
Classic Colour Light Signal

Operation and Maintenance Manual

Document Ref. C64.63267 Issue 7

This Manual Is To Be Read Before Commencing The Installation.

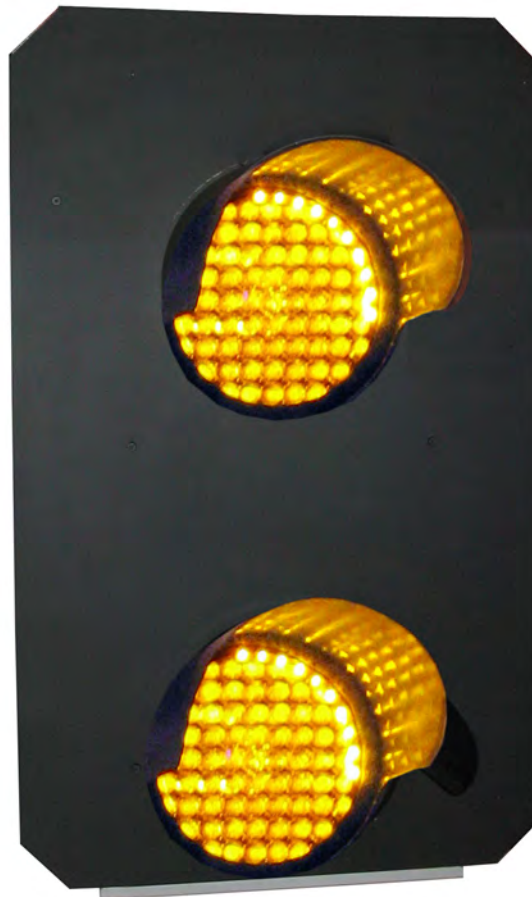


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Document Control

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	Date	Alteration	DCC/E CN No.	Initial
2	04/08/04	Document control page added. Clause 4.5 Door Reversal Instructions added. Clause 6.2.1 Rear Access cleaning instructions added. Clause 6.4 Text change. Clause 2.4 Torque values added. Clause 4.2 Text added. Clause 6.2.2 Text regarding the LMT condensed. Clause 7 Text expanded.	2452	DR
3	23/08/04	Clause 4.4 Note added detailing a cable clamp Clause 6.1 Note added ref lens 3 month cleaning frequency. Clause 6.2.1 Note added ref lens cleaning and optional cleaning agents.	2532	DR
4	21/01/05	Clause 2 Storage instructions inserted. All subsequent clauses renumbered to suit. Clause 5.4 Instruction to remove the temporary plug from the gland entrance removed. Clause 5.1 Important note:-.....added. Clause 1.4 Table of Signal variants, Module variants and spares expanded to show additional options.	2669	DR
5	11/12/06	Removal of Maintenance Plans and Record Cards. Minor alterations to associated text. Clause 1.2 Network Rail Certificate PA05/2706 added. Clause 1.4 Medium Range Signal and Module variants added.	3093	DR
6	27/10/08	Address and contact details changed to Wennington Road.	4360	AD
7	18/11/21	Document simplified and transferred to latest UR Template.	3737_0	MD

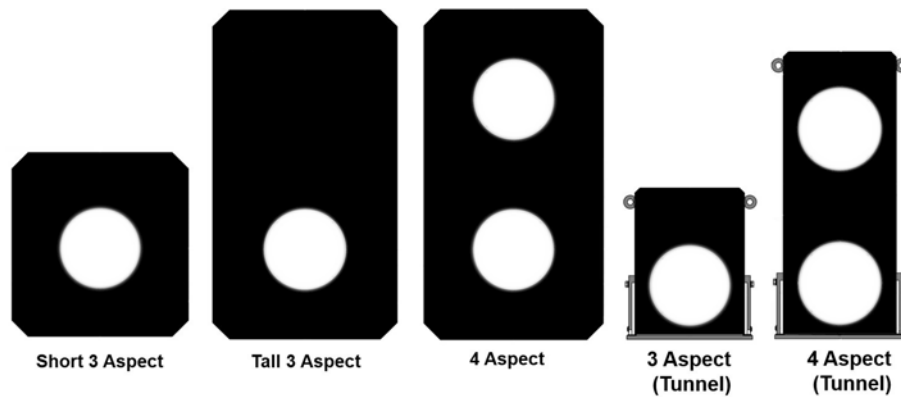
Introduction

The Unipart Dorman LED Classic Colour Light Signal (CLS) Range has been successfully used on the UK Railway Network since 1999. It was designed to and remains fully compliant with RT/ES/10062 (Later Network Rail/SP/Sig/10062) – 'Requirement Specification for Performance of Long Range Colour Light Signals'. Since the introduction of the CLS LITE signal head this version is generally referred to as a 'Classic Colour Light Signal'.

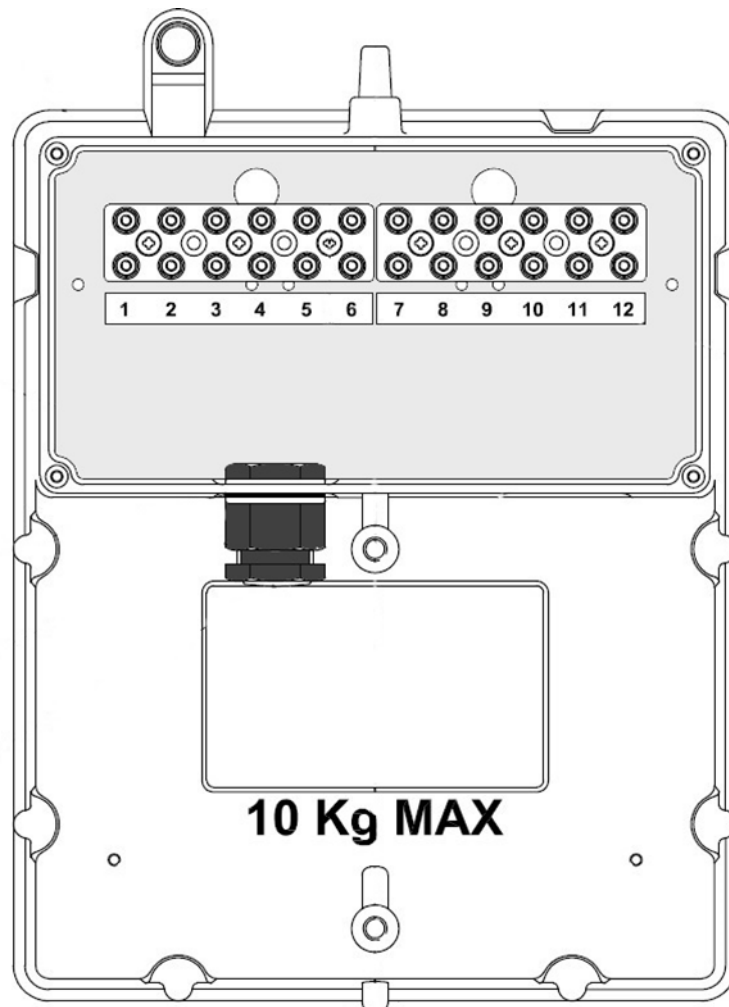
It is designed to be completely reverse compatible and will replace existing filament and fibre optic lit signal heads with no modification or new design work required.

The CLS comprises a common housing and one LED Module capable of showing Red Yellow or Green in the lower aperture and a second Module which only shows Yellow to deliver 4 aspect signals indications in the upper. This arrangement is reversed in Tunnel and other signal applications where the signal is mounted lower than 2750mm above the running rail, to ensure that the most restrictive aspect is closest to the driver's eye line.

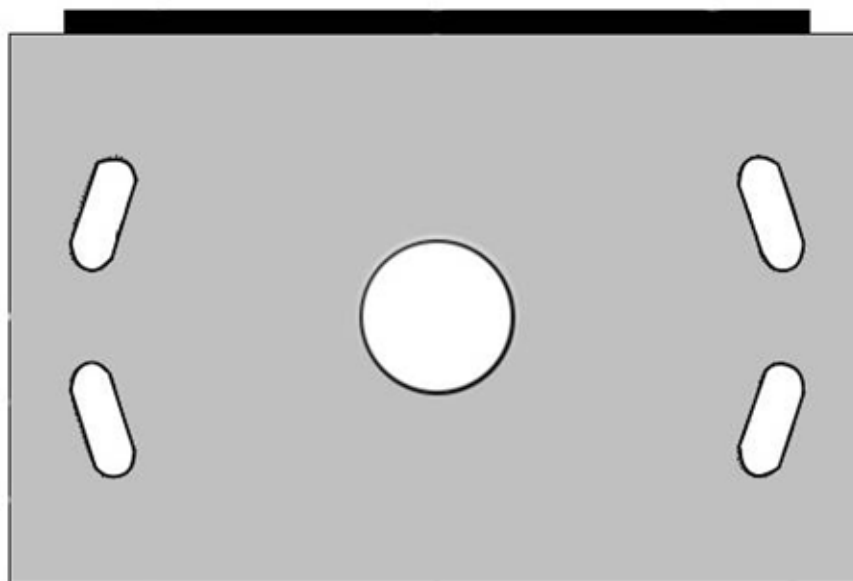
The signal is configured in a number of housing types as shown below:



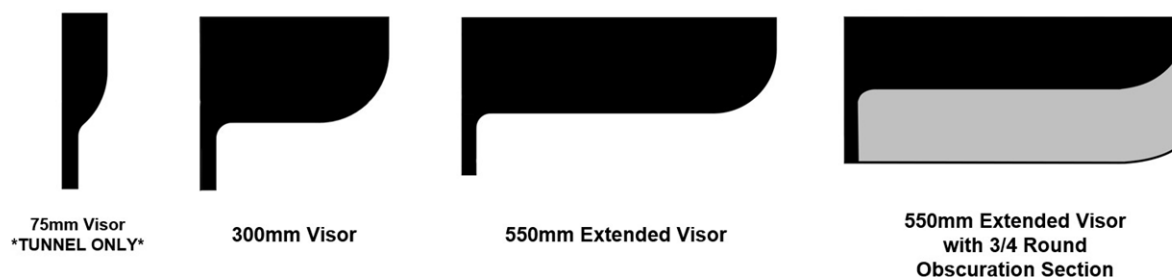
All aspects can be flashed by the interlocking and the head is electrically connected to the infrastructure using 2BA PIDG Ring terminals. The infrastructure cable is fed into the IP65 Rated terminal Box through a standard gland nut arrangement



It is mounted onto an existing structure and the mounting detail is mandated in Network Rail/SP/Sig/10062 Section 4.3, Figure 4.

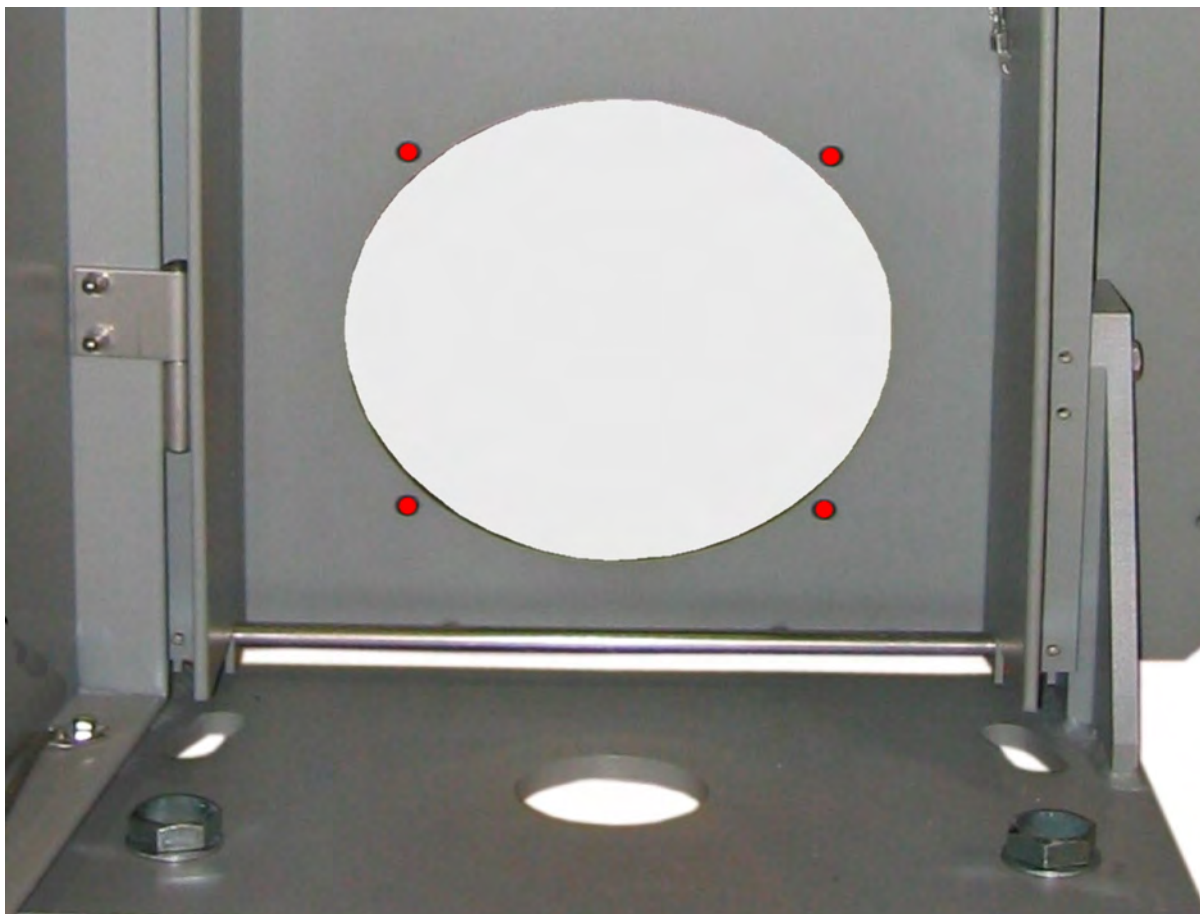


The standard visor length is 300mm and the signals can also be supplied with 550mm extended visors (with or without $\frac{3}{4}$ round obscuration sections) as required. 75mm short visors are fitted to heads destined for tunnel use.



The grey section in the obscuration visor is to illustrate the extra $\frac{3}{4}$ round section - the visor is uniformly black.

The Visors are replaced by first removing the module and then the 4x 5mm socket screws marked in red below. It will then lift off the front of the signal and fitment is a reversal of removal.



Classic CLS can be mounted using a lightweight gantry fixture known as a 'Paddington Bracket' and as a complete standalone signal using a GRP post with an adaptor bracket and an Assisted Lift Trunnion. For more information please contact Unipart Dorman.

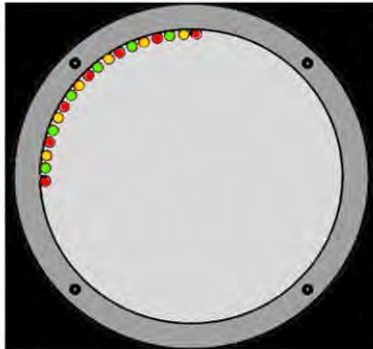
The heads and modules are classified by range and beam angle:

- Long Range (800m at $\pm 3^\circ$)
- Medium Range (400m at $\pm 10^\circ$ or 250m at $\pm 12.5^\circ$)

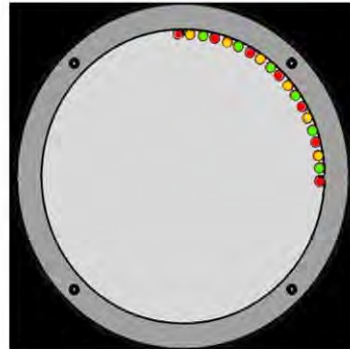
Medium Range modules and signal heads are clearly marked and the signal label is also annotated as Medium Range. Long and Medium Range modules shall not be mixed in a signal head.

Conversion from Long to Medium or vice versa cannot be carried out at site and the module should be returned to Unipart Dorman to be reconfigured.

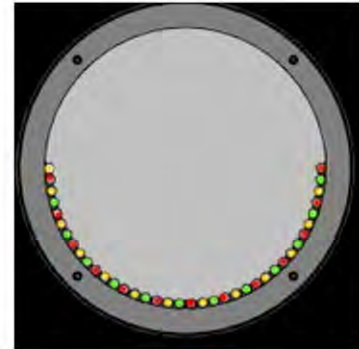
Classic CLS have an extra array of LEDs arranged to facilitate close up viewing and these are displayed as an upper degree arc (positioned at the 9 to 12 and 12 to 3 o'clock position) where the signal is used >2750mm above the running rail or a lower 180 degree arc for signals at <2750mm (positioned at the 3 to 9 o'clock position).



**Left Hand
Upper (LUQ)**
for mounting to
the left of the
track above
2750mm



**Right Hand
Upper (RUQ)**
for mounting to
the right of the
track above
2750mm



**Bottom Half
(BH) for
mounting
either side of
the track below
2750mm and in
Tunnels**

These are representative images only and don't accurately reflect the actual LED colours

Storage

The signal is supplied complete on a wooden pallet with protective packaging which should not be removed prior to delivery to the installation site. (All packaging materials are generally recyclable and should be disposed of in accordance with local regulations).

The hardware used to secure the signal to the pallet shall not be used to mount the signal onto the structure.

The signal heads can be stored outdoors with no special measures except pre-installation husbandry as required.



The signal should be retained on the pallet until ready for installation and when removed should be kept in a vertical position, as laying it down flat may damage visors or encourage dirt to accumulate on the module lenses/sighting scope.

Installation

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

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 the signal is clearly marked and installers should ensure that they have sufficient measures in place to ensure a safe lift. The modules can be removed to reduce the weight and the procedure for this is shown in the maintenance section

All activity on the CLS, 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 CLS 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



Pre Installation Checks

The signal should be checked for damage and any remaining transit packing materials should be removed and correctly disposed of.

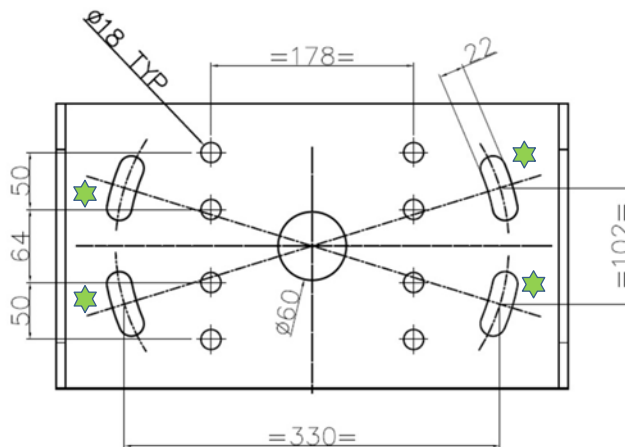
The signal modules can be removed to lighten the signal for lifting during installation and this is covered in a later section.

Installation Method

Whilst it may be physically possible to install a signal using manual handling techniques, Unipart Dorman recommends that even with the module(s) removed, the use of mechanical lifting aids should be considered to reduce any risk of personal injury or physical damage to the signal.

Signal Mounting and Alignment

Once in the required position the CLS is secured to the base platform using four Stainless Steel nuts, bolts and flat & spring washers as required. These should be left hand tight only until the sighting of the signal has been completed.



MOUNTING PLATE FIXINGS TO SUIT
 BRITISH RAIL STANDARD DESIGN
 ADAPTOR PLATES REF.
 BRS SM 2076 & BRS - SM 65/10



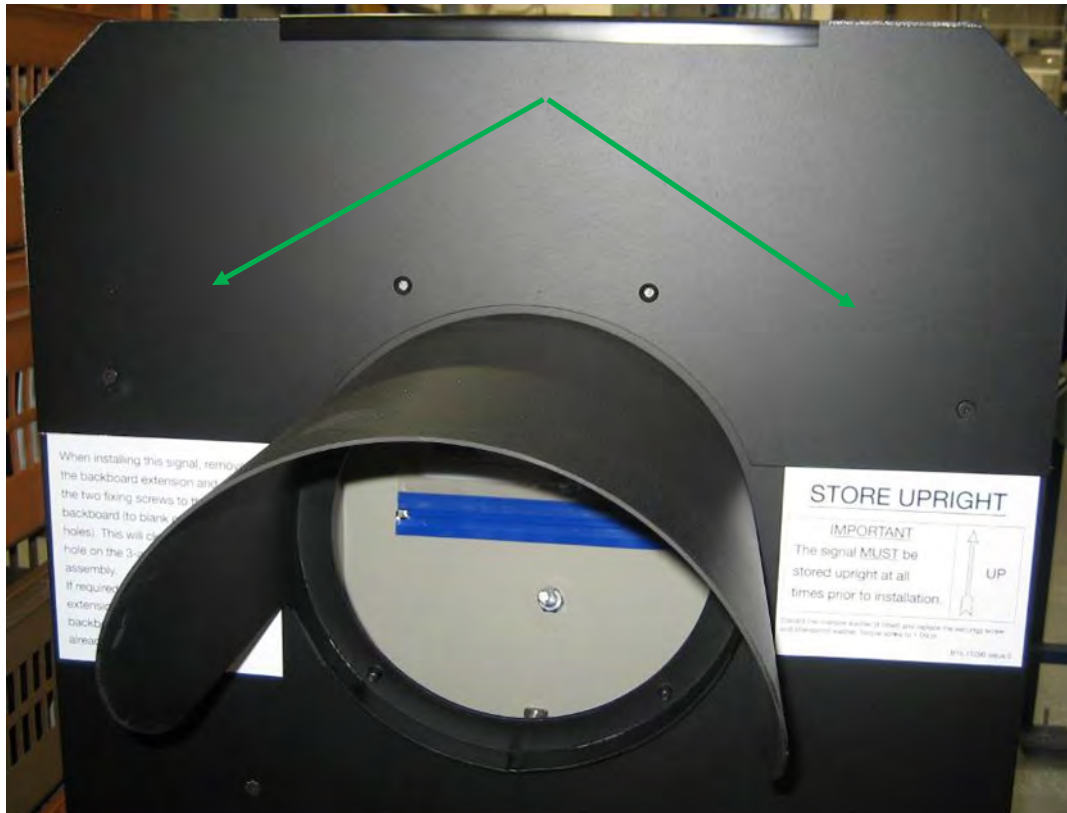
The mounting hardware securing the signal to the transit pallet is not Stainless Steel and should not be used.

Backboard Arrangement

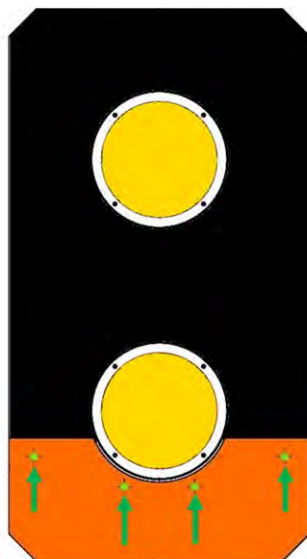
The signal head is designed to have a uniform distance from the centre of the aspect to the edge of the backboard and in order to prevent any damage during transit, the bottom section consists of a removable extension piece that is fitted in a stowed position above the module aperture which enables the signal head to be bolted securely to its pallet.

This extension piece should only be moved into its operational position after the head is mounted on the support structure.

Remove the Lower Backboard Extension from its stowage above the top aperture and refit the two Allen screws. Dispose of the 2 labels properly.



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



Signal Alignment

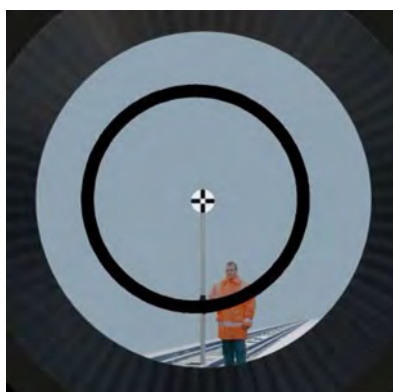
General Notes



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

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

Where the centre of the most restrictive aspect is greater than 2750mm above the LH running rail, the signal is generally aligned to a target board (PADS Number 086/011540) at a point detailed in the Signal Sighting Form.



Conventional Structures and Collis Folding Post

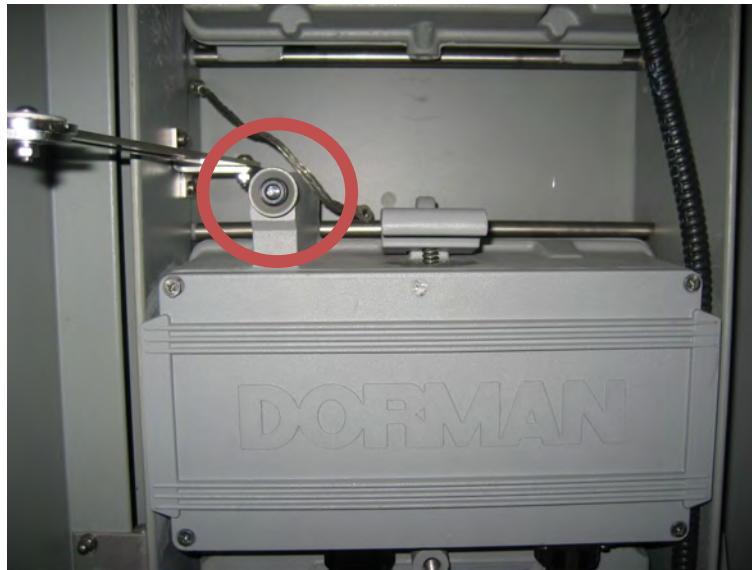
The following instructions refer to standard climbable structures such as posts/gantries and the Collis Fold Down Post system only. The Collis Post is easily identified by the use of a single, separate spring pot on the unit on a square base.



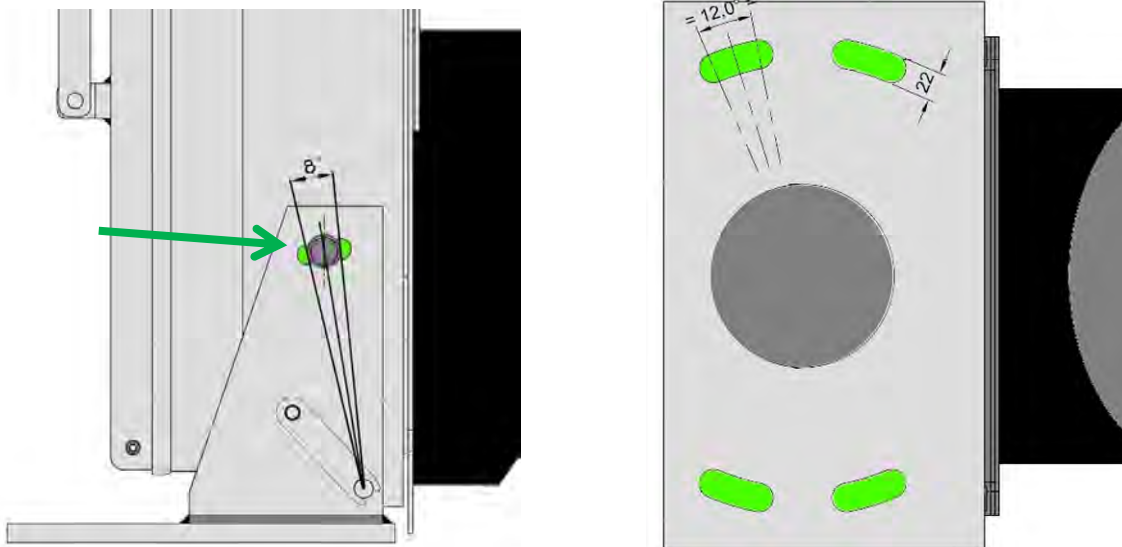
This method is not to be used for Unipart Dorman Spigot Mounted Classic CLS fitted into the GRP Post and installed in the ALT.

Instructions for this mounting method are contained in their own section of this document

The Alignment scope is built into the top of the module as shown below.



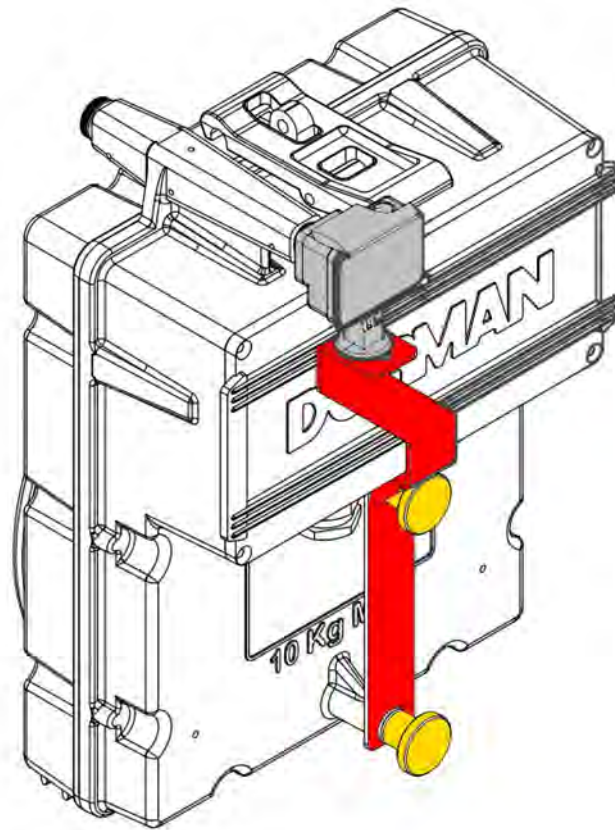
Vertical adjustment of the head's tilt angle is carried out by loosening the bolt on either side of the baseplate highlighted and tilting it about the pivot shaft. Once the vertical alignment has been set and verified, tighten the bolts to 40Nm.



Horizontal adjustment is achieved by swivelling the head in the kidney slots on the fixed mounting as shown.

Once the horizontal adjustment is complete tighten the mounting bolts to the torque value specific to the size and material of the fasteners used.

The Collis Post System requires the use of an action camera which attaches to the signal head using the Unipart Dorman camera mount.



The camera mount has its own instructions available on the Unipart Dorman website.

Once the camera is fitted, the signal is raised and the alignment checked using a Bluetooth Link from the camera to a suitable viewing device such as a Tablet or Laptop etc. The post is then lowered and the head is adjusted in relation to the post using the horizontal and vertical adjustment methods shown above as required. It is then raised again and the alignment is verified before the signal is lowered finally to retrieve the camera and bracket.

Unipart Dorman does not recommend any particular camera or Bluetooth App. It is the user's responsibility to ensure 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.

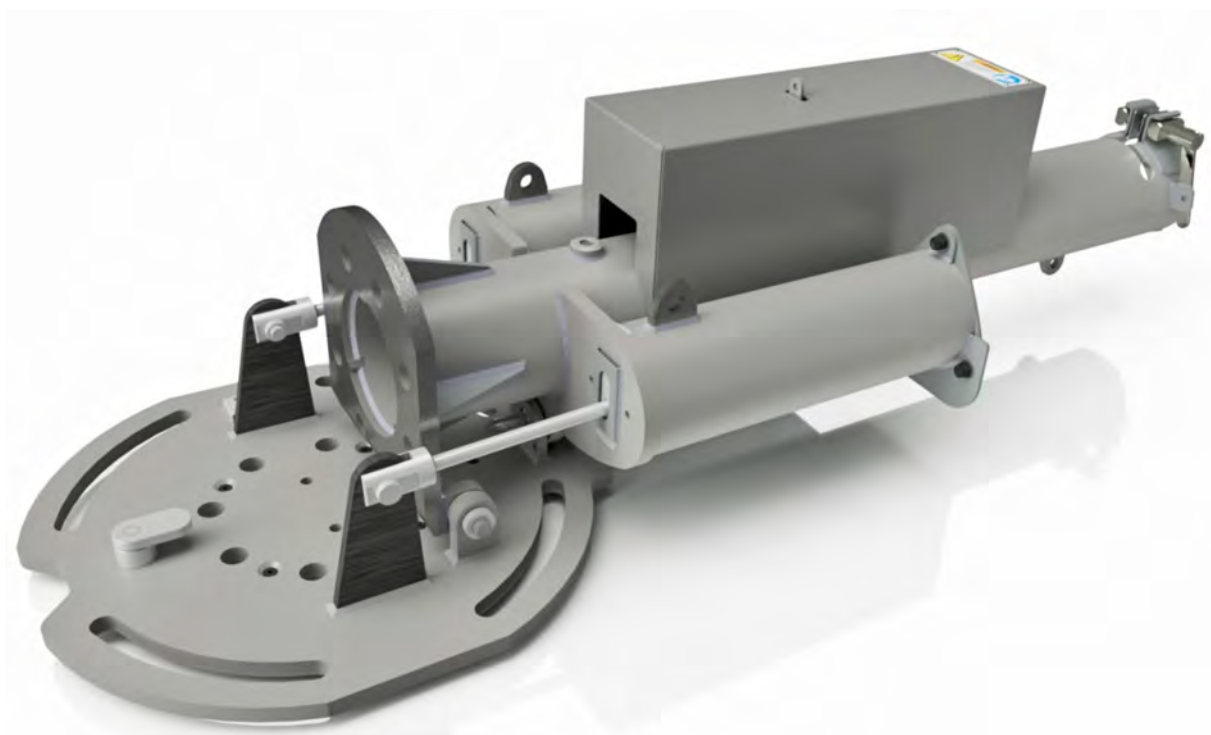
Users of these devices and their supporting operating systems should satisfy themselves that their usage will not compromise the device through the introduction of malicious software, bugs and viruses etc.

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.

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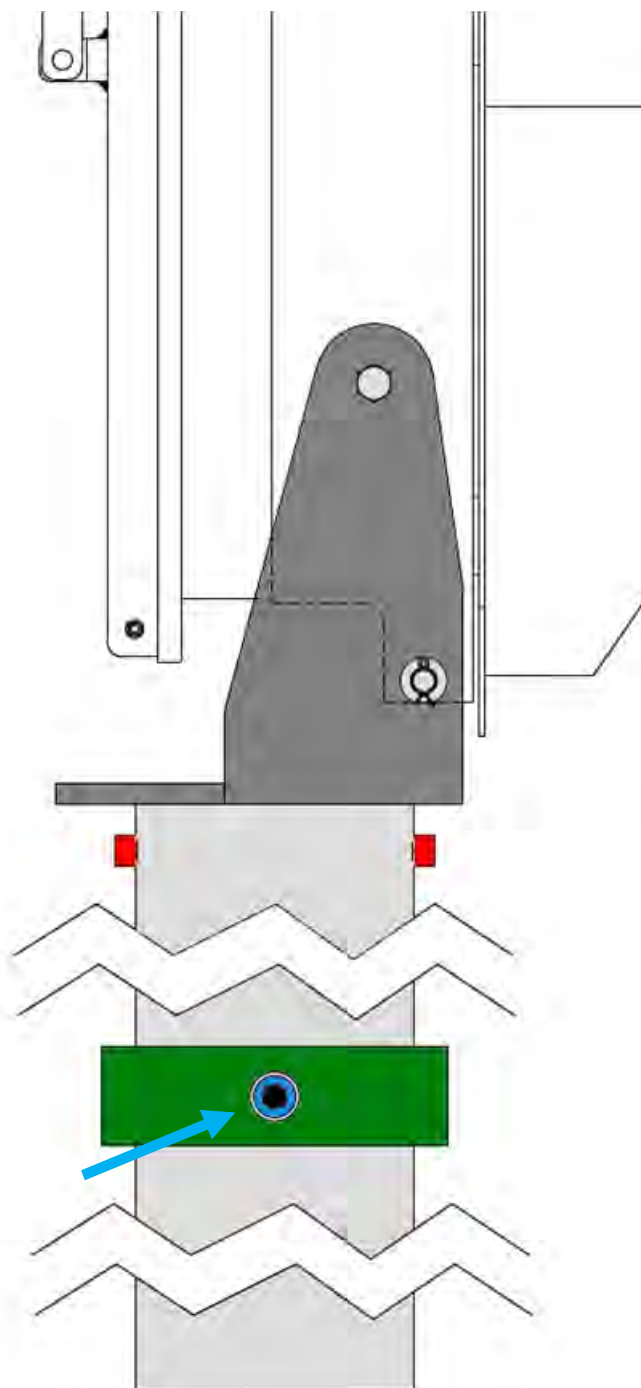
Unipart Dorman HD ALT

The following instructions are unique to Classic CLS mounted in the Unipart Dorman Heavy Duty Assisted Lift Trunnion which is easily identified by the use of a single connection cover, two external spring pots and a circular baseplate. Installation of the HD ALT is covered in its own O&M Document.

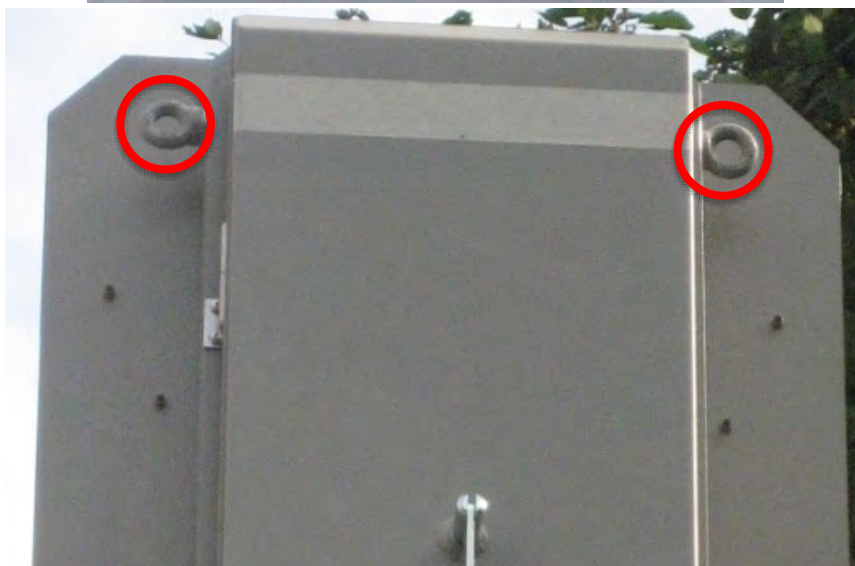


Preparing and Mounting the Signal Head

Where the signal is to be installed in a Unipart Dorman ALT the standard base plate is replaced by a Spigot Bracket which fits into the GRP Post and the orientation of the head to the post is fixed during manufacture to enable signal alignment from ground level.



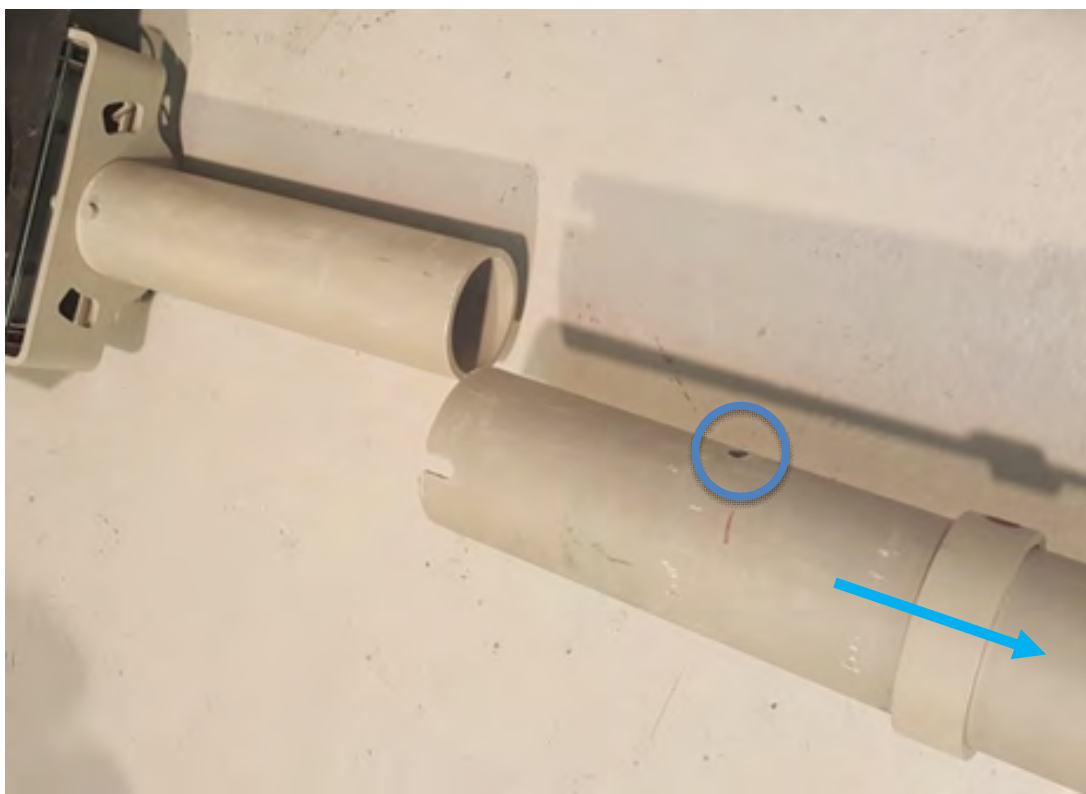
Where the head is to be fitted to the GRP Post and ALT, it will arrive upright on a pallet secured to a special to type mount. To remove it from the Pallet remove and retain the grub screws shown in blue above and slide the collar (in green) to the bottom of the mounting fixture. It is strongly recommended that the signal is removed from the transport fixture with mechanical lifting equipment using the lifting eyes provided.





A FOUR ASPECT HEAD WEIGHS UP TO 44 Kg AND SHOULD BE LIFTED OFF THE PALLET CAREFULLY

To install the head into the post, ensure you slide the collar onto the post and move it to a position below the holes for the spigot screws .



Fit the head into the post and ensure the two anti-rotation stops are aligned correctly within the slots set in the top of the GRP post.



Slide the collar into position and secure it to the spigot through the GRP post using the grub screws tightened to 40 Nm.



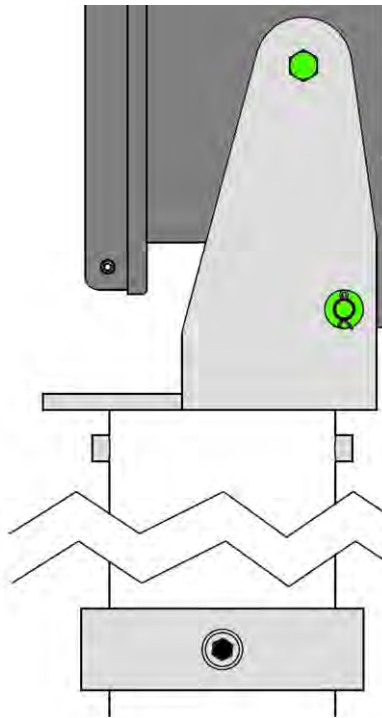
Ensure the Lower Backboard Extension is fitted in its operational position. The installation is now exactly the same as the procedure followed for a GRP Head and Post installed in an Assisted Lift Trunnion, as shown in the ALT Operations and Maintenance Manual C64.65976 which is available on the Unipart Dorman website.

Where the head is mounted on the Unipart Dorman GRP post installed in an ALT, the alignment and all adjustment is done from ground level as the head is fixed in the bracket with no adjustment facility.



When the signal is sighted from the HD ALT at ground level, it is essential that it is aligned to a point on the ground at the distance specified by the SSF

DO NOT USE A SIGNAL SIGHTING TARGET POLE



The diagram above shows highlighted in green, that the vertical adjustment slot in the side bracket has been replaced with a simple through hole bolt securing the housing to the base plate and the E-Clip/Locking Plate on the pivot bar with a split pin arrangement.

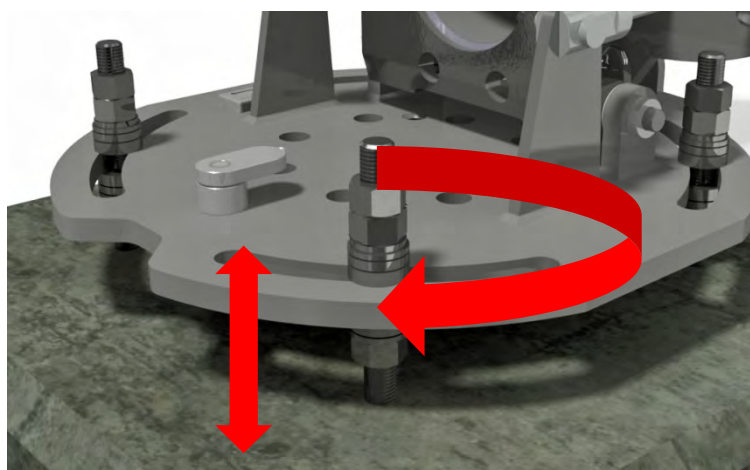
Alignment is carried out by fitting the detachable scope to the HD ALT and then all vertical/horizontal adjustment is facilitated at the baseplate.

The removable sighting scope unit should be fitted to the trunnion by screwing the two knurled screws into the threaded holes if a record of the sighting picture is required an action camera on a bracket can be fitted using the instructions available on the Unipart Dorman website





Using the sighting scope to provide visual cues the signal is adjusted horizontally by rotating the base within the kidney slots in the bases and vertically by adjusting the angle of the base using the nuts travelling up and down the studs.





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

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.

Electrical Connection

Infrastructure Connection



It is recommended that the signal is mechanically installed prior to electrical connection. A competent person should ensure that the supply is isolated and an appropriate lock-out device is in place before connecting the plug coupler.

The CLS is electrically connected to the infrastructure using standard 2BA PIDG ring terminals. In 4 Aspect signals the incoming connection for the top yellow module is contained in the RYG module and this then feeds to an umbilical. There is no requirement to access the terminals in the top yellow as all testing etc can be done in the RYG module's terminal box and the top yellow terminal box cover is secured using anti-tamper screws.

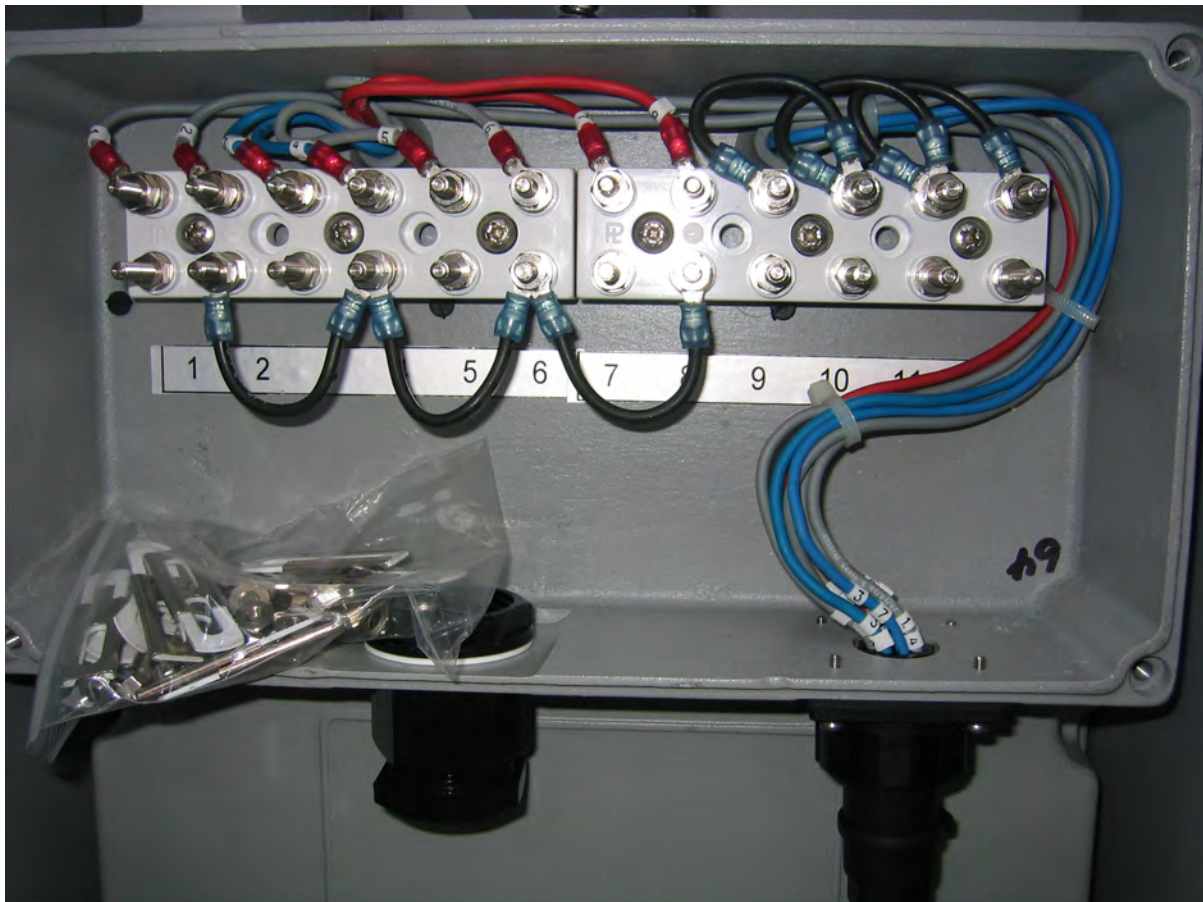
In 4 aspect tunnel and ground mounted heads the RYG module is in the upper aperture and the rear door is deeper to accommodate the cable entering the bottom of the head and routing past the YY module.

Electrical Connection



ENSURE ALL LOCK OUT PROCEDURES AND OTHER ELECTRICAL SAFETY PRECAUTIONS HAVE BEEN TAKEN PRIOR TO STARTING THE CONNECTION PROCESS

The incoming cables are terminated with 2BA PIDG Ring Terminals in accordance with standard Network Rail assembly and test procedures and the cable is fed into the terminal box through the gland nut.



The terminal box will have a bag of loose nuts washers and slip links inside and these should be assembled onto the terminal bar along with the incoming cables.



Each Module is bonded to the main enclosure using earth straps as shown above.

A wiring connection diagram is provided inside the terminal box cover but installers should always consult the relevant Network Rail Documentation to establish the correct connection detail.



Module Interconnection

The double yellow module is powered by an umbilical cable fitted with a quick release 'Bulgin' type connector. Both connectors are keyed to ensure it is not possible to misalign or incorrectly connect them.



Once the connection is made the locking ring should be done up hand tight only – there is no need to use handtools.

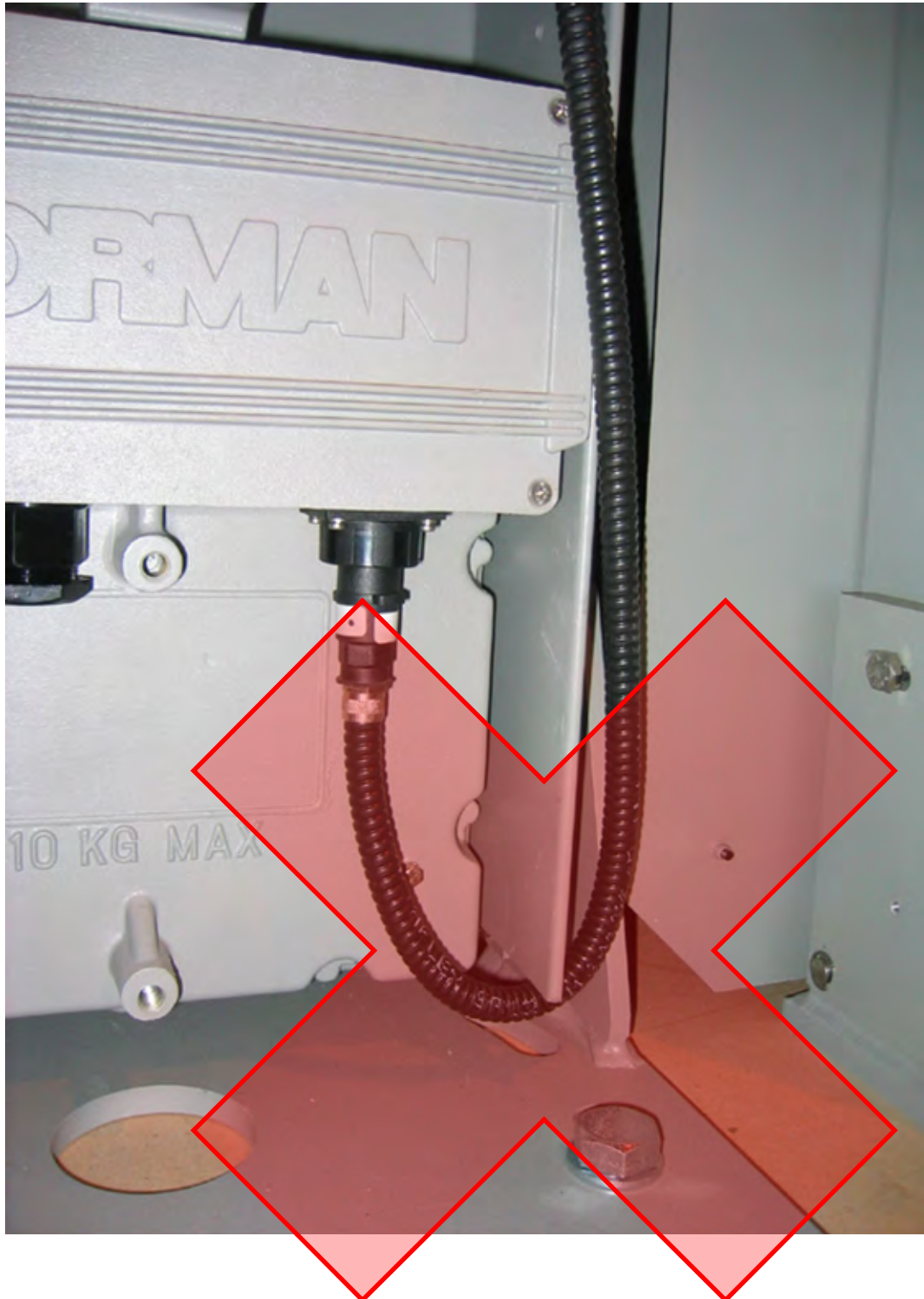


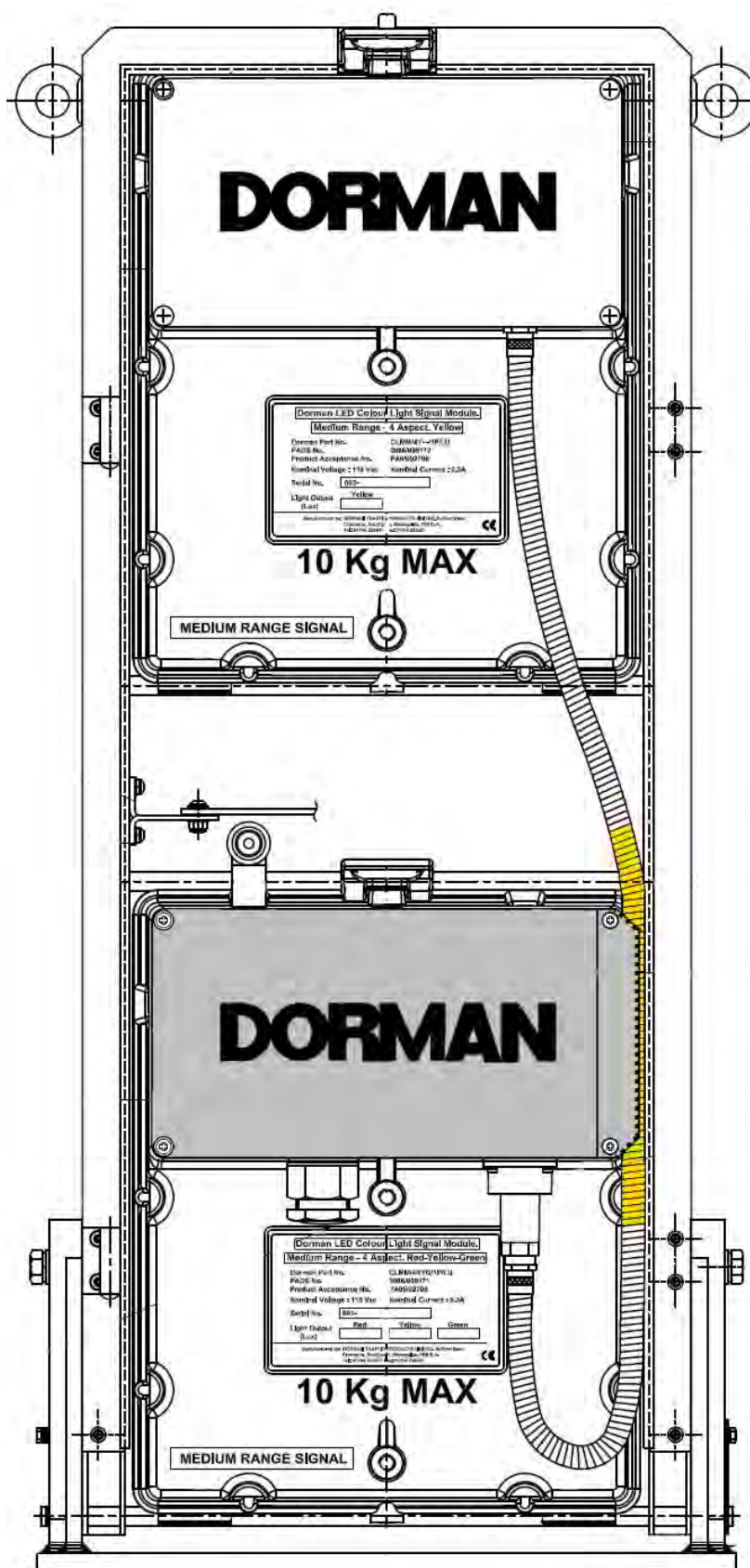
If the umbilical cable feeding the double yellow module is not connected or damaged, this will cause the ECR relay to de-energise on RRI systems or the Current Proving Bit on an SSI interlocking to be removed from the reply telegram.

The main cause of damage to the umbilical cable is incorrect routing, causing it to become trapped when the module is restored to its operational position following

tilting or removal and the rear door trapping the cable when it is closed. Care should be taken not to trap the umbilical under the frame when fitting the modules

The correct routing is behind the lip on the terminal box cover as illustrated below





Changing the Door Opening Side

To enable fitting of the CLS against walls etc the door can be set to open either left or right.

Note the assembly order of any fasteners removed in the instructions below, to ensure correct re-assembly sequence.

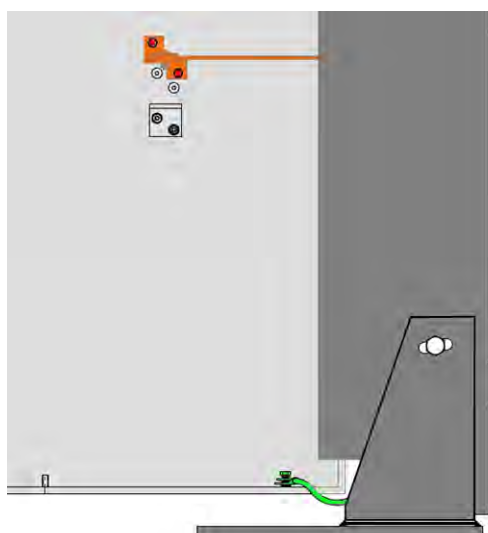
Door Preparation

Remove the padlock and unscrew the locking bolt and bar to release the door (care should be taken in windy conditions to control the door as it opens).

Remove the 4 x rubber doorstops and refit them to the clinch studs on the opposite side of the door.



Remove and retain the door stay assembly and earth bonding strap at the bottom of the door/frame.



Remove the door by removing the hinges and then move them to the opposite side of the door. (Do not fully tighten at this stage to allow later door / frame alignment).

Frame Preparation

Refit the earth strap on the opposite side of the frame.

Refitting the Door

Rehang the door onto the frame aligning the door hinges to the corresponding points on the frame. Adjust the hinges for satisfactory door operation and to give 1mm clearance between the inner face of the door and the top of the rolled edge on the frame. Then turn the door stay over and refit to the opposite side and finally tighten all door, frame and hinge fasteners.

The door is closed and secured using the locking bolt and bar and a standard padlock.

Maintenance Activity

The signal design is such that it is maintenance free apart from any general husbandry required. However, the network operator may mandate some maintenance activity and this will be promulgated through the normal channels.

With the rear door open, the LED module(s) can be unlatched and tilted back for access without electrically disconnecting the signal.

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.

Open the rear door and supporting the weight of the module press firmly on the spring loaded latch at the top of the module and allow the module to rotate backwards about the pivot shaft at the bottom.



Once the cleaning activity is complete, the module should be 'slam shut' back to its installed position to ensure that the locking latch engages correctly as shown.



There are safety lugs on the door which prevent it being closed if the module latches are not fully engaged.



Confirm the umbilical cable on four aspect signals is routed correctly as described in the Module Interconnection section above

Service and Repair

The LED modules have no user maintainable elements and are intended to be replaced completely should they fail and then returned to the manufacturer for repair.

Module Replacement



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



A competent person should ensure that the supply is isolated and an appropriate lock-out device is in place before disconnecting/connecting the module.

Before replacing the module disconnect the infrastructure cable from the 2BA terminals and the umbilical cable on four aspect heads as described in the sections above. Disconnect the earth bonding strap at the module end.

Support the module and release the locking latch to allow the module to tilt backwards as shown:



The module can then be lifted off the lower support bar and moved to a safe place.

Remove any blanking caps from the new module (and fit to the old module for return). Engage the forks at the bottom of the module on the lower support bar in the frame and then tilt the module to its installed position and 'slam shut' the module as detailed in the Husbandry section above.

Refit the umbilical and bonding strap, then restore the power to the signal and carry out any post installation checks required to bring the signal into service.



Confirm the umbilical cable on four aspect signals is routed correctly as described in the Module Interconnection section above

End of Life Disposal

Wherever possible the component parts and complete assemblies of the signal should be recycled.

Contact Us

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