



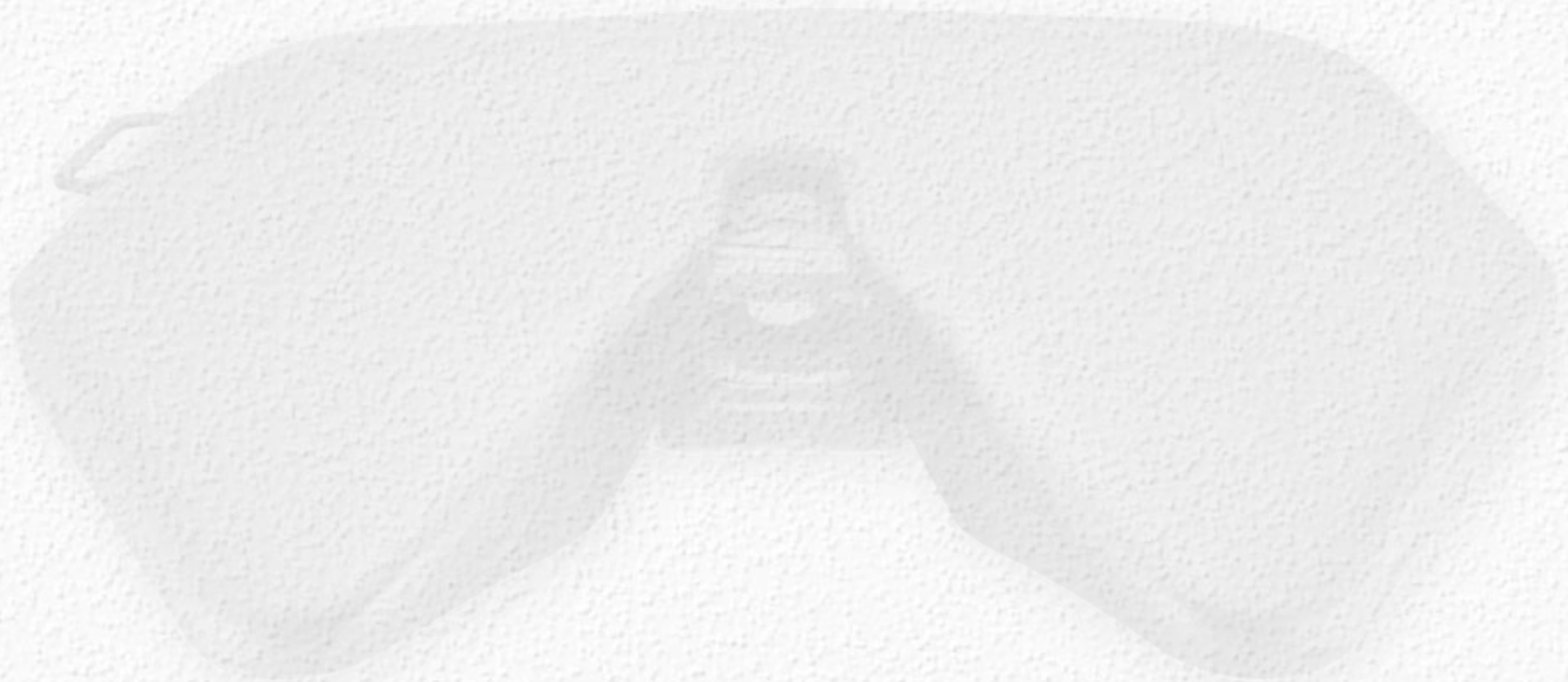
*A Marmon Highway Technologies / Berkshire Hathaway Company*

Arkansas Trucking Association

Maintenance & Technology Council

November 19, 2010

**Why is it called a fifth wheel?**



# 1915

- John Endebrock working for Sechler & Co.
  - His trailer design could move 1,000 lbs. with a Model T
  - Called it a “trailmobile” because it trailed the automobile
  - 1919 Sechler changed their name to the Trailmobile Co.
  - Also in 1919 Endebrock developed jaw coupler device that mounted on the tractor frame and coupled to a kingpin on the trailer!
- 
- (from an article published in Overdrive magazine, July 1996)

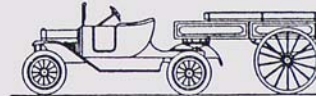
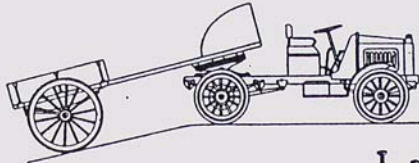
# Fifth Wheel Evolution

C. H. MARTIN, PRES.

A. A. GEISEL, TREAS. AND GEN. MGR.

H. G. FARR, SECY

## MARTIN ROCKING FIFTH WHEEL CO.



244 MAIN ST.

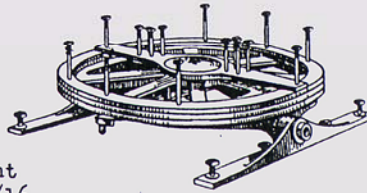
SPRINGFIELD, MASS.

Invoice No. 475

Your Order No. 20

Shipped Via Freight  
10/17/16

Terms Net Cash

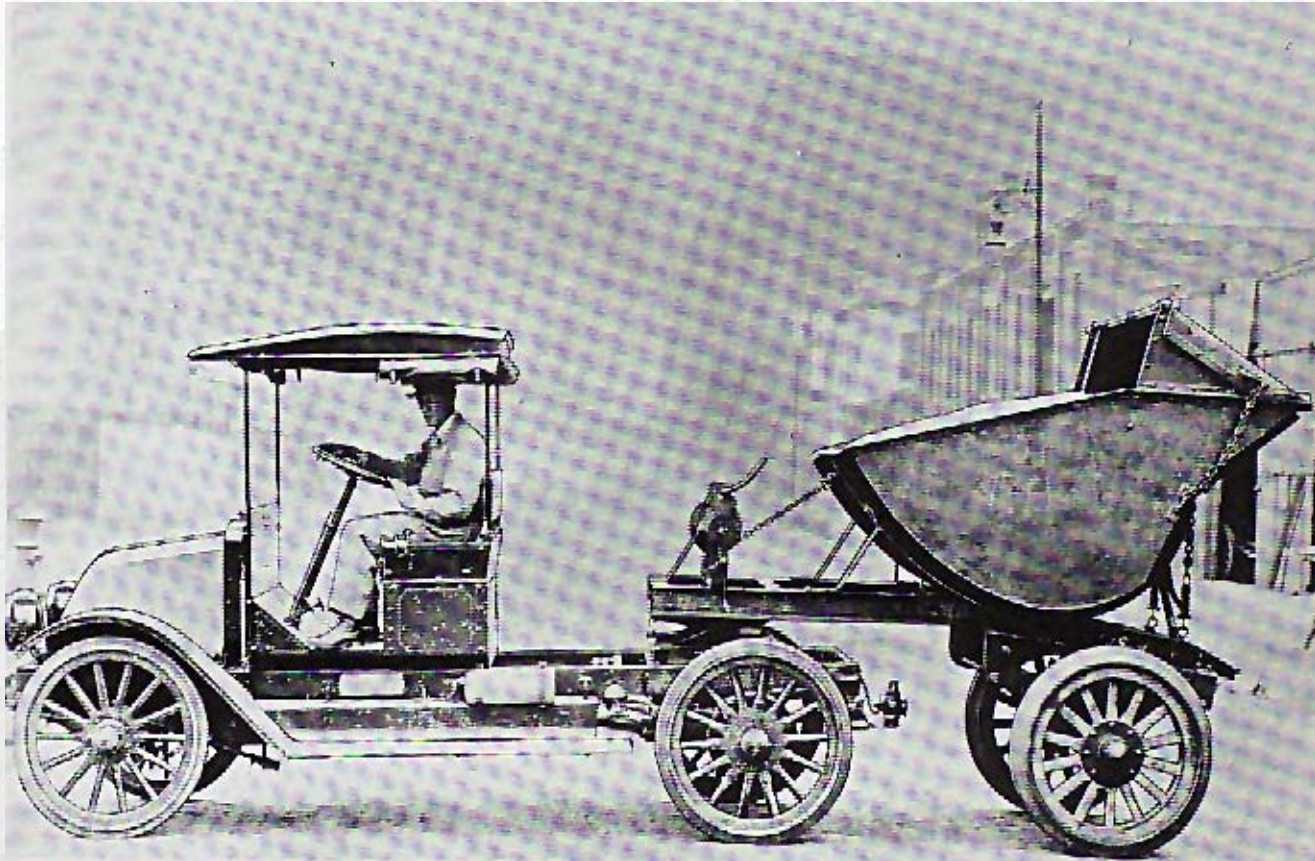


October 20th, 1916.

SOLD TO

Wm. M. Jahn Co.,  
20 Hendrie Ave.,  
Detroit, Michigan.

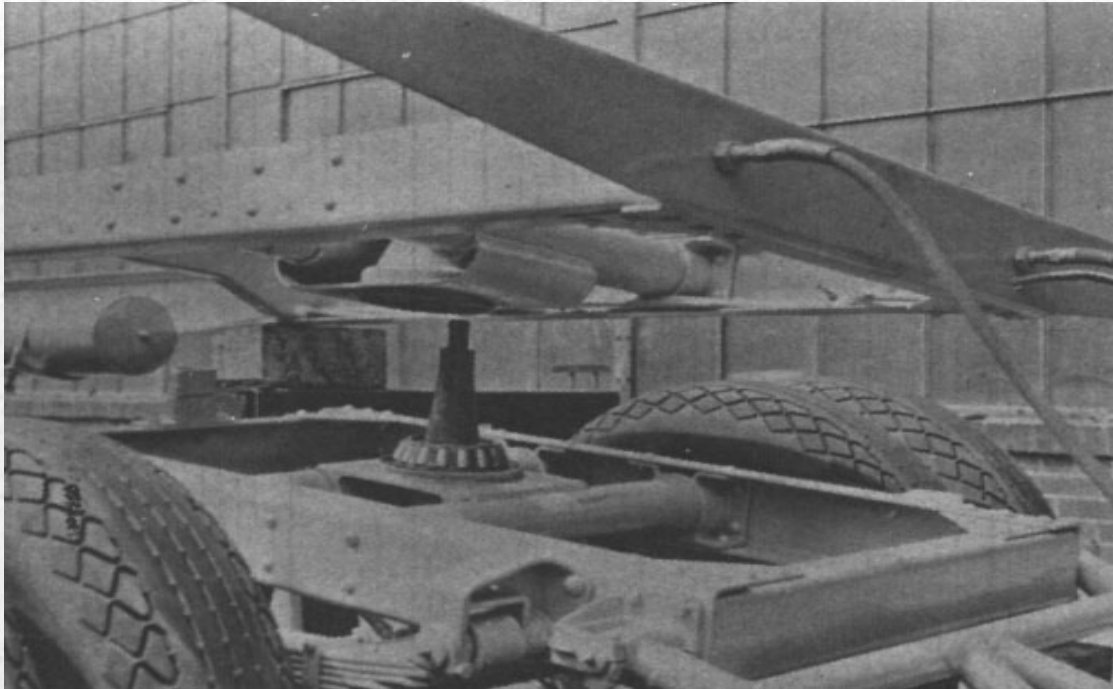
# Fifth Wheel Evolution



# Fifth Wheel Evolution



# Fifth Wheel Evolution



**How do you get to the next step?**

***TECHNOLOGY***

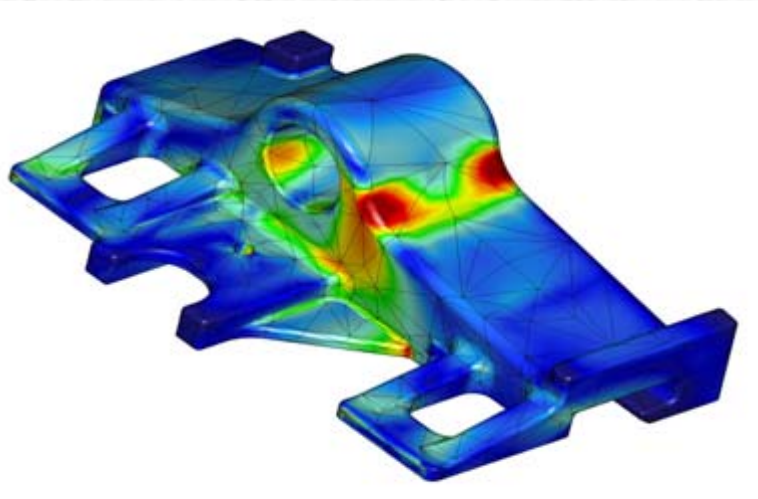


# Research Center



- State-of-the-art research and testing facility
- Largest research center in the world dedicated exclusively to fifth wheels

# Research Center



- Design technology
- Product quality and performance begin with sophisticated design technology such as finite element analysis

# 3D Imaging Printer



Wax Prototype Models



# Research and Development

## Testing Capabilities

- Life Cycle
- Ultimate Strength
- Wear
- Vibration Analysis
- Environmental
- Corrosion

Test per EC 94/20  
standards





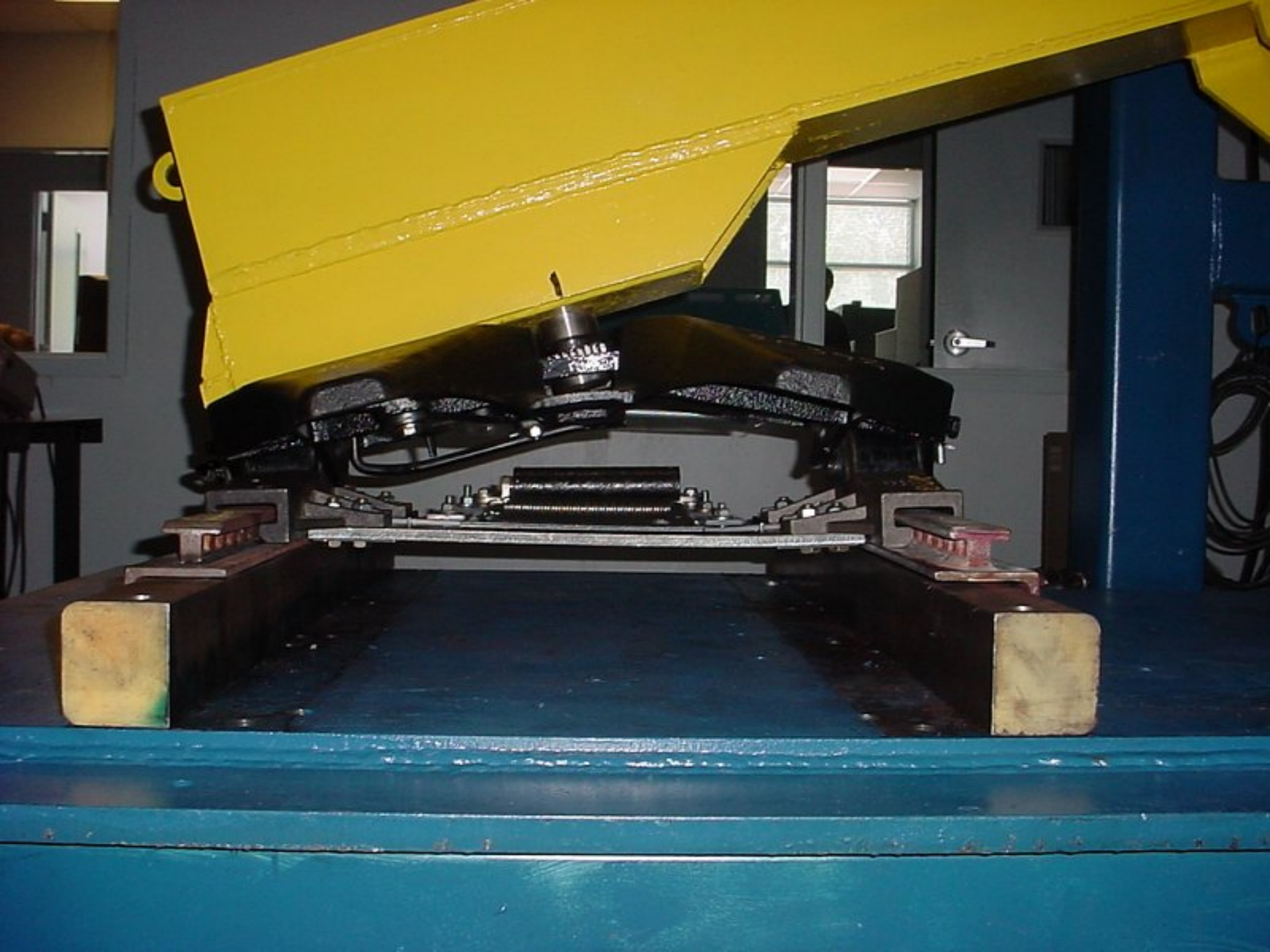
## **2 Axis Dynamic Test Stand**

Two axis dynamic loading  
(Vertical, For & Aft) of a fifth  
wheel assembly per EC  
94/20 standard.



## Overturn Test

Static Load Test Frame  
Determines vertical load  
rating and ultimate strength  
of a fifth wheel assembly per  
EC 94/20 standard.





## Single Axis Shaker Table

Vibration profiles are applied to various fifth wheel components. Lock components, sensors, air cylinders, auto lube components, etc.

# Open and Close Simulator

## Lock Cycle Test Stand

Repeatedly opens and closes a fifth wheel locking mechanism. Tests for component wear and fatigue.

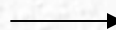


# Environmental Testing



Corrosion Testing

Environmental Chamber  
up to 320F down to -40F



# What does all this Research & Development lead to?

Continuous improvement in existing products and

*Cleaner*

*Safer*

*Easier to operate and*

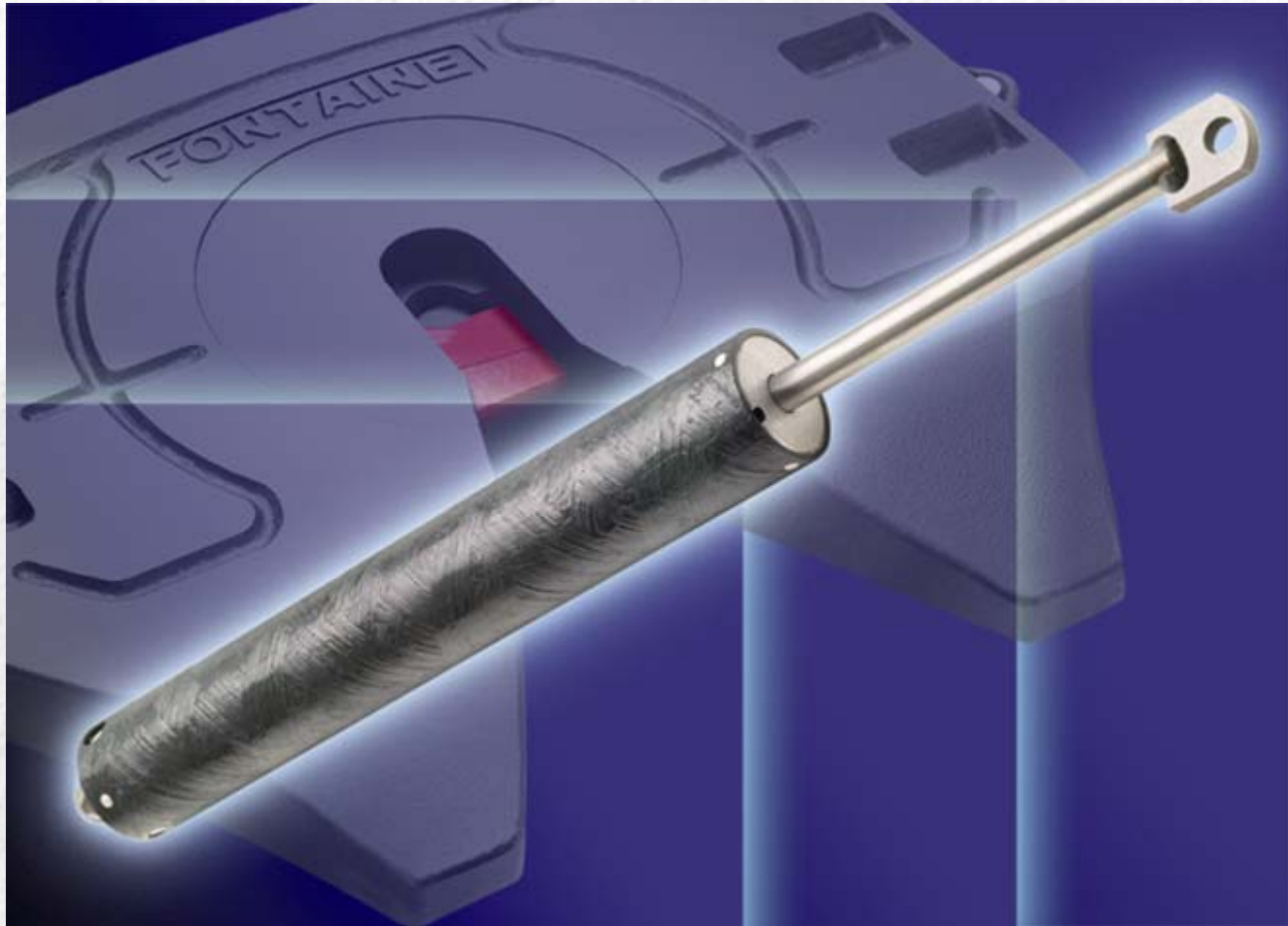
*Lighter weight*

New Products to meet today's demands!

# Low Lube **Clean Connect**



# Composite Air Cylinder





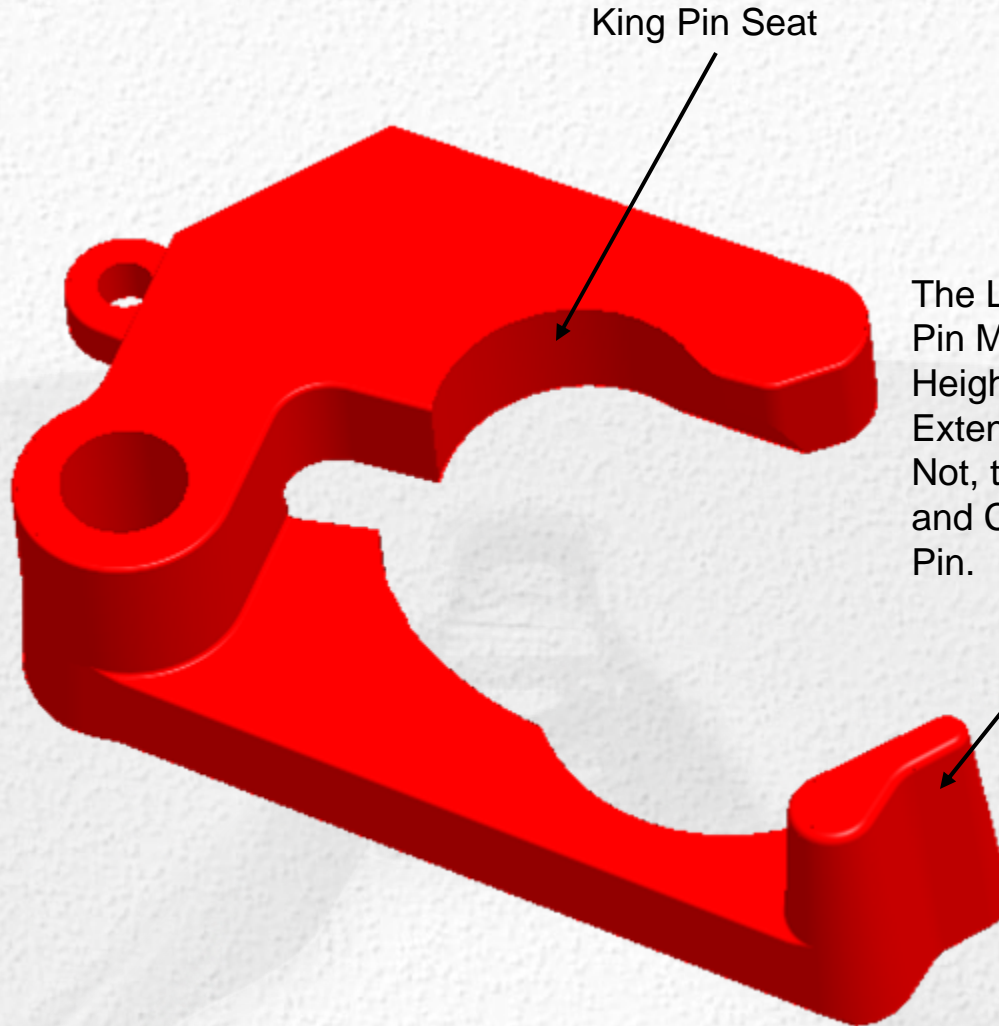
Pause

Step

Play



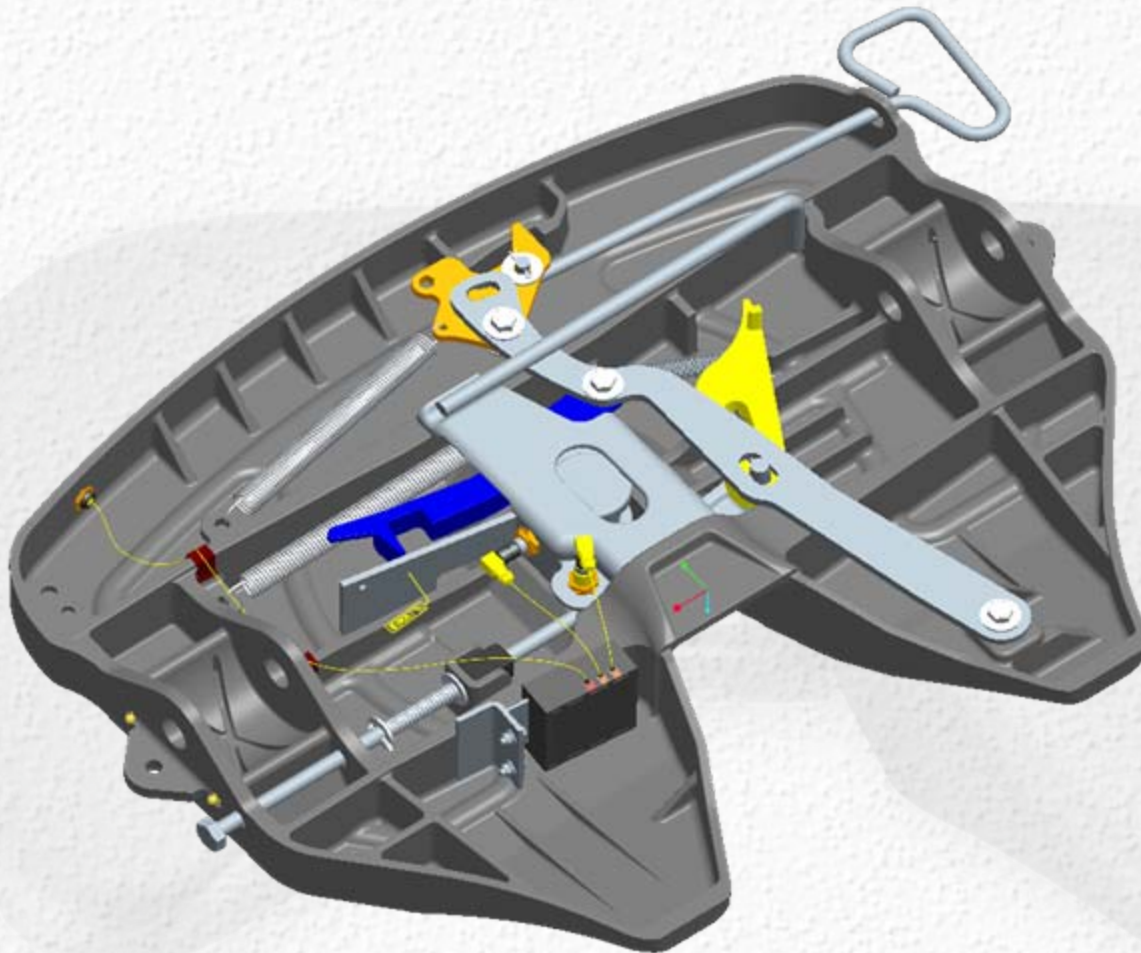
# Patented Anti-High Hitch Feature



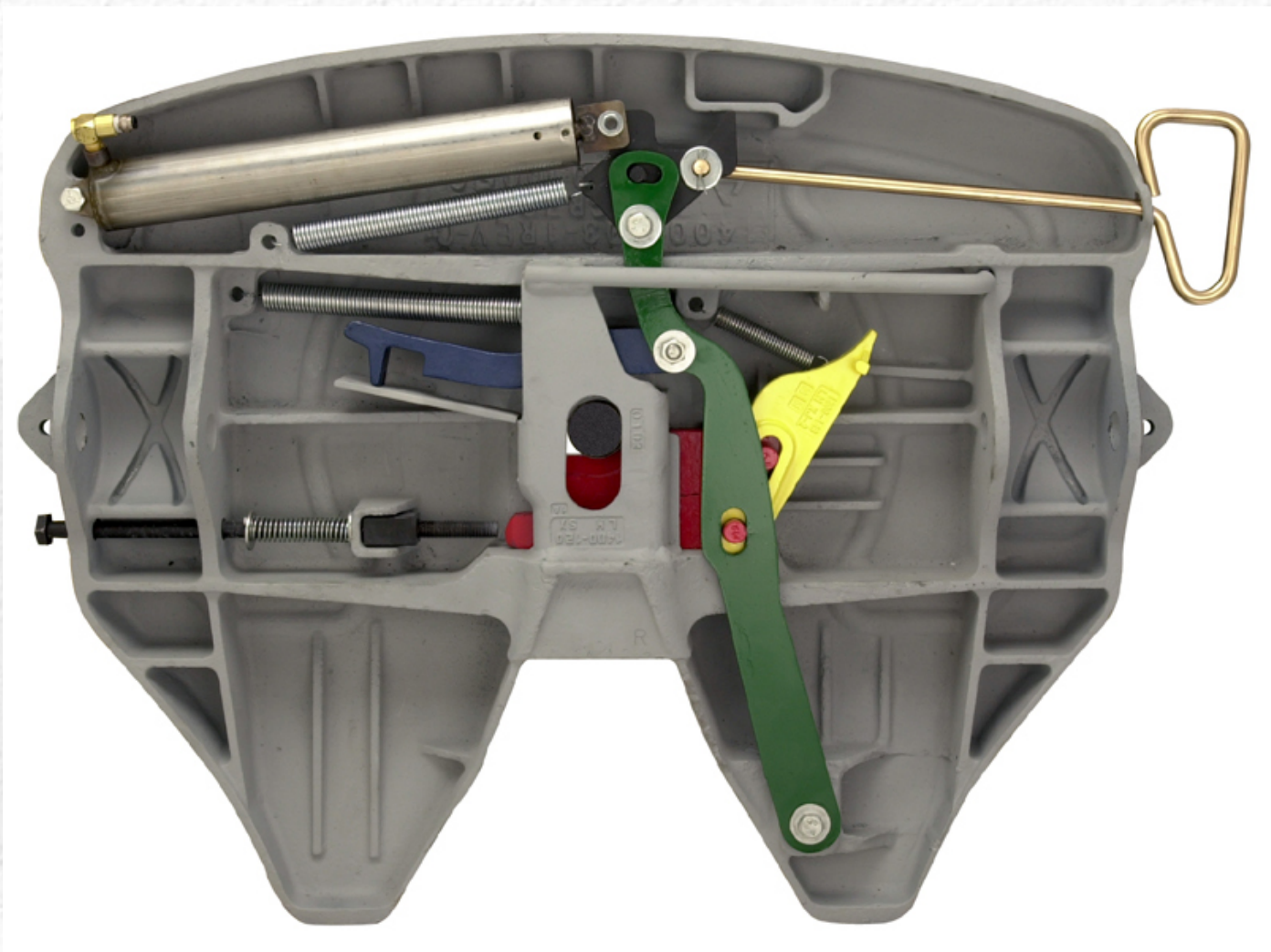
King Pin Seat

The Lower Flange of King Pin Must Be At the Proper Height to Contact This Extension of the Jaw. If It is Not, the Jaw Will Not Rotate and Close Around the King Pin.

# Electronic Lock Indicator



# Air Actuated



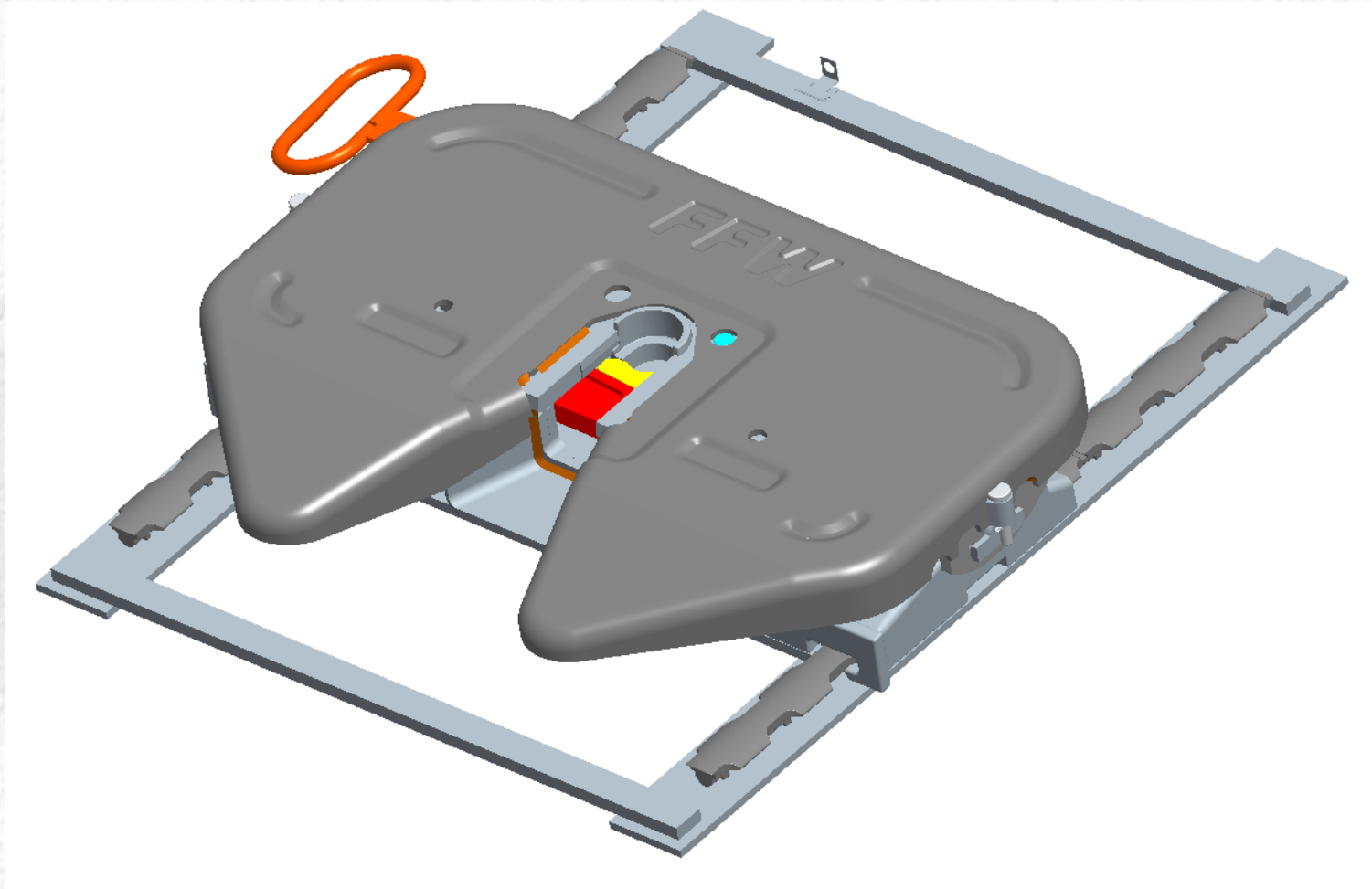
# Light weight products...

HOW ABOUT A COMPOSITE FIFTH WHEEL?



**OR**

How about a complete 24" sliding model made from steel that weighs less than an aluminum model?



# How is your fifth wheel maintenance program working?

Do you know?

Do you have one?

Is the procedure in writing or does your PM sheet just say “check fifth wheel”?

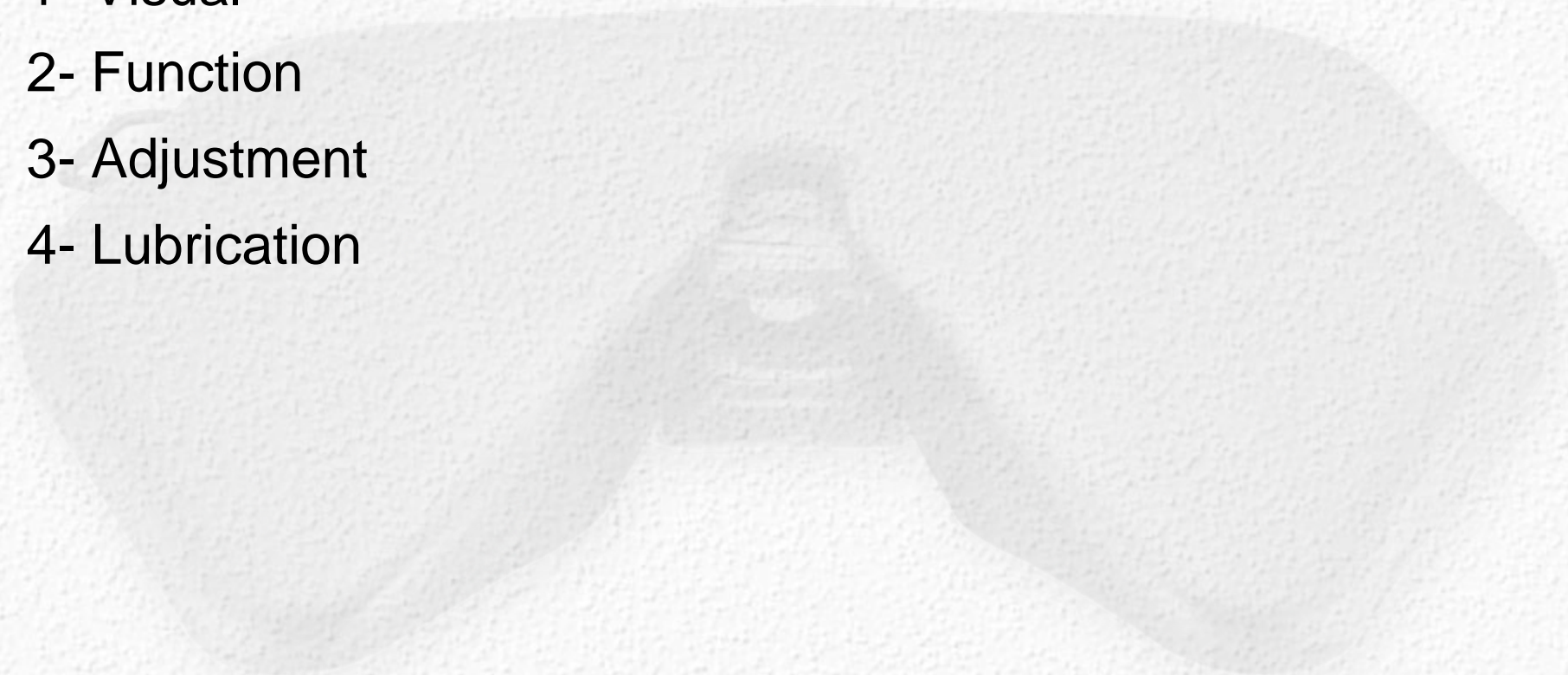
I challenge you to go back to your shop and check.

It is as easy as 1,2,3,4!

**If you do not have a program in place contact your fifth wheel supplier for instructions.**

We recommend a simple four step procedure:

- 1- Visual
- 2- Function
- 3- Adjustment
- 4- Lubrication



# What about the upper coupler and plate?

34,96

## KINGPIN WEAR LIMITS—COMMERCIAL TRAILERS AND SEMITRAILERS—SAE J2228 JUN93

SAE Recommended Practice

Replaces the Truck and Bus Fifth Wheel Subcommittee of the SAE Truck and Bus Council Committee approved June 1993.

1. Scope—This SAE Recommended Practice applies to upper coupler kingpins for commercial trailers and semitrailers conforming to the dimensional requirements of SAE J700 when new and originally installed. The dimensions of SAE J700 are the frame of reference for this document.

1.1 Purpose—The purpose of this document is to establish maximum parameters for kingpin wear and to suggest a gauge configuration for inspecting kingpin wear. Kingpins exceeding the conditions of this specification must be removed from service and replaced.

### 2. Reference

2.1 Applicable Document—The following publication forms a part of this specification in the extent specified herein. The latest issue of SAE publications shall apply.

2.1.1 SAE PUBLICATION—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

SAE J700—Upper Coupler Kingpin—Commercial Trailers and Semitrailers

3. Figure 1 shows minimum diameters and allowable areas for wear on kingpins. Check diameter at several points around the kingpin in order to detect and measure nonuniform wear conditions. Kingpin wear is restricted to areas shown in Figure 1 in crosshatch. Wear on non-crosshatched areas is not acceptable.

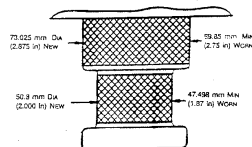


FIGURE 1—KINGPIN WEAR LIMITS

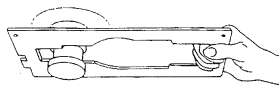


FIGURE 3—INSPECTION OF KINGPIN DIAMETERS USING ONE TYPE OF GAUGE

Figure 2 shows areas on kingpin where nicks, burrs, gouges, etc., are allowed. However, no burr, nick, and/or gouge may exceed 3.2 mm (0.12 in) in depth. The maximum number of nicks, burrs, gouges, etc., that exceed 1.5 mm (0.06 in) in length should not exceed 10 on the 50.8 mm (2.00 in) diameter. Nicks, burrs, gouges, etc., should not exceed 6.4 mm (0.25 in) in length when measured at their maximum length.

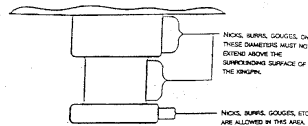


FIGURE 2—KINGPIN NICKS, BURRS, GOUGES

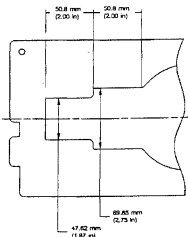
Figures 3 and 4 show a recommended gauge to inspect:

- Wear on 50.8 mm (2.00 in) diameter
- Wear on 73.02 mm (2.875 in) diameter
- Kingpin length
- Kingpin squareness to bolster plate

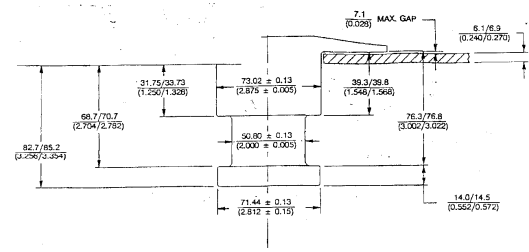
The gauge shown is of a "No Go" design so any engagement of the gauge on the appropriate diameter indicates the kingpin is worn and must be removed from service and replaced.

Kingpin length, squareness, and bolster plate flatness must be in accordance with SAE J700. Check squareness at several points around the kingpin to detect an out-of-square condition.

Other gauge configurations and direct reading measurement devices, such as micrometers and dial calipers, may also be used.



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INSTALLED DIMENSIONS

TYPICAL KINGPIN DIMENSIONS FOR 6.35 (1/4) PLATE

ALL DIMENSIONS IN (mm)

FIGURE 1—UPPER COUPLER KINGPIN

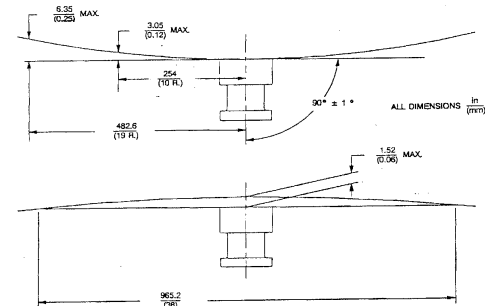


FIGURE 2—ALLOWABLE UPPER COUPLER PLATE BOWING

# Cold Weather Maintenance

- Clean and degrease the fifth wheel locking mechanism
- Check that all moving parts operate freely
- Lubricate per manufacturers specifications
- We suggest a Moly based lube
  - If temperatures are extreme you may want to consider a 90 wt. oil *However, check the mixing compatibility with your lubricant manufacturer – some do not mix well!*

# Training

- Do you have a training program in place for Fifth Wheel maintenance?
- If not, contact your fifth wheel supplier.
- Visit [www.fifthwheel.com](http://www.fifthwheel.com) for online training on Fontaine fifth wheels. Videos are also available in VHS, CD or DVD format



**FONTAINE**  
FIFTH WHEEL®

*Ideas in motion*



**MARMON HIGHWAY TECHNOLOGIES®**  
A BERKSHIRE HATHAWAY COMPANY