

Integrated Lightweight Signal

OPERATION AND MAINTENANCE MANUAL

Winch Trunnion Mounted Signal

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APPENDIX A – HAACON WINCH INSTRUCTIONS

Document Control

It is the reader’s responsibility to ensure they have the correct version of this document. If in doubt, please contact Unipart Dorman to verify the current issue status.

Issue Number	Dated	Reason
1	Sep 12	Initial Issue
2	Nov 12	Updated Winch Information
3	Mar 13	Updated Winch Information
4	Oct 13	Updated Module Replacement
5	Feb 19	Updated Signal Sighting Information

1 Introduction

The Unipart Dorman Integrated Lightweight Signal (iLS) is a versatile yet simple signalling solution for installation in a wide variety of applications. The signal is designed to interface with all standard modular route relay, geographical and solid state interlocking systems used in the UK. It is quickly installed onto standard foundations and the use of modular based construction with plug coupled electrical components reduces test and commissioning time to a minimum.

The key to the simplicity of the system is the small number of user defined elements. These are:

- The use of a simple hinged construction for the Trunnion base which has either one or two lockable electrical connection boxes.
- A post and signal head constructed from lightweight Glass Reinforced Plastic (GRP) to a height as defined by the customer.
- Customer defined signal aspect configurations which can include a 1, 2, 3 or 4 aspect Colour Light Signal; Position Light Junction Indicators; Position Light Signals and Standard/Miniature Alphanumeric Route Indicators. Standalone Banner Repeater or Preliminary Route Indicators are also available

In addition to the standard Current Proved versions, Voltage Free Contact Proving is available and signals can be specified where the infrastructure is compatible.

All aspects are capable of being flashed under control of the interlocking.

It is installed onto the Base and then the signal is raised or lowered using a special to type winch kit which consists of a hand operated winch attached to a winch frame, an under frame and a tie rod. There is a separate Installation Winch Technical Information Pack which should be read in conjunction with this Manual and gives in depth detail of the winch equipment. The winch manufacturer's operation guide can be found in Appendix A to this document and also at:

http://www.haacon.de/media/betriebsanleitungen/094297_b_gb_hseilw_s.pdf

2 Compliance Matrices

The following tables show the Specifications and/or Regulations which the signal and the winch are compliant with.

2.1 Signal

Specification	Title
Railway Group Standard	GK/RT0057 (Lineside Signals, Indicators and Layout of Signals)
Network Rail Standards	NR/L2/SIG 10062 (Requirement Specification for the Performance of Long Range Colour Light Signals)
	NR/L2/SIG 10110 (Requirement Specification for the Performance of Position Light Signals)
	BR1651 (Specification for Standard and Miniature Alphanumeric Route Indicators)
	BRS – SE 152 (Specification for Junction Route Indicators)
Network Rail Approval Certificate Numbers	PA05/04240 PA05/05571

2.2 Winch

Specification	Title
BS EN 13977:2011	Railway applications — Track — Safety requirements for portable machines and trolleys for construction and maintenance
NR/LRMVP/0200/P006 Issue 2 March 2012	Safe Use of Plant for Infrastructure Work
RIS- 1700-PLT Issue 2	Rail Industry Standard for Safe Use of Plant for Infrastructure Work
RIS- 1701-PLT Issue 2	Rail Industry Standard for Portable and Transportable Plant Used for Infrastructure Work
ISO 9001: 2015	Certificate of Registration FM14371 (compliance with the relevant standards for implementation of a Quality Management System)
LOLER	The Lifting Operations and Lifting Equipment Regulations (LOLER) 1998
PUWER	Provision and Use of Work Equipment Regulations (PUWER) 1998.

3 Specifications

For all elements:

Nominal Voltage	110Vac
Operating Voltage	Max 121Vac, Min 88Vac
Operating Temperature Range	-25°C to +40°C
Flashing Aspects	Flashing controlled by the Interlocking

Current Proving Variant

(Main signal, Position Light Shunting Signal, Standard /Miniature Alphanumeric Route Indicators).

Nominal Operating Current	300 mA @ 110Vac
Relay Based Interlocking	BR941A
Solid State Interlocking (SSI)	Current Path 1 or 4

Position Light Junction Indicator

Nominal Operating Current	1100 mA @ 110Vac
Relay Based Interlocking	BR942A
Solid State Interlocking (SSI)	Current Path 3

110V Low Power Consumption (5 Watt CLS) Variant with Voltage Free Contacts

(Main signal, Position Light Shunting Signal, Standard /Miniature Alphanumeric Route Indicators).

Nominal Operating Current	45 mA @ 110Vac
Relay Based Interlocking	BR941A
Solid State Interlocking (SSI)	Current Path 1 or 4

Position Light Junction Indicator

Nominal Operating Current	1100 mA @ 110Vac
Relay Based Interlocking	BR942A
Solid State Interlocking (SSI)	Current Path 3

Light Output Colour Classification

Red	BS1376 Class C (Restricted)
Yellow	BS1376 Class B
Green	BS1376 Class C
Lunar White	BS1376 Class C

Signal Performance Categories

Colour Light Signal	Long Range 800m +/- 3° Medium Range Wide 400m +/- 10° Medium Range Narrow 400m +/- 3°
Position Light Junction Indicator	Long Range 800m +/- 3°
Position Light Signal	250m
SARI/Banner/PRI	250m
MARI	65m

4 Storage

Trunnion Base

The Trunnion is supplied on a pallet and may be stored in the open air. It is recommended for ease of mechanical handling that the Trunnion is retained on the transport pallet. The fasteners used to secure the unit to the pallet should not be used as mounting hardware during installation.

It should be noted that the Trunnion weighs typically 50kg and if it is to be moved by anything other than mechanical means, then the appropriate risk assessment should be undertaken by the user prior to manual handling. A purpose designed trolley is available from Unipart Dorman to assist with the movement of the Trunnion when dismantled from the pallet.

Post / Head

This is supplied complete on a large pallet with protective packaging which should not be removed prior to delivery to site. (All packaging materials should be disposed of in accordance with local regulations).

The post and integrated head are weatherproof and therefore may be stored outdoors. It is recommended that the post is stored with the signal elements facing upwards to reduce the risk of damage to the signal aspects.

Winch

Once the winch kit is supplied it should be stored under cover or indoors wherever possible. The Winch Certificate and any other supplied documentation must be kept dry and readily available for use.

To maintain the correct rope lay tension on a stored winch's drum, the hook should be attached to the tie rod attachment pin on the frame as shown.



(Pin retaining lanyards removed for clarity)

5 Installation

It is assumed that the foundation for the particular signal has been installed and has been accepted by the person responsible for structures prior to commencement of the installation.

There shall be a minimum exposed thread length of 200mm available on all four M24 mounting studs.

5.1 Safety

Before commencing assembly, any local safety requirements affecting the continued safe working environment of the signalling installation and/or the working railway, either directly or indirectly should be carried out. It is the user's responsibility to ensure all necessary risk assessments, permissions to work and preparatory safety activities are correctly completed and adhered to throughout the installation and subsequent life of the signal.

The all up weight of both the Trunnion and the signal/post assembly are clearly marked and installers should ensure that they have sufficient measures in place to ensure a safe lift

All activity on the iLS, both mechanical and electrical, must only be carried out by staff deemed competent in these fields by their employer. It is the user's sole responsibility to ensure that the iLS is installed and/or maintained by certificated and competent staff.

Activities identified as needing extra care are highlighted using the Caution Symbol



ACTIVITIES WHICH ARE OR HAVE THE POTENTIAL TO BE HAZARDOUS TO PERSONNEL AND/OR EQUIPMENT ARE HIGHLIGHTED WITH THE WARNING SYMBOL

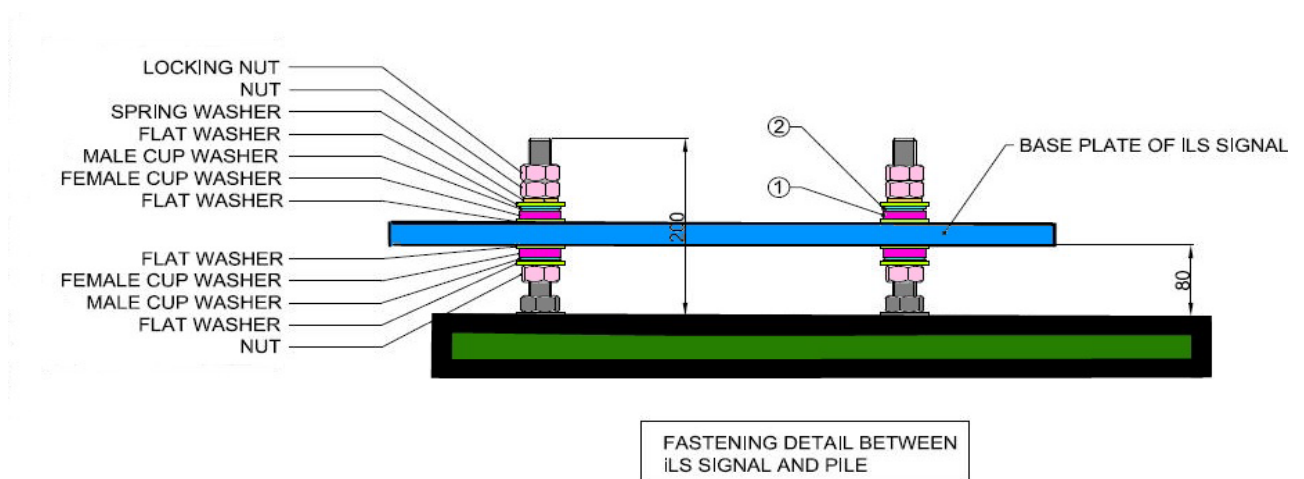


5.2 Tooling

With the exception of the winch and sighting scope the only tools required are simple hand tools such as Torque Wrenches and 36mm Sockets/Spanners. A spirit level is required to prove that the foundation is level prior to any installation activity.

5.3 Pre Installation Checks

Prior to mounting the Trunnion a check shall be made with a spirit level to ensure that the foundation and therefore the top of all four mounting studs are level. The Trunnion is installed onto the four M24 mounting studs which should be clean, free of damage and lubricated, they should also have a minimum of 200mm threaded portion available above the foundation top surface. Mounting nuts and washers shall then be fitted strictly in the sequence shown below; ensuring that the distance between the bottom of the Trunnion base (blue) to the foundation top surface (green) is not less than 80mm.



The only mounting hardware supplied by Unipart Dorman is the M24 spherical cup washer set as detailed in the table shown in the diagram above. All other nuts and washers etc should be procured through normal channels.



The 80mm gap between the top of the foundation and the Trunnion base plate is essential to give the necessary clearance for the winching fixture.

The signal and post should be checked for damage and any remaining transit packing materials should be removed and correctly disposed of. The Trunnion bore is to be free of debris and any other obstruction and the Post Clamp should be loosened to enable the post to be inserted.

If the signal is not to be commissioned immediately, the out of use mask complete with white "X" is to be refitted prior to erection of the post.

5.3.1 Torque Loadings

	Nm	Lbf/Ft
M24 Adjusting Nuts	195	143
M24 Trunnion moving plate Nuts	195	143
T/Box Padlock Lever	**Hand tight Only**	-
Scope Fitment Screws	**Finger tight Only**	-
Trunnion Collar	24	17.7

6 Installation Method

6.1 Safety

Following a positive local risk assessment, it is possible to install and erect the lighter signals in the iLS range in line with good manual handling practices. Unipart Dorman recommends that the winch system is used so as to seek to minimise the risk of personal injury or physical damage to the signal.

Before commencing installation, any local safety requirements affecting the continued safe working environment of the signalling installation and/or the working railway - either directly or indirectly must be carried out. It is the user's responsibility to ensure all necessary risk assessments, permissions to work and preparatory safety activities are correctly completed, recorded as required and adhered to throughout the installation and subsequent life of the signal.

The all up weight of both the Trunnion and the signal/post assembly are clearly marked and installers should ensure that they have sufficient measures in place to ensure a safe lift.

The winching operation must only be undertaken after first setting a safety exclusion zone which only the winch operator enters. The zone should be overseen by a lookout positioned in a place of safety. An assistant may enter the exclusion zone during the winching operation to help with the setting of Trunnion fasteners etc , but this person must only take instructions from the winch operator and spend the minimum amount of time in the exclusion zone possible.

All activity on the iLS and associated Winch Kit must only be carried out by staff deemed competent in their fields by their employer. It is the user's sole responsibility to ensure that the signal and/or winch kit is operated and/or maintained by certificated and competent staff.

Unipart Dorman strongly recommends the use of second nuts to lock the securing nuts on both the Trunnion mounting and movable section securing studs. (Photographs of the installation in this document may not show them fitted for clarity purposes)



BEFORE THE COMMENCEMENT OF ANY ACTIVITY ARRANGEMENTS SHALL BE APPLIED TO PROTECT THE WORKING RAILWAY.



Winching Safety

IF ANY DOUBT EXISTS ON THE SERVICEABILITY OR OPERATION OF THE WINCH YOU SHOULD CONTACT UNIPART DORMAN IMMEDIATELY

6.2 Tooling

The winch kit can be assembled and dismantled without the use of hand tools. It is recommended that adequate PPE is provided for all personnel engaged in the winching operation. The tools required for installing the signal are detailed in section 5.2.

6.3 Winch Kit Pre Use Checks

Prior to leaving the depot it is strongly recommended that the following checks are carried out on the Winch Kit:

- The Winch Test Certificate is valid*
- There is no sign of damage to any of the equipment.
- The winch and frame assembly should be free from corrosion. Particular attention should be paid to the winch internal parts during this check.
- The winch rope is in good condition and shows no signs of kinks, fraying, wear, splaying or flattening. It should be free from dirt/corrosion.

- A copy of these instructions is readily available and anyone required to operate the winch is to be fully conversant with them and deemed sufficiently competent and where necessary properly certified, to undertake the task.
- The Winch Kit is complete and the two locking pins and R Clips are securely fastened to the frames with the lanyards intact.
- The handle is securely fixed to the winch and the grasp section is free to rotate.
- The snap clip on the hook is functioning correctly
- The Tie Rod ends are 'in safety' determined by the visual check described in Section 6.3.1
- The white marker paint used as witness marks to indicate the nut/bolt has not become loosened is intact on all fasteners

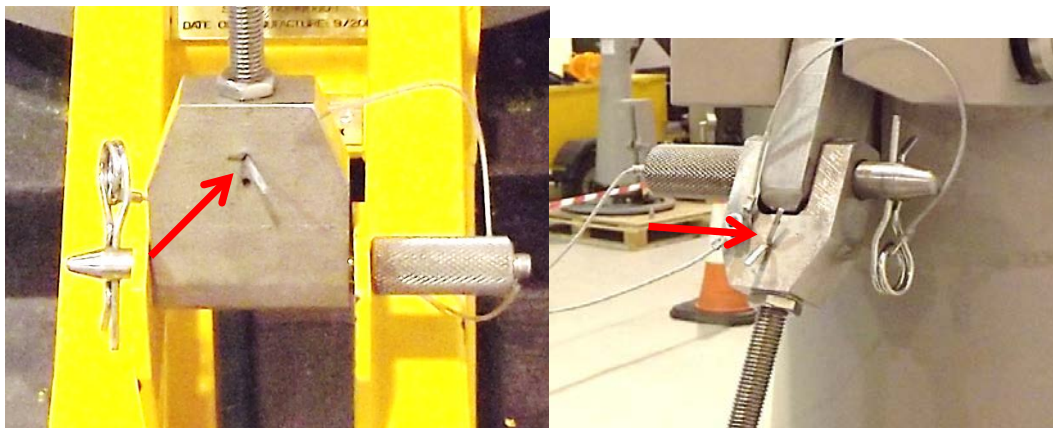
*** The Winch shall be subjected to testing every six months for certification**

6.3.1 Tie Rod End Safety



Do not attempt to adjust the length of the tie rod. A check that the end fittings are 'In Safety' as defined in this section shall be carried out prior to using the winch kit.

The end fittings on the winch tie rod shall have a minimum of 30mm of tie rod inserted. To ensure this a split pin is fitted in each end fitting as indicated by the red arrows and the tie rod is only deemed to be 'in safety' if these split pins are securely fitted.



Split pin ends not splayed correctly in these images to aid illustration

6.3.2 Handle Force

The following force values are only applicable when the winch handle is in its normal operating position not stowed.

The forces needed to operate the winch are:

Raising a signal – 33.5 Nm

Lowering a signal – 25 Nm

If the handle force is +/- 5% of these values or if the operator considers the handle forces to be incorrect winching should be terminated and an investigation into the cause carried out.



Winch handle shown in stowed position (to stow/unstow, pull the grasp section of the handle towards the operator and fold as required)

6.3.3 Nut and Bolt Witness Marks

All nuts and bolts on the winch kit leave the factory with marker paint applied to them acting as witness marks as shown in the example below. If the paint is not intact an investigation should be carried out and once the fastener torque has been correctly established the paint can be re-applied.



6.3.4 Winch Certification

This example of a Winch Test Certificate is shown with the date of its last test highlighted. If this date is more than six months before the date the lifting operation is to be undertaken, the winch shall not be used and is to be returned to an authorised test facility for recertification.

An example of a winch certificate is shown below.



Serving the Railway Maintenance Infrastructure

Tel: +44 (0)121 460 1113
Fax: +44 (0)121 460 1116

E-mail: info@wor-rail.co.uk
Website: www.wor-rail.co.uk

Report of Thorough Examination of Lifting Equipment

This report complies with the requirements of the Lifting Operations and Lifting Equipment Regulations 1998

CUSTOMER DETAILS: UNIPART DORMAN WENNINGTON ROAD SOUTHPORT MERSEYSIDE PR9 7TN		SITE ADDRESS: UNIPART RAIL LTD- DORMAN Wennington Road Southport Merseyside PR9 7TN		REPORT NO. 003250-1	DATE OF EXAMINATION 24 Aug 2012
				EXAMINATION TYPE: F. Initial Upon Supply (Types: Initial, 6 Monthly, 12 Monthly, Under A Scheme, After Exceptional Circumstances)	
Job No 009200	Report Date: 07/09/2012	Prev. Exam Date	Next Exam Date 23.02.2013	Page 1 of 1	
DESCRIPTION, IDENTIFYING NO/MARK, MANUFACTURER & MANUFACTURE DATE OF THE EQUIPMENT ITEM EXAMINED					
Plant No. 9200	Description WINCH FRAME ASSEMBLY C/W WIRE ROPE SLING (as per drawing B20.19327) Wire Rope Sling - T34388 Hand Winch 0937120	SWL / SWP 460 Kgs X=794 @ 460kgs			
Serial No T343877/0937120	Model Details	Location Preston			
Manufacturer	Manufacture Da August 2012	Exam Frequency 6 MONTHLY			
EXAMINATION DETAILS					
Type of Examination/Test Carried Out: Proof Load Test		Examination Result \ Equipment Status: No Defects Found		Safe For Use ✓ Yes	
(A) Defects In Need of Attention To Prevent Immediate Failure & Details of Action Required to rectify Defects: None		(B) Defects to be Kept Under Observation, Date When Defects Must Be Rectified By and Parts Required: None			
Particulars of Any Tests Carried Out as Part of the Examination: (None)		Additional Comments Made As Part of This Examination:			

Examination Carried Out By Worliffs Limited Guild House, Sandy Lane, Wildmoor, Bromsgrove Worcestershire, B61 0QU	Examiner Details Name Alan Taylor Position Service Engineer	Signatory for Worliffs Limited Name Mark Whitehouse Date 07 Sep 2012 Signature
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Worliffs Limited
 Company Registered Address: Guild House, Sandy Lane, Wildmoor, Bromsgrove, Worcestershire, B61 0QU
 Company Registration No. 1282246 Registered in England VAT Registration No. GB 300 0964 11

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6.3.5 List of Signals within the Winch Capability

The only signals that are authorised for lifting by the winch are listed on the iLS Signal Master Matrix available from Unipart Dorman. This matrix covers signal head types only and the final check is carried out by using the calculator based on head type, post height and wind loading data. To prevent the risk of a signal being delivered which would be too heavy for the winch, a system is in place at Unipart Dorman which uses 3 separate signatories who sign off the manufacturing drawing as within deflection parameters and weight limits before the order is placed on the GRP Post/Head Fabricator.

7 Installation of the Winch Kit



Winching Safety

These Instructions should be consulted before using the winch

IF ANY DOUBT EXISTS ON THE SERVICEABILITY OR OPERATION OF THE WINCH YOU SHOULD CONTACT UNIPART DORMAN IMMEDIATELY

Slide the underframe unit between the bottom of the Trunnion Mount and the top of the foundation base and secure it in place using the lockpin.

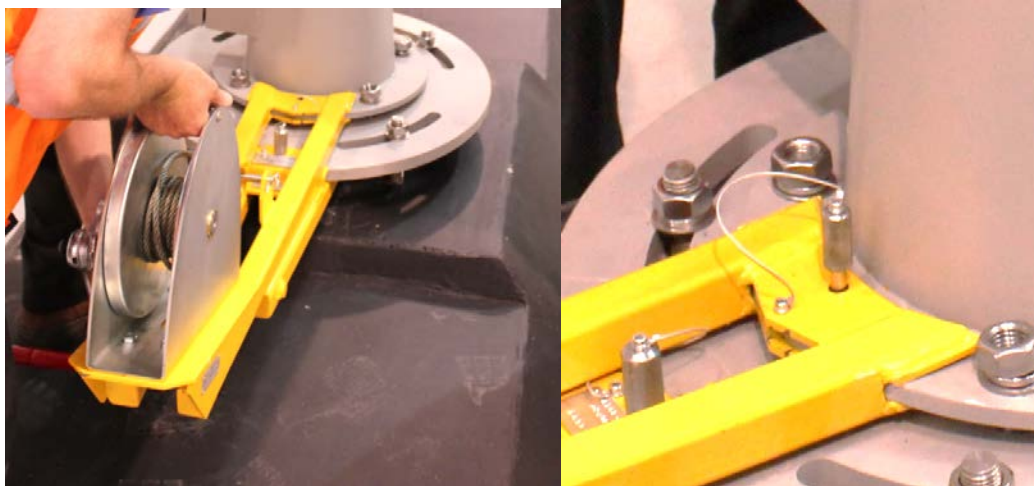


Remove all Locknuts from the movable section of the Trunnion Base studs and slacken the four Trunnion assembly nuts in preparation for fitting the winch frame.



DO NOT REMOVE THE NUTS COMPLETELY (leave at least one thread showing above the nut)

This will allow the Trunnion to be tipped back sufficiently to fit the winch frame assembly which should also be secured with the lockpin provided.

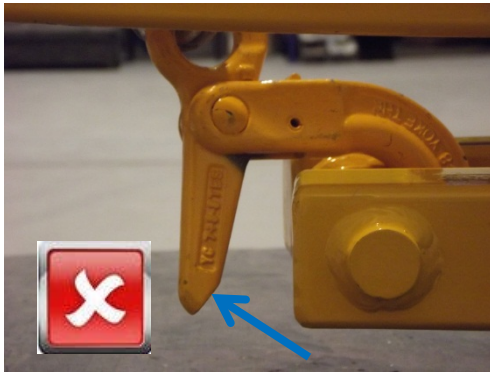


Warning

ROCKING THE TRUNNION BACK TO FIT THE WINCH FRAME EXPOSES A SIGNIFICANT TRAPPING HAZARD.

NEVER ALLOW FINGERS/HANDS OR TOOLS ETC. TO BE INTRODUCED BETWEEN THE TWO PLATES

Connect the winching cable to the underframe unit, ensuring the snap link on the hook (shown arrowed in blue below) is firmly engaged to prevent the hook becoming detached. The hook should only be fitted such that the snap link portion faces way from the signal attachment end of the frame.



Warning

THE TIE ROD MUST BE INSERTED INTO THE END FITTING BY NOT LESS THAN 30MM

PRIOR TO USING THE TIE ROD ASSEMBLY CHECK THAT THE ROD IS INSERTED THE REQUISITE AMOUNT BY LOOKING INTO THE INSPECTION HOLE AND ENSURING IT IS COMPLETELY FILLED BY THE THREADED ROD AND THE SPLIT PINS MENTIONED IN THE PRE-USE CHECKS ARE CORRECTLY FITTED

DO NOT ATTEMPT TO ADJUST THE TIE ROD LENGTH BY ALTERING THE POSITION OF THE END FITTINGS

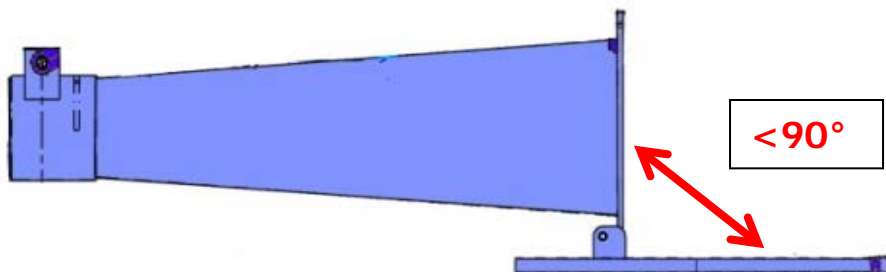
Connect both ends of the tie rod and secure the clevis pins with the R Clips as shown.





Once the winching operation is in progress the only person who should enter an exclusion zone defined by the swept area of a lowered signal is the winch operator. However, the winch operator can call upon an assistant to fit nuts etc. The assistant shall remain under the sole authority of the winch operator and is to be inside the exclusion zone for the shortest practicable time. During its operation, the safety zone should be overseen by lookouts positioned in a place of safety

The Trunnion/Trunnion and Signal should be lowered to the horizontal position which is defined as **not greater** than 90° between the bottom of the moveable portion of the Trunnion and the fixed baseplate.



NEVER LOWER THE TRUNNION/TRUNNION AND SIGNAL PAST THE HORIZONTAL AS THIS MAY CAUSE DAMAGE COMPROMISE THE FUNCTIONALITY OF THE WINCH.

Once the Trunnion/Signal is in the position required it should be supported and the weight taken off the winch cable without delay.



NEVER WORK ON A TRUNNION OR SIGNAL WHICH IS ONLY SUPPORTED BY THE WINCH.

DUE TO THE SIGNIFICANT LEVERAGE FORCES WHICH CAN BE INDUCED ON THE WINCH WHEN A SIGNAL IS IN THE HORIZONTAL POSITION, IT IS VITAL THAT NO ADDITIONAL LOADING IS ADDED TO THE WEIGHT OF THE SIGNAL, AND THAT IT IS SUPPORTED - WITH ALL TENSION TAKEN OFF THE WINCH ROPE - AS SOON AS PRACTICABLE

When erecting a signal, as soon as the Trunnion has been winched sufficiently over the base plate studs, fit a nut plus 1 x flat and 1x spring washer with at least one

thread visible protruding through the nut on them, winching can then be stopped and the winch kit removed.



Do not delay fitting all four nuts to the base studs



Do not continue to operate the winch when the signal has reached the position where the nuts can be fitted

Removing the winch kit is a reversal of the fitting procedure



Warning

ROCKING THE TRUNNION BACK TO REMOVE THE WINCH FRAME EXPOSES A SIGNIFICANT TRAPPING HAZARD.

NEVER ALLOW FINGERS/HANDS OR TOOLS ETC. TO BE INTRODUCED BETWEEN THE TWO PLATES

Finally ensure locknuts are applied and correctly torque loaded to the Trunnion base and movable section mounting studs/nuts.

7. Winch Failure Mitigation

There are only two catastrophic winch failure modes, one where the winch fails and the load subsequently free falls; and one where the winch ceases to operate in either lifting or lowering mode.

In the first case, the establishment of an exclusion zone when the winch is in operation will prevent injury as described in Section 3.1. If the winch jams, do not try to force the handle as this may lead to the first type of failure. Depending on the size and weight of the signal being lifted, the Person in Charge should organise an alternative lifting method to take the weight off the cable sufficiently to replace the winch and carry on with the lift.

If a winch fails in either manner it should be quarantined and contact made with Unipart Dorman as soon as possible.



If the signal impacts the ground or any structure as it falls, it should not be installed as there may be unseen damage to the GRP construction which may not be apparent.

8. Inserting the Post and Erecting the Signal



There is no provision for using lifting equipment to install the post is in the vertical position. Any attempts to lift the signal post into a vertical Trunnion, or to lift a pre-assembled post and Trunnion onto a foundation may result in undetectable damage to the post/signal assembly.

The bore of the Trunnion and the signal post should be checked for damage paying particular attention to the keyways on the post and the keys at the bottom of the Trunnion. Check the Plug Coupler and cable for damage, bent pins etc and any signs of moisture and then push them back into the bore of the post.

Undo the Trunnion Post Clamp and set the Trunnion to the 90° position, orientate the post correctly and slide it into the Trunnion until approximately 300mm travel remains before the keyways are engaged at the Trunnion base. This will allow the cable to be routed out of the keyway slot and out through the hole in the Trunnion which passes into the connection box.



Approximately 750mm of cable should be drawn through the keyway into the connection box. The lugs and keyways are then carefully aligned and the post pushed fully home.

Check that the post cannot rotate in the Trunnion bore and that the painted witness mark indicated below on the post is level with the top of the Trunnion.



The assembled signal and Trunnion can then be winched upright.



As soon as the Trunnion has been winched sufficiently over the base plate studs, fit a nut plus 1 x flat and 1x spring washer with at least one thread visible protruding through the nut on them, winching should be stopped and the winch kit removed.



Do not delay fitting all four nuts to the base studs

Removing the winch kit is a reversal of the fitting procedure.

Warning

ROCKING THE TRUNNION BACK TO REMOVE THE WINCH FRAME EXPOSES A SIGNIFICANT TRAPPING HAZARD. NEVER ALLOW FINGERS/HANDS OR TOOLS ETC. TO BE INTRODUCED BETWEEN THE TWO PLATES

All mounting hardware should then be torque loaded to the values shown in the table in Section 5.3.1.

Finally, tighten the Trunnion collar to hand tight (approximately 24Nm) and secure with a padlock.

8.1 Electrical Connection

Align the keyway and lug inside the connector shells and turn the locking collar by hand until an audible 'click' is detected and the two indicator spots are aligned. (The spots may be of different colours; this is simply the preference of the manufacturer and does not affect the plug coupler's physical attributes)



The Plug Couplers should connect easily and the use of handtools is discouraged. If the coupler cannot be fully engaged by hand, there may be a fault or mismatch in connection detail. This should be investigated as any attempt to force the connection may result in bent or broken pins/sockets which may require

complete replacement of either the infrastructure cable or the signal module and cable.

Once the connection is made the Plug Couplers should be stowed in the connection box as shown with the signal cable fitting into the recess in the mounting plate so it runs up and over the Plug Couplers whilst maintaining a smooth bend radius in the cable. Spare signal cable can be tucked back into the post for stowage.



Close the connection box door ensuring the cable is central in the cut out and the door seal is not damaged or pinched by the door. Secure the door with a padlock.

The Trunnion should be bonded to earth if required by the use of bonding straps. No specific earth bonding arrangements to the signalling elements are required by virtue of the double insulated design.

9 Signal Sighting and Alignment



GREAT CARE SHOULD BE TAKEN TO ALIGN THE SIGNAL IN STRICT ADHERENCE TO THE SIGNAL SIGHTING FORM REQUIREMENTS

The Signal Sighting Form will provide the signal specific sighting details and should always be consulted prior to commencement of work.

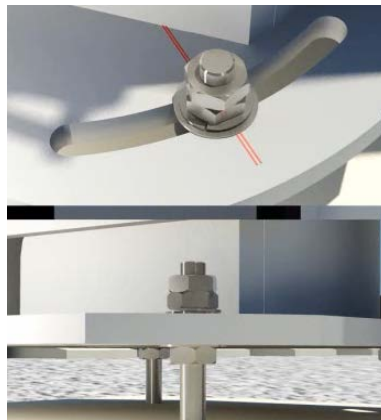
The removable sighting scope unit should be fitted securely to the two Trunnion mounting points by screwing the two knurled screws into the threaded holes adjacent to the padlock plate (at 1130mm above the base plate) as shown below.



Using the sighting scope to provide visual cues the signal is adjusted in azimuth by rotating the base within the kidney slots in the bases and elevation by adjusting the angle of the base using the nuts travelling up and down the studs. It should be aligned to a point on the ground at the distance specified on the SSF



The arbitrary method of sighting to the AWS magnet shall not be used unless specifically authorised by the Signal Sighting Chair and correctly recorded on the latest version of the Signal Sighting Form



Representative image only

As required the Trunnion can be sighted with or without the signal post installed, the post can then be fitted as and when required. When the signal is sighted as per the signal sighting form, ensure all the mounting nuts are correctly torque loaded and the sighting scope is removed and stored in its protective case.



BEFORE THE SIGNAL IS BROUGHT INTO USE THE ALIGNMENT AND LOCKING DOWN OF THE HEAD SHALL BE VERIFIED AND WHERE MANDATED, A PHOTOGRAPH TAKEN OF THE SIGHTING PICTURE FOR RETENTION



When torque loaded to the correct value there shall be at least one thread of the stud protruding past the top of the nut. If it is not possible to align the signal correctly and have all four nuts in safety as described plus the 80mm gap mandated in Section 5.3 above, the foundation should be checked for misalignment or slippage.

10 Post Installation Checks

The iLS has been designed with Plug and Play installation in mind. Unipart Dorman recommends that the only test required is to have the signaller call on the aspects and ensure that the correct indications are displayed by the signal. This advice does not supersede any instructions issued by Network Rail.

11 Maintenance Activity

The signal design is such that it is maintenance free. However, Network Rail may however, mandate some additional maintenance activity and this will be promulgated through the normal channels.



There is no provision to carry out any activity with the signal erected. Therefore it is to be lowered to the horizontal position using the instructions as shown in this manual.

11.1 Signal Husbandry

If the signals require any cleaning to be carried out, the only mediums approved are water and proprietary detergents.



Do not use any solvent based or abrasive cleaning material as this may irreparably damage the signal.

11.2 Module Replacement (CLS Module)

Prior to installation ensure that you have the correct replacement module.

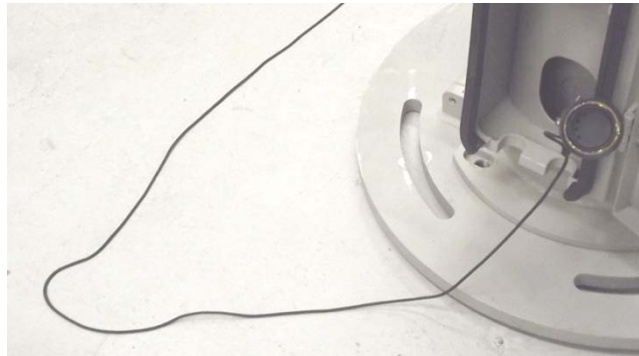
The winch should be fitted as described in Section 6 of this manual and the signal should be lowered to the horizontal position and supported.



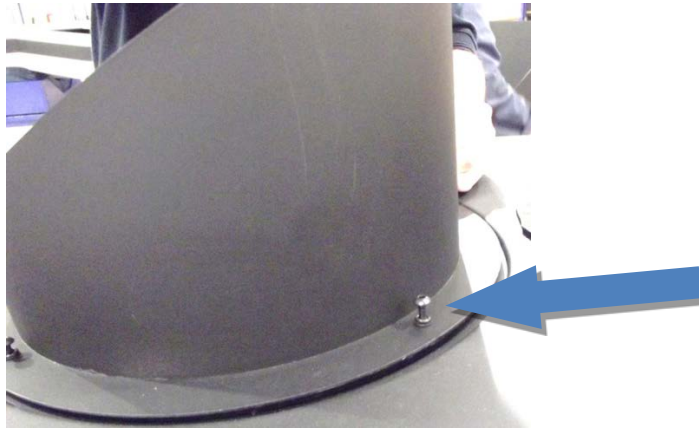
NEVER WORK ON A TRUNNION OR SIGNAL WHICH IS ONLY SUPPORTED BY THE WINCH

Open the Connection Box and disconnect the plug coupler. Attach a piece of tracer cord which is approximately 1.5m longer than the post height to the plug and temporarily secure the other end to a convenient point on the Trunnion. This will allow the new plug to be inserted down the post with ease.

Undo the Trunnion Locking clamp and withdraw the post from the Trunnion sufficiently to allow the end of the module cable to be passed through the bore of the post.



Remove the existing module by undoing the captive screws with a 5mm Allen Key.



Withdraw the module sufficiently to access the inside of the signal head. If the signal is a four aspect variant, disconnect the plug coupler which connects the two modules together.



To reduce the amount of spares that need to be held, all iLS Colour Light Signal Modules have the splitter cable for the second Yellow module attached. If the signal only uses a single Red Yellow Green module the splitter cable will have a blanking cap fitted and it will be secured on the cable clamp bar.

Remove and retain the cable clamps using a flat blade screwdriver

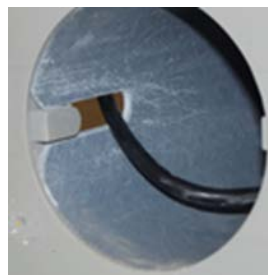


(Cable not shown for clarity)

It is then possible to remove the module completely, as the cable is withdrawn the tracer cord will travel up the post and when it reaches inside the signal head can be undone from the plug.

Tie the tracer cord to the plug on the new module and use it to pull the new cable down the bore of the post, guiding the cable through the slot in the bottom of the post and into the connection box. (The tracer cord can then be removed) Reconnect the splitter cable if the signal has a second module and refit the cable clamp(s). Carefully stow any excess cable inside the post/head and secure the new module in place using the socket headed screws.

Relocate the post in the keyways at the bottom of the Trunnion then the signal can be returned to the vertical position and correctly secured.



The signal should be electrically connected as shown in Section 8.1 and the post installation tests carried out.

Because the signal alignment has not been disturbed during this process there is no requirement for a signal sighting exercise to be carried out.

11.3 Module Replacement (Other Signal Modules)



Junction Route Indicator Modules operate at a higher temperature than other modules. Caution should be exercised when replacing these modules to ensure that the residual heat has fully dissipated from the alloy heatsink attached to the back of the modules prior to handling.



Image illustrating the heatsink and short plug coupler connection lead for a PLJI Module

The instructions in Section 6 for lowering the signal should be followed.

There are no requirements for the Plug Couplers at the base of the signal to be disturbed as the signal modules are all individually plug coupled inside the head.

Simply unscrew all the captive screws and withdraw the required module sufficiently to disconnect its plug coupler and remove.



As the signal structure has not been disturbed there is no need to carry out a signal sighting exercise.

11.4 Service and Repair

The Trunnion, post/signal head and LED modules have no user maintainable elements (apart from general husbandry requirements) and are intended to be replaced completely should they fail

11.5 End of Life Disposal

Wherever possible the component parts and complete assemblies of the Unipart Dorman iLS are designed to be disposed of in accordance with the requirements of the Waste Electronic and Electrical Equipment Regulations 2006. Please contact Unipart Dorman for full details of the procedure to be undertaken when a signal is permanently withdrawn from service for disposal.

12 Contact Us

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Southport
Merseyside
PR9 7TN

Tel **01704 518000**
Fax **01704 518001**
Email **dorman.info@unipartdorman.co.uk**
Website **www.unipartdorman.co.uk**

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APPENDIX A – HAACON WINCH INSTRUCTIONS



OPERATING INSTRUCTIONS

(Translation)



Rope winch

Type	KWE 250	KWV 300
	KWE 650	KWV 650
	KWE 1000	KWV 1250

1. USER GROUPS

	Duties	Qualifications
Operator	Operation, visual inspection	Instruction by means of the operating instructions; Authorised person 1
Specialist personnel	Assembly, disassembly, repair, maintenance	Mechanic
	Tests	Authorised person 2 per TRBS-1203a (Technical expert)

2. SAFETY INSTRUCTIONS

Appropriate use

Operate the equipment in accordance with the information in these operating instructions.

- Only use to lift, lower and pull freely-movable loads.
- Only use when in perfect working order.
- Only allow to be operated by personnel instructed on how to do so.

Safety-conscious work

- First read the operating instructions.
- Always be conscious of safety and hazards when working.
- Observe lifting device and load during all movements.
- Immediately report any damage or defects to the person in charge.
- Repair equipment first before continuing work!

The following are not allowed:

- Overload (--> technical data, type plate, payload plate)
- Mechanical propulsion.
- Impacts, blows.

Use exclusions

- Not suitable for permanent operation and vibration stress.
- Not approved for use as builders' hoist (BGV D7).
- Not approved for use on stages or in studios (BGV C1).
- Not approved for use as a retractable transportation device for personnel (BGR 159).
- Not approved for use in explosive areas/environments.
- Not suitable for aggressive environments.
- Not suitable for lifting hazardous loads.

Organisational measures

- Ensure that these operating instructions are always at hand.
- Ensure that only trained personnel work with the equipment.
- Check at regular intervals whether it is being used in a safety and hazard conscious manner.

Installation, service and repair

Only by specialist personnel!

Only use original spare parts for repairs.

Do not modify or alter safety-relevant parts!

Additional attachments must not impact safety.

Further regulations to be observed are

- German Industrial Health and Safety Ordinance (BetSichV).
- Country-specific regulations.
- German Accident prevention regulations (BGV D8).

Load

- Do not leave suspended without supervision.
- Do not allow to swing.
- Do allow to fall in the rope.

Rope

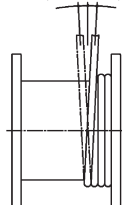
- Compliant with EN 12385-1 and EN 12385-4 and the technical data
- Maintain rope deviation angle
 - non-rotating rope $\leq 3^\circ$ (standard)
 - rotation-resistant rope $\leq 1.5^\circ$
- Use a rotation-resistant rope for unguided loads. This can reduce the resting period of the rope (drive mechanism group).



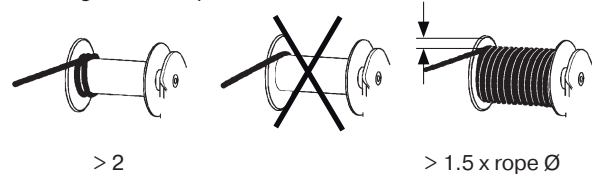
Wear on the rope is reduced if the rope is fully unwound in an unloaded state and then wound back up in layers while under load.



$\leq 3^\circ$
 $\leq 1.5^\circ$

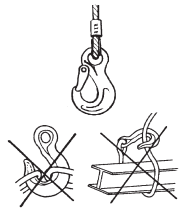


The length of the rope is correct if:



Lifting equipment

- Ensure sufficient load-bearing capacity.
- Only use load hooks with a safety flap.
- Use the approved load hooks with rope thimbles and rope clip.
- Attach the load properly.
- Do not use the winch rope to secure the load.



3. TECHNICAL DATA

Type		KWE	KWV	KWE	KWV	KWE	KWV
Nominal load [kg]		250	300	650	650	1000	1250
1 st Layer	W.L.L [kg]	250	300	650	650	1000	1250
	Storage [m]	3,4	2,8	3,4	3,2	3,4	3,2
max. no. of layers		6	6	6	7	9	9
Last layer	W.L.L [kg]	125	150	340	330	390	490
	Storage [m]	22	22	16	23	28,5	28,5
Rope Ø [mm]		4	4	7	6	8	8
FEM Rating ¹		1Em	1Em	1Em	1Em	1Em	1Em
Breaking load [kN]		7,4	8,9	19,2	19,2	29,5	36,8
Crank force [N]		220	270	250	240	200	240
Weight [kg] w.o. rope		3,9	3,9	6,3	5,9	16	16

1) FEM Rating according to DIN 15020 resp. FEM 9.511 for ordinary rope

4. GENERAL

The hand winches are drum type winches. They are driven by a single reduction pair of straight cut internal spur gear or direct. The load is safely supported in any position by means of an automatic mechanical brake.

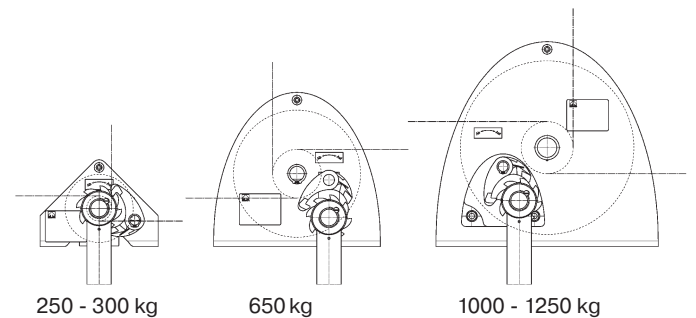
5. MOUNTING

- the mounting structure must be designed to sustain the max forces imposed by the winch
- pay careful attention that the mounting surface is flat and true
- use always 4 screws size M10 (min. quality 8.8)
- tighten the screws evenly and secure screws
- ensure that the crank is free running (crank clearance).

6. ROPE MOUNTING



With wrong rope coiling the brake is not effective!



Wire rope fixing



Grease slightly the drum, before fixing the wire rope.

Recommended ropes:

Ordinary ropes, zinc plated

EN 12385, Tab. 12, 6x19 WC 1770 B sZ (former DIN 3060 SE znk 1770 sZ)

Ordinary ropes, stainless steel:

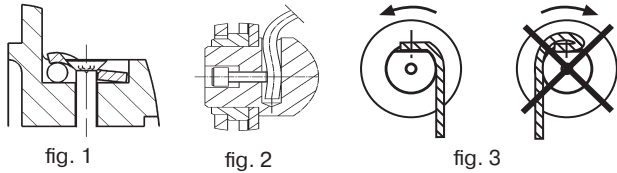
similar to EN 12385. 7 x 19


[former DIN 3060 SE bk 1570 sZ (1.4401)]

Rope diameter and breaking load see point 3

It is not allowed to use plastic coated ropes.

Hard solder the rope end clamp to the rope drum with a hexagonal wrench (SW 4 with 6 Nm, SW 5 with 5 Nm) (fig 1 and fig. 2). After rotating the crank in clockwise direction, the rope must reel up on the drum as illustrated in fig. 3.



 A functional test must always be accomplished before beginning work.

7. OPERATION


Lift the load: Turn crank clockwise.

Lower the load: Turn crank anti-clockwise.

If the crank is not turned the load is suspended safely. When lifting a load, do not wind rope beyond the point where at least 1,5 x rope diameter is left free on drum flanges above outermost layer.

When loaded, at least 2 turns of the rope must remain on the drum. The capacity of the first layer corresponds to the nominal capacity of the winch. This means that the capacity decreases with every further layer (refer to type-/ capacity number plate for capacity of first and last layer).

Version with crank to declutch rope drum (option)

 Only for unloaded rope.

Declutchable rope drum:

- Push crank arm towards the rope winch. The coupling pins move out of the coupling disc. Unloaded rope can be pulled off.

Clutch in:

- Pull and turn crank until the coupling pins engage into the coupling disc.

Version with adjustable crank arm (option):

- Loosen wing screw, adjust crank radius, tighten wing screw.

8. INSPECTION

The equipment must be inspected in accordance with the conditions of use and the operating conditions at least once per year by an authorised person 2 per TRBS 1203 (Technical expert) (testing per BetrSichV, §10, sect.2 represents implementation of EC Directives 89/391/EEC and 95/63/EC and the annual occupational safety inspection per BGV D8, §23, sect. 2 and BGG956). These inspections must be documented:


- Before commissioning.
- After significant alterations before recommissioning.
- At least once per year.
- In the event of unusual occurrences arising that could have detrimental effects on the safety of the winch (extraordinary tests, e.g. after a long period of inactivity, accidents, natural events).
- After repair works that could have an influence on the safety of the winch.

Technical experts (AP2) are persons, who have sufficient knowledge based on their specialist training and experience, in the areas of winches, lift and pull systems and the relevant official occupational health and safety rules, accident prevention regulations, guidelines and generally accepted engineering rules (e.g. EN standards), to evaluate the operational safety of winches, and lift and pull systems. Technical experts (AP2) are to be nominated by the operator of the equipment. Performance of the annual occupational safety inspection as well as the training required to obtain the aforementioned knowledge and skills can be provided by haacon hebetechnik.

9. MAINTENANCE RECOMMENDATION

The operator determines the intervals themselves based on frequency of use and the operating conditions.

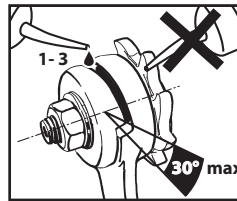
- Regular cleaning, no steam jets!
- Carry out visual check on inaccessible brakes / locks every 5 years at the latest, replace brake pads as required.
- General overhaul by the manufacturer after 10 years at the latest.

 **CAUTION!** Only perform inspection, maintenance and repair work on an unloaded hoist. Only allow work on brakes and locks to be performed by qualified specialist personnel.


Maintenance and inspection work	Intervals
Visual check of the rope hooks (load carrier)	Before every use
Function of the winch	
Condition of the rope and lifting equipment	
Brake function under load	
Grease bearing of drive pinion	Quarterly Annually
Check rope for wear acc. to DIN 15020 Sheet 2 and service	
Check fastening bolts for secure seating	
Check all parts of the winch and crank for wear, if applicable, replace defective parts and lubricate.	Annually
Check type plate for legibility	
Have an inspection performed by an expert	

Lubricant recommendations: Multi-purpose grease per DIN 51502 K3K-20

Safety crank



If sluggishness occurs during lowering, pour a few drops of oil into the gap in the crank cam. Safety cranks with a gap aperture >30° should be replaced. Repair must be carried out by only by the manufacturer.

 **CAUTION!** Only disassemble the crank, ratchet brace and locking pawl when the equipment is not under load! Do not oil or grease the brake pads!

10. OPERATION FAILURES AND THEIR CAUSES

Failure	Cause	Elimination
In unloaded state, it is difficult to turn the crank	Lubricant in bearing points is missing. Dirt or something similar has accumulated in the bearing	Execute maintenance works
	Winch was distorted during mounting.	Check the fixing. Is the mounting surface even, are the screws tightened correctly
Load is not held	Wrong coiling of the rope winding direction for lifting was not correct. The brake is worn-out.	Lay the rope correctly. Check brake parts and replace worn-out parts.
	Too light load	The load has to be at least ca. 20 kg resp. 50 kg
Brake does not release, load may only be lowered with high expenditure of force.	Brake discs or brake mechanism is distorted.	Release the brake by slightly striking against the crank arm with the flat of the hand in lowering direction.

11. SPARE PARTS

When ordering spare parts it is essential to quote:

- The type and serial number of the equipment / item and part number

12. DISASSEMBLY, DISPOSAL

- Make sure to observe the safety instructions.
- Dispose of the equipment and the substances within it in an environmentally responsible manner.

EU Installation Declaration

haacon hebetchnik gmbh
Josef-Haamann-Strasse 6
D-97896 Freudenberg/Main

**Manufacturer:**

haacon hebetchnik gmbh
Josef-Haamann-Strasse 6
D-97896 Freudenberg/Main

Phone +49 (0) 9375 / 84-0
Fax +49 (0) 9375 / 8466

The product

Product name: Hand rope winches

Type:	220	241	421	462	468	4060	4185	4202
	4210	4216	4235	4284	4321	4471	4472	4483
	4491	4585	4751	4821	4843	4862	209480	KWV
	KWE	Tango	WA					

Load capacity range: 0,05 – 3 t

conforms with the basic requirements of the directive **Machines (2006/42/EG)**

Appendix I, article

- 1.1.2 Basic for the integration of safety
- 1.1.3 Materials and products
- 1.1.5 Construction of the machine regarding its handling
- 1.3.2 Risk of breakage during operation
- 1.3.4 Risks by surface, edges and corners
- 1.3.7 Risks caused by moving parts
- 1.3.9 Risk of uncontrolled movements
- 1.7 Information
- 4.1.2 Protective measures against mechanical hazards
- 4.3.3 Machines to lift loads
- 4.4 Operating instructions

The product is an incomplete machine as per machine directive (2006/42/EG). The product must not be taken into operation until it is determined that the machine, in which it is to be installed conforms with the machine directive (2006/42/EG).

If the product is changed significantly, it will lose this conformity declared by the manufacturer.

The manufacturer agrees to submit the specific documentation pertaining to this product to individual state institutions electronically, if so requested.

The specific technical documentation as outlined in Appendix VII Part B were compiled.

Responsible for the documentation: Construction

Signed by:

Freudenberg, 21.12.2010

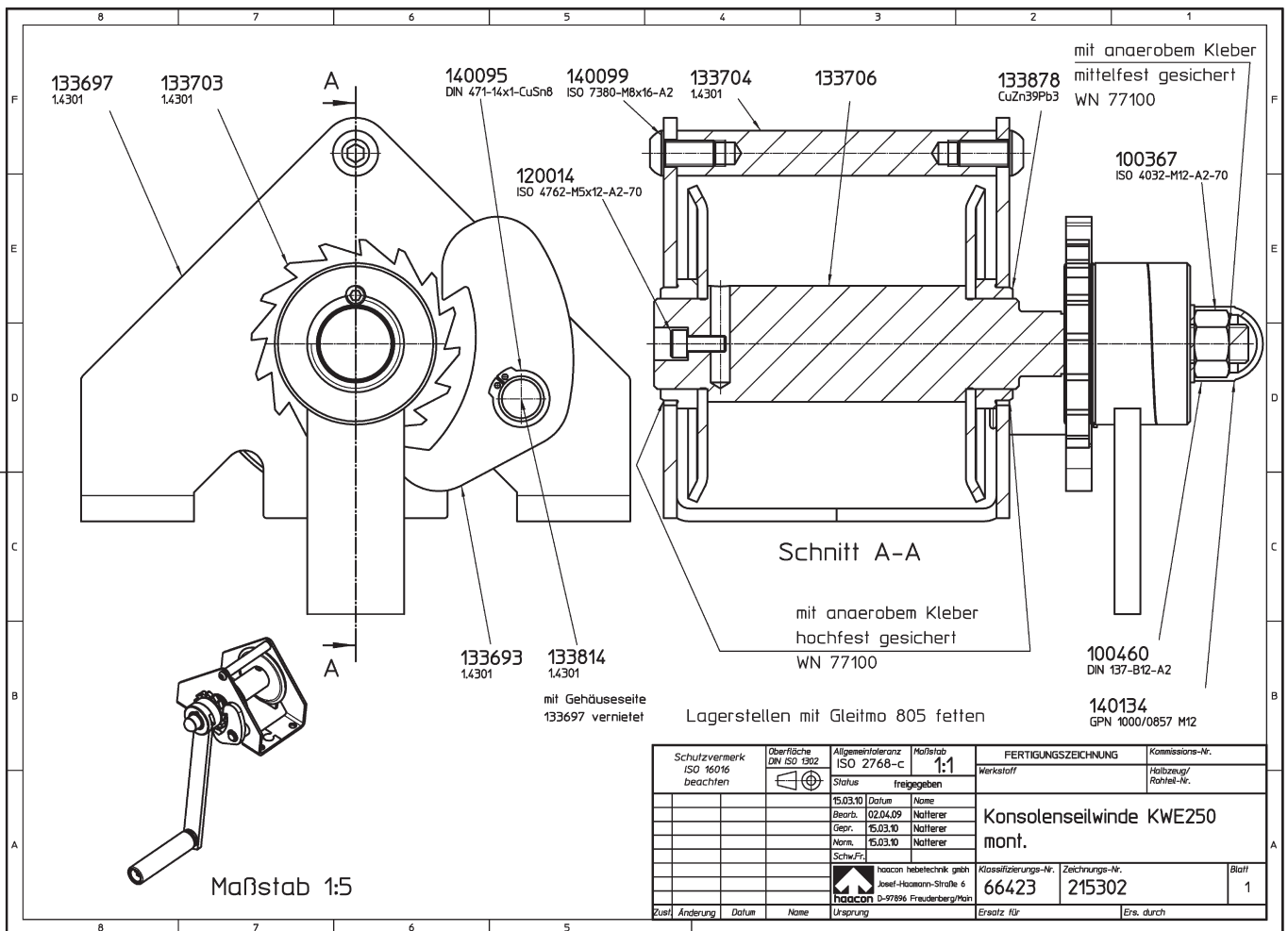
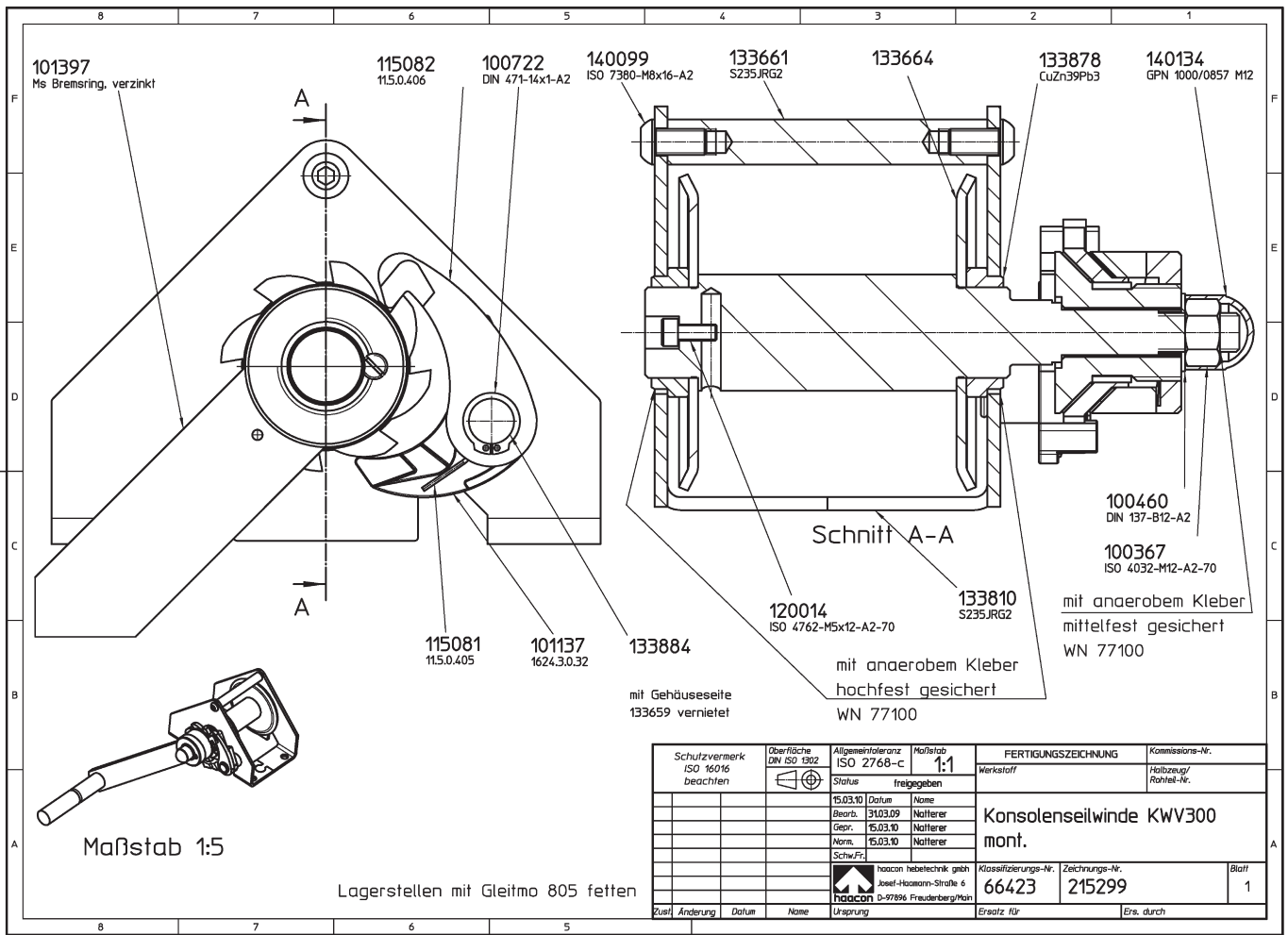

on behalf of Robert Miltenberger

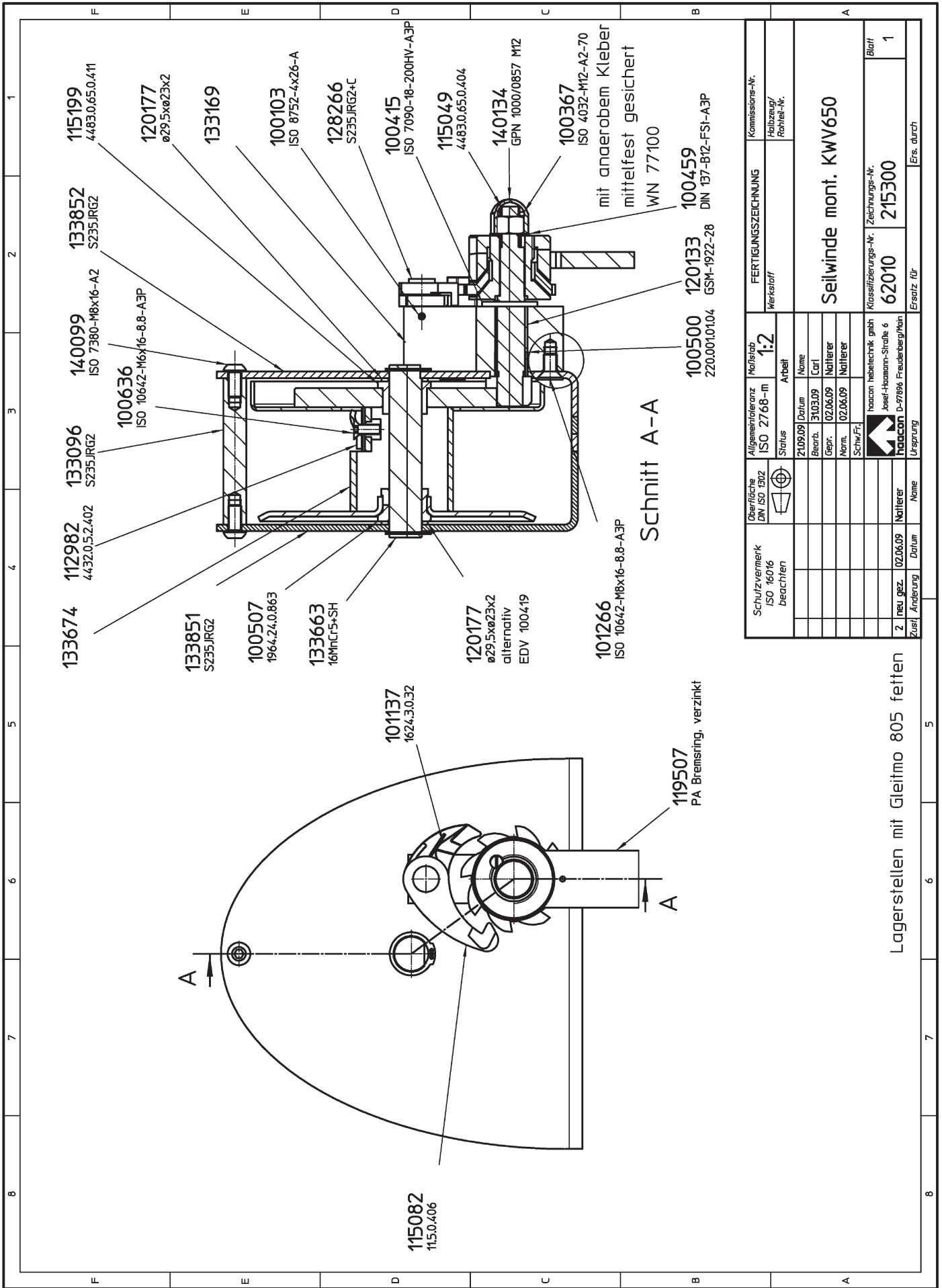

on behalf of Thed Müller

gb Edition 4; 12/10

092079 of 21.12.2010

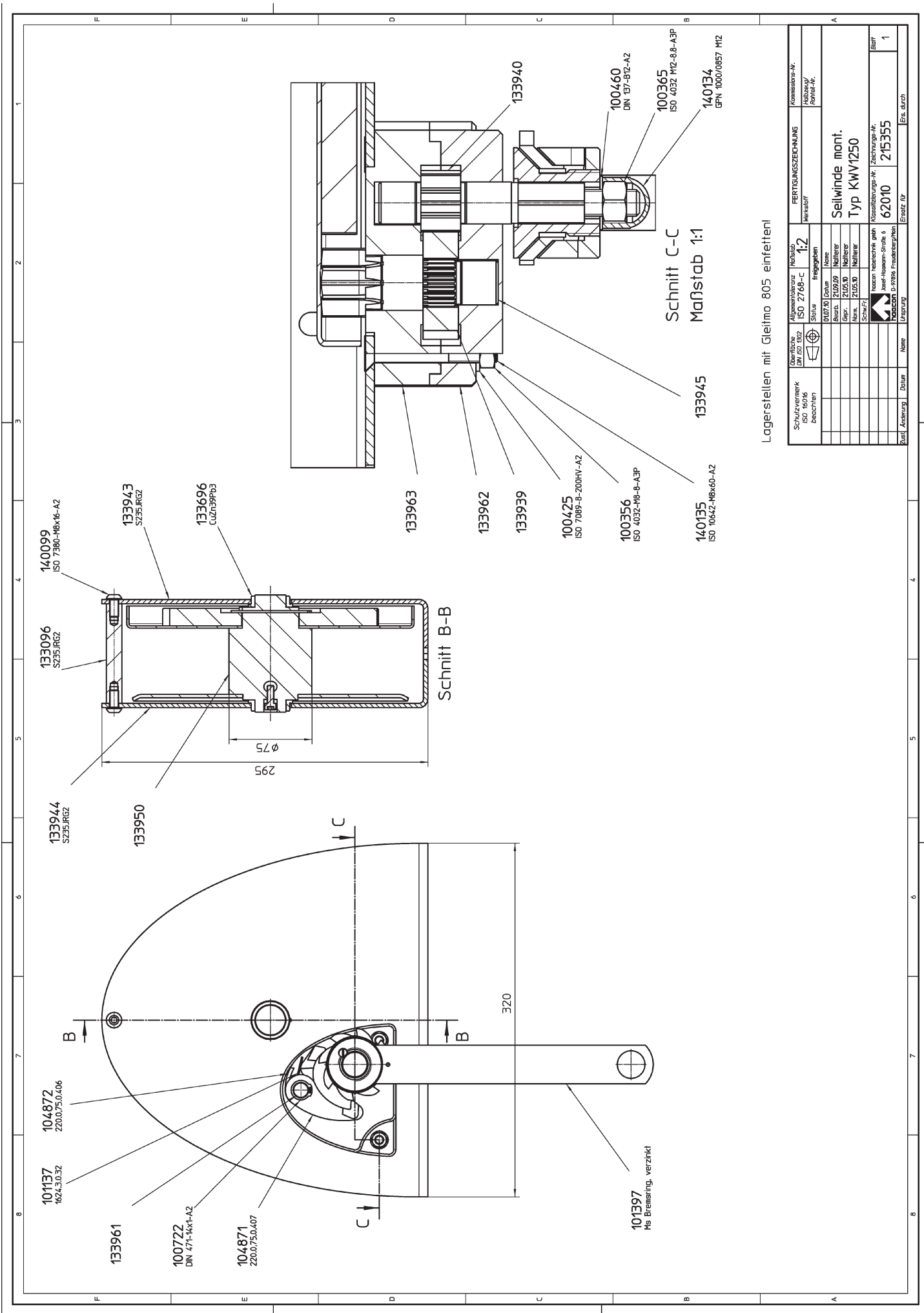
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Status Arbeit		21.09.09 Datum	Name Carl	Seilwinde mont. KWV650		
Bezirg. Natterer		31.03.09 Datum	Carl	Klassifizierungs-Nr. 215300		
Gepr. Natterer		02.06.09 Datum	Natterer	Zeichnungs-Nr. 1		
Norm. Natterer		02.06.09 Datum	Natterer	Ersatz für		
Schw.F.H.		haacon hebeteknik gmbh Josef-Humann-Strabe 6 D-97896 Freudenberghausen				
2. neu geg. Natterer		haacon				
Zust. Änderung		Ursprung				
Datum		Name				
Ersatz für		Ers. durch				

Lagerstellen mit Gleitmo 805 fetten



Lagerstellen mit Gleitmo 805 einfetten!

Schulz-Logo ISO 9001 bescheinigt	Überfläche DIN ISO 1922	Maßstab ISO 2768-C	1:2	FERTIGUNGSZEICHNUNG Werkzeitz Kombi-Logo Rohr-Logo
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		Spez.	Z10530	
		Norm.	Z10530	
		Schwarzf.		
			hacon hebetechnik gmbh Josef-Haumann-Str. 6 D-97984 Frensdorfer-Mün Ursprung	Ersatz für

