

# 3. APTA PR-M-RP-002-98

## Recommended Practice for Inspection and Maintenance of Type H-Tightlock Couplers

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**APTA PRESS Task Force**

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**APTA Commuter Rail Executive Committee**

**Abstract:** This recommended practice assists inspection and maintenance forces to detect and correct improper conditions involving the complete coupler, coupler parts, coupler operating mechanism, yoke, radial connection and attachments.

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

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# APTA PR-M-RP-002-98

## Recommended Practice for Inspection and Maintenance of Type H-Tightlock Couplers

### 1. Overview

#### 1.1 Scope and purpose

This recommended practice assists inspection and maintenance forces to detect and correct improper conditions involving the complete coupler, coupler parts, coupler operating mechanism, yoke, radial connection and attachments. 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, APTA Specification M-206A should be followed.

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

### 2. 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 When the following standards are superseded by an approved revision, the revision shall apply.

AAR Specification M-205, Coupler Yokes and Figure 2A

APTA PR-M-RP-004-98, Recommended Practice for Second Hand and Reconditioned Type H-Tightlock Couplers

### 3. General

#### 3.1 Tightlock couplers

Figure 1 depicts a typical tightlock coupler. Tightlock couplers must be maintained in a level position on the coupler carrier to insure 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.

#### 3.2 Steam and train lines and supports

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

### 3.3 Slack

Excessive slack in the draft attachments 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. 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 draft arrangement. The maximum free slack permitted is 1/2 inch (1.27 cm).

### 3.4 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 inspections described in 4.2 or 4.3. Any cracked or broken part uncovered by this inspection must be replaced.

Refer to tightlock coupler and draft gear system, Figure 2. An APTA C-Y65 yoke and a twin unit draft gear are shown for purposes of illustration. Additional yokes are identified in AAR Specification M-205, Coupler Yokes and Figure 2A.

Also refer to the APTA tightlock coupler No. 6 operating mechanism, as shown in Figure 3. The double operating mechanism is as shown in Figure 3A.

An exploded view of the Type H tightlock coupler is shown in Figure 4.

## 4. Operation

### 4.1 Operating rod conditions

The operating rod conditions specified in Figure 3 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 3, it is important to maintain rod eye clearance (Dimension A) when the coupler is centered on the carrier and fully locked.

### 4.2 Opening

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

### 4.3 Dropping

The lock must drop freely to the locked position when the knuckle is fully closed. The coupler is fully locked when the telltale recess in the lock hole shroud is clear and unobstructed as shown in Figure 1.

## **4.4 Anti-Creep protection**

Anti-creep protection must be assured in accordance with procedures illustrated in Figure 5.

## **5. Contour inspection**

### **5.1 Not meeting requirements**

Couplers and/or knuckles not meeting the gaging requirements of this Section shall be removed from service.

### **5.2 Correctness of contour**

Correctness of contour must be checked with gage No. 31000 as shown in Figure 6. If the gage does not pass, parts may be replaced or locks modified in accordance with 6.5.1 to allow passage of the gage.

### **5.3 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 7 and vertical height aligning wing pocket and guard arm gage No. 34101- 4 as shown in Figure 10.

### **5.4 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 11.

### **5.5 Contour slack**

#### **5.5.1 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 3/8" (.95 cm) as checked with gage No. 34100-1, Figure 8.

#### **5.5.2 Exceeding the limit**

When the coupler contour exceeds the limit of gage No. 34100-1, 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.

### 5.5.3 Knuckle removed

Any knuckle removed per 5.5.2 shall be checked with the nose wear and stretch limit gage No. 34100-2A as shown in Figure 9. If the limits of this gage are reached, indicating wear and/or stretch of 1/4" (.63 cm) or more, the knuckle shall be scrapped.

## 6. Coupler body and parts

### 6.1 Portions missing

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

### 6.2 Shank wear plates

On couplers requiring shank wear plate, the wear plate shall be replaced if it is worn more than 3/16" deep or is missing or loose. Coupler not requiring shank wear plate shall be replaced if the shank is worn more than 3/8" (.95 cm) deep. Shank wear plates shall be repaired or replaced only in accordance with *APTA PR-M-RP-004-98*<sup>1</sup>, with coupler removed from car.

### 6.3 Out of alignment

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

### 6.4 Coupler body pin protector and pivot lugs

#### 6.4.1 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.

### 6.5 Locks

#### 6.5.1 Closed knuckle

When the knuckle is closed, the lock shall be seated not more than 1/8" (.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 1/8" (.32 cm) above the shelf and it is to be seated on the shelf the amount of metal to be removed from the lock face is one-eighth of 1/8" (.32 cm) or 1/64" (.4 mm).

---

<sup>1</sup> For references in Italics see Section 2.

### **6.5.2 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. Sticking locks can be relieved by reducing the thickness of the lock as described in Section 6.5.1.

## **7. Cleaning and lubrication**

### **7.1 Satisfactory operation**

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

### **7.2 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 lubricant or paint.

## **8. Maintenance gages**

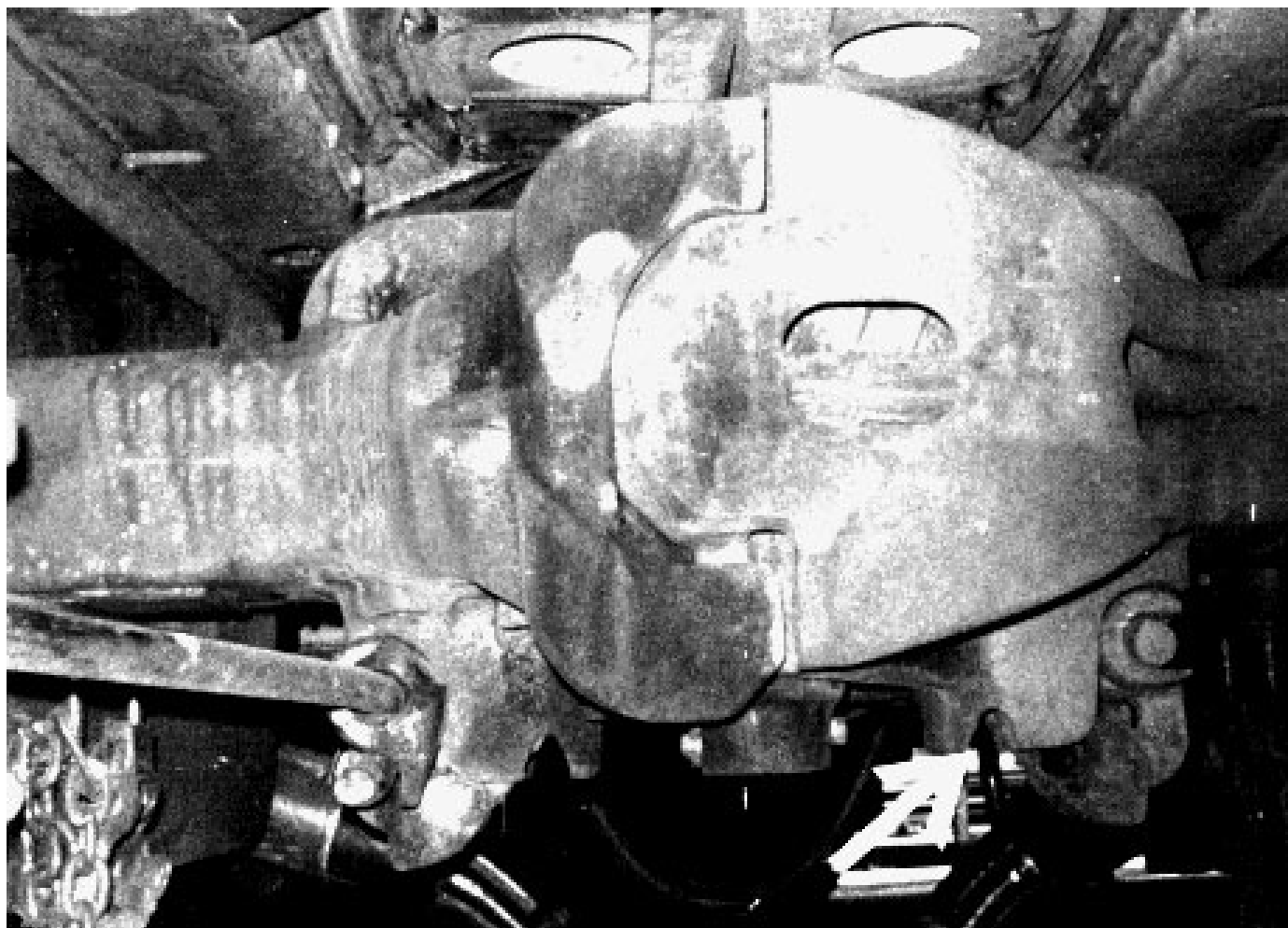
The various maintenance gages referred to in these specifications may be purchased from the Standard Coupler manufacturers.

Purchase of drawings for the various maintenance gages referred to should be directed to:

Office of the Chairman  
Mechanical Committee of the Standard Coupler Manufacturers  
10 S. Riverside Plaza - 10th Floor  
Chicago, IL 60606



Figure 1



TELL TAIL SLOT

American Public Transit Association

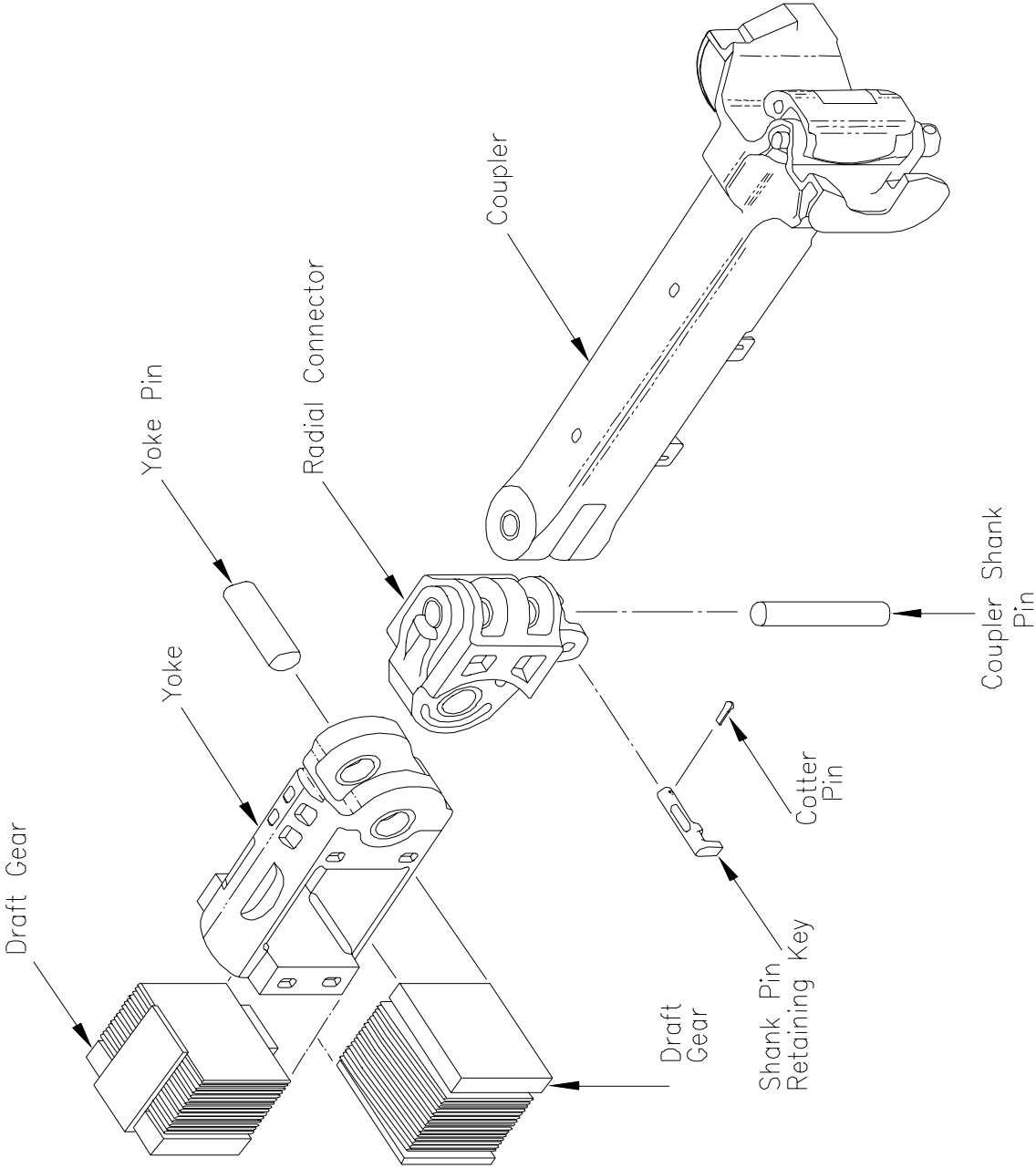


FIG. 2

Figure 2A

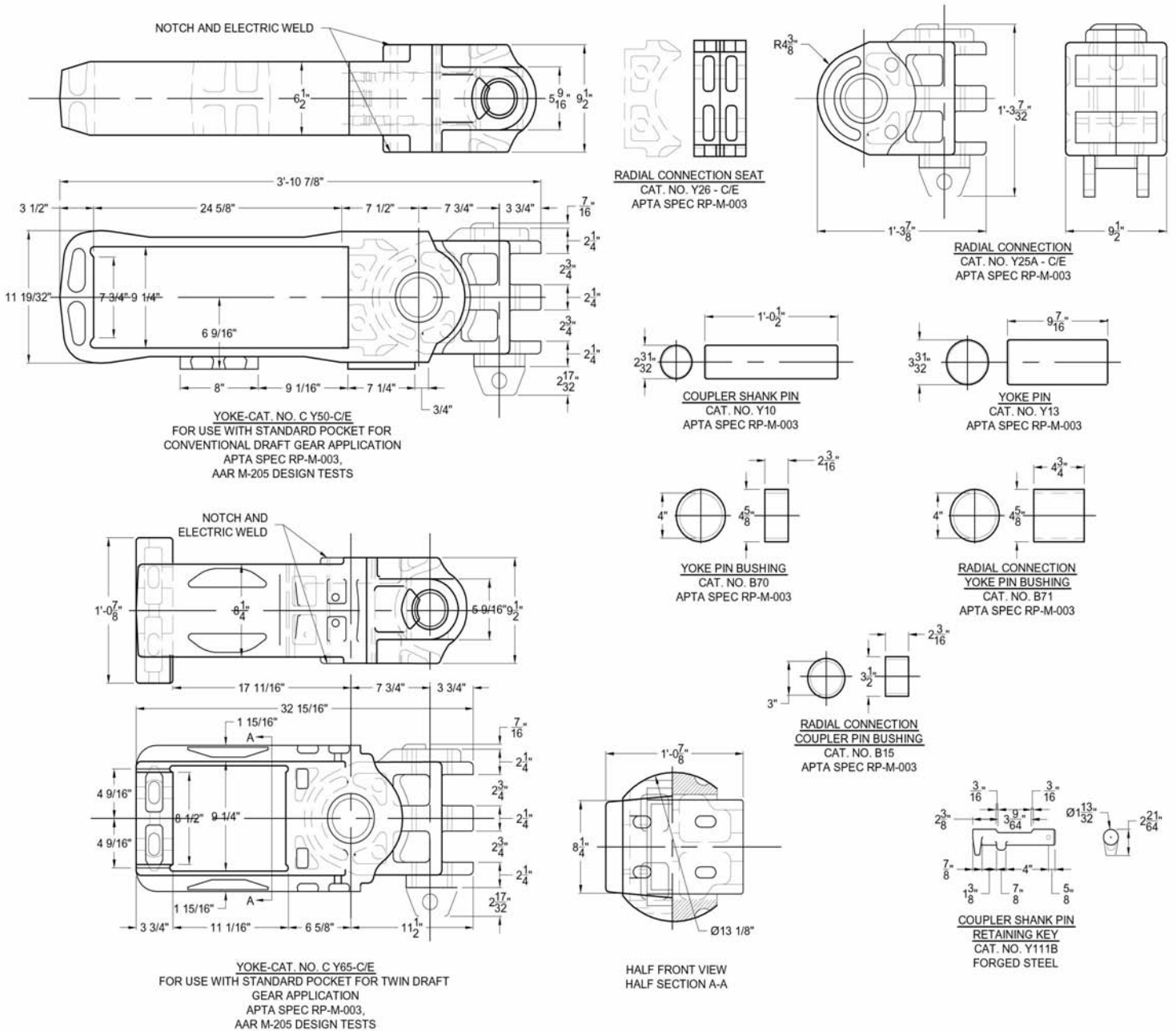
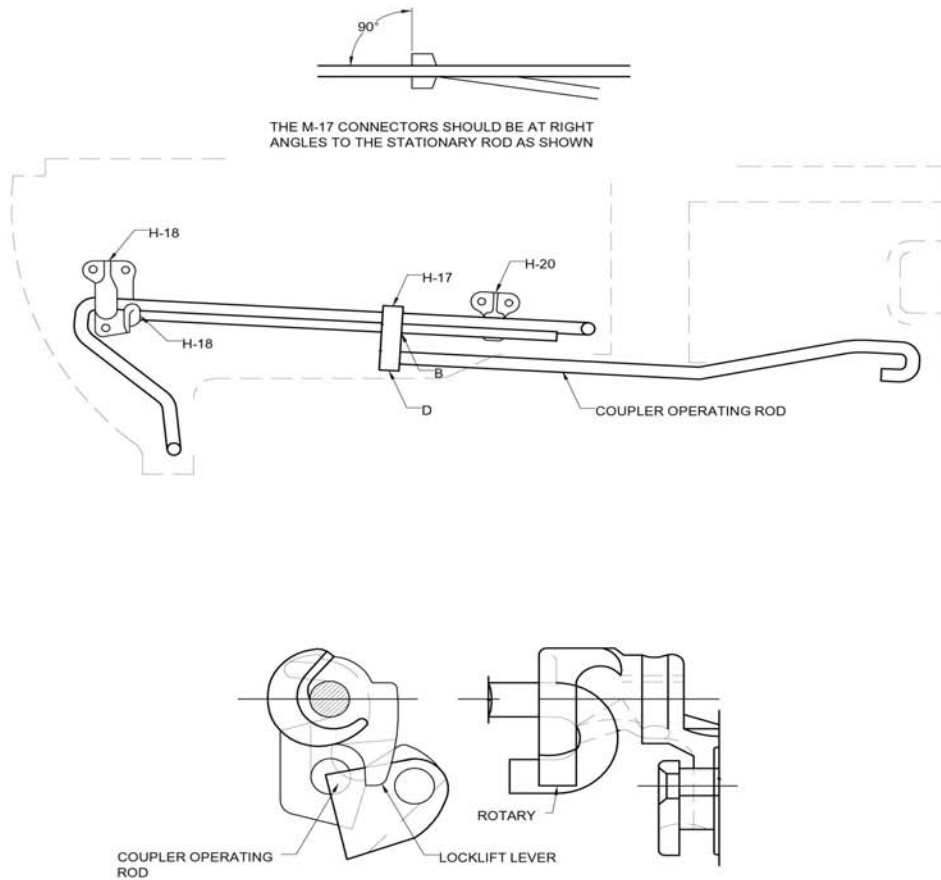


Figure 3

ENLARGED VIEW OF LOCK LIFT LEVER AND OPERATING ROD EYE



**IMPORTANT:**

THERE MUST BE 1/8" TO 1/4" CLEARANCE AT THE CLOSEST POINT BETWEEN THE OPERATING ROD EYE 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 H-17 CONNECTOR AT "D".

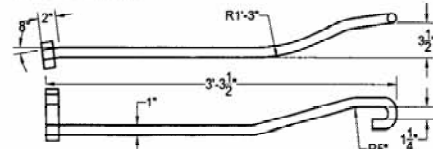
SAME CONDITIONS APPLY TO OPERATING RODS ON RIGHT SIDE WHEN USED

Figure 3A

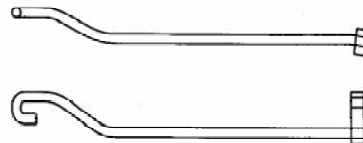
STANDARD H TIGHTLOCK COUPLER  
OPERATING MECHANISM TYPE NO. 6

NOTES:

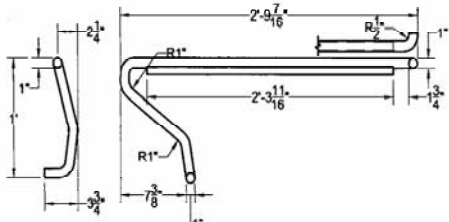
1. COUPLER OPERATING RODS TO BE FURNISHED BY RAILROADS. COUPLER OPERATING BRACKETS (CASTINGS) TO BE FURNISHED BY COUPLER MANUFACTURER.
2. WHEN T TYPE COUPLERS ARE MODIFIED FOR ROTARY OPERATION (CIRCULAR 942A) THIS DESIGN OF COUPLER MECHANISM IS TO BE USED.
3. WHEN IT IS DESIRED TO OPERATE THE COUPLE FROM THE LEFT SIDE OF THE CAR, ONLY ITEMS H17, H19, H20 AND THE UNCOUPLING RODS LOCK LIFT END AND HANDLE END AS SHOWN ON RIGHT SIDE OF ASSEMBLY SHOULD BE OMITTED



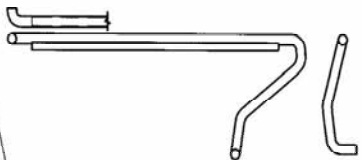
ANTI-SWING COUPLER OPERATING ROD LOCKLIFT END LEFT SIDE  
1 REQUIRED PER CAR END



ANTI-SWING COUPLER OPERATING ROD LOCKLIFT END RIGHT SIDE  
1 REQUIRED PER CAR END  
(SEE LEFT SIDE FOR DIMENSIONS)



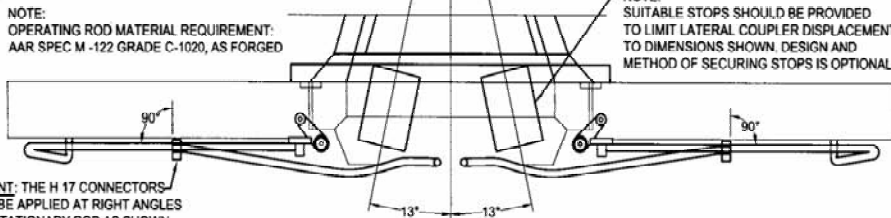
ANTI-SWING COUPLER OPERATING ROD HANDLE END LEFT SIDE  
1 REQUIRED PER CAR END



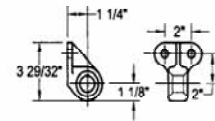
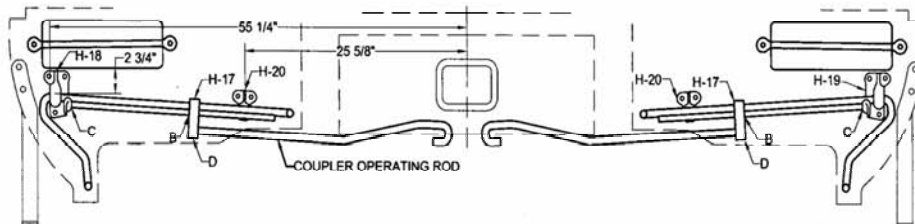
ANTI-SWING COUPLER OPERATING ROD HANDLE END RIGHT SIDE  
1 REQUIRED PER CAR END  
(SEE LEFT SIDE FOR DIMENSIONS)

NOTE:  
OPERATING ROD MATERIAL REQUIREMENT:  
AAR SPEC M -122 GRADE C-1020, AS FORGED

NOTE:  
SUITABLE STOPS SHOULD BE PROVIDED  
TO LIMIT LATERAL COUPLER DISPLACEMENT  
TO DIMENSIONS SHOWN. DESIGN AND  
METHOD OF SECURING STOPS IS OPTIONAL.

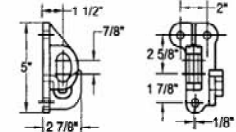


IMPORTANT: THE H 17 CONNECTORS  
SHOULD BE APPLIED AT RIGHT ANGLES  
TO THE STATIONARY ROD AS SHOWN

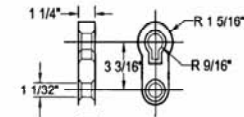


COUPLER OPERATING ROD BRACKET  
CAT. NO. H20

MALLEABLE IRON, ASTM A-47, GRADE 32510 OR  
DUCTILE IRON, ASTM-A536, GRADE 65-45-12  
2 REQUIRED PER CAR END

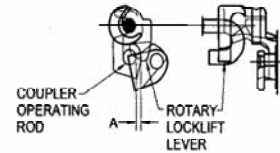


ANTI-SWING COUPLER OPERATING ROD BRACKET  
CAT. NO. H 18 LEFT SIDE (SHOWN) - CAT. NO. H 19 RIGHT SIDE  
MALLEABLE IRON, ASTM-A 47, GRADE 32510, OR  
DUCTILE IRON, ASTM-A 536, GRADE 65-45-12  
1 EACH REQUIRED PER CAR END



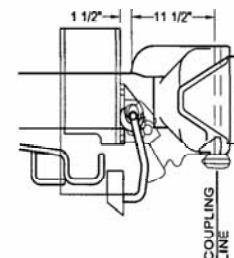
COUPLER OPERATING ROD CONNECTOR  
CAT. NO. H17

CAST STEEL AAR SPEC GRADE B  
2 REQUIRED PER CAR END



THERE MUST BE 1/8" TO 1/4" CLEARANCE AT THE  
CLOSEST POINT BETWEEN THE OPERATING ROD END  
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 H-17 CONNECTOR AT "D".



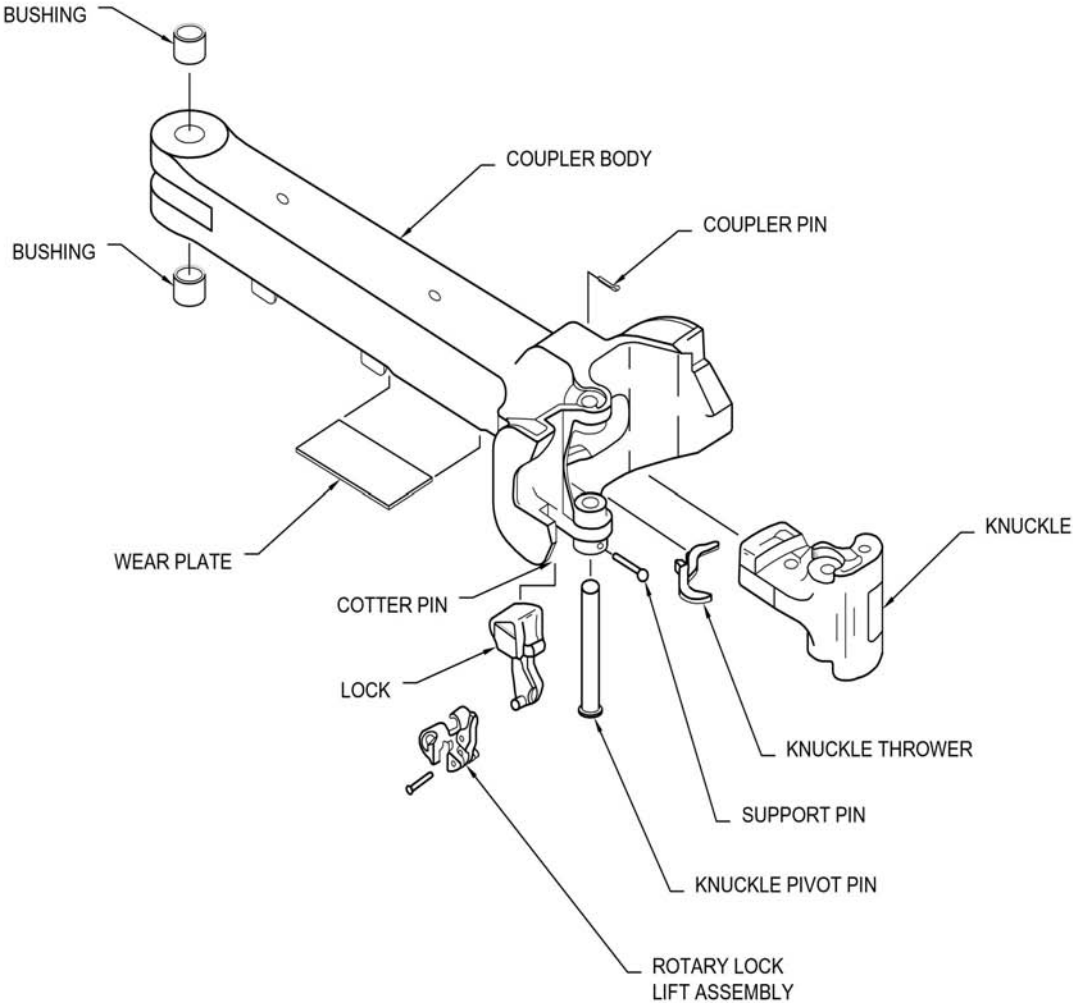


Figure 4

American Public Transit Association

TIGHTLOCK COUPLERS  
PROCEDURE TO DETERMINE AMOUNT OF ANTICREEP PROTECTION

Recommended Practice  
Adopted, 1956

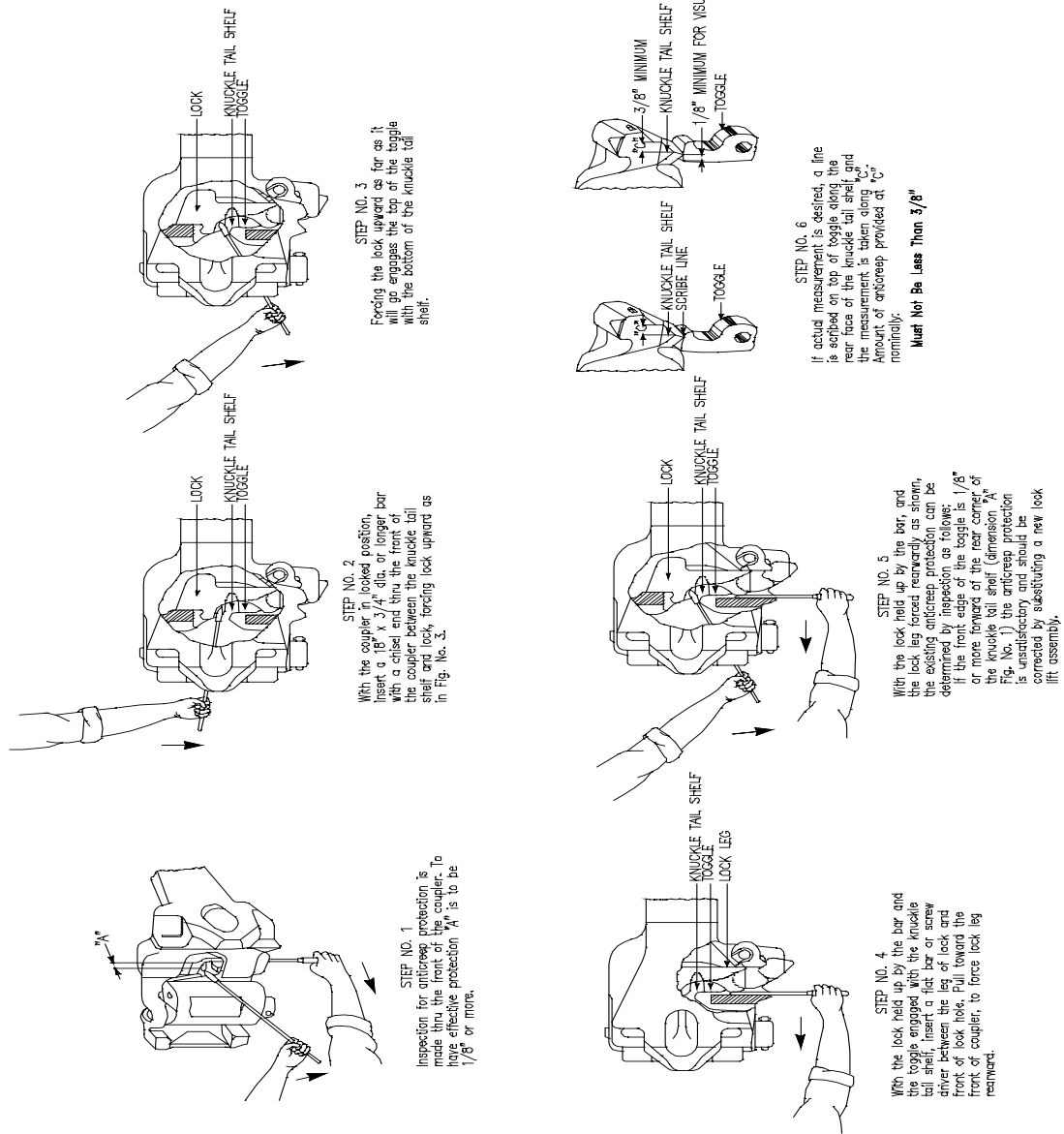
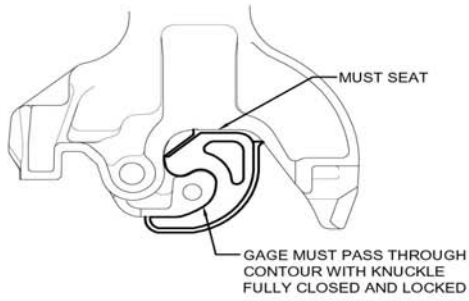


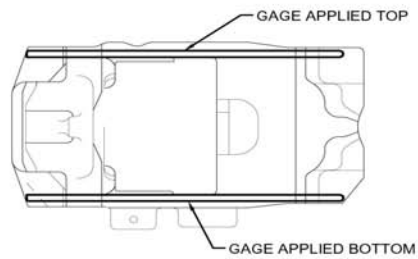
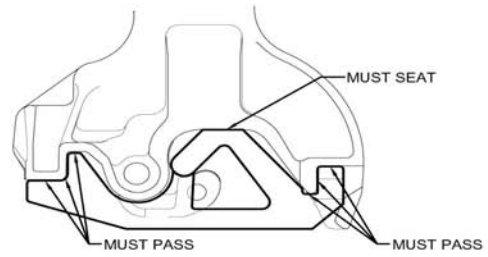
FIG. 5

APTA TIGHTLOCK COUPLER MAINTENANCE GAGES



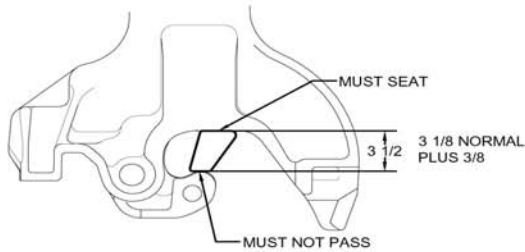
CONTOUR MAINTENANCE GAGE  
NO. 31000

FIG 6



ALIGNING WING LIMIT GAGE  
NO. 32600

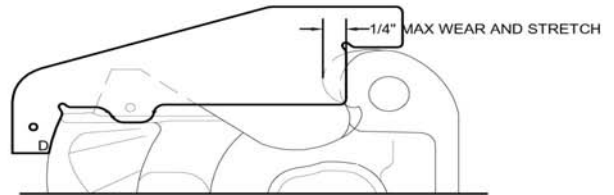
FIG 7



CONTOUR CONDEMNING LIMIT GAGE  
NO. 34100-1

FIG 8

POINT "D" MUST NOT TOUCH OR CLEAR MORE THAN 1/4" WITH A, B, & C SEATED



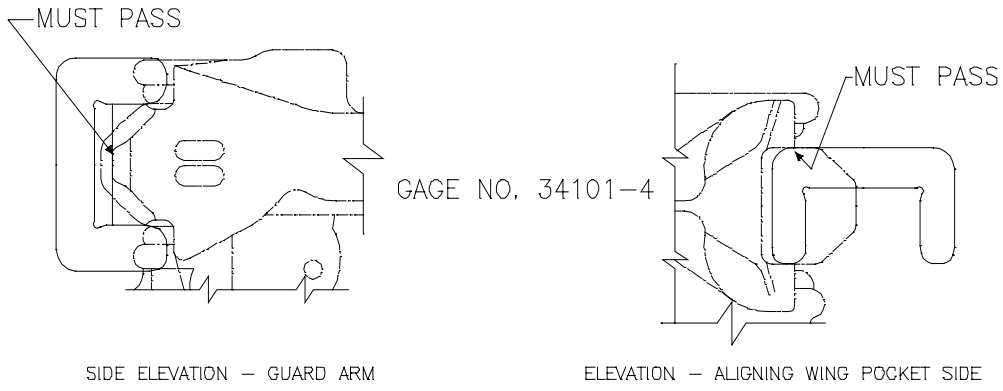
KNUCKLE NOSE WEAR AND STRETCH LIMIT GAGE  
NO. 34100-2A

FIG 9

NOTE: FORMER DESIGN GAGE NO. 34100-2  
MAY BE USED WITH CARE

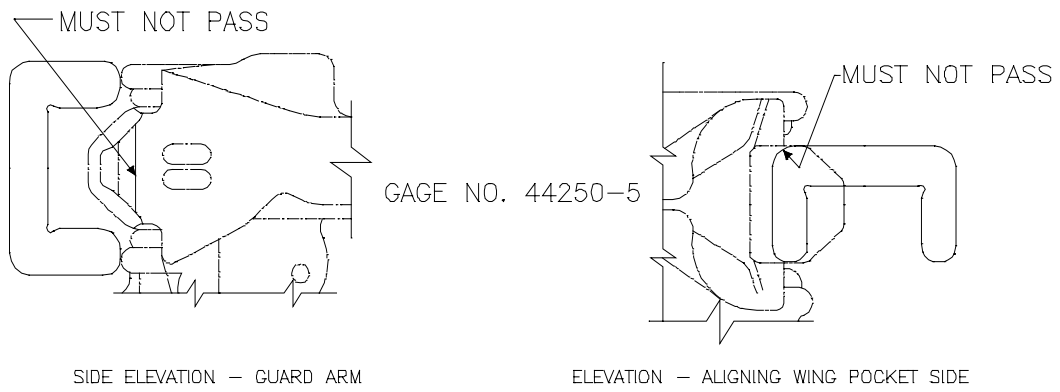


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VERTICAL HEIGHT ALIGNING WING POCKET AND GUARD ARM GAGE

FIG. 10



VERTICAL HEIGHT CONDEMNING LIMIT  
ALIGNING WING POCKET AND GUARD ARM GAGE

FIG. 11