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PRESS Mechanical Working Group

Inspection and Maintenance of Type H Tightlock Coupler Systems

Abstract: This recommended practice assists inspection and maintenance forces in detecting and correcting improper conditions involving the complete coupler, coupler parts, coupler operating mechanism, yoke, radial connection and attachments.

Keywords: coupler operating mechanisms, coupler parts, inspection, locomotives, maintenance, passenger cars, radial connections, rail attachments, specification M-206B, Type H Tightlock couplers, yokes

Summary: This document details how to detect and correct improper conditions involving the complete coupler, coupler parts, coupler operating mechanism, yoke, radial connection and attachments. This recommended practice was titled “Inspection and Maintenance of Type H Tightlock Couplers” in the previous publication of this document.

Scope and purpose: This recommended practice covers the inspection and maintenance practice for Type H Tightlock coupler systems, including field inspection gages. In the case of proprietary couplers, the coupler manufacturer should be consulted for proper maintenance procedures. Where secondhand couplers are involved or reconditioning procedures are required, the latest revision of APTA PR-M-RP-004-98, “Secondhand and Reconditioned Type H Tightlock Coupler Systems,” should be followed.

This document represents a common viewpoint of those parties concerned with its provisions, namely transit operating/planning agencies, manufacturers, consultants, engineers, and general interest groups. The application of any recommended practices or guidelines contained herein is voluntary. APTA standards are mandatory to the extent incorporated by an applicable statute or regulation. In some cases, federal and/or state regulations govern portions of a transit system's operations. In cases where this is a conflict or contradiction between an applicable law or regulation and this document, consult with a legal advisor to determine which document takes precedence.

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Introduction

This introduction is not part of APTA PR-M-RP-002-98, Rev. 2, “Inspection and Maintenance of Type H Tightlock Coupler Systems,” formerly titled “Inspection and Maintenance of Type H Tightlock Couplers.”

This recommended practice applies to all:

1. Railroads that operate intercity or commuter passenger train service on the general railroad system of transportation; and
2. Railroads that provide commuter or other short-haul rail passenger train service in a metropolitan or suburban area, including public authorities operating passenger train service.

This recommended practice does not apply to:

1. Rapid transit operations in an urban area that are not connected to the general railroad system of transportation;
2. Tourist, scenic, historic, or excursion operations, whether on or off the general railroad system of transportation;
3. Operation of private cars, including business/office cars and circus trains unless otherwise required by other standards or regulations; or
4. Railroads that operate only on track inside an installation that is not part of the general railroad system of transportation.

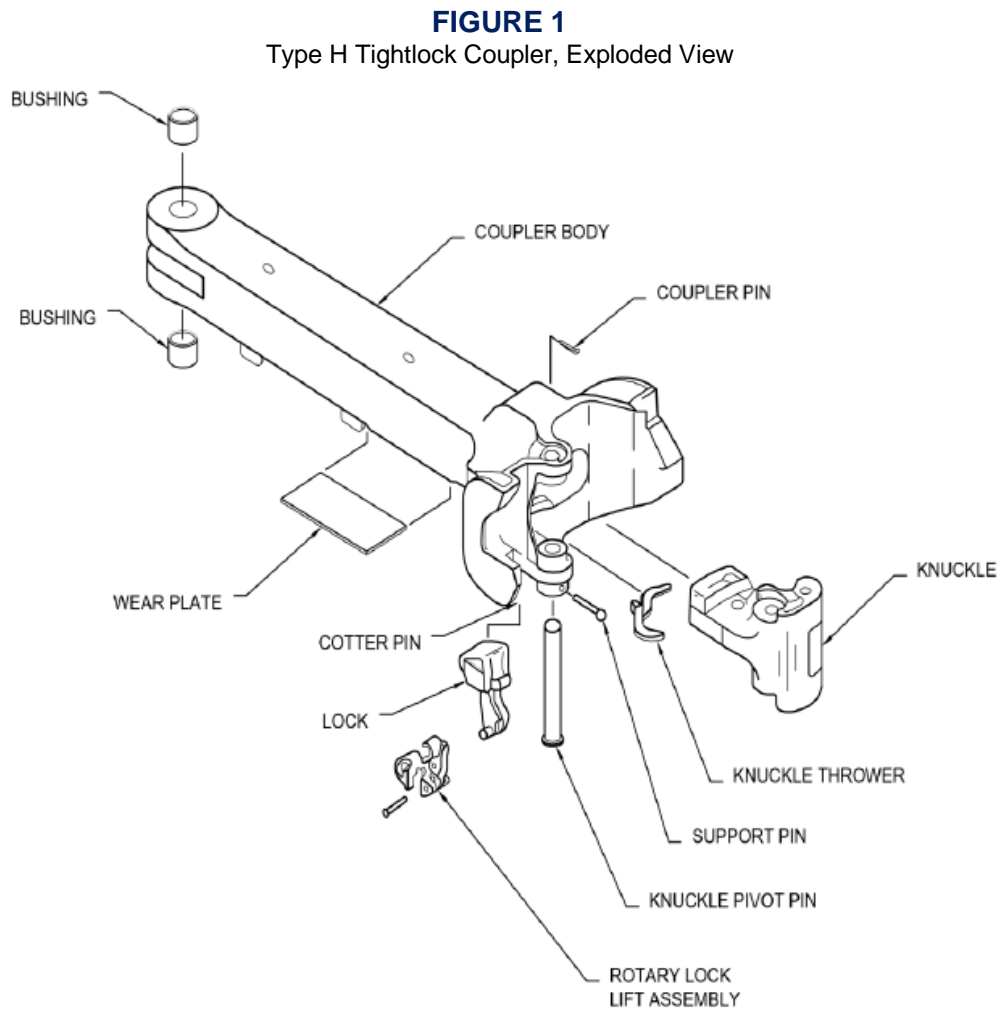
The passenger rail industry phased this recommended practice into practice over the six-month period from July 1 to Dec. 31, 1999. The recommended practice took effect Jan. 1, 2000.

Inspection and Maintenance of Type H Tightlock Coupler Systems

1. General

1.1 Tightlock couplers

Figure 1 depicts a typical exploded view of a Type H Tightlock coupler. Tightlock couplers must be maintained in a level position on the coupler carrier to ensure satisfactory coupling. A simple check for levelness of the coupler may be made by suspending a weighted string against the machined front face of the coupler head when the car is on reasonably level track.



1.2 Trainlines and supports

Trainlines and supports, or other attachments, must not interfere during train operations with the coupler, coupler operating parts or coupler operating mechanism.

1.3 Slack

Excessive slack in the Tightlock coupler and draft gear system should be reduced or eliminated. The amount of free slack can be determined by first sledging the coupler back solid and then measuring the clearance between the coupler horn and the striker face (an established fixed reference point on the carbody). Next, by inserting a long bar between the coupler horn and striker face, pry the coupler out as far as possible and again measure the space between the horn and the striker face. The difference between these two measurements is the amount of free slack in the Tightlock coupler and draft gear system. The maximum free slack permitted is ½ in. (1.27 cm). In **Figure 2**, the coupler horn (the raised portion attached to the coupler body at about 5 in.) and the striker face (the horizontal lip at the end of the measuring tape) are shown.

FIGURE 2
Free Slack Measurement

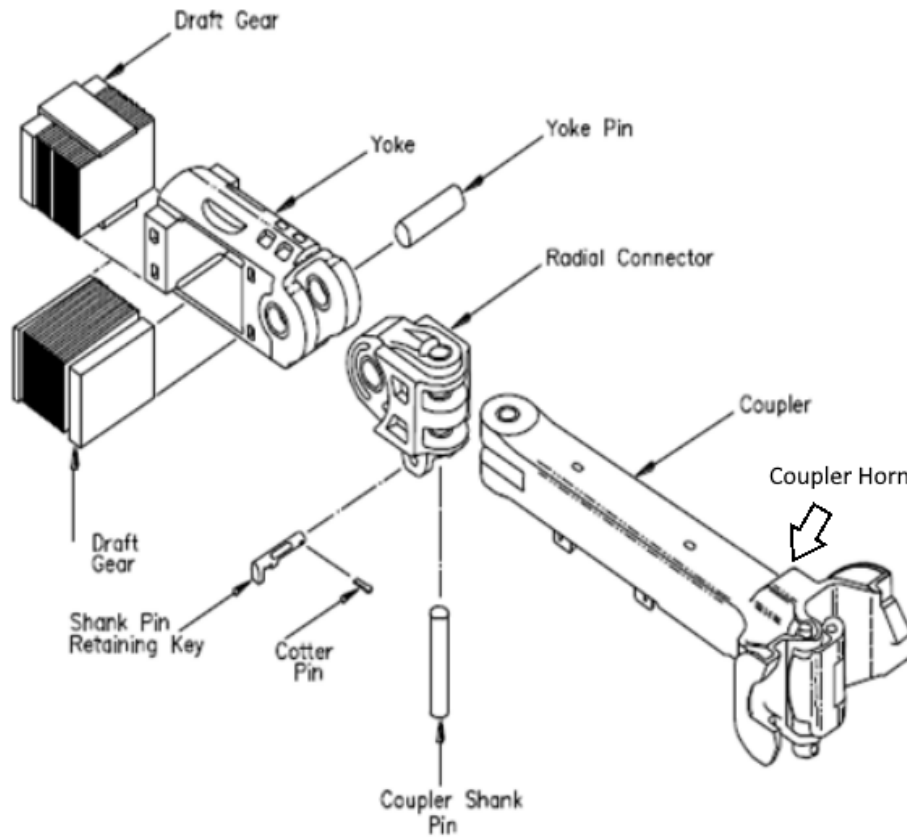


1.4 Yoke and radial connection inspection

A visual inspection should be made of the yoke and radial connection, as well as the carrier plates and fasteners attaching the carrier plates. The shank pin retaining key and cotter key should be inspected and replaced if worn more than 25 percent. This inspection is mandatory if excessive free slack is found during the inspections described in sections 2.2 or 2.3. Any cracked or broken part uncovered by this inspection must be replaced.

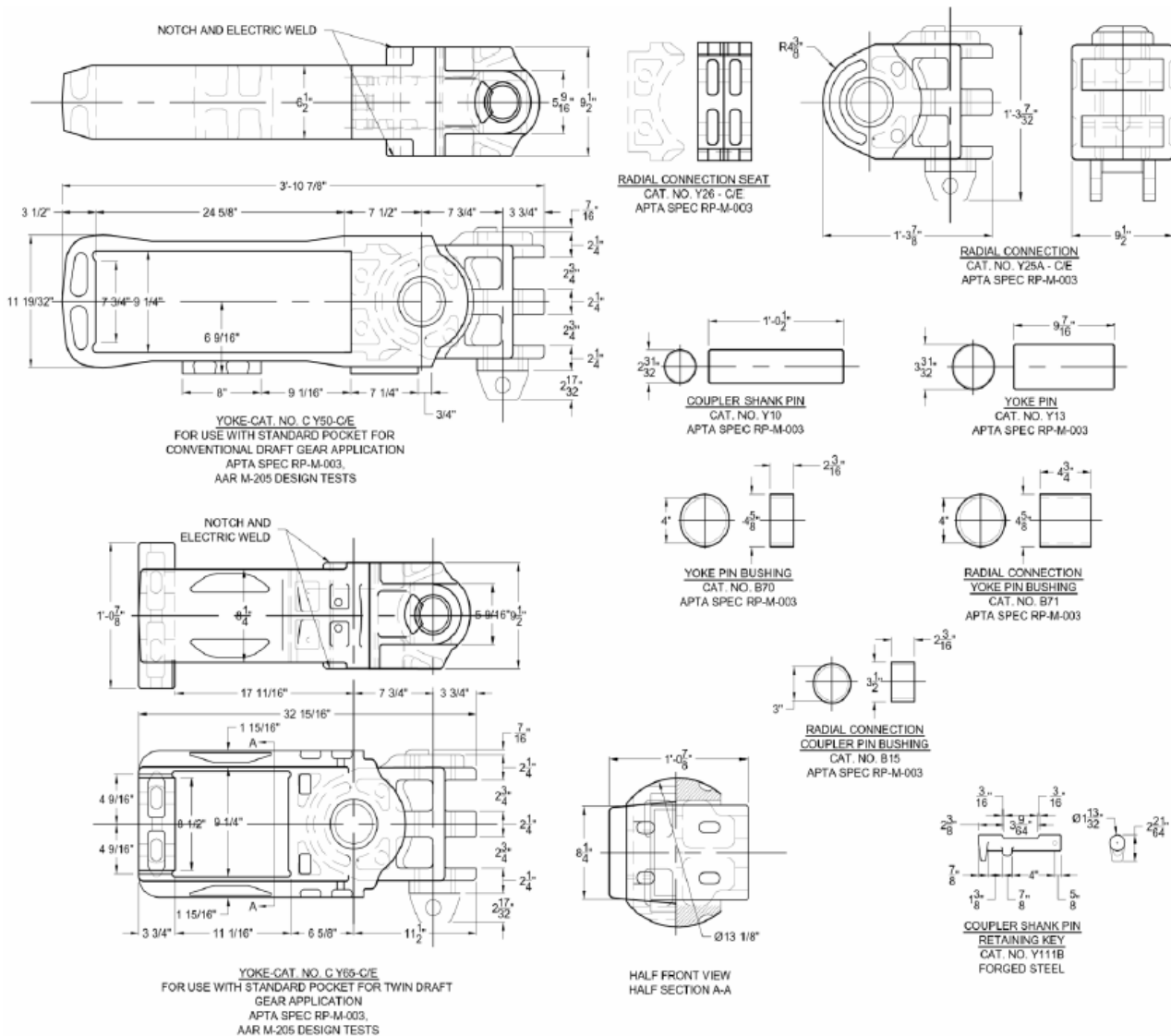
A diagram of the Tightlock coupler and draft gear system is shown in **Figure 3**. An APTA C-Y65 yoke and a twin unit draft gear are shown for purposes of illustration. Additional yokes are identified in **Figure 4**.

FIGURE 3
Tightlock Coupler and Draft Gear System



NOTE: The draft gear pictured in **Figure 3** is double-acting. Other varieties exist and can be used.

FIGURE 4
 CH80 and CH81 Coupler Yokes



Note: Other yoke variations exist, some of which do not require a radial connection.

1.5 Operating rod conditions

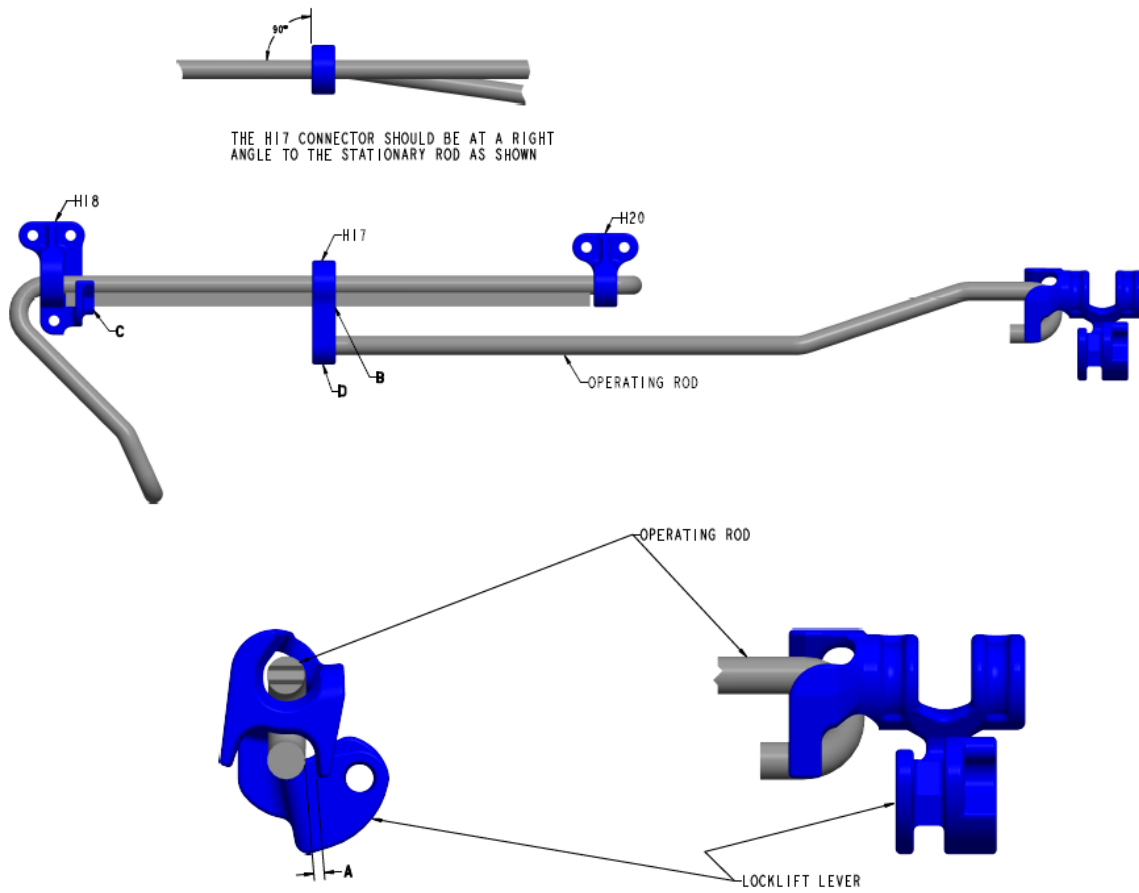
The operating rod conditions specified in **Figure 5** must be maintained. It is important that the requirements for the shape of the rod and the bracket location be provided and maintained. As illustrated in **Figure 5**, it is important to maintain rod eye clearance (Dimension A) when the coupler is centered on the carrier and fully locked. The double operating mechanism is as shown in **Figure 6**.

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FIGURE 5

No. 6 Operating Mechanism

ENLARGED VIEW OF LOCKLIFT LEVER AND OPERATING ROD



IMPORTANT:

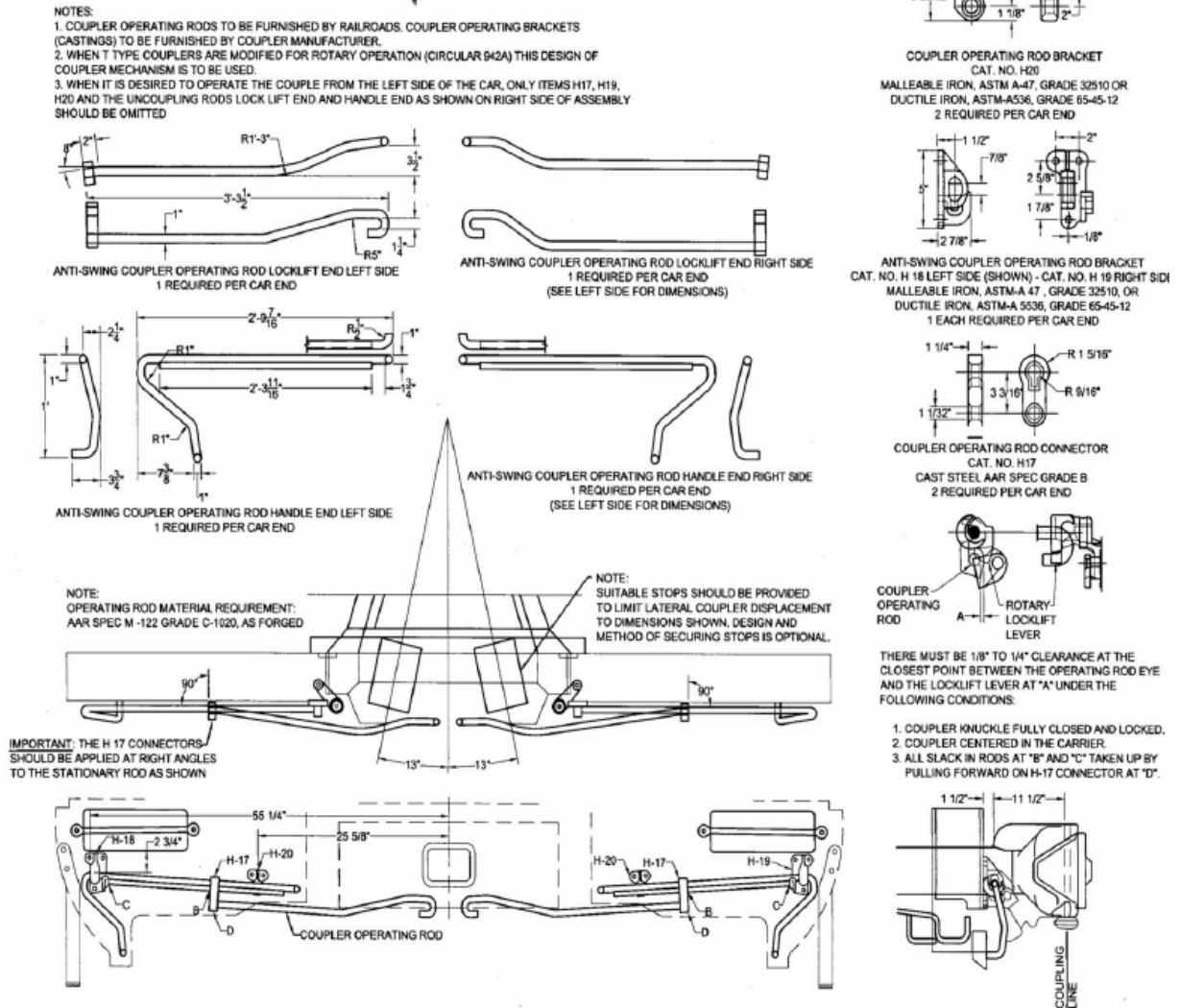
THERE MUST BE 1/8" TO 1/4" CLEARANCE AT THE CLOSEST POINT BETWEEN THE OPERATING ROD AND THE LOCKLIFT LEVER AT "A" UNDER THE FOLLOWING CONDITIONS:

1. COUPLER KNUCKLE FULLY CLOSED AND LOCKED.
2. COUPLER CENTERED IN THE CARRIER.
3. ALL SLACK IN RODS AT 'B' AND 'C' TAKEN UP BY PULLING FORWARD ON H17 CONNECTOR AT "D".

SAME CONDITIONS APPLY TO OPERATING ROD ON RIGHT SIDE WHEN USED

FIGURE 6
 Double Operating Mechanism

STANDARD H TIGHTLOCK COUPLER
 OPERATING MECHANISM TYPE NO. 6



2. Operation

2.1 Opening

The coupler operating mechanism must open the knuckle when the handle is raised to the top position.

2.2 Dropping

The lock must drop freely to the locked position when the knuckle is fully closed. The coupler is fully locked when the tell-tale recess in the lock hole shroud is clear and unobstructed, as shown in model in **Figure 7A**. For examples of obstructions, see **Figure 7B**.

FIGURE 7A

Unobstructed Tell-Tale Slot

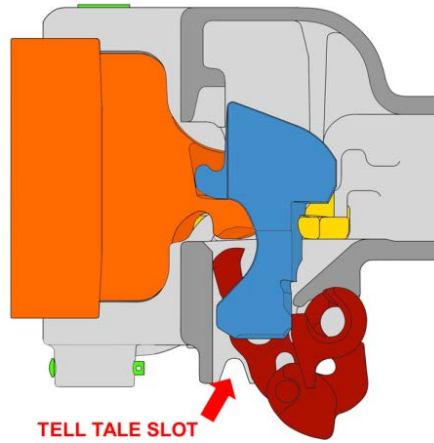
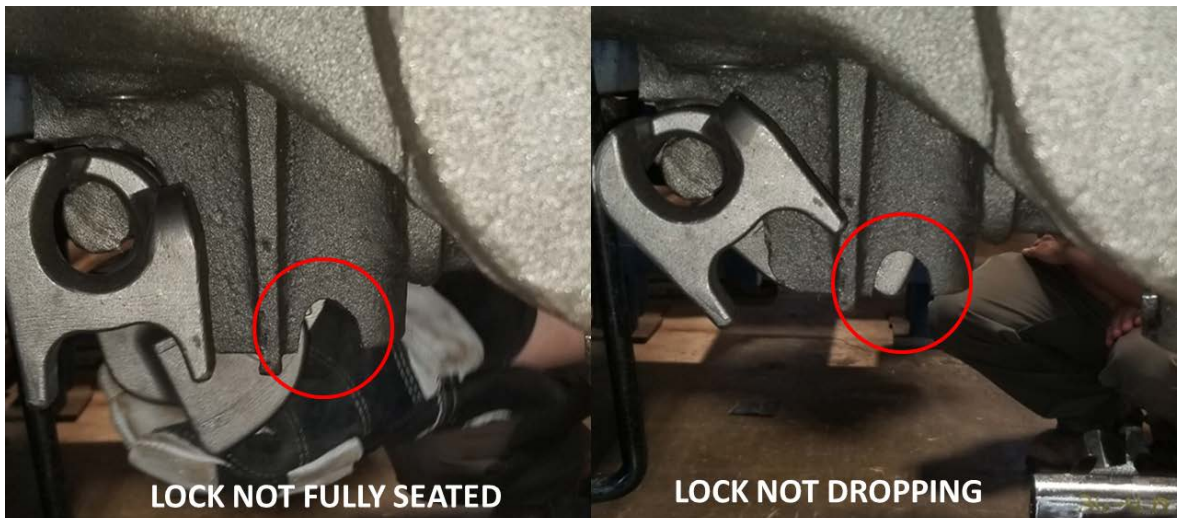


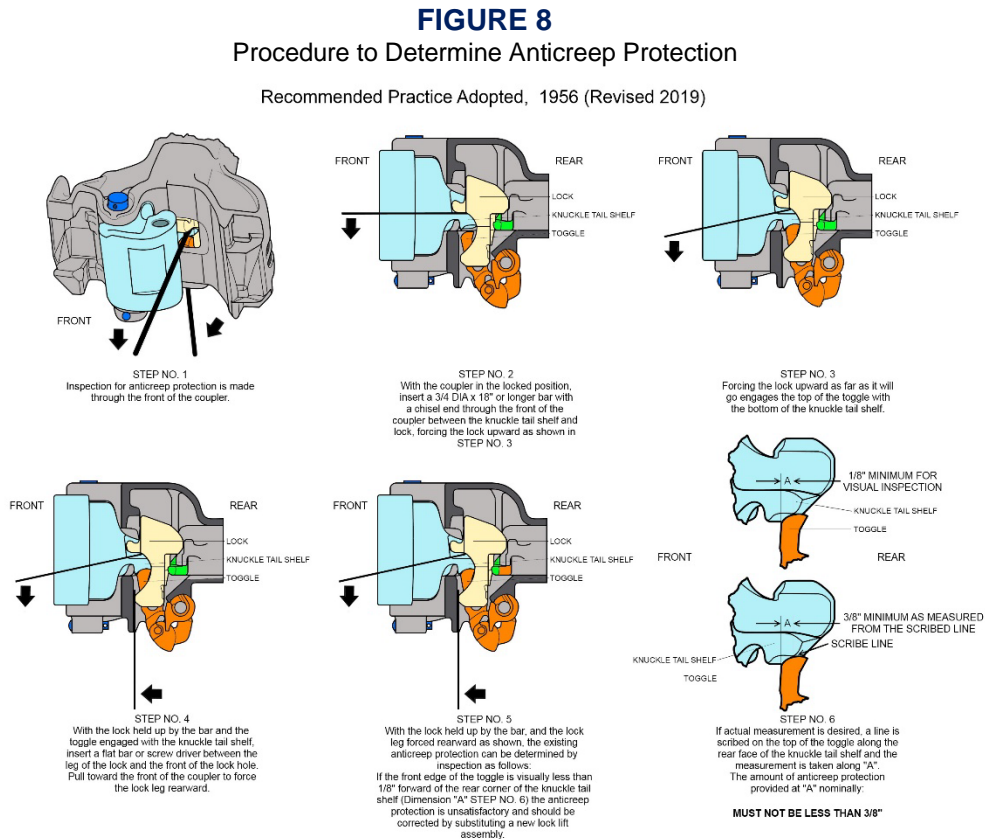
FIGURE 7B

Obstructed Tell-Tale Slots



2.3 Anticreep protection

Anticreep protection must be ensured in accordance with procedures illustrated in **Figure 8**.



3. Contour inspection

3.1 Not meeting requirements

Couplers and/or knuckles not meeting the gaging requirements of this section shall be removed from service. Gage application nomenclature is defined below:

Must Contact: Gage surface must make contact with the casting at one or more points; no shimming required unless otherwise noted.

Must Seat: Gage surface and casting must, at a minimum, contact at three nonlinear points, and a 1/2 x 0.015 in. thick shim not pass anywhere between "must seat" gage surfaces and the casting.

Must Not Seat: Gage must not make any contact at "Must Not Seat" area of gage.

Go or Must Pass: Gage must pass through or over total area of the gaged surface.

No Go: Gage must not pass through or over more than 25 percent of the total gaged surface.

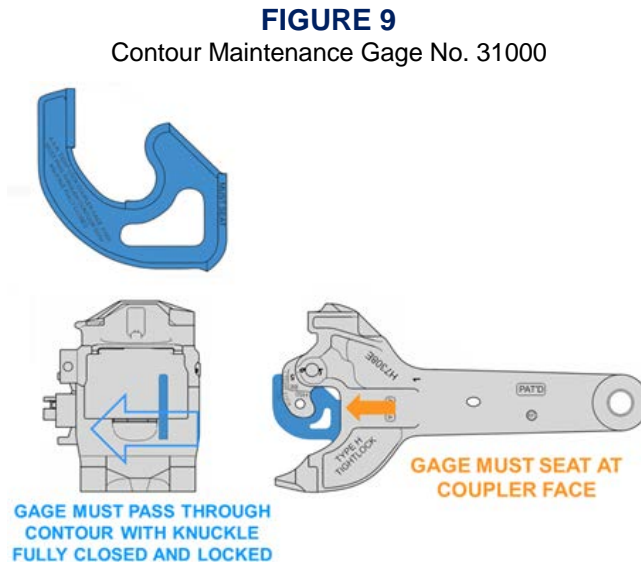
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Inspection and Maintenance of Type H Tightlock Coupler Systems

No Start: Gage must not enter or pass over any part of the gaging surface, except for radii and chamfers per casting drawing.

Must Not Pass Through: Gage must not pass through the full depth of the gaged area.

3.2 Correctness of contour

Correctness of contour must be checked with gage No. 31000, as shown in **Figure 9**. If the gage does not pass, then parts may be replaced or locks modified in accordance with Section 4.5.1 to allow passage of the gage.



3.3 Distortion

Distortion of the aligning wing pocket and guard arm must be checked by using aligning wing limit gage No. 32600, as shown in **Figure 10**, and vertical height aligning wing pocket and guard arm gage No. 34101-4, as shown in **Figure 11**.

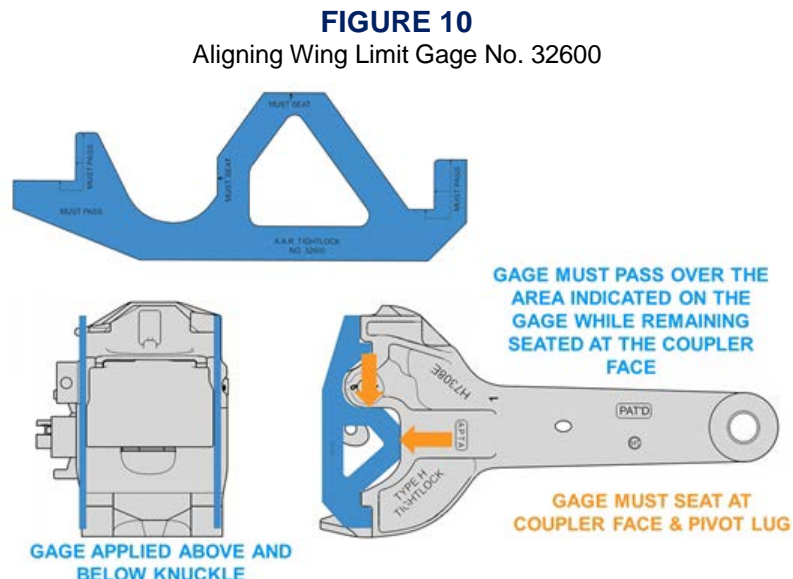
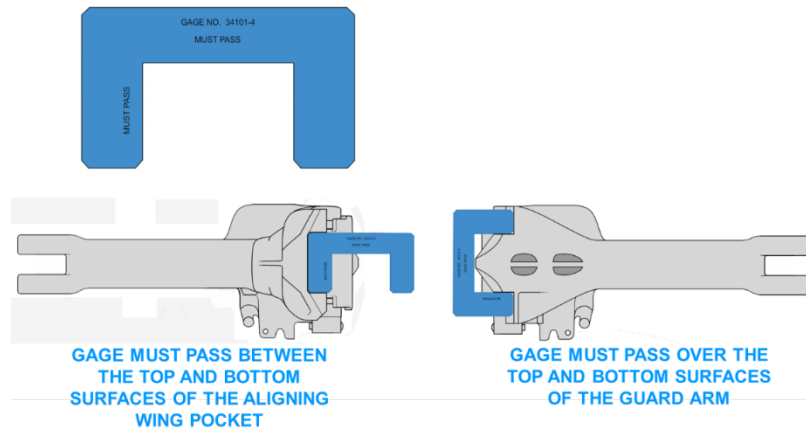


FIGURE 11

Vertical Height Aligning Wing Pocket and Guard Arm Gage No. 34101-4

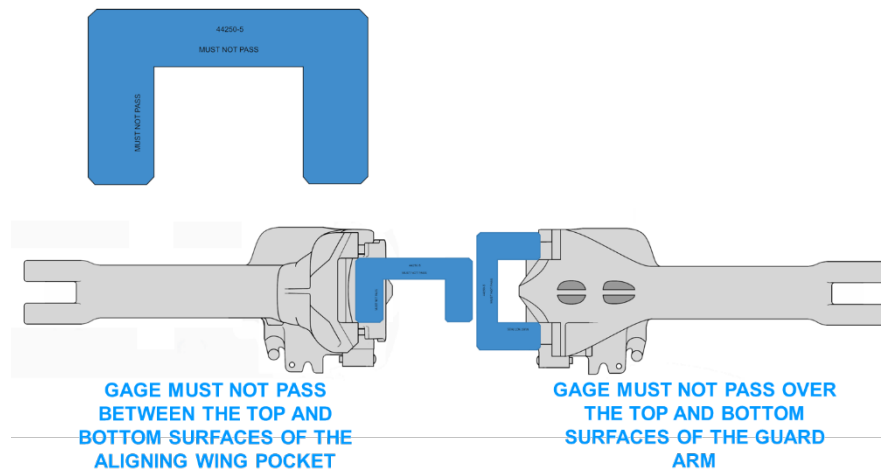


3.4 Wear

Wear of the aligning wing pocket and guard arm must be checked with the vertical height condemning limit aligning wing pocket and guard arm gage No. 44250-5, as shown in **Figure 12**.

FIGURE 12

Vertical Height Condemning Limit Aligning Wing Pocket and Guard Arm Gage No. 44250-5



3.5 Contour slack

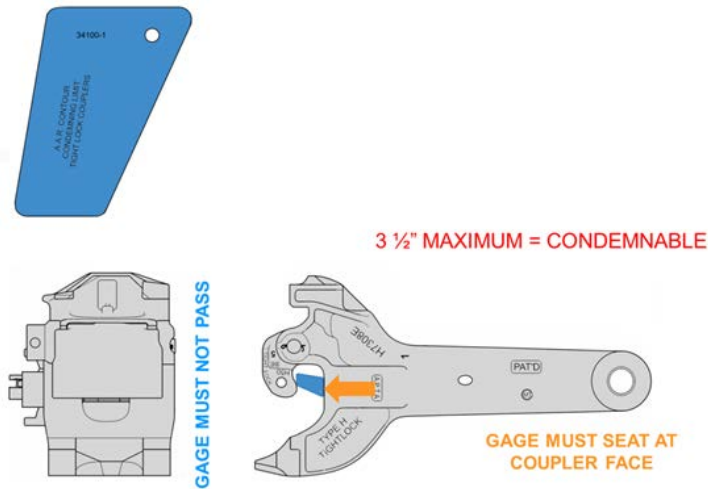
3.5.1 Free slack

Free slack in the contour of a Tightlock coupler develops very slowly in service when it is mated with another Tightlock coupler, but when coupled with non-Tightlock couplers the wear rate is somewhat accelerated. A value for the limit of contour slack due to wear has been set at $\frac{3}{8}$ in. (0.95 cm) as checked with gage No. 34100-1, **Figure 13**.

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FIGURE 13

Contour Inspection Limit Gage No. 34100-1



3.5.2 Exceeding the limit

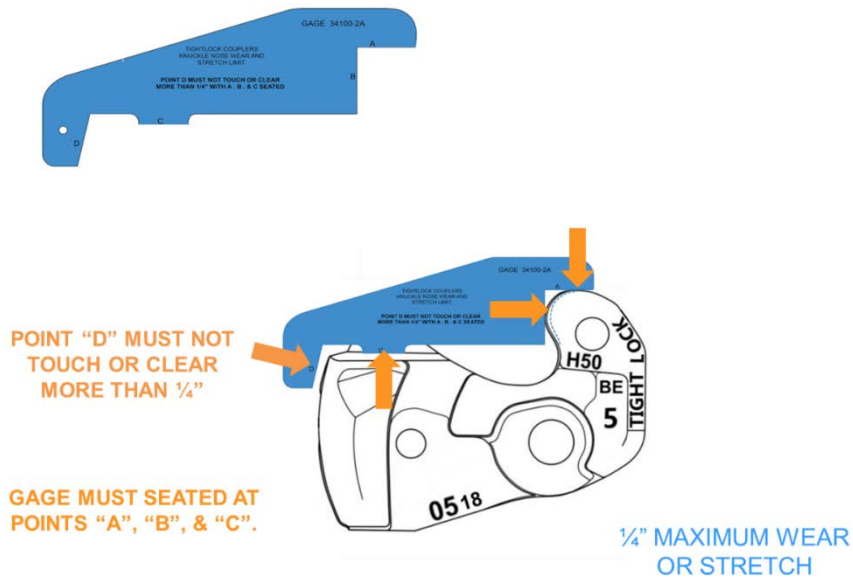
When the coupler contour exceeds the limit of gage No. 34100-1, the knuckle pivot pin should be removed and replaced. If the limit of the gage is still exceeded after the replacement of the knuckle pivot pin, then the knuckle should be removed and replaced with a new knuckle. If this substitution does not bring the coupler within the limits of gage No. 34100-1, then the lock may be replaced with a new lock. If the contour is still not within the limits of gage No. 34100-1, the coupler body should be replaced.

3.5.3 Knuckle removed

Any knuckle removed per Section 3.5.2 shall be checked with the nose wear and stretch limit gage No. 34100-2A, as shown in **Figure 14**. If the limits of this gage are reached, indicating wear and/or stretch of 1/4 in. (0.63 cm) or more, then the knuckle shall be scrapped.

FIGURE 14

Knuckle Nose Wear and Stretch Limit Gage No. 34100-2A



4. Coupler body and parts

4.1 Portions missing

Coupler body and parts, yokes, and connections, cracked, broken and/or with portions thereof missing, shall be replaced.

4.2 Shank wear plates

On couplers requiring shank wear plate, the wear plate shall be replaced if it is worn more than $\frac{3}{16}$ in. deep or is missing or loose. If the wear plate is replaced, then the replacement wear plate must have fully developed chamfers on the edges. Coupler not requiring shank wear plate shall be replaced if the shank is worn more than $\frac{3}{8}$ in. (0.95 cm) deep. Shank wear plates shall be repaired or replaced only in accordance with the latest revision of APTA PR-M-RP-004-98, "Secondhand and Reconditioned Type H Tightlock Coupler Systems," with coupler removed from car.

4.3 Out of alignment

Coupler shall be replaced when shank is obviously bent out of alignment with coupler head, including rippling of walls.

4.4 Coupler body pin protector and pivot lugs

4.4.1 Passenger service equipment

On passenger service equipment, a coupler with a cracked or broken pin protector boss or pivot lug shall be removed from service.

4.5 Locks

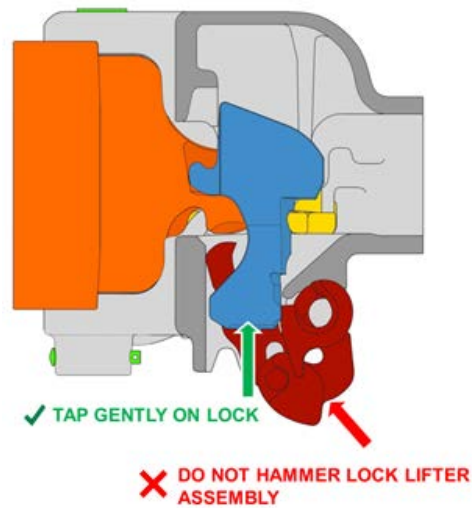
4.5.1 Closed knuckle

When the knuckle is closed, the lock shall be seated not more than $\frac{1}{8}$ in. (0.32 cm) above the knuckle tail shelf, but should be preferably seated on the shelf. When adjustment is necessary, metal should be removed from the guard arm (non-tapered) side of the lock by grinding or preferably by machining. The amount of metal to be removed is one-eighth the distance the lock is to be lowered. For example, if the lock is $\frac{1}{8}$ in. (0.32 cm) above the shelf and it is to be seated on the shelf, then the amount of metal to be removed from the lock face is one-eighth of $\frac{1}{8}$ in. (0.32 cm) or $\frac{1}{64}$ in. (0.4 mm).

4.5.2 Stuck lock

In the event a lock becomes stuck, it should be released by tapping upward on the bottom of the lock leg through the lock hole shroud. No hammering should ever be done on any part of the locklift assembly, as this may cause distortion and result in faulty operation of the coupler. Locations on the coupler where tapping is prohibited and permitted are illustrated in **Figure 15**. Sticking locks can be relieved by reducing the thickness of the lock, as described in Section 4.5.1.

FIGURE 15
Procedure for Freeing Stuck Lock



5. Cleaning and lubrication

5.1 Satisfactory operation

Tightlock couplers should be cleaned frequently to ensure satisfactory operation. Dirt or other foreign matter should be removed with a dry air blast or other means.

5.2 Debris

The inside of the coupler head, the coupler operating parts and the machined surfaces of the coupler contour shall be kept free from any petroleum based-lubricant or paint. A thin layer of dry, non-petroleum-based lubricant is permitted to assist fit-up and to smooth operation

6. Maintenance gages

The various maintenance gages referred to in this recommended practice may be purchased from manufacturers approved by the Mechanical Committee of Standard Coupler Manufacturers (MCSCM) and should be calibrated to the MCSCM drawings at regular intervals as determined by the end user, but no more than five years.

Purchase of drawings for the various maintenance gages referred to should be directed to the indicated contact on the landing page for this recommended practice.

Related APTA standards

APTA PR-M-RP-004-98, latest revision, “Secondhand and Reconditioned Type H Tightlock Coupler System”

References

This standard shall be used in conjunction with the following publications. When the following standards are superseded by an approved revision, the revision shall apply.

Association of American Railroads:

AAR Specification M211, Foundry and Product Approval Requirements for the Manufacture of Couplers, Coupler Yokes, Knuckles, Follower Blocks, and Coupler Parts.

AAR Specification M201, Castings, Steel

AAR Specification M205, Yoke, Coupler Test Requirements

Abbreviations and acronyms

AAR	Association of American Railroads
MCSCM	Mechanical Committee of Standard Coupler Manufacturers
NATSA	North American Transportation Services Association

Summary of document changes

- Title changed to “Inspection and Maintenance of Type H Tightlock Coupler Systems”
- Document formatted to the new APTA standard format.
- Sections have been moved and renumbered.
- Scope and summary moved to the front page.
- Definitions, abbreviations and acronyms moved to the rear of the document.
- Two new sections added: “Summary of document changes” and “Document history.”
- Some global changes to section headings and numberings resulted when sections dealing with references and acronyms were moved to the end of the document, along with other changes, such as capitalization, punctuation, spelling, grammar and general flow of text.
- Participants updated.
- Figures moved from the end of the document and placed into document body near first reference to each figure. Gage descriptions and figures revised to clarify usage and application procedures.
- “Scope and purpose:” Removed reference to M-206 and added reference to APTA PR-M-RP-004-98. Historical industry adoption dates moved to “Introduction.”
- **Figure 1** replaced with exploded view of Type H Tightlock Coupler.
- Added new **Figure 2** detailing the striker face and coupler horn.
- Added note below **Figure 3** indicating that, while the draft gear pictured is double-acting, other varieties exist and can be used.
- Renumbered **Figure 4** (formerly Figure 2A). All subsequent figures were renumbered accordingly.
- Clarified Dimension A in **Figure 4**.
- Replaced **Figure 5** and moved former Section 2.1 to become Section 1.5.
- Renumbered **Figure 6** (formerly Figure 3A). All subsequent figures were renumbered accordingly.
- Added new **Figure 7** detailing tell-tale slot.
- Updated **Figure 8** for clarity.
- Section 3.2: Removed reference to steam lines.
- Updated **Figure 9**, **Figure 10** and **Figure 11** for clarity.
- Section 3.4: Removed reference to additional yokes found in AAR M-205.
- Updated **Figure 12**, **Figure 13** and **Figure 14** for clarity.

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- Added **Figure 15** to illustrate the procedure for freeing a stuck lock.
- Section 6: Added Gage Calibration. Modified gage purchase statement to direct inquiries to the contact on the landing page for this recommend practice.

Document history

Document Version	Working Group Vote	Public Comment/ Technical Oversight	Rail CEO Approval	Policy & Planning Approval	Publish Date
First published	—	—	—	Jan. 22, 1998	March 17 ,1999
First revision	—	—	—	—	Feb. 13, 2004
Second revision	Mar. 30, 2020	Jun. 8, 2020	Jun. 22, 2020	Aug. 31, 2020	Sept. 17, 2020

This document was retitled to its current title from “Inspection and Maintenance of Type H Tightlock Couplers” as part of Rev. 2. For all previous publications of this document prior to Rev. 2, unless otherwise indicated, this document was titled “Inspection and Maintenance of Type H Tightlock Couplers.”