

CAUTION: Don't forget to check the following information carefully before you
 to download the software. The software is specifically designed for use on a
 Windows 95/98/NT/2000/XP/2003/2008/2012/2016/2019/2022/2023/2024/2025/2026/2027/2028/2029/2030/2031/2032/2033/2034/2035/2036/2037/2038/2039/2040/2041/2042/2043/2044/2045/2046/2047/2048/2049/2050/2051/2052/2053/2054/2055/2056/2057/2058/2059/2060/2061/2062/2063/2064/2065/2066/2067/2068/2069/2070/2071/2072/2073/2074/2075/2076/2077/2078/2079/2080/2081/2082/2083/2084/2085/2086/2087/2088/2089/2090/2091/2092/2093/2094/2095/2096/2097/2098/2099/2100/2101/2102/2103/2104/2105/2106/2107/2108/2109/2110/2111/2112/2113/2114/2115/2116/2117/2118/2119/2120/2121/2122/2123/2124/2125/2126/2127/2128/2129/2130/2131/2132/2133/2134/2135/2136/2137/2138/2139/2140/2141/2142/2143/2144/2145/2146/2147/2148/2149/2150/2151/2152/2153/2154/2155/2156/2157/2158/2159/2160/2161/2162/2163/2164/2165/2166/2167/2168/2169/2170/2171/2172/2173/2174/2175/2176/2177/2178/2179/2180/2181/2182/2183/2184/2185/2186/2187/2188/2189/2190/2191/2192/2193/2194/2195/2196/2197/2198/2199/2200/2201/2202/2203/2204/2205/2206/2207/2208/2209/2210/2211/2212/2213/2214/2215/2216/2217/2218/2219/2220/2221/2222/2223/2224/2225/2226/2227/2228/2229/2230/2231/2232/2233/2234/2235/2236/2237/2238/2239/2240/2241/2242/2243/2244/2245/2246/2247/2248/2249/2250/2251/2252/2253/2254/2255/2256/2257/2258/2259/2260/2261/2262/2263/2264/2265/2266/2267/2268/2269/2270/2271/2272/2273/2274/2275/2276/2277/2278/2279/2280/2281/2282/2283/2284/2285/2286/2287/2288/2289/2290/2291/2292/2293/2294/2295/2296/2297/2298/2299/2300/2301/2302/2303/2304/2305/2306/2307/2308/2309/2310/2311/2312/2313/2314/2315/2316/2317/2318/2319/2320/2321/2322/2323/2324/2325/2326/2327/2328/2329/2330/2331/2332/2333/2334/2335/2336/2337/2338/2339/2340/2341/2342/2343/2344/2345/2346/2347/2348/2349/2350/2351/2352/2353/2354/2355/2356/2357/2358/2359/2360/2361/2362/2363/2364/2365/2366/2367/2368/2369/2370/2371/2372/2373/2374/2375/2376/2377/2378/2379/2380/2381/2382/2383/2384/2385/2386/2387/2388/2389/2390/2391/2392/2393/2394/2395/2396/2397/2398/2399/2400/2401/2402/2403/2404/2405/2406/2407/2408/2409/2410/2411/2412/2413/2414/2415/2416/2417/2418/2419/2420/2421/2422/2423/2424/2425/2426/2427/2428/2429/2430/2431/2432/2433/2434/2435/2436/2437/2438/2439/2440/2441/2442/2443/2444/2445/2446/2447/2448/2449/2450/2451/2452/2453/2454/2455/2456/2457/2458/2459/2460/2461/2462/2463/2464/2465/2466/2467/2468/2469/2470/2471/2472/2473/2474/2475/2476/2477/2478/2479/2480/2481/2482/2483/2484/2485/2486/2487/2488/2489/2490/2491/2492/2493/2494/2495/2496/2497/2498/2499/2500/2501/2502/2503/2504/2505/2506/2507/2508/2509/2510/2511/2512/2513/2514/2515/2516/2517/2518/2519/2520/2521/2522/2523/2524/2525/2526/2527/2528/2529/2530/2531/2532/2533/2534/2535/2536/2537/2538/2539/2540/2541/2542/2543/2544/2545/2546/2547/2548/2549/2550/2551/2552/2553/2554/2555/2556/2557/2558/2559/2560/2561/2562/2563/2564/2565/2566/2567/2568/2569/2570/2571/2572/2573/2574/2575/2576/2577/2578/2579/2580/2581/2582/2583/2584/2585/2586/2587/2588/2589/2590/2591/2592/2593/2594/2595/2596/2597/2598/2599/2600/2601/2602/2603/2604/2605/2606/2607/2608/2609/2610/2611/2612/2613/2614/2615/2616/2617/2618/2619/2620/2621/2622/2623/2624/2625/2626/2627/2628/2629/2630/2631/2632/2633/2634/2635/2636/2637/2638/2639/2640/2641/2642/2643/2644/2645/2646/2647/2648/2649/2650/2651/2652/2653/2654/2655/2656/2657/2658/2659/2660/2661/2662/2663/2664/2665/2666/2667/2668/2669/2670/2671/2672/2673/2674/2675/2676/2677/2678/2679/2680/2681/2682/2683/2684/2685/2686/2687/2688/2689/2690/2691/2692/2693/2694/2695/2696/2697/2698/2699/2700/2701/2702/2703/2704/2705/2706/2707/2708/2709/2710/2711/2712/2713/2714/2715/2716/2717/2718/2719/2720/2721/2722/2723/2724/2725/2726/2727/2728/2729/2730/2731/2732/2733/2734/2735/2736/2737/2738/2739/2740/2741/2742/2743/2744/2745/2746/2747/2748/2749/2750/2751/2752/2753/2754/2755/2756/2757/2758/2759/2760/2761/2762/2763/2764/2765/2766/2767/2768/2769/2770/2771/2772/2773/2774/2775/2776/2777/2778/2779/2780/2781/2782/2783/2784/2785/2786/2787/2788/2789/2790/2791/2792/2793/2794/2795/2796/2797/2798/2799/2800/2801/2802/2803/2804/2805/2806/2807/2808/2809/2810/2811/2812/2813/2814/2815/2816/2817/2818/2819/2820/2821/2822/2823/2824/2

Specifications	4A-1	Maintenance and Repair	4A-13
General Specifications	4A-1	On-Vehicle Service	4A-13
Fastener Tightening Specifications	4A-1	Manual Bleeding the Brakes	4A-13
Component Locator	4A-2	Pressure Bleeding the Brakes	4A-16
Brake System (ABS)	4A-2	Brake Hose (Rear)	4A-17
Brake System (Non-ABS)	4A-4	Brake Hose (Front)	4A-18
Diagnosis	4A-5	Stoplamp Switch	4A-20
Brake System Testing	4A-5	Brake Pedal	4A-21
Brake Hose Inspection	4A-5	General Description and System	
Warning Lamp Operation	4A-6	Operation	4A-24
Brake Lamp Warning Circuit Diagnosis	4A-7	Warning Lamp Operation	4A-24

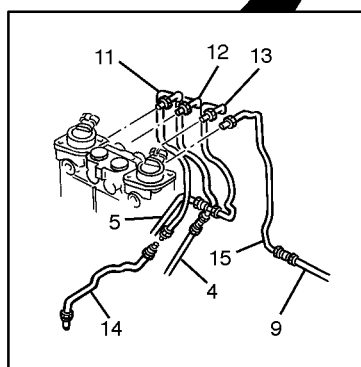
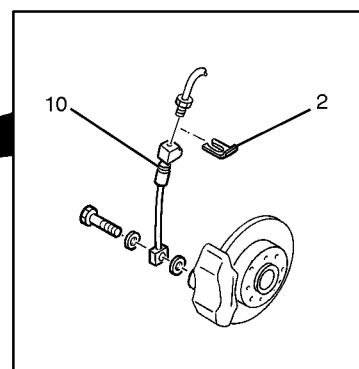
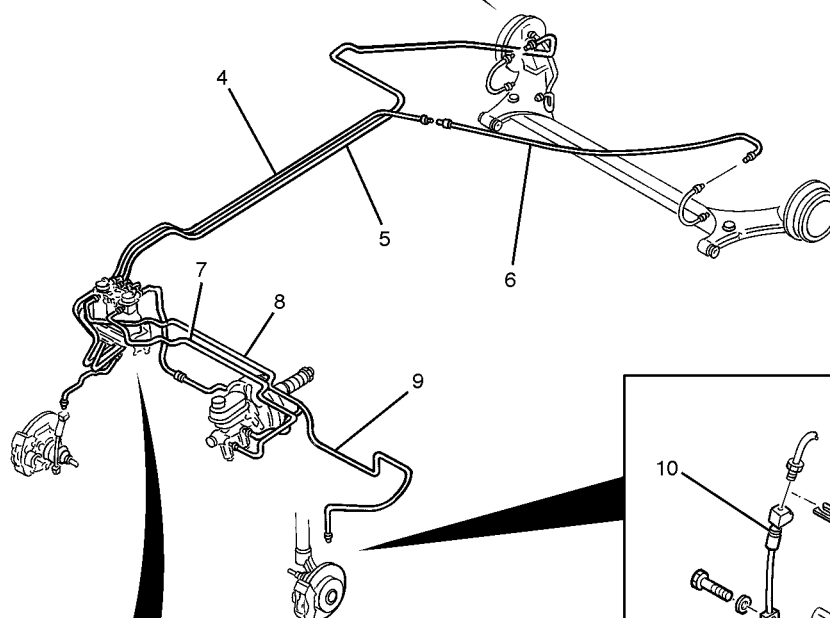
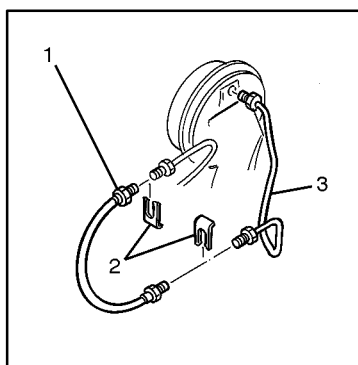
	1.3/1.5 SOHC Engine		1.6 DOHC Engine	
Application	Millimeters	Inches	Millimeters	Inches
Brake Drums:				
Inside Diameter	200.00	7.87	200.00	7.87
Maximum Rebore Diameter	201.00	7.91	201.00	7.91
Out-of-Round	0.050	0.002	0.050	0.002
Brake Rotors:				
Discard Thickness	19.00	0.75	23.00	0.90
Lateral Runout (Installed)	0.030	0.001	0.030	0.001
Rotor Diameter	236.00	9.29	256.00	10.08
Rotor Thickness (New)	20.00	0.79	24.00	0.95
Thickness Variation	0.005	0.0002	0.005	0.0002
Master Cylinder:				
Bore Diameter	20.71	0.82	22.29	0.88
Minimum Bore Diameter	20.64	0.81	22.22	0.88
Caliper:				
Piston Minimum Diameter	47.99	1.89	51.99	2.05
Wheel Cylinder Diameter:				
Maximum	17.460	0.687	19.050	0.750
Nominal	17.529	0.690	19.116	0.753

Application	N•m	Lb-Ft	Lb-In
Bleeder Screw	9	-	80
Brake Lines	16	12	-
Brake Pedal-to-Pedal Bracket Hex Nut	18	13	-
Front Brake Hose-to-Caliper Bolt	40	30	-
Trim Panel Screws	7	-	62

COMPONENT LOCATOR

BRAKE SYSTEM (ABS)

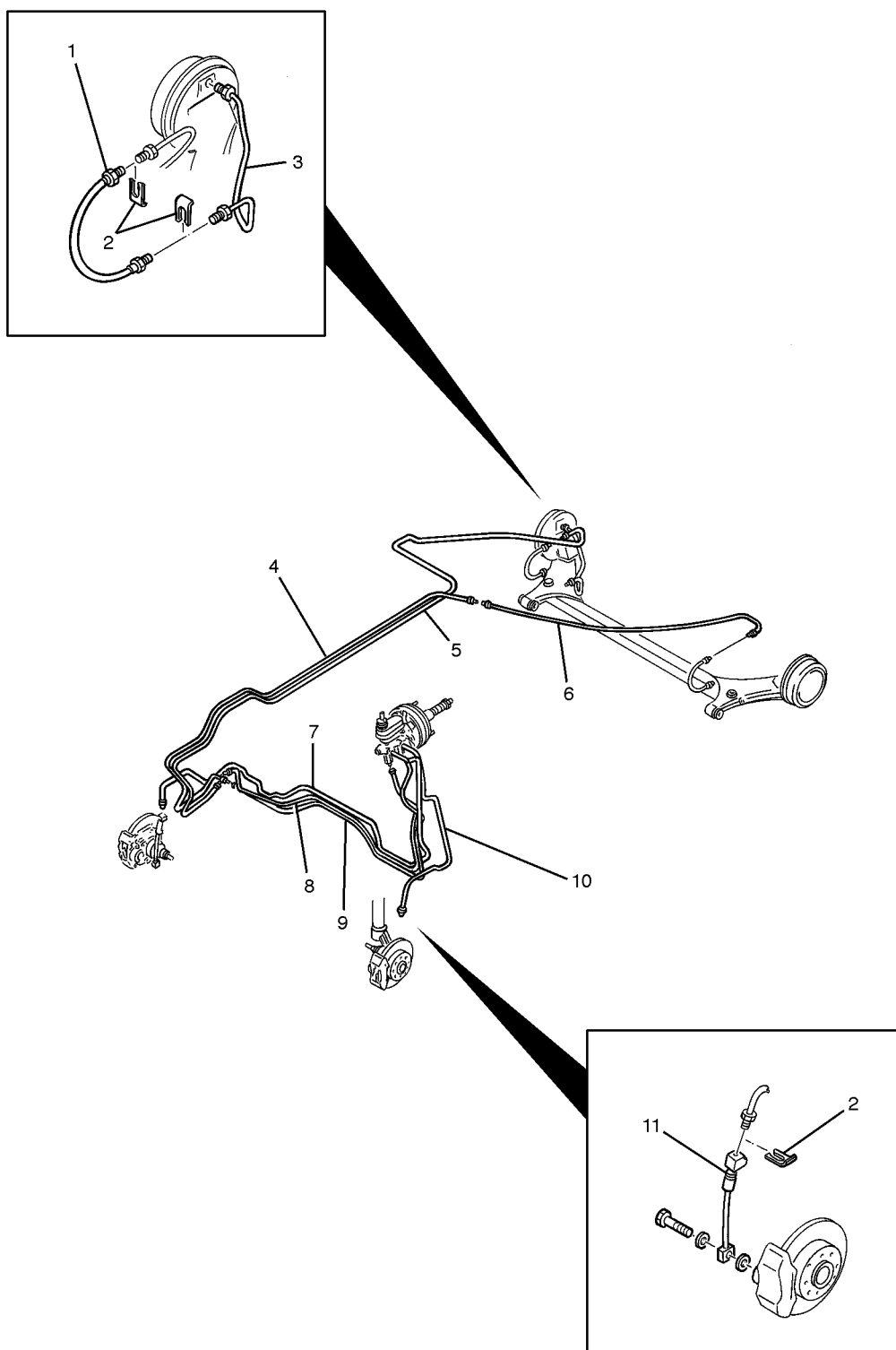
(Left-Hand Drive Shown, Right-Hand Drive Similar)



A207A002

- | | |
|--------------------------|----------------------------|
| 1 Rear Brake Hose | 9 LH 2nd Front Brake Pipe |
| 2 E-ring | 10 Brake Hose |
| 3 Rear Brake Pipe | 11 RH 1st Front Brake Pipe |
| 4 LH 2nd Rear Brake Pipe | 12 RH 1st Rear Brake Pipe |
| 5 RH 2nd Rear Brake Pipe | 13 LH 1st Rear Brake Pipe |
| 6 3rd Rear Brake Pipe | 14 RH 2nd Front Brake Pipe |
| 7 Secondary Brake Pipe | 15 LH 1st Front Brake Pipe |
| 8 Primary Brake Pipe | |
-

BRAKE SYSTEM (NON-ABS)



A207A001

- 1 LH or RH Rear Brake Hose
- 2 E-ring
- 3 LH or RH Rear Brake Pipe
- 4 LH 2nd Rear Brake Pipe
- 5 RH 2nd Rear Brake Pipe
- 6 3rd Rear Brake Pipe

- 7 RH Front Brake Pipe
- 8 RH 1st Rear Brake Pipe
- 9 LH 1st Rear Brake Pipe
- 10 LH Front Brake Pipe
- 11 Brake Hose

DIAGNOSIS

BRAKE SYSTEM TESTING

Brakes should be tested on a dry, clean, reasonably smooth and level roadway. A true test of brake performance cannot be made if the roadway is wet, greasy, or covered with loose dirt whereby all tires do not grip the road equally. Testing will also be adversely affected if the roadway is crowned so as to throw the weight so roughly that the wheels tend to bounce.

Test the brakes at different vehicle speeds with both light and heavy pedal pressure; however, avoid locking the brakes and sliding the tires. Locked brakes and sliding tires do not indicate brake efficiency since heavily braked, but turning, wheels will stop the vehicle in less distance than locked brakes. More tire-to-road friction is present with a heavily braked, turning tire than with a sliding tire.

Because of the high deceleration capability, a firmer pedal may be felt at higher deceleration levels.

There are three major external conditions that affect brake performance:

- Tires having unequal contact and grip of the road will cause unequal braking. Tires must be equally inflated, and the tread pattern of the right and the left tires must be approximately equal.
- Unequal loading of the vehicle can affect the brake performance since the most heavily loaded wheels require more braking power, and thus more braking effort, than the others.
- Misalignment of the wheels, particularly conditions of excessive camber and caster, will cause the brakes to pull to one side.

To check for brake fluid leaks, hold constant foot pressure on the pedal with the engine running at idle and the shift lever in N (Neutral). If the pedal gradually falls away with the constant pressure, the hydraulic system may be leaking. Perform a visual check to confirm any suspected leaks.

Check the master cylinder fluid level. While a slight drop in the reservoir level results from normal lining wear, an abnormally low level indicates a leak in the system. The hydraulic system may be leaking either internally or externally. Refer to the procedure below to check the master cylinder. Also, the system may appear to pass this test while still having a slight leak. If the fluid level is nor-

mal, check the vacuum booster pushrod length. If an incorrect pushrod length is found, adjust or replace the rod.

Check the master cylinder using the following procedure:

- Check for a cracked master cylinder casting or brake fluid leaking around the master cylinder. Leaks are indicated only if there is at least one drop of fluid. A damp condition is not abnormal.
- Check for a binding pedal linkage and for an incorrect pushrod length. If both of these parts are in satisfactory condition, disassemble the master cylinder and check for an elongated or swollen primary cylinder or piston seals. If swollen seals are found, substandard or contaminated brake fluid should be suspected. If contaminated brake fluid is found, all the components should be disassembled and cleaned, and all the rubber components should be replaced. All of the pipes must also be flushed.

Improper brake fluid, or mineral oil or water in the fluid, may cause the brake fluid to boil or cause deterioration of the rubber components. If the primary piston cups in the master cylinder are swollen, then the rubber parts have deteriorated. This deterioration may also be evidenced by swollen wheel cylinder piston seals on the drum brake wheels.

If rubber deterioration is evident, disassemble all the hydraulic parts and wash the parts with alcohol. Dry these parts with compressed air before reassembly to keep alcohol out of the system. Replace all the rubber parts in the system, including the hoses. Also, when working on the brake mechanisms, check for fluid on the linings. If excessive fluid is found, replace the linings.

If the master cylinder piston seals are in satisfactory condition, check for leaks or excessive heat conditions. If these conditions are not found, drain the fluid, flush the master cylinder with brake fluid, refill the master cylinder, and bleed the system. Refer to "Manual Bleeding the Brakes" or "Pressure Bleeding the Brakes" in this section.

BRAKE HOSE INSPECTION

The hydraulic brake hoses should be inspected at least twice a year. The brake hose assembly should be checked for road hazard damage, cracks, chafing of the outer cover, and for leaks or blisters. Inspect the hoses for proper routing and mounting. A brake hose that rubs

4A - 6 HYDRAULIC BRAKES

on a suspension component will wear and eventually fail. A light and a mirror may be needed for an adequate inspection. If any of the above conditions are observed on the brake hose, adjust or replace the hose as necessary.

WARNING LAMP OPERATION

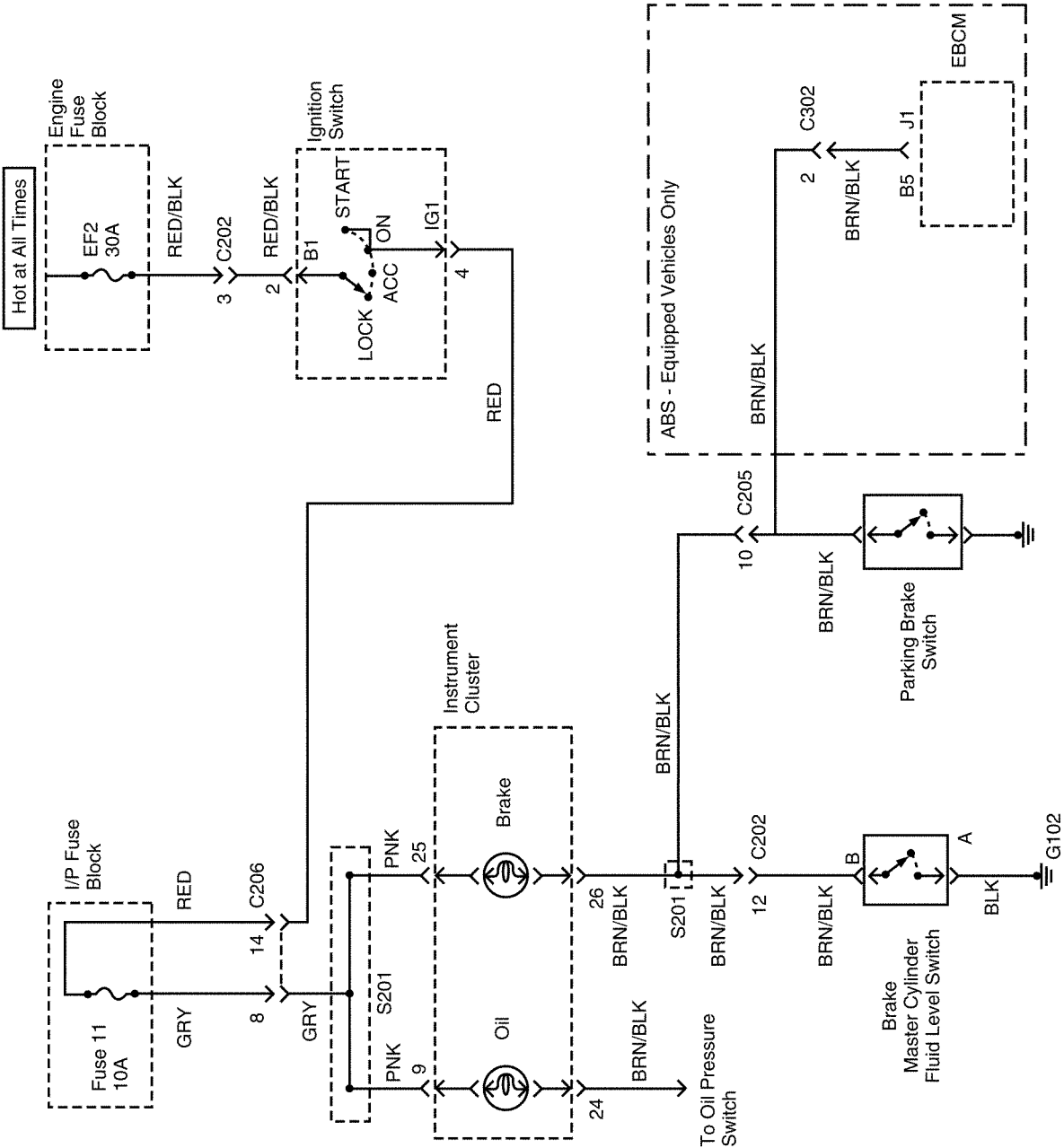
This brake system uses a BRAKE warning lamp located in the instrument panel cluster. When the ignition switch

is in the START position, the BRAKE warning lamp should glow and then go off when the ignition switch returns to the RUN position.

The following conditions will activate the BRAKE lamp:

- Parking brake applied. The light should be on whenever the parking brake is applied and the ignition switch is ON.
- Low fluid level. A low fluid level in the master cylinder will turn the BRAKE lamp on.

BRAKE LAMP WARNING CIRCUIT DIAGNOSIS



A207A016

4A - 8 HYDRAULIC BRAKES

Test Description

The number(s) below refer to step(s) on the diagnostic table.

1. There are three possible symptoms of a problem: the brake warning lamp is always on; the brake warning lamp is never on; the brake warning lamp will not operate for a particular function. This test takes you to the appropriate starting point in the procedure.
2. This test checks whether the Antilock Brake System (ABS) system has turned on the brake warning lamp. If the vehicle is not equipped with ABS, the answer will be NO.
- 4, 5. These steps test for simple conditions that can turn on the brake warning lamp.
7. This checks whether the brake fluid level switch is faulty.
9. This checks whether the parking brake switch is faulty.
12. This removes the circuit to the electronic brake control module (EBCM) in a vehicle with ABS.
14. This removes the parking brake switch circuit.
16. This removes the brake fluid level switch circuit.
18. This checks the only remaining circuitry that can activate the brake warning lamp.
20. This tests for the presence of battery voltage used by both the oil pressure lamp and the brake warning lamp.
21. This step begins a sequence that will restore voltage to the lamps.
29. This checks for a burned out indicator lamp.
31. This begins a sequence that will find the open that prevents contact to ground needed to operate the lamp.
33. This checks whether the ABS system has tried to turn on the brake warning lamp and could not. If the vehicle is not equipped with ABS, the answer is NO.
34. This step begins a search for a problem in the parking brake switch circuit.
38. This step begins a search for a problem in the brake fluid level switch circuit.

Brake Lamp Warning Circuit Diagnosis

Step	Action	Value(s)	Yes	No
1	Turn the ignition ON. Is the brake warning lamp always on?	-	Go to Step 2	Go to Step 19
2	Check the ABS warning lamp. Is the ABS warning lamp also on?	-	Go to Step 3	Go to Step 4
3	Use a scan tool to check for diagnostic trouble codes (DTCs) and follow the procedures for any DTCs found. Is the lamp still on?	-	Go to Step 4	System OK
4	Release the parking brake fully. Is the lamp off?	-	System OK	Go to Step 5
5	Check the brake fluid level. Is the fluid level acceptable?	-	Go to Step 7	Go to Step 6
6	1. Fill the brake fluid reservoir with clean DOT 3 equivalent hydraulic fluid. 2. Replace the cap on the brake fluid reservoir. Is the lamp still on?	-	Go to Step 7	System OK
7	Unplug the harness connector from the brake fluid sensor switch. Is the lamp still on?	-	Go to Step 9	Go to Step 8
8	Replace the brake fluid level switch. Is the repair complete?	-	System OK	-
9	1. Reconnect the brake fluid level switch. 2. Remove the rear console cover to expose the parking brake mechanism. 3. Release the brake completely. 4. Slide off the terminal with the BRN/BLK wire from the wiring harness. Does the lamp go out?	-	Go to Step 10	Go to Step 11
10	Replace the switch. Is the repair complete?	-	System OK	-
11	Replace the terminal back onto the switch. Is the vehicle equipped with ABS?	-	Go to Step 12	Go to Step 14
12	Unplug connector C302. This is a flat, 6-pin connector found under the passenger seat near the engine control module (ECM). Does the lamp go out?	-	Go to Step 13	Go to Step 14
13	Repair the short to ground in circuit BRN/BLK between terminal 2 of connector C302 and terminal B5 of connector J1 on the EBCM. Is the repair complete?	-	System OK	-
14	Disconnect connector C205. This is the large connector in the center of the connection block behind the left-side kick panel. Is the lamp still on?	-	Go to Step 16	Go to Step 15
15	Repair the short to ground in circuit BRN/BLK between connector C205 and connector C302 or between connector C205 and the parking brake switch. Is the repair complete?	-	System OK	-

Brake Light Warning Circuit Diagnosis (Cont'd)

Step	Action	Value(s)	Yes	No
16	Disconnect connector C202. This is the 18-pin connector to the front harness just above the left side kick panel, near the grommet that allows that harness through the fire wall. Does the lamp go out?	-	Go to Step 17	Go to Step 18
17	Repair the short to ground in circuit BRN/BLK between connector C202 and the brake fluid level switch. Is the repair complete?	-	System OK	-
18	Repair the short to ground in circuit BRN/BLK between terminal 25 of the instrument cluster and splice S201, or between S201 and connector C202 or connector C205. Is the repair complete?	-	System OK	-
19	Check the brake lamp after doing each of the following functions: <ul style="list-style-type: none"> • Apply the parking brake. • Remove the cap from the brake fluid reservoir. • Command the lamp on using a scan tool. Does the brake warning lamp operate for any of these conditions?	-	Go to Step 32	Go to Step 20
20	Turn the ignition ON. Does the oil pressure indicator light?	-	Go to Step 27	Go to Step 21
21	Check fuse 11 in the I/P fuse block behind the left-side kick panel. Is the fuse in good condition?	-	Go to Step 23	Go to Step 22
22	Replace fuse 11 with another 10-amp fuse. Does the brake warning lamp function now?	-	System OK	-
23	Check EF2 in the engine fuse block. Is EF2 in good condition?	-	Go to Step 25	Go to Step 24
24	Replace EF2 with another 30-amp device. Is the repair complete?	-	System OK	-
25	1. Unplug C206 from the connection box behind the left-side kick panel. This is the large connector at the bottom of the box. 2. Use a digital volt meter (DVM) to measure voltage from terminal 8 of the connector in the box to ground. This is the fourth pin from the left on the top row as you face the connection box. Does the DVM indicate the specified voltage?	11-14 v	Go to Step 27	Go to Step 26
26	Repair the open in circuit GRY from connector C206 in the connection box fuse 11 in the I/P fuse block. Is the repair complete?	-	System OK	-
27	1. Reconnect harness connector C206 to the connection box. 2. Gain access to the rear of the instrument cluster. 3. Unplug the instrument 10-pin cluster connector. 4. Use a DVM to measure the voltage from terminal 26 of the 10-pin cluster connector to ground. Does the DVM show the specified value?	11-14 v	Go to Step 28	Go to Step 29

Brake Light Warning Circuit Diagnosis (Cont'd)

Step	Action	Value(s)	Yes	No
28	Repair the open in circuit PNK between the 10-pin instrument cluster connector terminal 26 and splice S201 or from there in circuit GRY to terminal 8 of connector C206. Is the repair complete?	-	System OK	-
29	Remove the brake indicator lamp from its socket and examine it. Is the lamp burned out?	-	Go to Step 30	Go to Step 31
30	Replace the brake indicator lamp. Is the repair complete?	-	System OK	-
31	1. Return the brake indicator lamp to its socket in the instrument cluster. 2. Look for the open in circuit BRN/BLK between terminal 25 of the 10-pin I/P harness cluster connector and splice S201. 3. Repair any open found in circuit BRN/BLK. Is the repair complete?	-	System OK	-
32	Check the ABS lamp. Is the ABS lamp flashing?	-	Go to Step 33	Go to Step 34
33	Use a scan tool to determine what DTCs are present and repair them according to the tables for the DTCs involved. Is the repair complete?	-	System OK	-
34	Try applying the parking brake fully. Does the brake warning lamp fail to light when the parking brake is applied?	-	Go to Step 35	Go to Step 38
35	1. Expose the parking brake mechanism by removing the rear console. 2. Use a jumper to short the terminal from the BRN/BLK wire to ground. Does the lamp come on?	-	Go to Step 36	Go to Step 37
36	Replace the parking brake switch or repair the grounding between the parking brake switch and the brake handle mounting or between the brake handle mounting and the vehicle body. Is the repair complete?	-	System OK	-
37	Repair the open in circuit BRN/BLK. This will be in one of two places: • The I/P harness between splice S201 and terminal 10 of connector C205. • The floor harness between terminal 10 of connector C205 and the parking brake switch. Is the repair complete?	-	System OK	-
38	If the brake warning lamp is not indicating low brake fluid, remove the cap from the brake fluid reservoir to lift the sensor from the brake fluid. Does the lamp come on?	-	System OK	Go to Step 39
39	1. Unplug the harness connector from the sensor on the brake fluid reservoir cap. 2. Use a jumper to short the terminals in the harness connector together. Does the lamp come on?	-	Go to Step 40	Go to Step 41

Brake Light Warning Circuit Diagnosis (Cont'd)

Step	Action	Value(s)	Yes	No
40	Install a new fluid level sensor switch into the brake fluid reservoir. Is the repair complete?	-	System OK	-
41	Use the jumper to short terminal B (BRN/BLK wire) to ground. Does the lamp come on?	-	Go to Step 42	Go to Step 43
42	Repair the open to ground in circuit BLK between the terminal A (BLK wire) of the harness connector for the level sensor switch and ground G102 at the left front corner of the vehicle. Is the repair complete?	-	System OK	-
43	Repair the open in circuit BRN/BLK. There are two possible locations for this open: <ul style="list-style-type: none"> • The I/P harness between splice S201 and terminal 12 of connector C202. • The front harness between terminal 12 of connector C202 and terminal B of the harness connector for the level sensor switch. Is the repair complete?	-	System OK	-

Low brake fluid level in the master cylinder will turn the BRAKE lamp ON. Refer to "Brake System Testing" in this section to test for fluid leaks.

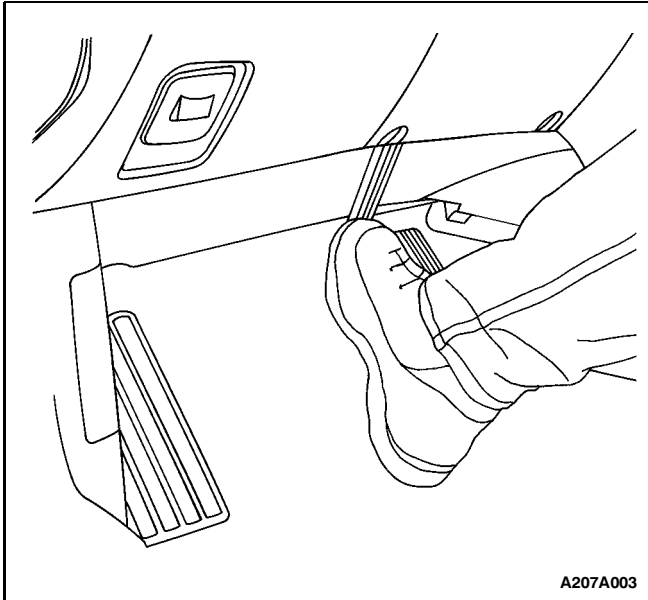
MAINTENANCE AND REPAIR

ON-VEHICLE SERVICE

MANUAL BLEEDING THE BRAKES

(Left-Hand Drive Shown, Right-Hand Drive Similar)

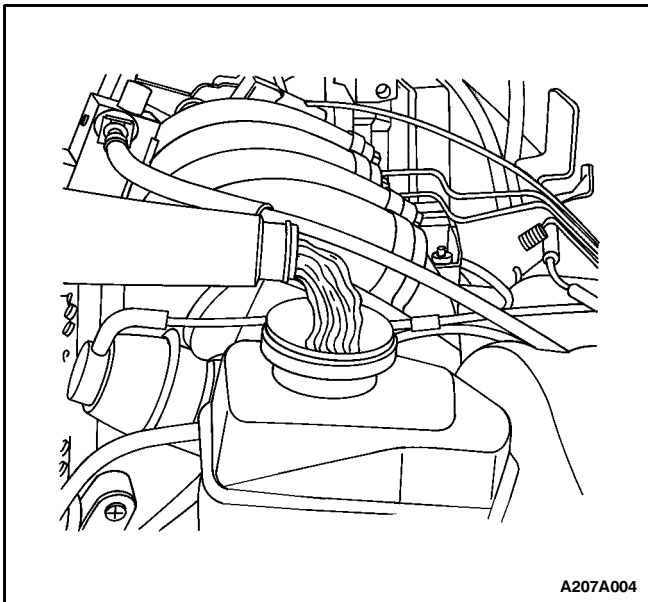
1. Remove the booster reserve by applying the brakes several times with the engine OFF until all the reserve is depleted.



A207A003

Important: If the master cylinder is known or suspected to have air in the bore, then it must be bled before any wheel cylinder or caliper is bled.

2. Fill the master cylinder reservoir with brake fluid. Keep the master cylinder at least one-half full of fluid during the bleeding operation.

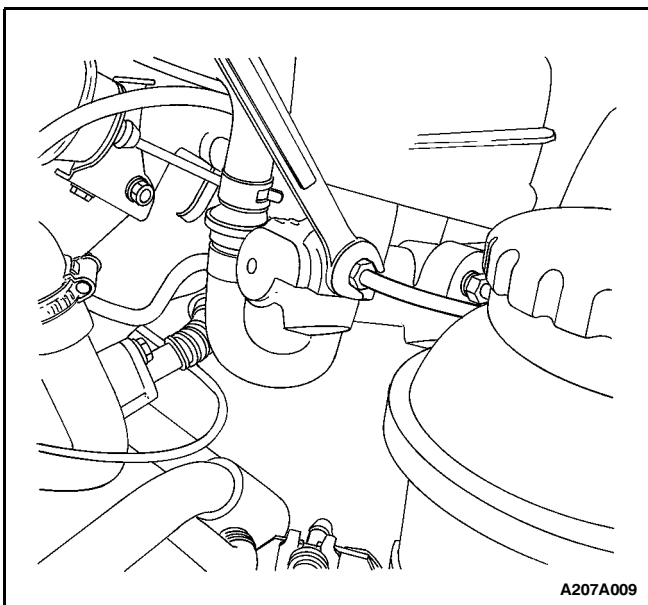


A207A004

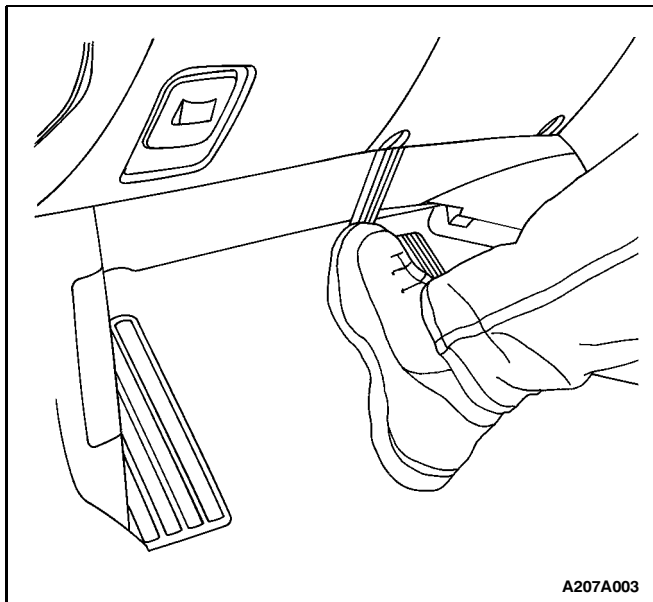
3. Disconnect the front brake line(s) at the master cylinder.
4. Allow the brake fluid to fill the master cylinder until it begins to flow from the front pipe connector port.
5. Connect the front brake line(s) to the master cylinder.

Tighten

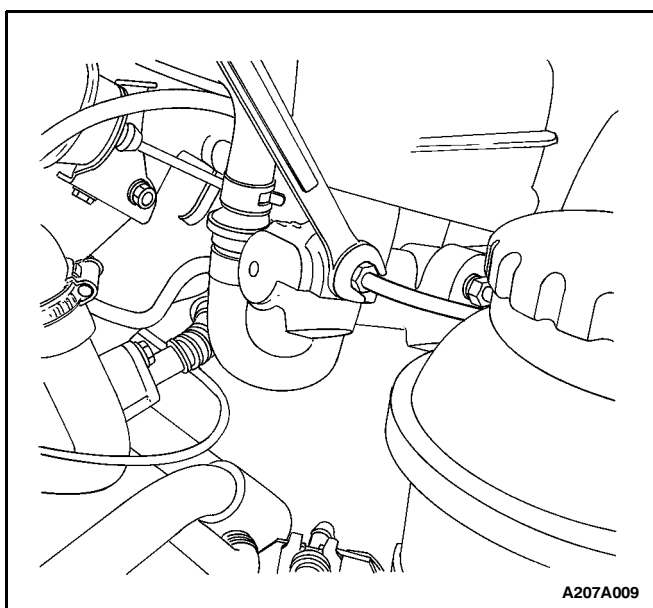
Tighten the brake lines to 16 N•m (12 lb-ft).



A207A009



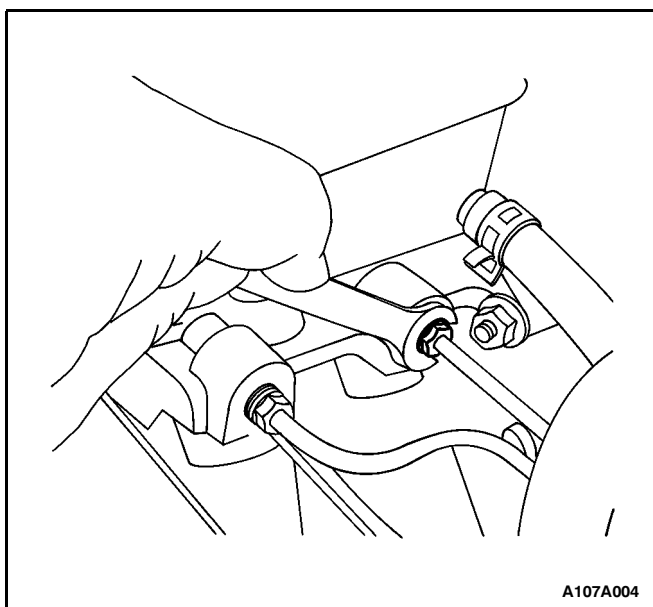
6. Slowly push and hold the brake pedal one time.



7. Loosen the front brake line at the master cylinder to purge all air from the cylinder.

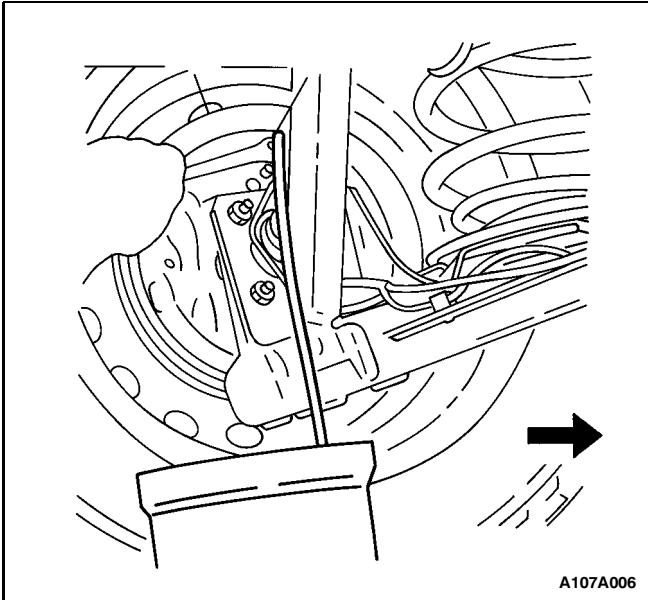
8. Tighten the brake line as in Step 5, and then release the brake pedal slowly. Wait 15 seconds before proceeding to the next step.

9. Repeat the sequence, including the 15-second wait, until all the air is removed from the master cylinder bore.



Notice: Care must be taken to prevent brake fluid from contacting any painted surface to prevent damage to the paint finish.

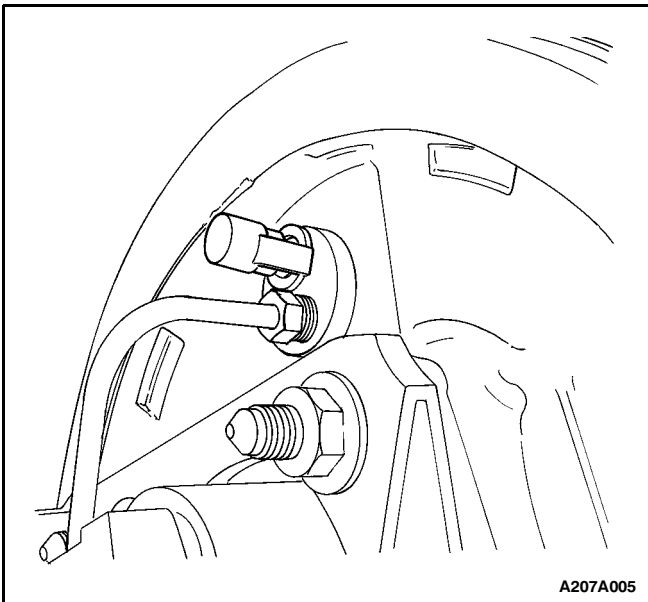
10. After all the air has been removed at the forward connection(s), bleed the master cylinder at the rear (cowl) connection(s) in the same manner as with the front connections.



A107A006

Important: For vehicles equipped with a non-antilock braking system, non-ABS, the bleeding sequence is as follows: right rear, left front, left rear, and right front. For ABS-equipped vehicles, refer to Section 4F, Antilock Brake System for the correct sequence and bleeding procedure.

11. Attach a transparent tube over the valve. Allow the tube to hang submerged in brake fluid in a transparent container.



A207A005

12. Slowly push and hold the brake pedal one time.
13. Remove the bleeder cap and loosen the bleeder screw to purge the air from the cylinder.
14. Tighten the bleeder screw.

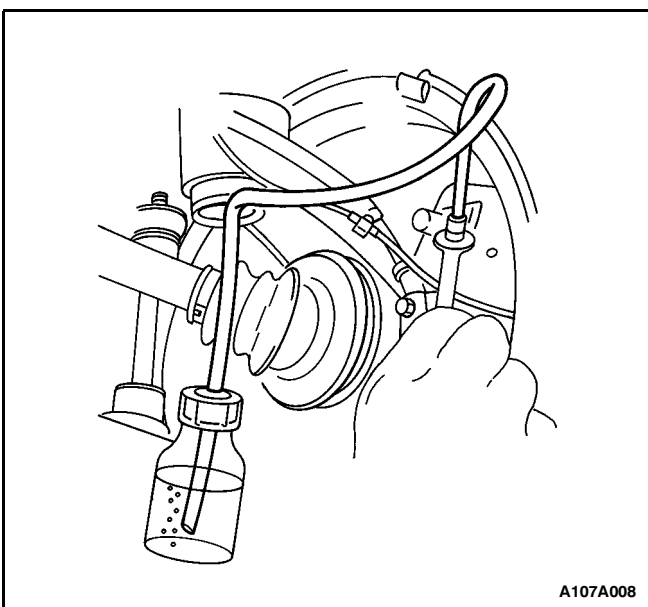
Tighten

Tighten the bleeder screw to 9 N·m (80 lb-in).

15. Slowly release the brake pedal. Wait 15 seconds before proceeding with the next step.

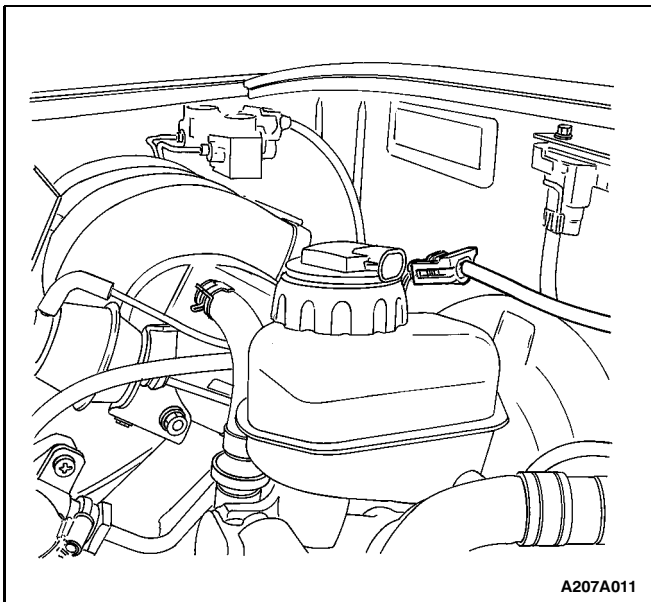
Important: Rapid pumping of the brake pedal pushes the master cylinder secondary piston down the bore in a manner that makes it difficult to bleed the system.

16. Repeat the sequence, including the 15-second wait, until all the air is removed. It may be necessary to repeat the sequence 10 or more times to remove all the air.
17. Locate the front bleeder caps.

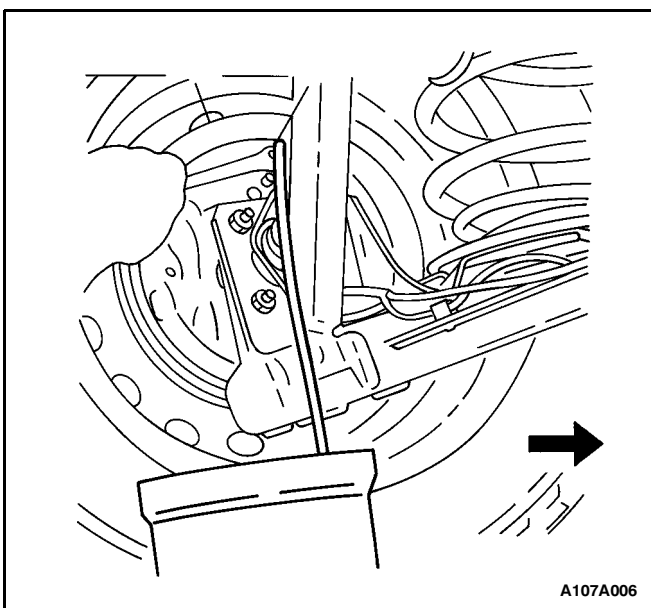


A107A008

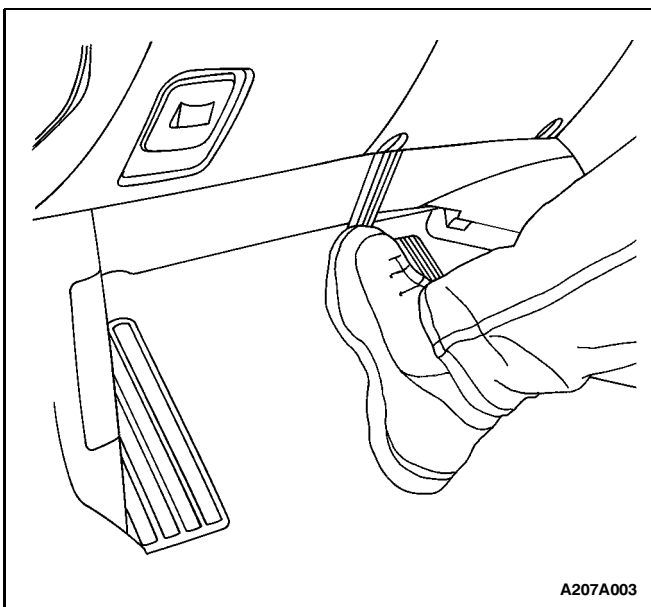
18. Proceed to bleed the front brakes following the appropriate sequence, beginning with Step 12.
19. Check the brake pedal for sponginess. Repeat the entire bleeding procedure to correct this condition.



A207A011



A107A006



A207A003

PRESSURE BLEEDING THE BRAKES

(Left-Hand Drive Shown, Right-Hand Drive Similar)

Notice: Pressure bleeding equipment must be of the diaphragm type. It must have a rubber diaphragm between the air supply and the brake fluid to prevent air, moisture, oil, and other contaminants from entering the hydraulic system. Contamination could lead to deterioration of the braking components and loss of braking action.

1. Disconnect the master cylinder electrical connector.
2. Remove the master cylinder reservoir cap.

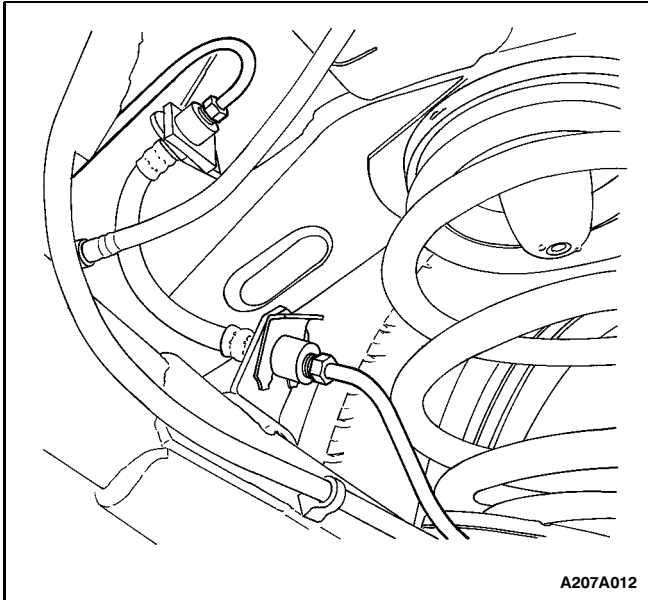
3. Connect the bleeder with the adapter to the master cylinder reservoir.
4. For vehicles with the antilock brake system (ABS), locate and remove the hydraulic modulator bleeder valves. Refer to Section 4F, Antilock Brake System.
5. Charge the bleeder ball to 140 to 172 kPa (20 to 25 psi).
6. Connect the line to the adapter. Open the line valve.
7. Raise and suitably support the vehicle.

Important: The bleeding sequence is as follows: right rear, left front, left rear, and right front.

8. Attach the bleeder hose to the bleeder valve. Submerge the opposite end of the hose in a clean container partially filled with brake fluid.
9. Open the bleeder valve one-half to three-fourths of a turn and allow the fluid to flow until no air is seen in the fluid.

Notice: After the bleeding operation, the brake reservoir may be pressurized. While disconnecting the bleeder hose or the unthreaded adapter cap, cover the cap and the connection with a shop towel to protect painted surfaces from contact with the brake fluid.

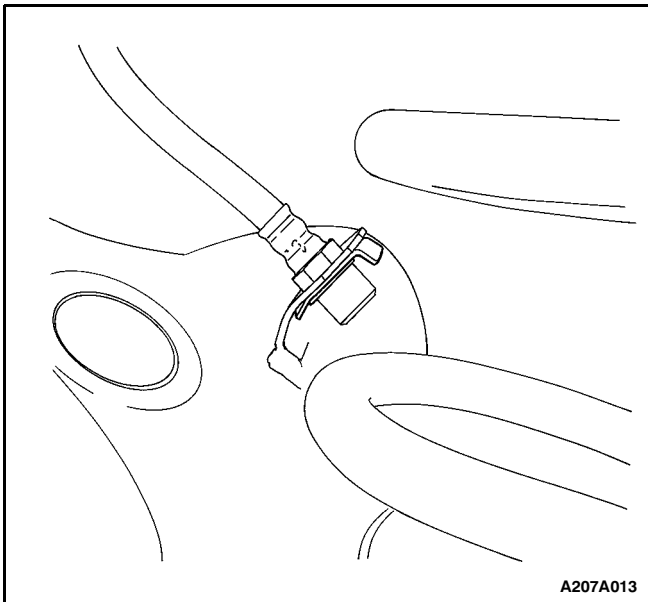
10. Inspect the brake pedal for sponginess. Repeat the entire bleeding procedure to correct this condition.



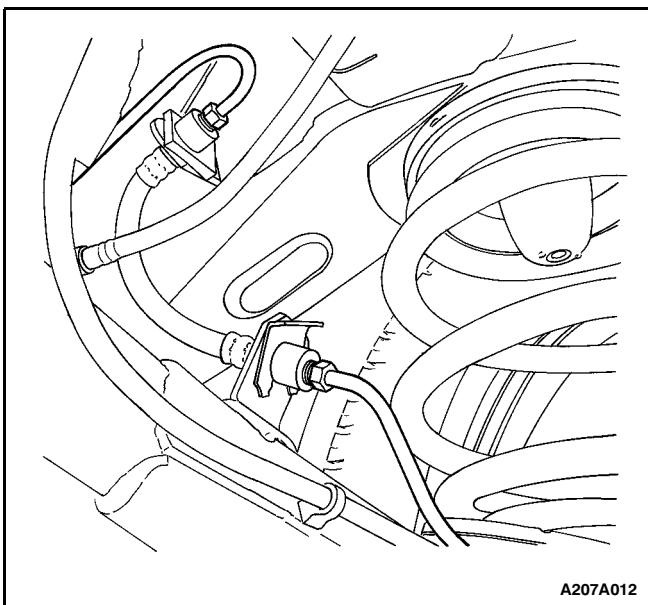
BRAKE HOSE (REAR)

Removal Procedure

1. Raise and suitably support the vehicle.
2. Disconnect the brake lines from the brake hoses at the body and the rear axle brackets.



3. Remove both brake hose E-ring retainers.
4. Remove the brake hoses from the brackets.

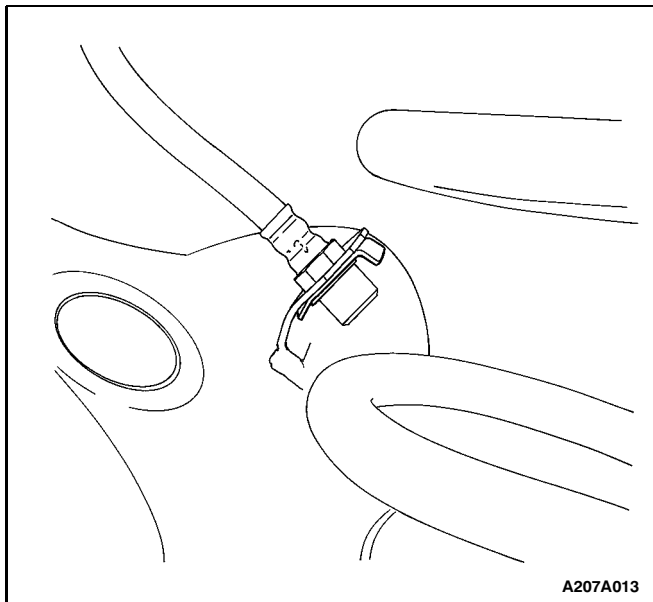


Installation Procedure

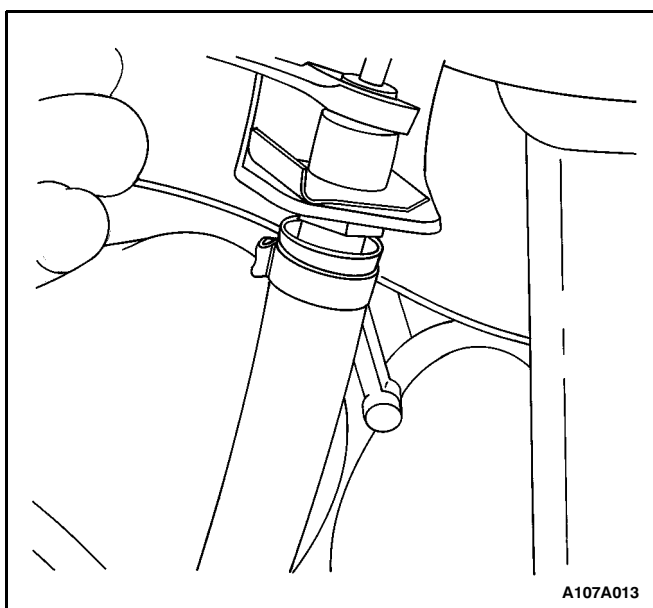
1. Install the brake hoses to the body and the rear axle brackets.
2. Connect the brake lines to the brake hose.

Tighten

Tighten the brake lines to 16 N•m (12 lb-ft).



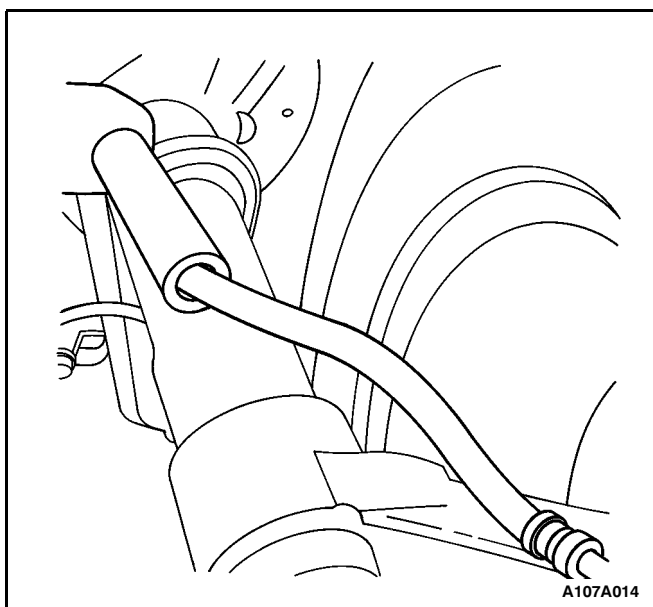
3. Install the brake hose retainers.
4. Lower the vehicle.
5. Bleed the brake system. Refer to "Manual Bleeding the Brakes" in this section.
6. Check the brake system for leaks.



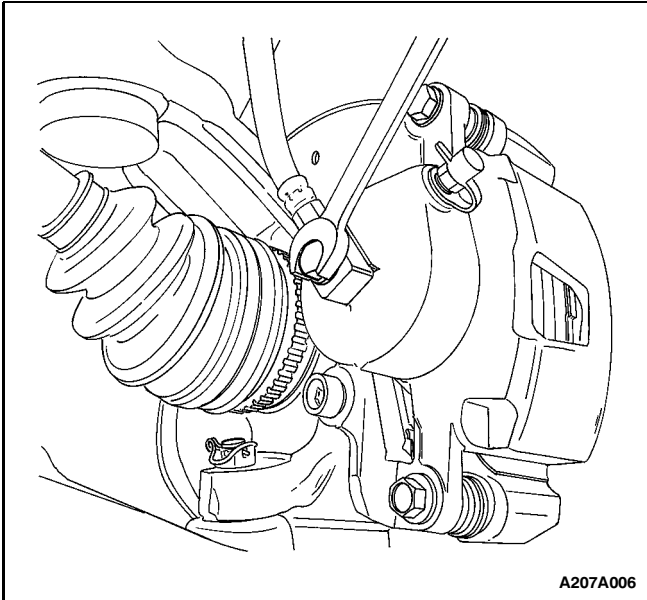
BRAKE HOSE (FRONT)

Removal Procedure

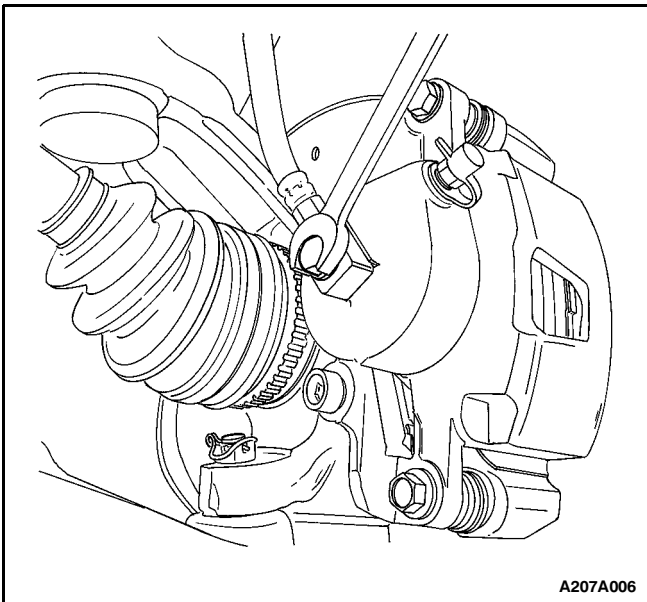
1. Raise and suitably support the vehicle.
2. Disconnect the brake line from the brake hose support bracket on the wheel housing.
3. Remove the E-ring retainer.



4. Remove the brake hose from the wheel housing bracket.



5. Remove the bolt from the brake caliper.
6. Remove the seal rings and the brake hose.

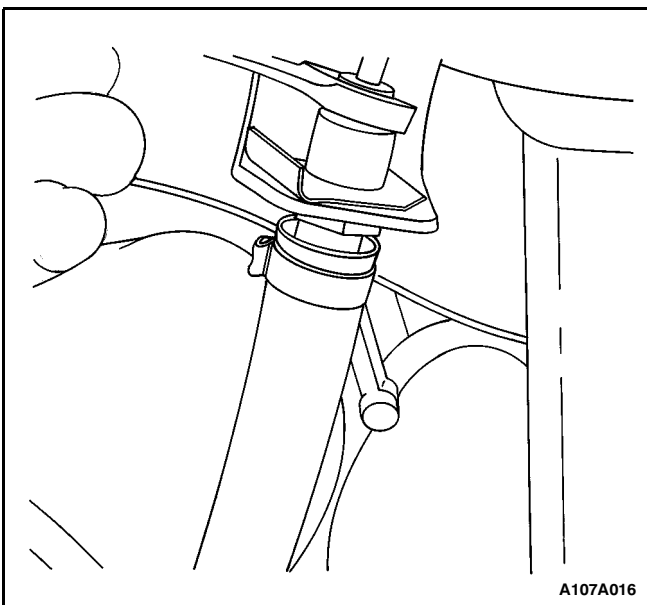


Installation Procedure

1. Install the new brake hose to the caliper with new seal rings and the bolt.

Tighten

Tighten the front brake hose-to-caliper bolt to 40 N•m (30 lb-ft).

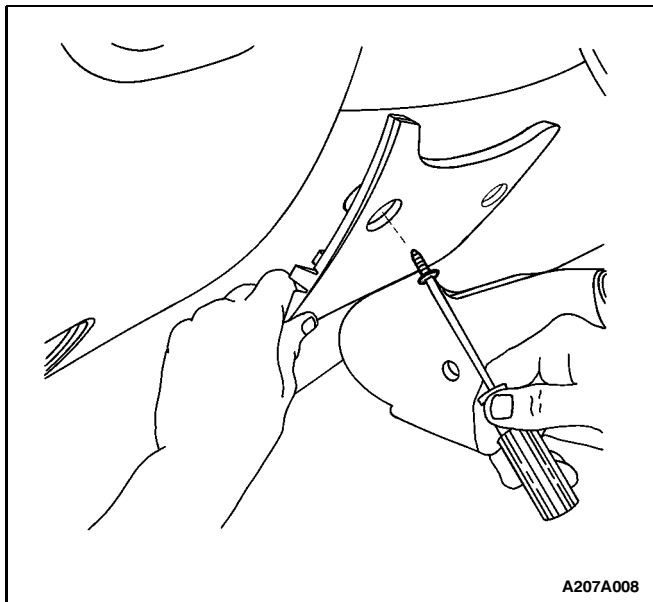


2. Install the brake hose and the E-ring retainer to the wheel housing bracket.
3. Connect the brake line to the brake hose.

Tighten

Tighten the brake line to 16 N•m (12 lb-ft).

4. Lower the vehicle.
5. Bleed the brake system. Refer to "Manual Bleeding the Brakes" in this section.
6. Check the brake system for leaks.

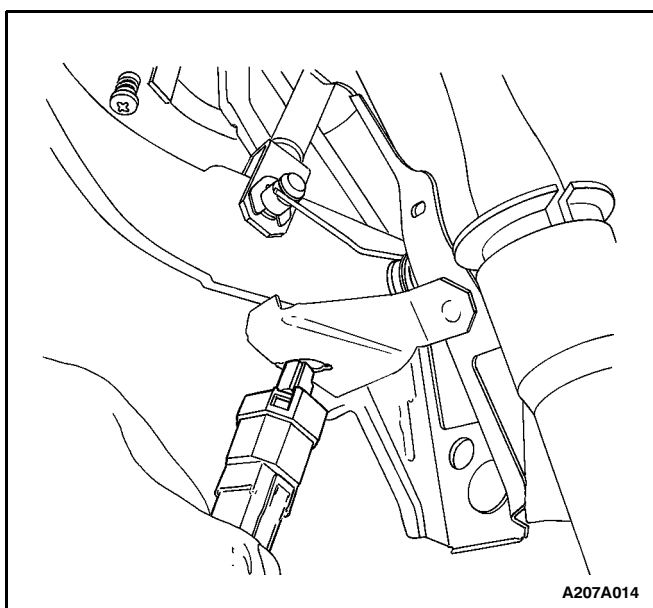


STOPLAMP SWITCH

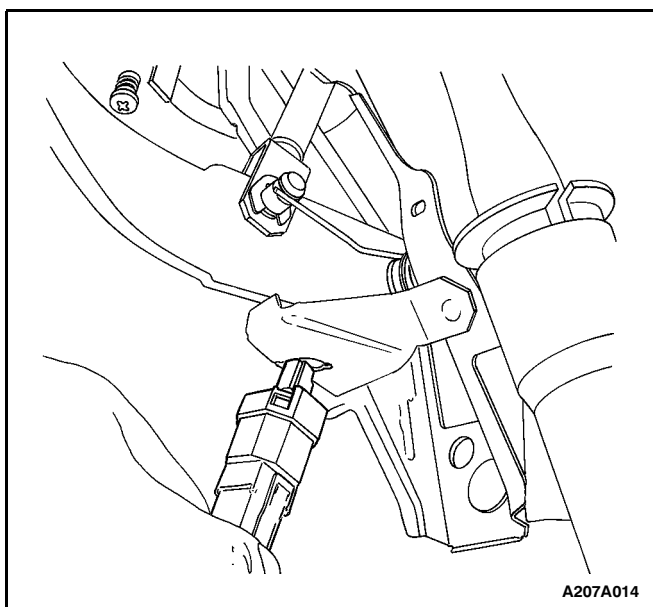
(Left-Hand Drive Shown, Right-Hand Drive Similar)

Removal Procedure

1. Disconnect the negative battery cable.
2. Remove the trim panel screws.
3. Remove the trim panel.

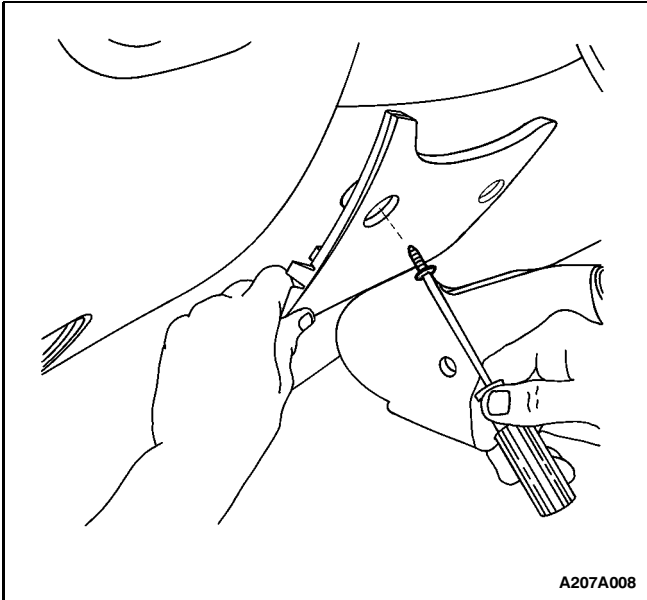


4. Turn the stoplamp switch and the connector assembly, and pull it from the brake pedal bracket.
5. Separate the stoplamp switch from the connector to replace the stoplamp switch.



Installation Procedure

1. Turn the stoplamp switch and the connector assembly, and twist it into the brake pedal bracket.



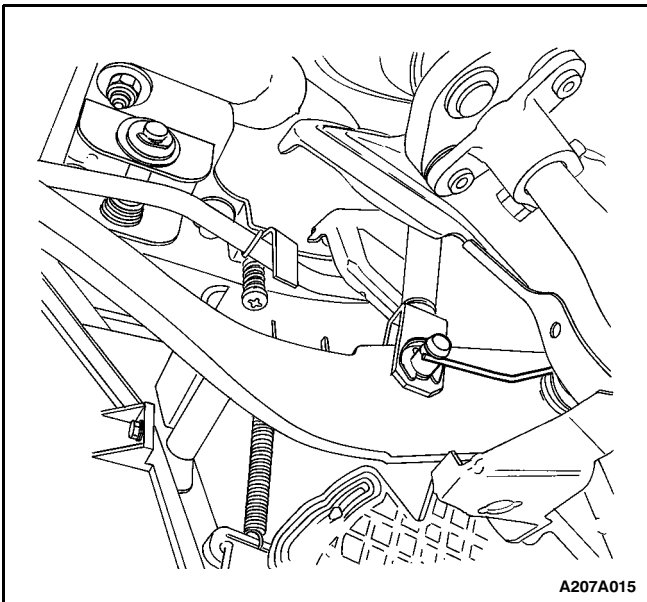
A207A008

2. Press the brake pedal and pull the switch plunger to its maximum setting to adjust the switch.
3. Release the plunger and pull up on the pedal.
4. Install the trim panel screws.

Tighten

Tighten the trim panel screws to 7 N•m (62 lb-in).

5. Connect the negative battery cable.



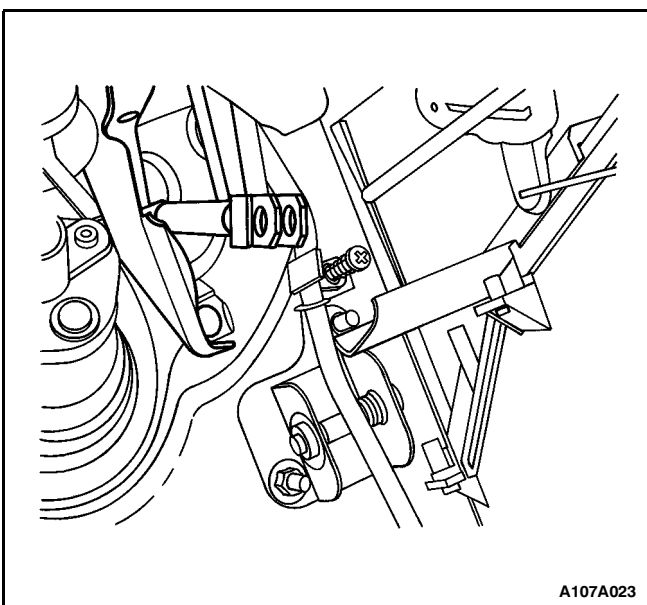
A207A015

BRAKE PEDAL

(Left-Hand Drive Shown, Right-Hand Drive Similar)

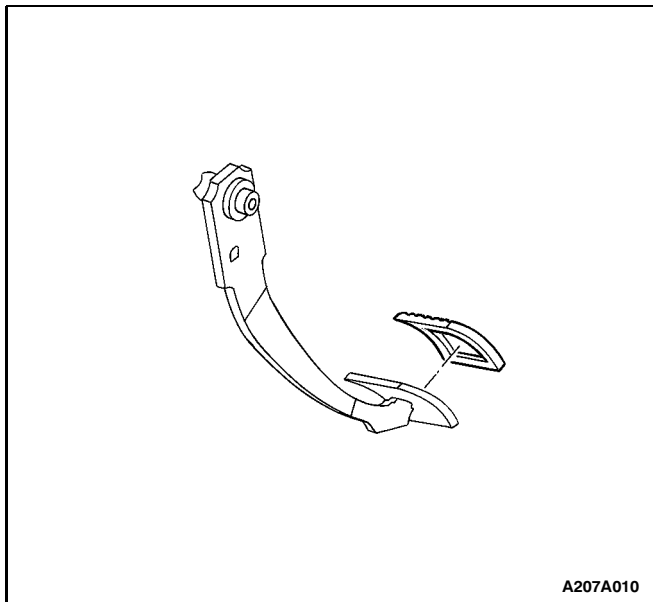
Removal Procedure

1. Remove the screws that hold the trim panel to the instrument panel.
2. Remove the trim panel.
3. Remove the stoplamp switch. Refer to "Stoplamp Switch" in this section.
4. Disconnect the retaining ring, the pin, and the spring from the pushrod/brake pedal connection.

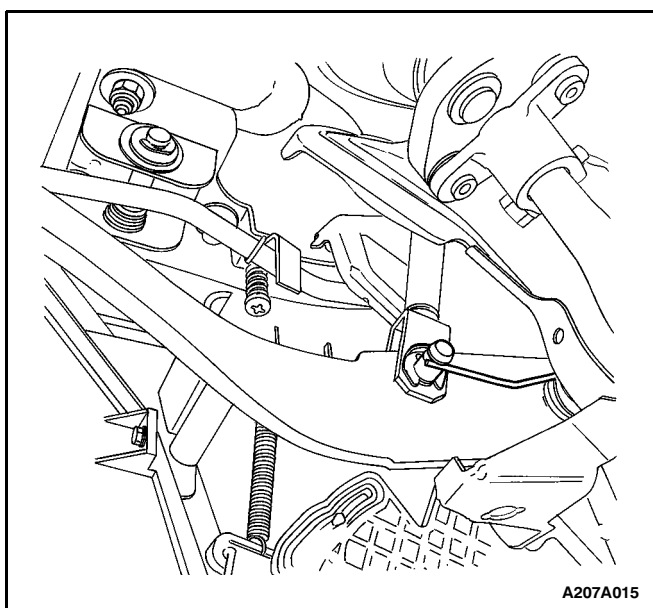


A107A023

5. Remove the pedal mounting shaft and nut.
6. Remove the brake pedal, exposing the brake booster pushrod and the pedal-to-dash panel bracket.



7. Remove the brake pedal cover.



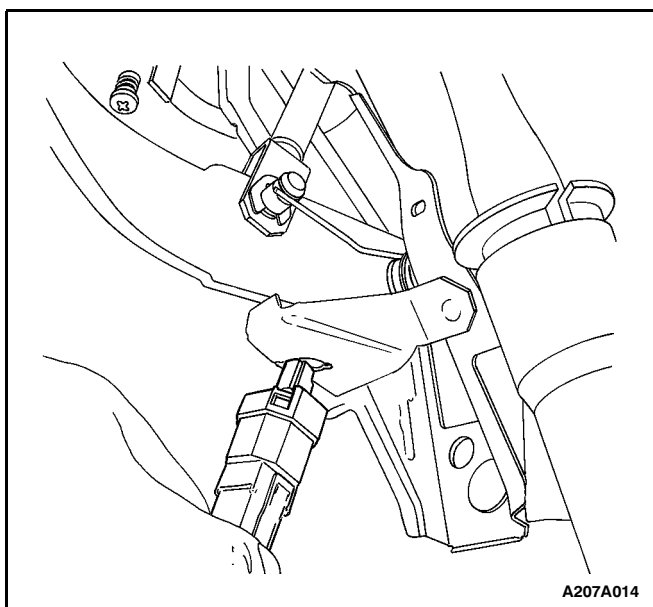
Installation Procedure

1. Install a new brake pedal cover, if needed.
2. Coat the pedal shaft with grease.
3. Position the brake pedal on the pedal-to-dash panel bracket and the pedal shaft.
4. Place the nut on the pedal mounting shaft.

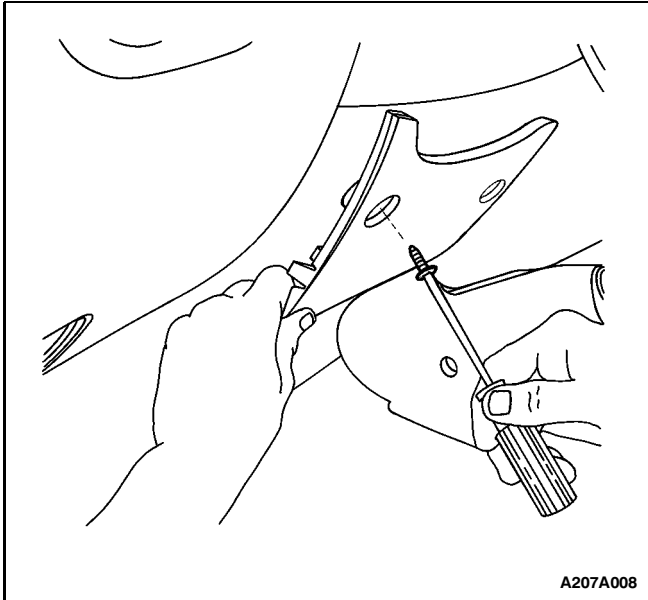
Tighten

Tighten the brake pedal-to-pedal bracket nut to 18 N•m (13 lb-ft.)

5. Install the pushrod to the pedal with the pin and the retaining ring.



6. Install the spring on the shaft in its original position.
7. Connect the stoplamp switch and the connector assembly by twisting it into the pedal bracket.



8. Install the trim panel with the screws.

Tighten

Tighten the trim panel screws to 7 N•m (62 lb-in).

GENERAL DESCRIPTION AND SYSTEM OPERATION

WARNING LAMP OPERATION

This brake system uses a BRAKE warning lamp located in the instrument panel cluster. When the ignition switch is in the START position, the BRAKE warning lamp

should illuminate. It should go off when the ignition switch returns to the ON position.

The following conditions will activate the BRAKE warning lamp:

- The lamp should be on whenever the parking brake is applied and the ignition switch is in the ON position.
- A low fluid level in the master cylinder will turn the BRAKE lamp on.