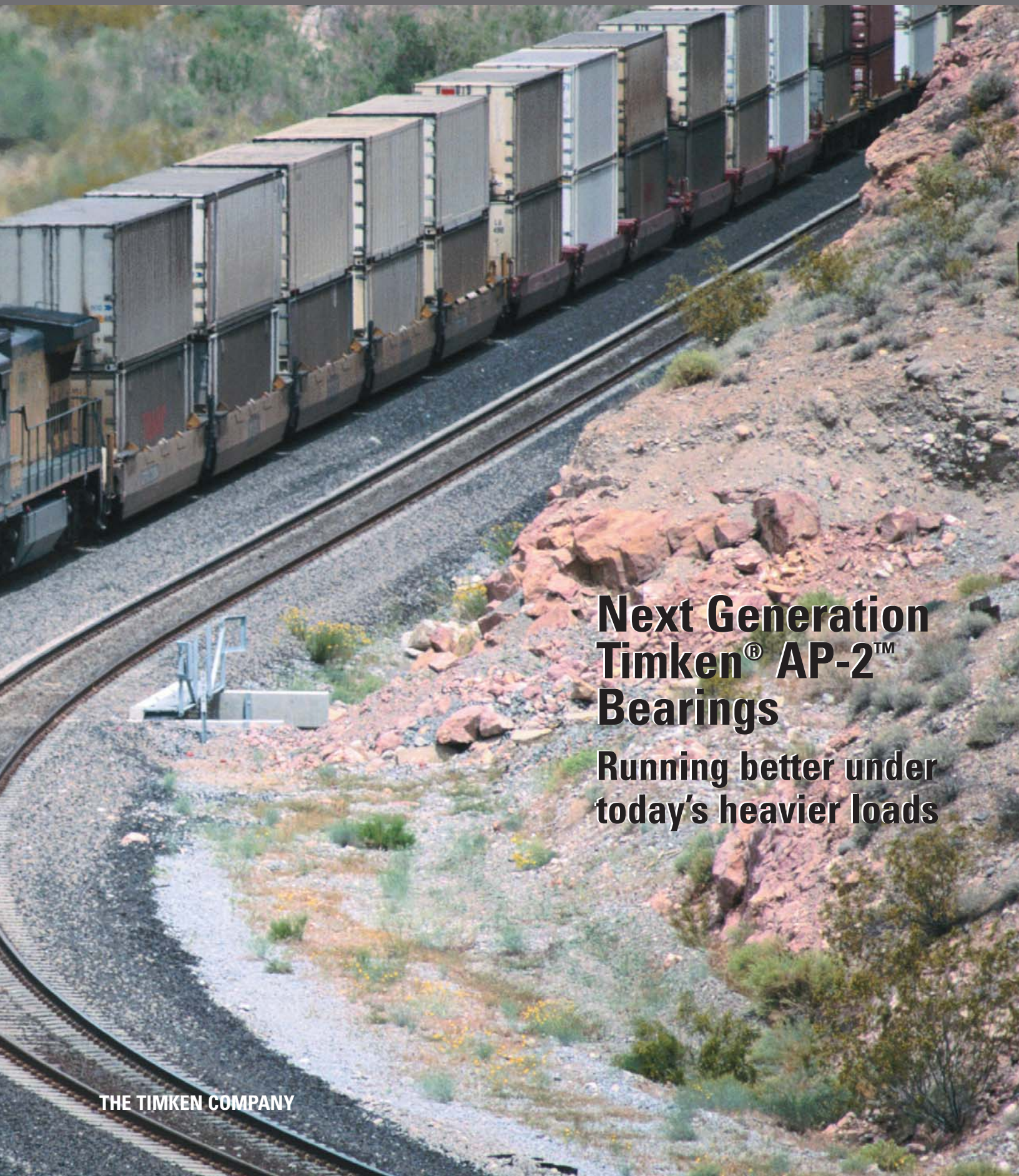
TIMKEN®



Next Generation Timken® AP-2™ Bearings

Running better under today's heavier loads

THE TIMKEN COMPANY

Shorter journal means longer be

When it was introduced in 1994, the Timken® AP-2™ Class K (6-1/2 x 9) bearing attracted the attention of the railroad industry by promising improved service life under heavier loads. The AP-2 bearing has exceeded our expectations and delivered reliable service for operators and car owners. In addition, when examined after service, the AP-2 bearing exhibited less bearing component and axle wear.

The AP-2 bearing design was based on the original AP™ (All-Purpose) bearing, which set a new standard in the industry when it was unveiled in 1954. For the shorter AP-2 bearing, journal axle flexure is reduced which means less fretting wear between bearing components and less chance of the bearing adjustment going out of specification over an increased service life.

For the AP-2 bearing design, sealing techniques using The Timken Company's reliable HDL™ Seal technology eliminate seal wear rings and enhance the reliability of the bearing by lowering torque and maintaining low operating temperatures.

The family of AP-2 railroad bearings is another example of The Timken Company's leadership in research and in the development of innovative products that support the improved efficiency and effectiveness of the railroad industry's locomotives and rolling stock.

Today, it is becoming increasingly important to improve efficiency and productivity and to lower cost. If freight cars can carry additional weight, transportation productivity is enhanced.

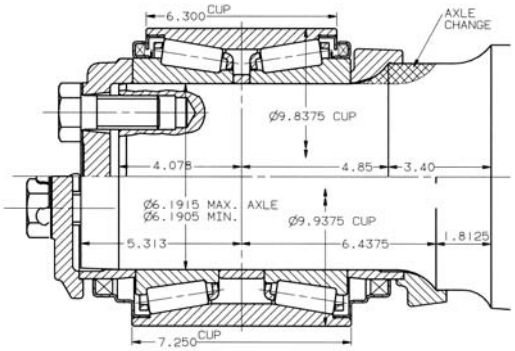
When freight car weight increases, wear and tear on the equipment and track also increase, as do the associated costs. As a load is applied to a shaft, the shaft bends. If the load increases, the shaft bends more. For a journal bearing mounted on the end of an axle, bending causes minor, but continuous, movement between the bearing component parts and the axle, causing fretting wear between those mating surfaces.

Will wear on axles and journal roller bearings cause axle grooving and make you fret over bearing performance in the future? Not if Timken AP-2 Class K, L and M bearings are installed.

The AP-2 bearing has a shorter journal which reduces axle flexure.

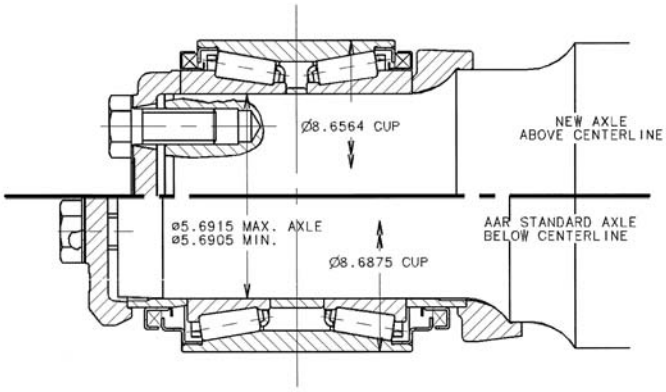
aring life

Timken AP-2 Class K Bearing



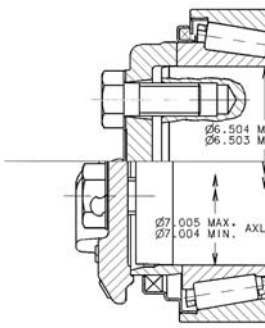
Timken AP Class F Bearing

Timken AP-2 Class L Bearing



Timken AP Class E Bearing

Timken AP-2



Timken AP

Benefits of the Timken AP-2 bearing

- A shorter journal design reduces journal deflection and minimizes fretting between components and axles. The design eliminates axle grooving, cone backface wear and loose backing rings.
- Its compact design incorporates fewer components and reduces bearing weight. The weight savings per car using AP-2 bearings in place of their predecessor AP bearings can reduce the light weight of your railcar up to 456 pounds or even more for special truck designs.
- The AP-2 bearing features better sealing technology, providing the lowest torque to be achieved in freight car service. This also means reduced locomotive fuel consumption, extended grease life and improved bearing life. AP-2 bearing HDL Seals also offer even better protection from water ingress.

WEIGHT SAVINGS COMPARISON
TIMKEN AP BEARING VS. TIMKEN AP-2 BEARING

(Weights in pounds)

AP-2 CLASS K (6 1/2 X 9) FOR 286,000 LBS GRL CARS

	BEARINGS(2)	ADAPTERS(2)	AXLE	TOTAL
CLASS F NON-SHROUDED	201.5	70.5	1175.0	1447.0
CLASS K	178.0	64.0	1168.0	1410.0
SAVINGS PER WHEELSET				37.0
SAVINGS PER CAR				148.0
CLASS F SHROUDED	223.5	70.5	1175.0	1469.0
CLASS K	178.0	64.0	1168.0	1410.0
SAVINGS PER WHEELSET				59.0
SAVINGS PER CAR				236.0

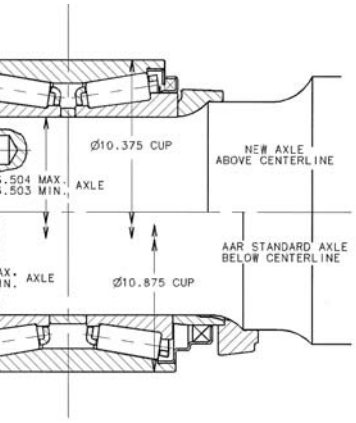
AP-2 CLASS L (6 X 8) FOR 220,000 LBS GRL CARS

	BEARINGS(2)	ADAPTERS(2)	AXLE	TOTAL
CLASS E	137.0	55.6	931.4	1124.0
CLASS L	124.8	51.4	923.8	1100.0
SAVINGS PER WHEELSET				24.0
SAVINGS PER CAR				96.0

AP-2 CLASS M (7 X 9) USING STANDARD CLASS G (7 X 12) FRAME FOR 315,000 LBS GRL CARS

	BEARINGS(2)	ADAPTERS(2)	AXLE	TOTAL
CLASS G	260.0	111.0	1330.0	1701.0
CLASS M	202.0	102.0	1283.0	1587.0
SAVINGS PER WHEELSET				114.0
SAVINGS PER CAR				456.0

AP-2 Class M Bearing



AP Class G Bearing

AP VS AP-2 BEARING FRETTING INDEX COMPARISON CHART

AXLE CLASS	F	K	E	L	G	M
BEARING LOAD (LBS.)	34,400	34,400	26,300	26,300	38,000	38,000
GROSS RAIL LOAD (LBS.)	286,000	286,000	220,000	220,000	315,000	315,000
FRETTING INDEX	1.09	0.30	1.00	0.27	0.60	0.23

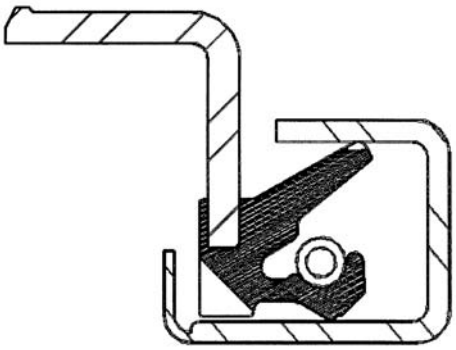
- In Timken AP-2 bearings, the HDL™ Seal is mounted on the cone large rib, where it is near the area of maximum pumping action of the tapered bearing. In consideration of this and the dynamic operating environment, Timken developed an HDL Seal that incorporates a low-tension spring on the secondary lip.

  Testing has shown that for the AP-2 HDL Seal, the combination of the seal design and location on the cone rib, coupled with the natural pumping action on the grease, affords users the lowest-torque seal available today.

  Because HDL Seals have very low torque, they generate little heat. This improved seal along with the other improvements in the new classes of bearings are among the reasons that AP-2 bearings reduce locomotive fuel consumption, extend grease life and improve bearing life.

- Elimination of seal wear rings means no fretting wear grooves under the seal wear rings and the need for subsequent axle repair.

The AAR has defined a method to evaluate the potential for fretting wear and acceptability of new bearing designs by comparing them to existing designs. The table above calculates the fretting index and provides a comparison among axle designations.



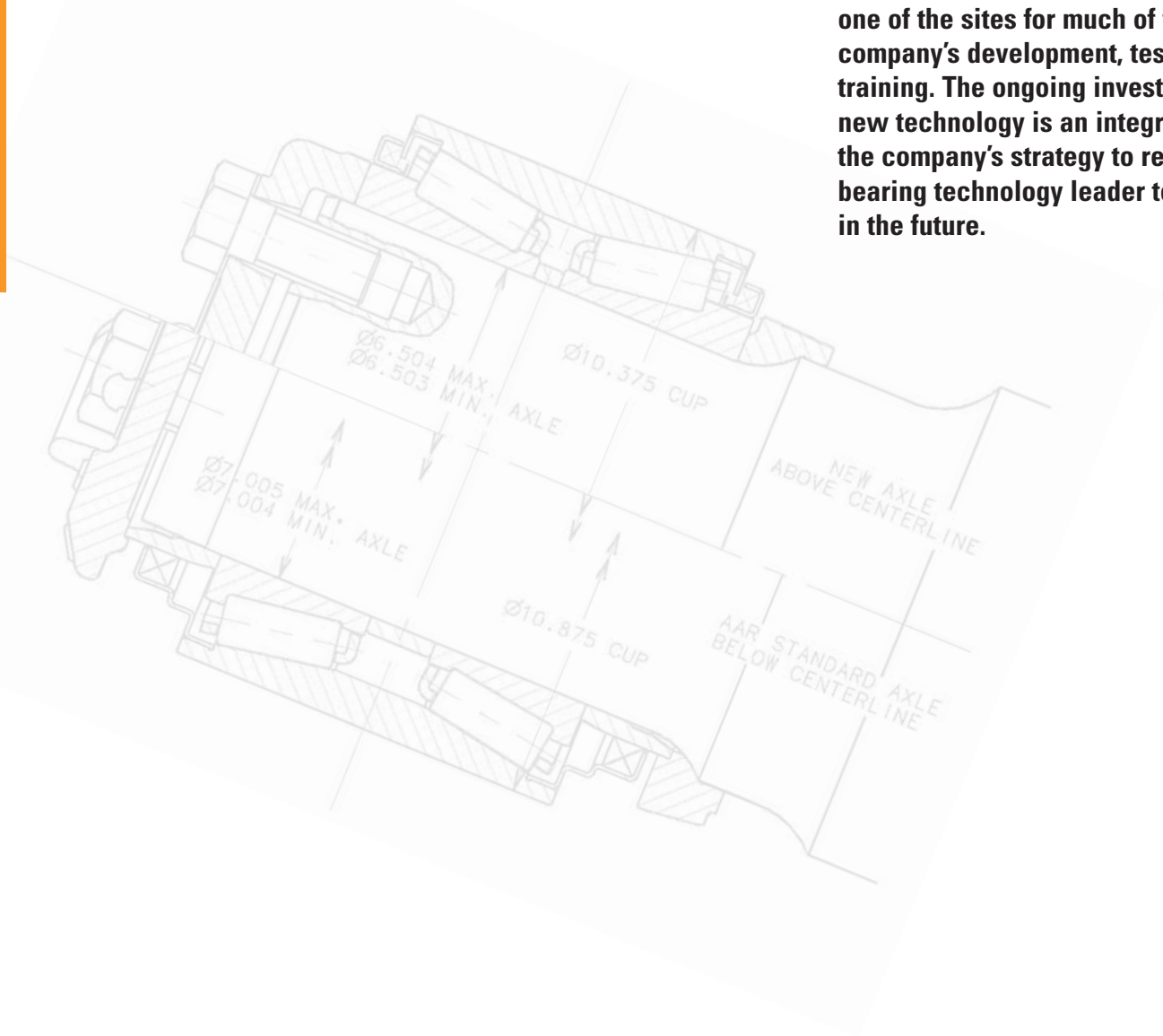
AP-2 HDL Seal

WARNING:

Proper bearing maintenance and handling practices are critical. Failure to follow installation instructions and to maintain proper lubrication can result in equipment failure, creating a risk of serious bodily harm.

To learn more about your journal roller bearing options, contact a Timken Company representative today.

The Timken Company is a leading international manufacturer of highly engineered bearings, alloy and specialty steels and components, and a provider of related products and services. Following its February 2003, acquisition of The Torrington Company, Timken employs 28,000 people worldwide in operations in 29 countries. More than 1,200 of them are engineers and scientists who develop products that reduce costs, improve quality and expand application limits. Timken Research in Canton, Ohio, is one of the sites for much of the company's development, testing and training. The ongoing investment in new technology is an integral part of the company's strategy to remain a bearing technology leader today and in the future.



For additional information regarding The Timken Company's products and services, call one of the offices below.

Timken/Rail Bearing Service Sales Offices

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Canton, OH (330) 438-3000
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Lake Zurich, IL 60047

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1139 W Armitage – #2R
Chicago, IL 60614

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2955 Hartley Road, Suite 106B
Jacksonville, FL 32257

Kansas City, KS (913) 599-3158
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Lodge Farm Industrial Estates
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