RETHINKING RADIALS

HOW BIAS CAN PROVIDE COST AND PERFORMANCE BENEFITS

WHITE PAPER

As construction equipment has grown in the last couple decades — in size, power, weight and speed — so too has the need for off-the-road tires that can keep up with the increased demand. As such, a tire market that was comprised of 100 percent bias designs only a couple decades ago has now moved primarily to radial for larger earthmoving equipment. While radial technology outperforms bias in many instances (justifying the increased cost), bias tires, when used in the proper application, can provide significant cost savings and performance benefits over radial — proving the latest isn't *always* the greatest.

HERE'S WHAT YOU NEED TO KNOW WHEN IT COMES TO CHOOSING THE RIGHT TIRE FOR YOUR SPECIFIC APPLICATION.

BIAS VS **RADIAL**

Constructed with several layers of nylon providing the benefit of increased puncture resistance in the sidewall	Constructed with steel belts to protect the tread area and generate less heat for a longer life in haulage applications
BENEFITS: • Often easier to repair the nylon plies of a bias as compared to the steel belts of a radial • Less sidewall flexibility and greater stability, which can result in better breakout force on a loader, potentially less bucket spillage and increased operator comfort • Less expensive than radial	**BENEFITS:** • Offers greater weight load capacity at lower inflation pressures • Generates less heat when hauling at higher speeds and longer distances

FACTORS TO CONSIDER WHEN CHOOSING BIAS VS RADIAL

Determine which is the most applicable for your job. The Tire and Rim Association (TRA) has several categories of applications that apply with speed and distance requirements:

THE E CATEGORY (EARTHMOVER)

- Designed for haulage and transport of materials on unimproved surfaces
- Speeds up to 40 mph and up to 2.5 miles at a time
- Radial is usually a better choice

THE G CATEGORY (GRADER)

- Designed for grading material over unimproved surfaces
- Speeds up to 25 mph and for unlimited distances
- Radial or bias could be a better choice, depending on application

THE L CATEGORY (LOADER)

- Designed for use on loaders and dozers
- Do not exceed 5 mph and distances of 250 feet each way
- Radial or bias could be a better choice, depending on application

IS THE MACHINE BEING USED TO ITS FULL CAPACITY?

One could conclude that since radials are better for longer distances, they're perfect for graders. However, that's not always the case. Just because the equipment has the capability of going up to a certain speed doesn't necessarily mean it's going to.

GRADER SCENARIO #1

If you typically work on site prep jobs where you're transporting your grader on a trailer to the jobsite, grading at the jobsite and then transporting the grader on a trailer to the next job, chances are you very rarely run the grader beyond the 5-6 mph for long distances.

BIAS MAY OFFER COST SAVINGS.

GRADER SCENARIO #2

If you're doing road maintenance in a municipality where you're frequently traveling at higher speeds and greater distances between roads…

RADIAL IS GOING TO BE A BETTER CHOICE.

FACTOR IN THE LOAD

LOAD RATING

The higher the PSI, the higher the load rating. If you bump up the PSI, but do not bump up the load, you can utilize that tire a little bit harder. It allows you to travel faster without generating so much heat. And it works vice versa – you can carry more loads but can't travel as fast.

CONDUCT A STUDY

OPERATIONAL ASSESSMENT

One way to determine if you're exceeding the speed and distance requirements for bias is with a VBOX study.

A VBOX study will document:

- Average speeds
- Stopping and starting times
- Tonnage moved/day
- Cycles/day
- Loads on an average basis

BEST-FIT APPLICATIONS

BIAS

- Situations with high risk of punctures
- Speed and distance aren't a huge factor
- Slow-pace conditions and lack of travel
- Development projects that include:
  - Scrapers
  - Container handling
  - General loader service
  - Forestry work
- Different compounds with more puncture resistance have been developed to accommodate for steel mills, scrap steel and molten steel applications.
- Skid steers and backhoes are expected to remain primarily a bias market for the foreseeable future.

RADIAL

- Heavier loads at faster speeds and longer distances.
  - Heavy earthmoving
  - Haul applications such as aggregates and mining
  - County road maintenance and long-distance grading

ASK THE EXPERTS

Staffed with a team of field engineers and an expansive network of expert dealers, Titan can help contractors and earthmovers develop and implement a comprehensive and cost-saving tire management plan. From site assessments and service history analysis to implementation of tire management software integrated with telematics — Titan and its network of dealers can help ensure customers are able to achieve a low cost per hour through better tire selection and management practices.

To find out if bias or radial is right for you, consult with your local Titan representative.

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