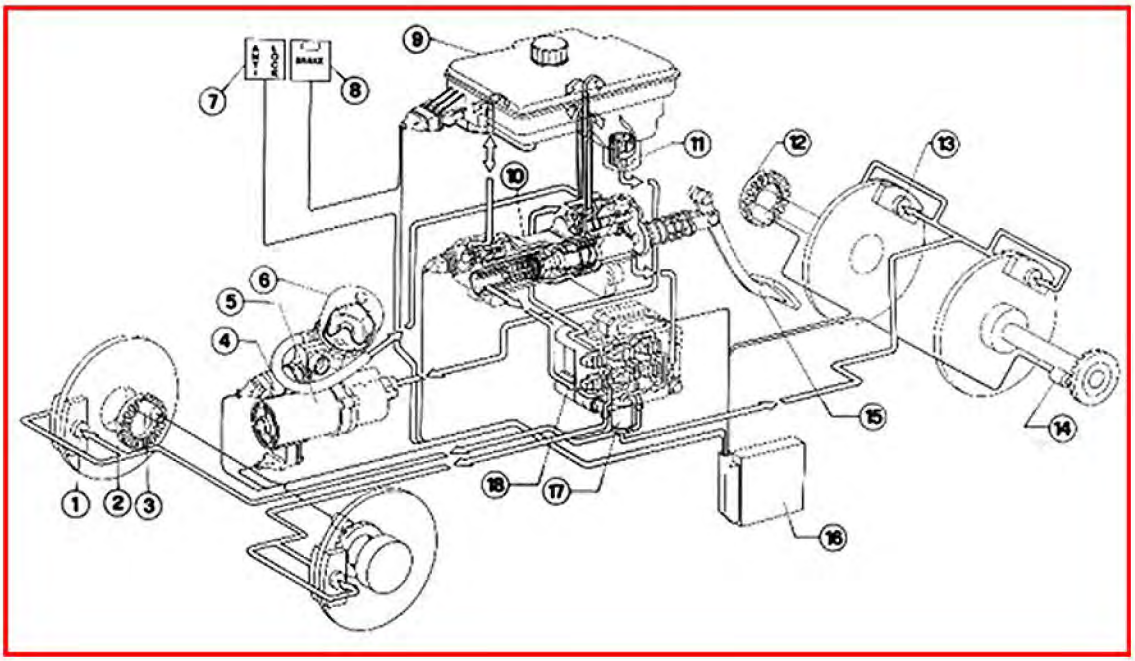
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ABS Braking System



There are some simple checks that can be performed without tools to see what might be causing error messages, warning lights, and/or reduced braking ability on 1987 through 1992 Cadillac Allante's with the Bosch III ABS system. These checks can be performed by anyone, and require absolutely no mechanical knowledge. Learning about your ABS system will help save you money when it comes time for repairs, and enable you to respond appropriately if problems develop in the future.

The following is a brief description of the ABS system components. The ABS system consists of the Electronic Brake Control Module (EBCM on 1987-1989 models), or Electronic Brake and Traction Contol Module (EBTCM on 1990-1992 models), a pump to generate hydraulic assist, the ABS master cylinder unit, and wheel sensors at each wheel to provide feedback. In the case of 1990 through 1992 Allante's the Traction Control feature is integrated with the ABS system. There two are other components that come into play, the relay which runs the ABS pump, and one of the stop light switches. The ABS master cylinder has several major components: the sensor block, the accumulator, the pressure control switch, the fluid reservoir, the valve body, and the hydraulic unit. Some of these components will be discussed later on.

Here's how the system works. Each time the car is started, messages and warning lights are tested. When the ignition is turned on, electric power is available to the ABS pump. This pump generates the hydraulic assist to operate the ABS system and make the car stop when the brakes are applied. The pump relay must be working properly for the pump to run. The pressure control switch provides the feedback to the EBCM or EBTCM . The sensor block controls the relay when the pump is needed to generate more pressure by providing ground to one side of the pump relay coil, or shutting off the ground when it is time to shut the relay off. The accumulator on the ABS unit stores pressurized fluid to assist in stopping the car. As soon as the brake pedal is applied, the EBCM operates the system as needed, in conjunction with the various inputs from around the car. Each time the brakes are applied, the EBCM monitors the system and all the components for proper operation. Under normal braking conditions, the pump will run for a short time each time the pedal is applied. If stopping is gradual, the antilock brake function does not come into play. ABS braking occurs only when a wheel starts to skid. Feedback from the wheel sensor to the EBCM signals the skid, and the appropriate wheel valve inside the ABS system is opened for a long enough time to enable the wheel to start to roll. Then the wheel valve is closed and braking is reapplied.

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This system has superb stopping ability when everything is right. But sometimes problems arise. There are four general categories of failure. First there is loss of power assist. This is a serious condition. It occurs when the ABS pump doesn't run, or doesn't generate adequate pressure to run the ABS system. The symptoms are a rock hard pedal, and very little stopping ability, no matter how hard you press on the pedal. Second, there can be the sudden loss of fluid as a result of a blown seal or ruptured brake hose or line. In that case, the pedal goes to the floor, and you'll will find significant fluid leakage under the car. Third, there are a number of conditions for which error messages and red brake warning lights are seen, but braking ability seems pretty much OK. Lastly, there are a number of conditions for which red brake warning lights and error messages are received, and the car experiences reduced or inconsistent braking ability. Please let us know which of these general groupings best describes the brakes on your car. We can help walk you through diagnosing what's wrong, provide the parts you need, and help get it fixed correctly the first time.

QUICK CHECK OF ABS PUMP AND ACCUMULATOR

The first step to take when attempting to diagnose Bosch III ABS problems on your Allanté is to determine if your ABS pump and accumulator seem to be functioning within normal limits. These items can be evaluated without any tools or special knowledge. Although there are more technically correct methods offered in the service manuals, by performing the following simple tests you can quickly determine if further investigation of these two components is needed. Read this entire section before proceeding.The ABS pump is located below and in front of the master cylinder. If you follow the flexible lines from the master cylinder, both run to the pump. When the key is turned on, the pump should run long enough to repressurize the system, and then shut off. First, locate the pump. Turn the key on. Depending upon how long it has been since the car last ran, the pump may or may not run. Next, completely depressurize the ABS system. To do this, turn the ignition off, and pump and release the brake pedal firmly at least 25 times. Somewhere along the way, you should notice a change in the feel of the pedal. Normally, the pedal will go to the floor when you first starting pressing it. After a number of applications, it will come off the floor, and feel like you are building pressure. This is the point at which the system is depressurized. Once you have depressurized the system, have a watch with a second hand ready. Then turn the ignition on without starting the car. You should hear the ABS pump run. Time how long the pump runs before it shuts off. This should be between 25 and 30 seconds. Next, depressurize the system again. To do this, shut off the key. This time, count the number of times the brake pedal is pressed before you experience the change in the feel of the pedal, when it stops going all the way to the floor. A good accumulator should store 10 to 20 pumps before it is depressurized. If the ABS pump does not run for the above test, the cause must be found and corrected before any further analysis can be performed. The remainder of the ABS system simply cannot be evaluated unless there is adequate power assist available to run the system. Please e-mail the results of these simple tests to Allantesource at allantesource@prodigy.net, along with a description of your symptoms, and we will be pleased to provide you with our opinion of what your results show, and what should be done next.

RUNNING DIAGNOSTICS, 1987 THROUGH 1989 ALLANTE'S

The ABS trouble codes for 1987 through 1989 Allantés are cleared each time the ignition is turned off. Therefore, the car must be driven or the brake pedal applied as required until the problem condition is observed. Then the ignition must be left on while the diagnostic codes are obtained.To begin, the OFF and WARMER buttons on the air conditioning control must be pressed and held until the dash display changes. Trouble codes, if any, will appear in the Driver Information Center (DIC) message window. Write down any codes that appear. They may or may not apply to the ABS system.After the message "ECM?" appears in the window, press the LO fan speed button. Next the "BCM?" message will appear. Press LO again. For "LIGHTING?" press LO. Next "ANTILOCK BRAKES?" will appear. Press the HI fan speed button to select this segment. You will then be instructed to press and hold the brake pedal, and to count the flashes of the red brake warning light on your instrument cluster. The sequence will repeat after a 10 second delay. The 1987 through 1989 Allantés can store only one trouble code. It will be the lowest number of the 16 possible codes.Sometimes no codes are set, even when there are warning lights and error messages being received. Send as much information as possible to allantesource@ prodigy.net, and we will try to help you decide what step(s) should be taken next.

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HOW TO REPLACE THE ACCUMULATOR

If you have determined that your accumulator needs to be replaced, the following steps will allow you to replace it with the ABS system still installed in the car. Recharged accumulators are available from Allantesource for much less than the price of a new accumulator from Cadillac. They were originally designed as throwaways. But we have modified them to be rechargeable. With new seals, they will give the same service as a brand new one, at less than half the price. Or sometimes we have low mileage used accumulators, that were recently installed and good as a new one. Tools you will need: ¼" drive ratchet, w/ ¼" drive 3" extension ¼" drive THIN WALL ¼" hex socket, #30 Torx bit (comes with magnetic Torx screwdriver with multiple bits). If bleeding brakes: clear hose, glass jar, new brake fluid, DOT 3 or DOT 4 only. Do NOT use SYNTHETIC brake fluid! It is not compatible!!!

To replace: Key off, depress brake pedal 25 times to completely depressurize system.There are two Torx screws holding accumulator to hydraulic unit from up underneath. Location can be seen by observing bottom of recharged accumulator.Check size of Torx bit in screw head for proper fit. Assemble ratchet handle, 3" extension, ¼" socket, and #30 Torx bit to remove both screws. Be careful not to drop screws. Once the screws have started to come loose, ratchet can be removed, and screws turned out by gripping the end of the extension and turning them out much like a screwdriver. What can go wrong here: You can strip the screw heads if you are not very careful. Then you will have a lot more work. You must keep your ratchet as straight as possible into the Torx head. If you don't use a thinwall socket, you cannot be straight, and you will most likely end up stripping the Torx head. If this happens, let me know, see below for the procedure for removing the entire ABS unit. Wipe off plate on top of hydraulic unit after old accumulator is removed. Put new O-ring into port on bottom of recharged accumulator. Reinstall two screws and tighten. Very little brake fluid is lost. Turn on key, and check for leaks. Time the length of time pump runs before it shuts off. It should be around 25 to 30 seconds.To bleed hydraulic unit, which is a good idea, shut off key and depressurize system by pumping brake pedal 25 times with key off. Attach clear hose to bleeder fitting on passenger side of hydraulic unit. Take a glass jar. Add about 1" of new brake fluid to jar. Submerge end of clear hose in brake fluid in jar. Open bleeder screw, turn key on, let fluid run until no bubbles are present, then shut off bleeder. Turn off key. More bleeding should not be necessary, unless you are changing your brake fluid. Add brake fluid as necessary to full line on reservoir.If you purchased a recharged accumulator from Allantesource, please return the core to us as soon as possible by ground UPS.

HOW TO REPLACE THE BOSCH III ABS SYSTEM

The following is a general description of the work required to replace the Allanté ABS system. There are some differences among years. It is not intended to be a step by step detailed instruction, but rather a general overview that would be useful to anyone who is mechanically proficient, with proper tools, and good work habits. There are a few things to watch for when installing the brake system. First and foremost is to press the brake pedal 25 times with the key off to remove any stored pressure before disconnecting anything. Also, once you are removing the system, make sure you don't turn the key back on for any reason unless you have disconnected the electrical connector to the ABS pump. The shop manual recommends disconnecting the negative battery terminal, but I do not do this. To save some mess, get a jar and pull the hose off the bottom of the brake fluid reservoir where it feeds the ABS pump. Let the fluid from the reservoir drain into the jar. I use a jar from the Campbells Home Cooking Soup. It fits in the area OK.Removing the unit is pretty straightforward. Disconnect all the brake lines. Disconnect the two hoses to and from the ABS pump. Disconnect the electrical connector that goes to the top of the sensor block, and the connector to the brake fluid reservoir. There are four nuts that hold the system to the fire wall bracket. I leave them in place until I have disconnected the pedal linkage.There is a connecting link on the master cylinder that attaches to the brake pedal. 1987 through mid model year 1991 Allante's use one link, and late 1991 through 1992 model Allante's use a different link. If you have a 1991 Allante', we will help you determine which link you need, so the new master cylinder will arrive ready to bolt in. Once your old system has been removed, compare the systems to see what parts must be transferred and reused.The link must be disconnected from the brake pedal when removing the ABS system from the car. You have to remove the trim panel from around the brake pedal. There are two different types of clips used, depending upon the year of your car. The late 1991 and 1992 link is a clevis type, which just pushes through a hole on the pedal pin .

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HOW TO REPLACE THE BOSCH III ABS SYSTEM
cont'd

The earlier type locks over the end of the pin into a groove. For the latter, you have to gently pry up the end, so it clears the end of the pin, and then push the clip sideways to get it to release. Then there is a module beside the brake pedal. There are two nuts on the bottom of the module. Loosen them, and slide the module out of the mounting holder. That will give you clearance to slide the brake system sideways to get the link off the pin on the pedal, once you have removed the retaining clip.cket on the driver's side of the system which supports the traction control valve assembly. That stays in place and is reused. With traction control, there would also be an adapter on the bleeder screw port that must be reused from your old unit. Just make sure you reuse anything that's different. When reattaching the lines, be very careful not to cross thread anything. On some of the systems I have installed personally, I had some difficulty getting the bottom connection to reconnect, the one that drops straight down. I always work fingers only until I am sure the connection is started straight. I spent about 15 minutes on one of them. The angle was just a little off, and it's tight to work there. I have since been told by a mechanic who installed one of these systems that with traction control if you leave the traction bracket loose until all the lines are started, it will be easier to get them started.Make sure you pay attention to these issues. First, make sure you put the pedal linkage back on the pin before putting the four nuts back on the firewall bracket. Second, go around all connections before powering up the system to make sure they are all tight. Make sure you use only DOT 3 or DOT 4 brake fluid to refill the systems. The seals in Allante' ABS systems are not compatible with silicone (synthetic) brake fluid. Here is the procedure for manually bleeding (without a power bleeder or vacuum bleeder) the system after reinstallation. First the ABS pump gets bled, key on, until bubbles are gone. A clear hose gets attached to the pump bleeder screw, the end of this hose submerged in a jar with about an inch of clean brake fluid in the bottom. Open the bleeder screw on the pump, and let it run until it clears up. About 30 seconds at a time is all you should let the pump run. Let it rest for a minute, then another 30 seconds, etc. Generally three cycles of this will be enough. Keep the reservoir full, within 1/4 inch of the full line. Next you bleed through the bleeder screw on the master cylinder. Again, have a clear hose on the bleeder, end submerged into a glass jar with clear brake fluid. Open the bleeder screw. Turn the key on, and let it run until fluid is clear of bubbles. 30 seconds on cycle, then rest.I will walk you through manual bleeding, which I what I do. It requires two people. This portion is performed with the key off. The order of wheels is RR, LF, LR, RF. Attach clear hose to bleeder, end submerged in glass jar with 1" of brake fluid in it. Have an assistant pump pedal a few times, then hold, and open bleeder screw until flow stops. Tighten screw before pedal is released. Repeat as needed until fluid is clear and there are no more bubbles. Keep an eye on the fluid level in the reservoir. This whole portion of the bleeding is with KEY OFF.If you obtained a rebuilt system from Allantésource, please return the old system as soon as possible by ground UPS. If you have any questions or problems or problems during installation, **please call 561-844-3938** for technical assistance, or e-mail us at **allantesource@prodigy.net** .