



## APTA PR-M-RP-004-98, Rev. 2

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PRESS Mechanical Working Group

# Secondhand and Reconditioned Type H Tightlock Coupler Systems

**Abstract:** This recommended practice covers requirements for secondhand and reconditioned Type H Tightlock couplers and their parts.

**Keywords:** secondhand couplers, reconditioned couplers

**Summary:** This document details requirements for secondhand and reconditioned APTA-approved Type H Tightlock couplers and their parts, coupler yokes, draft gear followers, connecting pins and other parts used in the coupler and yoke passenger car applications. This recommended practice was titled “Secondhand and Reconditioned Type H Tightlock Couplers” in the previous publication of this document.

**Scope and purpose:** This recommended practice contains the requirements for secondhand and reconditioned Type H Tightlock Coupler Systems. Its recommendations do not cover requirements for proprietary parts, except as noted in Section 2. This document applies to the APTA coupler head. For CEM and nonstandard couplers, refer to OEM for reconditioning practices.

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## Introduction

*This introduction is not part of APTA PR-M-RP-004-98, Rev. 2, “Secondhand and Reconditioned Type H Tightlock Coupler Systems” (formerly titled “Secondhand and Reconditioned 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.

# Secondhand and Reconditioned Type H Tightlock Coupler Systems

## 1. Controls

For purposes of this specification, the following controls shall apply.

### 1.1 Draft gear followers

Draft gear followers shall be reconditioned in accordance with AAR Specification M-212.

### 1.2 Knuckle pivot pins

Knuckle pivot pins may be reused if they meet the requirements outlined in AAR Specification M-212, current issue.

### 1.3 Coupler bodies and yokes

Only coupler bodies and yokes shall be reconditioned in accordance with this specification, Sections 4.1 and 4.2. All crash energy management (CEM) system coupler heads must be returned to the original equipment manufacturer for reconditioning.

### 1.4 Non-reconditioned parts

The following parts must not be reconditioned:

- a. Coupler knuckles and locks
- b. Knuckle throwers
- c. Coupler shank bushings
- d. Knuckle pivot support pins
- e. Rotary locklift assemblies
- f. Connecting pins
- g. Radial connection seats
- h. Coupler shank pin retaining keys
- i. Yoke pins
- j. Radial connection bushings

### 1.5 Rotary locklift

Rotary locklift assemblies must not be used secondhand.

## 2. Classification procedure

AAR Type T Tightlock couplers, parts and yokes must not be classified for further service.

Parts or assemblies classified as proprietary are suitable for secondhand classification or reconditioning after consulting with the manufacturer to determine conformance with this specification.

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The results of inspection and gaging will determine if a part or assembly is suitable for secondhand classification or for reconditioning.

## **2.1 Parts inspections**

Parts to be classified must be disassembled for inspection.

Parts must be clean and free of dirt, paint, rust and scale, which may interfere with gaging and inspection.

Parts must be visually inspected for cracks, fractures, sections broken out, worn surfaces, distortion, surface upset and service notches.

## **2.2 Gauge drawings**

The drawings of the various gages listed in this specification may be purchased from the Mechanical Committee of Standard Coupler Manufacturers (MCSCM). Gages can be purchased from manufacturers approved by the MCSCM.

## **3. Secondhand acceptance requirements**

### **3.1 Parts and assemblies**

Parts and assemblies must be evaluated in accordance with the procedures in Section 2 and meet the requirements of APTA PR-M-RP-002-98, latest revision, "Inspection and Maintenance of Type H Tightlock Coupler Systems." Parts or assemblies must not be painted.

### **3.2 Dry lubricant**

Only dry lubricant shall be applied to the coupler head or the coupler head fittings. This lubricant may be applied using a water, alcohol or other non-petroleum-based carrier.

### **3.3 Debris**

Part or assembly must be free of cracks, fractures, sections broken out and service notches.

### **3.4 Surface upset**

Surface upset must be ground and blended to the surrounding surfaces. This ground area must be free of cracks.

## **4. Reconditioning procedures**

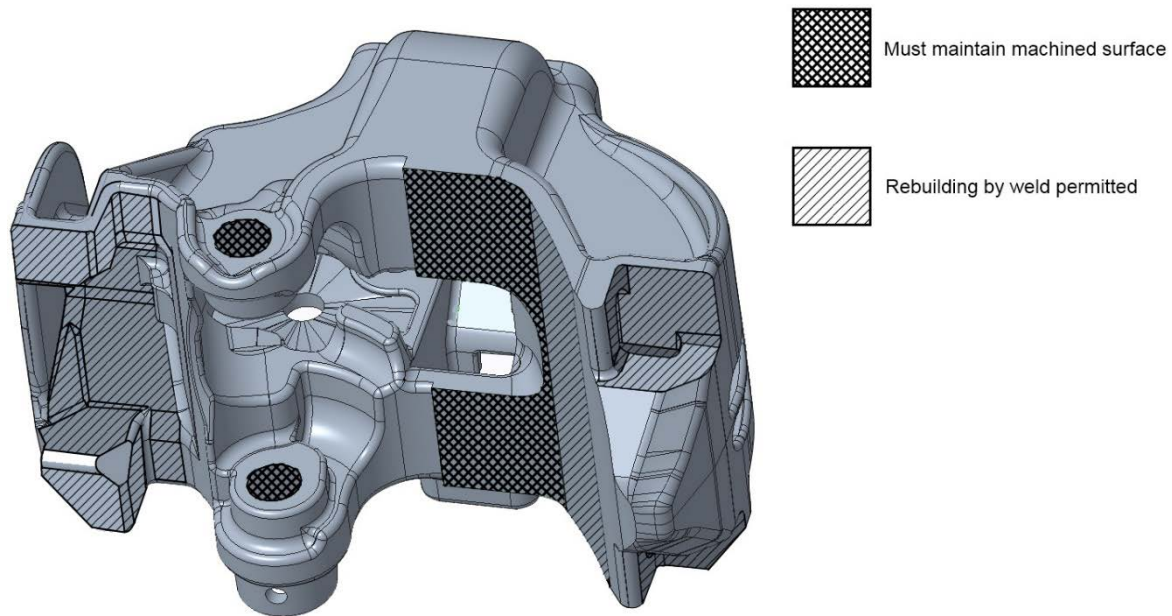
### **4.1 Coupler**

#### **4.1.1 Coupler body**

Acceptable surface finishes on certain faces of the coupler body are detailed in **Figure 1**. Cross-hatched areas of coupler head must remain machine-finished. Hatched areas can be rebuilt by weld and blended with hand grinding per Section 5. Bushings must be replaced if the complete coupler body is heat-treated.



**FIGURE 1**  
Acceptable Surface Finishes



#### 4.1.1.1 Shank wear against carrier

Coupler shanks that are worn to a depth not exceeding  $\frac{1}{4}$  in. (0.63 cm) into the bottom wall, due to contact with the carrier, may be restored by machine-finishing the worn surface to a depth of  $\frac{1}{4}$  in. (0.63 cm). A steel wear plate, in accordance with AAR Standard S-137, shall then be welded in place. Couplers worn in excess of  $\frac{1}{4}$  in. (0.63 cm) in this location must *not* be reconditioned. Coupler shank wear plates that are loose, missing or worn in excess of  $\frac{1}{8}$  in. (0.32 cm) must be replaced.

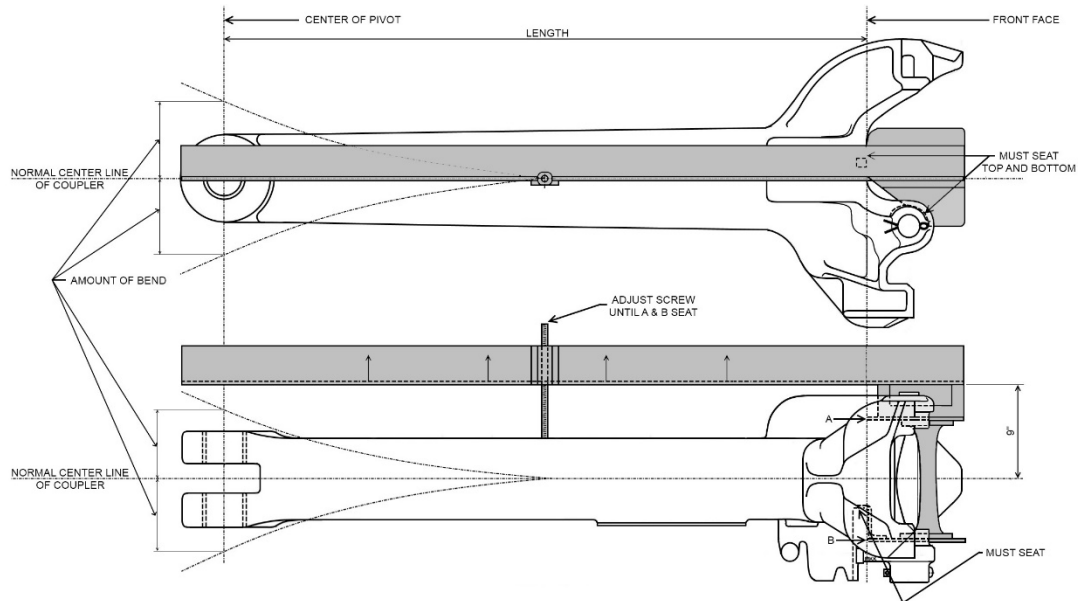
#### 4.1.1.2 Bent shank

Couplers with shanks bent in any direction out of alignment with the front face of the coupler head, as typically illustrated in **Figure 2**, may be reconditioned, provided that the following conditions are met:

- No cracks have developed as a result of bending.
- The amount of bend, measured as shown in **Figure 2** using gage No. 34105, does not exceed 1 in. per foot of shank length, measured from front face to pivot point of shank.
- Top wall is not buckled.

To satisfactorily perform the straightening operation, except in cases where there is only a slight amount of bend, the shank shall be heated in the locality of the bend. The amount of heat necessary may vary according to the degree of bend, but in most cases, temperatures from 1500 to 1600 °F (816 to 871 °C) will be required. The heat should be applied on the side toward the bend (concave) side. The straightening pressure should be applied through a heavy plate placed on the shank to distribute the load and prevent indentation.

**FIGURE 2**  
Shank Distortion Reconditioning Gage No. 34105



After straightening, a careful examination should be made to make certain no cracks have resulted from this operation. When shanks are bent near the horn, extreme care must be exercised to avoid distortion of the head during the straightening operation. In all cases where shanks have been heated to straighten, the coupler body shall be heat-treated in accordance with Section 6. Couplers with shanks bent in excess of 1 in. per foot in any direction out of line with the front face of the head, or that have developed cracks as a result of bending or straightening, shall not be reconditioned. After completion of the straightening operation, the alignment of the shank should be checked using gage No. 34105 (**Figure 2**).

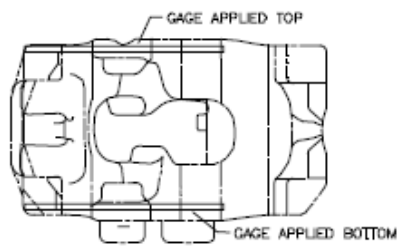
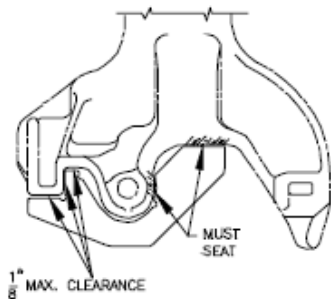
#### 4.1.1.3 Aligning wing pocket distorted

Couplers with distorted aligning wing pockets may be restored to normal by locally heating the distorted area and straightening under a press, or by other suitable means. The amount of heat necessary may vary according to the degree of distortion, but in most cases temperatures of 1500 to 1600 °F (816 to 871 °C) will be required. Care should be exercised to confine the heat as much as possible to the pocket proper in order to prevent distortion of the coupler head during the straightening operation. The coupler body is then to be heat-treated in accordance with Section 6.

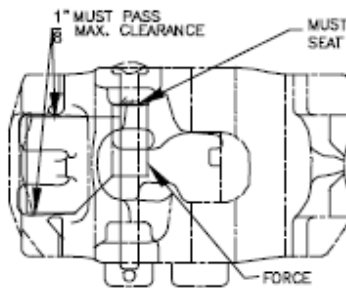
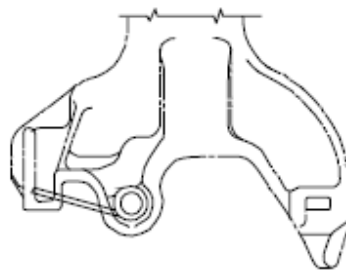
Gage No. 34101-1, shown in **Figure 3**, and gage No. 34101-2, shown in **Figure 4**, should be used during the straightening operation. The completed work shall then be checked and must meet the requirements of gage No. 34102, shown in **Figure 5**.

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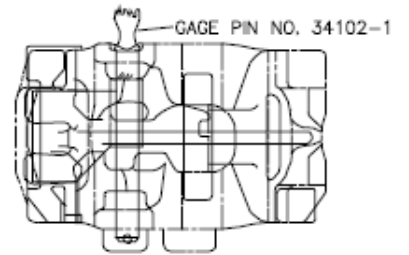
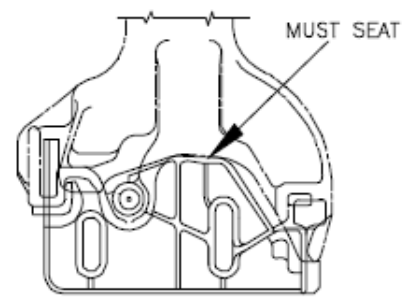
**FIGURE 3**  
Aligning Wing Reconditioning Gage  
No. 34101-1



**FIGURE 4**  
Aligning Wing Reconditioning Gage  
No. 34101-2



**FIGURE 5**  
Aligning Wing Reconditioning Gage  
No. 34102



**4.1.1.4 Aligning wing pocket cracked**

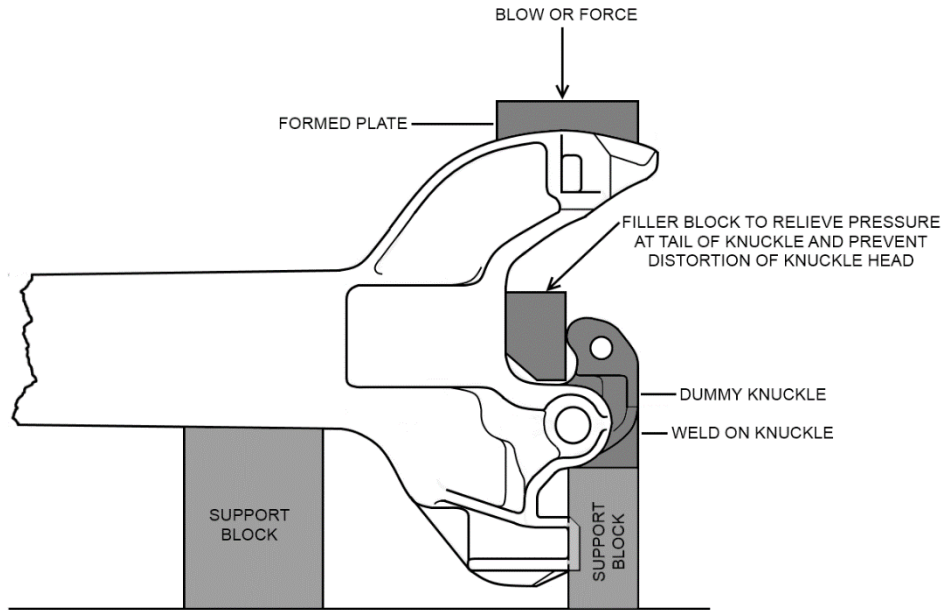
Couplers with cracks in the aligning wing pocket may be reconditioned by welding, in accordance with Section 5, provided that any such cracks do not extend into the coupler head proper. Couplers having cracks in the aligning wing pocket extending into the coupler head proper, or with the aligning wing pocket broken off, shall not be reconditioned.

**4.1.1.5 Guard arm distortion and cracks**

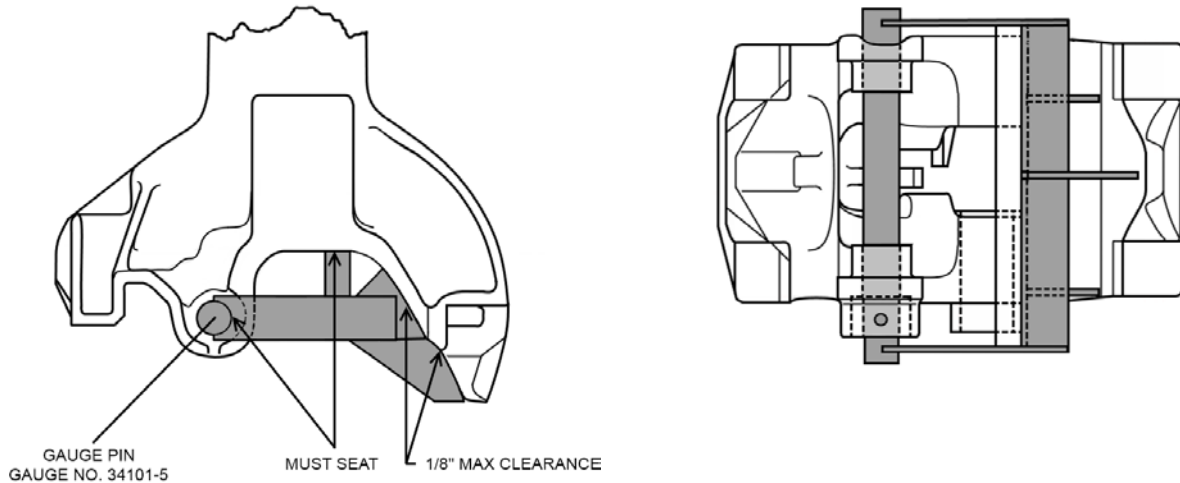
Couplers with cracks in the guard arm may be reconditioned by welding, in accordance with Section 5, provided that any such cracks do not extend into the coupler head proper. Couplers having cracks in the guard arm extending into the coupler head proper, or with the guard arm broken off, shall not be reconditioned. Couplers having the guard arm distorted may be restored to normal, either in a press or under light blows of a power hammer. A suggested setup for performing this operation is illustrated in **Figure 6**.

In preparation for straightening, the outside of the guard arm in the zone approximating the center should first be heated to approximately 1500 to 1600 °F (816 to 871 °C). The straightening force should be applied to the forward portion of the guard arm through a heavy steel plate formed to the outer contour of the guard arm in this vicinity to distribute the load and avoid possible indentation. Extreme care must be exercised to avoid distortion of the coupler head during the straightening operation. Gage No. 34101-3A, **Figure 7**, should be used during the straightening operation to determine when restoration is completed.

**FIGURE 6**  
Suggested Setup for Straightening Guard Arm



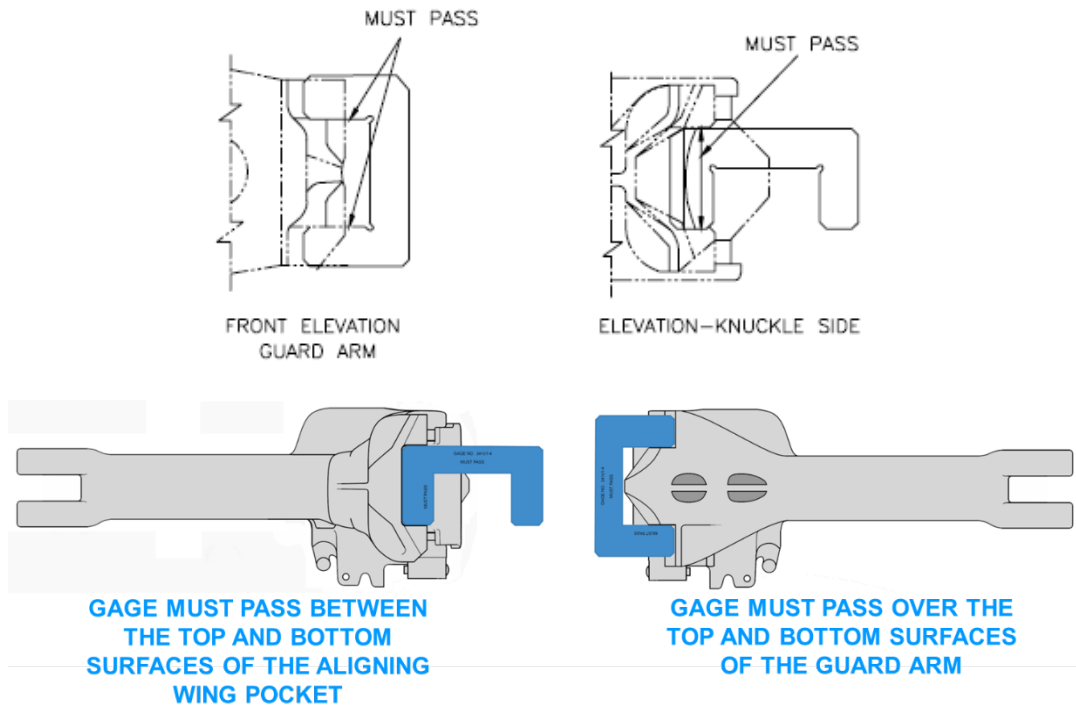
**FIGURE 7**  
Aligning Wing Reconditioning Gage No. 34101-3A



In some cases, vertical distortion of the guard arm has occurred, presumably caused by severe impact on the outer end. This results in increasing the distance between the top and bottom vertical interlocking faces on the guard arm and thus prevents coupling with another Tightlock coupler. This condition can be corrected by pressing after heating to 1500 to 1600 °F (816 to 871 °C). Gage No. 34101-4, shown in **Figure 8**, is provided for use to detect such distortion during the pressing operation. An examination shall be made after straightening to make certain no cracks have developed as a result of this operation. The coupler body is then to be heat-treated in accordance with Section 6. After heat treatment, a final check of the coupler should be made using gage No. 34102, **Figure 5**.

**FIGURE 8**

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

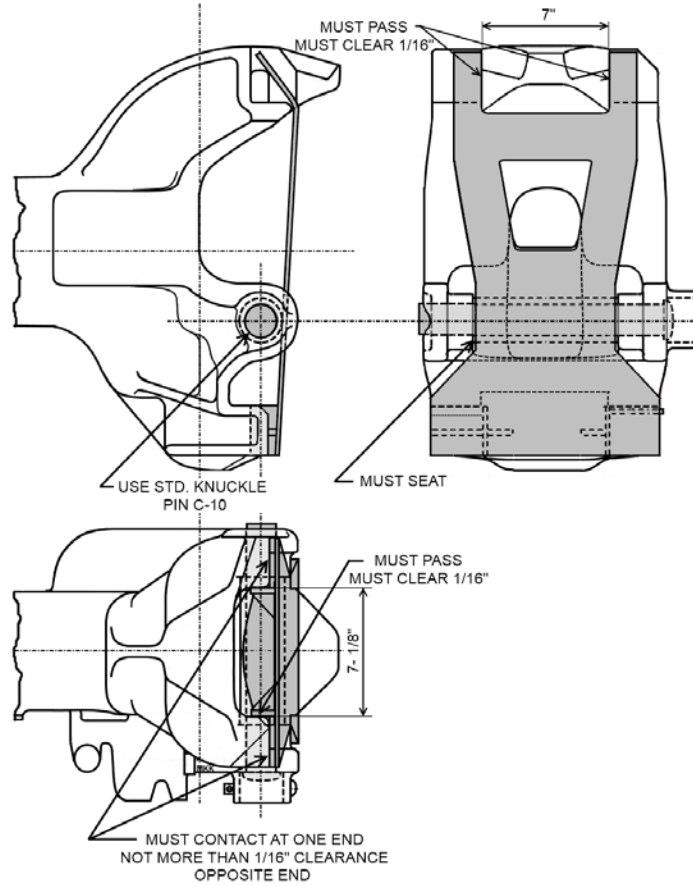


#### 4.1.1.6 Wear on aligning surfaces

Coupler aligning wing pockets and guard arms with worn aligning surface may be reconditioned by welding. Gage No. 40097, shown in **Figure 9**, shall be used during buildup of weld and after being ground smooth; the completed work shall meet the gage requirements. Care shall be taken to blend the built-up area into the existing sloping surface of the guard arm nose, which shall be maintained. The vicinity of the welded area shall then be stress relieved by heating locally to a temperature between 750 and 930 °F (399 and 499 °C) and allowed to cool slowly in still air.

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**FIGURE 9**  
Aligning Wing Pocket and Guard Arm Aligning Surfaces Reconditioning Gage No. 40097



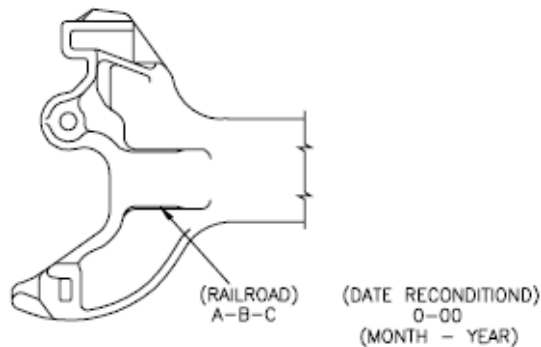
**4.1.1.7 Lock seated**

All reconditioned Tightlock couplers should have the locks seated not more than 1/8 in. (0.32 cm) above the knuckle tail shelf, but preferably on the shelf.

**4.1.1.8 Identifying reconditioned couplers**

All couplers reconditioned must be identified by stamped markings in accordance with **Figure 10**.

**FIGURE 10**  
Marking



## 4.2 Yokes and radial connections

Yokes and radial connections must not be reconditioned except for replacement of bushings.

## 4.3 Coupler and yoke bushings

When bushings are loose or worn excessively, they will be replaced. Replace bushings that are loose or worn more than halfway through their wall sections. For replacement bushings, see AAR Standard S-100.

## 5. Welding

See AAR Specification M-212 for welding instruction. Welding on knuckles and coupler components is prohibited entirely.

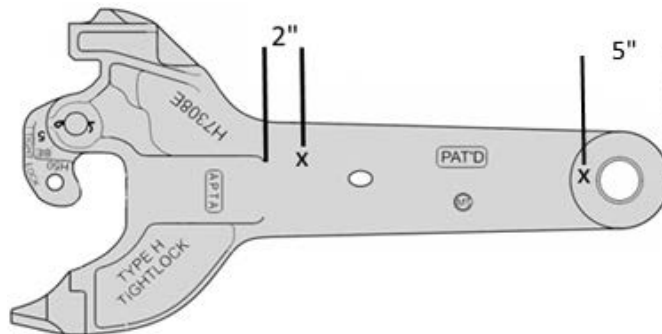
## 6. Heat treatment

Heat treatment is required after weld repair and heat straightening (hot mechanical straightening). See AAR Specification M-212 for heat treatment instructions.

## 7. Reconditioned acceptance requirements

Hardness readings should be taken after heat treatment at the locations indicated in **Figure 11**. See **Table 1** for acceptable hardness ranges. A minimum of two coupler bodies shall be tested per heat treatment load.

**FIGURE 11**  
 Hardness Reading Locations



**TABLE 1**  
 Acceptable Hardness Ranges

Steel Grade	Hardness Range (BHN)
Grade C	179–241
Grade E	241–311

### 7.1 Evaluation

Part must be evaluated in accordance with the procedure in Section 2 of this specification.

### 7.2 Painting

Part or assembly must not be painted after reconditioning.



### 7.3 Dry lubricant

Only dry lubricant shall be applied to the coupler head or the coupler head fittings. This lubricant may be applied using a water, alcohol or other non-petroleum-based carrier.

### 7.4 Service defects

Part or assembly must be free of cracks, fractures, sections broken out and service notches.

### 7.5 Surface upset

Surface upset must be ground and blended to the surrounding surfaces. This ground area must be free of cracks.

### 7.6 Process

Process procedure must be in accordance with Section 4.

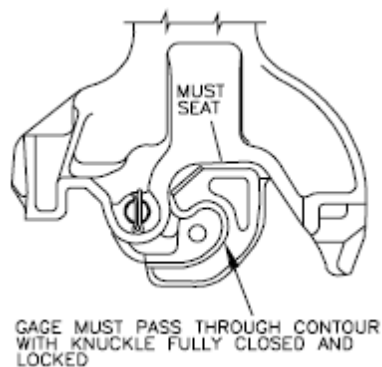
### 7.7 Identification

The part or assembly classified as reconditioned must have, by the required methods, identification of the remanufacturing facility doing the reconditioning and its location. Records of repairs can be made available at the request of the purchaser. These records may include which gages failed prior to repair, materials/processes used in the repairs, and gages used to requalify the coupler.

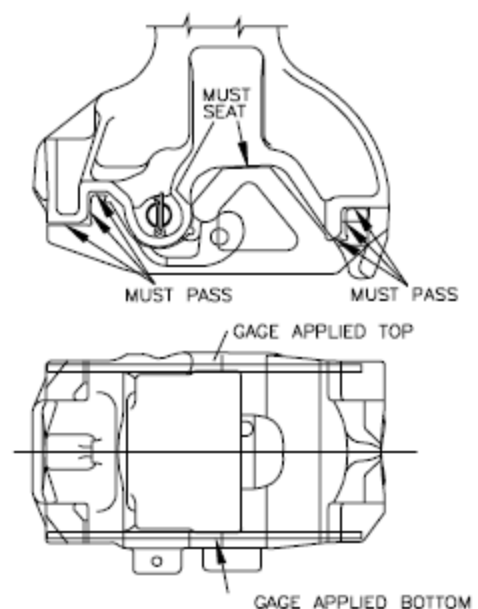
### 7.8 Inspection and maintenance

In addition to the aforementioned requirements, all reconditioned parts must meet requirements of APTA PR-M-RP-002-98, latest revision, "Inspection and Maintenance of Type H Tightlock Coupler Systems," including all field maintenance gages. Further details of gage application including inquiries regarding the purchase of maintenance gages can be also found in APTA PR-M-RP-002-98, latest revision. **Figure 12**, **Figure 13**, **Figure 14** and **Figure 15** are included for reference.

**FIGURE 12**  
Contour Maintenance Gage No. 31000



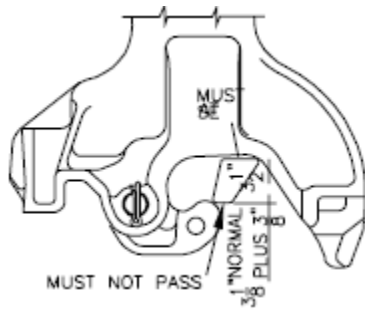
**FIGURE 13**  
Aligning Wing Limit Gage No. 32600



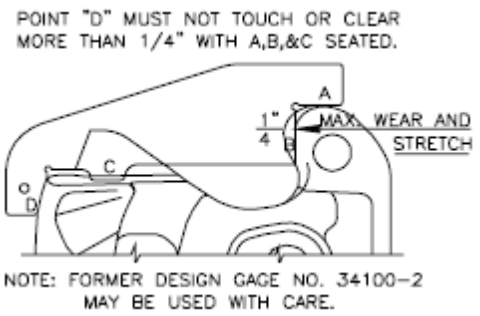


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**FIGURE 14**  
Contour Condemning Limit Gage No. 34100-1



**FIGURE 15**  
Knuckle Nose Wear and Stretch Limit Gage No. 34100-2A



## 8. Storage

See Section 5.12 of APTA PR-M-RP-003-98, latest revision, "Purchase and Acceptance of Type H Tightlock Coupler Systems."

## Related APTA standards

**APTA PR-M-RP-002-98**, “Inspection and Maintenance of Type H Tightlock Coupler Systems”

**APTA PR-M-RP-003-98**, “Purchase and Acceptance of Type H Tightlock Coupler Systems”

## 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 M-212, Couplers and Yokes, Secondhand—Classification and Reconditioning Procedure. Sections 5.1 and 5.2

AAR Standard S-100, Bushings, Seamless Steel Tube—Coupler Shanks and Yokes

AAR Standard S-137, Coupler Shank Wear Plates and Application

## Definitions

For purposes of this specification, the following definitions shall apply:

**secondhand:** Any used component or assembly, meeting the requirements of this specification, that can be reused without reconditioning, except where noted.

**reconditioned:** Any component that has been rebuilt and/or heat-treated in accordance with this specification.

**new:** Any component not previously used that meets the requirements of APTA PR-M-RP-003-98, “Purchase and Acceptance of Type H Tightlock Coupler Systems,” which may be used in assemblies defined by these specifications.

**proprietary:** Any component having an identification number other than current APTA or former AAR catalog numbers.

## Abbreviations and acronyms

<b>AAR</b>	Association of American Railroads
<b>BHN</b>	Brinell hardness number
<b>CEM</b>	crash energy management
<b>MCSCM</b>	Mechanical Committee of Standard Coupler Manufacturers
<b>NATSA</b>	North American Transportation Services Association
<b>OEM</b>	original equipment manufacturer

## Summary of document changes

- Title changed to “Secondhand and Reconditioned 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.

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- 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: Historical industry adoption dates moved to “Introduction.”
- Scope and purpose: Added “This recommended practice applies to the APTA coupler head. For CEM and nonstandard couplers, refer to OEM for reconditioning practices.”
- Section 1.1: Removed section reference.
- Section 2: Added “including CEM style” to first paragraph.
- Section 2.2: Title changed to gage drawings. Text revised to indicate that gage drawings may be purchased from the Mechanical Committee of Standard Coupler Manufacturers for a nominal fee.
- Section 3.2: Added graphite as an acceptable dry lubricant.
- Section 4.1.1: Added new text and **Figure 1** detailing machined surfaces and weld-permissible surfaces.
- Section 4.1.1.1: Added wear plate language.
- Section 4.2: Title changed to “Yokes and radial connections.”
- Section 5: Added “Hardness reading should be taken at the locations indicated in **Figure 11**.” Added **Figure 11**, “Hardness Reading Locations.” Added **Table 1**, “Acceptable Hardness Ranges.”
- Sections 5 and 6: Added “Surface welding is prohibited.”
- Section 7.3: Added graphite as an acceptable dry lubricant.
- References: Removed AAR M-206 and added AAR S-137.

**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 “Secondhand and Reconditioned 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 “Secondhand and Reconditioned Type H Tightlock Couplers.”