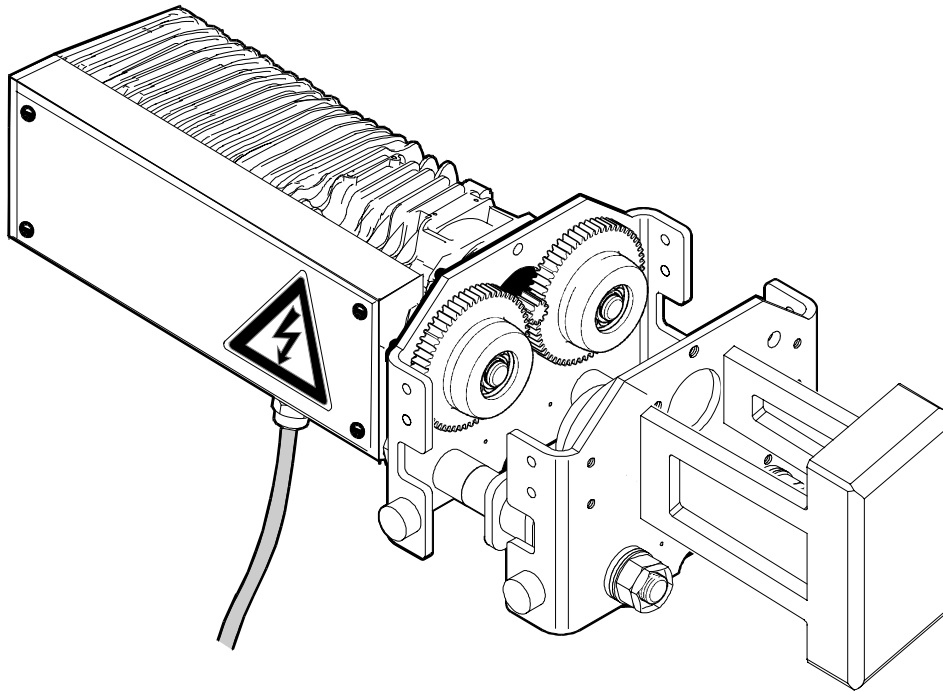




TDU MOTORIZED TROLLEY



INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS

Serial Number: _____

(RECORD TROLLEY SERIAL NUMBER FOR FUTURE REFERENCE)

Authorized Sales & Service

J. HERBERT CORPORATION

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R&M Materials Handling, Inc
Springfield, Ohio USA
☎: 800 955-9967
web: www.rmhoist.com

LoadMate Chain Hoist
TDU Instruction Manual
Revision 2

Before proceeding with the installation, operation or maintenance of the trolley it is important that the installation, operating, and maintenance personnel read this bulletin carefully in order to ensure the safe and efficient use of the trolley.

Also, it is strongly recommended that the personnel responsible for the operation, inspection, and servicing of this trolley, read and follow the Safety Standard ANSI B30.16-1993 (or current revised edition). This standard covers Overhead Trolleys (under-hung) as promulgated by the American National Standards Institute and is published by the American Society of Mechanical Engineers. Copies of this publication are available from the Society at United Engineering Center, 345 East 47th St., New York, NY 10017.

If any instructions are unclear, contact the manufacturer or distributor of the trolley before attempting to install or use the trolley.

R&M Materials Handling, Inc
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FOREWORD

This manual has been prepared to acquaint you of the procedures necessary for the installation, operation, and maintenance of the hoist you have purchased.

Proper installation is important to the ultimate performance of this equipment. Careful study of and adherence to the instructions will help ensure safe, dependable operation. It is also recommended that you keep this manual readily accessible to operators as well as maintenance and safety personnel.

Information in this manual is subject to change without notice.

Standard Guarantee and Warranty

R&M Materials Handling, Inc., hereinafter called the Company, will repair or replace, at its option, equipment or parts with defects in material and/or workmanship identified within two years from shipment from R&M for electric chain hoists. Should a problem develop, contact the factory or authorized repair center for written authorization to inspect, repair, or replace.

The Warranty Administrator will provide a written Return Goods Authorization (RGA) for return of the equipment. All equipment shall be returned freight prepaid to the factory or authorized repair center; the RGA number should be clearly indicated. If the problem is covered under warranty, the equipment will be repaired or replaced and returned freight prepaid. If inspection reveals that the problem is not warranty related, the purchaser will be provided a quotation for repairs. If no purchase order is provided for repairs, the equipment will be returned freight collect. The purchaser is responsible for removal and installation. In event that replacement parts are issued for warranty related field repairs, parts will be invoiced at net value; original parts must be returned (freight collect) for failure evaluation. If evaluation reveals a warranty situation, a credit will be issued against the replacement parts invoice.

This warranty does not cover failure due to normal operating wear and tear. All products shall be regularly maintained and operated in accordance to the equipment's Installation, Operation and Instruction manual. The original warranty period is not renewed or extended by repair work or parts supplied after the original ship date.

This warranty does not cover damage due to abuse from side pulling of load, excessive jogging, eccentric loading, chemical exposure not specified in order, damage resulting from an accident, or damage resulting from improper storage or handling prior to placing the equipment in service. Failure of equipment to meet published performance specifications due to abnormal operating conditions beyond R&M's knowledge or control shall not be considered defective workmanship and/or material unless R&M's examination discloses such a defect. Correction of such defects shall constitute fulfillment of this warranty.

This warranty is void if parts or materials used in the repair or maintenance of R&M's equipment are not supplied or approved by R&M. Any modification or change made by the Purchaser without R&M's written approval will void the warranty.

How to Order Repair Parts Correctly

The Parts Catalog section of this manual covers replacement parts required for your R&M Materials Handling, Inc. hoist. To ensure prompt service, each repair parts order must contain the following information:

1. Hoist serial number (affixed to hoist)
2. Capacity
3. Reference number from spare parts identification sheet
4. Quantity
5. Description
6. Voltage, phase, cycles
7. Correct shipping destination.



The Serial Number of your hoist will be found on the nameplate affixed to the hoist. Without this serial number we cannot be sure of sending you correct parts, so always mention the serial number for parts, service, etc.

All verbal orders must be immediately followed up with a written confirmation since the company cannot assume responsibility for the correctness of the verbal message.

R&M Materials Handling, Inc. spare parts are available locally in major industrial areas. Contact our Customer Service Department should you desire the name and address of the Authorized Stocking Parts Distributor for your area.

Minimum Charges

All orders for repair parts are subject to a minimum charge.

Claims for Damage in Shipment

All shipments are carefully inspected and are delivered to the carrier in good order. Upon receipt of shipment caution should be exercised so that there is no loss or damage. If damage has occurred, refuse to accept the shipment until the carrier makes the proper notation to that effect.

In the event of concealed loss or damage, notify the carrier immediately. By following these suggestions you will encounter less difficulty collecting your claim.



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General

- ❑ Service life of the trolley depends on the way in which it is installed.
- ❑ Any use contrary to our instructions may be dangerous.
- ❑ Before operating the equipment, read and follow the Installation, Operation and Maintenance Instruction manual.
- ❑ Always keep the Instruction manual close to the equipment, readily available to operator and person responsible for maintenance.
- ❑ Make sure that personnel safety rules are followed (harness, clearance of work area, posting of instructions to be followed in the work area, etc.).
- ❑ The crown tread profile of trolley wheel is compatible to flange profiles such as S or WF beam.
- ❑ Couple or hook on the hoist after installation of the trolley to the monorail or beam.

CAUTION

Check the width of beam flange and adjust the spacing of the flanges of the trolley as indicated in tables.

Before installing make sure:

- ❑ Beam is secured as appropriate.
- ❑ Beam is suitable to the loads to be supported.
- ❑ Dimensions of beam flange are compatible with the trolley, which is to be installed.
- ❑ Power supply voltage is same as that shown on nameplate of TDU.

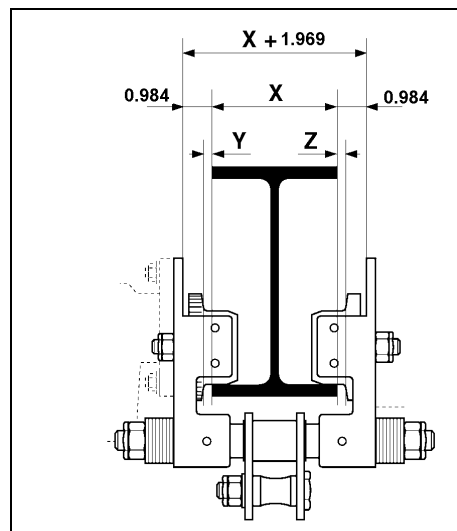
Installation of Trolley

Method 1

1. Remove the side plate on the counterweight side
2. Position the trolley on the beam
3. Reinstall side plate.
4. Check that all nuts are correctly tightened.
5. Connect the electrical cable to the trolley.
6. Grease the teeth of the drive pinion and the drive wheels.

Method 2

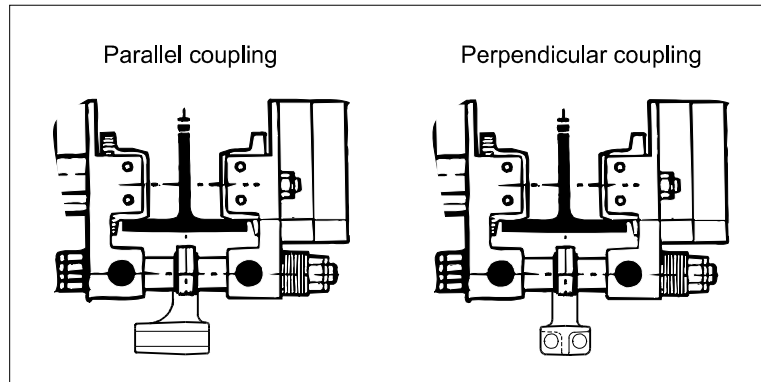
1. Install the trolley as a complete assembly onto the beam from the end.
2. Install the trolley end stops at each beam end.
3. Check that all the nuts on the trolley are properly tightened.
4. Connect the electrical cable to the trolley.
5. Grease the teeth of the drive pinion and the drive wheels.



$$Y + Z = 5/32" [4\text{mm}] \text{ MAX}$$

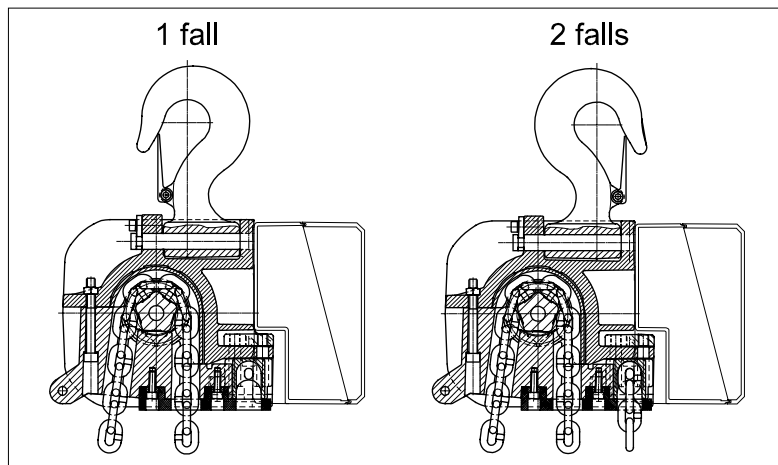
The total play between wheel flange and the beam flange must not exceed 5/32" [4mm]. The distance between trolley side plates must be equal to the sum of the beam flange width + 1 15/16" [50mm].

Coupling Suspension



When setting the hoist in position, check that the suspension hook or coupling is correctly positioned, depending on whether the chain hoist is a one-fall or two-fall design. This is necessary for proper balance of hoist when loaded.

Hook Suspension

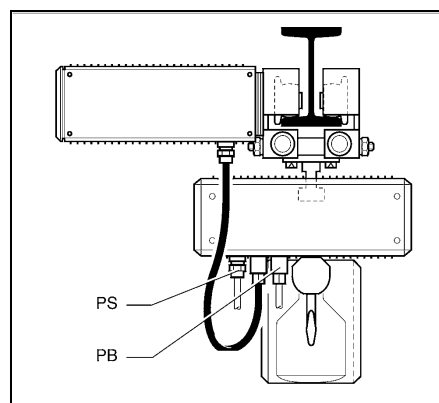


Trolley Power Connection

Plug the trolley cable into the designated plug receptacle on the hoist electrical enclosure.

PS: Power supply cable entry

PB: Push button plug





Technical Characteristics

CAUTION

The trolley that you have just purchased should only be used with the nominal load indicated on the rating plate. The service life of the TDU depends on the demands placed on it such as the average operating time, and the number of start/stops and its maintenance.

A transformer that is mounted to the trolley side plate opposite the motor side, supplies the proper power to the TDU motor and controller. The transformer for a 460 volts or 575 volts power supply is dual voltage rated and it is field reconnectable. The transformer for a 208 volts or 230 volts power supply is single voltage rated. Without the transformer, the power supply for the TDU motor is 400VAC, 50 Hz and the control voltage is 48V.

The controller for the TDU offers built-in flexibility such as the method of speed control and the selection of output speeds. The speed control method allows the user to select from a two-step speed mode or a step-less speed mode. Each of these speed modes allows the use of a two-speed push button operator. The trolley speeds is selected by adjusting switches (DIP) on the I/O card. It is extremely easy to reprogram the unit to meet changing needs.

| | |
|---|-----------------------------------|
| Input voltage: | 208, 230, 460, or 575 V AC |
| Control voltage: | 115 V AC |
| Frequency: | 60Hz |
| Fuse: | 16 A |
| Nominal output torque (at output pinion): | 3.87 lb-ft |
| Maximum output torque (at output pinion): | 7.74 lb-ft |
| Nominal output power: | 2 horsepower |
| Braking torque: | 2.58 lb-ft |
| Minimum speeds: | 8, 12, 16 and 20 ft/min |
| Maximum speeds: | 65, 80, 100 and 125 ft/min |
| Step-less variable speed with above mentioned minimum and maximum speeds | |
| Acceleration times: | 1.67, 2.50, 3.33 and 5.00 seconds |
| Slowdown limit speeds: | 2, 20, 30 and 40 ft/min |
| Stall prevention (during acceleration and at constant speed) reaction time: | 1.83 seconds |
| Motor overload protection: | Bimetal switch (option) |
| Nominal current: | 2 to 5 amps |
| Maximum starting current: | 15 amps |
| Protection: | IP-55 |
| Approvals: | CSA |

Because of the step-less soft-start, a heavy load can be moved safely at quick speed. The control unit's characteristics minimize pendulum load swing and allow the load to be positioned easily.

Environmental data

| | |
|----------------------|--|
| Ambient temperature: | -5°F to +104°F |
| Humidity: | 90%RH (no condensation) |
| Vibration: | 0.2g _n (2m/s ²) |

Dimensions and Weights

Weight of **C2** motorized trolley assembly, for capacity ≤ 2 ton is approximately 117 lbs.
 Weight of **C3** motorized trolley assembly, for capacity > 2 ton is approximately 137 lbs.

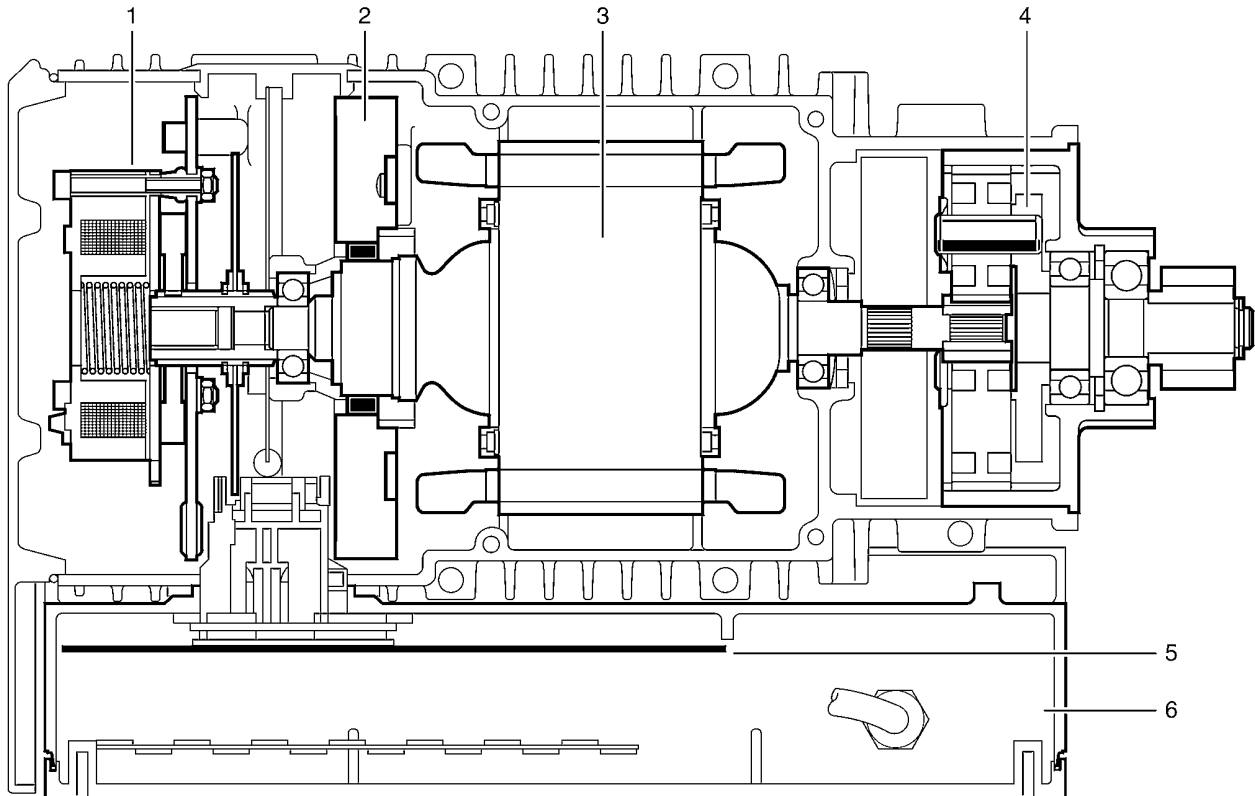
For more dimensional information, refer to hoist outline drawings.



TDU Trolley Flange Settings

| | | C2 Motorized Trolley | | | C3 Motorized Trolley | | | | |
|---------------------------|---|----------------------------|---------|------|----------------------|----------------------------|---------|------|---|
| Flange width Inch (mm) | Cross beam Length | Total length of washers | Washers | | Cross beam Length | Total length of washers | Washers | | |
| | | | 4 mm | 2 mm | | | 4 mm | 2 mm | |
| 2 ¼ (58) | Length 10.23 in (260 mm) 2152563 | | | | Length 305 mm | | | | |
| 2 ½ (64) | | 0 | 0 | 0 | | | | | |
| 2 5/8 (66) | | 2 | 0 | 1 | | | | | |
| 2 13/16 (72) | | 8 | 2 | 0 | | | | | |
| 2 15/16 (74) | | 10 | 2 | 1 | | | | | |
| 3 3/16 (82) | | 17 | 4 | 1 | | | 3 | 0 | 1 |
| 3 ½ (90) | | 25 | 6 | 1 | | | 11 | 2 | 1 |
| 3 13/16 (98) | | 34 | 8 | 1 | | | 19 | 4 | 1 |
| 3 15/16 (100) | | 36 | 8 | 2 | | | 19 | 4 | 1 |
| 4 1/8 (106) | | 42 | 10 | 1 | | | 27 | 6 | 1 |
| 4 ¼ (108) | | 44 | 10 | 2 | | | 27 | 6 | 1 |
| 4 5/16 (110) | | 46 | 10 | 3 | | | 30 | 6 | 2 |
| 4 7/16 (113) | | 48 | 12 | 0 | | | 32 | 8 | 0 |
| 4 5/8 (118) | | 54 | 12 | 3 | | | 38 | 8 | 2 |
| 4 ¾ (120) | | 56 | 14 | 0 | | | 40 | 10 | 0 |
| 4 15/16 (125) | 60 | 14 | 2 | | 46 | 10 | 2 | | |
| 5 (126) | 62 | 14 | 3 | | 46 | 10 | 2 | | |
| 5 1/8 (131) | Length 12.80 in. (325 mm) 2152564 | 2 | 0 | 1 | Length 355 mm | 51 | 12 | 1 | |
| 5 ¼ (133) | | 6 | 0 | 3 | | 54 | 12 | 2 | |
| 5 5/16 (135) | | 8 | 2 | 0 | | 54 | 12 | 2 | |
| 5 3/8 (137) | | 8 | 2 | 0 | | 56 | 14 | 0 | |
| 5 ½ (140) | | 12 | 2 | 2 | | 3 | 0 | 1 | |
| 5 5/8 (143) | | 14 | 2 | 3 | | 6 | 0 | 2 | |
| 5 ¾ (146) | | 17 | 4 | 1 | | 8 | 2 | 0 | |
| 5 ¾ (147) | | 20 | 4 | 2 | | 8 | 2 | 0 | |
| 5 ¾ (149) | | 20 | 4 | 2 | | 11 | 2 | 1 | |
| 5 7/8 (150) | | 22 | 4 | 3 | | 11 | 2 | 1 | |
| 6 1/16 (155) | | 26 | 6 | 1 | | 16 | 4 | 0 | |
| 6 1/8 (158) | | 30 | 6 | 3 | | 19 | 4 | 1 | |
| 6 ¼ (160) | | 32 | 8 | 0 | | 22 | 4 | 2 | |
| 6 ½ (166) | | 38 | 8 | 3 | | 27 | 6 | 1 | |
| 6 5/8 (168) | | 40 | 10 | 0 | | 30 | 6 | 2 | |
| 6 11/16 (170) | 42 | 10 | 1 | 32 | 8 | 0 | | | |
| 7 (178) | 50 | 12 | 1 | 40 | 10 | 0 | | | |
| 7 1/16 (180) | 52 | 12 | 2 | 43 | 10 | 1 | | | |
| 7 ¼ (185) | 56 | 14 | 0 | 46 | 10 | 2 | | | |
| 7 5/16 (186) | 58 | 14 | 1 | 48 | 12 | 0 | | | |
| 7 3/8 (188) | 60 | 14 | 2 | 51 | 12 | 1 | | | |
| 7 ½ (190) | 62 | 14 | 3 | 51 | 12 | 1 | | | |
| 7 ¾ (198) | 6 | 0 | 3 | 3 | 0 | 1 | | | |
| 7 7/8 (200) | 8 | 2 | 0 | 3 | 0 | 1 | | | |
| 8 1/8 (206) | 14 | 2 | 3 | 11 | 2 | 1 | | | |
| 8 ¼ (210) | 17 | 4 | 1 | 14 | 2 | 2 | | | |
| 8 7/16 (215) | 22 | 4 | 3 | 19 | 4 | 1 | | | |
| 8 ½ (218) | 26 | 6 | 1 | 22 | 4 | 2 | | | |
| 8 5/8 (220) | 28 | 6 | 2 | 24 | 6 | 0 | | | |
| 8 7/8 (226) | 34 | 8 | 1 | 30 | 6 | 2 | | | |
| 9 7/16 (240) | 48 | 12 | 0 | 43 | 10 | 1 | | | |
| 9 ¾ (248) | 56 | 14 | 0 | 51 | 12 | 1 | | | |
| 10 ¼ (260) | 4 | 0 | 2 | 6 | 0 | 2 | | | |
| 10 ½ (268) | 12 | 2 | 2 | 14 | 2 | 2 | | | |
| 11 (280) | 24 | 6 | 0 | 27 | 6 | 1 | | | |
| 11 15/16 (288) | 32 | 8 | 0 | 35 | 8 | 1 | | | |
| 11 13/16 (300) | 44 | 10 | 2 | 46 | 10 | 2 | | | |
| 11 7/8 (302) | 46 | 10 | 3 | 48 | 12 | 0 | | | |
| 11 15/16 (304) | 48 | 12 | 0 | 51 | 12 | 1 | | | |
| 12 (306) | 50 | 12 | 1 | 51 | 12 | 1 | | | |
| 12 1/8 (308) | 52 | 12 | 2 | 54 | 12 | 2 | | | |
| 13 3/16 (310) | 54 | 12 | 3 | 56 | 14 | 0 | | | |

Motor and Brake



- | | | |
|-------------------|--------------------------|----------------------|
| 1. Brake Assembly | 2. Brushes | 3. Rotor Stator |
| 4. Gear Reducer | 5. Printed Circuit Board | 6. Control Enclosure |

Motor

Two phases of the power supply are used where one phase is always energized.

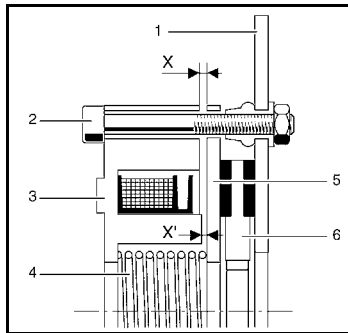
Reminder: With reference to the standards, the user must provide an emergency shutdown or mainline disconnect switch at a maximum of 24 feet from the trolley. On the electric chain hoist, a mainline contactor is provided in hoist control enclosure as standard.

Note: If the motor has been in a humid atmosphere, it is advisable to check the insulation resistance. This should not be less than 5000 ohms per volt of rated voltage.

Brake

Braking occurs when the D.C. coil is de-energized. The asbestos free friction material is on each side of the disk. The energized coil pulls the disc against the spring and releases the brake. Once the coil is de-energized the spring applies a clamping force, setting the brake.

Description of Brake



1. Support
2. Adjusting screw
3. Electromagnet
4. Spring
5. Anchor disk
6. Brake disk

The minimum Air gap is 0.018" [0.45mm]. Reset air gap if it exceeds 0.037" [0.95mm].

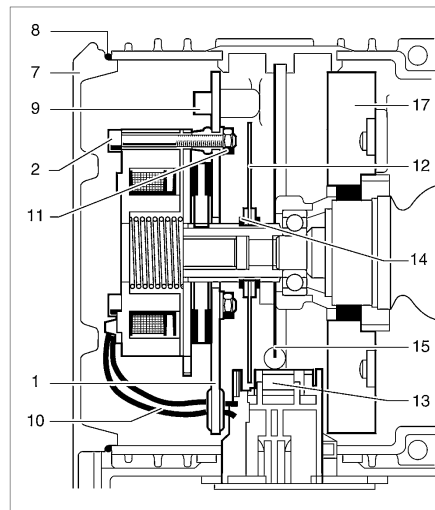
Brake Spring

With a standard spring

Spring force: 7.6 lb.
 Braking torque: 0.051 lb.ft

Adjustment of the Air Gap

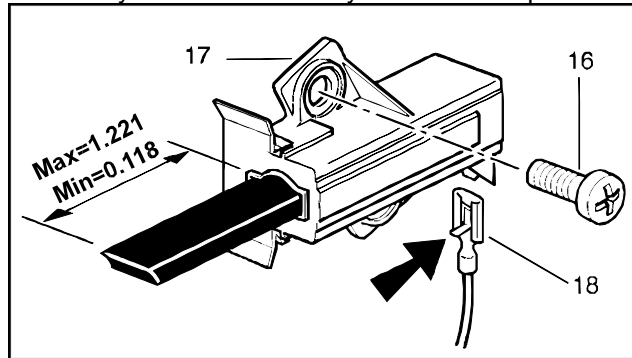
1. Remove the cover (7) and the sealing (8).
2. Remove the wires coming from PC-board from the terminal. The brake wires are not needed to remove.
3. Remove the two screws, (9) from the support, (1).
4. Extract the support / brake assembly taking care not to force the feed wires.
5. Use a feeler gauge to measure the air gap at several points and then adjust it by loosening or tightening the three screws, (2). Set air gap for 0.018" [0.45mm].
6. Once adjusted, tighten the 3 nuts (11) for the each screw (2).
7. Fit the brake and the cover and wires to terminal and tighten to the required torque.
8. Connect the wire to terminal.
9. Carry out the braking tests.



Motor Brushes

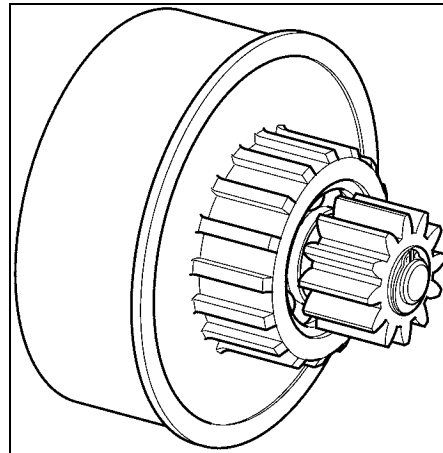
1. Removal
2. Remove the brake as shown above.
3. Open the electric box cover and remove the printed circuit board so disk (12) is disengaged from the pulse sensor (13).
4. Remove the stop ring (14) and then pull out the disk (12).
5. Pull out the protection plate (15).
6. Loosen the four screws, (16) on the 2 brushes, (17) and remove the lugs, (18) by pressing on the tab before pulling it.

When replacing lugs, make sure they are turned correctly so there is no problem when removing them again.

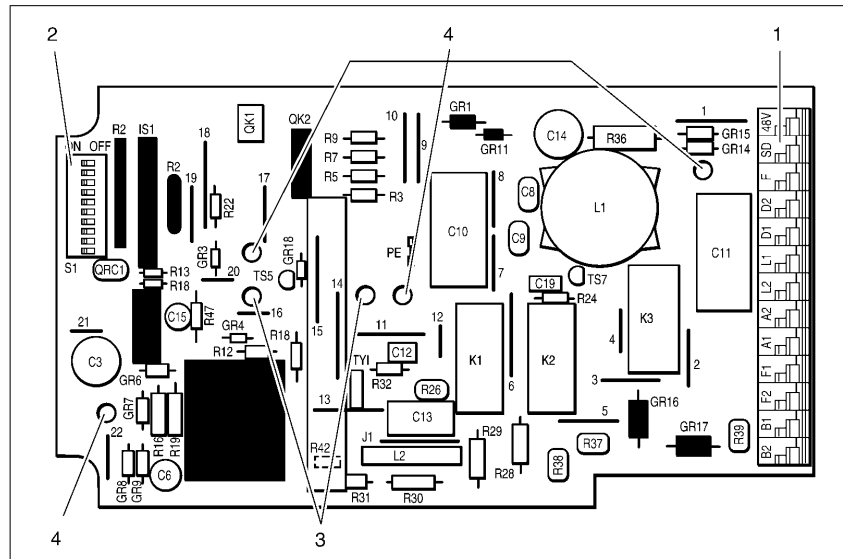


Gear Reducer

Lubrication of gear reducer is for lifetime and does not require regular maintenance. To disassemble gear reducer, pull hard on the outer part of the gear casing.

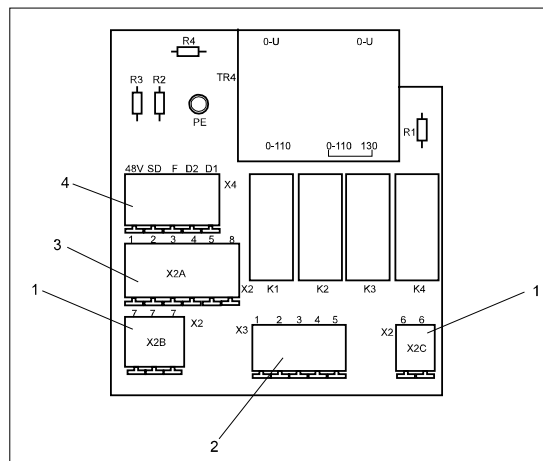


TDU Printed Circuit Board



1. Terminals
2. DIP switches
3. Pulse sensor attachment
4. Printed circuit board attachment

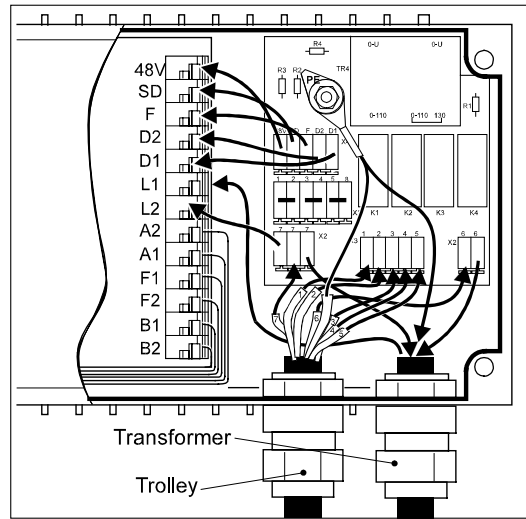
Voltage transformer card



1. Main supply connections (from hoist terminal X24)
2. Control voltage connection and control connections (from hoist terminal X2A)
3. Limit switches (option)
4. Connection to TDU board terminals



Control Panel



Trolley Plug

| Pin No. | Function | Connection |
|---------|----------|------------|
| 1 | common | X3, 1 |
| 2 | slowdown | X3, 2 |
| 3 | fast | X3, 3 |
| 4 | left | X3, 4 |
| 5 | right | X3, 5 |
| 6 | supply | X2, 6 |
| 7 | supply | X2, 7 |
| 9 | Ground | PE |

| Terminal board | Function | Wires | Connection |
|----------------|----------|-----------|---------------|
| 48 V | gray | common | - X4, 48V |
| SD | gray | slowdown | - X4, SD |
| F | gray | fast | - X4, F |
| D2 | gray | left | - X4, D2 |
| D1 | gray | right | - X4, D1 |
| L1 | orange | supply | - transformer |
| L2 | orange | supply | - X2, 7 |
| A1 | gray | rotor | white - |
| A2 | gray | rotor | blue - |
| F1 | gray | stator | brown - |
| F2 | gray | stator | green - |
| B1 | orange | brake (-) | yellow - |
| B2 | orange | brake (+) | yellow - |



Operating Tests

CAUTION!

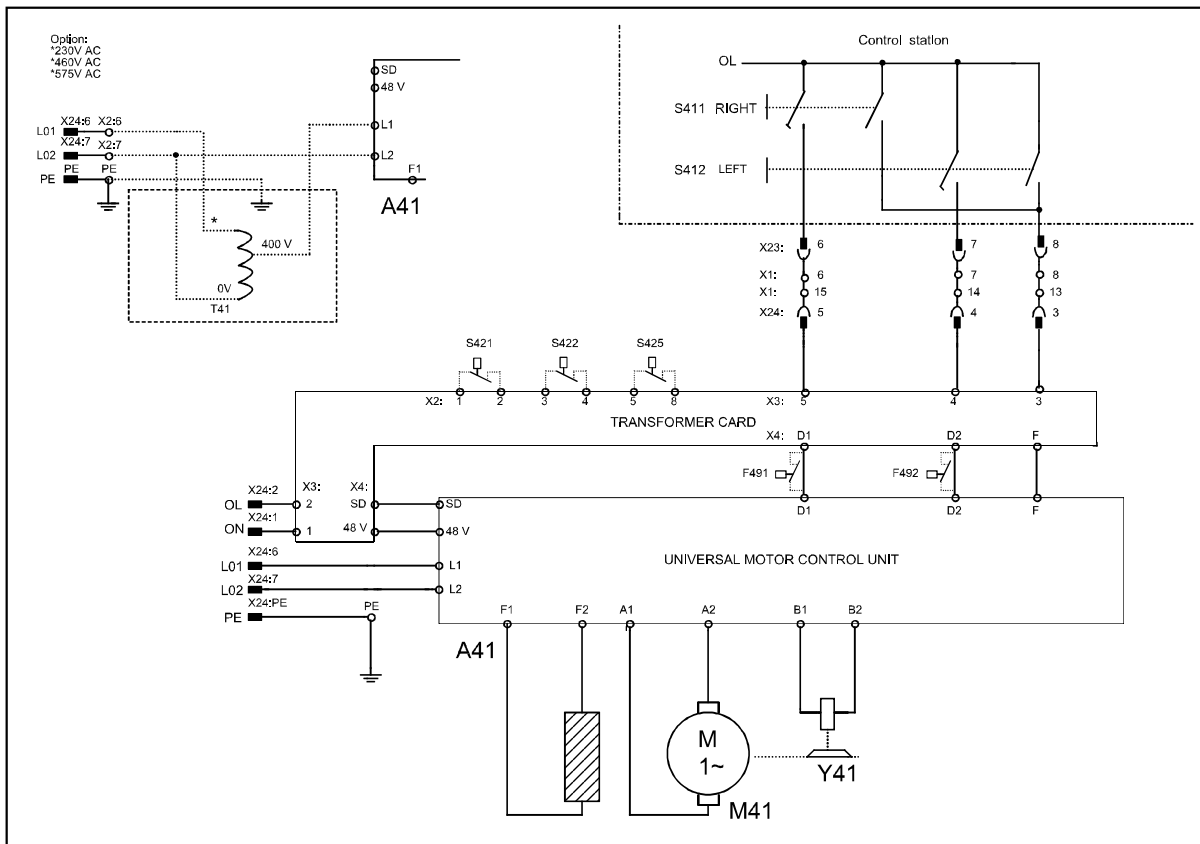
Always be ready to press the emergency stop button.

- Check that the electrical connections and mechanical assemblies are all correct.
- Check that the operating parameters are as required.
- Close the electrical box cover.
- Check that the movements of the trolley do not cause any danger.
- Turn on the power supply.
- Operate at minimum speed for 5 to 10 seconds. Accelerate up to maximum speed and hold it for 5 to 10 seconds.
- Carry out the same operation in the opposite direction, first at minimum speed and then at maximum speed.
- If the trolley moves to the wrong direction, invert the cables (blue and white) of the rotor.
- Check the operations of the left and right travel limit switches. Limit switch is an optional component.

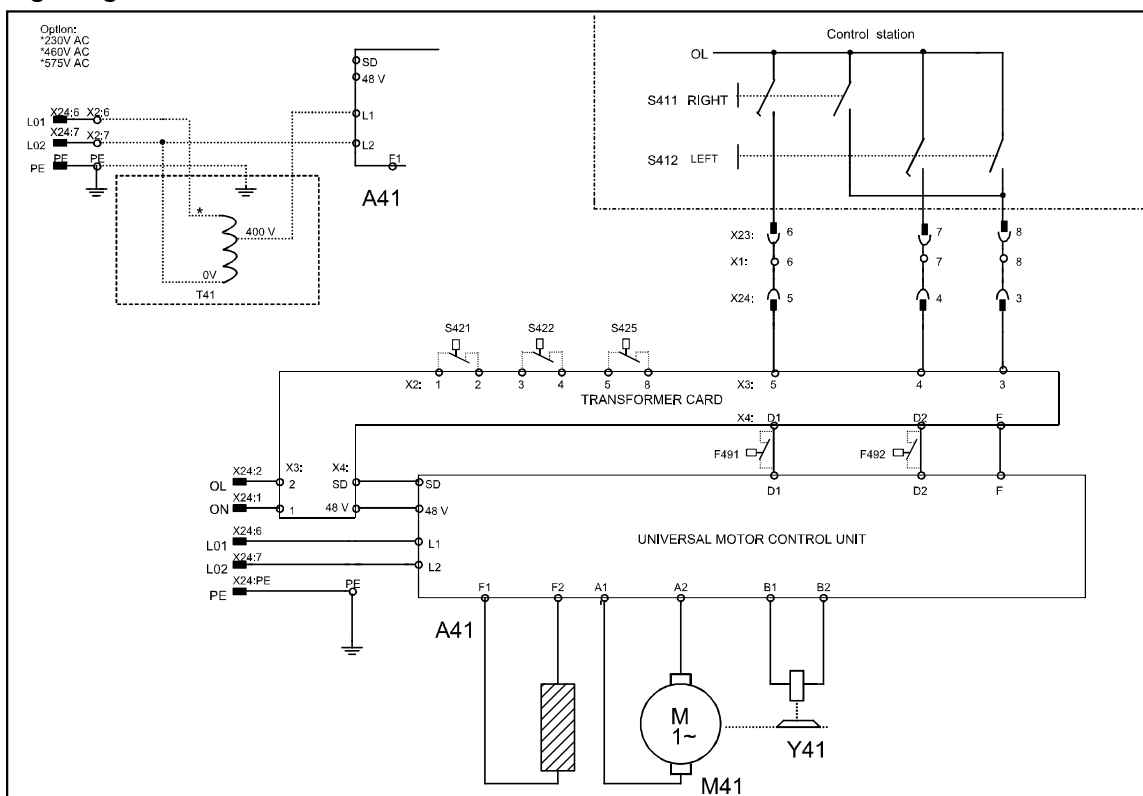
Wiring Diagram

| | |
|-----------|--|
| S 421 | Right limit switch (option) |
| S 422 | Left limit switch (option) |
| S 425 | Selector switch (slow/fast speed) (option) |
| F 491-492 | Thermal protection (option) |
| T41 | Transformer 208VAC, 230VAC or 460/575VAC |
| L1, L2 | Main power supply |
| SD, 48V | Control 48 voltage |
| F1, F2 | Field magnet |
| A1, A2 | Armature |
| B1, B2 | Brake |
| D1, D2 | Right / Left control |
| F | Speed selector |
| X24 | Connection plug from hoist to TDU |
| X23 | Connection plug from push button to hoist |

Wiring Diagram - Electrical Connection with LM 5 hoist



Wiring Diagram - Electrical Connection with LM 10/16/20/25 hoist





Preventative Maintenance

Maintenance table

| Check | Interval | Qualification of personnel |
|--|-----------------|----------------------------|
| Brake operation | Daily | Operator |
| For loose screws and signs of corrosion | Annually | Qualified mechanic |
| Adjustment of the brake | Annually | Qualified mechanic |
| Measurement of the diameter of the roller raceway band | Annually | Operator |
| Condition of the roller drive pinion | Annually | Operator |
| Motor brushes | Every 800 hours | Qualified mechanic |
| Lubrication of open gear | weekly | Operator |

CAUTION! These intervals should be shortened if TDU is used daily for eight hours in 24 hour period, if it is used with maximum loads or in difficult ambient conditions.

Lubricants

| Lubrication point | Specifications | Possible brands | Quantity |
|---------------------|--|---|----------------------------------|
| Roller drive pinion | KP 0 K grease (DIN 51502) Soap-based lithium + MoS 2 Approx. melting point + 356°F Worked penetration 671 - 725°F Operating temperature - 22°F to + 266°F | Tribol: Molub Alloy multi-purpose grease Aral: Aral P 64037 grease Aralub PMD0 BP: Multi-purpose grease L 21 M Esso: Multi-purpose grease M Mobil: Mobilgrease Special Shell: Shell Retimax AM Texaco: Molytex grease EP 2 Fuchs: Renolit FLMO | As necessary *) 0.02 L |
| Bearing (*) | | | |

Spare Part Replacement Table

After a long period of non-use or during a routine check, check the operation and adjustment of the safety items (brake, end stops...). If there is a possibly defective element, deformation or abnormal wear, the parts must be changed.

CAUTION! Disconnect the power supply before replacing any parts.

| Spare part | To be replaced by | Qualification of the personnel |
|-----------------------|-----------------------------------|--------------------------------|
| Roller drive pinion | Authorized manufacturer personnel | Qualified mechanic |
| Gear reducer assembly | Authorized manufacturer personnel | Qualified mechanic |
| Brake cap seal | Authorized manufacturer personnel | Qualified mechanic |
| Other seals | Authorized manufacturer personnel | Qualified mechanic |
| Brake assembly | Authorized manufacturer personnel | Qualified mechanic |
| Brake disc | Authorized manufacturer personnel | Qualified mechanic |
| Rubber buffer | Customer | Qualified mechanic |
| PC-board | Authorized manufacturer personnel | Qualified electrician |
| Connection, plug | Authorized manufacturer personnel | Qualified electrician |

If a part has been replaced, check the operation of the equipment.



Trouble Shooting

Trolley operates for 2 seconds then stops:

- ✓ Control unit is not receiving pulses from the pulse sensor
- ✓ Sensor in the wrong position or defective ⇒ position it correctly or replace it
- ✓ Toothed disk is defective ⇒ replace it.

Trolley accelerates very fast then stops

- ✓ Press the emergency stop. Check that there is no risk of collision and start the trolley again.
- ✓ If the same thing happens again, STOP THE TROLLEY AND REPLACE THE CONTROL UNIT

TDU Brake does not open

- ✓ Check the air gap and look for other possible mechanical problems
- ✓ Check the brake cable connections
- ✓ Disconnect the control unit cables. Check the brake coil resistance (1500 to 1540 Ohm) and the insulation resistance (>1 Mohm). If the resistance is defective, replace the brake.
- ✓ Measure the voltage between terminals 13 and 14 while the unit is operating. It should be between 160 and 200 VDC. If not, the control unit is defective and should be replaced. If encountering difficulty when measuring the voltage while the trolley is running, disconnect the blue and white wire from the terminal. In this case the voltage is possible to be measured only within 2 seconds.

Brake cannot be released:

- ✓ Air gap badly adjusted ⇒ adjust it
- ✓ Presence of foreign matter ⇒ clean it
- ✓ Mains voltage too low ⇒ revise it

Insufficient braking torque:

- ✓ Grease on lining ⇒ replace lining
- ✓ Damaged lining ⇒ replace lining
- ✓ Sliding of armature and disc ⇒ clean, replace if necessary

If the trolley moves to the wrong direction of the push button being pressed, invert the cables (blue and white) of the rotor.

No movement when trying to operate the trolley:


Disconnect the power supply for 3 seconds and try again.

Movement?

No **Yes**  Disturbance in the program. No action is necessary




Is the thermal protection (option) activated?

No **Yes**  Let the trolley cool down




Is the motor running?

No **Yes**  The transmission is damaged. Replace the damaged parts or the whole unit



Is there a mechanical blockage?

No **Yes**  Remove the blockage




Are the cables connected?

Yes **No**  Connect the cables




Check whether the power supply is correct
 (400 VAC ± 10% between terminals 6 and 7)

Yes **No**  Check the power supply and the fuses



Check whether the control signals are correct (48 VAC between
 terminals 1 & 4 or 5 during operation)

Yes **No**  Check the control voltage, the limit switches
 and the thermistor




Check that the stator resistance is between 3 and 5 Ohms
 (terminals 11 and 12)

Yes **No**  The cable is broken or the motor is damaged



Check that the rotor resistance is between 3 and 6 Ohms
 (terminals 9 and 10)

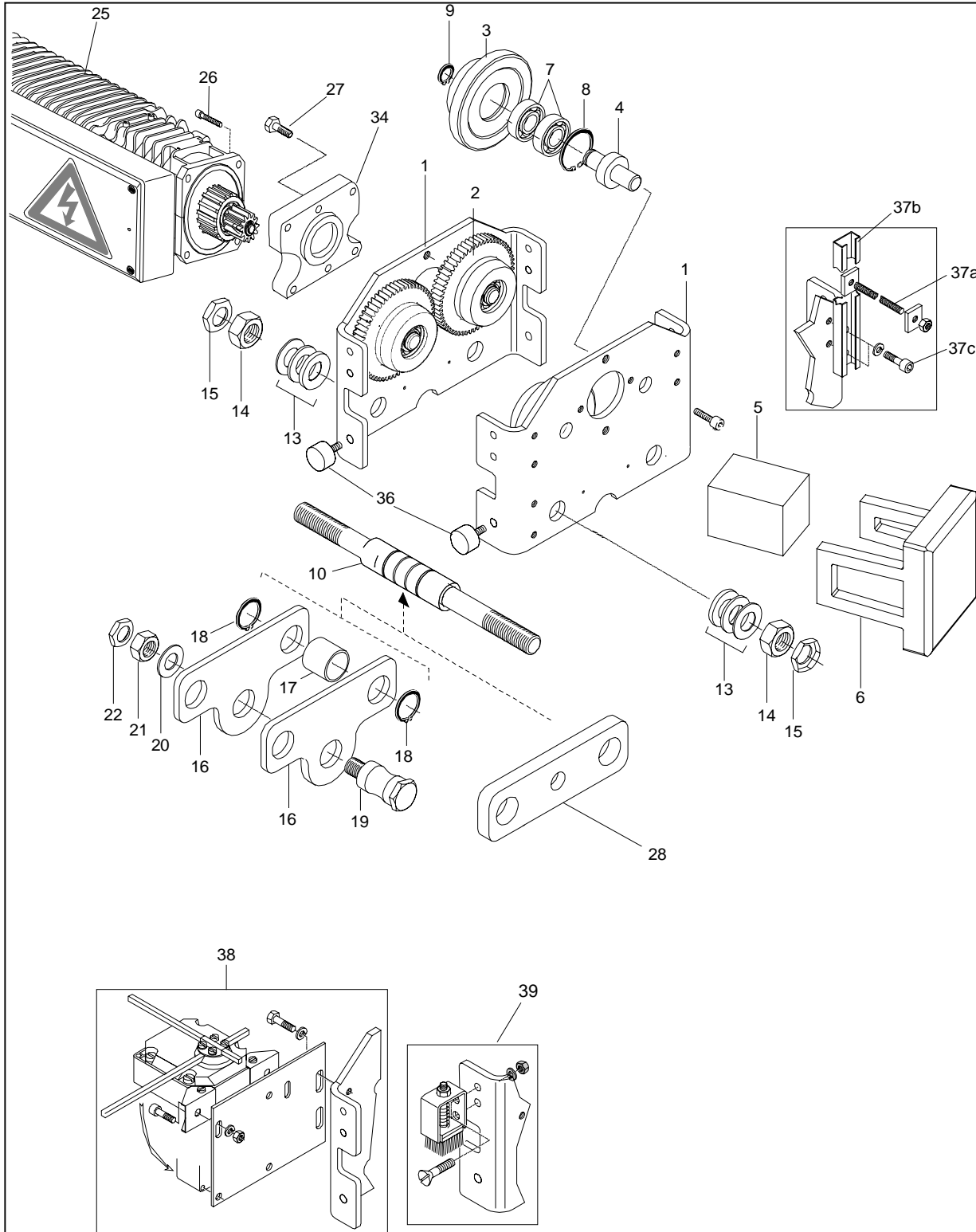
Yes **No**  The cable is broken, the brushes are damaged
 or the motor is damaged



The control unit is damaged, replace it

Spare Parts

TDU Trolley



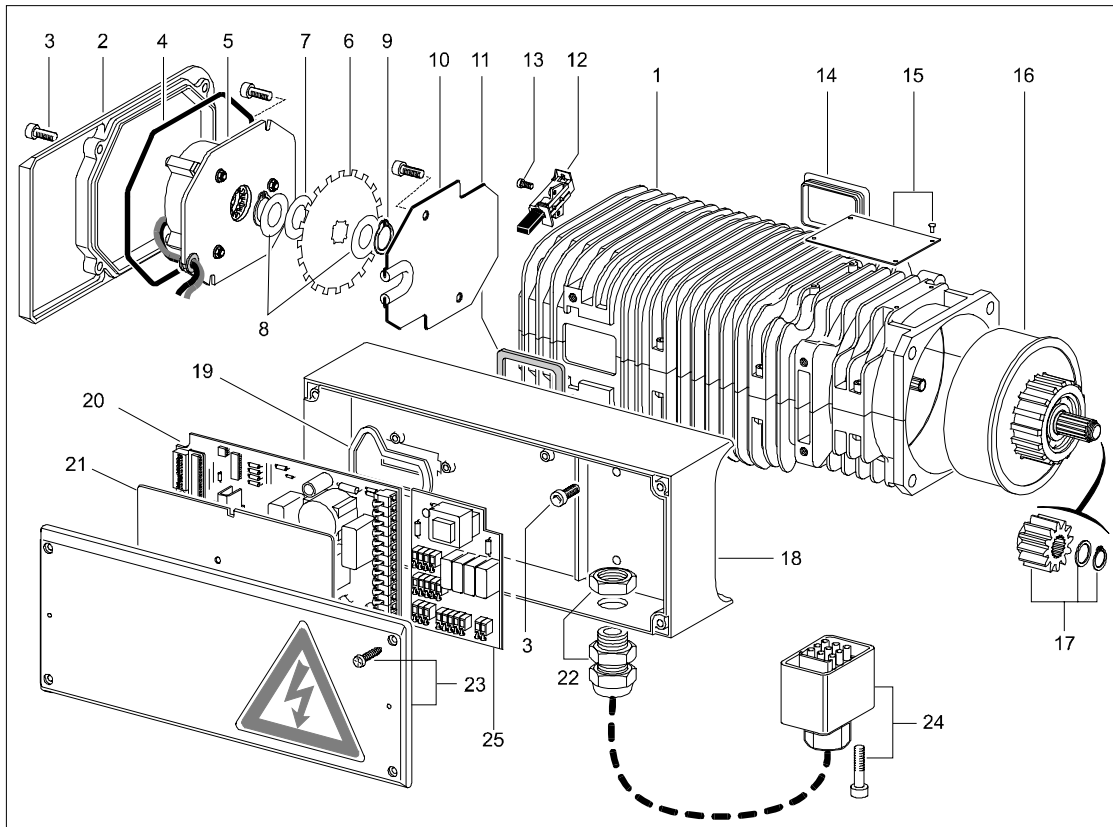


TDU Trolley

| Item | Part Number | Description | Quantity |
|------|-------------|--------------------------|-------------|
| 1 | 2151001 | Trolley side plate | 2 |
| 2 | 2143001 | Drive wheel | 2 |
| 3 | 558913 | Idler wheel | 2 |
| 4 | 558915 | Wheel axle | 4 |
| 5 | 2229922 | Transformer 460/575 Volt | 1 |
| 5 | 2229923 | Transformer 230 Volt | 1 |
| 5 | | Transformer 208 Volt | 1 |
| 6 | 2221067 | Counterweight set | 1 |
| 7 | 833704 | Wheel bearing | 8 |
| 8 | 300077 | Retaining ring | 4 |
| 9 | 830860 | Retaining ring | 4 |
| 10 | - | Cross head bar | 2 |
| 13 | 832112 | Washer 4 mm | As required |
| 13 | 832113 | Washer 2 mm | As required |
| 14 | 831540 | Nut | 4 |
| 15 | 831576 | PAL locking nut | 4 |
| 16 | 558941 | Coupling plate | 2 |
| 17 | 558944 | Spacer tube | 2 |
| 18 | 400078 | Retaining ring | 4 |
| 19 | 558947 | Suspension axle | 1 |
| 20 | 832110 | Washer | 1 |
| 21 | 831523 | Nut | 1 |
| 22 | 831575 | PAL locking nut | 1 |
| 25 | 2220000 | Gearmotor assembly | 1 |
| 26 | 830915 | Screw M8 x 35 | 4 |
| 27 | 830210 | Screw M8 x 30 | 6 |
| 28 | 2222003 | Coupling part | 1 |
| 34 | 2142004 | Adapter | 1 |
| 36 | 558993 | Rubber bumper | 4 |
| 37a | 602910 | Tow arm 170mm | 1 |
| 37a | 602911 | Tow arm 400mm | 1 |
| 37b | 558996 | Tow arm support 125mm | 1 |
| 37b | 558997 | Tow arm support 235mm | 1 |
| 37b | 558998 | Tow arm support 335mm | 1 |
| 37b | 558999 | Tow arm support 435mm | 1 |
| 37c | 7215453J | Screw M6 x 16 | 2 |
| 38 | | Limit switch | 1 |

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Gearmotor Assembly



| Item | Part Number | Description | Quantity |
|------|-------------|--------------------------------------|----------|
| 1 | 2220000 | Gearmotor assembly | 1 |
| 2 | 2221009 | Brake housing | 1 |
| 3 | 7215353A | Screw CHC M6 x 16 | 4 |
| 4 | 8370001 | Gasket | 1 |
| 5 | 2221002 | Brake assembly | 1 |
| 6 | 2221003 | Disk | 1 |
| 7 | 8593422 | Plastic washer | 1 |
| 8 | 8582232 | Spacer | 2 |
| 9 | 8292112 | Retaining ring | 2 |
| 10 | 2221004 | Protection plate | 1 |
| 11 | 2221005 | Box gasket | 1 |
| 12 | 2221006 | Motor brush | 2 |
| 13 | 8083508 | Screw | 4 |
| 14 | 2221013 | Closing gap | 1 |
| 15 | 2226502 | Rating plate | 1 |
| 16 | 2221014 | Gears | 1 |
| 17 | 2144001 | Drive pinion, washer, retaining ring | 1 |
| 18 | 2221015 | Control enclosure & hardware | 1 |
| 19 | 2221016 | Gasket | 1 |
| 20 | 2223004 | P.C. Board & hardware | 1 |
| 21 | 2221017 | Protection plate | 1 |
| 22 | 7481630 | Cable gland | 1 |
| 23 | 2221018 | Enclosure cover | 1 |
| 24 | 2221019 | Plug | 1 |
| 25 | 2223005 | Transformer card | 1 |