

Dale E Dawkins
Director
Vehicle Compliance & Safety Affairs

October 1, 1996

95V-1811 (1)

Ms. Kathleen DeMeter
Office of Defect Investigations
National Highway Traffic Safety Administration
400 Seventh Street, S.W.
Washington, D.C. 20590

Dear Ms. DeMeter:

In accordance with the provisions of the National Traffic and Motor Vehicle Safety Act of 1966 and 49 CFR Part 573, Chrysler Corporation herewith furnishes additional details that expands the subject population of a prior recall regarding a potential safety related problem in some 1989 through 1991 model year vehicles. The potential for the antilock brake system (ABS) to malfunction exists in some of these vehicles.

This condition is the subject of NHTSA inquiry RQ96-028 of September 6, 1996 which identifies issues similar to Chrysler recall #685, (NHTSA reference 95V-099). This report, filed in accordance with your suggestion as detailed in your September 6, 1996 letter, resolves the subject issue by the herein described voluntary recall action on the part of Chrysler.

At the time of the launch of this portion of the recall, representative copies of communications to dealers and customers will be provided. Vehicle Identification Number range and assembly plant information for the involved vehicles will also be furnished at that time.

Sincerely,



Dale E. Dawkins

Enclosures: Information Report for Chrysler Recall #702

cc: Division of Occupational Safety & Health
California Department of Industrial Relations

407-200 (32)

INFORMATION REPORT FOR CHRYSLER RECALL #702

Submission date: October 1, 1996

Identifying classification of vehicles potentially affected:

| <u>Make</u> | <u>Model</u> | <u>Model Year</u> | <u>Inclusive Dates of Manufacture</u> | <u>Volume</u> | <u>Other</u> |
|-------------|----------------------|----------------------|---------------------------------------|---------------|----------------------------|
| Jeep | Cherokee Wagoneer | 1989 through 1991 | July, 1988 through June, 1991 | 52,000 (est) | Vehicles equipped with ABS |

Estimated percentage in which problem may occur:

Unknown.

Description of problem:

The antilock brake system (ABS) hydraulic control unit may experience excessive brake actuator piston seal wear which may cause pump-motor deterioration. If this occurs, the ABS function may be lost and reduced power assist may be experienced during vehicle braking. The instrument panel warning lights will signal system impairment and the base manual brakes will remain functional.

The name, address and telephone number of the supplier who manufactured the subject component:

Bosch Braking Systems Corporation
 20650 Civic Center Drive
 P.O. Box 5060
 Southfield, MI 48085
 Phone no.: (810) 827-5836

INFORMATION REPORT FOR CHRYSLER RECALL #702

October 1, 1996

Page 2

44V-280 (9)

Chronological summary of events which were the basis for determining existence of problem:

The following events occurred in the period from June, 1996 through September, 1996.

- Chrysler began reviewing owner and warranty information associated with Bendix 9 equipped vehicles.
- NHTSA opened a recall query (RQ96-029) for vehicles equipped with Bendix 9 ABS.
- Investigation determined that, in some cases, the ABS brake actuator unit may fail to adequately pressurize the brake system due to internal leakage past a prematurely worn brake actuator piston seal. An inadequately pressurized brake system may result in pump-motor deterioration or failure due to extended operation.
- An analysis of improved ABS diagnostic procedures and potential field fix was initiated.
- Investigation determined that the affected population includes all vehicles produced with the subject ABS model (Bendix 9) system.
- Chrysler estimates the field record of Bendix 9 to be proportional to that of Bendix 10 based on exposure.

Statement of measures to be taken and estimated notification schedule:

Chrysler will take the actions listed below for the affected vehicles:

- Inform owners of the potential for excessive ABS brake actuator piston seal wear and possible pump-motor deterioration. Owners of vehicles that experience illumination of brake warning lamps or that sense any ABS malfunction should contact their dealers immediately to have their vehicle's ABS tested and repaired as necessary.
- The warranty on all ABS components will be extended to 10 years or 100,000 miles (except for the brake actuator piston assembly and the pump-motor assembly which will have lifetime coverage).
- Owners will be reimbursed for previous ABS component repair costs.

Chrysler's notification schedule for implementing this recall has not been finalized. We are currently arranging for enhanced dealer diagnostic test equipment and for a supply of necessary replacement parts and preparing the information required for implementation. Chrysler expects to begin parts distribution and national notification to both dealers and owners when a sufficient quantity of parts become available. Further, a follow up notification will be conducted about two years after initial notification.

JAN 30 1997

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Susan M. Cische, Executive Director
Vehicle Compliance & Safety Affairs
Chrysler Corporation - CIMS 482-00-91
800 Chrysler Drive East
Auburn Hills, MI 48326-2757

NSA-111bdh
96V-260

Dear Ms. Cische:

This acknowledges receipt of the Defect Information Report dated October 1, 1996, submitted in accordance with 49 CFR Part 573, "Defect and Noncompliance Reports." This recall involves 52,000 Chrysler Corporation (Chrysler) 1989 through 1991 Jeep Cherokee and Wagoneer model vehicles manufactured from July 1988 through June 1991, in which the antilock brake system (ABS) hydraulic control unit can experience excessive brake actuator piston seal wear causing pump-motor deterioration. If this occurs, the ABS function can be lost and reduced power assist can occur during vehicle braking. The assigned ID Number for this recall campaign is 96V-260.

This recall campaign was the subject of a Recall Query, RQ96-028, conducted by the Office of Defects Investigation.

Chrysler is responsible for the remedy of these vehicles from this date forward, regardless of vehicle age, mileage, or ownership. You should know that the agency provides a listing of safety recalls to the media at the end of each month. This recall will be a part of that listing.

ADDITIONAL INFORMATION REQUIRED

In order for us to complete our file on this matter, effective January 4, 1996, a manufacturer conducting a safety recall is required to provide the estimated date on which it will begin sending notifications to owners that there is a safety-related defect or noncompliance and that a remedy without charge will be available, and the estimated date on which it will have completed such notification. In addition, if a manufacturer subsequently becomes aware that either the beginning or the completion date reported to the agency will be delayed more than two weeks, it shall promptly advise the agency of the delay and the reasons therefore, and furnish a revised estimate. Our review of the Defect Information Report filed by your company in accordance with Part 573 does not contain the estimated dates for the notification campaign. Please provide the information within 5 days.

NOTIFICATION TO PURCHASERS

Also, in accordance with Part 577, amended July 7, 1995, a draft owner notification letter must be submitted with the Defect/Noncompliance Information Report for review prior to mailing.

QUARTERLY STATUS REPORTS

As stated in Part 573.6, submission of the first of six consecutive quarterly status reports is required within 1 month after the close of the calendar quarter in which notification to purchasers begins. For instance, the current calendar quarter began on January 1 and ends on March 31, 1997. If notification occurs in this time frame, the first quarterly report is due by April 30, 1997. In the case where the recall appears to be completed, quarterly reporting is required until your company is notified otherwise by this office.

If you have any questions, please contact Mrs. Pat Wallace or Mrs. Barbara Hayes at (202) 366-5232 or fax at (202) 366-7882.

Sincerely,

JSI

Jonathan D. White, Chief
Recall Analysis Division
Office of Defects Investigation
Safety Assurance

Susan M. Clischke
Executive Director
Vehicle Certification Compliance and
Safety Affairs

April 17, 1997

Mr. Kenneth N. Weinstein
Associate Administrator, Safety Assurance
National Highway Traffic Safety Administration
400 Seventh Street, S.W.
Washington, D.C. 20590

Dear Mr. Weinstein:

96V-260

Reference: NHTSA Identification Number 96V-099

Enclosed are representative copies of communications relating to the 1989 through 1991 model year vehicles involved in the referenced recall. The exact number of manufactured vehicles in the recall is 53,182 broken down as follows:

| <u>Model Year</u> | <u>Volume</u> |
|-------------------|---------------|
| 1989 | 10,843 |
| 1990 | 23,338 |
| 1991 | 19,001 |

The involved Vehicle Identification Number range is:

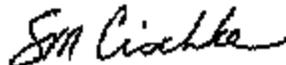
| <u>Low</u> | <u>High</u> |
|------------|-------------|
| KL400009 | KL644320 |
| LL100001 | LL292706 |
| ML500012 | ML642584 |

(VIN last eight characters) - K = 1989 Model Year; L = 1990 Model Year; M = 1991 Model Year; L = Toledo Assembly Plant, Toledo, Ohio; and last six digits = sequential number.

We caution that the above range represents only the lowest and highest VIN sequential numbers included in the recall. This range cannot be used to determine conclusively that a vehicle is involved in the recall because many vehicles with a VIN within the range are not affected by the recall.

This completes Chrysler's package of information for this recall as required by the Defects Report Regulation.

Sincerely,



S.M. Clischke

Enclosure: Recall #702

cc: K. C. DeMeter

IMPORTANT

DEALER SERVICE INSTRUCTIONS

Safety Recall #702 – ABS Actuator and Pump/Motor Assemblies

- This service requirement applies only to 1989 through 1991 Jeep Cherokee and Wagoneer (XJ) vehicles equipped with a Bendix-9 Antilock Brake System.
- **Owners of involved vehicles will be instructed to make an appointment with their dealer only if specific symptoms occur.** (See owner letter for details.)
- A small number of the involved vehicles may experience ABS hydraulic control unit actuator piston seal wear and/or hydraulic pump/motor deterioration. To correct this condition, **the ABS system must be tested** and the actuator and/or pump/motor replaced **if necessary.**
- This recall will be launched in stages. Owners of 1991 model year vehicles will be notified initially. Owners of 1989 and 1990 model year vehicles will be notified about one month later.
- Effective immediately all actuator and pump/motor assembly replacements on involved vehicles are to be performed according to this Recall Notification. The Labor Operation Numbers for these components listed in Warranty Bulletin D-98-37 are being canceled.

10 Year/100,000 Mile Bendix-10 ABS Component Warranty:

- Vehicles involved in this recall also have a 10 year or 100,000 mile warranty on Bendix-9 ABS components (the actuator and pump/motor have lifetime coverage). If any conditions covered by the ABS warranty are found, now or in the future, dealers are to correct these conditions free of charge. Refer to Warranty Bulletin D-98-37 issued December, 1988 for specific details of coverage. Parts for any of the covered components should be ordered through the normal means.

Alternate Transportation:

- Dealers who are servicing a vehicle that requires actuator and/or pump/motor replacement should attempt to minimize customer inconvenience. Contact your zone office for further instructions on alternate transportation authorization if necessary.

Parts Packages:

- **Due to the small number of vehicles expected to require repair, no parts will be distributed initially to dealers. Dealers are requested to order Actuator Assembly packages through normal methods for scheduled repairs only. Dealers must contact the STAR Center (1-800-850-STAR Ext. 5) to order Pump/Motor Assemblies.** The technician must perform the ABS diagnostic tests prior to contacting the STAR Center and have the results available for review.

Recall Notification

No. 702

April, 1997

To: All Jeep/Eagle Dealers

Subject: Safety Recall #702 -- ABS Actuator and Pump/Motor Assemblies

**Models: 1989 Through 1991 Model Year Jeep Cherokee and Wagoneer (XJ)
Vehicles Equipped With a Bendix-θ Antilock Brake System**

A small number of the involved vehicles may experience ABS hydraulic control unit actuator piston seal wear and/or hydraulic pump/motor deterioration. To correct this condition, the ABS system must be tested and the actuator assembly and/or pump/motor replaced if necessary. If testing determines other ABS components are faulty, repairs are to be performed using the revised service and diagnostic procedures manual (81-699-96225) and existing parts. Submit a separate warranty claim using the existing labor operation numbers.

IMPORTANT: Some of the involved vehicles may be in dealer used vehicle inventory. Be sure to complete this recall service on these vehicles before retail delivery. Dealers should perform this recall on vehicles in for service as determined by using DIAL System Function 70 or VIP.

Details of this service action are explained in the following sections.

Service Procedure Videotape

No videotape of the service procedure for this recall will be provided.

Dealer Notification & Vehicle List

Involved dealers: Each dealer to whom involved vehicles were invoiced (or the current dealer at the same street address) will receive a copy of this dealer recall notification letter and a list of the involved vehicles by first class mail.

The Vehicle List is arranged in Vehicle Identification Number (VIN) sequence. Owners known to Chrysler are also listed. The lists are for dealer reference in arranging for service of involved vehicles.

All other dealers: Each Dodge, Chrysler-Plymouth and Jeep/Eagle dealer who does not receive a Vehicle List will receive a copy of this dealer recall notification letter by first class mail.

DIAL System Functions 53, 70 and VIP

All Involved vehicles will be entered to DIAL System Functions 53, 70 and VIP at the time of recall implementation for dealer inquiry by VIN as needed.

Parts

Important Due to the small number of vehicles expected to require repair, no parts will be distributed initially to dealers. Dealers are requested to order Actuator Assembly packages through normal methods only for scheduled repairs. Dealers must contact the STAR Center (1-800-850-STAR Ext. 5) to order Pump/Motor Assemblies. The technician must perform the ABS diagnostic tests prior to contacting the STAR Center and have the results available for review.

Refer to the table below for the appropriate actuator assembly package and/or pump/motor assembly:

| Model Year | Actuator Assembly Package PN | Pump/Motor Assembly PN |
|--------------|------------------------------|----------------------------|
| 1989 1990 | R4746418 or 4746418 | R2003297 or 52003297 |
| 1991 | R4746415 or 4746415 | R2007515 or 52007515 |

Each Actuator Assembly Package also includes:

- 1 – Nut, Push Rod (J4005311)* – '89/'90 MY ONLY
- 1 – Nut, Push Rod (J8420186)* – '89/'90 MY ONLY
- 1 – Clip, Push Rod (4294036)* -- '91 MY ONLY

* Actuator assembly push rod clips or nuts for NON-REMANUFACTURED Actuator Packages must be ordered separately.

Owner Notification and Service Scheduling

All involved vehicle owners known to Chrysler are being notified of the service requirement by first class mail. They are requested to schedule appointments for the service with their dealers only if specific symptoms occur. A copy of the owner notification letter is attached.

Enclosed with each owner notification is an Owner Notification Form. The involved vehicle and recall are identified on the form for owner or dealer reference as needed.

Service Procedure

A. Test ABS for Proper Operation:

1. Connect the DRB II Scan Tool to the data link connector located near the right shock tower. The Jeep/Eagle adapter must be used on 1989 and 1990 MY vehicles. Make sure that the DRB II contains a "1983 - 1994 Super Cartridge".
2. With the DRB II Scan Tool, read, record and then erase any existing ABS diagnostic trouble codes (DTC's).

NOTE: For 1991 MY vehicles, the ignition key must be turned to the OFF position after erasing DTC's to ensure that all DTC's are properly erased inside the Controller - Antilock Brake (CAB). For 1989 and 1990 MY vehicles, the battery must be disconnected to erase the DTC's.

3. With the ignition key in the ON position, perform the ABS system test using the DRB II, and then monitor the DTC's for four minutes.
 - If any DTC's (except "Low Accumulator Fault") are displayed, they must be diagnosed and repaired in the order that they are listed on page 51 of the revised Bendix Antilock 9 & 10 Service and Diagnostic Procedures Manual (81-699-96225).
 - If any DTC's (except "Low Accumulator Fault") were recorded initially but did not reoccur during the ABS system test, road test the vehicle for a minimum of five minutes at various speeds while performing several antilock braking and normal braking stops. If any DTC's are set during this test, they must be diagnosed and repaired in the order that they are listed on page 51 of the revised Bendix Antilock 9 & 10 Service and Diagnostic Procedures Manual (81-699-96225).
 - If no DTC's or only a "Low Accumulator Fault" are displayed, continue with Step 4.
4. With the ignition key in the OFF position, pump the brake pedal 40-60 times using about 50 lbs (222 N) of pedal force. A noticeable change in the pedal feel will occur when the accumulators are discharged.

WARNING: Brake system is under extreme pressure. The Hydraulic Control Unit (HCU) may be charged with hydraulic pressure up to 2200 psi. Failure to de-pressurize the accumulators could result in personal injury and/or damage to painted surfaces. Wear safety goggles when disconnecting system fluid lines.

5. When a definite increase in pedal pressure is felt, pump the pedal a few additional times to ensure removal of all hydraulic pressure from the brake system.

Service Procedure (Continued)

6. Install the ABS internal leakage test fixture (Special Tool #8169) per the following procedure:

A. Locate the high pressure brake hose going from the pump/motor to the accumulator (Figure 1). Clean the area where the high pressure hose attaches to the accumulator block fitting.

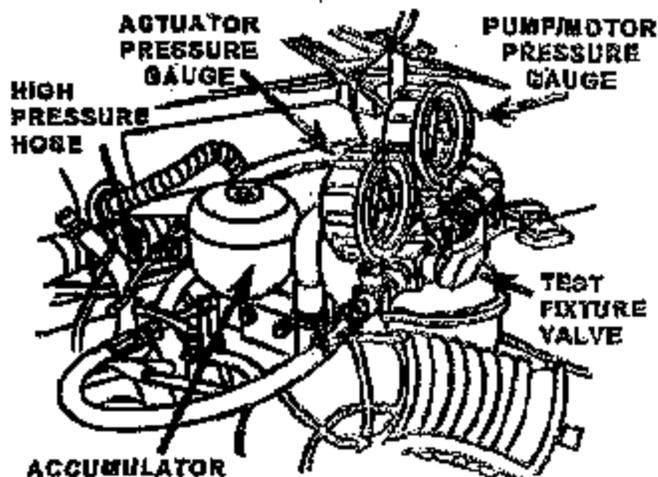


Figure 1

B. Remove the high pressure hose from the accumulator block fitting.

C. Install the test fixture in-line with the high pressure hose (Figure 1). Loosely install the test fixture hose onto the accumulator block fitting.

CAUTION: The accumulator block fitting threads can be stripped if the fixture fitting is not properly aligned when it is installed. To ease installation and prevent thread stripping, loosen the accumulator block fitting, rotate it slightly upward and then retighten the fitting before attaching the test fixture.

D. Loosely install the high pressure brake hose onto the other test fixture hose.

E. Position the test fixture as shown in Figure 1 and then tighten the fittings to 132 in-lbs (15 N·m).

7. Open the shut-off valve on the test fixture.

NOTE: The actuator pressure gauge is on the LEFT side of the shut-off valve and the pump/motor gauge is on the RIGHT side of the shut-off valve.

8. Turn the Ignition key to the RUN position.

9. Verify that there are no leaks at the test fixture connections. If any leakage is found, correct it as necessary.

Note: If the accumulator block fitting becomes stripped, it must be replaced. The fitting is available through Mopar (PN 4637633).

Service Procedure (Continued)

10. If the pump shuts off within four (4) minutes, continue with Step 11. If the pump does not shut off, continue with Step 12.
11. Following pump shutoff, start a timer, record the pump (right) pressure gauge reading and turn the ignition OFF.
 - If the pump shut off and the pump/motor pressure is 1800-2200 psi, continue with STEP 13.
 - If the pump shut off and the pump pressure is above 2200 psi or below 1800 psi, replace the pump/motor switch and begin the test procedure again.
12. • If the pump did not shut off and the pressure is above 2200 psi, check the pump/motor relay following Test 14 (page 94) in the diagnostic manual and then begin this test again.

WARNING: Turn the Ignition key off if pressure exceeds 2500 psi. Damage to pump/motor components may occur at pressures greater than 2500 psi.

- If the pump did not shut off and the pressure is below 2200 psi, close the test fixture valve.
 - If the pump shuts off within one (1) minute, start a timer, record the pump/motor side pressure reading, turn the ignition OFF and then record the pump/motor side pressure reading again after 120 seconds. Compare the second reading with the initial reading.
 - If the PUMP/MOTOR side reading dropped less than 350 psi, replace the ACTUATOR assembly per the instructions in Section B.
 - If the PUMP/MOTOR side reading dropped more than 350 psi, replace the PUMP/MOTOR assembly per the instructions in Section C.
 - If the pump continues to run with the test fixture valve closed and the steady state pressure is LESS THAN 2200 psi, inspect the low pressure hose and the brake fluid reservoir supply filter for restriction. A supply filter restriction can be determined by noting inadequate fluid flow from the supply filter when the pump/motor supply (low pressure) hose is disconnected at the pump/motor side of the pump supply filter. If no restriction is found, replace the pump/motor assembly per the instructions in Section C.

Service Procedure (Continued)

13. Record the pump/motor side pressure reading after 120 seconds and compare with the initial reading.
 - If the pressure drop is less than 200 psi, continue with Step 14.
 - If the pressure drop is greater than 200 psi, continue with Step 21.
14. With the ignition key in the OFF position, ensure that the test fixture shut-off valve is open. Pump the brake pedal 40-50 times using approximately 50 lbs (222 N) of pedal force.
15. Turn the ignition key to the RUN position.
16. Allow accumulator pressure to build to its highest steady state value or until the pump shuts off.
17. If the pump shuts off within four (4) minutes, continue with Step 18. If the pump does not shut off, continue with Step 19.
18. Following pump shutoff, start a timer, record the pump (right) pressure gauge reading and turn the ignition OFF.
 - If the pump shut off and the pump/motor pressure is 1800-2200 psi, continue with STEP 20.
 - If the pump shut off and the pump pressure is above 2200 psi or below 1800 psi, replace the pump/motor switch and begin the test procedure again.
19. ● If the pump did not shut off and the pressure is above 2200 psi, check the pump/motor relay following Test 14 (page 94) in the diagnostic manual and then begin this test again.
 - If the pump did not shut off and the pressure is below 2200 psi, close the test fixture valve.
 - If the pump shuts off within one (1) minute, start a timer, record the pump/motor side pressure reading, turn the ignition OFF, and then record the pump/motor side reading again after 120 seconds:
 - If the PUMP/MOTOR side reading dropped less than 350 psi, replace the ACTUATOR assembly per the instructions in Section B.
 - If the PUMP/MOTOR side reading dropped more than 350 psi, replace the PUMP/MOTOR assembly per the instructions in Section C.

Service Procedure (Continued)

- If the pump continues to run with the test fixture valve closed and the steady state pressure is LESS THAN 2200 psi, inspect the low pressure hose and the brake fluid reservoir supply filter for restriction. A supply filter restriction can be determined by noting inadequate fluid flow from the supply filter when the pump/motor supply (low pressure) hose is disconnected at the pump/motor side of the pump supply filter. If no restriction is found, replace the pump/motor assembly per the instructions in Section C.
20. Record the pump/motor side pressure reading after 120 seconds and compare with the initial reading.
- If the pressure drop is less than 200 psi, continue with STEP 28.
 - If the pressure drop is greater than 200 psi, continue with STEP 21.
21. With the ignition key in the OFF position, ensure that the test fixture shut-off valve is open. Pump the brake pedal 40-60 times using approximately 50 lbs (222 N) of pedal force.
22. Turn the ignition key to the RUN position.
23. Allow accumulator pressure to build to its highest steady state value or until the pump shuts off.
24. If the pump shuts off within four (4) minutes, continue with Step 25. If the pump does not shut off, continue with Step 26.
25. Following pump shutoff, CLOSE THE TEST FIXTURE VALVE, start a timer, record both pressure gauge readings and then turn the ignition OFF.
- If the pump shut off and the pump/motor pressure is 1800-2200 psi, continue with STEP 27.
 - If the pump shut off and the pump pressure is above 2200 psi or below 1800 psi, replace the pump/motor switch and begin the test procedure again.

Service Procedure (Continued)

26. ● If the pump did not shut off and the pressure is above 2200 psi, check the pump/motor relay following Test 14 (page 94) in the diagnostic manual and the begin this test again.
- If the pump did not shut off and the pressure is below 2200 psi, close the test fixture valve and turn the ignition ON.
- If the pump shuts off within one (1) minute, start a timer, record the pump/motor side pressure reading, turn the ignition OFF and then record the pump/motor side pressure reading again after 120 seconds. Compare the readings.
- If the PUMP/MOTOR side reading dropped less than 350 psi, replace the ACTUATOR assembly per the instructions in Section B.
- If the PUMP/MOTOR side reading dropped more than 350 psi, replace the PUMP/MOTOR assembly per the instructions in Section C.
- If the pump continues to run with the test fixture valve closed and the steady state pressure is LESS THAN 2200 psi, inspect the low pressure hose and the brake fluid reservoir supply filter for restriction. A supply filter restriction can be determined by noting inadequate fluid flow from the supply filter when the pump/motor supply (low pressure) hose is disconnected at the pump/motor side of the pump supply filter. If no restriction is found, replace the pump/motor assembly per the instructions in Section C.
27. Record the pump/motor side and actuator side pressure readings 120 seconds after closing the test fixture valve and compare with the initial readings.
- If the ACTUATOR side pressure reading dropped more than 200 psi, replace the ACTUATOR assembly per the instructions in Section B.
- If the PUMP/MOTOR side pressure reading dropped more than 350 psi, replace the PUMP/MOTOR assembly per the instructions in Section C.

NOTE: Both of the above repairs may be required.

Service Procedure (Continued)

28. With the ignition key in the OFF position, ensure that the test fixture valve is open and then pump the brake pedal 40-60 times. A noticeable change in the pedal feel will occur when the accumulators are discharged.
29. When a definite increase in pedal pressure is felt, pump the pedal a few additional times to ensure removal of all hydraulic pressure from the brake system.
30. Close the test fixture valve.
31. Turn the ignition key to the RUN position.
32. Observe the pump/motor pressure gauge:
 - If the pump/motor pressure builds to 450 psi +/- 200 psi in less than 5 seconds, continue with Step 33.
 - If the pump/motor pressure does not reach 450 psi +/- 200 psi in less than 5 seconds, replace the pump/motor assembly per the instructions in Section C.
33. With the ignition key in the OFF position, open the test fixture valve and then pump the brake pedal 40-60 times. A noticeable change in the pedal feel will occur when the accumulators are discharged.

WARNING: Brake system is under extreme pressure. The hydraulic control unit (HCU) may be charged with hydraulic pressure up to 2200 psi. Failure to de-pressurize the accumulators could result in personal injury and/or damage to painted surfaces. Wear safety goggles when disconnecting system fluid lines.

34. When a definite increase in pedal pressure is felt, pump the pedal a few additional times to ensure removal of all hydraulic pressure from the brake system.
35. Remove the ABS internal leakage test fixture (Special Tool #8169).
 - A. Remove the high pressure brake fluid hose from the test fixture.
 - B. Remove the test fixture from the accumulator block fitting.
 - C. Install the high pressure hose tube nut on the accumulator block fitting and tighten to 132 in-lbs (15 N-m).

NOTE: If the accumulator block fitting was repositioned to install the test fixture, remember to return it to its original position before reinstalling the high pressure hose.

Service Procedure (Continued)

35. Turn the ignition to the RUN position to energize the pump/motor and pressurize the hydraulic system. Check for leaks and repair as necessary.
37. Check the brake fluid level in the reservoir and adjust as necessary.
38. No further action is necessary, the system is operating properly at this time. Return the vehicle to the customer.

NOTE: If a "Low Accumulator Fault" was recorded initially, and/or the original customer complaint stated that "the pump runs all the time" or "the pump runs every time that the brakes are applied", test the accumulator for proper operation by following Diagnostic Test #22 – Steps 13 and 14 (Page 122) in the revised Bendix Antilock 9 & 10 Service and Diagnostic Procedures Manual (81-699-96225). Submit a separate warranty claim if replacement is necessary, per the provisions of the extended warranty.

Service Procedure (Continued)

B. Replace the Actuator Assembly:

1. With the ignition key in the OFF position, open the test fixture valve (if necessary) and then pump the brake pedal 40-60 times. A noticeable change in the pedal feel will occur when the accumulators are discharged.

WARNING: Brake system is under extreme pressure. The hydraulic control unit (HCU) may be charged with hydraulic pressure up to 2200 psi. Failure to de-pressurize the accumulators could result in personal injury and/or damage to painted surfaces. Wear safety goggles when disconnecting system fluid lines.

2. When a definite increase in pedal pressure is felt, pump the pedal a few additional times to ensure removal of all hydraulic pressure from the brake system.
3. Remove the windshield washer fluid reservoir (Figure 2).
4. Remove the air cleaner assembly cover and air inlet hose.
5. Disconnect the CAB wire harness connector from the HCU (Figure 3).

NOTE: For 1991 MY vehicles:

The CAB wire harness should be disconnected at the same time that HCU assembly is being removed from vehicle.

6. Disconnect the wires from the proportioning valve differential switch (Figure 3).

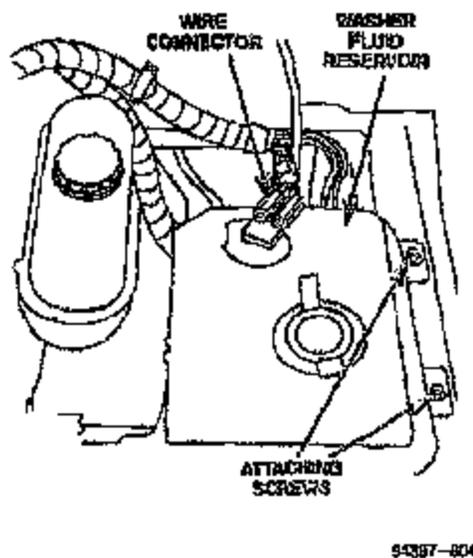


Figure 2

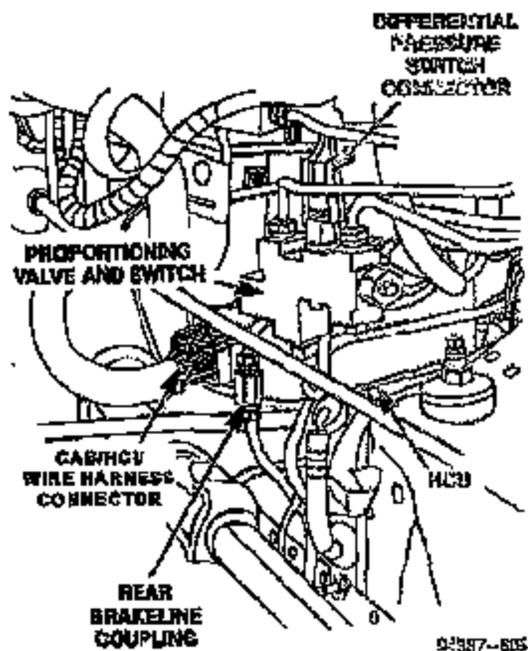
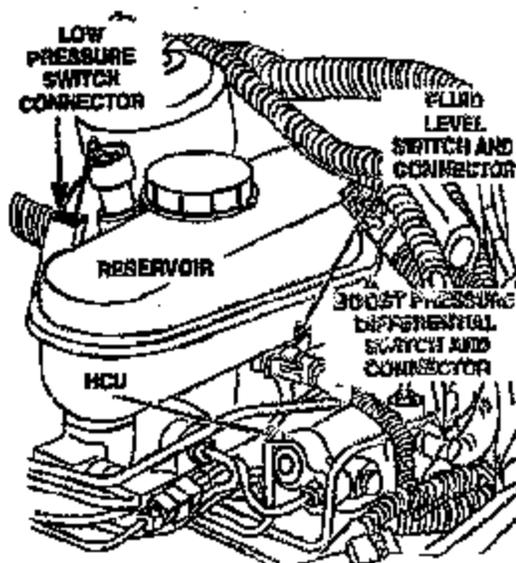


Figure 3

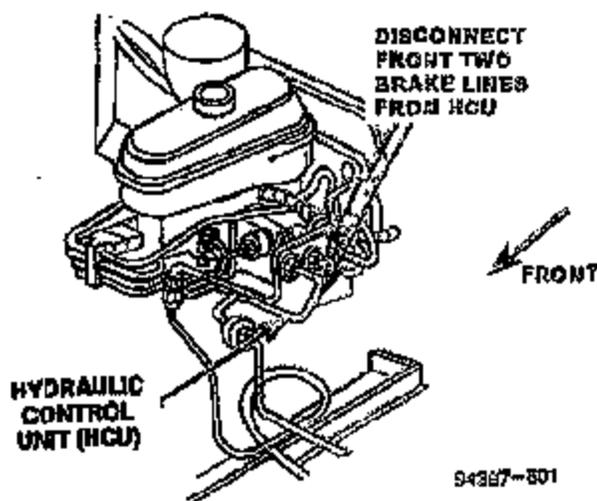
Service Procedure (Continued)

7. Disconnect the low pressure switch wiring connector (Figure 4).
8. Disconnect the wires from the HCU boost pressure differential and fluid level switches (Figure 4).
9. Disconnect the brake line from the underside of the proportioning valve (Figure 3).
10. Remove the ABS internal leakage test fixture (Special Tool #8169).
 - A. Remove the high pressure brake fluid hose from the test fixture.
 - B. Remove the test fixture from the accumulator block fitting.
11. Disconnect the brakes lines from the HCU (Figure 5).
12. Disconnect the ABS low pressure supply hose from the brake fluid reservoir.
13. Remove the brake lamp fuse from the fuse block. For 89 and 90 MY vehicles, the fuse is located under the instrument panel and identified as HZ/STOP. For 1991 MY vehicles, the fuse is located in the underhood power distribution center and identified as HAZ LAMP.



94367-87

Figure 4



94367-801

Figure 5

Service Procedure (Continued)

14. Remove the instrument panel lower trim panel if necessary.
15. Remove the clip or nuts that secure the master cylinder push rod to the brake pedal and disconnect the rod from the pedal.
16. For 1989/1990 MY vehicles, remove the brake switch from the master cylinder push rod.
17. Remove the brake mounting bracket stud nuts (Figure 6).
18. In the engine compartment, pull the brake HCU and mounting bracket forward until the bracket studs clear the dash. Remove the assembly from the engine compartment. Discard the brake fluid from the reservoir into an appropriate container.
19. Carefully secure the HCU assembly in a vice (Figure 7). **DO NOT** clamp on to the electrical connector located below the master cylinder or damage the mounting studs.
CAUTION: Do not overtighten HCU in vice.
20. Remove the line clip from the front of the master cylinder.

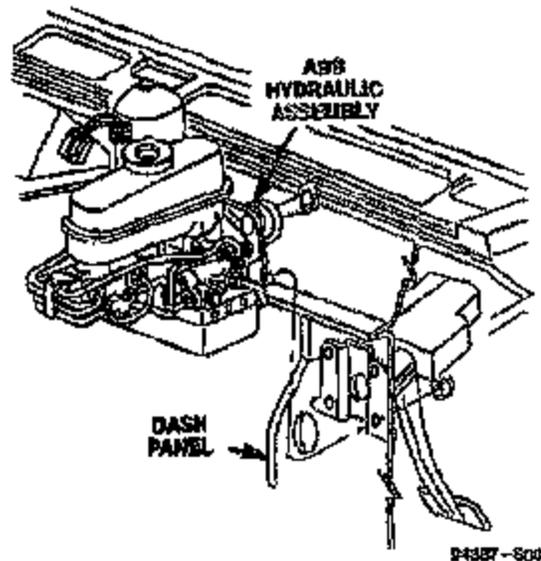


Figure 6

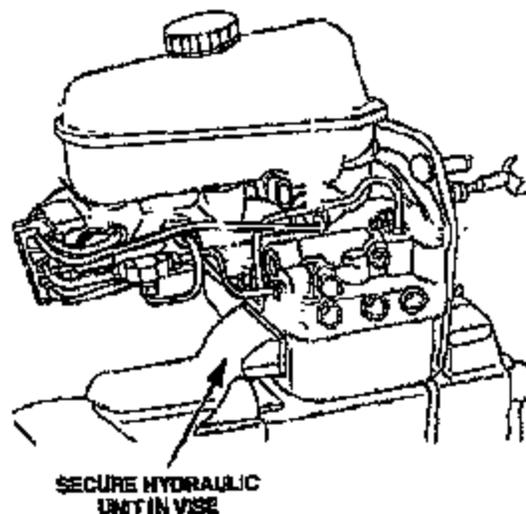
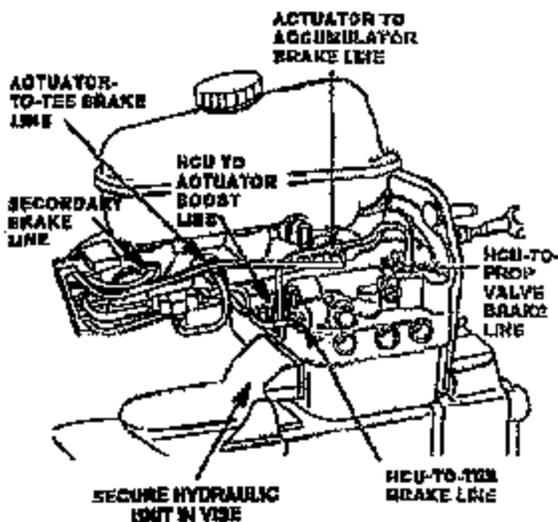


Figure 7

Service Procedure (Continued)

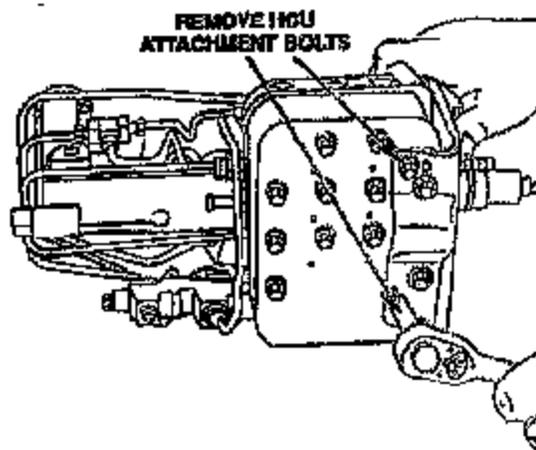
21. Disconnect the HCU to proportioning valve line from the HCU (Figure 8).
22. Disconnect the HCU-to-tee line from the HCU (Figure 8).
23. Disconnect the actuator to accumulator line from the actuator (Figure 8).
24. Disconnect the actuator-to-tee line (primary brake line) from the actuator (Figure 8).



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Figure 8

25. Disconnect the secondary brake line from the actuator (Figure 8).
26. Disconnect the HCU to actuator boost line from the HCU (Figure 8).
27. Disconnect the HCU to actuator boost line from the actuator.
28. Remove the proportioning valve and its attached line as an assembly by tilting the assembly down in the front and sliding it forward.
29. Loosen the HCU fluid return hose clamp at the reservoir and remove the hose.
30. Remove the HCU-to-actuator boost line.
31. Remove the assembly from the vice and place on a clean work surface.
32. Remove the two (2) HCU attaching bolts from the bottom of the bracket (Figure 9).
33. Remove the HCU by tilting the front down and moving it forward.



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Figure 9

Service Procedure (Continued)

34. Secure the HCU mounting bracket back into the vice.
35. Remove the two (2) actuator assembly mounting nuts and remove the actuator and reservoir as an assembly.
36. Install the provided actuator and reservoir assembly and tighten the two (2) mounting nuts to 27 ft-lbs (37 N•m).
37. Remove the assembly from the vice and place on a clean work surface.
38. Install the HCU and tighten the attaching bolts to 144 in-lbs (16 N•m) (Figure 9).
39. Carefully secure the HCU assembly in a vice (Figure 7). DO NOT clamp on to the electrical connector located below the master cylinder or damage the mounting studs.
40. Connect the HCU-to-actuator boost line to the actuator.
41. Connect the HCU fluid return hose to the reservoir and tighten the hose clamp to 10 in-lbs (1.1 N•m).
42. Install the proportioning valve and its attached line as an assembly.
43. Connect the secondary brake line to the actuator (Figure 8).
44. Connect the HCU-to-actuator boost line to the HCU (Figure 8).
45. Connect the actuator-to-tee line (primary brake line) to the actuator (Figure 8).
46. Connect the actuator-to-accumulator line to the actuator (Figure 8).
47. Connect the HCU-to-tee line to the HCU (Figure 8).
48. Connect the HCU-to-proportioning valve line to the HCU (Figure 8).
49. Tighten all brake line fittings to 115 in-lbs (13.6 N•m). Do not over-tighten.
50. Install the line clip at the front of the master cylinder.
51. Remove the HCU assembly from the vice.

Service Procedure (Continued)

52. Position the HCU assembly on the dash panel. Tighten the mounting bracket stud nuts to 31 ft-lbs (42 N·m).

NOTE: For 1991 MY vehicles: The CAB wire harness should be connected at the same time that HCU assembly is being installed.

53. **For 1991 MY vehicles:** Coat the surface of the brake pedal pin with Lubriplate or equivalent.

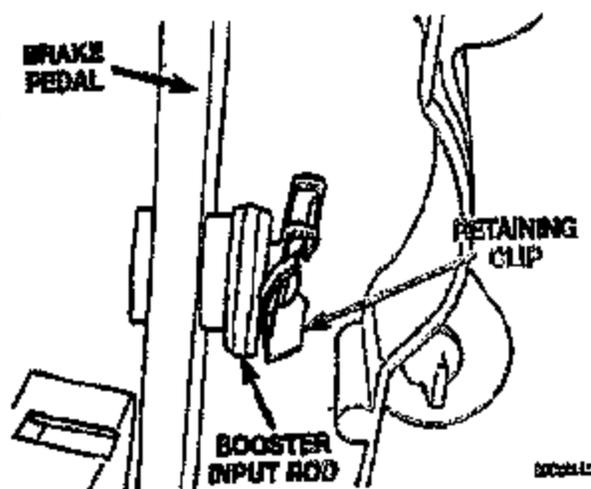


Figure 10

54. • **For 1991 MY vehicles:** Connect the push rod to the pedal pin and install the provided retainer clip (Figure 10). Make sure that the brake lamp switch is properly adjusted.

- **For 1989 and 1990 MY vehicles:** Connect the brake lamp switch to the actuator push rod with the bushings and spacers. Connect the push rod to the pedal by inserting the bolt through the pedal and push rod bushing from the left side and then secure the push rod with the provided nut and lock nut.

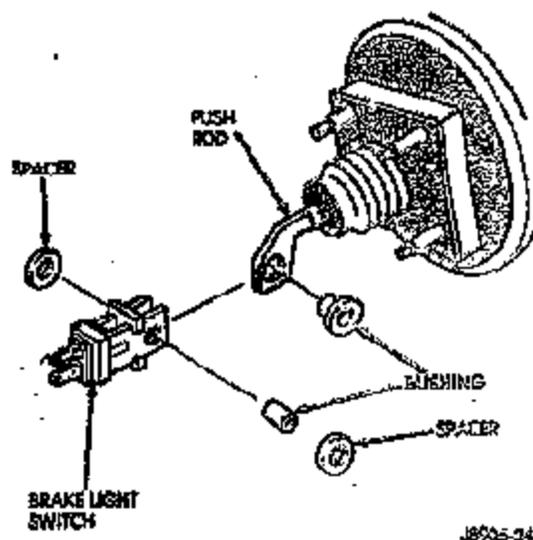


Figure 11

The larger nut must be installed first. Tighten the inner nut to 25 ft-lbs (34 N·m). Tighten the outer locknut to 75 in-lbs (8 N·m) (Figure 11).

55. Reinstall the instrument panel lower trim panel, if necessary.
56. Install the brake lamp fuse into the fuse block.
57. Connect the ABS low pressure supply hose to the brake fluid reservoir. Tighten the hose clamp to 10 ft-lbs (1.1 N·m).

Service Procedure (Continued)

58. Connect the brake lines to the HCU (Figure 5). Tighten the fittings to 180 in-lbs (20 N•m).
59. Connect the high pressure brake hose to the accumulator block fitting. Tighten the fitting to 132 in-lbs (15 N•m).
60. Connect the brake line to the underside of the proportioning valve (Figure 3). Tighten the fitting to 132 in-lbs (15 N•m).
61. Connect the wires to the HCU boost pressure differential and fluid level switches (Figure 3).
62. Connect the low pressure switch wiring connector.
63. Connect the wires to the proportioning valve differential switch (Figure 3).
64. Connect the CAB wire harness connector to the HCU (Figure 3).
65. Install the air cleaner assembly cover and air inlet hose.
66. Install the windshield washer fluid reservoir (Figure 2).
67. If the pump/motor assembly does not require replacement, continue with Section D.

Service Procedure (Continued)

C. Replace Pump/Motor Assembly:

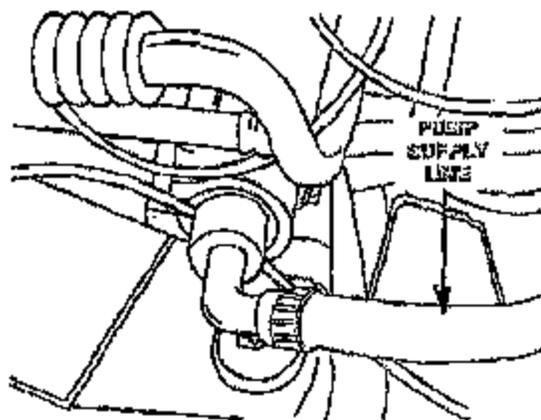
1. With the ignition key in the OFF position, open the test fixture valve and then pump the brake pedal 40-60 times. A noticeable change in the pedal feel will occur when the accumulators are discharged.

WARNING: Brake system is under extreme pressure. The hydraulic control unit (HCU) may be charged with hydraulic pressure up to 2200 psi. Failure to de-pressurize the accumulators could result in personal injury and/or damage to painted surfaces. Wear safety goggles when disconnecting system fluid lines.

2. When a definite increase in pedal pressure is felt, pump the pedal a few additional times to ensure removal of all hydraulic pressure from the brake system.
3. Remove the ABS internal leakage test fixture (Special Tool #8169).
 - A. Remove the high pressure brake fluid hose from the test fixture.
 - B. Remove the test fixture from the accumulator block fitting.
 - C. Install the high pressure hose tube nut on the accumulator block fitting and tighten to 132 in-lbs (15 N·m).

NOTE: If the accumulator block fitting was repositioned to install the test fixture, remember to return it to its original position before reinstalling the high pressure hose.

4. For 1989 and 1990 MY vehicles only: Remove the coolant pressure bottle retaining wrap and move the coolant bottle aside. Do not disconnect the hoses from the coolant bottle.
5. For 1989 and 1990 MY vehicles only: Remove the relay center cover.
6. Disconnect the pump/motor wiring harness from the engine wiring harness.
7. Disconnect the low pressure (supply) hose from the pump/motor (Figure 12).



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Figure 12

Service Procedure (Continued)

8. Disconnect the high pressure hose from the pump/motor (Figure 13).
9. Remove the four (4) pump/motor bracket attaching bolts.
10. Remove the pump/motor and bracket assembly from the engine compartment (Figure 14).
11. Remove the pump/motor assembly from the mounting bracket (Figure 14).

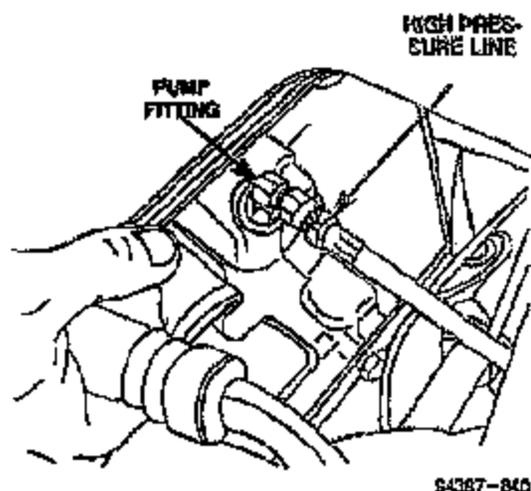


Figure 13

12. Position the new pump/motor assembly on the bracket and securely tighten the attaching screws.
13. Position the pump/motor and bracket assembly into the engine compartment. Install the four (4) attaching bolts and tighten securely (Figure 14).
14. Connect the high pressure hose to the pump/motor. Tighten the hose fitting to 132 in-lbs (15 N·m) (Figure 11).
15. Connect the low pressure (supply) hose to the pump/motor. Tighten the hose clamp to 10 in-lbs (1.1 N·m) (Figure 12).
16. Connect the pump/motor wiring harness to the engine wiring harness.

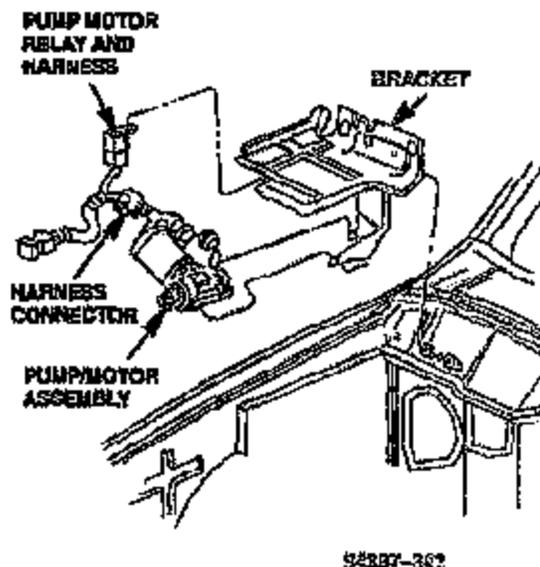


Figure 14

Service Procedure (Continued)

17. For 1989 and 1990 MY vehicles only: Install the relay center cover.
18. For 1989 and 1990 MY vehicles only: Install the coolant pressure bottle and secure it with the retaining wrap.
19. Proceed to Section D.

D. Bleed Brakes and Verify Proper System Operation:

1. **IF THE ACTUATOR ASSEMBLY WAS REPLACED, the brake lines must be bled as described on pages 135 of the revised Bendix Antilock 9 & 10 Service and Diagnostic Procedures Manual (81-699-96225).**

NOTE: It is not necessary to bleed the foundation brakes of the vehicle if only the pump/motor assembly has been replaced.

2. Turn the ignition to the RUN position to energize the pump/motor and pressurize the hydraulic system. Check for leakage at the HCU and/or pump/motor.
3. Check the brake fluid level in the HCU reservoir and adjust as necessary.
4. With the ignition key in the ON position, perform the ABS System Test using the DRB II and then monitor the DTC display for four minutes.
 - If any DTC's are displayed, they must be diagnosed and repaired in the order that they are listed on page 51 of the Bendix Antilock 9 & 10 Service and Diagnostic Procedures Manual (81-699-96225).
 - If no DTC's are displayed, continue with Step 5.
5. Road test the vehicle for a minimum of 5 minutes at various speeds while performing several antilock braking and normal braking stops.
6. With the ignition key in the ON position, check for DTC's.
 - If any DTC's are displayed, they must be diagnosed and repaired in the order that they are listed on page 51 of the Bendix Antilock 9 & 10 Service and Diagnostic Procedures Manual (81-699-96225).

Completion Reporting and Reimbursement

Claims for vehicles which have been serviced must be submitted on the DIAL System. Claims submitted will be used by Chrysler to record recall service completions and provide dealer payments.

Use one of the following labor operation numbers and time allowances:

| | Labor Operation Number | Time Allowance |
|---|-----------------------------------|---------------------------|
| inspect ABS for proper operation | 05702181 | 0.9 hours |
| Inspect ABS and replace pump/motor assembly | 05702182 | 1.6 hours |
| Inspect ABS and replace actuator assembly: | | |
| • 1989 and 1990 MY | 05702183 | 3.5 hours |
| • 1991 MY | 05702184 | 3.2 hours |
| Inspect ABS and replace actuator assembly and pump/motor assembly: | | |
| • 1989 and 1990 MY | 05702185 | 4.0 hours |
| • 1991 MY | 05702186 | 3.8 hours |

Add the cost of the recall parts package(s) plus applicable dealer allowance to your claim.

NOTE: Any other ABS repairs must be performed according to the Bendix Antilock 9 & 10 Service and Diagnostic Procedures Manual and/or applicable Technical Service Bulletins and a separate warranty claim must be filed for reimbursement.

Parts Return

Removed actuator assemblies and pump/motor assemblies must be returned to the Warranty Material Return Center. **Timely parts return is critical in assuring an adequate supply of future repair parts.** Dealers will be charged back for parts which are not promptly returned.

Note: See Warranty Administration Manual, Recall Claim Processing Section for complete recall claim processing and material return instructions.

Vehicle Not Available

If a vehicle is not available for service for a known reason, let us know by filling out the pre-addressed Vehicle Disposition Form portion of the Owner Notification Form or describe the reason on a postcard and mail to:

**Chrysler Corporation
CIMS 482-00-85
800 Chrysler Drive East
Auburn Hills, Michigan 48326-2757**

Following the above procedures will expedite the processing of your claim.

If you have any questions or need assistance in completing this action, please contact your Zone Service Office.

**Customer Services Field Operations
Chrysler Corporation**



SAFETY RECALL TO TEST AND REPAIR YOUR VEHICLE'S ANTILOCK BRAKE SYSTEM

Dear Jeep Owner:

This notice is sent to you in accordance with the requirements of the National Traffic and Motor Vehicle Safety Act.

Chrysler Corporation has determined that a problem which relates to motor vehicle safety exists in some 1989 through 1991 Jeep Cherokee and Wagoneer vehicles equipped with an antilock brake system (ABS).

The problem is... The ABS hydraulic control unit on your vehicle (identified on the enclosed form), may experience excessive brake actuator piston seal wear and/or pump-motor deterioration. If this occurs, the ABS function may be lost and reduced power assist may be experienced during braking. This may result in increased stopping distance that could result in an accident.

What you should do...

Owners of vehicles that experience any of the following symptoms should contact their dealers *immediately* to schedule a service appointment:

- Either the Brake System Warning Light or the Antilock Warning Light remains *illuminated more than two minutes* after starting the vehicle; *or if either light comes on* at any other time during vehicle operation;
- A *substantial* increase in *brake* pedal force is needed to stop the vehicle; or
- Any other ABS malfunction occurs.

Please bring the enclosed Owner Notification Form with you to your dealer. It explains the required service to the dealer.

If your ABS brake system is operating properly and none of the above symptoms are present, no action is necessary at this time. However, if any of these symptoms appear in the future, contact your dealer for a free repair. *Keep this letter with your vehicle's other owner information in case you notice any of these conditions in the future.*

*Buckle up
for Safety*



**What Chrysler
and your dealer
will do...**

Chrysler will test your vehicle's ABS for excessive piston seal wear and possible pump-motor deterioration. If problems *with these components* are found at any time during the entire life of your vehicle, **Chrysler** will replace these components free of charge. The test will take about one hour to complete. Another one to three hours *may* be required if components must be replaced. However, additional time may be necessary depending on how dealer appointments are scheduled and processed.

**Extended
Warranty...**

In addition to this recall action, the warranty period on other ABS components in your vehicle is being extended to 10 years or 100,000 miles, whichever ever occurs first. This means that if any of these other ABS components fail within 10 years or 100,000 miles, your dealer will correct the problem free of charge. This extended warranty is limited to the same conditions defined in the original warranty and does not include any base brake system components (calipers, pad/shoe linings, etc.). Further, Chrysler will reimburse owners for any previous ABS component expenses incurred within the limits of the extended warranty. Just send the original receipt to:

Chrysler Corporation - Recall #702 Reimbursement
P.O. Box 21-8004
Auburn Hills, MI 48321-8004

**If you need
help...**

If you have any questions about whether your ABS system is operating properly, contact your dealer.

If you have trouble getting your vehicle repaired, please call the **Chrysler Customer Center**, toll free, at 1-800-853-1403. A representative will assist you in getting your vehicle repaired. If your dealer fails or is unable to remedy this defect without charge and within a reasonable time, you may submit a written complaint to the Administrator, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590, or call the Toll Free Auto Safety Hotline at 1-800-424-9393. (Washington, D.C. area residents may call 366-0123.)

We're sorry for any inconvenience, but we are sincerely concerned about your safety. Thanks for your attention to this important matter.

Customer Services Field Operations
Chrysler Corporation
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