages listed on page 3. Be aware that the instantaneous current surge experienced when lifting is typically up to three times the steady current. The unit has a control pigtail and power pigtail for electrical connections. Control voltage is 115V as a standard (24V optional). Power conductors and branch circuits connected to the unit should be adequate to handle the current draw. This is especially important to consider when a unit is wired for 115V (See Table 2, page 11).

PRELIMINARY CHECKS

Before installing the lifting motor, check the following:

1. After unpacking the unit, carefully inspect for any damage that may have occurred during transit. Check for loose, missing or damaged parts. Shipping damage claims must be filed with the carrier. Be sure that the voltage labeled on the unit matches your power supply.
2. Make sure all supporting structures and attaching devices have the strength to withstand several times the weight of the intended loads. If in doubt, consult a qualified structural engineer.
3. Provide proper branch circuit protection for the lifting motor as required by the prevailing electrical codes in your area.
4. Lifting motors should not experience voltage drops of more than 10% of the supply voltage. It is critical to use adequate sized power cables, especially with 1-phase models (See Table 2). On dual voltage lifting motors, the installer must ensure that the lifting motor is correctly wired for the intended voltage (See WIRING, page 9).
5. **ALWAYS DISCONNECT LIFTING MOTOR FROM POWER SUPPLY** before removing electrical cover or when making any electrical connection in the lifting motor.
6. The user's control board must be grounded in accordance with the electrical codes that are applicable in your area. Power cables to lifting motors must include a ground conductor. The power pigtail includes a green grounding conductor.
7. 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.

INSTALLING THE LIFTING MOTOR

1. Be certain that supporting structures and attachment points have the strength to withstand several times the weight of the intended loads.
2. Hooks should be attached to appropriate points such that the load will be applied at the saddle of the hook only. Never allow a load to rest on the tip of a hook. Hook latches should always close completely.
3. The UJC can be mounted upright or upside down.
4. Connect the controls to the lifting motor as shown in the Wiring Diagrams starting on page 11. When installing a three-phase lifting motor, check to make sure the lifting motor travels in the direction intended when operating the controls. To correct improper motor travel, reverse any two wires (except the green ground wire) at the power source. Do not change connections in the lifting motor. Once the direction of travel is verified to be correct, permanent connections can be made at the power source.
5. Once the controls are properly connected, run the motor in the down direction to allow enough length of chain to attach the load hook to its suspension point. Once again, you should be certain of the structural strength at the attachment point and ensure that the load will bear on the saddle of the hook. The lifting motor should be permitted to align itself for a straight line pull. Do not attempt to pull around corners.
6. Reset the limit switches to allow for only the amount of travel required (See LIMIT SWITCH ADJUSTMENT, page 8).
7. It is imperative that no twists exist in the chain, especially on double-reeved units. **Chain twists can create hazardous conditions!** Twists occur when the 2-ton load block is capsized or when the slack end of chain is not properly attached at the side of the lifting motor.
8. If necessary, lubricate the chain, see LUBRICATION, page 9.

CHAIN BAG (OPTIONAL ACCESSORY)

It is strongly recommended to use a chain bag with the UJC. Chain bags like shown in Figure 1 are available from Coffing Hoists. The bags, which are colored black, fit closely to the lifting motor and are as inconspicuous as possible. Be sure to follow the directions that come with UJC chain bags before installing.

CAUTION

Do not attempt to store more chain in a chain bag than outlined on its instruction sheet or serious damage to the lifting motor may result and hazardous conditions may be created.

Note: UJC4008 uses twice the amount of chain than the single-reeved models.



Figure 1 - UJC With Optional Chain Bag

Product Codes:
UJC927-3
70 ft Chain Capacity
UJC927-4
120 ft Chain Capacity

OPERATION

This lifting motor is designed for operation within the limits of its rated capacity. It is controlled by a user supplied control system or a pushbutton station. The UP direction is controlled by closing the circuit between X1 and C20. DOWN is controlled by closing the circuit between X1 and C21 (See Figures 7A-7C).

WARNING

Do not use lifting motor to lift, support or otherwise transport people.

OVERLOAD LIMITING PROTECTION

This lifting motor is equipped with a factory-calibrated overload limiting clutch that will permit the lifting of loads within its rated capacity, but will prevent the lifting of damaging overloads while the lifting motor is being operated. If the load being lifted exceeds the lifting capability of the overload clutch, the motor will continue to run, causing overheating of both the clutch and motor. This condition should be avoided by immediately releasing the "UP" button and reducing the load to within the rated capacity of the lifting motor. See GEARING, page 10, for additional instructions on this device.

CAUTION

The overload limiting clutch is an emergency protective device and should not be used to measure the maximum load to be lifted, or to sense the overload imposed by a constrained load. While the overload limiting clutch will protect the lifting motor from damaging overloads, it will not ensure that a load is within the rated capacity of the lifting motor.

WARNING

Do not purposely allow the overload limiting clutch to slip. Excessive slippage will damage the clutch and motor. Hazardous conditions will be created!

LIMITS OF TRAVEL

The UJC's travel is limited by "UP" and "DOWN" limit switches that should be adjusted for the application to prevent dangerous conditions or incidents that could occur with overtravel. The operator should be aware of the location of the load at all times. If the extreme limits are encountered, the user should immediately stop the motor.

With properly set limits, tandem units can be synchronized by easing each one to its corresponding limit. Depending on the application, you will use the "UP" or "DOWN" limit as your guide.

OPERATING NOTES

Here are some points which must be observed to maintain proper operation.

1. Do not overload the lifting motor.
2. Do not make extreme side pulls with the lifting motor.
3. **Do not sling the lifting motor load chain around an attachment point. Use a proper sling.**
4. Before raising a load, always check to see that it is held securely in the hook or sling chains, etc. Raise the load only until the load chain is taut and then double check the

- rigging before continuing to raise the load. Load must be supported in saddle of hook, not by hook tip or hook latch.
- Do not stand beneath a moving load! Do not move a load in such a manner as to endanger personnel.
 - Do not lower into areas where visibility is obscured unless someone else is guiding the operation.
 - Use common sense at all times when operating a lifting motor.
 - Do not operate if direction of hook travel is not the same as indicated on button being pushed.
 - Do not operate unless hook travel limit devices function. Test without load each shift.
 - Do not operate when lifting motor is not centered over load.
 - Do not operate if chain is not seated properly in sprockets or sheave grooves.
 - Do not operate a damaged or malfunctioning lifting motor.
 - DO NOT USE LIFTING MOTOR TO LIFT, SUPPORT OR OTHERWISE TRANSPORT PEOPLE.**

MAINTENANCE

INSPECTIONS

A planned inspection routine should be established for this lifting motor based upon frequency of use, severity of use, and environmental conditions. Some inspections should be made frequently (daily to monthly) and others periodically (monthly to yearly). It is strongly recommended that an Inspection and Maintenance Check List and an Inspector's Report, similar to those shown in Figures 8A and 8B, be used and filed for reference. All inspections should be performed or overseen by a designated inspector. Special inspections should be made following any significant repairs or any operating occurrence leading one to suspect that the lifting motor's capability may have been impaired.

LOWERING WITHOUT POWER

If the power fails with a load suspended, the lifting motor will automatically stop. In an emergency the load can be lowered without power as follows:

- DISCONNECT LIFTING MOTOR FROM POWER SUPPLY AND REMOVE ELECTRICAL COVER.



WARNING

Failure to follow proper lockout/tagout procedures may present the danger of electrical shock.

TO AVOID INJURY:

Disconnect power and lockout/tagout disconnecting means before removing cover or servicing this equipment.

- Open disc brake manually by using two screwdriver blades, one on each side of the brake at a point close to the brake spring posts. Apply pressure to the underside of the armature plate (points "X", Figure 4, page 9) to close the solenoid and release the brake.

WARNING

Do not allow screw driver blades to touch rotating friction disc "C" (See Figure 4, page 9).

CAUTION

Do not allow the load to descend rapidly. This causes the motor to race and serious damage may result.

- Use several quick releases instead of holding brake open continuously. Do not exceed normal lowering speed.

HOOKS

Refer to Figure 2.

- Inspect hooks once daily for cracking, extreme wear or spreading. Replace hooks showing any of these signs. If the throat openings are spread wider than the maximum permissible 15% increase listed here, the hooks have been overstressed and must be replaced. Any hook that is bent or twisted more than 10° from the plane of an unbent hook must also be replaced.
- The hook latches should be inspected to ensure that they close the hook throat opening in a secure manner when a load is applied. Inspect the hook shank and nut for any stripping of the threads or other damage. The hook nut should be fully restrained by the retaining pin.
- In addition to above, hooks should be inspected for cracks by the magnetic particle, dye penetrant or other suitable crack testing inspection method. This should be done at least once a year.

Lifting Motor Capacity	"X" Dimension*	
	Load Hook	Suspension Hook
1 Ton & Under	1 ¹¹ / ₃₂ "	1 ⁷ / ₃₂ "
2 ton	1 ¹¹ / ₃₂ "	1 ¹¹ / ₃₂ "

(*) Maximum permissible throat opening of hook.

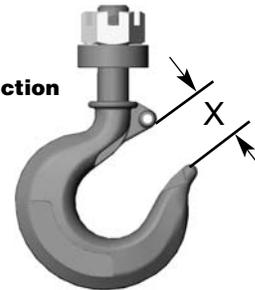


Figure 2 — Hook Inspection

CHAIN

Chain is to be kept clean and lubricated (See LUBRICATION, page 9). Visually check chain every time lifting motor is used. The lifting motor must not be operated when chain is twisted or kinked. An important phase of lifting motor maintenance is chain inspection. Check individual links and check for chain elongation.

CAUTION

The chain used on this lifting motor has very carefully controlled dimensions and has been heat treated. Do not attempt to substitute any other manufacturer's chain.

1. Check the chain for overall wear or stretch by selecting an unworn, unstretched length of chain (at the slack end for example). Let the chain hang vertically with a light load (about 20 pounds) on the chain to pull it taut. Use a large caliper to measure the outside length of a convenient number of links (about 12"). Measure the same number of links in a used section of chain and calculate the percentage increase in length of the worn chain.
2. If the length of the worn chain is more than 1½% longer than the unused chain (0.015" per inch of chain measured), then the chain should be replaced. If the chain is worn less than 1½%, check it at several more places along its length. If any section is worn more than 1½%, the chain should be replaced.

Chain Replacement with Chain in Lifting Motor

1. With the unit hanging by the suspension hook (decals upside down), run the load hook to its "UP" limit.
2. DISCONNECT LIFTING MOTOR FROM POWER SUPPLY and remove the electrical cover.



WARNING

Failure to follow proper lockout/tagout procedures may present the danger of electrical shock.

TO AVOID INJURY:

Disconnect power and lockout/tagout disconnecting means before removing cover or servicing this equipment.

3. Using a screwdriver, pry the spring guide plate out of the slots in the limit switch nuts (See Figure 5). Turn the gold nut back to about the center of the threaded shaft. Do not disconnect the wires from the limit switches.
4. Remove the load block assembly from the old chain. On double-chained lifting motors detach the chain from the chain support and pull it through the load block assembly.
5. Make a "C" shaped chain link by grinding through the end link on the load end of the old chain.
6. Using the "C" link, attach the new chain to the load end of the old chain. Be sure that the welds of the upstanding links of the new chain will face outward from the load sheave. The end links must be oriented for attachment to the dead-end shackle and the chain support (double-chained only) without any twist in the chain. Note that the chain end is attached to the shackle with a split link.
7. With the electrical cover off, connect the lifting motor to the power supply. Be sure that the green ground wire is properly grounded (See INSTALLATION, page 4).
8. Carefully jog the "UP" button and run the joined pieces of chain into the lifting motor until about 15" of the new chain comes out the other side.
9. DISCONNECT LIFTING MOTOR FROM POWER SUPPLY.



WARNING

Failure to follow proper lockout/tagout procedures may present the danger of electrical shock.

TO AVOID INJURY:

Disconnect power and lockout/tagout disconnecting means before removing cover or servicing this equipment.

10. Remove the "C" link and the old chain. Remove the chain stop from the old chain by prying off its retaining ring with a flathead screwdriver. If attached, remove the old chain from the shackle on the side of the lifting motor by opening up the split link.
11. Attach the chain stop to the slack end of the new chain by capturing the 12th link with the two stop halves positioned with their tapered ends pointing towards the lifting motor. Slide the sleeve over the halves and attach the retaining ring. If you are not using a chain container, attach the slack end of the new chain to the shackle on the side of the unit using the split link. DO NOT allow twists in the chain.
12. Adjust the lower limit switch (See ADJUSTING LOWER LIMIT, page 8).
13. Attach the load block on single-chained lifting motors using a new load block screw or pin (See Figure 19). On double-chained lifting motors, feed the chain through the load block (welds of the upstanding links will be in towards the sheave) and fasten the end of the chain to the chain support using a new chain support pin (See Figure 19). Be sure there are no twists in the chain.
14. Adjust the upper limit switch (See ADJUSTING UPPER LIMIT, page 8).

Chain Replacement with No Chain in Lifting Motor

1. DISCONNECT LIFTING MOTOR FROM POWER SUPPLY and move lifting motor to a work table. Remove the electrical cover, electrical panel and the electric brake assembly.



WARNING

Failure to follow proper lockout/tagout procedures may present the danger of electrical shock.

TO AVOID INJURY:

Disconnect power and lockout/tagout disconnecting means before removing cover or servicing this equipment.

2. Detach the chain stripper from the bottom of the lifting motor.
3. Insert the new chain between the load sheave and the chain guide. Feed the chain into the lifting motor by manually turning the brake hub. Allow about 15" of chain below the lifting motor on the slack end. Be sure the welds of the upstanding links are out away from the load sheave and that proper orientation is observed for attachment of the slack end. Also be sure the load hook assembly (if already attached to the chain) is toward the center of the lifting motor or to your right looking from the transmission end.

CAUTION

There are wires running through the lifting motor. Carefully ease the lifting motor sections apart. Do not jerk them apart.

4. Reinstall the chain stripper observing proper chain alignment and avoiding any twist in the chain.

5. Follow steps 11 through 14 in previous section, CHAIN REPLACEMENT WITH CHAIN IN LIFTING MOTOR, to complete the chain replacement procedure.

NOTE: Inspect chain guides and load sheave for wear, replace as needed.

LIMIT SWITCH ADJUSTMENT

Refer to Figure 5.

IMPORTANT: Before placing lifting motor in operation, check the limit switch adjustment. Limit switches are provided to protect the lifting motor against damage resulting from overtravel or to allow setting the hook travel within the factory-set limits of travel. The standard UJC limit switch allows for the maximum amount of lift, which is 134 ft on 1/2 ton lifting motor models, 143 ft on the 1 ton models, and 71 ft on the 2 ton models.

The limit switch adjusting nuts are color-coded gold for the "UP" limit and silver for the "DOWN" limit. Movement of the limit switch nuts toward or away from each other increases or decreases the hook travel respectively.

Adjusting Upper Limit (Gold Nut)

1. Suspend the lifting motor. For single-chained models operate "UP" until there is a minimum clearance of 2" from the lifting motor housing and the top of the block. Double-chained models require a minimum clearance of 1" from the chain support to the top of the load block.
2. DISCONNECT LIFTING MOTOR FROM POWER SUPPLY and remove the electrical cover.



WARNING

Failure to follow proper lockout/tagout procedures may present the danger of electrical shock.

TO AVOID INJURY:

Disconnect power and lockout/tagout disconnecting means before removing cover or servicing this equipment.

3. With a screwdriver, pry the spring guide plate out of the slots in the limit switch nuts.
4. Turn the slotted gold nut toward its limit switch until the switch "clicks" then turn two slots farther. Release the spring guide plate and be sure it slips back into the slots in both limit switch nuts. Do not disturb the silver slotted nut if it has been set previously.

Adjusting Lower Limit (Silver Nut)

1. Suspend the lifting motor. Operate "DOWN" to a point where the slack-end loop of the chain hangs down 6" or more from the lifting motor housing (or the limit desired in any particular application allowing the minimum 6"). There should be a minimum clearance of 1½" between the chain stop and the bottom of the lifting motor.
2. DISCONNECT LIFTING MOTOR FROM POWER SUPPLY and remove the electrical cover.



WARNING

Failure to follow proper lockout/tagout procedures may present the danger of electrical shock.

TO AVOID INJURY:

Disconnect power and lockout/tagout disconnecting means before removing cover or servicing this equipment.

3. With a screwdriver, pry the spring guide plate out of the slots in the limit switch nuts.

4. Turn the slotted silver nut toward its limit switch until the switch "clicks," then turn two slots farther. Release the spring guide plate and be sure it slips back in the slots in both limit switch nuts. Do not disturb the gold slotted nut if it has been set previously.

Check Both Upper and Lower Limits

1. Connect the lifting motor to the power supply. Be sure the green ground wire is properly grounded.

CAUTION

If the wires running to the limit switches are ever disconnected for any purpose, be sure to replace wires in accordance with the correct wiring diagram (See Figures 7A - 7C).

2. Check the direction of hook travel (See INSTALLING THE LIFTING MOTOR, page 5).
3. Carefully operate to upper limit and observe if it stops automatically at desired level. Do not allow load block to run into the lifting motor housing — this will damage the lifting motor. Maintain a minimum clearance of 2" from the lifting motor housing and the load block on single-chained models and 1" from the chain support to the load block on double-chained models.
4. Carefully operate to lower limit and observe if it stops automatically at the desired level. Do not allow slack-end loop of chain to become taut against lifting motor housing. This will damage the lifting motor. There should be a minimum clearance of 1½" between the chain stop and the lifting motor.
5. If upper and lower limits operate satisfactorily, lifting motor is ready for use. If they are not as desired, repeat adjustment.

BRAKE

Properly adjusted, this brake will release promptly when energized. It is capable of both smoothly stopping and securely holding the rated capacity of the lifting motor. If the lifting motor develops either undesirable over-travel after a pushbutton is released (this condition is most noticeable in the lowering direction) or hesitates to lift the load promptly, the brake should be adjusted.

Brake Adjustment

Refer to Figure 4.

1. DISCONNECT LIFTING MOTOR FROM POWER SUPPLY and remove the electrical cover.



WARNING

Failure to follow proper lockout/tagout procedures may present the danger of electrical shock.

TO AVOID INJURY:

Disconnect power and lockout/tagout disconnecting means before removing cover or servicing this equipment.

2. With reference to Figure 4, the gap between the brake armature "A" and the field "B" should be checked. The correct gap is 0.015". Adjustment should not be necessary until gap reaches 0.040".

- Adjust gap by adjusting the 3 locknuts "F" and checking with a feeler gauge to be sure gap is the same on both ends of the solenoid.

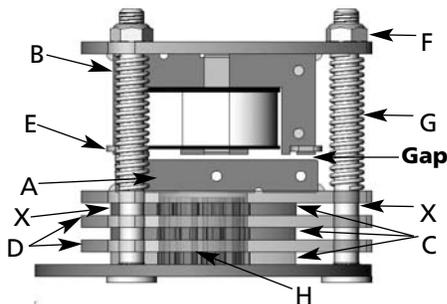


Figure 4 — Brake Assembly

- Adjustment is now complete and the brake properly set. Replace the electrical cover, reconnect the power supply, and check lifting motor brake action.

CAUTION

Be sure the bottom of the armature does not bear against the splined adapter "H". As adjustments are made, the built-in clearance will be reduced. When this clearance is gone REPLACE BRAKE DISCS. Minimum allowable disc thickness is .162". See Figure 13 for further illustration.

WIRING

Refer to Figures 7A, 7B and 7C.

Single-phase units (115/230V) are wired for 230V and 230/460V-3 phase units are wired for 230V unless otherwise specified when ordering. Lifting motors ordered with other 3-phase voltages are single-voltage only. Conversion of dual voltage units can be done simply and quickly as follows.

- DISCONNECT LIFTING MOTOR FROM POWER SUPPLY and remove electrical cover.
- On 230/460V-3 phase units converting to 460V requires removing the C1, C2 and C3 jumpers as shown on the wiring diagram 983CE2100-000. The motor leads T4, T5 and T6 are then connected to the blocks as shown. Save the three jumper wires for conversions back to 230V. One of the transformer leads H2 (230V) and H4 (460V) is connected to the contactor as shown depending on the voltage.
On 115/230V-1 phase units, connections are only modified at the terminal blocks as shown on wiring diagram 981CE0100-000.
- Make sure that all of the screw clamps on the contactor and terminal blocks are tightened. **Tug on the wires to ensure they are securely connected.**
- Check the operation of the lifting motor, ensuring that the direction of travel is correct (See INSTALLING LIFTING MOTOR, page 5).

IMPORTANT: Always refer to the wiring diagram located on the inside of the electrical cover or Figures 7A, 7B and 7C when performing electrical repairs. Make sure all terminals are securely fastened and check for damaged insulation. It is also imperative that the power circuit has conductors of adequate size.

LUBRICATION

Refer to Figure 9.

Proper lubrication is necessary to ensure a long and reliable lifting motor life. Refer to the following and the RECOMMENDED LUBRICATION SCHEDULE for lubrication points, type of lubricant, and frequency of lubrication.

Load Chain

Clean the load chain with acid-free solvent and coat with new SAE 90 gear oil. Wipe excess oil to prevent dripping. Never apply grease to the chain.

Gearing

The gearbox of this lifting motor is filled at assembly with 1½ pints of SAE 90 EP gear oil. To check oil level, hang the unit by the suspension hook (the unit and decals will be upside down) and remove the oil level check plug. With the lifting motor hanging level, the gear oil should be even with the hole.

Bearings

All bearings except hook and idler sheave bearings are lubricated at the factory and should not require additional lubrication. Noisy or worn bearings should be replaced.

Limit Switch Shaft

Remove any dirt accumulation and spray with a general purpose lubricant.

Hook Bearing

Apply a few drops of new SAE 30 gear or motor oil around the edge of the bearing.

Idler Sheave Bearing (Bushing)

Disassemble load block and apply a light coat of NLGI #2 grease, or equivalent, inside of bearing.

NOTE: If lifting motor is used in an atmosphere containing abrasive dust, frequent cleaning and oiling may be necessary.

LIFTING MOTOR REPAIRS

NOTE: If you do not have an experienced mechanic to do your repair work, we recommend that you send your lifting motor to an approved service station for repairs. Use authorized repair parts only.

WARNING

Remove load and disconnect lifting motor from power supply before starting to do any repairs or to take any sections apart.

- For major repairs or when the lifting motor is to be sectioned in the suspension area, it will be necessary to move the lifting motor to a workbench or table.
- For repairs which can be done by removing the electrical cover only, the lifting motor need not be moved. Lowering the lifting motor to a convenient working level is desirable.

The following repair instructions will help you in understanding repair procedures, when related to the Replacement Parts List starting on page 16. For clarity these are broken down into areas.

Electrical Parts and Brake

1. Refer to Figures 14 and 15. Remove the cover to access the controls. Single-phase models also have a starting switch and capacitor mounted on the motor as shown in Figure 14. The terminal blocks and end clamps snap off of the rails on the plate using a small screwdriver. DO NOT SLIDE THE END CLAMPS.

The contactor can be slid off the rail, but must be snapped on. Where the contactor fits the rail, one side has springs or pads that apply pressure against the edge of the rail. By pressing against that side at the base of the contactor, you can snap the part on or off using a rotating action. Note the numbers that label the terminals on the contactor and orient the part as shown in Figures 7A-7C. Single-phase contactors have a small jumper that is not present on the 3-phase (note the 3 and 5 terminals on the reversing contactor in Figure 7A).

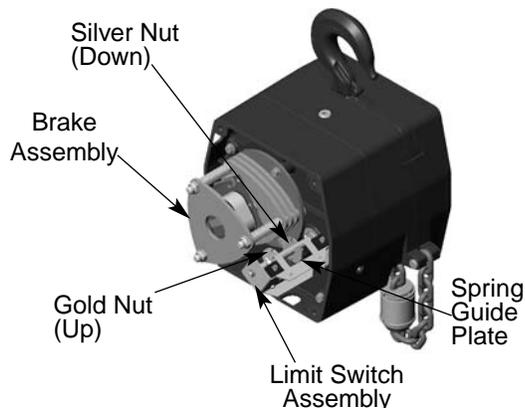


Figure 5 — Brake and Limit Switch Assembly

2. Remove the electrical panel by removing the stand-off screws (See Figures 14 & 15). The limit switch and brake are now accessible as shown in Figure 5.
3. Remove the transformer bolted to the back of the panel plate if it requires replacement.
4. Refer to Figure 13 to disassemble the brake. See BRAKE ADJUSTMENT on page 8 to properly set the brake.
5. Refer to Figure 16 to disassemble the limit switch. See LIMIT SWITCH ADJUSTMENT on page 8 to properly set the upper and lower limits of travel.
6. Refer to Figure 17 for repairs on the pushbutton station. Also refer to the wiring diagram inside the electrical cover or Figures 7A, 7B and 7C for wiring instructions.

Motor

Refer to Figures 11 and 12.

The lifting motor's motor is located on the opposite end to that of the electrical parts, but the two are tied together with electrical leads running through the housing.

1. If it is necessary to replace or repair the motor, DISCONNECT THE LIFTING MOTOR FROM THE POWER SUPPLY and remove the electrical cover.
2. Loosen the screw clamps on the terminal blocks and reversing contactor to disconnect the motor leads (See Figures 14 and 15).
3. Remove the four motor mounting bolts attaching the motor to the housing. It will come loose at the motor coupling.



WARNING

Failure to follow proper lockout/tagout procedures may present the danger of electrical shock.

**TO AVOID INJURY:
Disconnect power and lockout/tagout disconnecting means before removing cover or servicing this equipment.**

4. Inspect the motor coupling, motor shaft and all the bearings. Replace as necessary.
5. Install new or repaired motor according to the wiring diagram located inside the electrical cover or Figures 7A, 7B and 7C.

Gearing

Use the Replacement Parts List for Basic Unit and Gearbox Parts to help in repairs on gearing (See Figures 10 and 18). As disassembly is extensive for gearing, disconnect the lifting motor and move it to a workbench.

1. Remove electrical cover.
2. Remove electrical panel.
3. Remove brake assembly.
4. Drain oil from the gearbox.
5. Remove the four screws attaching the gearbox cover to the gear housing and remove the gearbox cover.
6. Inspect gears for broken or severely worn teeth and inspect all bearings. Replace as necessary. The overload slip clutch is factory calibrated and must not be disassembled or readjusted.

CAUTION

Do not disassemble or readjust clutch, or replace with a clutch assembly from another lifting motor. Doing so will void the warranty and may create an unsafe condition. If replacement is needed due to wear or loss of adjustment, always use a new clutch assembly.

7. Reassemble in reverse order of disassembly making sure the gasket is in place and in good condition. Coat gasket with Permatex® or other gasket cement. Extreme care should be taken to avoid damage to oil seals.
8. Check all wire terminals to be sure they are properly seated and in accordance with wiring diagram. Before placing lifting motor back into service, check brake adjustment.

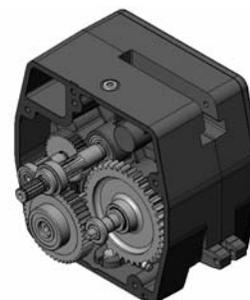


Figure 6 - Assembled Gearing

Suspension

Use the Parts List for Basic Unit and Chaining Parts to help in repairs in this section (See Figures 10 and 19). The lifting motor sections must be separated at the top hook line in order to inspect the load sheave and chain guides. See CHAIN REPLACEMENT WITH NO CHAIN IN LIFTING MOTOR, page 7.

While this section is apart, check the following:

- Load sheave
- Chain, Chain guides and plates
- Chain support (on 2 ton models)
- Bearings

Replace parts as necessary including screws, lockwashers, etc. When reassembled, recheck operation.

POWER CORD PRECAUTIONS WITH 1-PHASE LIFTING MOTORS

Electric lifting motors require a sufficient power supply. It is especially important with single-phase voltage to ensure that the conductors running to the lifting motor from the power source are adequate in size to handle the power requirements of the lifting motor. Inadequate **power cables** and **branch circuits** will cause low voltage, high amperage, damage to the lifting motor, and potential fire hazards. Such problems can be minimized by using 230V power on 115/230V lifting motors. The following are recommendations for the conductor gage size depending on the length, horsepower, and voltage.

Table 2 - Recommended Conductor Sizes for 1-Phase Lifting Motors

HP	Voltage (1-Phase)	Maximum Length of Power Cord in Feet			
		14 AWG	12 AWG	10 AWG	8 AWG
1/2	115V	40	60	100	150
	230V	200	330	520	810
1	115V	0	30	50	75
	230V	120	190	310	490

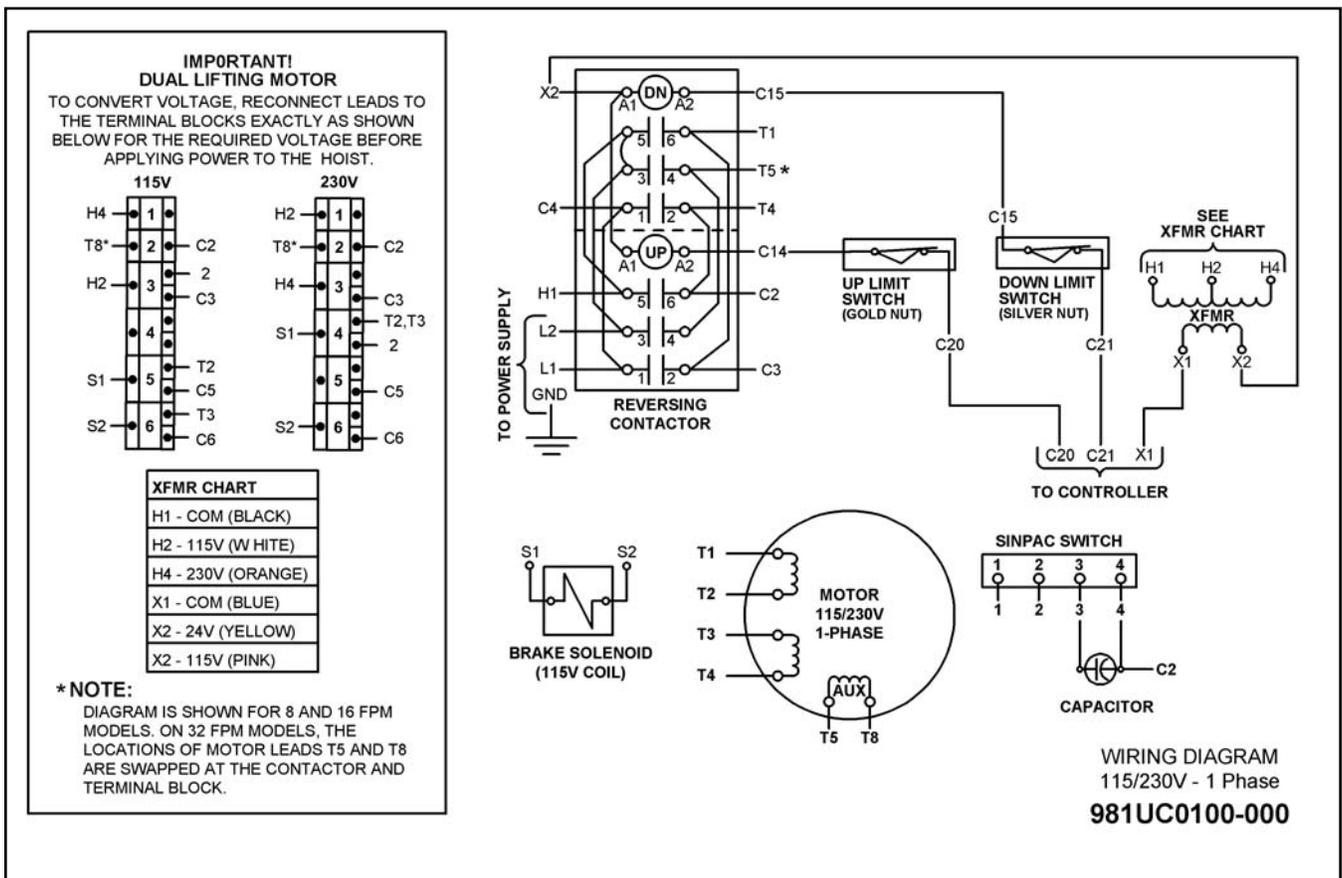


Figure 7A — Wiring Diagram for 115/230V - 1 Phase Models

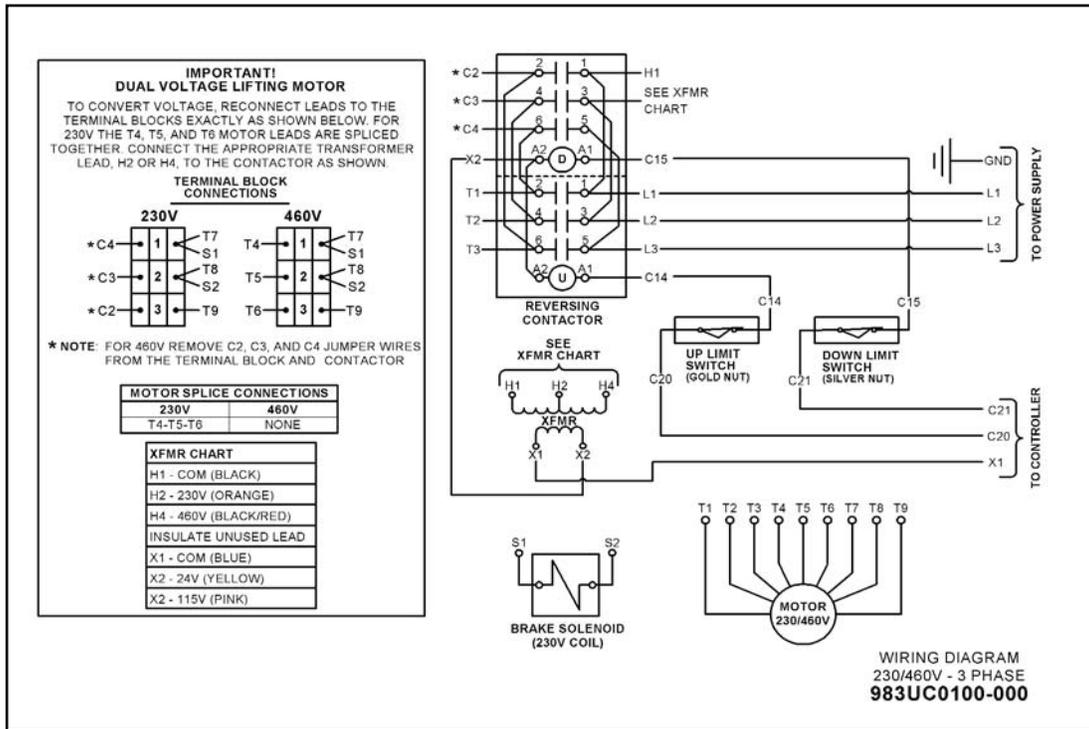


Figure 7B — Wiring Diagram for 230/460V - 3 Phase Models

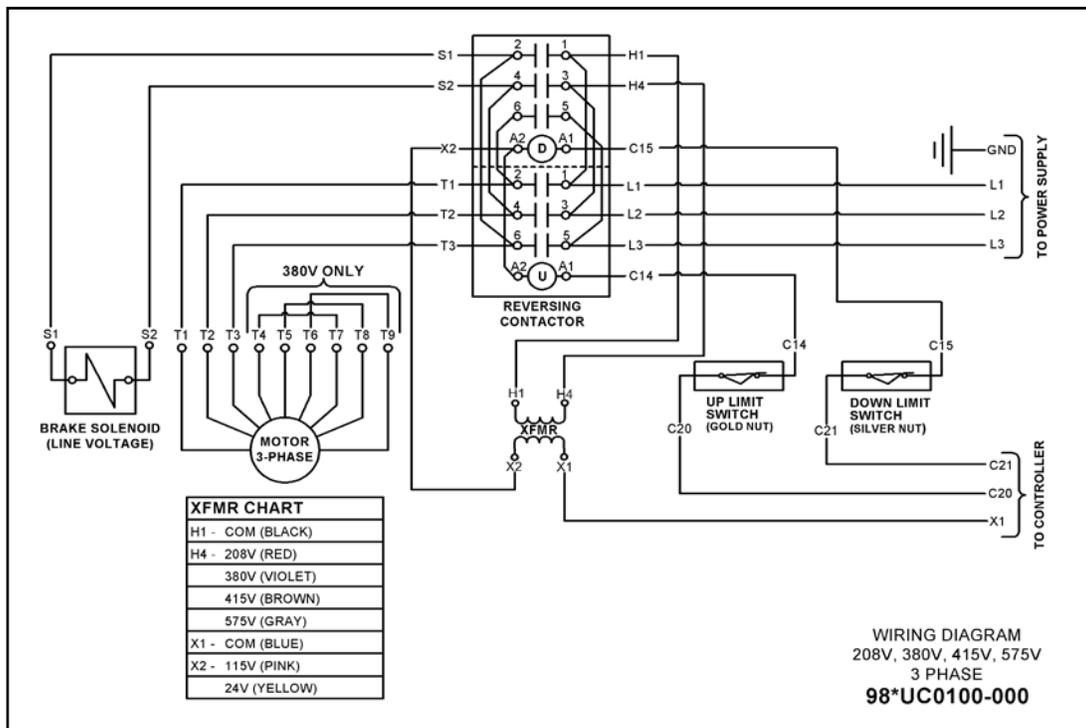


Figure 7C - Wiring Diagram for 208V, 380V, 415V and 575V - 3 Phase Models

*Factory supplied wiring diagrams will have numbers beginning with 985 for 575V, 987 for 208V, 988 for 380V and 989 for 415V.

TROUBLE SHOOTING

Always disconnect unit from the power supply system before removing lifting motor covers or the back cover of control station.



WARNING

Failure to follow proper lockout/tagout procedures may present the danger of electrical shock.

**TO AVOID INJURY:
Disconnect power and lockout/tagout disconnecting means before removing cover or servicing this equipment.**

— Probable Cause —

— Remedy —

Probable Cause	Remedy
Hook fails to stop at end of travel	
<ol style="list-style-type: none"> Limit switch not operating Brass limit switch nuts not moving on shaft Reversing contactor malfunctioning 	<ol style="list-style-type: none"> Check adjustment (See LIMIT SWITCH ADJUSTMENT, page 8). Check connections against wiring diagram. Tighten loose connections or replace. Check for stripped threads or bent nut guide. Remove electrical cover and check reversing contactor.
Lifting motor does not respond to pushbutton	
<ol style="list-style-type: none"> Power failure in supply lines Wrong voltage or frequency Improper connections in lifting motor or pushbutton station Brake does not release Faulty reversing contactor 	<ol style="list-style-type: none"> Check circuit breakers, switches and connections in power supply lines. Check voltage and frequency of power supply against the rating on the nameplate of the motor. Check all connections at line connectors and on terminal block. Check terminal block on dual voltage lifting motors for proper voltage connections. Check connections to the solenoid coil. Check for open or short circuit. Check for proper adjustment (See BRAKE ADJUSTMENT, page 8). Check coils for open or short circuit. Check all connections in control circuit. Check for burned contacts. Replace as needed.
Hook does not stop promptly	
<ol style="list-style-type: none"> Lifting motor overloaded Brake not holding 	<ol style="list-style-type: none"> Reduce load to within rated capacity of lifting motor. Check brake adjustment (See BRAKE ADJUSTMENT, page 8). It may be necessary to replace discs.
Hook moves in wrong direction	
<ol style="list-style-type: none"> Three phase reversal Improper connections 	<ol style="list-style-type: none"> Reverse any two wires (except the green ground wire) at the power source (See INSTALLATION, page 4). Check all connections against wiring diagram.
Lifting motor hesitates to lift when energized	
<ol style="list-style-type: none"> Lifting motor overloaded Motor brake requires adjustment Worn overload limiting clutch Low voltage Faulty SINPAC® starting switch or start capacitor (single phase lifting motors only) 	<ol style="list-style-type: none"> Reduce load within rated capacity of lifting motor. Check motor brake adjustment (See BRAKE ADJUSTMENT, page 8). Replace clutch. Determine cause of low voltage and bring up to within plus or minus 10% of the voltage specified on the motor. Measure voltage at the lifting motor reversing contactor while lifting a load. Replace faulty component.
Hook raises but will not lower	
<ol style="list-style-type: none"> "DOWN" circuit open Broken conductor in pushbutton cable Faulty reversing contactor 	<ol style="list-style-type: none"> Check circuit for loose connections. Check "DOWN" limit switch for malfunction. Check each conductor in the cable. If one is broken, replace entire cable. Check coils for open or short circuit. Check all connections in control circuit. Check for burned contacts. Replace as needed.
Hook lowers but will not raise	
<ol style="list-style-type: none"> Lifting motor overloaded Low voltage "UP" circuit open Broken conductor in pushbutton cable Faulty reversing contactor Faulty capacitor (single phase lifting motor only) Worn overload limiting clutch Loose screw clamps 	<ol style="list-style-type: none"> Reduce load to within rated capacity of lifting motor. Determine cause of low voltage and bring up to within plus or minus 10% of the voltage specified on the motor. Measure voltage at the lifting motor reversing contactor while lifting a load. Check circuit for loose connections. Check "UP" limit switch for malfunction. Check each conductor in the cable. If one is broken, replace entire cable. Check coils for open or short circuit, check all connections in control circuit. Check for burned contacts. Replace as needed. Check starting capacitor on motor. Replace if necessary. Replace overload clutch assembly. Ensure that screw clamps are tightened on the terminal blocks and reversing contactor.
Motor overheats	
<ol style="list-style-type: none"> Excessive load Low voltage Extreme external heating Frequent starting or reversing Brake dragging 	<ol style="list-style-type: none"> Reduce load to within rated capacity of lifting motor. Determine cause of low voltage and bring up to within plus or minus 10% of the voltage specified on the motor. Measure voltage at the lifting motor reversing contactor while lifting a load. As the ambient temperature rises towards the 130°F limitation of the unit, frequency of the lifting motor operation must be limited to avoid overheating of the motor. See ADVERSE ENVIRONMENTAL CONDITIONS, page 3. Excessive inching, jogging or reversing should be avoided since this type of operation will drastically shorten the life of motor, contactor and brake. Check brake adjustment (See BRAKE ADJUSTMENT, page 8).
Lack of proper lifting speed	
<ol style="list-style-type: none"> Lifting motor overloaded Brake dragging Low voltage Overload limiting clutch intermittently slipping 	<ol style="list-style-type: none"> Reduce load to within rated capacity of lifting motor. Check for proper brake adjustment or other defects. Ensure that the voltage at the reversing contactor is within ±10% of the nominal voltage while lifting a load. Replace overload clutch assembly.

TROUBLE SHOOTING (Continued)

Motor brake noise or chatter (while starting lifting motor)	
1. Brake needs adjustment 2. Low voltage	1. See BRAKE ADJUSTMENT, page 8. 2. Ensure that the voltage at the reversing contactor is within $\pm 10\%$ of the nominal voltage while lifting a load.
Motor brake "buzz" (anytime lifting motor is running)	
1. Brake needs adjustment 2. Broken shading coil on brake frame	1. See BRAKE ADJUSTMENT, page 8. 2. Replace shading coil or complete brake frame assembly.

INSPECTION AND MAINTENANCE CHECK LIST ELECTRIC POWERED OVERHEAD CHAIN LIFTING MOTOR

Type of Lifting Motor _____ Capacity (Tons) _____
Location _____ Original Installation Date _____
Manufacturer _____ Manufacturer's Serial No. _____

Item	Frequency of Inspection			Possible Deficiencies	OK	Action Required
	Frequent		Periodic 1-12 Mo.			
	Daily	Monthly				
Operating Controls	*	*	*	Any deficiency causing improper operation		
Limit Switches	*	*	*	1. Any deficiency causing improper operation 2. Pitting or deterioration		
Brake Mechanism	*	*	*	1. Slippage or excessive drift 2. Glazing, contamination or excessive wear		
Hooks	*	*	*	Excessive throat opening 15% bent or twisted more than 10 degrees, damaged hook latch, wear, chemical damage, worn hook bearing. To find cracks, (use dye penetrant, magnetic or other suitable detection methods)		
Suspension Lug (if used)	*	*	*	Cracks, excessive wear or other damage which may impair the strength of the lug. To find cracks, (use dye penetrant, magnetic particle or other suitable detection methods)		
Chain	*	*	*	Inadequate lubrication, excessive wear or stretch, cracked, damaged or twisted links, corrosion or foreign substance		
Hook and Suspension Lug Connections			*	Cracks, bending, stripped threads		
Pins, Bearings, Bushings Shafts, Couplings			*	Excessive wear, corrosion, cracks, distortion		
Nuts, Bolts, Rivets			*	Looseness, stripped and damaged threads, corrosion		
Sheaves			*	Distortion, cracks, and excessive wear. Build-up of foreign substances		
Housings, Load Block			*	Cracks, distortion. Excessive wear, internal build-up of foreign substances		
Wiring and Terminals			*	Fraying, defective insulation		
Lifting Motor Reversing Contactor, other Electrical Apparatus			*	Loose connections, burned or pitted contacts		
Supporting Structure and Trolley (if used)			*	Damage or wear which restricts ability to support imposed loads		
Nameplates, Decals, Warning Labels			*	Missing, damaged or illegible		

NOTE: Refer to Maintenance and Inspection Sections of the Lifting Motor-Maintenance Manual for further details.

FREQUENCY OF INSPECTION

Frequent — Indicates items requiring inspection daily to monthly. Daily inspections may be performed by the operator if properly designated.

Periodic — Indicates items requiring inspection monthly to yearly. Inspections to be performed by or under the direction of a properly designated period. The exact period of inspection will depend on frequency and type of usage. Determination of this period will be based on the user's experience. It is recommended that the user begin with a monthly inspection and extend the periods to quarterly, semi-annually or annually based on user's monthly experience.

Figure 8A — Recommended Inspection and Maintenance Check List

NOTE: This inspection and maintenance check list is in accordance with our interpretation of the requirements of the Safety Standard for Overhead Hoists ASME B30.16. It is, however, the ultimate responsibility of the employer/user to interpret and adhere to the applicable requirements of this safety standard.

INSPECTOR'S REPORT			
ITEM	REMARKS (LIST DEFICIENCIES AND RECOMMENDED ACTION)		
Inspector's Signature	Date Inspected	Approved by	Date

Figure 8B — Recommended Inspector's Report

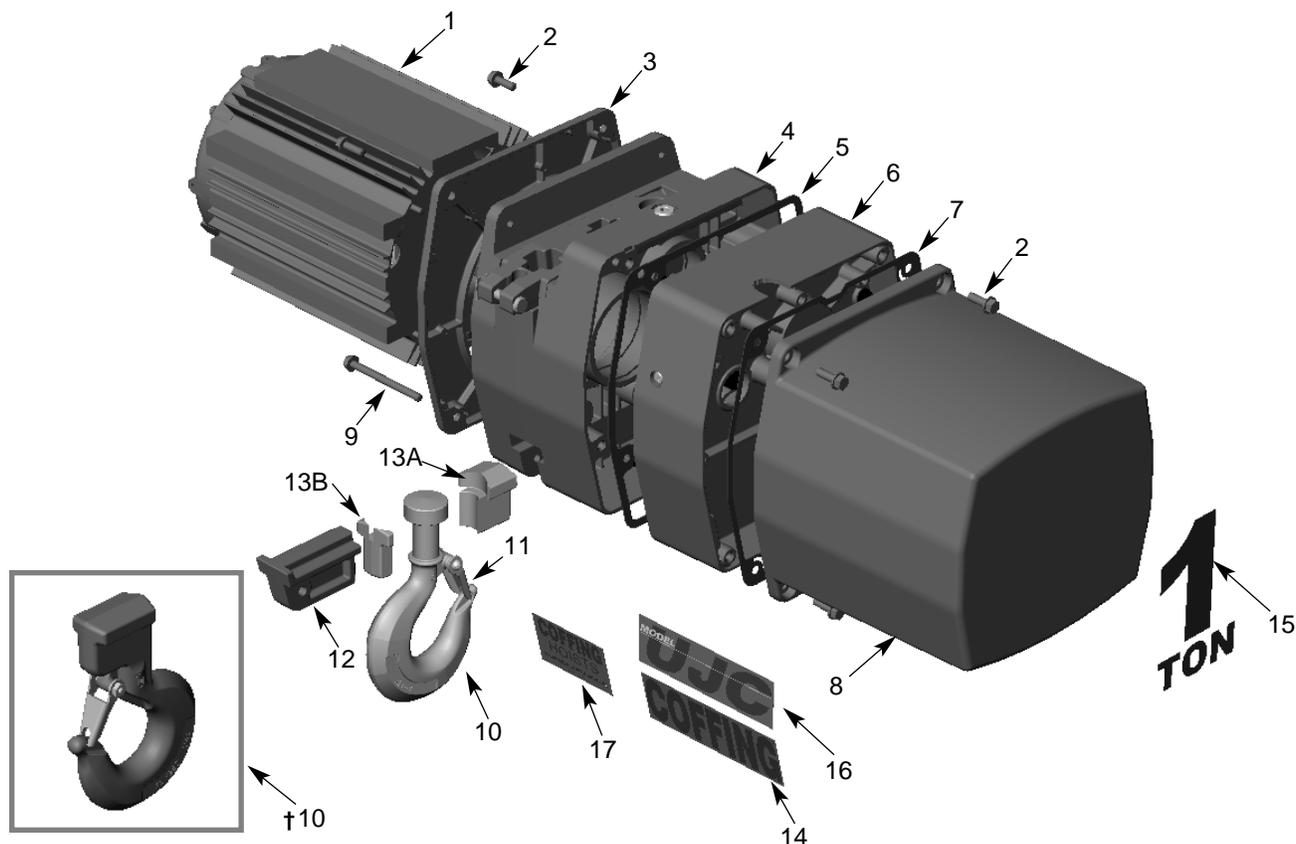
RECOMMENDED LUBRICATION SCHEDULE*					
LIFTING MOTOR					
FIGURE & REFERENCE NO.	COMPONENT	TYPE OF LUBRICANT (USE ONLY NEW LUBRICANT)	TYPE OF SERVICE AND FREQUENCY OF LUBRICATION		
			HEAVY	NORMAL	INFREQUENT
Figure 19 Ref. No. 8	Load Chain	SAE 90 gear oil	Daily	Weekly	Monthly
Figure 18	Gearing	SAE 90 extreme pressure (EP) gear oil	At periodic inspection (See Figure 8A)		
Figure 19 Ref. No. 18 & 30	Load Hook Bearing	SAE 30 gear or motor oil	Weekly	Monthly	Yearly
Figure 19 Ref. No. 27	Idler Sheave Bearing (Bushing) Assembly	NLGI #2 multi-purpose lithium base grease	At periodic inspection (See Figure 8A)		

NOTE: All bearings except hook and idler sheave bearings are prelubricated and sealed.

(*) This lubrication schedule is based on a lifting motor operating in normal environment conditions. Lifting motors operating in adverse atmospheres containing excessive heat, corrosive fumes or vapors, abrasive dust, etc., should be lubricated more frequently.

Figure 9 — Recommended Lubrication Schedule

Figure 10 - Basic Unit

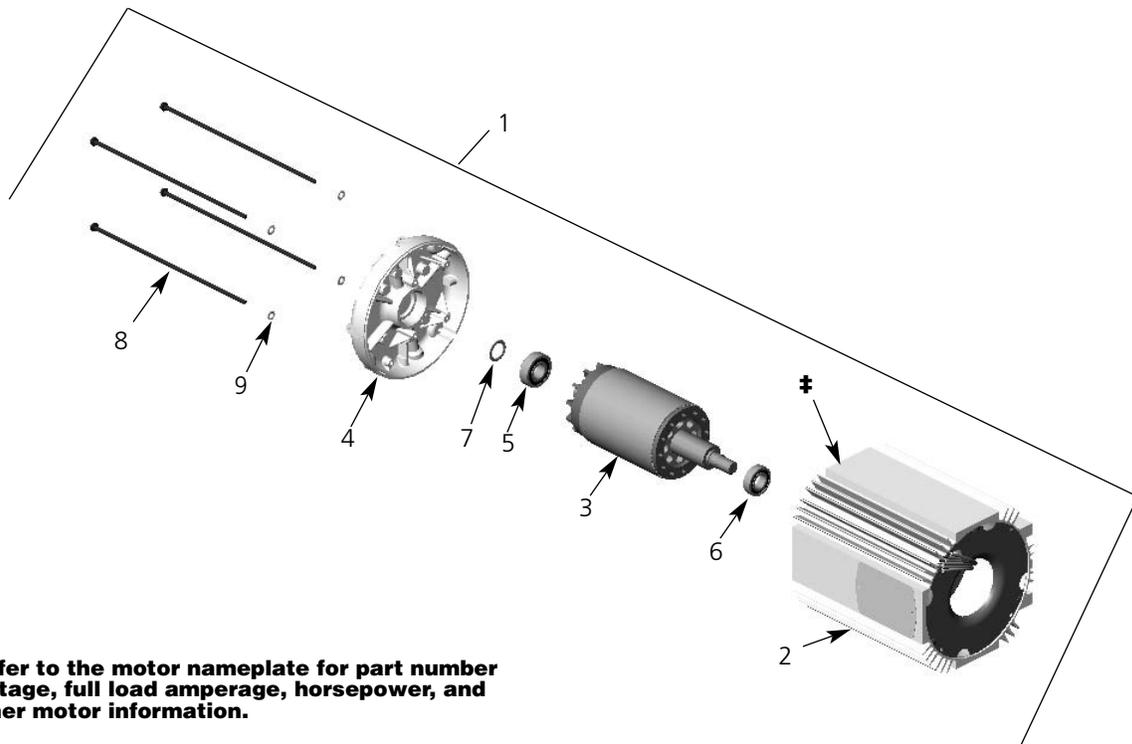


Parts List for Basic Unit

Ref No.	Description	Part No.	Qty	Ref No.	Description	Part No.	Qty
1	Motor (See Figures 11 & 12)	—	1	11	Latch Kit Assembly	4X1305	1
2	Cover Screw	H2976P	7	12	Hook Retainer	JM285	1
3	Trim Cover	JM37	1	13A	Swivel Hook Retainer	JM49-2A	1
4	Transmission Housing	JM3533	1	13B	Swivel Hook Retainer	JM49-2B	1
5	Transmission Case Gasket	JM560	1	14	Coffing Decal	677J7R	2
6	Transmission Cover	JM34	1	15	Capacity Decal		
7	Electrical Cover Gasket	JM563	1		1/2 ton	JLC675R-05	1
8	Electrical Cover	JM36	1		1 ton	JLC675R-10	1
9	Hook Retainer Screw	H2709P	1		2 ton	JLC675R-20	1
10	Top Hook Assembly with Latch			16	UJC Decal	677JM8	2
	Swivel Hook (std.)	3M205A01S	1	17	Coffing Decal	JM677R	2
	†Rigid Hook	3M405A01S	1				

(†) Optional

Figure 11 - Motor, 3-Phase



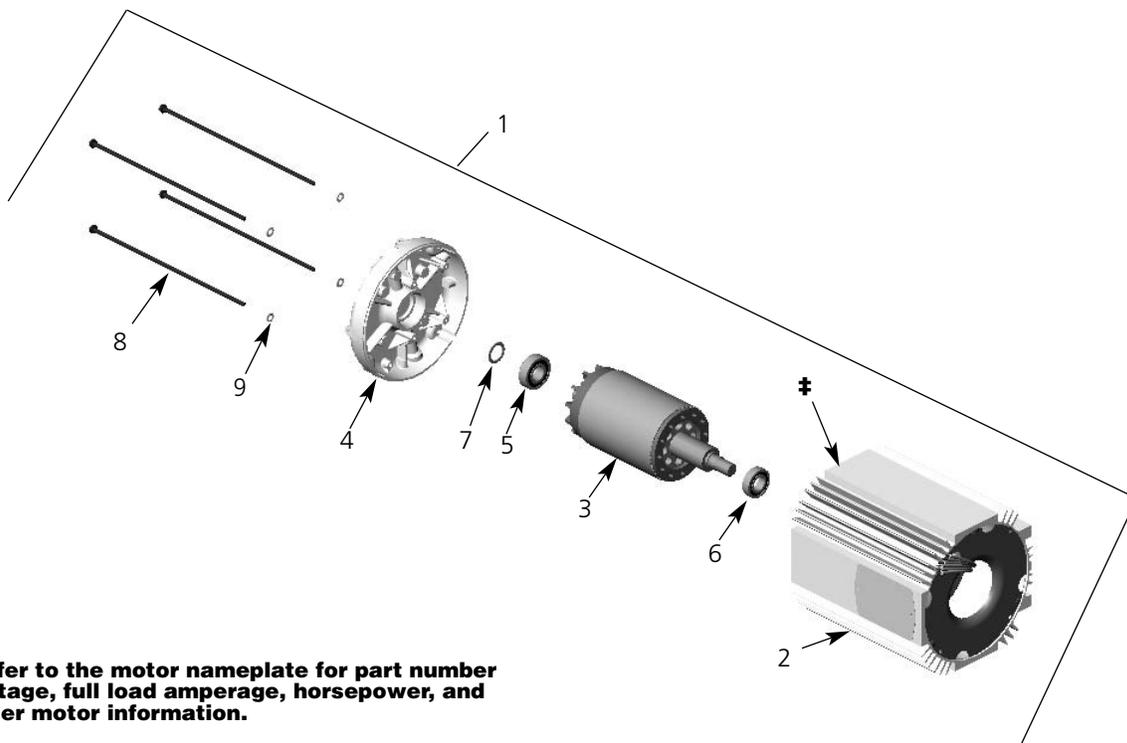
(‡) Refer to the motor nameplate for part number voltage, full load amperage, horsepower, and other motor information.

Parts List for Motor, 3-Phase

Ref. No.	Description	Part No.	Qty.	Ref. No.	Description	Part No.	Qty.
1	Motor			2	Stator Assembly	*	1
	1/2 hp, 230/460V-3Ph-60Hz	863JX2	1	3	Rotor Assembly	*	1
	1 hp, 230/460V-3Ph-60Hz	863JX4	1	4	End Shield	35EP3100D15	1
	1/2 hp, 190/380V-3Ph-50Hz	863JX2	1	5	Rear Bearing	500K3	1
	1 hp, 190/380V-3Ph-50Hz	863JX4	1	6	Front Bearing	732012C	1
	1/2 hp, 208V-3Ph-60Hz	863JX10	1	7	Shim Washer	JL4301-01	1
	1 hp, 208V-3Ph-60Hz	863JX12	1	8	Thru Bolt (1-Speed)	HA3100A56	4
	1/2 hp, 415V-3Ph-50Hz	863JX26	1	9	#10 Spring Lockwasher	H4082P	4
	1 hp, 415V-3Ph-50Hz	863JX28	1				
	1/2 hp, 575V-3Ph-60Hz	863JX6	1				
	1 hp, 575V-3Ph-60Hz	863JX8	1				

* Not available as an individual part.

Figure 12 - Motor, 1-Phase



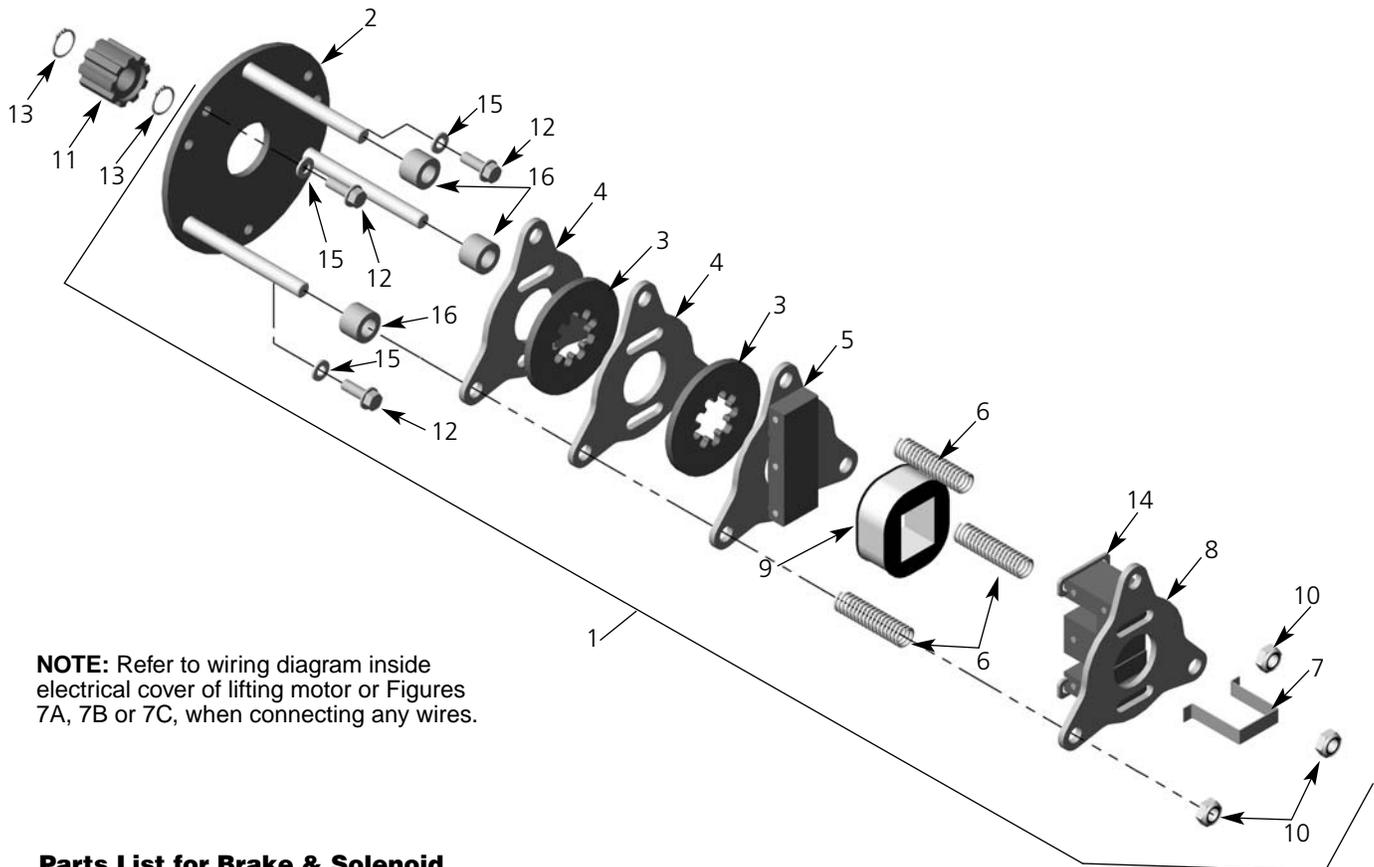
(#) Refer to the motor nameplate for part number voltage, full load amperage, horsepower, and other motor information.

Parts List for Motor, 1-Phase

Ref. No.	Description	Part No.	Qty
1	Motor		
	1/2 hp, 115/230V-1Ph	861JX12	1
	1 hp, 115/230V-1Ph	861JX14	1
2	Stator Assembly	*	1
3	Rotor Assembly	*	1
4	End Shield	35EP3100D15	1
5	Rear Bearing	500K3	1
6	Front Bearing	732012C	1
7	Shim Washer	JL4301-01	1
8	Thru Bolt	HA3100A56	4
9	#10 Spring Lockwasher	H4082P	4

* Not available as an individual part.

Figure 13 - Brake & Solenoid Parts



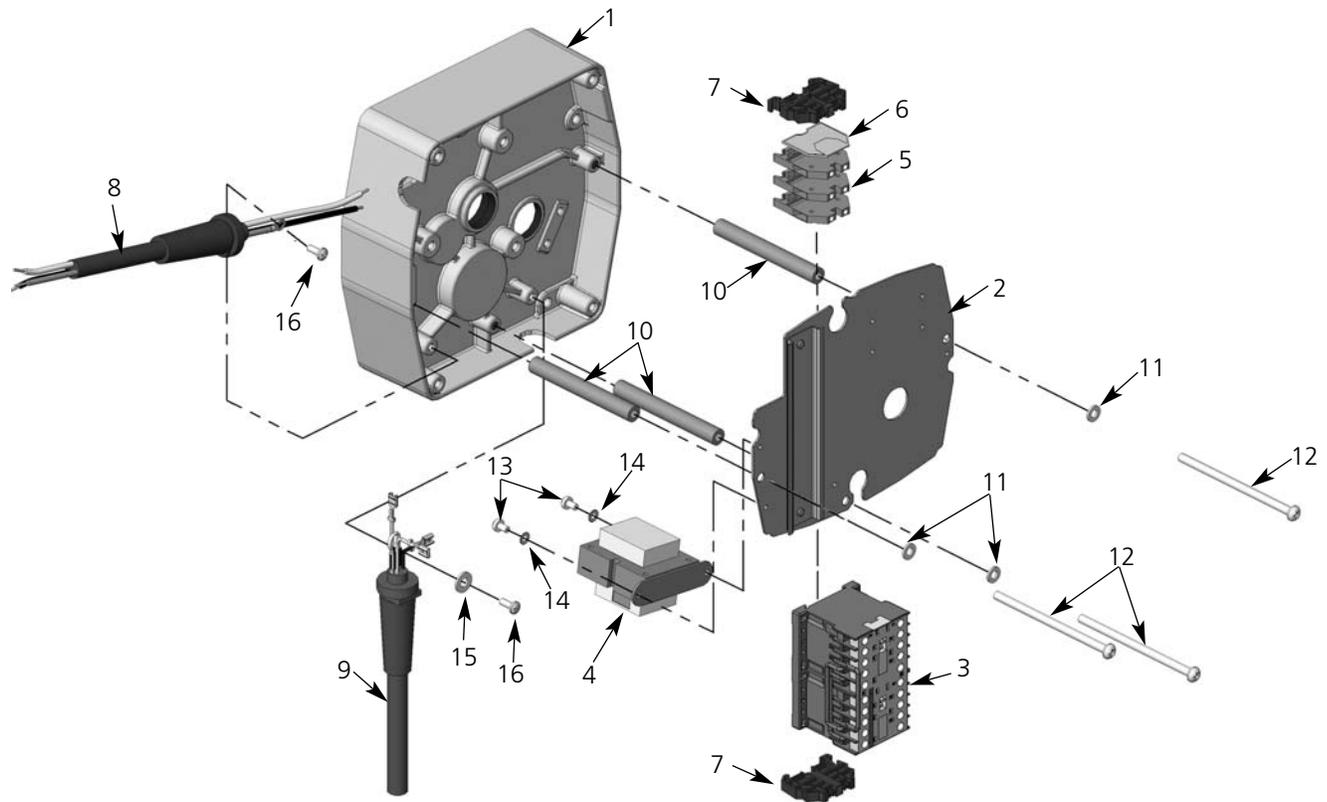
NOTE: Refer to wiring diagram inside electrical cover of lifting motor or Figures 7A, 7B or 7C, when connecting any wires.

Parts List for Brake & Solenoid

Ref No.	Description	Part No.	Qty	Ref No.	Description	Part No.	Qty
1	Disc Brake Assembly*			8	Plate & Frame Assembly	JF857	1
	1 hp, 115 Volt	854JM1	1	9	Brake Coil*		
	1/2 hp, 115 Volt	854JM12	1		115V*	853JL1	1
	1 hp, 230 Volt	854JM2	1		230V*	853JL2	1
	1/2 hp, 230 Volt	854JM22	1		575V	853JL4	1
	1 hp, 575 Volt	854JM4	1		208V	853JL5	1
	1/2 hp, 575 Volt	854JM42	1		380V	853JL6	1
	1 hp, 208 Volt	854JM5	1		415V	853JL7	1
	1/2 hp, 208 Volt	854JM52	1	10	Locknut	H3978	3
	1 hp, 380 Volt	854JM6	1	11	Adapter	JM142	1
	1/2 hp, 380 Volt	854JM62	1	12	Screw	H2976P	3
	1 hp, 415 Volt	854JM7	1	13	Retaining Ring	H5501	2
	1/2 hp, 415 Volt	854JM72	1	14	Shading Coil	860J1	2
2	Plate & Stud Assembly	859JG1	1		Shading Coil Adhesive	H7812	1
3	Brake Disc			15	Lockwasher	H4134	3
	1/2 hp	581J1A	2	16	Spacer 1/2 hp	141J2	3
	1 hp	581J1A	3				
4	Brake Plate	JF291	2				
5	Plate & Armature Assembly	JF858	1				
6	Spring	344J6	3				
7	Retainer	JF710	1				

* **Note:** 115/230V-1Phase models use 115V brake coils.
230/460V-3 Phase models use 230V brake coils.

Figure 14 - Electrical Parts, 3-Phase

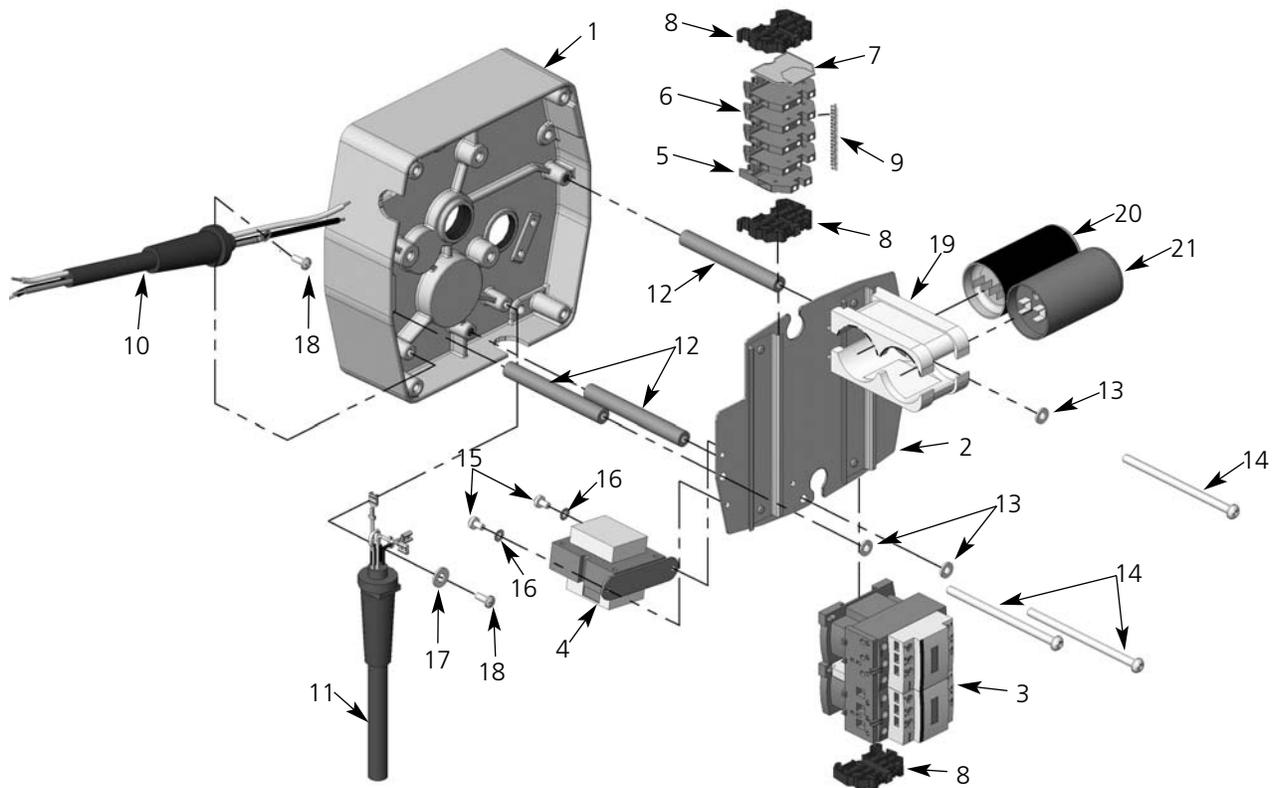


Parts List for Electrical Parts, 3-Phase

Ref No.	Description	Part No.	Qty	Ref No.	Description	Part No.	Qty
1	Transmission Cover	JM34	1	5	Terminal Block, 230/460V	909J10	3
2	Panel Plate	257UJ200	1	6	End Plate, 230/460V	909J12	1
3	Reversing Contactor*			7	End Clamp	909J17	2
	24V Coil	28860	1	8	Power Pigtail		
	115V Coil	24799	1		3-Phase (4 cond.)	953JM1	1
4	Transformer*			9	Control Pigtail	299JG4-2	1
	Pri.: 230/460V, Sec.: 24V	821J432	1	10	Panel Standoff Spacer	200J4	3
	Pri.: 230/460V, Sec.: 115V	821J431	1	11	1/4" Internal-tooth Lockwasher	H4134	3
	Pri.: 208V, Sec.: 24V	821J472	1	12	1/4-20UNC X 4" Screw	H1027P	3
	Pri.: 208V, Sec.: 115V	821J471	1	13	8-32UNC X 5/16" Screw	H2751	2
	Pri.: 380V, Sec.: 24V	821J482	1	14	#8 External-tooth Lockwasher	H4158	2
	Pri.: 380V, Sec.: 115V	821J481	1	15	1/4" Flatwasher	H4002P	1
	Pri.: 415V, Sec.: 24V	821J492	1	16	10-24UNC X 1/2" Screw	H2970	2
	Pri.: 415V, Sec.: 115V	821J491	1				
	Pri.: 575V, Sec.: 24V	821J452	1				
	Pri.: 575V, Sec.: 115V	821J451	1				

* Coil voltage of the contactor and the secondary voltage of the transformer are the same. This is referred to as the control voltage. Standard units are supplied with 115V Control.

Figure 15 - Electrical Parts, 1-Phase

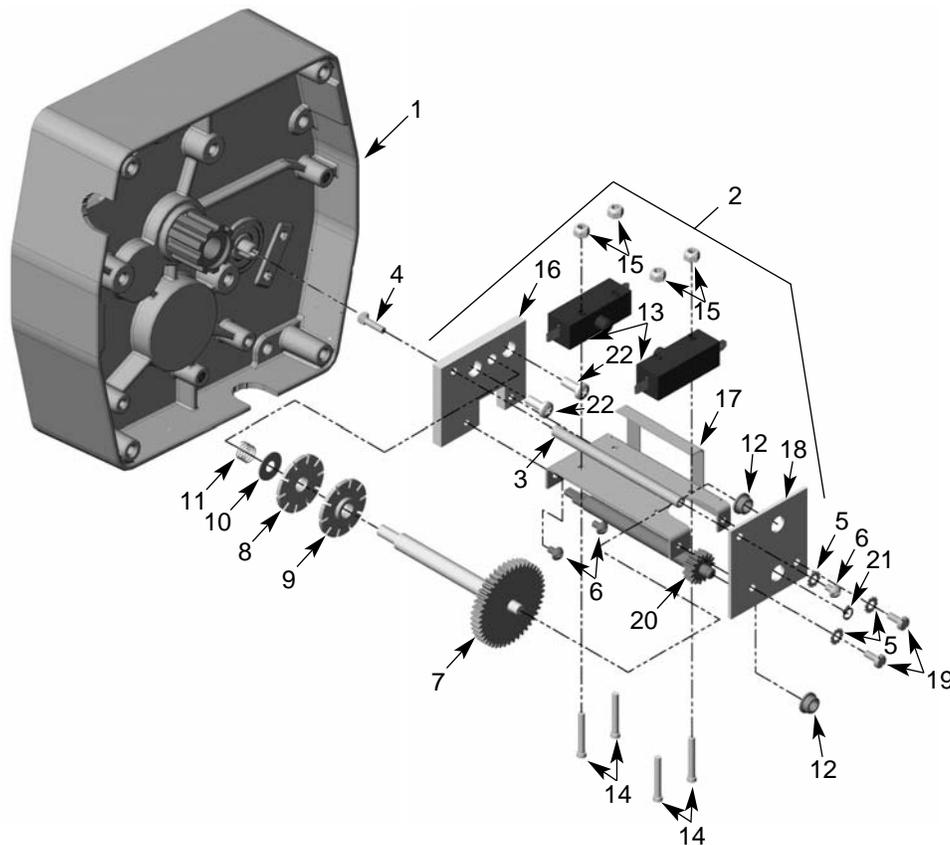


Parts List for Electrical Parts, 1-Phase

Ref No.	Description	Part No.	Qty	Ref No.	Description	Part No.	Qty
1	Transmission Cover	JM34	1	10	Power Pigtail		
2	Panel Plate	257JM200	1		115/230V, 1/2 hp (3 cond.)	951JM1	1
3	Reversing Contactor*				115/230V, 1 hp (3 cond.)	952JM1	1
	1/2 hp:			11	Control Pigtail	299JG4-2	1
	24V Coil	28860	1	12	Panel Standoff	200J4	3
	115V Coil	24799	1	13	1/4" Internal-tooth Lockwasher	H4134	3
	1 hp:			14	1/4-20UNC X 4" Screw	H1027P	3
	24V Coil	24791	1	15	8-32UNC X 5/16" Screw	H2751	2
	115V Coil	28905	1	16	#8 External-tooth Lockwasher	H4158	2
4	Transformer*			17	1/4" Flatwasher	H4002P	1
	Pri.: 115/230V, Sec.: 24V	821J412	1	18	10-24UNC X 1/2" Screw	H2970	2
	Pri.: 115/230V, Sec.: 115V	821J411	1	19	Can Mounting Bracket	JM811	2
5	Terminal Block	909J10	2	20	SINPAC® Starting Switch	839J3	1
6	Terminal Block	909J14	4	21	Capacitor	JL810-4	1
7	End Plate	909J15	1				
8	End Clamp	909J13	3				
9	Marking Strip	909J11	1				

* Coil voltage of the contactor and the secondary voltage of the transformer are the same. This is referred to as the control voltage. Standard units are supplied with 115V Control.

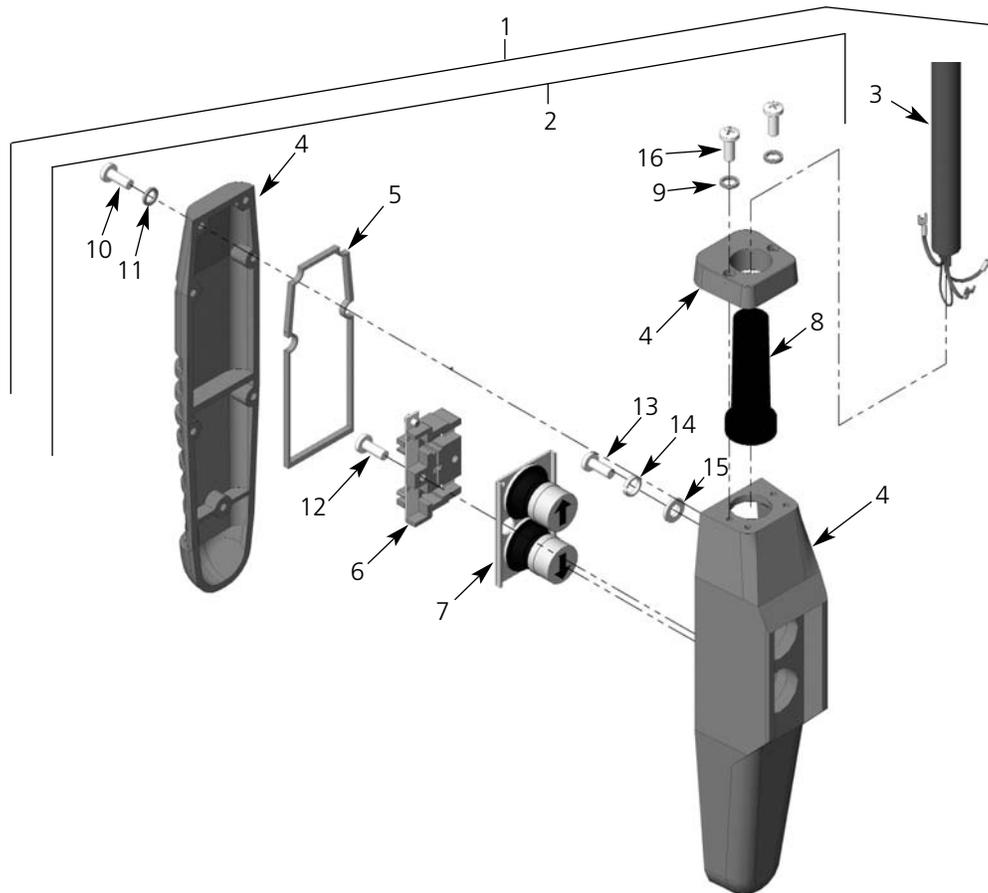
Figure 16 - Limit Switch Parts



Parts List for Limit Switch

Ref No.	Description	Part No.	Qty	Ref No.	Description	Part No.	Qty
1	Transmission Cover	JM34	1	12	Bushing	JF531-4	2
2	Limit Switch Assembly (Includes items 3-21)	944JG6	1	13	Switch	815J1	2
3	Post	110J14	1	14	6-32UNC X 1" Screw	H1402P	4
4	8-32UNC X 1/2" Screw	H1210	1	15	6-32UNC Elastic Locknut	H3944	4
5	#8 External-tooth Lockwasher	H4158	3	16	Mounting Plate	129J1	1
6	8-32UNC X 1/4" Screw	854823	3	17	Frame and Guide Assembly	258JG7	1
7	Limit Switch Shaft & Gear	117JG2	1	18	End Plate	258J8	1
8	Limit Switch Nut (gold)	SK6000-63W	1	19	8-32UNC X 3/8" Screw	H2741P	2
9	Limit Switch Nut (silver)	SK6000-63Z	1	20	Drive Pinion	427J1	1
10	Thrust Washer	255K16	1	21	Retaining Ring	H5520	1
11	Spring	PB287	1	22	10-24UNC X 3/8" Screw	H2981P	2

Figure 17 - Pushbutton Station (Pickle) - Optional Accessory



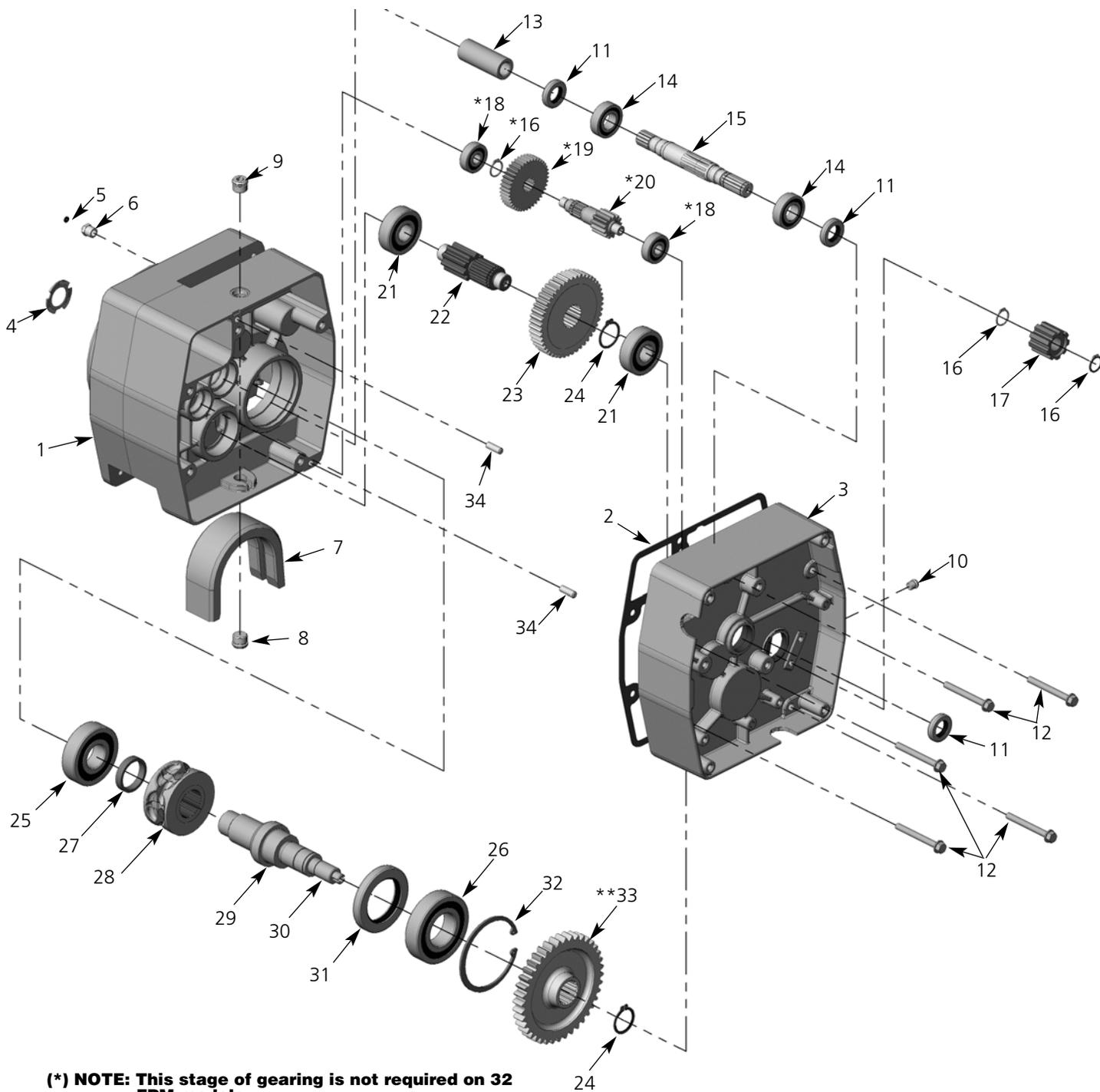
Parts List for Pushbutton Station (Pickle)

Ref No.	Description	Part No.	Qty	Ref No.	Description	Part No.	Qty
1	Pushbutton Station & Control Cable Assembly			4	Enclosure	36998	1
	6 ft Cable Length	PB2100-6	1	5	Gasket	36986	1
	11 ft Cable Length	PB2100-11	1	6	Contact Assembly	36987	1
	16 ft Cable Length	PB2100-16	1		(Includes item 7)		
	Special Drop	PB2100-S†	1	7	Button Assembly	36988	1
2	Pushbutton Station Assembly	36900R	1	8	Grommet	36989	1
3	Control Cable Assembly			*	Hardware Kit	36939	1
	6 ft Cable Length	PBC2100-6	1		(Includes items 9 - 16)		
	11 ft Cable Length	PBC2100-11	1	△	Warning Tag	687K3W	1
	16 ft Cable Length	PBC2100-16	1				
	Special Drop	PBC2100-S†	1				

(†) Equal to cable length (pushbutton drop).

(△) Not shown.

Figure 18 - Gearbox



(*) NOTE: This stage of gearing is not required on 32 FPM models.

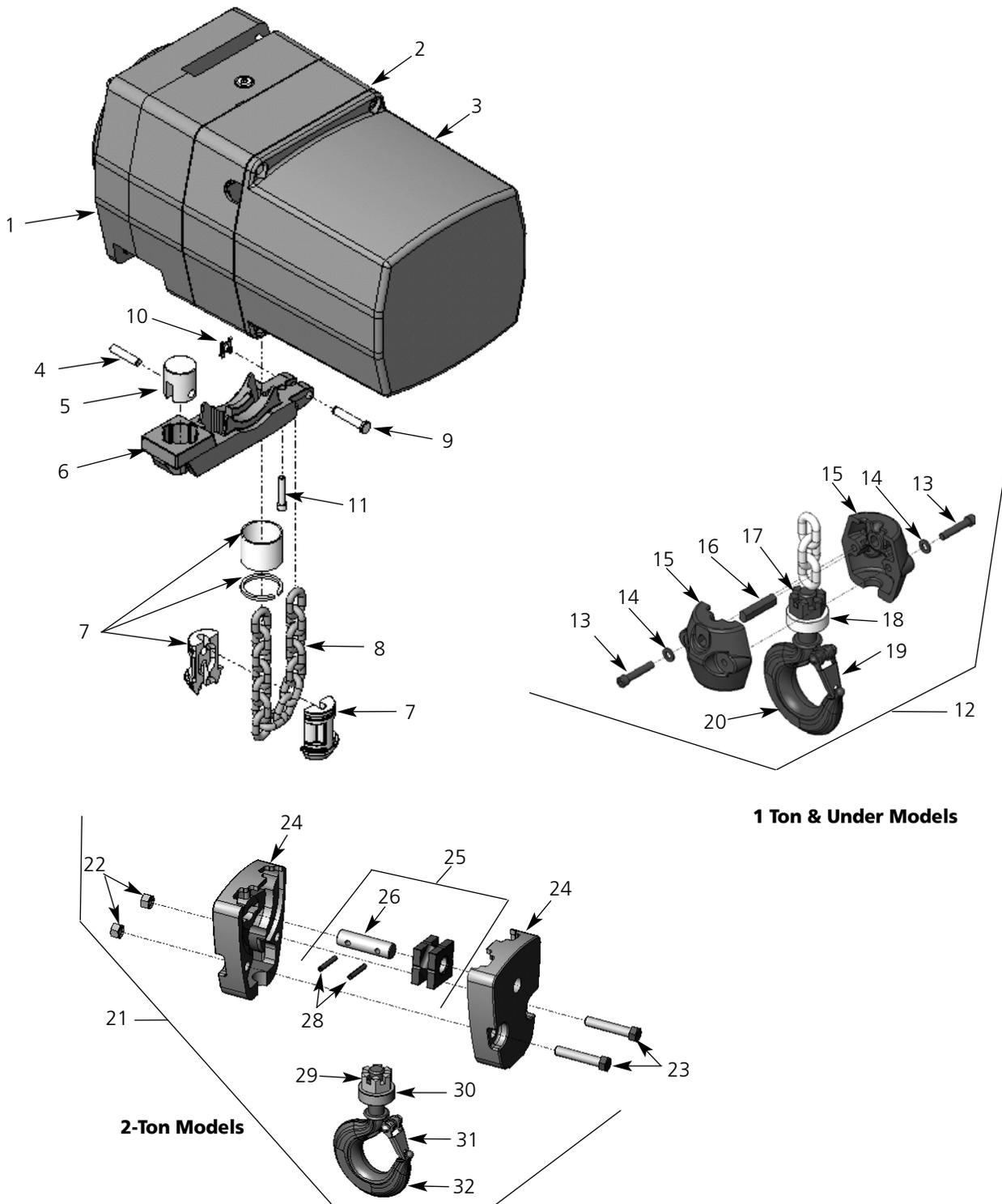
() NOTE: Orient output gear (32) with long boss towards gear housing (2) on 1/2 ton & under models and towards transmission cover (3) on 1 & 2 ton models.**

Parts List for Gearbox

Ref. No.	Description	Part No.	Qty
1	Sheave Housing	JM3533	1
2	Transmission Gasket	JM560	1
3	Transmission Cover (Includes Oil Seals)	JM34	1
4	Spring Washer	360J1	1
5	O-ring	H5605	1
6	Pressure Relief Fitting	SK1912-21W	1
7	Chain Guide	JM273	1
8	Oil Plug - Drain	H6297	1
9	Oil Plug - Fill	H6296	1
10	Oil Plug - Level	H6295	1
11	Oil Seal	561K2	3
12	Screw, HWH Self-threading	H2693P	5
13	Motor Coupling	JM107	1
14	Bearing	500K33	2
15	Input Pinion 8 & 16 fpm	JL400B	1
	32 fpm	JL400-1	1
16	Retaining Ring	H5501	3
17	Brake Adapter	JM142	1
18	Bearing for 8 & 16 fpm	500K34	2
19	High Speed Pinion for 8 & 16 fpm	JL426	1
20	Intermediate Pinion 1/2 ton, 16 fpm	JL402A	1
	1 & 2 ton	JL403A	1
21	Bearing	500K39	2
22	Output Pinion	JL401	1
23	Overload Clutch Assembly 1/2 ton, 16 fpm	591JG16	1
	1/2 ton, 32 fpm	591JG21	1
	1 & 2 ton	591JG17	1
24	Retaining Ring	H5503	2
25	Bearing	500K28	1
26	Bearing	P003255	1
27	Spacer - Load Sheave	JM127	1
28	Load Sheave-9/32" Chain	JF16-3	1
29	Load Sheave Shaft	JM132	1
30	Stub Shaft - Limit Switch Drive	JM140	1
31	Oil Seal	011612800	1
32	Retaining Ring	H5598	1
33	Output Gear	JL421	1
34	Dowel Pin	H5382	2
*	Gear Oil	H7642	1½ pt

* Not Shown

Figure 19 - Chaining Parts



Parts List for Chaining Parts

Ref No.	Description	Part No.	Qty	Ref No.	Description	Part No.	Qty
1	Housing	JM3533	1	21	Bottom Block Assembly		
2	Transmission Cover	JM34	1		for 2 Ton	JF914-6	1
3	Electrical Cover	JM36	1	22	3/8-24 Hex Locknut	H3964P	2
4	Anchor Pin (2 ton only)	JM111	1	23	Load Block Screw	H2403P	2
5	Anchor (2 ton only)	JM109	1	24	Load Block Frame	JF30-1	2
6	Chain Stripper	JM254	1	25	Sheave Shaft Assembly	JF917-1	1
7	Chain Stop Kit	75JG6K	1	26	Sheave Shaft	JF122-1	1
	(Kits include halves, sleeve and retaining ring)			27	Sheave & Bearing Assembly	JF916	1
8	Load Chain	JL19-1	*	28	Roll Pin	H5234	2
9	Attachment Pin	JM18-1	1	29	3/8-24 Hex Locknut	H3991P	1
10	Retaining Clip	H5597	1	30	Bearing	JF511	1
11	1/4-20UNC x 1 1/4"			31	Latch Kit	4X1305	1
	Socket Head Cap Screw	S49-77	1	32	Bottom Hook Assembly		
12	Bottom Block Assembly				with Latch for 2 Ton	3KG1W	1
	1 ton & Under	913JG3AS	1				
13	1/4-20UNC x 1 1/4"	S49-77	2				
	Socket Head Cap Screw						
14	1/4" Internal-tooth						
	Lockwasher	H4134	2				
15	Load Block Frame	30J14	2				
16	Load Block Pin	18J8	1				
17	Slotted Hex Nut	H3986P	1				
18	Bearing	JF510	1				
19	Latch Kit	4X1304	1				
20	Bottom Hook Assembly						
	with Latch for 1 Ton & Under	3JG20S	1				

*** Replacement chain is sold by the foot. For single-chained models, add 2 ft to the lift for the total amount of feet. For double-chained models, double the lift and add 3 ft.**

COFFING® WARRANTY



Every lifting motor is thoroughly inspected and performance tested prior to shipment from the factory. If any properly installed, maintained and operated lifting motor as outlined in the applicable accompanying Coffing Hoists manual develops a performance problem due to defective materials or workmanship as verified by Coffing Hoists, repair or replacement of the lifting motor will be made to the original purchaser without charge and the lifting motor will be returned, transportation prepaid. This warranty does not apply where deterioration is caused by normal wear, abuse,

improper or inadequate power supply, improper or inadequate maintenance, eccentric or side loading, overloading, chemical or abrasive actions, excessive heat, unauthorized modifications or repairs, or use of non-Coffing repair parts. **EXCEPT AS STATED HEREIN, COFFING HOISTS MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**

⚠ WARNING

Alterations or modifications of equipment and use of non-factory repair parts can lead to dangerous operation and injury.

TO AVOID INJURY:

- **Do not alter or modify equipment**
- **Do not use equipment to lift, support or otherwise transport people**
- **Do not suspend unattended loads over people**

COFFING® HOISTS

Coffing Hoists • Country Club Road • P.O. Box 779 •
Wadesboro, North Carolina 28170 USA
Tel: 800.477.5003 • **Fax:** 800.374.6853 • 704.694.6829
www.coffinghoists.com