

# Adapter Head Selection and Specification Guide

Lifting Beams and Attachments.

Issue 5 - March 2019



# Introduction

**Selecting the correct adapter head system for your new beam or attachment is vital to the safe and efficient working of the device.**

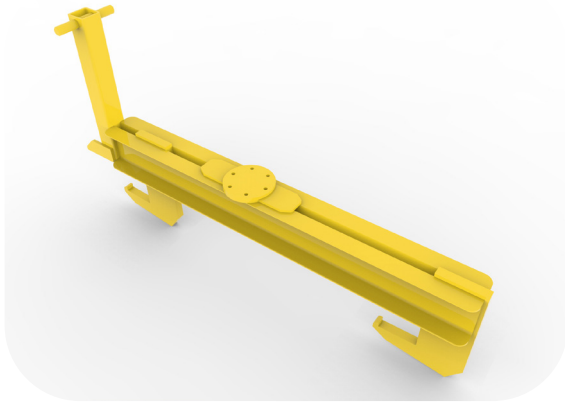
This document has been prepared to assist in choosing the best options for your application. It covers the most common types specified, provides an explanation of the proper application for each type and shows the measurements required to manufacture it correctly for your machine.

Please note that not all adapter heads available are shown in this document. Please contact us if you need a customised design.

Illustrations which include a hydraulic rotator are based on a 10,000kg capacity rotator; however different rotator capacities are factory fitted according to the size and payload of the beam, grab or attachment required.



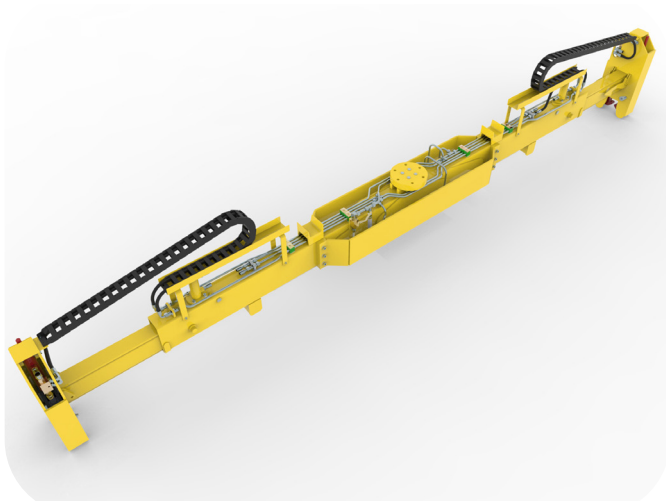
# Standard Attachment Point on Beams & Grabs



**Almost all beams and grabs and many of our range of attachments are fitted with a standard 6 bolt flange attachment point.**

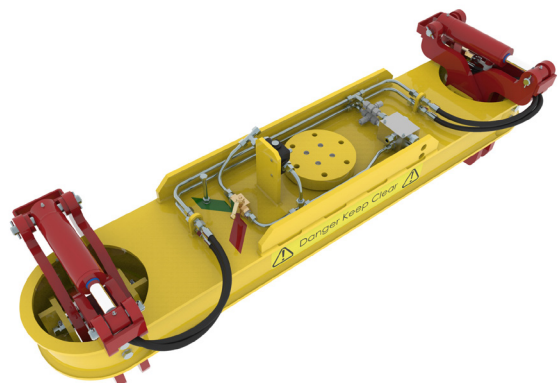
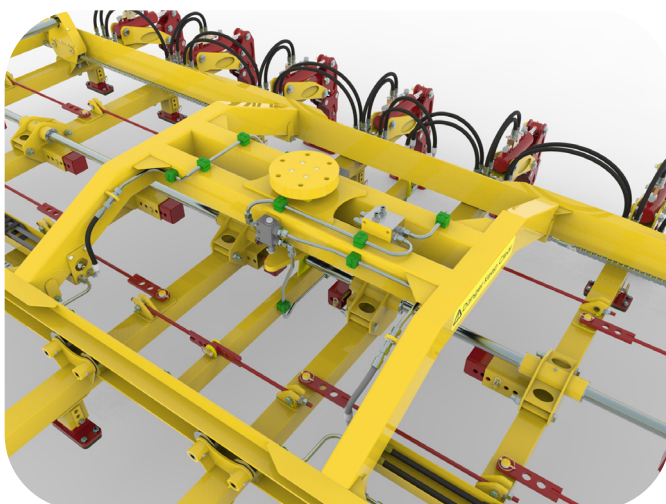
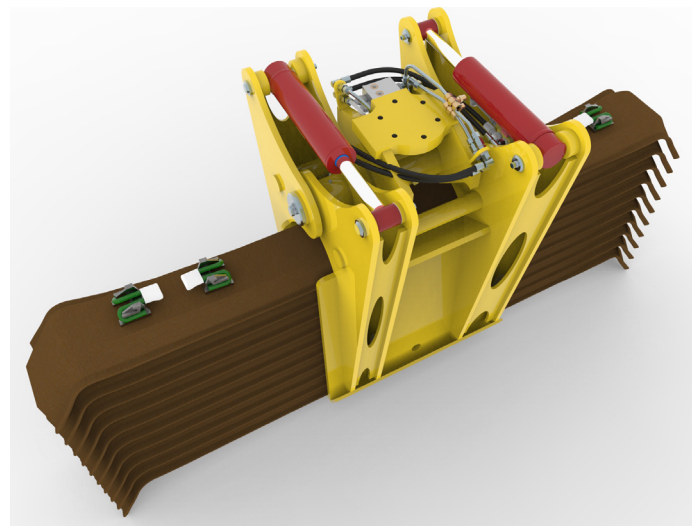
This feature allows hydraulic rotators to be fitted, swivel heads and low headroom attachment points to the device. This interchangeability allows us to provide the correct solution for your application.

These options are discussed in more detail on the following pages, however, please contact us to discuss your specific project requirements.



**NOTE: All attachments equipped with 6-bolt flange attachment points must be fitted with free-hinged adapters**

See page 4 & 5 for details



# Important Note When Specifying Adapters

## Hinged Connection

**When specifying an adapter system for any lifting attachment equipped with a bolted flange adapter mount, it is very important to ensure that the system chosen allows the attachment to swing freely to align with the load.**

Two-pin and one-pin rotator adapters incorporate hinges at 90 degrees to each other to allow the attachment to swing around the machine boom end pin and the rotator top pin to give the attachment complete freedom of movement.

## Free Rotation

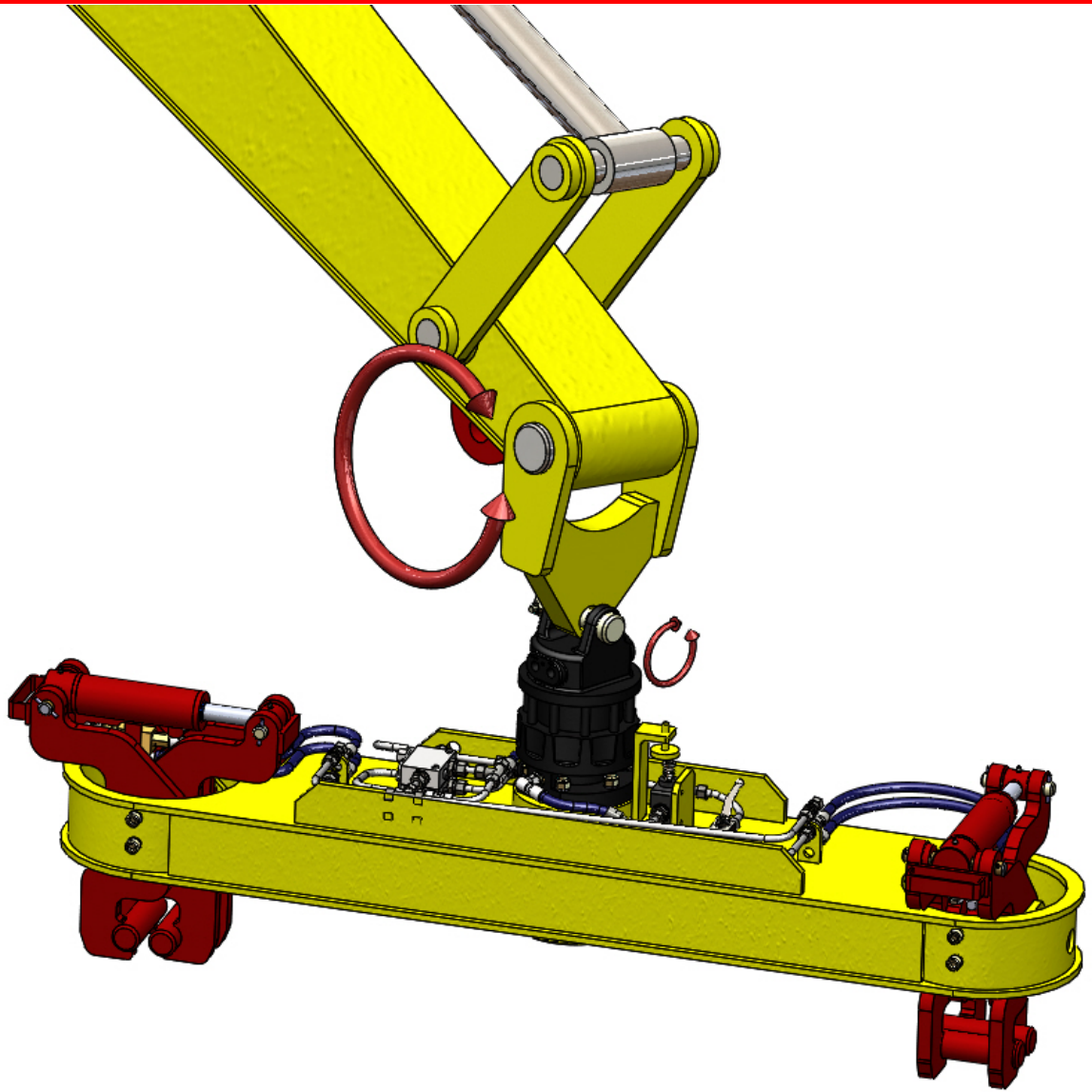
**When using a hydraulic rotator it is also important to ensure that a suitable pressure relief system is installed to prevent shock loading: for example, when an operator is rotating a load and suddenly releases the control the momentum of the load can cause extremely high shock loads if no relief system is fitted.**

Hydraulic Rotators fitted to the attachments have a small bore cross line connection installed between the hoses on the rotate circuit to dampen out shock loads.



Rotator hoses are connected together using a 1mm bore fitting to dampen out shock loadings.





Two Hinges at 90 degrees to each other allow the attachment to swing freely and prevent the bolted flange becoming overloaded.

# Heads for Hooks

**Three broad classes of hook are used on cranes and lifting machines: swivel hooks which have a bearing built into the hook assembly allowing the load to spin freely, rotating hooks which can be spun when unloaded, and fixed hooks which do not spin at all.**

It is important to check which type of hook is fitted to your machine, as damage may occur if a fixed adapter head is used with a fixed or rotating hook.

## Fixed or Rotating (unladen only) Hooks

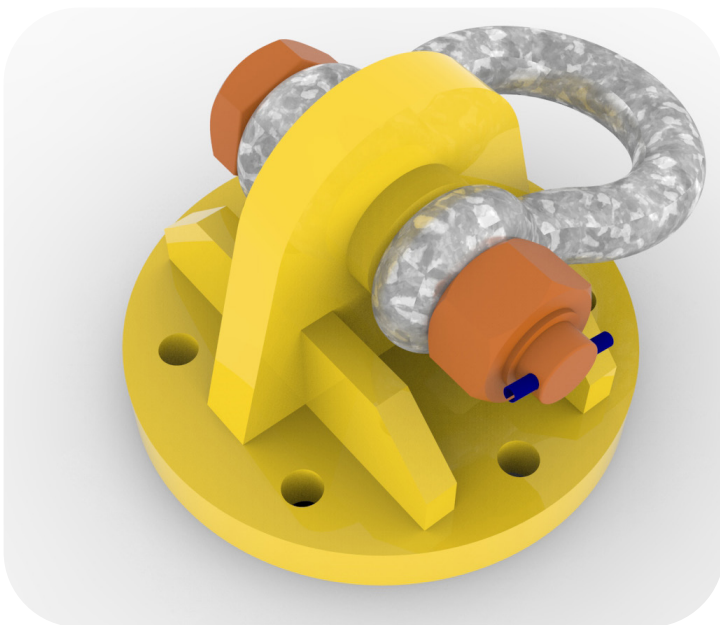
A Swivel Head Adapter must be specified with this type of hook. The Swivel head incorporates bearings to allow the load to spin and reduce the stress applied to the attachment, the hook and the host machine.

Swivel Head Adapters are factory-fitted with a safety pin bow shackle for attachment to the hook. They bolt directly to the 6-bolt flange on the lifting device.

## Swivel Hooks

Where swivel hooks are fitted to the host machine, the most popular system is the Low Headroom Attachment Head.

This adapter also incorporates a safety pin bow shackle for attaching to the hook but it is rigidly fixed to the beam or grab.



Low Headroom Attachment Head



Typical swivel head adaptor



### Typical application of a Swivel Head Adapter fitted to a Universal Lifting Beam.

Here, the Swivel Head Adapter has been specified for a pair of Universal Lifting Beams used for tandem lifting track panels.

The use of Swivel Heads allows the two lifting machines to slew without over stressing the load, the lifting beam or the host machines.

# Heads for Hydraulic Rotators

**Where a hydraulic rotator is required, the selection of the correct adapter head system is more complex.**

For individual beams, grabs or attachments the rotator is normally fitted directly onto the device and a suitable adapter head for the host machine fitted to the top of the rotator.

Where multiple attachments are to be provided for the same host machine, the quick change adapter system can substantially reduce costs as it allows one rotator to be used with multiple attachments.

## Quick change Adapter System

With the Quick Change Adapter System, the hydraulic rotator is mounted on a specially designed Square Drive Base.

Each attachment, grab or hydraulic beam is fitted with a matching Square Drive Adapter Head, which bolts directly onto the 6 bolt flange attachment point.

The parts are carefully machined so that when the rotator section is engaged with the Square Drive Adapter Head, the fixing pin can be easily inserted by hand to complete the fitting of the attachment.

As with all of the rotator based attachment systems, the top of the rotator may be fitted with any of a wide variety of attachment heads to suit your host machine.

**NOTE: All attachments equipped with 6-bolt flange attachment points must be fitted with free-hinged adapters**

See page 4 & 5 for details



The parts of the Quick Change System





### Typical application of the Quick Change System with three attachments.

The Road Rail Excavator can swap from a Telescopic Rail Beam to a Plate Grab, to a Universal Lifting Beam in seconds.

The rotator part of the Quick Change System has been fitted with a I-Pin Adapter Head fixing to the boom end.

# Two-pin Rotator Heads for Quick Couplers

**Where the beam, grab or attachment has a rotator and is to be fitted to an excavator with a Pin type quick coupler, a Two-Pin Attachment Head is required.**

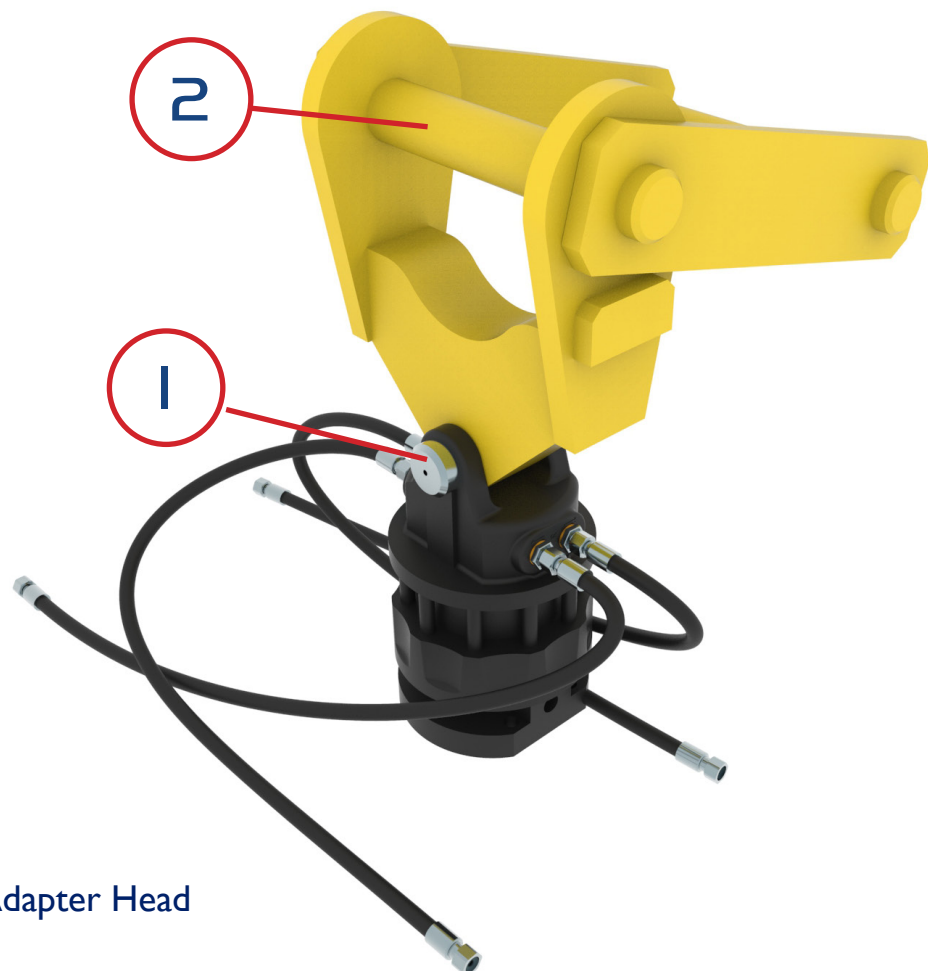
This arrangement is as shown below.

The Two-Pin Attachment Head can pivot about the rotator top pin (1) and the rear attachment pin (2), so that the grab always hangs freely below the quick coupler.

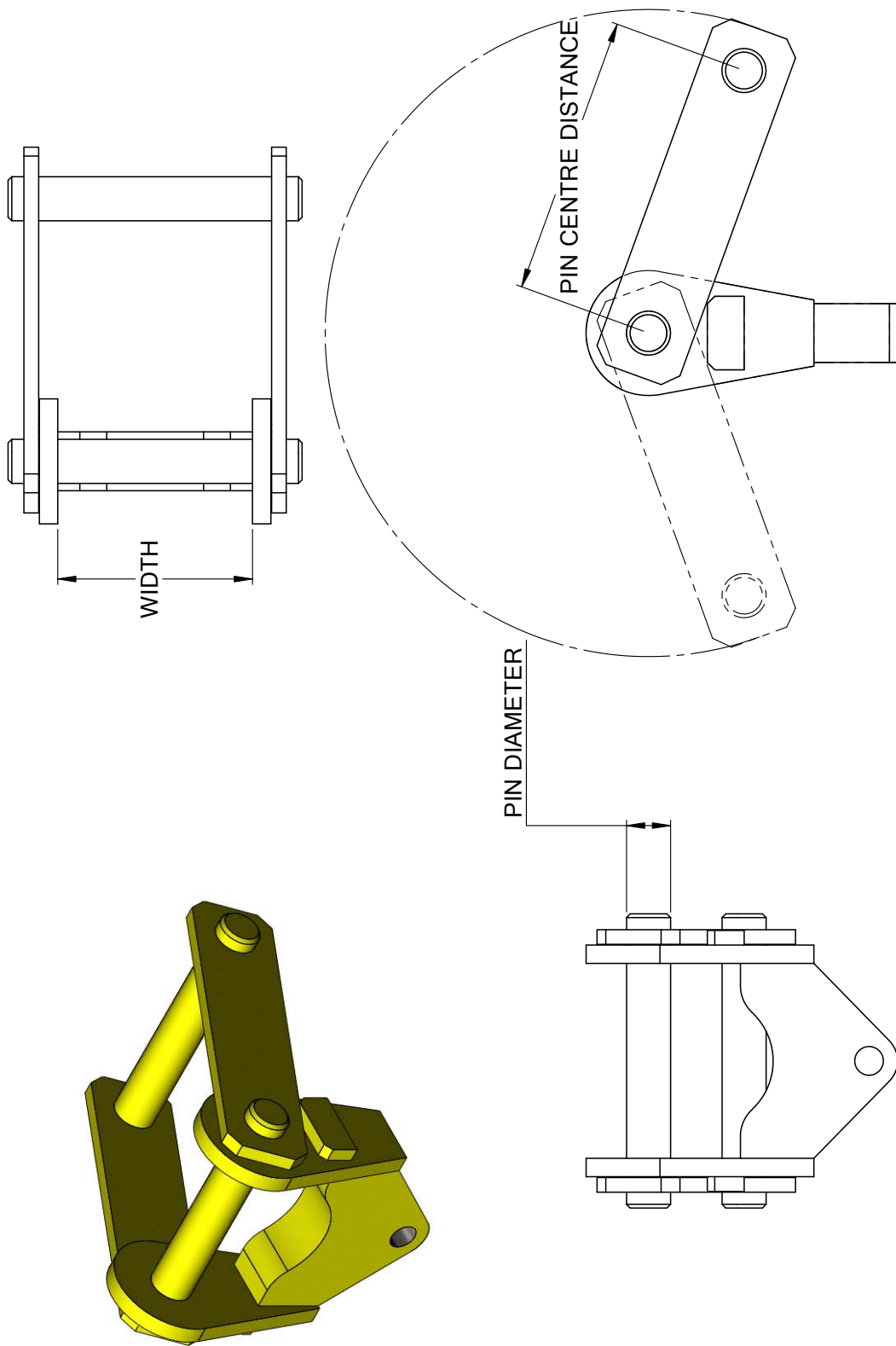
When specifying this attachment system we will require the three dimensions as shown on page 11.



A typical Pin Type Quick Coupler



Rotator and Two-Pin Adapter Head



PIN DIAMETER.....mm      WIDTH.....mm      PIN CENTRE DISTANCE.....mm

# One-pin Rotator Heads for Quick Couplers

**Where the beam, grab or attachment has a rotator and is to be fitted to an excavator which does not have a quick coupler, a One-Pin Adapter Head should be specified.**

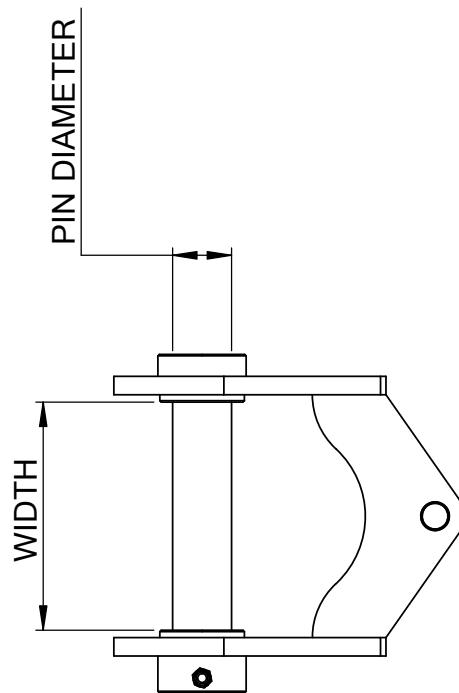
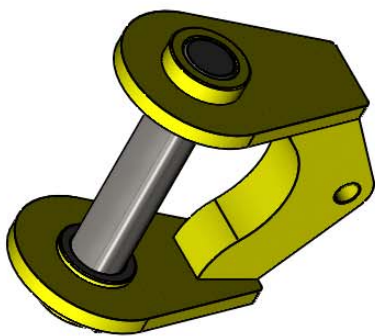
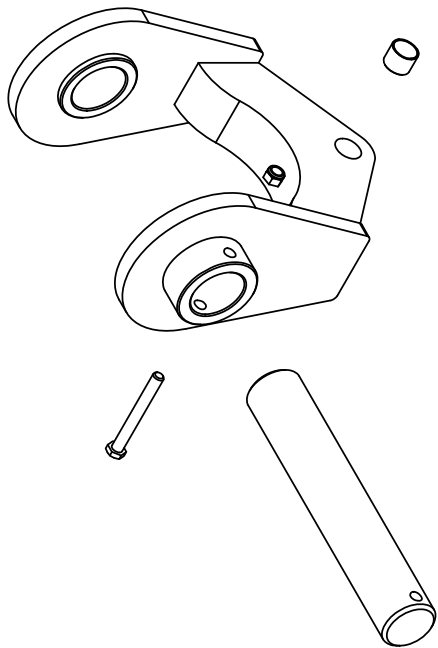
This arrangement is as shown below.

The Main Pin (1) is removable and fits through the excavator boom end boss.

When specifying this attachment system we will require the two dimensions shown on Page 13.



Rotator and One-Pin Adapter Head



WIDTH.....mm

PIN DIAMETER.....mm

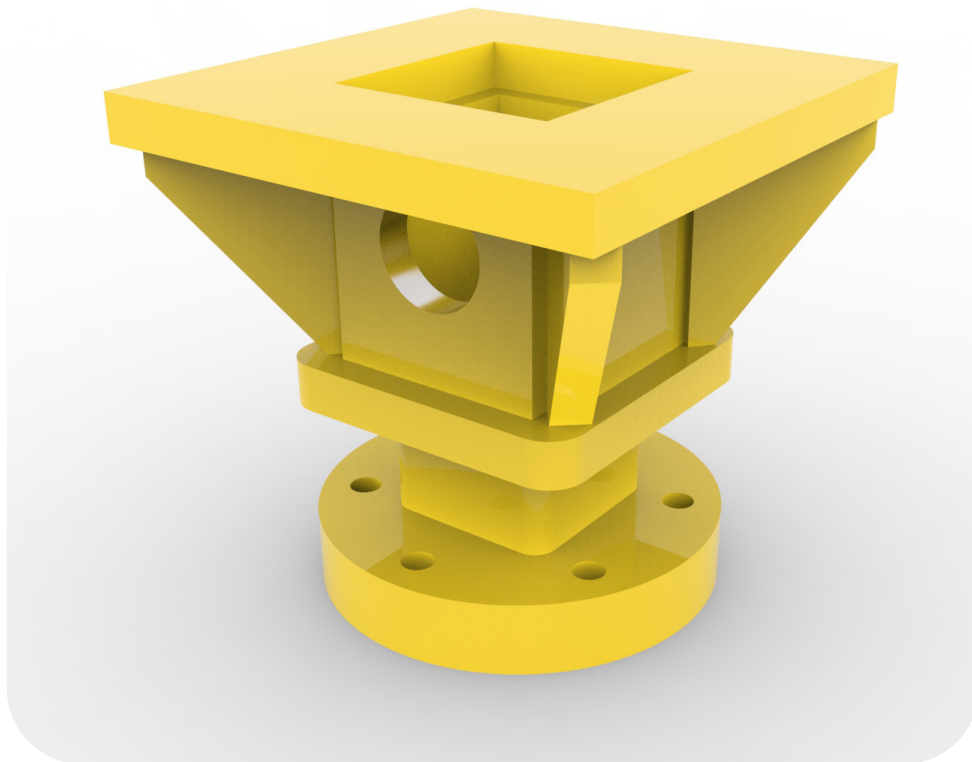


# Archimedes Adapter Heads

**Where the beam, grab or attachment is to be fitted to an excavator equipped with an Archimedes Rotator, an Archimedes Adapter must be specified.**

A typical Archimedes Adapter Head is shown below. The square recess engages with the square drive-shaft of the Archimedes rotator and is fixed with a cross pin (not shown).

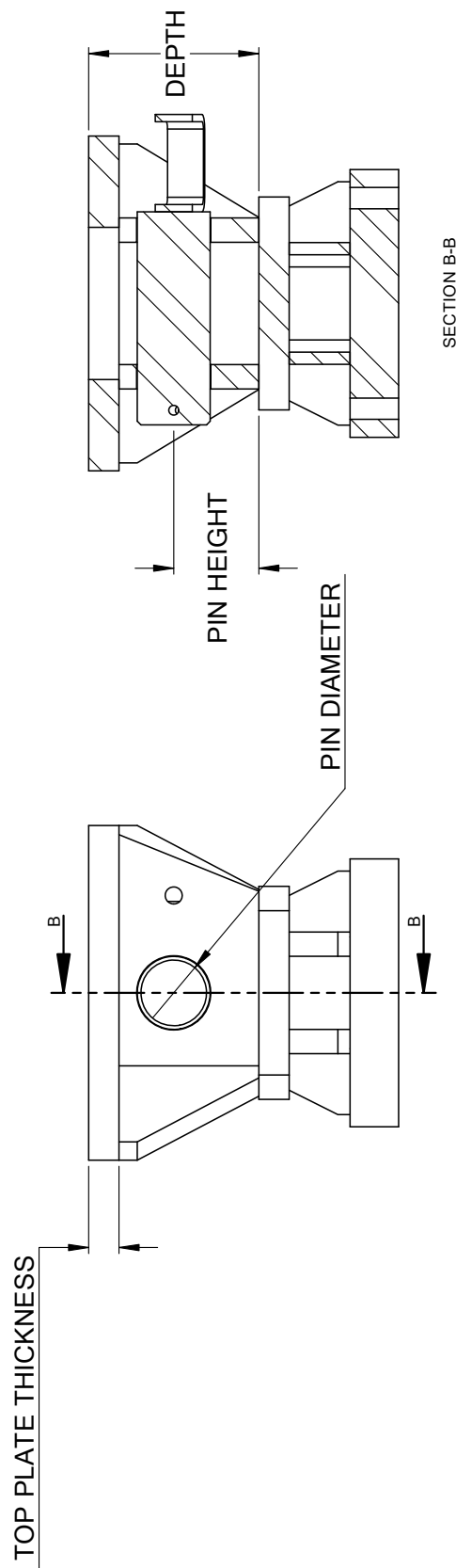
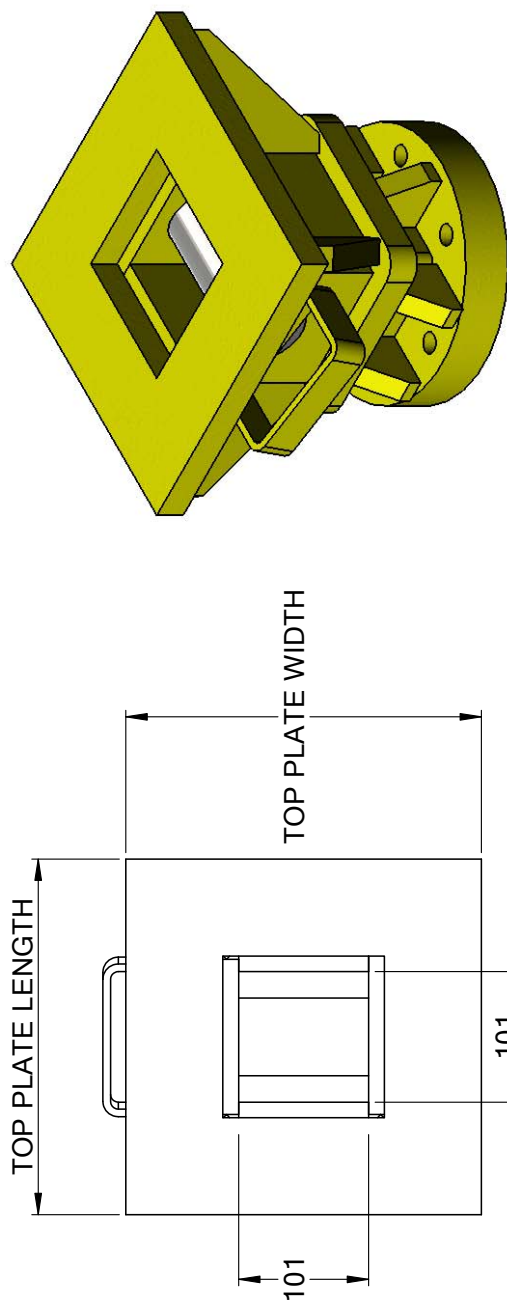
When specifying this attachment system we will require the six dimensions shown on Page 15.



A typical Archimedes Square Drive Adapter Head

**NOTE: All attachments equipped with 6-bolt flange attachment points must be fitted with free-hinged adapters**

See page 4 & 5 for details



PIN DIAMETER.....mm    PIN HEIGHT.....mm    DEPTH.....mm    TOP PLATE LENGTH.....mm

TOP PLATE WIDTH.....mm    TOP PLATE THICKNESS.....mm

# Atlas Adapter Heads

**Where the beam, grab or attachment is to be fitted to an excavator equipped with an Atlas type adapter head, an Atlas Adapter must be specified.**

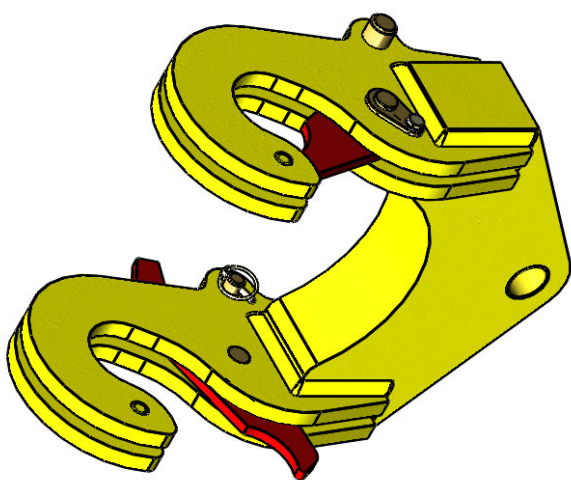
A typical Atlas Adapter Head is shown below.

The 'cow horns' on the top of the adapter engage with the mounting bosses on the quick coupler and are locked into place by the red latch plates which are fixed by removable pegs.

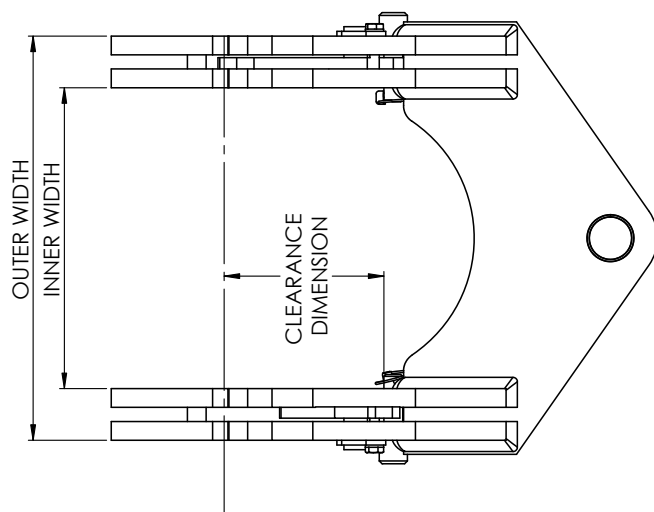
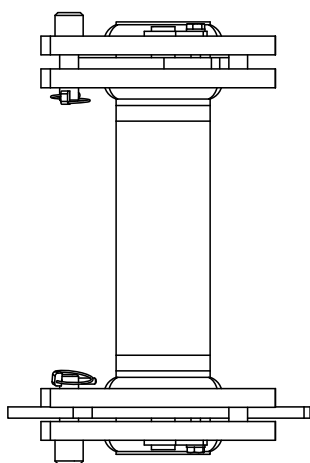
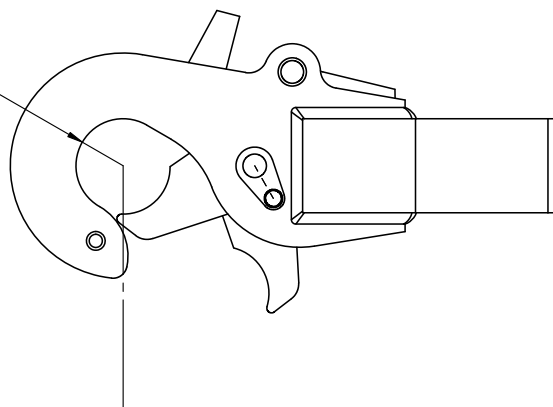
When specifying this attachment system we will require the four dimensions shown on Page 17.



A typical AtlasAdapter Head



BOSS DIAMETER



BOSS DIAMETER..... INNER WIDTH..... OUTER WIDTH..... CLEARANCE DIMENSION.....

# Adapter Heads for truck mounted cranes

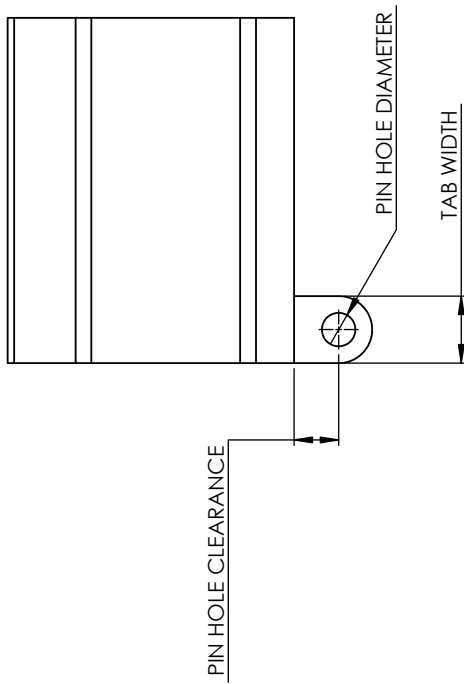
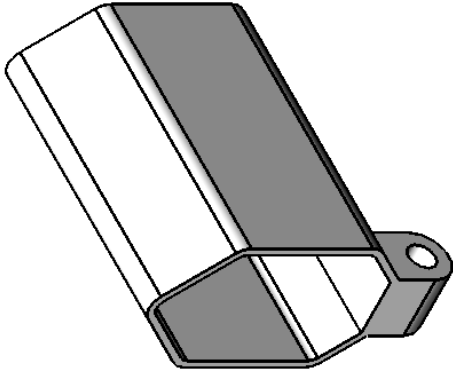
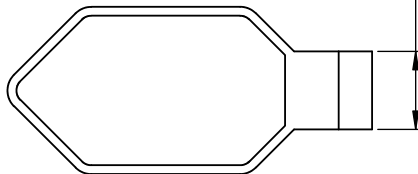
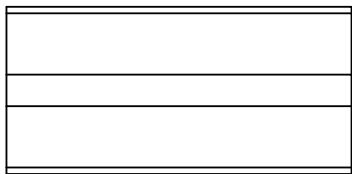
**Where the beam, grab or attachment is to be fitted to a truck mounted crane the crane mounting will normally take the form shown on Page 17 and will require an adapter link as shown in the illustration below.**

When specifying this attachment system we will require the four dimensions shown on Page 19.

Please also note that we can supply plain pins, or pins with grease ways as required.





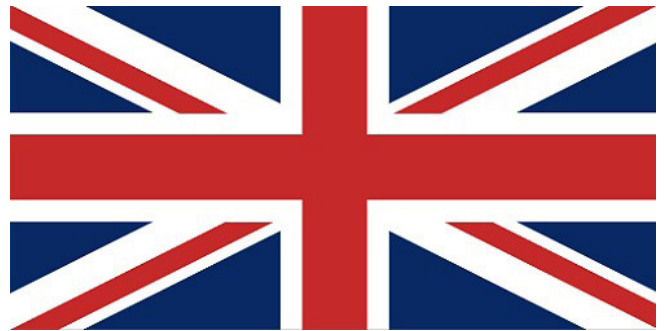


PIN HOLE DIAMETER.....PIN HOLE CLEARANCE.....TAB WIDTH.....MAX TAB THICKNESS

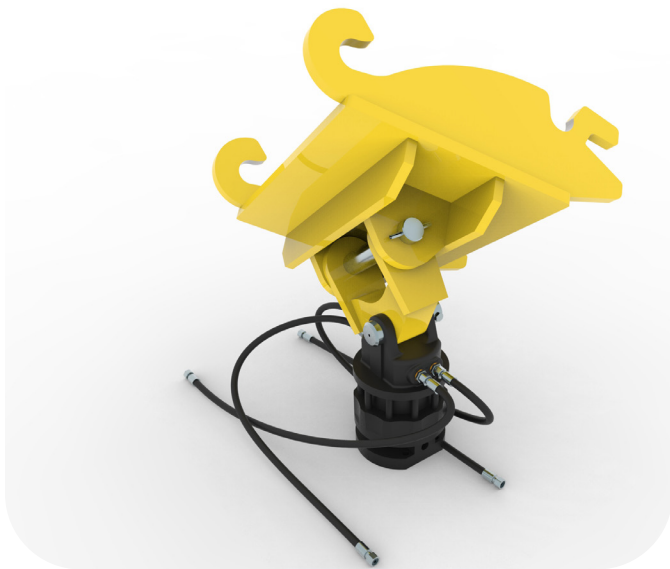
## Special Adapter Heads

We can provide an extensive range of custom adapter heads for all applications to suit specific project requirements.

For further details, please contact **[railplant@unipartrail.com](mailto:railplant@unipartrail.com)**.



All products are proudly designed and manufactured in the United Kingdom



Caterpillar CW40



Atlas / Pesci / Hiab Truck  
Crane



Atlas Excavator



Quick Coupler Convertor



Swivel Converter

If you require additional information on our full range of plant and machinery solutions, please get in touch.

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