

# Technical Report – Large Scale Couplers

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## A Guide

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*Note: The report has been significantly revised based on feedback from the large scale community. Changes include:*

- *Addition of Bachmann Spectrum, Delton, and LGB couplers to the analysis.*
- *Addition of an introductory paragraph indicating what the document is and is not*
- *Deletion of recommended changes to the S-2 Standard. These changes are now in progress*
- *Addition of note regarding USA Trains development*
- *Editorial updates*

# Supplement to NMRA Recommended Practices 21

Initial Publication January 13, 2010

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# *NMRA Large Scale Coupler Compatibility*

## **Introduction**

The NMRA coupler compatibility working group has developed a Recommended Practice (RP) for future large scale coupler designs. Although large scales (#1 to Fn3) have coupler characteristics in common with the smaller scales (Z to O) some characteristics are unique to large scale. For that reason this RP applies only to large scale. The group may in the future create a similar RP for application to the smaller scales. The RP is appendix A of this document.

Please note that this document does not recommend the development of a coupler standard, a standard coupler, or the standardization of any existing coupler. It is primarily the analysis of the current large scale coupler situation with a determination of what couplers are currently compatible with each other and what factors make them compatible or incompatible. This analysis plus the draft RP provide manufacturers with the information in one place that will enable them to develop future couplers that are compatible.

## **Background**

An unofficial coupler standard has emerged in the smaller scales around Kadee and Kadee-like couplers to the point that a customer can buy a piece of rolling stock and have it couple easily, securely, and reliably to any rolling stock in the same scale from any manufacturer. This is not true in the large scales, where each manufacturer of rolling stock equips its products with couplers of its own design. These couplers are often not compatible with each other or with Kadees.

The primary reason for this is simple. In the 1970s, when the large scale movement was started, there was no well established large scale coupler standard or design on which companies entering that market could base their work.

The coupler standardization process in the smaller scales took approximately 50 years. The large scale community is about 20 years into a similar process. An RP published by the NMRA for large scales may shorten the process.

## **Composition of the Group**

The NMRA coupler compatibility working group was initially formed by a few individuals interested in finding a solution to the large scale compatibility problem. They approached the head of the NMRA standards organization and were invited to join a coupler study group being formed.

Manufacturers of large scale rolling stock and couplers were invited to join the group. Two of them did so and have contributed to the development. Other manufacturers have established points of contact and have been kept informed of the group's activity.

## **Basic Approach**

After several months of discussion the group arrived at two possible approaches to achieving large scale coupler compatibility.

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- The first was to adopt the Kadee G and #1 couplers as an official NMRA standard. This became known as the DKO (declare Kadee official) approach. Whenever a standards organization wants to make the product of one company a standard for an industry, that company traditionally gives up any patent rights, and other legal protections, so that others in the industry can produce the product. This is basically the arrangement that the NMRA has with the Lenz company, on whose products the DCC standards are based. This approach was informally communicated to Kadee's management. After serious consideration the company indicated that they do not feel this approach is in their best interests.
- The second approach is to look at all of elements of coupling, identify those relevant to compatibility, and create a document that defines the characteristics of those elements needed for compatibility. This approach was dubbed the SPEC approach and is the subject of this report.

The basic compatibility problems and the two approaches were described in an article published in the September 2009 issue of *Scale Rails*, the NMRA periodical. A copy of the article is included as appendix B. This article also contained a call for more volunteers to join the group. Several large scale modelers and others joined the group effectively doubling its size.

### **Compatibility Study**

The initial effort of the group was to document the compatibility, and lack thereof, of current large scale couplers. The group used the following criteria for determining compatibility:

- Did the couplers couple when pushed together on straight track?
- Did couplers stay coupled during operation until deliberately uncoupled?
- Did the coupling mechanism contribute to derailments or other problems?

The group only considered knuckle couplers. There is another type of coupler used in large scale called hook-and-loop. It was initially used by the LGB company and is still offered by some large scale manufacturers. However it is a completely different approach to coupling and is not compatible with any style of knuckle coupler.

The group accumulated one or more sets each of the couplers now used in the large scale community. These were photographed with knuckles both open and closed at a long focal length to minimized distortion. The photos were converted into drawings in CAD (computer aided design) software. The drawings were manipulated in the CAD software to determine:

- Whether the contours mated
- Whether lateral motion could cause inadvertent uncoupling
- How tightly they coupled

These findings were then verified via tests with the actual couplers. The results are illustrated in the matrix in table 1 below:

## NMRA Large Scale Coupler Compatibility

- Green cells indicate that the contours mate well and will stay coupled until deliberately uncoupled.
- Yellow cells indicate that the contours mate but may uncouple inadvertently due to lateral motion or height mismatch.
- Red cells indicate that the contours do not mate at all.
- Blue cells indicate contours that mate very tightly and the couplers form a rigid structure.

**Table 1. Large Scale Coupler Contour Mating Matrix**

AMS20	AMS29	AMS32	Aristocraft	Kuppler	Bachmann	B'm Spectrum	Delton	Kadee 820	Kadee 830	Kadee 900	LGB	MTH	USA Trains	
Green	Green	Red	Green	Green	Yellow	Green	Green	Green	Green	Green	Green	Green	Yellow	AMS20
Green	Green	Red	Green	Green	Yellow	Green	Green	Green	Green	Green	Green	Green	Yellow	AMS29
Green	Green	Red	Red	Red	Yellow	Red	Red	Red	Red	Red	Red	Red	Red	AMS32
Green	Green	Red	Green	Green	Yellow	Green	Green	Green	Green	Green	Green	Green	Blue	Aristocraft
Green	Green	Red	Green	Green	Yellow	Green	Green	Green	Green	Green	Green	Green	Yellow	Kuppler
Green	Green	Red	Green	Green	Yellow	Green	Green	Green	Green	Green	Green	Green	Green	Bachmann
Green	Green	Red	Green	Green	Yellow	Green	Green	Green	Green	Green	Green	Green	Yellow	B'm Spectrum
Green	Green	Red	Green	Green	Yellow	Green	Green	Green	Green	Green	Green	Green	Yellow	Delton
Green	Green	Red	Green	Green	Yellow	Green	Yellow	Green	Green	Green	Green	Green	Yellow	Kadee 820
Green	Green	Red	Green	Green	Yellow	Green	Green	Green	Green	Green	Red	Green	Yellow	Kadee 830
Green	Green	Red	Green	Green	Yellow	Green	Green	Green	Green	Green	Green	Green	Yellow	Kadee 900
Green	Green	Red	Green	Green	Yellow	Green	Green	Green	Green	Green	Green	Green	Yellow	LGB
Green	Green	Red	Green	Green	Yellow	Green	Green	Green	Green	Green	Green	Green	Yellow	MTH
Green	Green	Red	Green	Green	Yellow	Green	Green	Green	Green	Green	Green	Green	Green	USA Trains

*Note: On June 6, 2010 at the Big Train Show in Ontario, CA USA Trains demonstrated adaptors to mount couplers at the S-2 height. According to USA Trains these will be released in a few weeks. When tested, use of these is expected to turn the yellow boxes in the USA Trains column to green.*

The general findings of this study were:

- Many incompatibilities are due to height mismatch.
- Newer coupler designs tend to be more compatible with each other and with Kadees. That is, the general trend is already in the right direction.
- The most serious compatibility problem exists between the two most popular manufacturers of standard gauge rolling stock.

## NMRA Large Scale Coupler Compatibility

### Requirements for RP

After much experimentation, discussion, and observation the group settled on the following elements as relevant to coupler compatibility.

#### **Coupler Height**

Correct coupler height is already specified in NMRA standard S-2. The specified height for #1 scale standard gauge couplers corresponds to scale height for the prototype. The specified height for Fn3 couplers corresponds to the height recommended for the Kadee G coupler. Correspondence to a prototype scale height is not applicable in this case because there is no universal height standard for narrow gauge prototypes.

#### **Coupling**

Rolling stock should couple when pushed together on straight track when the knuckle of one or both couplers are open. Kadee couplers are excepted because those knuckles are spring loaded in the closed position. They automatically open when pushed on by the knuckle of the other coupler.

The force needed to couple should not exceed 8oz.

#### **Tracking Influence**

Poor coupling often leads to derailments. This generally happens in two different ways.

#### **Adequate lateral swing to negotiate reverse curves**

The coupler must be able to swing to the side far enough to accommodate a reverse curve. This limitation is particularly applicable to body-mounted couplers. The amount of swing needed is best expressed by the amount of lateral offset of car bodies when both couplers are at their maximum swing position.

Couplers should be designed to provide at least a half inch of lateral offset as defined in figure 1.

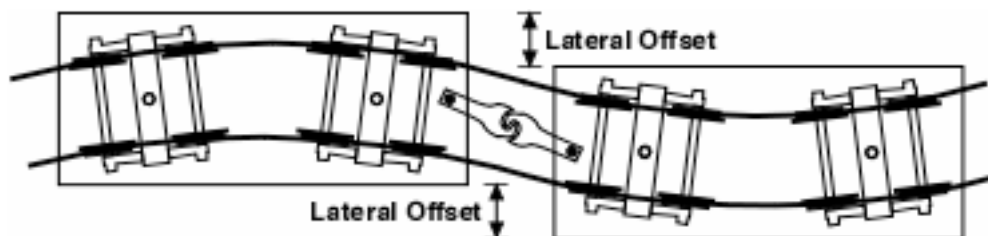


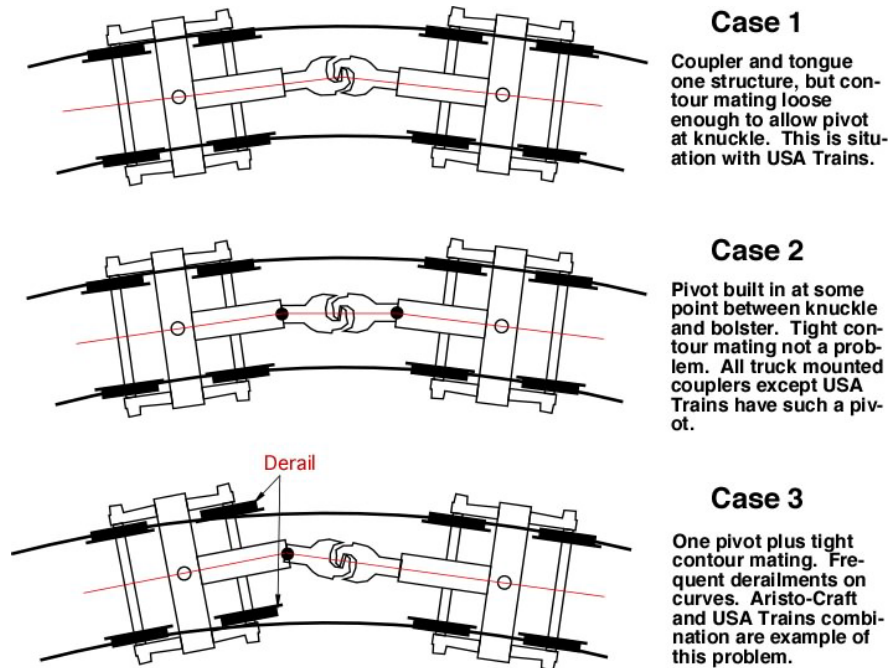
Fig 1. Coupler Swing Provides Lateral Offset

#### **Binding/Excessively tight coupling**

Often couplers mate, but they bind so tightly that the two couplers form a rigid structure. This poses two problems:

## NMRA Large Scale Coupler Compatibility

- One truck or piece of rolling stock will pull the truck or rolling stock to which it is coupled off the track on a curve. This problem is primarily associated with truck-mounted couplers. Figure 2 illustrates the problem.



**Fig 2. Derailment Caused by Rigid Coupler Mating**

- Most large scale railroads are outdoors. Leaves, twigs, and other unavoidable obstacles will occasionally cause a piece of rolling stock to topple over. If the couplers mate too tightly this will cause attached cars to also topple.

### **Mating Contours**



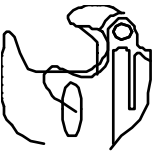





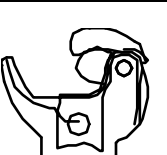
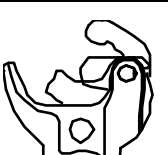
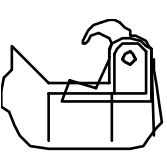
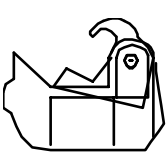


Contours are the shape of the mating surfaces. This is the key element in creating the RP. Table 2 below provides additional information on each of the couplers.

The couplers with contours that mate well were assigned to two sets, one intended for standard gauge models, the second for narrow gauge models. The RP indicates that future contour designs should mate with each of the contours in one of the two sets.

*Note that several couplers, factory installed on current standard gauge models, are oversize on those models. These oversize couplers are, however, approximately the correct size for narrow gauge models and are therefore included in that set.*

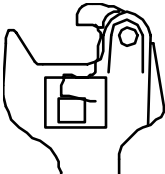


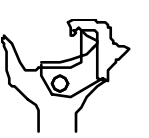




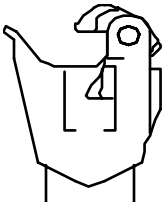



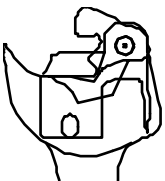

## NMRA Large Scale Coupler Compatibility

**Table 2. Current Large Scale Couplers**

Manufacturer/ Model	Knuckle Closed	Knuckle Open	Width, Knuckle Height, Lateral Offset	Comment/ Compatibility Set
<b>AMS20</b>			<b>.83"</b> <b>.55"</b> <b>0.5"</b>	Installed by Accucraft on AMS Fn3 product line. <b>Member narrow gauge set.</b>
<b>AMS29</b>			<b>.78"</b> <b>.55"</b> <b>1.25"</b>	Installed by Accucraft on AML 1:29 product line. <b>Member narrow gauge set.</b>
<b>AMS32</b>			<b>.58"</b> <b>.37"</b> <b>.75"</b>	Installed by Accucraft on AMS 1:32 product line. <b>Member standard gauge set.</b>
<b>Aristo-Craft (truck mount)</b>			<b>.86"</b> <b>.51"</b> <b>N/A</b>	Installed by Aristo-Craft on 1:29 trucks. <b>Member narrow gauge set.</b>
<b>Aristo-Craft (body mount aka Kuppler)</b>			<b>.77"</b> <b>.47"</b> <b>1.0"</b>	Developed by Aristo-Craft for body mounting on 1:29 products. <b>Member narrow gauge set.</b>
<b>Bachmann (truck mount)</b>			<b>.87"</b> <b>.51"</b> <b>N/A</b>	Mounted low. Inadvertent uncoupling problems when mated with other couplers. <b>Not assigned to a set.</b>
<b>Bachmann Spectrum (body mount)</b>			<b>.81"</b> <b>.52"</b> <b>.875"</b>	Installed on newer high quality Spectrum line. Body mounted at correct height. <b>Member narrow gauge set.</b>



## NMRA Large Scale Coupler Compatibility

Manufacturer/ Model	Knuckle Closed	Knuckle Open	Width, Knuckle Height, Lateral Offset	Comment/ Compatibility Set
<b>Delton</b>			.85" .53" N/A	Truck mounted on Delton line of 1:24 scale rolling stock. <b>Member narrow gauge set.</b>
<b>Kadee #1 (820 series)</b>			.60" .37" 1.0"	Most compatible of all couplers tested. <b>Assigned to both narrow &amp; standard gauge sets.</b>
<b>Kadee G (830 series)</b>			.85" .47" 1.25"	Being replaced by Kadee 900 series. <b>Member narrow gauge set.</b>
<b>Kadee 900 series</b>			.73" .49" 1.25"	New Kadee product. <b>Member narrow gauge set.</b>
<b>LGB</b>			.82" .56" N/A	Truck mounted on LGB products. <b>Member narrow gauge set.</b>
<b>MTH</b>			.87" .49" N/A	Installed by MTH on 1:32 product line. <b>Member narrow gauge set.</b>
<b>USA Trains</b>			.83" .46" N/A	Factory mounting too low. Mating and inadvertent uncoupling problems with other couplers. <b>Not assigned to a set.</b>

## *NMRA Large Scale Coupler Compatibility*

### **Elements not Required for Compatibility**

In addition to the elements of coupling already mentioned, the group looked at other elements but determined that they are not relevant to an RP/standard for compatibility. Each of these elements is discussed briefly below.

#### ***Mounting***

This is primarily an issue of body mounting vs. truck mounting. Unlike HO scale but like N-scale, large scale rolling stock manufacturers have traditionally truck mounted their couplers. However, one large scale company is body-mounting couplers on their newest high quality line of products. Another has announced plans to do so.

After considerable discussion the group concluded that mounting style was not relevant to compatibility so long as the subject couplers were mounted at the correct height.

#### ***Uncoupling***

This discussion revolved around remote uncoupling. That is the ability to uncouple a car without touching it. The *de facto* Kadee standard in the smaller scales includes Kadee's magnetic uncoupling system. That is, all the Kadee-like designs that have emerged in the smaller scales include a trip pin that reacts to uncoupling magnets between the rails or buried under the track.

Specifying a similar system for large scale was considered but two issues led the group away from it.

- Large scale rolling stock is large enough that it is feasible to model the prototype's method of uncoupling. That is using a cut lever and chain to lift a pin in the coupler to release the knuckle. Several large scale manufacturers include this mechanism in their models and many modelers use it.
- Innovation, miniaturization, and price reduction in electronics have made it feasible to develop remote uncoupling systems other than the Kadee magnetic method. Several companies have indicated that they have electronic systems in the works.

#### ***Pulling Power***

This was briefly considered. In the first discussions some members reacted negatively to the idea that a very weak coupler should be considered compatible with one that could pull 100 or more cars. As issues emerged we saw no apparent and significant difference between the pulling power of the current products. It is not likely that a significant difference will emerge in the future. The group also realized that it would be difficult to determine what adequate pulling power should be, how to specify it, how it measure it, and how to test it.

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## **Appearance**

Serious modelers are always interested in having components of their models be the correct size and shape. However, it has not been shown that these issues are at all related to coupler functionality or compatibility.

## **Recommendation to Delete Outdated Documents**

In research for this project the group examined several coupler related documents and found that the information presented in them is no longer needed. The group recommends that they be deleted from the list of RPs.

### ***RP-21.1 Coupler Contour***

This was created in 1957 to promote a “standard” contour to which manufacturers could design couplers that would mate. It was never populated with data other than HO scale. The smaller-scale community has adopted Kadee contours as a *de facto* standard thus obviating the need for RP-21.1. In the large scales the RP recommended in this report contains information that supercedes that in RP-21.1.

### ***RP-21.2 Solid Coupler***

This was created in 1960 to provide a standard design for low cost couplers that did not have a functioning knuckle. It is populated with data for several scales. In the drawing the contour looks like that of a prototype type E coupler, but a call-out says the contour should be that of RP-21.1. The group also looked at a #1 scale version of the prototype contour and concluded that no current large scale contour would mate with it. It is unlikely that any Kadee or Kadee-like coupler contour in the smaller scales would mate with it either.

## **Conclusion**

The working group is confident that in this document they have identified the relevant elements associated with large scale coupler compatibility and recommends that the NMRA management adopt appendix A as an RP for large scale coupler compatibility.

# NMRA Large Scale Coupler Compatibility

## Appendix A

### Recommended Practice for Large Scale Coupler Compatibility

This RP applies only to knuckle couplers on large scale (#1 to Fn3) rolling stock running on #1 (45mm) gauge track.

#### Coupler Height

Couplers should be mounted at the height specified in Standard S-2:

- For narrow gauge rolling stock use the Fn3 scale height (1.125"/28.5 mm).
- For standard gauge rolling stock use the #1 scale height (1.063"/27 mm).

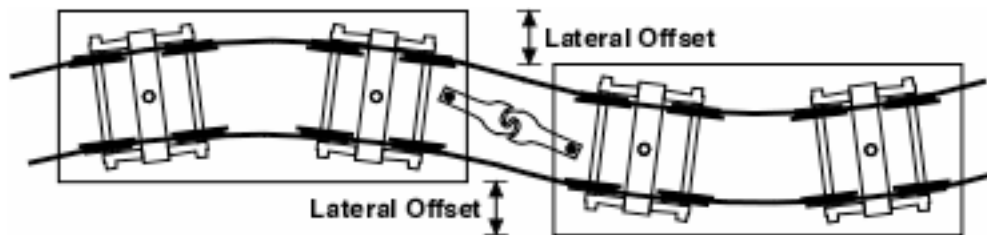
#### Coupling

Rolling stock should couple when pushed together with minimal force on straight track when the knuckle of one or both couplers is open. *Note: Kadee and Kadee-like couplers are excepted because those knuckles are spring loaded in the closed position. They automatically open when pushed on by the knuckle of the other coupler.*

The force needed to couple should not exceed 8 oz. This recommendation assumes that springs, latches, and other mechanisms are lubricated and “broken in.”

#### Coupler Swing

Couplers should swing from side to side far enough to allow at least a half inch of lateral offset as defined in the following figure to negotiate moderate reverse curves.



#### Binding/Tight Coupling

Couplers should not mate so tightly that they cause derailments or pull other cars over if one car topples.

#### Mating Contours

New coupler designs should have contours that mate with the following sets of current couplers.

- Couplers intended for standard gauge models should have contours that mate with current AMS32 **and** Kadee 820 series couplers.
- Couplers intended for narrow gauge models should have contours that mate with **each** of the current couplers in the following set -- AMS20, AMS29, Aristo-Craft (truck mount), Aristo-Craft Kuppler (body mount), Bachmann Spectrum, Delton, Kadee 820 series, Kadee 830 series, Kadee 900 series, LGB, and MTH couplers.

# NMRA Large Scale Coupler Compatibility

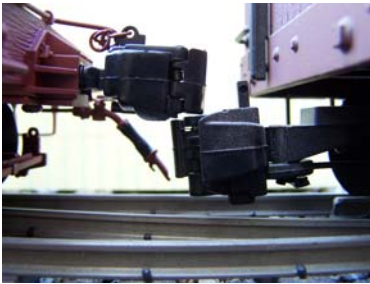
## Appendix B

### Sept 09 Scale Rails Article

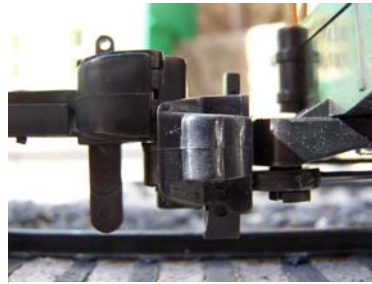
#### Large Scale Coupler Compatibility: The Need for Standards

A customer buying a locomotive or car in any of the small scales (Z to O) can set it on the track and be confident that it will couple easily, securely, and reliably to a locomotive or car of the same scale from any manufacturer. This is seldom true for large scale (Fn3 to #1). Instead one of the following frequently happens:

- The couplers pass one on top of the other and do not couple at all (*fig 1*).
- They couple but height mismatch causes them to inadvertently uncouple over uneven track (*fig 2*).
- The couplers bind and form a rigid structure that does not bend on curves, causing derailments (*fig 3*).



**Fig 1**



**Fig 2**



**Fig 3**

Each large scale manufacturer has its own knuckle coupler design. They are different sizes, different shapes, mounted at different heights, or have different mechanisms. The reason for this lack of compatibility is simple. As large scale emerged in the 70s there was no common reference on which these companies could base their knuckle designs. The NMRA had not issued any coupler standard. Kadee, the *de facto* standard in the small scales, had not yet introduced their large scale products.

The NMRA made a major effort to set a standard for couplers in the 50s and 60s. A working group within the NMRA designed what is known as the HO “horn hook” coupler. It bore little resemblance to prototype couplers and its ability to easily, securely, and reliably couple cars is debatable. When put to a vote, the full membership of the NMRA rejected it as a standard.

Memories of bitter debates and recriminations over this issue have effectively kept the NMRA from tackling full coupler compatibility standards again. However, the NMRA did partially address the issue when it published the Coupler Height standard (S-2) in 2004.

# NMRA Large Scale Coupler Compatibility

## Emergence of the *de facto* Coupler Standard

In the 50s twin brothers, Keith and Dale Edwards, devised a coupler system that they thought was better than anything the locomotive/car manufacturers were providing. It coupled easily, securely and reliably. It even looked like a prototype coupler. In the 60s they added a clever magnetic uncoupling system.

Their company, Kadee, protected the designs with a series of patents. Kadee did not license the design of these couplers to the locomotive/car manufactures and until recently did not sell the couplers to other manufacturers.

Kadee expanded the product line to include every popular model railroad scale. They were so successful that every serious modeler threw away whatever coupler came with their car or locomotive and installed Kadee couplers. Eventually the key patents expired and the locomotive/car makers from Z to O scale started equipping their rolling stock with Kadee-like couplers of their own design.

## The Need for a Compatibility Standard

This process of achieving coupler compatibility in the smaller scales took about 50 years. We are about 20 years into a similar cycle with the large scale community. Can we shorten this cycle?

Large scale is the fastest growing component of the model railroad market. The manufacturing community is dynamic. MTH, a large toy train manufacturer, is now offering excellent line of #1 scale models – with its own coupler design. Accucraft, long a supplier of high end Fn3 models, is expanding its lines into lower priced #1 scale models and Fn3 models – each with new coupler designs. Bachmann has recently upgraded its Fn3 product line. A major feature of the new line is redesigned body-mounted couplers. Aristo-Craft has announced that it will redesign its #1 scale couplers.

LGB, the German company that created the large scale movement, has gone out of business. New companies will replace it. Existing companies will continue to refine their products. *The large scale community badly needs a standard that will encourage and enable manufacturers to converge on coupler design.*

## Current NMRA Coupler Standards Efforts

About a year ago the NMRA formed a working group to address coupler standards. Its first task is tackling large scale coupler compatibility. The group is small and exchanges comments via the Yahoo group mechanism. All the large scale manufacturers have been invited to send representatives. Two have done so and are active participants. The other manufacturers have identified points of contact and have asked to be kept informed of developments.

After a fair amount of discussion the group has agreed in principle that because Kadee products already represent a *de facto* coupler standard, any NMRA standardization effort will maintain compatibility with Kadee's large scale products.

Right now the working group is at a fork in the road of developing an RP/Standard. Should the NMRA create a specification that defines a "standard" coupler on which manufacturers can base future designs? Or should the NMRA adopt current Kadee

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designs and declare them as the “standard” coupler? Each of these approaches has some attractive strengths, but each has some significant problems associated with it.

### **Standard Coupler Specification**

The idea behind this approach is to examine the various aspects of knuckle coupler design and determine which characteristics and dimensions are critical for mating with other couplers. Couplers designed and built with those characteristic and dimensions would be compatible. When the group is satisfied that it has chosen the correct characteristics and dimensions it would publish them in a specification that would be the guts of an RP/Standard.

Such a specification would be tight enough so that couplers built to that specification would be compatible with each other. That is, if company A’s coupler adhered to the specification and company B’s also did, then the couplers from the two companies should be compatible. If they are not compatible the fault would be in the specification.

An RP/Standard based on this approach could and should be based on Kadee designs. The RP/Standard could acknowledge a Kadee heritage, but it need not. The key patents protecting the basic Kadee design are long expired. The industry is free to imitate the design and make other uses of it, as indicated by the proliferation of Kadee-like couplers in the smaller scales.

There would be little incentive for companies to build to the RP/Standard if they could not point to NMRA certification in their packaging and advertising. Therefore the NMRA would have to set up a testing program to determine if products claiming to be built to the RP/Standard actually meet the requirements and a certification process to “bless” those products.

Developing such a specification is not a trivial effort. Although railroad couplers may seem simple, determining what needs to be specified vs. what is irrelevant, getting the contours right, establishing the proper tolerances, and the like will require discipline and talent. The group would also consider coupling mechanisms, uncoupling mechanisms, strength, and other factors that may not be obvious at the start of the project.

Creating such a specification will require extensive research, input from the community, and the talent of professional engineers. The NMRA is an organization of volunteers. Development of an air tight specification will require significant time and talent. Does the NMRA’s corps of volunteers include the necessary talent? Are any interested or passionate enough to devote the time necessary? Does it have a leader with the enthusiasm, talent, and experience to guide this effort to completion?

### **Proclaim Existing Kadee Products as Standard**

In essence, this approach would make official the informal standard that is Kadee. Making Kadees an official NMRA RP/Standard would encourage manufacturers to adopt Kadees or make Kadee-like couplers. It would lessen the 50-year span that it took a standard to emerge in the smaller scales. Using this approach large scale coupler compatibility could be achieved in a little as five years.

## *NMRA Large Scale Coupler Compatibility*

Basing a standard on an existing product is something not normally done by standards making organizations. This approach seems to be very counter to the NMRA culture based on the discussion that the working group has had on this issue. This is understandable. Any industry organization needs to treat all its members fairly and not give an advantage to one of its members. The credibility of the organization depends on this.

However, sometimes a standards organization does adopt the product of one of its members. This is often done in the communications industry to take advantage of work already done. In these situations the company providing the product normally gives up patent protection and any proprietary data so that its product or data can be used by other companies.

There is precedent for this approach within the NMRA. The DCC Standard is based on products developed by the Lenz Corporation and this is acknowledged in the documentation of the DCC Standard. Lenz gave the manufacturing rights and data to the NMRA to pass on to other manufacturers of DCC components.

The situation with a Kadee based coupler standard is not an exact parallel but the same principles apply. If the NMRA were to name Kadee products as standard it would be reasonable for the company to release any proprietary data such as drawings needed by other companies to make copies of Kadee couplers. This possibility has been informally discussed with the Kadee representative on the working group. He indicated that the company would consider such issues, but it is too early in the process to take specific commitments.

There is one other issue that needs to be explored with this approach. What happens when Kadee introduces a new coupler design? Presumably any new coupler would be backward compatible with Kadee's older couplers, but it may not be compatible with other companies' Kadee-like couplers. What is the NMRA's position in that case? Does the new coupler automatically become a new standard? Does the NMRA keep only the older design as standard? Should the NMRA discourage Kadee from coming out with new designs? These questions must be addressed if the group chooses this path to development of an RP/Standard.

### **Conclusion**

The purpose of this article is to inform NMRA membership of a problem in the model railroad community and identify how an RP/Standard may contribute to its solution. If any reader has feed back to the article or is interested in participating in the Coupler Compatibility Working Group please contact Steve Seidensticker, one of the group moderators, at [sseiden@cox.net](mailto:sseiden@cox.net).