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Monorail Trolley Hoist

Model YGK

Model YGK-E

Capacity 1.600 kg - 15.000 kg

Operating- and Maintenance Manual

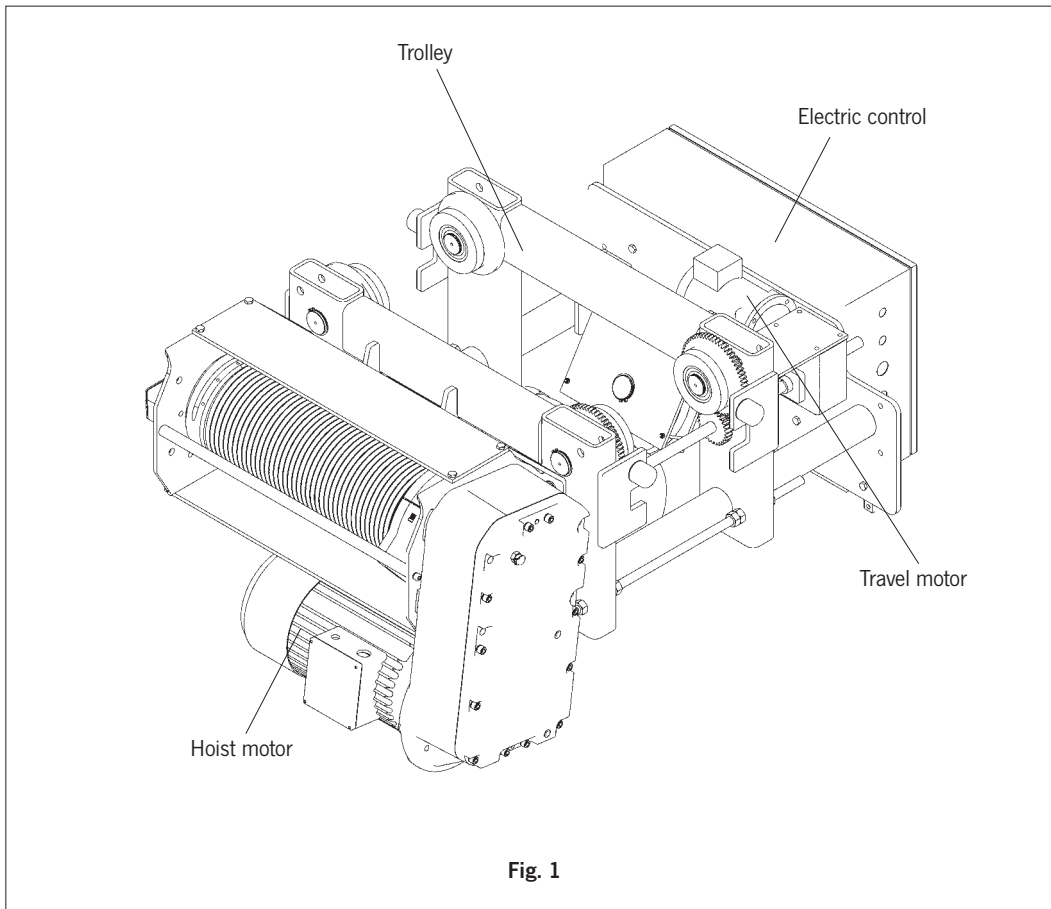


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Technical data model YGK/-E

Model	Capacity in kg/ reeving	FEM/ISO	Lifting height	Rope diameter	Lifting speed	Hoist motor	Hoist motor	Electric trolley travel speed m/min at 50 Hz	Electric trolley motor kW at 50 Hz	Beam flange width	Weight
			m	mm	m/min	kW	rpm			mm	kg
YGK/-E 1,6-6/12	1.600/2	2m/M5	12	6,4	6/1,5	2,2/0,56	3.000/750	12/4	0,20/0,06	219 - 356	283
YGK/-E 3,2-5/6	3.200/4	2m/M5	6	6,4	5/1,3	3,7/0,93	3.000/750	12/4	0,37/0,17	219 - 356	317
YGK/-E 3,2-5/12	3.200/4	2m/M5	12	6,4	5/1,3	3,7/0,93	3.000/750	12/4	0,37/0,17	219 - 356	363
YGK/-E 5-5/7	5.000/4	2m/M5	7,5	9	5/1,3	5,6/1,4	3.000/750	14/4,5	0,37/0,17	206 - 356	408
YGK/-E 5-5/12	5.000/4	2m/M5	12	9	5/1,3	5,6/1,4	3.000/750	14/4,5	0,37/0,17	206 - 356	476
YGK/-E 10-5/7	10.000/4	2m/M5	7,5	12	5/1,3	11/2,8	3.000/750	12/4	0,56/0,19	206 - 356	794
YGK/-E 10-5/12	10.000/4	2m/M5	12	12	5/1,3	11/2,8	3.000/750	12/4	0,56/0,19	206 - 356	862
YGK/-E 15-4/7	15.000/4	2m/M5	7,5	15	4,5/1,0	15/3,7	3.000/750	12/4	0,75/0,25	206 - 356	1.284
YGK/-E 15-4/12	15.000/4	2m/M5	12	15	4,5/1,0	15/3,7	3.000/750	12/4	0,75/0,25	206 - 356	1.415

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1. GENERAL INFORMATION

Attention: All users must read these operating instructions carefully prior to the initial operation. These instructions are intended to acquaint the user with the monorail trolley hoist / trolley and enable him to use it to the full extent of its intended capabilities.

The operating instructions contain important information on how to handle the monorail trolley hoist / trolley in a safe, correct and economic way. Acting in accordance with these instructions helps to avoid dangers, reduce repair costs and downtime and to increase the reliability and lifetime of the monorail trolley hoist / trolley.

Anyone involved in doing any of the following work with the monorail trolley hoist / trolley must read the operating instructions and act accordingly:

- operation, including preparation, trouble shooting and cleaning
- maintenance, inspection, repair
- transport

Apart from the operating instructions and the accident prevention act valid for the respective country and area where the monorail trolley hoist / trolley is used, also the commonly accepted regulations for safe and professional work must be adhered to.

The user is responsible for the proper and professional instruction of the operating personnel.

Every unit leaving the factory is furnished with a test certificate that shows the serial number of the monorail trolley hoist. This certificate has to be stored together with the test log book (see paragraph 6 and 8.2).

The continuous sound level at the place of work is equal to >70 dB. The measurements were taken at a distance of 1 m from the monorail trolley hoist at 9 positions in accordance with DIN 45635, precision class 2.

Yale electric wire rope hoists model YGK are delivered with an integral trolley. These hoists offer a low headroom with the rope drum and bottom block mounted at the trolley frame laterally to the beam. There are three basic frame sizes, each with two lifting heights as standard.

The integral trolley has a flange width range of 219 - 356mm with a maximum flange thickness of 41mm.

The hoist motor is 2-speed with a 4:1 ratio between high and low speed as standard. The motor driven trolley has two speeds available.

Basic construction

Yale electric hoists model YGK consist of a rugged steel frame, made from structural tubing, which houses the lifting drum and serves as the suspension means for the rated hoist load. An aluminium gearcase, attached to one end of the drum frame, houses a triple-reduction, helical gear train. Applying power to the gearcase is a 2-speed, AC hoisting motor with a 4:1 speed ratio. High strength wire rope and an enclosed bottom block serve as the load carrying means. Standard equipment includes a rope guide, a rotary geared limit switch to limit hook travel in both up and down directions as well as an overload limit switch.

2. CORRECT OPERATION

Maximum capacity

The Yale monorail trolley hoist series YGK-E has been designed to lift and lower loads up to the rated capacity. The lifting capacity indicated on the hoist / trolley is the maximum safe working load which must not be exceeded.

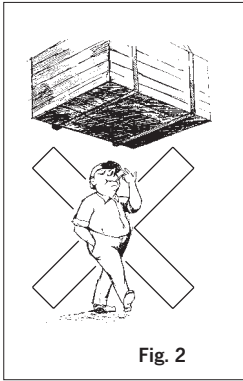


Fig. 2

Danger zones

- Do not lift or transport loads while personnel are in the danger zone.
- Do not allow personnel to pass under a suspended load (see Fig. 2).
- After lifting or tensioning, a load must not be left unattended for a longer period of time.
- Start moving the load only after it has been attached correctly and all personnel are clear of the danger zone.

Usage of the hoist

The operator must ensure that the monorail trolley hoist / trolley is attached in a manner that does not expose himself or other personnel to danger by the hoist, trolley, chain(s) or the load.

Temperature range

The units can be operated in ambient temperatures between -10°C und +40°C. Consult the manufacturer in case of extreme working conditions.

Note: At ambient temperatures below 0°C check the brake is not frozen.

Theoretical service life

The monorail trolley hoist is classified to group 2 m (ISO M5) corresponding to FEM 9.511. According to FEM 9.755 the operation method and running time have to be monitored and recorded in the test log book in order to determine the actually used portion of the theoretical service life. Basic information for the calculation of the used portion of the theoretical service life is given in the national UvV "Windeln, Hub- und Zugeräte" BGV D8. After expiry of the service life (S.W.P.), the unit has to be subject to general overhaul.

Basic principles for the calculation of the theoretical remaining service life are given in BGV D8. When the theoretical remaining service life has been reached, the monorail trolley hoist should be subjected to a general overhaul.

Regulations

The accident prevention act and/or safety regulations of the respective country for using manual and electric hoists must be strictly adhered to. In Germany these regulations are BGV D6 and BGV D8.

Maintenance / Repair

In order to ensure correct operation, not only the operating instructions, but also the conditions for inspection and maintenance must be complied with. If defects are found stop using the hoist / trolley immediately.

Attention: Before starting work on electrical components switch OFF the main current switch and secure it against unintentionally being switched back on.

3. INCORRECT OPERATION

- Do not exceed the rated capacity of the monorail trolley hoist / trolley.
- Do not lift or transport tight or jammed loads.
- Excessive inching operation by short and frequent actuation of the control switch should be avoided.
- Do not use the monorail trolley hoist / trolley for the transportation of people (Fig. 3).
- Welding on hook and wire rope is strictly forbidden. The wire rope must never be used as a ground connection during welding (Fig. 4).

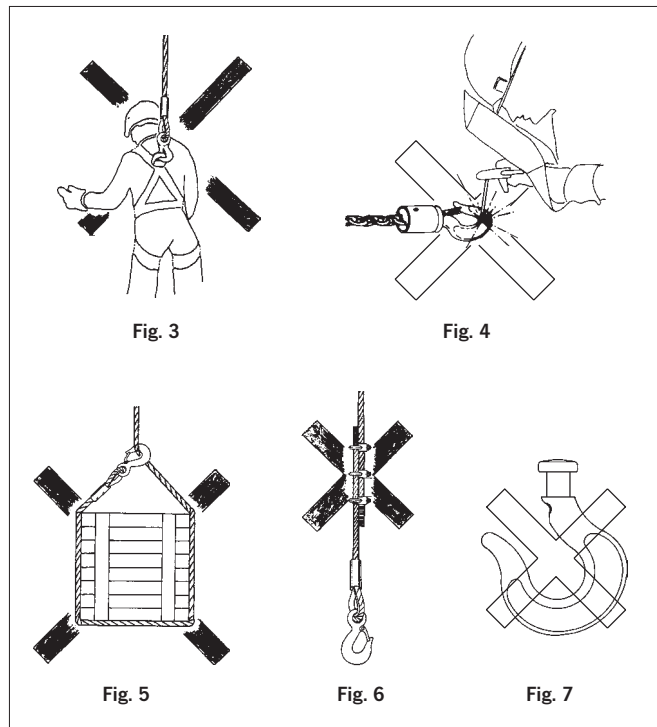


Fig. 3

Fig. 4

Fig. 5

Fig. 6

Fig. 7

- Side pull, i.e. lateral load on either housing or bottom block is not permitted.
- The wire rope must not be used for lashing purposes (Fig. 5).
- Do not knot or shorten the wire rope by using clamps, screws, screwdrivers or other devices (Fig. 6). Do not use the wire rope over sharp edges.
- Do not remove the safety latch from the load hook (Fig. 7).
- Do not use the geared end stop as an operational limit device.
- The unit must not be operated in potentially explosive atmospheres.
- The longitudinal downward slope of the runway must not exceed 3%.
- The adjustment of the trolley width must not be extended in order to e.g. obtain a greater radius curvature.
- Turning of loads under normal operating conditions is not allowed, as the bottom blocks of the hoists are not designed for this purpose. If turning of loads is required as standard, the bottom blocks have to be provided with swivel hooks supported by axial bearings. In case of queries consult the manufacturer.

4. ASSEMBLY

4.1 INSPECTION BEFORE ASSEMBLY

- Check for transport damage
- Check for completeness
- Check that the capacity indication on monorail trolley hoist and bottom block match
- Check that the adjustment of the trolley was in line with the requirements.

Attention: Assembling of the monorail trolley hoist may be carried out by experts only.

4.2 ASSEMBLING AT AN OPEN-END BEAM

If the trolley can be installed directly from the end of the supporting beam, adjust the spacing between the trolley wheel flanges to be 4,7 - 6,3 mm greater than the exact width of the beam flange (see Fig. 8).

- Before adjusting the width of the trolley frame, make sure to loosen the pinion set screws nearest the traverse drive on the keyed cross shaft and those on the traverse reducer. Do not lose the keys for the pinion and reducer during adjustment.

Attention: Loosen all electrical cable or conduit attached to the frame and alignment bars before adjusting trolley width. Ensure that the electrical cable is not stretched, pinched, twisted or otherwise damaged when adjusting trolley width.

- Also, the electrical conduit/cable must not be constrained when attempting to adjust the trolley sides, in or out. The trolley width is adjusted by loosening the jam nuts on the traverse drive side of the threaded rods at each end of the hoist. If necessary, lubricate the frame alignment bars with penetrating oil before attempting to adjust trolley width. The trolley side may then be pushed or driven into position by turning the adjusting nuts on the threaded rods. Adjust nuts on each side of the hoist simultaneously, to avoid binding. After adjusting the trolley to the proper width, tighten all adjusting nuts and setscrews, and re-secure the electrical conduit/cable. Verify that the geared wheels mesh properly with the traverse drive pinions. Using proper equipment, carefully lift the hoist and install on the end of the beam. Lubricate the wheel gear and pinion.

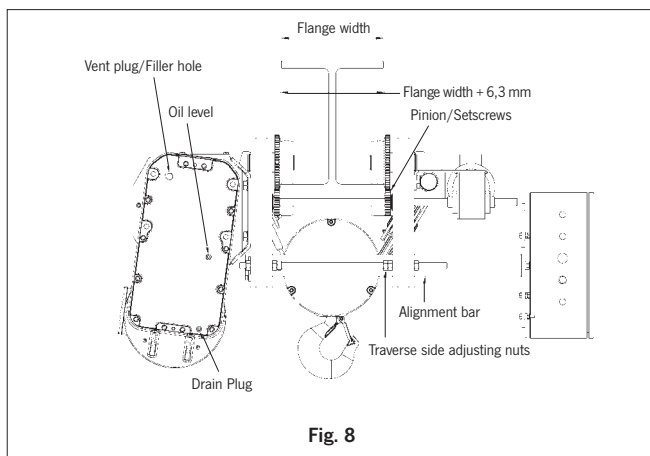


Fig. 8

4.3 ASSEMBLING AT AN CLOSE-END BEAM

- For trolleys which are to be mounted along the span of a beam not having open ends, the trolley must be adjusted in the same manner as described above to a width that allows clearance between the axle ends and the beam flange. Using proper lifting equipment, the trolley and hoist must then be lifted to the beam where it is to be installed.

Once in position, adjust the spacing between the trolley wheel flanges to be 4,7 - 6,3 mm greater than the exact width of the beam flange (see Fig. 8). After tightening all adjusting bolts, set screws, and all electrical conduit/cable clamps, carefully set the trolley on the beam. Lubricate the wheel gear and pinion.

4.4 ELECTRICAL CONNECTION

Attention!

Work at electrical installations may be carried out by electrical experts only. The local regulations have to be strictly observed, e.g. EN 60204-32 / VDE 0113.

Preparation

- Before beginning work on electrical components the mains current switch must be switched OFF and secured against unintentionally being switched back on.
- Before connecting the monorail trolley hoist ensure that the electrical data on the nameplate match the local supply specifications.
- The length of the pendant control cable is determined by working conditions. Attach the tension relief wire in a manner that the pendant control cable hangs load-free.
- Wiring and terminal connecting diagrams are included with the hoist.

Mains supply connection

1. The mains supply cable must be connected to the monorail trolley hoist before it is connected to the mains supply.
2. After removing the terminal box cover, connect the wiring as shown on the wiring diagram attached.
3. After replacing the terminal box cover, connect the other end of the supply cable to the disengaged mains switch and power supply system respectively.
4. Check the motor's direction of rotation.
 The wiring diagram included has been drawn for a normal, clockwise rotating installation. Should the user's mains supply not fulfil these requirements, e.g. the hoist lowers when lift is selected (or vice versa), switch the unit OFF immediately and exchange two of the three phase connections in the terminal box.

The wiring in the pendant control has to be in line with the attached wiring diagram. Modifications are not allowed.

5. FUNCTIONAL CHECK AFTER ASSEMBLY

Before the hoist is put into regular service, following additional inspections must be made:

- Are all screwed connections on hoist and trolley tight and are all locking devices in place and secure?
- Are the end stops on the trolley runway in place and secure?
- Is the rope drive correctly reeved?
- Check Oil Level (Fig. 8)

The gearcase has been filled with oil to the proper level. However, this should be rechecked before operating the hoist.

Check oil level by removing the plug indicated. When properly filled, oil should be level with the bottom of the tapped hole.



- Check Push Button Operation and Phasing
 - With „POWER OFF“, operate all the push buttons and determine that they do not bind or stick in any position.
 - Connect hoist to power source.
 - Operate „UP“ button briefly to determine direction of hook travel.
 - If hook raises when „UP“ button is depressed, phasing is correct.
 - If hook lowers when „UP“ button is depressed, hoist is „Reverse Phased.“ TURN AND LOCK POWER OFF and check the pushbutton wiring. If the pushbutton was wired properly, correct the problem by interchanging any two leads at power source connection. Do not change internal wiring of hoist.

Attention: On three phase hoists, it is possible to have „Reverse Phasing“ causing the block to lower when the „UP“ button is depressed. When this condition exists, the automatic limit switch is inoperative and hoist operation will be dangerous.

- Check Lower Block and Hoisting Cable:

Depress „DN“ push button and run lower block to its lowest position. No less than two wraps shall remain on the drum with the loaded hook in its lowest position. Also check to see that the lower block and rope do not twist excessively. If it does twist to the extent that two ropes rub against each other, disengage the swaged rope end from the frame anchor and twist the rope four or five turns in a direction opposite to that which the block turns. Reconnect rope to the frame anchor, holding firmly to eliminate rope twisting back to its original position. Operate hoist up and down a few times. If lower block still rotates excessively, repeat process until twisting is corrected.
- Lubricate Hoisting Cable:

For longer cable life, it is recommended that the cable be lubricated at time of installation by applying a heavy coating of lubricant.
- Check Limit Switch Operation:
 - A geared rotary type upper and lower limit switch is provided as standard equipment on YALE „Global King“ hoists. This switch is adjustable and although preset by the factory, it should be adjusted at time of installation to the desired high and low limits of lower block travel (see page 12).
 - An overcapacity limit switch is provided as standard equipment on YALE „Global King“ hoists. This switch is adjustable and although preset by the factory, it should be adjusted at the time of installation to the desired setting (see page 12).
- When first using the hoist and trolley, operate with lighter loads through full travel before applying maximum load.

Afterwards the complete crane runway has to be checked travelling with the trolley along the beam. Doing this especially the adjustment of the trolley has to be checked.

Attention: Under normal operating conditions, stop hoist travel before engaging limit switches. Limit switches are safety devices and should not be used as normal operating control.
- The function of the brake has to be checked during lowering and lifting operation.

6. COMMISSIONING

Inspection before initial operation

Each monorail trolley hoist / trolley must be inspected prior to initial operation by a competent person and any failures be removed. The inspection is visual and functional. These inspections have to assure that the hoist is safe and has not been damaged by incorrect transport or storage. Inspections should be made by a representative of the manufacturer or the supplier although the company can assign its own suitably trained personnel. Inspections are instigated by the user.

7. OPERATION

Installation, service, operation

Users delegated to install, service or independently operate the hoist must have had suitable training and be competent.

Users are to be specifically nominated by the company and must be familiar with all relevant safety regulations.

Inspection before starting work

Before starting work inspect the hoist / trolley, chains and all load bearing components every time for visual defects. Furthermore test the brake and make sure that the load and hoist / trolley are correctly attached by carrying out a short work cycle of lifting and lowering resp. travelling in both directions. Selection and calculation of the proper suspension point and beam construction are the responsibility of the user.

Inspection of wire rope

For safety reasons the wire rope must be changed if the amount of wire breaks is higher than a mandatory amount.

The breaks must be counted along a wire rope length of 6 resp. 30 times of the wire rope diameter (see Tab. 1).

The wire rope has to be changed if a complete cord is broken, there is waviness, links or other wear and damage.

Decisive for inspection and maintenance of wire ropes are DIN 15020-2 „Grundsätze für Seiltriebe, Überwachung und Gebrauch“ and ISO 4309 „Cranes - Wire ropes - Care, maintenance, installation, examination and discard“ as well as the regulation of the country of operation.

Seildurchmesser dia	6 d mm	Drahtbrüche broken wires max.	30 d mm	Drahtbrüche dia max.
6,4	38,4	6	192	13
9	54	6	270	13
12	72	6	360	13
15	90	8	450	16

Tab. 1

Inspection of load hook

Check the load hook for deformations, cracks, damages, abrasion and signs of corrosion.

Check adjustment of trolley width

Check that the clearance between the trolley wheel flange and the beam outer edge is equal on both sides and within the tolerances given. Enlarging the clearances, e.g. to enable the trolley to negotiate tighter curves, is forbidden.

Traversing the trolley

By operating the ▶ resp. ◀ button. The first stage of button depression activates the slow speed, further depression activates the fast speed. Use the slow speed for short periods only. Consider the braking distance of the trolley. Do not use the beam end stops as operational limit devices.

Attaching the load

Attach the load to the hoist using only approved and certified slings or lashing devices. Never use the load chain as sling chain. The load must always be seated in the saddle of the hook. Never attach the load to the tip of the hook. Do not remove the safety latch from the load hook.

Lifting / lowering the load

The load is lifted by depressing the ▲-button, it is lowered by depressing the ▼-button. The first stage of button depression activates the slow speed, further depression activates the faster speed. In order to raise the load, always use the lowest available lifting speed. The chain must be loaded at this speed and may not lie slack on the floor. The slow speed may only be used for short distances. The geared end stop may not be used as operational limit switch.

Emergency stop

All movement can be immediately halted by depressing the red, mushroom shaped button on the pendant control.

Attention: Operating the red emergency button does NOT automatically disconnect the mains supply to hoist or trolley.

To release the emergency stop, rotate the button in an clockwise direction.

End limit switch

This hoist is provided with an end limit switch for the lowest and highest hook position as standard. This limit switch is a safety device and may not be used as operational limiting device.

8. SERVICE

- Service and inspections may only be carried out by a competent person.
- The inspection must determine that all safety devices are present and fully operational and covers the condition of the hoist, lifting gear, accessories and supporting constructions.
- The service intervals and inspections noted are for normal working conditions. Adverse working conditions, e.g. heat or chemical environments, can dictate shorter periods.
- The monorail trolley hoist YGK/-E is classified to group 2m accordance to FEM 9.511 (equivalent ISO M5). This results in a theoretical service lifetime of 1600 operating hours under full load. This is equivalent to 10 years under normal operating conditions. After this period the hoist requires a general overhaul. Further information is contained in national BGV D8 resp. FEM 9.755.

Attention: Maintenance work requires subsequent function testing with nominal load.

8.1 DAILY CHECKS

1. Visually check the pendant control switch and cable for damage.
2. Function test of brake
3. Function test of end limit switch
4. Electric chain hoists with trolley:
 - Check that the trolley runway is free from obstructions
 - Check that the end stops on the trolley runway are fitted and secure.

Inspection and Maintenance	Initial checks			Periodical checks		
	during commissioning	after 50 operating hours	after 200 operating hours	daily	after 200 operating hours	annually
Lubricate wire rope	•	•	•		•	
Pendant control and support wire	•	•		•		
Check oil level	•	•			•	
Function test of brake	•			•		
Function test of end limit switch	•			•		
Function test of overload device	•					•
Electrical installation and power supply	•					•
Check for wear at rope drive		•	•		•	
Inspect rope fixation for cracks		•				•
Inspect suspension bracket and load hook for cracks and deformation		•				•
Check screwed connections for tightness		•				•
Inspect trolley components for cracks and deformation		•				•
Oil change			•			•
Inspect motor and transmission of monorail trolley hoist						•
Inspect motor and transmission of trolley						•
Inspect of overload device						•
Adjustment of brake						•
Lubricate geared trolley drive						•

8.2 REGULAR INSPECTIONS, SERVICE AND TESTING

According to prevailing national / international occupational safety and health regulations, hoisting equipment must be inspected at least annually by a competent person. Adverse working conditions may dictate shorter inspection periods.

The commissioning and inspection details can be noted on the test certificate delivered with the hoist or on page 14 of this manual.

Repairs may only be carried out by specialist workshops that use original Yale spare parts.

The inspection must determine that all safety devices are present and fully operational and cover the condition of the hoist, lifting gear, accessories and supporting constructions.

If required by the Occupational Health and Safety Organisation, the results of the adequate inspections and competent performance of repairs have to be substantiated. If the electric hoist (with capacity of 1 t and up) is installed in a carriage, or if the load is moved in one or several directions, the installation is considered as crane.

ATTENTION: Tests must - as far as possible - be carried out in an unloaded condition and the hoist / trolley currentless.

8.3 LUBRICATION

The lubrication services should be performed before initial operation of the hoist and at regular intervals at least every 6 months, coinciding with spring and fall seasons is recommended. The reason for this is that on hoists installed outside or in unheated areas a „cold test“ oil is required. Such (below freezing) climates makes seasonal changes necessary.

Changing gearcase oil (Fig. 9)

- Remove oil drain plug from bottom of gearcase and drain oil out.
Attention: Dispose of oil has to be in accordance with local environmental codes.
- Reinstall drain plug.
- Remove oil level plug from front of gearcase cover.
- Refill through filler hole to proper level (bottom of oil level plug hole).

YGK/-E 1,6-6/12	2,8 Litre
YGK/-E 3,2-5/6; YGK/-E 3,2-5/12	2,8 Litre
YGK/-E 5-5/7; YGK/-E 5-5/12	4,7 Litre
YGK/-E 10-5/7; YGK/-E 10-5/12	10 Litre
YGK/-E 15-4/7; YGK/-E 15-4/12	11,3 Litre

Tab. 2

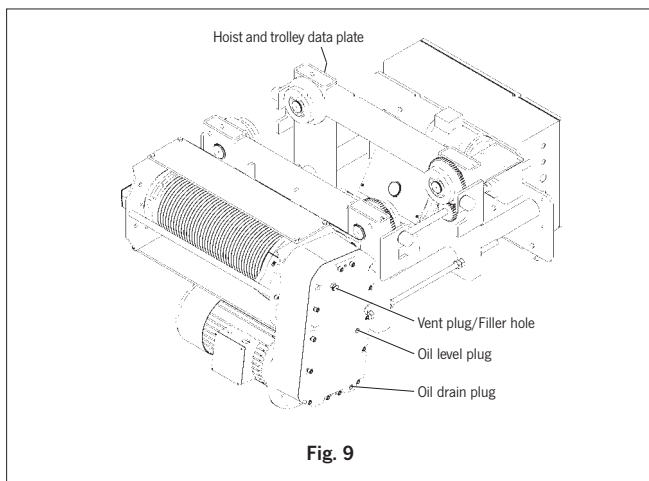


Fig. 9

Lubrication of hoisting cable

Hoists are shipped from the factory without an exterior coating of grease on hoisting cable. It is recommended that the cable be thoroughly coated at installation and kept well lubricated.

Lubrication of limit switch

Provide a light film of grease on bevel gear of rotary geared limit switch.

Lubrication of geared trolley wheels and pinions

At installation and periodically, apply grease to the traverse drive pinions and the gears of the trolley wheels.

Lubrication of rope guide

The rope guide is made of a molded selflubricated reinforced nylon material. It is lubricated prior to installation at the factory and requires only periodic inspection.

Periodically re-grease with by applying grease to the leading edge of the guide and rope drum.

Every 6 months, the rope guide should be removed, cleaned and inspected. When reassembled, the rope guide should be thoroughly greased with and the hoist run up and down to lubricate both the drum and the wire rope.

8.4 ROPE INSPECTION, MAINTENANCE AND REPLACEMENT

Wire Rope improperly handled or abused can create a SAFETY HAZARD. Decisive for inspection and maintenance of wire ropes are DIN 15020-2 „Grundsätze für Seiltriebe, Überwachung und Gebrauch“ and ISO 4309 „Cranes - Wire ropes - Care, maintenance, installation, examination and discard“ as well as the regulation of the country of operation.

Inspections should take place at the most active sections of the rope, which may be identifiable through visual inspection of rope color. Ropes will wear more quickly in areas that are more frequently in contact with the running sheaves and drum.

The wire rope has to be replaced

- if the number of visible broken wires exceeds a special amount (see Tab. 1, page 6)
- if a complete strand has broken
- if rope exhibits swelling, bruises, permanent bends, kinks, crushing, bird-caging or especially heavy wear
- if rope has suffered heat damage from any cause
- if rope shows internal or external corrosion and/or rust formation
- if rope shows wear from improper lubrication

Rope being idle for one month or more due to shutdown or inactivity it has to be inspected by a competent person before next use.

Special attention should be exercised when inspecting rope normally hidden during inspecting procedures.

Lubrication of wire rope

Keep rope well lubricated to help reduce internal friction and prevent corrosion. Lubricant should be applied as a part of the regular maintenance program. Special attention is required to lubricate sections of rope over equalizing sheaves and other hidden areas.

Avoid dragging ropes in dirt or around sharp objects that will scrape, nick, crush, or induce sharp bends in the rope.

Replacement of wire rope

Care must be taken to avoid twisting or kinking when uncoiling and handling during reeving.

Before replacing rope, check condition of grooves in sheaves and drums to determine if they are excessively worn.

When first using hoist after rope replacement, break in rope by operating under lighter loads to full travel before applying maximum load.

Rope reeving (Fig. 10)

It is imperative that rope reel or coil rotates as rope unwinds. If coil or reel does not rotate the wire will be twisted as it is uncoiled and kinking will result. A kinked rope may be damaged and unsafe for maximum service.

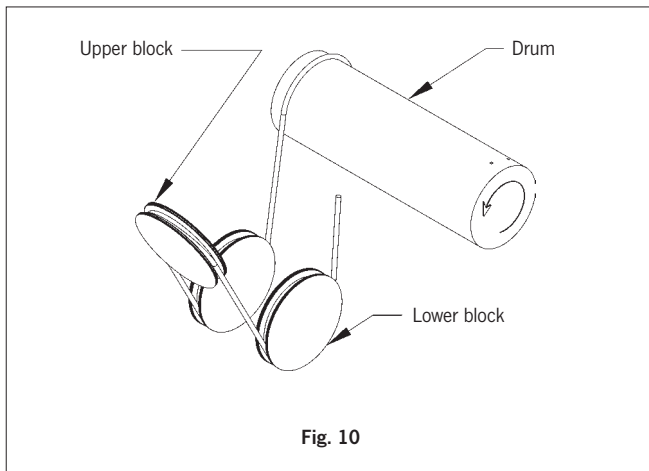


Fig. 10

Removing old rope

Attention: Be certain all personnel are clear of hoist as components, hardware, and wire rope are removed from hoist. Power supply has to be switched off.

- Lower the lower block to a scaffold approx. 2 m below hoist to relieve tension on wire rope. Lower block may be lowered to the floor if desired; however, to handle less weight and for ease of reeving, adequate scaffold below the hoist is recommended.
- Remove the cap screws and hex nuts that retain the lower block sheave covers. Remove covers.
- Remove retaining rings from lower block sheave pin.
- Slide out lower block sheaves and remove wire rope.
- Remove two rope retention bolts and nuts from upper block yoke.
- Remove one retaining ring on upper block to allow removal of upper block sheave pin.
- Securely grasp the upper block sheave before carefully sliding the sheave pin out. Note that two spacers will also be released as the pin is removed.
- Remove wire rope from sheave.
- Remove cotter pin from dead end anchor pin. Securely grasp the swaged wire rope before removing the pin.
- Remove rope guide
- Make certain all personnel are clear of hoist, switch on the power supply and operate hoist „DN“ to completely unwind all wire rope from drum. Stop hoist so all (3) rope clamps are accessible.
- Remove rope clamps and wire rope from drum.

Attention: Winding rope on rope drums with power can be hazardous. Keep hands safe distance from drum; wear gloves and use extreme care when winding rope.

Installing new rope

Attention: Use only factory-approved rope with swaged wire rope socket.

- Thread rope to drum from trolley frame side then secure with rope clamps as follows:
 - Make sure that the rope clamp is orientated such that the clamp grooves capture and fully seat the rope in the drum grooves.
 - With the rope lying in the bottom of the drum groove, begin by tightening the rope clamp at the tail end of the rope using a torque spanner (Tab. 3).
 - Applying tension to the rope and keeping it properly seated in the drum groove, install the remaining two clamps to the specified torque above.

Model	Torque
YGK/-E 1,6-6/12; YGK/-E 3,2-5/6/12	16 - 20 Nm
YGK/-E 5-5/7; YGK/-E 5-5/12	34 - 40 Nm
YGK/-E 10-5/7; YGK/-E 10-5/12	34 - 40 Nm
YGK/-E 15-4/7; YGK/-E 15-4/12	88 - 95 Nm

Tab. 3

- With all personnel clear of hoist turn on power.
- Operate hoist „UP“ guiding six wraps of new rope into drum grooves with gloved hand.
- Reinstall rope guide over rope in rope drum grooves. Continue lubricating as rope is spooled onto the drum until about 70 cm remain unwound.
- With outer lower block covers removed, thread the wire rope through the sheaves of the upper and lower block.
- Attach swaged rope end to the dead end anchor pin and fasten with either the new cotter pin provided with the rope (YGK/-E 3,2 - YGK/-E 10) or the retaining rings provided with the hoist (YGK/-E 1,6 + YGK/-E 15).
- Replace the lower block sheave covers.
- Lubricate rest of rope.

Checking for and removal of rope twisting

- Observe direction block tends to rotate.
- Lower the block to a low position and turn off (lock out) power.
- Remove swaged fitting from anchor pin and rotate rope several turns in a direction tending to correct block rotation.
- Turn on power; raise and lower the block several times to feed the correcting twist in the rope through the reeving.

This operation has to be repeated unless there is only a minimum twist of the bottom block visible.

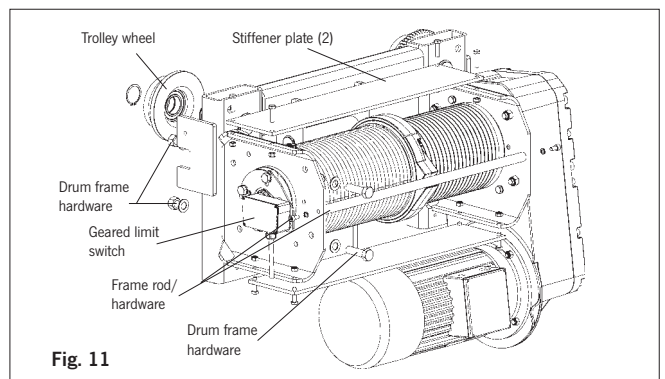


Fig. 11

Inspection of lower block

- Check lubrication of all parts.
Also lubricate the shank of the hook that passes through the crosshead.
- Check each sheave to insure rope groove is smooth and free from burrs, or other surface defects.
- Check each sheave for freedom of rotation; replace bearings if defective.
- Make certain that the spring pin holding the hook nut to the hook is securely in position.
- Check hook latch to determine that it is in good operating condition.
- Inspect the load hook for deformation, damage, surface cracks, wear and signs of corrosion as required but at least annually. Adverse working conditions may dictate shorter periods. Hooks that do not fulfill all requirements must be replaced immediately. Welding on hooks to compensate for wear or damage is not permissible. Hooks must be replaced when the mouth of the hook has opened more than 10% (Fig. 12) or the nominal value of other dimensions has decreased by 5% due to wear. Nominal dimensions and wear limits are shown in the following table.

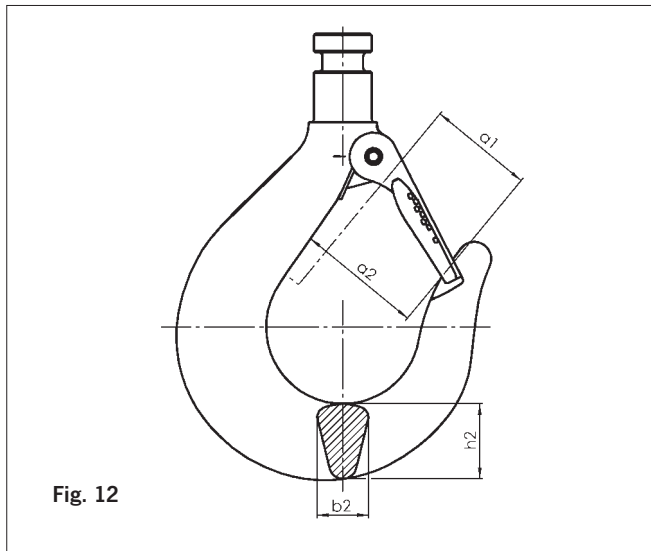


Fig. 12

Inspection	Dim.	YGK/-E 1,6	YGK/-E 3,2	YGK/-E 5,0	YGK/-E 10,0	YGK/-E 15,0
		nominal value [mm]	nominal value [mm]	nominal value [mm]	nominal value [mm]	nominal value [mm]
Hook saddle	b ₂	23,0	34,0	43,0	55,0	69,0
Hook saddle	h ₂	27,0	37,0	46,0	66,0	76,0
Hook opening	a ₂	25,0	36,0	43,0	56,0	77,0

Tab. 4

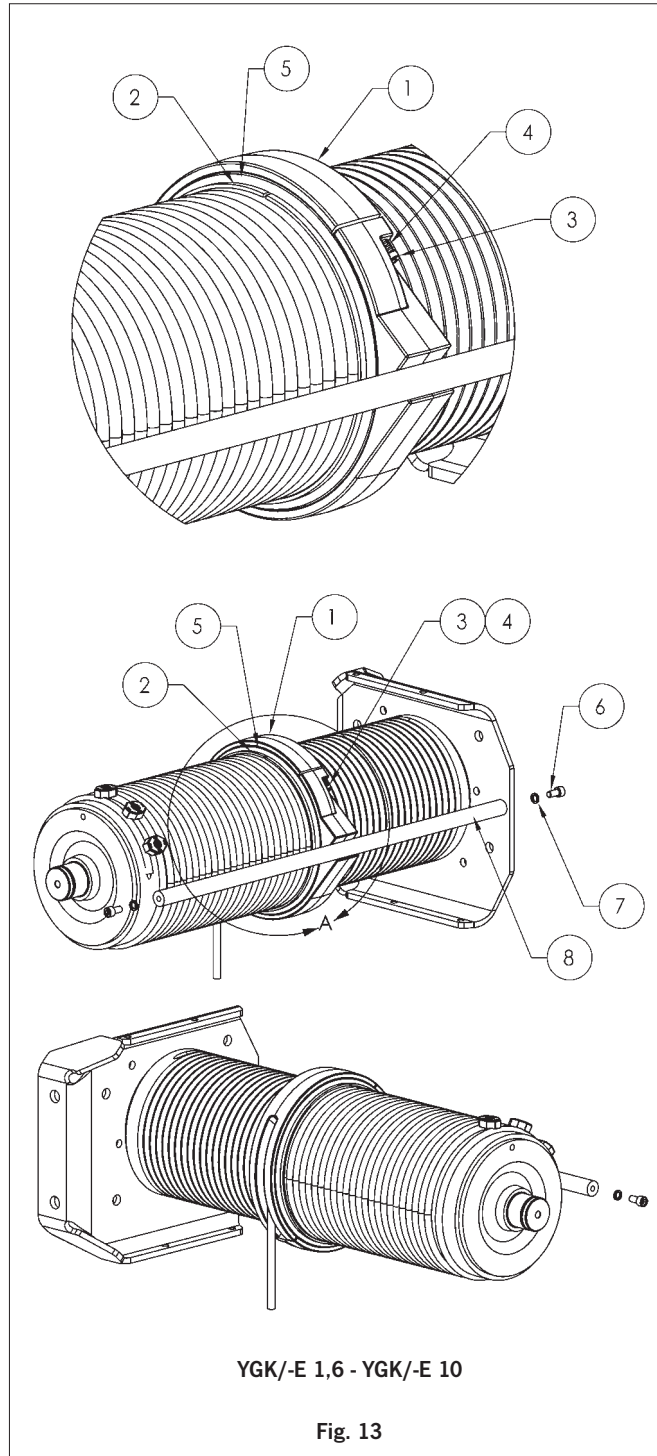
Inspection of upper block

- Check upper block sheaves for wear, damage and freedom of rotation. If sheaves do not rotate freely, disassemble block and inspect bearings. Replace worn or damaged bearings, washers, pins, or sheaves.
- Make certain that all sheaves, bearing and hanger pins are free of foreign material. Bearings without grease fittings are lubricated for the life of the bearing and require no further lubrication.
- Make certain that the rope retention bolts are not bent, loose or otherwise distorted; bolts must have close clearance to sheave flange to keep rope in sheave grooves.

Inspection of rope guide

The rope guide is intended to help prevent the rope from „back-winding“ and to hold the rope in the proper groove. Side pulling and excessive load swing will severely damage the rope guide and must be avoided.

Attention: Side pulling and excessive load swing will severely damage the rope and rope guide. Failure of these components may result in injury.



YGK/-E 1,6 - YGK/-E 10

Fig. 13

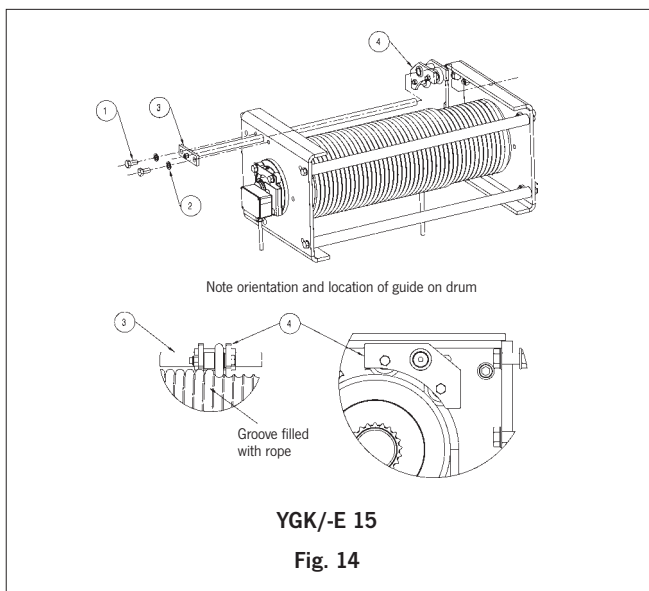
YGK/-E 1,6 - YGK/-E 10 (Fig. 13)

- Remove socket head cap screws and lock washers (Items 6 and 7).
- Remove drum frame rod (Item 8).

- Remove shoulder bolts (Item 3) and compression springs (Item 4). The two halves of the rope guide body (Item 1) can now be pulled off the drum separately. When reassembling be sure that the half with the rope slot is on the top half of the drum.
Attention: Once shoulder bolts are removed, the halves will separate and, if not properly supported, the halves could fall.
- Carefully unhook the rope tensioning spring (Item 5), which is under tension.
Attention: The rope tensioning spring is under considerable tension; use caution when unhooking to avoid injury.
- Remove the split plastic shroud (Item 2) from the drum. When reassembling the rope guide, be sure the plastic shroud (Item 2) fits snugly in the rope guide body groove.
- Thoroughly clean and inspect all components.
- Follow steps in reverse to reassemble. Be sure to regrease the rope guide after assembling.

YGK/-E 15 (Fig. 14)

- Remove hex head cap screws and lock washers (Items 1 and 2). Pull back on drum frame rod assembly (Item 3) until the free end pulls free of the gearcase end drum bracket.
- Slide the rope guide assembly (Item 4) off the end of the drum frame rod and remove from drum groove area. Note the required orientation of the rope guide assembly for re-installation.
- Thoroughly clean and inspect all components.
- Follow steps in reverse to re-install, paying attention to orientation and making sure to seat the assembly into the correct drum groove. Be sure to regrease the rope guide after assembling.



Inspection of rope drum and shaft

- To remove the rope drum, remove the rope guide and hoisting cable.
- Remove the geared limit switch or disconnect the wires so that the electrical cable will not inhibit removal of the drum.
- Remove the hoist from the beam, place it on the ground and provide adequate means to support the drum before removing the frame rod cap screw(s) and stiffener plate hardware at the outboard end drum frame.
- The hardware attaching the drum frame to the hoist and trolley frame may then be removed.

- Keeping the drum level, remove the drum from the splined output shaft at the gear case end.
- Inspect the gearcase output shaft and drum splines for wear.
- Before re-assembling, by reversing above instructions, make sure to apply a liberal amount of spline grease to both the output shaft and drum splines. The screws has to be assebled by using a torque spanner (see Tab. 5).

Model	Torque
YGK/-E 1,6-6/12; YGK/-E 3,2-5/6/12	81 - 108 Nm
YGK/-E 5-5/7; YGK/-E 5-5/12	230 Nm
YGK/-E 10-5/7; YGK/-E 10-5/12	440 Nm
YGK/-E 15-4/7; YGK/-E 15-4/12	440 Nm

Tab. 5

Inspection of trolleys

In particular check following parts:

- Side plate: For cracks or deformation in particular around the areas of screwed connections.
- Trolley wheels: Visually check for cracks and wear on trolley wheel flanges. Grease the transmission.
- Crossbars: In particular around threaded areas for cracks.
- Fasteners: Check nuts, screws and locking devices for tightness.

Inspection of gear hoist (Fig. 15)

The hoist gear case is a triple-reduction, splash lubricated, vertically split, cast aluminum case and cover. A helical gear train provides smooth and quiet hoisting operation. The gear shafts are supported with ball and roller bearings housed in the back of the case and in the cover. The input pinion is integrated onto the motor shaft. An oil seal housed in the gear case at the motor input seals the motor shaft as it passes into the gear case. Since the entire motor shaft is submerged in oil, anytime the motor is removed, the oil must be drained from the gear case. All pinions are integral with their shafts while the gears are keyed and pressed onto their shafts, with exception of the integral output shaft. The output shaft passes through an oil seal in the back of the gear case and drives the drum by means of a crowned spline. One end of the rope drum is supported on this output shaft.

- Inspection and disassembly
 - Lower hook block to the floor and relieve all load from ropes.
 - Make sure power to hoist is off and locked out.
- Attention:** Before disassembly, prevent rope drum from free spinning by wedging drum in place with a block of wood, and resting lower block on work surface so all weight is off rope drum. Rope may also be removed from hoist drum.
- Drain the oil from the gear case.
- At YGK/-E 5 and YGK/-E 10 check to make sure that the two (2) hex bolts securing the gearcase to the drum frame bracket are in place and tightened securely. These bolts will be supporting the gearcase after the cover is removed. On YGK/-E 15 the bolts supporting the gearcase are installed through tabs on the outside of the housing and do not pass through the cover. These bolts are not to be removed.
- Provide adequate means to support the gearcase cover. On YGK/-E 5 and YGK/-E 10 remove the four (4) socket head cap screws that protrude through the cover and gearcase. Remove the smaller socket head cap screws and lockwashers holding the cover to the gearcase.

Carefully draw the cover directly away from the gearcase, as damage to this surface will prevent the gasket from sealing properly. If needed, lightly tap on the top and bottom cover tabs to release. As the cover is removed, ensure that all gear and shaft assemblies remain in the case and are fully supported by the gearcase bearings.

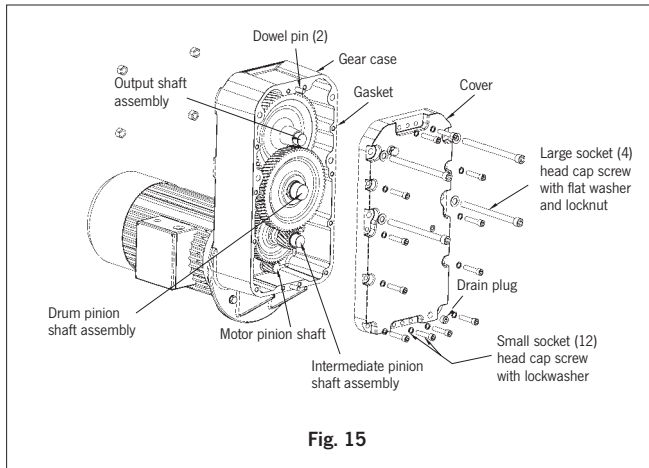


Fig. 15

Inspection of overload device (Fig. 16)

The overload protection system is adjusted to 110% of the rated capacity (the exact value is visible on a sticker close to the limites). If it was found at inspection that the monorail trolley hoist is lifting less or more than 110% than the rated capacity the overload protection system has to be adjusted.

Adjustment of overload device

Attention: The adjustment of the overload device may only be done by authorized, competent personnel.

Attention: During this job the hoist remains operable which can result in danger of injury by rotating parts.

- open locking nut.
- changing adjustment by turning the adjusting nut.

Attention: Only a small turn will show a big change of the adjustment.

Attention: The adjustment must not be higher than 110% of rated capacity.

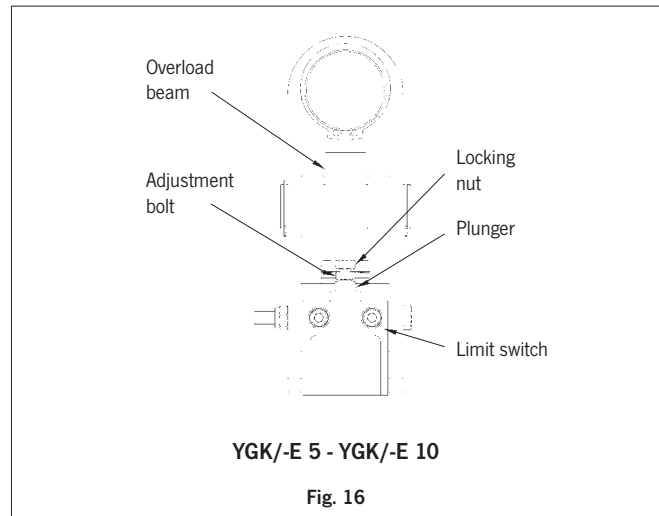
- secure adjusting nut by using the lock nut and secure the adjustment by using sealing wax.

NOTE: If the adjusting of the overload protection system was changed the changing must be documented in the test and inspection log book of the crane!

NOTE: For an overload inspection the contactor of the limit switch has to be jumpered.

(for systems without control box: black and black/white)

(for systems with control box: X 1.15 and X 1.16).



Inspection of end limit switch

If the function of end limit switch was tested in line with the description at page 6 but works not proper it has to be adjusted as follows:

Adjustment of end limit switch

- Disconnect hoist from power supply.
- Open cover of geared end limit switch.
- The position of upper and lower limit switches are indicated on the fibre insulator.
- Loosen the screws to permit guide plate to be moved out of engagement with the travelling nuts.
- Reconnect hoist to power supply.
- Run hook to the desired upper position, cautiously operating the hoist without a load. The bottom block may not touch the hoist neither fittings.
- **Attention:** A safety clearance of 10 cm has to be considered.
- Disconnect hoist from power supply.
- Moving one travelling nut toward the other increasing hook travel and away from the other decreases the travel. Now, turn the nut nearest the switch indicated as the "UPPER LIMIT SWITCH" until it just breaks the limit switch contacts. An audible click will be heard as the switch opens. Continue to rotate the nut toward the switch an additional one full tooth.
- Reposition the guide plate in the next slot and securely tighten screws.
- Reconnect hoist to power supply and check the stopping point of hook by first lowering the hook about 25 cm, then raise the hook by joggling cautiously until the upper limit switch stops upward motion. The stopping point of hook should be the desired upper position. If not, repeat the above instructions.
- Double check the setting by lowering the hook about 60 cm and then run the hook into the upper limit with ▲ (UP) control held depressed.

To adjust the lower position follows the instructions for the upper position.

Line connection YGK/-E

Cable trolley motor

Label	Color	Connection
CT1	black	1U
CT2	white	1V
CT3	red	1W
CT11	orange	2U
CT12	blue	2V
CT13	orange / black	2W
GRD	green	earth
40	white / black	thermal sensor
40B	red / black	thermal sensor

Cable hoist motor (1)

Label	Color	Connection
HT1	black	1U
HT2	white	1V
HT3	pink	1W
HT11	orange	2U
HT12	blue	2V
HT13	red / black	2W
GRD	green	earth

Cable hoist motor (2)

Label	Color	Connection
HB1	orange	brake
HB2	red	brake
OB	black	thermal sensor
OC	white	thermal sensor
GRD	green	earth

Cable limit switches hoist

Label	Color	Connection
1	black	limit switch lower
1H	orange	limit switch lower
O	white	limit switch raise
Ob	red	limit switch raise
GRD	green	earth

Cable overload protection

Label	Color	Connection
(no label)	black	limit switch overload (No)
(no label)	black / white	limit switch overload (No)
(no label)	blue	„free“ (NC)
(no label)	brown	„free“ (NC)
(no label)	green / yellow	earth



Yale Monorail Trolley Hoist YGK/-E



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Inspection Chart

Inspection before initial operation:

by:

Date of initial operation:

Regular Inspections

Date	Findings	Repair	Test	
			Date	by *

* competent person

EC DECLARATION OF CONFORMITY
in accordance with Machinery Directive 2006/42/EC (Appendix II A)

We,

Yale Industrial Products GmbH
D-42549 Velbert, Am Lindenkamp 31

hereby declare, that the design, construction and commercialized execution of the below mentioned machine complies with the essential health and safety requirements of the EC Machinery Directive. The validity of this declaration will cease in case of any modification or supplement not being agreed with us previously.

Furthermore, validity of this declaration will cease in case that the machine will not be operated correctly and in accordance with the operating instructions and/or not be inspected regularly.

Machine description:	Monorail Trolley Hoist YGK/-E Mod. YGK/-E 1,6-6/12; Mod. YGK/-E 3,2-5/6; YGK/-E 3,2-5/12; Mod. YGK/-E 5-5/7; Mod. YGK/-E 5-5/12; Mod. YGK/-E 10-5/7; Mod. YGK/-E 10-5/12; Mod. YGK/-E 15-4/7; Mod. YGK/-E 15-4/12 Capacity: 1.600 - 15.000 kg
Machine type:	Monorail Trolley Hoist
Serial number:	from manufacturing year 07/2009 Serial numbers for the individual capacities/models are registered in the production book with the remark CE-sign
Relevant EC Directives:	EC Machinery Directive 2006/42/EC Directive for electrical equipment 2006/95/EC ROHS directive 2002/95/EC WEEE directive 2002/96/EC EMC directive 2004/108/EC
Transposed harmonised standards in particular:	ISO 12100-1:2004 ISO 12100-2:2004 EN 349:2008 + A1 EN 818-1:1993 EN 818-7:2002 EN 14492-2:2008 EN 60204-32:1999 EN 61000-6-2:2005
Transposed (either complete or in extracts) national standards and technical specifications in particular:	FEM 9.511, FEM 9.671, FEM 9.681, FEM 9.682, FEM 9.755 DIN 15018-1:1984, DIN 15400:1990, DIN 15404-1:1989 BGR 500
Quality assurance:	DIN EN ISO 9001:2000

Date/Manufacturer's signature:

05.11.2009



Identification of the signee:

Dipl.-Ing. Andreas Oelmann
Manager Quality assurance

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-European Headquarters-

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