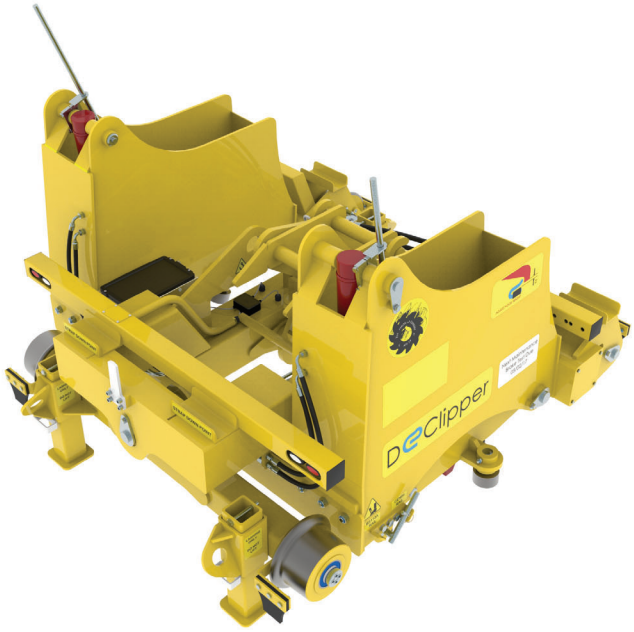
# EDCI5-01 DECLIPPER
# for Pandrol E and PR clips




## A Heavy Duty RRV Attachment for Extracting Pandrol Clips

Issue 5

July 2022


Document Number: EDCI5-01-SPEC Issue: 05 Date: JULY 2022

THOMSON ENGINEERING DESIGN
A CRI SYSTEMS COMPANY

# Introduction

*A large part of our work at Thomson Engineering Design involves building special tailor-made equipment for the rail industry. In 2009, in association with Balfour Beatty Rail Plant we developed an RRV attachment incorporating a combination installer / extractor for E-Clips and PR401 Clips.*

Part of the development work on that machine involved the design of a clip removing device which could safely remove Pandrol clips without risk of breaking the sleepers where the clips are badly seized by corrosion.

This clip remover proved so successful that we have now developed it into a specialised clip extraction attachment utilising the system developed in 2009 but in a lighter and more compact format.

The result is the new EDC15-01 Declipper, proven in trials, CE marked and fully approved for use on Network Rail controlled infrastructure.

The key features of this new design are:

- Hydraulic retraction of de-clipping hooks
- Simple and independent adjustment of hook heights
- Ability to de-clip one rail or two
- Containment of flying clips
- EasyTilt adapter head
- Full RIS1530 Issue 6 compliance

Our Clipper / De-Clipper developed in 2009

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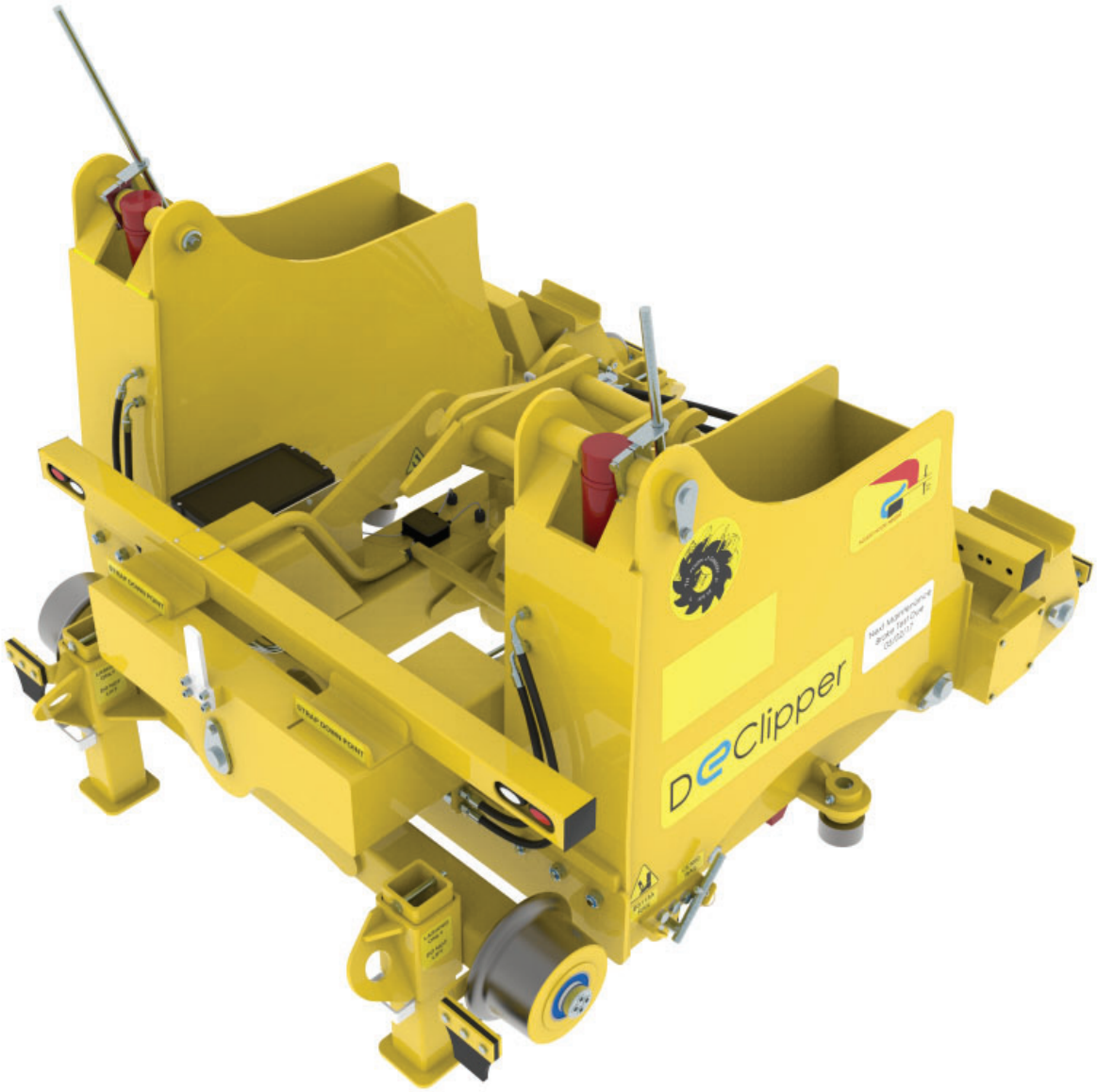
# Overview

*The EDC15-01 Declipper is attached to the RRV via the normal quick coupler via a unique Easy-Tilt adapter head. Dual hydraulic services are connected to the auxiliary supply from the host machine and used to raise and lower the de-clipping hooks at each side of the machine.*

All other systems are self-contained within the attachment. Fail safe spring brakes released by pressing down on the attachment head apply brake pads to the rear wheels. A 12 Volt battery, recharged by a built-in solar panel, powers the marker lights which are controlled by an electronic direction sensor.

At the start of the shift the height of the de-clipping hooks is set to suit the rail section (BS113A or CEN60) by a simple lever on each side.

A 'flag' marker shows the operator when the de-clipping hooks have been raised for travel or lowered for releasing clips.







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# General Specifications

*A general arrangement drawing of the EDC15-01 Declipper is given on page 6 showing the standard model.*

Other general specifications are as follows:

| | |
|---|---|
| Overall Dimensions | 2,176 mm (L) |
| | 1,920 mm (W) |
| | 1,376 mm (H) on legs |
| Wheelbase | 1,682 mm |
| Overall Weight | 1,980 kg |

## Wheels

| | |
|---|---|
| Wheel Profile | P1 |
| Wheel Diameter | 225 mm |
| Back-to-Back Dimension | 1,360mm +/- 2mm |
| Wheel Bearings | Deep Groove Ball Bearings |
| Sealing | Rubber Seals both sides |
| Wheel Capacity | 1,500 kg per wheel |

## Brakes

| | |
|---|---|
| Brake System | Direct on wheel |
| No. of Braked Wheels | 2 (rear) |
| Brake Lining Material | 5 mm Asbestos-free |
| Brake Pad Area | 3,686mm$^2$ per wheel |
| Design Total Brake Force | 2.1 kN |
| Max. Design Gradient | 1:25 |

## Dual Hydraulic System

| | |
|---|---|
| Max. Inlet Pressure | 300 Bar |
| System Pressure | 150 Bar[1] |
| Cylinder Bore | 80 mm |
| Cylinder Stroke | 400 mm |
| Hose Burst Protection | 2PO Check Valves[2] |

## Lighting System

| | |
|---|---|
| System Voltage | 12 V |
| Battery Type | Gel Filled |
| Charging System | Solar Panel[3] |
| Control | On/ Off Toggle Switch |
| Direction Detection | Automatic[4] |
| Lights | LED |
| Protection | 20A Resetable Breaker |

1 Pressure control valve fitted
2 Fitted directly on cylinders
3 Mains Charger available
4 Magnetic wheel sensor on R/H rear wheel




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## Adapter Head

| | |
|---|---|
| Type | 2 piece - hinge mounted<br>Easy-Tilt system |
| Rotation | + / - 10 degrees |
| Options | A full range of 2 pin head types are available |

## De-Clipping Modules

| | |
|---|---|
| Type | Spring Loaded Hook |
| Retraction | Hydraulic |
| Adjustment | Two position pre-sets |
| Standard Position Settings[5] | BS113A / CEN60 |
| Total Hook Travel | 150 mm |
| Lateral Adjustment | +/- 15mm[6] |

## Stability on Track

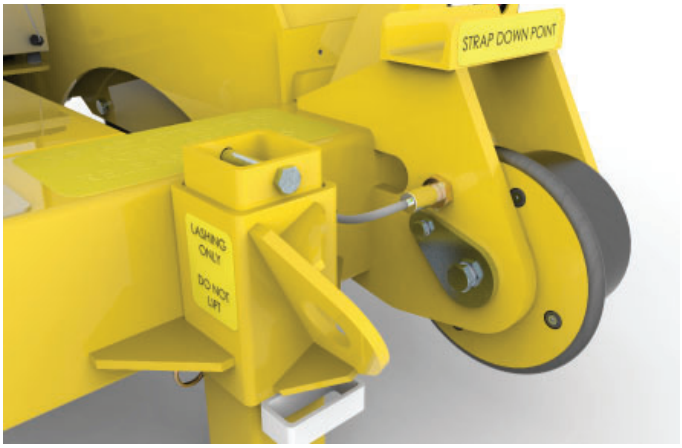
| | |
|---|---|
| Centre of Mass in working mode | 267 mm Above Rail Level |
| Track Twist Compensation | Pivoting Front Axle |
| Max. Working Cant | 200 mm |

## Stability in Transit

| | |
|---|---|
| Centre of Mass in Transport Mode | 461 mm Above Ground Level |
| Rear Leg Centres | 850 mm |
| Ground Unevenness Compensation | Legs on Pivoting Front Axle |
| No. of Lifting Points | 2 |
| Lifting Point Height | 283 mm Above Centre of Mass |

## Optional Equipment

| | |
|---|---|
| Elephant's-Foot Rollers | For use with light excavators |
| Air Brakes | In place of standard brakes |
| Hydraulic Brakes | In place of standard brakes |
| Work Lights | Requires uprated battery |
| Uprated Battery | Include uprated solar panel |




For security in transport, each end of the machine is equipped with steel channels for lashing down with ratchet straps and lashing point eye plates for chaining to a lorry.

Four magnets set into the back face of the off side rear wheel are used to trigger the automatic direction switch to control the marker lights.

5 Factory set. Alternative settings available
6 Requires loosening of mounting bolts

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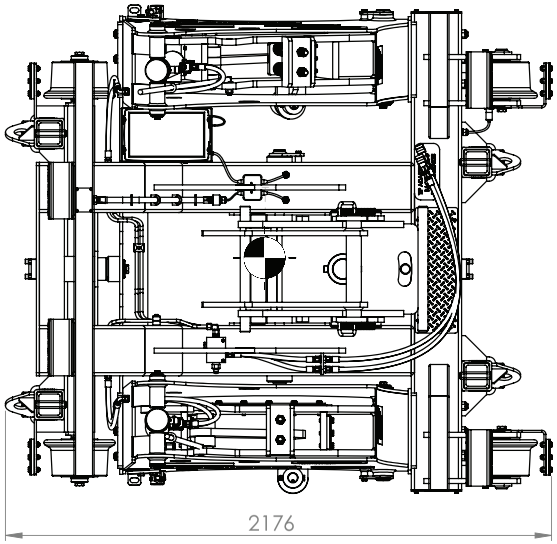


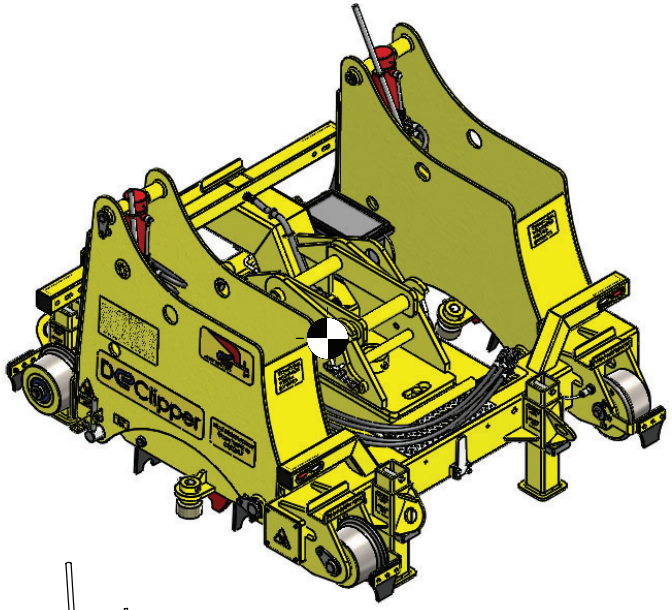


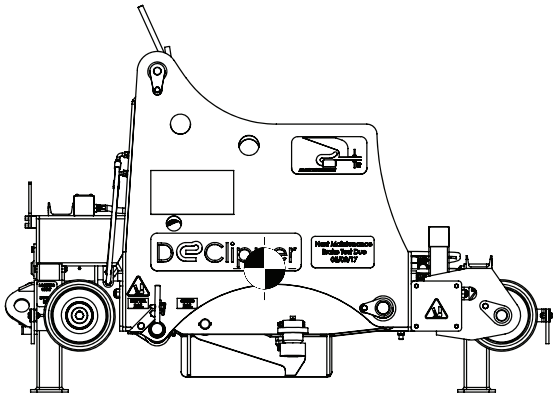


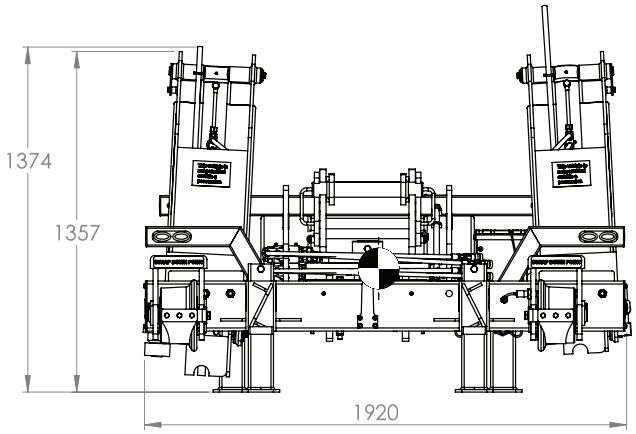


| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | PROJECT<br>EDC15-01 DECLIPPER | UNLESS OTHERWISE SPECIFIED:<br>DIMENSIONS ARE IN MILLIMETERS<br>SURFACE FINISH:<br>TOLERANCES:<br>LINEAR: +0.5 / -0.5mm<br>ANGULAR: +/- 0.5deg | | FINISH: AS PARTS<br>SOURCE: | | DEBUR AND BREAK SHARP EDGES | DO NOT SCALE DRAWING | REVISION 6 | |
| | | | | | | | The information contained in this drawing is the sole property of THOMSON ENGINEERING DESIGN Ltd. Reproduction in part or as a whole is prohibited | | |
| Stock Size | | | NAME | ORGANISATION | DATE | | TITLE: | | |
| Stock Length | | DRAWN | D. Thomson | Thomson ED Ltd | 31/12/2015 | | GENERAL ARRANGEMENT | | |
| Vendor | | CHK'D | | | | | | | |
| Vendor No. | | APPV'D | | | | | | | |
| Cost | | MFG | | | | | | | |
| Configuration | Default | Q.A | | | | MATERIAL: | DWG NO. EDC15-01-01 | | A3 |
| Q'TY REQ'D | 1 PER MACHINE | | | | | | | | |
| Client | THOMSON ENGINEERING DESIGN LTD | | Third angle Projection | | | WEIGHT: 2024.00 | SCALE:1:20 | SHEET 1 OF 11 | |


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# Fail-Safe Braking System

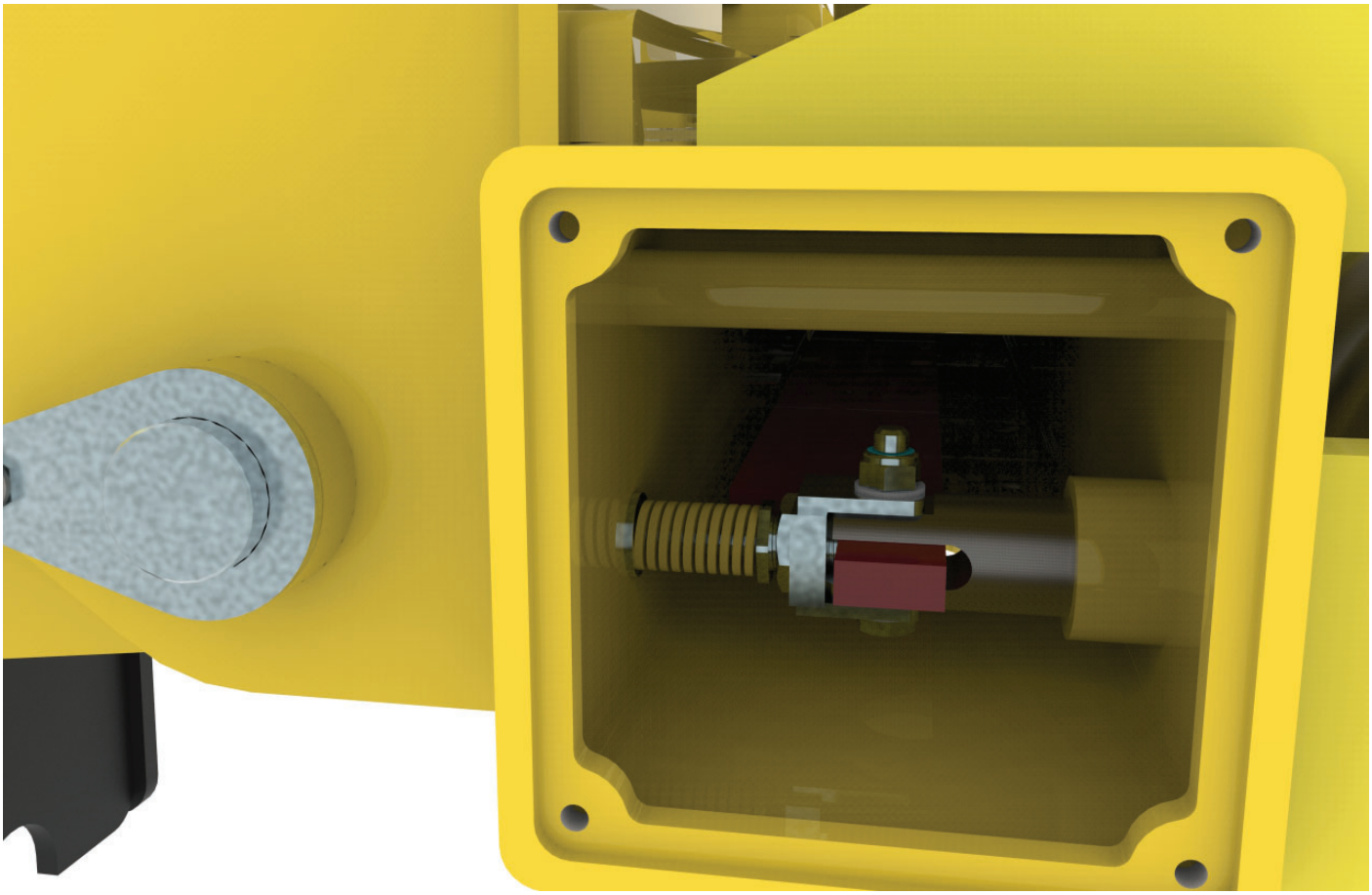
*The standard braking system uses the powerful springs to apply the brakes to the rear wheels. The spring mechanism is protected by mounting it inside the heavy section chassis rear cross-member.*

This system has been designed to be both reliable and simple to maintain.

The brakes are designed to produce a braking effort equivalent to 8% of the mass of the machine which is significantly in excess of the requirements of RIS1530-plt Issue 6.

Fail-safe air brakes are available as an option.

Hydraulically released spring brakes with a separate manual parking brake may also be specified if required.



Powerful Springs are used to Apply the Brakes

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# Wheels

*In operation a considerable part of the RRV's weight is used to press down on the attachment to improve stability.*

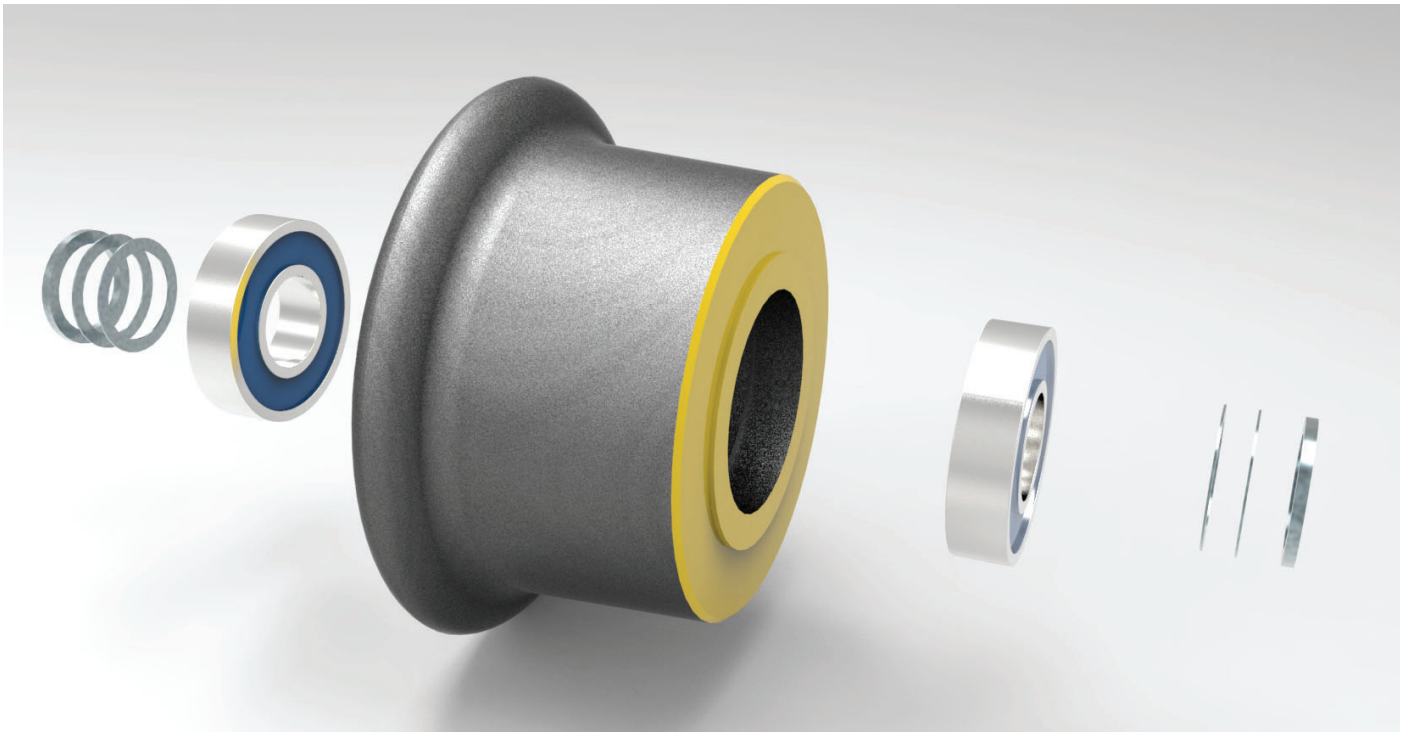
To cope with this load the wheels are fitted with heavy duty deep groove ball bearings of 115mm OD and 27mm width running on 50mm axle shafts.

The bearings are grease packed and sealed for a long, maintenance-free life. Shims on either side of the wheel guarantee the correct back-to-back dimension.

Bearings are a common standard size for easy replacement.

Wheels are P1 profile and are fully machined from EN8 billets. Wheels may be case hardened if required.

If the machine is to be used with smaller excavators, elephant's-foot rollers - which engage with the rail head to hold the machine down - can be specified. Please note that the use of elephant's-foot rollers requires more care on the part of the operator to avoid colliding with fish plates and insulated block joints.



Robust Precision-Machined Wheel Assembly

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# Adapter Head

*The Easy-Tilt adapter head assembly is shown in the exploded view below. It consists of a base fabrication mounted on the chassis cross shaft with Teflon bushes and a tiltable upper section.*

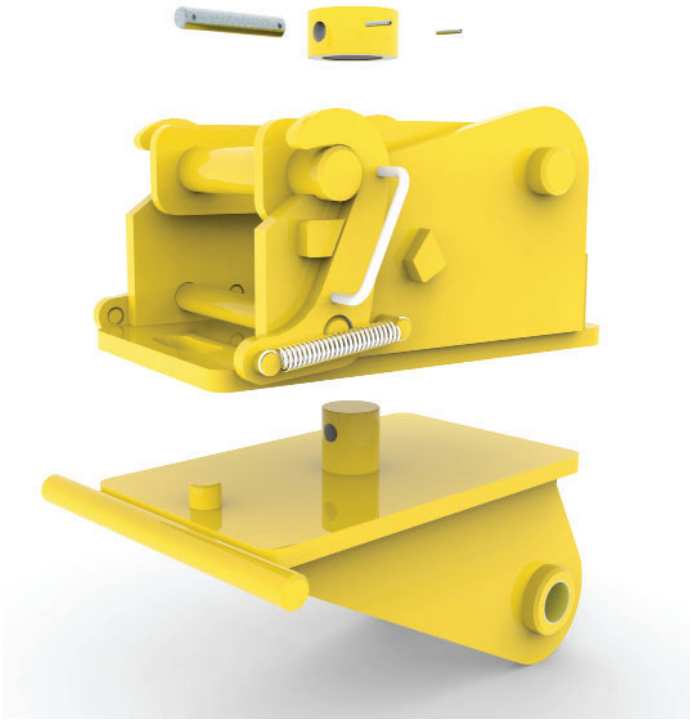
The replaceable Easy-Tilt adapter head is swivel mounted onto the base fabrication. This adapter head is specially designed to work with quick couplers which have to be fully crowded before releasing.

Simply push back the spring loaded hooks and the adapter head frame can hinge up for easy release.

The adapter head swivels on an 80mm diameter centre pin and is held in place by a 25mm EN24 cross pin through an EN8 collar. A slot and peg system limit the rotation of the head to 10 degrees either side.

Adapter heads are also available for Atlas, Mecalac and all other excavator hitch types.

Adapter Head Tilts to Allow Release from Automatic Quick Couplers



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# De-Clipping Modules

*The heart of the de-clipping system is the de-clipping hook. This is made from a work hardening steel to give a long working life and is mounted on a substantial pin and bush hinge arrangement.*

Twin heavy-duty coil die springs are set to give a total of 16kN preload on the hook which is enough to prevent it rising in normal operation but will allow the hook to jump over very badly stuck clips without damaging the sleeper.

Working at walking pace the mass of the machine and the RRV is used to drive the clips from the housing in a smooth continuous operation.

The hooks (one on each side of the machine) remove the clips on one side of each rail as the machine travels along the track. At the end of the work site the RRV lifts the machine up, turns to face the other way and returns back to the start point removing the remaining clips.

In this way up to 1.5 miles of rails may be released per hour.

The height of each hook can be adjusted prior to the start of work to compensate for the rail type using a simple two-position lever to select the appropriate setting.

Hydraulic cylinders are used to hold the hooks in position or to raise one or both hooks for de-clipping one rail only or for travelling along track.

To prevent the clips flying and causing damage or injury, the whole hook arrangement is enclosed behind thick, reinforced rubber baffles on three sides and by the rail section on the fourth side.

The rubber baffles to the front and rear of the unit have cut-outs in the bottom edge to allow the operator to see the hook when setting the working height.

A roller running against the head of the rail on the opposite side to the hook prevents the hook jumping out of alignment.




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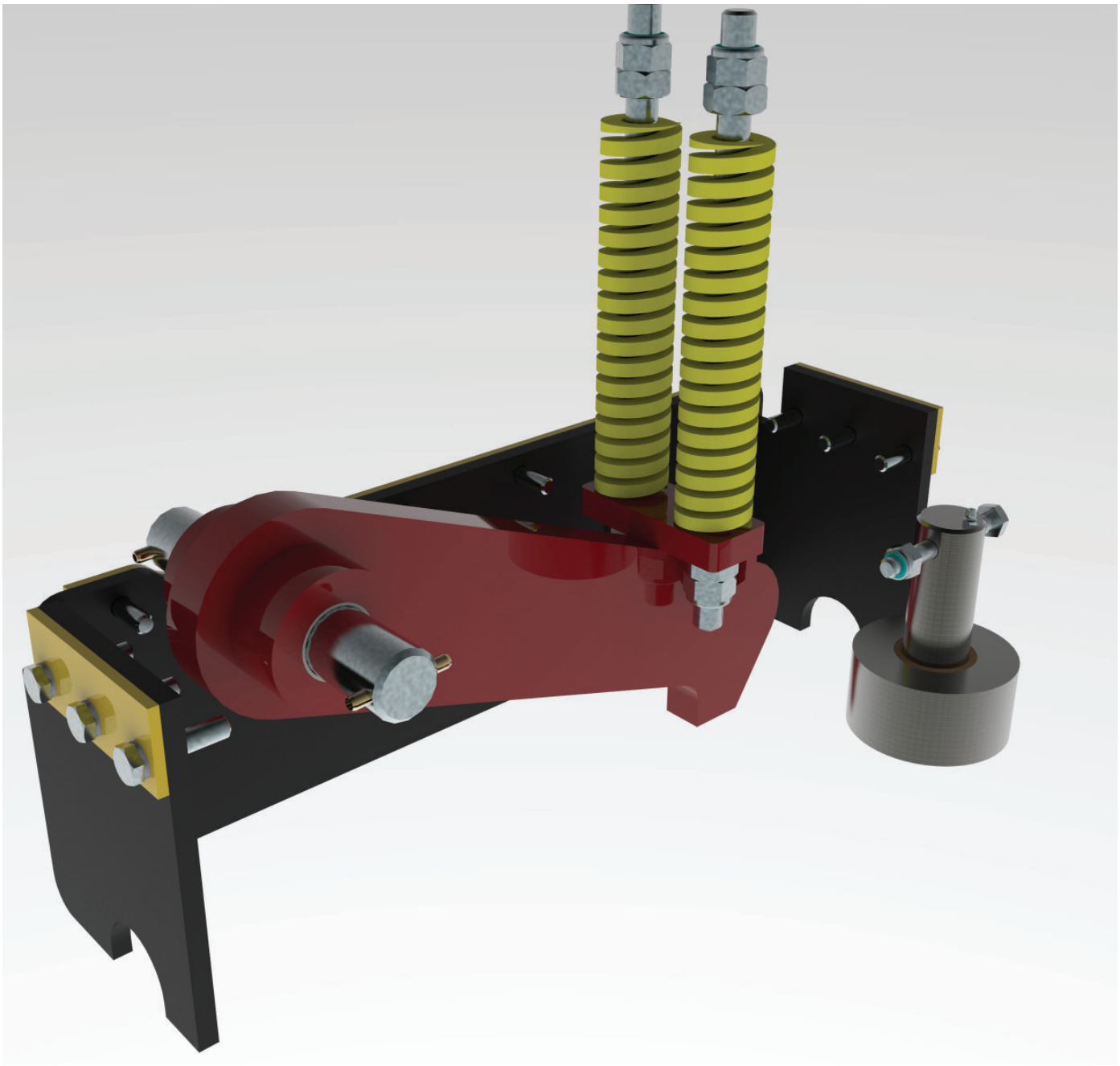
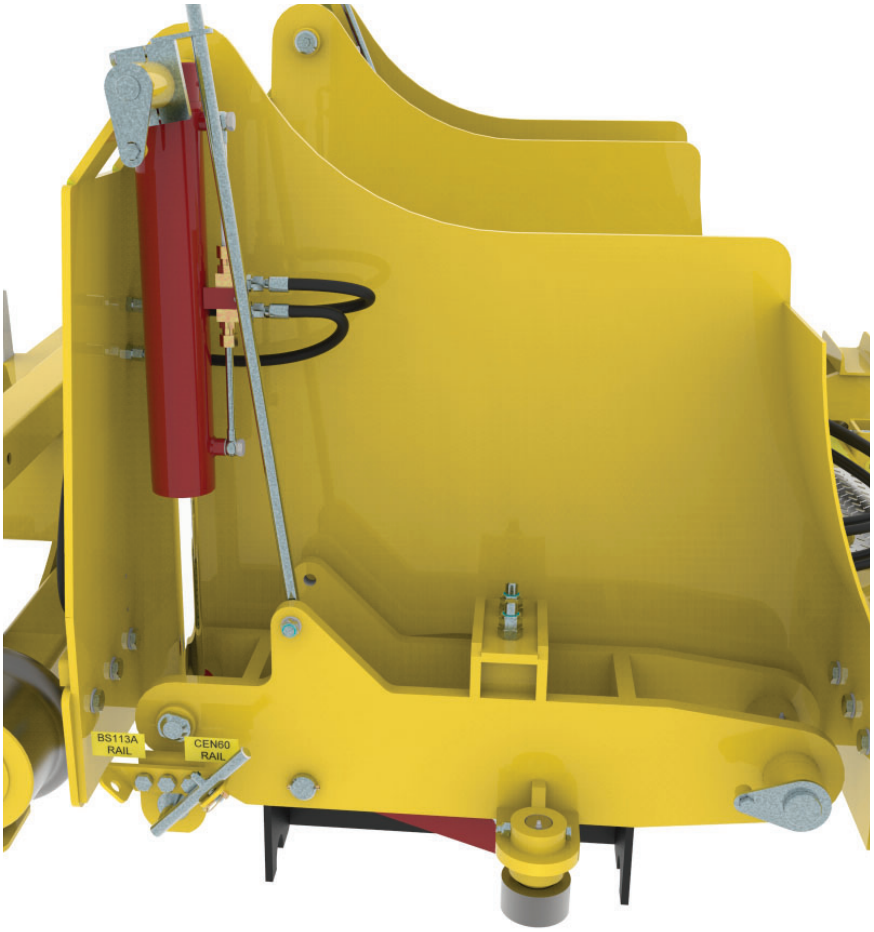
*The entire de-clipping system is housed in a massive fabricated subframe which incorporates a 50mm close tolerance mounting boss at the rear end and a cylinder rod connection point at the front.*

The operation of the cylinder is shown in the pictures on page 12. When fully retracted the cylinder lifts the entire mechanism clear of the rail head for traversing S+C and other track obstacles.

Where elephant's-foot rollers are fitted these are integrated into the same hydraulic system so that retracting the de-clipping hooks simultaneously releases the elephant's-foot rollers for easy passage over fish plates and IBJ's.






*With the cylinder extended (left) the de-clipping mechanism is ready to remove clips, retracting the cylinder raises the de-clipping mechanism clear of the rail head for safe transit on track and for transport.*

When the cylinder is extended it lowers the de-clipping mechanism to the adjustable stops. Two stop settings are selectable using the selector lever: on standard models these are factory set to suit BS113A and CEN60 rail types but may be adjusted to suit a wide range of rail and sleeper types.

In this way the de-clipping hooks can be quickly retracted to overcome an obstacle then quickly and accurately returned to the working position all from the cab of the host machine.

When elephant's-foot rollers are fitted these automatically retract and deploy at the same time.

*The casing of the module assembly is mounted onto the chassis with three bolts at each end.*

These bolts pass through slots in the module end plates which allow the modules to be adjusted sideways to accurately position the hooks above the centre of the clip housings.

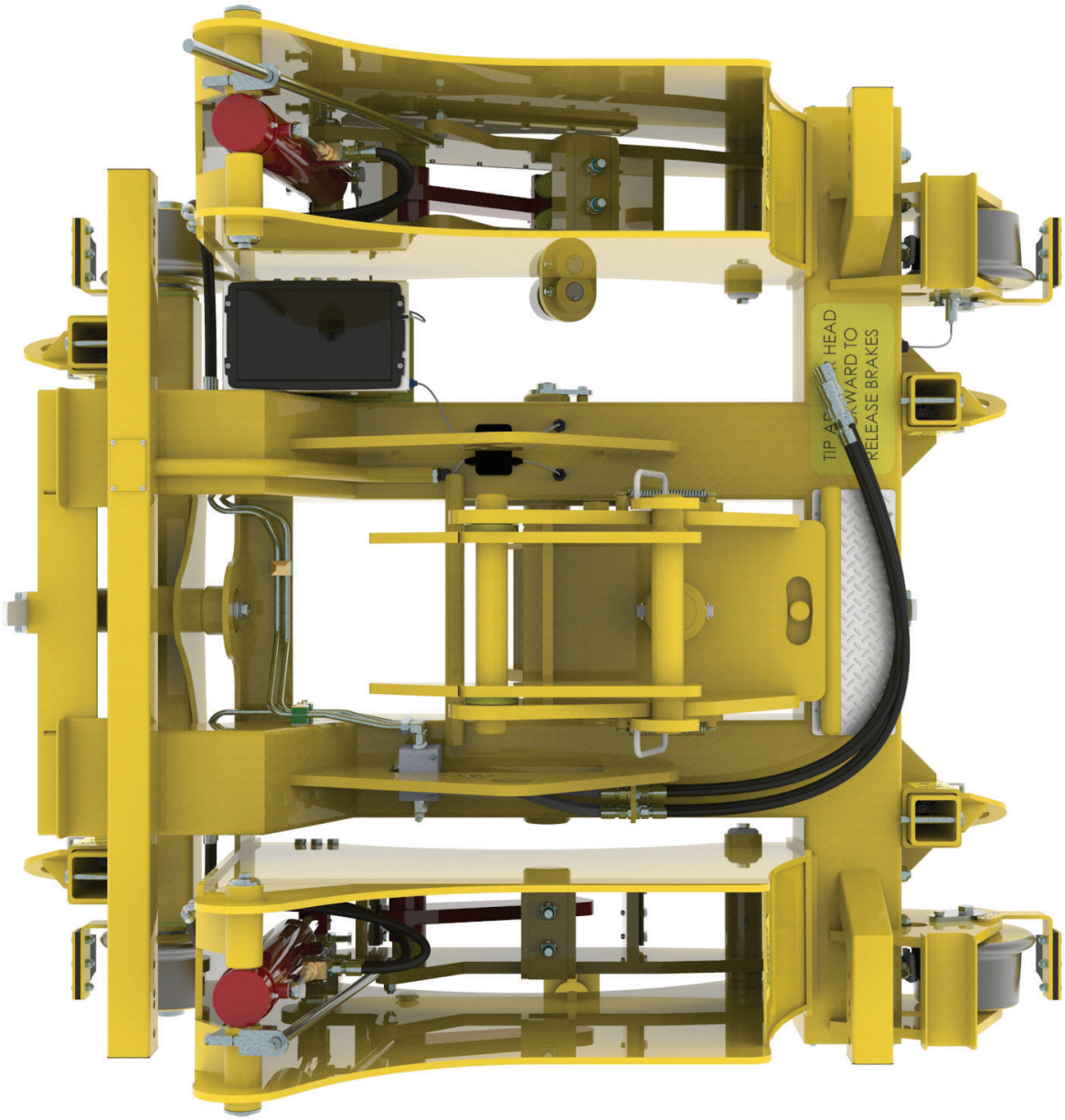
This minimises the effort required to remove the clips and thus improves the life of the de-clipping hooks.

A sticker close to the operating handle on each side of the machine reminds the operator of the correct setting for the de-clipping hooks.

*With the rubber baffles rendered as clear plastic the approach of the de-clipping hook to the clip can be clearly seen.*

The momentum of the RRV and the machine is used to drive out the clips.

# Images







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*Some safety quick couplers must be fully crowded under the boom before the coupler can be released.*

With many attachments this can lead to a lot of strain being placed on the adapter system as the whole attachment is tilted up under the boom.

The unique tilting head arrangement on the EDC15-01 Declipper overcomes this issue by releasing the adapter head frame to hinge up, allowing the quick coupler to be crowded whilst leaving the attachment hanging level.

# Approvals and Compliance

*The EDC15-01 E-Clip De-Clipper is CE marked and is compliant with the following key standards:*

- RIS1530-plt: issue 6
- 2006/42/EC
- BS EN 14033-3:2017
- BS 7608:2014+A1:2015

The machine has also received Network Rail Product Acceptance under certificate number:

- PA 05/06677

# Contact Details

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## PLEASE NOTE

Whilst every care is taken to ensure that the contents of this document are true and accurate, the specifications of our products and the scope of our services are constantly changing as part of our policy of continuous improvement.

We strongly recommend contacting the factory to ensure that details given are still current.

More than half our business comes from special products designed and built as one-off's and we are always pleased to discuss amended specifications should the product detailed here not meet your exact requirements.




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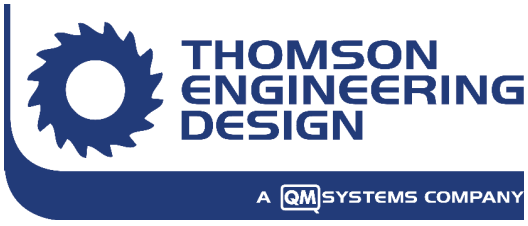


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