Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Rail Delivery Group

National Rail BRITAIN RUNS ON RAIL

RDG/ACOP/EC/01008

Approved Code of Practice – EMU Tightlock Coupler and Autoconnector Maintenance (IB/TP1008 – Issue 6 – Rev A)

Issue: Two
Date December 2016

Approved Code of Practice – EMU Tightlock Coupler and Autoconnector Maintenance
(IB/TP1008 – Issue 6 – Rev A)

Synopsis

This Approved Code of Practice (ACOP) details recommended good maintenance practice for Tightlock Couplers and Autoconnectors at Level 4 Depots.

This document captures a revision of IB/TP1008 and is republished in the ACOP series (as pre previous versions)

Prepared by

Peter Waite
Principal Engineer
SNC-Lavalin

Authorised by

Simon Jarrett
Chair, Technical and Standards Forum

Tim Sayer
Chair, RDG Engineering Council

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

1. ISSUE / REVISION RECORD

This publication will be updated when necessary by the re-issue of the complete document. Amendments will be marked by a vertical black line in both the left and right margins.

ISSUE/REVISION	DATE	PAGE(S) AFFECTED	INSERTED BY
1 / A	Aug 97	Original document	
1 / B	April 98	Section 5 Page 13 of 69. Section 6 Procedure F and M	
2 / A	DRAFT	Complete re-issue. Additional content included for all Tightlock variants	
3 / A	DRAFT	Complete rewrite	
4 / A	March 2001	Whole document re-formatted into Inter-business document	
5 / A Draft	January 2007	Complete re-issue. (See section 3.2 for detailed list of amendments and background).	
5 / A	June 2008	Complete re-issue permitting critical component renewal subject to additional gauging criteria. Publication as an ATOC Engineering Council Code of Practice ACOP/EC/1008	
6 / A	Nov 2015	Amendments included to take account of changes to CR/CI0545 from Issue 3A to 4 and the publication of CR/CI0518	

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

2. CONTENTS

	Section	Page
1	Issue / Revision Record	2
2	Table of Contents	3
3	Introduction	4
3.1	Purpose or Scope	4
3.2	Amendments from issue 5 / A	4
3.3	Categories of Work	5
3.4	Differences in Tightlock couplers between different manufacturers	5
3.5	Interchangeability of Components	10
3.6	Definition of Terms	11
3.7	Supplier's Responsibilities	13
3.8	Summary of Jobs by T & RS Code	15

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

3. INTRODUCTION

3.1 Purpose and Scope

This document is prepared to assist RDG Train Operator member companies in adopting good practice in depot maintenance of Tightlock Coupler equipment. It is an update of industry document IB/TP1008 and is hereby published in updated form as a RDG Code of Practice.

The document itemises common tasks for the maintenance of Tightlock couplers and Autoconnectors as identified in the table below:-

Tightlock couplers and Autoconnectors	313, 314, 315, 317, 318, 319, 320, 321, 322, 323, 365, 465/0, 465/1, 465/2, 465/9, 466, 507, 508, and EMU Translator Vehicles that are fitted with Tightlock couplers.
Tightlock couplers only	334, 455, 456, 57/3.

The procedures in this document are only to be implemented when authorised by an appropriate maintenance instruction. Such instruction should be implemented in accordance with the maintenance duty-holder's Safety Management System

This specification does not apply to Tightlock couplers fitted to class 357 Electrostar or class 458 Juniper units, unless specifically called up by the maintenance documentation for those units. This specification does not apply to autoconnectors fitted to class 334 and autoconnectors are not fitted to classes 455, 456 and 57/3.

When the vehicles were supplied, the vehicle builders produced their own versions for jobs covering Tightlock coupler maintenance. The jobs as originally supplied have been combined and rewritten, with additional work content included where omissions have been identified, to form this document.

This document combines information and data taken from a variety of sources and contains what is believed to be the "best practice" to be adopted in maintaining this equipment. The "star chart" detailing the periodicities is a recommendation only. It is the responsibility of the Maintainer / Operator to call up individual tasks at whatever periodicity is appropriate to assure safety and reliability in the context of the mileage and duty cycle of the fleet concerned.

Corrective procedures have also been included in this document to assist the maintenance depots in carrying out remedial arising work from the scheduled maintenance jobs.

3.2 Amendments from issue 5 / A.

This re-issue has been revised to incorporate the lessons learned and mitigations resulting from the industry wide investigative work carried out following a number of in-service coupler failures and details are reported in ITLR-T30575-001. This included NIR reports 2266, 2440, 2583, 2595, 2768, 2824, 2905 and 3012. The content has been brought into line with the Joint ROSCO overhaul document CR/CI0545 Issue 4

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

that was specifically revised from the earlier issue 3A so as to eliminate the failure modes that caused the in service breakaways as reported inITLR-T30575-001.

Classes 334 and 57/3 have been added to the Jobs relating to the Tightlock coupler and uncoupling mechanism. Class 334 autoconnector is excluded from the scope of the document (as was the case in the previous version). For clarity, the lack of an autoconnector on classes 455, 456 and 57/3 is added.

Component catalogue numbers have been amended in line with CR/CI0545 Issue 4, CR/CI0518 Issue 2A. The catalogue number for the M16 spring washer in Job MP UC0217 has been corrected as 003/019555 is not valid and the EP3 grease in Jobs UC0149 and MP UC0216 has been amended to specify the available alternative grease specified on PADSNet.

The painting of rotor eyes is included in Jobs UC0103 and UC0149 for all classes to supplement the Tell-Tale and improve the visibility of the correct coupled position for train crew. Also, on class 334 the Tell-Tale is not easily visible from the platforms due to the anti-climbers blocking the view.

Where coupler bodies, knuckles, locks, lock lift levers or rotors are replaced, this document has been amended to ensure these are required to be gauged in accordance with requirements equivalent to CR/CI0545 Issue 4 irrespective of the issue status of the previous overhaul completed on the coupler. This document has been amended to ensure that a coupler failing the gauging requirements specified herein, the coupler shall be returned for overhaul in accordance with CR/CI0545 Issue 4.

3.3 Categories of Work

Scheduled Work:- This is mandatory work to be carried out at Level 4 Depot maintenance.

Abnormal Work:- This is work identified as resulting from defects found during the scheduled work.

Sequence of Work

Except where specified otherwise, the maintainer is free to select the sequence in which jobs are carried out. Where a component or system is disturbed after testing, the appropriate parts of the test shall be repeated in order to confirm that the component or system performs correctly.

3.4 Differences in Tightlock couplers between different manufacturers

Originally there were three manufacturers of the Tightlock coupler used on EMU stock, NAP (US made), Sheffield Forgemasters (SFE) (or previously known as English Steel, BSC or River Don Castings) and WCR (or previously known as Blair, but now William Cook Rail Products). However, Sheffield Forgemasters coupler division has now been taken over by William Cook Rail.

The original design emanates from NAP in the USA and some may have been supplied in the early days and later on for the class 465/2, 465/9 and 323 units. The bulk of the couplers on the 313, 314, 315, 317, 318, 319, 320, 321, 322, 455, 456, 507 & 508 EMU fleet as well as the class 465/0 and 466 were supplied from SFE. The class 334, 465/1, 365 and 57/3 fleets had WCR manufactured couplers supplied.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Components from different manufacturers must not be mixed during the re-assembly of the coupler, except for rotor shafts and lock lift levers where specifically allowed in 3.5 Interchangeability of Components.

As a guide the following classes have the following couplers fitted:-

Class	Cat No	Manufacturer
313, 314, 315, 319, 507, 508, Translator Vehicles	098/006804	SFE
317, 318	098/006807 098/010545	SFE
320, 321, 322	098/009542	SFE
323	400/000562	NAP
334	093/061519	WCR
365	098/072813	WCR
455	098/006214	SFE
456	098/011810	SFE
465/0, 465/1	098/014966 098/072813	SFE WCR
465/2, 465/9, 466	093/061550 098/013446	SFE NAP
57/3	093/061520	WCR

The Tightlock coupler fitted to the class 357 Electrostar type EMU is manufactured by WCR but differ from earlier EMU couplers in that they have bushed rotor shaft holes in the coupler body with a machined stainless steel rotor shaft fitted with a switch cam to provide coupled detection, a retractable BSI type autoconnector (electrical only) and the coupler body has a cast manifold section above the aligning wings housing the air connections.

The Tightlock coupler fitted to the class 334 and 458 Juniper type EMU is also manufactured by WCR but differ from earlier EMU couplers in that they have a different type of Alstom autoconnector (air and electrical) with the air manifold cast above the electrical connections.

3.4.1 Identification of Coupler Bodies

NAP Manufactured – these all have “NAP” or “National A P” cast into the body with “D” shaped cut outs in the body side. They also have shorter, recessed gathering wings than the Sheffield ones – see figure 1(a) and a thicker nose.

Sheffield Forgemasters (SFE) Manufactured – these have either “RDC” or “BR” or “SFE” cast into the body and rounded corners with similar “D” shaped cut outs in the body side. They also have longer, recessed gathering wings with a thinner tip – see figure 1(b).

WCR (Blair) Manufactured – the castings are generally better finished with very square corners and have shorter, non recessed gathering wings than the SFE ones – see figure 1(c). This manufacture also has an oval shaped side cut out as opposed to the “D” shaped ones on NAP & SFE bodies – see figures 1(a) to 1(c) below.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

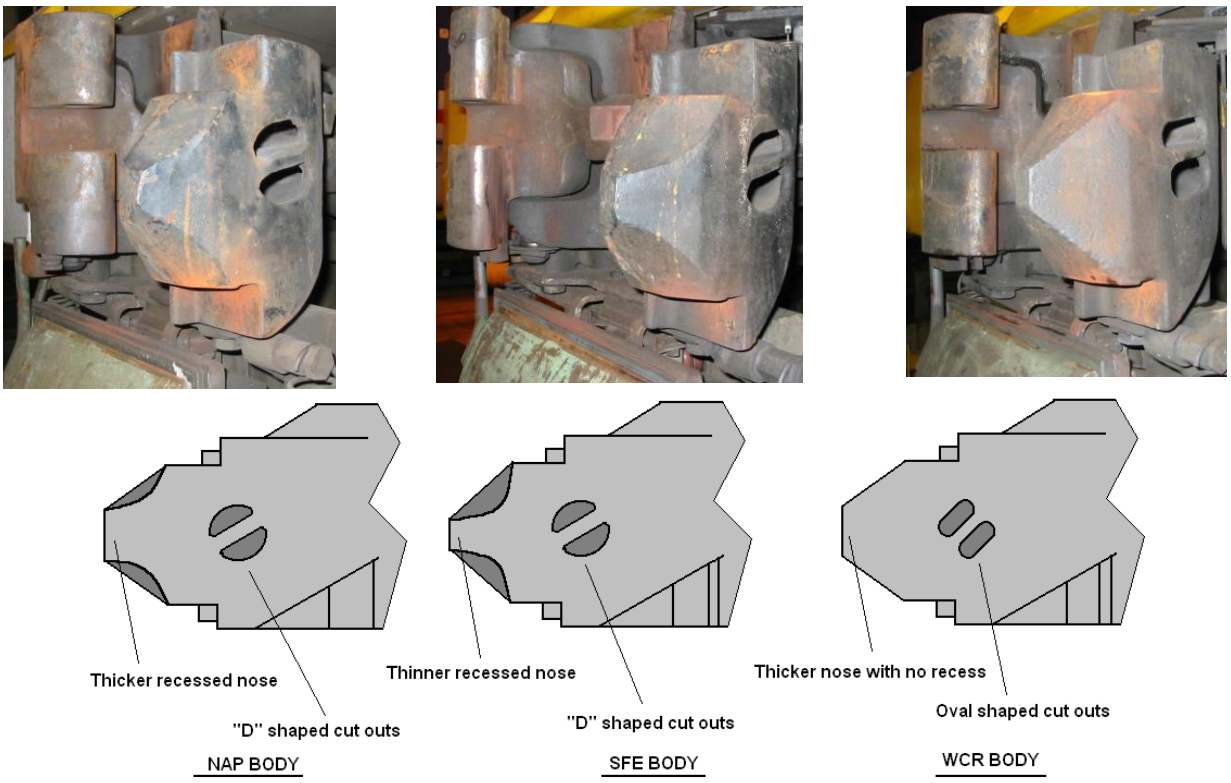


Figure 1(a) NAP Body **Figure 1(b) SFE Body** **Figure 1(c) WCR Body**

Figure 2 – Identification of Coupler Bodies

In addition, it is useful to be able to identify by comparison the two types of coupler head that are not attached to a drawbar. Those for class 465/2, 465/9 and 466 (BSI draftgear) have a small diameter muff coupler, whereas those for class 465/0, /1 and 365 (Dellner draftgear) have a much larger diameter muff coupler.

For those with built in drawbar, a gangway saddle is fitted to those for class 317, 318 and 455, and the drawbar is extra long for class 456.

3.4.2 Identification of Knuckles

NAP and SFE Manufactured – these are virtually indistinguishable from one another, except that the NAP knuckle (Figure 2(a)) may have "C211E" cast on to their top face. The ***WCR (Blair) manufactured*** one (Figure 2(c)) stands out as detailed below.

SFE and NAP Knuckles also generally had a "B" stamped on to the top face during the bushing modification, although new ones will not, whereas WCR ones have "901" or "901A" or "BLR6308" or "WCR10015" cast or stamped in a similar place.

The other obvious difference is the spring retaining forks on the bottom of the knuckle on SFE and WCR knuckles only. The NAP knuckle does not have these, the spring being retained by a bolt into a tapped hole on class 465/2, 465/9 and 466, or by engagement with the cored hole on class 323.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

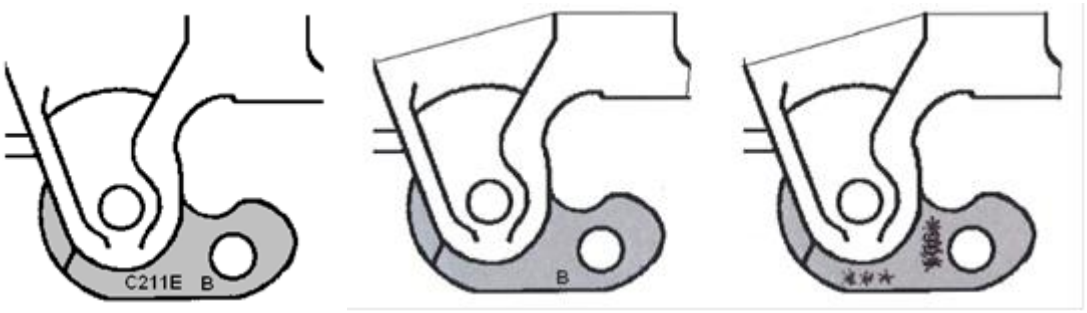


Figure 2(a) NAP **Figure 2(b) SFE** **Figure 2(c) WCR**

Figure 2 – Identification of Coupler Knuckles

3.4.3 Identification of Locks

There are three types of lock. The original NAP one tends to be more roughly manufactured, often with a poorly formed anti creep ledge. These are identified by "C410" cast into their side, see figure 3(a).

The SFE and WCR (Blair) locks (figures 3(b) and 3(c)) are very different in profile and thickness and these are shown in figures 3 and 4. In general the SFE lock is wider across the locking face (nominally 70mm at the widest point) and very square cornered when viewed from the front, whereas the WCR (Blair) lock is generally narrower (nominally 68mm), with the corners more rounded and has WCR6310 or BLR6310 cast in.

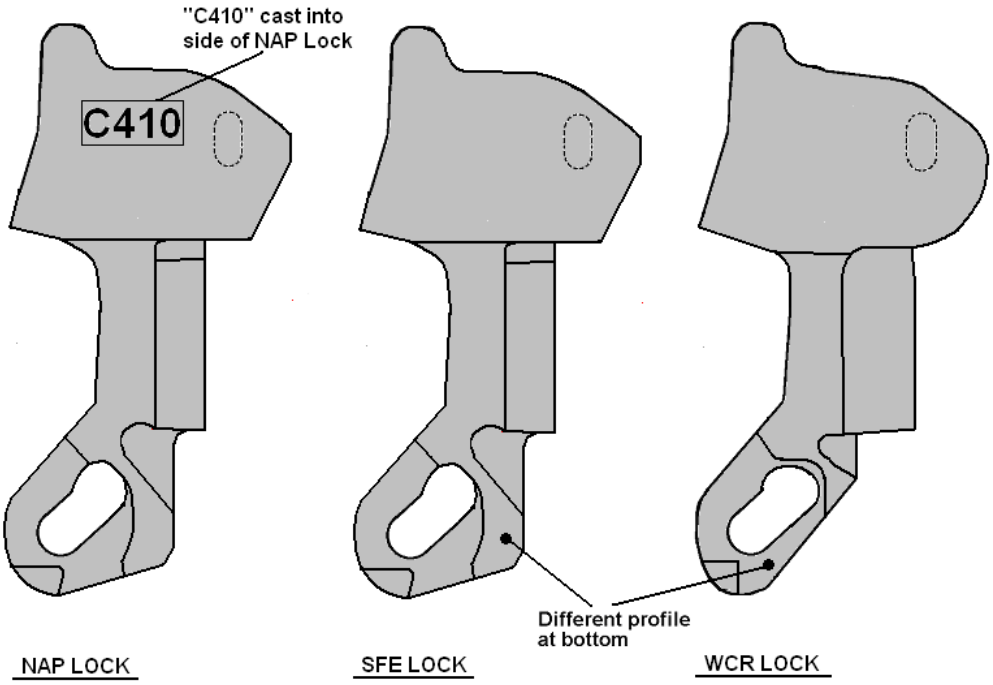


Figure 3(a)
NAP Lock
"C410" Cast into Side

Figure 3(b)
SFE Lock
Similar to NAP, but without "C410" Mark

Figure 3(c).
WCR Lock
Different Bottom Profile to either NAP or Sheffield & Larger Lifting Peg

Figure 3 – Identification of Coupler Locks

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018



Figure 4(a) NAP or SFE Lock **Figure 4(b) WCR Lock**

Figure 4 – Identification of Coupler Locks

3.4.4 Identification of Lock Lift Levers

The original NAP design had the long legged lever with a "foot" on the end. The modified type that should be fitted to all EMU couplers is the cut down version manufactured by SFE or the WCR version. The differences are shown in figures 5(a) and 5(b). The correct profile lever has a dimension from the inside of the lever bore to the tip of bottom leg that complies with the S13 / W13 gauge requirements.

The NAP lever also has "U520A" cast into the underside of the bottom leg and a keyway angle oriented 5º out with respect to that on the SFE lever. The WCR lever has a keyway angle oriented to within 1.5º of that on the SFE lever.

The shorter lock lift lever may be either of SFE or WCR manufacture.



Figure 5(a) Original NAP Lock Lift Lever (MUST NOT be used on EMUs)



Figure 5(b) Modified Lock Lift Lever (to be used on all EMUs)

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

3.5 Interchangeability of Components.

Whilst the coupler can be stripped, cleaned, examined and re-assembled, IT IS NOT RECOMMENDED that component parts, with certain exceptions are replaced with new items as this may invalidate the component matching and gauging criteria that would have been undertaken during the overhaul process to CR/CI 0545 Issue 4 (or later approved version).

If any of the following components are found, after dismantling, to be defective and require replacement, it is recommended that the coupler is re-assembled with these defective components, and returned complete to an overhauler suitably labelled as defective, indicating the defective components, then fit an overhauled coupler to CR/CI 0545 Issue 4 (or later approved version) to the vehicle.

Components that are NOT recommended to be replaced:-

- Coupler body,
- Knuckle,
- Lock,
- Lock Lift Lever,
- Rotor Shaft

However, if Operators wish to change these components themselves (if found defective) as opposed to changing the complete coupler, certain additional gauging will be required on the replacement components and the existing coupler body so as to ensure that no additional risks of couplers uncoupling are imported. It is essential that reference is made to Section 7 of Maintenance procedure MP UC0216 Tightlock Couplers, Rectification of Defects BEFORE any of these components are exchanged.

Failure to adhere to this instruction could lead to a coupler that has an increased risk of the lock lift lever top leg slipping behind the lock lifting peg and so result in a breakaway in service.

A complete list of what components can and CANNOT be changed without the additional gauging work is shown in Job MP UC0216 Tightlock Couplers Rectification of Defects section 6.3.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

3.6 Definition of Terms

Within this document, any of the terms used from the following list shall be regarded as having the definition stated.

TERM	DEFINITION
CHANGE	Remove the original and fit a new or overhauled part or assembly in its place
CHECK	Determine a particular nominated condition before, during or after repair, e.g. completeness, security, position.
CLEAN	Take off all dirt and deposits.
DEFECT/ DEFECTIVE	Any fault or faults in a component or assembly, which may prevent the component or assembly from fulfilling its designed purpose
DISMANTLE	Take to pieces.
ENGINEER	Reference within this and all related documents to the Engineer shall identify the authorised agents of the Head of Engineering, of the TOC concerned.
EXAMINE	Determine general condition before repair, e.g. wear, cracks, splits, leaks, scoring, corrosion, distortion, looseness.
GAUGE	Determine a nominated dimension by using suitable measuring equipment, e.g. ruler, micrometer, callipers, feeler gauge, or Go/No-Go gauge.
INSPECT	Determine conformity to required standards during and after repair
OVERHAUL	Do what is necessary to make a component re-usable, i.e., dismantle, strip, clean, examine, fit new parts, repair, re-assemble, test and inspect as required (does not include rewinding or renewal).
REASSEMBLE	Put together.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

3.6 Definition of Terms (Cont'd)

TERM	DEFINITION
RECORD	Put down in writing the result of any specified examination, test, or inspection.
RECTIFY	To set right (does not include rewinding or renewal).
REFIT	Put back and reconnect.
REMOVE	Disconnect and take off.
RENEW	Remove and scrap the original part, and provide a new specified part in its place as defined in the BR catalogue
REPAIR	Restore an original part to the required condition, e.g. by hand tooling, machining, building up, welding, patching, bending and setting, heat treating, re-securing etc. (does not include rewinding or renewal).
REPORT	Convey to the Supervisor the condition of the item examined.
STRIP	Take off covering, e.g. paint, polish, fabric.
SUPPLIER	Reference within this and any related documents to the Supplier shall identify an organisation which is contracted to the Train Operating Company and their authorised agents for the purpose of undertaking a specified task.
TEST	Prove correct operation by specified trial.

Note Where in the job description the phrase "Repair or Renew" is referred to, it means that the most cost effective of the alternative actions must be adopted.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

3.7 Supplier's Responsibilities

Mandatory requirements

Condition on release

The condition of the vehicle and all components and systems on completion of maintenance and repairs shall be such that the safety of public and staff alike is not in any way endangered. If any doubt exists remedial action shall be taken by the Maintainer.

Statutory Requirements, Safety Regulations, etc.

When working to this specification, it is the responsibility of the Supplier to ensure that all relevant local and mandatory safety instructions are strictly followed. This shall include, where applicable, adherence to Industry Standards and Railway Group Standards.

Standards

Group Standards issued by Network Rail are mandatory, and all applicable Group Standards shall be adhered to, irrespective of whether they are specifically referenced in this document. The Supplier shall advise the Engineer if any requirement of a Group Standard conflicts with any requirement of this document or any subsidiary document.

Materials and Components

It is the responsibility of the Supplier to ensure that all repaired components and systems conform to the current standards and that the current issue of all instructions are complied with. If the Supplier becomes aware that the contractual issue of a document is not the latest issue, he shall advise the Engineer who will determine whether the revised issue is to be implemented for the contract.

Where a component is required to be cleaned, unless otherwise stated it is the responsibility of the supplier to identify the most suitable method which will ensure that the component is not in any way damaged.

Whenever it is necessary to remove or isolate a faulty or redundant cable the work must be carried out in accordance with Technical Procedure CR/TP1084.

Threaded Fasteners

Renewal Policy

All split cotter pins, star washers, locking tabs, spring washer and torque prevailing nuts removed during maintenance or overhaul SHALL BE RENEWED. Unless otherwise specified all other fasteners removed during this overhaul shall be renewed if found to be defective in any way.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

3.8 Supplier's Responsibilities (Cont'd)

Tightening of Threaded Fasteners

Where a torque loading is specified, nuts shall only be tightened by means of a calibrated torque wrench. If the Supplier considers that any joint where torque loadings are not specified is critical, he shall consult the Engineer.

Threads are not to be lubricated but a thin film of corrosion inhibitor can remain on the threads.

It is essential to check that all bolts, in a multi-hole fixing, carry their allocated proportion of the load. Unless otherwise specified, they shall first be tightened in a staggered pattern from the centre outwards and subsequently re-tightened in the same sequence. This second tightening is necessary since bolts may lose tension when adjacent bolts are tightened.

Unless otherwise specified slotted or castellated nuts shall subsequently be over tightened if necessary to align the next slot to allow for the insertion of split cotter pins. Under no circumstances shall nuts be eased back.

Protection of Components

All electrical, hydraulic and pneumatic connections shall be sealed to prevent ingress of foreign matter.

Pipes shall be protected from ingress of dirt during cutting, bending, welding or installing. Threaded fittings shall be checked for burrs or metal slivers and removed if found, before fitting into pipe bores.

Rubber components shall be protected from contamination with cleaning agents when cleaning is undertaken. They shall not be contaminated with lubricants or rust inhibitors.

Joint faces shall be clean and free from damage or burrs before assembly.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

3.9 SUMMARY OF JOBS BY T&RS CODE

SCHEDULED WORK

JOB TITLE	T & RS CODE	SUGGESTED PERIODICITY (MILES)
Tightlock coupler, examine and manual test	UC0103	10,000
Autoconnector Exam Roll Cover Exam & Gauge	UC0148	10,000
Tightlock coupler, dismantle, clean, examine, lubricate, test and gauge	UC0149	30,000
Autoconnector Gauge	UC0215	30,000

ABNORMAL WORK

JOB TITLE	T & RS CODE	SUGGESTED PERIODICITY (MILES)
Tightlock couplers, incidents check	MP UC0104	As required
Tightlock Couplers, Rectification of Defects	MP UC0216	As required
Autoconnectors, Rectification of Defects	MP UC0217	As required

Note these mileages are recommendations, based largely on an EMU on inner suburban duties carrying out regular coupling / uncoupling on a daily basis. It is left, however, to individual Operators to establish the most suitable exam for each of these jobs to be carried out on, taking into account the unit's duty cycle, mileage, frequency of coupling operations etc.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock coupler, examine and manual test UC 0103

Safety: **Wheels scotched.**
Unit isolated from traction and auxiliary shore supply.
Pantograph isolated and earthed, and personal padlock applied.
Auxiliary supply switch locked 'Off'.

1 Tightlock coupler (All classes).

1.1 Visually examine the Tightlock coupler for obvious signs of damage or defects.

1.2 Visually check that all fasteners and locking systems are in place and secure.



Knuckle Open **Knuckle Closed**

Figure 1 – Coupler Open and Closed

1.3 If the knuckle is closed, unlock the knuckle by rotating the rotor shaft from the rotor eye side (See Figure 2 item A) anti-clockwise either by hand or with an uncoupling lever and check that the knuckle moves freely to the fully open position (See Figure 1). Slowly close it by hand and check that the lock freely drops fully home.

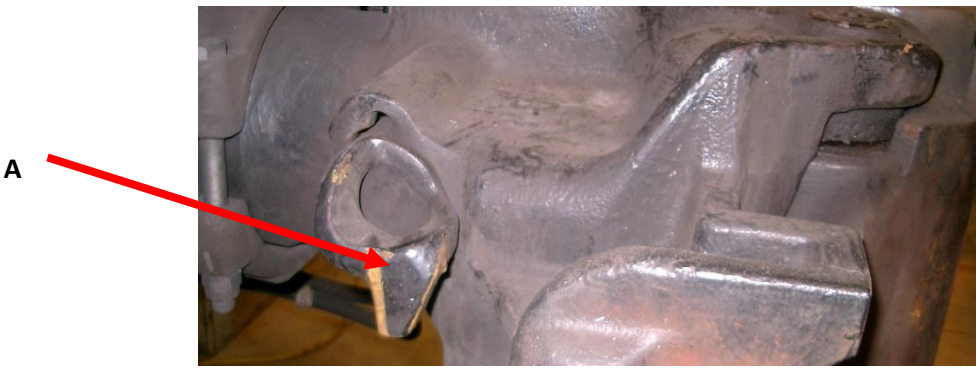


Figure 2 – Coupler Rotor Shaft

1.4 Unlock the knuckle again and check that the knuckle moves freely to the fully open position (See Figure 1).

1.5 If the lock is stiff to lift, or if the knuckle fails to move freely to the fully open position, rectify in accordance with Job MP UC 0216 (Tightlock Couplers, Rectification of Defects).

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock coupler, examine and manual test (Cont'd) UC 0103

2. Uncoupling mechanism and tell tale indication.

2.1 **ALL Classes except 57/3, 323, 334, 365, 465 and 466**

Check the body mounted uncoupling mechanism for damage or defects, and check that the "trombone" assembly is free to pivot in its trunnion bearings. Check that, with the coupler fully locked, the tell-tale has clearance between the indicator and the coupler body, as shown in figure 3. Check that the yellow line on the rotor and rotor eye is vertical as shown in figure 3(a).

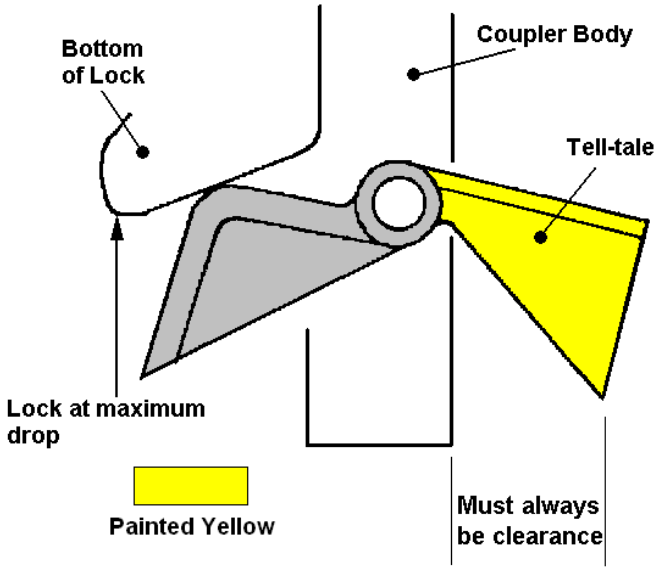


Figure 3 – Correct tell-tale indication when locked (All classes except 465 / 466).

Check the position of the rotor shaft eyes are as shown in figure 3(a).

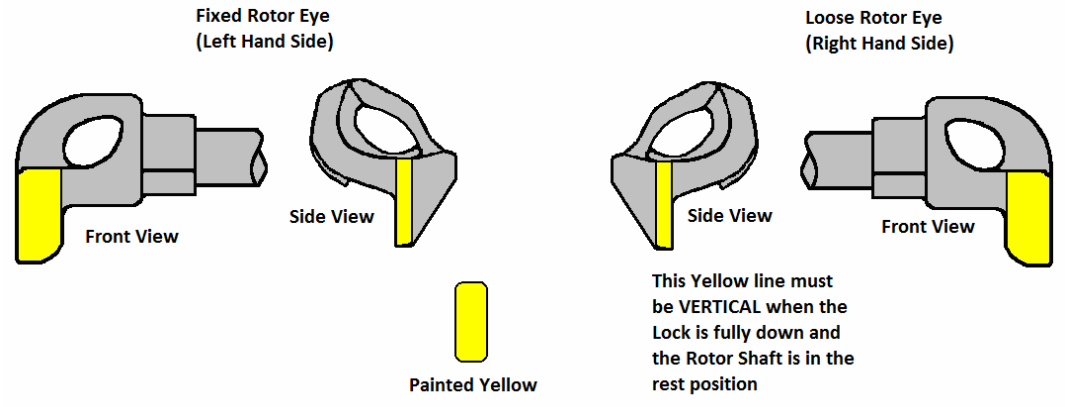


Figure 3(a) – Correct tell-tale indication on rotor shaft eyes (All classes).

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock coupler, examine and manual test (Cont'd) UC 0103

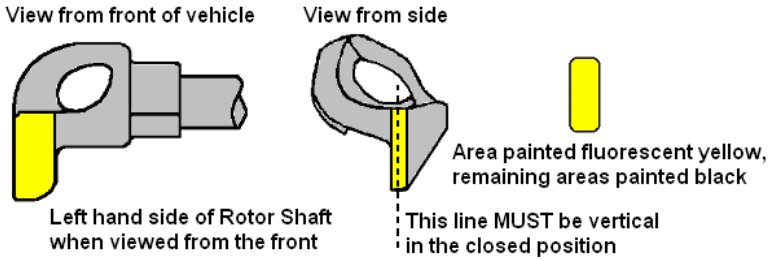
2.2 **Class 323 only.**
Check the coupler head mounted uncoupling diaphragm cylinder, Bowden cable and linkages for damage or defects. Also check that, with the coupler fully locked, the tell-tale has clearance between the indicator and the coupler body, as shown in figure 3.

2.3 **Class 365.**
Check the coupler head mounted uncoupling cylinders and linkages for damage or defects. Also check that, with the coupler fully locked, the tell-tale has clearance between the indicator and the coupler body, as shown in figure 3.

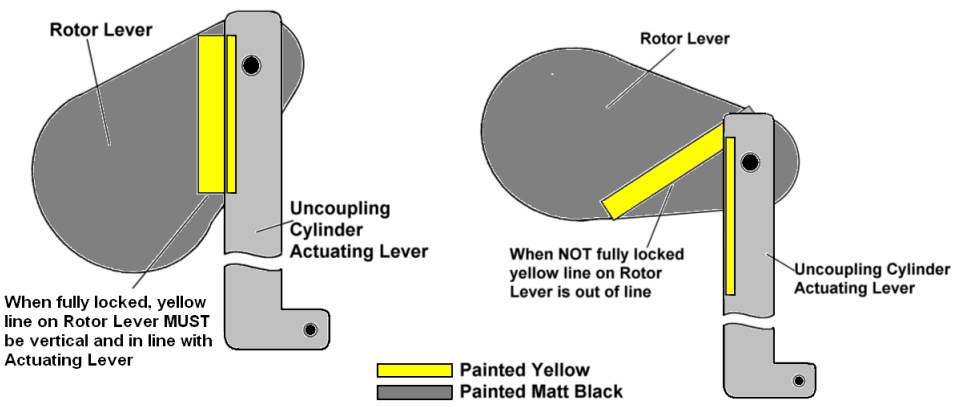
2.4 **Classes 57/3, 334, 365, 465 & 466 only.**
Check the coupler head mounted uncoupling cylinders and linkages for damage or defects. Also check that the position of the rotor arms are as shown in figure 4 (for class 57/3, 334, 365, 465/0 & 465/1 units), or figure 5 (for class 465/2, 465/9 or 466 units).

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock coupler, examine and manual test (Cont'd) **UC 0103**



Rotor Eye Side Shown Coupled
(Both Original Design and Modified Design Uncoupling Cylinders)



Coupled Condition **Uncoupled Condition**

Uncoupling Cylinder Side (Modified Design Uncoupling Cylinders only)

Figure 4 –Class 57/3, 334, 365, 465/0 & 465/1 only Tell Tale Indications On Rotor Eye and Uncoupling Cylinder Actuating Lever When Fully Locked and Fully Open

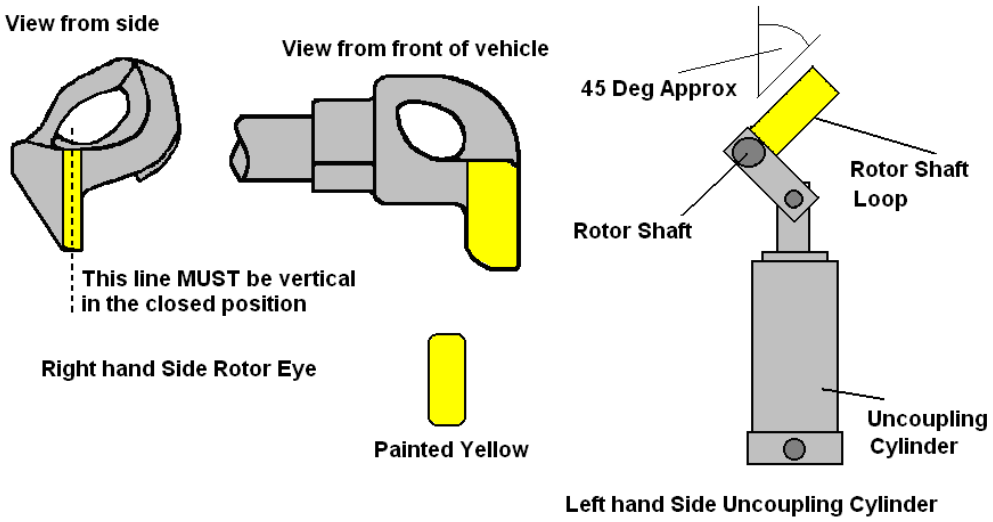


Figure 5 – Class 465/2, 465/9 and 466 Tell Tale indications on Rotor Eye and Rotor Shaft Loop when fully locked and areas to be painted yellow.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock coupler, examine and manual test (Cont'd) **UC 0103**

2.5 Check that the coupler head mounted uncoupling cylinders and linkages for damage or defects.

2.6 Close the knuckle by hand and check that the position of the rotor arms are as shown in Figures 4 or 5.

2.7 With the knuckle in the closed position, use a soft brush or cloth and a degreaser to clean the tell-tale painting on the rotor eyes and rotor arm and check the condition of the paint. If the paint is not present or damaged or faded apply a coat of fluorescent yellow paint or Warning yellow paint in accordance with Job UC0149, taking care not to apply paint to the coupler body (see Figures 3, 3(a), 4 or 5 for details of painting).

3 Report any defects to the Supervisor.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Autoconnector Exam, Roll Cover Exam & Gauge UC 0148

Safety: **Wheels scotched.**
Unit isolated from traction and auxiliary shore supply.
Pantograph isolated and earthed, and personal padlock applied.
Auxiliary supply switch locked 'Off'.

SPECIAL TOOLS AND MATERIALS			
ITEM	**DESCRIPTION**	**GAUGE NO.**	**CAT NO.**
1	Roll cover horn gauge	IL/0003	-
2	Degreaser - Electro Quick Clean		007/007186

Note See Job MP UC 0217 (Autoconnectors, Rectification of Defects) for list of spare parts.

1 Hoses, pipes and electrical connections.

1.1 Check the flexible electrical connections to the Autoconnector for obvious damage and security (See Figure 1 item A).

1.2 Check the air flexible hoses and rigid pipes for obvious damage, security, cracks, corrosion or deterioration (See Figure 1 item B).

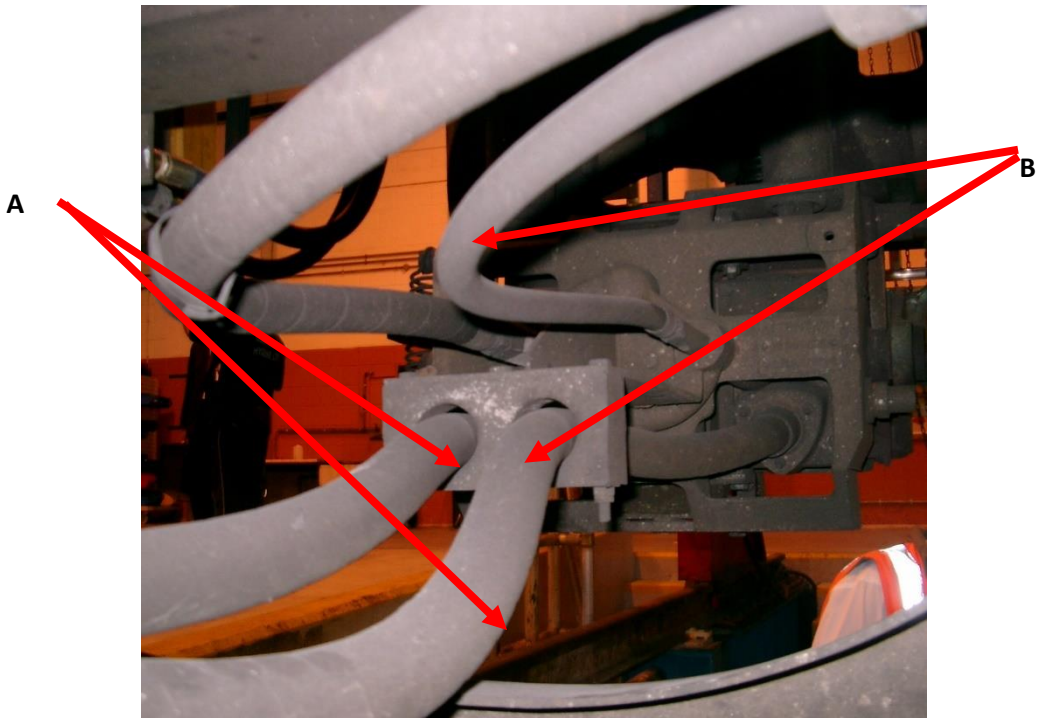


Figure 1 – Typical Example of Flexible Electrical and Pneumatic Connections to Autoconnector

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Autoconnector Exam, Roll Cover Exam & Gauge (Cont'd) UC 0148

2 Roll Cover (Conventional type to Cat No 830/117801).

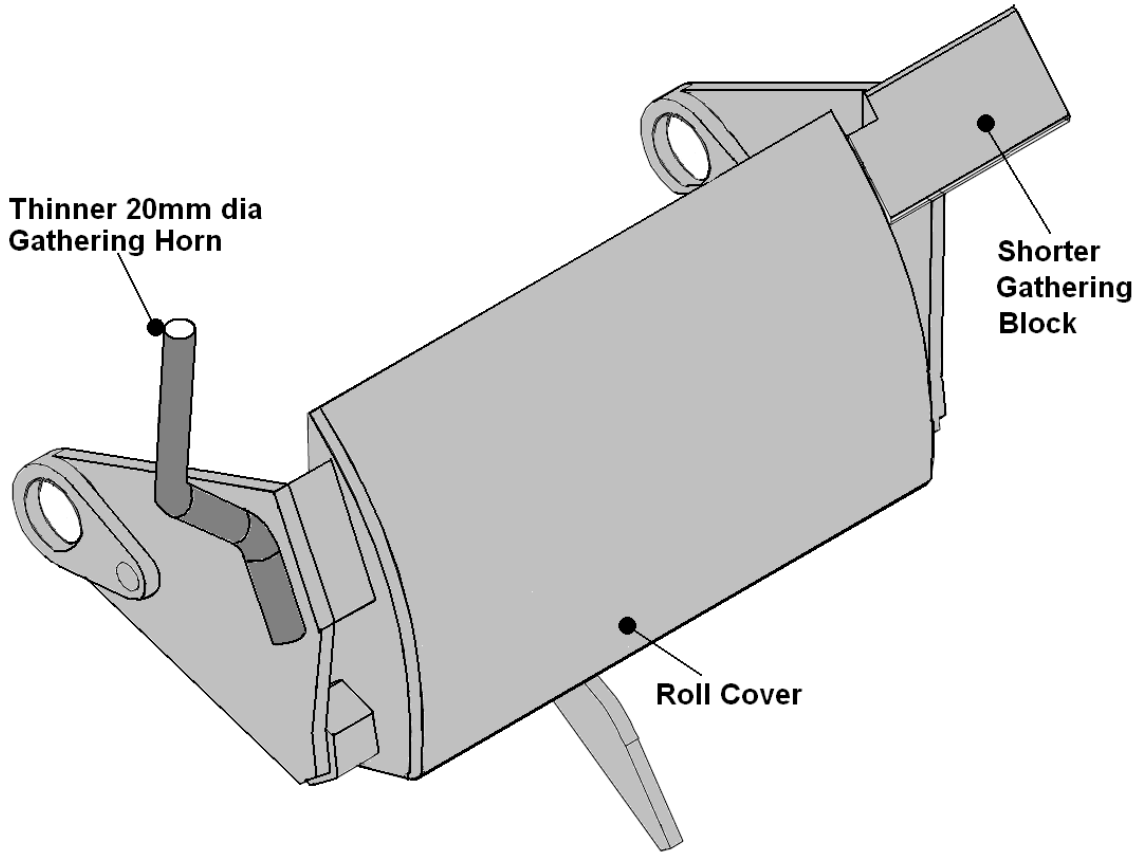


Figure 2 – Original type Roll Cover (to Cat No 830/117801).

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Autoconnector Exam, Roll Cover Exam & Gauge (Cont'd) UC 0148

2.1 Examine the roll cover gathering horn for damage or distortion. Gauge the horn using gauge (IL/0003) as below and shown in Figure 3:-

1 Parallel Set – Check that the upper section of the horn is parallel to the lower section by placing the gauge against the side of the lower section of the horn, where it is welded to the block, and check that it sits flat against both the upper and lower sections.

2 Forward Angle – Check that the horn is straight and projects forward at the correct angle by placing the gauge on the front of the lower section of the horn, where it is welded to the block, and check that the horn touches the gauge along its length

3 Straighten gathering horn or renew cover if necessary.

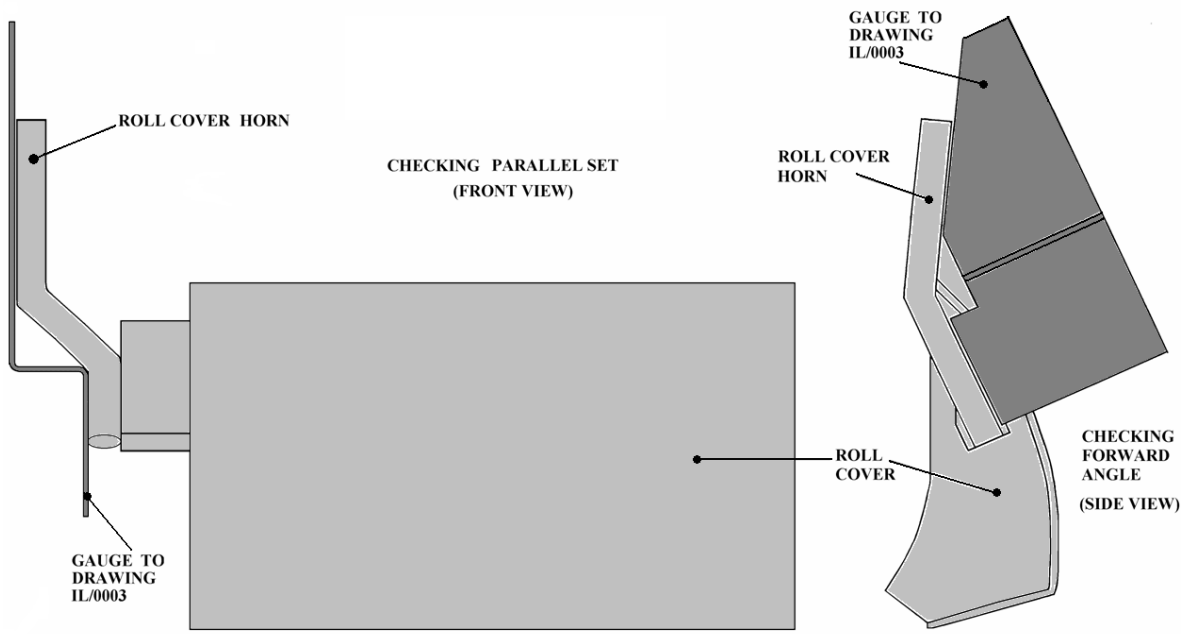


Figure 3 – Roll Cover Horn Gauging using Gauge IL/0003

2.2 Pull the roll cover down and examine the condition of the cover seal. Raise the cover to the halfway point and release checking that it fully raises and seats correctly on the weather seal. Renew the roll cover if damaged, distorted or if it will not seat on the weather seal. See Job MP UC 0217 (Autoconnectors, Rectification of Defects) for gauging of the contact block and renewal of roll cover.

NOTE This gauge should not be used on the improved type Roll Cover to Cat No 230/004501 (See section 3 below)

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Autoconnector Exam, Roll Cover Exam & Gauge (Cont'd) UC 0148

3 Roll Cover (Improved type to Cat No 230/004501).

3.1 Examine the roll cover (See Figure 4 item A), pivots and return springs (See Figure 4 item B & D) for damage or defects. Renew roll cover or springs if defective. Renew Roll Cover in accordance with Job MP UC 0217 (Autoconnectors, Rectification of Defects).

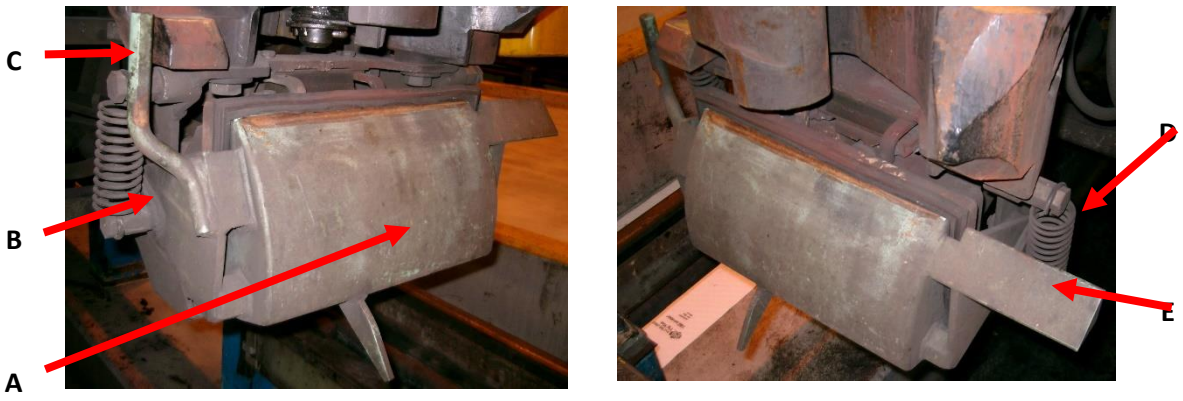


Figure 4 – Improved Autoconnector Roll Cover

3.2 Examine the Roll Cover Gathering Horn (See Figure 4, Item C) and Gathering Block (See Figure 4, Item E) for damage, distortion or cracking on corners or welds. Check that the Gathering Horn is vertical when viewed from the front (See Figure 5, Item A), and that its machined flat rests against a projected line drawn across the top edge of the Gathering Block and Roll Cover (See Figure 6). Renew Roll Cover in accordance with Job MP UC 0217 (Autoconnectors, Rectification of Defects) if the Gathering Horn is distorted or damaged.

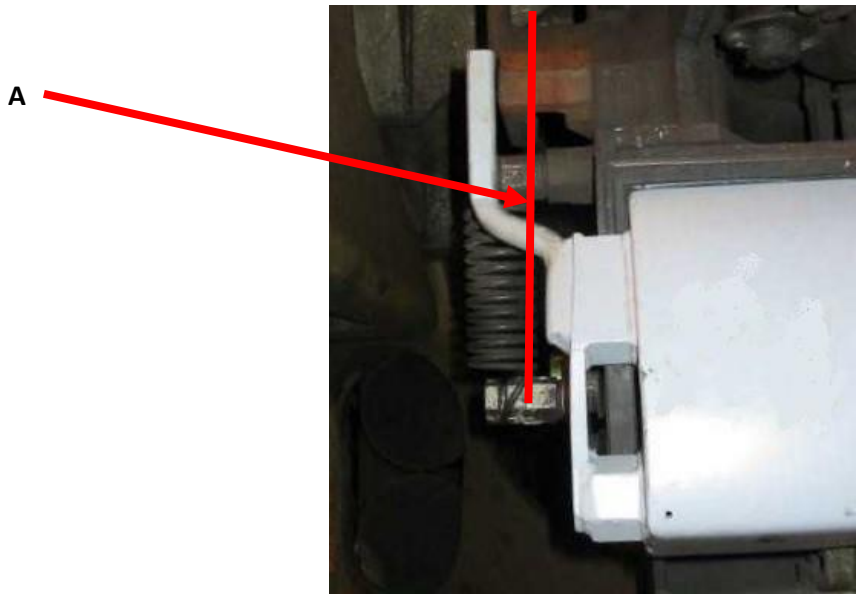


Figure 5 – Correct Vertical Alignment of Roll Cover Gathering Horn

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Autoconnector Exam, Roll Cover Exam & Gauge (Cont'd) **UC 0148**

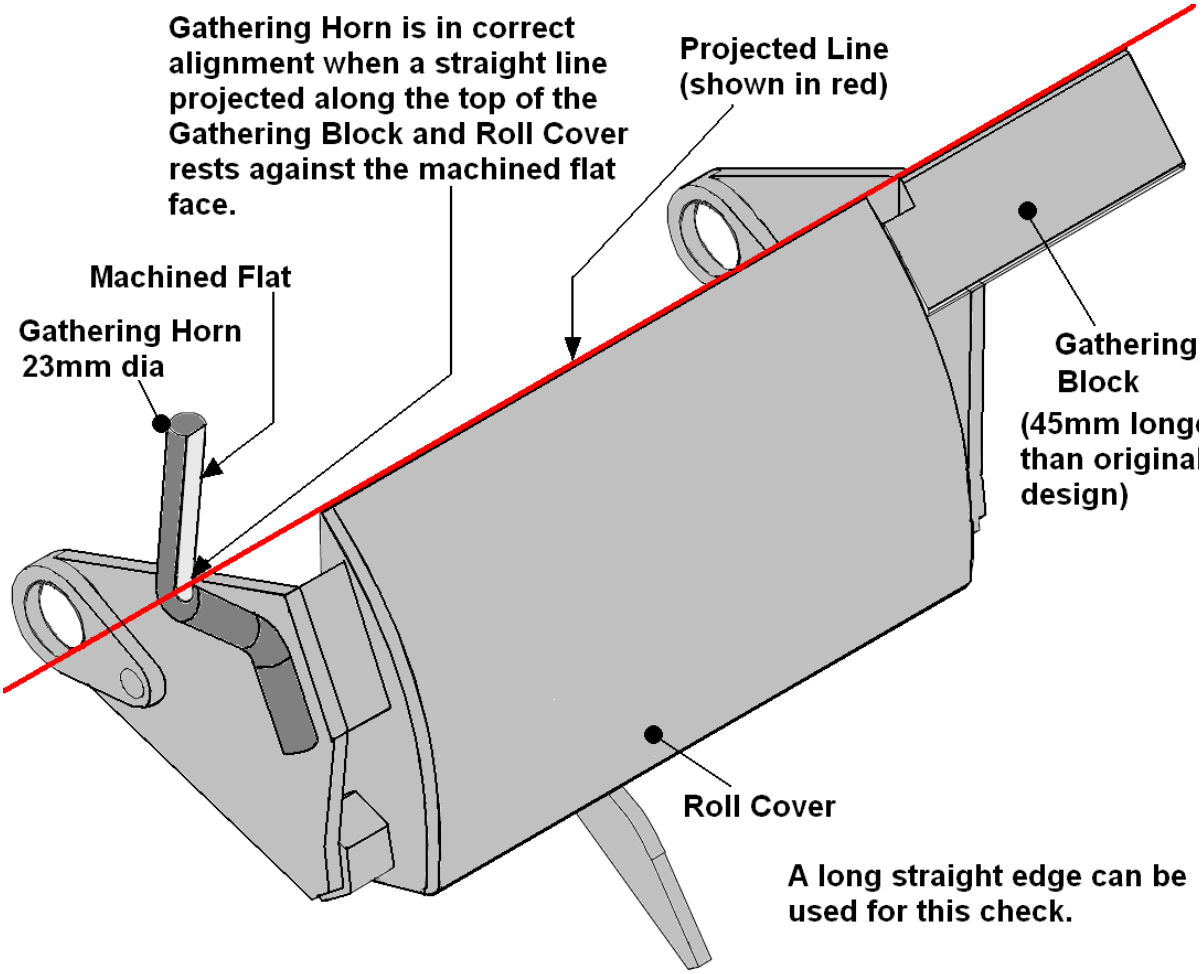


Figure 6 – Roll Cover (Improved type to Cat No 230/004501). Correct Alignment of Gathering Horn

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Autoconnector Exam, Roll Cover Exam & Gauge (Cont'd) UC 0148

4 Autoconnector Contacts and Air valves.

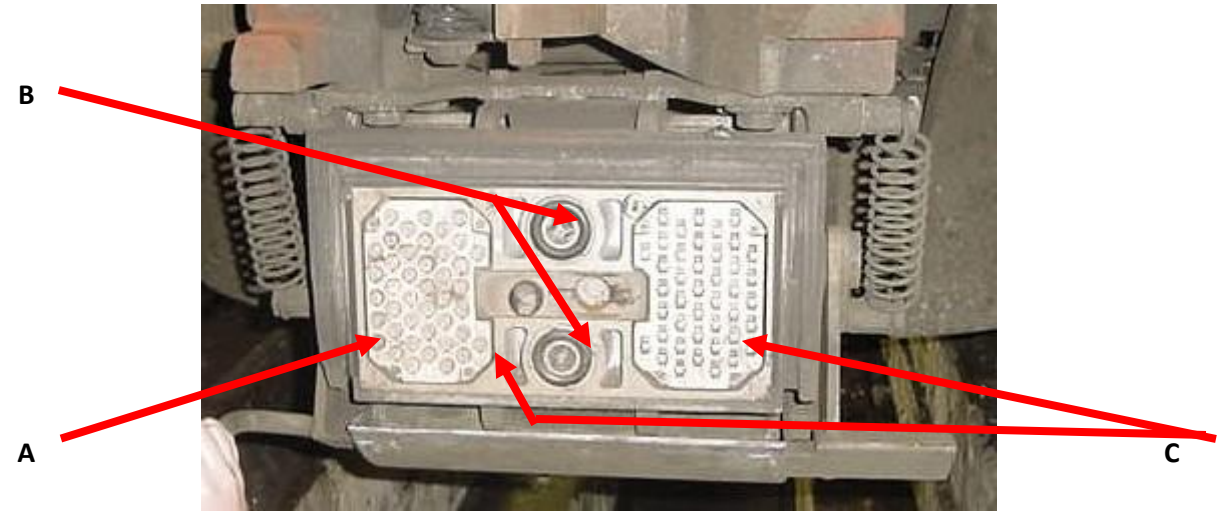


Figure 7 – Autoconnector with Roll Cover Open

4.1 Pull the Roll Cover down and examine the condition of the cover seal. (See Figure 7 item A) Raise the cover to the halfway point and release checking that it fully raises and seats correctly on the weather seal. Renew the Roll Cover if damaged, distorted, if the pivots are seized or if it will not seat on the weather seal in accordance with Job MP UC 0217 (Autoconnectors, Rectification of Defects). Renew weather seals if damaged. If the Roll Cover binds on the weather seals, check adjustment of contact block in accordance with Job MP UC 0217 (Autoconnectors, Rectification of Defects).

4.2 Wedge the Roll Cover down and check the operation of the star valves by manually pressing in and checking they are free (See Figure 7 item B). Examine the 'O' ring seals for damage, renew if defective, by prising out with a small screwdriver and pressing in a new seal.

4.3 Examine the auto-connector contact blocks for damage and the button contacts (See Figure 7 item C) for burning and excessive pitting. If signs of excessive pitting are present, check adjustment of contact block in accordance with Job MP UC 0217 (Autoconnectors, Rectification of Defects). Wipe clean the contact block and contacts with dry lint free cloth, moistened with Electro Quick Clean (Item 2), lightly depressing each contact to check free movement.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Autoconnector Exam, Roll Cover Exam & Gauge (Cont'd) UC 0148

4.4 Lightly depress each contact checking for free movement over the full range of travel and that it freely returns to the normal extended state and that all contact pins project forward of the contact block by a similar distance. If the contacts are severely burnt or pitted, show signs of overheating, are bent, stick in or have "popped out" or extend outwards of their carrier, change the contact pin or the contact block. Renew contact pins in accordance with Job MP UC 0217 (Autoconnectors, Rectification of Defects).

4.5 Following renewal of any contact pins, carry out an electrical continuity test as detailed in Job MP UC 0217 (Autoconnectors, Rectification of Defects).

4.6 Remove the wedge and allow roll cover to rise gently, and check that it fully closes.

5 Drumswitch.

5.1. Manually operate the Drumswitch handle, check for freedom of movement from the uncoupled to the coupled position and also the return to the uncoupled position (See Figure 8, Item A for location of Drumswitch Handle).

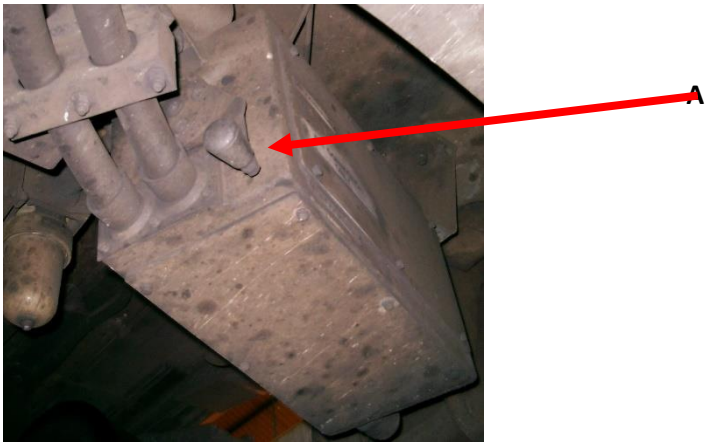


Figure 8 – Location of Drumswitch Handle

6. Report any defects to the Supervisor.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Examination, Lubrication and Gauging UC 0149

Safety: Wheels scotched.
Unit isolated from traction and auxiliary shore supply.
Pantograph isolated and earthed, and personal padlock applied.
Auxiliary supply switch locked 'Off'.

LUBRICANTS AND PAINTS			
ITEM	DESCRIPTION	QTY/VEH	BR CAT NO
1	Grease Mobil Mobilux EP2	As required	027/004051
2	Dry Lubricant Molykote 321R	As required	027/004058
3	Grease Calcium based Graphite	As required	027/001361
4	Mineral Oil	As required	027/023022
5	Paint - Fluorescent yellow	As required	028/006217
6	Paint - Warning yellow	As required	028/005316

MATERIALS			
ITEM	DESCRIPTION	QTY/VEH	BR CAT NO / PART NO
1	Split Pin	2	029/031833
2	Grease nipple	1	039/031715

SPECIAL TOOLS			
ITEM	**DESCRIPTION**	**GAUGE NO.**	**CAT NO.**
1	Aligning Wing Pocket Condemning Gauge	916F301	039/028026
2	Maximum Knuckle Gap *	9039324-02 (916F337)	039/028024
3	Maximum Knuckle Gap *	9039324-03 (916F341)	039/028035

Note - * - these gauges are shown on drawing S5-C0-9039324 and may also be referred to as Contour Condemning Limit Gauges.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

IMPORTANT NOTE

Whilst the coupler can be stripped, cleaned, examined and re-assembled, IT IS NOT RECOMMENDED that component parts, with certain exceptions are replaced with new items as this may invalidate the component matching and gauging criteria that would have been undertaken during the overhaul process to CR/CI 0545 Issue 3A, 4 (or later approved version).

If any of the following components are found, after dismantling, to be defective and require replacement, it is recommended that the coupler is re-assembled with these defective components, and returned complete to an overhauler suitably labelled as defective, indicating the defective components, then fit an overhauled coupler to CR/CI 0545 Issue 4 (or later approved version) to the vehicle.

Components that are NOT recommended to be replaced:-

- *Coupler body,*
- *Knuckle,*
- *Lock,*
- *Lock Lift Lever,*
- *Rotor Shaft*

However, if Operators wish to change these components themselves (if found defective) as opposed to changing the complete coupler, certain additional gauging will be required on the replacement components and the existing coupler body so as to ensure that no additional risks of couplers uncoupling are imported. It is essential that reference is made to Section 7 of Maintenance procedure MP UC0216 Tightlock Couplers, Rectification of Defects BEFORE any of these components are exchanged.

Failure to adhere to this instruction could lead to a coupler that has an increased risk of the lock lift lever top leg slipping behind the lock lifting peg and so result in a breakaway in service.

A complete list of what components can and CANNOT be changed without the additional gauging work is shown in Job MP UC0216 Tightlock Couplers Rectification of Defects section 6.3.

Details of this additional gauging is shown in Section 7 of Maintenance procedure MP UC0216 Tightlock Couplers, Rectification of Defects and this MUST be referred to BEFORE any of these critical components are renewed.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Examination, Lubrication and Gauging (Cont'd) UC 0149

1. Tightlock coupler strip and examination (ALL Classes).



Figure 1 – Removal of Pin, Knuckle and Lock

1.1 Remove split pin (See Figure 1 item A), washer (See Figure 1 item B), spring (See Figure 1 item C), knuckle pin (See Figure 1 item E) and knuckle (See Figure 1 item D) from coupler. Remove lock (See Figure 1 item F) by tipping forward at top and lifting out.

1.2 Disconnect uncoupling cylinder mechanism or uncoupling drive assembly from the rotor shaft as appropriate and remove rotor shaft from rotor eye side and lock lift lever through front opening.

NOTE: Some units may be fitted with a modified uncoupling cylinder. These have the rotor arm connected to a sprung loaded cylinder, which holds the rotor arm in the 'LOCKED' position. These cylinders can be identified by only having a single air connection. Be aware that the rotor shaft may be under spring tension when removing the roll pin.

1.3 Wire brush clean the following parts to remove all rust, dirt and lubricant deposits:-

All mating surfaces of the lock, lock lift lever, rotor shaft and knuckle, paying particular attention to the locking face and the top surface of the tail shelf of the knuckle and both vertical sides of the lock. Stubborn deposits may be removed using a soft brush or cloth and a degreaser.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Examination, Lubrication and Gauging (Cont'd) UC 0149

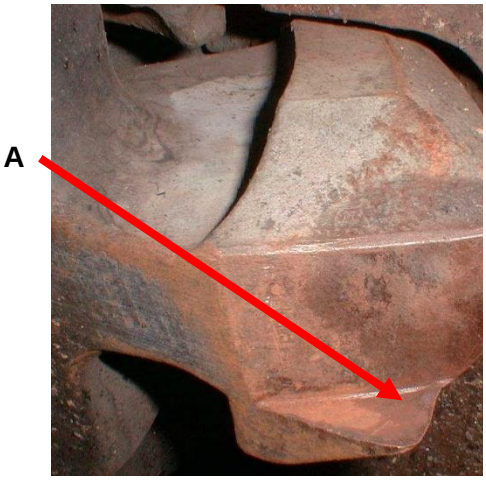


Figure 3 – Knuckle Tail Shelf

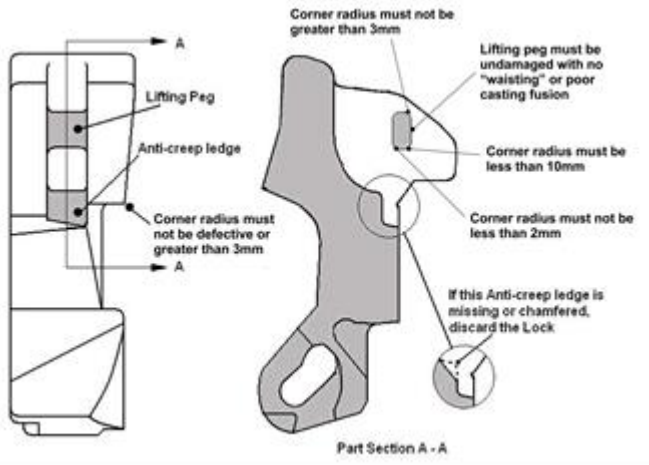


Figure 4 – Lock Anti-Creep Ledge

1.4 Examine the knuckle for major damage or burring, paying particular attention to any burring of the tail shelf (See Figure 3 item A). Burrs may be dressed off using a file. If the knuckle is found defective during this attention, refer to Section 7 of Maintenance procedure MP UC0216 Tightlock Couplers, Rectification of Defects.

1.5 Examine the lock for damage or defects, paying particular attention to the anti-creep ledge in the rear recess of the lock (See Figure 4). This should form a distinct ledge. If the lock anti-creep ledge is poorly formed, indistinct, chamfered or ground away, or if the lock requires replacing during this attention, refer to Section 7 of Maintenance procedure MP UC0216 Tightlock Couplers, Rectification of Defects.



Correct Lock Lift Lever



Incorrect Lock Lift Lever

Figure 5 – Correct and Incorrect Lock Lift Levers

1.6 Examine the rotor shaft and lock lift lever for damage or distortion. If bent or damaged, refer to Section 7 of Maintenance procedure MP UC0216 Tightlock Couplers, Rectification of Defects. Ensure that a short profile lock lift lever to Cat No 098/008906 (for all SFE and NAP couplers) or Cat no 093/059009 (for WCR couplers) is fitted.

1.7 Examine the coupler body for major damage or burring. Burrs may be dressed off using a file. If major damage is found, change the coupler and return to an overhauler for rectification in accordance with CR/CI0545 Issue 4 (or later approved version).

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Examination, Lubrication and Gauging (Cont'd) UC 0149

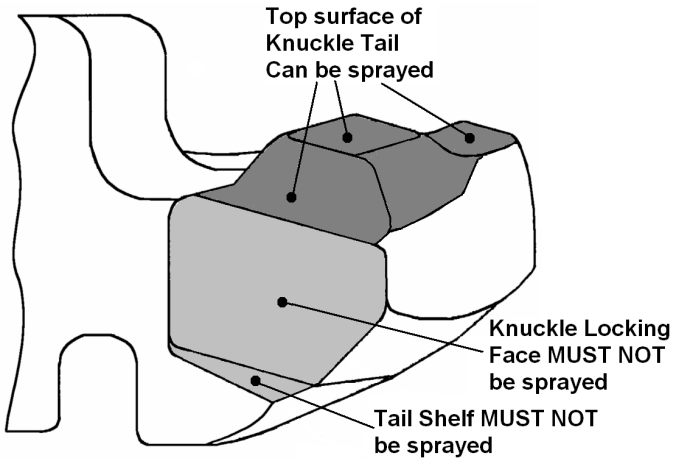


Figure 6 – Areas That Can Be Spray Lubricated on the Knuckle Tail

1.8 Lightly spray the rotor shaft and TOP SURFACE ONLY of the knuckle tail with dry lubricant (Molykote 321R, Cat No 027/004058). Leave spray lubricant to dry for five minutes or longer. See figure 6 for positions to spray.

NOTE: Under no circumstances spray lubricate the lock, lock lift lever or knuckle locking faces as this will allow the lock to be "squeezed" upwards and may lead to uncoupling.

1.9 Re-assemble lock lift lever, rotor shaft and lock in reverse order, ensuring that the lifting peg on the back of the lock is 'hooked' over the bottom fork of the lock lift lever.

1.10 Rotate rotor shaft to fullest 'uncoupled' extent so that lock sits in the "lock set" position on the knuckle thrower. Refit knuckle and knuckle pin. Refit spring with knuckle open, short leg to front of vehicle, washer and a new split pin to Cat No 029/031833 (NAP Couplers) or 093/059022 (SFE / WCR Couplers).

1.11 Refit uncoupling cylinder or drive assembly as appropriate for the class involved to rotor shaft.

1.12 Visually check that all fasteners and locking systems are in place and secure.

1.13 Remove blanking plug from top of the knuckle pin and fit standard grease nipple (Cat No 039/031715). Using a hand grease gun, apply Calcium based Graphite grease (Cat No. 027/001361) until it exudes around knuckle. Remove excess grease. Remove grease nipple and refit blanking plug.

1.14 If either the lock or the knuckle requires replacing during this attention, see Job MP UC 0216 (Tightlock Couplers, Rectification of Defects) for details of how to do this.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Examination, Lubrication and Gauging (Cont'd) UC 0149

2. Uncoupling mechanism examination and lubrication.

2.1 All classes EXCEPT 323, 334, 465, 466, 57/3 and 365.

2.1.1 Check the body mounted uncoupling mechanism for damage or defects, and check that the "trombone" assembly is free to pivot in its trunnion bearings.

2.1.2 Lightly lubricate the operating rod and "trombone" assembly with Mobil Mobilux EP2 grease (Cat No. 027/004051) or Calcium based Graphite grease (Cat No. 027/001361) at the two headstock trunnion bearings and at the point where the "J" hook engages with the loose rotor eye.

2.1.3 With the knuckle closed and locked, check that as the lock drops, and the rotor shaft freely rotates to the fully locked position, and neither the split pin securing the rotor eye nor the rotor eye 'horn' contacts or rubs on the coupler body; see figures 7 and 8. Reposition the spilt pin or reduce the length of the 'horn' to by grinding if there is contact with the body.

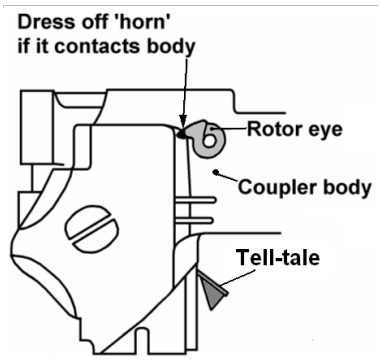


Figure 7 – Rotor Eye fouling

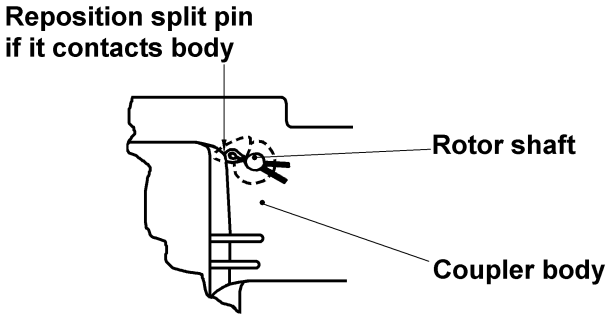


Figure 8 – Split pin fouling

2.1.4 With the knuckle closed and locked, check that the Rotor Shaft has rotated fully anti-clockwise and for classes fitted with a body mounted uncoupling cylinder and "J" hook check that there is a clearance of 3mm to 6mm between the "J" hook and the Rotor Eye as shown in figure 9. If the clearance is less than 3mm, fit a Matched Rotor and Rotor Eye Cat No 098/023827. If the clearance is still less than 3mm, the "J" hook angle should be adjusted by removing the Operating Rod and adjusting the angle by heating and bending.

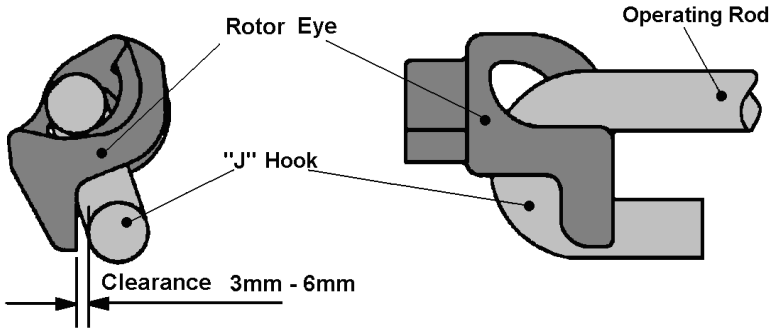


Figure 9 - Essential clearance between Rotor Eye and "J" Hook

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Examination, Lubrication and Gauging (Cont'd) UC 0149

2.2 Class 323 only.

2.2.1 Examine air hoses for damage and security.

2.2.2 Examine rubber bellows for damage and splitting.

2.2.3 Examine Bowden cable between lever arm and rotor for correct fitting. Renew cable if signs of fraying or kinking are found. See Figure 10.

2.2.4 With the knuckle closed and locked, check the setting of actuator stop bolt (swing bolt). Ensure that the top of the upper nut aligns with the underside of the coupler shank.

2.2.5 Check that the lever arm is returning fully to its rest position under the action of the return spring and that the diaphragm cylinder is correctly retracting. Failure to do so will prevent the Rotor Shaft from fully returning, and will lead to a failure of the Anti-Creep feature.

2.2.6 Manually operate the mechanism to check that it releases the knuckle.

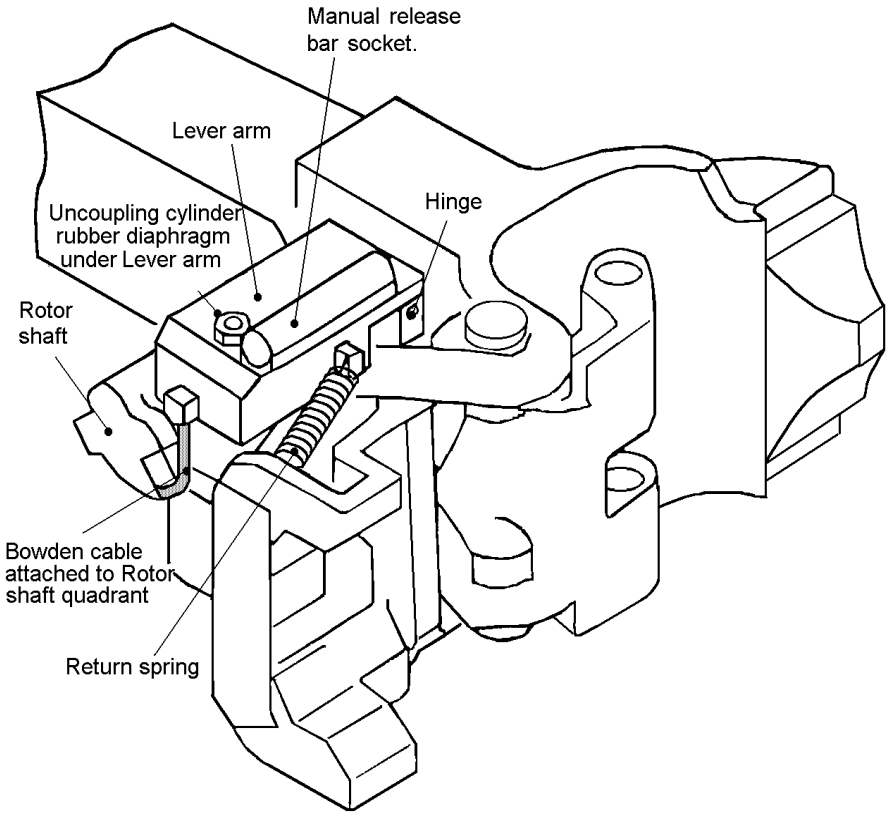


Figure 10 – Detail of the Class 323 uncoupling mechanism

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Examination, Lubrication and Gauging (Cont'd) UC 0149

2.3 Class 465/2, 465/9 and 466 only.

2.3.1 Check the coupler head mounted Uncoupling Cylinder and linkages for damage or defects.

2.3.2 Lubricate the uncoupling cylinder via its grease nipple using Mobil Mobilux EP2 grease (Cat No. 027/004051). Sparingly apply a few drops of light oil (Cat No. 027/023022) to the piston rod / rotor shaft loop pivot bolt.

2.3.3 With the knuckle closed and locked, check that the Uncoupling Cylinder has fully retracted and the Rotor Shaft has rotated fully clockwise.

2.4 Class 465/0, 465/1, 334, 365 and 57/3 only.

2.4.1 Check the coupler head mounted uncoupling cylinders and linkages for damage or defects.

2.4.2 Sparingly apply a few drops of light oil (Cat No. 027/023022) to the uncoupling cylinder actuating lever top and bottom pivot pins.

2.4.3 With the knuckle closed and locked, check that the Uncoupling Cylinder has fully retracted and the Rotor Shaft has rotated fully anti-clockwise.

3. Tightlock coupler manual and anti creep tests (ALL Classes).

3.1 Unlock the knuckle by either rotating the Rotor Shaft by hand or by using the manual uncoupling lever. Slowly close the knuckle by hand and check that the lock freely drops fully home, and that the Rotor Shaft has rotated fully anti-clockwise. Failure of the Rotor Shaft to fully return will lead to a failure of the Anti-Creep feature, and this could result in an uncontrolled train division.

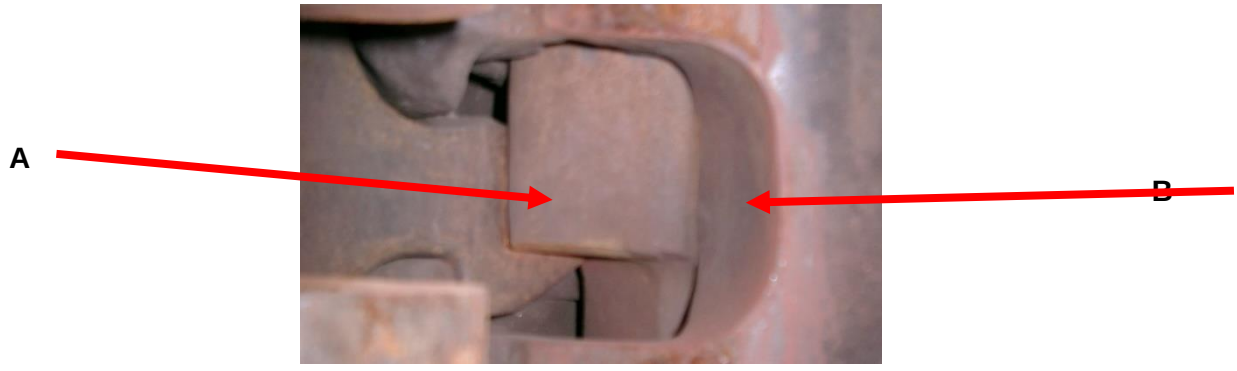


Figure 11 – Lock Clearance When Fully Locked

Tightlock Couplers Examination, Lubrication and Gauging (Cont'd) UC 0149

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Examination, Lubrication and Gauging (Cont'd) UC 0149

3.2 Press the knuckle in to relieve any force on the lock resulting from the knuckle spring. Check that the lock can be moved side to side with approximately 1 to 2 mm clearance and is not being held tight by the knuckle (See Figure 11 items A & B – clearance should be either at A or B). Check also that as the knuckle is pushed in to relieve the lock, the knuckle does not jam within the coupler body.

3.3 Check that the knuckle moves freely to the fully open position when the rotor shaft is turned either by hand or with an uncoupling lever. If the lock is still stiff to lift, or if the knuckle fails to move freely to the fully open position, strip and overhaul in accordance with Job MP UC 0216 (Tightlock Couplers, Rectification of Defects).

3.4 With the knuckle fully open, lightly chalk the vertical locking face on the knuckle tail.

3.5 Slowly close the knuckle by hand and check that the lock freely drops fully home. Push the knuckle towards the coupler body to open a clearance between the knuckle tail and the lock. Insert a small wire hook into the coupler body aperture between the knuckle tail and the lock, engage it with the lock. Using the hook, pull the lock forward against the coupler body front internal face.

3.6 Insert a bar between the underside of the shelf on the lock and the bottom surface of the opening on the coupler body; see figure 12. Whilst still pulling the lock forwards against the coupler body, lever the lock upwards smartly and squarely until it 'jams' in the anti-creep condition. This is indicated by the lock moving forward just before point of 'jamming'.

3.7 With the Lock held in this position, lightly scribe a line, using a scriber or sharp pencil, across the vertical locking face of the Knuckle tail at the underside of the Lock. See figure 13.

3.8 Remove the bar and the wire hook and press Knuckle in to release the Lock. Manually operate the Rotor Shaft to open the Knuckle to the uncoupled position.

3.9 On the vertical locking face of the Knuckle tail, measure the distance from the scribed line to the top surface at the centre point. If there is a radius between the vertical and top surfaces, measure to the start of the radius. See figure 14. This distance must not be less than 6mm at the centre of the locking face. In practice, the scribed line is likely to be tapered with respect to the top surface, so 6mm at the centre is adequate.

3.10 Repeat this test three times and ensure that the results indicate that the correct Anti-Creep overlap is obtained each time. If the correct anti creep overlap cannot be obtained, see Job MP UC 0216 (Tightlock Couplers, Rectification of Defects) for details of rectification.

IMPORTANT NOTE

If no Anti-Creep overlap can be obtained and the test consistently fails, then **before** stripping down and rectifying in accordance with Job MP UC 0216 (Tightlock Couplers, Rectification of Defects), check that the Rotor Shaft is fully returning to its correct rest position with a locked knuckle, i.e. rotated fully anti-clockwise when viewed from the Drivers side and that it is not being held up or is sticking or jamming. In the case of units with a body mounted uncoupling

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Examination, Lubrication and Gauging (Cont'd) UC 0149

cylinder and "J" Hook, ensure that there is a 3mm – 6mm gap between the Rotor Eye and the "J" Hook as shown in figure 4.

This is vital, as the Anti-Creep will fail to engage if the Rotor Shaft is not fully returning to the rest position.

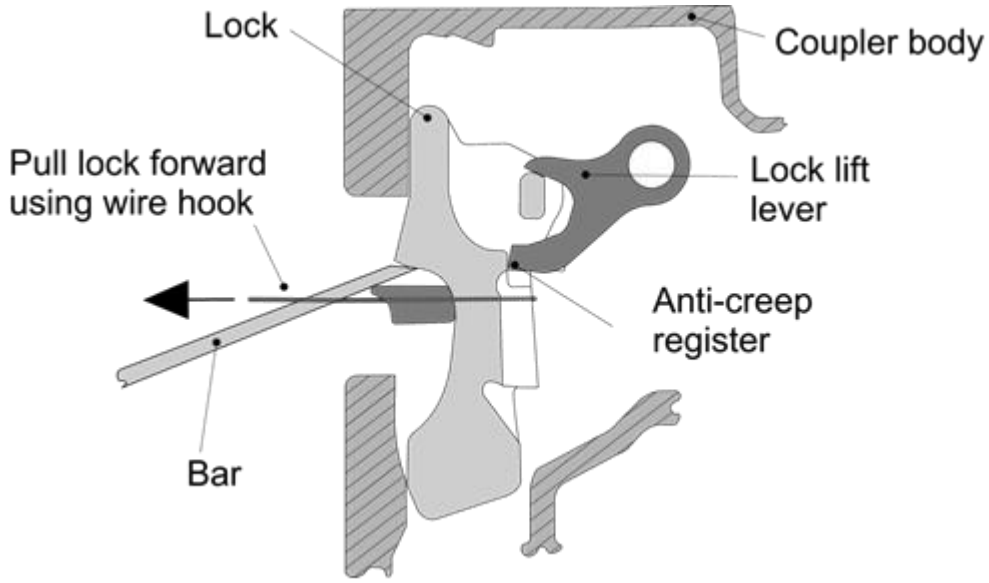


Figure 12 - Levering the Lock into Anti-Creep Position

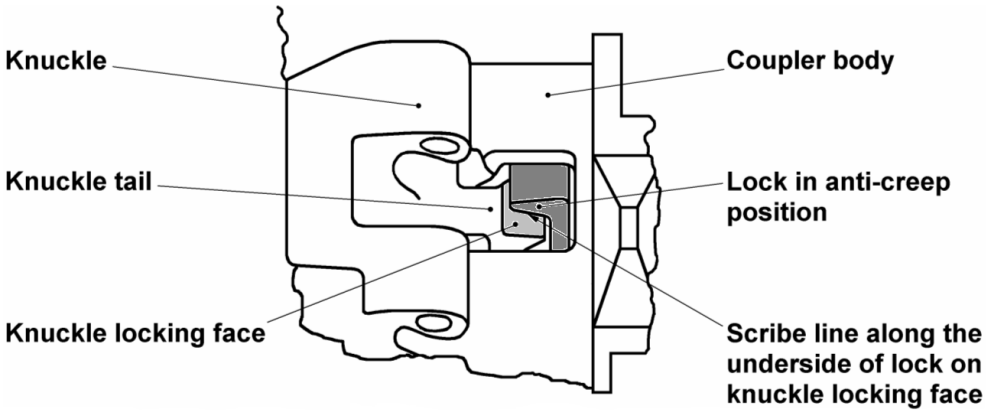


Figure 13 - Lock Held in the Anti-Creep Position

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Examination, Lubrication and Gauging (Cont'd) **UC 0149**

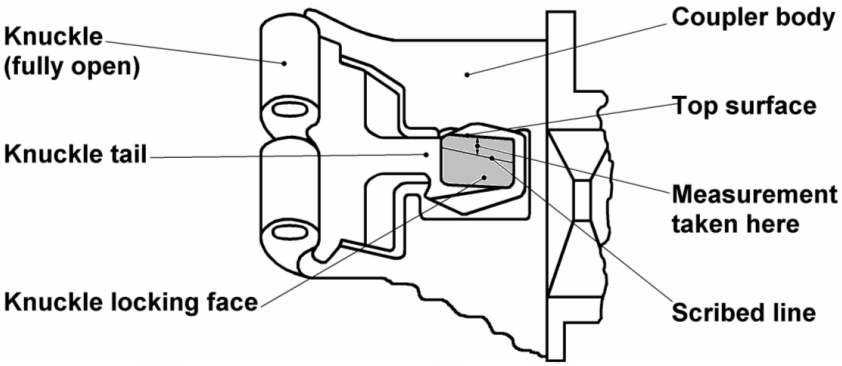


Figure 14 - Measurement of Anti-Creep Overlap

3.11 All classes EXCEPT 465 & 466.

When fully locked, check the tell-tale clearance between the indicator and the coupler body, as in figure 15, also check the positions of the rotor shaft eyes as in Figure 15a.

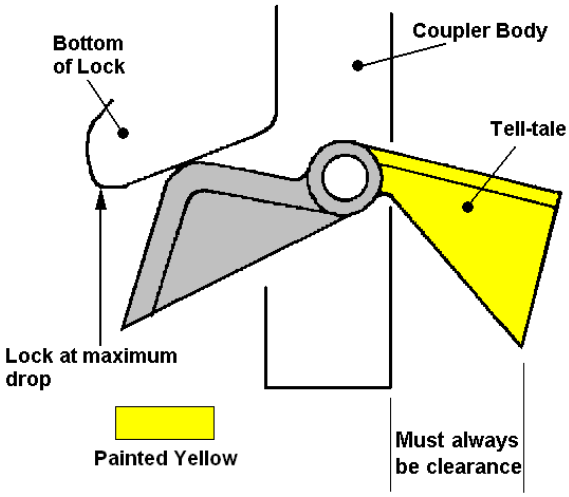


Figure 15 - Tell-tale position when coupler fully locked and areas to be painted yellow

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Examination, Lubrication and Gauging (Cont'd) UC 0149

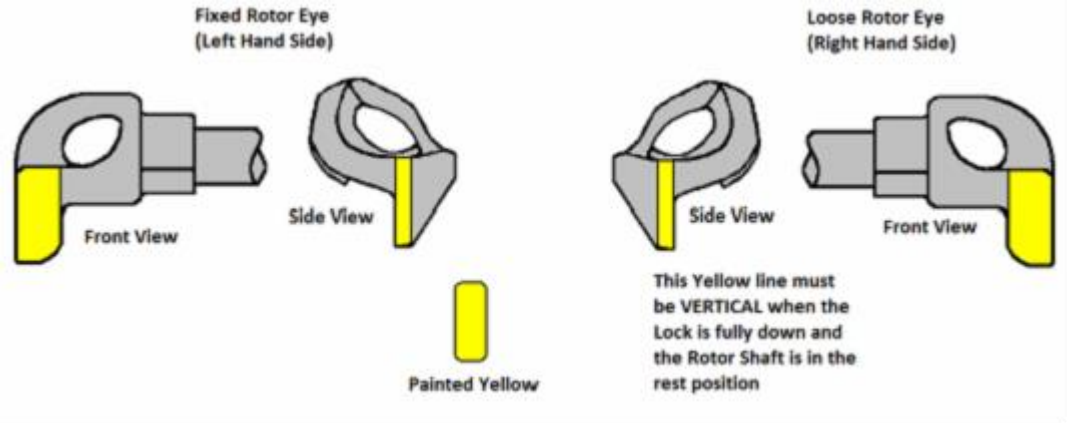


Figure 15(a) – Correct tell-tale indication on rotor shaft eyes (All classes).

3.12 Class 465/2, 465/9 and 466 only.

When fully locked, check that both the rotor eyes and arms have rotated to the fully locked position, and the rotor shaft loop is in the correct position, see figure 16.

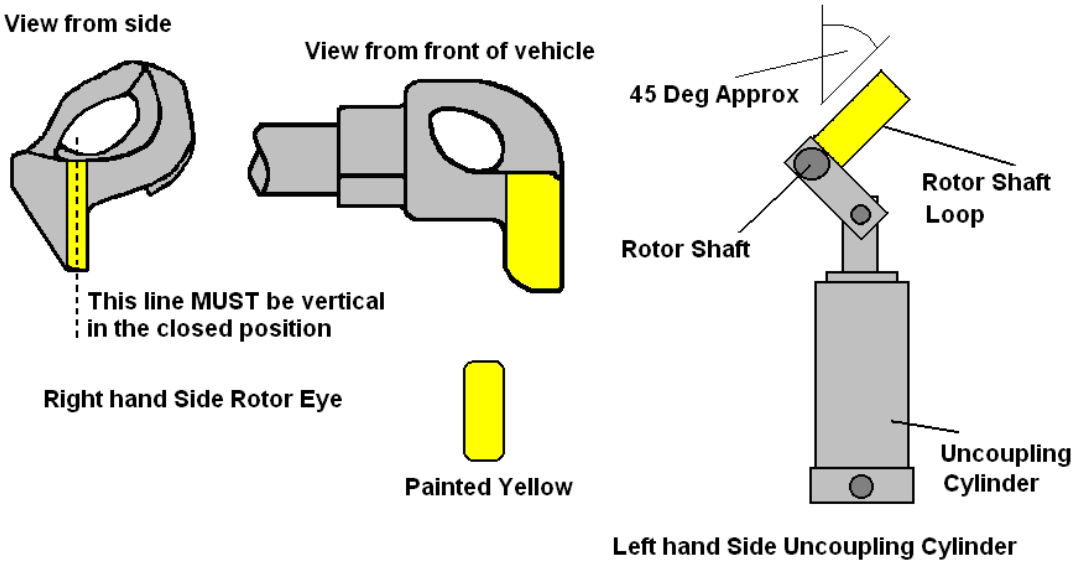


Figure 16 – Class 465/2, 465/9 and 466 Tell Tale indications on Rotor Eye and Rotor Shaft Loop when fully locked and areas to be painted yellow.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Examination, Lubrication and Gauging (Cont'd) UC 0149

3.13 Classes 57/3, 334, 365, 465/0, 465/1 only.

When fully locked, check that both the rotor eyes and arms have rotated to the fully locked position, and the rotor lever is in the correct position in relation to the uncoupling cylinder actuating lever, see figure 17.

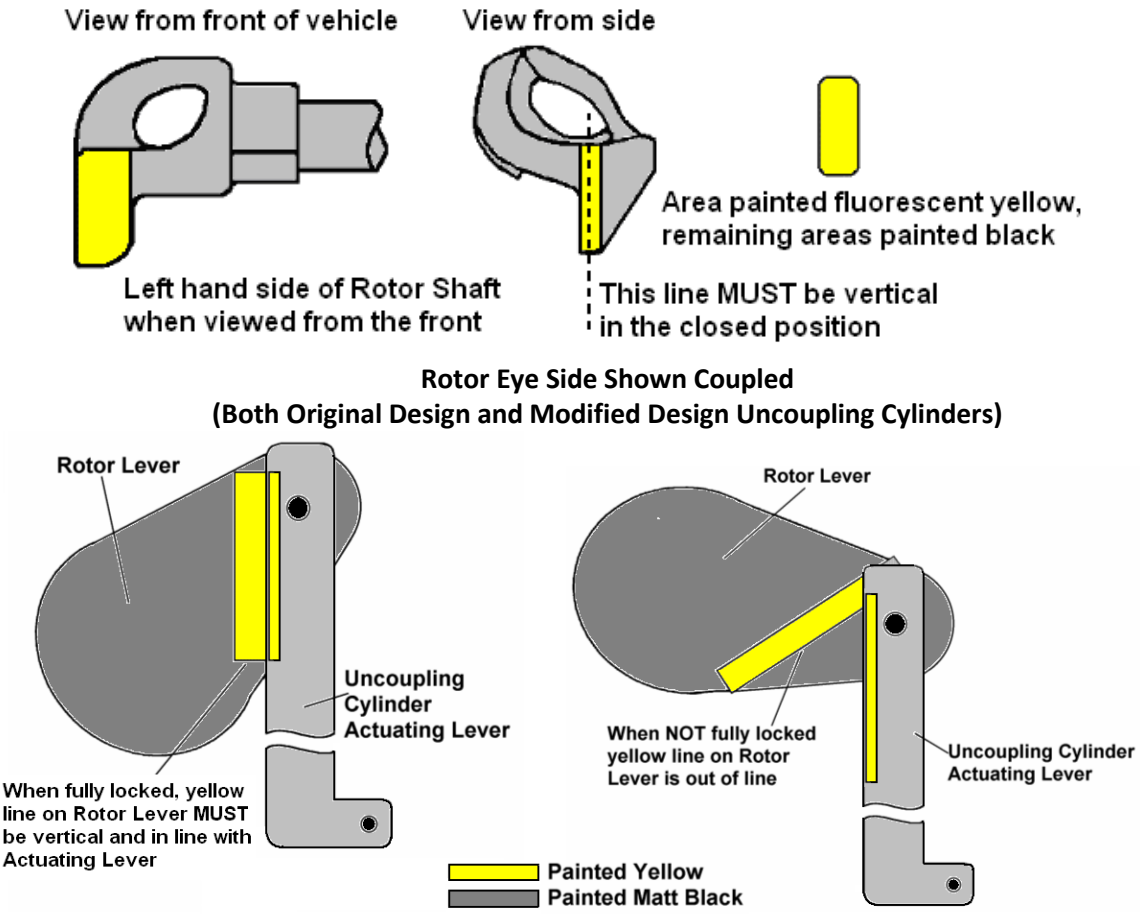


Figure 17 –Tell Tale Indications On Rotor Eye and Uncoupling Cylinder Actuating Lever When Fully Locked and Fully Unlocked

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Examination, Lubrication and Gauging (Cont'd) UC 0149

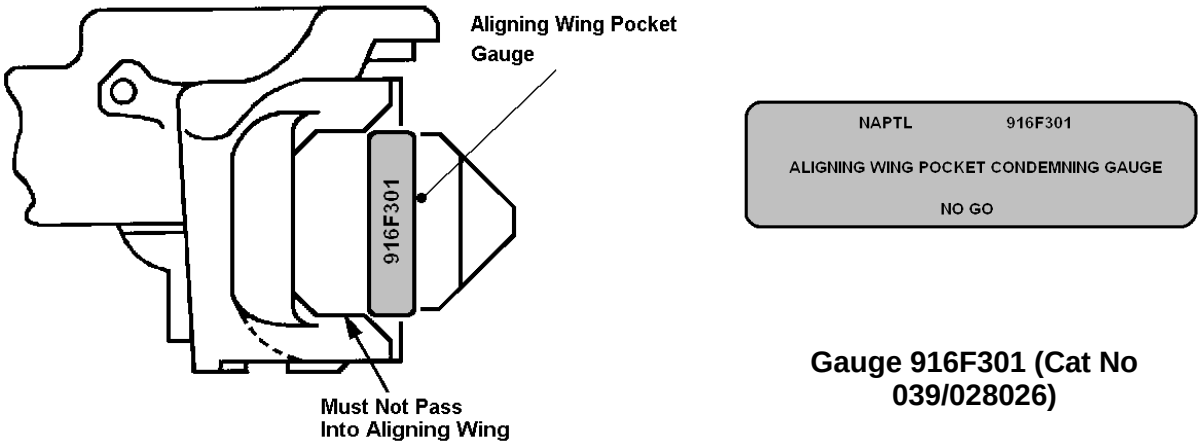
4. Gauging the coupler (ALL Classes).

4.1 Examine the aligning wings and pockets for damage or burring. Any burrs can be lightly dressed off (See figure 18).



Figure 18 – Examination of Aligning Wings

4.2 Gauge the coupler aligning wing for wear with gauge 916F301 (Cat No 039/028026), see figure 19. Change the coupler and return to an overhauler for rectification in accordance with CR/CI0545 Issue 4 (or later approved version) if it fails the gauge.



Gauge 916F301 (Cat No 039/028026)

Figure 19 - Gauging The Aligning Wing For Wear

4.3 Maximum Knuckle Gap gauging.

4.3.1 With the knuckle closed pull out the knuckle as far as the lock will allow, then gauge the knuckle gap using the Maximum Knuckle Gap Gauge as under:-

4.3.2 For all classes fitted with an Autoconnector (ALL classes EXCEPT 455 and 456), using gauge 9039324-02 (916F337, Cat No 039/028024), check the knuckle gap, see figure 20.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Examination, Lubrication and Gauging (Cont'd) UC 0149

4.3.3 For Classes 455 and 456 units only (classes NOT fitted with an Autoconnector), using gauge 9039324-03 (916F341, Cat No 039/028035), check the knuckle gap, see figure 20.

4.3.4 The gauge must not enter either the top or more than 20mm from the bottom of the knuckle contour. If it does enter, the knuckle gap is too wide. In this case refer to Section 7 of Maintenance procedure MP UC0216 Tightlock Couplers, Rectification of Defects before renewing the knuckle and / or lock and re-gauge. If the relevant gauge still enters, regardless of lock or knuckle fitted, the coupler body is worn. In this case change the coupler and return to an overhauler for rectification in accordance with CR/CI0545 Issue 3A (or later approved version).

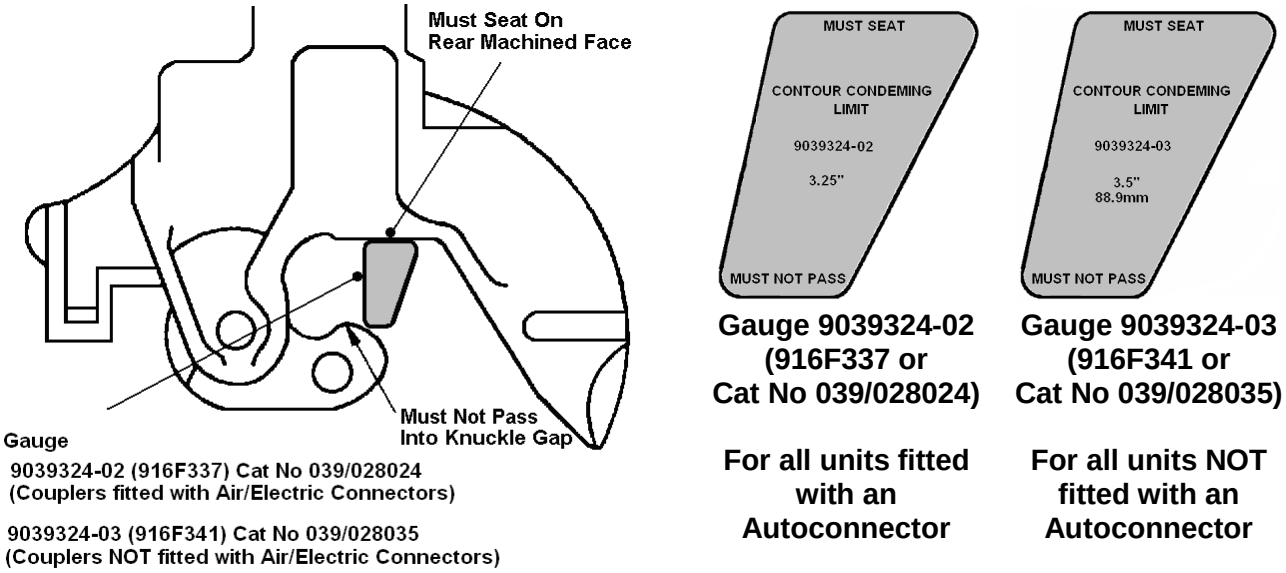


Figure 20 - Gauging the Contour for Wear using the Maximum Knuckle Gap Gauges

NOTE – Maximum Knuckle Gap Gauges may be marked "Contour Condemning Limit"

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Examination, Lubrication and Gauging (Cont'd) UC 0149

5. Painting of Tell Tale indicators.

5.1 All classes EXCEPT 465 and 466.

5.1.1 With the knuckle in the closed position, use a soft brush or cloth and a degreaser to clean the tell-tale and check the condition of the paint on the Tell-Tale and the Rotor Eyes. If the paint is damaged or faded apply a coat of fluorescent yellow paint (Cat No 028/006217) or Warning yellow paint (Cat No 028/005316), taking care not to apply paint to the coupler body. See figures 15 and 15(a).

5.2 Class 465 and 466.

5.2.1 With the knuckle in the closed position, use a soft brush or cloth and a degreaser to clean the tell-tale painting on the rotor eyes and rotor arm and check the condition of the paint. If the paint is damaged or faded apply a coat of fluorescent yellow paint (Cat No 027/006217) or Warning yellow paint (Cat No 028/005316), taking care not to apply paint to the coupler body. See figures 16 and 17 for details of painting.

6 Report any defects in accordance with local procedures.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Autoconnector, Gauge UC 0215

Safety: Wheels scotched.
Unit isolated from traction and auxiliary shore supply.
Pantograph isolated and earthed, and personal padlock applied.
Auxiliary supply switch locked 'Off'.

	DESCRIPTION	BR CAT NO
1	Coupler Contact Block gauge to drawing C2/6/24	039/028330

1 Hold open fully the Roll Cover and gauge the Contact Block using Coupler Contact Gauge C2/6/24, (Cat No 039/028330) see figure 1.

2 Check that the gap, dimension 'A', between the face of the gauge and the face of the air valve assembly is between 1mm and 3 mm (See Figure 1 item A). If outside these limits, or if the contact assembly /air valve assembly is not visibly square within the support box, adjust the Contact Block in accordance with Job MP UC 0217 (Autoconnectors, Rectification of Defects).

NOTE The gauging must also be carried out if the coupler contacts show evidence of burning, or if the contact block or roll cover is damaged, or if a new roll cover is to be fitted in accordance with Job MP UC 0217 (Autoconnectors, Rectification of Defects).

3 Report any defects to the Supervisor.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Autoconnector, Gauge (Cont'd) **UC 0215**

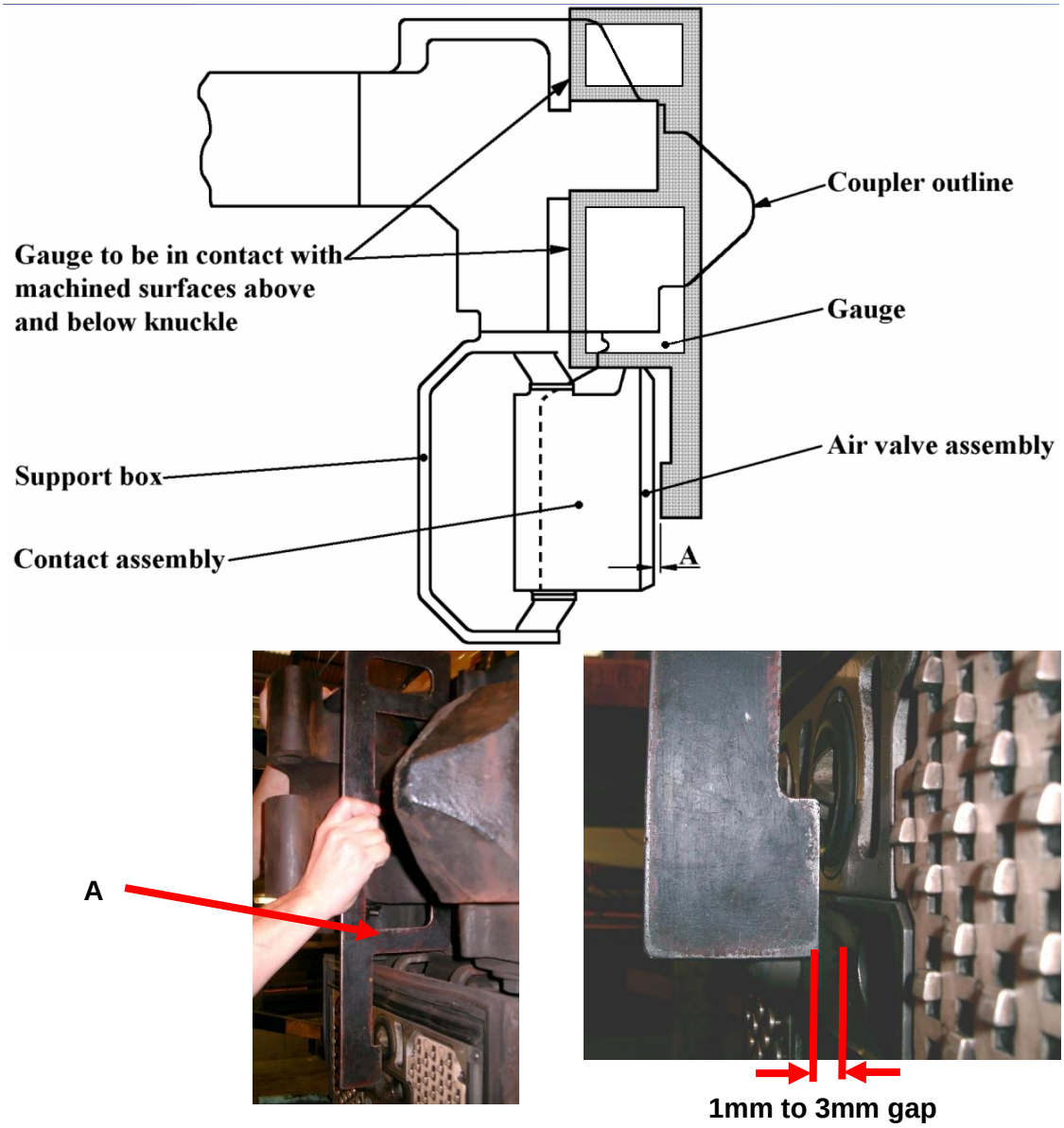


Figure 1 - Coupler Contact Block Gauging (Gauge C2/6/24) (Cat No 039/028330)

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers, Incidents Check MP UC 0104

1. Breakaways - Trains Becoming Divided

1.1 Where Tightlock couplers are involved in a breakaway incident the two portions of the train should not be re-coupled unless there is no alternative in order to clear the running line.

1.2 Each part of the divided train must then be either worked or assisted individually to a depot in accordance with the relevant Operating Instructions for an examination and 'pull-away' test.

1.3 Any staff called to a breakaway must carry out the requirements of item 1.5 below (as far as possible) and report immediately to the Service Delivery Centre/ Control Centre. The OTMR's (where fitted) must be downloaded in all cabs of the formation.

1.4 When the units are returned to a depot, the examination as detailed in items 1.5 to 1.7 and 'pull-away' tests in 1.19 are to be conducted in the presence of a responsible member of the Operating Department in accordance with local procedures. If the complete train is not returned to a depot for a coupler examination and testing, the first portion to arrive should be held until the second portion arrives so as to be able to examine and test both portions together. When the other portion of the alleged defective train arrives in depot the requirements of Section 1 must be carried out.

1.5 Examine the Tightlock coupler for signs of damage, i.e. evidence of coupling with the knuckles closed, bruising to knuckle faces, gathering prongs etc.

1.6 Examine the roll cover, gathering arm and the electrical/pneumatic connections for damage.

1.7 Check the operation of the knuckle lock and tell tale. Check that with the knuckle in the 'closed' position that the lock fully drops and that there is a correct tell tale indication for the class concerned in accordance with Job UC 0149 Sections:-

3.11 & Figures 15 and 15(a) for all classes except 465 and 466.
3.12 & Figure 16 for class 465/2, 465/9 and 466 only.
3.13 & Figure 17 for class 465/0 and 465/1 only.

1.8 Where applicable for the class concerned, with the knuckle closed and locked, check that as the lock drops, the rotor shaft freely rotates to the fully locked position, and neither the split pin securing the rotor eye nor the rotor eye 'horn' contacts or rubs on the coupler body; - see Job MP UC 0216 sections 4.10 and 4.11 and figures 24 (a) and 24 (b).

1.9 Where applicable for the class concerned, with the knuckle closed and locked, check that the Rotor Shaft has rotated fully anti-clockwise and that there is a clearance of 3mm to 6mm between the "J" hook and the Rotor Eye as shown in Job MP UC 0216 section 4.7 and figure 23.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers, Incidents Check (Cont'd) MP UC 0104

1.10 With the knuckle closed and the lock fully dropped, press the knuckle to relieve any force on the lock and check that the lock can be moved side to side with approximately 1 to 2 mm clearance and is not held tight by the knuckle as detailed in Job MP UC 0216 section 5.1 and Figure 25.

1.11 Carry out the Test of overlap between Lock Lift Lever and Lock Lifting Peg (Joggle Test) as detailed in Job MP UC 0216 section 5.2.

1.12 Carry out the check of the amount of effective anti-creep in accordance with Job MP UC 0216 section 5.3 and figures 26 to 28. This overlap must be at least 6 mm.

1.13 Gauge the coupler in accordance with Job MP UC 0216 sections 5.4, 5.5, 5.6 and 5.7 and figures 26 and 29 to 32. Measure the lock lift lever top leg / lock lifting peg and lock lift lever bottom leg / lock anti-creep ledge overlaps in accordance with Job MP UC 0216 section 7.6 and figure 42(a).

1.14 Remove the drumswitch cover and examine UV1 and UV2 (NV8 type) magnet valves for damage or defects. Manually operate the valves and check the armatures are free. Replace the drumswitch cover.

1.15 Visually examine the wiring and terminal bars for signs of 'tracking' or short circuits having occurred, and check the security of the terminal bar wiring

1.16 Move the Drivers Direction Switch (DDS) or Master Switch (MS) to the 'N' position and press the couple push-button. Check that the drumswitch throws to the correct position, but the pneumatic uncoupling cylinder remains in the retracted position.

1.17 With the knuckle fully closed, press the uncouple push-button. Check that the drumswitch throws to the uncoupled position, the pneumatic uncoupling cylinder extends to operate the uncoupling mechanism, and the knuckle fully opens.

1.18 Release the uncouple push-button. Check that the pneumatic uncoupling cylinder retracts fully and that the operating mechanism does not bind.

1.19 Couple the two units together in accordance with the relevant Operating Instructions and carry out the 'pull-away' tests.

1.20 During the 'pull-away' tests check for any air leaks from the uncouple/couple magnet valves and the pneumatic uncoupling cylinder.

1.21 On completion of the 'pull-away' tests uncouple the units.

1.22 Move the DDS or MS to the 'Off' position and check that the couple/uncouple push-buttons are isolated.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers, Incidents Check (Cont'd) MP UC 0104

1.23 If the examination and 'pull-away' tests are not considered satisfactory the necessary repairs should be carried out and the couplers re-tested as in Section 1.7 to 1.22.

1.24 If the initial examination and 'pull-away' tests are considered satisfactory, then providing it can be established without doubt that the breakaway occurred immediately after a coupling operation in service, or the cause was train crew error, the units may be returned to service.

1.25 In all other cases the couplers must be removed from the vehicles and returned to an approved overhauler and suitably labelled for quarantining. The overhauler should be requested by the TOC to dismantle and gauge all components, then re-assemble, test and re-gauge in accordance with the relevant issue of the Tightlock Coupler overhaul instruction. The relevant issue will be the version that the coupler was last overhauled to. In addition, the full gauging in accordance with CR/CI0545 Issue 4 (or later approved version) should be completed to establish if the inspection and gauging to this standard would mitigate the failure mode and provide a report into the findings. Alternatively, the TOC may wish to have this test carried out by the overhauler witnessed by TOC technical staff or an independent observer.

Note: - It is not recommended that the TOC carries out this testing as it is necessary to know the issue of CR/CI0545 to which the coupler was last overhauled and in the case of overhaul to versions of CR/CI0545 earlier than Issue 4, out dated gauges S2, S11 and W3 would need to be used.

1.26 Any coupling renewed, or any broken parts of the drawgear, should be sent paired up, for investigation.

2. Failure to Couple Incidents

2.1 In the event of a failure to couple, (after making several attempts), the same arrangements as for a breakaway must, as soon as practical, apply. However, in these circumstances, it will not be necessary for the examination and 'pull-away' test to be witnessed by the Operating Department.

3. Reporting

3.1 The results of all Tightlock coupler examinations and tests must recorded and reported in accordance with local procedures.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Rectification of Defects MP UC 0216

Contents

	Section	Page
1	**Dismantling the Coupler**	**3**
2	**Examination and gauging of the component parts**	**5**
3	**Rectification of defective anti-creep**	**10**
4	**Reassembly of the Coupler**	**11**
5	**Testing and gauging after reassembly**	**15**
5.1	Initial Tests and lock to body / knuckle clearance	15
5.2	Test of overlap between Lock Lift lever and Lock Lifting Peg (Joggle Test) without partial disassembly of coupler.	16
5.3	Test of anti-creep overlap between Knuckle Tail and Lock.	16
5.4	Maximum and Minimum Knuckle Gap gauging.	19
5.5	Contour Check gauging.	21
5.6	Anti-creep Point of Engagement Test.	22
5.7	Lockset Condition Test	22
6	**Data section**	**23**
6.1	Gauges	23
6.2	Lubricants and Paints	24
6.3	Component List	24
	SFE Coupler	25
	NAP Coupler	28
	WCR Coupler	30
6.4	Component List (Tightlock coupler uncoupling equipment)	32
6.5	Components for Tightlock coupler	33
7	**Renewal of Critical Components**	**34**
7.1	Gauging the Coupler Body Rotor Shaft Hole vertical and horizontal position	34
7.2	Knuckle	36
7.3	Lock	36
7.4	Lock Lift Lever	40
7.5	Rotor Shaft	41
7.6	Initial Test during Assembly	42
7.7	Special Gauges required for the renewal of critical components	45
7.8	Special Tools	45

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Rectification of Defects (Cont'd) MP UC 0216

IMPORTANT NOTE

Whilst the coupler can be stripped, cleaned, examined and re-assembled, IT IS NOT RECOMMENDED that component parts, with certain exceptions are replaced with new items as this may invalidate the component matching and gauging criteria that would have been undertaken during the overhaul process to CR/CI 0545 Issue 3A, 4 (or later approved version).

If any of the following components are found, after dismantling, to be defective and require replacement, it is recommended that the coupler is re-assembled with these defective components, and returned complete to an overhauler suitably labelled as defective, indicating the defective components, then fit an overhauled coupler to CR/CI 0545 Issue 4 (or later approved version) to the vehicle.

Components that are NOT recommended to be replaced:-

- *Coupler body,*
- *Knuckle,*
- *Lock,*
- *Lock Lift Lever,*
- *Rotor Shaft*

However, if Operators wish to change these components themselves (if found defective) as opposed to changing the complete coupler, certain additional gauging will be required on the replacement components and the existing coupler body so as to ensure that no additional risks of couplers uncoupling are imported. It is essential that reference is made to Section 7 of this procedure BEFORE any of these components are exchanged.

Details of this additional gauging is shown in Section 7 of this procedure and this MUST be referred to BEFORE any of these critical components are renewed.

A complete list of what components can and CANNOT be changed without the additional gauging work is shown in section 6.3 of this procedure.

Failure to adhere to this instruction could lead to a coupler that has an increased risk of the lock lift lever top leg slipping behind the lock lifting peg and so result in a breakaway in service.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Rectification of Defects (Cont'd) MP UC 0216

1 Dismantling the Coupler.

1.1 Dismantle the Tightlock coupler head as follows:- (See figures 1 to 6)

1.2 Check that the knuckle is in the open position.

1.3 Remove the split pin, washer and knuckle spring from the bottom of the knuckle pin.

1.4 Disconnect the uncoupling cylinder mechanism or uncoupling drive assembly as appropriate for the class involved from the rotor shaft

1.5 Lift out the knuckle pin and remove the knuckle.

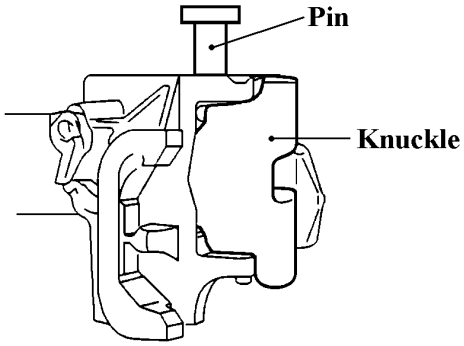
1.6 Remove lock by tipping forward at top and lifting out.

1.7 Remove the knuckle thrower and rotor eye.

1.8 Slide out the rotor shaft from the side and remove the lock lift lever through the front opening.

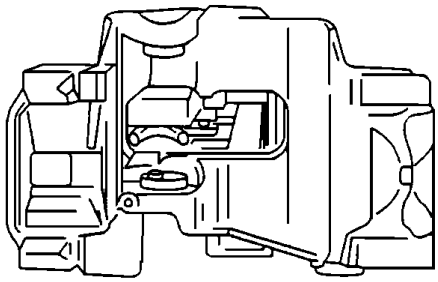
Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Rectification of Defects (Cont'd) **MP UC 0216**



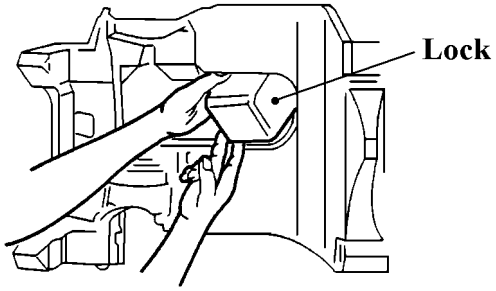
Remove spring, washer and lift out Knuckle Pin

Figure 1



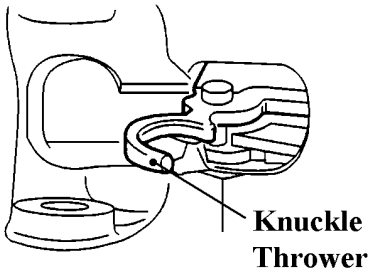
Remove Knuckle

Figure 2



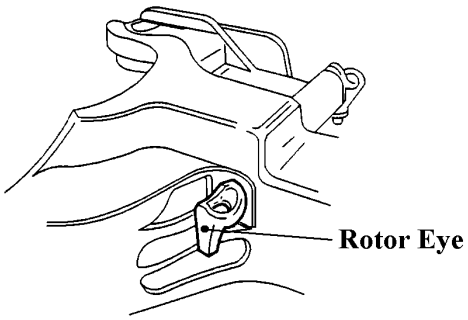
Remove Lock

Figure 3



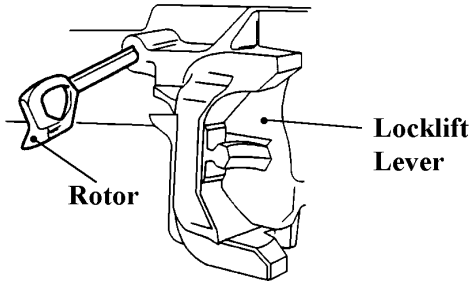
Remove Knuckle Thrower

Figure 4



Remove Rotor Eye

Figure 5



Slide out Rotor Shaft and Remove Lock Lift Lever

Figure 6

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Rectification of Defects (Cont'd) MP UC 0216

2 Examination and gauging of the component parts.

2.1 Clean off oily or greasy contamination from the lock, knuckle thrower and locking face of the knuckle using an approved solvent in a cleaning bath. Dry off the residue.

2.2 Wire brush clean to remove all rust, dirt and lubricant deposits from all mating surfaces of the lock, lock lift lever, rotor shaft and knuckle, paying particular attention to the locking face and top surface of the knuckle and both vertical sides of the lock. Stubborn deposits may be removed using a soft brush or cloth and a degreaser.

2.3 Examine the knuckle for major damage or burring. Examine the locking face of the knuckle for damage or burring – see figure 7. Examine the tail shelf of the knuckle for any burring upwards at the right hand corner. If burring is present in either location, dress off using a file or small hand grinder ensuring the tail shelf remains flat.

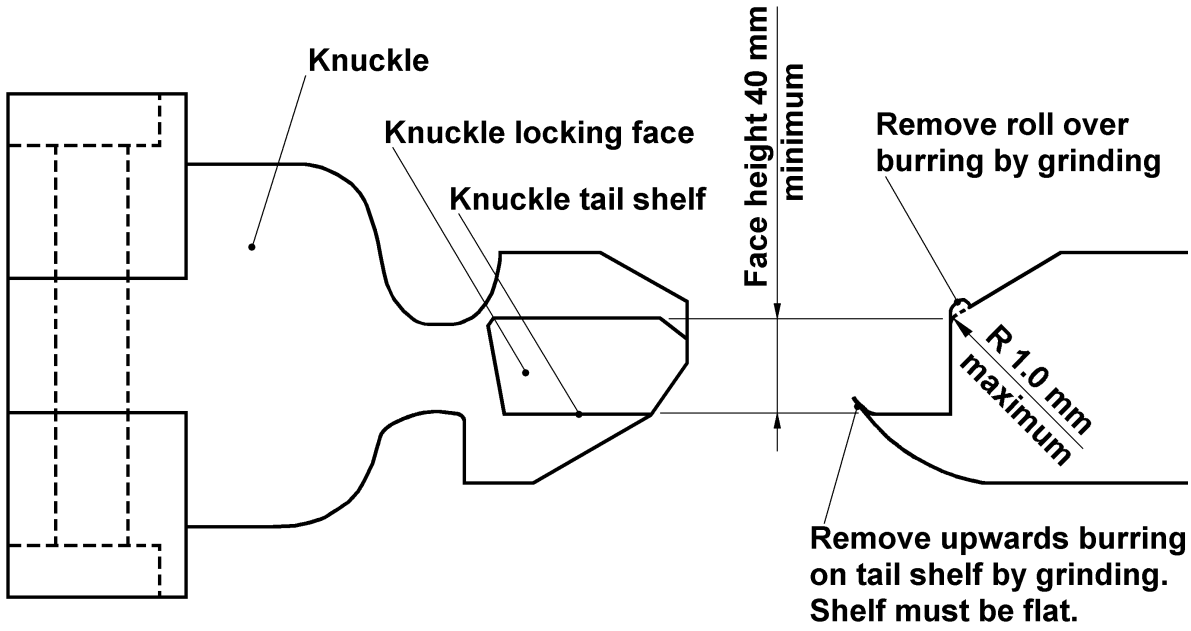
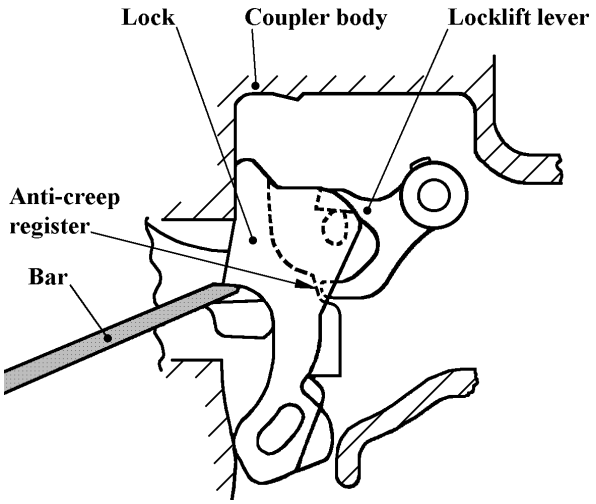


Figure 7 - Examination of Knuckle Locking Face and Tail Shelf

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

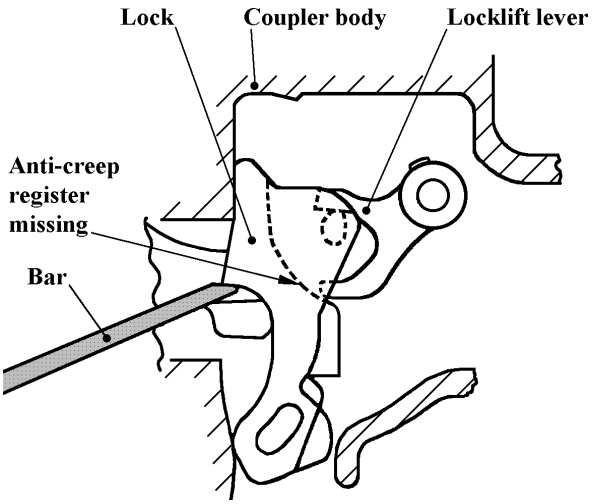
Tightlock Couplers Rectification of Defects (Cont'd) **MP UC 0216**

2.4 Examine the lock for damage or defects, paying particular attention to the anti-creep ledge in the rear recess of the lock. This should form a distinct ledge. Refer to Section 7 if the lock anti-creep ledge is poorly formed, indistinct, chamfered or ground away See figures 8, 9 and 10.



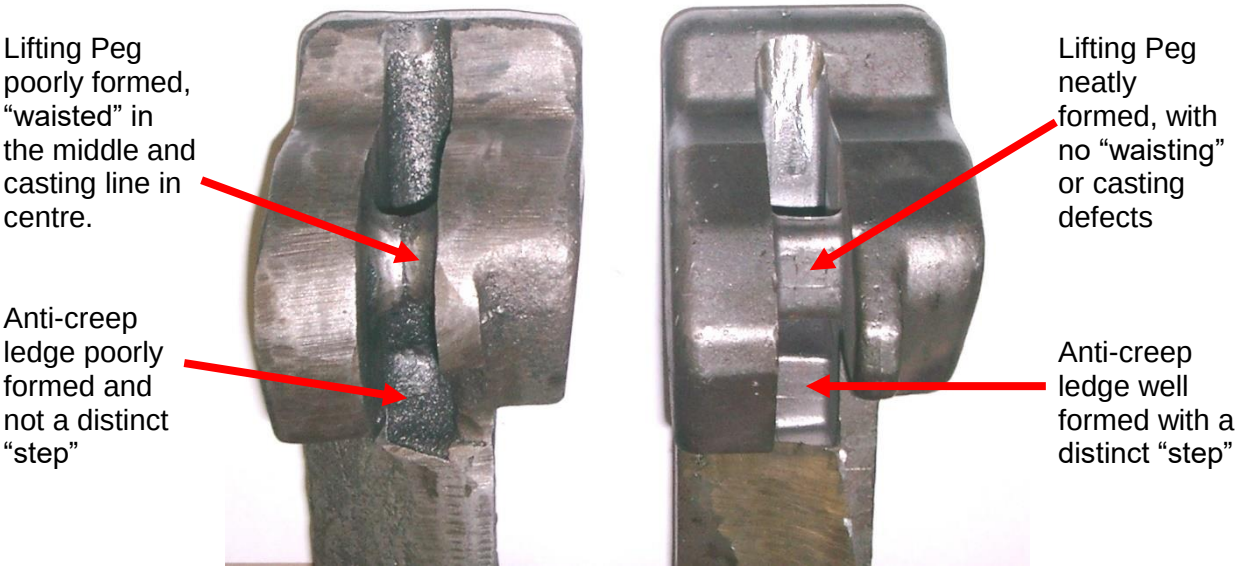
Anti-creep register on the inside rear of the lock is engaged with the lock lift lever

Figure 8 - Lock Profile with Anti-creep Register (Will Work)



Anti-creep register is missing, lock lift lever will not engage

Figure 9 - Lock Profile Anti-creep Register Missing (Will Fail)



Unacceptable Lock **Acceptable Lock**

Figure 10 – Typical examples of Unacceptable and Acceptable Locks

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Rectification of Defects (Cont'd) MP UC 0216

2.5 Examine the rotor shaft and lock lift lever for damage or distortion. Refer to Section 7 if either the lock lift lever or rotor shaft is bent or damaged. Ensure that a short profile lock lift lever to Cat No 098/008906 (for all SFE and NAP couplers) or WCR 6314 (for WCR couplers) is fitted. See figure 11 (a) and 11 (b).



Figure 11 (a) - Original Lock Lift Lever Profile NOT TO BE USED on EMU Couplers



Figure 11 (b) – Modified Lock Lift Lever Profile for EMU Couplers

2.6 Examine the coupler body for major damage or burring. Burrs may be dressed off using a file. Re-assemble and change the coupler and return to an overhauler for rectification in accordance with CR/CI0545 Issue 4 (or later approved version) if the body is damaged or defective.

2.7 Gauge the knuckle pin for wear in the areas where it contacts the four bushes using gauge 916F343, see figure 12. Renew the pin if it fails the gauge.

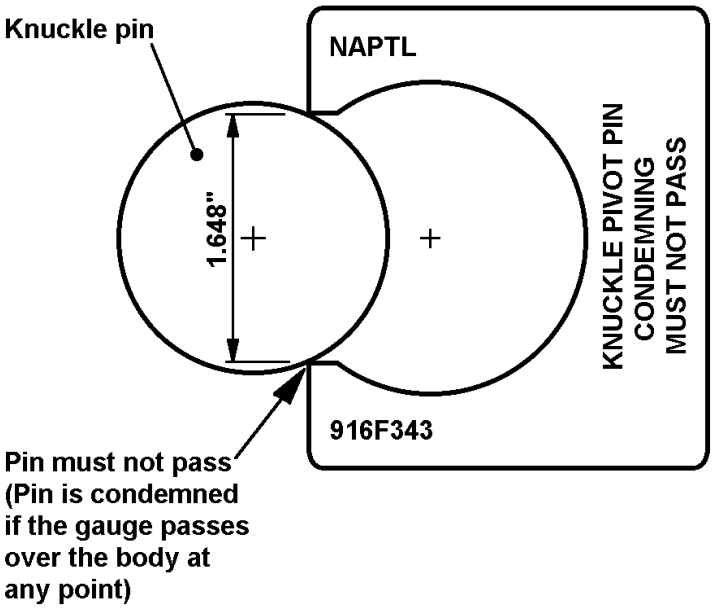


Figure 12 - Knuckle Pin Condemning Gauge (916F343)

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Rectification of Defects (Cont'd) MP UC 0216

2.8 Gauge the knuckle for wear using the knuckle condemning gauge as detailed below:-

For couplers fitted with an Air/electric connector use gauge 916F310,
For couplers NOT fitted with an Air/electric connector (Coupler Cat Nos 098/006214 or 098/011810 only) use gauge 916F342.

See figures 13 and 14.

Refer to Section 7 if the knuckle fails the gauge.

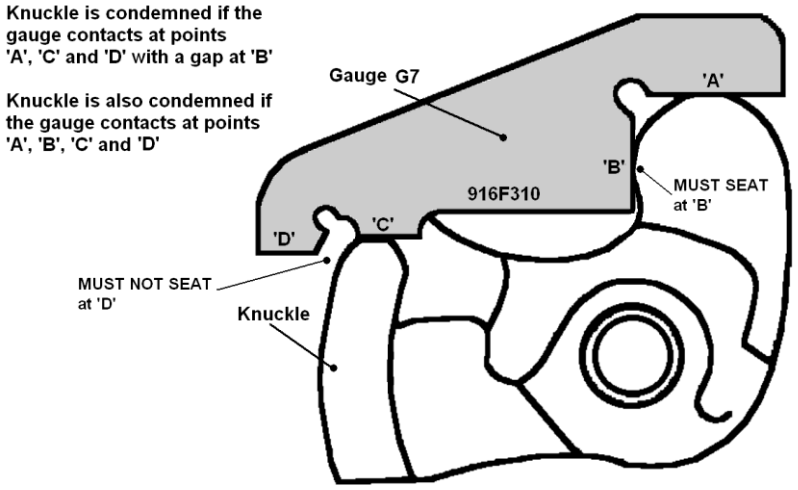


Figure 13 - Gauging the Knuckle for Wear Using Gauge 916F310 for couplers fitted with an Air/electric connector.

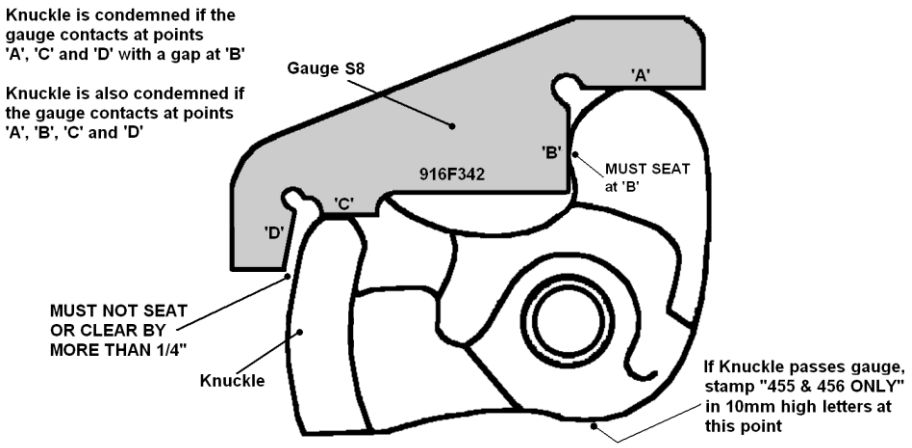


Figure 14 - Gauging the Knuckle for Wear Using Gauge 916F342 for couplers NOT fitted with an air/electric connector (Cat Nos 098/006214 or 098/011810),

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Rectification of Defects (Cont'd) **MP UC 0216**

2.9 Gauge the knuckle pin bush holes in the Tightlock Head and the Knuckle for wear using gauge 916F344, see figure 15. Re-assemble and change the coupler and return to an overhauler for rectification in accordance with CR/CI0545 Issue 4 (or later approved version) if the Head or Knuckle bush holes fail the gauge.

NOTE – Tightlock Heads or Knuckles that fail this can be returned for re-bushing.

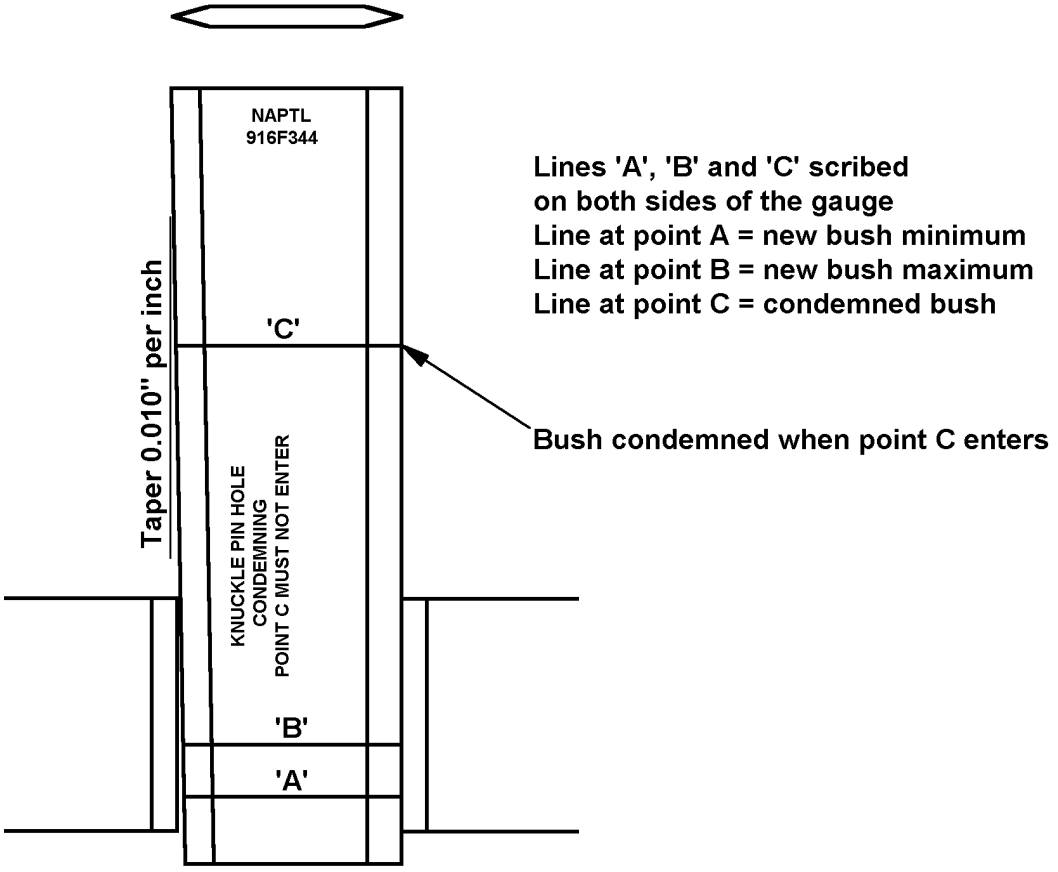


Figure 15 - Knuckle Pin Bush Condemning Gauge (916F344)

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Rectification of Defects (Cont'd) MP UC 0216

3 Rectification of defective anti-creep.

Note This procedure is to be used when the coupler has failed the anti-creep test in job UC 0149 - Tightlock Couplers Examination, Lubrication and Gauging.

3.1 With the coupler dismantled, examine the following:-

3.2 Examine the anti-creep ledge in the rear recess of the lock. This should form a distinct ledge. Refer to Section 7 if the anti-creep ledge is poorly formed or ground, or if the anti-creep register is not as shown in figures 8, 9 and 10.

3.3 Check that both the lock and lock lift lever are clean and dry. Clean off oily or greasy contamination using an approved solvent and dry off the residue. Remove rust with a wire brush.

3.4 Examine the rotor shaft and lock lift lever for damage or distortion. Refer to Section 7 if Rotor Shaft if bent, twisted or damaged.

3.5 Examine the lock lift lever for damage or defects. Ensure that a short profile lock lift lever to Cat No 098/008906 is fitted See figure 11.

3.6 Measure the height of the top edge of the knuckle locking face from the tail shelf, the height should not be less than 40 mm; see figure 7. If this height is less than 40mm, refer to Section 7.

Note Where the height is less than 40 mm it will be difficult or impossible to obtain the correct anti-creep overlap, indicating that the knuckle has been incorrectly formed or machined.

3.7 Examine top surface of the tail shelf and the top edge of the locking face for bruising or burring and check that the roll over radius is not greater than 1 mm; see figure 7. Remove any damage by grinding flat to restore the original profile.

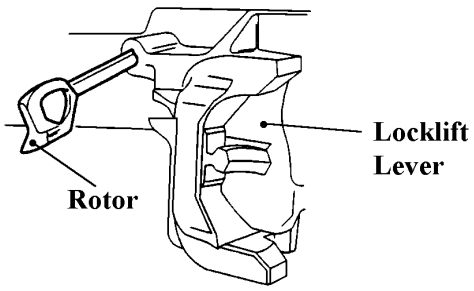
Note Tail shelf and locking face damage on knuckles is most likely to be found on WCR coupler heads as fitted to classes 365 and 465/0 & 465/1 units.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Rectification of Defects (Cont'd) MP UC 0216

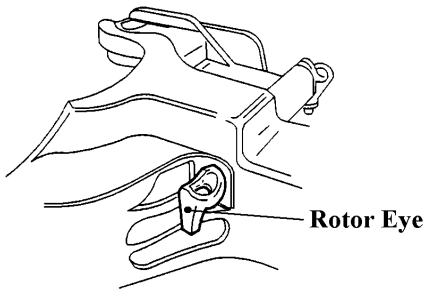
4 Reassembly of the Coupler.

4.1 Assemble the coupler as follows:- (See figures 16 to 21)



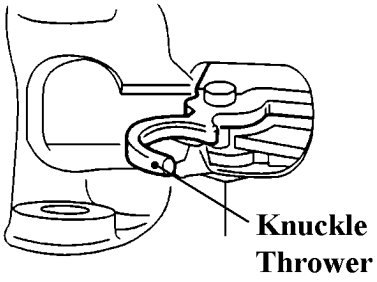
Install Locklift Lever

Figure 16



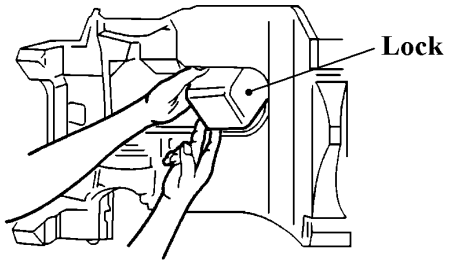
Fit Rotor Eye and Rotor

Figure 17



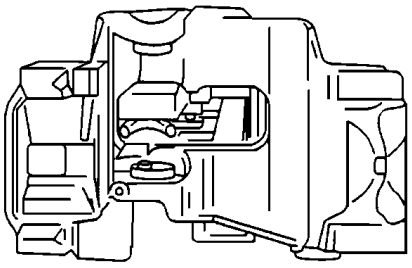
Fit Knuckle Thrower

Figure 18



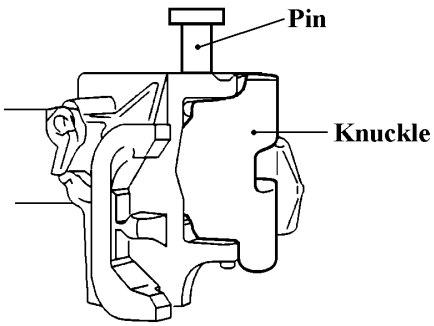
Fit Lock

Figure 19



Install Knuckle

Figure 20



Install Knuckle Spring and Knuckle Pin

Figure 21

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Rectification of Defects (Cont'd) **MP UC 0216**

4.2 All parts must be clean and dry with no lubrication applied except as stated below.

4.3 Lightly spray the rotor shaft and TOP SURFACE ONLY of the knuckle tail with dry lubricant (Molykote 321R, Cat No 027/004058). Leave spray lubricant to dry for five minutes or longer. See figure 22.

Note: Under no circumstances spray lubricate the lock, lock lift lever or knuckle locking faces as this will allow the lock to be "squeezed" upwards and may lead to uncoupling.

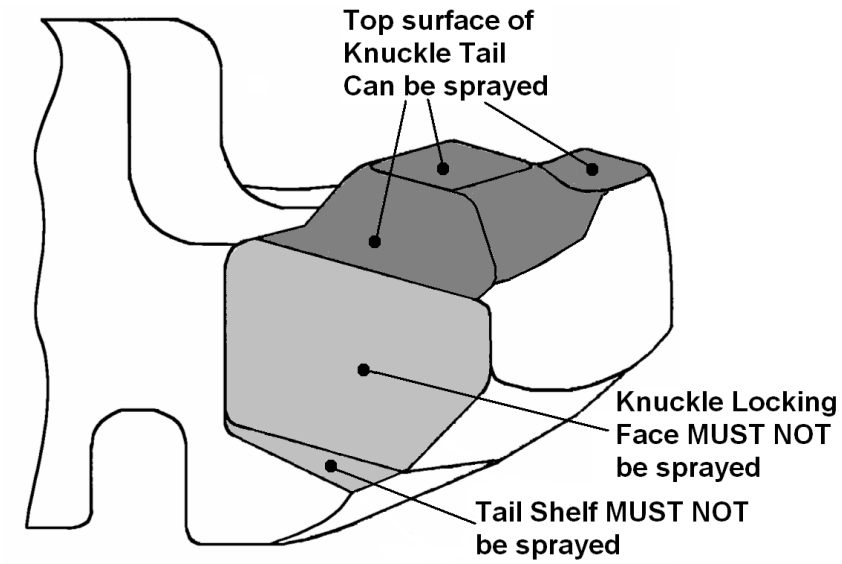


Figure 22 – Areas That Can Be Spray Lubricated On The Knuckle Tail

4.4 Fit the knuckle thrower, lock lift lever, rotor shaft and lock in reverse order, ensuring that the lifting peg on the back of the lock is 'hooked' over the bottom fork of the lock lift lever. Fit the rotor eye using a new split pin to Cat No 029/031833 (SFE / NAP Couplers) or 093/059022 (WCR Couplers).

4.5 Rotate rotor shaft to fullest 'uncoupled' extent so that lock sits in the "lock set" position on the knuckle thrower. Refit knuckle and knuckle pin. Refit spring with knuckle open, short leg to front of vehicle, washer and a new split pin to Cat No 029/031833 (NAP Couplers) or 093/059022 (SFE / WCR Couplers).

4.6 Refit uncoupling cylinder or drive assembly as appropriate for the class involved to rotor shaft.

4.7 With the knuckle closed and locked, check that the Rotor Shaft has rotated fully anti-clockwise and for classes with a body mounted uncoupling cylinder and "J" hook check that there is a clearance of 3mm to 6mm between the "J" hook and the Rotor Eye as shown in figure 23. If the clearance is less than 3mm, fit a Matched Rotor and Rotor Eye Cat No 098/023827. If the clearance is still less than 3mm, the "J" hook angle should be adjusted by removing the Operating Rod and adjusting the angle by heating and bending.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Rectification of Defects (Cont'd) **MP UC 0216**

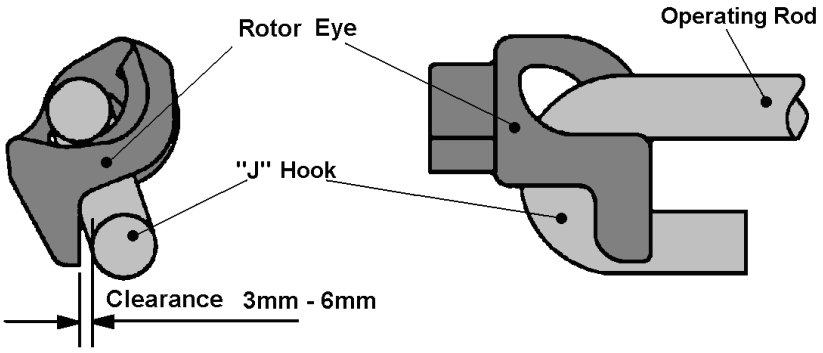


Figure 23 - Essential clearance between Rotor Eye and "J" Hook

4.8 Charge the knuckle pin with Calcium based graphite grease (Cat No. 027/001361) and apply a film of grease to the external surface of the pin. Fit the knuckle pin, spring, washer and new split pin to Cat No 029/031833 (NAP Couplers) or 093/059022 (SFE / WCR Couplers).

4.9 Clean off any excess grease.

4.10 Open the coupler and fully close the knuckle by hand and check that the lock drops freely, and the rotor shaft rotates to the fully locked position. Lateral clearances between the lock, lock chamber and the knuckle tail are important to free movement of the lock. There should be at least 1.5mm lateral clearance between the lock and the knuckle tail when the lock is levered laterally against the lock chamber side opposite the knuckle tail. If the lock does not drop freely, check that this clearance is available and if not replace the lock and repeat the above action. Also check that neither the split pin securing the rotor eye, rotor eye body or rotor eye 'horn' contacts or rubs on the coupler body; see figures 24 (a), 24 (b) and 24(d). Reposition the spilt pin to clear if it contacts the body. Correct as follows:

- If the split pin contacts the coupler body, reposition the split pin;
- If the rotor eye horn contacts the coupler body, remove the rotor eye and reduce the length of the 'horn' to clear by grinding and refit;
- If the rotor eye body contacts the coupler body, remove any flash on the 50mm diameter boss on the coupler body if this is causing the foul. If this does not resolve the foul, remove the rotor eye and reduce the length of the 'rotor eye body' to clear by grinding up to 3mm off ensuring at least 4mm wall thickness between the split pin hole and the end of the rotor eye as shown in Figure 24 (d) and refit.

4.11 If the lock jams while dropping or if it fails to freely drop when the knuckle is closed, remove the lock lift lever and re-profile as shown in figure 24 (c) below. Repeat the test following lock lift lever re-profiling.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Rectification of Defects (Cont'd) **MP UC 0216**

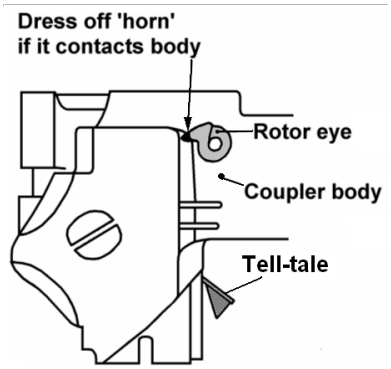


Figure 24 (a)– Rotor Eye Fouling

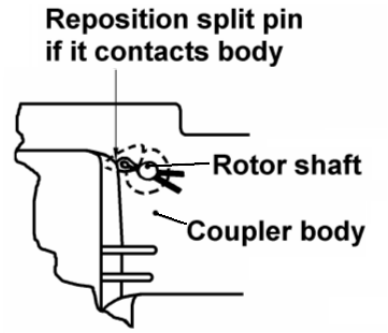


Figure 24 (b) – Split Pin Fouling

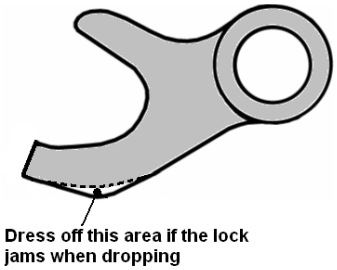


Figure 24 (c) – Area of Lock Lift Lever to Dress Off if Lock Jams

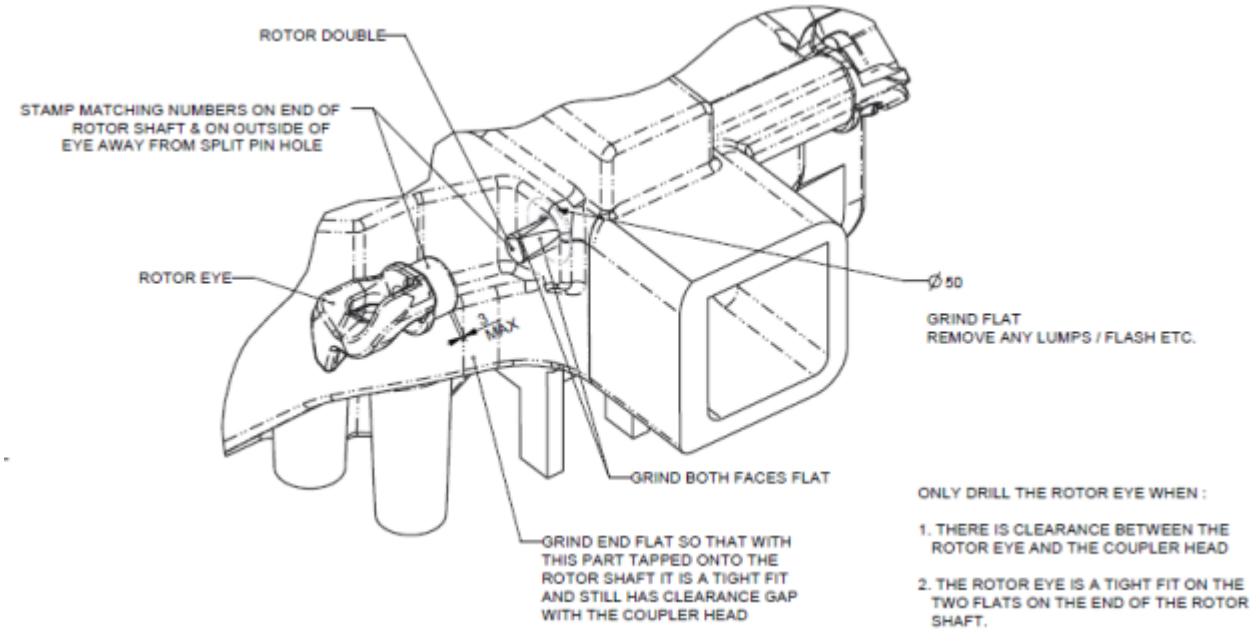


Figure 24 (d)– Rotor Eye Body Fouling

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

5 Testing and Gauging after reassembly.

5.1 Initial Tests and Lock to Body / Knuckle Clearance Check.

5.1.1 Unlock the knuckle by either rotating the Rotor Shaft by hand or by using the manual uncoupling lever. Slowly close the knuckle by hand and check that the lock freely drops fully home, and that the Rotor Shaft has rotated fully anti-clockwise (when viewed from the Driver's side). Failure of the Rotor Shaft to fully return will lead to a failure of the Anti-Creep feature, and this could result in an uncontrolled train division.

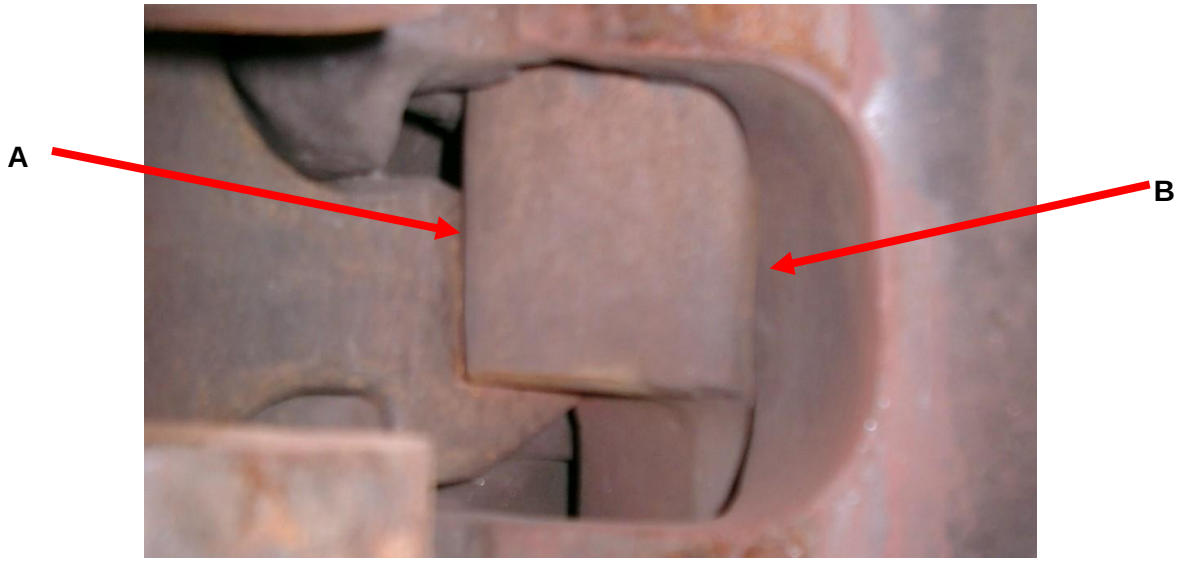


Figure 25 – Lock Clearance When Fully Locked

5.1.2 Press the knuckle in to relieve any force on the lock resulting from the knuckle spring. Check that the lock can be moved side to side with approximately 1 to 2 mm clearance and is not being held tight by the knuckle (See Figure 25 items A & B – clearance should be either at A or B). Check also that as the knuckle is pushed in to relieve the lock, the knuckle does not jam within the coupler body.

5.1.3 Check that the knuckle moves freely to the fully open position when the rotor shaft is turned either by hand or with an uncoupling lever. If the lock is still stiff to lift, or if the knuckle fails to move freely to the fully open position, strip and rectify in accordance with this procedure Sections 1 and 2.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Rectification of Defects (Cont'd) MP UC 0216

5.2 Test of overlap between Lock Lift Lever and Lock Lifting Peg (Joggle Test) without partial disassembly of coupler.

5.2.1 Check for overlap between the lock lift lever top leg and the lock lifting peg as below:-

5.2.2 Close the knuckle and allow the lock to fully drop. Push the knuckle towards the coupler body to open a clearance between the knuckle tail and the lock. Insert a small wire hook into the coupler body aperture between the knuckle tail and the lock, engage it with the lock and pull forward as far as possible, whilst holding the knuckle towards the coupler body.

5.2.3 Whilst holding the lock fully forward, release the knuckle and "joggle" the rotor shaft around while attempting to rotate it towards the coupled position (or clockwise when viewed from left hand side) and ensure that it is not possible to force the rotor shaft past its limit (i.e. it is not possible to force the lock lift lever top leg down past the lock lifting peg). Remove wire hook after test.

5.2.4 If the lock lift lever can be made to pass the lock lifting peg, change the coupler and return to an overhauler for rectification in accordance with CR/CI0545 Issue 3A (or later approved version).

5.3 Test of anti-creep overlap between Knuckle Tail and Lock.

5.3.1 With the knuckle fully open, lightly chalk the vertical locking face on the knuckle tail.

5.3.2 Slowly close the knuckle by hand and check that the lock freely drops fully home. Push the knuckle towards the coupler body to open a clearance between the knuckle tail and the lock. Insert a small wire hook into the coupler body aperture between the knuckle tail and the lock, engage it with the lock. Using the hook, pull the lock forward against the coupler body front internal face.

5.3.3 Insert a bar between the underside of the shelf on the lock and the bottom surface of the opening on the coupler body; see figure 26. Whilst still pulling the lock forwards against the coupler body, lever the lock upwards smartly and squarely until it 'jams' in the anti-creep condition. This is indicated by the lock moving forward just before point of 'jamming'.

5.3.4 With the Lock held in this position, lightly scribe a line, using a scriber or sharp pencil, across the vertical locking face of the Knuckle tail at the underside of the Lock. See figure 27.

5.3.5 Remove the bar and the wire hook and press the Knuckle inwards to release the Lock. Manually operate the Rotor Shaft to open the Knuckle to the uncoupled position.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Rectification of Defects (Cont'd) MP UC 0216

5.3.6 On the vertical locking face of the Knuckle tail, measure the distance from the scribed line to the top surface at the centre point. If there is a radius between the vertical and top surfaces, measure to the start of the radius. See figure 28. This distance **must not be less than** 6mm at the centre of the locking face. In practice, the scribed line is likely to be tapered with respect to the top surface, so 6mm at the centre is adequate.

5.3.7 Repeat this test three times and ensure that the results indicate that the correct Anti-Creep overlap is obtained each time. If the correct anti creep overlap cannot be obtained, carry out work as detailed in Section 3.

IMPORTANT NOTE

If no Anti-Creep overlap can be obtained and the test consistently fails, then **before** stripping down and rectifying in accordance with Section 3, check that the Rotor Shaft is fully returning to its correct rest position with a locked knuckle, i.e. rotated fully anti-clockwise when viewed from the Drivers side and that it is not being held up or is sticking or jamming.

In the case of units with a body mounted uncoupling cylinder and "J" Hook, ensure that there is a 3mm – 6mm gap between the Rotor Eye and the "J" Hook as shown in figure 23.

This is vital, as the Anti-Creep will fail to engage if the Rotor Shaft is not fully returning to the rest position.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Rectification of Defects (Cont'd) **MP UC 0216**

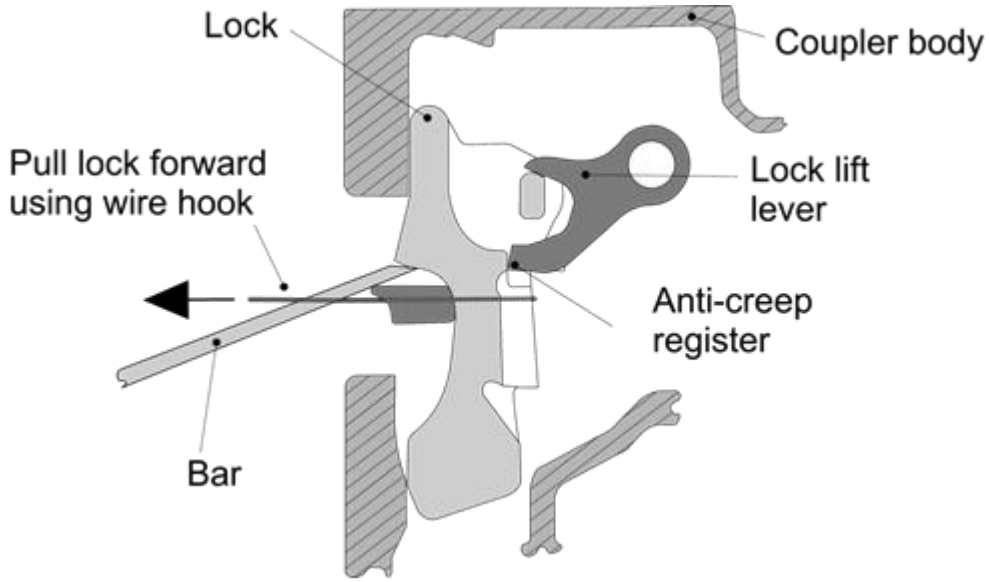


Figure 26 - Levering the Lock into Anti-Creep Position

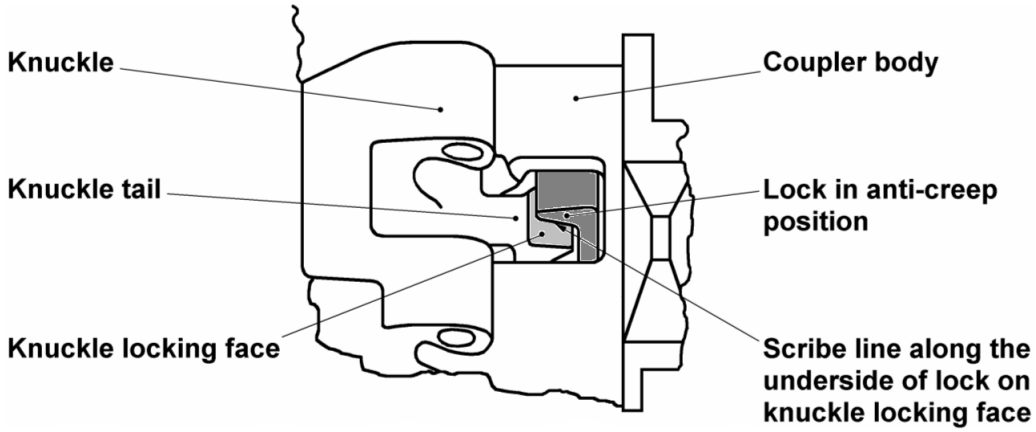


Figure 27 - Lock Held in the Anti-Creep Position

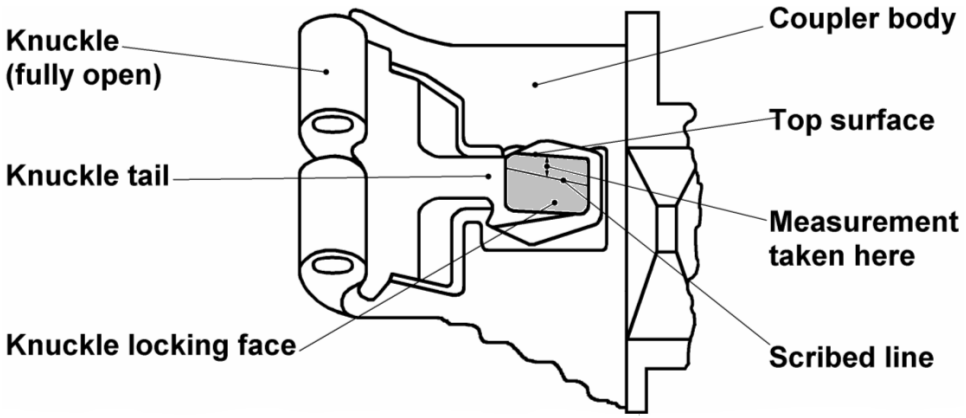


Figure 28 - Measurement of Knuckle Tail/ Lock Overlap

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Rectification of Defects (Cont'd) MP UC 0216

5.4 Maximum and Minimum Knuckle Gap gauging.

5.4.1 With the knuckle closed pull out the knuckle as far as the lock will allow, then gauge the knuckle gap using the Maximum Knuckle Gap Gauge as under:-

5.4.2 For all classes fitted with an Autoconnector (ALL classes EXCEPT 455 and 456), using gauge 9039324-02 (916F337, Cat No 039/028024), check the knuckle gap, see figures 29 and 31.

5.4.3 For Classes 455 and 456 units only (classes NOT fitted with an Autoconnector), using gauge 9039324-03 (916F341, Cat No 039/028035), check the knuckle gap, see figures 29 and 31.

5.4.4 The gauge must not enter either the top or more than 20mm from the bottom of the knuckle contour. If it does enter, the knuckle gap is too wide. In this case Refer to Section 7 if the knuckle is to be renewed.

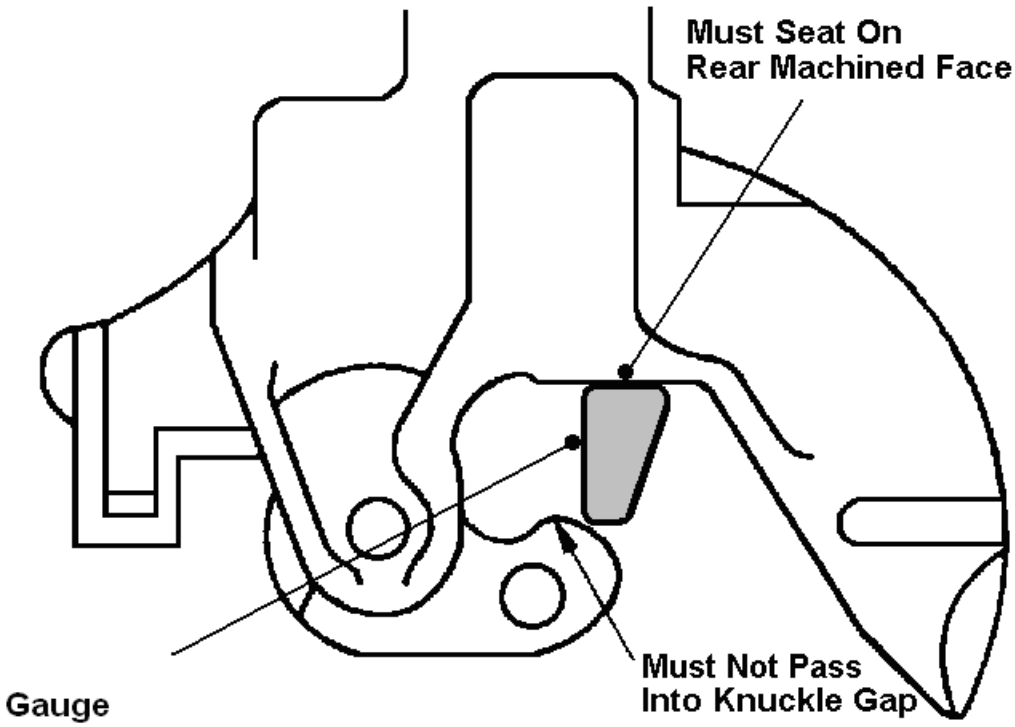


Figure 29 - Gauging the Knuckle Gap.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Rectification of Defects (Cont'd) **MP UC 0216**

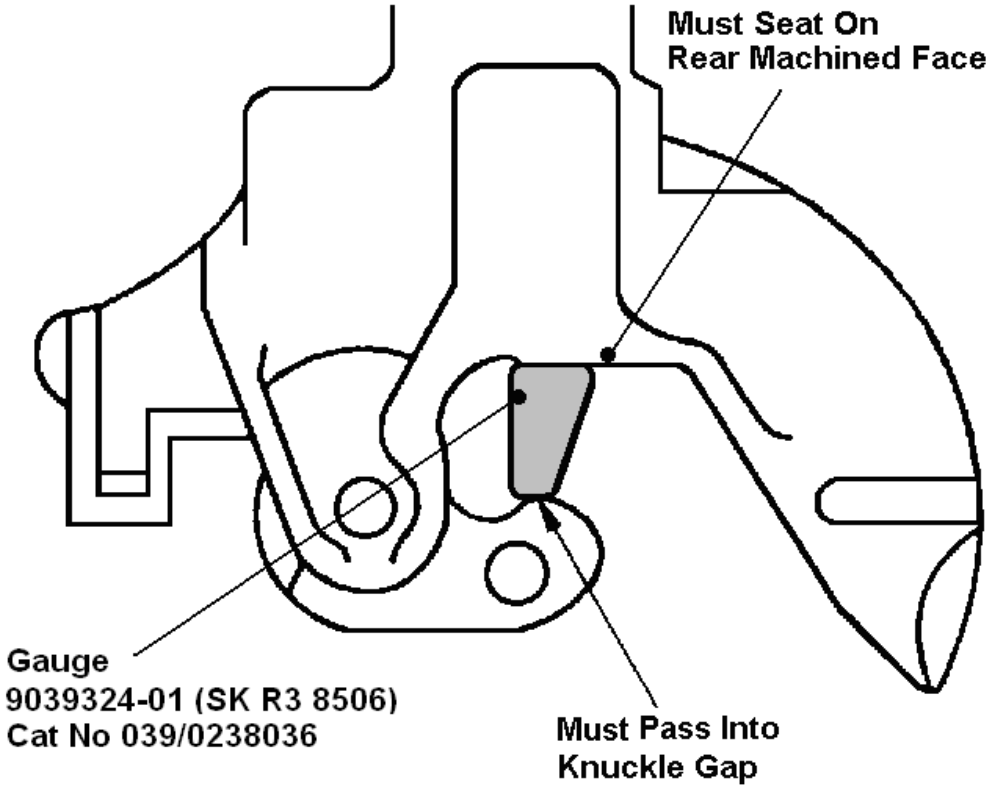
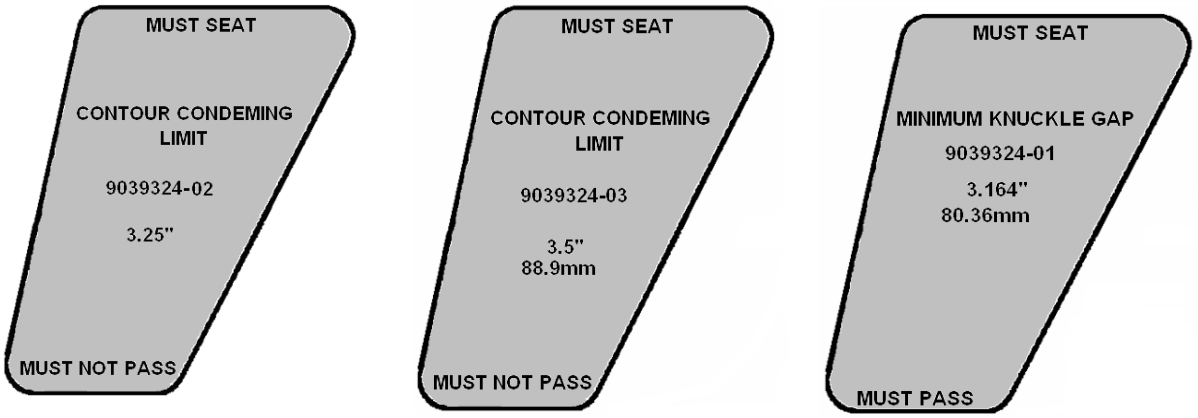


Figure 30 - Gauging the Minimum Knuckle Gap Using S15 or W15



Gauge 9039324-02 (916F337)
To Cat No 039/028024

For all units fitted with an Autoconnector

Gauge 9039324-03 (916F341)
To Cat No 039/028035

For all units NOT fitted with an Autoconnector

Gauge 9039324-01
(SK R3 8506)
To Cat No 039/028036

For ALL couplers

Figure 31 - Maximum and Minimum Knuckle Gap Gauges

NOTE – Maximum Knuckle Gap Gauges may be marked "Contour Condemning Limit"

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

5.4.5 Fully close knuckle by hand and make sure that the lock drops freely to its fullest extent.

5.4.6 With the knuckle closed pull out the knuckle as far as the lock will allow, then gauge the knuckle gap using the Minimum Knuckle Gap Gauge 9039324-01 (SK R3 8506) (Cat No 039/028036) – See figures 30 and 31.

5.4.7 This gauge must pass into the knuckle / body gap at all points. If it does not, the gap is too tight and the coupler will not reliably engage with another coupler. In this case dress off the lock's vertical face parallel to existing face where it contacts the coupler body (opposite side to the face that contacts knuckle lock face) in 0.25mm stages. After each stage, refit the lock and re-gauge.

5.5 Contour Check gauging.

5.5.1 Gauge the knuckle contour with the knuckle fully closed using gauge 916F340 (Cat No 039/028023) for SFE & NAP Couplers or WCR 8288 for WCR couplers; see figures 32 and 33. Check that the gauge passes through the coupler contour freely. If gauge fails to pass through the profile, dress off any burrs present on either the knuckle or body.

5.5.2 If the gauge still fails to pass through, the knuckle gap is too small and the Minimum Knuckle gap check in 5.3 above should be repeated.

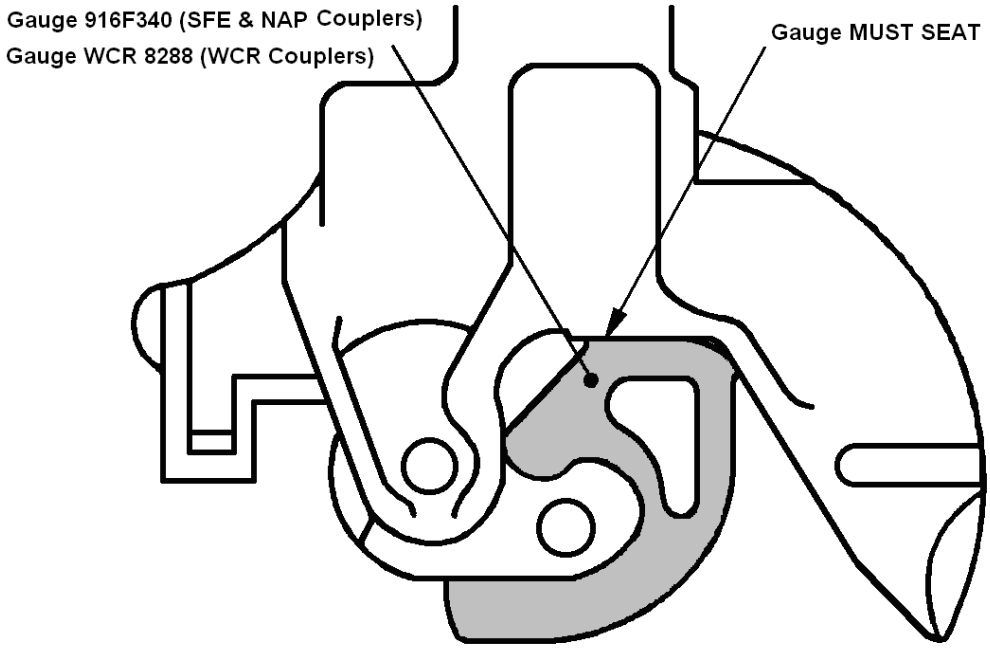
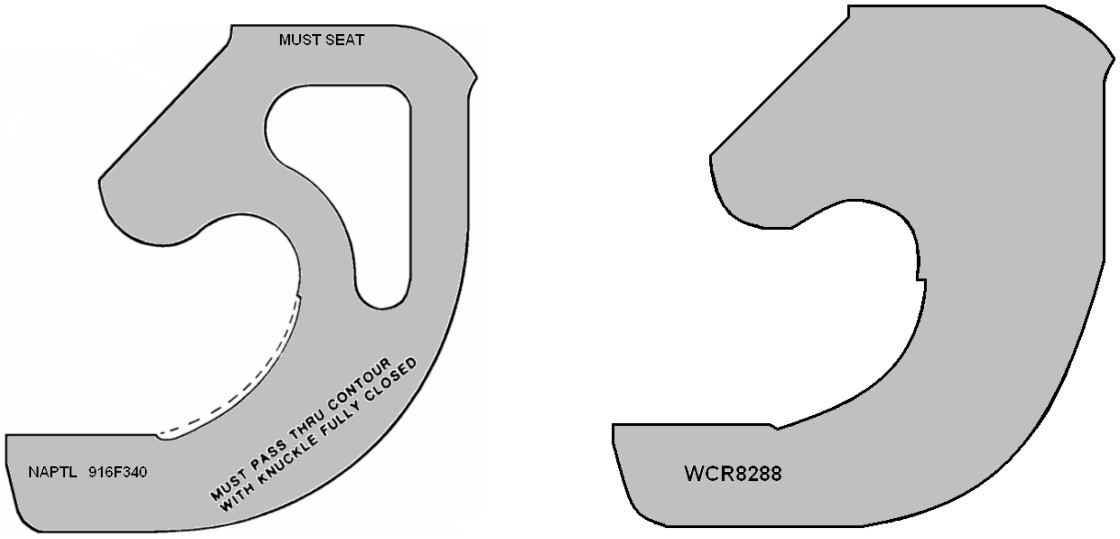


Figure 32 - Gauging the Contour for Wear

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018



For NAP & SFE Couplers 916F340 (Cat No 039/028023) **For WCR Couplers WCR 8288**

Figure 33 - Contour Check Gauge

5.6 Anti-creep Point of Engagement Test.

5.6.1 With the knuckle open, place the 6mm side of the Gauge G19 on to the top face of the knuckle locking shelf.

5.6.2 Slowly close the knuckle by hand and, whilst gently pushing the lock backwards using the wire hook used for the anti-creep test, allow the lock to drop on to this 6mm thick gauge (i.e. allowing the lock to drop but stopping 6mm short of the fully locked condition). Remove the wire hook.

5.6.3 Carry out an anti-creep test by inserting a bar between the underside of the shelf on the lock and the bottom surface of the opening on the coupler body (see Figure 26). Lever the lock upwards smartly and squarely and check that it 'jams' in the anti-creep condition. This is indicated by the lock moving forward just before the point of 'jamming'.

5.6.4 This test is to check that the anti-creep feature has engaged if the lock stops 6mm short of the fully locked position. If the anti-creep fails to engage, renew the lock and/or lock lift lever with an alternative and repeat the test (see Section 6 for component list).

5.6.5 Repeat steps 5.6.1 to 5.6.3 but with packing thicknesses in 1mm increments in addition to the G19 gauge until the lock just by-passes the anti-creep mechanism. Record the thickest packing that resulted in the lock being held by the anti-creep mechanism when lifted.

5.7 Lockset Condition Test.

5.7.1 Check that the knuckle is in the fully closed position and held in that position.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

5.7.2 Rotate the rotor shaft to the fully uncoupled position to lift the lock up to its limit of travel.

5.7.3 Still holding the knuckle fully closed slowly release the rotor shaft and check that the lock remains at the top limit of its travel and does not drop back to lock the coupler. This is the lockset position. If the lock falls back to the locked position when the rotor shaft is released, the lockset feature is defective and the lock and/or knuckle thrower must be renewed (see Section 6 for component list).

5.7.4 Pull open the knuckle to the uncoupled position, then close the knuckle and check that the lock falls, fully locking the coupler and that the tell-tale indicates a fully locked condition.

6 Data Section and Materials List

6.1 Gauges

Gauge Reference	Gauge Description	Gauge No.	Cat No.
~~G1~~			
G7	Knuckle Wear Gauge (Couplers fitted with Autoconnector)	916F310	039/028025
G19	Anti-Creep (Point of Engagement)	WCR10014	039/028158
S8	Knuckle Wear Gauge (Couplers NOT fitted with Autoconnector)	916F342	039/028041
N/A	Maximum Knuckle Gap Gauge (Couplers fitted with Autoconnector)	9039324-02 or 916F337	039/028024
S17	Maximum Knuckle Gap Gauge (Couplers NOT fitted with Autoconnector)	9039324-03 or 916F341	039/028035
S18	Contour Check Gauge (SFE & NAP Couplers)	916F340	039/028023
W18	Contour Check Gauge (WCR Couplers)	WCR 8288	093/059015
N/A	Knuckle Pin Condemning Gauge	916F343	093/059011
N/A	Knuckle Pin Bush Condemning Gauge	916F344	093/059012
S15	Minimum Knuckle Gap Gauge	9039324-01	039/028036

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Rectification of Defects (Cont'd) MP UC 0216

6.2 Lubricants and Paints

	Lubricant	Cat No.
1	Grease Mobil Mobilux EP2	027/004051
2	Dry Lubricant Molykote 321R	027/004058
3	Grease Calcium based Graphite	027/001361
4	Mineral Oil	027/023022

6.3 Component List (Tightlock Coupler).

Note SFE refers to Sheffield Forgemasters Engineering couplers (often referred to as River Don or "RDC" couplers)

WCR refers to William Cook Rail couplers (often referred to as Blair couplers).

NAP refers to NAP Couplers.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Rectification of Defects (Cont'd) MP UC 0216

Part A – Sheffield Forgemasters (SFE) Couplers

As fitted to classes 313, 314, 315, 317, 318, 319, 320, 321, 322, 455, 456, 465, 466, 507 & 508 units and the No 2 end of EMU Translator Vehicles.

Note Classes 465/2, 465/9 and 466 units have a mixture of SFE and NAP couplers, and Classes 465/0 and 465/1 units have a mixture of SFE and WCR couplers.

Components that can be changed by a Level 4 Depot without any additional gauging.

Description	Class	Cat No	Manufacturers Part No
Blanking Plug 1/8" BSP x 5/16"	All	093/061502	005.005
Bush (Knuckle Pin)	All	098/007145	010.378
Bush (Tail Pin)	All	067/104666	010.402
Calcium Based Grease No. 2 Consistency	All	027/001361	-
Coupler Complete	313, 314, 315, 319, 507, 508, Translator Veh.	098/006804	000.003
Coupler Complete	320, 321, 322	098/009542	000.010
Coupler Complete (not fitted with Air/Electric Connector)	456	098/011810	000.013
Coupler Complete (fitted with Gangway Saddle but not fitted with Air/Electric Connector)	455	098/006214	000.008
Coupler Complete (minus gangway saddle)	317, 318	098/006807	000.005
Coupler Complete	465/2, 465/9, 466	093/061550	000.017
Coupler Complete	465/0, 465/1	098/014966	000.014 or 400024276
Grease Nipple	All	039/031715	-
Knuckle Pin	All	098/001273	009.286
Knuckle Spring	All	098/001239	013.255
Knuckle Thrower	All	098/001241	105.007
Roll Pin (6mm)	465/0, 465/1	093/061505	WCR 10005/26

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Rectification of Defects (Cont'd) MP UC 0216

Part A – Sheffield Forgemasters (SFE) Couplers (Cont'd)

Components that can be changed by a Level 4 Depot without any additional gauging (Contd)

Description	Class	Cat No	Manufacturers Part No
Rotor Eye	Not 465/0 and 465/1	098/001232	110.014
Rotor Eye	456	093/061506	110.020
Rotor Arm	456	093/061508	110.019
Split Pin (Knuckle Pin) 3/8" x 2 1/2"	All	093/059022	WCR 10005/8
Tell-Tale	All	098/001240	148.002
Tell-Tale Pivot Bolt	All	093/059022	WCR 6313
Tell-Tale (Pivot Bolt) Nut	All	098/001240	WCR 10005/13
Tell-Tale (Pivot Bolt) Split Pin	All	093/059020	WCR 10005/14
Washer	All	003/090158	003.039
Split Pin (Rotor Eye) 3/8" x 2 1/2"	Not 465/0 and 465/1	029/031833	008.010
Gangway Saddle (drawing B1-S-9001340)	455, 317, 318	097/007697	9008004/01

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Rectification of Defects (Cont'd) MP UC 0216

Part A – Sheffield Forgemasters (SFE) Couplers (Cont'd)

Components that MUST NOT be changed by a Level 4 Depot, UNLESS gauging as detailed in Section 7 is carried out.

Changing these components will invalidate the combined gauging criteria in the overhaul document CR/CI 0545 (or later approved version).

Description	Class	Cat No	Manufacturers Part No
Coupler Body	313, 314, 315, 319, 507, 508, Translator Veh.	098/006805	198.134
Coupler Body	320, 321, 322	098/009543	198.161
Coupler Body	456	098/023839	198.166
Coupler Body	455	098/006215	198.151
Coupler Body (minus gangway saddle)	317, 318	098/006808	198.146
Coupler Body	465/2, 465/9, 466	093/061503	198.169
Coupler Body	465/0, 465/1	093/061504	198.168
Knuckle	All	098/006806	103.072
Knuckle (Couplers not fitted with Air/Electric Connector)	455 & 456	098/019009	103.072
Lock (SFE)	All	098/001235	104.031
Lock Lift Lever	All SFE & NAP couplers	098/008906	111.009
Matched Rotor and Rotor Eye	All except 365, 456, 465 & 466,	098/023827	110.013 with 110.014
Rotor Shaft	465/2, 465/9,466 with SFE bodies	098/013440	110.022
Rotor Shaft	365, 465/0 & 465/1	093/061507	WCR 6315
Rotor Shaft	456	098/001238	110.013

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Rectification of Defects (Cont'd) MP UC 0216

Part B – NAP Couplers

As fitted to class 323, and some class 465/2 & 466 units

Components that can be changed by a Level 4 Depot without any additional gauging.

Description	Class	Cat No	Manufacturers Part No
Blanking Plug 1/8" BSP x 5/16" (for greased Knuckle Pin)	All NAP	093/061502	005.005
Bush (Knuckle Pin)	All NAP	098/007145	010.378
Bush (Tail Pin)	323	093/061509	XB183H
Calcium Based Grease No. 2 Consistency	All NAP	027/001361	-
Coupler Complete	323	400/000562	NCI51652
Coupler Complete	465/2, 465/9, 466	098/013446	2-00-116
Knuckle Pin (NAP for unbushed bodies)	323	093/061502	XP121
Knuckle Pin (SFE for bushed bodies)	323	098/001273	009.286
Knuckle Pin	465/2, 465/9, 466	098/013439	FF4797-5
Knuckle Spring (NAP for unbushed bodies)	323	098/061513	52591-1
Knuckle Spring (SFE for bushed bodies)	323	098/001239	013.225
Knuckle Spring	465/2, 465/9, 466	098/013449	AW063B10/16
Knuckle Thrower	323	064/071064	A300A
Knuckle Thrower	465/2, 465/9, 466	098/013438	FF4797-4
Rotor Eye	All NAP	098/001232	110.014
Split Pin (Knuckle Pin) 3/8" x 2 1/2"	All NAP	029/031833	008.010
Tell-Tale	All NAP	064/071063	44275
Tell-Tale (alternative No)	All NAP	098/013442	FF4797-8
Tell-Tale Pivot Bolt and Nut	All NAP	098/001231	001.113
Washer	All NAP	003/090158	-
Split Pin (Rotor Eye) 3/8" x 2 1/2"	All NAP	029/031833	
Rotor eye clamp screw M8 x 25	465/2, 465/9, 466	035/100652	
Rotor eye clamp screw locknut M8	465/2, 465/9, 466	003/175114	
Slipper bearing	465/2, 465/9, 466	093/055086	4.00.290
Slipper bearing screw M8 x 25	465/2, 465/9, 466	035/100652	

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Rectification of Defects (Cont'd) MP UC 0216

Part B – NAP Couplers (Cont'd)

As fitted to class 323, and some class 465/2, 465/9 & 466 units

Components that MUST NOT be changed by a Level 4 Depot, UNLESS gauging as detailed in Section 7 is carried out.

Changing these components will invalidate the combined gauging criteria in the overhaul document CR/CI 0545 (or later approved version).

Description	Class	Cat No	Manufacturers Part No
Coupler Body	323	093/061510	62U7601
Coupler Body	465/2, 465/9, 466	093/061511	FF4826
Knuckle (NAP for unbushed bodies)	323	093/061512	C111-HT-S
Knuckle (SFE for bushed bodies)	323	098/006806	103.072
Knuckle (bushed)	465/2, 465/9, 466	098/013435	FF4826-1
Lock	All NAP	064/071065	C410E
Lock (alternative Part No)	All NAP	098/013436	FF4797-2
Lock (alternative SFE Manufacture)	All NAP	098/001235	104.031
Lock Lift Lever (SFE manufacture)	All NAP	098/008906	111.009
Rotor Shaft	323	400/000563	U562A
Rotor Shaft	465/2, 465/9, 466	098/013440	FF4797-6

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Rectification of Defects (Cont'd) MP UC 0216

Part C – WCR (William Cook Rail or Blair) Couplers

As fitted to class 334, 365, 57/3 and some class 465/0 and 465/1units

Components that can be changed by a Level 4 Depot without any additional gauging.

Description	Class	Cat No	Manufacturers Part No
Blanking Plug 1/8" BSP x 5/16"	All WCR	*	-
Bush (Knuckle Pin)	All WCR	093/061514	WCR 6309
Calcium Based Grease No. 2 Consistency	All WCR	027/001361	
Coupler Complete	365, 465/0, 465/1	098/061515	WCR 10150A
Coupler Complete	334	093/061519	WCR 10005/3
Coupler Complete	57/3	093/061520	WCR 6877
Grease Nipple	All WCR	093/059010	WCR 10005/5
Knuckle Pin	All WCR	093/059016	WCR 6316
Knuckle Spring	All WCR	093/059017	WCR 6317
Knuckle Thrower	All WCR	093/057629	WCR 6311
Roll Pin (6mm)	All WCR	093/061505	WCR10005/26
Split Pin	All WCR	093/059022	WCR 10005/8
Tell-Tale	All WCR	093/059019	WCR 6312
Tell-Tale Pivot Bolt Tell-Tale (Pivot Bolt) Nut Tell-Tale (Pivot Bolt) Split Pin	All WCR	093/059020 093/059021 093/059022	WCR 6313 WCR 10005/13 WCR 10005/14
Washer	All WCR	003/084631	WCR 6879

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Rectification of Defects (Cont'd) MP UC 0216

Part C – WCR (William Cook Rail or Blair) Couplers (Cont'd)

Components that MUST NOT be changed by a Level 4 Depot, UNLESS gauging as detailed in Section 7 is carried out.

Changing these components will invalidate the combined gauging criteria in the overhaul document CR/CI 0545 (or later approved version).

Description	Class	Cat No	Manufacturers Part No
Coupler Body	365, 465/0 and 465/1	093/061515	WCR 10104
Coupler Body	334	093/061516	WCR 6321
Coupler Body	57/3	093/061517	WCR 10208
Knuckle	334,-365, 465/0 and 465/1	093/052678	WCR10015
Knuckle	57/3	093/061518	BLR 6308
Lock	All WCR	093/052679	WCR 6310
Lock Lift Lever	All WCR	093/059009	WCR 6314
Rotor Shaft	All WCR	093/061507	WCR 6315

Note * Cat No either not issued or it has been not possible to trace it.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Rectification of Defects (Cont'd) MP UC 0216

6.4 Component List (Tightlock coupler uncoupling equipment)

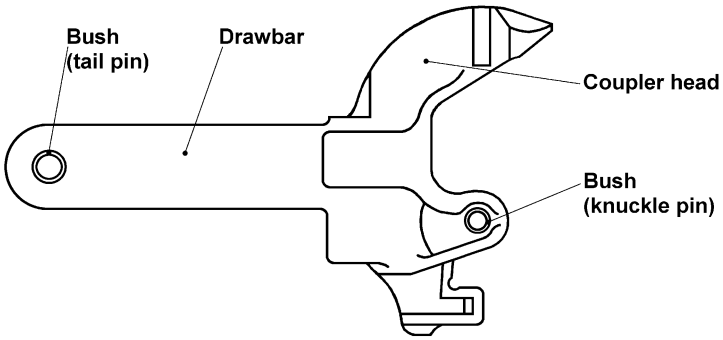
Description	Class	BR Cat No.	Manufacturers Part No.
Operating rod ("J" hook)	313, 314, 315, 507 & 508	098/000812	136.014
Operating rod ("J" hook)	317, 318 & 319	098/006213	136.020
Operating rod ("J" hook)	455	098/006217	136.021
Operating rod ("J" hook)	320, 321 & 322	098/010297	136.028
Operating rod ("J" hook)	456	098/012371	136.029
Operating rod (Pivoted)	313, 314, 315, 317, 318, 507, 508 & 455	098/00814	136.015
Operating rod (Pivoted)	319, 320, 321, 322 & 456	098/012292	136.027
Link pin	All except 323, 365, 465 & 466	098/00817	009.265
Link	All except 323, 365, 465 & 466	098/001246	155.012
Link	317, 318, 319, 320, 321, 322, 455 & 456	098/006212	155.010
Link	313, 314, 315, 507 & 508	098/000811	155.014
Uncoupling Air Actuator	465/2, 465/9 & 466	098/013448	2-00-133
Actuating Lever	365, 465/0 & 465/1	*	BLR 6347
Clevis Pin	365, 465/0 & 465/1	*	BLR 6464
Actuating Cylinder	365, 465/0 & 465/1	070/024092	BLR 6718
Cylinder Mounting Plate	365 & 465/1	*	BLR 6341
Cylinder Mounting Plate	465/0	*	BLR 8154
Rotor Lever	365, 465/0 & 465/1	*	BLR 6558
Bowden Cable	323	400/000568	51687-9B
Lever Arm	323	400/000565	51687-4C
Actuator Assembly – Air	323	400/000564	51688
Mounting Plate	323	*	51687-2A
Spring – extension	323	400/000576	51687-3B
Pin Cotter	323	400/000569	51687-10
Swing Bolt	323	400/000567	51687-5

Note * Cat No either not issued or it has been not possible to trace it.

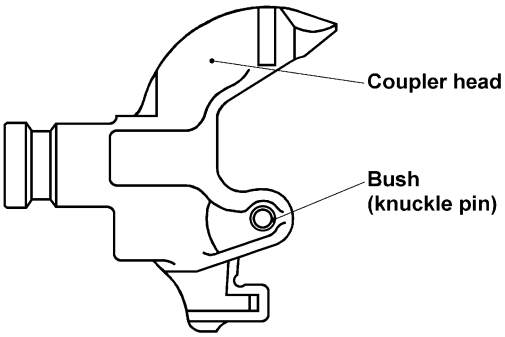
Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Rectification of Defects (Cont'd) MP UC 0216

6.5 Components for Tightlock Couplers

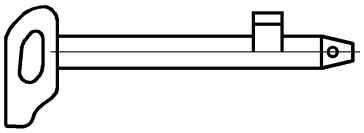


Coupler Body (Drawbar Type)

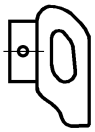


Coupler Body

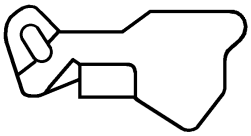
(Detachable Type with Muff)



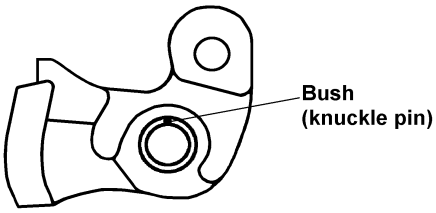
Rotor Shaft



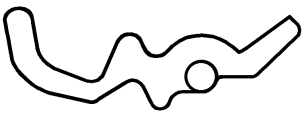
Rotor Eye



Lock



Knuckle



Knuckle Thrower



Knuckle Spring

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

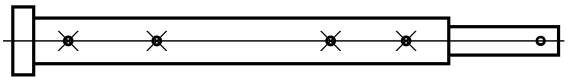
Tightlock Couplers Rectification of Defects (Cont'd) **MP UC 0216**



Tell-Tale Device



Lock Lift Lever



Knuckle Pin

Identification of Tightlock Coupler Components.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Rectification of Defects (Cont'd) MP UC 0216

7 Renewal of Critical Components.

This section details the actions and additional gauging requirements should any of the following components be found to be defective.

- *Coupler body,*
- *Knuckle,*
- *Lock,*
- *Lock Lift Lever,*
- *Rotor Shaft*

7.1 Gauging the Coupler Body Rotor Shaft Hole vertical and horizontal position.

In ALL CASES where any of the above components are renewed, IT IS ESSENTIAL that the coupler body Rotor Shaft Hole horizontal and vertical position is checked to ensure that it is not in a position that would adversely affect the lock lift lever top leg to lock lifting peg and lock lift lever bottom leg to lock anti-creep ledge overlaps (Section 7.6). The horizontal position MUST be gauged using the Rotor Shaft that is to be refitted to the coupler (see also section 7.5 if renewing the rotor shaft). This gauging should be carried out as detailed below.

If the coupler body is found to be defective in any way such that it requires renewal, including failing the gauging in this section, change the complete coupler and return to an overhauler for rectification in accordance with CR/CI0545 Issue 4 (or later approved version). It is not recommended that the coupler body alone is be changed as it is easier to change the complete coupler.

7.1.1 Rotor Shaft Hole height (vertical position).

Gauge the height of the rotor shaft hole in relation to the knuckle shelf using gauge G4 as shown in figure 34.

Place the rotor shaft hole height gauge G4 such that it fits in place of a knuckle and is secured and located by the Special Tool (230/182902) fitted through the coupler body bushed holes and the gauge as shown in figure 34.

Attempt to fit gauge S3B (for SFE / NAP couplers) or W3B (for WCR couplers) through the rotor shaft holes and ensure that it CANNOT be fitted through both holes from either side.

If gauge S3B or W3B as appropriate CAN be fitted through the rotor shaft holes with gauge G4 in place, then either the rotor shaft hole is misplaced, the knuckle shelf face is worn, or the two knuckle pin holes in the coupler body have been bored off the vertical.

Check the knuckle shelf face for wear or damage, also check that the gap between the top and bottom knuckle shelf faces is no greater than 158mm.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Rectification of Defects (Cont'd) MP UC 0216

If the knuckle shelf is worn or the gap is greater than 158mm, if the knuckle pin holes are bored off vertical, or if the rotor hole is misplaced, change the complete coupler and return to an overhauler for rectification in accordance with CR/CI0545 Issue 4 (or later approved version).

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

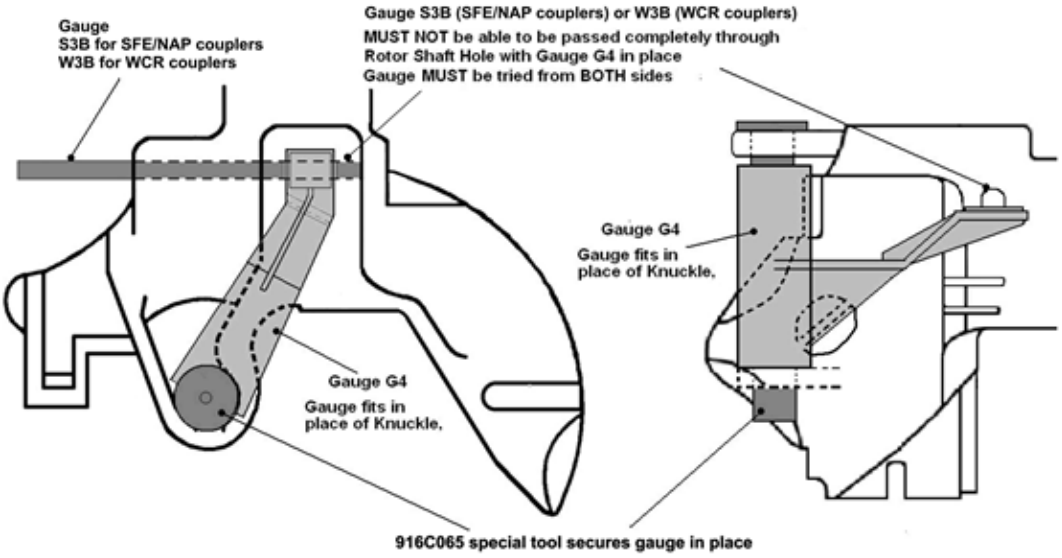


Figure 34 – Gauging the Rotor Hole Height Using Gauge G4

7.1.2 Rotor Shaft Hole Inner Front Face Gap (horizontal position).

Gauge the position of the inner front face of the coupler body (at the point the lock contacts) from the rotor shaft hole using gauge S5 (for SFE / NAP couplers) or W5 (for WCR couplers) fitted, with the keyway engaged, on to the rotor shaft to be used. The gauge MUST NOT pass – see figure 35. If the gauge passes, then either the front inner face to rotor shaft hole distance is too great, or the diameter of the selected rotor shaft is at the bottom end of the permissible limit and there will be an inadequate overlap between the lock lift lever and the lock.

If the coupler body fails the gauge, change the complete coupler and return to an overhauler for rectification in accordance with CR/CI0545 Issue 4 (or later approved version).

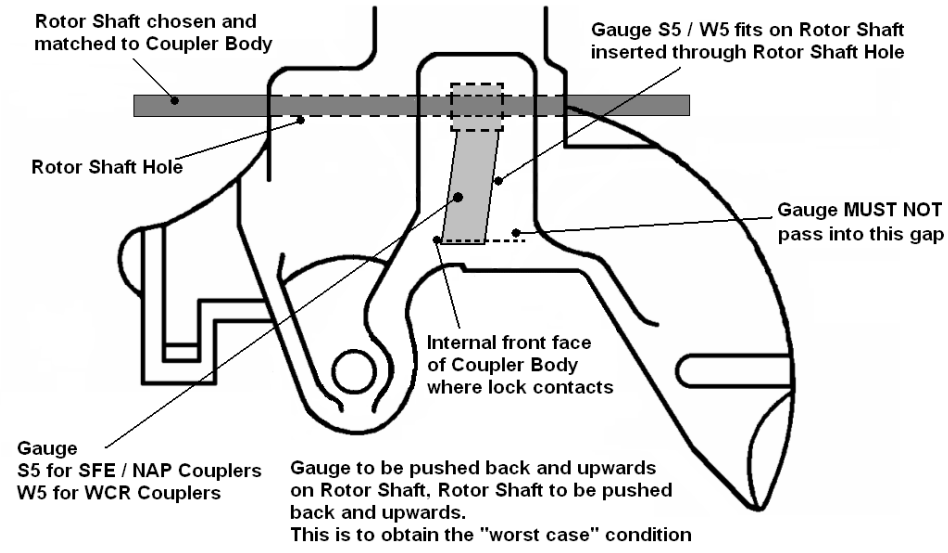


Figure 35 – Gauging the Rotor Shaft to Inner Front Face Gap Using Gauge S5 or W5

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Rectification of Defects (Cont'd) MP UC 0216

7.2 Knuckle.

A knuckle of the correct type supplied by a manufacturer or approved supplier can be fitted provided it has been guaranteed by the supplier to have been gauged in accordance with CR/CI0545 Issue 4(or later approved version) Section 5.4.7.

If this guarantee cannot be obtained, the Operator will need to carry out the following gauging and ensure that it is acceptable BEFORE fitting the knuckle.

Gauge the height of the knuckle tail shelf from the knuckle bottom pivot point using gauge S9 (for SFE / NAP couplers) or W9 (for WCR couplers). This MUST NOT pass – See figure 36. If the gauge passes over the tail shelf, reject the knuckle.

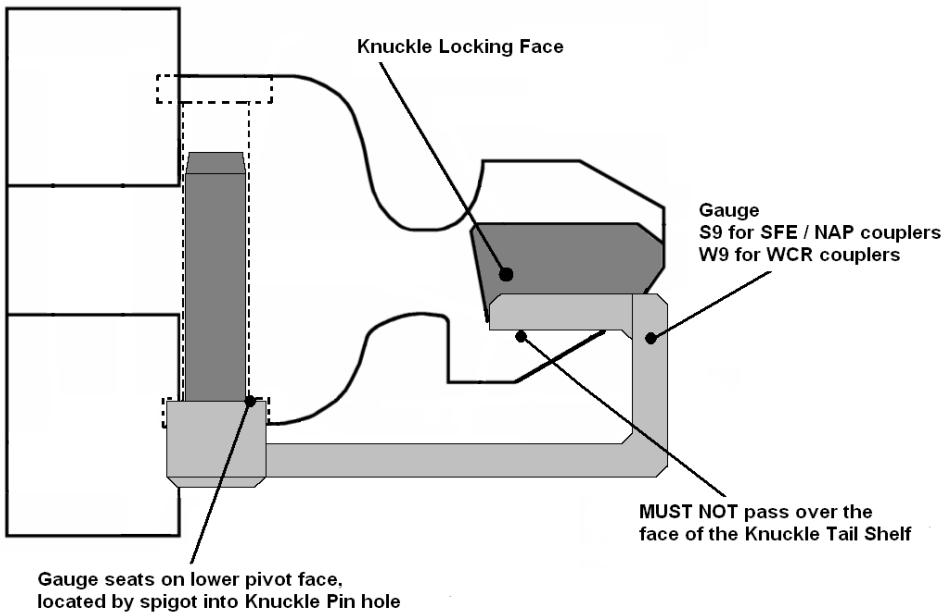


Figure 36 – Gauging the Height of the Knuckle Tail Shelf Using Gauge S9 or W9

7.3 Lock

A lock of the correct type supplied by a manufacturer or approved supplier can be fitted provided it has been guaranteed by the supplier to have been inspected and gauged in accordance with CR/CI0545 Issue 4 (or later approved version) Section 5.5.

If this guarantee cannot be obtained, the Operator will need to carry out the following gauging and ensure that it is acceptable BEFORE fitting the lock.

7.3.1 Lock anti-creep ledge horizontal position.

Gauge the horizontal position of the anti-creep ledge from the front face of the lock using gauge S10B (for SFE / NAP couplers) or W10B (for WCR couplers). See figure 37.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Rectification of Defects (Cont'd) **MP UC 0216**

Seat the gauge flat on the front face of the lock and push in the pin as far as it will go. The tip of the pin MUST contact the anti-creep ledge BEFORE the pin head contacts the back of the gauge.

Check also that with the tip of the pin seated on the anti-creep ledge, any gap between the head of the pin and the back of gauge S10B (for SFE / NAP couplers) or W10B (for WCR couplers) is not more than 3mm.

If the pin head contacts the back of the gauge BEFORE the tip of the pin contacts the anti-creep ledge, or if there is a gap of more than 3mm, discard the lock.

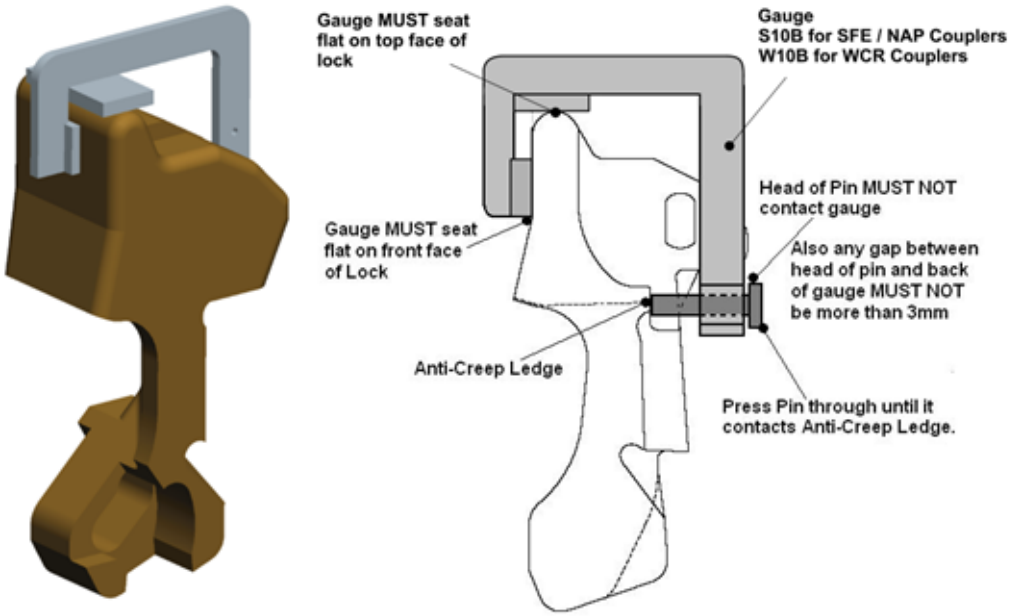


Figure 37 – Gauging the Position of the Anti-Creep Ledge Using Gauge S10B or W10B

7.3.2 Lock lifting peg horizontal position.

Gauge the horizontal position of the lifting peg from the front face of the lock using gauge S11B (for SFE / NAP couplers) or W11 (for WCR couplers). See Figure 38. The gauge must seat on the front vertical face and MUST NOT pass behind the rear of the lifting peg. If the gauge does pass behind the rear of the lifting peg, discard the lock.

7.3.3 Lock lifting peg vertical position.

Gauge the vertical position of the lifting peg from the ledge that sits on the tail shelf of the lock using gauge S12 (for SFE / NAP couplers) or G12 (for WCR couplers). See figure 39. The gauge must seat on the ledge that sits on the knuckle tail when coupled and MUST NOT pass over the top of the lifting peg. If the gauge does pass over the top of the lifting peg, discard the lock.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Rectification of Defects (Cont'd) **MP UC 0216**

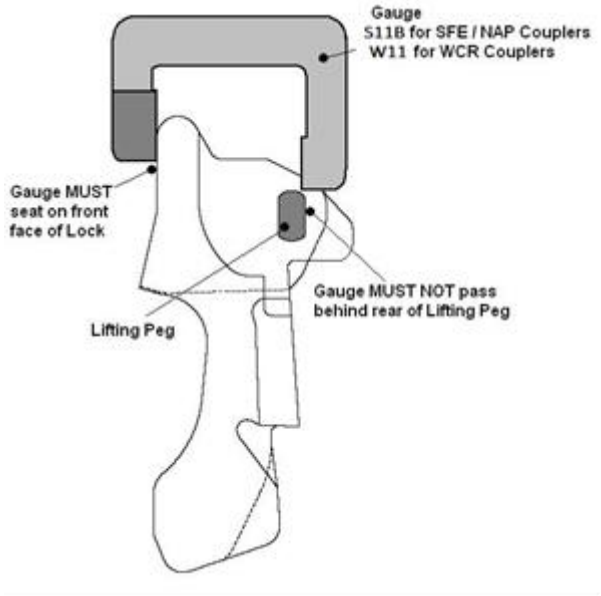


Figure 38 – Horizontal Gauging of the Lock Lifting Peg Using Gauge S11B or W11

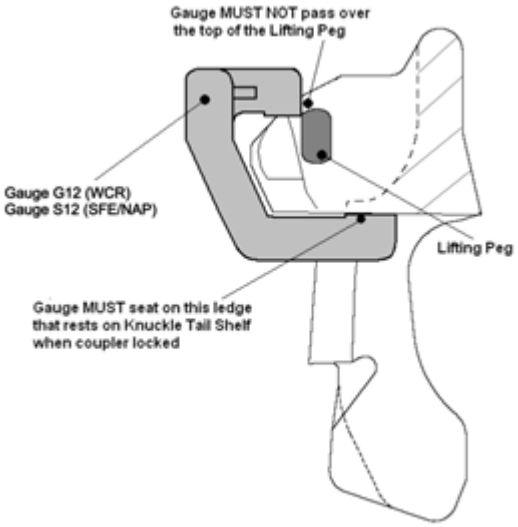


Figure 39 – Vertical Gauging of the Lock Lifting Peg Using Gauge S12 or G12

7.3.4 Lock slot width.

Gauge the lock slot width above and below the lifting peg using the thicker section of gauge S11B (for SFE / NAP couplers) or W11 (for WCR couplers) (section highlighted on figure 40). This must pass into the lock slot at all accessible points - see figure 40. If this portion of the gauge does not pass into the lock slot, at any point, the lock slot may be carefully fettled to provide the necessary clearance.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Rectification of Defects (Cont'd) **MP UC 0216**

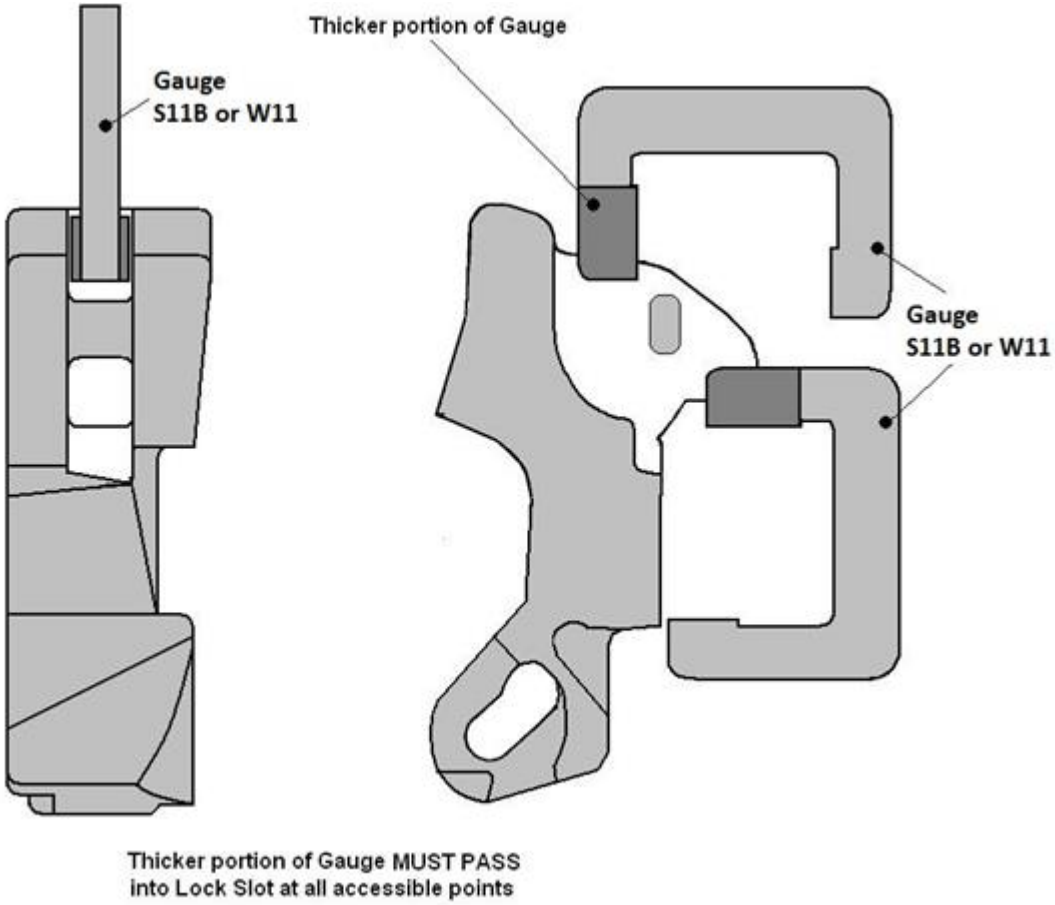


Figure 40 – Gauging the Lock Slot Width Using Gauge S11B or W11

7.3.5 Anti-creep shelf height.

Gauge the vertical position of the anti-creep ledge from the lifting peg using gauge S20 (for SFE/NAP couplers only), see Figure 40(a). Align contact face "A" with the top of the lock peg and slide the Go and No Go faces towards the anti-creep ledge. If it fails the Go gauge, grind the top anti-creep ledge off level until the Go gauge passes. If it fails the No Go gauge, replace the lock (see Section 6 for component list).

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Rectification of Defects (Cont'd) **MP UC 0216**

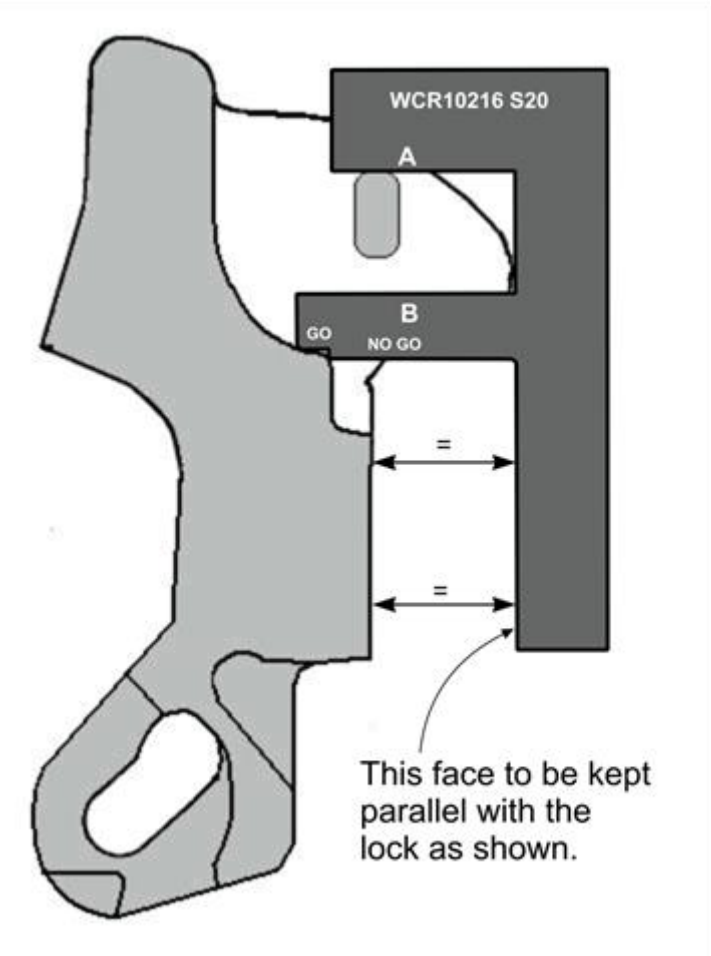


Figure 40(a) – Gauging the Position of the Anti-creep Ledge Using Gauge S20

7.4 Lock Lift Lever.

A Lock Lift Lever of the correct type supplied by a manufacturer or approved supplier can be fitted provided it has been guaranteed by the supplier to have been gauged in accordance with CR/CI0545 Issue 4 (or later approved version) Section 5.6.2.

If this guarantee cannot be obtained, the Operator will need to carry out the following gauging and ensure that it is acceptable BEFORE fitting the lock lift lever.

Gauge the lock lift lever top and bottom legs using gauge S13 (for SFE / NAP couplers) or W13 (for WCR couplers), see figure 41. If either leg does not pass the MUST PASS sections, the relevant leg is too long and may be carefully dressed off until it passes. Discard lever if either top or bottom legs pass by the MUST NOT PASS sections (legs too short).

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Rectification of Defects (Cont'd) **MP UC 0216**

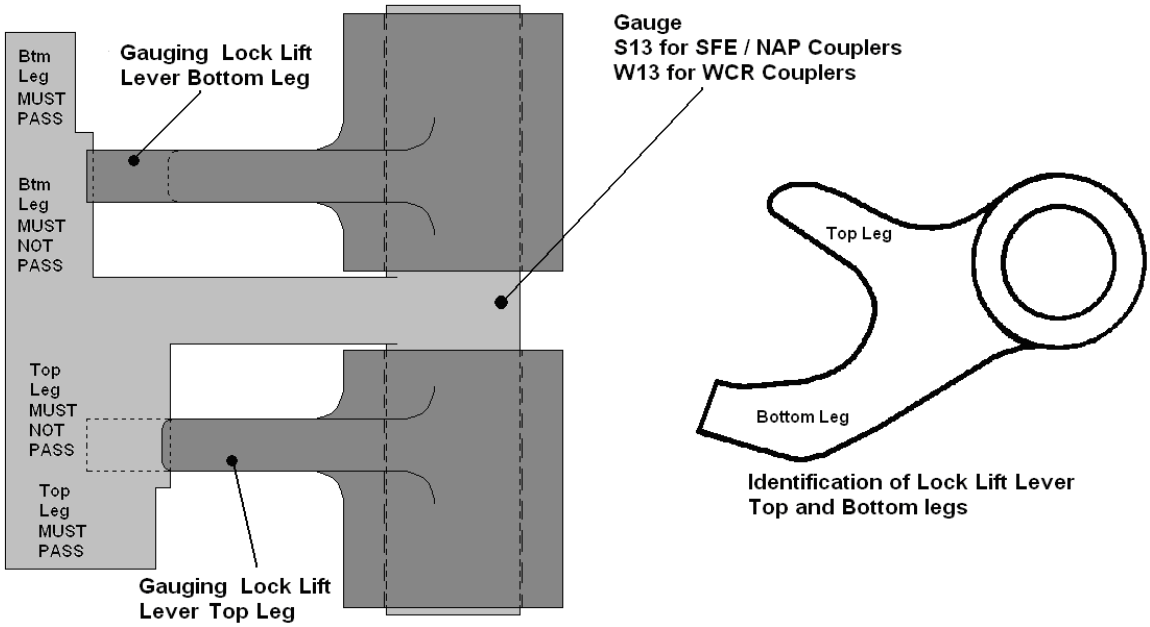


Figure 41 - Gauging the Lock Lift Lever Legs Using Gauge S13 or W13

7.5 Rotor Shaft.

A Rotor Shaft of the correct type supplied by a manufacturer or approved supplier can be fitted provided it has been guaranteed by the supplier to have been gauged in accordance with CR/CI0545 Issue 4 (or later approved version) Section 5.3.8.

If this guarantee cannot be obtained, the Operator will need to carry out the following gauging and ensure that it is acceptable BEFORE fitting the rotor shaft.

Gauge the surface condition of the rotor shaft over the sections where it rotates within the coupler body using gauge S2B (for SFE / NAP couplers) or W2 (for WCR couplers), see figure 42. Renew the rotor shaft if it shows any signs of wear or ridging at these points, or is less than the gauge dimension at any point.

Fit the rotor shaft through the rotor hole and check that the rotor shaft can be freely rotated within the body.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Rectification of Defects (Cont'd) **MP UC 0216**

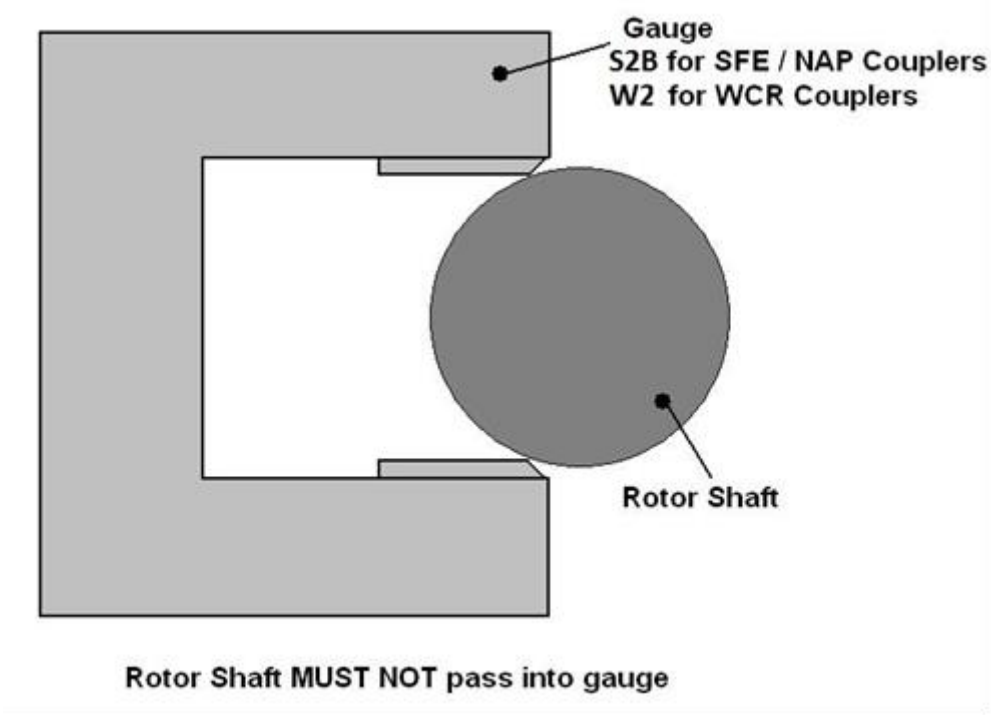


Figure 42 – Gauging the Rotor Shaft Diameter Using Gauge S2 or W2

Note If the rotor shaft is renewed, the coupler body rotor shaft hole horizontal position MUST ALSO then be gauged using the new rotor shaft as detailed in section 7.1 and figure 35.

7.6 Initial Testing during Assembly.

7.6.1 Following the replacement of any of the critical components identified in Section 7, it is necessary to measure the lock lift lever top leg / lock lifting peg and lock lift lever bottom leg / lock anti-creep ledge overlaps during re-assembly ensuring the components remain matched with the coupler following the measurement.

7.6.2 Select the lock and lock lift lever to be fitted to the coupler.

7.6.3 Using a spray marker fluid, spray the top of the lock peg and the face of the anti-creep ledge on the lock.

7.6.4 Fit the lock lift lever selected above and fit the rotor shaft. Check that the rotor shaft freely rotates within the body.

7.6.5 Fit a knuckle thrower and the lock sprayed in step 7.6.3, making sure that the lock lift lever engages correctly with the rear of the lock.

7.6.6 Fit the new knuckle and knuckle pin (without greasing or fitting the knuckle spring at this stage). See Materials Section 6 for new parts.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Rectification of Defects (Cont'd) MP UC 0216

7.6.7 Close the knuckle and allow the lock to fully drop. Push the knuckle towards the coupler body to open a clearance between the knuckle tail and the lock. Insert a small wire hook into the coupler body aperture between the knuckle tail and the lock, engage it with the lock and pull forward as far as possible, whilst holding the knuckle towards the coupler body.

7.6.8 With the rotor shaft pushed backwards and the lock pulled forwards to touch the front face of the lock chamber, insert a bar in the rotor eye and tap lightly with a hammer to create a witness mark in the marker fluid at the engagement point between the lock lift lever top leg and the lock lifting peg (refer to Figure 42(a)). Remove the bar.

7.6.9 With the wire hook still inserted, pull the lock forward against the coupler body front internal face. Insert a bar between the underside of the shelf on the lock and the bottom surface of the opening on the coupler body (see Figure 26). Whilst still pulling the lock forwards against the coupler body, pry up the lock until the anti-creep is engaged then using a hammer lightly tap the end of the pry bar down to create a witness mark in the marker fluid at the engagement point between the lock lift lever bottom leg and the lock anti-creep ledge (refer to Figure 42(a)).

7.6.10 Remove the bar and the wire hook and press the knuckle inwards to release the lock, manually operate the rotor shaft to open the knuckle to the uncoupled position.

7.6.11 Remove the knuckle pin, knuckle and knuckle thrower and lock.

7.6.12 Inspect the top of the lock lifting peg for the witness mark caused by the contact with the lock lift lever top leg (generated in step 7.6.8). There must be an overlap of 3mm or more from the rear of the lock lifting peg to the witness mark (see Figure 42(a)). Measure and record this distance.

7.6.13 Inspect the anti-creep ledge of the lock for the witness mark caused by the contact with the lock lift lever bottom leg (generated in step 7.6.9). There must be an overlap of 3mm or more from the top of the anti-creep ledge to the witness mark (see Figure 42(a)). Measure and record this distance.

7.6.14 If either of the overlaps measured in steps 7.6.12 and 7.6.13 are less than 3mm, use alternative inspected and gauged locks and or lock lift levers and repeat the tests in steps 7.6.7 to 7.6.13 until satisfactory results are obtained.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Rectification of Defects (Cont'd) **MP UC 0216**

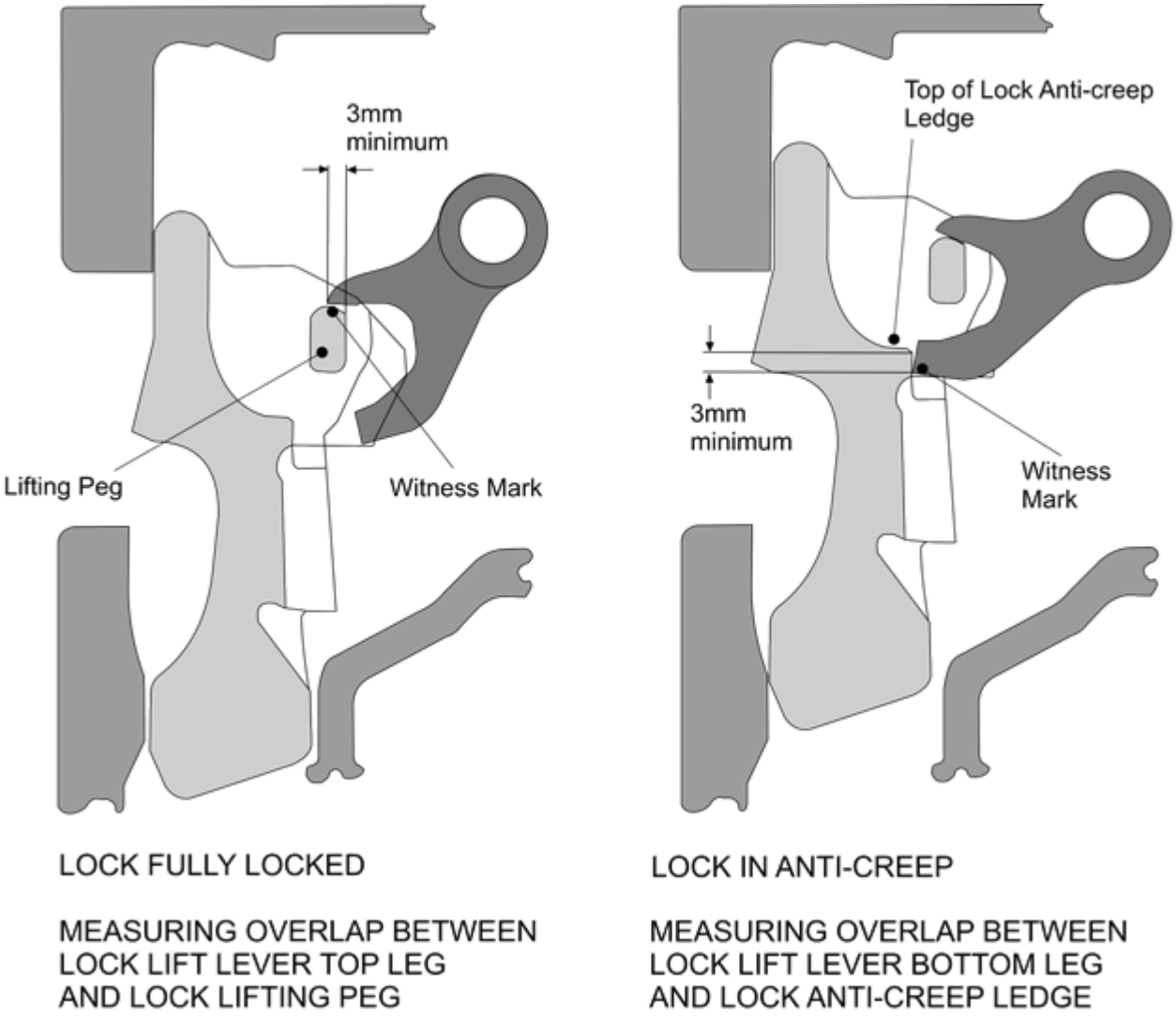


Figure 42(a) – Measuring the Lock Lift Lever to Lock Peg and Anti-Creep Ledge Overlaps

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Tightlock Couplers Rectification of Defects (Cont'd) MP UC 0216

7.7 Special Gauges required for the renewal of critical components.

Gauge Reference	Gauge Description	GO / NO GO	Gauge Part / Drawing No	Cat No
G4	Rotor Hole Height	NO GO *	2300099-03	230/009903
G12	Lock Peg Vertical Position	NO GO	2300098-02	230/009802
S2B	Rotor Shaft Minimum Diameter	NO GO	2300099-04	230/009904
G19	Anti-Creep (Point of Engagement)	GO	WCR 10014	039/028158
S3B	Rotor Hole Minimum Diameter	GO	2300099-02	230/009902
S5	Rotor Shaft Horizontal Position	NO GO	2300099-01	230/009901
S9	Knuckle Tail Shelf Height	NO GO	2300101-01	230/010101
S10B	Lock Anti-creep Thickness	NO GO	2300101-02	230/010102
S11B	Lock Peg Horizontal Position	NO GO	2300098-01	230/009801
S12	Lock Peg Vertical Position	NO GO	2300098-10	230/009810
S13	Lock Lift Lever Leg Length	GO & NO GO	2300098-03	230/009803
S20	Anti-Creep Ledge Vertical Position	GO & NO GO	2301829-01	093/061523
W2	Rotor Shaft Minimum Diameter	NO GO	WCR 10119	093/061524
W3B	Rotor Hole Minimum Diameter	GO	WCR 10120	093/061525
W5	Rotor Shaft Horizontal Position	NO GO	WCR 10121	093/061526
W9	Knuckle Tail Shelf Height	NO GO	WCR 10074	093/061527
W10B	Lock Anti-creep Thickness	NO GO	WCR 10075	093/061528
W11	Lock Peg Horizontal Position	NO GO	WCR 10076	039/028169
W13	Lock Lift Lever Leg Length	GO & NO GO	WCR 10122	093/059013

Note * S3B or W3B gauge must not go when the G4 gauge is fitted

Gauges prefixed "G" apply to all manufacturers of Tightlock couplers (except G12 which now only applies to WCR couplers).
Gauges prefixed "S" apply to all SFE and NAP type Tightlock couplers only.

Details of these gauges are contained in the following drawings available on PADS:-

CR-C0-2300098 Tightlock Coupler Gauges S11B, G12, S12 & S13
CR-C0-2300099 Tightlock Coupler Gauges S2B, S3B, G4 & S5
CR-C0-2300101 Tightlock Coupler Gauges S9 & S10B
CR-C0-2301829 Tightlock Coupler Gauge S20 and Special Tool Details

Gauges prefixed "W apply to all WCR type Tightlock couplers only and are available directly from William Cook Rail.

7.8 Special Tools.

Item	Description	Cat No.
1	Special Tool (Manufacturer's Part No. WCR 916C065)	230/182902

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Autoconnectors, Rectification of Defects MP UC 0217

Contents

	Section	Page
1	Renewal of Roll Cover	2
2	Autoconnector - Change	4
3	Gauging and Adjustment of Contact Blocks	5
4	Renewal of Autoconnector Contact Pins	11
5	Electrical Continuity of Autoconnector Contact Pins	12
6	Data Section	
6.1	Gauges	14
6.2	Lubricants	14
6.3	Component List	14

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Autoconnectors, Rectification of Defects (Cont'd) MP UC 0217

1 Renewal of Roll Cover.

Before this procedure is used the auto-connector is to be gauged in accordance with VMI Jobs UC 0148 and UC 0215.

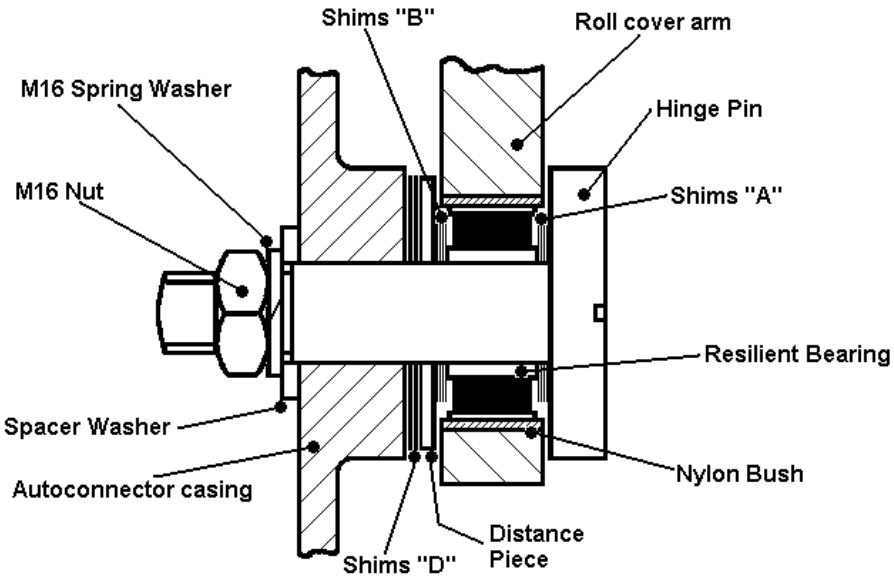


Figure 1 – Component parts of hinge assembly.

1.1 Remove and discard the existing roll cover and springs, but retain the anchor pins, hinge pins and nuts, spacer washers and shims, for use on the new roll cover.

1.2 Press out the nylon bushes and resilient bearings from the old roll cover and examine for damage or defects. If they are not fit for reuse, discard, otherwise retain for fitting to new roll cover.

1.3 Check that the resilient bearings to be fitted to the new roll cover are free to rotate in the nylon bushes. Remove material from the outside of the resilient bearings with emery cloth to achieve the fit if necessary.

1.4 Refit the anchor pins to the new roll cover. Fit the new cover, complete with new springs to the auto-connector and adjust the shims as necessary, see section 1.5 and Figure 2.

1.5 Check that there are clearances as under:-

- Clearance at "a" of 1mm between heads of the hinge pins and the pivot arms. (Adjust Shims A to provide this),
- Clearance at "b" of 1mm between Shims C and the heads of the hinge pins. (Adjust Shims B to provide this),
- The roll cover is positioned centrally with the Autoconnector housing seals in a lateral plane. (Adjust Shims D to provide this),

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Autoconnectors, Rectification of Defects (Cont'd) **MP UC 0217**

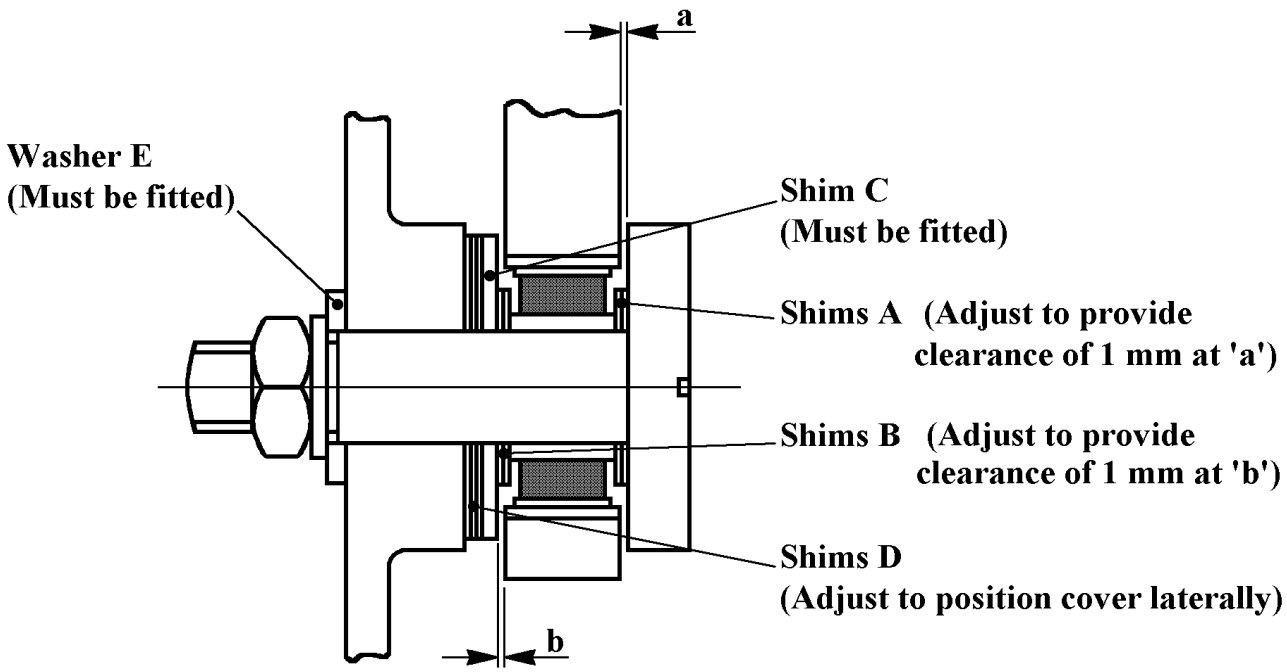


Figure 2 - Roll Cover Hinge Pin Adjustment.

1.6 Check that when the roll cover is moved up and down, the hinge pins do not turn.

Note If these hinge pins turn when the roll cover is moved, then there is either too much friction between the Nylon Bushes and the Resilient Bearings or the shimming is incorrect and is causing binding, or the Spacer Washer is missing. Adjust and rectify as required to free the roll cover and retest to ensure hinge pins do not turn.

1.7 Lower roll cover to the fully opened position and release. Roll cover should fully close and top edge should fit into the groove of the top seal along its entire length. The sides of the roll cover should fit snugly into the curved side seals.

1.8 Lower roll cover to the 2/3 opened position and release. Roll cover should fully close without sticking or jamming.

1.9 Lower roll cover to the 1/3 opened position and release. Roll cover should fully close without sticking or jamming.

Note If the Roll cover sticks or jams on the curved side seals, the most likely cause is that the Autoconnector Contact Block is out of adjustment. In this case adjust the Contact Block in accordance with Part 3 of this procedure.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Autoconnectors, Rectification of Defects (Cont'd) MP UC 0217

2 Autoconnector - Change

This procedure is to be used when the auto-connector needs changing.

2.1 Check that the air supply to the auto-connector is drained and isolated and the electrical system is isolated.

2.2 **All classes except 465/2, 465/9 & 466.** Disconnect the two 42 way cables running from the auto-connector at the terminal bars in the drumswitch and pull through the gland.

2.3 **Class 465/2, 465/9 and 466 only.** Disconnect the two 42 way cables running from the auto-connector at the two 'Litton' connectors at the rear of the drumswitch.

2.4 Release the two 42 way cables and the air hoses by removing the cable and air hose support clamps.

2.5 Support the auto-connector (approximate weight 100 kg).

2.6 Remove and discard the four M24 bolts securing the auto-connector to the Tightlock coupler head and remove the auto-connector taking care not to damage the cable looms and their connectors.

2.7 Support the replacement auto-connector under the Tightlock coupler head and secure with four new M24 bolts. Torque tighten the bolts to 220Nm.

2.8 **All classes except 465/2, 465/9 & 466.** Pull the two 42 way cables through the gland in the drumswitch and fit to the terminal bars.

2.9 **Class 465/2, 465/9 and 466 only.** Connect the two 42 way cables at the two 'Litton' connectors at the rear of the drumswitch.

2.10 Refit the air hoses. Fit the cable and air hose support clamps.

2.11. Check and adjust the autoconnector contact blocks for correct alignment in accordance with Part 3 of this procedure.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Autoconnectors, Rectification of Defects (Cont'd) MP UC 0217

3 Gauging and Adjustment of Contact Blocks.

This procedure is to be used when the auto-connector has failed the gauge in Job No UC 0215.

3.1 Wedge the roll cover down and gauge the contact block using coupler contact gauge (C2/6/24) (Cat No 039/028330), see figure 3.

3.2 Check that the gap, dimension 'A', between the face of the gauge and the face of the air valve assembly is between l mm - 3 mm.

3.3 If outside these limits, adjust the contact block using coupler contact face setting gauges. The adjustments must also be carried out if the coupler contacts show evidence of burning, or if the contact block or roll cover is damaged, or if a new roll cover is to be fitted.

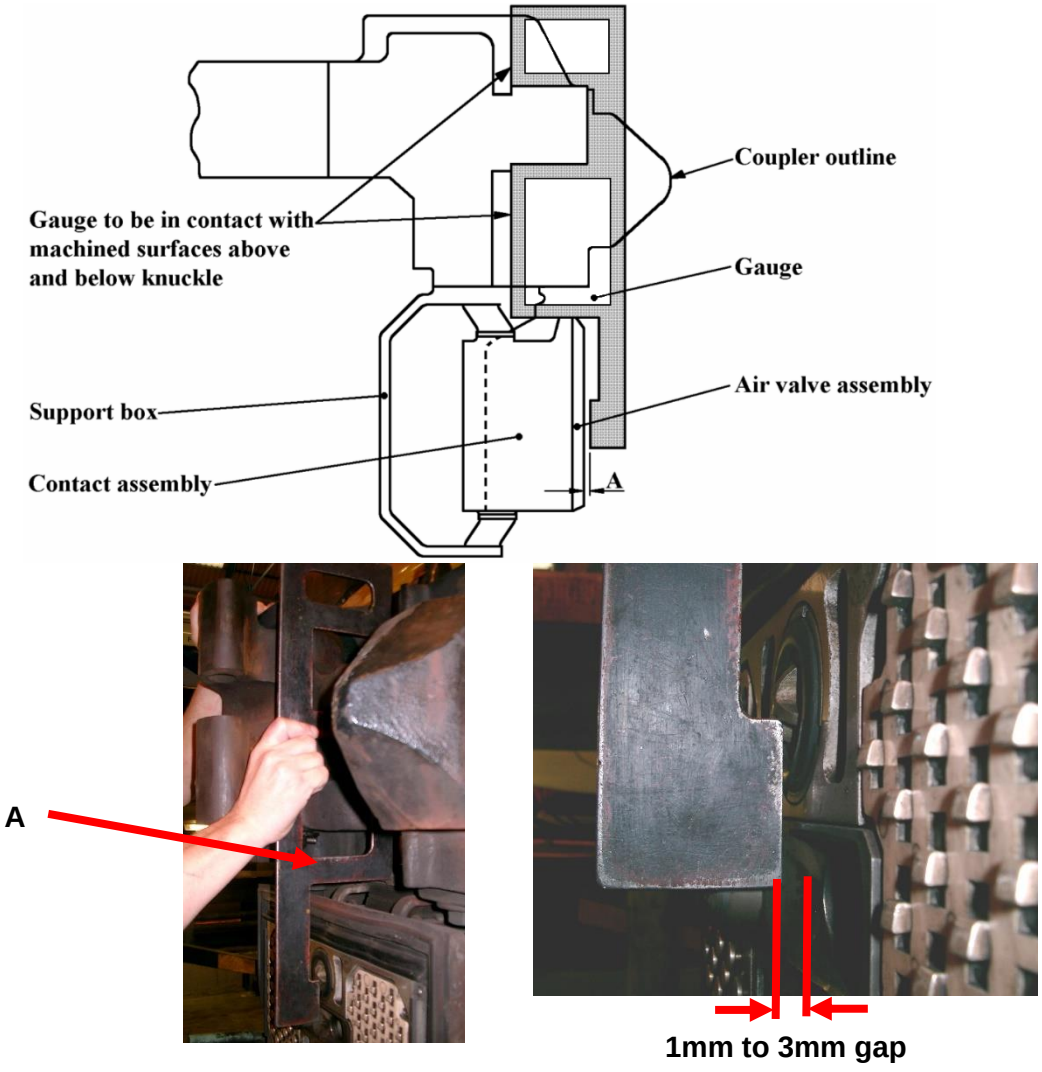


Figure 3 - Coupler Contact Block Gauging (Gauge C2/6/24 to Cat No 039/028330)

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Autoconnectors, Rectification of Defects (Cont'd) **MP UC 0217**

3.4 Remove the roll cover, retain the springs, anchor pins, hinge pins and nuts, spacer washers, nylon bushes and resilient bushes for use on the new roll cover.

3.5 Locate the three M10 tapped holes in the rear face of the support box, see figure 4.

3.6 Fit the three setting gauges shown in figure 6 by using three M10 x 30 screws to secure the plain hole end of each gauge to its respective M10 tapped hole in the support box, see figures 4 to 7 and table 1.

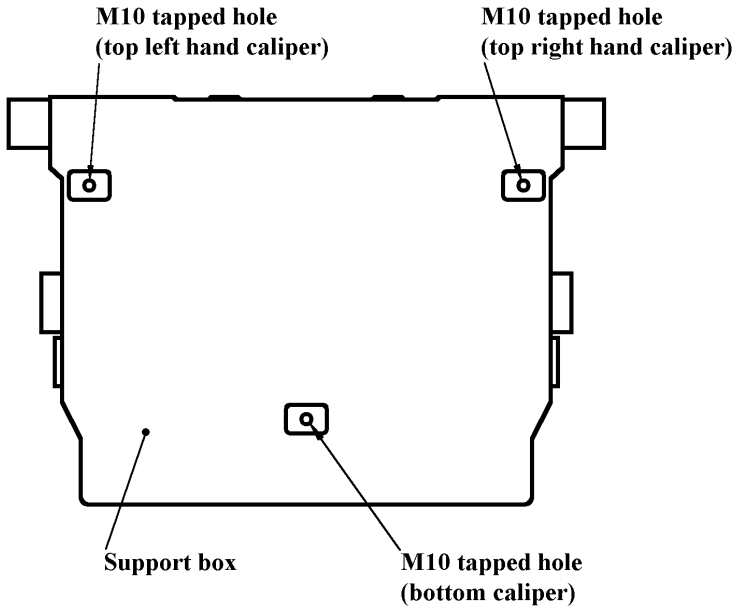


Figure 4 - Rear View of Coupler Showing M10 Tapped Holes

3.7 Screw the three shouldered screws into the calliper gauges until either the ends of the screws touch the connector housing, or the shoulders of the screws touch the gauges.

3.8 If **either** the gap between the end of the screw and the housing, dimension 'a' on figure 6, **or** the gap between the shoulder of the screw and the gauge, dimension 'b' on figure 6 is greater than 1 mm, the contact block should be adjusted either forward or back using the four adjusting bolts until all three shouldered screws can be fully screwed in so that both the shoulder is in contact with the gauge and the end of the screw is in contact with the contact block. See figure 6.

3.9 If dimensions 'a' or 'b' are less than 1mm, adjustment is not required.

3.10 Adjustment of the autoconnector housing is carried out using the four adjusting bolts shown in figure 5. If adjustment is necessary, proceed as follows:-

3.11 To ease the movement back of the contact block adjustment bolts, release the tension on the contact block springs by using hardwood timber blocks (to protect the contacts) and clamps in the positions shown in figure 8.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Autoconnectors, Rectification of Defects (Cont'd) **MP UC 0217**

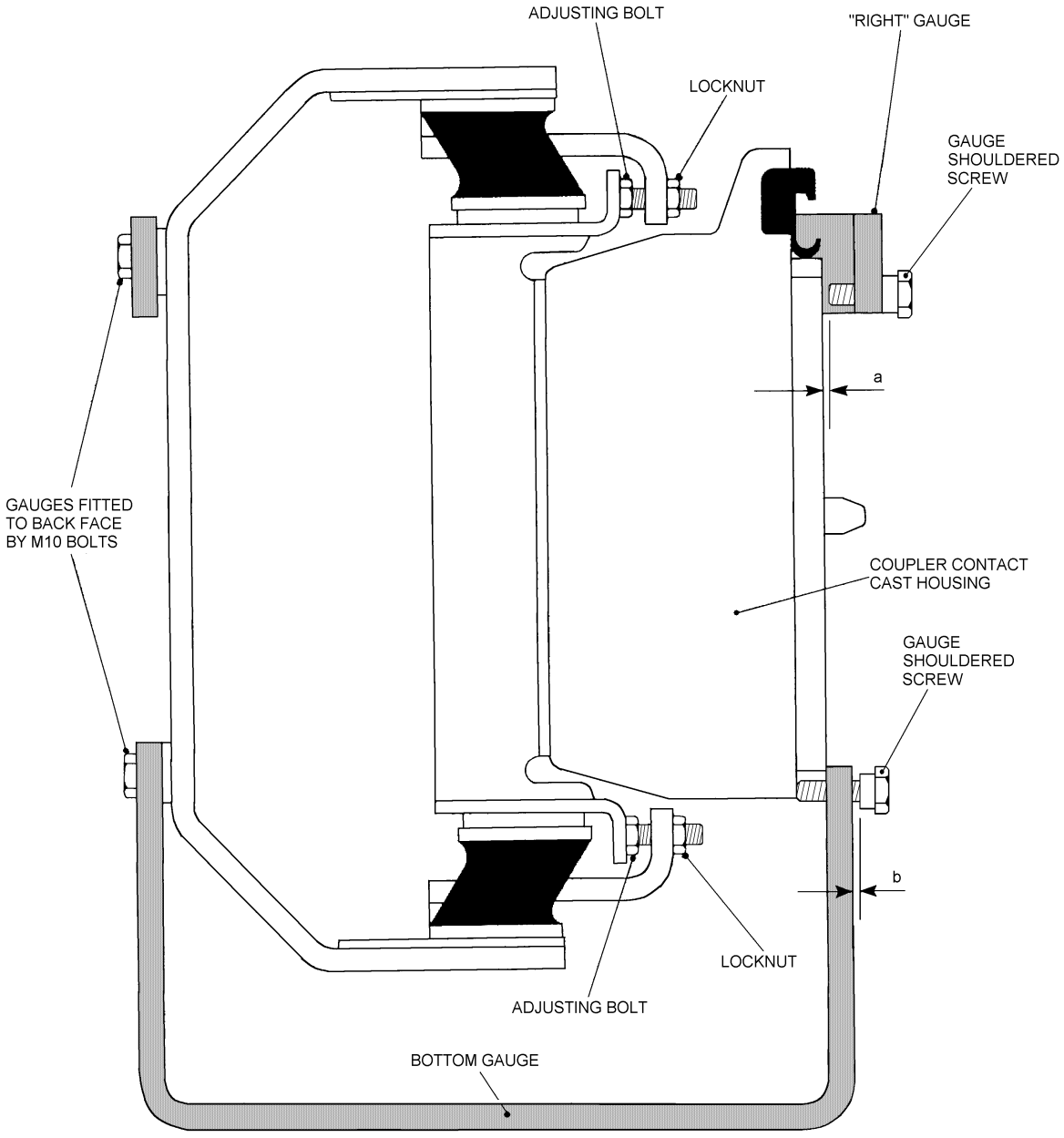
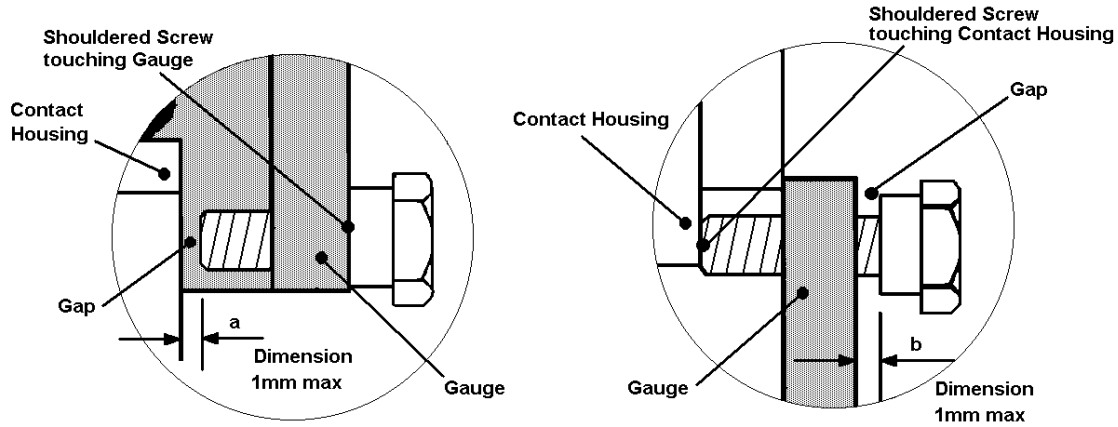


Figure 5 - Coupler Contact Face Gauging

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Autoconnectors, Rectification of Defects (Cont'd) **MP UC 0217**



Contact Housing too far back
Adjust forward

Contact Housing too far forward
Adjust back

Figure 6 – Adjustment of Contact Housing

3.12 Unscrew and remove the locknut. Clean the exposed threads of the adjusting bolts.

Note:-

If dimension "a" greater than 1mm, contact housing too far back - Adjust forward
If dimension "b" greater than 1mm, contact housing too far forward - Adjust back
If dimension "a" or "b" is less than 1mm, adjustment is not required

3.13 Adjust the adjusting bolts as necessary to obtain the correct dimensions given in 3.8.

3.14 Carry out the adjustment until all three shouldered screws are screwed in fully and just touch the housing.

3.15 Apply Loctite 242 to the threads and refit the locknut.

3.16 Remove the gauges and refit the roll cover as follows:-

3.17 Check that the resilient bushes are free to rotate in the nylon bushes. Remove material from the outside of the resilient bushes with emery cloth to achieve the fit if necessary.

3.18. Fit the cover to the autoconnector roll cover and adjust the shims as necessary, see figure 9.

3.19 Check that when the roll cover is moved up and down, the hinge pins do not turn.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Autoconnectors, Rectification of Defects (Cont'd) **MP UC 0217**

3.20 Check the roll cover side edges line up with grooves in the cover seal.

3.21 Check that there is clearance between the heads of the hinge pins and the pivot arms.

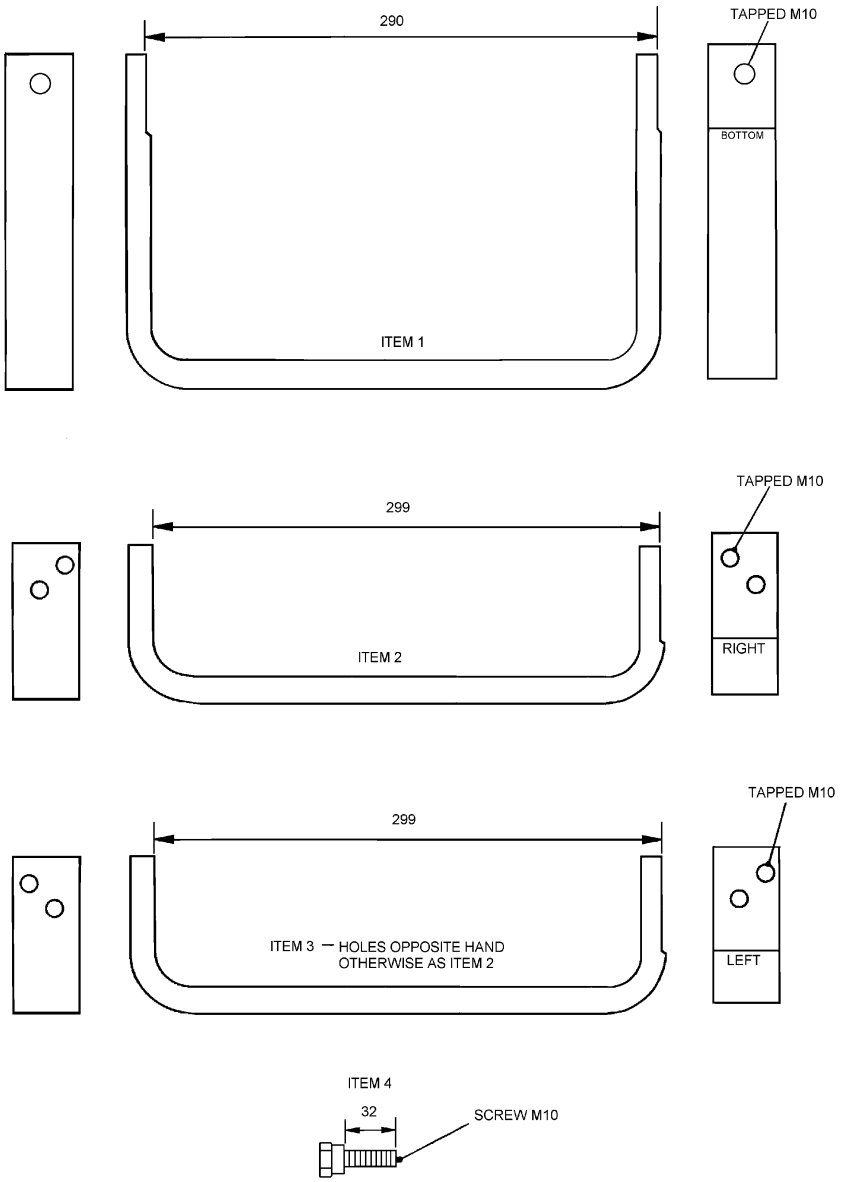


Figure 7 – Coupler contact face gauges

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Autoconnectors, Rectification of Defects (Cont'd) MP UC 0217

Gauge	GEC-A Traction Gauge No.
Bottom Calliper	238211
Right Hand Calliper	238212
Left Hand Calliper	238213

Table 1 - Calliper Gauge Detail Numbers

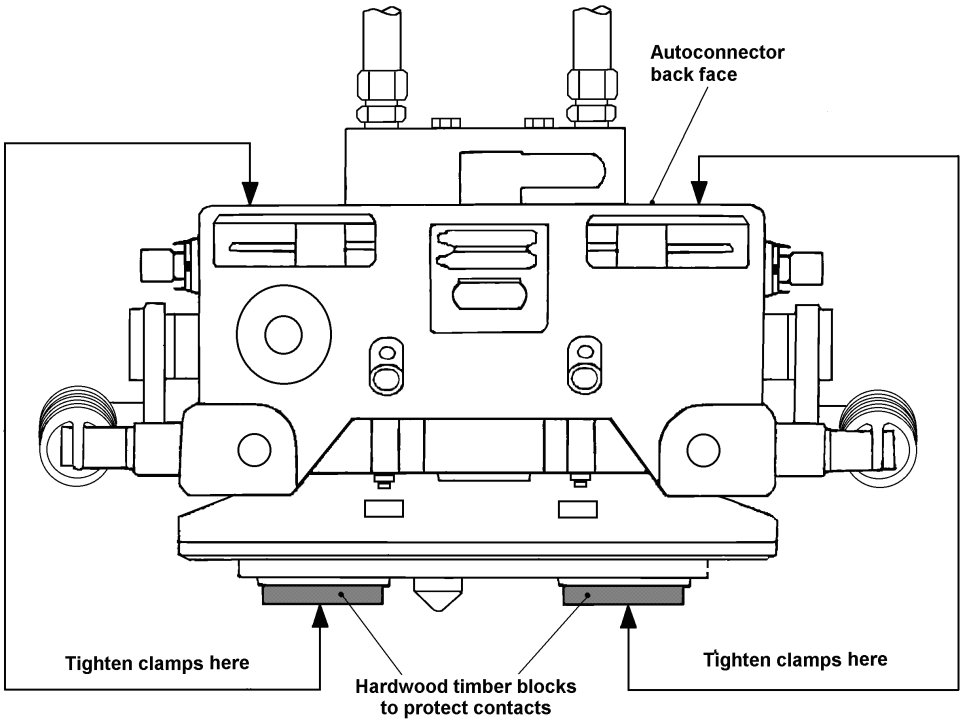


Figure 8 – Contact block spring tension release (Plan view)

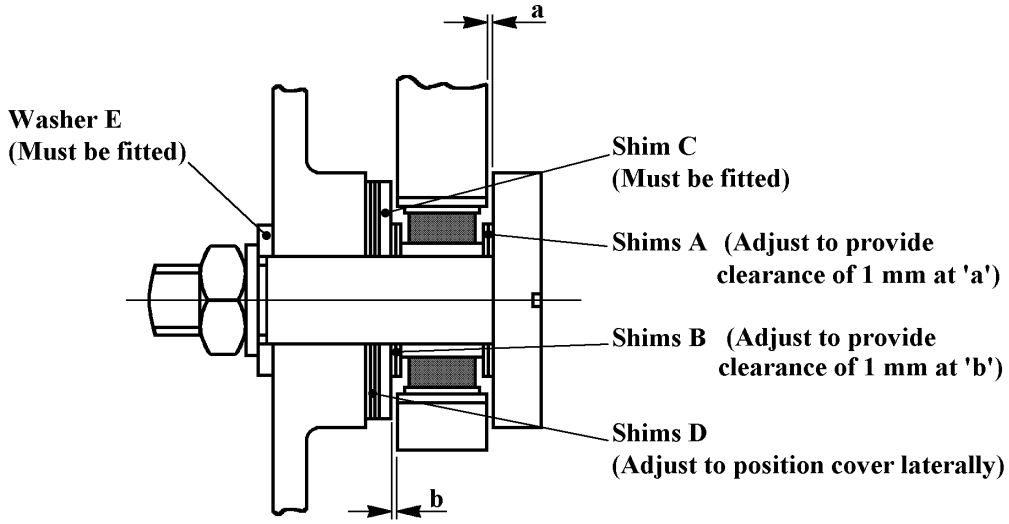


Figure 9 - Roll Cover Hinge Pin Adjustment

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Autoconnectors, Rectification of Defects (Cont'd) MP UC 0217

4 Renewal of Autoconnector Contact Pins.

MATERIAL LIST	CAT NO.
Inline Splice Cable (30/0.25 cable 300/500V)	006/101600
Inline Splice	054/119478
Square Tip Coupler Contact (except Class 507/508)	098/001254
Square Tip Coupler Contact (Class 507/508)	093/062370
Round Tip Coupler Contact (except Class 507/508)	098/001255
Round Tip Coupler Contact (Class 507/508)	093/062155
Split Pin	029/127036

Note 1 Coupler Contact Tip 15 wire MUST NOT be in-lined spliced. The 42-way cable must be renewed.

Note 2 No more than 6 inline splices maybe inserted on any coupler contact face. If more than 6 need renewing, the 42-way cable must be renewed.

4.1 Remove 4 x M5 x 50mm Socket Head Cap Screws securing the contact assembly and draw forward the contact assembly.

4.2 Visually inspect ALL contact wiring for damage.

4.3 On one contact at a time carry out the following procedure,

4.4 Remove the 1.6 mm x 10 mm split pin from the contact and slide back the distance piece.

4.5 Cut off the old contact hard up against the crimped shoulder end remove the old contact.

4.6 Dependant on the type of contact to renew, strip and inline splice original cable to new contact cable ensuring that collar insulating sleeve and split pin are fitted, crimp the contact end to the cable.

4.7 Carry out items 4.4 to 4.6 above on any further damaged contacts.

4.8 Carry out electrical continuity tests on all pins renewed in accordance with Part 5 of this procedure.

4.9 Slide back the contact assembly, taking care not to damage cables. Secure the contact block by fitting the 4 x M5 x 50mm socket head cap screws.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Autoconnectors, Rectification of Defects (Cont'd) MP UC 0217

5 Electrical Continuity of Autoconnector Contact Pins.

Note See figure 10 and table 2 for contact numbers when carrying out the continuity test, taking care where train wires are deliberately crossed at the Autoconnector and where wires are not duplicated between the round and square contact pins.

5.1 Using a digital multi-meter set to read ohms, check for continuity between each round contact and its square opposite number on the other coupler block, ensure it reads short circuit (approximately 0.02 Ω or less) (See NOTE above).

5.2 Remove Drumswitch Covers to gain access to Drumswitch connection tips.

5.3 Check the continuity of each contact and its appropriate tip on the Drumswitch ensuring that the reading is a short circuit as in 5.1 above.

5.4 With the Drumswitch in the uncoupled position check that there is no continuity between any contact number and other contact number on the Autoconnector (there will still be continuity between each square and round pin for the same wire number)

5.5 Refit Drumswitch cover(s).

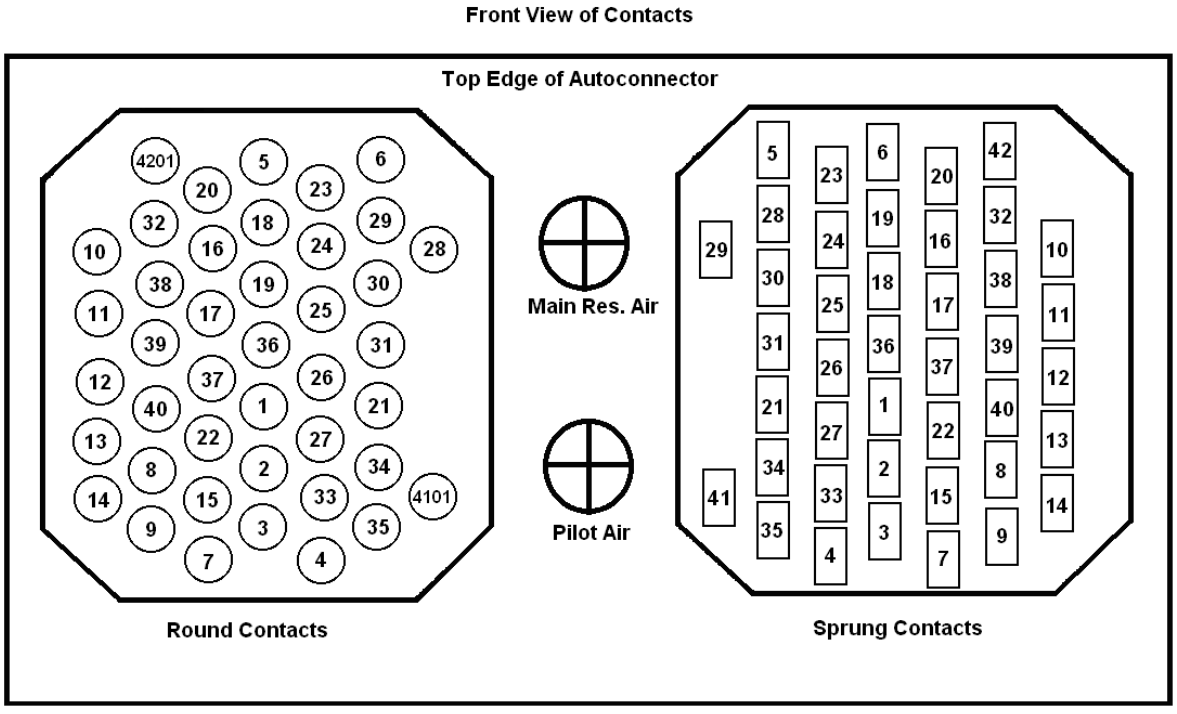


Figure 10 – Autoconnector Contact Pin arrangement

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Autoconnectors, Rectification of Defects (Cont'd) **MP UC 0217**

Round Contact	Square Contact	Continuity	Typical Function
1	1	YES	Power Notch 1
2	2	YES	Power Notch 2
3	3	YES	Power Notch 3
4	4	YES	Power Notch 4
5	**6**	**CROSSED**	Forward
6	**5**	**CROSSED**	Reverse
7	7	YES	Dynamic Brake Control
8	8	YES	Pan Up / Overload Reset
9	9	YES	Pan Down / DC Select
10	10	YES	Brake Code 1
11	11	YES	Brake Code 2
12	12	YES	Brake Code Emergency
13	13	YES	Brake Continuity
14	14	YES	Spare / Bell Interlock
15	15 & 34	YES	Brake Negative
16	16 & 17	YES	Control Negative
17	17 & 16	YES	Control Negative
18	**19**	**CROSSED**	Control Positive Normal
19	**18**	**CROSSED**	Control Positive Emergency
20	20	YES	Auxiliaries Set
21	21	YES	Auxiliaries Trip
22	22	YES	Compressor Synch / Short Plat. Detection
23	23	YES	Lighting Set / Heating Trip
24	24	YES	Lighting Trip
25	25	YES	Spare / Remote Door Enable
26	26	YES	Door Interlock
27	27	YES	Signal Bell
28	**29**	**CROSSED**	Door Release Left
29	**28**	**CROSSED**	Door Release Right
30	30	YES	Doors Close
31	31	YES	Door Interlock / Pass Comm
32	32	YES	Master Switch On
33	33	YES	Spare
34	34 & 15	YES	Brake Negative
35	35	YES	AC Select
36	36	YES	VCB Indication / Fault Indication
37	37	YES	Audible Warning
38	38	YES	Communication 1
39	39	YES	Communication 2
40	40	YES	Communication Control
4101	41	**NO**	Local Drumswitch Control Couple
4201	42	**NO**	Local Drumswitch Control Uncouple

Table 2 – Autoconnector Pin Continuity and Typical Function.

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Autoconnectors, Rectification of Defects (Cont'd) MP UC 0217

6 DATA SECTION AND MATERIALS LIST

6.1 GAUGES

Gauge Description	Gauge No.	Cat No.
Coupler Contact Gauge	C2/6/24	039/028330
Bottom Calliper Gauge	238211	
Right Hand Calliper Gauge	238212	
Left Hand Calliper Gauge	238213	

6.2 LUBRICANTS

Description	Cat No
Degreaser - Electro Quick Clean	007/007186

6.3 COMPONENT LIST

Description	BR Cat No.
Autoconnector complete (class 313, 314, 315, 317, 318, 319, 507, 508) Type 37KK05C1	098/007436
Autoconnector complete (class 320, 321, 322) Type 37KK05D1	098/009634
Autoconnector complete (class 365) Type 37KK005E1	No Cat No
Autoconnector complete (class 465/0 & 465/1) Type 400-0189-57	098/014715
Autoconnector complete (class 465/2, 465/9 & 466) Type 37KK005F01	098/013143
Inline Splice Cable 0/0.25 cable 300/500V)	006/101600
Inline Splice	054/119478
Square Tip Coupler Contact (except Class 507/508)	098/001254
Square Tip Coupler Contact (Class 507/508)	093/062370
Moulding – square tip	098/001999
Round Tip Coupler Contact (except Class 507/508)	098/001255
Round Tip Coupler Contact (Class 507/508)	093/062155
Moulding – round tip	098/001991
Split Pin	029/123016
Distance piece (often referred to as Shim "C")	098/002016
Roll Cover (conventional type)	830/117801
Roll cover (improved type)	230/004501
Roll cover Resilient bearing	098/002014
Roll cover nylon bush	098/002012
Roll cover return spring	098/001993
Autoconnector air valve seal	098/005619
Roll cover seal	098/005608
Roll cover seal (inner)	098/005612
Contact block rear "O" ring	010/052687

Uncontrolled when printed
Supersedes ATOCACOPEC01008 Iss 1 on 01/12/2017
Published by RSSB on behalf of Rail Delivery Group on 03/03/2018

Anchor pin	098/001994
Hinge pin	098/002015
Shims “D”	098/001995
M16 spring washer	003/195118
M16 Nut	003/175122
Spacer Washer (often referred to as Washer “E”)	098/002010
Shims “A” & “B”	Local supply