IGL10/IGL20 Gearless Machine

Complete Operation and Service Manual



IGL10/IGL20

TORINDRIVE International

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Limited Liability and Warranty

The manufacturer shall NOT be liable for any loss of profit, indirect, incidental or consequential damages to include, but not limited to, personal injury, labor cost, downtime, etc. The manufacturer warranty shall cover 12 months from the date of installation or 18 months from the date of shipment whatever comes first. The limited warranty does not apply to normal wear and tear items or any machines that have been subjected to misuse, misapplication, improper installation, improper modification/adjustment/repair or inadequate maintenance, etc.

Safety Precautions

Read this page BEFORE any work is performed on Elevator Equipment

Important!

The procedures contained in this manual are intended for the use by qualified elevator personnel only. In the interest of your personal safety and the safety of others, do NOT attempt ANY procedure that you are NOT qualified to perform

All procedures must be done in accordance with the applicable rules in the latest edition of the National Electrical Code the latest edition of ASME A17.1; and any governing local codes.

Terms in This Manual

CAUTION! CAUTION statements identify conditions that could result in Damage to the equipment or other property if improper procedures are followed

WARNING! WARNING statements identify conditions that could result in personal injury if improper procedures are followed.

General Safety

Specific warnings and cautions are found where they apply, and DO NOT appear in this summary

Personal protection equipment



Electrical Safety

All wiring must be in accordance with the National Electrical Code, and must be consistent with all state and local codes.

Use the Proper Fuse

To avoid fire hazards, use only a fuse of the correct type, voltage, and current rating as specified In the parts list for the product

Electrical Hazards

Electric shocks can cause personal injury or loss of life. Circuit breakers, switches and fuses may **NOT** disconnect all power to the equipment. Always refer to the wiring diagrams. Whether the AC supply is grounded or not, high voltage will be present at many points.

Printed Circuit Cards

When printed circuit cards are involved, do **NOT** remove connections or cards from the equipment while power is applied. This can damage equipment. Always store and ship printed circuit cards in separate static bags.

Mainline Disconnect

Unless otherwise suggested, always turn OFF, Lock and Tag out the mainline disconnect to remove power from the equipment

Test Equipment Safety

Always refer to manufacturers' instruction book for proper test equipment operation and adjustments. Meggering or buzzer type continuity testers can damage electronic components. Connection of devices such as voltmeters on certain low level analog circuits may degrade electronic system performance. Always use a voltmeter with a minimum impedance of 1M Ohm/Volt. A digital voltmeter is recommended

When Power Is On

Dangerous voltages exist at several points in some products. To avoid personal injury, do **NOT** touch exposed electrical connections or components while power is **ON**.

Product Specific Warnings

WARNING! The IGL20 Machine MUST be balanced during hoisting. See Hoisting Methods in the Installation section for proper lifting procedures.

WARNING! Hang the elevator car before removing ANY bolts. Failure to do so may result in severe injury and equipment damage.

Arrival of the Equipment

Receiving

Upon arrival of the machine, make a visual check for any external damage immediately upon their arrival on site. If any damage incurred in transit is found, make a notice of claim in the presence of the forwarder. If necessary, do not put these machines into operation.

Storing

During storage in a warehouse or on the elevator job site, precautions should be taken to protect the machine from dust, dirt, moisture, and temperature extremes.

Application

Overview

The IGL10 Machine is a synchronous permanent magnet gearless machine designed for elevators. Its configuration allows speeds up to 1.75 m/s Load is 2000 kg. (Maximum) and an elevator capacity up to 544 kg with 2 to 1 roping and single wrap arrangement

The IGL20 Machine is a synchronous permanent magnet gearless machine designed for elevators. Its configuration allows speeds up to 2 m/s Load is 3000 kg. (Maximum) and an elevator capacity up to1088 kg with 2 to 1 roping and single wrap arrangement.

Environmental Specifications

Operating ambient temperature: 0° to 50° Storage temperature: 0° to 60° Humidity: relative humidity of 10% to 95% noncondensing Altitude: Up to 1000m above sea level without de-rating.

Specifications

IGL10

Maximum Shaft Load: 2000 kg Maximum Speed: 1.75 m/s Maximum Capacity: 544 Kgs (50% Counterweight with 2 to 1 Roping and single wrap arrangement). Designed for 180 starts per hour at 50% elevator duty cycle Sheave Diameter: 325 mm Rope Size: 8 mm (4, 5 ropes) Maximum Power: 5.7 KW Motor Voltage: 380VAC (suitable for 400VAC inverter drives) 145VAC (suitable for 208-240VAC inverter drives) Brake Stroke: Upper: 0.27mm-0.28mm and Lower: 0.32mm- 0.33mm Pick Voltage/Current: 90VDC/1.2A Hold Voltage/Current: 45VDC/0.6A

IGL20

Maximum Shaft Load: 3000 kg Maximum Speed: 2 m/s Maximum Capacity: 1088 Kgs (50% Counterweight with 2 to 1 Roping and single wrap arrangement). Designed for 180 starts per hour at 50% elevator duty cycle Sheave Diameter: 340 mm / 400 mm Rope Size: 10 mm (4, 5 ropes) Maximum Power: 13.4 Motor Voltage: 380VAC (suitable for 400VAC inverter drives) 145VAC (suitable for 208-240VAC inverter drives) Brake Stroke: Upper: 0.27mm-0.28mm and Lower: 0.32mm- 0.33mm Pick Voltage/Current: 90VDC/1.2A Hold Voltage/Current: 45VDC/0.6A

Machine overview

The following is a list of major components of the IGL20 Machine. Along with a description of their functions, there is an overview of some of the critical adjustments and maintenance information. See Installation and Maintenance in detail.



IGL20 Machine Assembly

- 1. Sheave A grooved sheave is connected directly to the output shaft. The grooves provide the proper coefficient of traction between the sheave and the hoist ropes
- 2. **PMS Motor -** The part is used to provide the necessary torque and speed to move the elevator in operation.
- 3. Brake The electromechanical device is used to prevent the elevator from moving when the car is at rest.
- 4. **Encoder** This device is directly coupled to the main shaft of the hoisting motor. It is provided to give the absolute speed feedback of the hoist motor to the inverter drive system and to the elevator controller.
- 5. Brake Drum The smooth surfaced drum is connected to the main shaft. When the brake is energized, the brake is released from the brake drum.
- 6. Sheave cover Keep the rope out of touch after hang up the ropes.

Installation

Recommended Hoisting Methods



IGL20 Machines Installation methods

Motor Connection

Use the job wiring diagrams with the motor configuration information to connect the motor to the controller.

WARNING!

Do not connect motor directly to the three-phase power. It may damage the motor Inverter drive output reactor: it is strongly recommended that a reactor to be installed between the inverter and motor to filter out high transient peak voltages that may damage the motor windings

WARNING!

Before operating the machine, refer to the appropriate Product manual and verify that the drive parameters for the job are set correctly.

Motor Connection

Connect the motor cable (U, V, W, and grounding) to three phase AC reactor then to frequency inverter output terminal and check the short-circuiting between the windings and the ground before connection.



Brake Connection

The power cable of cable of normal brake is NBK+ (positive pole), NBK-(negative pole).



There are two micro switches installed in the brake that are used to feed back the action of the brake, one is for emergency brake and another is for normal brake (NNO, NCOM normally opened contact).

Absolute Encoder Connection

These machines are supplied with Heidenhain End at absolute encoder ERN1387 with sub D 15-pin connector and 7 meters in length. The sine/cosine incremental resolution is 2048 pulses per revolution. The absolute encoder is rear mounted for IGL20 machines



Encoder Connect Cable

Adjustments

Brake Stroke Adjustment

WARNING! If the brake lining wears out, the brake stroke will increase. If the brake stroke is ≥1mm (0.4"), the brake may be disabled.

Required Tools & Materials:

Open end wrench: 21mm Hex wrench: 8mm Feeler gauges: 0.27mm, 0.29mm, 0.32mm, 0.34mm, 0.35mm, 0.40mm.

Adjust Procedure Steps

- 1. Remove the elevator from service.
- 2. Check the gap "A" (brake stroke) at point 1 and 2, and check the gap "B" (brake stroke) at point 3 and 4, which are marked on the brake as well, with feeler gauge as the following picture shows. Max. Gap "A" after wear should be <0.35mm (0.014"), MAX. Gap "B" after wear should be <0.4mm (0.016"), otherwise the gap must be readjusted.</p>
- 3. Go to Step 4 only if the gap is bigger than the standard data. Otherwise the stroke is good
- 4. Loose the bolt M10 use hex wrench (8mm) about 1 turn
- 5. Then adjust the guide bushing slowly use open end wrench (21mm). If the gap is too big, turn the guide bushing (the pitch of guide bushing is 2mm) counter-clockwise to reduce it. Otherwise, turn the guide bushing clockwise to increase.
- 6. Then tighten the bolts M10 use hex wrench (8mm)
- 7. Test the clearance again to make sure the gap "A" is between 0.27~0.28mm, the gap "B" is between 0.32~0.33mm
- 8. Adjust the other point where the gap is out of standard use the same method.

CAUTION!

Adjusting the point 2 and 4, then adjust the point 1 and 3.





Brake Noise Adjustment

WARNING! Generally, brake noise adjustment has been performed at the factory and there is no need to be adjusted any more.

Required Tools & Materials:

Open End Wrench: 10mm Hex wrench 3 mm

Brake Noise Adjust

If the brake noise is too big, the brake absorb pad height should readjust. Generally, brake noise adjustment has been performed at the factory and there is no need to be adjusted any more.

- 1. Loosen the nut M6 use the open end wrench 10mm.
- 2. Tighten the bolt M6 60° with hex wrench 3mm to increase the height of noise absorb pad.
- 3. Use the same method to adjust another 3 bolts show in the following picture.
- 4. Retest the brake open noise until the noise level is acceptable. If not, repeat step 2.
- 5. Make sure the hold current (voltage) can hold the brake.
- 6. Fix the M6 bolts by the lock nut M6 with open end wrench 10mm.
- 7. Then apply red Loctite 271 between the bolt and luck nut for anti-vibration purpose



Brake Switch Adjustment

WARNING! Generally, the brake switch has been adjusted in the factory and does not need to be readjusted any more.

1. Use the open end wrench 8mm to loosen the lock nut M4 and the activation bolt



- 2. Apply one drop of Loctite 271 or equiv. on the bolt thread for anti-vibration purpose.
- 3. Adjust the bolt M4×50(GB/T 5783) with open end wrench (8mm) clockwise slowly until, you hear the switch action sound
- 4. Then adjust bolt M4 anticlockwise about 90° (0.17mm).
- 5. Use open end wrench 8mm to hold the bolt M4 \times 50(GB/T 5783) steady and then use another open end wrench 8mm to tighten the lock nut M4.



6. Use feeler gauges to make sure the new switch is functional by inserting feeler gauges between the bolt M4 \times 50(GB/T 5783) and the switch. The switch should not activate when inserting 0.10mm (0.004'') feeler gauge and it should activate when inserting 0.20mm (0.008'') feeler gauge. Otherwise, readjust the activation bolt until it works and then repeat step 5 above

Note: make sure the feel gauge is vertical when inserting to the gap between bolt and



1. Brake adjustment

After relocating the brake, the brake gap must be readjusted. Please refer to the "Brake Stroke Adjustment" procedure on page 8 of this manual.

Brake Assembly



No.	Torin Drive Part No.	Description
1	GTW8.2-2	Guide bushing
2	GTW8.2.1	Brake lining
3	GB/T 70.1	Bolt M10×110
4	V4NSY1UL-3373	Brake switch
5	GTW8.2-3	Hand shank
6	GTW8M2.1	FZD12M brake assembly

Maintenance

WARNING! Only qualified personnel are allowed to perform any maintenance work. The person who performs the maintenance work must be very careful because some work must be performed when the machine is running.

Brake Stroke Check

WARNING! Please pay attention to the value of brake stroke during the course of routine maintenance. If the brake lining wears out, the brake stroke will increase. If the brake stroke is ≥ 1 mm (0.4"), the brake may be disabled. Generally, the brake stroke has been adjusted in the factory and does not need to be adjusted in the field.

Suggest check cycle

Every 3 months after install in the first 6 months. Every 1 year afterwards

Benchmark Criteria

The brake stroke "A" should <0.35mm (0.014"), the brake stroke "B"<0.40mm (0.016").

Brake Lining Wear Check

WARNING! If the brake lining wears too much, the brake will be disabled

Suggest check cycle

Every 1 year

Benchmark Criteria

The brake lining wear out must be <2mm. Use beam calipers to check the distance "A" (eye able guide bushing) between the anchor disc and the machine frame at the side, it must >8mm. Generally, the distance "A" is about 10mm has been adjusted in the factory.



Replacement

WARNING! Only qualified personnel are allowed to perform the replacement work. The person who performs the replacement work must make sure that the machine power is off and that the elevator will not move unexpectedly

WARNING! Please refer to the troubleshooting procedure first and make sure that the component is actually bad before performing this replacement procedure

Encoder Replacement

Required Tools & Materials:

Encoder (ERN1387) Hex wrench (2mm, 4mm, and 8mm) Torque Wrench (Need to measure 9 in-lb and 44 in-lb) Socket Allen Wrench, 2mm and 4mm

1. Methods of Disassembly



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1 Remove the encoder end cover-bolt of encoder by inner hex wrench 4mm.



2. Loosen the bolt M2.5 by Inner hex wrench 2mm



3. Loosen the bolt M5 inside by hex wrench (4mm) 1~2 turns only.



4. Use the M10 bolt supplied with the encoder to push the encoder out of encoder shaft. Remove both the M10 and M5 bolts with the hex wrench (8mm). Remove the encoder



5. Remove the encoder

2. Methods of assembly

1. Remove end cover-bolt of the encoder by hex wrench (4mm).



2. Reconnect the encoder cable for the ERN1387 only.



3. Install the encoder to the encoder shaft .Use the bolt M5 to fix the encoder to the encoder shaft By hex wrench (4mm), Use 4mm sockets Allen and torque wrench to tighten the bolt to 44 in-lb

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- 4. Install the end cover, and then tighten the end cover-bolt. Use 4mm socket Allen and torque wrench to tighten the bolt to 44 in-lb.
- 5. Tighten the M2.5 with hex wrench (2mm) to 9 in-lbs.



6. . Power supply for the machine, and test the machine.

Brake Replacement

WARNING! The personnel who perform this replacement work must make sure that the machine power is off and the elevator will not move unexpectedly. Brakes are the safety devices! Only Qualified Personnel are allowed to perform any assembly, adjusting or maintenance work!

Required Tools & Materials

Open end wrench (21mm) Hex wrench (8mm) Torque wrench (need to measure 65ft-lb) Straight head screw driver Phillips head screw driver Feeler gauges Clean cotton fabric Loctite 243 Double end guide bolt M16×2×160

3. Methods of removing the brake

- 1. Disconnect the brake cable from emergency brake junction box.
- 2. Loosen two bolts M10×110 which are on the opposite angle with hex wrench (8mm).
- 3. Then install two double end guide bolt (M16×2×160) into the holes.
- 4. Loosen other 2 bolts $M10 \times 110$ evenly, move out the brake.



4. Methods of installing the brake

- 1. Clean the brake lining and the head face of the contact frame with cleaner.
- 2. Install the double end guide bolts (M16×2×160) into the opposite angle-hole of brake fame as show in The picture below
- 3. Tighten two bolts M10×110 with the proper quantities of Loctite 243 diagonally and evenly
- 4. Remove the double end guide bolts (M16×2×160), tighten another bolts M10×110 with the Proper quantities of Loctite 243 evenly
- 5. Re-connect the brake cable



5. Test brake

CAUTION!

Retest and confirm the new brake's brake torque before use the elevator.

Brake Switch Replacement

WARNING! Please refer to the troubleshooting procedure first and make sure that the switch is actually bad before performing this replacement procedure.

Required Tools & Materials:

Brake switch Scissors Sealant (Loctite 480 or equiv) Philips head screw driver Straight head screw driver Torque screw driver (Need to measure 1.8 in-lb) Open end wrench (8mm) Loctite 271 Cable ties Multimeter Feeler gauges

1. Methods of Disassembly

- 1. Loosen the bolts $M5 \times 20$ and the washers (4 pieces) in the brake terminal box by the Phillips head screw driver, and remove the terminal box cover.
- 2. Cut off the cable ties which use to fix the brake switch cable.
- 3. Remove the brake switch cable which is needed to be replaced from the brake terminal by straight hear screw driver and then move it out from the hole in the machine seat.
- 4. Loosen the screws M2×10(GB/T 69) with Philips head screw driver, then remove the broken switch.



2. Methods of assembly

1. Clean the brake switch installing surface.



2. Apply a thin layer of sealant (Loctite 480 or equiv.) on brake switch installing surface



3. Install the brake switch on the brake body by tighten the screws M2×10(GB/T 69) by Phillips head screw driver. Use torque screw driver to tighten the bolt to 1.8 in-lb, then apply Loctite 480 or equiv. between the screw heads and the switch body



4. Reconnect the new brake switch cable and fix it by cable ties.

Traction sheave replacement method

Remove the traction sheave

1. Configuration protective cover: With Inner hexagon spanner (6 mm) loosen pieces of 1 (bolt M8×16, 2 (flat washer 8) and 3 (spring washer 8), unload 4 (Protective cover).



- 2. Configuration rope rod: Stay with the wrench (24 mm) loose pieces of 1 (nut M16) and 2 (washers 16), unload 4 (swinging rod) reoccupy stay wrench (24 mm) loose pieces of 5 (nut M16), with inner hexagon spanner (8mm) to unload 3(bolt M16x70).
- 3. With Inner hexagon spanner (10 mm) loosen pieces of 1 (bolt M12 x 50) and 2 (spring washer).



4. In 1 (traction sheave) 4 - M12 remove threaded hole bolt in 2 (bolt M12 x 90), with the stay wrench (16 mm) diagonal gradually tighten bolts, until out 1 (Traction sheave) Traction sheave remove pin 16 x 75 (two).



Installation of traction sheave

1. Will lift traction units with lifting equipment, horizontal (stand upside down on the back, Mat 2 (block), pay attention to protect good traction machine other parts).Clean brake wheel and the traction sheave mating surface. And two diagonal screw hole in the brake wheel turned into pieces of 1 (stud M12x160).



2. Check and clean 3 (traction sheave), traction sheave with heating equipment heating (heating temperature to 80°) Traction sheaves lift with hoisting equipment, through the stud M12 x 160 hot set into the brake wheel, cooperate in place, attention must ensure that the traction sheave pin hole and pin hole location of brake wheel alignment. With 1 (bolt M12 x 50), along with 2 (washer) fixed; with Inner hexagon spanner (10 mm) tighten. Two studs M12 x 160, with Inner hexagon spanner (10 mm) will be the last two screws in bolts M12 x 50 and washers, tighten. After being traction sheave cooling, reconfirm by torque wrench screw torque for 50 to 60 Nm.



3. Will be 1 (pin 16 x 75) into the traction sheave and brake wheel corresponding to the pin hole, pay attention to the pin end should be higher than that of traction sheave end face 2 to 3 mm.



- 4. Will lift vertical traction machine with lifting equipment, electric gate, with a dial indicator detection: traction sheave groove surface method to beat 0.15 mm or less, at the same time require components: flexible rotor rotation, the bearing without a murmur, rotor and stator without interference.
- 5. Configuration protective cover: 4 (protective cover) fittings to stand face, with pieces of 1 (bolt M8×16, 2 (flat washer 8) and 3 (spring washer 8) is fixed, with inner hexagon spanner fastening (6 mm).



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6. Configuration rope rod: Will 5 (nut M16) screw in parts 3 (bolts M16 x 70), together into the base end corresponding to the bolt hole (screw into the depth of about 20 mm), stay with the wrench (24 mm) lock pieces of 5 (nut M16); Then 4 (rocker) and the bolts M16 x 70, with 1 (nut M16) together with 2 (Spring washer 16) fixed, stay wrench (24 mm) fastening.



7. Traction machine the machine electricity, the machine commissioning.



Bearing replacement

Remove the bearing 6213-2RS

- 1. Remove the encoder (reference IGL20 permanent magnet synchronous elevator traction machine spare parts to replace manual encoder replacement method).
- 2. Written in marker pen in 3 (transition) and rear cover attaches labels, with Inner hexagon spanner (4 mm) loosen the 1 (bolt M5×16) and 2 (spring washer 5), unload 3 (The transition set).



3. With Inner hexagon spanner (6 mm) to unload 1 (bolt M8×30) and 2 (spring washer).



4. In 1 (back cover) 2 - M8 remove threaded hole screw in parts 2 (bolt M8 x 45), with inner hexagon spanner (6 mm) diagonal gradually tighten the screws, until out pieces of 1 (back cover).



5. To unload 1 (back cover) and 2 (wave washer 120).





6. With bearing puller will be 1 (bearing 6213-2 - RS) drawn out from the main shaft bearing block.





Installation of the bearing 6213-2RS

1. Clean the spindle bearing retainer, will be 2 (bearing 6213-2 -RS) using heating equipment heating (heating temperature to 80°), the heat to the main shaft bearing, bearing damage, skewed, and cooperate with the spindle is in place, reoccupy 1 (Retaining ring 65) pliers will be retaining ring in the spindle bearing retainer, fixed bearing inner ring.



2. After being bearings cooled sufficiently, the traction machine seat screwed into the bolt hole 3 (stud M8x220).Will be 2 (wave washer 120), BME grease, coated with a moderate amount of the Great Wall into 1 (back cover), again on the back cover bearing hole with a moderate amount of 32 # machine oil, through the stud M8 x 220 on main shaft bearing end, stay back cover contain into the bearing, with a rubber hammer knock back cover, make its assembly in place.



3. With 1 (bolt M8×30) along with 2 (8) fixed back cover and base, with inner hexagon spanner fastening (6 mm).Two stud M8×220, with inner hexagon spanner (6 mm) for the last two pieces bolt M8×30 and washer 8 screw in ,tighten



4. Transition will be 3 (The transition set) mounted to the back cover face (note alignment remove tag), with 1 (bolt the M5×16) coated with TONSAN 1243 screw glue together with 2.



- **5.** Install encoder (see IGL20 permanent magnet synchronous elevator traction machine spare parts to replace manual encoder replacement method).
- 6. Traction machine the machine electricity, the machine commissioning.

Bearing 23024CA-2CS2 Change

Remove the bearing 23024CA-2CS2

- 1. Remove the protective cover or rope rod (see IGL20 permanent magnet synchronous elevator traction machine spare parts to replace manual traction sheave replacement method).
- 2. Remove the brake (see IGL20 permanent magnet synchronous elevator traction machine spare parts to replace manual brake adjustment method of replacement).
- 3. Remove the encoder (reference IGL20 permanent magnet synchronous elevator traction machine spare parts to replace manual encoder replacement method).
- 4. Remove the cover, back cover, wave washer 120 (reference IGL20 permanent magnet synchronous elevator traction machine spare parts to replace manual replacement bearing 6213-2RS method).
- 5. With Inner hexagon spanner (6 mm) to 2 (bolt $M8 \times 30$) and 3 (spring washer 8) to loosen, unload 1 (gland).



6. Body is installed to traction sheave side, with a 2 (bolt M12×50), with stay wrench (18 mm) fastening. Reoccupy stay wrench (36 mm) to 1 (bolt M24 x 200) twist into the body.



7. Stay wrench (36 mm) slowly tighten bolts M24x200, make the spindle component force, slow out pieces of brake wheel spindle components.



8. Unload the spindle component, stay wrench (36 mm) unload parts 2(bolts M24 x 200), reoccupy stay wrench (18 mm) release 1 (bolt M12 x 50, unload body.



9. With the circlip pliers to unload 1(Retaining ring120).



10. After a 1 (Stud M8×250) screw into the base side corresponding to the screw hole, then block set into the guide components, will lead to component, together with the top piece through the stud M8 x 250, pack to stand back face, with 3 (bolt M8×30) together with parts 2 (spring washer 8), inner hexagon spanner fastening. Two stud (M8×250), the last two screws with inner hexagon spanner M8×30 and washer screw in spring washer 8, tighten.



11. Will sling fittings to the traction sheave brake wheel side, with 2 (bolt M12 x 30) is fixed; with Inner hexagon spanner (10 mm) tighten. Use lifting equipment through 1 (ring M12).Will be 3 (bolts M16 x 150) screw into the guide components corresponding to M16 screw hole, stay wrench (24 mm) fastening



12. Stay with the wrench (24 mm) slowly and evenly tighten parts (bolts M16 x 150) 3, knocking out pieces of brake wheel.



13. Pieces of brake wheel, pay attention to the magnet steel magnetic force. Stay wrench (24 mm) unload 2 (bolt M16 x 150), with inner hexagon spanner (6 mm) loosen pieces of 1 (bolt M8×30) and 3 (spring washer 8), unload oriented components and top piece



14. With Inner hexagon spanner (6 mm) loosen pieces of 1 (bolt M8×30) and 3 (spring washer 8), unload 2 (outer gland), and then with the circlip pliers to unload 4 (retaining ring 180).



15. In 1 (bearing 23024CA – 2CS2) remove the pressing sleeve end loading, knock playing for unload bearings.



Installation of the bearing 23024CA-2CS2

1. With the circlip pliers to a 1(retaining ring 180) pack to stand bearing hole corresponding to the retaining ring groove.



2. Use lifting equipment traction units lift in horizontal (such as pad on the underside of the base block).Stand bearing hole with a moderate amount of 32 # machine oil, then 1 (bearing 23024CA-2CS2) on the base bearing Kong Duan, put pressure bearing block, diagonal percussion bearing press block machine to receive strength evenly in (bearing), for bearing 23024CA-2CS2 installed, remove the bearing press block.



3. Clean 3 (gland), will be outside gland to stand end face, with 1 (bolt M8×30) along with 2 (spring washer 8) fixed, with Inner hexagon spanner (6 mm) tighten (bolt should be tighten diagonally), with a torque wrench, torque for 15 to 20 Nm, dynamic bearing should be flexible rotation; Clean the stand inside the cavity. Use lifting equipment traction units flip vertical, remove the contour blocks.



4. M8 will be 1 (stud M8x250) screw-in frame back end corresponding to the screw hole, and then locate enters into the guide components, will lead to component together with the locating sleeve through the bolt M8 x 250, pack to stand back face, with 3 (bolt M8x 30) along with 2 (spring washer 8)fixed, with inner hexagon spanner fastening (6 mm).Unload two stud (M8x250), with inner hexagon spanner (6 mm) will be the last two bolts M8 x 30 and washer screw in 8, tighten.



5. Will be 1 (nut M16) screw in parts 2 (bolts M16x80), then bolts M16 x 80 diagonal screw-in guide components, make the locating sleeve bearing, pressure bearing 23024CA-2CS2 inner ring, lock the bolt M16 x 80 with a nut M16.



6. Clean brake wheel parts, hoist brake wheel with lifting equipment parts, pieces of brake wheel axis and the direction axis component level, through the guide components with the stator installation. Note: magnetic force to ensure that the brake wheel slowly and smoothly with the stator installation, so as to make it components and cooperate.



7. Will screw M24 through the guide components center hole to the traction sheave, to suit to screw M24, 1 (nut M24) fittings to screw M24.



8. Stay wrench (36 mm) tighten 1 (nut M24), make the top set of bearing, the brake wheel installed.



9. Stay with the wrench (36 mm) to unload 6 (nut M24), then remove top cover, screw M24.Stay wrench (24 mm) loosen the two (nut M16), unload 3 (bolts M16 x 80);With Inner hexagon spanner (6 mm) loosen the four (bolt M8x30) and 1 (spring washer), remove the guide components and positioning; With inner hexagon spanner finally (10 mm) loose pieces of 5 (bolt M12 x 30), a sling remove brake wheel



10. With the circlip pliers install 1 (retaining ring 120) in place.



11. Clean the spindle component and a spindle brake wheel gear, debarring, and in the cylindrical shaft (cooperate with brake wheel surface) with a moderate amount of 32 # machine oil, containing pieces into the brake wheel brake wheel spindle hole.



12. Will screw M12 twist into the end of the spindle M12 bolt hole, the plate through the screw M12 is installed to the brake wheel end face, reoccupy stay wrench (18 mm) to 1 (nut M12) screw in screw M12.



13. Stay wrench (18 mm) slow fasteners (nuts M12) 1, install the spindle components in place.



14. Stay wrench (18 mm) to unload 1 (nut M12), then remove plate and screw M12.



15. In 2 (bolt M8×30) corresponding to the screw holes with moderate TONSAN 1243 screw glue, will be 1 (gland) to the brake wheel end face, with a 2 (bolt M8×30) and 3 (spring washer 8) is fixed, with Inner hexagon spanner (6 mm) fastening, reconfirm by torque wrench, torque for 15 to 20 Nm.



- 16. To install wave washer 120, back cover, transition of (see IGL20 permanent magnet synchronous elevator traction machine spare parts to replace manual replacement bearing 6213-2RS method).
- 17. Install encoder (see IGL20 permanent magnet synchronous elevator traction machine spare parts to replace manual encoder replacement method).
- 18. Install brake (see IGL20 permanent magnet synchronous elevator traction machine spare parts to replace manual brake adjustment method of replacement).
- 19. Install protective cover or rope rod (see IGL20 permanent magnet synchronous elevator traction machine spare parts to replace manual traction sheave replacement method).
- 20. Traction machine the machine electricity, the machine commissioning.

Troubleshooting chart

WARNING! The proper maintenance of the gearless machines requires adequately trained qualified personnel and proper tools

Faults	Possible causes	Possible solutions	
	a. Incorrect inverter wiring	Verify the inverter wiring to make sure it is done correctly	
	b. Incorrect inverter parameters	Verify the inverter parameters	
Motor not	c. Incorrect encoder wiring	Verify the encoder wiring is correct.	
working	d. Loose encoder mounting	Tighten the encoder mounting screws	
	e. Bad encoder	Replace the encoder.	
	f. Bad brakes	Verify the brake operations	
	g. Bad motor contactor	Replace motor contactor	
	a. Brake friction noise	a. Verify brake control currents.b. Verify brake strokes.	
Abnormal	b. Bad grounding	Verify that earth ground is good.	
noise or	c. Bad inverter parameters	Make sure inverter parameters are correct	
vibration	d. Bad encoder feedbacks	Check grounding and shielding.	
	e. Bad bearing	Replace the machine or bearing	
	a. Bad grounding	Make sure that ground is solid.	
Electrical	b. Bad humidity level	Make sure the humidity is within the specs	
shocks	c. Broken cable insulation	Replace the cable.	
Brake	a. Incorrect noise absorber height	Perform brake opening noise procedure	
opening and closing noise	b. Incorrect brake stroke	Readjust the brake stroke to factory standard	
	a. Oil or grease on brake disk	Remove the oil and change the brake lining	
	b. Incorrect brake stroke	Readjust the brake stroke to factory standard	
Brake not	c. Brake lining wear out to much	Check the brake lining thickness and readjust the brake stroke or replace the brake	
working	d. Bad brake coils	Replace the brake assembly	
	e. Incorrect counterweight percentage	Verify counterweight percentage	
	f. Noise absorber height is too big	Reduce the absorber height	
	a. Bad wiring	Verify brake wiring	
Brake switch Not working	b. The position of brake switch not installed correctly	Readjust the brake switch position	
	c. Bad brake switch	Replace the switch	
	a. Elevator is overloaded	Verify elevator loading and duty cycle	
Motor is too hot	b. Incorrect counterweight percentage	Verify counterweight percentage	



Machine Assembly

No.	Torin Drive Part No.	Description
1	GTW8M.1.2	Stator winding
2	GTW8M.1-3	Sheave
3	GTW2.1-4	Outside cover
4	GB/T288	Bearing 23024CA-2CS2
5	GTW8M.1-2	Spindle
6	GTW8M.1-4	Cover
7	GB/T894.2	Thackeray washer 120
8	GB/T893.2	Thackeray washer 180
9	GTW8.1-4	Rear Cover
10	GB/T276	Bearing 6213-2RS
11	ECN413	Encoder
12	GTW8M.3	Ward off rope device
13	GTW8M.1	Brake

MACHINES DIMENSIONS IGL20/IGL10





IGL20/IGL10 MRL Remote manual brake release

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