

Air disc brake maintenance Daniel Philpott

Meritor Air Disc Brake Evolution











External Slack External Auto Adjust

External Lever Internal Auto Adjust Internal Lever Internal Auto Adjust

1980

1990

2003

Field Experience

European Market: Over 3 million brakes supplied since 2000

- N.A. Market: Over 150,000 brakes supplied to the NA market
 - <u>Vocational Applications</u>
 Ove Refuse, Fire, Coach and Bus

The vocational market leader in NA

<u>Military Applications</u>
 MRAP
 ProTec 50 Series

Over 20,000 brakes supplied since 2008

Over 100,000 brakes supplied since 2003

Over the Road Applications
 Truck tractor & trailer
 OE releases since 2013

Proven in the most severe applications













Operation Video





EX225H – Heavy Duty



Actuator secondary seal addresses a key contaminant ingress point to delivery best-in-class reliability

Integral piston stop and internal synchronization are factory set and uniquely prevent accidental piston loss during service

Robust adjuster drive and internals maximizes reliability while maintaining compatibility with N.A. service tools and procedures Optimized friction material and brake performance characteristics to provide the best balance of rotor and pad life

Guided trilobal pistons minimize radial and tangential tapered wear to maximize pad life

Corrosion resistant materials and double sealing maximize reliability in the harsh environment while being easily serviceable

Optional Pad Wear Warning Indicator (PWWI) provides electronic indication to optimize utilization

Different mounting options to provide access for installation and service

features focused on reliability



Piston Boot damage



Principal Cause	Effect	Repair options	Prevention / Detection
Debris damage. Heat Damage.	Seizure of clamping mechanism due to water ingress.	Service Piston Boots. New Housing. New brake.	Visual inspection & Operation check at maintenance interval



Notes:- EX+ boots replaceable "in-situ" with effective secondary sealing.



Principal Cause	Effect	Repair options	Prevention / Detection
Debris Damage. Heat Damage.	Seizure of sliding system due to water ingress.	Service slide pin Boots. New brake.	Visual inspection & Slide check at maintenance interval



Notes:- EX+ H brakes with standard Stainless slide pins.

"play" in slide pin bushings



		Delection
Rattle of brake assy.	Service bushings. New housing. New brake	Measure play at periodic inspection.
Ra as	attle of brake sy.	attle of brake Service bushings. Sy. New housing. New brake.

MST 1000 - Bush fitting tool



Water in brake housing mechanism



Principal Cause	Effect	Repair options	Prevention / Detection
Leaking Air chamber.	Brake has difficulty	New housing assy.	Use of High quality air chambers only.
	applying or releasing.	New brake.	Visual / Vacuum Inspection check



Corrosion on ball end of actuator and liner part of seal

Corrosion inside the brake housing

Notes:- Replace air chamber at same time to prevent re-occurrence

Adjuster damage



Principal Cause	Effect	Repair options	Prevention / Detection
Mechanic abuse Damage to brake mechanism.	New housing assy. New brake.	Mechanic training. Do not use power tools.	
	mechanism.		Adjuster function check.

Notes:-EX+ designed to handle high abuse torques without damage.



Carrier abutment wear / Grooving



Principal	Effect	Repair	Prevention /
Cause		options	Detection
High vibration / environment combined with very slow pad wear rate	Pad slop / uneven pad wear.	Replace brake carrier. New brake.	Visual inspection at maintenance interval.



Servicing benefits of radial mount calipers





Restricted bolt access



- Mechanic is beside vehicle at the end of the axle rather than under.
- Caliper mounting bolts are accessed in ergonomic position.

Pad Wear out sensing

Loop of wire goes through both pads on each brake











- Modern Air Disc Brakes are proven in the field as highly reliable units with fairly simple maintenance when required.
- Servicing information at Meritor.com
 - Service manual MM0467
 - Parts book PB8857B
- Maintenance manuals & service parts catalogues for specific brakes are the master document and provide latest information.
- APTA is working via committee on commonized service documentation for various brake / vehicle manufacturers.
 - No attempt to cover "Air system" related issues.
 - No attempt to cover extreme scenarios (crash damage / consequential damage from adjacent part failure (wheel bearing)).