

Brake Systems

DELCO-MORAINE AUTOMATIC ADJUSTER

Buick
 Cadillac
 Chevrolet (Exc. Corvette, Vega)
 Oldsmobile
 Pontiac
 Jeep

DESCRIPTION

Hydraulic single anchor type brake with Bendix type shoes. Brake shoe anchor pins are fixed in backing plate and require no adjustment. Automatic adjusting mechanism consists of a link, actuating lever, pawl and pawl spring (mounted on secondary brake shoe). System also contains an override pivot plate and spring, which acts to protect against binding linkage. **NOTE** — Some models use an adjuster pawl having a separate blade to contact adjuster star wheel. Use of this design eliminates override spring.

OPERATION

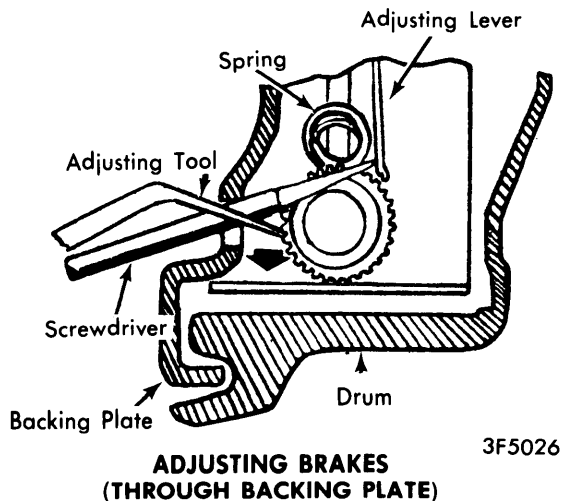
The adjusters operate only when brakes are applied as car is moving in reverse. The link which holds top of actuating lever stationary, forces lever to pivot on secondary shoe. This pivoting action forces pawl downward against end of a tooth on the star wheel adjusting screw. If lining-to-drum clearance is correct, the downward movement will stop before star wheel is turned. If clearance is too wide, the secondary shoe will move outward and the pawl will move downward far enough to turn star wheel one notch and take up the adjustment. Should the star wheel become frozen, or clearance be too excessive, the override mechanism will act to prevent the movement and binding of automatic adjuster linkage.

ADJUSTMENT

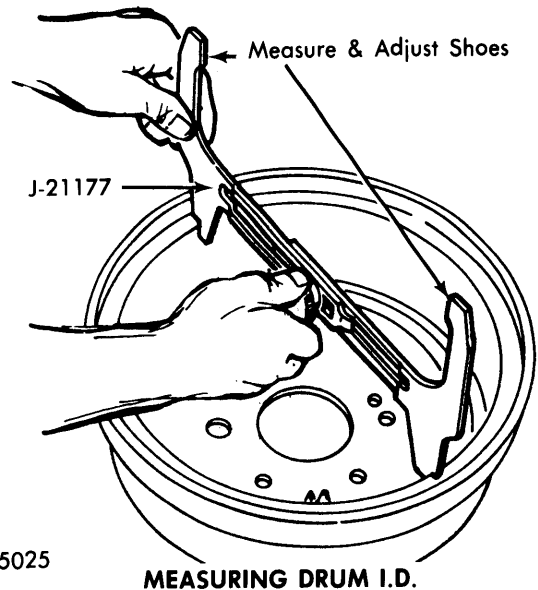
BRAKE SHOE ADJUSTMENT

Adjustment should be required only after shoe relining or replacement, or when length of star wheel has been changed.

Buick — Remove adjusting hole cover and install a suitable tool through hole to move self-adjuster actuator lever off adjusting screw. Use a suitable tool to turn adjusting screw and expand brake shoes until wheel can just be turned by hand. Make sure drag is equal at all wheels. Back off adjusting screw 30 notches. If shoes still drag, back off an additional one or two notches, or check for tight parking brake cable.

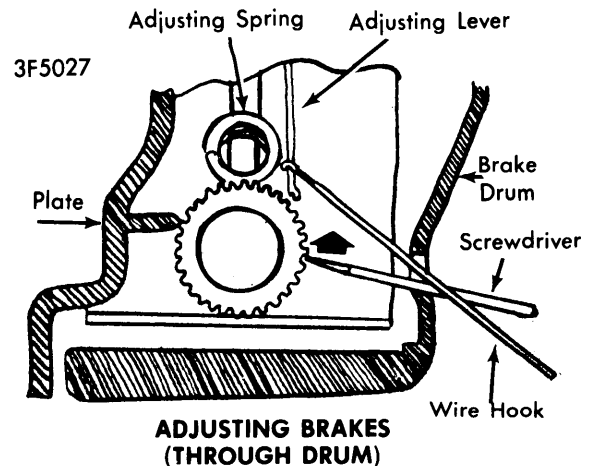


Cadillac & Oldsmobile — Remove drums and ensure parking brake cable and linkage is free. Measure drum inside diameter, using suitable tool (J-21177). Adjust shoes to fit opposite side of measuring tool (see illustration). Replace drums and drive vehicle alternately backward and forward, applying brakes moderately, until pedal travel is adequate (2 1/16" maximum).



Chevrolet — Use same procedure as described for Cadillac and Oldsmobile. If tool is not available, disengage adjusting lever from star wheel and turn star wheel until drum slides over shoes with a slight drag; then, turn adjusting star 1 1/4 turns to retract shoes. Install drums and drive vehicle alternately backward and forward, making firm braking stops, until pedal travel is satisfactory.

Pontiac — Remove drum. Remove ridge at open end of drum with #40 grit sandpaper or equivalent. Adjust suitable measuring tool (J-22364) to diameter of drum, then adjust shoes to fit opposite side of tool. Replace drum, drive vehicle alternately forward and backward, braking moderately until pedal travel is adequate. As an alternate method, use procedure as described for Buick, adjusting star to the following: Catalina, Bonneville, Grand Ville, back off 30 notches; all others, back off 20 notches.



DELCO-MORAINE AUTOMATIC ADJUSTER (Cont.)

Jeep — Using suitable drum-to-brake shoe clearance gauge, measure inside diameter of brake drum, then reverse gauge and place on brake linings. To adjust, turn star wheel on adjuster screw until gauge just slides over lining surface. If drum-to-shoe gauge is not available, adjust as follows: Turn star wheel until drum slides over shoes with slight drag. With drum in place, back adjuster off 30 notches. Complete adjustment by making a number of forward and reverse stops (using firm pedal effort) until a satisfactory brake pedal height is obtained. *NOTE* — All stops must be completed to allow automatic adjusters to operate properly.

PARKING BRAKE ADJUSTMENT

Buick — Depress parking brake exactly three ratchet clicks on all models except Estate Wagon (six clicks). Loosen jam nut at rear of equalizer adjusting nut. Tighten adjusting nut until rear wheels can just be turned rearward with two hands, but will lock if turned forward. Tighten jam nut against adjusting nut. With mechanism totally disengaged, rear wheels should turn freely in either direction with no drag. *NOTE* — Some vehicles may have a torque prevailing adjusting nut instead of a free-running nut with a jam-nut for adjusting cable setting.

Cadillac — Lubricate parking brake linkage at equalizer and cable stud, and ensure free movement of cables. Depress parking brake pedal to approximately one inch from fully released position. Raise rear wheels. Hold brake cable stud from turning, and tighten equalizer nut, one turn at a time (checking for brake drag after each turn), until light drag is felt on either wheel (turning forward). Release parking brake. No drag should be present at either wheel. After adjustment, parking brake pedal should travel 1 3/4-2 3/4" on Eldorado, and 2-3" on all other models. Pedal travel measurement force is 125 lbs.

Chevrolet — Apply parking brake two notches from fully released position. Loosen equalizer check nut, and tighten or loosen front jam nut until a light-to-moderate drag is felt when rear wheels are rotated forward. Tighten nuts securely. With brake fully released, no drag should be felt at rear wheels.

Oldsmobile — Depress parking brake pedal exactly three ratchet clicks. Tighten adjusting nut until rear wheels can just be turned rearward, using two hands, but are locked when forward rotation is attempted. With mechanism fully released, no drag should be present.

Pontiac — Depress parking brake pedal eight notches from fully released position. Loosen equalizer rear locknut. Adjust front nut until a light-to-moderate drag is felt when rear wheels are rotated. Tighten locknut. Fully release parking brake and turn rear wheels; no drag should be felt.

Jeep — Adjust parking brake only after service brakes have been adjusted. Release parking brake, then loosen lock nuts at equalizer and relieve tension on cables. Inspect for defective cables, replace as necessary. Tighten cables until a slight drag is felt at wheels, then loosen cables until wheels rotate freely and no drag is felt. Tighten lock nuts at equalizer, then check operation of parking brake.

SERVICING

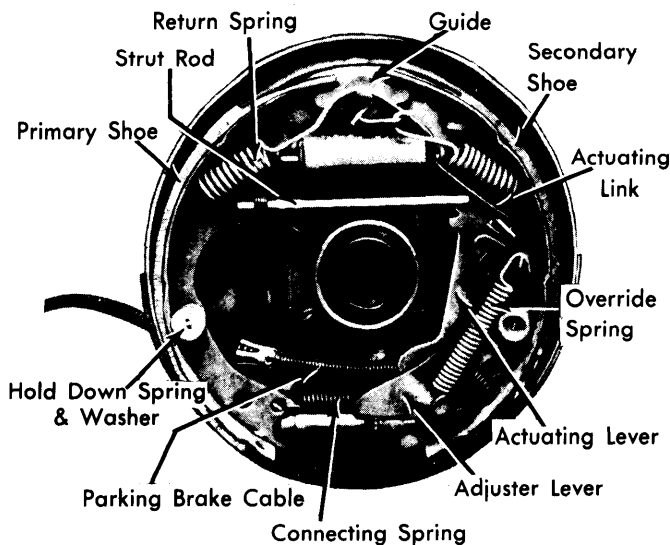
SHOE & LINING REPLACEMENT

Removal — *NOTE* — Mark position of springs and star adjusters as they are removed, for reinstallation in original position. Loosen parking brake cable at equalizer. If necessary, back off brake adjustment before removing drum. Unhook return springs. Remove hold down springs and cups. Lift actuator and unhook actuating link from anchor pin. Separate shoes from wheel cylinder connecting links, remove parking brake strut and spring, disconnect cable from parking brake lever, and remove shoes. Detach adjuster screw and spring from shoes. Remove parking brake lever.

Installation — Lubricate fulcrum end of parking brake lever, then attach to secondary shoe. Connect adjusting screw spring, then place screw in position (align star with adjusting hole). *NOTE* — Ensure adjuster screws are installed in original positions. Lubricate shoe and cable contact surfaces on backing plate. Position shoes and insert into wheel cylinder links. Connect cable to parking brake strut and spring, between lever and primary shoe. Install actuator, actuator return spring, and actuating link. Replace hold down springs and return springs. Adjust brake shoe clearance as previously described.

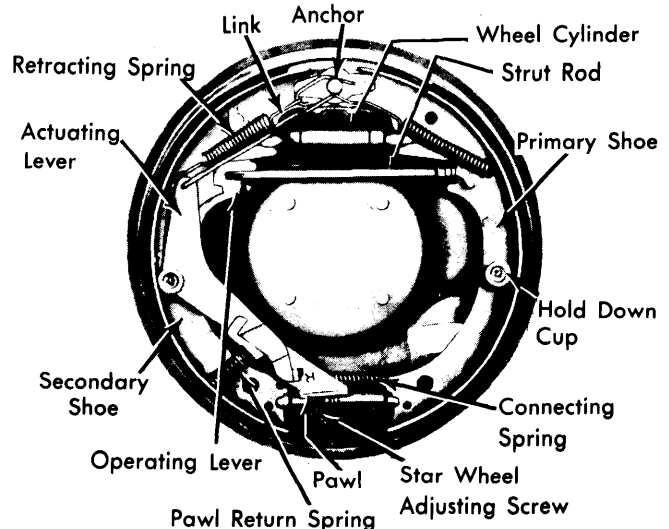
BLEEDING SYSTEM

See Hydraulic Brake Bleeding in this section.



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BRAKE ASSEMBLY (TYPICAL, EXC. CADILLAC)



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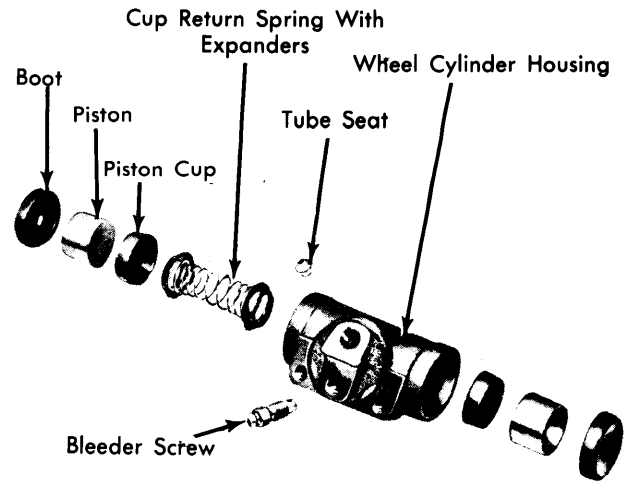
BRAKE ASSEMBLY - CADILLAC (TYPICAL)

Brake Systems

DELCO-MORAINE AUTOMATIC ADJUSTER (Cont.)

TIGHTENING SPECIFICATIONS

Application	Ft. Lbs.
Wheel Attaching Nuts	
Buick	
Century	70
All Others	75
Cadillac	130
Chevrolet	
Full Size Models	65-85
All Others	60-80
Oldsmobile	
Omega, Cutlass	80
88,98.....	85
Toronado	130
Pontiac	
Catalina,Bonneville,Grand Ville.....	75
All Others	70
Jeep	65-80



4P003

WHEEL CYLINDER DISASSEMBLED

Application	BRAKE SYSTEM SPECIFICATIONS			
	Drum Diam.	Wheel Cylinder Diameter		Master Cylinder
		Front	Rear	Diameter
Buick				
Apollo	9 1/2"	1 1/8"	7/8"	1"ⓐ
Century	9 1/2"	ⓑ	7/8"	1"ⓐ
LeSabre,Electra,Riviera	11"	ⓑ	15/16"	1 1/8"
Estate Wagon	12"	ⓑ	1"	1 1/8"
Cadillac				
All	12"ⓓ	ⓑ	15/16"ⓔ	1 1/8"
Chevrolet				
Nova	9 1/2"	1 1/8"	7/8"	1"
Chevelle (Exc. S/W),Camaro, El Camino,Monte Carlo	9 1/2"	ⓑ	7/8"	1"
Chevelle S.W.	11"	ⓑ	15/16"	1"
Chevrolet (Exc. S/W)	11"	ⓑ	15/16"	1 1/8"
Chevrolet S/W	12"	ⓑ	1"	1 1/8"
Oldsmobile				
Omega	9 1/2"	1 1/8"	7/8"	1"
Cutlass (Exc S/W)	9 1/2"	ⓑ	7/8"	1 1/8"
Cutlass Wagon	11"	ⓑ	7/8"	1 1/8"
88,98,Toronado	11"	ⓑ	15/16"	1 1/8"
Custom Cruiser Wagon	12"	ⓑ	1"	1 1/8"
Pontiac				
Ventura	9 1/2"	1 1/8"	7/8"	1"ⓐ
Firebird,LeMans (Exc S/W), Grand Am,Grand Prix	9 1/2"	ⓑ	7/8"	1"ⓐ
LeMans S/W	11"	ⓑ	15/16"	1"ⓐ
Catalina,Grand Ville (Exc S/W) & Bonneville	11"	ⓑ	15/16"	1 1/8"
Catalina,Grandville S/W	12"	ⓑ	1"	1 1/8"
Jeep				
Cherokee	11" ⓑ	1 1/8"	15/16"	1"
Wagoneer	11"	ⓑ	15/16"	1 1/8"

ⓐ - Power Disc Brakes - 1 1/8"

ⓑ - Eldorado - 11"

ⓓ - 12" Drum is optional.

ⓔ - Front Disc Brake Equipped

ⓕ - Commercial Chassis - 1"

Brake Systems

DELCO-MORAINE AUTOMATIC ADJUSTER (Cont.)

BRAKE LINING SPECIFICATION							
Application	Drum Dia.	Width		Length		Thickness	
		Front	Rear	Primary	Secondary	Primary	Secondary
Buick							
Apollo	9 1/2"	2 1/2"	2"	7 3/8"	9 15/16"	3/16"	17/64"
Century	9 1/2"	⓪	2"	7 7/16"	9 13/16"	3/16"	17/64"
LeSabre, Electra, Riviera	11"	⓪	2"	8 13/16"	11 7/16"	15/64"	17/64"
Estate Wagon	12"	⓪	2"	9 7/8"	12 7/8"	15/64"	19/64"
Cadillac							
All (Exc. Eldorado)	12"	⓪	2 1/2"	11"	12 3/8"	15/64"	17/64"
Eldorado	11"	⓪	2"	9"	12"	13/64"	13/64"
Chevrolet							
Nova	9 1/2"	2 1/2"	2"	7 5/8" ②	9 13/16" ③	3/16"	1/4"
Monte Carlo, Chevelle (Exc S/W)	9 1/2"	⓪	2"	7 7/16"	9 13/16"	15/64"	19/64"
Chevelle S/W	11"	⓪	2"	8 13/16"	11 7/16"	1/4"	9/32"
Camaro	9 1/2"	⓪	2"	9"	9 3/4"	13/64"	13/64"
Chevrolet (Exc S/W)	11"	⓪	2"	8 15/16"	11 7/16"	1/4"	9/64"
Chevrolet S/W	12"	⓪	2"	9 13/16"	12 3/4"	1/4"	9/16"
Oldsmobile							
Omega, Cutlass (Exc. S/W)	9 1/2"	2 1/2" ④	2"	7 3/8"	9 15/16"	3/16"	17/64"
Cutlass Wagon	11"	⓪	2"	9"	11 1/2"	7/32"	1/4"
88, 98 (Exc. S/W)	11"	⓪	2"	9"	11 1/2"	7/32"	1/4"
Custom Cruiser Wagon	12"	⓪	2"	12"	12"	7/32"	1/4"
Toronado	11"	⓪	2"	8 7/8"	11 5/8"	7/32"	9/32"
Pontiac							
Ventura	9 1/2"	2 1/2"	2"	8 1/16"	9 9/32"	7/32"	1/4"
Grand Prix, Grand Am, LeMans (Exc. S/W)	9 1/2"	⓪	2"	7 3/8"	9 7/8"	15/64"	19/64"
LeMans Wagon	11"	⓪	2"	8 7/8"	11 1/2"	1/4"	5/16"
Firebird	9 1/2"	⓪	2"	9"	9 3/4"	13/64"	13/64"
Catalina, Bonneville, Grandville (Exc. S/W)	11"	⓪	2"	8 7/8"	11 1/2"	1/4"	19/64"
Safari Wagons	12"	⓪	2"	9 7/8"	12 3/4"	1/4"	5/16"

⓪ - Front Disc Brake Equipped

② - Rear - 9"

③ - Rear - 9 3/4"

④ - Cutlass Front Disc Brake Equipped

BRAKE DRUM SPECIFICATIONS				
Application	Drum Diameter	Original Diameter	Maximum Refinish Diameter	Discard Diameter
General Motors All Models	9 1/2"	9.500"	9.560"	9.590"
	11"	11.000"	11.060"	11.090"
	12"	12.000"	12.060"	12.090"
Jeep Cherokee, Wagoneer	11"	11.000"	11.060"	11.090"
	12"	12.000"	12.060"	12.090"