
GENERAL	6
Installation of Trolley.....	6
Coupling Suspension	7
Hook Suspension	7
Trolley Power Connection.....	7
TECHNICAL CHARACTERISTICS	8
Environmental data.....	8
Dimensions and Weights.....	8
TDU Trolley Flange Settings.....	9
MOTOR AND BRAKE	10
Motor.....	10
Brake	10
Description of Brake	11
Brake Spring.....	11
Adjustment of the Air Gap.....	11
Motor Brushes.....	12
Gear Reducer	12
TDU Printed Circuit Board	13
Voltage transformer card.....	13
Control Panel	14
Operating Tests	15
Wiring Diagram	15
Wiring Diagram - Electrical Connection with LM 5 hoist	16
Wiring Diagram - Electrical Connection with LM 10/16/20/25 hoist	16
PREVENTATIVE MAINTENANCE.....	17
Maintenance table	17
Lubricants.....	17
Spare Part Replacement Table	17
TROUBLE SHOOTING	18
SPARE PARTS	20
TDU Trolley.....	20
Gearmotor Assembly	22



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.

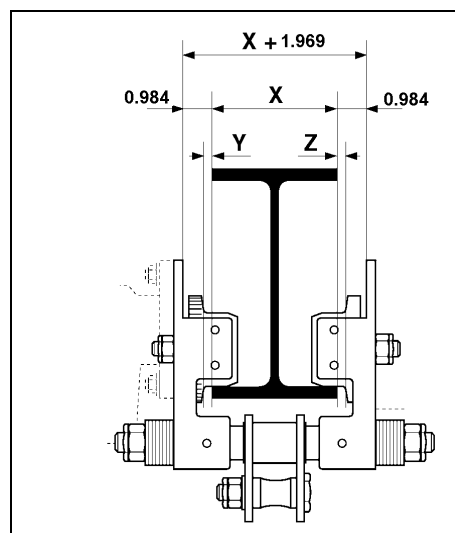
Installation of Trolley

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.

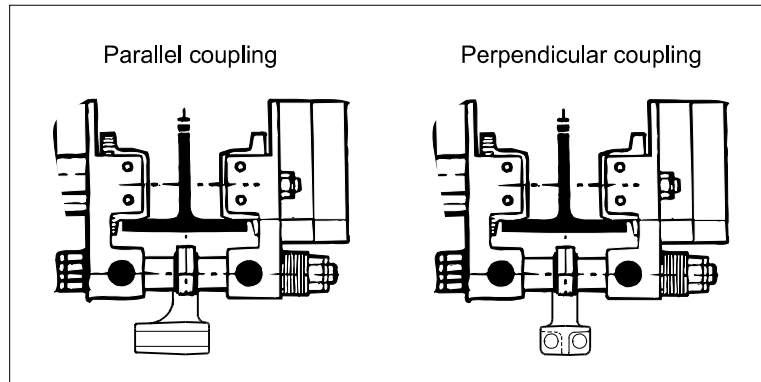


$$Y + Z = 5/32" [4\text{mm}] \text{ MAX}$$

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].

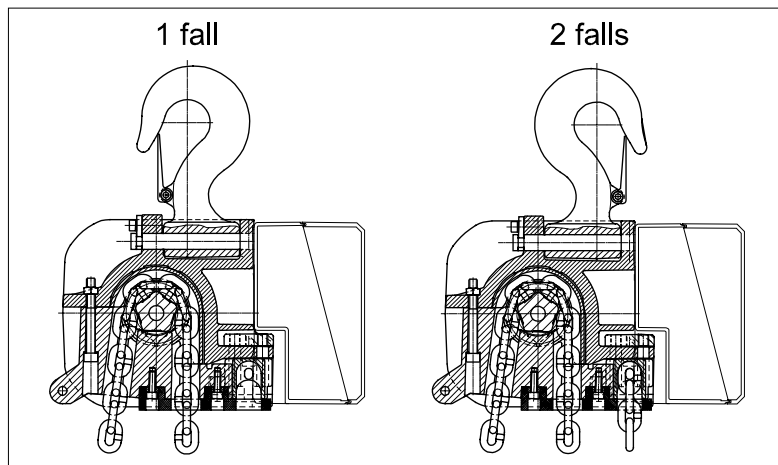


Coupling Suspension



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

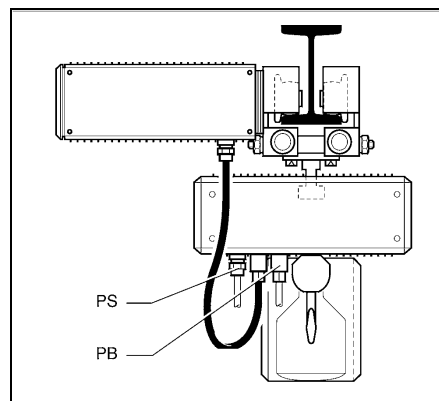


Trolley Power Connection

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.

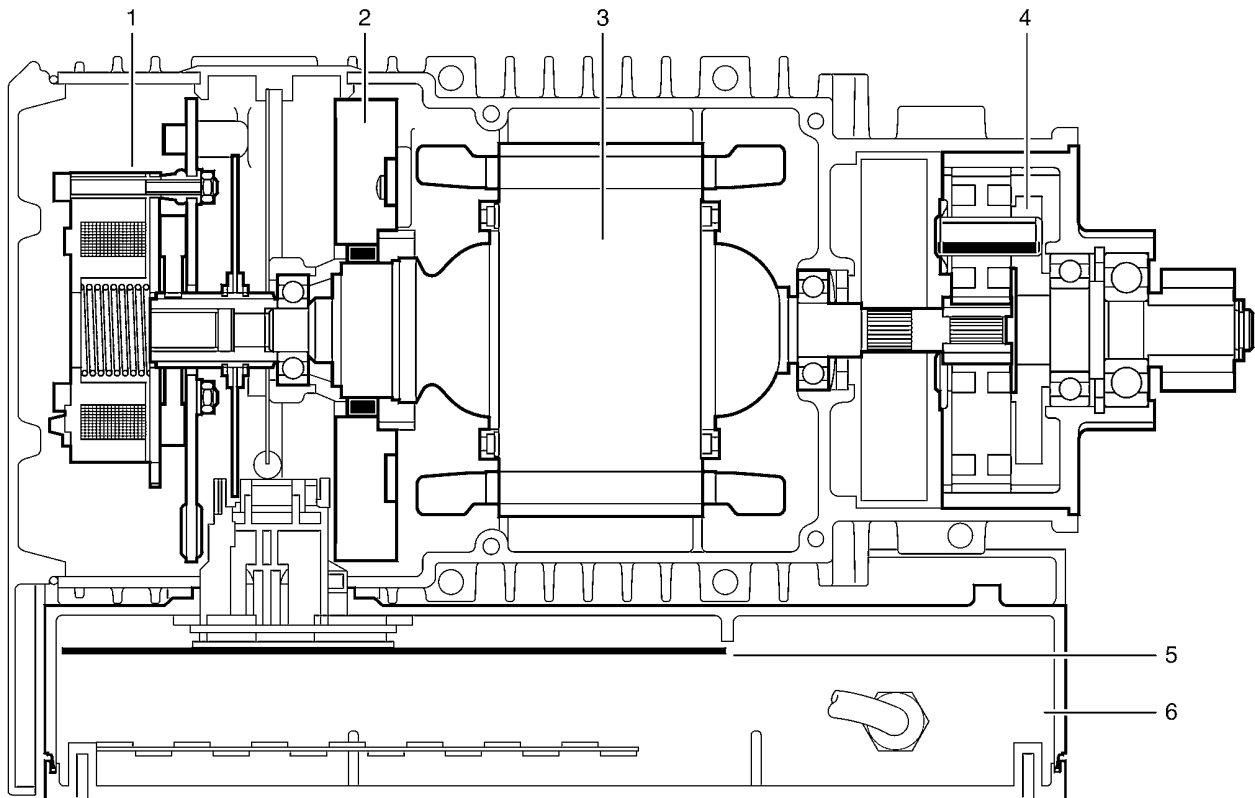


TDU Trolley Flange Settings

		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.

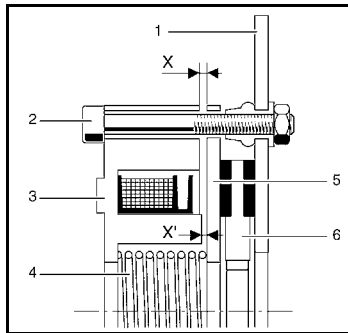
Note: If the motor has been in a humid atmosphere, it is advisable to check the insulation resistance. This should not be less than 5000 ohms per volt of rated voltage.

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

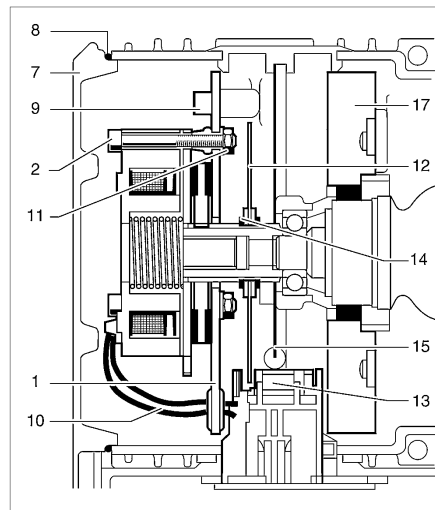
With a standard spring

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.

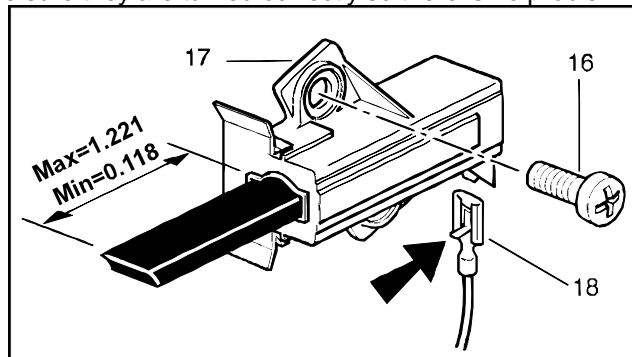




Motor Brushes

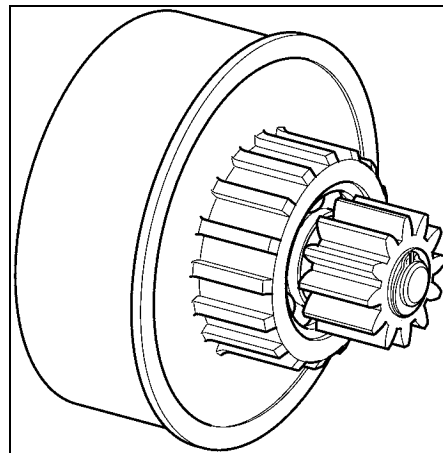
1. Removal
2. Remove the brake as shown above.
3. Open the electric box cover and remove the printed circuit board so disk (12) is disengaged from the pulse sensor (13).
4. Remove the stop ring (14) and then pull out the disk (12).
5. Pull out the protection plate (15).
6. Loosen the four screws, (16)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



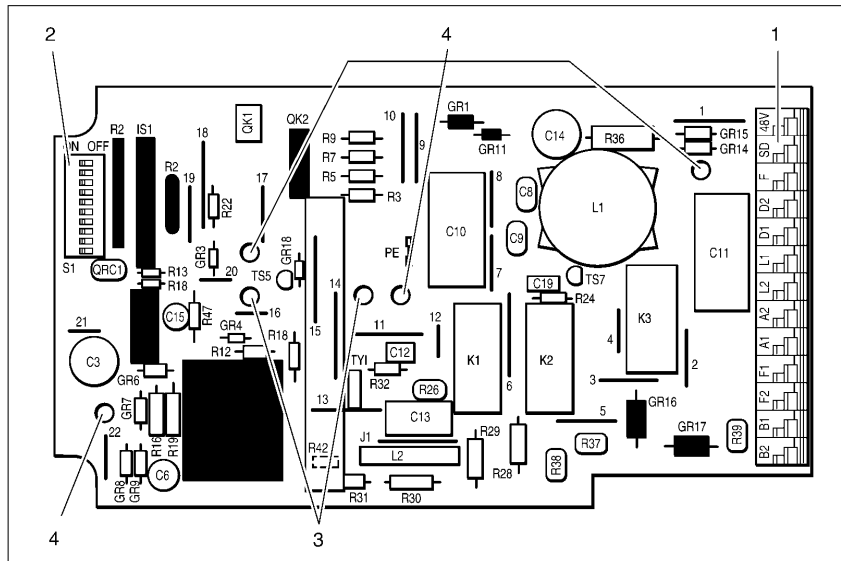
Gear Reducer

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.



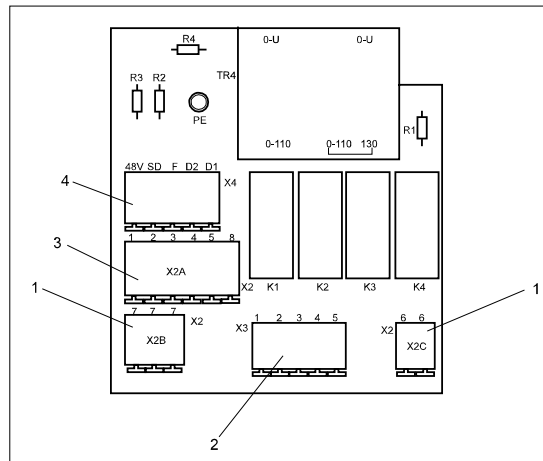


TDU Printed Circuit Board



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

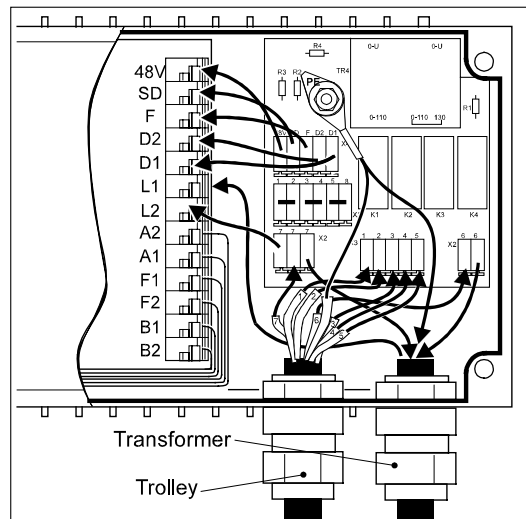
Voltage transformer card



1. Main supply connections (from hoist terminal X24)
2. Control voltage connection and control connections (from hoist terminal X24)
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.

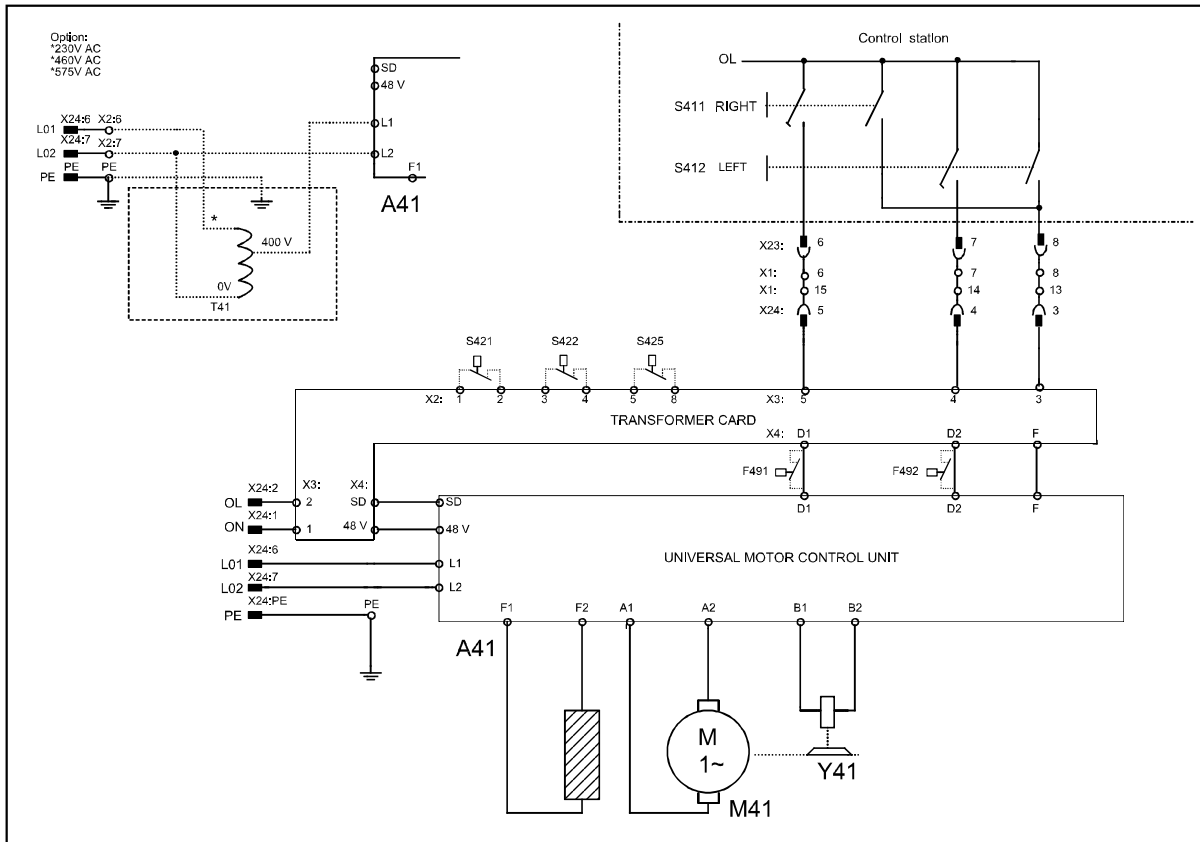
- Check that the electrical connections and mechanical assemblies are all correct.
- Check that the operating parameters are as required.
- Close the electrical box cover.
- Check that the movements of the trolley do not cause any danger.
- Turn on the power supply.
- Operate at minimum speed for 5 to 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

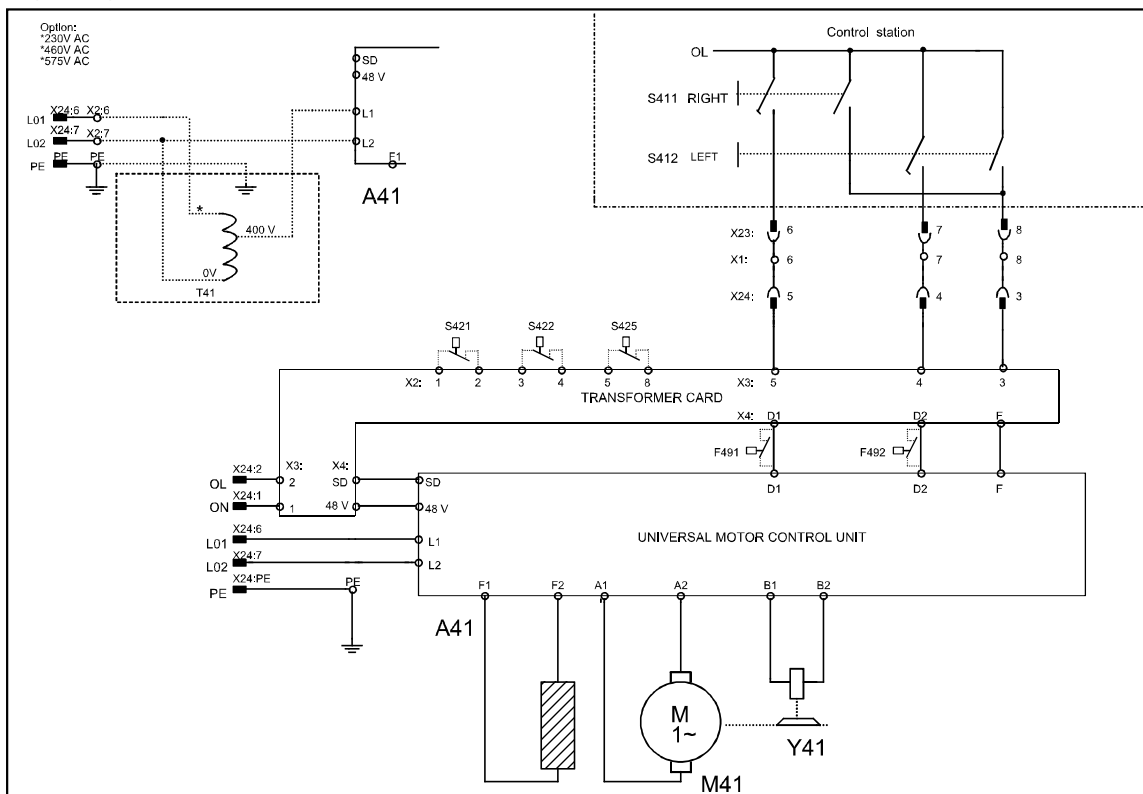
S 421	Right limit switch (option)
S 422	Left limit switch (option)
S 425	Selector switch (slow/fast speed) (option)
F 491-492	Thermal protection (option)
T41	Transformer 208VAC, 230VAC or 460/575VAC
L1, L2	Main power supply
SD, 48V	Control 48 voltage
F1, F2	Field magnet
A1, A2	Armature
B1, B2	Brake
D1, 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

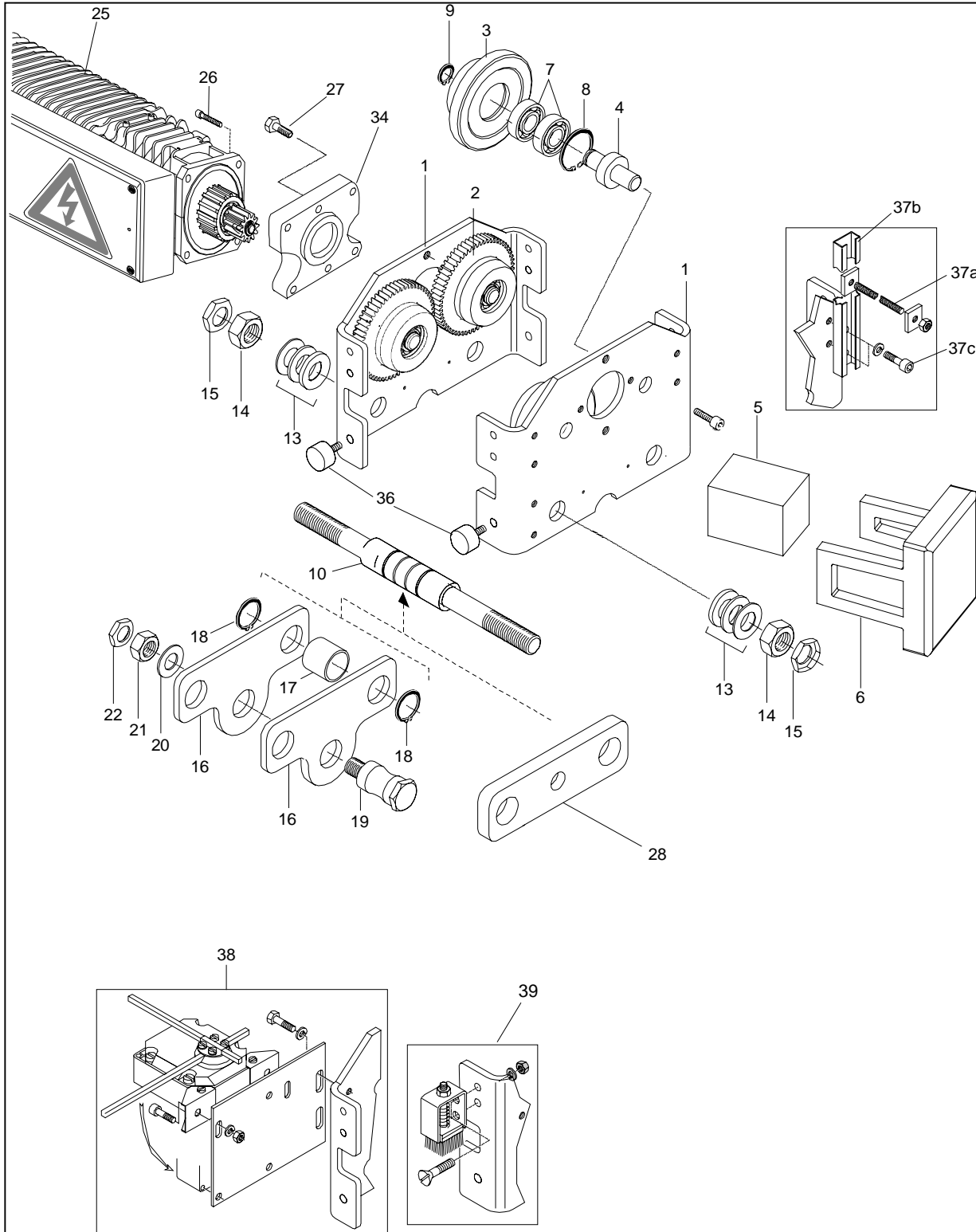


The control unit is damaged, replace it



Spare Parts

TDU Trolley



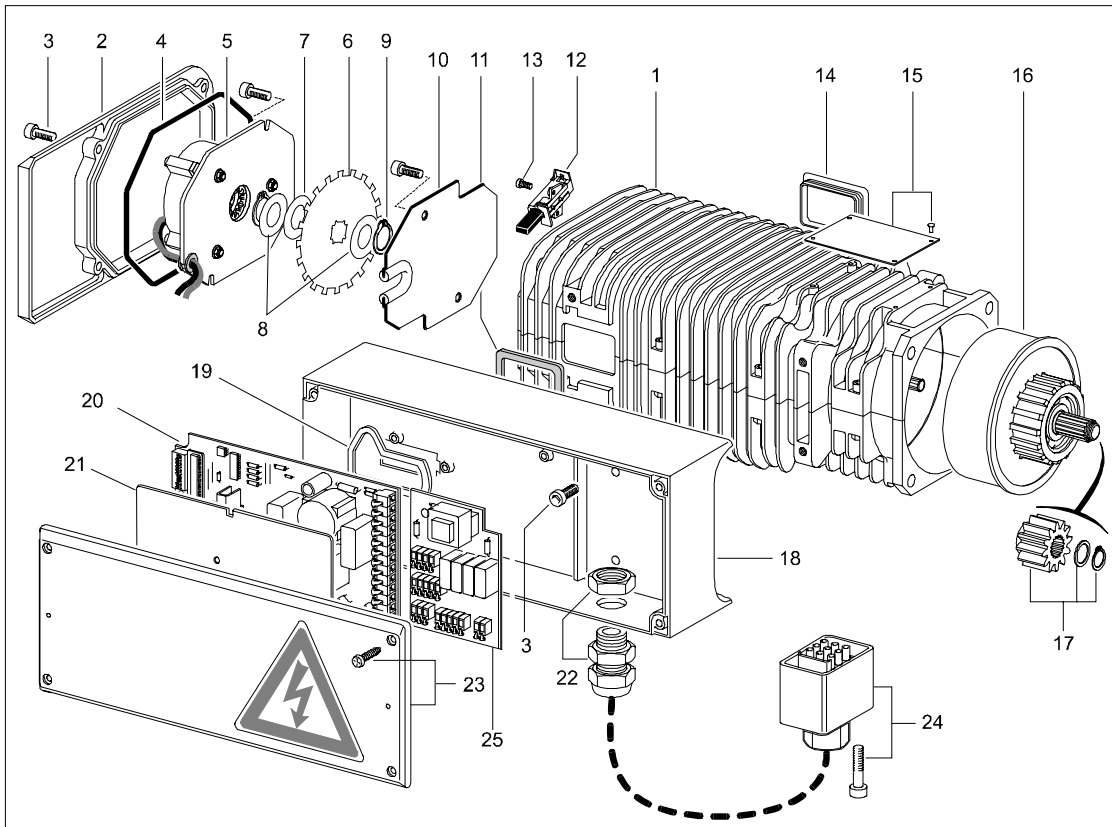


TDU Trolley

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



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