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DRAFT

Maintenance Instructions For WD-66-BD-06 Draft Gear & Other Draft gears fitted in Wagons

IRCAMTECH/M/2017/Draft gear/WD-66/Maintenance/1.0

July, 2017



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Instructions for Draft Gear to RDSO No. WD-66-BD-06 fitted in BOXNHL/BCNHL & other Draft gears.

(Ref: - RDSO'S letter No. MW/DGR.BG.HG.dated 13.01.2016.)

1.0 General: - RDSO/LKO vide letter mentioned above has intimated that draft gear to RDSO specification no. WD-66-BD-06 fitted in BOXNHL/BCNHL wagons are required to be maintained as per following AAR standard documents meant for inspection and maintenance of draft system.

- 1. AAR field manual Rule no. 21 Section A, cause for Renewal (2015 Page 238-239)**
- 2. AAR RP -101 Draft gear inspection**

As per clause 2.1.2 of RP-101, when wagon are undergoing general repairs, draft gears should be removed for examination. As per extant instructions on draft gears maintenance, Draft gear is dropped only during POH repairs and is supposed to give maintenance free service from one POH to another. Thorough inspection of draft gear is possible only when it is taken out of wagon.

In view of the above, it is recommended that draft gears to RDSO specification no. WD-66-BD-06 are to be dropped in first and every POH cycle. After dropping, each draft gear should be inspected as per car inspection procedures issued by concerned OEM and to be overhauled/ reconditioned only in case of noticing any defect as listed in AAR field manual Rule no. 21. The known sources for supply of maintenance spares for various make of WD-66-BD-06 draft gear as follows-

S.No.	Make of draft gears	Source for maintenance spares
1	Wabtec Mark 70E/Mark 325	Contact Persons & email ID's – 1. S.L.Ahuja - sahuja@wabtec.com 2. T Das Gupta – tggupta@wabtec.com Contact Address- Wabtech Texmaco Rail Pvt Ltd CI-44/73 Paharpur Road Near Nature Park ,Kolkata- 700066 Phone – 033-65000532/0533
2	Miner SL-76	Contact Persons & email ID's – Chetan Bhatia- chetanfas@gmail.com Contact Address- M/s Frontier Alloy Steels Ltd, KM/25/5&6, Kalpi Road, Rainia, Kanpur Dehat- 209304
3	Amsted F-325G/Stucki Power Guard XE	Contact Persons & email ID's – Rajesh Sehgal- asf@aarvpl.com Contact Address- Amsted International Inc, 1DDA Commercial Complex, Geetanjali Enclave, New Delhi-110017

1.1 AAR Rule 21 – Draft Gears, Carriers, and Followers

A. Wear Limits, Gauging, Cause for renewal

1. Condemnable at any time

a. Draft Gear

1. Broken or split housings, housings with cracks of any length in critical areas as shown in the following diagrams or cracks 1 inch or longer anywhere in the housing. Cracks less than 1 inch in non critical areas shall not be considered defects.
2. Broken or cracked yoke castings that are an integral part of the draft gear assembly, as shown in the following diagrams.
3. A bulge in the rear wall of housing more than 3/16 inch.
4. Broken or cracked parts that bear on the follower at any time during the buff or draft stroke. Small chips are not defects.
5. Splitting or separation of rubber from metal plates as noted in the following diagrams (except twin -pack system group Q and R)
6. Obvious heat or fire damage to rubber or rubber friction draft gears.
7. Draft gears with broken or missing external retaining bolt or rod only shall not be considered defective.
8. Missing.
9. Wrong (not standard to car).
10. Prohibited as per Rule 90.

b. Carriers.

1. Draft gear carrier cracked, broken, or worn more than 50 percent of the original thickness, wear plate missing or worn through
2. Wrong (not standard to car)

c. Followers

1. Broke bent ½ inch or more or missing.
2. Wrong (not standard to car).

2. Condemnable when wagon is on shop or repairs track for any reason.

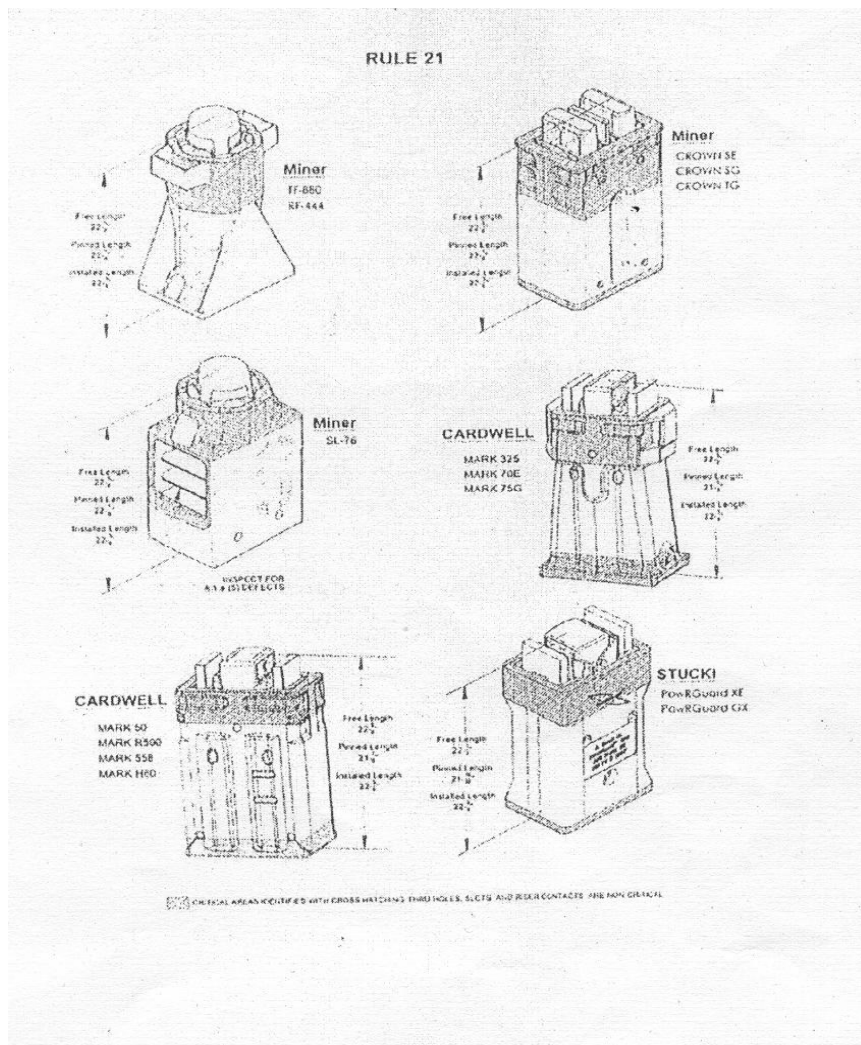
a. Draft Gear

1. Installed draft gears with gear length less than specified in section B, correct repairs of this rule.
2. Draft gears with loose friction components (except National NC-660 when not compressed)

3. When draft gear is removed in conjunction with other work when defective or missing rotating bolts or rods are discovered
4. Broken friction components that do not bear on the follower block, only if draft gear is removed for any other cause.

b. Followers

1. Thickness worn more than 1/8 inch at any location



AAR Manual of Standards and Recommended Practices for Freight wagon Components

Draft Gear Inspection [Recommended practice RP-101 Adopted: 1981 last Revised: 2011]

1. **Scope:** When wagons are on repair tracks, examine and renew defective parts of draft gears, couplers, and their attachment and supports. This will not require removal of draft gear for this examination, except where found defective or where total slack from

coupler horn to striking casting exceeds 1 inch Slack to be the difference in distance between coupler striking horn and striking casting when coupler is pulled out with a bar and sledged back solid.

2. Inspection of the Draft Gear system

To avoid personal injury when performing inspection or repairs on rail wagons always make certain the wagon is in a protected location with the wheels chocked and that proper safety equipment(hard hats, gloves safety shoes, etc are worn).

2.1 Recommended Inspection

2.1.1 Every time a wagon goes through interchange, draft gear system components should be given a visual inspection for damage. While on the repairs track, a more complete examination should be made. This may not require removal of the draft gear except where defects are found.

2.1.2 When wagon are undergoing general repairs, the draft gears should be removed for examination. Couplers their attachments, and supports should be inspected and necessary repairs and replacement made.

2.1.3 High utilization wagons as defined in FRA Safety Standards Para.215.15 should be inspected more frequently than general service cars.

2.2 Indications of Draft Gear System Problems

2.2.1 A drooping coupler is an indication of worn, broken, or missing components that act in a vertical direction, such as coupler shank, coupler wear plate, coupler support plate, draft key, coupler key slot, yoke key slot, and the striker key slot (See Fig.2.1)

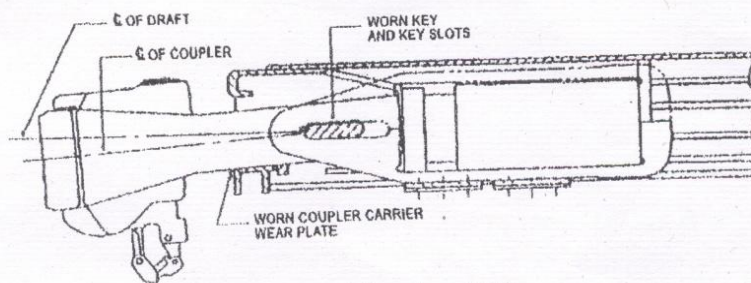


Fig. 2.1 Drooping coupler

2.2.2 Striker face indentation is an indication of worn or deformed components that act in a buff direction, such as the coupler butt, follower, draft gear housing, or rear draft lugs.

2.2.2.1 As a 21 ½ inch –length E type coupler shank approaches its 21-inch condemning limits, the probability for striker /horn contact increase .Fig2.2 illustrates that 3/32inch .draft gear travel remains at the occurrence of striker/coupler horn contact because of construction tolerances when the coupler shanks length is at the condemning limit of 21 inch. A combination of worn components can result in striker contact. To avoid this, it is recommended that the coupler be replaced if its shank length is less than 21 ¼ inch

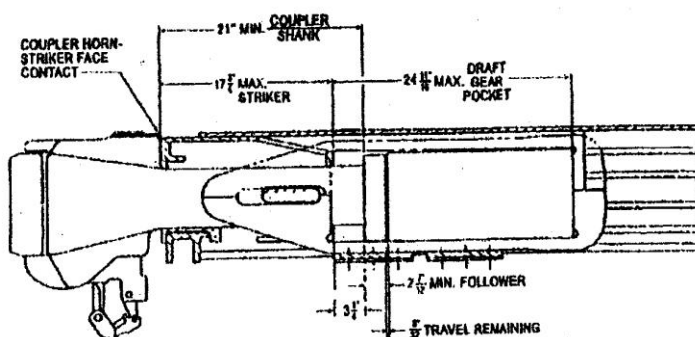


Fig. 2.2 Combination of parts resulting in striker face indentation

2.2.2.2 A worn or deformed pocket is a common cause of striker face indentation. It is important to measure a draft gear pocket for conformity to the Manual of Standard and Recommended Practices, Section C, Standards S-254. If the pocket exceeds 24 ¾ inch length, it is good practice to apply shims to the rear lugs to restore the pocket to 24 5/8±1/16 inch.

2.2.2.3 Another cause of striker face indentation is the use of wrong parts, especially coupler shanks and draft gear for a given striker and draft gear pocket. For example a Type E-60 coupler application involving a 17 ¾ inch length striker and 24 5/8 inch length pocket requires the use of 21 ½ inch length coupler shank to accept the use of any 3 ¼ inch travel draft gear of appropriate capacity for the car. The use of a 3 ¼ inch travel draft gear in an older car having a type E-60 coupler and an 18 ¼ inch length striker is prohibited because striker face contact with the coupler horn will occur. The use of a 2 ¾ inch travel draft gear such as those listed in the AAR Field manual Rule 21, Groups A, C, or M are appropriate for wagons having 18 ¼ inch length strikers. On wagons being rebuilt for use of draft gears to M-901E or M-901G requirements, the striker arrangement must provide a nominal 3 ¾ inch coupler horn clearance and a 13 inch key slot on rigid shank applications.

Fig.2.3 illustrates that sufficient coupler horn/striker clearance exists at impact when proper application is made.

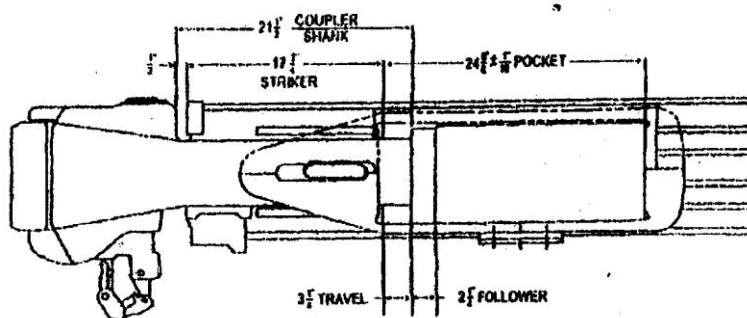


Fig. 2.3

2.2.3 Free slack exceeding 1 inch is an indication of a worn or defective coupler shank, coupler yoke connection, yoke, draft gear, follower, or car pocket. Excess of slack in draft attachments should be reduced or eliminated. **WARNING!** Excess slack may be an indication of a stuck draft gear that could cause personal injury. Never attempt to check free slack without first verifying that the draft gear is not stuck. 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, insert a long bar between horn and striker face and pry the coupler out as far as possible and again measure the space between the horn and striker (Fig.2.4). The difference between these two measurements is the amount of free slack present. The maximum permissible free slack in the draft attachments is 1 inch.

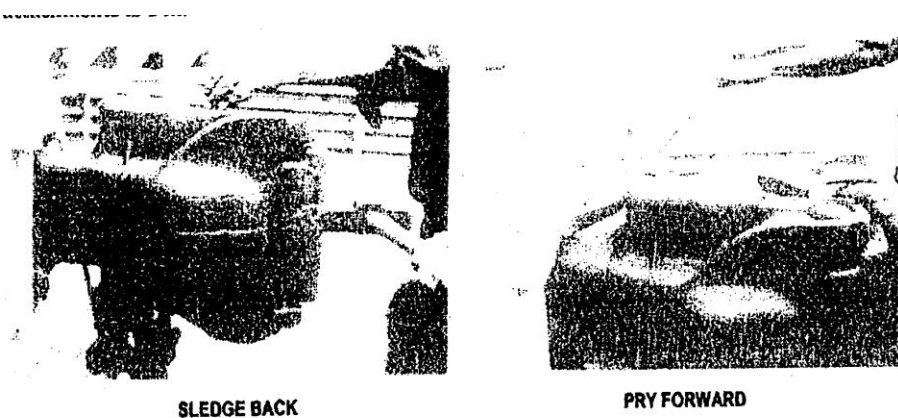


Fig. 2.4

2.2.4 Excessively worn or loose yoke support plates will lower the draft gear system from the center line of draft and may cause considerable damage to the car structure. Inspect for tightness of the plate fasteners and their proper application, noting that any yoke plate with an offset is assembled upward in a wagon. For safety purposes, it is recommended that yoke support plates be replaced if 1/4 inch of wear is observed.

2.2.5 If any of the symptoms in paragraphs 2.2.1, 2.2.2, 2.2.3, or 2.2.4 are observed, it is recommended that the draft gear be removed from the car and a complete inspection made.

3.0 Draft Gear Removal.

3.1 Safety Precautions

3.1.1 To avoid personal injury, a visual inspection should be made of the draft gear system to determine if the draft gear is in a “stuck” condition or if any other unsafe or abnormal condition is evident. If an abnormal condition is present, proceed with extreme caution “Stuck ”gear is a term used to describe a condition where friction or unseen broken parts prevents the components of the friction clutch , still under high force from returning to their normally fully released position and filling out the draft gear pocket. Any longitudinal gap in excess of ¼ inch between gear and the wagon pocket should be viewed with great caution: a stuck gear is dangerous because the slightest vibration could cause the gear to suddenly release forcibly propelling the friction components and the follower plate outward.

3.1.2 Before attempting to remove the draft gear, make certain that the wagon is in a protected location.

3.1.3 Chock the wheel at end of the car not being worked on.

3.1.4 Disconnect the brake rigging from the truck to be rolled out.

3.1.5 Jack the Car and roll the truck clear of the working area (chock the wheels to prevent unwanted movement)

3.1.6 Remove the uncoupling rod, draft key, coupler end, and coupler wear plate.

3.1.7 DO NOT remove the yoke support plate until a lift table or lowering device is placed under the yoke and draft gear. Draft gear should always be lowered, never dropped.

3.1.8 Determine if the yoke or key slot is broken or if the yoke will interfere with the coupler carrier as it is lowered.

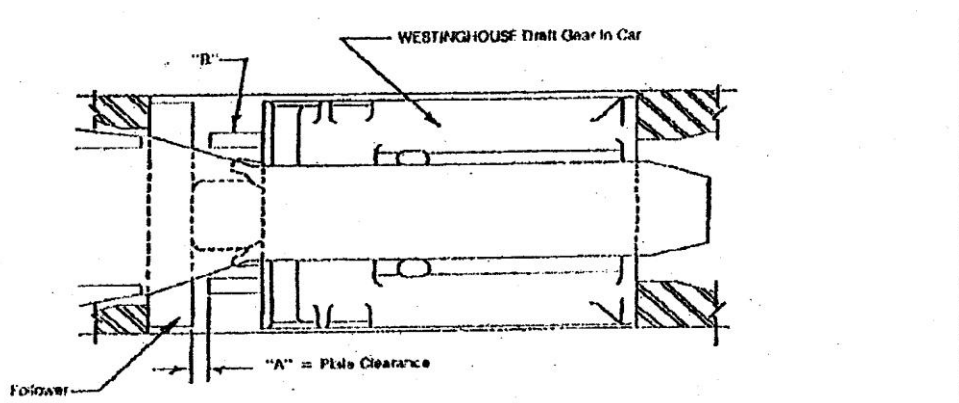
3.1.9 Proceed with the instructions for the particular draft gear removal device.

3.2 Tools for Draft Gear Removal: See manufacturer’s instructions operation of special tool for draft gear removal.

1.2 Instruction for Westinghouse Draft Gear

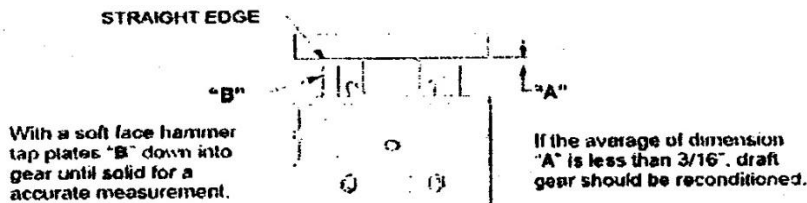
Inspection Procedures for Westinghouse Draft Gears:

All current models of Cardwell Westinghouse draft gears have built in wear indicators. As Mark series draft gears wear internally, the distance between the center wedge and the movable plates decreases. In most cases, this dimension can be checked without removing the draft gear from the car. Do not remove the yoke support plate to measure plate clearance unless there are two carrier plates. If there are two carrier plates, the front one can be removed to measure plate clearance.



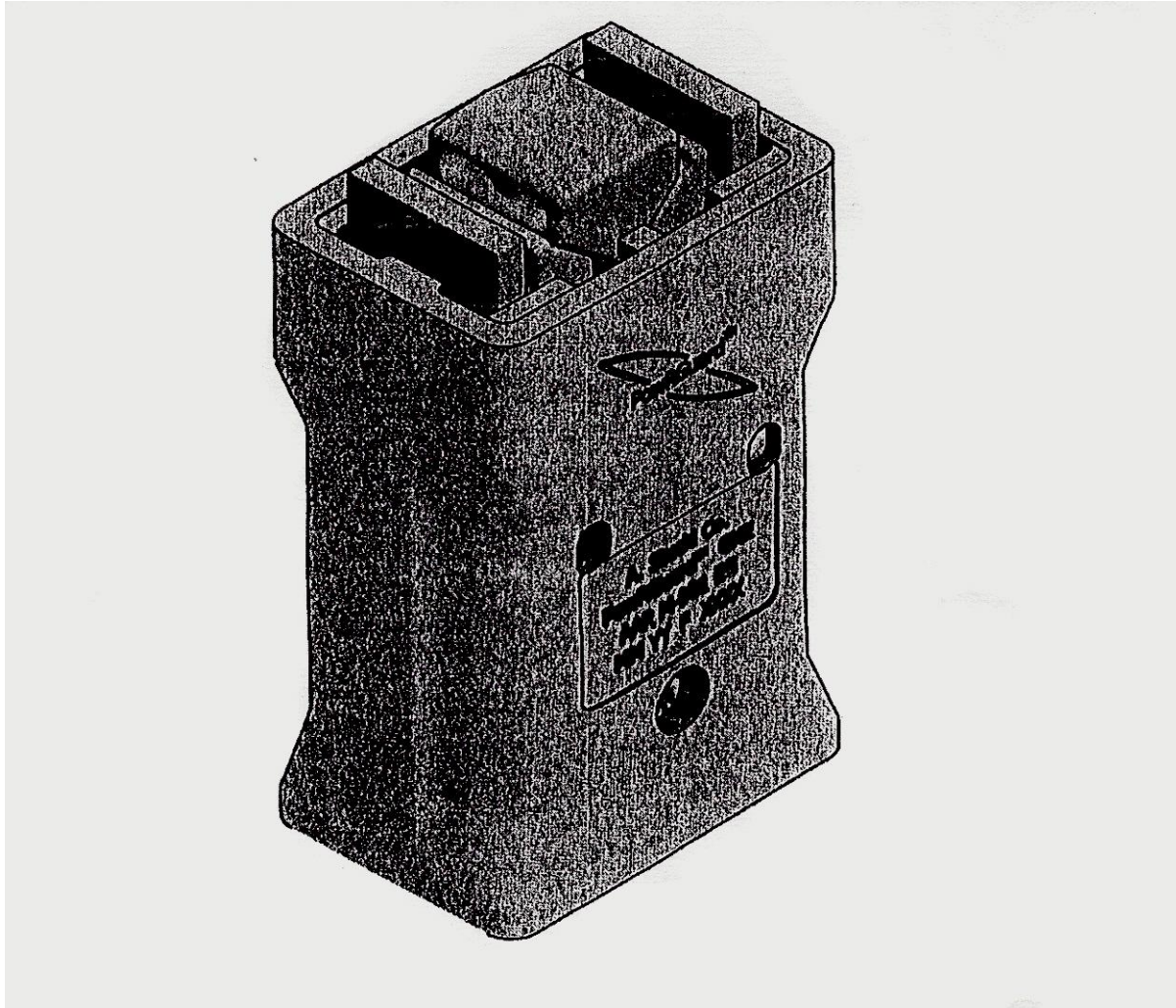
If the average plate clearance visible between the follower plate and movable plates exceeds 1/8", the remaining wear life of the gear is acceptable. To accurately measure the plate clearance when the gear is still in the gear pocket, a steel wedge can be inserted between plates 'B' and follower and hammered to force plates 'B' into the gear until solid. Remove steel wedges after forcing plates 'B' into gear. If dimension 'A' is less than 1/8", the draft gear should be replaced.

For draft gears that are out of the car, the minimum plate clearance is 3/16". If the plate clearance becomes less than 3/16" the draft gear should be reconditioned. It is important to ensure that the pre-shortening plugs have sheared prior to taking this measurement. If the pre-shortening plugs are still intact, plate clearance cannot be used as a measurement of remaining gear life.



Location	Plate Clearance - Condemnable Limit
Draft Gear Removed from Car	'A' ≤ .188" [4.78mm]
Draft Gear Installed in Car	'A' ≤ .125" [3.18mm]

1.3 Instruction for Maintenance of PowRGuardXE, PowRGuardGXE, PowRGuardGX. Draft Gear.

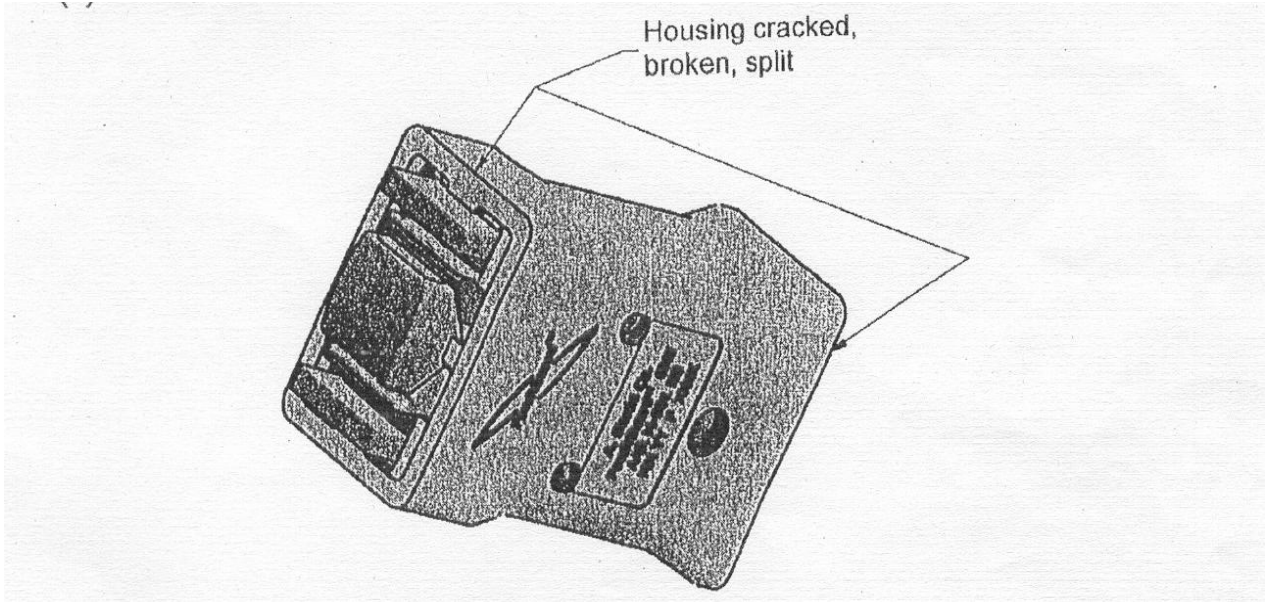


General Overview:

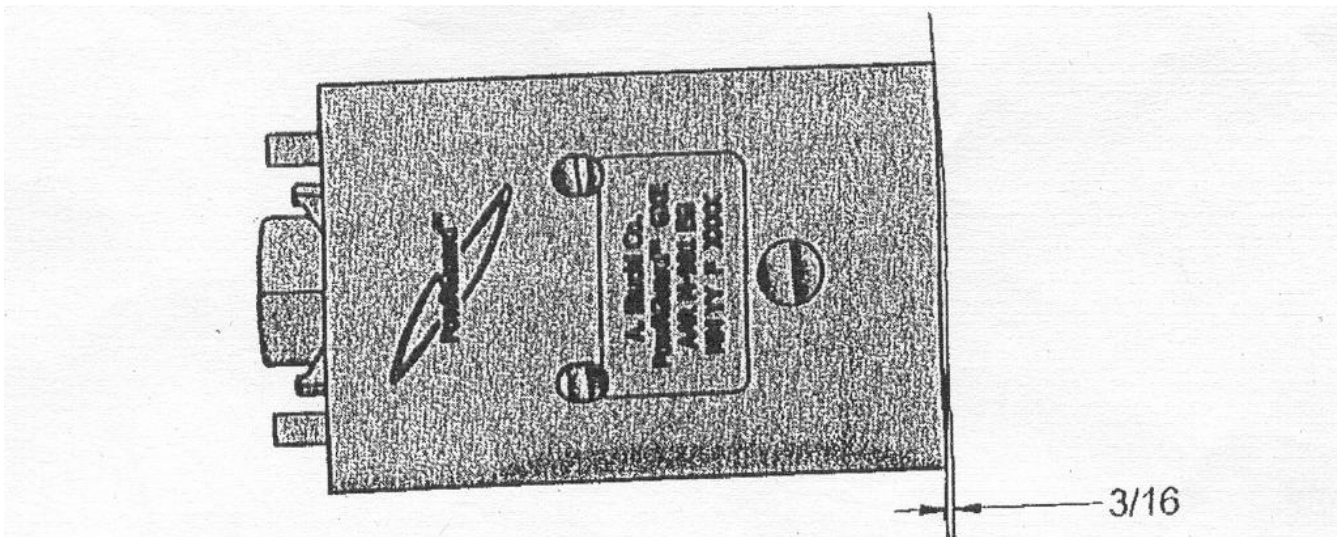
Draft gear maintenance responsibility is low. There is no actual maintenance needed on a draft gear; what should be noted is when the draft gear becomes defective and needs to be replaced. The following illustrations shall guide the owner of the draft gear on whether a gear is defective and should be replaced.

Once a gear is dropped from the car, refer to Rule 21 for defects. Each of the defects will be addressed in this document to further explain for the PowRGuard.

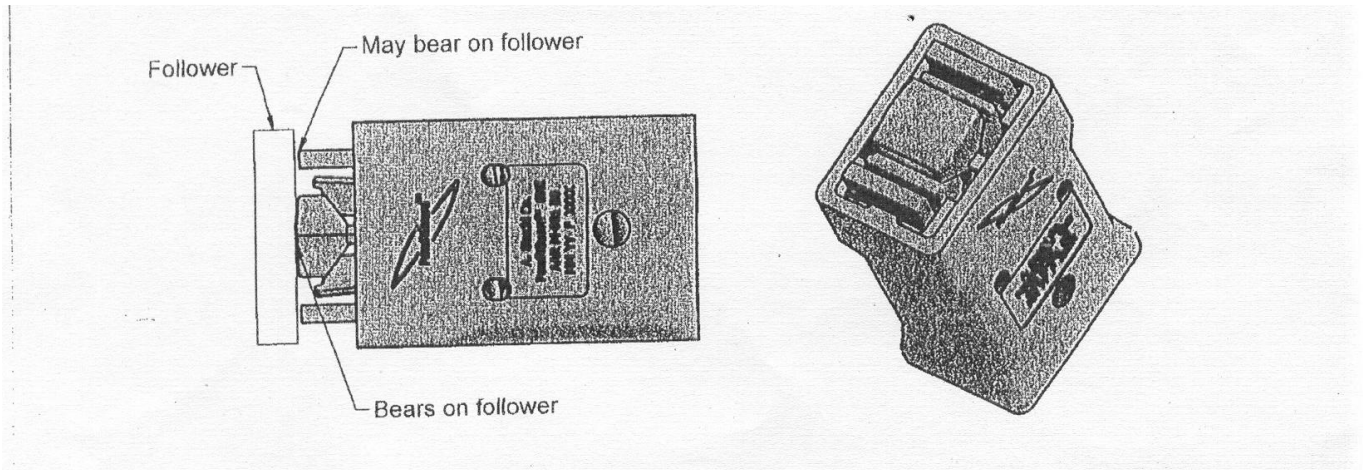
- a. The PowRGuard shall be considered defective when any of the defects below are found
 - (1) Broken, cracked , or split housings



(2) Rear wall of housing bulged more than 3/16 inch.

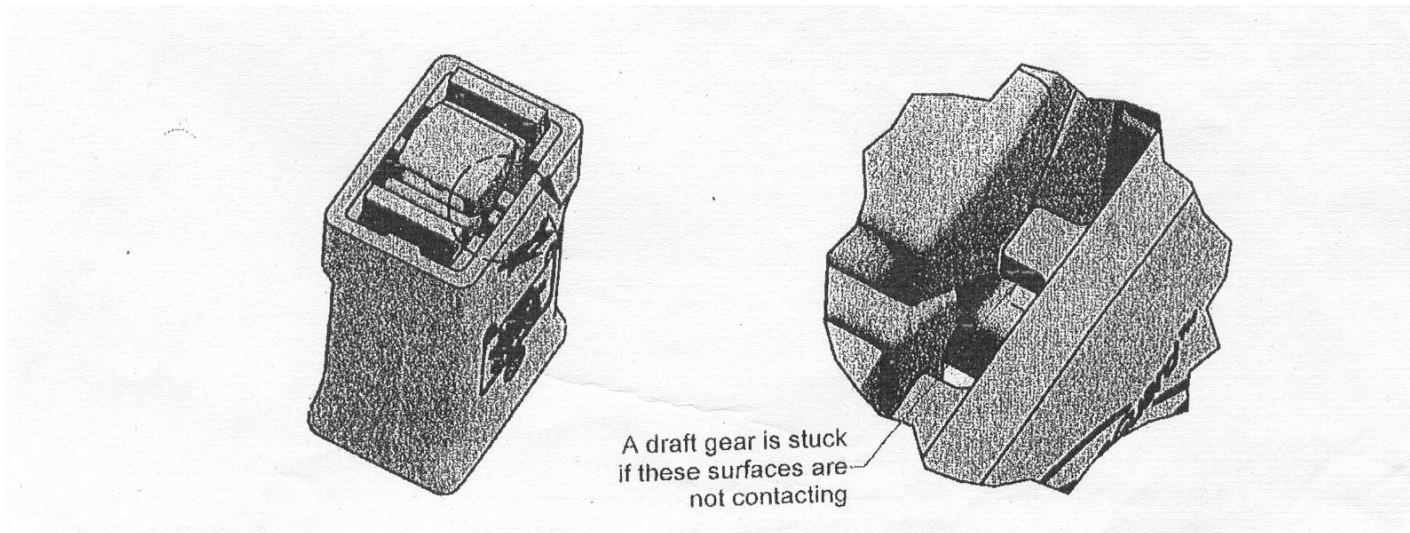


- (3) Broken or cracked parts which bear on the follower.
Small chips are not defects!

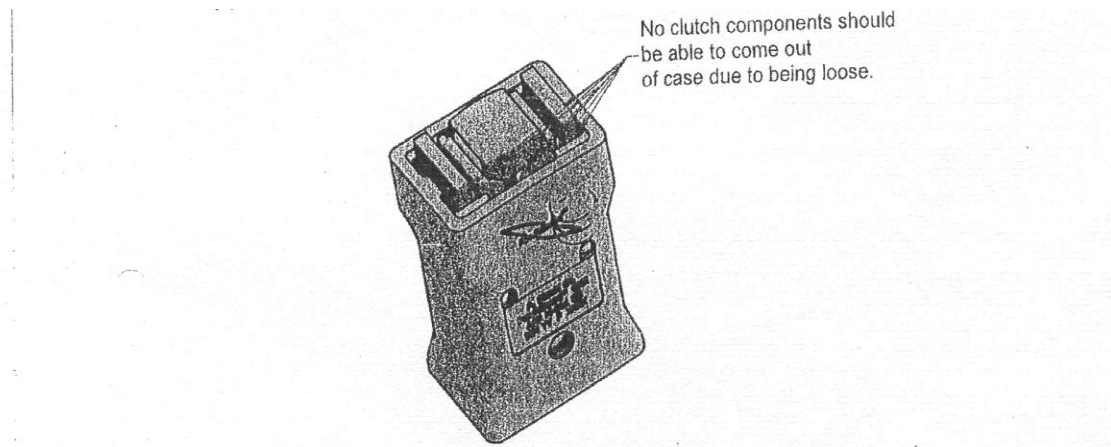


- (4) Obvious fire damage to rubber.

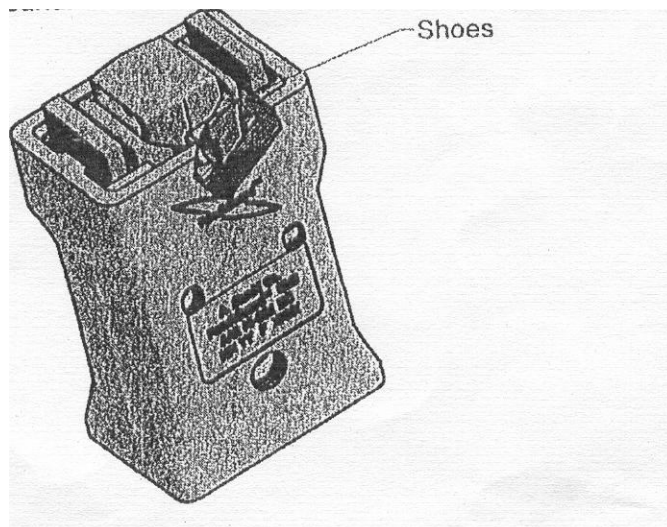
- (5) Stuck draft gears



- (6) Draft gear with gear length less than specified in Section B of Rule 21, Correct Repairs of this Rule.
- (7) Draft gears with depressed friction elements that may be moved by hand.



- b. Draft gears with broken or missing external retaining bolt or rod only shall not be considered defective. When draft gear is removed in conjunction with other work, defective or missing retaining bolts or rods should be replaced.
- c. Broken shoes, none of which bear on the follower, are not cause for renewal. However, a draft gear removed for cause other than broken shoes should not be reinstated if a broken shoe is found.



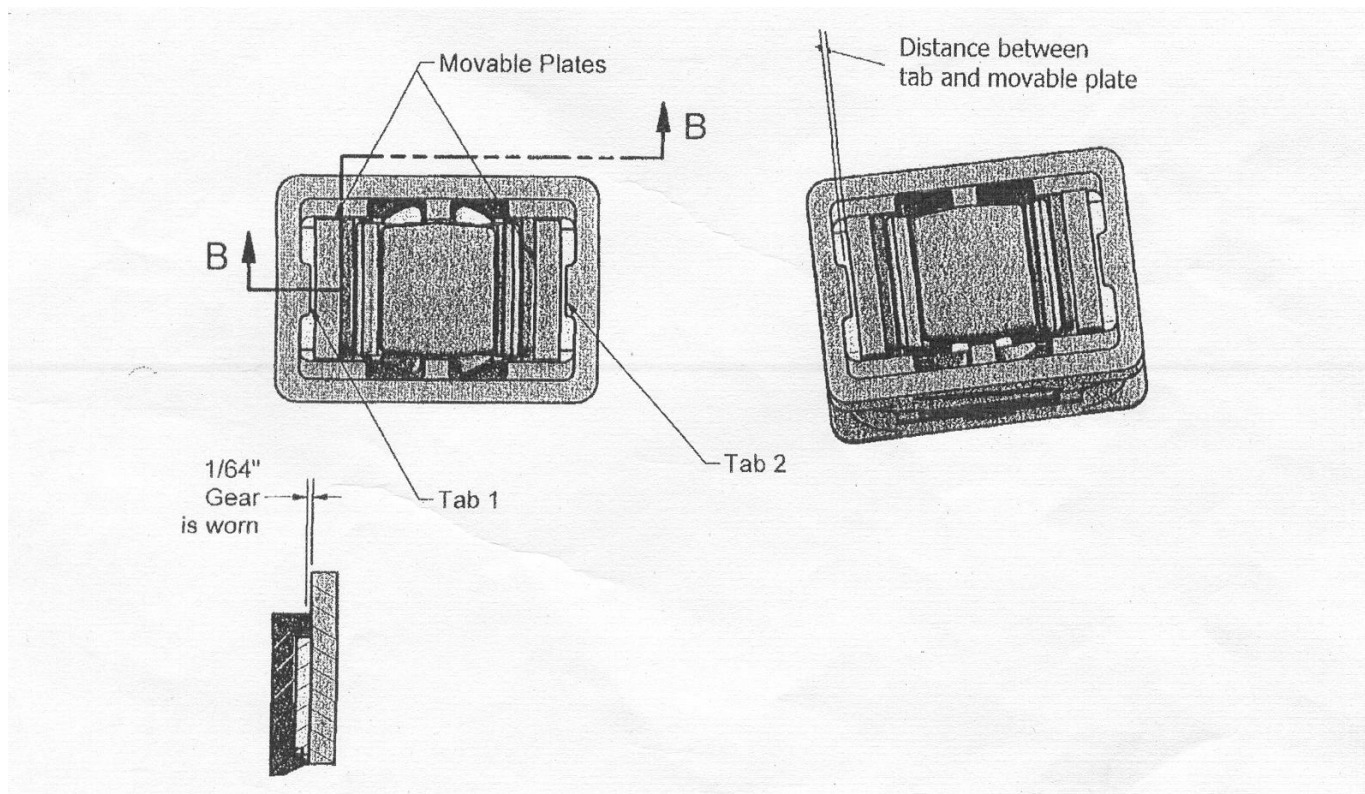
- d. Missing draft gear
- e. Wrong (not standard to car)
- f. Prohibited per Rule 90

Lastly, the PowRGuard draft gear incorporates its own wear limits in order to give an idea of when it has reached its useful life.

There are two tabs located on each side of the length of the gear. In the views below, Tab 1 and Tab 2. A new gear has approximately $\frac{3}{32}$ inch distance between the tab and the movable plate. This is most evident when viewing the gear from the top view.

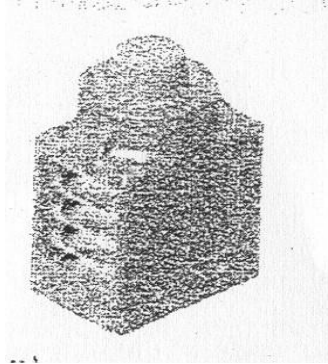
As the gear wears, the movable plates will creep outward toward the tab. When the movable plates are about $\frac{1}{64}$ inch from touching the tab, (i.e. almost flush with the tab), the gear should be replaced.

Keep in mind that testing has shown the gear will continue to work even if the movable plates wear into the tab.



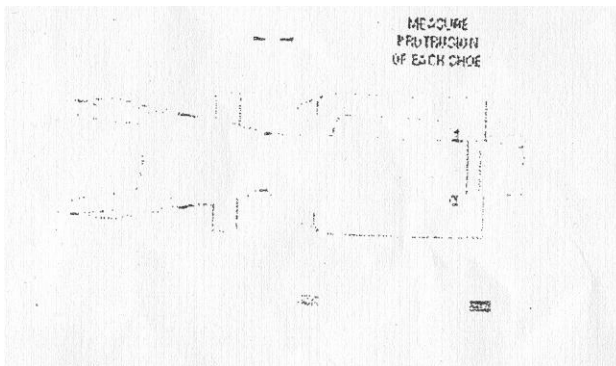
1.4 Instructions for Miner SL -76 Draft Gear

SL -76 is specifically designed to meet the most severe requirements of today's railcars. Miner's service proven friction clutch mechanism and natural rubber package provide extra heavy duty car protection and less appearing slack.



SL-76 “(In car inspection): Inspect for excessive draft slack coupler horn /striker contact, and excessive wear on carrier plate and still walls, indicating possible unsatisfactory draft gear performance. To remain in service, draft gear should be tight in pocket and free of loose or broken parts.

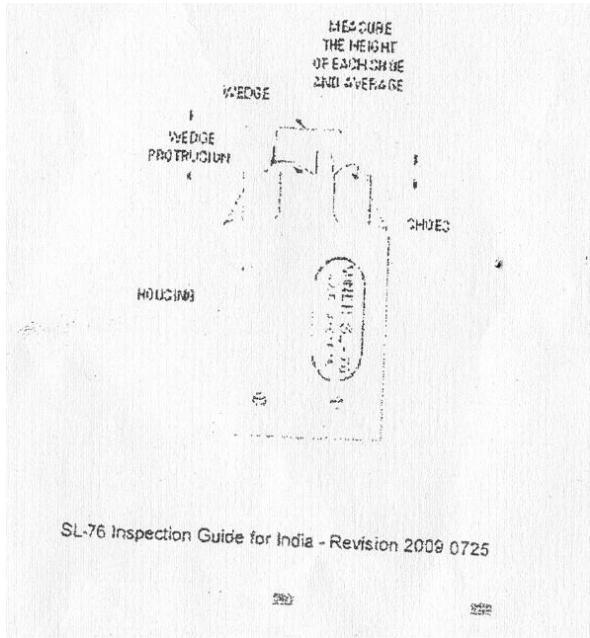
Change out draft gear if protrusion of the three shoes out of the housing averages 1-1/8 inch or more



SL-76 “ (Out of car inspection):

1. Wedge protrusion should measure approx. 3-5/6 inch (draft gear not preshortened).
2. If shoe protrusion averages 1-5/16 inch or more gear should be reconditioned (Do not reapply)

Before applying any draft gear, inspect for conformance to AAR Rule, Sections A & B.

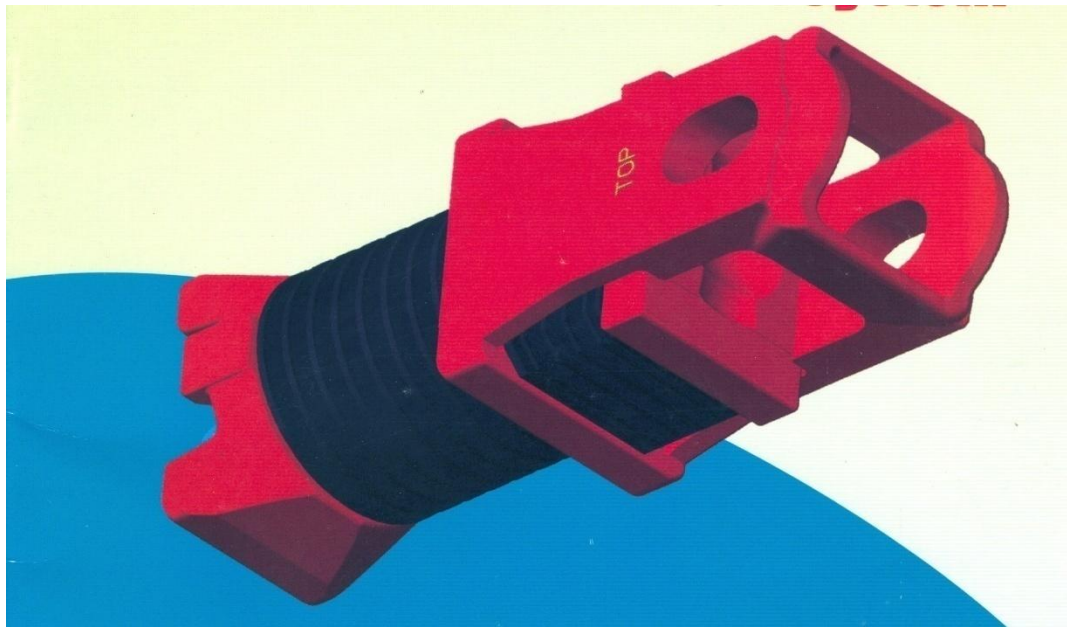


SL-76 Inspection Guide for India - Revision 2009 0725

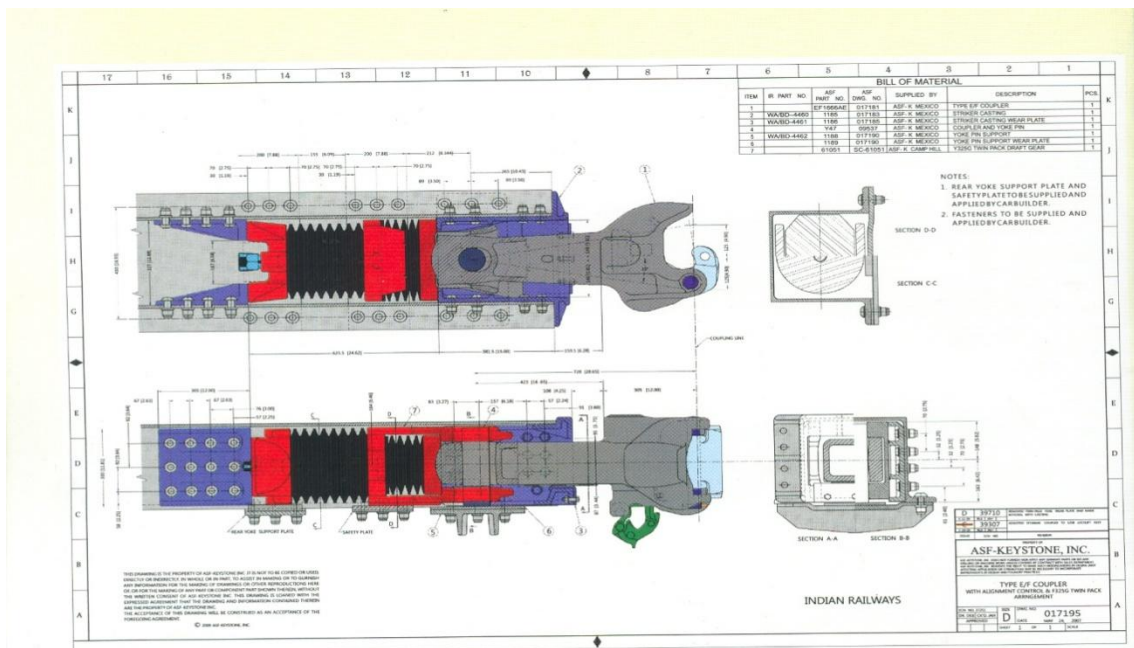
2007

2008

1.5 General Installation and Maintenance Instructions of F-325 G Twin Pack draft gear



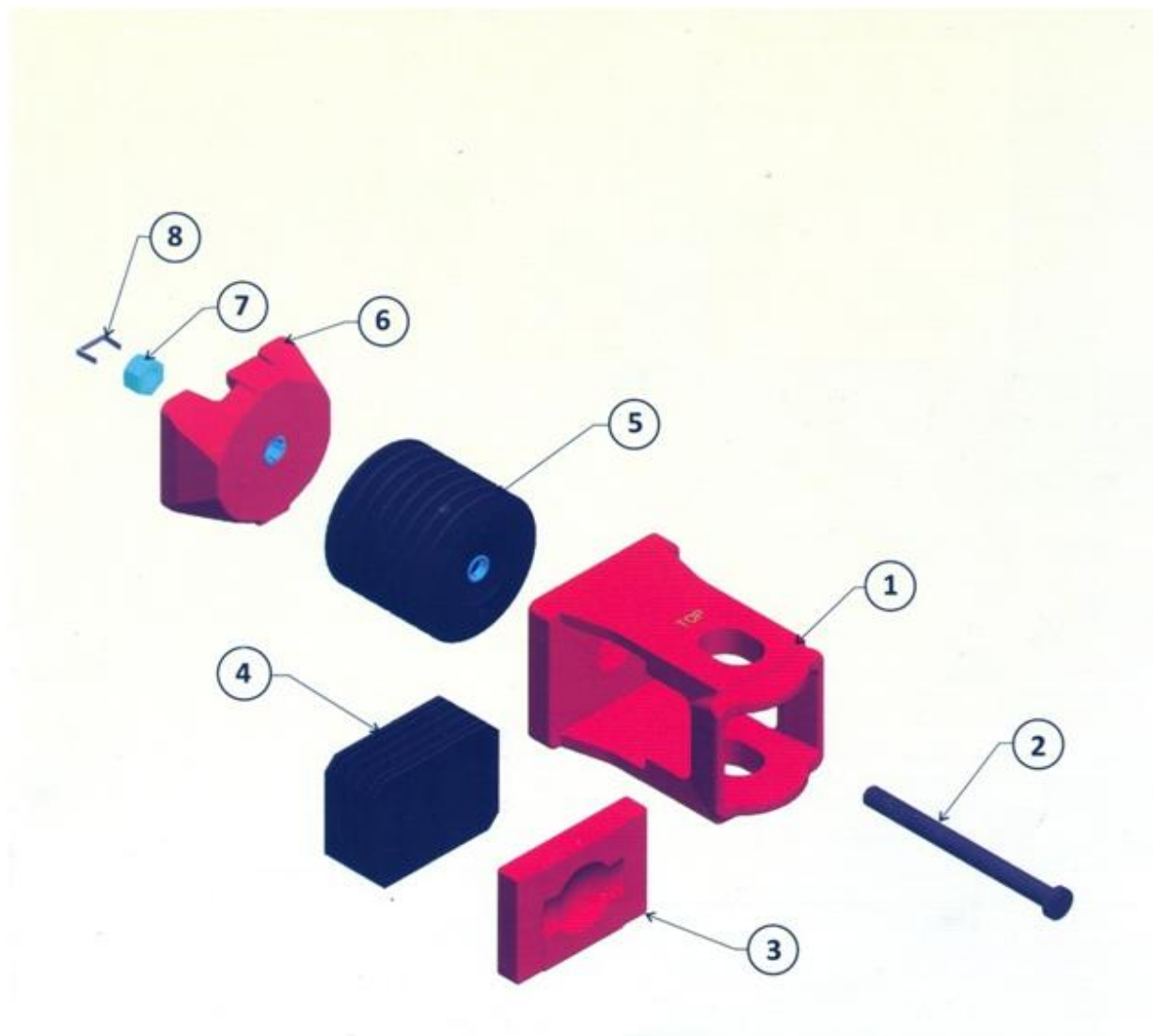
1. General Installation: For ease of Installation of F-325 G Twin Pack draft gear is pre-shortened at the factory. Pre-shortening gages will disengage after first buff impact allowing the unit to expand against unit stops.



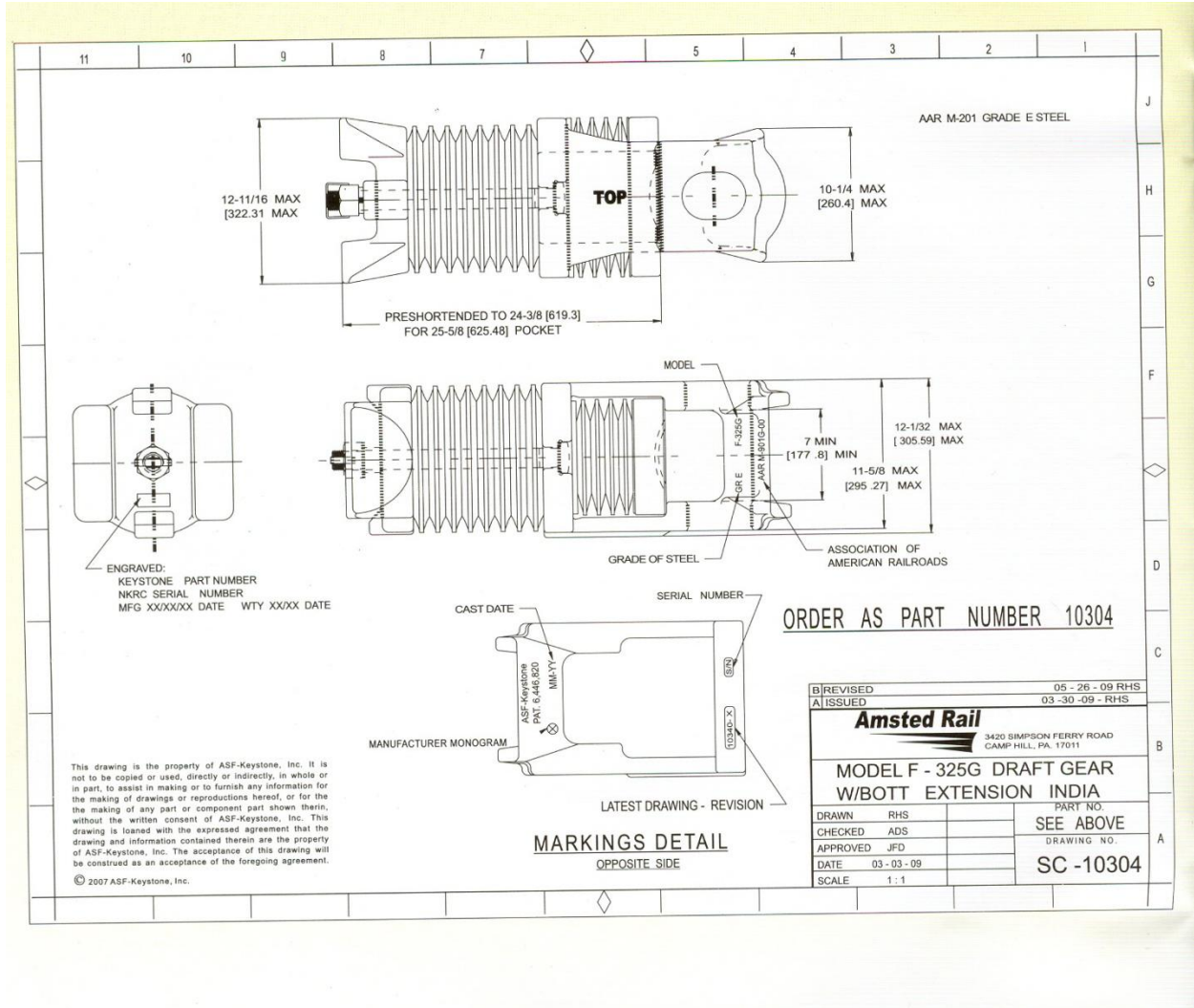
Reference Application Drawing 017195

2. F-325 G Twin Pack draft gear Components. :

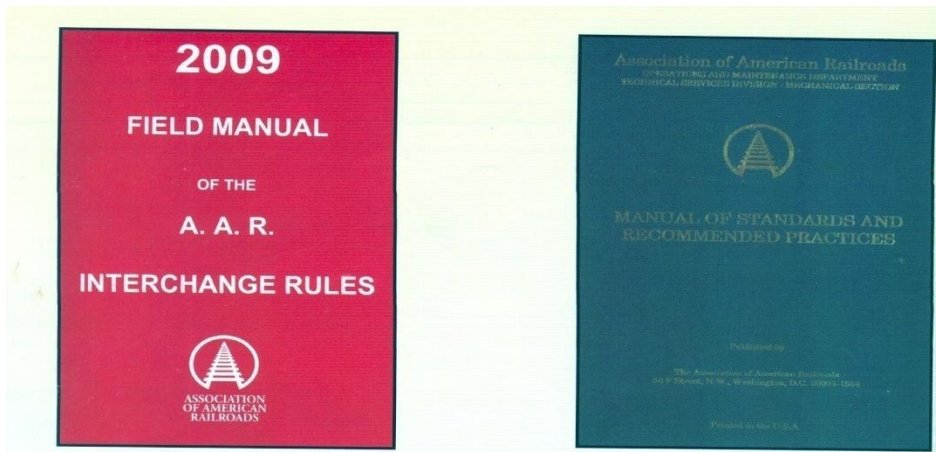
Item	F-325 G Twin Pack draft gear Components.	Part Number
1.	Yoke F-325 G Twin Pack with bolt Extension	10340
2.	Center Guide Rod 1-1/2 DIA	60634
3.	Front follower F-325 G	60030
4.	Front Pad Stack Assembly	60726
5.	Rear Pad Stack Assembly	60263
6.	Rear follower Assembly	10311
7.	Nut 1-1/2-8	19581
8.	Nut Retainer	60020



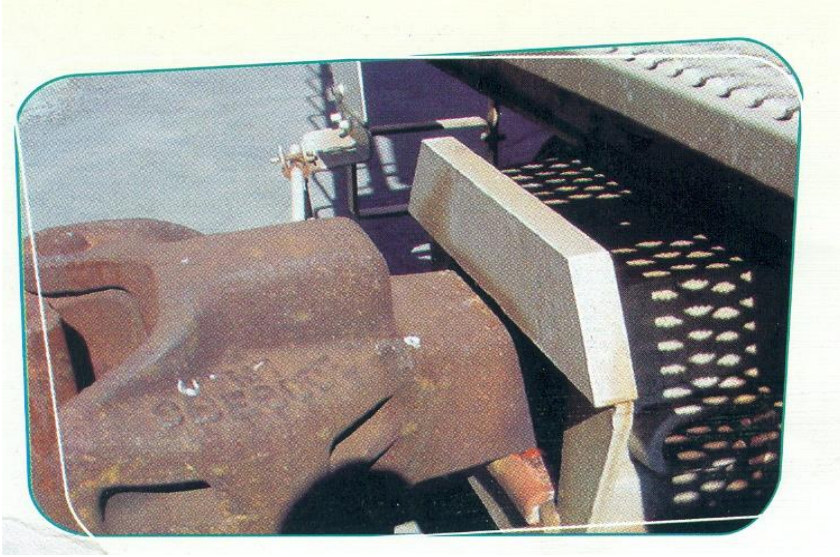
3. F-325 G Twin Pack draft gear A.A. R Marking Drawing:



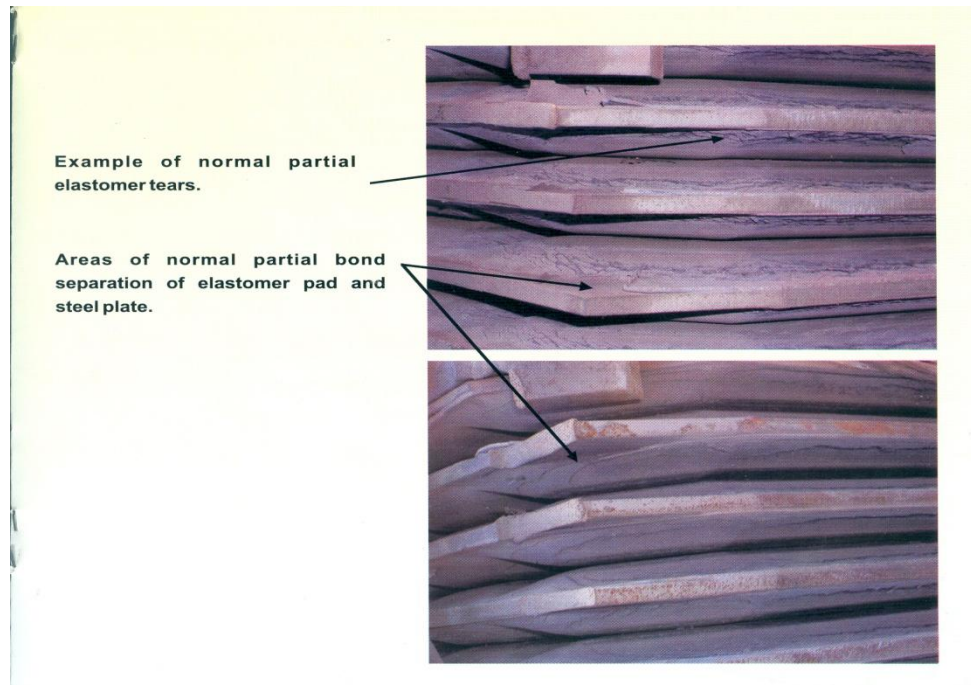
4. General Inspection: Standard draft gear inspection criteria contained in Rule 21 of the A.A.R Field Manual and Recommended Practice RP-101 of the office Manual apply to all twin pack draft gears.



If the total slack from coupler horn to striker exceeds 1 inch, the coupling system (coupler or draft gear) may need to be replaced or reconditioned. If it is apparent that the coupler horn to striker contact is occurring, this may be indication that the twin pack needs to be serviced.



Note: Partial elastomer tears or partial bond separation of the elastomer and steel plate (may occur after long service) is normal and will not diminish performance. If Twin Pack® is tight in the pocket, unit does not need to be removed from wagon.



5. General Removal Notes: Prior to removal, all Twin-Pack® systems must be regagged. Begin by bending the tabs of the 'nut lock' out of the way of the nut. See Figure 1. Next rotate the nut until it is seated against the Twin -Pack rear follower. See Figure 2 and figure 3.



Figure 1
Bend Locking tabs away from nut.

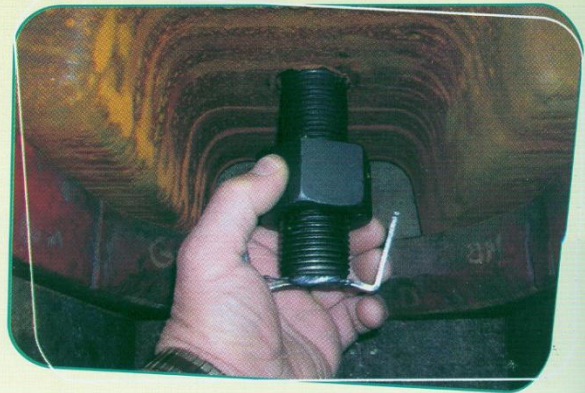


Figure 2
Rotate nut against rear follower.



Figure 3
Nut seated against rear follower.

Finally, using a standard draft gear removal tool such as the HydroJack II or Hydra-Tech and standard draft gear removal procedures, the Twin -Pack ® can now be removed from the wagon. See Figures 3, 4 and 5.



Figure 3

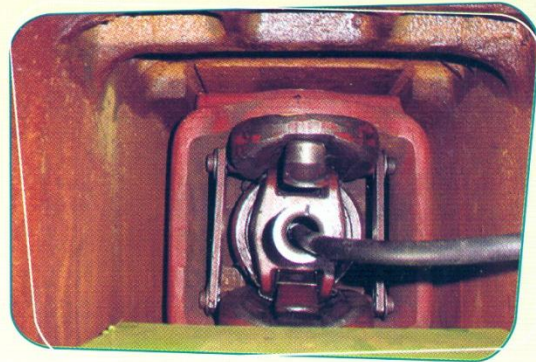


Figure 4

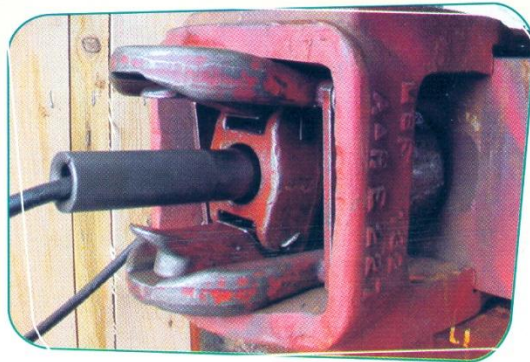


Figure 5