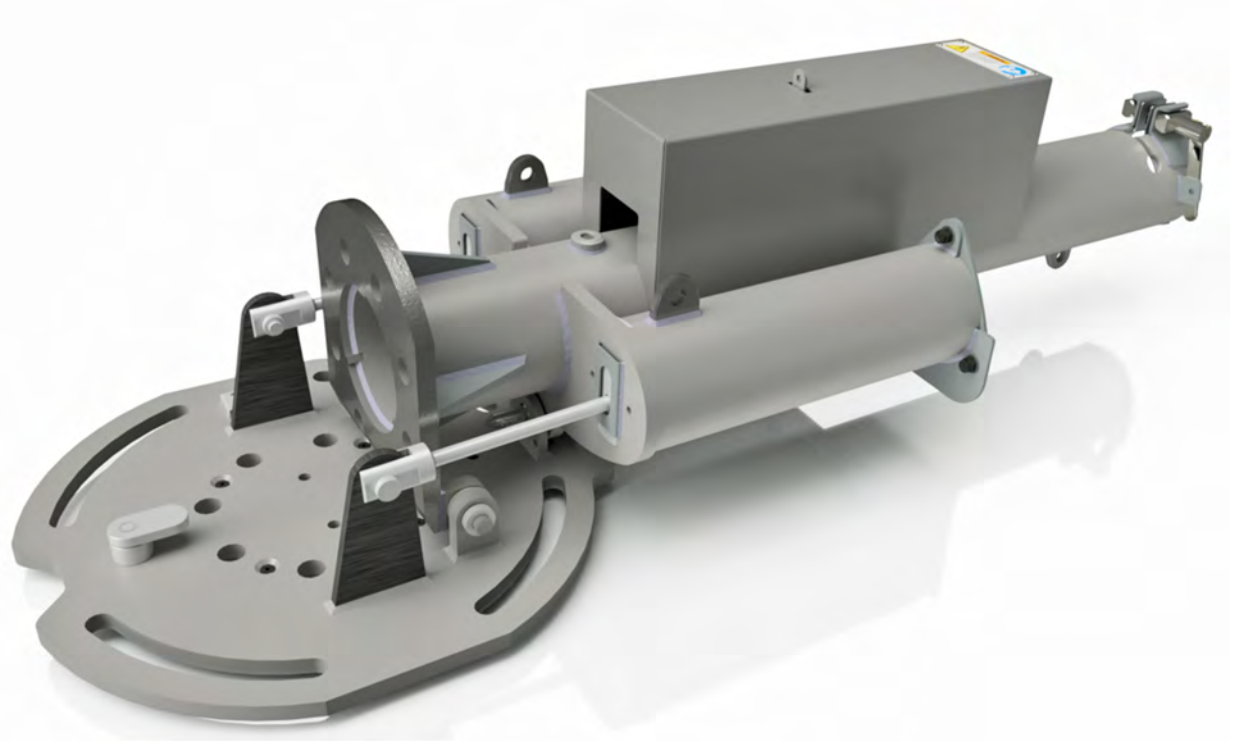
Heavy Duty Assisted Lift Trunnion



Operation and Maintenance Manual

C64.65546

Issue 6

May 2023

UNIPART RAIL

SERVING THE WORLD'S RAILWAYS

Table of Contents

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	Jul 19	• Initial Issue
2	Sep 19	• References to RBK-221 padlock added
3	Nov 19	• Images and layout updated following feedback from Network Rail PA review.
4	Jan 20	• Wording changes following Network Rail Product Acceptance and Ergonomics Review
5	May 21	• Additional Safety Warnings • Addition of extra information on signal alignment methods • New section on Module Replacement
6	May 23	• Appendix B added to suit Offset Post Assembly

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Approved by	John Lee	Head of Design and Development	

Safety Warning

THE UNIPART DORMAN HEAVY DUTY ASSISTED LIFT TRUNNION (HD ALT) UTILISES TWO SPRING ASSEMBLIES TO PROVIDE ASISTANCE WHEN RAISING AND LOWERING THE SIGNAL BY HAND

WHEN THE HD ALT IS IN THE HORIZONTAL POSITION KINETIC ENERGY IS STORED IN THE SPRINGS AND TO PREVENT RAPID DEPLOYMENT OF THIS, A SUITABLE HEAD AND POST SHALL BE FITTED TO PROVIDE A BALANCING LOAD TO COUNTER THE SPRING FORCE BEFORE ANY ATTEMPT TO RAISE THE UNIT INTO ITS VERTICAL STATE

DO NOT REMOVE THE PADLOCK/SAFETY PINS UNTIL THE HEAD AND POST ARE FITTED AND SUFFICIENT STAFF ARE AVAILABLE TO CONTROL THE SIGNAL AS IT RISES TO THE VERTICAL POSITION

THERE ARE NO USER MAINTAINABLE PARTS ON THE HD ALT

ANY ATTEMPT TO DISASSEMBLE THE SPRING UNITS OR FULCRUM ARMS COULD RESULT IN CATASTROPHIC RELEASE OF THE STORED SPRING ENERGY WHICH WILL PRESENT CONSIDERABLE RISK OF INJURY OR ENDANGER LIFE

Introduction

The Unipart Dorman Heavy Duty Assisted Lift Trunnion (HD ALT) uses twin reactive springs controlled by a fulcrum system that allows the force required to move the signal post from the horizontal to vertical to be equalised across the full range of movement. This means that it can be raised and lowered by hand without any additional mechanical handling equipment.

HD ALT is designed to interface with only Unipart Dorman Lightweight and CLS LITE Signals as shown in the product configuration drawing C64.65378. Additionally, the HD ALT can be used to mount a variety of Classic Signals & Indicators and level crossing Road Traffic Lights (Wigwags) using the brackets detailed in the Network Rail Product Acceptance Certificate PA05/06503.

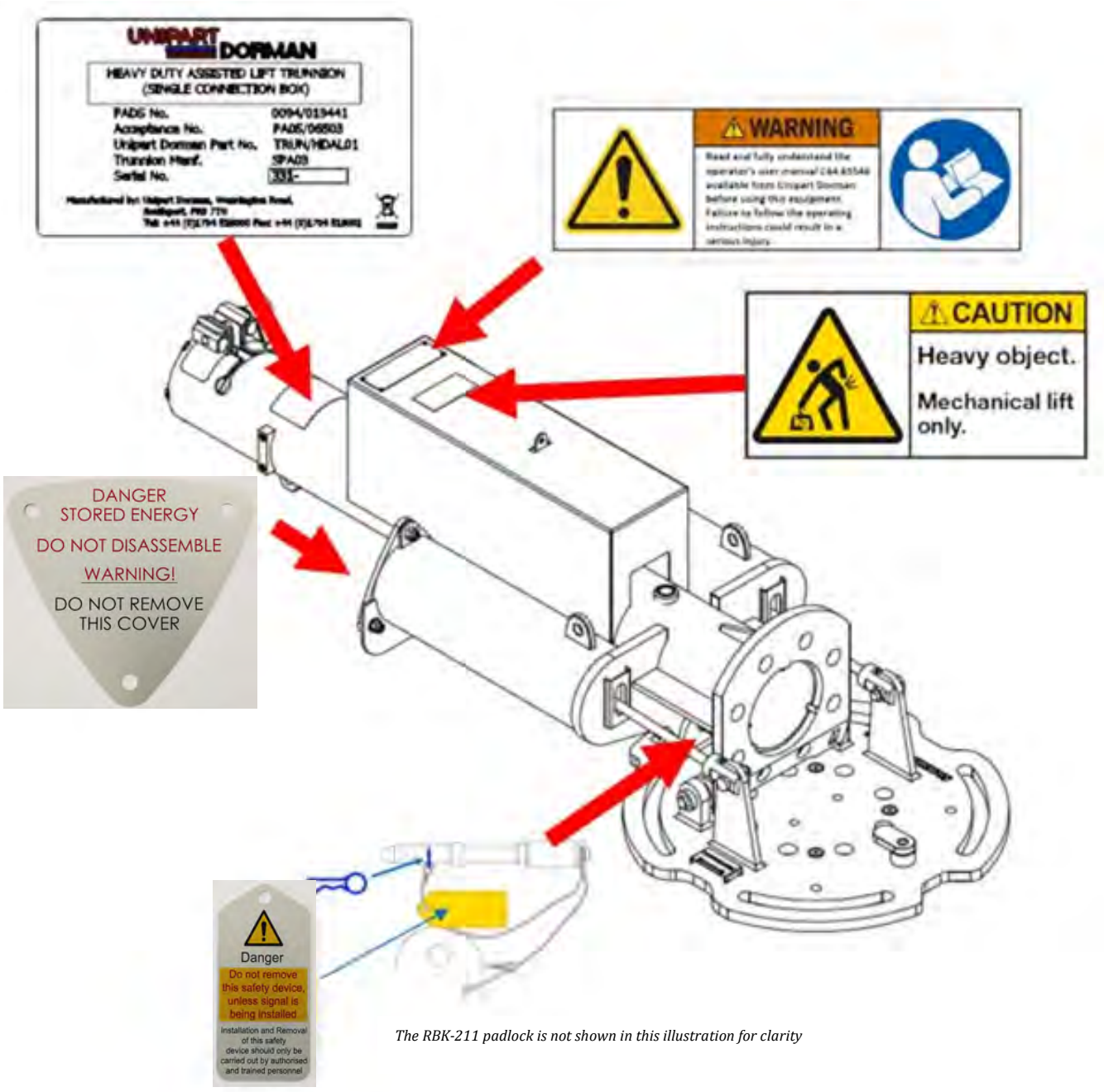
A separate document will cover the Offset post when used in HD ALT

The complete signal can be quickly installed onto a standard foundation or screw pile system set with 4 x M24 studs at 380mm centres as shown in Network Rail Drawing BRS-C-45. These studs should have a MINIMUM of 200mm threaded section available above the top face of the foundation.

Although the HD ALT was developed from and shares many similarities with the Standard ALT, they are entirely separate products with distinctive operation and safety properties. Any acquired knowledge of the Standard ALT shall not be used as a cross reference to the HD ALT. Separate O&M Manuals and Product Awareness Sessions are available for both Trunnions and these are available from Unipart Dorman.

Product Labelling

The following labels are applied to each HD ALT



The RBK-211 padlock is not shown in this illustration for clarity

Safety

Activities, which may pose a hazard, will have the following highlighters:

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

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

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 Unipart Dorman HD ALT has been designed in accordance with the principles and methods detailed in the Network Rail Design for Reliability Process and has been subjected to extensive testing throughout its development to meet these requirements and subsequently obtain Network Rail Product Acceptance.

This Operation and Maintenance document is designed to illustrate safe methods of work and highlight potential dangers to workers. It is a generic guide only and the content is not to be used to substitute or justify the omission of good engineering practices.

FAILURE TO ADHERE TO THE INSTRUCTIONS AND WARNINGS CONTAINED IN THIS PUBLICATION COULD CAUSE SERIOUS INJURY, ENDANGER LIFE AND/OR CAUSE CATASTROPHIC DAMAGE TO THE EQUIPMENT AND SURROUNDING INFRASTRUCTURE.

The weight of the HD ALT (165Kg) is clearly marked and installers should ensure that they have sufficient measures in place to ensure a safe lift. The marked weight is for the HD ALT only and does not include any pallet or packaging weight.

To enable simple transport and installation the HD ALT is delivered from the factory locked in the horizontal position using the lockdown safety pin secured with a standard RBK-221 Padlock.

DO NOT ATTEMPT TO REMOVE THE PADLOCK AND SAFETY PIN UNLESS A SUITABLE HEAD/POST IS FITTED CORRECTLY INTO THE HD ALT

REMOVING THESE HOLD DOWN DEVICES WITHOUT THIS LOAD MAY CAUSE SERIOUS INJURY AND ENDANGER LIFE DUE TO THE STORED ENERGY IN THE SPRING SYSTEM BEING RAPIDLY RELEASED

The HD ALT shall not be used for any purpose other than that described in the introduction above. If it is used for any other purpose, Unipart Dorman will not accept any responsibility for damage, injury or death caused by the activity.

THERE ARE NO USER SERVICEABLE PARTS IN THE HD ALT AND ANY ATTEMPT TO DISASSEMBLE THE SPRING UNITS MAY ENDANGER LIFE AND WILL VOID ANY WARRANTY

All activity on the HD ALT and any associated head/post, 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 apparatus is installed and/or maintained by competent staff in accordance with the latest policies published by Network Rail such as Noticeboards etc. Where a specific competency is subject to periodic retest and certification, it should be valid throughout the time of the works.

A copy of these instructions shall be readily available. Anyone required to operate the HD ALT is to be fully conversant with them and deemed sufficiently competent (and where necessary, properly certified) to undertake the task by their supervisory chain.

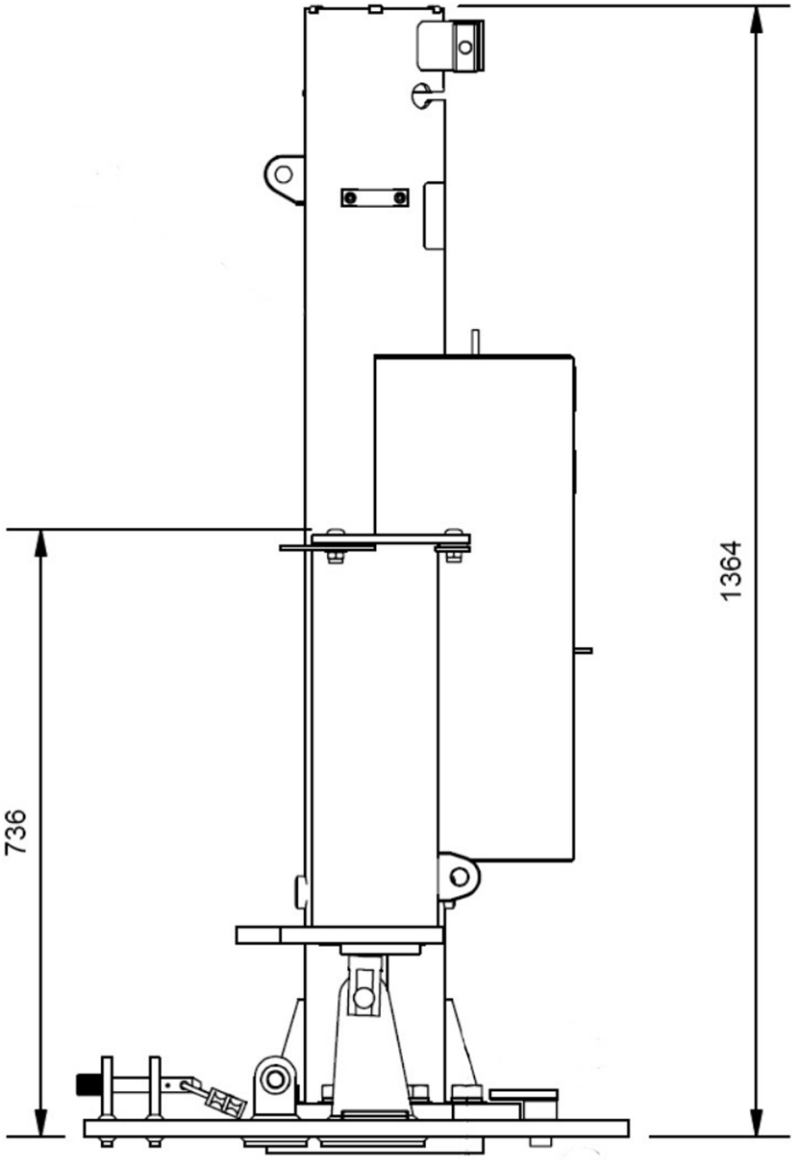
The latest version of this document is available from Unipart Dorman using the contact details on the back page or by visiting the Unipart Dorman website.

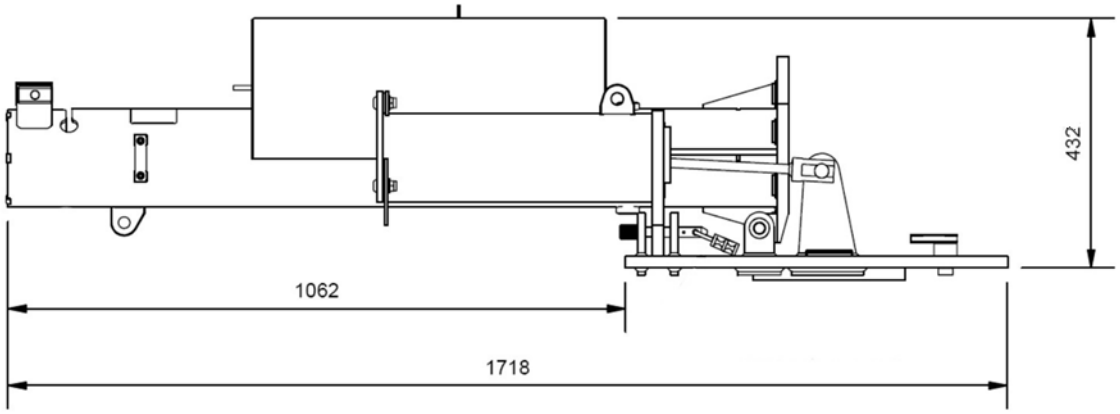
Operating Safely

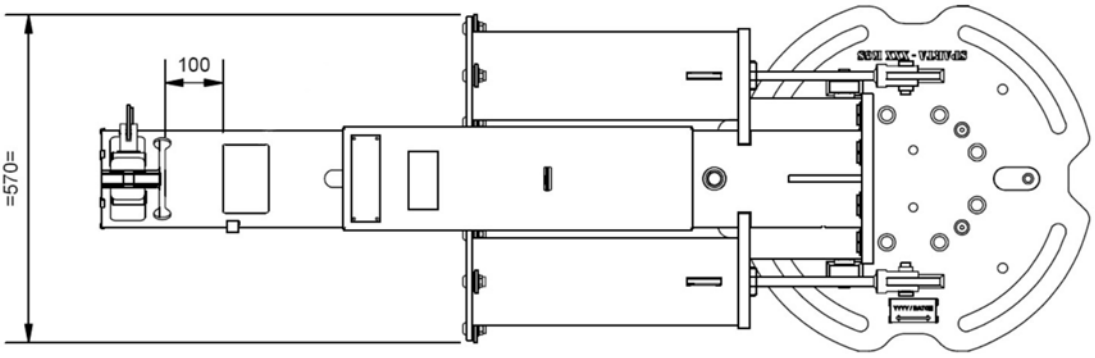
IF ANY DOUBT EXISTS ON THE SERVICEABILITY OF THE HD ALT, YOU ARE NOT SURE ABOUT ANY OF THE INSTRUCTIONS IN THIS DOCUMENT OR YOU ARE UNSURE OF

THE CORRECT WAY TO USE THE HD ALT, YOU SHOULD STOP WORK AND CONTACT YOUR SUPERVISOR IMMEDIATELY AND IF NECESSARY, UNIPART DORMAN FOR SPECIALIST ADVICE USING THE DETAILS ON THE BACK PAGE

Dimensions




432
1062
1718


100
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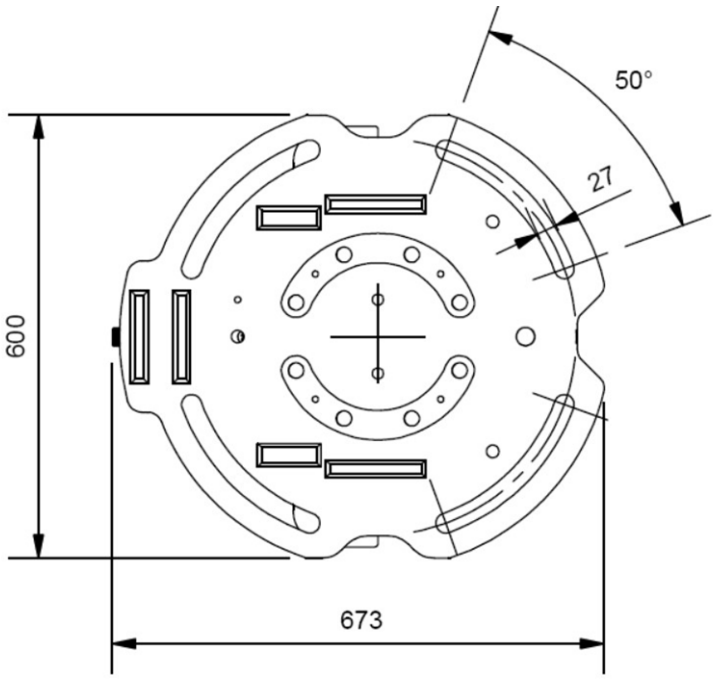
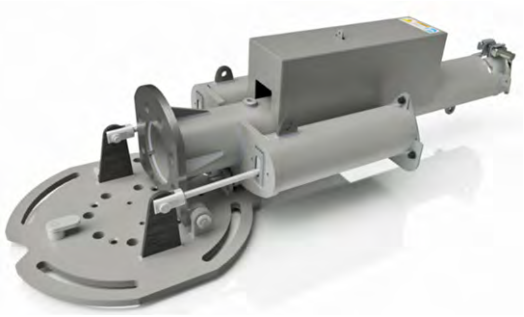

50°
27
600
673

Description

The Unipart Dorman HD ALT is a device designed for use in the railway environment as a means of erecting a signal and then forming the support structure for that signal. It is constructed of two main sub-assemblies. The base plate, designed to suit a BRS-SC-45 footprint and a tubular housing with two spring units attached connected by a main hinge. The main tubular housing has a signal securing collar and electrical connection box as constituent parts. The two sub-assemblies share mountings for the hold down pin and brackets. Lifting eyes are provided for ease of transport and installation.



Once the signal head and post are inserted and the HD ALT is in its vertical position the two sub-assemblies are secured together using 8 x M24 bolts and this action forms the main mounting interface between the signal and the foundation.

When vertical, all spring force is dispersed and there is no stored energy in the unit.

Signal Configuration and Lifting Data

The HD ALT system will support a wide range of Unipart Dorman signal heads as shown in Unipart Dorman drawing 0094/019441 which is available on the Unipart Dorman website.

The complete signal is available at varying heights as measured from the top of the railhead to the centre of the most restrictive aspect and a further dimension from the top of the rail to the top of the foundation. This data and the precise geographic location information is supplied by the customer against a unique signal identifier.

Each individual signal dataset then undergoes a set of structural calculations to confirm it complies with PAN/E/CE 0017 (Project Advice Note – Signal Structures – 'Form A' Guidance for Loading and Performance'). This, together with the restrictions on signal head configurations included within the generic F001, F002, and F003 submission, delivers a robust system that mitigates the risk of the safe working load on the Signal Post and HD ALT Assembly being exceeded.

Only if all of the deflection and safety calculations are within limits will a manufacturing, stress and loading drawing be produced for final sign off by the customer. Manufacturing begins when the signed drawing is received by Unipart Dorman.

The HD ALT spring system is designed to provide mechanical advantage to personnel engaged in manually lifting or lowering the signal about the vertical position. To give some guidance on the force required to operate the HD ALT system and consequently the *suggested* amount of workers needed to complete the task safely, Unipart Dorman has produced a lifting force graph as shown in Appendix A.

It is impossible to determine the site conditions, capability of the persons engaged in the operation and other variables at each individual location.

Therefore, the data shown in the Appendix is solely provided to *assist* in the formulation of individual site risk assessments and method statements etc.

Unipart Dorman does not accept any responsibility for misuse of this guidance data, which subsequently causes injury or damage

Storage and Movement

THE HD ALT SHOULD BE STORED IN THE HORIZONTAL POSITION AT ALL TIMES, SECURELY LOCKED DOWN WITH THE PIN AND PADLOCK.

ATTEMPTING TO MOVE THE UNIT TO THE VERTICAL POSITION WITHOUT A HEAD AND POST INSTALLED, MAY CAUSE SERIOUS INJURY AND ENDANGER LIFE DUE TO THE STORED ENERGY IN THE SPRING SYSTEM BEING RAPIDLY RELEASED

The HD ALT is supplied on a large pallet as shown below and may be stored in the open air. The fasteners used to secure the unit to the pallet shall not be used as mounting hardware during installation and all packaging materials when removed, should be disposed of in accordance with local regulations.

It should be noted that the HD ALT weighs typically 165kg not including the pallet weight and Unipart Dorman strongly recommends that it is moved by mechanical means, such as a forklift/palletiser etc or lifted and moved using the lifting eyes provided.

Exercise extreme care when handling in 3rd Rail and OLE areas even with isolation measures in place.

Tooling

With the exception of the sighting scope, the only tools required to install a HD ALT onto a pre-prepared foundation are simple hand tools such as Torque Wrenches, 30mm and 36mm Sockets/Spanners. A RBK-221 key to remove the locking pin padlock will be required.

Torque Loadings

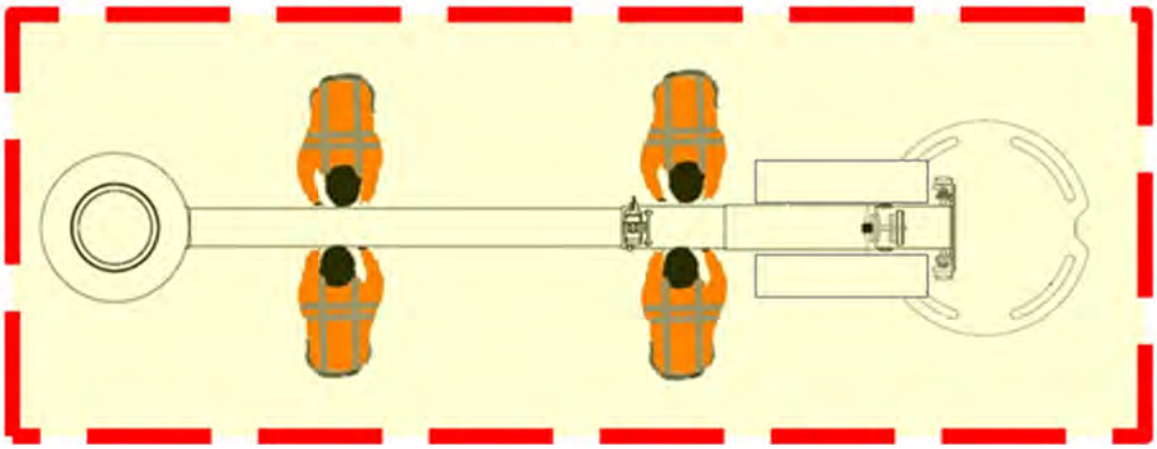
	Nm	Lbf/Ft
M24 Mounting Nuts	**195**	**143**
M20 Trunnion Bolts	**160**	**118**
Padlocking Lever	****Hand tight Only****	**-**
Scope Fitment Screws	****Finger tight Only****	**-**

Foundation and Site Checks

Foundations should be secure and clear of any obstructions with studs fitted as shown in the Pre Installation Checks below.

The laydown area for the signal shall not contain any obstacle or rising ground etc which would prevent the locking pin being inserted fully when the signal is reclined to its horizontal position

A zone equivalent to the swept area of the signal being raised/lowered plus a reasonable margin either side to allow adequate footing for personnel engaged in the lift should be established. This zone should be firm and level with all hazards that could cause slips, trips or falls removed.



Example Safety Zone in place for lifting/lowering a signal

This image is for illustrative purposes only and does not represent the number, or placement of workers to enable a safe lift

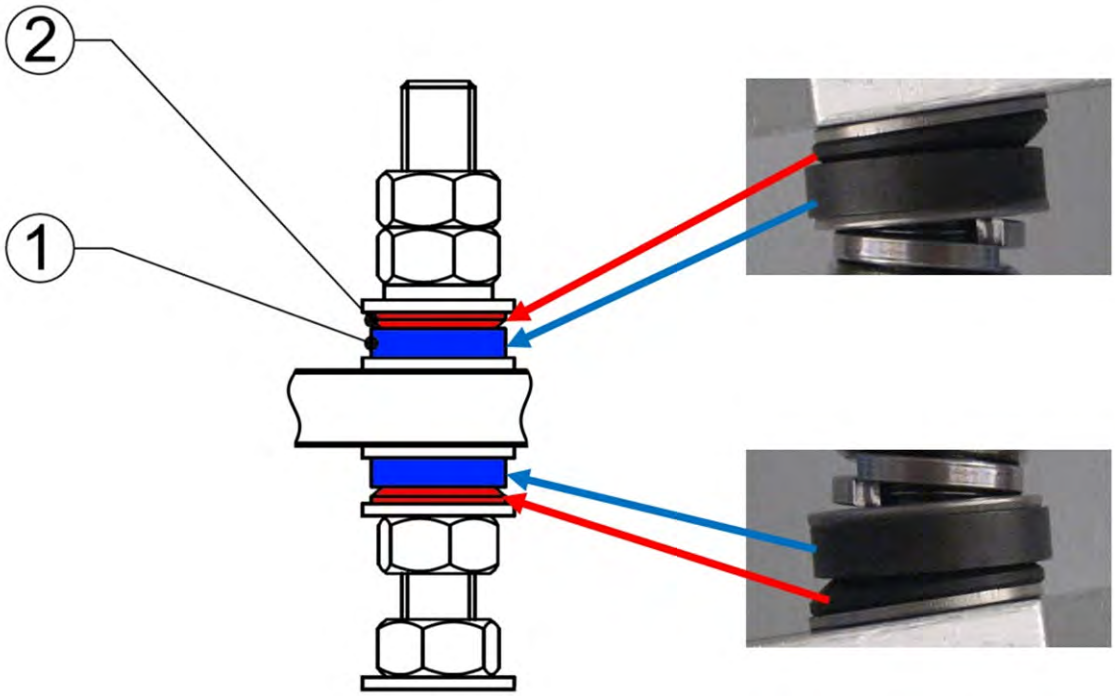
During lifting and lowering all workers should stand to the side of the assembled signal and never enter its swept area unless the unit is either secured in the horizontal using the locking pin or securely bolted down in the vertical position.

Pre Installation Checks

Prior to mounting the HD ALT 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 and at least 200mm of threaded stud is available above the foundation top. The mounting studs should be clean, free of damage and lubricated.

Ensure that the Cup and Cone Washer Pack and the 8 x M24 Bolts with their flat and spring washers are inside the electrical connection box. If the HD ALT is not to be installed immediately it is recommended the connection box is re-secured with a cable tie or padlock.

Mounting nuts and the cup and cone washers shall then be fitted strictly in the sequence shown below other spring and flat washers are fitted in accordance with the civils design or good engineering practice. The distance from the bottom of the HD ALT base to the foundation top surface shall be at least 80mm.



(The nut shown at the bottom of the 'stack' above is a representation to illustrate the method of securing the studs in grillage etc. and does not form part of the mounting arrangement).

The only mounting hardware supplied with the HD ALT is the 'cup and cone' washer set (items 1&2 on the illustration above). All other hardware is to be provided by the customer.

Spare washer sets are available using the order detail below.

ITEM	PART No.	QTY	DESCRIPTION
1	B18.17227	8	M24 SPHERICAL WASHER DIN 6319 TYPE D FEMALE
2	B18.17228	8	M24 WASHER DIN 6319 TYPE C MALE

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

Where the HD ALT is to be installed in advance of the post and head installation, it is essential to leave it in the horizontal position and correctly secured using the retaining pin which is locked in place by the R pin and an RBK-221 padlock

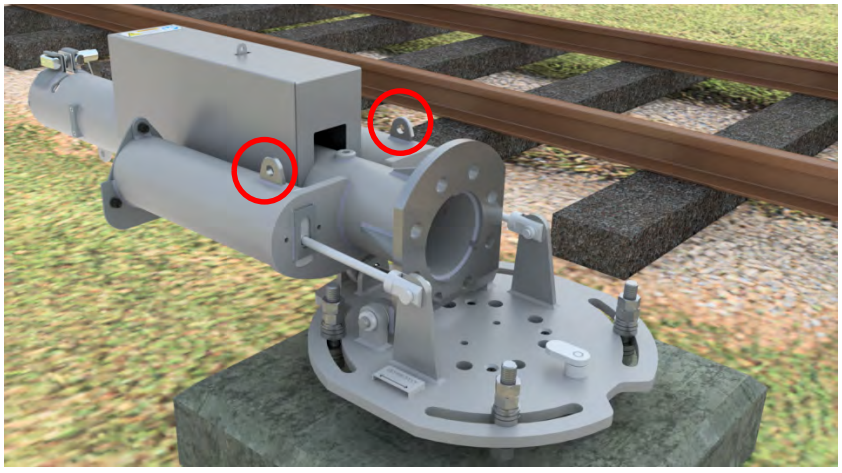
Unlike the standard ALT and Winch Trunnion/Enclosure Base, it is **not** possible to carry out the alignment of the signal without the head and post installed, as the HD ALT cannot be safely raised to the vertical position without this load in place.

Installation

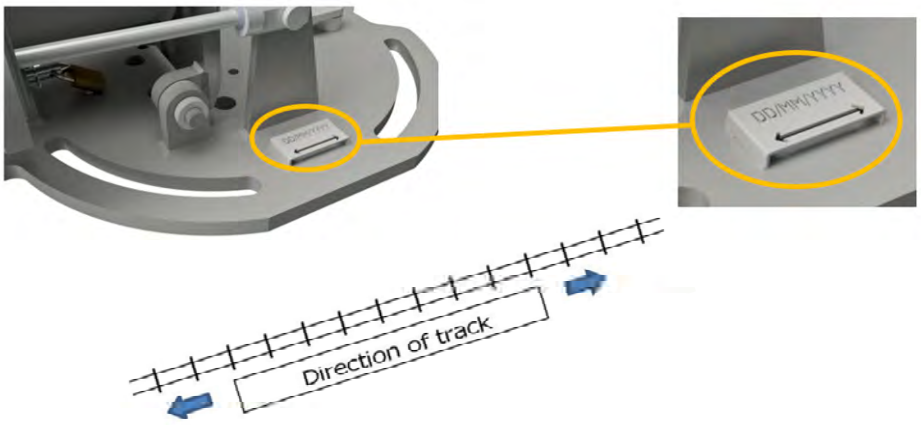
IF ANY DOUBT EXISTS ON THE SERVICEABILITY OR OPERATION OF THE HD ALT AND/OR THE SIGNAL YOU SHOULD CONTACT UNIPART DORMAN IMMEDIATELY

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.

Prior to the installation of the equipment, the lift procedure needs to be planned to in accordance with all relevant regulations to ensure a safe method of working.



Using the lifting eyes highlighted in red shown in the image above, lift the HD ALT into position onto the four 24mm studs taking care to align the arrow marked on the Manufacturer Information Plate on the HD ALT baseplate parallel with the direction of the running rail. Then fit the remaining washers and nuts to secure it onto the studs



Raising &Lowering the HD ALT

The HD ALT is normally delivered to site in the horizontal position with the retaining pin secured in place with an R clip and a RBK-221 padlock.

The Lockout warning tag and lanyards securing the pin and R Clip are not shown in this illustration for clarity

A set of 8 off hex head bolts and washers are provided inside the electrical connection box to secure the trunnion in its vertical position.

ONLY WHEN THE SIGNAL POST IS CORRECTLY INSERTED SHOULD THE RETAINING PIN BE REMOVED AND THE SIGNAL RAISED TO THE VERTICAL POSITION.

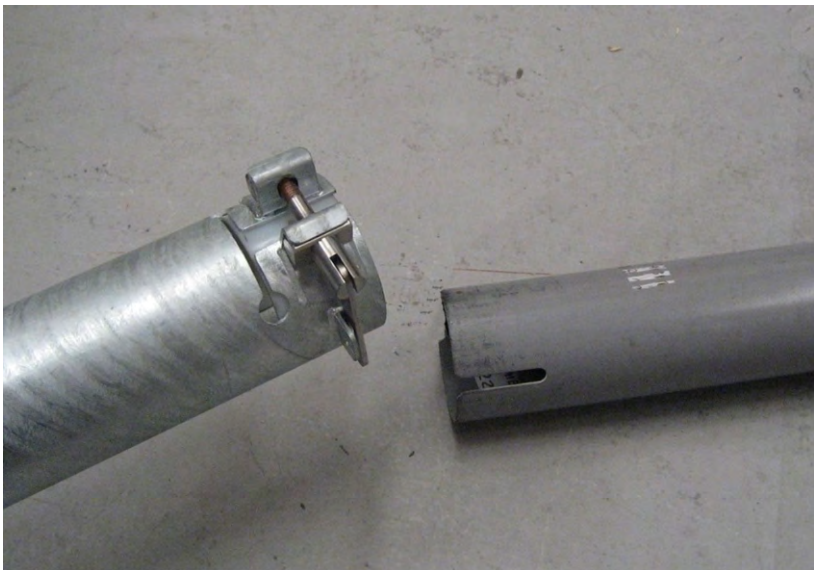
DO NOT ATTEMPT TO MOVE THE HD ALT FROM HORIZONTAL TO VERTICAL OR VICE VERSA WITHOUT A SUITABLE HEAD AND POST FITTED

Inserting the Post and Erecting the Signal

LIFTING OPERATIONS SHOULD NOT BE UNDERTAKEN WHERE THE GUSTING WIND SPEED EXCEEDS 26 MILES PER HOUR (48 Km per Hour)

Any attempt to lift the signal post into a vertical HD ALT, or to lift a pre-assembled post and HD ALT onto a foundation using strops etc around the signal head may result in undetectable damage to the GRP post / head assembly.

The bore of the HD ALT 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 HD ALT bore. 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 HD ALT Post Clamp, orientate the post correctly and slide it into the HD ALT until the keyways are engaged. The plug coupled cable is routed out of the access hole on the GRP post and the matching hole in the HD ALT then into the connection box. Sufficient cable should be

drawn through into the connection box to enable the plug coupler to be positioned onto the coupler retention bracket.

Check that the post cannot rotate in the HD ALT bore and that the painted witness mark (indicated below) on the post is level with the top of the HD ALT. Do not fully tighten the locking collar until the signal is in the vertical position to allow for any settling.

MOVING THE SIGNAL TO THE VERTICAL POSITION SHOULD ONLY BE DONE FROM A POSITION THAT DOES NOT REQUIRE THE OPERATOR(S) TO STAND DIRECTLY IN LINE WITH THE ARC THAT THE TUBE ASSEMBLY AND POST MOVES THROUGH.

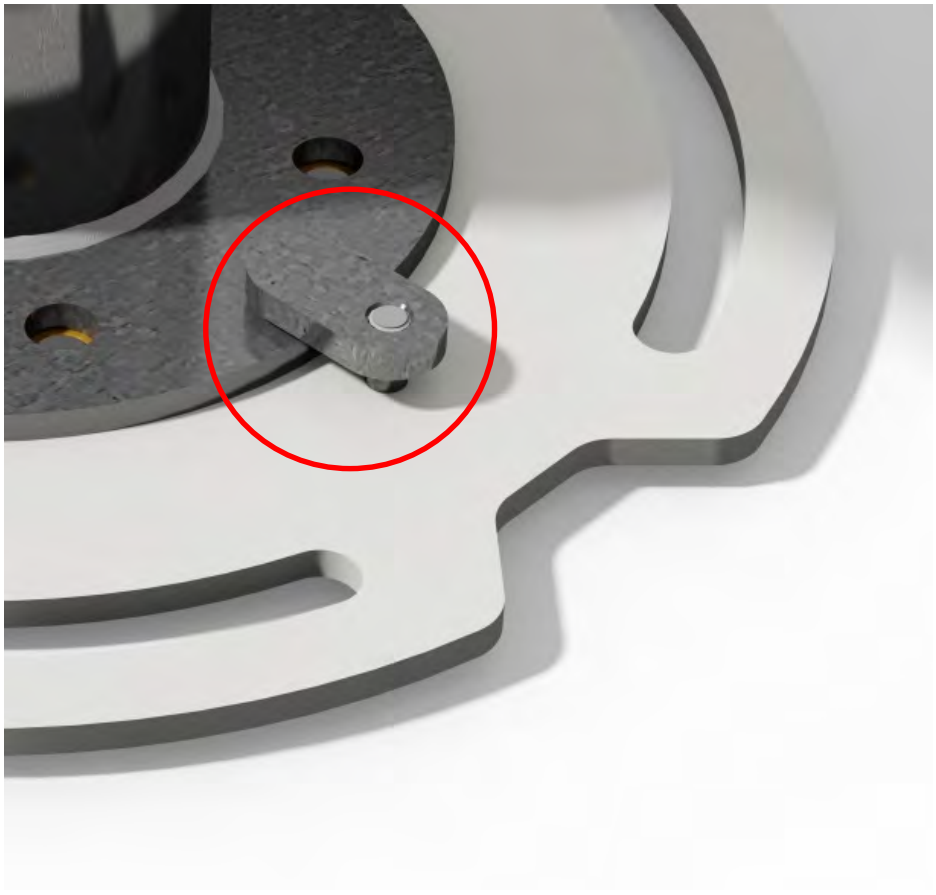
NOTE: The spring system is designed to provide assistance to staff as the signal is raised and they should remain in control of the motion at all times

To raise the assembled signal and HD ALT, position an adequate number of workers around the sign and have them ‘take the strain’ to control any movement of the signal and remove the retaining pin from the base plate. The post can then be lifted into the upright position using correct manual lifting technique augmented by the spring system.

IT IS VITAL THAT CONTROL OF THE MOVABLE SECTION AND HEAD/POST IS RETAINED AT ALL TIMES BY THE PERSONNEL CARRYING OUT THE LIFTING OPERATION.

THE COMBINED WEIGHT OF THE HEAD/POST MAY OVERCOME THE SPRING FORCE IF CONTROL IS LOST AND CAUSE IT TO FREE FALL TO THE GROUND WITH POTENTIAL RISK OF DAMAGE OR INJURY.

As soon as the Signal and Tube Assembly is in the vertical position, the latching cam should be rotated so it locks the two plates together as shown to prevent uncontrolled signal movement due to wind action etc. The 8x M24 bolts and correctly assembled washers should be fitted without delay to secure the signal in the vertical position.



Do not rely on the latching device to provide adequate security. This is only achieved by fitting all eight bolts to the base

All mounting hardware should then be torque loaded to the values shown in the table in the Section “Torque Loadings”.

Finally, hand tighten the HD ALT collar and secure with a padlock.

Electrical Connection

The infrastructure and signal cables are connected using standard plug couplers. To connect them, align the keyway and lug inside the connector shells then 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)

This space intentionally blank

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 that may require replacement of either the infrastructure cable or the signal module and cable depending on which plug coupler is damaged

Once the connection is made, the Plug Couplers should be stowed in the connection box with the signal cable fitting into the cutout in the mounting plate, making sure the cable maintains a smooth bend radius.

Enough spare cable is provided on the signal side of the connection to allow the signal to be folded down without disconnection. This excess is simply tucked back into the post for stowage.

Fit the connection box cover ensuring the cable is central in the cut out at the base of the box and the cable is not damaged or pinched. Secure the cover with a padlock.

The HD ALT 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, however a 17 mm through hole is provided on the base plate.

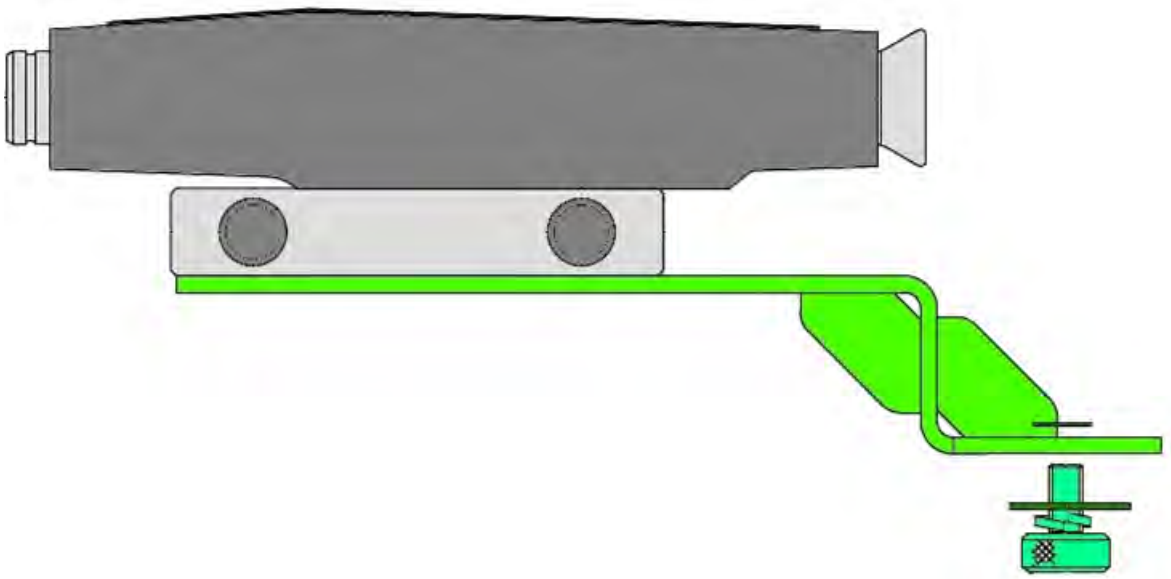
Signal Alignment

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

Detachable Alignment Scope

The Unipart Dorman Detachable Alignment Scope is an optical device that allows accurate signal alignment and is common to both iLS and CLS LITE. It is stored in a bespoke carrying box and should be returned to Unipart Dorman annually for an alignment verification check.

There is an adaptor bracket available that enable a suitable camera to be fitted to the scope. The camera and mount are subject to their own separate instruction sheets available on the Unipart Dorman website.



If the Scope lenses require any cleaning to be carried out, the only medium approved is water and proprietary detergents.

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

Ensure there is no grit etc. on the lens and then using a lint free cloth moistened with the water detergent solution, carefully wipe the lens clean before using a dry second cloth to remove any water spotting etc. and give a final buffing.

When the scope is moved from a cold to hot environment or vice versa there may occasionally be some temporary fogging of the internal lenses which will clear when the temperatures inside and outside the scope equalise.

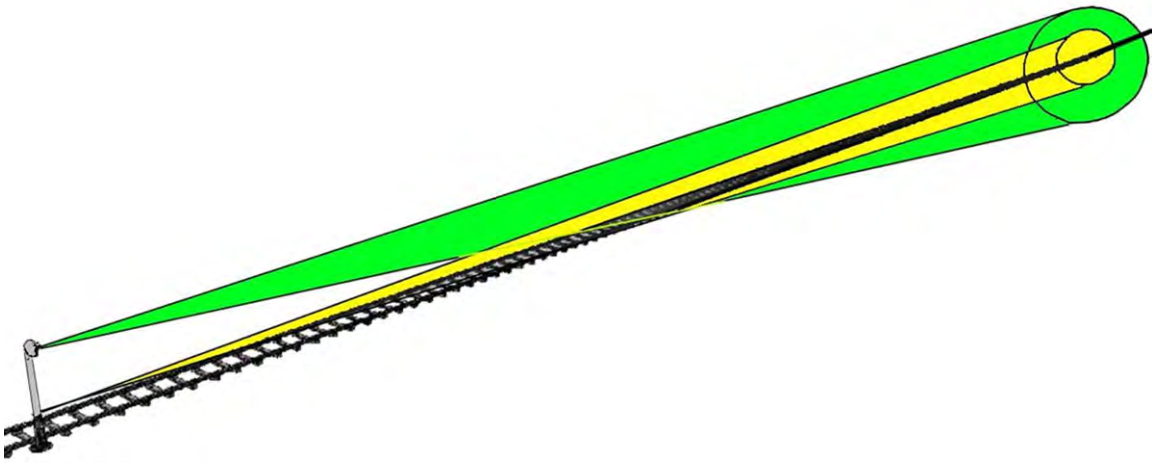
Do not attempt to disassemble the scope to gain access to the internal lenses as this will disturb the optical alignment and the scope will need to be returned to Unipart Dorman for repair and recertification

The signal shall be aligned to a point on the ground when sighted from the HD ALT scope fitting point. This includes where CLS LITE or Classic CLS are installed on a GRP post as they are manufactured with fixed geometry that allows ground sighting as opposed to sighting in the head

General Notes

The Signal Sighting Form (SSF) will provide the definitive, signal specific alignment details and should always be consulted prior to commencement of work

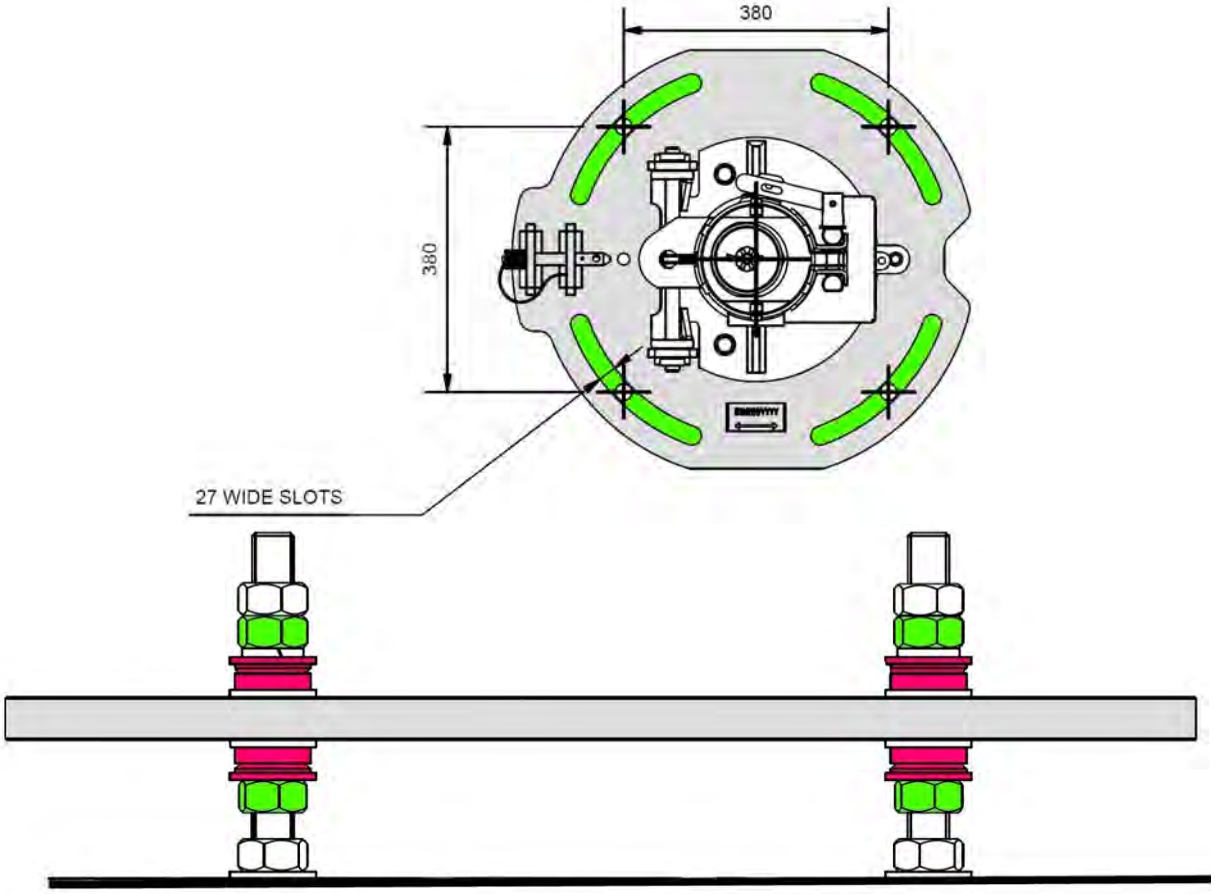
The signal should not be aligned to a target board when the sighting scope is fitted onto the Trunnion. The illustration below shows a representation of the light beam shown in green and the Alignment scope field of view in yellow, converging at a point on the ground at a distance determined by the Signal Sighting Form



Fitting the Scope

The removable alignment scope unit should be fitted to the Trunnion by screwing the two knurled screws into the threaded holes as shown in the illustration below. If a camera and bracket are to be fitted to the scope for recording purposes then please refer to the instruction leaflet, part number C65.65569 available on the Unipart Dorman Website.

Using the alignment scope to provide visual cues, the signal is adjusted horizontally by rotating the base within the kidney slots and vertically by adjusting the angle of the HD ALT using the securing and adjustment nuts and the spherical washer sets shown in red.



The spherical washer sets are specified as a mandatory feature in the Network Rail Product Acceptance and are essential for the tilt adjustment. Therefore, they shall not be omitted.

When the signal is aligned correctly to the point on the signal sighting form and any photographic records etc are obtained, ensure all of the mounting nuts are correctly torque loaded as shown below and the alignment scope is removed and stored in its **protective case.**

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

Torque Loadings

	Nm	Lbf/Ft
M24 Mounting Nuts	**195**	**143**
M20 Trunnion Bolts	**160**	**118**
Padlocking Lever	****Hand tight Only****	**-**
Scope Fitment Screws	****Finger tight Only****	**-**

When torque loaded to the correct value, there shall be at least one full 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 above, the foundation should be checked for misalignment or slippage.

Post Installation Checks

The Signal assembly has been designed for Plug and Play installation. 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. This advice does not supersede any instructions issued by Network Rail.

Module Replacement (CLS Module)

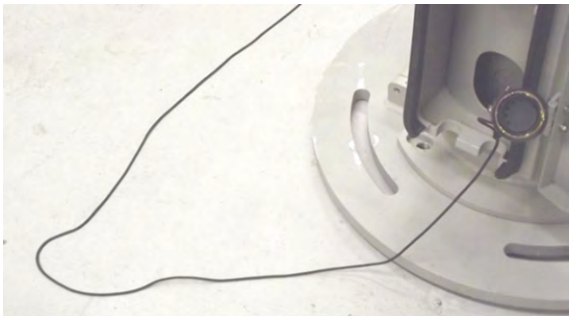
To reduce the amount of spares that need to be held, all iLS Colour Light Signal Modules have the splitter cable for the second Yellow module attached. If the signal only uses a single Red Yellow Green module, this splitter cable will have an IP65 blanking cap fitted and it will be secured onto the cable clamp bar.

Prior to lowering the signal ensure that you have the correct replacement module, especially with Medium Range signals a check to confirm whether it is a wide or narrow beam module and that matches the unit to be replaced.

The signal should be lowered to the horizontal position and locked into place.

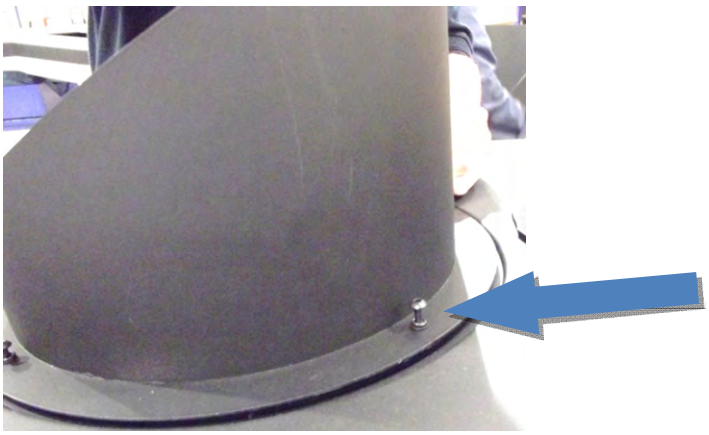
Remove the Connection Box cover and disconnect the plug coupler. Attach a piece of tracer cord which is approximately 1.5m longer than the post height to the signal post connector and temporarily secure the other end to a convenient point on the Trunnion. This will allow the new plug to be inserted down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

(This step is not required if only replacing the ‘top’ yellow module, as it disconnects at the short tail cable inside the head)



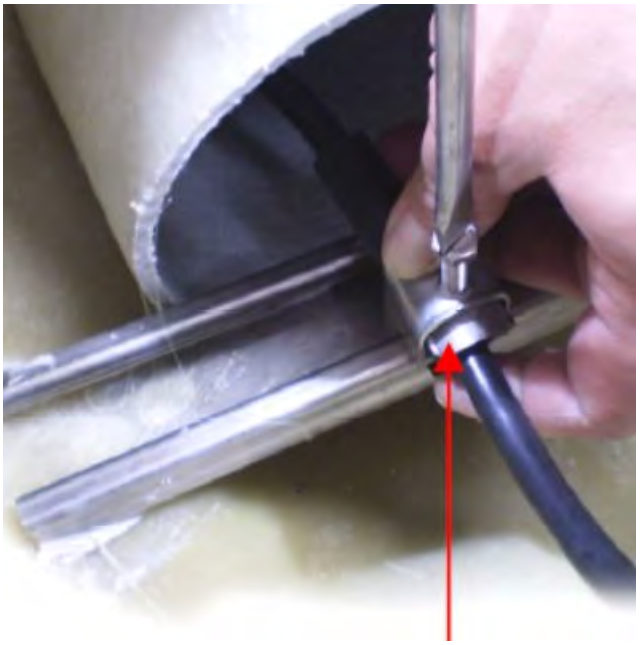
Winch Trunnion shown for illustrative purposes, HD ALT follows the same principle

Remove the existing module by undoing the screws using a 5mm Allen Key/Driver.



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.

Remove and retain the cable clamps using a flat blade screwdriver



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

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 post and into the connection box. (The tracer cord can then be removed)

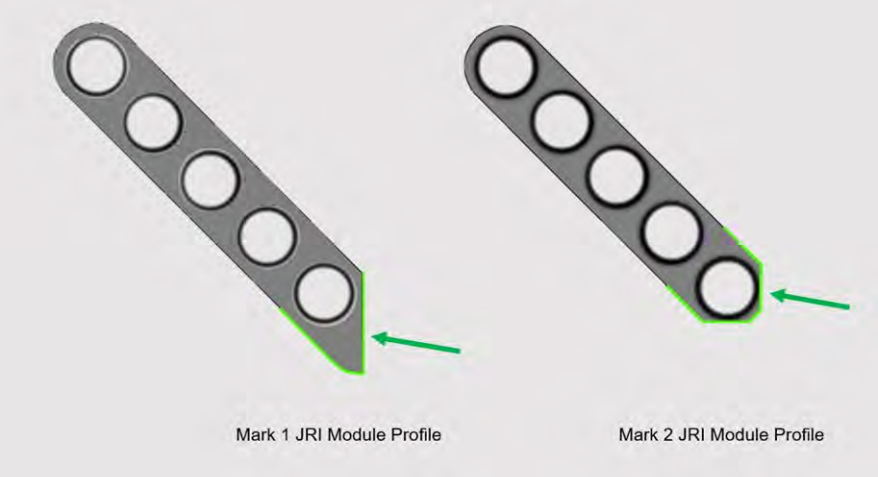
Reconnect the splitter cable if the signal has a second module or fit the blanking cover if not and refit the cable clamp(s). Carefully stow any excess cable inside the post/head and secure the new module in place using the socket headed screws.

The signal should be electrically connected as shown in the installation section 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.

Module Replacement (Other Signal Modules)

The Junction Route Indicator Modules were modified to Mark 2 standard to increase interoperability by changing the profile so one module would fit each arm position (1,2,4&5). Ensure the replacement module you have is the correct build standard prior to lowering the signal.



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 for lowering and raising the signal should be followed.

Simply unscrew all the captive screws and withdraw the required module sufficiently to disconnect its plug coupler (which may be in the head or in the connection box depending on the module type) and remove.

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

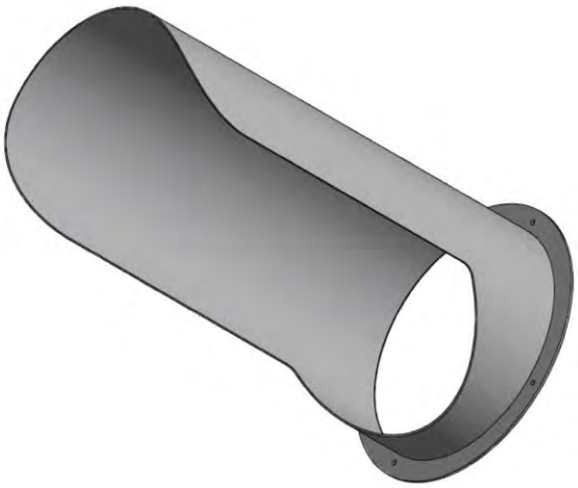
Additional Visors

Unipart Dorman iLS signals are designed to be very resistant to sunlight effects such as washout or phantom, there may be however, a very small number of signals that directly face East/West that may suffer from the effects of low winter sun. To mitigate these effects Unipart Dorman has a range of extended visors available.

The fitting kits all come with detailed instructions, which are also available from Unipart Dorman

Lens cleaning of iLS signals with extended visors fitted should be scheduled at an interval determined by local policy where the signal is being maintained under ROSE. This is because the lens is no longer directly exposed to the free-falling rain necessary for self-cleaning.

Colour Light Signal



Cat Number	Part Number	Description
086/007488	B20.19436	CLS 600mm Extended Visor
086/007485	B20.19433	CLS 600mm Extended Visor 135° LH Obscuration
086/007486	B20.19434	CLS 600mm Extended Visor 135° RH Obscuration

Junction Route Indicator Arms

The JRI Visor Kit is available in Mark 1 or 2 variants and this is determined as shown in the Module replacement section above

Cat Number	Part Number	Description
086/009514	D04.03540	iLS JRI Visor Fitting Kit Position 1 (Mk1 Indicators only)
086/009515	D04.03541	iLS JRI Visor Fitting Kit Position 4 (Mk1 Indicators only)
086/009516	D04.03542	iLS JRI Visor Array Fitting Kit Position 1
086/009517	D04.03543	iLS JRI Visor Fitting Kit Position 2
086/009518	D04.03544	ILS JRI Visor Fitting Kit Position 4
086/009519	D04.03545	iLS JRI Visor Fitting Kit Position 5

Position Light Signal

Cat Number	Part Number	Description
086/009531	D04.03546	iLS PLS Visor Fitting Kit

Wedge Inserts

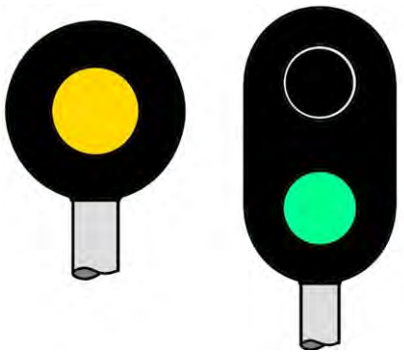
The Junction Route Indicator and Position Light Signal modules can be fitted with a tapered insert to depress the beam angle by 1.5° if required. Fitting the wedge is covered in a separate document available from Unipart Dorman. These inserts should only be ordered and fitted after consulting with the Signal Sighting Chair responsible for that particular signal.

Cat Number	Part Number	Description
086/009532	D04.03554	iLS JI Pos 1 or 4 Tapered Insert (1.5°), Mk1
086/009533	D04.03555	iLS JI Pos 1 or 4 Tapered Insert (1.5°), Mk 2
086/009534	D04.03556	iLS JI Pos 2 or 5 Tapered Insert (1.5°), Mk 2
086/009535	D04.03557	iLS Subsidiary Signal Tapered Insert (1.5°)

Blanking Plates

Colour Light Signal

To deliver a taller backboard 3 Aspect Colour Light Signal, a Type 50 head is used with a blanking plate fitted over the aperture where the second Yellow module would ordinarily fit.



3 Aspect CLS options showing a Type 01 and Type 50 with Blanking Plate fitted

Cat Number	Part Number	Description
086/009391	B20.19380	iLS CLS Module Blanking Plate

Position Light Signal

Used where a signal has its aspect configuration changed at site and the module is removed. The plate uses the same mounting screws as the removed module.

Cat Number	Part Number	Description
Contact Unipart Dorman	B20.19283	iLS PLS Module Blanking Plate

Maintenance Activity

Both the HD ALT and iLS/CLS LITE signals are designed to be maintenance free. However, Network Rail may mandate some 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.

Signal Husbandry

If the HD ALT/Signal requires any cleaning activity to be carried out, the only medium approved is water with the addition of proprietary soap based detergents if required.

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

Service and Repair

The HD ALT, post/signal head and LED modules have no user maintainable elements (apart from general husbandry requirements). The units are intended to be replaced completely should there be any failures.

End of Life Disposal

Electronic component parts and assemblies in Unipart Dorman modules are designed to be disposed of in accordance with the requirements of the latest version of the Waste Electronic and Electrical Equipment Regulations.

All other parts and assemblies are recyclable and end users should consult local and national regulations prior to disposal.

Please contact Unipart Dorman for full details of the procedure to be undertaken when a signal is permanently withdrawn from service for disposal.

Product Support

Unipart Dorman has developed a comprehensive support package including product overview and awareness sessions for the HD ALT and its signal range and this can be arranged by contacting Unipart Dorman using the details on the back page.

Due to the potential for mishap with the amount of stored kinetic energy in the spring system, Unipart Dorman strongly recommends staff attend one of these sessions and always familiarise themselves with the content of this manual before attempting any activity on HD ALT

Appendix A - HD ALT/Signal Lifting Force Data

The data shown in this Appendix is provided to <u>assist</u> in the formulation of individual site risk assessments and method statements only. It is not to be used as a generic or definitive document in its own right and Unipart Dorman cannot accept any responsibility for any loss of life, injury or damage caused by its use as such.

Calculation Parameters

A 70kg signal head has been used for the calculations mounted at the top of a 57kg post.

An example signal height of 4.5 metres from aspect centre to signal base (with lifting point at 3.5 metres) has been used.

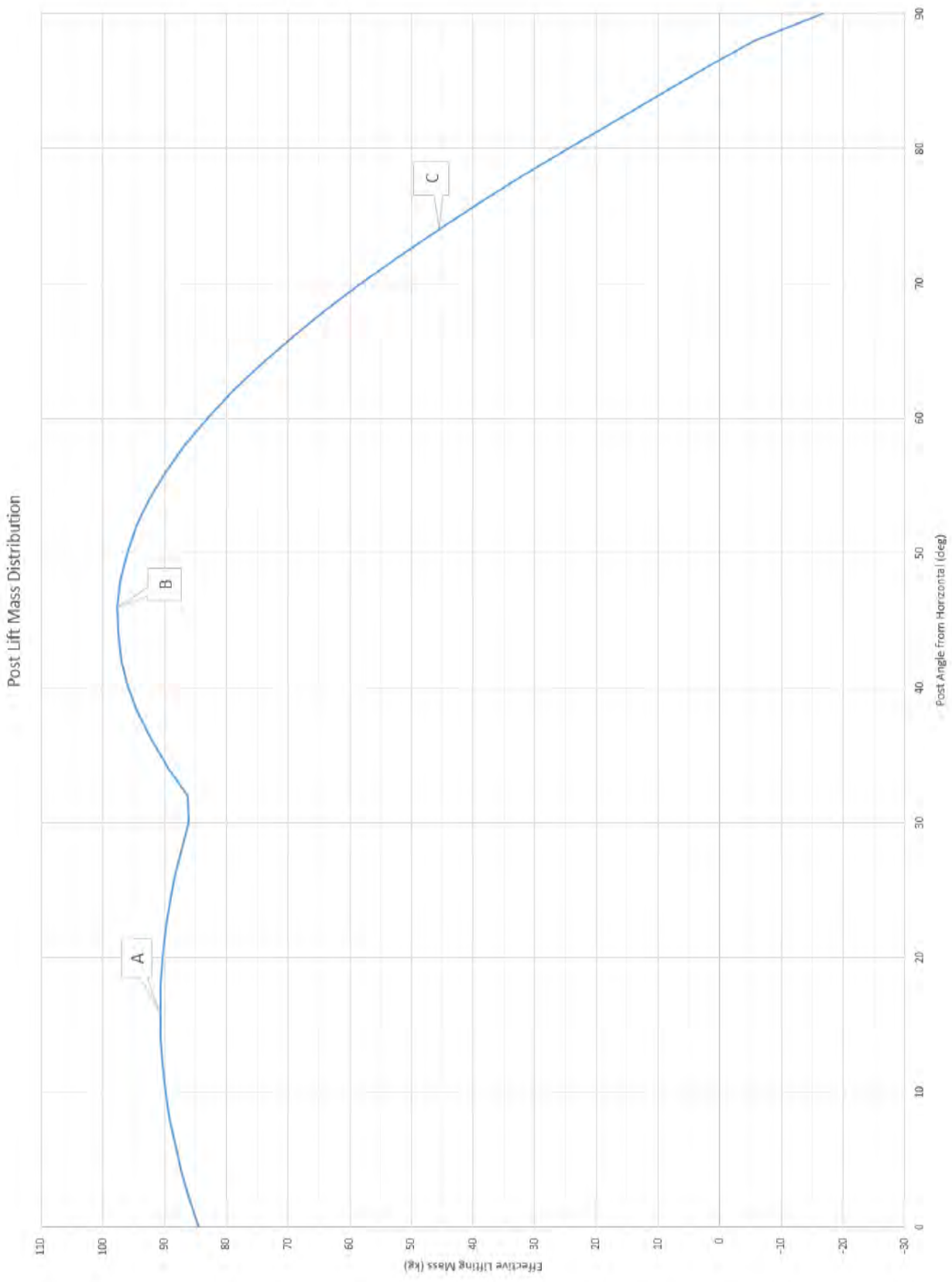
The dataset uses the lowest height, 1.82m, of the standard height range of a person (5th percentile women to 95th percentile men).

The distance from the ground to the lower part of the tube when it is horizontal is 190mm.

(Please note that the parameters above were chosen as an example only and do not form any limitation on the signal type, height or liner which can be specified).

The information used and shown in Table 1 has been calculated in Kilograms of weight applied as the unit is manoeuvred through an arc. It is anticipated that during a lift, the operators will be moving closer to the pivot point as the signal is raised and further away whilst being lowered which causes the 'force required factor' to change as the signal post angle changes.

Position	Height Raised	Movement Forward	Lift Angle	Weight
A	1.82m	0m	16°	91Kg
B	1.82m	1m	45°	98Kg
C	1.82m	1.5m	75°	46Kg

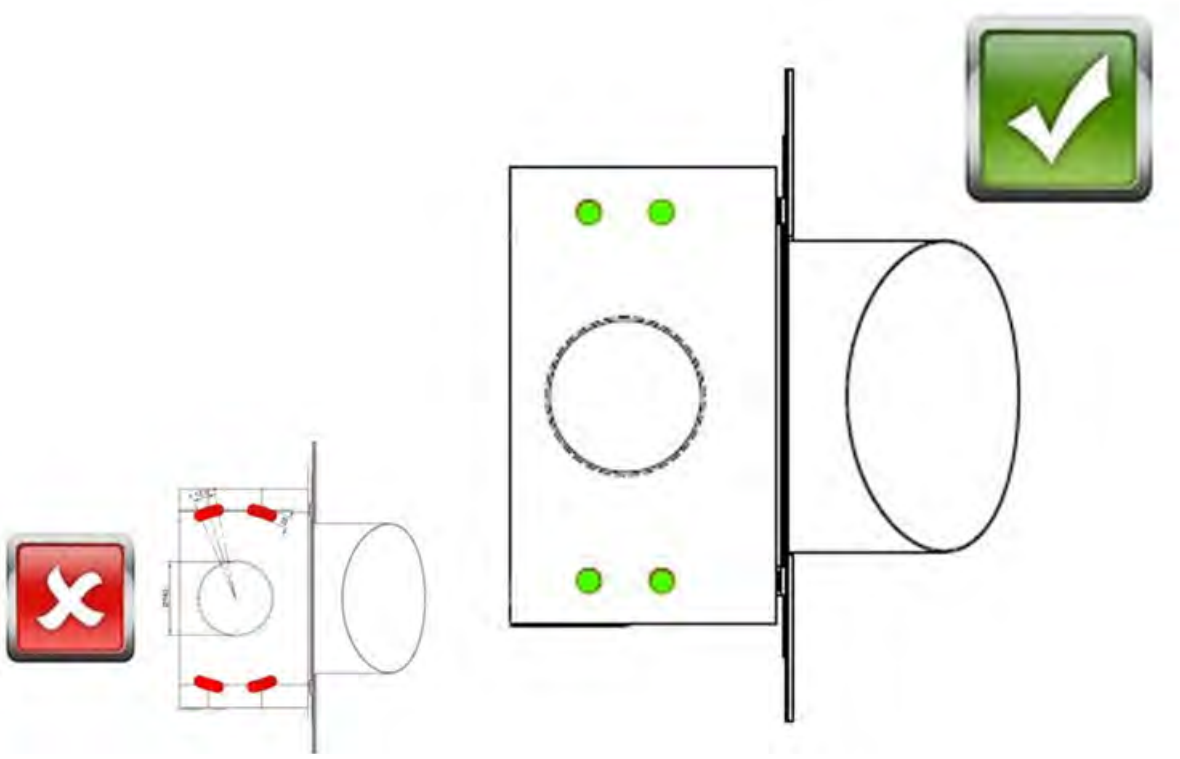

Post Lift Mass Distribution
A
B
C
Effective Lifting Mass (kg)
110
100
90
80
70
60
50
40
30
20
10
0
-10
-20
-30
0
10
20
30
40
50
60
70
80
90
Post Angle from Horizontal (deg)

Appendix B - HD ALT and Offset Post Assembly

Introduction

The Unipart Dorman Heavy Duty Assisted Lift Trunnion (HD ALT) with Offset Post uses twin reactive springs controlled by a fulcrum system which allows the force required to move the signal post from the horizontal to vertical to be equalised across the full range of movement. This means that it can be raised and lowered by hand without any additional mechanical handling equipment.

The Offset Post is designed to only interface with a special to type range of CLS LITE signals which have no adjustment facility in the head's base as the alignment is done using the slots in the HD ALT. The kidney slots have been replaced with through holes to ensure a fixed correlation between the beam and the base.



It is physically possible to use a CLS LITE with the standard kidney slot base but this would be contrary to the Product Acceptance Unipart Dorman holds for this product.

Safety

Activities which may pose a hazard will have the following highlighters:

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

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.

This Operation and Maintenance document is designed to illustrate safe methods of work and highlight potential dangers to workers. It is a generic guide only and the content is not to be used to substitute or justify the omission of good engineering practices.

THIS APPENDIX SHALL BE READ IN CONJUNCTION WITH THE HD ALT O&M MANUAL.

FAILURE TO ADHERE TO THE INSTRUCTIONS AND WARNINGS CONTAINED IN THESE PUBLICATIONS COULD RESULT IN SERIOUS INJURY, ENDANGER LIFE AND/OR CAUSE CATASTROPHIC DAMAGE TO THE EQUIPMENT AND SURROUNDING INFRASTRUCTURE

The weight of the HD ALT (165Kg) is clearly marked and installers should ensure that they have sufficient measures in place to ensure a safe lift. The marked weight is for the HD ALT only and does not include any pallet or packaging weight.

The Offset Post weight varies with length and is clearly marked on the post and the weight of the heaviest variant of the CLS LITE (4 Aspect Signal) is 33Kg.

DO NOT ATTEMPT TO REMOVE THE SAFETY PIN AND PADLOCK FROM THE HD ALT UNLESS A HEAD/POST IS FITTED CORRECTLY INTO THE BORE.

REMOVING THE HOLD DOWN DEVICES WITHOUT THIS LOAD MAY CAUSE SERIOUS INJURY AND ENDANGER LIFE DUE TO THE STORED ENERGY IN THE SPRING SYSTEM BEING RAPIDLY RELEASED

The HD ALT and Offset Post shall not be used for any purpose other than that described in Network Rail Product Acceptance Certificate PA05/06503. If it is used for any other purpose, Unipart Dorman will not accept any responsibility for damage, injury or death caused by the activity.

A copy of these instructions shall be readily available. Anyone required to operate the HD ALT with Offset Post and CLS LITE Signal Assembly is to be fully conversant with them and deemed sufficiently competent (and where necessary properly certified) to undertake the task by their supervisory chain. The latest version of this document is available from Unipart Dorman using the contact details on the back page or by visiting the Unipart Dorman website.

Operating Safely

IF ANY DOUBT EXISTS ON THE SERVICEABILITY OF THE HD ALT, THE OFFSET POST OR CLS LITE HEAD; YOU ARE NOT SURE ABOUT ANY OF THE INSTRUCTIONS IN THIS DOCUMENT OR YOU ARE UNSURE OF THE CORRECT METHODS REQUIRED, YOU SHOULD STOP WORK AND CONTACT YOUR SUPERVISOR IMMEDIATELY AND IF NECESSARY CONTACT UNIPART DORMAN FOR SPECIALIST ADVICE USING THE DETAILS ON THE BACK PAGE

Signal Lifting Force Data

The HD ALT and Offset Post Assembly is available at varying heights as measured from the top of the rail head to the centre of the most restrictive aspect and an offset dimension measured from the centre of the aspect to the centre of the post.

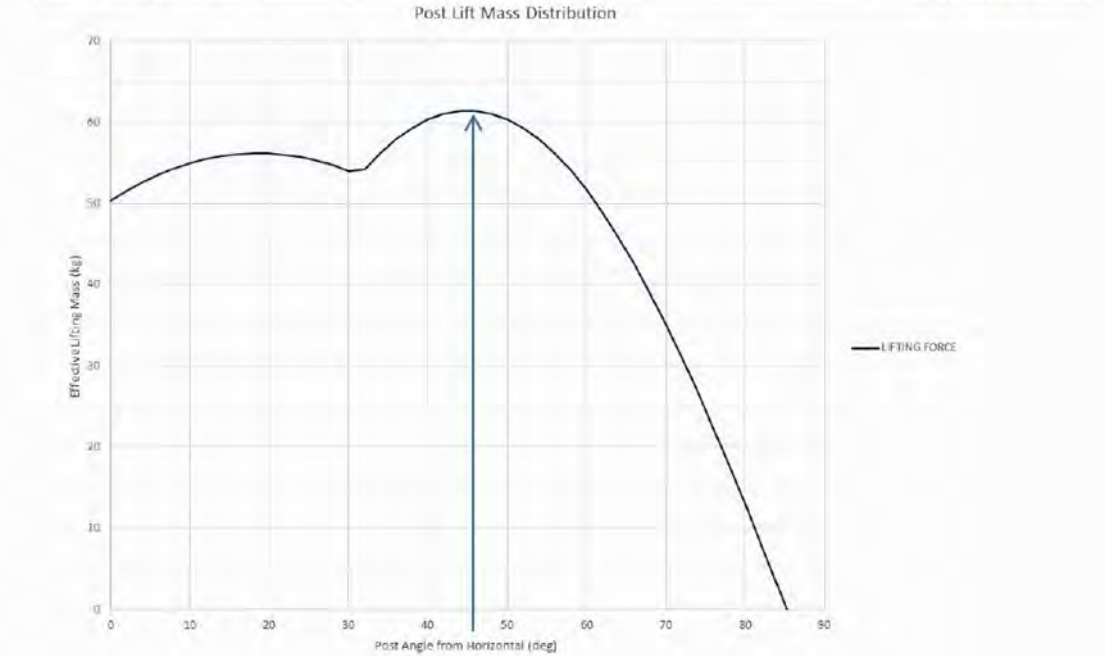
Each individual signal undergoes a set of structural calculations to confirm it complies with PAN/E/CE 0017 (Project Advice Note – Signal Structures – 'Form A' Guidance for Loading and Performance') and this, together with the restrictions on signal head configurations included within the generic F001, F002, and F003 submission delivers a robust system that mitigates the risk of the safe working load on the Signal Post and HD ALT Assembly being exceeded.

Part of the Offset Post design process was to calculate a 'worst case' for the assembly weight and the CLS LITE 4 Aspect Signal which has a maximum weight of 33kg was chosen for the calculations installed on a 66kg Post with an 890mm offset (CL of post to centre of the red aspect) and a signal height of 4500mm.

(These parameters were chosen as an example only and do not form any limitation on the CLS LITE type, height or offset which can be specified).

The dataset is based upon a 'standard' UK man who is 5ft 10inches (1.78m) tall and with average build. The force has been calculated in Kilograms applied as the unit is manoeuvred through an arc from horizontal to vertical. The complete post and head have been assessed using this calculation and a lifting force graph has been generated as shown below.

Position	Angle	Height Raised	Movement Forward	Weight
A	0°	0m (Initial Lift)	0m	50.2Kgs
B	26°	2m	1m	55.2Kgs
C	35°	2m	2m	57.0Kgs
D	56°	2m	3m	56.0Kgs
Peak Load	46°	-	-	61.5Kgs



It is impossible to determine the site conditions, capability of the persons engaged in the operation and other variables at each individual location. Consequently, the data shown in this Appendix is only provided to *assist* in the formulation of individual site risk assessments and method statements.

Unipart Dorman does not accept any responsibility for any misuse of this guidance data which subsequently causes injury or damage

Storage and Movement

The HD ALT is supplied on a large pallet as shown below and the Offset post will be on a long pallet - both may be stored in the open air. The CLS LITE will arrive on a standard pallet.

The fasteners used to secure the HD ALT, Post and CLS LITE to their pallets should not be used as mounting hardware during installation and all packaging materials removed, should be disposed of in accordance with local regulations.

HD ALT

Ensure that the Cup and Cone Washer Pack and the 8 x M24 Bolts with their flat and spring washers are inside the electrical connection box. If the HD ALT is not to be installed immediately it is recommended the connection box is re-secured with a cable tie.

DO NOT ATTEMPT TO MOVE THE HD ALT FROM ITS HORIZONTAL POSITION TO THE VERTICAL WHEN INSTALLED ON THE SHIPPING PALLET, AS THE FORCE REQUIRED WILL CAUSE IT TO TOPPLE AND POTENTIALLY INJURE THE OPERATOR OR DAMAGE THE UNIT.

It should be noted that the HD ALT weighs typically 165kg and Unipart Dorman strongly recommends it is moved by mechanical means using the lifting eyes provided.

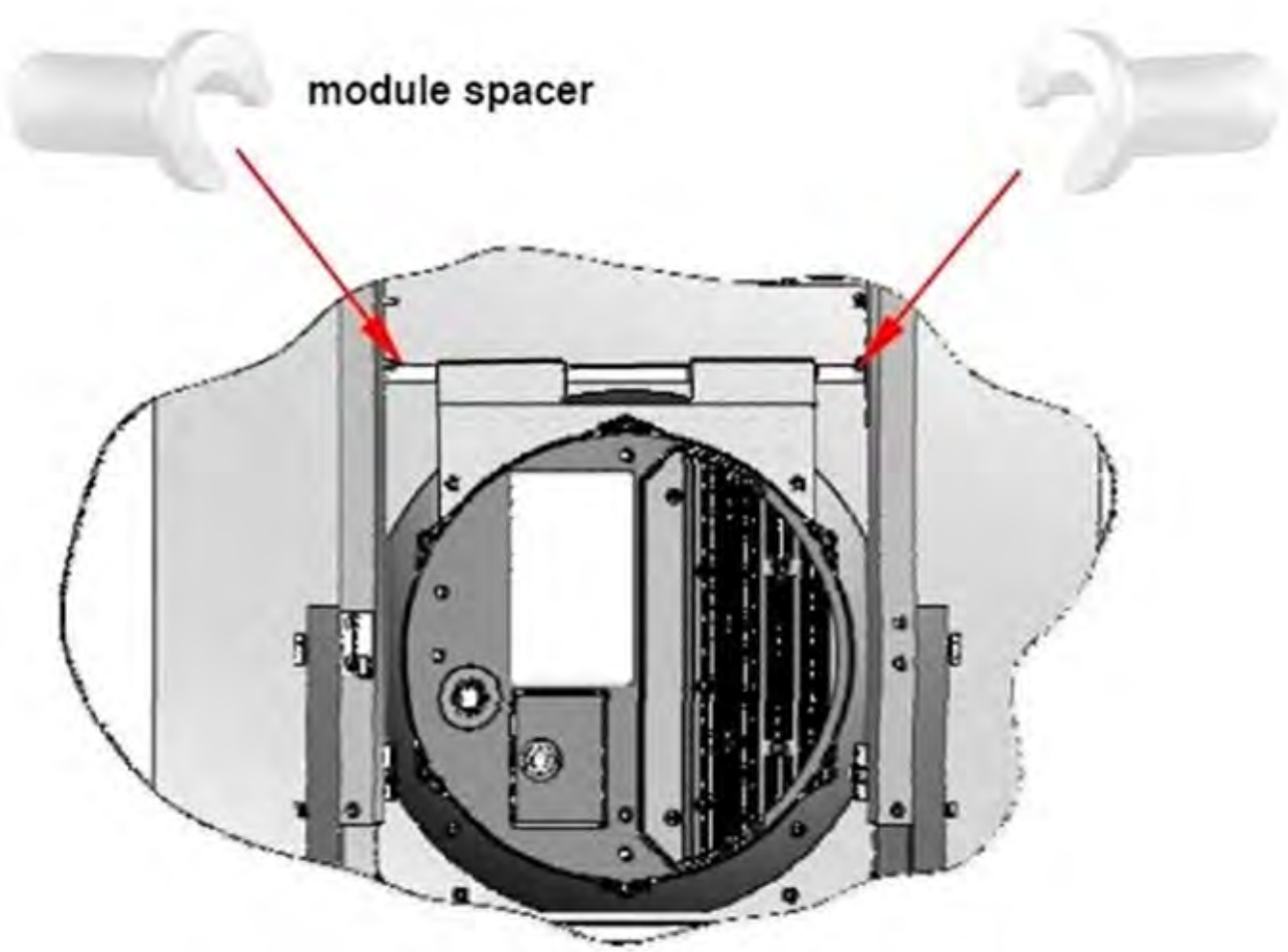
Offset Post

The post unit is light enough and even in its shortest form has sufficient length, for staff to be able to perform a coordinated manual handling move from the unloading point to the signal location.

CLS LITE

The module(s) in a CLS LITE can be temporarily removed to reduce the weight (10Kg per module) This is the preferred option when the signal head is being mounted on the post's mounting plate. There are 2 removable lifting eyes fitted if a mechanical move is necessary.

To remove the modules, open the rear door and note the position of the plastic module spacers on the pivot bar where fitted.



Support the module to stop it swinging back and release the two locking levers as shown below

The module can then be swung out and unhooked from the top bar for removal

Refitting is achieved by hanging the correct module (RYG or YY) onto the mounting rail ensuring the plastic module spacers are in the position noted before removal and then pushing the locking levers down past the horizontal until the slot in the lever has fully engaged with the lock pin on the inside of the frame.

Lever position shown without module fitted for clarity

BOTH LOCKING LEVERS MUST BE FULLY ENGAGED.

CHECK THE MODULE IS LOCKED IN PLACE BY TRYING TO PULL THE BOTTOM OF THE MODULE AWAY FROM THE FRAME - IT SHOULD NOT MOVE

Exercise extreme care when handling in 3rd Rail and OLE areas even with isolation measures in place.

Tooling

The only handtools required to install a HD ALT onto a pre-prepared foundation are a Torque Wrench, 30mm and 36mm Sockets/Spanners.

A Unipart Dorman Removable Sighting Scope complete with camera bracket and action camera (with Bluetooth connection to a suitable viewing device such as Laptop or Tablet), will be required to carry out the post installation signal alignment.

Preparing and Mounting the Signal Head

The signal head will arrive from the factory on a standard pallet where it should remain until ready to commence the installation onto the prepared base.

Remove all packaging materials and dispose of in accordance with current procedures and retain any paperwork etc as required.

The mounting nuts and bolts which attached the head to the pallet are transit fixings only and shall not be used to mount the signal onto the post.

Having taken into account the gross weight marked on the signal head and where necessary removed the module(s) to reduce this weight, an onsite risk assessment should be undertaken and a method of lifting the head into place shall be determined. Two removable lifting rings are fitted to assist in mechanical lifting.

Once in the required position, the CLS LITE is secured to the offset platform using suitable mounting hardware. Ensure the Lower Backboard extension is fitted in its operational position as detailed below.

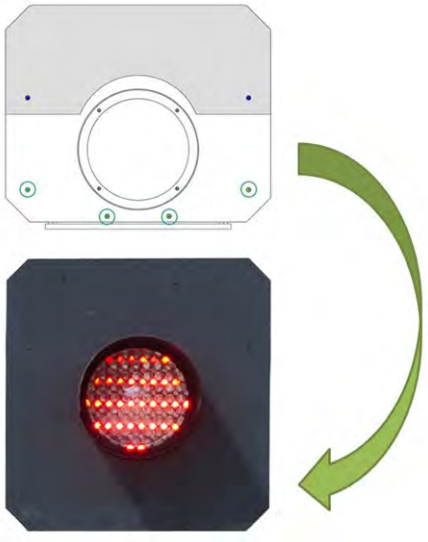
Backboard Arrangement

The signals are required to display a uniform backboard of at least 300mm from the centre of the lit aspect and the following procedure is applicable to both mounting arrangements. To prevent damage to the lower portion of backboard during transit a removable section is fitted in a stowed position to enable the signal head to be bolted securely to its pallet. As part of the installation, this extension piece must be moved into its operational position below the aperture once it has been removed from the pallet.

The backboard must be moved to its in-service position before aligning the signal as in the transit position; it obscures the holes in the backboard the scope looks through and the signal will not meet the 300mm backboard criterion

Remove the Lower Backboard Extension from its stowage position above the aperture by removing the two 3mm Allen screws shown in blue below. Refit the two screws and dispose of the 2 white plastic labels and the black plastic edge protector properly.

Using the existing Allen screws shown in green below, mount the plate at the bottom of the backboard.



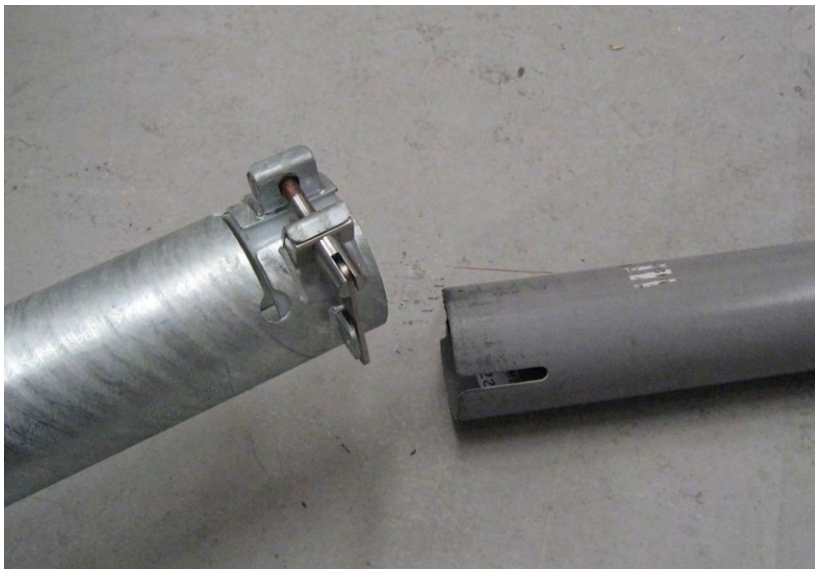
Correctly fitted backboard on a 3 aspect short housing signal head shown – 3 aspect tall and 4 aspect signals have the same arrangement).

Open the rear of the head and connect the plug coupler on the CLS LITE to the pre-installed cable that runs down the post bore.

Inserting the Post and Erecting the Signal

LIFTING OPERATIONS SHOULD NOT BE UNDERTAKEN WHERE THE GUSTING WIND SPEED EXCEEDS 26 MILES PER HOUR (48 Km per Hour)

The bore of the HD ALT 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 HD ALT. Check the Plug Coupler at the bottom of the post for damage and then push it back into the bore of the post.



Undo the HD ALT Post Clamp, orientate the post correctly and slide it into the HD ALT until the keyways are engaged. The plug coupled cable is then routed out of the access hole on the GRP post and the hole in the HD ALT which passes into the connection box. Sufficient cable should be drawn through into the connection box to enable the plug coupler to be positioned onto the coupler retention bracket.

(The cable has enough extra length to facilitate folding the signal without disconnecting the coupler and this excess is stowed by simply pushing it into the bore of the post).

Check that the post cannot rotate in the HD ALT bore and that the painted witness mark (indicated below) on the post is level with the top of the HD ALT. Do not fully tighten the locking collar until the signal is in the vertical position to allow for any settling.

MOVING THE SIGNAL TO THE VERTICAL POSITION SHOULD ONLY BE DONE FROM A POSITION THAT DOES NOT REQUIRE THE OPERATOR(S) TO STAND DIRECTLY IN LINE WITH THE ARC THAT THE TUBE ASSEMBLY AND POST MOVES THROUGH.

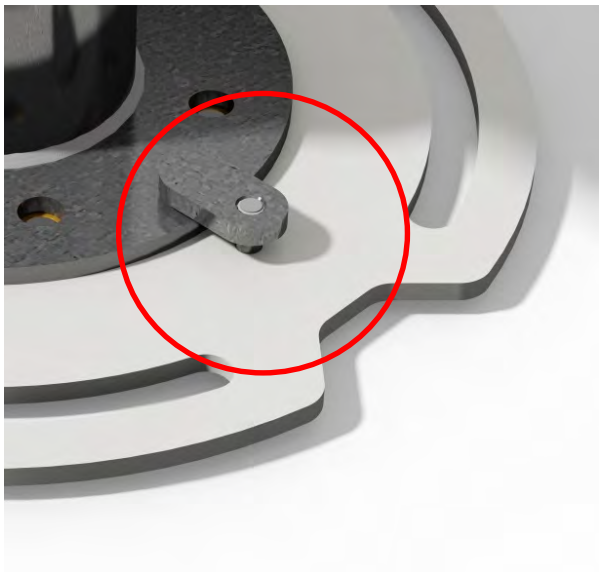
Do not allow the signal to rise or fall under its own weight. The spring is to provide assistance, not full support.

To raise the assembled signal, position an adequate number of workers around the sign and have them ‘take the strain’ to control any movement of the signal and remove the retaining pin from the base plate. Then the post can be lifted into the upright position using correct manual lifting technique augmented by the springs.

IT IS VITAL THAT CONTROL OF THE MOVABLE SECTION AND HEAD/POST IS RETAINED AT ALL TIMES BY THE PERSONNEL CARRYING OUT THE LIFT/LOWER OPERATION.

THE COMBINED WEIGHT OF THE HEAD/POST MAY NOT OVERCOME THE SPRING FORCE IF CONTROL IS LOST WITH POTENTIAL RISK TO LIFE.

As soon as the Signal and Tube Assembly is in the vertical position the latching cam should be rotated so it locks the two plates together as shown then all 8 bolts should be fitted to prevent uncontrolled signal movement due to wind action etc.



Do not rely on the latching device to provide adequate security. This is only achieved by fitting all four bolts to the base

All mounting hardware should then be torque loaded to the values shown in the table in the section of the main manual above “Torque Loadings”.

Finally, tighten the HD ALT collar until no movement can be detected in the spacer tube and secure with a padlock.

Lowering the signal is a reversal of this procedure.

Electrical Connection

All electrical connections are made using standard Mil-5015 Plug Couplers wired to Network Rail Diagram T00036

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 with the signal cable fitting into the recess in the mounting plate making sure the cable maintains a smooth bend radius.

Close the connection box door ensuring the cable is central in the cut out at the base of the box making sure the cable is not damaged or pinched by the door. Secure the door with a padlock.

The HD ALT should be bonded to earth if required by the use of bonding straps and a 17 mm through hole is provided on the base plate for this.

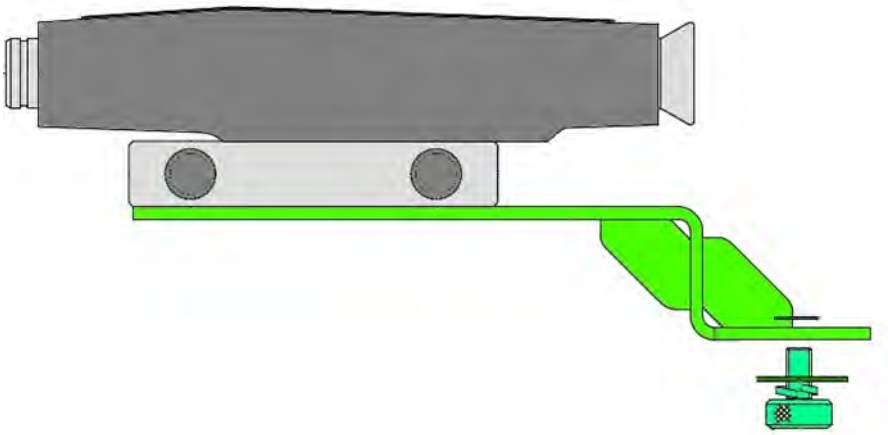
Signal Alignment

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

Detachable Alignment Scope

The Unipart Dorman Detachable Alignment Scope is an optical device that allows accurate signal alignment and is common to all variants of the CLS LITE. It is stored in a bespoke carrying box and should be returned to Unipart Dorman annually for an alignment verification check.

The adaptor bracket that enables a suitable camera to be fitted to the scope is required for aligning the offset post. The camera and mount are subject to their own separate instruction sheets available on the Unipart Dorman website.



If the Scope lenses 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 lenses.

Ensure there is no grit etc. on the lens and then using a lint free cloth moistened with the water detergent solution, carefully wipe the lens clean before using a dry second cloth to remove any water spotting etc. and give a final buffing.

When the scope is moved from a cold to hot environment or vice versa there may occasionally be some temporary fogging of the internal lenses which will clear when the temperatures inside and outside the scope equalise.

Do not attempt to disassemble the scope to gain access to the internal lenses as this will disturb the optical alignment and the scope will require re-calibration.

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

Signal Alignment

General Notes

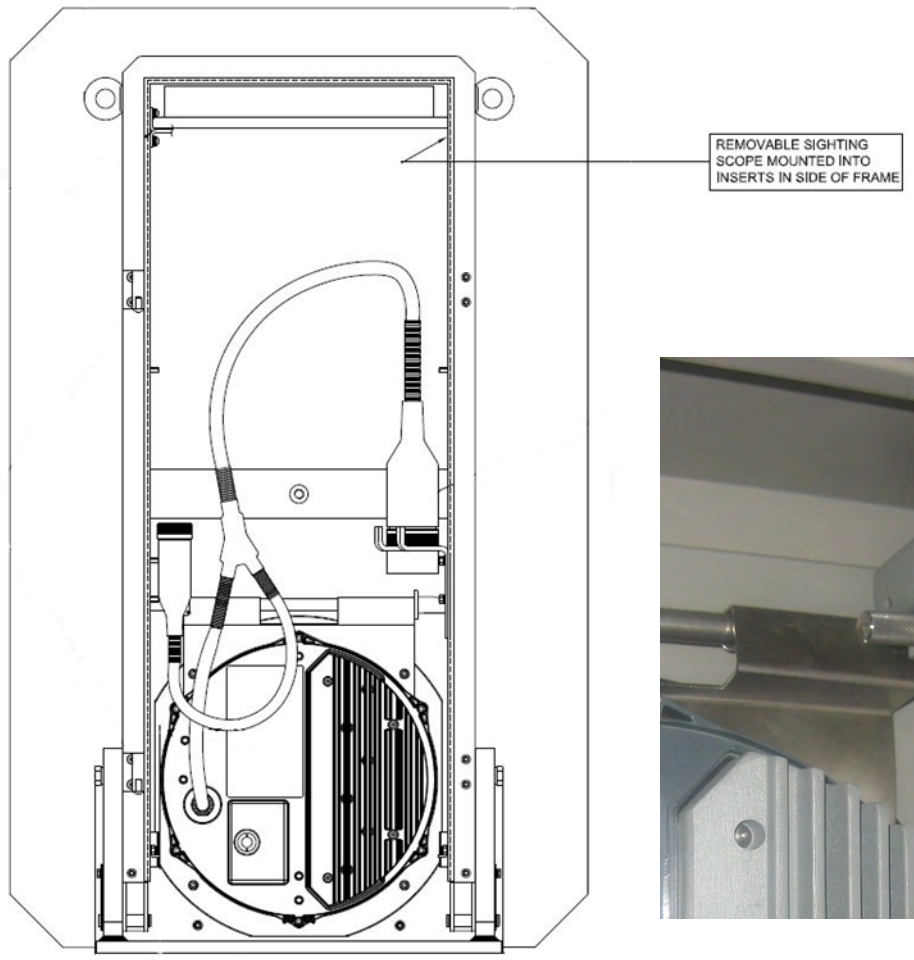
The Signal Sighting Form (SSF) will provide the definitive, signal specific alignment details and should always be consulted prior to commencement of work.

The signal is generally aligned to a target board (PADS Number 086/011540) at a point detailed in the Signal Sighting Form.

The removable Alignment scope should be fitted securely to the two mounting points by screwing the two knurled screws into the threaded holes in the positions shown for each signal configuration as shown:

4 Aspect and 3 Aspect tall Housings

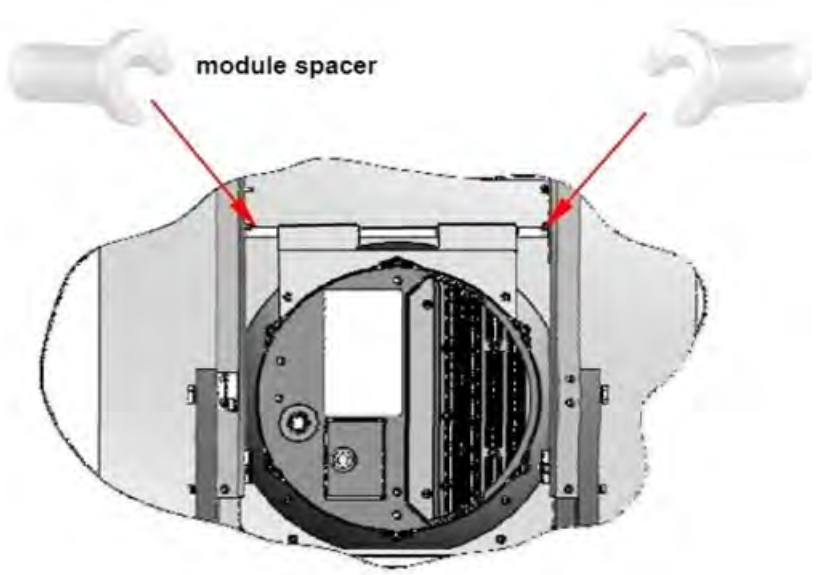
Use the threaded inserts in the inside of the frame in the positions shown below which correspond with the door stay mounting on the opposite side of the frame.



Scope fitted in a 4 aspect head – 3 aspect tall housing scopes are fitted in the same position

These two variants require the removal and retention of the plastic module spacer fitted to the pivot bar to give enough clearance for the scope to be fitted. Alternatively, unlock the module and lift off the pivot bar then slide the spacers into the centre of the bar.

The alignment scope will not locate and fit properly unless the spacer is moved from its normal operating position

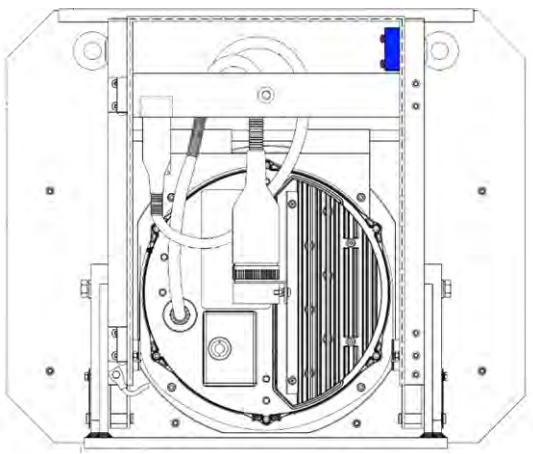


Once the alignment procedure is complete, refit the module spacer to the pivot bar with the flange end closest to the module. They are a ‘snap fit’ and will rotate freely on the bar when fitted correctly or where the spacers were moved to a different position on the bar return them to their original position.

The spacers centralise the module in its aperture and prevent the visor fretting on the backboard, so must be returned to their operational positions when the scope is removed

3 Aspect Short Housing

This signal uses an adaptor block to align the scope with the hole in the backboard as shown opposite:



The Offset Post System requires the use of a remote viewing device which attaches to the signal head by using the Unipart Dorman scope mounting plate. Unipart Dorman does not recommend any particular camera or App. It is the user's responsibility that any camera and App is used in accordance with the manufacturer's terms and conditions of use and instructions.

Unipart Dorman cannot accept any responsibility for the performance of third party equipment, applications or software systems.

Users of these devices and their supporting operating systems should satisfy themselves that their usage will not compromise the device through the introduction of malicious software, bugs and viruses etc.

The end user is also solely responsible for ensuring any images captured and retained do not conflict with the Information Commissioner's Office Codes of Practice on privacy and the use of cameras, or the General Data Protection Regulations.

When the signal is aligned correctly to the point on the signal sighting form, ensure all the mounting nuts are correctly torque loaded and the alignment scope is removed and stored in its protective case.

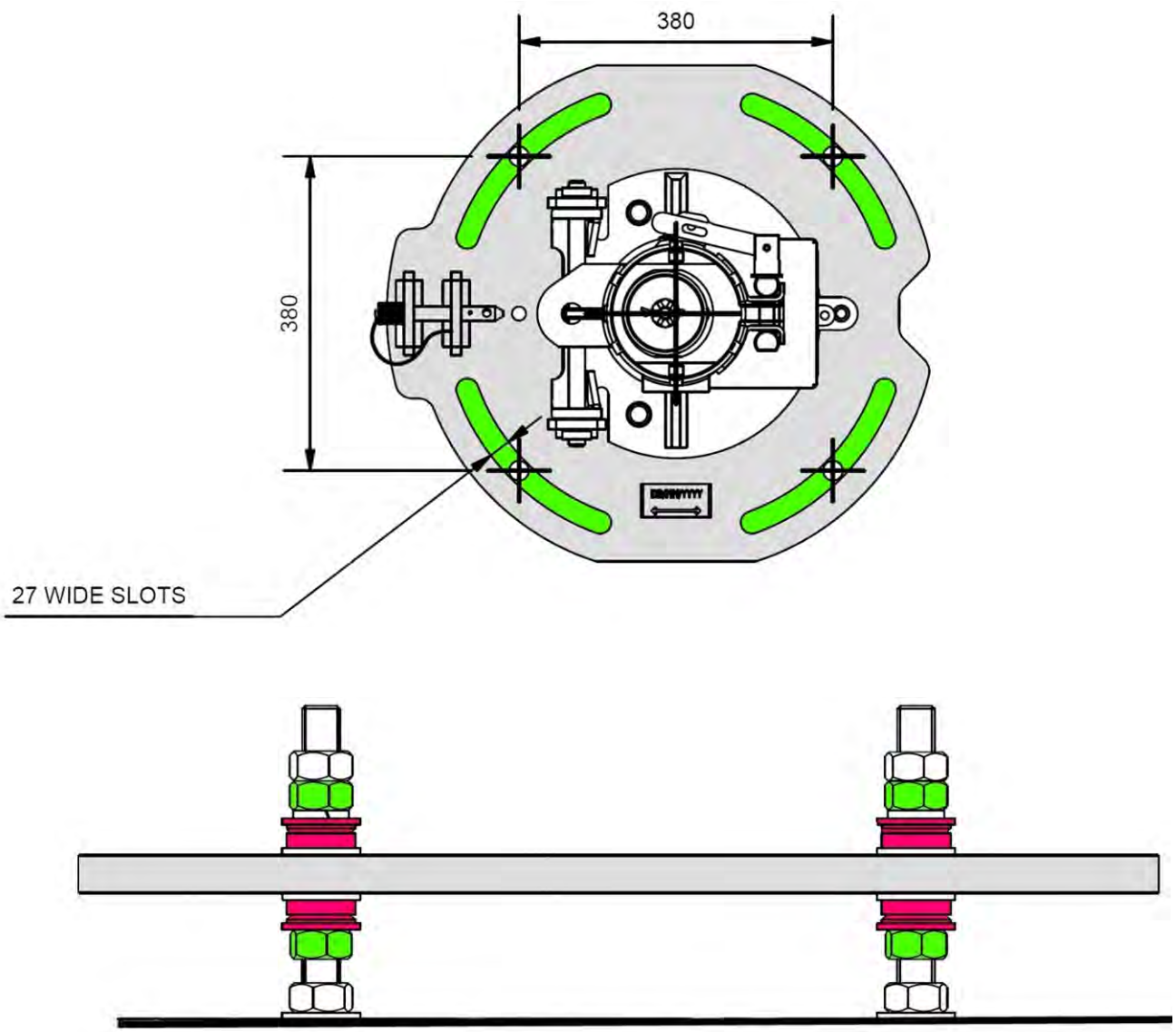
General Notes

The Signal Sighting Form (SSF) will provide the definitive, signal specific Alignment details and should always be consulted prior to commencement of work

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

After installing the camera and scope inside the head, confirm the Bluetooth link to the remote viewing device is made and raise the signal.

The whole signal is adjusted horizontally by rotating the base within the kidney slots and vertically by adjusting the angle of the HD ALT using the nuts and the spherical washer sets shown in red.



The spherical washer sets are essential for the tilt adjustment and shall not be omitted

When the signal is aligned correctly to the point on the signal sighting form, ensure all the mounting nuts are correctly torque loaded. Then lower the signal to recover the alignment scope and camera.

Lowering the signal to recover the camera and scope will not affect the signal's alignment.

Torque Loadings

	Nm	Lbf/Ft
M24 Mounting Nuts	195	143
M20 Trunnion Bolts	160	118
Padlocking Lever	**Hand tight Only**	-
Scope Fitment Screws	**Finger tight Only**	-

Post Installation Checks

The Signal assembly has been designed for Plug and Play installation. 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. This advice does not supersede any instructions issued by Network Rail.

Maintenance Activity

Both the HD ALT and iLS/CLS LITE signals are designed to be maintenance free. However, Network Rail may mandate some 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.

Signal Husbandry

If the HD ALT/Signal requires any cleaning activity to be carried out, the only medium approved is water with the addition of proprietary soap based detergents if required.

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

Service and Repair

The HD ALT, post/signal head and LED modules have no user maintainable elements (apart from general husbandry requirements). There are no spare parts available and the units are intended to be replaced completely should there be any failures.

End of Life Disposal

Wherever possible the electronic component parts and complete assemblies of the Unipart Dorman signal assembly are designed to be disposed of in accordance with the requirements of the latest version of the Waste Electronic and Electrical Equipment Regulations.

All other parts and assemblies are recyclable and end users should consult local and national regulations prior to disposal.

Please contact Unipart Dorman for full details of the procedure to be undertaken when a signal is permanently withdrawn from service for disposal.

Product Support

Unipart Dorman has developed a comprehensive support package including product awareness demonstrations for the complete lightweight signal range and this can be arranged by contacting Unipart Dorman using the details on the back page.

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