3. APTA PR-M-RP-002-98
Recommended Practice for Inspection and Maintenance of Type H-Tightlock Couplers

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 When the following standards are superseded by an approved revision, the revision shall apply.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

1 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
FIG. 2
ENLARGED VIEW OF LOCK LIFT LEVER AND OPERATING ROD EYE

THE M-17 CONNECTORS SHOULD BE AT RIGHT ANGLES TO THE STATIONARY ROD AS SHOWN

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 4
STEP NO. 1
Inspection for optimum protection is made thru the front of the coupler, to ensure effective protection. 
Minimum size is 1/8" or more.

STEP NO. 2
With the coupler in locked position, insert a 18" x 3/4" dia. or longer bar with a chisel end thru the front of 
the coupler between the knuckle ball shell and lock, forcing lock upward as shown in Fig. No. 3.

STEP NO. 3
Force the lock upward as far as it 
will go engaging the top of the toggle 
with the bottom of the knuckle ball shell.

STEP NO. 4
With the lock held up by the bar and 
the toggle engaged with the knuckle 
ball shell, insert a flat bar or screw 
driver between the leg of lock and 
front of lock hole, (Fig. No. 2) to force lock leg 
downward.

STEP NO. 5
With the lock held up by the bar, and 
the lock leg forced downward as shown, 
the existing optimum protection can be 
determined by inspection as follows:

1. If the rear edge of the toggle is 1/16" or more forward of the rear center of the knuckle ball shell (dimension T) (Fig. No. 1) the optimum protection is unsatisfactory and should be 
replaced by substituting a new lock 
leg immediately.

STEP NO. 6
If actual measurement is desired, a line 
is marked or top of toggle along the 
rear edge of the knuckle ball shell, and the measurement is taken along 
April 7, 1956

Must not be less than 3/8"
APTA TIGHTLOCK COUPLER MAINTENANCE GAGES

CONTOUR MAINTENANCE GAGE
NO. 31000
FIG 6

CONTOUR CONDEMNING LIMIT GAGE
NO. 34100-1
FIG 8

ALIGNING WING LIMIT GAGE
NO. 32600
FIG 7

KNUCKLE NOSE WEAR AND STRETCH LIMIT GAGE
NO. 34100-2A
FIG 9

NOTE: FORMER DESIGN GAGE NO. 34100-2
MAY BE USED WITH CARE
American Public Transit Association

VERTICAL HEIGHT ALIGNING WING POCKET AND GUARD ARM GAGE

FIG. 10

VERTICAL HEIGHT CONDEMNING LIMIT
ALIGNING WING POCKET AND GUARD ARM GAGE

FIG. 11