

ACDelco Brake Product Offering

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Friction



Friction Steel Plate Design

• Mechanical Attachment

- Improves shear strength on large puck assemblies
- Reduces the potential of pad end lift and noise

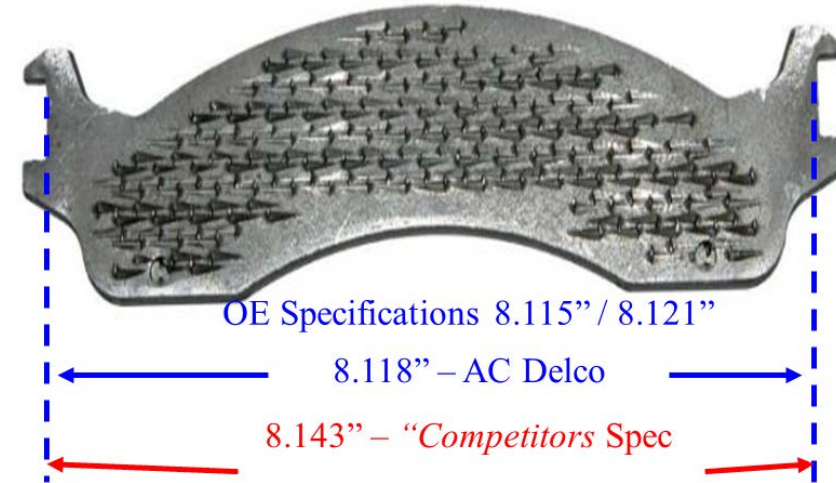
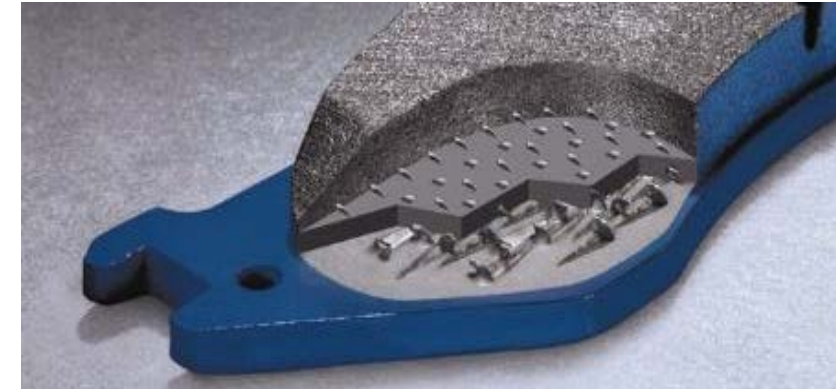
-Canada "Black Steel"

Shaved Abutment Steel

- Ends that are designed to hold critical tolerances to OE design
- Noise Reduction
- Reduces the potential for caliper drag

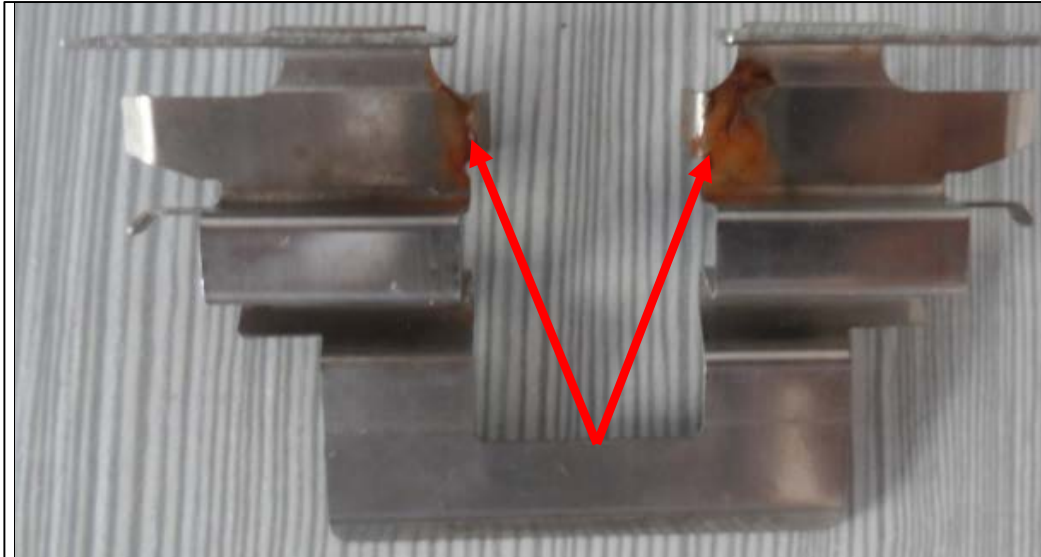
Shim Material

- Competitors shim material often gives up after 10-15,000 miles
- Preferred shim attachment is clip-on or staked
- Shims designed to perform for the service life of the brake pads



Abutment Hardware Material

- ACDelco uses only premium quality 301 SS hardware for all our Abutment hardware
- 201 grade material uses less Nickel and is more prone to rust cannot be detected by appearance.



201 Stainless after 48 hrs. Salt Spray



301 Stainless after 200 hrs. Salt Spray

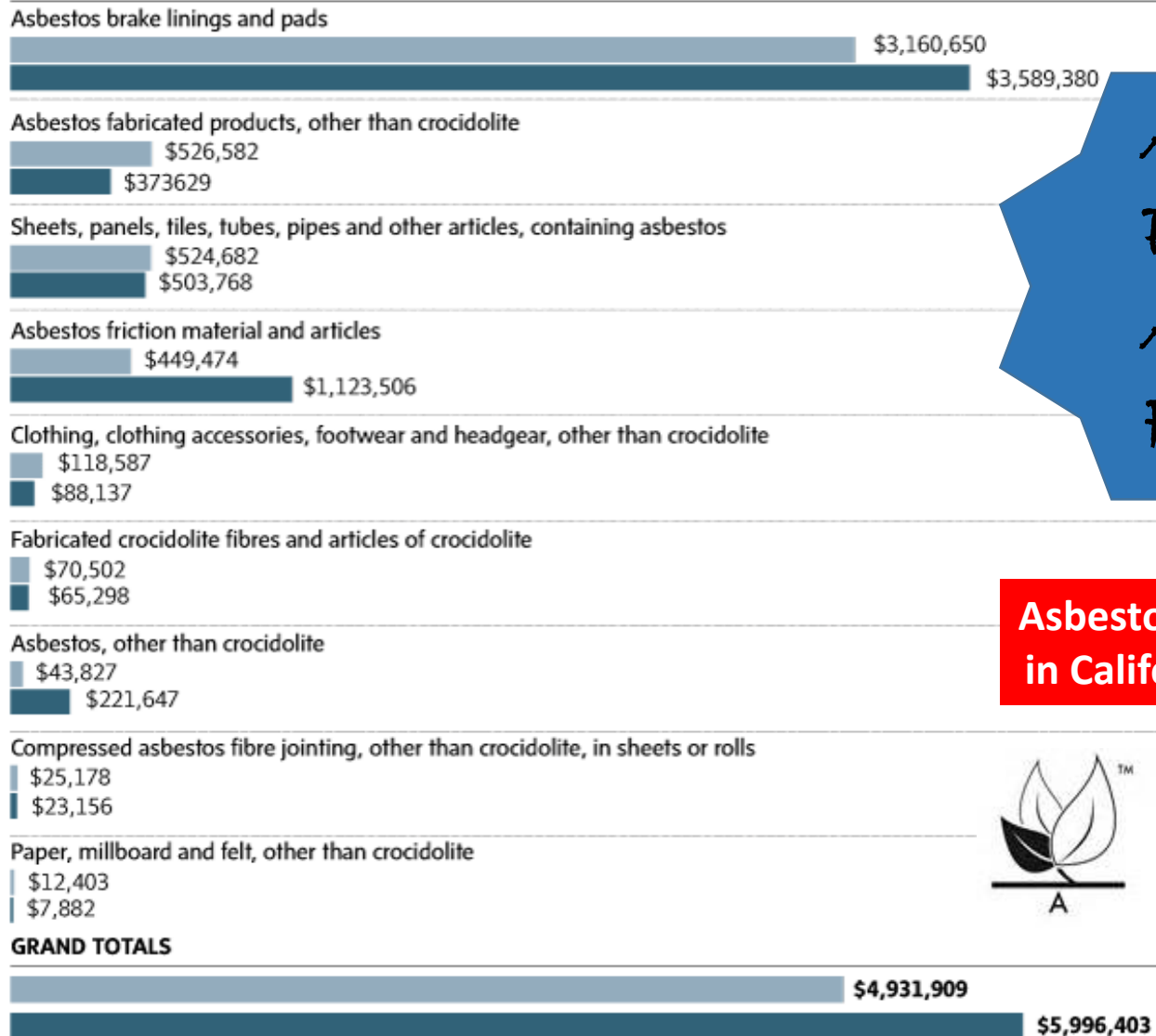
201 failed the test and would reduce the durability of the pad/caliper assembly.

*Test is performed in salt spray test chamber according to ASTM B117



Asbestos in Canada

SELECT ASBESTOS IMPORTS



ACDelco Pads are Asbestos Free

Asbestos in US only regulated in California and Washington



ACDelco
Advantage
 Brake Pads
 100% Asbestos Free

- Consistent braking performance throughout the life of the pads
- Reduced noise with shims where applicable

12 month/ 12,000 mile (20,000 km) warranty (See retailer for details)

ACDelco
Professional
 Disc Brake Pads
 100% Asbestos Free

- Reduced noise with shims where applicable
- Extended wear life and quieter operation from high technology manufacturing
- Consistent braking performance throughout the life of the pads

Limited Warranty (See Retailer for Details)



Air Disc Numbers

- Air Disc/MD



GM Long Number	ACDelco	FMSI Friction #	Pad Thickness MM	Plate Width MM	Brake Model	Caliper	Model
19296128	17D1203MHD	8323	29.70	247.30	SB7/SN7	KNORR BREMSE	12K-20K Air Disc Brake Axle Applications
19296129	17D1310MHD	8425	29.90	249.10	D-Elsa II	MERITOR	Lucas D Elsa 2 Caliper. European Style Truck & Bus Applications
19296130	17D1311MHD	8426	29.99	249.10	EX225H2	MERITOR	Meritor EX 225 Caliper. Highway Coach & Truck Applications
19296131	17D1312MHD	8427	27.68	248.90	D-Lisa	MERITOR	Meritor D Lisa Caliper. Highway Coach and Transit Bus Applications
19296132	17D1323MHD	8435	28.10	249.10	EX225H3	MERITOR	Meritor EX 225 H2/H3 Caliper. Truck & Transit Bus Applications
19296133	17D1369MD	8479	29.20	210.80	ADB22X, SK7, SN7	KNORR BREMSE	SB6000 Caliper. Trailer Applications
19296134	17D1370MHD	8480	28.19	216.10	EX225H2	MERITOR	Meritor EX225 Caliper. Truck and Trailer Applications
19296135	17D1407MD	8515	27.60	249.40	D-Elsa I	MERITOR	Meritor D Elsa 1
19296136	17D1560MD	8771	28.90	249.09	D Duco	#N/A	#N/A



Electronic Wear Sensor/ Low Frequency Damper/Drag Reduction

Electronic Wear Sensors- 181 part numbers

- Approximately 10 are in development
- Usually found in high end European applications, but have increasingly become more popular in non-Euro and mid-level vehicle applications



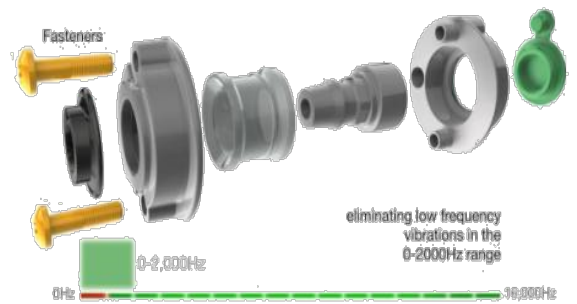
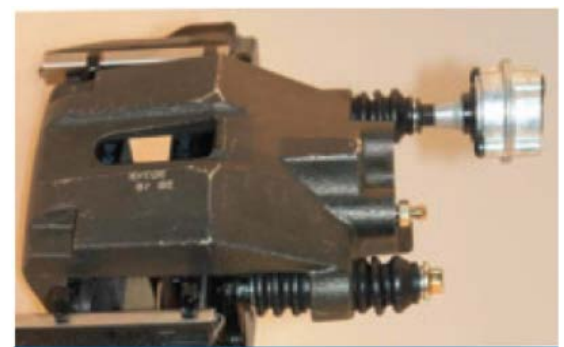
Drag Reduction Clip- 55 Part numbers

- Increase brake life by reduce drag to give better gas mileage and lower brake temperature in addition to reduce brake noise



Low Frequency Damper-7 Part numbers

- Low Frequency Dampeners Are The Latest Technology To Address NVH (Noise-Vibration Harshness) such as Moans, Groans And Squeal” May Occur

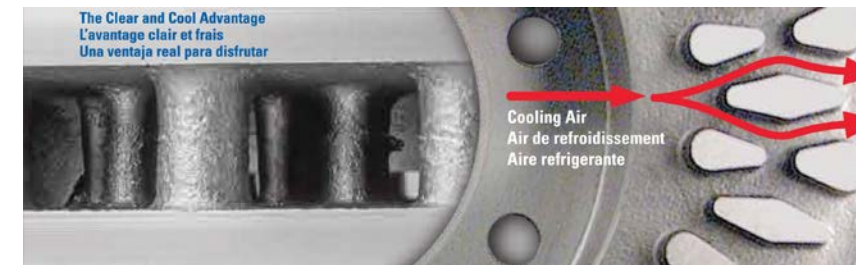
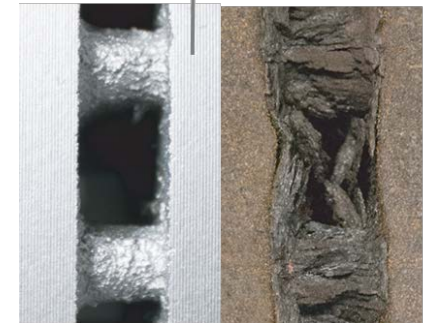


Brake Rotor



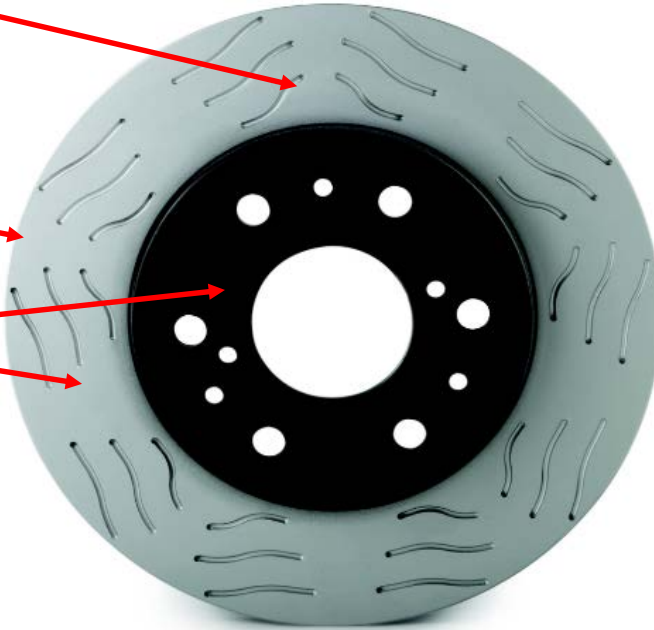
ACDelco Advantage Coated Rotor

- Expansion of Coated Line Offering
 - 640 Part numbers between Active and launching in March 2018
- 100% robotically applied coating
- Graphic box – Heavy Duty FOL and Pizza Box Style Construction Rotor in sealed bag
- Aluminum Zinc Based Fully Coated to Improve Rust and Corrosion Resistance



ACDelco Professional Severe Duty Rotors

- Specially designed grooves and metallurgy provide exceptional stopping power
- High Carbon Damped Iron
- Corrosion resistant black coating on the hat and grey coating on the rotor
- Design for Fleet and Performance Applications



- Dyno proven, improved gassing outflow from rotor
- Great brake pedal feel and performance
- Advance Design that doesn't require drilling holes which are more prone to cracking
- Eliminates need for right and left rotors
- Helps prevent corrosion on rotor surface and vane edges
- Helps rotor stay cooler and reduces noise

• **165 Part Numbers in Current Offering**

All Makes Coverage



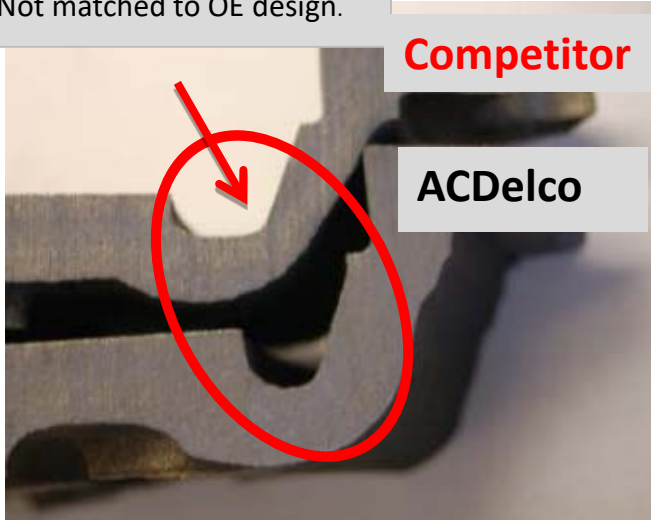
ACDelco
our time
is **now!**

Design Comparison VS "LIGHTWEIGHT"

Not matched to OE design.

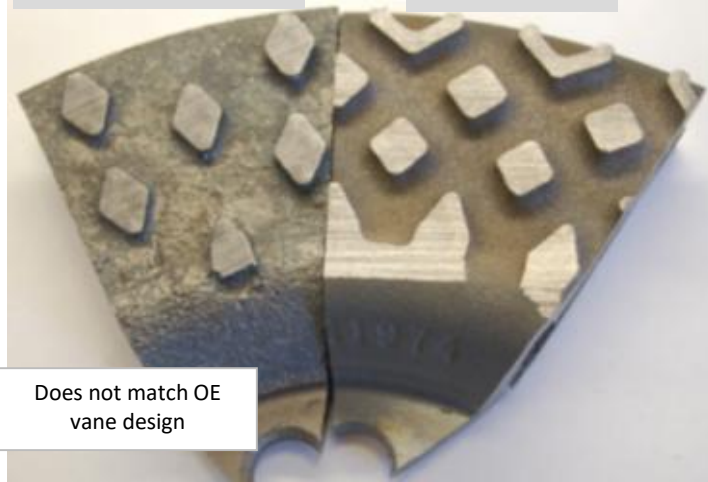
Competitor

ACDelco

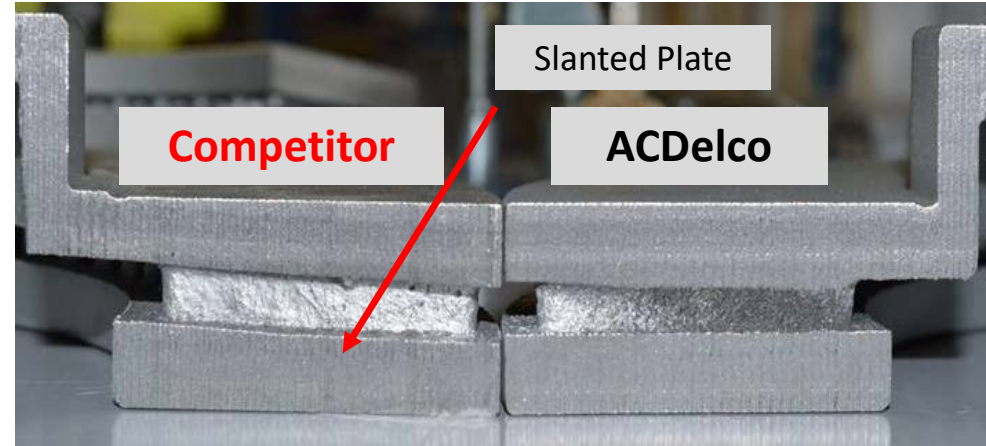


Competitor

ACDelco



Does not match OE vane design



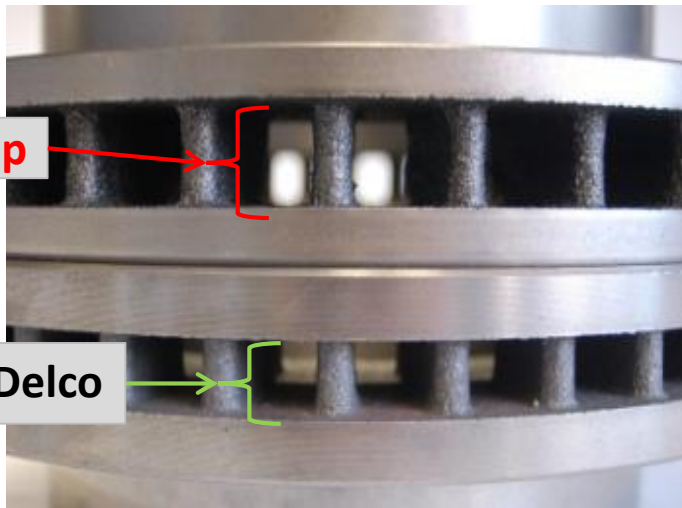
Competitor

Slanted Plate

ACDelco

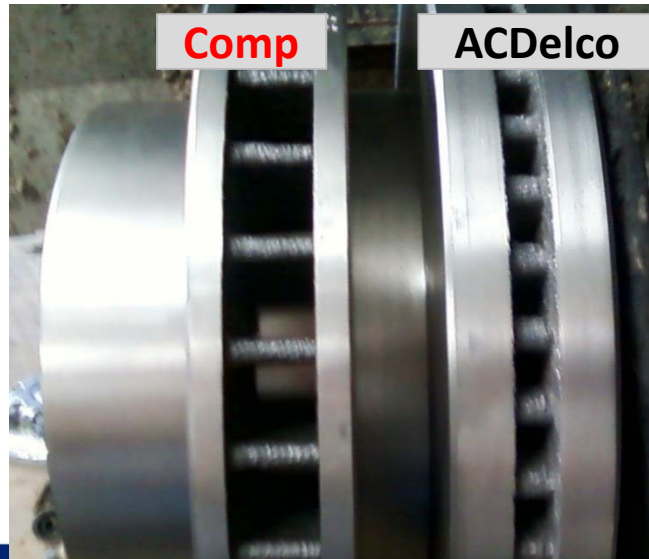
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ACDelco



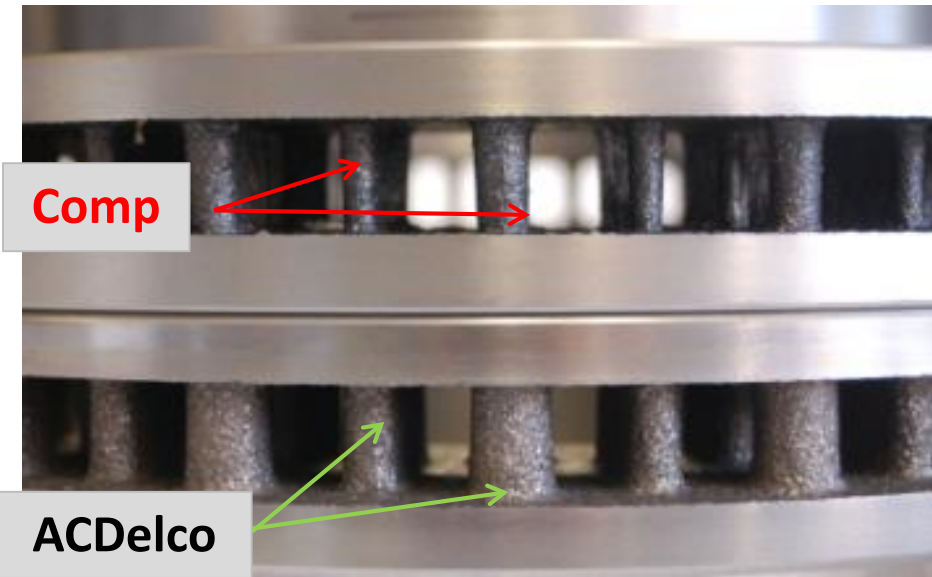
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ACDelco



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ACDelco



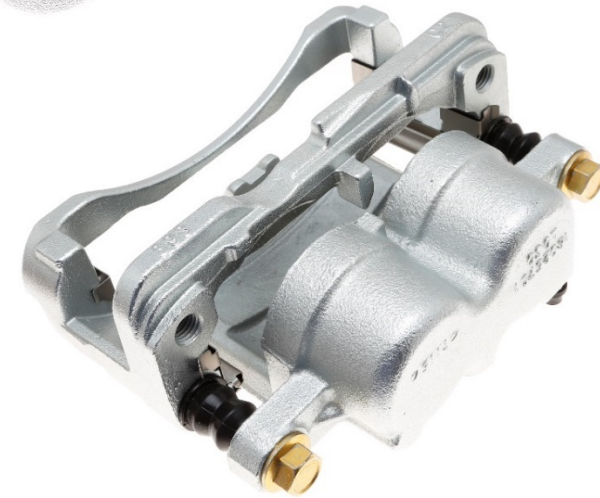
Calipers



ACDelco Professional Coated Caliper

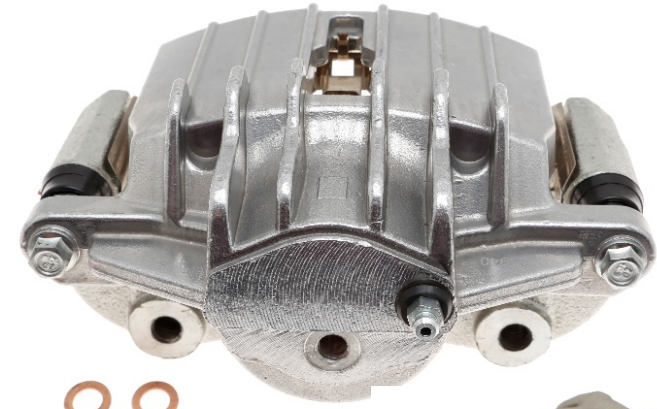
- Long Lasting Protection from environment elements
- Zinc Plated is more resistant to rust compared other coatings
- 100% New Seals and Bleeder Valves, Similar to O.E.
- Pre-Lubricated of Critical Areas to Prevent Binding
- All Newly Developed FR numbers will be only available in coated

• 471 Part Numbers Launched as of Jan 1st, All new numbers will only be in Coated. 72 are only in Coated



One-Way New Caliper Product Launch

- 100% New Components
- No Core Return Required
- Aluminum provides superior corrosion prevention
 - Increase on OE side using aluminum calipers
- Includes Brackets and Hardware were required
- *Program Introduction 205 PN's*
 - *6 unique to New Active*
 - *14 more launching soon*



Police Service Vehicle



ACDelco Service Vehicle Calipers

- 32 Skus Covering Domestic Vehicles
- Loaded with Severe Duty Pads
- High Temp Silicone Boots and Lube



Chevrolet Express 3500 (2003-2016), Express 4500 (2009-2014), Express Cargo (2016), Silverado 3500 (2001-2007), Silverado 3500 Classic (2007), Silverado 3500 HD (2007-2010); GMC Savana 3500 (2003-2016), Sierra 3500 (2001-2006), Sierra 3500 Classic (2007), Sierra 3500 HD (2007-2010)

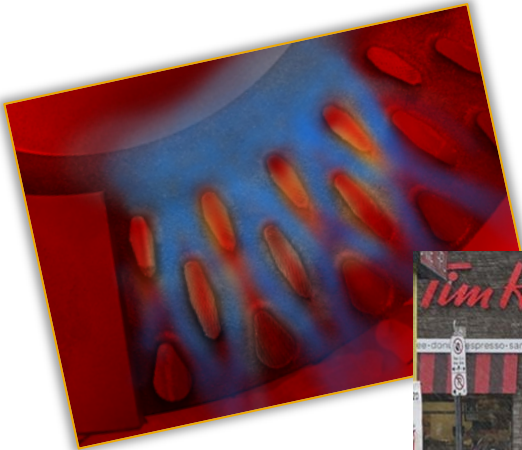
Ford E-150 (2008-2014), E-250 (2008-2014), E-350 Super Duty (2008-2016), E-450 Super Duty (2008-2014)

Ford Expedition (2007-2016)

ACDelco Professional Police

Rotors

- Performance Functional Hybrid Design that has a unique vane configuration
- Allows for best material transfer for optimal braking
- All NEW police introductions will have thicker plates than the OE



Friction

Michigan State and LASD Testing Vehicles

- ✓ 2015 Chevy Tahoe – Front D1367/D1367A Rear D1707
- ✓ 2015 Ford Explorer Interceptor - Front D1611A Rear D1612
- ✓ 2015 Dodge Charger – Front D1767 Rear D1766

Addition of 20 new PN's for 2017

Using NEW Tested Police Friction

Link Police Declaration of Conformity Program

Performance - LACSD Pomona Course Dyno Simulation

Performance - SAE J2784 (FMVSS 135 Simulation)

Friction Behavior – ISO 26867

Wear – SAE J2707

Noise – SAE J2521

Shear Strength – SAE J840



Link Police Testing Protocol – Dodge Charger – (D1767) Front



Police Declaration of Conformity Summary Results Tested Platform: 2015 Dodge Charger Front Axle



AMECA Police Conformity



Lasts almost 1.75 times longer

Quieter than OE

	Acceptance Criteria	OE AK NS423H	ACDelco	Results	
Link - EVOC dynamometer evaluation (164904-1)					
1	Deceleration level during 99% of handling & pursuit cycles	not less than 0.04 g below OE	100%	100%	Pass
2	Average of the average-by-distance friction level during handling cycles	no single stop below .06 of OE	100%	100%	Pass
3	Average of the average-by-distance friction level during pursuit cycles	not less than 0.05 of OE	0.27	0.29	Pass
4	Structural integrity of friction material	not less than 0.05 of OE	0.30	0.30	Pass
5	Backing plate permanent deformation at end of test	≥ 90%	100%	100%	Pass
6	Remaining Friction Material Thickness	≤ 4 mm	0	0	Pass
		≥ 2 mm	12.1	11	Pass
SAE J2784 - FMVSS 135 with Link-CA conformity assessment (165572-1)					
7	Calculated stopping distance during effectiveness sections	meet Link-CA criteria	26.8%	27.5%	Pass
8	Calculated stopping distance during failed power unit section	meet Link-CA criteria	48.9%	51.6%	Pass
9	Average deceleration during fade heating snubs	meet Link-CA criteria	36.4%	37.5%	Pass
SAE J2707 - Method B driving cycle with highway braking (164907-1)					
10	Average brake pad wear compared to baseline	≤ 120% OE wear*	3.85	2.32	Pass
11	Average brake rotor wear compared to baseline	≤ 120% OE wear*	0.08	0.06	Pass
SAE J2521 - Squeal noise with cold and post-fade evaluation (165570-1)					
12	Noise rating below OE baseline	one ranking or better or ranking of A or better	B	BB	Pass
ISO 26867 - Friction behavior assessment					
13	Average friction coefficient (Baseline Tests)	Average value	0.35		
14	Minimum friction coefficient (Baseline Tests)	Minimum value	0.27		
15	Maximum friction coefficient (Baseline Tests)	Maximum value	0.42		
SAE J2928 - Rotor crack testing at elevated temperature					
16	One rotor test	150 cycles			
17	Two rotor testing	100-150 cycles			
18	Two rotors compared to OE	≥ OE cycles			
SAE J840 - Shear strength evaluation					
19	Total torque calculated as a function of shear strength force	≥ 1.4 x 1 g (2066 N-m)	Margin Above 2000 N-m	Margin Above	



ACDelco Police Loaded Caliper



- 28 Part number available large expansion coming
- Police Friction Testing Program Completing est Q2 2017

