

Secretary of Transportation
Raymond LaHood
U.S. Department of Transportation
1200 New Jersey Ave, SE
Washington, DC 20590

November 6, 2010

On August 3, 2008, our mother, [REDACTED], finished a yard sale at her house and was leaving to pick up signs along the road. She was driving a 1997 Chrysler Town and Country Mini-Van equipped with a 4ITE automatic transmission. She stopped briefly to pick up a yard sale sign along the road, placed the van into park and got out of the van with the engine running. Once she was fully out of the van, it self-shifted into reverse knocking her to the ground and pinning her underneath the left front tire. It was there that our beloved mother died.

It wasn't until later that we found out about the defect known to Chrysler and the National Highway Traffic Safety Administration (NHTSA) as "park-to reverse, false park or inadvertent rearward movement." In a vehicle with the park-to-reverse defect, an operator of the vehicle in normal use can inadvertently place the shift selector (also referred to as the "Rooster Comb") between the intended park and reverse gear positions. The shift selector will remain for a period of time between the intended gear position and from this position it may (or may not) have a delayed engagement of powered reverse. Upon having an engineer inspect and test our mother's Chrysler Town & Country Mini-Van, he indicated the van did in fact have the defect. The vehicle would go into false park (the cues indicate that the van is in park but seconds later it will self-shift into reverse,) four out of ten times when tested.

As early as the 1960's, Chrysler had notice of the park-to-reverse defect in its vehicles. Prior to our mother's untimely death, Chrysler was the subject of no less than four NHTSA investigations regarding the park-to-reverse defect in its vehicles. Additionally, Chrysler and NHTSA have received thousands of complaints regarding park-to-reverse accidents involving serious personal injuries and fatalities, well prior to the accident that took the life of our mother. Despite its superior knowledge of this unreasonably dangerous defect, Chrysler and NHTSA have both failed to take the proper corrective action to fix, recall or redesign the defective shift selector. Chrysler is still using the defective shift selector in their vehicles to this day.

Due to the number of years this defect has been known to Chrysler, the number of complaints, injuries and deaths is hard for us to accurately calculate because of the number of makes, models and decades this defect encompasses. However, solely based on the four NHTSA reports we've included in this packet, we've configured the numbers to be: **Complaints 1717; Accidents 994; Injuries from Accidents 358; Fatalities; 19** (including our mother.) The numbers will be substantially higher once all the makes, models and years of vehicles that contain the defective shift selector are included.

Here is some of the documentation that my family has compiled over the last two years that support our allegations:

1. Our Summons and Complaint that was filed against Chrysler before the bankruptcy, which provides details and some history regarding the park-to-reverse defect.
2. Sworn testimony during the trial of the Estate of [REDACTED] vs. Daimler Chrysler where Chrysler employees' Neil Laymon and Antonius Brenders admit the existence of the defect. This case was a park-to-reverse accident where [REDACTED] was killed and the jury ruled in favor of the [REDACTED] family.
3. A memo from Chrysler employee, Antonius Brenders, whose testimony was given during the [REDACTED] trial. On page 5 of the memo in the paragraph titled "Decision on Conducting the Survey" under "Significant Risks" he says "**Product Liability credence to a concept we have long ignored.**"

4. Pictures of the shift selector also referred to as the "Rooster Comb," being left on the flat land between park and reverse.
5. An informal list obtained from Wikipedia that shows the years, makes, models and different transmissions of the Chrysler vehicles that have the propensity to have the park-to-reverse defect. The transmission in my mother's van was the 4ITE but Chrysler has changed the name of the transmission numerous times.

<http://en.wikipedia.org/wiki/Ultradrive>
6. The NHTSA campaign ID number's to the 4 investigations regarding park-to-reverse: 02V053000; 05V462000; 00V106000. The fourth ID is not available on the NHTSA website.
7. The Office of Defect Investigations (ODI) four action numbers for the proposed "fix" and/or recalls regarding the park-to-reverse defect: EA04025; EA96006; EA01017; EA91010. **None of the four recalls that Chrysler and NHTSA have proposed have fixed the actual defect in the shift selector of the transmission.** It is apparent when reading the investigations that NHTSA is aware that the shift selector in the transmission can be shifted to a position between park and reverse (detent roller below the peak on the rooster comb or the flat land,) however on four separate occasions Chrysler recalls something entirely different that does not fix the problem.
8. The Final Report from the Vehicle Research and Test Center concerning the "Unintended Powered Roll-Away in Reverse after Parking – Jeep Grand Cherokee (2003.)"
9. The website address to a video that was caught in a parking garage where Farbod Nourian suffered injuries after his defective Chrysler Jeep Cherokee shifted from park to reverse. Notice once the Jeep is in park, the brake lights come off, he exits the vehicle, then seconds later it self-shifts into reverse. The link can be found on the website under the title Detroit TV News Reports on Product Defect Victims in Chrysler Bankruptcy.

<http://www.lieffcabraser.com/news2009.htm>

Chrysler and NHTSA both failed to warn consumers of this deadly defect, which is why we have turned to you. We are asking for you to personally take ownership of this issue. Since our mother's passing, it has become our mission to warn the public and expose Chrysler so they will recall and stop producing this defective shift selector. We are asking you for a full investigation regarding this defect. We want to know how Chrysler has gotten away with this for so many years and why NHTSA, the government agency whose mission is to "save lives and prevent injuries," has failed to do their job. We would like to obtain the following information from Chrysler and NHTSA:

1. A complete list of makes, models and years of the vehicles with the park-to-reverse defect
2. The number of known deaths, injuries and complaints associated with the park-to-reverse defect
3. All Chrysler and NHTSA documents related to the park to reverse defect

It is no less than criminal that Chrysler can walk away from the tragedies they alone have engineered and the lives they have shattered with no repercussions or accountability. Chrysler's professed desire to honor warranties rings hollow, when its cars kill the very consumers that their warranties are designed to protect. As consumers and union members whose livelihood depends on the success of Chrysler, we are also victims who want to make sure that another family does not have to go through the devastation that our family has suffered.

Mr. LaHood, not a day goes by that we don't think about our mother. We have to live every day for the rest of our lives knowing that our mother's untimely death could have been prevented and we have only Chrysler to blame for that. Chrysler's gross negligence is what killed our mother and my family needs to know why Chrysler has gotten away with this for so long with no repercussions. Hopefully by reaching out to you we can get answers to our questions and save the lives of others driving vehicles with this defect. Please do not allow Chrysler and NHTSA to get away with this injustice any longer. We would like to further discuss with you as soon as possible what steps are going to be taken by you to resolve this matter. We look forward to hearing from you. Thank you for your time.

Sincerely,

[REDACTED]
Sterling Heights, MI. [REDACTED]
[REDACTED]

[REDACTED]
Wales, MI. [REDACTED]
[REDACTED]

[REDACTED]
Flat Rock, MI [REDACTED]

CC:

Vice President & Associate General Counsel
Louann Van Der Wiele
Chrysler Group LLC
CIMS 485-13-62
1000 Chrysler Drive
Auburn Hills, MI 48326

Sergio Marchionne, CEO
Chrysler Group LLC
1000 Chrysler Drive
Auburn Hills, MI 48326

Hand delivered to
UAW President, Bob King

NHTSA Headquarters
1200 New Jersey Avenue, SE
West Building
Washington, DC 20590

Office of Defects Investigations/CRD
NVS-216
1200 New Jersey Ave SE
Washington, DC 20590

Senator Debbie Stabenow
133 Hart Senate Office Building
Washington, DC 20510

Senator Carl Levin
269 Russell Office Building
Washington, DC 20510

Committee on Energy & Commerce
Rep. Bart Stupak
2268 Rayburn House Office Building
Washington, DC 20515

Committee on Energy & Commerce
Rep. Henry Waxman
2125 Rayburn House Office Building
Washington, DC 20515

Consumers for Auto Reliability and Safety
Rosemary Shahan
1303 J. Street, Suite 270
Sacramento, CA 95814

Safety Research & Strategies, Inc.
Sean Kane
340 Anawan Street, Suite 200
Rehoboth, MA 02769

Public Citizen
Robert Weissman
1600 20th Street, NW
Washington, DC 20009

Approved, SCAO

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STATE OF MICHIGAN

JUDICIAL DISTRICT
JUDICIAL CIRCUIT
COUNTY PROBATE

24th

SUMMONS AND COMPLAINT

CASE NO.

08- -NP

32664

Court telephone no.

Court address

60 W. Sanilac, Sandusky, MI 48471

Plaintiff name(s), address(es) and telephone no(s).

BRIAN CATALANO, Personal Representative of the
Estate of Linda Catalano,

Plaintiff attorney, bar no., address, and telephone no.

WOLFGANG MUELLER (P43728)
2684 W. Eleven Mile Road
Berkley, MI 48072
248-591-2300

v

Defendant name(s), address(es), and telephone no(s).

CHRYSLER, LLC
c/o The Corporation Company
Resident Agent
30600 Telegraph Road
Bingham Farms, MI 48025**SUMMONS** NOTICE TO THE DEFENDANT: In the name of the people of the State of Michigan, you are notified:

1. You are being sued.
2. **YOU HAVE 21 DAYS** after receiving this summons to file an answer with the court and serve a copy on the other party or to take other lawful action with the court (28 days if you were served by mail or you were served outside this state). MCR 2.111(C)
3. If you do not answer or take other action within the time allowed, judgment may be entered against you for the relief demanded in the complaint.

Issued

12-30-08

This summons expires

3-31-09

Court clerk

Lincoln K. K. K.

*This summons is invalid unless served on or before its expiration date.

This document must be sealed by the seal of the court.

COMPLAINT Instruction: The following is information that is required to be in the caption of every complaint and is to be completed by the plaintiff. Actual allegations and the claim for relief must be stated on additional complaint pages and attached to this form.

Family Division Cases

- ☐ There is no other pending or resolved action within the jurisdiction of the family division of circuit court involving the family or family members of the parties.
- ☐ An action within the jurisdiction of the family division of the circuit court involving the family or family members of the parties has been previously filed in _____ Court.

The action ☐ remains ☐ is no longer pending. The docket number and the judge assigned to the action are:

Docket no.

Judge

Bar no.

General Civil Cases

- ☒ There is no other pending or resolved civil action arising out of the same transaction or occurrence as alleged in the complaint.
- ☐ A civil action between these parties or other parties arising out of the transaction or occurrence alleged in the complaint has been previously filed in _____ Court.

The action ☐ remains ☐ is no longer pending. The docket number and the judge assigned to the action are:

Docket no.

Judge

Bar no.

VENUE

Plaintiff(s) residence (include city, township, or village)

St. Clair County, MI

Defendant(s) residence (include city, township, or village)

Sanilac County, MI

Place where action arose or business conducted

Sanilac County, MI

December 30, 2008

Date

Signature of attorney/plaintiff

If you require special accommodations to use the court because of a disability or if you require a foreign language interpreter to help you to fully participate in court proceedings, please contact the court immediately to make arrangements.

MC 01 (3/06) SUMMONS AND COMPLAINT

MCR 2.102(B)(11), MCR 2.104, MCR 2.105, MCR 2.107, MCR 2.113(C)(2)(a),(b), MCR 3.206(A)

Approved, SCAO

Original - Court
1st copy - Defendant2nd copy - Plaintiff
3rd copy - Return

STATE OF MICHIGAN JUDICIAL DISTRICT 24th JUDICIAL CIRCUIT COUNTY PROBATE	SUMMONS AND COMPLAINT	CASE NO. 08- <u>32664</u> -NP Court telephone no.
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Court address

60 W. Sanilac, Sandusky, MI 48471

Plaintiff name(s), address(es) and telephone no(s).

BRIAN CATALANO, Personal Representative of the Estate of Linda Catalano,

Plaintiff attorney, bar no., address, and telephone no.

WOLFGANG MUELLER (P43728)
2684 W. Eleven Mile Road
Berkley, MI 48072
248-591-2300

v

Defendant name(s), address(es), and telephone no(s).

CHRYSLER MOTORS, LLC
c/o The Corporation Company
Resident Agent
30600 Telegraph Road
Bingham Farms, MI 48025**SUMMONS NOTICE TO THE DEFENDANT:** In the name of the people of the State of Michigan, you are notified:

1. You are being sued.
2. **YOU HAVE 21 DAYS** after receiving this summons to **file an answer with the court** and serve a copy on the other party or to take other lawful action with the court (28 days if you were served by mail or you were served outside this state). MCR 2.111(C)
3. If you do not answer or take other action within the time allowed, judgment may be entered against you for the relief demanded in the complaint.

Issued <u>12-30-08</u>	This summons expires <u>3-31-09</u>	Court clerk <u>Lindael Kozak</u>
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COMPLAINT *Instruction: The following is information that is required to be in the caption of every complaint and is to be completed by the plaintiff. Actual allegations and the claim for relief must be stated on additional complaint pages and attached to this form.*

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- ☐ There is no other pending or resolved action within the jurisdiction of the family division of circuit court involving the family or family members of the parties.
- ☐ An action within the jurisdiction of the family division of the circuit court involving the family or family members of the parties has been previously filed in _____ Court.

The action ☐ remains ☐ is no longer pending. The docket number and the judge assigned to the action are:

Docket no.	Judge	Bar no.
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General Civil Cases

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- ☐ A civil action between these parties or other parties arising out of the transaction or occurrence alleged in the complaint has been previously filed in _____ Court.

The action ☐ remains ☐ is no longer pending. The docket number and the judge assigned to the action are:

Docket no.	Judge	Bar no.
------------	-------	---------

VENUE

Plaintiff(s) residence (include city, township, or village) St. Clair County, MI	Defendant(s) residence (include city, township, or village) Sanilac County, MI
Place where action arose or business conducted Sanilac County, MI	

December 30, 2008

Date

Signature of attorney/plaintiff

If you require special accommodations to use the court because of a disability or if you require a foreign language interpreter to help you to fully participate in court proceedings, please contact the court immediately to make arrangements.

STATE OF MICHIGAN

IN THE CIRCUIT COURT FOR THE COUNTY OF SANILAC

BRIAN CATALANO, Personal Representative
of the Estate of Linda Catalano,

Plaintiff,

-VS-

CHRYSLER, LLC, a Delaware corporation,
CHRYSLER MOTORS, LLC, a Delaware
corporation,

Case No. 08-32664-NP
Hon.

Defendants.

WOLFGANG MUELLER (P43728)

OLSMAN MUELLER, P.C.
Co-Counsel for Plaintiff
2684 W. Eleven Mile Rd.
Berkley, MI 48072
(248) 591-2300

SCOTT P. NEALEY (CA State Bar No. 193062)

CECILIA HAN (CA State Bar No. 235640)
LIEFF, CABRASER, HEIMANN & BERNSTEIN, LLP
Co-Counsel for Plaintiff
275 Battery Street, 30th Floor
San Francisco, CA 94111-3339
(415) 956-1000

THIS IS A
TRUE COPY
OF THE ORIGINAL
LINDA I. KOZEKAY
SANILAC COUNTY CLERK

COMPLAINT AND JURY DEMAND

There is no other pending or resolved civil action arising out of
the transaction or occurrence alleged in the Complaint.


WOLFGANG MUELLER (P43728)

Now come Plaintiff Brian Catalano, Personal Representative of the Estate of Linda Catalano, by and through his attorneys OLSMAN MUELLER, P.C., by Wolfgang Mueller, and LIEFF, CABRASER, HEIMANN & BERNSTEIN, LLP, by Scott P. Nealey and Cecilia Han, and hereby complain against Defendants, Chrysler, LLC and Chrysler Motors, LLC, as follows:

1. Plaintiff Brian Catalano ("Plaintiff") is the son of decedent Linda Catalano and the Personal Representative of the Estate of Linda Catalano. Plaintiff is a resident of St. Clair County, State of Michigan.

2. Decedent Linda Catalano was a resident of Sanilac County, State of Michigan;

3. Defendant Chrysler, LLC, is a Delaware Corporation, and was formerly known as the Chrysler Corporation, which manufactured the vehicle that is the subject of this action. Defendant Chrysler, LLC was also formerly known as DaimlerChrysler Corporation and DaimlerChrysler Company, LLC. Defendant Chrysler, LLC has its principle place of business in the State of Michigan, and regularly and routinely conducts business in Sanilac County, State of Michigan.

4. Defendant Chrysler Motors, LLC (hereinafter collectively "CHRYSLER"), is a Delaware Corporation, with its principle place of business in the State of Michigan, and regularly and routinely conducts business in Sanilac County, State of Michigan.

5. Jurisdiction is proper based on the parties and damages which exceed \$25,000.00, exclusive of interest and costs.

6. Venue is proper based on the situs of the incident and the residence of the Defendants pursuant to MCL § 600.16211629.

COMMON ALLEGATIONS

Facts of the Accident

7. In and or around 1997, Robert Hendershot, brother of decedent Linda Catalano, bought new one 1997 Chrysler Town & Country Mini-Van, VIN#1C4GP54R4VB267959 (hereinafter "MINI-VAN") which was equipped with a 41TE automatic transmission from Taylor Chrysler-Plymouth dealership located in Taylor, Michigan. Subsequently, the MINI-VAN was sold by Robert Hendershot to Merrill Hendershot, father of decedent Linda Catalano. Merrill Hendershot was the registered owner of the MINI-VAN for all relevant time periods herein.

8. These causes of action arise from an accident which occurred on the evening of August 3, 2008 at the intersection of Cedar Street near 6th Street in Forestville. That evening, then fifty-five year old Linda Catalano had just completed a garage sale and had left her home located at 5510 Cass River Road, Minden City to pick up some garage sale signs remaining along the road. Ms. Catalano was driving east on Cedar Street in Forestville when she stopped the MINI-VAN along the roadway to pick up some signs.

9. On information and belief, Ms. Catalano placed the MINI-VAN into what she reasonably believed to be "park" based on the MINI-VAN's "cues" -- such as the location of the shift selector, the sound of the engine, and that the MINI-VAN did not move when she pulled her foot off the service brake.

10. On information and belief, Ms. Catalano opened the door and stepped out of the MINI-VAN to pick up her garage sale signs, with the engine running and the driver's side door open. The ground at the accident scene is flat, and the MINI-VAN moves immediately when a driver's foot is removed from the brake if the MINI-VAN is in either drive or reverse. After a delay sufficient for Ms. Catalano to exit the vehicle, the MINI-VAN suddenly engaged in

powered reverse (i.e., it “self shifted”); the open door knocked her to the ground as the MINI-VAN was traveling backwards. While on the ground, Ms. Catalano was dragged underneath the MINI-VAN’s left front tire and pinned. Ms. Catalano sustained fatal blunt force neck trauma which resulted from the separation of the C-2/C-3 neck vertebrae.

11. As a direct and proximate result of the park-to-reverse design defect in the MINI-VAN, a defect long known to CHRYSLER, as described forth below, decedent Linda Catalano and Plaintiff on behalf of the Estate of Linda Catalano suffered the following injuries and damages:

- a. Reasonable medical, hospital, funeral and burial expenses;
- b. Tremendous pain and suffering inflicted upon decedent Linda Catalano;
- c. Losses suffered by the heirs of decedent Linda Catalano as result of her death, including, not limited to,
 - i. loss of financial support
 - ii. loss of services
 - iii. loss of gifts or other valuable gratuities
 - iv. loss of parental training and guidance
 - v. loss of society and companionship.

Allegations Regarding Park-To-Reverse Defect and CHRYSLER’s Knowledge

12. A “park-to-reverse” defect can exist in a vehicle equipped with an automatic transmission when there is inadequate mechanical force (called “detenting force”) provided by the automatic transmission system to ensure that a vehicle always defaults into an intended gear position (such as park or reverse) when an operator does not fully shift into that intended gear position.

13. In a vehicle with a park-to-reverse defect, an operator of the vehicle in normal use can inadvertently place the shift selector between the intended park and reverse gear positions. The shift selector will remain for a period of time between the intended gear position and from this position the vehicle then may (or may not) have a delayed engagement of powered reverse.

14. Because of the possible delay in the engagement of reverse gear when an operator places the vehicle into what, from the vehicle's "cues," the operator would reasonably believe to be park, the park-to-reverse defect is unreasonably dangerous because an operator may have exited the vehicle, or be exiting the vehicle, when the vehicle suddenly and unexpectedly moves backwards in powered reverse.

15. As a result of injuries and deaths resulting from park-to-reverse accidents (sometimes referred to as "inadvertent rearward movement"), from at least the 1950's and 1960's the Automobile Industry has been aware of the defect, and the need to design vehicles so as to prevent the vehicle's shift selector from being placed in a position between the intended gear positions from which the vehicle can then have a delayed engagement of reverse.

16. Defendant CHRYSLER in specific was well aware of the need to design its automatic transmission system so that an operator could not leave the vehicle between park and reverse from which there could be a delayed engagement of reverse. Notice to Defendant CHRYSLER, well prior to Ms. Catalano's fatal injuries, of the need to avoid a park-to-reverse defect included:

- a. numerous park-to-reverse incidents on various vehicles made by Defendant CHRYSLER in the 1960's, 1970's, and 1980's with both front wheel drive transaxles such as the 31 TE, and rear wheel drive transmissions such as the 727, and the 40-49 RE and RH transmissions;

- b. numerous reports of injuries and deaths and an investigation by the National Highway Traffic Safety Administration ("NHTSA") of Defendant CHRYSLER's K car vehicles in 1990-91 (EA 91-010), vehicles which had a functionally identical and substantially similar design to the 41 TE transmission on the MINI-VAN. By the closing of EA 91-010 in 1991, Defendant CHRYSLER had received notice of 318 field reports of the defect and had been sued 23 times, while at the same time receiving notice of 217 accidents involving property damage, 111 accidents involving injuries, and reports of 7 fatalities. CHRYSLER, however, intentionally took no action so as to save money knowing that its failure to act would lead to further injuries and deaths;
- c. numerous reports of park-to-reverse accidents and injuries in Dodge Dakota pickups beginning in model year 1988. These reports continued through the opening of an NHTSA investigation of the park-to-reverse problem in the Dakotas (EA 96-06) which was only closed when in 2000 Defendant CHRYSLER executed a voluntary recall of certain Dodge Dakotas in an effort to attempt to prevent further NHTSA action. By the time EA 96-06 was closed in 2000, Defendant CHRYSLER had received reports of 152 incidents, 95 crashes, 20 injuries, and 5 fatalities in 1991 and 1992 Dodge Dakotas, as well as numerous accidents and injuries in other model year Dodge Dakotas. As to the CHRYSLER initiated "fix" it knew the "fix" would not remedy the park-to-reverse defect;
- d. in 2001, NHTSA opened another investigation, this time of the Jeep Grand Cherokee for park-to-reverse problems (EA 01-017). By the time that CHRYSLER instituted another voluntary recall in order to prevent further NHTSA action, CHRYSLER had received 1,038 complaints involving 428 crashes, 192 injuries, and 4 fatalities on certain model Jeep Grand Cherokees. In addition CHRYSLER received reports of park-to-reverse accidents and injuries in additional model years (1999-forward) of the Jeep Grand Cherokee before and after this recall;
- e. in 2004, again prior to the Ms. Catalano's fatal injury, NHTSA opened a further investigation of Defendant CHRYSLER'S 2003-2005 Ram pickups (EA 04-025). In response to this NHTSA investigation Defendant CHRYSLER voluntarily recalled the vehicles and installed an "out-of-park alarm" which sounded the vehicle's theft deterrent system (flashing the vehicle's lights and sounding the vehicle's car alarm) if the vehicle operator placed the vehicle into "false park" and then attempted to open the driver's side door with the vehicle running. This simple "fix" had earlier been installed in model year 2005 Ram pickups;

- f. numerous reports of accidents and injuries as a result of the park-to-reverse defect, all again prior to Ms. Catalano's injuries, on vehicles in its fleet including Town & Countries, Dodge Neons, Dodge Durangos, Ram Vans; as well as model years of Grand Cherokees, Rams, and Dakotas which were not recalled by CHRYSLER; and
- g. over one hundred reports of park-to-reverse incidents on Grand Caravans equipped with the same 41 TE transaxles and shift system found on the MINI-VAN.

17. Despite many thousands of accidents, injuries, and deaths in park-to-reverse accidents, Defendant CHRYSLER adopted a consistent policy of refusing to admit the existence of a defect in the vehicle, test its vehicles including, but not limited to, the Town & Country, for any park-to-reverse problem prior to their sale, or to test its vehicles under the "read across" process once park-to-reverse defects were identified in other of its vehicles. Defendant CHRYSLER instead chose to falsely blame any resulting accidents, injuries, and deaths on "operator error."

18. The standard of care in the automobile industry is to fully investigate complaints or reports received by an automobile manufacturer which appear to pose a potential or actual safety risk.

19. The investigative process by which complaints or incident reports are investigated is a technique called "root cause analysis" in which the vehicle manufacturer's engineering staff or outside consultants will (a) determine if the issue is safety-related; (b) carefully analyze the complaint to fully understand it; (c) attempt to reproduce the complaint on the subject vehicle or an exemplar; (d) determine if the problem is a manifestation of a unique vehicle feature (e.g., a vehicle manufacturing defect); (e) if the problem is not so identified identify the engineering feature of the product which allows for the mechanical system to perform in the manner complained of; and (f) determine if there is an engineering solution

through redesigning the product which will prevent it as a mechanical system from manifesting the complaint in the system or if an adequate redress is not feasible, then warn adequately to prevent injury.

20. Despite the engineering standard being to conduct all necessary root cause analysis, and the fact that CHRYSLER conducted numerous root cause analyses on other potential and actual defects, CHRYSLER intentionally and purposefully avoided conducting any adequate root cause analysis on the park-to-reverse defects on any of its vehicles, including the Town & Country, so as to avoid identifying a defect which would require Defendant CHRYSLER to undertake expensive measures to fix defective and dangerous vehicles which had been, and were being, sold to its customers and used by the public such as decedent Linda Catalano.

21. Defendant CHRYSLER's refusal over a period of over 20 years to conduct appropriate and necessary "root cause analysis" was purposeful and intentional and was done with the understanding that its failure to conduct root cause analysis and identify and fix the park-to-reverse defect on its vehicles would result in injuries and deaths, including the fatal injury suffered by decedent Linda Catalano and her Estate as represented by Plaintiff.

22. It is appropriate engineering practice in the automobile industry to conduct a Design Failure Mode and Effects Analysis (DFMEA) any time a manufacturer or a supplier of the product creates a new design, makes a design change to an existing design, or has a different application of an existing component or subsystem.

23. In a DFMEA, engineers engage in a process by which they attempt to identify potential issues that may be presented by the design, redesign, or pairing of components.

In a DFMEA all prior complaints, campaigns, warranty data or other documentation available on

a specific component or system company-wide is reviewed and analyzed to identify potential failure modes of a product, develop a test protocol to test for each of the potential failure modes, and through completing such tests to rule out (or identify) the ability of a design, redesign or pairing of components to fail as have earlier designs.

24. Had a DFMEA been conducted on the transmission systems on Defendant CHRYSLER's other vehicles, or the MINI-VAN purchased by Robert Hendershot, it would have easily identified the park-to-reverse defect in the MINI-VAN.

25. Yet despite the fact that DFMEA is a standard procedure conducted by Defendant CHRYSLER, CHRYSLER at no time conducted any DFMEA on the transmission system of the MINI-VAN, or of other of its vehicles.

26. The decision not to conduct a DFMEA on the transmission system of the MINI-VAN, or other of Defendant CHRYSLER's vehicles, was purposeful and intentional so as not to identify the park-to-reverse defect which would require its being remedied and expose CHRYSLER to having to fix at considerable expense prior defective vehicles.

27. Once a defect in or on a system of parts (such as the shift system at issue in this case) designed and/or manufactured by an automotive manufacturer is identified, under TS16949 Standard 8.5.2.3, it is the professional standard in the industry to inspect and analyze other similar systems so as to ensure that the non conformity does not also exist in related or similar systems. At CHRYSLER, this is called the "read-across" process.

28. Despite knowing of the danger posed by the park-to-reverse defect, and having identified the defect in numerous of its vehicles, CHRYSLER purposefully and intentionally, at the direction of the safety office and general counsel, elected not to and/or ordered that no "read-across" process should be conducted on park-to-reverse issues as such a

process would have identified the defect in numerous vehicles, which would have then required the problem to be remedied at considerable expense.

29. As discussed below Defendant CHRYSLER'S acts in failing to design so as to prevent the park-to-reverse defect, test its vehicles to determine if the park-to-reverse defect existed, to apply what it learned on other vehicles to the MINI-VAN, or to remedy the park-to-reverse defect in the MINI-VAN once it was produced was intentional and purposeful and demonstrated a conscious disregard for public safety in that Defendant CHRYSLER knew that accidents and serious injuries, such as the fatal injury suffered by decedent Linda Catalano would result from Defendant CHRYSLER's actions and omissions.

COUNT I.

NEGLIGENCE

30. Plaintiff incorporates by reference all preceding paragraphs and allegations as if fully set forth herein.

31. CHRYSLER owed a duty to decedent Linda Catalano to use reasonable care in the design, engineering, manufacturing, testing, assembly, marketing, advertisement, inspection, maintenance, sale, warning and distribution of the MINI-VAN so as to eliminate any unreasonable risks of reasonably foreseeable injuries and harm.

32. CHRYSLER owed a duty to decedent Linda Catalano to "fix" or eliminate the park-to-reverse defect in its vehicles, including the MINI-VAN so as to eliminate any unreasonable risks of reasonably foreseeable injuries and harm.

33. CHRYSLER breached said duty to use reasonable care and is guilty of one or more of the following negligent acts and/or omissions:

- a. Failing to use due care in the design, engineering, manufacturing, testing, assembly, marketing, advertising, inspection, maintenance, sale and/or distribution of the MINI-VAN and/or to utilize and/or

implement reasonably safe designs in the manufacture of the MINI-VAN;

- b. Failing to provide adequate and proper warnings to owners and the public including decedent Linda Catalano of the MINI-VAN's propensity to be involved in park-to-reverse incidents when it was used in a reasonably foreseeable manner;
- c. Failing to design, manufacture and incorporate or to retrofit the MINI-VAN with reasonable safeguards and protections against park-to-reverse incidents and the consequences thereof when used in a reasonably foreseeable manner;
- d. Failing to adequately prevent, identify, mitigate, and fix defective designs and hazards associated with park-to-reverse incidents in accordance with good engineering practices;
- e. Failing to notify and warn the public including decedent Linda Catalano of reported park-to-reverse incidents and thus misrepresenting the safety of MINI-VAN;
- f. Failing to make timely and adequate corrections to the manufacture and design of the MINI-VAN so as to prevent and/or minimize the problem of park-to-reverse incidents;
- g. Failing to use due care in the testing, inspection, maintenance and servicing of the MINI-VAN at all times prior to the incident; and
- h. Otherwise being careless and negligent, which will be discovered through the course of this litigation.

34. CHRYSLER knew safer and cost-effective alternative transmission designs and adequate corrections were available which could have prevented the accident from occurring, but willfully and wantonly chose not to implement any of these alternative and instead continued to design, manufacture, sell and distribute vehicles such as the MINI-VAN with the unreasonably dangerous defect.

35. At the time the MINI-VAN left CHRYSLER's control, the MINI-VAN had a propensity to have a delayed engagement of reverse due to a transmission design defect long known to CHRYSLER, which allows an operator to leave the shift selector in a position

between park and reverse, which is not park, but an operator would reasonably believe to be "park" from the vehicle's "cues " and therefore was unreasonably dangerous.

36. As a direct and proximate result of CHRYSLER's negligence, decedent Linda Catalano sustained fatal neck injuries and tremendous pain and suffering.

37. As a direct and proximate result of CHRYSLER's negligence, the heirs of Linda Catalano suffered the significant losses including, but not limited to, the loss of Linda Catalano's society, companionship, parental training, guidance, financial support, services, and gifts.

WHEREFORE, Plaintiff, Brian Catalano as the Personal Representative of the Estate of Linda Catalano respectfully requests that this Court grant them against Defendants, Chrysler, LLC and Chrysler Motors, LLC, in whatever amount greater than \$25,000.00 to which they are deemed to be entitled, together with prejudgment and postjudgment interest, costs, and attorneys' fees.

COUNT II.

GROSS NEGLIGENCE

38. Plaintiff incorporates by reference all preceding paragraphs and allegations as if fully set forth herein.

39. At the time of design and manufacture of the MINI-VAN, CHRYSLER had actual knowledge that the MINI-VAN was defective from their testing of the production models of the MINI-VAN, and/or its predecessors, and/or from other vehicles they manufactured, distributed, inspected and maintained and the over tens of thousands of park-to-reverse complaints from owners of other Chrysler-manufactured vehicles as alleged in

Paragraphs 12-29.

40. At the time of design and manufacture of the MINI-VAN, CHRYSLER had actual knowledge that there was a substantial likelihood that the defect would cause the injury that is the basis of this action from their testing of the production models of the MINI-VAN, and/or its predecessors, and/or from other vehicles they manufactured, distributed, inspected and maintained and the over tens of thousands of park-to-reverse complaints from owners of other Chrysler-manufactured vehicles as alleged in Paragraphs 12-29.

41. Despite its prior actual knowledge of the extreme and hidden dangers posed by the park-to-reverse defect inherent in the design of the MINI-VAN and other Chrysler vehicles as evidenced in Paragraphs 12-29, CHRYSLER willfully and wantonly designed, manufactured, and sold the MINI-VAN with this defect and then failed to adequately fix or otherwise warn the consumers and the public including Decedent Linda Catalano of the defect.

42. CHRYSLER'S decisions to continue to design, manufacture, and sell vehicles such as the MINI-VAN that it knew to be inherently defective and its failure to adequately fix or otherwise warn the consumers and the public including Decedent Linda Catalano were "so reckless as to demonstrate a substantial lack of concern for whether injury results" and thus constitutes gross negligence, pursuant to MCL § 600.2945.

43. Based on CHRYSLER's actual knowledge of the park-to-reverse defect at the time of manufacture or distribution of the MINI-VAN, MCL §600.2946(a), 600.2946(a), 2947(1) – (4), and 600.2948(2) do not apply to this action, pursuant to MCL § 600.2949(a).

WHEREFORE, Plaintiff, Brian Catalano as the Personal Representative of the Estate of Linda Catalano respectfully requests that this Court grant them against Defendants, Chrysler, LLC and Chrysler Motors, LLC, in whatever amount greater than \$25,000.00 to which they are deemed to be entitled, together with prejudgment and postjudgment interest, costs, and

attorneys' fees.

COUNT III.

BREACH OF IMPLIED WARRANTY

44. Plaintiff incorporates by reference all preceding paragraphs and allegations as if fully set forth herein.

45. CHRYSLER owed a duty to decedent Linda Catalano to design, engineer, manufacture, test, assemble, market, advertise, inspect, maintain, sell, warn and distribute a MINI-VAN so that it was reasonably fit for reasonably anticipated or foreseeable uses.

46. At the time the MINI-VAN left CHRYSLER's control, the MINI-VAN was not reasonably fit for use reasonably anticipated or foreseeable by CHRYSLER, in one or more of the following ways:

- a. The MINI-VAN had a propensity to have a delayed engagement of reverse due to a transmission design defect long known to CHRYSLER, which allows an operator to leave the shift selector in a position between park and reverse, which is not park, but an operator would reasonably believe to be "park" from the vehicle's "cues."
- b. The MINI-VAN experienced an unreasonably dangerous delayed engagement of reverse when being used in the manner for which it was intended.

47. Decedent Linda Catalano sustained a fatal neck injury as a result of the using the MINI-VAN's in the manner for which it was intended and in a manner that was reasonably foreseeable or anticipated by CHRYSLER.

48. Decedent Linda Catalano's fatal injury was directly and proximately caused by CHRYSLER.

49. The losses suffered by the heirs of Linda Catalano as a result of her death including, but not limited to, loss of society, companionship, parental training, guidance, financial support, services, and gifts, were directly and proximately caused by CHRYSLER.

WHEREFORE, Plaintiff, Brian Catalano as the Personal Representative of the Estate of Linda Catalano respectfully requests that this Court grant them against Defendants, Chrysler, LLC and Chrysler Motors, LLC, in whatever amount greater than \$25,000.00 to which they are deemed to be entitled, together with prejudgment and postjudgment interest, costs, and attorneys' fees.

Respectfully submitted,

OLSMAN MUELLER, P.C.



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(415) 956-1000

Attorneys for Plaintiffs

Date: December 30, 2008

THIS IS A
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OF THE ORIGINAL
LINDA I. KO-EKAY
SANILAC COUNTY CLERK

JURY DEMAND

NOW COME Plaintiff Brian Catalano, Administrator of the Estate of Linda Catalano, by and through their attorneys OLSMAN MUELLER, P.C., by Wolfgang Mueller, and LIEFF, CABRASER, HEIMANN & BERNSTEIN, LLP, by Scott P. Nealey and Cecilia Han, hereby demand a jury trial of the above-entitled case.

Respectfully submitted,

OLSMAN MUELLER, P.C.



Wolfgang Mueller, Esq. (P43728)
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Attorneys for Plaintiffs

Date: December 30, 2008

THIS IS A
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OF THE ORIGINAL
LINDA I. KOZFKAY
SANILAC COUNTY CLERK

SUPERIOR COURT OF THE STATE OF CALIFORNIA
COUNTY OF LOS ANGELES

ADRIANA MRAZ, ESTATE OF RICHARD)
MRAZ; AND MINOR PLAINTIFFS,)
ADDISON MRAZ, JOE LOPEZ, ROY)
LOPEZ, THROUGH THEIR GUARDIAN AD)
LITEM ADRIANA MRAZ,)

Plaintiffs,)

-vs-)

DAIMLERCHRYSLER CORPORATION;)
AMERICAN PRESIDENT LINES, LTD;)
CERRITOS DODGE AND DOES 2-100,)
INCLUSIVELY,)

Defendants.)

CAUSE NO.
BC 332487

VIDEOTAPED

DEPOSITION OF NEIL LAYMON

The deposition upon oral examination of NEIL LAYMON, a witness produced and sworn before me, Tamara J. Brown, CSR, RMR, CRR, Notary Public in and for the County of Marion, State of Indiana, taken on behalf of the Plaintiffs, at the offices of the Courtyard Marriott, 2602 Fortune Circle, Indianapolis, Marion County, Indiana, on the 15th day of August, 2006, pursuant to the Indiana Rules of Trial Procedure with written notice as to time and place thereof.

Page 82

1 showed him the change history. And that was a
2 design function that we just, you know, I don't
3 know why they did, why it was designed that way.

4 Q But no one at DaimlerChrysler ever expressed to
5 you that they thought that design, that
6 difference between the park detent and reverse
7 detent as opposed to the radius in the other
8 detents, might have been a contributing factor
9 to why people were making complaints of putting
10 their car into a false park?

11 MR. HADDAD: Object to the form. The
12 question is, no one ever told him that?

13 MR. DaVEGA: Did anyone ever tell him that.
14 A No. Because, I mean he was -- they were looking
15 at --

16 MR. HADDAD: Is the answer no, no one told
17 you that?

18 A Yeah, no one told me. They were looking at why
19 it was different than the other ones, and we
20 said we used the same one in all of them, and it
21 has been that way for a long time. And I
22 remember pulling out different blueprints for
23 him. But...

24 Q For manual levers or for something else?

25 A For --

Page 83

1 Q Blueprints for what?

2 A It was probably manual lever assembly, and
3 probably a transmission assembly diagram which
4 shows where we're supposed to test, that has the
5 degrees of where you were supposed to go to test
6 them, test for park here, go to reverse at this
7 many degrees, go to neutral at this many
8 degrees. And I don't know why it's -- yeah, I
9 don't know why it is designed the way it is.

10 Q My understanding is that as the detent ball
11 travels in between or travels from one detent to
12 other between the gears in the manual lever,
13 that part of the process also is the valve
14 opening and closing and allowing fluid to come
15 through; is that correct?

16 A Well, the ball just moves in and out against the
17 spring. And as you turn the plate, then it
18 directs the manual valve that applies fluid to
19 the different clutches. And --

20 MR. HADDAD: That was the question, right?

21 THE WITNESS: Yeah, that was the question.
22 I'm still a little confused. What happens in
23 between?

24 MR. HADDAD: He asked you if that is what
25 happens.

Page 84

1 Q So it is a gradual process. The valve doesn't
2 just shut off and on, it opens in a manner --
3 now, I understand it may happen quickly -- but
4 it's a percentage, the valve opens until a
5 certain percentage is open and enough fluid goes
6 through to engage the clutch.

7 A Well, the valve moves and exposes one passage to
8 another, and depending on how fast you do that,
9 is how fast -- I mean if you move it really
10 slow, you can probably see fluid start to flow
11 into the clutch. But you still have to overcome
12 a big spring in the clutch.

13 So, you know, if you move it there really
14 quick, and the clutch is -- there are some other
15 factors, too, about how fast it can happen, how
16 new the unit is, how fast, what the RPM in the
17 engine is, how well the pump is working, and how
18 quick you build up that pressure to overcome the
19 spring. But then there's the reflective inertia
20 of the vehicle you have to overcome, too, to get
21 motion. So it, I mean it kind of varies.

22 I'm still not sure if I'm answering the
23 question.

24 Q Then my follow-up is, then, how does the
25 difference between a steel valve and an aluminum

Page 85

1 valve affect that fluid flow, that it would
2 prevent possible inadvertent rearward movement
3 problems?

4 MR. HADDAD: Form and foundation.

5 A Well, we were scratching our heads with that,
6 too. We changed, somewhere in the early '90s we
7 changed all the valves to aluminum valves.
8 Because they were looking for shift quality.
9 And we made all the steel valves, and they went
10 to another supplier and bought all these
11 aluminum valves, and had to go through all the
12 development.

13 Then when we later heard about, which was
14 much later, ten years later, something, we heard
15 about this recall, and once again, we never
16 really saw -- I never saw a recall notice.

17 But I just remember at the plant we were
18 thinking, that sure doesn't make sense, why are
19 they doing that. Because it affects just some
20 minor leaks here and there. But there was no
21 dimensional difference between one valve and the
22 other, that I can recall. They didn't move the
23 lens. They didn't change the diameters. They
24 just started making them out of aluminum. And
25 then they had to anodize them. It was kind of

Page 86

1 complicated.

2 Q So my follow-up to that is, the change from

3 steel to aluminum doesn't affect the fluid

4 flow -- well, scratch that.

5 Does the change from a steel valve to

6 aluminum valve affect the ability of the detent

7 ball to be stuck between park detent and reverse

8 detent in the transmission?

9 MR. HADDAD: Form and foundation.

10 A Well, that's a design question. My

11 understanding was, it was done for higher

12 temperature operation, highway shifts up and

13 down, and to reduce -- yeah, it had nothing to

14 do with the detent spring.

15 Q Does it affect the forces on the detent spring?

16 MR. HADDAD: Form and foundation.

17 A No, because you -- that's a manual effect of how

18 far you pull the lever down. So the aluminum

19 valve doesn't have anything to do with the ball

20 and spring.

21 Q Do you own a DaimlerChrysler vehicle?

22 A Yeah.

23 Q What do you own?

24 A I have a Durango. Well, I own a Neon. And I

25 have a Durango because they weren't selling them

Page 87

1 and made us a pretty good deal.

2 Q What year Durango?

3 A '96 -- or 2006.

4 Q Do you know what the transmission is in that

5 2006?

6 A It is a 42 RLE that we built at Kokomo.

7 Q And does it have that same inner manual lever,

8 manual lever that we have been discussing, or is

9 it a new one?

10 A The 42 RLE was a -- no, it's different, it's a

11 whole different design.

12 Q Have you ever owned any previous Daimler

13 vehicles that have that inner manual lever that

14 we have been describing today with the larger

15 radius between park detent and reverse detent?

16 A No. I was trying to think what Cherokee, I had

17 a Cherokee, I leased a Cherokee briefly, and I

18 believe it had the Aisin in it. It was about

19 the last year they made it.

20 Q Any other DaimlerChrysler vehicles you have

21 owned in your life, or Chrysler vehicles?

22 A I was a Jeep fan, too, I went through a string

23 of Jeep Cherokees, mostly with manual

24 transmissions. And I had a 45 RFE for a year, I

25 think. And, no, I never had a 42 RE.

Page 88

1 Q You never owned a DaimlerChrysler that has that

2 inner manual lever that we have been describing

3 or talking about all day?

4 A No.

5 Q Are you aware of any friends or family that

6 have?

7 A My -- no, those are 46s. Both my

8 brother-in-laws have older Durangos, but they

9 have 46s, which has that same lever.

10 Q And what I'm getting to, has anyone personally

11 complained to you that they thought they could

12 put their vehicle in between park and reverse

13 detent?

14 A No.

15 MR. DaVEGA: Let's go off for five minutes.

16 I need a break.

17 THE VIDEOGRAPHER: We're going off the

18 record. The time is 3:32 p.m.

19 (A discussion was held off the record.)

20 THE VIDEOGRAPHER: We're back on the

21 record. The time is 3:54 p.m.

22 Q I'm going to read to you a couple portions of

23 what's been marked as Exhibit 7, and not ask you

24 about the veracity of it, but whether it

25 refreshes your recollection about any of the

Page 89

1 events that we're talking about here today.

2 On page, the third page, it says, "NHTSA

3 claims that the complaint disparity may arise

4 from two product changes." It's referring to

5 the '91/'92 Dodge Dakota. "According to this

6 theory, the relative position of the park pawl

7 when engaged in relationship to the transmission

8 hydraulic activity may be the significant

9 contributor to the higher number of reported

10 incidents of unintended rearward vehicle

11 movement for the 1991 and 1992 model years. The

12 two relevant product changes are as follows:

13 "The steering column was changed from a

14 Saginaw design and supplied column to a

15 corporate designed and supplied column for the

16 '91 model year. NHTSA conducted a study of 24

17 vehicles and concluded the retrograde movement

18 of the steering column gear shift selector would

19 allow the manual valve to move back toward

20 reverse and delay engagement of powered reverse

21 due to the effect of low friction."

22 And the second one is, "The transmission

23 manual valve material was changed in the '93

24 model year from a steel material to aluminum to

25 reduce the leakage created by the different

1 The motion is based upon the grounds that the evidence is irrelevant, immaterial,
 2 prejudicial, and hearsay (to the extent such evidence is in the form of texts or statements by
 3 parties other than DaimlerChrysler). The motion is based on the Court's authority to exclude
 4 evidence that is irrelevant [Evidence Code Section 350] or misleading, confusing or unduly
 5 prejudicial [Evidence Code Section 352], as well as leading cases. People v. Crow (1994) 28
 6 Cal.App.4th 440, 449.

7 This motion is based on the attached Declaration and the accompanying
 8 memorandum of points and authorities, on the papers and records on file herein, and on such oral
 9 and documentary evidence as may be presented at the hearing of this motion.

10 MEMORANDUM OF POINTS AND AUTHORITIES

11 I. INTRODUCTION AND FACTUAL BACKGROUND

12 On April 13, 2004, Mr. Richard Mraz (38 years old and married father of an infant
 13 daughter, Addison Mraz – age 1, and stepfather of two teenage boys, Joe Lopez – age 12, and
 14 Roy Lopez – age 14) while working as a marine clerk for Eagle Marine Services Ltd., at the Port
 15 of Los Angeles, suffered fatal head injuries due to being struck and knocked to the ground when
 16 the defective 1992 Dodge Dakota work vehicle (manufactured by defendant DaimlerChrysler) he
 17 was driving self shifted into powered reverse after he had exited the vehicle.

18 Antonius Brenders headed up Daimler's investigation into the 1991-1992 Dakota
 19 which resulted in a recall in 2001. According to Mr. Brenders, the problem causing self shifting
 20 was leakage through the inner manual valve when the vehicle's shift selector was left on the flat
 21 land between park and reverse. As he explained:

22 We did find that as you migrated [the shift selector] from the
 23 reverse position of the vehicle, which is where the valve is
 24 completely open, and a position where it wasn't completely open
 25 and in park, [where it] should be completely closed, that you get
 26 some leakage and eventually, after you generate enough leakage
 27 and enough pressure, you actually have the transmission engage
 28 reverse gear. So it takes time.

6/15/06 Deposition of Tony Brenders at 212:1-2. Accord *id.* at 107:13-108:8; 180:3-181:2;
 182:7-20; 185; 186:12. (Exh. 1). Further, Mr. Brenders not only admitted the existence of the

1 defect, but he then admitted that Daimler's alleged "fix" for the defect in the form of a recall in
2 2001 which replaced a steel manual valve with an aluminum valve, did not prevent delayed
3 engagement of the vehicle's reverse gear while in false park, instead it just (hypothetically)
4 caused it to self shift into reverse *more slowly* when the vehicle was not fully warmed up. As Mr.
5 Brenders testified:

6 Q. So if I'm understanding what you're saying, you're saying
7 that when you tested these vehicles quantitatively against each
8 other, you found that it took longer for the vehicle with a steel valve
when it was warming up to self-shift into reverse than it took for an
aluminum valve?

9 MR. HADDAD: Object to form.

10 THE WITNESS: Essentially, under the same conditions,
11 that was what we found.

12 Q. But they would both still have a delayed engagement of
reverse?

13 MR. HADDAD: Object to form.

14 THE WITNESS: Depending on the situation that you can
15 try to put them in, you would - in the exact same location, the
16 aluminum valve would not bleed as much fluid as the steel valve
would is what I'm telling you.

17 BY MR. NEALEY:

18 Q. And so everything else being equal, replacing the steel valve
19 with the aluminum valve would lengthen the amount of time that it
would take for the vehicle to engage the reverse circuitry?

20 MR. HADDAD: Object to form.

21 THE WITNESS: Under the exact same situation.

22 Id. at 188:11-189:18. Yet, as Mr. Brenders testified, Daimler was unable to show there was
23 actually any increased "dwell time from the fix."

24 Q. Did you come up with a quantitative assessment of how
25 much extra delay in engagement of the reverse function you got
from the aluminum valve versus the steel valve?

26 A. Because it was dependent on the location and the location
27 did not always give you a repeatable result, we were unable to draw
that conclusion with any kind of statistical reliability.

28 Id. at 191:16-25. As a result, as Mr. Brenders testified, Daimler was unable to show any actual

1 change in vehicle response due to the "fix":

2 Q. But you guys, DaimlerChrysler, didn't independently run
3 any testing?

4 A. No, sir, we did not.

5 Q. So DaimlerChrysler has no information to either support or
6 contradict the notion that the switch from a steel to an aluminum
7 valve would change the dwell time before the reverse gear is
8 engaged when the vehicle is left in a position between park and
9 reverse?

10 A. We do not, to my knowledge, have that data.

11 Q. Do you have any data within DaimlerChrysler that would
12 show that the rate of injuries as a result of parked or [sic] reverse
13 incidents on the Dakota would be reduced by more than half by
14 substituting an aluminum valve for a steel valve?

15 A. I'm not familiar with that data.

16 Q. You know of no data that DaimlerChrysler has that would
17 show that the rate of injuries would be reduced by half or more as a
18 result of changing the steel valve to an aluminum valve?

19 MR. HADDAD: Form and foundation.

20 THE WITNESS: I'm not aware of any such data.

21 Id. at 208:7-16 and 208:20-209:10. As Mr. Brenders made clear during followup questioning by
22 APL's counsel, there was no possible difference from the "fix" when the vehicle was already
23 warmed up:

24 Q. Let me see if I understand this.

25 The theory was that during the warm-up period of the
26 automobile, that if you used an aluminum manual valve, that if the
27 car was going to shift from this position between park and reverse
28 into reverse, it would happen quicker?

29 A. You would get more immediate feedback with the
30 aluminum valve than you would with the steel valve.

31 Q. Is that what Mr. Nealey was talking about dwell time, the
32 time between when the person puts the shifter into a position
33 between park and reverse and the time that the car actually begins
34 to go into reverse?

35 A. Again, I don't want to speak to Mr. Nealey's definition, but
36 when we are conducting testing we did indicate - or we did find
37 that as you migrated from the reverse position of the vehicle, which
38 is where the valve is completely open, to a position where it wasn't

1 completely open and in park, you should be completely closed, that
2 you can get some leakage and eventually, after you generate enough
3 leakage and enough pressure, you actually have the transmission
engage reverse gear. So it takes time. So that would generate the
dwell time that Mr. Nealey talked about.

4 Q. And just so I'm clear, the difference between the two
5 materials, steel and aluminum, is only significant when the car is
warming up?

6 A. The key difference between those components is they're a
7 different rate of thermal expansion. One expands faster with
temperature than the other one does.

8 Q. And once the car is warmed up and they have both
9 expanded, then the dwell time presumably is very similar, if not the
same?

10 A. Assuming that you're at a steady state temperature, because,
11 as you know, temperatures heat up and cool down depending on the
12 load, and most of that heat is carried by the fluid in the
transmission. So it's not a static thing, it doesn't heat up and stay at
the same temperature. Heats up and cools down, depending on the
load placed on the transmission.

13 Id. at 214:15-216:12. As Mr. Brenders testified when asked the key question, Daimler could not
14 say the recall would have affected anything:

15 Q. Can you say whether or not this accident would have
16 happened if this vehicle had had the aluminum manual valve
instead of the original steel valve?

17 A. No ability to answer that question.

18 Id. at 230:9-13.

19 Since there is no evidence the vehicle which killed Mr. Mraz was not fully warmed
20 up, the introduction of any claims that the recall would have affected the vehicle response to
21 disprove Daimler's liability or attempt to prove APL's contributing negligence, would be
22 (1) prejudicial and misleading, (2) irrelevant, (3) inadmissible, and/or (4) hearsay by implying a
23 standard of negligence or liability that does not exist and/or purported facts that are rank hearsay.
24 Nor would such arguments have a tendency to prove or disprove any disputed fact in the
25 determination of the action regarding Defendant's duty to produce a non-defective automobile,
26 the breach of said duty, the cause of Plaintiffs' injuries, and the extent of those damages.
27 Therefore, Plaintiff asks that any such evidence be excluded.

EA96-006 AN "Park to Reverse" Overview

PE opened 06/23/95

EA opened 05/31/96

Complaint Overview

NHTSA (Shadle) Theory Development

NHTSA Proposed Survey Method

Parts/Process review history

Contingency Proposals Brainstorming

Decision on conducting the Survey

NHTSA position from DeMeter

03395

Confidential
Prepared for review with Counsel

Page 1

02/04/99

Complaint Overview

Model Year	Complaints (US)	Population (A500)	Rate / 100,000
1991	36	55,596	64.8
1992	67	67,411	99.4
Total	103	123,007	83.7

* Two VIN's remain unknown (VOQ only) and Two VIN's are for Canadian built vehicles

Trend Analysis.

All VOQ analysis - Competitive Overview (Chart)

Dakota "Noise" level slightly higher than competitive

Subject year Dakota rate an order of magnitude greater than competitive

Complaint Vehicles

Date of Complaint (Chart)

Highest complaints after EA date (28 within 6 months)

Only 5 complaints within 6 months of PE opening

Age of Complaint at Complaint Date (Table)

A small number of complaints (18 total, 6-'91, 12-'92) are obviously "aged" and likely the result of publicity.

Sales Codes - DGN - A500 Transmission (Table - List by VIN)

Calculated for the complaint vehicle population the percentage of representation for each vehicle sales code and compared it to the population rate for the same sales codes.
No other codes seem significant.

State Accident data - Prepared by Failure Analysis. (Draft Analysis)

Accident data collected from 17 States which keep such data.

PRO

Shows Dakota in middle of the pack

CON

Only lists 15 "crashes in which driverless vehicles run away backwards." For all of 1987-1995 Dakotas.

A number of crashes in the complaint database clearly indicate that no Police report was filed.

Confidence bands are only against four States with reliable data.

03396

NHTSA (Shadle) Theory Development

Early Focus

- NHTSA originally was looking for higher shift force peaks to occur during the reverse to park shift, that would cause an operator to stop "thinking they had obtained park"
- NHTSA requested all drawings associated with steering column and controls linkages. All design changes were reviewed and established as unrelated.
- Chrysler conducted testing. Successfully showed through testing that no "peak" forces exist in the shift from Reverse to Park
- Shift Forces
 - Lift approximately 3.25 lbs
 - Rotation approximately 5.5 lbs (lowest average force in the peer group)

Current NHTSA Hypothesis:

The high rate of complaint for the subject vehicles can be explained as follows:

- *The flat on the rooster comb (inner manual lever) is a place where an operator can mistakenly place the shift lever while shifting to park with the engine running.*
NHTSA has assumed that all operators of Dakota vehicles have the same propensity for placing the shift lever on the flat spot in the rooster comb. Only operators of 1991 and 1992 vehicles are affected by doing this. This portion of the hypothesis is completely arbitrary but must be accepted for this vehicle explanation to exist. No vehicle reason can be put forth that would explain why an operator would stop at this point.
- *Once the operator makes the mistake, the vehicle will dwell in this position long enough to exit the vehicle but will ultimately move under power.*
NHTSA has arbitrarily determined the defective dwell period to be 3 seconds or greater. No data has been suggested to validate this number. Exit time is entirely human factors dependant. We have a video that documents exit times as low as 1 second.
- *At this point the transmission is slowly building pressure in the reverse hydraulic circuit. Once sufficient time has elapsed and sufficient pressure has built, the vehicle begins to move.*
As the manual valve closes, the opening for transmission fluid to flow becomes exponentially smaller, so the volume of flow exponentially approaches zero. This would mean that the time required to engage reverse would correspondingly increase to infinity. (see NHTSA hypothesis chart) Creating long delay times. Since the relationship is between reverse delay and shifter position, Scott has suggested that the size of the "3 second or greater" window may also be the "defect factor." He also has suggested that a limiting factor could be is the location where the park pawl may engage, preventing the vehicle from moving even though it is in hydraulic reverse.

Testing (FAA and NHTSA) and Computer simulation (VSA) have determined that there is a range of variation of reverse hydraulic engagement between park and reverse. The Pawl engagement point is variable and not repeatable measurable.

03406

NHTSA Proposed Survey Method

(attached)

Samples

Test four populations to statistical significance:

1. Prior to the subject vehicles, 1988 and 1989
2. Subject, non-complaint vehicles
3. Subject complaint vehicles
4. Post the subject vehicles, 1993 and beyond.

Method:

Artificially positioning the manual lever at linear defined discrete intervals, establish the reverse engagement delay time corresponding to each point. Repeat each point five times to reduce variability.

Expected outcome:

The number of points where delay times exceeds 3 seconds will be greater in the second group.

Status

NHTSA has sent a refined survey protocol. They have run the many variations on the method several times and feel confident in it.

We have reviewed with transmission, controls and transmission test and have very low confidence in repeatability and reliability of the test result.

Pro's to doing the Survey

It would identify a performance difference between the subject vehicles.

Con's

Repeatability suspect

Outcome does not result in a potential for field action

Product Liability concerns about giving credence to a hypothesis we continually challenge.

Parts/Process review history

A complete transmission change history has been generated by engineering through drawing change block records. Kokomo transmission plant also provided an independent design process, and supplier histories. This history matched the engineering history.

No changes or set of changes have been identified that relate to the transmission that could explain the complaint rate in the subject vehicles.

Independent Review

Product Liability has independently produced a similar chart that clearly shows no design change issues. (see chart)

Plant Visit Result

A Kokomo Plant Visit was conducted on July 27, 1998 to identify potential Process Changes. The visit determined that most of the equipment that produced the subject vehicles is still in use today. Some of the equipment experienced a major overhaul after 1993. The end of line check validates that the transmission is not in both park and reverse in either the detented park or reverse positions. No process controls exist that would control transmission operation when the manual lever is placed between the park and reverse detent positions.

Confidential
Prepared for review with Counsel

Page 4

02/04/99

03393

MRAZ_ID004424

Contingency Proposals Brainstorming

Warning Buzzer

Concept; a warning buzzer would sound if a vehicle door were opened with the key in the on position and the park/neutral switch not engaged. The three switches and buzzer exist on the vehicle, concept would be to identify wiring and logic to implement.

Reduce Delay Time through earlier engagement of the park pawl

Concept; reduce the Park Rod length on a vehicle by vehicle basis to minimize the size of the window for delay. Would require an adjustable park rod and test method. Risk includes not being able to get out of park into Reverse without going to Drive first.

Reduce Delay Time through faster reverse onset time

Concept; change the manual valve/body to reduce maximum dwell time while the fluid bleeds to reverse. Would require a new design valve body.

Decision on conducting the Survey

Conduct survey

- Possible Outcome 1: The subject vehicles are found to be statistically different.

Action:

- Conduct one of the contingency proposals on the subject population.

Significant Risks:

- Survey is focused on performance and not a design/build characteristic. This does not lend the outcome to an action.
- Product Liability credence to a concept we have long ignored.

- Possible Outcome 2: The subject vehicles are found to be no different but the complaint vehicles are found to be different.

Action:

- Conduct an inspection for the performance characteristic on the subject population, and change the vehicles that display unacceptable performance.

Significant Risks:

- Survey is focused on performance test would have to be designed for dealers to conduct.
- Product Liability credence to a concept we have long ignored.

- Possible Outcome 3: The subject and complaint vehicles are found not to be statistically different from the non-subject vehicles.

Action:

- Unknown.

Significant Risks:

- Entire population of A500 transmission vehicles at risk, 926,500 vehicles from 1988 to 1994 AN, AB, AD, ZJ

Opt to not conduct survey

- NHTSA would likely conduct a limited survey.

Significant Risk:

- DaimlerChrysler will not be able to review or refute survey data without going to court to fight an ordered recall.

NHTSA position from DeMeter

03394

Suggestion

Action:

Conduct the warning buzzer action as a safety recall based entirely on the anomalous complaint rate in the subject years identifying the exact functional defect as the operator did not place the lever in park, set the brake or turn off the engine.

Defect

The defect that could be that the operator is not placing the transmission lever firmly in the Park position.

This is the basis for the NHTSA hypothesis.

Advantage:

This could eliminate all the disagreement about placing the lever between park and reverse and just focuses on the correct placement not being achieved by the operator.

Justification:

The wording of the law seems less than exact and allows for this position. If complaint rates are prima-facie evidence of a defect, why not just defer to that definition.

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Confidential
Prepared for review with Counsel

Page 6

02/04/99

MRAZ_ID004424

Ultradrive

From Wikipedia, the free encyclopedia

The **Ultradrive** is a 4-speed automatic transmission from Chrysler Corporation. It has been produced since 1989 and is commonly paired with the Chrysler 3.3 engine in transverse engined cars. The Ultradrive and its descendants are produced at Kokomo Transmission in Kokomo, Indiana.

Contents

- 1 History
- 2 Technical information
- 3 A604 to 41TE
- 4 A604/41TE
 - 4.1 41AE
- 5 A606/42LE
- 6 42RLE
- 7 40TES/41TES
- 8 62TE
- 9 See also

Ultradrive

Manufacturer	Chrysler Corporation DaimlerChrysler
Also called	41TE/A604 41AE/A604 42LE/A606 42RLE 40TES 41TES 62TE
Production	1989-present
Predecessor	A670
Class	4-speed automatic
Related	PowerFlite

History

The Ultradrive was a significant technological advancement in transmission operation, as it was one of the first electronically-controlled automatics. It pioneered many now-common features, such as adaptive shifting: the computer would optimize shifting based on the driving style of the operator. Unfortunately it earned a reputation for being unreliable, especially in Chrysler's minivans, which had high failure rates. A misprint in both owner's manuals and transmission fluid dipsticks in early models advocated the use of Dexron II transmission fluid in the event the required fluid (Type 7176, also known as ATF+3) was not available. Dexron does not provide the necessary fluid properties for proper operation of the transmission, often resulting in malfunction (commonly deferring the computer into the notorious "limp-home" mode, under which the transmission will not shift out of second gear) or complete failure of the unit. As a result, the older hydraulically-controlled 3-speed automatic was later made available on vehicles equipped with Mitsubishi's 6G72 V6 engine, which was usually paired with the Ultradrive during its first few years.

On paper, the A604 was a great innovation. When working correctly, it will shift smoothly and perfectly, thus providing a soft, comfortable ride often associated with high-end luxury cars. Also, electronic transmissions lack bands to adjust.

The torque converter measured 9.5 inches in diameter and was mounted to the flywheel by a flexible drive plate. The transaxle was cooled through an oil-to-water heat exchanger in the collector tank on the radiator, and/or a standard oil-to-air heat exchanger.

The Ultradrive has evolved dramatically over its long years of production. Countless changes, both electrical and mechanical have been made in an attempt to improve the reliability of the A604. Such changes include different valve bodies, solenoid packs, sensors, etc. One of the better improvements was the introduction of a flash-programmable TCM, which monitors the operator's driving habits, and sets up a custom shifting pattern for the driver.

The A604/41TE transmission also uses 20 fewer parts than its 3-speed siblings.

Mitsubishi's Sportronic transmission was a modified version of the 41TE.

Technical information

There are 4 different types of units. The differences between the types are the bell housing bolt pattern and valve body assemblies. The first type was used for the 2.5 L engine, second type for the 6G72 V6, third type for the 3.3 L and 3.8 L V6s and the fourth type for the 2.0 L and 2.4 L engines.

A604 to 41TE

The most common problems^[citation needed] with A604 transmissions are poor shifting quality and sudden locks into second gear ("limp-home" mode), even during highway driving. Nine design changes were made^[citation needed] in an attempt to fix clutch failure, and four were directed to "shift busyness", or excessive shifting on hills.

After much pressure from the Center for Auto Safety^[citation needed], Consumer Reports and others, Chrysler promised^[citation needed] to waive the \$100 deductible in the warranty, provide loaners, and buy back any cars with Ultradives that could not be fixed. Chrysler ran an unprecedented campaign^[citation needed] to contact all owners of cars with Ultradives to find and fix problems...

A604/41TE

Applications:

- 1989-1993 Chrysler New Yorker
- 1989-1995 Chrysler LeBaron
- 1989-present Dodge Caravan
- 1989-1993 Dodge Daytona
- 1989-1993 Dodge Dynasty
- 1989-1994 Dodge Shadow
- 1989-1994 Plymouth Sundance
- 1989-1994 Dodge Spirit
- 1989-1994 Plymouth Acclaim

- 1989-2000 Plymouth Voyager
- 1990-1993 Chrysler Imperial
- 1990-1993 Chrysler New Yorker Fifth Avenue
- 1990-present Chrysler Town and Country
- 1992-1994 Plymouth Duster
- 1995-2000 Chrysler Cirrus
- 1995-2006 Chrysler Sebring
- 1995-2000 Dodge Avenger
- 1995-2006 Dodge Stratus
- 1996-2000 Plymouth Breeze
- 2000-2003 Chrysler Voyager
- 2001-present Chrysler PT Cruiser
- 2002-2005 Dodge Neon
- 2004-2008 Chrysler Pacifica
- 1995-1999 Mitsubishi Eclipse Non-turbo

41AE

The **41AE** is a variant of the 41TE that was originally used for the all-wheel drive variants of the minivans, and was also used for the Chrysler Pacifica from its 2004-model-year introduction until the model was discontinued in 2008.

Applications:

- 1991-2004 Chrysler Town and Country
- 1991-2004 Dodge Caravan
- 1991-2000 Plymouth Voyager
- 2000-2003 Chrysler Voyager
- 2004-2008 Chrysler Pacifica

A606/42LE

The **42LE** was an upgraded version of the 41TE modified for longitudinal engines. It debuted in 1993 on the LH cars. It is strengthened with a reworked final drive unit, barreled axle shafts, and upgraded clutch packs. The major modification to a N-S drivetrain while maintaining front wheel drive was accomplished by adding a differential to the transmission case, which was driven by means of a transfer chain from the output shaft of the low/reverse clutch assembly at the rear of the transmission case.

Applications:

- 42LE
 - 1999-2004 Chrysler 300M
 - 1993-2004 Chrysler Concorde
 - 1994-2001 Chrysler LHS
 - 2001-2002 Chrysler Prowler (Rear Mounted)
 - 1994-1996 Chrysler New Yorker

- 1993-2004 Dodge Intrepid
- 1993-1997 Eagle Vision
- 1997-2001 Plymouth Prowler (Rear Mounted)

42RLE

The 42LE was modified in 2003 as the **42RLE**, originally for the then-new Jeep Liberty. It is a 42LE transaxle, modified for RWD use by removing the integral differential and transfer chain. Power flow exits the rear of the now transmission. The case has also been modified. This transmission is still in production for several models.

Applications:

- 42RLE
 - 2005-present Chrysler 300
 - 2006-present Dodge Charger
 - 2004-present Dodge Dakota
 - 2004-2009 Dodge Durango
 - 2005-2008 Dodge Magnum
 - 2007-present Dodge Nitro
 - 2003-present Jeep Liberty
 - 2003-present Jeep Wrangler
 - 2009 Dodge Challenger V6

40TES/41TES

The 40TES and 41TES are upgraded replacement versions of the 41TE, which were first introduced with the 2007 Chrysler Sebring. The 40TES is used with the 2.4 L *GEMA* I4 engine while the 41TES is used with the 2.7 L *EER* V6. The difference between the TES and TE is the TES has a shallower bell housing, and the torque converter is more compact. This was done for the revised packaging of the 2007 Sebring's engine compartment.

Applications:

- 2007-present Chrysler Sebring
- 2008-present Dodge Avenger
- 2009-present Dodge Journey

62TE

The 62TE is a six-speed derivative of the 41TE first introduced with the 2007 Chrysler Sebring, and used on the 3.5 L *EGJ* V6. Applications also include the Pacifica (4.0 L), RT Platform minivans (3.8 L & 4.0 L), and the Dodge Journey (3.5 L).

Applications:

- 2007–2008 Chrysler Pacifica
- 2007–present Chrysler Sebring

- 2008–present Dodge Avenger
- 2008–present Chrysler Town and Country
- 2008–present Dodge Grand Caravan
- 2009–present Volkswagen Routan
- 2009–present Dodge Journey

See also

- List of Chrysler transmissions

Retrieved from "<http://en.wikipedia.org/wiki/Ultradrive>"

Categories: Chrysler transmissions

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3/28/2010

NHTSA ODI - Defects

S10-101110-004



OFFICE OF DEFECTS INVESTIGATION (ODI)

Defects - Search Results

1 Record(s) Displayed.

Report Date : **March 28, 2010 at 12:31 AM**

NHTSA Action Number : **EA91010**

NHTSA Action Number : EA91010

NHTSA Recall Campaign Number : N/A

Make / Models :

Model/Build Years:

CHRYSLER / E CLASS
CHRYSLER / LEBARON
CHRYSLER / LEBARON GTS
CHRYSLER / NEW YORKER
DODGE / 400
DODGE / 600
DODGE / ARIES
DODGE / CARAVAN
DODGE / GRAND CARAVAN
DODGE / LANCER
DODGE / MINI RAM VAN
PLYMOUTH / CARAVELLE
PLYMOUTH / GRAND VOYAGER
PLYMOUTH / RELIANT
PLYMOUTH / VOYAGER

1983-1984
1982-1987
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1984-1990
1985-1987
1984-1990
1985-1988
1984-1990
1981-1990
1984-1990

Manufacturer : CHRYSLER GROUP LLC

Component :
POWER TRAIN

Date Investigation Opened : December 10, 1990

Date Investigation Closed : December 31, 1991

Summary:

There is no summary currently available

ODI RESUME

INVESTIGATION: EA91-010

DATE CLOSED : 31-DEC-91

SUBJECT : GEAR SHIFT LEVER FAILURE
 PROMPTED BY : DP90-014

ENGINEER : L. STRICKLAND *C. Strickland*

MFR: : CHRYSLER CORPORATION

MODEL(S) : FRONT WHEEL DRIVE MODELS WITH AUTOMATIC TRANSMISSION, 4-CYL
 ENGINE, AND COLUMN MOUNTED SHIFT LEVER

MODEL YR :

SYNOPSIS : ALLEGED FAILURE OF TRANSMISSION PARK LOCK SYSTEM ALLOWS
 INADVERTENT SHIFT FROM PARK TO REVERSE, PERMITTING VEHICLE
 ROLLAWAY.

VEHICLE POPULATION: 3.84 MILLION

BASIS:

FAILURE REPORT ANALYSIS
TOTALS

COMPLAINTS:	318
ACCIDENTS :	212
INJ ACCID :	109
# INJURED :	111
FAT ACCID :	7
# FATALS :	7
OTHER :	0

DESCRIPTION OF OTHER:

ACTION: THIS ENGINEERING ANALYSIS HAS BEEN CLOSED.

BRCH CHF

P. Chert Boyd
31-Dec-91

DATE

DIV CHF

Laura Brown
31 Dec 91

DATE

Acting
 OFC DIR

W. D. [Signature]
12/31/91

DATE

SUMMARY: REFER TO THE ENGINEERING ANALYSIS CLOSING REPORT.

EA91-010

Page 1

ENGINEERING ANALYSIS CLOSING REPORT

SUBJECT: ALLEGED MALFUNCTION OF AUTOMATIC TRANSMISSION
PARK LOCK SYSTEM IN 1981-1990 CHRYSLER MOTORS
CORPORATION VEHICLES

EA No.: EA91-010 **Date Opened:** 10-DEC-90 **Date Closed:** DEC 31 1991

BASIS:

The Center for Auto Safety (CAS) petitioned the National Highway Traffic Safety Administration (NHTSA) by letter dated July 16, 1990, to initiate investigation of alleged malfunctions of the park lock systems installed in certain 1981 through 1989 model year vehicles produced by the Chrysler Motors Corporation. The vehicles were identified as front wheel drive models equipped with automatic transmissions and steering column mounted gear shift levers. The petition (DP90-014) alleged that such malfunctions allow the automatic transmissions to inadvertently shift from the "Park" position into Reverse gear, resulting in incidents in which unattended vehicles roll away. The petition claimed that 76 such incidents had resulted in property damage and injury accidents, as well as two fatalities.

An analysis of information relevant to the petition was conducted and, the petition was granted. The subject EA was initiated on December 10, 1990, to evaluate the matter more thoroughly. In response to the petitioner's request dated July 31, 1990, the investigation was expanded to include the 1990 minivan models.

THE ALLEGED DEFECT:

The common description of the alleged defect by consumers is that the
". . . transmission jumped out of Park and went into Reverse. . . ."

This investigation, however, considers the alleged defect from a broader perspective in order to establish whether such a defect exists in fact, and if so, to determine its precise nature and cause. In this EA, the alleged defect is therefore defined as failure of the automatic transmission to properly engage or lock in the "Park" position when shifted to that position by the vehicle operator.

EA91-010
Page 2

DESCRIPTION OF VEHICLE SYSTEM:

The subject vehicles of this EA are 1981 through 1990 front wheel drive models produced by the Chrysler Motors Corporation, each equipped with a four-cylinder engine, an automatic transaxle, and the gear selector lever mounted on the steering column. Vehicles with the shift lever mounted in a floor console are not included in this investigation.

The basic transaxle installed in the subject vehicle group is identified as Model A-413, and the model A-470 transaxle is available as optional equipment. Both transaxles combine a torque converter, fully automatic 3-speed transmission, final drive gearing, and differential into a front wheel drive system. The A-413 model is designed and built by Chrysler and is installed in vehicles using 2.2 liter and 2.5 liter engines, which are also built by Chrysler. The primary difference between the two transaxles is that the bell housing of the A-470 is sized to accommodate mounting of the transaxle to a 2.6 liter, 4-cylinder engine which is designed and built for Chrysler by an outside supplier. The fully automatic transmissions and shift mechanisms are identical in both transaxle models, for vehicles with column mounted shift levers.

The automatic transmission gear selector system includes the entire mechanism, from the gear selector lever to the internal components of the transmission. The gear selector mechanism transmits the selecting action of the vehicle operator to the transmission.

Details of the gear selector mechanism installed in the subject vehicles are shown in Figures 1 through 3. When the vehicle operator shifts to a selected gear, tactile feedback is provided by a combination of component loads and frictional forces within the shift mechanism. When any gear position is selected, the shift lever slides over a gearshift lever gate located inside the steering column housing. For each transmission gear position there is a corresponding position on the gate. The gate is designed so that in order to shift from Reverse to Park, the vehicle operator must first pull the shift lever toward the steering wheel, then apply a counterclockwise force to the shift lever, i.e., push the lever upward toward the windshield. The limit of rotational movement of the shift lever is established by a hard stop on the shift gate. The gear selector indicator provides visual validation of the selected gear position.

The rotational shift input force by the vehicle operator (and the gear selection) is transmitted to the transmission as a linear displacement via a cable which extends from the base of the steering column to a bellcrank which is attached to the manual lever of the transmission (Figure 1). Linear movement of the cable is converted to a rotational

EA91-010

Page 3

force by the bellcrank which rotates with the manual lever assembly and "rooster comb" about a common center (Figure 4). The rooster comb contains a detent position for each gear that corresponds to a position on the shift lever gate.

Each gear position on the rooster comb is locked by a spring loaded detent roller. Thus, when the vehicle operator selects a transmission gear, he also selects a position on the rooster comb. This action also selects the position of the manual valve which opens or closes a series of internal ports in the transmission, permitting or preventing the flow of fluid through the proper hydraulic circuits within the transmission. This action, in turn, controls the delivery of engine power to the driving wheels of the vehicle.

When the transmission is placed in the Park position, the manual lever and rooster comb are rotated so that the detent roller engages the park position of the rooster comb. Simultaneously, rotation of the manual lever assembly linearly displaces the parking rod, actuating the park pawl and engaging the park gear (Figure 5). In this position, the transaxle output shaft is mechanically locked to prevent rotation of the powered wheels. In a properly adjusted gear selector mechanism, the Park position of the shift lever gate will correspond to the Park position of the rooster comb and engagement of the park gear of the transmission. The key can be removed from the ignition switch only when the gear selector is in Park.

The transmission park lock system is properly engaged when the park pawl engages the teeth on the park sprag gear. When shifted into Park, these teeth either engage or butt against each other; full engagement effects park lock. If the park pawl and the park gear teeth butt, the pawl will seat in the teeth of the park gear only after slight vehicle movement rotates the park gear and permits proper lineup of the teeth with the pawl.

FAILURE/MALFUNCTION MODES:

Several potential failure or malfunction conditions are considered in this EA, as follows:

1. Mechanical disengagement of the transmission park lock system so as to release the powered wheels and allow the vehicle to move in a rearward direction.
2. Mechanical or hydraulic shift of the transmission from the Park position into reverse gear, resulting from fluid pressure in the reverse gear circuit of the transmission, providing engine power to the driving wheels.

EA91-010
Page 4

3. False park conditions that may provide tactile or visual indication to the driver that the transmission has been properly shifted into the Park position when, in fact, it has been shifted to an intermediate position between reverse and Park.

This false park indication could potentially result if either of the following were observed by the driver:

- a. Friction in the transmission shift linkage produces a peak in the input force required to shift from reverse to park before the true park position is selected.
 - b. Misadjustment or plastic deformation of any of the components of the transmission shift linkage so that the gear selector indicator shows the Park position to have been selected when, in fact, the transmission park lock system has not been engaged.
4. Performance characteristics of the vehicles that could, under varying conditions of static inertia or engine load, cause the transmission to accidentally shift from Park into reverse gear.

This EA addressed all of the potential conditions cited above, in an effort to determine whether any of these conditions suggest a safety-related defect in the design or performance of the subject automatic transmission park lock systems.

This EA is limited in its concern to inadvertent shift of the transmission from Park into reverse gear. There are known consumer reports of malfunctions at other points in the "PRNDL" shift sequence of automatic transmissions, however, this investigation does not address those reported problems.

CORRESPONDENCE:

<u>Supplement</u>			<u>Confidentiality</u>		
<u>NHTSA to Requested</u>	<u>Mfr. to Response</u>	<u>Mfr. to NHTSA Supplement</u>	<u>Date Requested</u>	<u>Date NCC Response</u>	<u>Items Confidential</u>
07/03/91	10/18/91	N/A	N/A	N/A	N/A

EA91-010

Page 5

STATUS

PROBLEM EXPERIENCE:

	EA Opened	EA Closed
<u>Owner/Field Reports</u>	269	318
<u>Lawsuits</u>	17	23
<u>Accidents/ Property Damage</u>	199	212
<u>Injury Accidents/ Injuries</u>	90/ 92	109/ 111
<u>Fatal Accidents/ Fatalities</u>	4/ 4	7/ 7

VEHICLE POPULATION:

The following tabulation shows the makes, models, and model years of the subject vehicles equipped with A-413 and A-470 automatic transmissions and column mounted gear selector levers produced by Chrysler for domestic sale. All of the subject vehicles are equipped with 4-cylinder engines. They represent 65.3 percent of the total of the given makes and models produced for the model years in question. The remaining 34.7 percent of the total production are vehicles equipped with console shift levers or six cylinder engines, or both.

YEAR/MAKE/MODEL	POPULATION
1981-1989 Dodge Aries	816,000
1981-1989 Plymouth Reliant	991,000
1982-1983 Dodge 400	28,000
1984-1986 Dodge 600 - 2DR	14,000
1983-1987 Dodge 600 - 4DR	150,000
1982-1987 Chrysler Lebaron	316,000
1985-1987 Chrysler Lebaron GTS	33,000
1985-1987 Dodge Lancer	33,000
1985-1988 Plymouth Caravelle	134,000
1983-1988 Chrysler New Yorker	282,000

EA91-010

Page 6

1983-1984 Chrysler E-Class	71,000
1984-1990 Dodge Caravan	474,000
1987-1990 Dodge Grand Caravan	2,000
1984-1990 Dodge Caravan C/V 112WB	62,000
1987-1990 Dodge Caravan C/V 119WB	1,000
1984-1990 Plymouth Voyager	435,000
1987-1990 Plymouth Grand Voyager	2,000
1990 Chrysler Town and Country	0

TOTAL 3.84 Million

WARRANTY:

Warranty information was not considered relevant to this investigation and was not acquired.

SERVICE BULLETINS:

No service bulletins, advisories, or related literature were reported by Chrysler to have been issued regarding the alleged defect in the subject vehicles.

PART SALES:

Part sales information was not considered relevant to this investigation and was not acquired.

DESIGN, MATERIAL, AND/OR PRODUCTION MODIFICATIONS:

The following design, materials, and/or production modifications were identified as potentially relevant to this EA:

1. October 1982 - added an adjustment preload spring to the shift cable at the transaxle end to eliminate the need for a special adjustment tool at the assembly plant.
2. July 1983 - changed specifications for heat treatment of the park sprag rod to require hardening of the portion of the rod under the pawl actuating bullet, and to specify more positive control of removal of the heat treat scale from the rod. This was done to reduce variability of friction in the park sprag system.

EA91-010
Page 7

3. July 1983 - eliminated forging of the park sprag pawl to allow stamped versions only. The superior surface finish and dimensional control offered by the stamped version also reduced the variability of friction in the park sprag system.
4. February 1990 - changed details in the sliding components of the PRNDL indicator in S-body (mini-vans) vehicles to increase sliding friction. This was done to ensure positive alignment of the indicator with the display gear positions so that severe vibration inputs would not cause movement of the indicator.

In November 1991, a meeting of NHTSA engineers and Chrysler Automotive Safety staff and product development personnel disclosed an additional production modification. A new vendor began supplying the shift cable to Chrysler at the start of the 1988 model year production. The new vendor produced a cable with a slightly modified configuration from that of earlier production. Although the new cable was physically different from the earlier version, Chrysler's performance specification for the cable (including allowable friction) was not altered. The new cable was designed to be completely interchangeable with the earlier version.

TESTING: Contractor: Vehicle Research and Test Center (VRTC)

Date of Test Request: 8/21/91

Description: A test plan was devised to accomplish the following objectives:

1. Evaluate whether the transmission park lock system is subject to malfunction as a result of component wear and/or deterioration.
2. Evaluate whether the "feel" or tactile feedback characteristics of the gear shift lever could give a false indication to the driver that the Park position has been properly engaged.
3. Compare the performance of the transmission park lock system to peer vehicles.

Results: The VRTC test program included several areas of inquiry and evaluation.

EA91-010

Page 8

1. Several central Ohio area residents who had reported the alleged defect in their personal vehicles were identified and contacted. Three of these consumers were interviewed and their vehicles inspected. None of these vehicles was found to exhibit a malfunction as had been described by the owners. One vehicle from this group was used as a test vehicle. After all in-vehicle tests were completed, the transmission and shift mechanism were removed, disassembled and inspected. No evidence of component failure, or of unusual wear or deformation was found.
2. A complete gear shift mechanism of the subject type in this investigation was acquired, cut away at key locations on the linkage, and affixed to a stationary mount so that the various component displacements and actions during shifting could be observed.
3. Visual inspections enabled a qualitative determination that the input force levels required to plastically deform any of the components in the shift mechanism would exceed the physical capabilities of most vehicle operators. Further, the forces necessary to achieve such deformation are so abnormally high that any reasonable vehicle operator would probably have concern about bending or breaking the shift lever, and would almost certainly realize that the forces far exceed "normal" shifting actions.
4. Tests were conducted to determine and compare the average force required to shift the transmission from one gear position to the next position in the PRNDL sequence. Several vehicles were employed for these tests, as follows:
 - o 1989 Plymouth Voyager, 58.4 K miles, vehicle reported to have exhibited P-R malfunction
 - o 1984 Plymouth Reliant, 117.0 K miles, no malfunction reported
 - o 1988 Ford Taurus, 68.2 K miles, no malfunction reported
 - o 1986 Buick Electra, 39.3 K miles, no malfunction reported
 - o 1987 Toyota Camry, 72.2 K miles, floor mounted shift lever, no malfunction reported

EA91-010

Page 9

The results of the tests conducted with the engine on are summarized in the table below. The shift forces measured in pounds with the engine off were consistently lower than with the engine on. Shift force in the test vehicles was determined by using hand-held force gauge with digital readout, with the force applied approximately 1.5 inches from the end of the shift lever. The force was applied in the direction of normal driver shifting action, at quasi-static loading rate. This procedure was followed in both directions of the PRNDL sequence, and the averages of three readings are reported below.

SHIFT FORCE REQUIRED, POUNDS

Shift Position	L-2/1-2	2-D	D-OD*	OD-N/D-N	N-R	R-P
89 Voyager	6.2	6.3	--	5.8	6.3	9.2
84 Reliant	7.2	6.0	--	5.2	4.5	6.5
86 Electra	10.8	8.7	8.3	7.7	7.0	7.5
87 Camry	6.3	6.0	--	6.2	6.0	6.2
88 Taurus	--	7.3**	7.5	7.3	7.3	7.0

* OD denotes OVERDRIVE in shift sequence

** Value given for 1-D in Taurus shift sequence

The measurements of required shift force produced several significant findings. First, while the actual values of force varied from one vehicle to another and at various points in the PRNDL sequence, they are all of the same order of magnitude and the variations are small. Second, the values are small in comparison to the physical capabilities of most drivers. Third, different transmission designers appear to use different relative values of shift forces required at various points in the shift sequence. There is no known evidence, however, to show that any one such force is more or less "correct" than any other.

The Chrysler-produced vehicles included in the test group required a small increase in the force required to shift from reverse to Park, as compared to some of the other vehicles in the sample. However, the data do not suggest any significant difference in required shift force among these vehicles for two reasons. First, the absolute values of the increase in force observed in all vehicles are much lower than the forces humans can impose. As such, the measured differences are not perceptible to most drivers.

EA91-010
Page 10

Second, the margin for error in the measurements has not been quantified, and test-to-test variability has not been established, although the test procedure used was simple, consistent and repeatable.

Another set of tests conducted at VRTC show that the transmission can be shifted to a position between Reverse and Park (detent roller below the peak on the rooster comb), provided that the driver is willing to spend the time and effort to do so through a trial and error process. The tests also showed that, after purposely shifting the transmission to such an intermediate position, almost any external disturbance of the vehicle (e.g., air conditioning cycles off, door is slammed shut), is sufficient to cause the detent roller to fall into the reverse position, allowing the vehicle to roll away under power. Similarly, tests showed that with the transmission shifted to such an intermediate position, it is possible that hydraulic leakage within the manual valve can occur so that pressure begins to build up within the reverse fluid circuit, and that when this pressure reaches about 25 psi, the vehicle will roll away under power. These results were characteristic of all vehicles tested, however, so no defect was apparent in the subject Chrysler vehicles.

ADDITIONAL INFORMATION:

The number of complaints of park lock system malfunctions received from all sources represents a small proportion of the affected vehicle population. When the number of opportunities for such an event is considered, even qualitatively, it is apparent that such occurrences are rare. The 318 incidents reported in this investigation for a vehicle population of 3.8 million, represent an incident report rate that is an order of magnitude smaller than the rate found in a previous NHTSA investigation of a similar malfunction involving vehicles produced by the Ford Motor Company (C78-02, in which 23,000 incidents were reported for a population of 21 million vehicles). From a statistical perspective, therefore, the number of incidents reported to have occurred over a total exposure period of more than 10 years, does not suggest that a trend of failure or malfunction has been demonstrated in the subject vehicles. On the contrary, the number of incidents reported in this EA suggests that each event represents a random, isolated occurrence.

NHTSA representatives inspected the vehicles owned by seven complainants of park lock system malfunctions (Russell, Fink, Moore, Bidwell/Stalder, Smith, Ostrowski, and Burk). Several other vehicles, within the subject vehicle group not reported to have experienced a park lock problem, were also inspected in search of any clue of a potential mechanical causal factor. Detailed reports of two of the incidents, including one case involving a fatality, were prepared and placed in the investigative file.

EA91-010
Page 11

Inquiry was made into the details of a second fatal incident (Tanaka), but the vehicle was not readily available for inspection due to its geographic location. In the absence of specific causal information in the other five incidents, detailed reports were not prepared, although one of these vehicles was used as a test vehicle at VRTC. In the total of 12 vehicles inspected by NHTSA engineers, none showed evidence of a malfunction, and no deficiencies in the design or performance of their gear selector mechanisms were detected.

In an effort to assess whether the subject vehicles showed a history of accidents potentially resulting from malfunctions of a transmission-related nature, NHTSA'S National Center for Statistics and Analysis (NCSA) conducted searches of their data files in support of this investigation. The Fatal Accident Reporting System (FARS) files were searched for listings of fatal accidents involving passenger cars, light trucks, and minivans which occurred during calendar years 1981 through 1990, involving certain vehicle makes with rear impact point and no driver present in the vehicle at the time of the accident. The FARS file search disclosed listings of four fatal accidents involving Chrysler vehicles, as compared with 43 fatal accidents involving Ford models, 46 involving Chevrolet models, 52 involving Buick/Cadillac/Pontiac/Oldsmobile models, and 12 involving Honda models.

A review was also conducted of individual state data files for any notation on the police accident reports which may have identified a "defective transmission," or any defect related to the transmission. Texas was the only state with such a notation, and there were insufficient data to draw any conclusion regarding the accident involvement of 1981 through 1990 model year passenger cars, light trucks, and light vans produced by Chrysler Motors, General Motors, Ford, and Honda.

NCSA data for the six CARDfile states (Indiana, Maryland, Texas, Michigan, Pennsylvania, and Washington) were also examined for calendar years 1987-1989. The data analysis included passenger cars, light trucks, and light vans for comparison of two vehicle groups: (1) Chrysler, Dodge, and Plymouth, and (2) All Makes. The analysis was conducted to investigate the "type 611" accident, i.e., one vehicle is moving in a reverse direction and strikes another vehicle, object, pedestrian, or pedacyclist. This accident type includes the situation in which a vehicle may unintentionally make a backing maneuver where there was potentially a slippage of the transmission from Park to Reverse. Although this accident type includes causal factors other than possible malfunction of the transmission park lock system, it was searched because it represents the only potentially relevant accident scenario for which comparative data were available.

EA91-010

Page 12

The CARDfile analysis disclosed that 3,191 Chrysler vehicles were involved in type 611 accidents, which accounted for 0.9 percent of all crashes involving this vehicle group. In comparison, there were 37,506 vehicles of all makes involved in such accidents, which accounted for 1.0 percent of all crashes involving all makes during the time period studied. Thus, it is clear that Chrysler vehicles are not over-represented, in comparison to all other vehicle makes, in their involvement in collisions while moving in a reverse direction due to all causes, including possible transmission park lock system malfunctions. Although a more relevant analysis would have entailed review of crashes with no driver present in the vehicle, there were insufficient data available to enable this additional study. Thus, based on analysis of all available real world accident data, there is no suggestion of a defect associated with the transmission in the subject vehicles.

Analyses were performed of the design elements of the shift mechanism to determine whether the physical contours and positional relationships between components which actuate the engagement of park lock were inherently subject to actual malfunction or false park indications. Figures 6 and 7 depict the correlations between the position of the manual lever detent roller on the rooster comb and the position of the manual valve which actuates the hydraulic circuits of the transmission.

From Figure 6, it is seen that the angular displacement of the detent roller from the bottom of the Reverse position to the bottom of the Park detent is 12.83 degrees. With the detent roller in the reverse gate, the manual valve is actuated to the full open position in the reverse gear circuit.

Figure 7 shows further detail of these relationships. This depicts the full angular displacement between Reverse on the shift lever gate and Park on the rooster comb of 13.4 degrees. When the shift lever is moved from Reverse-to-Park, hydraulic reverse is lost at 8.1 degrees before the shifter seats in the Park gate, meaning that the manual valve closes the Reverse fluid circuit in the transmission. At 6.8 degrees before seating of the roller in the Park detent, the park sprag locks in the Park position. This occurs 1.6 degrees before the Reverse-to Park detent peak is reached, or 5.2 degrees before full seating of the roller in the Park detent. At 2.8 degrees before full seating of the detent roller in the Park detent, the PRNDL indicator inside the passenger compartment will indicate that the Park position has been selected. At zero degrees, the shift lever is fully seated in the park gate inside the steering column, the detent roller is seated at the bottom of the Park detent on the rooster comb, and the ignition key can be removed from the switch.

EA91-010

Page 13

Several facts are disclosed in this information. First, the angular displacement between Reverse and the Reverse-to-Park detent peak is 7.6 degrees, or about 0.39 linear inches on the rooster comb (the difference between the bottom of the reverse detent at 12.8 degrees and the Park-Reverse detent peak at 5.7 degrees, is 7.6 degrees-See Figure 7). Tests indicate that minimal shift lever force is required to move the detent roller this distance. Because the spring loaded detent roller maintains line contact with the rooster comb, once it has passed the detent peak, it will tend to fall into the full Park position. On the Reverse side of the peak, it will tend to fall back toward Reverse, but this will occur immediately unless the vehicle is positioned so that its static rolling resistance prevents the wheels from rolling in the reverse direction.

The most significant fact disclosed by this analysis of the design, confirmed by inspections of complainant vehicles and tests conducted at VRTC, is that shifting the transmission to a position between Reverse and Park is an extremely tedious, totally unrealistic action to be taken by a vehicle operator in an actual driving or parking situation. There are no apparent or logical reasons that explain precisely why a vehicle operator would purposely try to leave the transmission in a shift position midway between Reverse and Park.

Similarly, vehicle inspections, examinations of the shift mechanisms on test stands, and VRTC tests disclosed no evidence of a propensity of these mechanisms to exhibit false park. This condition would be evidenced by a sudden increase in the force required to move the gear shift lever beyond any point between the true reverse position and the full engagement of true Park. Such an increase in the required shift force could be falsely interpreted by a driver as confirmation that the Park position had been properly engaged. No evidence was found of such an increase in the force required to shift from Reverse to Park at any point between the two positions on the rooster comb. On the contrary, tests showed the shift action from Reverse to Park to be smooth and free of false indication of Park, and the amount of force required to accomplish the shift to be minimal. In addition, the components of the system appear to have been designed to carry far greater loads than almost any driver is likely to exert during the shift process, and in the unlikely event that any component of the mechanism should become permanently damaged through excessive shift force, the transmission will engage in the Park position before the PRNDL indicator shows that the shift sequence has been completed.

If the park lock system is engaged with the vehicle on an incline, or with the wheels firmly abutted against a curb, the park pawl may engage the park gear teeth under considerable load. In such an instance, the vehicle operator may experience difficulty in shifting the transmission out of the Park position. This problem can be overcome if

EA91-010

Page 14

the vehicle can be rocked back and forth in its stationary position enough to momentarily rotate the axle slightly and release the load on the pawl while the transmission is shifted out of Park. Although this condition is not the principal concern of this EA, it is mentioned because some vehicle owners have complained of this occurrence. It is also noted that Chrysler engineering standard PF-8107 requires that the subject transmissions be tested for "pull out of Park effort" with the vehicle at a maximum gross weight and on a 32 percent grade. The standard allows a maximum effort of 45 pounds and specifies that after 200 test cycles, no physical damage and/or misalignment is permitted to the PRNDL indicator, shift linkage, or manual lever.

WARNING SYMPTOMS:

There are no symptoms to warn that the subject transmission has not been properly engaged in the Park position with the engine running. If the engine is off, however, warning of improper engagement in Park is evidenced by the fact that the key cannot be removed from the ignition switch. This verifies that incidents of alleged unpowered vehicle roll away also involve the operator having left the ignition key in the switch.

CONTRIBUTING FACTORS:

This EA focused on understanding and evaluating the physical design features of the subject gear selector and transmission park lock systems, in an effort to ascertain whether design or materials deficiencies could precipitate system malfunctions as a result of component failure or wear.

Proper and complete shifting of the automatic transmission into Park is an oft-repeated, but critical task associated with safe motor vehicle operation. All automatic transmissions with mechanical park lock engagement can be improperly or incompletely shifted to that position. Because it was recognized that proper driver input is necessary to engage the park lock system, the lack of this input was considered to represent a potential contributing factor in incidents upon which this investigation was based.

MANUFACTURER'S EVALUATION OF THE ALLEGED DEFECT:

The manufacturer believes that the dominant causal factor regarding the alleged defect is failure of the vehicle operator to properly engage the gear selector mechanism in the Park position during "quick stop" circumstances before exiting the vehicle. Chrysler notes that most of the reported incidents involve the operator exiting the vehicle and leaving the engine running in order to perform another task of short duration and that in doing so, fails through inattentiveness to verify proper engagement of Park.

EA91-010

Page 15

Chrysler also states that there are no elements of the gear selector system linkages, transmissions, or vehicles capable of creating an independent force sufficient to shift the transmission from the Park to Reverse position. Finally, Chrysler notes that the frequency of occurrence of the reported malfunction is very low and, "... in the absence of any product defect trend, Chrysler does not believe that the alleged defect represents an unreasonable risk to motor vehicle safety."

REASON FOR CLOSING:

This investigation has not disclosed the existence of a safety defect in the transmission park lock systems of the subject vehicles. The following specific findings provide a basis for closing this EA:

1. The number of incidents reporting malfunction of the park lock system, in the context of the vehicle population and exposure time, does not identify a trend of failure.
2. Accident data show that the subject vehicles, when compared to peer vehicle groups, have not shown an over-involvement in accidents of the types that would indicate possible park lock system failure.
3. Tests showed that the amount of force required to shift the subject transmissions to the Park position is not significantly different from the forces required to perform the same shifting task in other vehicles, and that these force levels are well within the capabilities of most drivers.
4. Tests also disclosed no tactile feedback to an operator of the subject vehicles that give false indication of complete and proper engagement of the Park position.
5. Analysis of the subject transmission shift mechanism did not disclose a mechanical or hydraulic defect that would cause the subject transmissions to shift from Reverse to Park without external input.
6. No deficiencies in the materials, performance, or manufacture of the subject park lock systems that could result in Park to Reverse shifting malfunctions were identified in this investigation.

EA91-010

Page 16

A safety defect in the design, materials, or performance of the subject transmission park lock system has not been identified, and further expenditure of agency resources in this matter is not warranted.

James H. Highland
Safety Defects Engineer

12/31/91
Date

I Concur:

Richard P. Boyd
Chief, Vehicle Control Branch

12/31/91
Date

Louis J. Brown Jr.
Chief, Defect Evaluation Division

12/31/91
Date

William P. Boy
Acting Director, Office of Defects Investigation

12/31/91
Date

Figure 1. Components of Gear Selector Mechanism

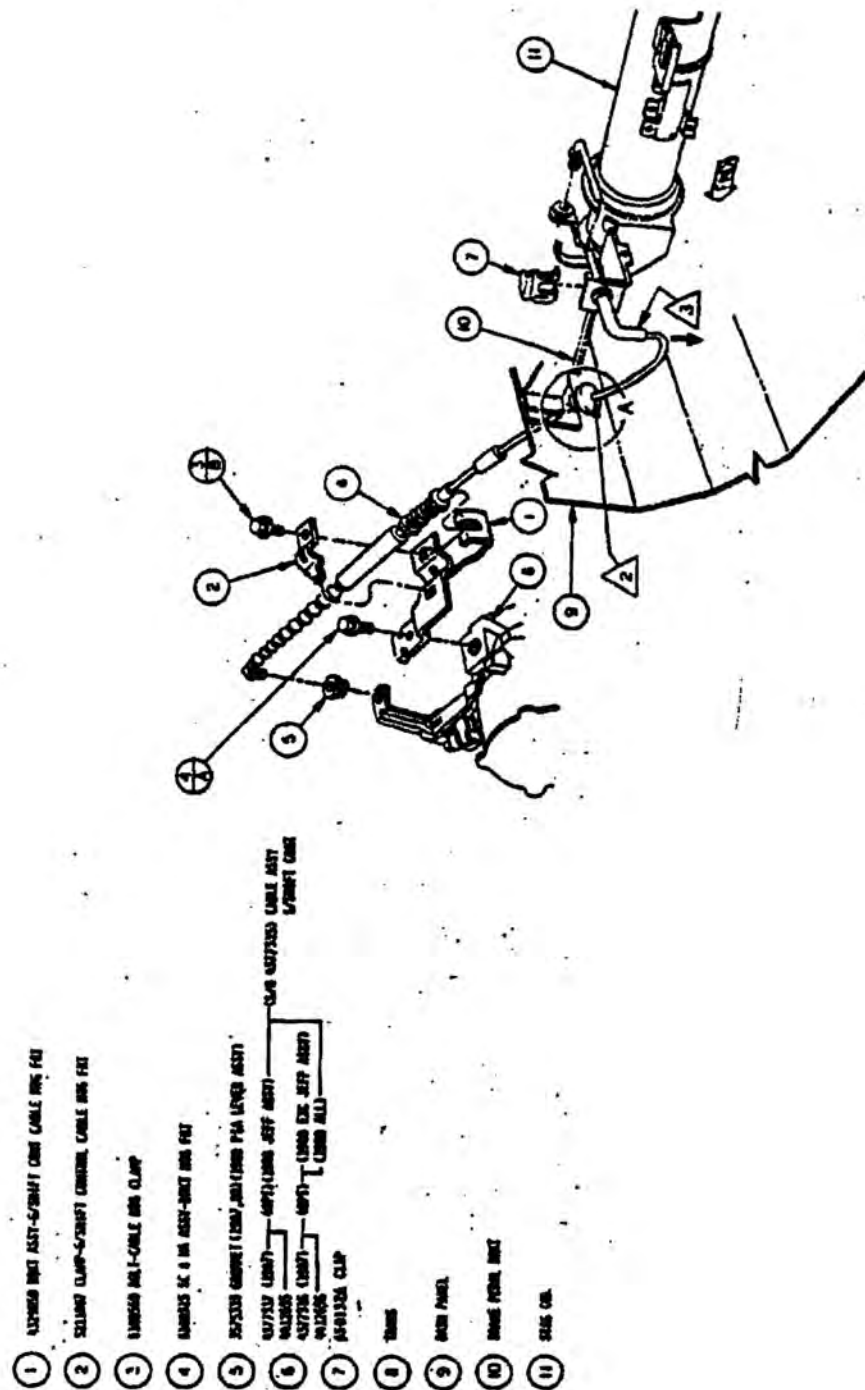


Figure 2. Steering column upper end showing installation of shift lever gate

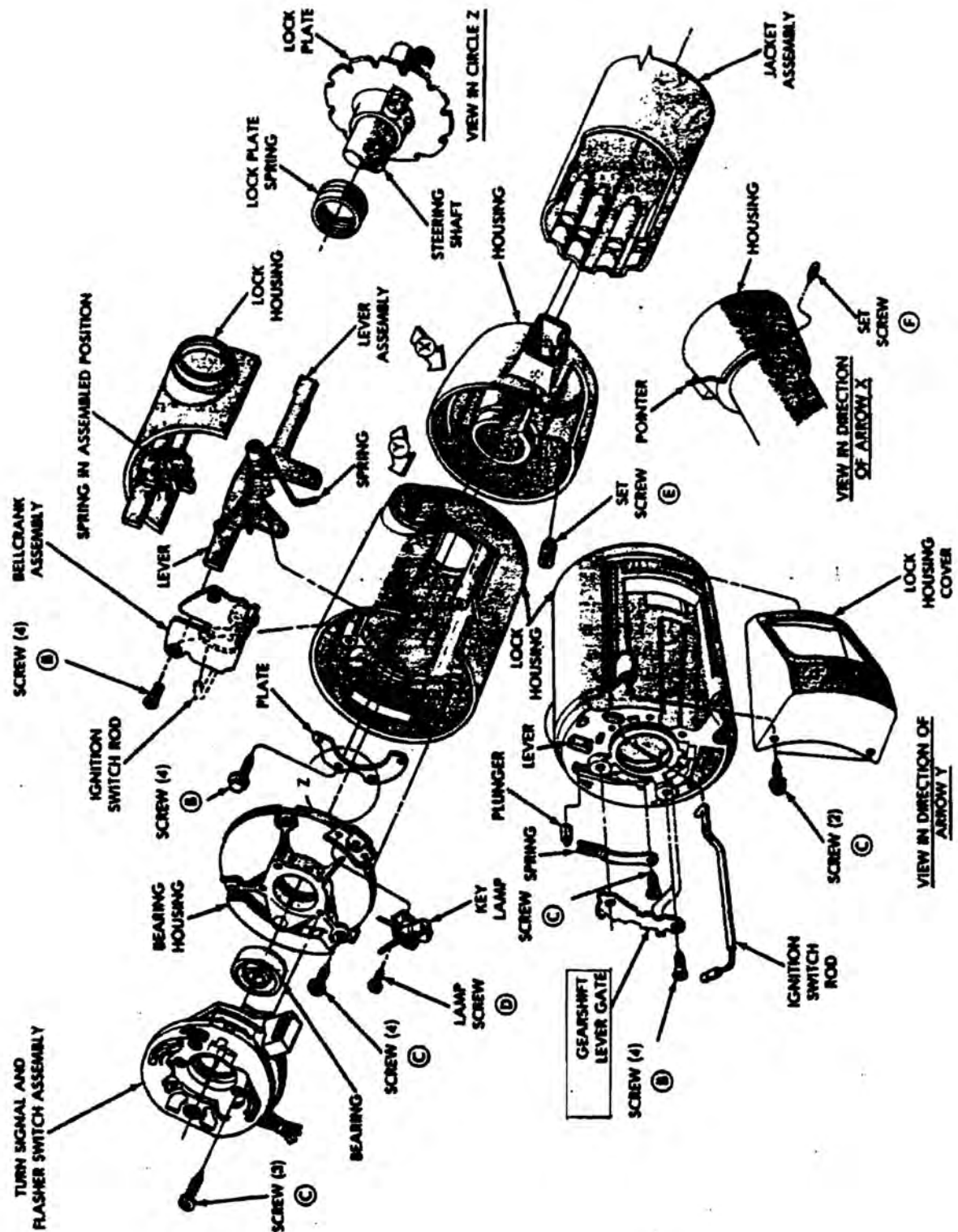


Figure 3. Shift lever installation and lock housing with gate

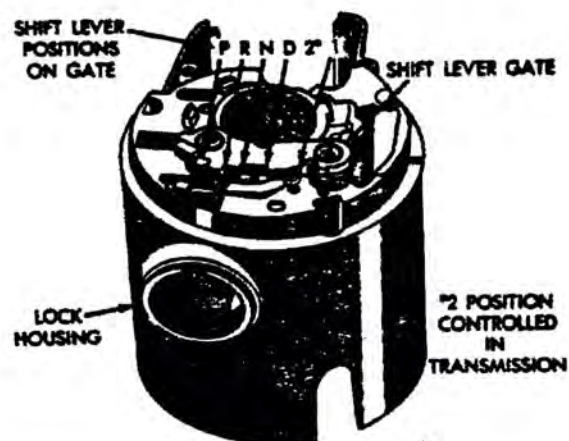
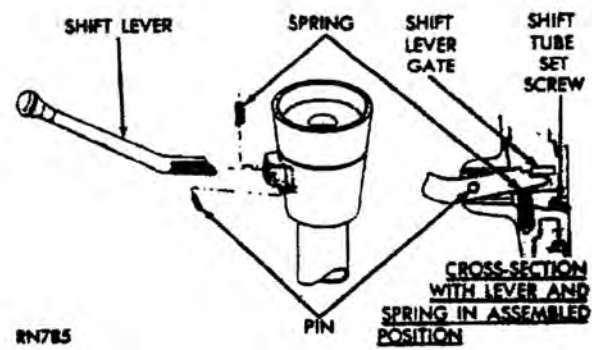
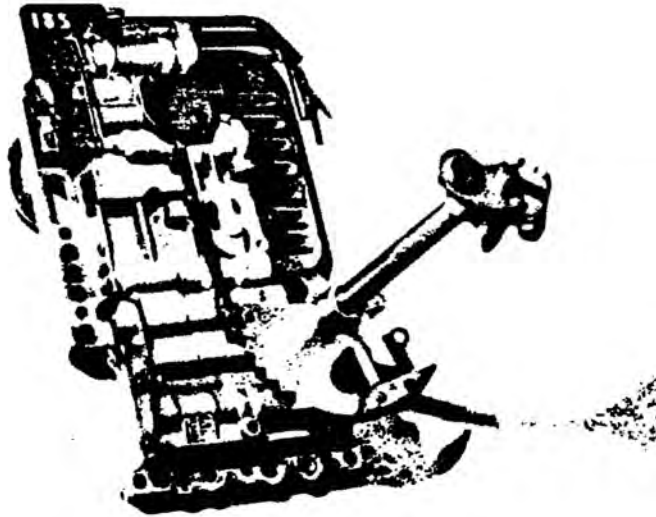


Figure 4.

- A. Manual valve and lever assembly, showing manual lever, rooster comb, and spring loaded detent roller engaged in Park detent of rooster comb.



- B. Manual valve and lever assembly, also showing manual lever bellcrank with park rod attached.

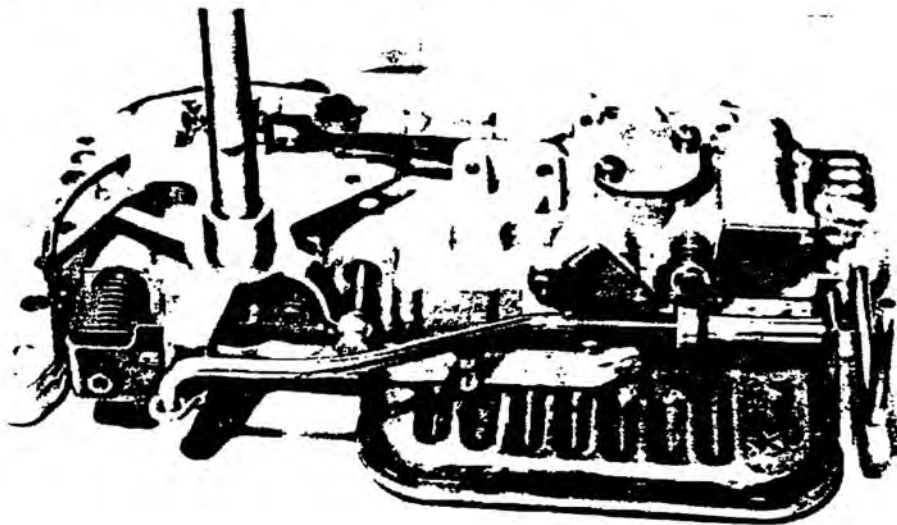
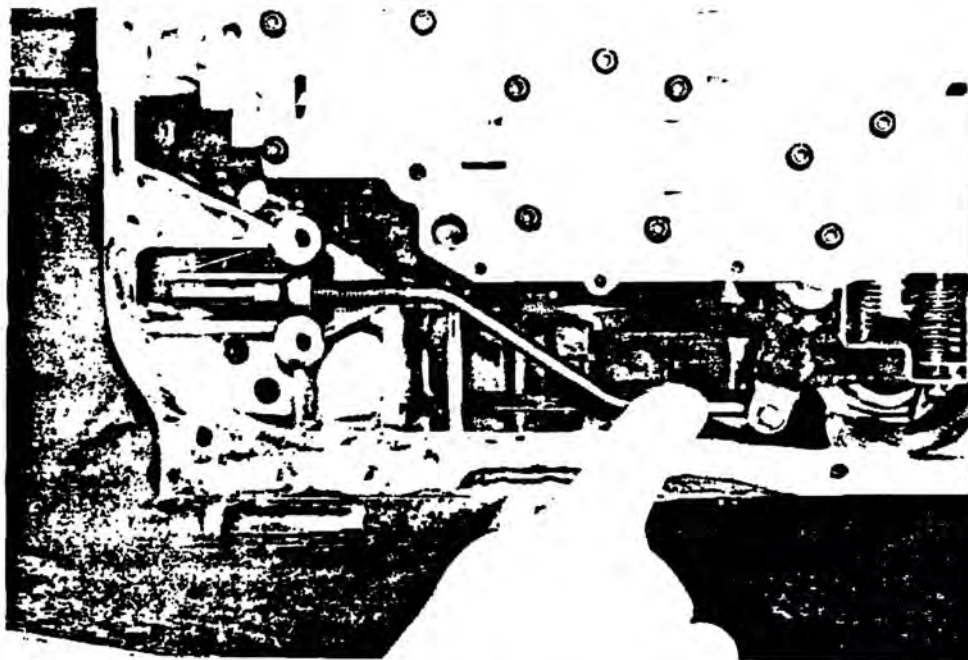
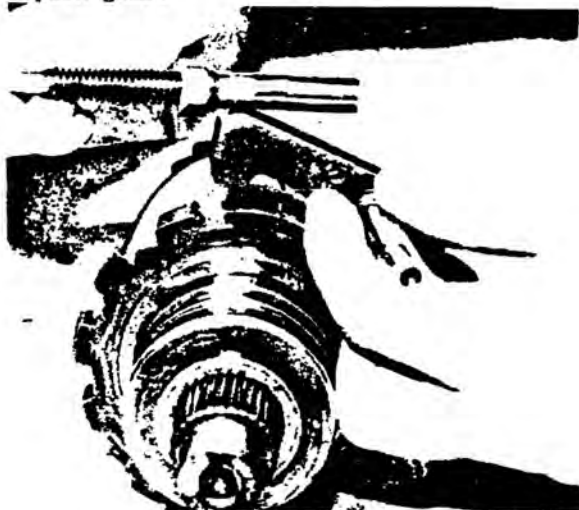


Figure 5.

- A. Location of park rod installed. Park pawl located under cone of park rod at left.



- B. Park Not Applied. Relative positions of park rod (with cone), park pawl, and park gear.



- C. Park Applied. Park pawl engages park gear. Transmission output shaft locked.

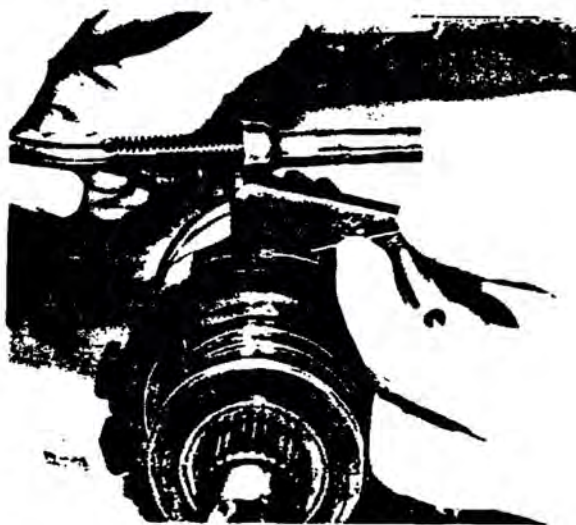
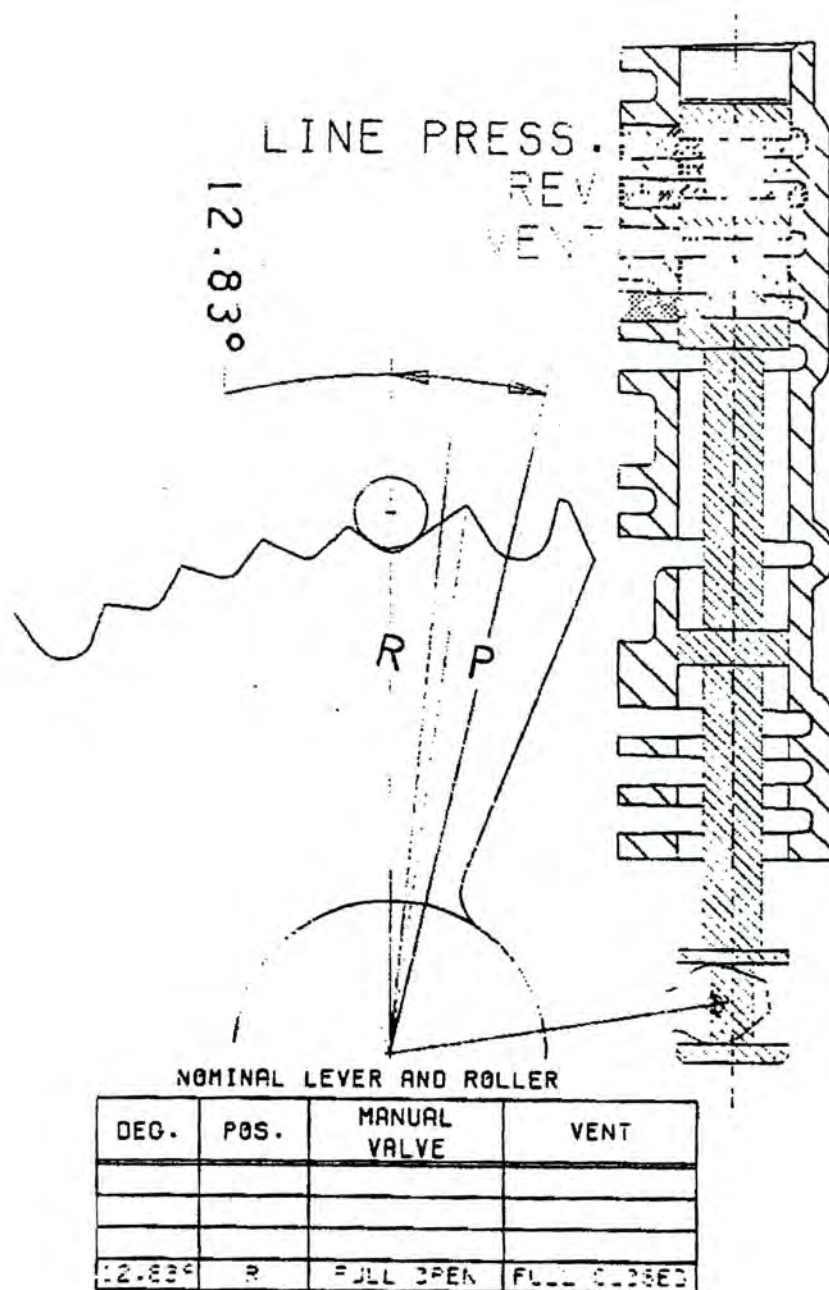


Figure 6. Angular displacement between reverse and park in rooster comb. Detent roller at reverse gear, manual valve fully open at R, vent fully closed.



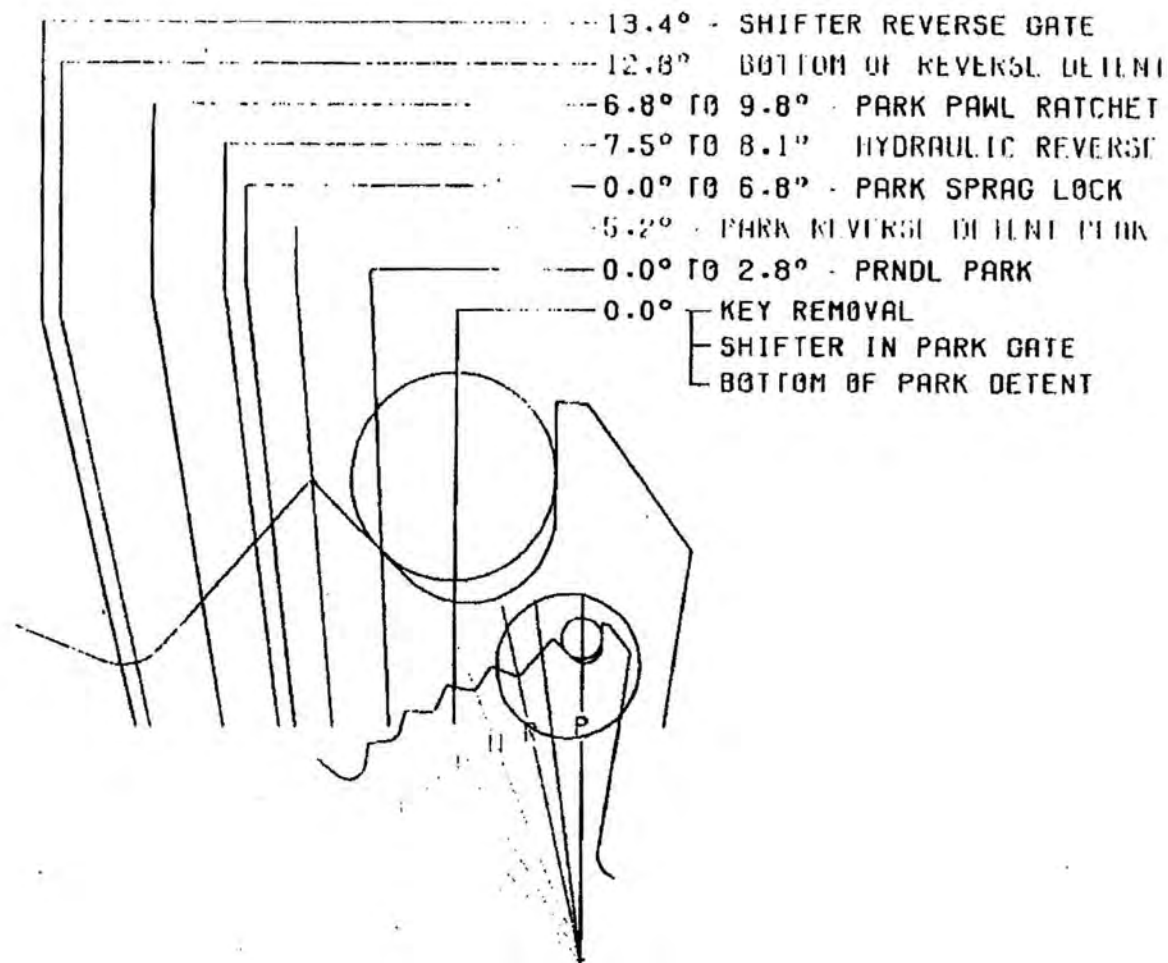


Figure 7. Reverse to Park shift events corresponding to angular position of detent roller in rooster comb.

3/27/2010

NHTSA ODI - Defects

S10-101110-004



OFFICE OF DEFECTS INVESTIGATION (ODI)

Defects - Search Results

1 Record(s) Displayed.

Report Date : **March 27, 2010 at 10:15 AM**

NHTSA Action Number : **EA96006**

NHTSA Action Number : EA96006

NHTSA Recall Campaign Number : 00V106000

Make / Models :

DODGE / DAKOTA

Model/Build Years:

1991-1992

Manufacturer : CHRYSLER GROUP LLC

Component :

POWER TRAIN

Date Investigation Opened : May 31, 1996

Date Investigation Closed : August 10, 2000

Summary:

CHRYSLER 1991-1992 DOKOTA PICKUP TRUCK



U.S. Department
of Transportation
National Highway
Traffic Safety
Administration

ODI RESUME

INVESTIGATION: EA96-006

DATE OPENED: 5/31/96

SUBJECT: Inadvertent Rollaway in Reverse When Parked

DATE CLOSED: 8/10/00

PROMPTED BY: PE95-041

PRINCIPAL ENGINEER: Scott Shadle

MANUFACTURER: DaimlerChrysler Corporation

MODEL S: Dodge Dakota

MODEL YEAR(S): 1991-1992

VEHICLE POPULATION: 154,393

PROBLEM DESCRIPTION: Drivers allege that they place the vehicle into park with the engine running and at some time after exiting the vehicle (this time varies from a few seconds to more than a couple of minutes), the vehicle begins to drive away in reverse.

FAILURE REPORT SUMMARY

	ODI	MANUFACTURER	TOTAL
COMPLAINTS:	41	69	110
INCIDENTS:	64	88	152
CRASHES:	34	61	95
INJ CRASHES:	11	17	28
# INJURIES:	11	17	28
FAT CRASHES:	3	2	5
# FATALS:	3	2	5

ACTION: The Engineering Analysis has been closed. On April 7, 2000, DaimlerChrysler Corporation submitted a safety defect report, 00V-106 (copy attached), recalling all 1991-1992 Dodge Dakota trucks equipped with A-500 transmissions. The affected vehicles will have the steel manual valve in the transmission's valve body replaced with the aluminum manual valve used on 1993 and later model year Dakotas.

ENGINEER:

DIV CHF:

OFC DIR:

8/10/00
DATE

8/10/00
DATE

8/11/00
DATE

49825-00

754

RECALL CAMPAIGNS

NAME OF MANUFACTURER : <u>DAIMLERCHRYSLER</u>	
-SUBJECT OF RECALL : <u>TRANSMISSION SHIFT LEVER</u>	
RECALL CAMPAIGN NUMBER : <u>00V-106</u>	
ACTION THAT INFLUENCED RECALL	
MANUFACTURED INFLUENCED	
ODI INFLUENCED:	
ACTION NO.	: <u>EA96-006</u>
DED INVESTIGATOR	: <u>S. SHADLE</u>
RAD INVESTIGATOR	:
OVSC INFLUENCED:	
ACTION NO.	:
OVSC INVESTIGATOR	:

755

DAIMLERCHRYSLER

DaimlerChrysler Corporation

00V-106 (01)

April 7, 2000

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:

Attached is DaimlerChrysler Corporation's report containing details of a recall regarding a potential safety related defect in some 1991 and 1992 model year Dakota trucks. This recall has been the subject of NHTSA's Engineering Analysis 96-006. DaimlerChrysler Corporation has decided to initiate this recall to assist vehicle owners who may experience unintended rearward vehicle movement believing that they have placed the shift lever in the Park position.

DaimlerChrysler Corporation believes that most of the instances in which such vehicle movement has been alleged are in fact attributable to the inadvertent placement of the shift lever in reverse. NHTSA claims that a product change affecting the 1991 and 1992 model years may have contributed to a higher number of complaints alleging unintended rearward vehicle movement in those model years. The product was changed for the 1993 and later model years and customer complaints declined.

While DaimlerChrysler Corporation has not identified a vehicle based reason or trend to explain the difference in the complaint rates, DaimlerChrysler Corporation has nevertheless decided to conduct a safety recall in accordance with 49 CFR Part 573 and 49 CFR Part 577.

00V-106 02

Submission date: April 7, 2000

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>
Dodge	Dakota	1991 1992	September 1990 through August 1992	123,000 (est)	Equipped with A500 automatic transmissions

Estimated percentage containing defect: Each vehicle in the recall population is subject to the defect described below.

Description of defect: All vehicles within the recall population are subject to the inadvertent placement of the shift lever in Reverse when the driver believes that it is placed in Park. NHTSA claims that a model change for the 1991 model year may have contributed to increased incidents of unintended rearward vehicle movement. Under this theory, some drivers apparently did not receive enough feedback from the vehicle to alert them before leaving the vehicle that the shift lever had not been placed in Park. An unrelated product change after the 1992 model year apparently alleviated the effect of the 1991 change.

The following chronology of principal events led to the determination of a defect:

- NHTSA initiated an investigation into this issue by opening PE 95-041. NHTSA upgraded this investigation to EA96-006. The inability "to draw any firm conclusion that would . . . explain the complaint rate exhibited by these vehicles" led NHTSA to conclude that "further investigation is warranted."
- DaimlerChrysler has received approximately 40 complaints for the 1991 model year and about 60 complaints for the 1992 model year in which customers generally allege the vehicle moved in reverse when it was left running and unattended. The company has received substantially fewer complaints for each of the surrounding model years.
- DaimlerChrysler conducted a thorough review of the complaints. The company believes that almost all of the complaints can be explained on an individual basis as common errors made when shifting into park. Analysis of available State accident databases found that accident rates involving driverless vehicles (in reverse) in those States did not differ between the subject model years and the surrounding model years.

757

00V-106 (63)

- DaimlerChrysler also considered buyer demographics, vehicle build period, equipment level differences, and design changes to vehicles. Testing was conducted to identify any vehicle reasons that would explain why customers did not achieve the park position or if vehicle movement after achieving park was possible. No vehicle based reasons or trends were found to explain the difference in the complaint rates.
- NHTSA claims that the complaint disparity may arise from two product changes. According to this theory, the relative position the park pawl when engaged in relationship to the transmission hydraulic activity may be the significant contributor to the higher number of reported incidents of unintended rearward vehicle movement for the 1991 and 1992 model years. The two relevant product changes are as follows:
 - The steering column was changed from a Saginaw designed and supplied column to a corporate designed and supplied column for the 1991 model year. NHTSA conducted a study of 24 vehicles and concluded that retrograde movement of the steering column gear shift selector would allow the manual valve to move back toward reverse and delay engagement of powered reverse due to the effect of low friction.
 - The transmission manual valve material was changed in 1993 model year from a steel material to aluminum to reduce the leakage created by the different thermal expansion properties of the two materials.
- This postulate could explain the difference in complaints for each of the 1991 and 1992 model years, as compared to the surrounding model years.
- This information was presented to the Vehicle Regulations Committee on March 31, 2000 and a decision to implement a safety recall was made.

Statement of measures to be taken to correct defect:

DaimlerChrysler Corporation will send a letter to owners pursuant to 49 CFR Part 577 advising owners that DaimlerChrysler Corporation will replace the steel manual valve in the transmission with an aluminum version to reduce leakage and increase the likelihood that they will receive more immediate feedback of reverse engagement if they do not place the shift lever in gated park on all affected vehicles. DaimlerChrysler Corporation also intends to remind owners always to ensure that the shift lever is firmly placed in the Park position, the ignition is off and the parking brake is applied before exiting the vehicle. A supply of the necessary replacement parts is being procured and the information required for implementation is being prepared. DaimlerChrysler expects to implement parts distribution and national notification to both dealers and owners in May 2000.

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758

OFFICE OF DEFECTS INVESTIGATION (ODI)

Defect Investigation EA96006 has 1 Related Recall(s)

NHTSA Campaign ID number: 00V106000

Make/Model(s)

DODGE / DAKOTA

Model/Build Year(s)

1991-1992

Manufacturer:

DAIMLERCHRYSLER CORPORATION

Mfr's Report Date:

APR 07, 2000

Component:

POWER TRAIN:AUTOMATIC TRANSMISSION:GEAR POSITION
INDICATION (PRNDL)

Potential Number of Units Affected:

123000

Summary:

VEHICLE DESCRIPTION: LIGHT DUTY PICKUP TRUCKS EQUIPPED WITH A500 AUTOMATIC TRANSMISSION. INADVERTENT PLACEMENT OF THE SHIFT LEVER IN REVERSE CAN OCCUR WHEN THE DRIVER BELIEVES THAT THE TRANSMISSION HAS BEEN PLACED IN PARK.

Consequence:

THIS CAN CAUSE THE VEHICLE TO ROLL AWAY WITH THE ENGINE ON AFTER THE DRIVER HAS LEFT THE VEHICLE.

Remedy:

DEALERS WILL REPLACE THE STEEL MANUAL VALVE IN THE TRANSMISSION WITH AN ALUMINUM VERSION.

Notes:

OWNER NOTIFICATION BEGAN JUNE 5, 2000. OWNERS WHO TAKE THEIR VEHICLES TO AN AUTHORIZED DEALER ON AN AGREED UPON SERVICE DATE AND DO NOT RECEIVE THE FREE REMEDY WITHIN A REASONABLE TIME SHOULD CONTACT DAIMLERCHRYSLER AT 1-800-992-1997. ALSO CONTACT THE NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION'S AUTO SAFETY HOTLINE AT 1-888-DASH-2-DOT (1-888-327-4236).

[Document Search](#)[Close Window](#)

DAIMLERCHRYSLER

SAFETY RECALL TO REPLACE THE MANUAL VALVE IN YOUR VEHICLE'S TRANSMISSION

Dear Dodge Dakota Owner:

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

It has been determined that a defect, which relates to motor vehicle safety, exists in some 1991 and 1992 model year Dodge Dakota trucks equipped with a 42RH (A500) automatic transmission.

The problem is...

If you move the gearshift selector in your Dakota (identified on the enclosed form) forward, but not into, the park position, the following two conditions can occur:

- > After a short delay, the transmission reverse gear may hydraulically engage and the vehicle may move forward if the engine is running; or
- > The vehicle may roll downhill if the engine is turned off.

Either of these conditions can cause an accident and/or injury without warning.

What DaimlerChrysler and your dealer will do...

DaimlerChrysler will update your vehicle free of charge (parts and labor). To do this, your dealer will replace the steel manual valve in your vehicle's transmission with an aluminum valve. This update will also involve replacing several seals, transmission fluid, filter and pan gasket. The work will take about 1 1/2 hours to complete. However, additional time may be necessary depending on how dealer appointments are scheduled and processed. This recall does NOT include replacement of any other transmission components. If other transmission service is required, the additional associated costs are the owner's responsibility.

Note: This update is NOT a substitute for ensuring that the gear selector is placed into the park position. The aluminum manual valve reduces the amount of internal fluid leakage in the transmission valve body.

What you must do to ensure your safety...

- > Simply contact your dealer right away to schedule a service appointment. Ask the dealer to hold the parts for your vehicle or to order them before your appointment.
- > Bring the enclosed Owner Notification Form with you to your dealer. It identifies the required service to the dealer.
- > Always ensure that the vehicle gearshift selector is placed into the park position, the ignition key is removed and the parking brake is applied before exiting your vehicle.

If you need help...

If you have questions or concerns which the dealer is unable to resolve, please contact the DaimlerChrysler Customer Assistance Center at 1-800-992-1997. A representative will assist you. 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, DC 20590, or call the toll-free Auto Safety Hotline at 1-800-424-9393. Washington, DC area residents may call 1-202-366-0123.

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

Customer Services Field Operations
DaimlerChrysler Corporation
871

**Buckle
up
for**

3/27/2010

NHTSA ODI - Defects

S10-101110-004



OFFICE OF DEFECTS INVESTIGATION (ODI)

Defects - Search Results

1 Record(s) Displayed.

Report Date : **March 27, 2010 at 10:43 AM**

NHTSA Action Number : **EA01017**

NHTSA Action Number : EA01017

NHTSA Recall Campaign Number : 02V053000

Make / Models :

JEEP / GRAND CHEROKEE

Model/Build Years:

1993-2002

Manufacturer : CHRYSLER GROUP LLC

Component :

POWER TRAIN

Date Investigation Opened : November 1, 2001

Date Investigation Closed : December 18, 2002

Summary:

DAIMLERCHRYSLER HAS RECALLED THE ZJ MODELS TO INCORPORATE A SECONDARY DETENT SPRING INTO THE SHIFTER. EVEN THOUGH THE WJ 6 CYL. VEHICLES USE THE SAME MANUAL DETENT LEVER THAT AS THE VEHICLES IN THE RECALL POPULATION, ODI BELIEVES THAT THE WJ REDESIGNED SHIFTER, WHICH IMPROVES FLOOR SHIFTER FUNCTIONALITY AND ERGONOMICS, HELPS TO PROVIDE FEEDBACK TO THE DRIVER TO INDICATE WHETHER $\downarrow$ PARK $\downarrow$ HAS OR HAS NOT BEEN ACHIEVED. ALTHOUGH THE INVESTIGATOR WAS ABLE TO INDUCE A $\downarrow$ FALSE PARK $\downarrow$ IN THE WJ PLATFORM FOR 6 CYL. VEHICLES, THE LEVEL OF DIFFICULTY WAS GREATER THAN THAT REQUIRED FOR ALL ZJ MODELS, AND THE COMPLAINT RATE WAS SIGNIFICANTLY LOWER THAN THE RECALLED ZJ POPULATION. FURTHER, THE ODI INVESTIGATOR WAS ALSO ABLE TO CREATE A $\downarrow$ FALSE PARK $\downarrow$ IN PEER VEHICLES WITH THE SAME LEVEL OF DIFFICULTY AND FREQUENCY AS THE SUBJECT VEHICLE WJ PLATFORM. THE WJ COMPLAINT RATE WAS INFLATED DUE TO NATIONAL EXPOSURE THROUGH THE PRESS. THE COMPLAINT RATE PRIOR TO THE JULY 5, 2001 MEDIA COVERAGE FOR THE WJ VEHICLES IS SIMILAR TO THE PEER VEHICLE INCIDENT RATE. BASED ON THE ABOVE, A SAFETY-RELATED DEFECT TREND HAS NOT BEEN IDENTIFIED AT THIS TIME IN THE WJ POPULATION. ACCORDINGLY, THIS INVESTIGATION IS CLOSED WITH A SAFETY RECAL FOR THE "ZJ" PLATFORM ONLY.

PLTF EXH# 118
p. 12

DAIMLERCHRYSLER

**SAFETY RECALL TO INSTALL A SECONDARY DETENT SYSTEM
ON YOUR VEHICLE'S FLOOR SHIFTER**

Dear Grand Cherokee/Grand Wagoneer Owner:

To facilitate the safe operation of your vehicle, DaimlerChrysler Corporation will modify the floor shifter of some 1993 through 1998 model year Jeep® Grand Cherokee and 1993 model year Jeep Grand Wagoneer vehicles equipped with an automatic transmission.

This modification will help ensure that you have properly placed the shifter lever fully into the "Park" position by making it very difficult to inadvertently place the shifter lever between the "Park" and "Reverse" positions.

The problem is...

DaimlerChrysler has determined that, in certain circumstances when a driver has not placed the shifter lever fully into the "Park" position and leaves the engine running, the vehicle may unexpectedly move rearward after seeming to be stable. Unintended rearward movement of a vehicle could injure those in and/or near the vehicle.

As with all vehicles, you should never exit the vehicle while the engine is running and should always remove the key from the ignition and apply the parking brake before leaving the vehicle.

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

DaimlerChrysler will modify your vehicle (identified on the enclosed form) free of charge (parts and labor). To do this, your dealer will install a secondary detent system to the floor shifter assembly. The work will take less than ½ hour to complete. However, additional time may be necessary depending on how dealer appointments are scheduled and processed.

*What you must do to
ensure your safety...*

- Simply contact your dealer right away to schedule a service appointment. Ask the dealer to hold the parts for your vehicle or to order them before your appointment.
- Bring the enclosed form with you to your dealer. It identifies the required service to the dealer.

If you need help...

If you have questions or concerns which the dealer is unable to resolve, please contact the DaimlerChrysler Customer Assistance Center at 1-800-853-1403. A representative will assist you.

If your dealer fails or is unable to remedy this condition 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, DC 20590, or call the toll-free Auto Safety Hotline at 1-888-327-4236.

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

*Buckle up
for Safety*

Customer Services Field Operations
DaimlerChrysler Corporation
B02



U.S. Department
of Transportation
**National Highway
Traffic Safety
Administration**

ODI RESUME

INVESTIGATION: EA01-017

DATE OPENED: 01-11-01 DATE CLOSED: DEC 18 2002

SUBJECT: Roll-away in Reverse When Parked

PROMPTED BY: PE01-021

PRINCIPAL ENGINEER: Peter Kivett

MANUFACTURER: DaimlerChrysler Corporation

MODEL(S): Jeep Grand Cherokee

MODEL YEAR(S): 1993-Current Production

VEHICLE POPULATION: 2,497,981

PROBLEM DESCRIPTION: Drivers allege that after placing the vehicle in PARK while stopped on a level surface with the engine running, and at some time after exiting the vehicle (this time varies from seconds to more than a couple of minutes), the vehicle spontaneously rolls away in REVERSE.

FAILURE REPORT SUMMARY

	ODI	MANUFACTURER	TOTAL
COMPLAINTS:	671	367	1038
CRASHES:	142	282	424
# INJURIES:	136	56	192
# FATALS	0	4	4

ACTION: The Engineering Analysis (EA) has been closed. Recall 02V-053

ENGINEER: *[Signature]*

DIV CH: *[Signature]*

FC DIR: *[Signature]*

DATE: 12/13/02

DATE: 12/13/02

DATE: 12-18-02

SUMMARY: On February 13, 2002, DaimlerChrysler submitted a Defect Information Report to ODI describing a condition in approximately 1.6 million model year (MY) 1993 through 1998 Jeep Grand Cherokee ("ZJ" platform) and Grand Wagoneer vehicles that could contribute to unexpected rearward powered rollaway if a driver has not placed the shifter fully into the "Park" position while the engine is left running (NHTSA Recall 02V-053, DaimlerChrysler Recall # B02). DaimlerChrysler advised ODI in February 2002 that it was developing a modification to the shifter assembly to be used as the recall remedy. The modification involved the installation of a secondary detent device in the shifter assembly to promote proper shifting into "Park." DaimlerChrysler sent interim notices to owners concerning this problem on March 22, 2002, pending final validation of the recall parts. Owner notification for the recall campaign began September 23, 2002.

Following DaimlerChrysler's recall of the ZJ vehicles, ODI continued to investigate similar complaints in the redesigned MY 1999 through current production Grand Cherokee vehicles ("WJ" platform). The WJ vehicles are equipped with a redesigned shifter assembly that is located closer to the driver and incorporates a secondary detent device. In addition, the WJ vehicles equipped with the 4.7L V-8 engine have a redesigned transmission and transmission "Park" system.

[Handwritten initials]
12/14/02

EA01-017

Page 2

MY 1993-02 Jeep Grand Cherokee False Park

The alleged defect condition involves a scenario when the driver attempts, but fails, to place the shifter fully into the "Park" position with the engine running and the parking brake disengaged. In many of the reported incidents, including most of those involving crash or injury, the rearward movement did not begin until after the driver had exited the vehicle. A typical incident involves the following elements: (1) the driver attempts to place the shifter in the "Park" position with the engine running and the vehicle resting stationary on a level surface; (2) the shifter is not placed fully into the "Park" position, but is perceived by the driver to be in "Park;" (3) the driver exits the vehicle to perform an errand without turning off the engine, setting the parking brake, or removing the keys from the ignition - note that the keys cannot be removed from the ignition unless the shifter is fully in the "Park" position; and (4) after some delay ranging from a few seconds to several minutes, the reverse circuit inside the transmission develops sufficient hydraulic pressure to cause the vehicle to move rearward.

While the condition is initiated by driver error, there are certain vehicle design characteristics that have been identified by ODI and DaimlerChrysler that can influence the opportunity for the error to occur. DaimlerChrysler maintains that "A unique combination of four elements - ergonomics, shifter design, transmission design, and transmission Park system design - may be a contributor to the operator errors leading to the complaint rate for the 1993-1998 Grand Cherokee [ZJ] population." ODI believes that certain aspects of the shifter and transmission designs are important contributors to the risk of the alleged defect.

One important characteristic of the transmission design is the use of a manual detent lever with a "flat" area between the "Reverse" and "Park" detents (Figure 1).



This manual detent lever is on all ZJ model transmissions and all 6 cyl. WJ model transmissions.

Figure 1

The manual detent lever conveys the driver's gear selection to the transmission and starts the hydraulic activity inside the transmission. The flat spot on the manual detent lever used in these transmissions differs from the tooth profile design that is more commonly used in the industry. This flat spot on the manual detent lever can increase the opportunity for the driver shifting errors to occur. If the driver fails to completely engage "Park", the shifter can allow the manual valve to stop in this area (on the flat spot between "Park" and "Reverse") and hydraulically activate the reverse circuitry within the transmission. Thus, failure of the driver to fully engage "Park" can result in a powered rollaway.

EA01-017

Page 3

MY 1993-02 Jeep Grand Cherokee False Park

This scenario does not apply to the MY 1999 and later V8 transmissions due to a significant design change that incorporated a sharp "Reverse" peak and quick drop off into "Park" as seen in Figure 2. These transmissions are unique in design in that they incorporate, among other things, a "slider" manual valve mechanism that hydraulically engages the selected gear. Unlike the design used on earlier transmissions, this mechanism does not incorporate a "Rooster Comb" (Figure 1) that rotates around its axis. The possibility of leaving the shifter between "Reverse" and "Park" is therefore significantly reduced.



Figure 2

In addition to the changes in the transmission, DaimlerChrysler, in moving from the earlier ZJ platform to the newer WJ platform in MY 1999, improved the floor shifter functionality and ergonomics in four different ways: (1) locating the shifter closer to the driver; (2) adding a secondary detent spring to the shifter in an effort to enhance feedback from the shift detent to the driver (Figure 3); (3) decreasing the size of the PRNDL window to make it more visually defined; and (4) designing a gearshift selector button that creates an audible click and tactile feedback when the shifter is properly engaged in "Park."

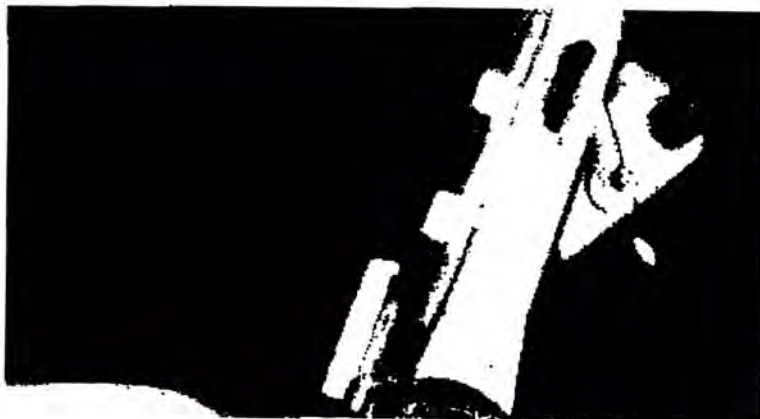


Figure 3

EA01-017

MY 1993-02 Jeep Grand Cherokee False Park

Page 4

COMPLAINT RATES ODI AND DAIMLERCHRYSLER COMBINED:

Tables 1 and 2 provide failure data for both the recalled ZJ vehicles and the WJ vehicles that have not been recalled. Table 1 shows the total figures and associated rates that have been received by ODI and DaimlerChrysler. Table 2 shows the data for complaints received before July 5, 2001.

Table 1

	Total	
	ZJ Recalled Population 1993-98 MY	WJ 1998-02 MY
Production	1,513,830	894,351
Incidents	703	247
Crashes	308	135
Injuries	146	47
Fatalities	2	0
Rate/100K Incidents	46.4	27.6
Rate/100K Crashes	20.4	15.1
Rate/100K Injuries	9.8	5.3
Rate/100K Fatalities	0.1	0.0

The WJ Platform complaint rate before July 5, 2001 (Table 2), when there was substantial media coverage is 2.5 incidents per 100,000 vehicles sold. This rate increased abruptly after July 5, 2001. To assess the relevance of consumer complaints received in this investigation, ODI had to take into account the potential for inflated rates due to publicity as well as exposure. Therefore, ODI compared the average elapsed time between the reported rollover incident date and complaint date for each model year/platform/transmission combination. This information was then categorized so as to determine the effect of the July 5, 2001 media coverage. Complaints received prior to July 5, 2001 pertaining to incidents that also occurred prior to this date averaged four months between incident and complaint date. Complaints received after July 5, 2001 that related to incidents prior to this date averaged 19 months between incident and complaint dates. Complaints received after July 5, 2001 that involved incidents that also occurred after this date averaged one month between incident and complaint date.

Table 2

	Before July 5, 2001	
	ZJ Recalled Population 1993-98 MY	WJ 1998-02 MY
Production	1,513,830	814,074
Incidents	219	20
Crashes	183	14
Injuries	42	5
Fatalities	0	0
Rate/100K Incidents	14.5	2.5
Rate/100K Crashes	10.8	1.7
Rate/100K Injuries	2.8	0.6
Rate/100K Fatalities	0.0	0.0

EA01-017

Page 5

My 1993-02 Jeep Grand Cherokee False Park

TESTING:

VRTC conducted a comprehensive testing program that compared the ZJ to the WJ platform for both 6 and 8 cyl. models. Furthermore, VRTC compared the shift characteristics of the subject vehicles with those of certain peer SUV vehicles that also used floor-mounted shifters.

VRTC tested for:

- Shift Force/Deflection
- Shift ergonomics
- Inspected complaint vehicles

Test results can be found in the test report, which is entitled: "Unintended Power Roll-away in REVERSE after Parking Jeep Grand Cherokee." Report # VRTC-DCD1030

A summary of testing performed by VRTC to support this investigation demonstrated unintended powered rollaway in reverse was more likely to occur on the ZJ Jeep Grand Cherokees than other vehicles tested. Unintended powered rollaway in reverse was found to be possible on WJ Grand Cherokees, more so with 6 cyl. engines using the Model 42RB transmission than with V8 engines and the Model 45RFE transmission.

FIELD ANALYSIS:

ODI inspected a total of eight subject vehicles in the field and five at VRTC. Peer vehicles were also inspected at VRTC. The investigator was able to induce a "False Park" in all ZJ models and in all 6 cyl. WJ models, but not in the 8 cyl. WJ models.

REASON FOR CLOSING:

DaimlerChrysler has recalled the ZJ models to incorporate a secondary detent spring into the shifter. Even though the WJ 6 cyl. vehicles use the same manual detent lever that as the vehicles in the recall population, ODI believes that the WJ redesigned shifter, which improves floor shifter functionality and ergonomics as previously discussed, helps to provide feedback to the driver to indicate whether "Park" has or has not been achieved. Although the investigator was able to induce a "False Park" in the WJ platform for 6 cyl. vehicles, the level of difficulty was greater than that required for all ZJ models, and the complaint rate was significantly lower than the recalled ZJ population. Further, the ODI investigator was also able to create a "False Park" in peer vehicles with the same level of difficulty and frequency as the subject vehicle WJ platform. The WJ complaint rate was inflated due to national exposure through the press. The complaint rate prior to the July 5, 2001 media coverage for the WJ vehicles is similar to the peer vehicle incident rate.

Based on the above, a safety-related defect trend has not been identified at this time in the WJ population. Accordingly, this investigation is closed with a safety recall (02V-053) for the ZJ models. The closing of this investigation does not constitute a finding by NHTSA that no safety-related defect exists in the WJ models. The agency will take further action if warranted by the circumstances.

3/27/2010

NHTSA ODI - Defects

S10-101110-004



OFFICE OF DEFECTS INVESTIGATION (ODI)

Defects - Search Results

1 Record(s) Displayed.

Report Date : **March 27, 2010 at 10:07 AM**

NHTSA Action Number : **EA04025**

NHTSA Action Number : EA04025

NHTSA Recall Campaign Number : 05V462000

Make / Models :

DODGE / RAM
DODGE / RAM 2500
DODGE / RAM 3500
DODGE / RAM PICKUP
DODGE / RAM QUAD CAB
DODGE / RAM2500 REGCAB 4X4 SWB
DODGE / RAM2500 REGCAB SWB
DODGE / RAM3500 QUADCAB 4X4 LWB
DODGE / RAM3500 QUADCAB 4X4 SWB

Model/Build Years:

2003-2004
2003-2005
2003-2005
2003
2003
2005
2005
2005
2005

Manufacturer : CHRYSLER GROUP LLC

Component :

POWER TRAIN:AUTOMATIC TRANSMISSION
POWER TRAIN:AUTOMATIC TRANSMISSION:GEAR POSITION INDICATION (PRNDL)
POWER TRAIN:AUTOMATIC TRANSMISSION:LEVER AND LINKAGE:COLUMN SHIFT

Date Investigation Opened : August 26, 2004

Date Investigation Closed : December 22, 2005

Summary:

THE SUBJECT VEHICLES ARE HEAVY DUTY PICKUP TRUCKS WITH DIESEL ENGINES AND AUTOMATIC TRANSMISSIONS COMMONLY USED FOR COMMERCIAL AND WORK PURPOSES. A COLUMN MOUNTED SHIFT LEVER IS USED FOR GEAR SELECTION AND AN ELECTRONIC PRNDL ON THE INSTRUMENT PANEL PROVIDES GEAR POSITION INFORMATION TO THE DRIVER. THE SUBJECT VEHICLES ARE ALSO EQUIPPED WITH A BRAKE-TRANSMISSION SHIFT INTERLOCK THAT PREVENTS THE SHIFT LEVER FROM BEING MOVED FROM THE PARK POSITION (WHEN THE ENGINE IS ON) UNLESS THE BRAKE PEDAL IS DEPRESSED AND AN IGNITION-SHIFT INTERLOCK THAT PREVENTS KEY REMOVAL UNLESS THE TRANSMISSION IS IN THE PARK POSITION. COMPLAINANTS GENERALLY REPORT THAT THE VEHICLE WAS BEING OPERATED IN A FORWARD GEAR AND BROUGHT TO A STOP THROUGH BRAKE APPLICATION ON A LEVEL SURFACE, AT WHICH TIME THE OPERATOR MOVED THE SHIFT LEVER TO ENGAGE THE PARK POSITION. THE OPERATOR THEN OPENED THE DRIVER SIDE DOOR AND, WITHOUT VERIFYING PARK ENGAGEMENT (E.G., PRNDL GEAR INDICATION), SECURING THE PARK BRAKE, OR TURNING THE ENGINE OFF, EXITED THE VEHICLE. INITIALLY, NO VEHICLE MOVEMENT WAS APPARENT, HOWEVER, A SHORT TIME LATER,

www-odi.nhtsa.dot.gov/cars/.../defectresults.cfm?sta...

3/27/2010

NHTSA ODI - Defects

S10-101110-004

TYPICALLY REPORTED AS 10 TO 30 SECONDS, THE VEHICLE MOVED REARWARD UNDER ENGINE POWER. THE INCIDENT OFTEN ENDED IN A VEHICLE CRASH, AND SOMETIMES INVOLVED SERIOUS INJURY. TWO FATALITIES ARE ALLEGED. ODI'S ANALYSIS OF TEST VEHICLES AND SOME INCIDENT VEHICLES FOUND NO EVIDENCE TO INDICATE THAT A SHIFT LEVER PROPERLY PLACED IN PARK COULD UNINTENTIONALLY (I.E., WITHOUT DRIVER INPUT) DISENGAGE FROM THAT POSITION. HOWEVER, ODI DID FIND THAT THE SHIFT LEVER COULD BE INADVERTENTLY PLACED, AND REMAIN AT REST, WITHIN AN INTERMEDIATE POSITION BETWEEN THE PARK AND REVERSE GEAR POSITIONS. WHEN PLACED IN SUCH AN INTERMEDIATE POSITION, THE VEHICLE CAN EXPERIENCE A DELAYED PRESSURIZATION OF THE REVERSE HYDRAULIC CIRCUIT THAT IS SUFFICIENT TO CAUSE THE VEHICLE TO ROLL REARWARD UNDER POWER. THE DELAY PERIOD ALLOWS SUFFICIENT TIME FOR OPERATORS TO EXIT THE STATIONARY VEHICLE WITHOUT PERCEIVING THAT THE SHIFTER IS NOT IN PARK. THE SUMMARY REPORT DISCUSSES THE TECHNICAL ANALYSIS OF THIS ISSUE IN GREATER DETAIL AND COMPARES THE FREQUENCY OF THESE INCIDENTS IN THE SUBJECT VEHICLES TO OTHER PEER VEHICLES THAT ODI EXAMINED. AS DESCRIBED IN THEIR OCTOBER 4, 2005 LETTER TO NHTSA, DAIMLERCHRYSLER CORPORATION (DCC) WILL CONDUCT A SAFETY RECALL (NHTSA RECALL NO. 05V-462, DCC NO. E17) TO INSTALL AN OUT-OF-PARK ALARM SYSTEM IN THE SUBJECT VEHICLES. THE ALARM WILL PROVIDE AUDIBLE AND VISUAL FEEDBACK TO ALERT THE DRIVER, AND OTHERS, IF THE DRIVER ATTEMPTS TO EXIT THE VEHICLE WHILE THE ENGINE IS RUNNING AND THE SHIFT LEVER IS NOT IN THE PARK POSITION. THE TIMING OF DCC'S ACTION HAS YET TO BE DETERMINED.



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**National Highway
Traffic Safety
Administration**

ODI RESUME

Investigation: EA04-025
Prompted By: PE04-039
Date Opened: 08/26/2004 Date Closed: 12/22/2005
Principal Investigator: Scott Yon
Subject: False Park

Manufacturer: DaimlerChrysler Corporation
Products: 2003-2005 Dodge Ram 2500/3500 Diesel With Auto. Transmission
Population: 250,285

Problem Description: The vehicle may experience a reverse powered rollaway incident after an attempted shift into "Park" with the engine running and the park brake unsecured.

FAILURE REPORT SUMMARY

	ODI	Manufacturer	Total
Complaints:	81	209	250
Crashes/Fires:	69	165	205
Injury Incidents:	14	21	27
# Injuries:	14	21	27
Fatality Incidents:	2	2	2
# Fatalities:	2	2	2

Action: This Engineering Analysis has been closed, Recall 05V-462.

Engineer: D. Scott Yon
Div. Chief: Jeffrey L. Quandt
Office Dir.: Kathleen C. DeMeter

12/22/05

Date: 12/22/2005
Date: 12/22/2005
Date: 12/22/2005

Summary: The subject vehicles are heavy duty pickup trucks with diesel engines and automatic transmissions commonly used for commercial and work purposes. A column mounted shift lever is used for gear selection and an electronic PRNDL on the instrument panel provides gear position information to the driver. The subject vehicles are also equipped with a brake-transmission shift interlock that prevents the shift lever from being moved from the Park position (when the engine is on) unless the brake pedal is depressed and an ignition-shift interlock that prevents key removal unless the transmission is in the Park position.

Complainants generally report that the vehicle was being operated in a forward gear and brought to a stop through brake application on a flat level surface, at which time the operator moved the shift lever to engage the park position. The operator then opened the driver side door and, without verifying Park engagement (e.g., PRNDL gear indication), securing the park brake, or turning the engine off, exited the vehicle. Initially, no vehicle movement was apparent, however, a short time later, typically reported as 10 to 30 seconds, the vehicle moved rearward under engine power. The incident often ended in a vehicle crash, and sometimes involved serious injury. Two fatalities are alleged.

ODI's analysis of test vehicles and some incident vehicles found no evidence to indicate that a shift lever properly placed in Park could unintentionally (i.e., without driver input) disengage from that position. However, ODI did find that the shift lever could be inadvertently placed, and remain at rest, within an intermediate position between the Park and Reverse gear positions. When placed in such an intermediate position, the vehicle can experience a delayed pressurization of the Reverse hydraulic circuit that is sufficient to cause the vehicle to roll rearward under power. The delay period allows sufficient time for operators to exit the stationary vehicle without perceiving that the shifter is not in Park. The summary report discusses the technical analysis of this issue in greater detail and compares the frequency of these incidents in the subject vehicles to other peer vehicles that ODI examined.

As described in their October 4, 2005 letter to NHTSA, DaimlerChrysler Corporation (DCC) will conduct a Safety Recall (NHTSA Recall No. 05V-462, DCC No. E17) to install an Out-Of-Park alarm system in the subject vehicles. The alarm will provide audible and visual feedback to alert the driver, and others, if the driver attempts to exit the vehicle while the engine is running and the shift lever is not in the Park position. The timing of DCC's action has yet to be determined.

S10-101110-004

VRTC-DCD1030
EA01-017

Unintended Powered Roll-Away In Reverse
After Parking - Jeep Grand Cherokee

VEHICLE RESEARCH AND TEST CENTER
EAST LIBERTY, OHIO 43319

FINAL REPORT
FEBRUARY 2003



U.S. Department of Transportation
National Highway Traffic Safety Administration

Technical Report Documentation Page

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No. EA01-017	
4. Title and Subtitle Unintended Powered Roll-Away in Reverse After Parking - Jeep Grand Cherokee		5. Report Date February 2003	
7. Author(s) R. C. Esser		6. Performing Organization Code NVS-313	
9. Performing Organization Name and Address National Highway Traffic Safety Administration Vehicle Research and Test Center P.O. Box 37 East Liberty, OH 43319		8. Performing Organization Report No. VRTC-DCD1030	
12. Sponsoring Agency Name and Address National Highway Traffic Safety Administration 400 Seventh Street, S.W. Washington, DC 20590		10. Work Unit No. (TRAIS) code	
		11. Contract or Grant No.	
		13. Type of Report and Period Covered Final October 2001 - February 2003	
		14. Sponsoring Agency Code	
15. Supplementary Notes The author acknowledges the support of this effort by Harry Mulline, Rick Hughes, and Scott Erickson			
16. Abstract The purpose of this project was to evaluate various scenarios that could lead to instances of Unintended Powered Rollaway (UPR) in Reverse in 1993 through 1999 Jeep Grand Cherokee vehicles. UPR is a condition that begins when owners allegedly stop the vehicle, place the transmission in Park, leave the engine running, and exit the vehicle. The vehicle at first remains stationary but then, after a relatively short time, begins to travel in Reverse, usually stopping only when it hits something. From a list of over 400 complaints of UPR from Grand Cherokee owners, 15 owners were contacted of which 11 granted VRTC permission to inspect their "complaint" vehicle. Of these, one was found not to be a Grand Cherokee, two were Grand Cherokees that did not exhibit UPR during the inspection, and eight were Grand Cherokees that did exhibit UPR during the inspection. Of these last eight, three were brought to VRTC for instrumented testing. Four peer vehicles were also inspected, none of which exhibited UPR. Using a computer-controlled stepper motor, testing consisted of pushing the shift lever into Park from just forward of Reverse while measuring force and displacement. Data indicated that a drop-off of the force existed approximately halfway between Reverse and Park. Inspection of internal parts of the transmission showed that the manual detent lever had a flat area between Reverse and Park. It was determined that UPR can occur on some Grand Cherokees when consumers mis-shift the transmission and leave the mechanism perched on the flat spot on the manual detent lever instead of fully engaging Park. It was also determined that not all Grand Cherokees experience UPR when perched. Whether or not UPR occurs depends on when hydraulic Reverse disengages during the shift process from Reverse to Park. When perched, UPR was found to occur in every instance of early hydraulic disengagement. When perched, UPR was never found to occur with late hydraulic disengagement. After DaimlerChrysler (D/C) agreed to recall 1993 - 1998 Grand Cherokees, but not 1999 and later models, additional testing was performed on 1999 and later Grand Cherokees and peer vehicles to determine whether or not 1999 and later Grand Cherokees exhibited UPR. This additional testing showed that the 1999 and later Grand Cherokees equipped with a V8 engine used a different transmission that greatly reduced the likelihood of UPR. However, Grand Cherokees equipped with an I6 engine continued to be equipped with the same transmission as the 1993 - 1998 models so that UPR was still possible.			
17. Key Words Powered Rollaway, Jeep, Grand Cherokee, Transmission		18. Distribution Statement	
19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. No of Pages	22. Price

Form DOT F1700.7 (8-72)

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TABLE OF CONTENTS

Section	Page
TECHNICAL REPORT DOCUMENTATION PAGE.....	i
LIST OF FIGURES	iv
LIST OF TABLES	v
1.0 INTRODUCTION	1
2.0 TERMS USED IN THIS REPORT	1
3.0 PROCEDURE FOR PHASE I	2
3.1 Owner Contacts.....	2
3.2 Vehicle Inspections.....	2
3.3 Testing.....	2
4.0 RESULTS FOR PHASE I	4
4.1 Peer Vehicle Inspections.....	4
4.1.1 1995 Non-Complaint Grand Cherokee (VIN: 1J4GZ78Y7SC [REDACTED]).....	4
4.1.2 1995 Chevrolet Blazer (VIN: 1GNDT13W0T2 [REDACTED]).....	5
4.1.3 1995 Ford Explorer (VIN: Not Recorded).....	5
4.1.4 1997 Jeep Cherokee (VIN: 1J4FJ68S3V [REDACTED]).....	6
4.2 Complaint Vehicle Inspections.....	6
4.2.1 1998 Grand Cherokee (VIN: 1J4GZ58Y2WC [REDACTED]).....	6
4.2.2 1994 Grand Cherokee (VIN: 1J4GZ78Y0RC [REDACTED]).....	7
4.2.3 1998 Grand Cherokee (VIN: 1J4GZ58S2WC [REDACTED]).....	7
4.2.4 1995 Grand Cherokee (VIN: 1J4GZ58S1SC [REDACTED]).....	7
4.2.5 1998 Grand Cherokee (VIN: 1J4GZ58S6WC [REDACTED]).....	8
4.2.6 1994 Cherokee (VIN: Not Recorded).....	8
4.2.7 1999 Grand Cherokee (VIN: 1J4GW58S7XC [REDACTED]).....	8
4.2.8 1999 Grand Cherokee (VIN: 1J4GW58S9XC [REDACTED]).....	9
4.2.9 1994 Grand Cherokee LTD (VIN 1J4GZ78Y5RC [REDACTED]).....	9
4.2.10 1995 Grand Cherokee (VIN: 1J4GZ58S1SC [REDACTED]).....	9
4.2.11 1998 Grand Cherokee LTD (VIN: 1J4GZ78Y6WC [REDACTED]).....	9
4.2.12 Summary of Inspections	10
4.3 Manual Detent Levers.....	10
4.4 Results of Instrumented Testing for Phase I	11
4.4.1 General	11
4.4.2 Grand Cherokee No. 2 (VIN: 1J4GZ58Y2WC [REDACTED]).....	12
4.4.3 Grand Cherokee No. 3 (VIN: 1J4GZ58S2WC [REDACTED]).....	12
4.4.4 Grand Cherokee No. 4 (VIN: 1J4GZ58S1S [REDACTED]).....	12

TABLE OF CONTENTS

Section	Page
5.0 DISCUSSION OF PHASE I.....	13
6.0 BACKGROUND FOR PHASE II.....	13
7.0 PROCEDURE FOR PHASE II.....	13
7.1 Comparison of Transmissions for I6 and V8 Engines.....	13
7.1.1 Transmission Model Number Determination.....	13
7.1.2 Force vs. Displacement Characteristics.....	14
7.2 Evaluation of New Shift Lever Detent Mechanism.....	15
7.3 Peer Vehicle Comparison.....	16
7.3.1 Force vs. Displacement Characteristics of Peer Vehicles.....	16
7.3.2 Analysis of Force vs. Displacement Data for Peer Vehicles.....	17
7.4 Comparison of 1999 Grand Cherokees to Recalled Models.....	19
8.0 DISCUSSION OF PHASE II.....	20
9.0 CONCLUSIONS.....	21
APPENDIX I Instrumentation.....	22
APPENDIX II Data Plots for Phase I.....	23
APPENDIX III Data Plots for 45RFE Transmission.....	27
APPENDIX IV Data Plots for 42RE Transmission.....	34
APPENDIX V Data Plots for 1998 42RE & 1999 42RE Transmissions.....	42
APPENDIX VI Data Plots for Peer Vehicles.....	45

LIST OF FIGURES

Figure		Page
3.1	Force Application Fixture Mounted in Vehicle	3
4.1	Transmission Manual Detent Lever for Models 42RE, 45RE, & 46RE.....	11
4.2	GM Manual Detent Lever	11
7.1	Manual Valve Cam Plate for Model 45RFE Transmission	14
7.2	Force/Displacement Curves for Model 45RFE Transmission	15
7.3	Force/Displacement Curves for Model 42RE Transmission	15
7.4	Force/Displacement Curves for 1999 Model 42RE Transmission	16
7.5	Force/Displacement Curves for 1998 Model 42RE Transmission	16
7.6	Force vs. Displacement Curve for 1995 Mitsubishi Montero.....	17
7.7	Force vs. Displacement Curve for 2000 Nissan Xterra	17
7.8	Force vs. Displacement Curve for 2001 Chevrolet Trailblazer	17
7.9	Force vs. Displacement Curve for 1997 Jeep Cherokee	17
7.10	Force vs. Displacement Curve for 1997 Chevrolet Blazer	18
7.11	Force vs. Displacement Curve for 1997 GMC Jimmy	18
7.12	Manual Detent Lever for Mitsubishi Montero and Jeep Cherokee.....	18
7.13	Manual Detent Lever for GM Blazer, Jimmy, and Trailblazer.....	18
7.14	Manual Detent Lever for Nissan Xterra.....	19
7.15	Force vs. Displacement Curves for 1995 and 1998 42RE Transmissions.....	19
7.16	Force vs. Displacement Curves for 1999 Model 42RE Transmissions	19

LIST OF TABLES

Table	Page
3.1 Test Conditions for Force vs. Displacement Testing.....	3

1.0 INTRODUCTION

This program was performed in two phases at the Vehicle Research and Test Center (VRTC) in response to a request by the Office of Defects Investigation (ODI) of the National Highway Traffic Safety Administration (NHTSA). ODI has received complaints from owners of 1993 through 1999 Jeep Grand Cherokees claiming that when they stop the vehicle, place the transmission shift lever in Park, and exit the vehicle with the engine running, the vehicle at first remains stationary, then begins to travel in Reverse, usually stopping only when it hits something. All claims indicated that the vehicle moved in Reverse. For this report, this phenomenon will be called Unintended Powered Roll-away. (UPR) This unintended vehicle movement has resulted in crashes causing both injury and property damage. The purpose of this project was to evaluate various scenarios that could lead to instances of UPR. Phase I of the program covered 1993 through 1999 vehicles and had three goals: 1) to evaluate scenarios that could lead to UPR, 2) to determine force vs. displacement characteristics encountered by the driver when shifting from Reverse to Park, and 3) to compare the performance of subject and peer vehicles in terms of the ability to exhibit UPR. These same three items were investigated on 1999 and newer vehicles during Phase II.

2.0 TERMS USED IN THIS REPORT

- Gated Park – The location at which the shift lever is locked in Park.
- Gated Reverse – The location at which the shift lever is fully in Reverse.
- Hydraulic Reverse – When Reverse gear is hydraulically engaged, regardless of the position of the shift lever.
- Hydraulic Disengagement – The point at which the transmission is no longer in hydraulic Reverse.
- Annulus Gear – A gear mounted to the transmission output shaft into which the parking pawl engages to prevent vehicle movement.
- Park Pawl – A lever within the transmission that engages the annulus gear when the transmission is placed in Park and prevents vehicle movement.
- Shift Lever – The gear selector lever operated by the driver.
- Shift Cable – The cable connecting the shift lever to the transmission.
- Manual Detent Lever – The device within the transmission that provides detents for each shift lever position.
- Shift Lock Button – The button on shift lever that allows shifting between gears.
- Tick Point – The point at which the parking pawl just touches the annulus gear when shifting from Reverse to Park.

- Pawl Engagement – The point at which the parking pawl engages the annulus gear sufficiently to prevent vehicle movement.
- Pawl Engaged – The condition where the parking pawl engages and locks the annulus gear.
- Pawl Abutted – The condition where the parking pawl rests (perches) on a tooth of the annulus gear rather than engaging the gears.

3.0 PROCEDURE FOR PHASE I

3.1. Owner Contacts

A list containing over 400 names, addresses, phone numbers, and complaints from owners of 1993 through 1999 Jeep Grand Cherokees was forwarded to VRTC by ODI. Fifteen owners from this list were found to reside within a 3-hour drive from VRTC. Following multiple attempts to contact these 15 owners, 11 owners granted permission for VRTC personnel to inspect their vehicle to determine whether or not the UPR condition could still be demonstrated. The remaining four owners either no longer owned the subject vehicle or could not be contacted.

3.2. Vehicle Inspections

During each inspection, the vehicle was started, the shift lever was placed at several positions between Reverse and Park, and the actions of both the vehicle and the shift lever were noted. Peer vehicles, including a 1996 Chevrolet Blazer, a 1996 Ford Explorer, a 1997 Jeep Cherokee, and a non-complaint 1995 Jeep Grand Cherokee, were also inspected in the same manner.

3.3. Testing

Three inspected vehicles were transported to VRTC for instrumented testing. A fixture was fabricated that allowed the shift lever to be pushed from just forward of gated Reverse, into gated Park at the rate of 0.1 in/sec using a computer-controlled electric stepper motor. The force required to move the shift lever was measured using a 50-lb load cell. The travel of the shift lever was measured using a 4-inch linear potentiometer. Data was collected and stored on a laptop computer for subsequent processing. A list of instrumentation is provided in Appendix I. The test fixture is shown in Figure 3.1.

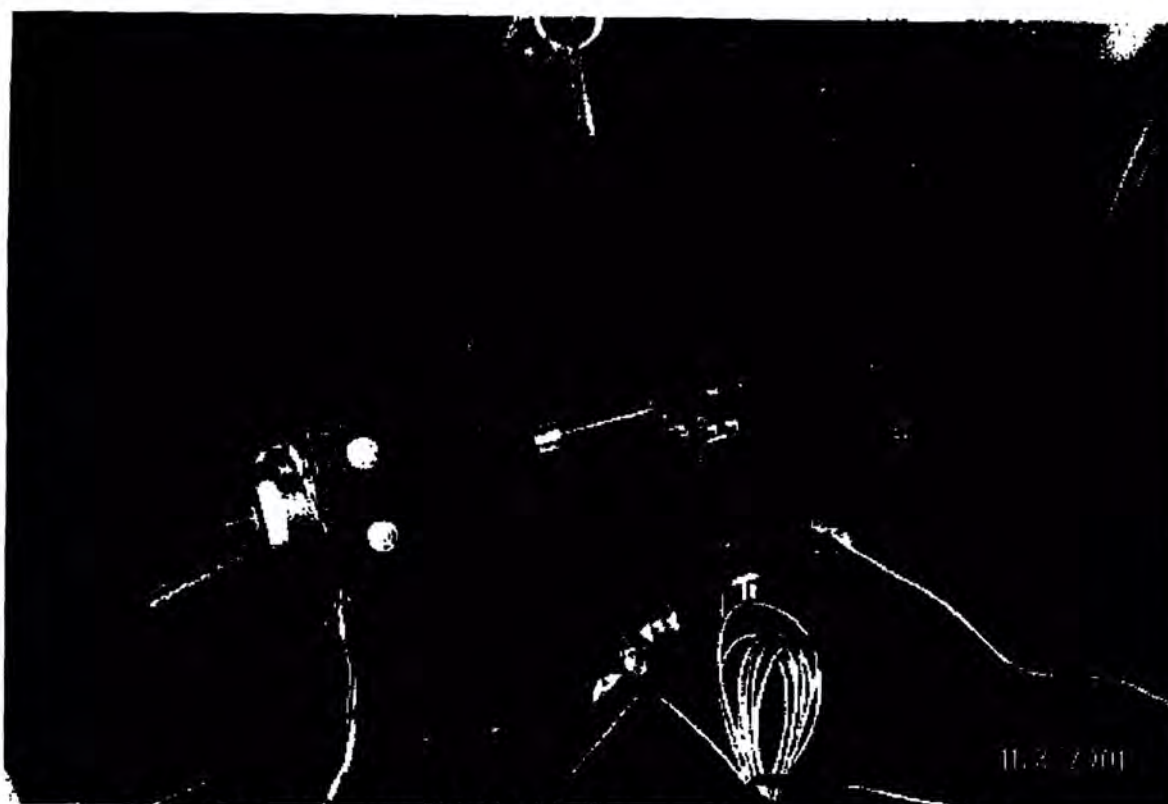


Figure 3.1 - Force Application Fixture Mounted in Vehicle

Force vs. displacement characteristics were determined for the conditions listed in Table 3.1. For repeatability, each condition was measured three times.

Table 3.1 - Test Conditions for Force vs. Displacement Testing

Condition	Shift Cable	Engine	Park Pawl	Shift Lock Button
1	Disconnected	Off	N/A	Out
2	Disconnected	Off	N/A	In
3	Connected	Off	Abutted	Out
4	Connected	Off	Abutted	In
5	Connected	Off	Engaged	Out
6	Connected	Off	Engaged	In
7	Connected	Running	Abutted	Out
8	Connected	Running	Abutted	In
9	Connected	Running	Engaged	Out
10	Connected	Running	Engaged	In

4.0 RESULTS FOR PHASE I

4.1. Peer Vehicle Inspections

The results of the inspections of one "non-complaint" Grand Cherokee and three peer vehicles are discussed in the following sections.

4.1.1. 1995 Non-Complaint Jeep Grand Cherokee (VIN: 1J4GZ78Y7SC [REDACTED])

The cable between the column-mounted key switch and the floor-mounted shift lever, designed to prevent the shift lever from moving when the key is in the lock position, was found to operate normally. The same cable also prevented the key from being removed when the shift lever was not in gated Park. The cable had an in-line device which, when the ignition switch was in the "run" position, prevented the shift lever from being moved out of Park unless the brake pedal and the shift lock button were both depressed simultaneously. The device did not affect any other shifting operations.

A separate cable (shift cable) connected the shift lever to the transmission. When slowly moving the shift lever from gated Reverse toward gated Park with the engine running, hydraulic disengagement of Reverse usually occurred after the shift lever reached gated Park. On rare occasions, hydraulic disengagement could, with care, be made to occur before the shift lever reached gated Park. On these rare occasions, pawl engagement had already occurred and vehicle movement was not possible. Because the shift lever was not in gated Park at that point, the ignition key could not be removed. Any forward force (toward Park) to the shift lever from this position caused the shift lever to engage gated Park. A deliberate rearward movement (toward Reverse) of the shift lever of at least ½ inch was required to engage hydraulic Reverse from this point.

In summary, when shifting from Reverse to Park, the shift lever could be placed in a range of positions between gated Reverse and gated Park where it would remain until acted on by an outside force. At any of these positions, depending on the position of the shift lever, the transmission was either 1) in Reverse so the vehicle moved as soon as the brake was released, thus warning the driver, or 2) immobile in Park with the pawl fully engaged.

4.1.2. 1995 Chevrolet Blazer (VIN: 1GNDT13W0T2)

A cable interlock between the key switch and the shift lever, both of which were column-mounted, prevented the shift lever from moving when the key was in the "lock" position. The same cable also prevented the key from being removed when the shift lever was not in gated Park. A separate cable connected the shift lever to the transmission. When the ignition was in the "run" position, an interlock prevented the shift lever from being moved out of Park unless the brake pedal was depressed simultaneously with the shift lever being pulled toward the driver. The device did not affect any other shifting operations.

When the shift lever was slowly moved from Reverse toward Park, hydraulic Reverse disengaged almost immediately when the lever was moved. At this point, the "R" light in the electronic PRNDL indicator remained illuminated. Further movement of the shift lever toward Park then caused the "R" light to extinguish and an "over-center" condition to be felt through the shift lever. When the shift lever was released at any point before going over center, spring loading caused the shift lever and transmission to return to the gated Reverse position. When the shift lever was released at any point after going over center, spring loading caused the shift lever and transmission to enter the gated Park position. The investigator was unable to leave the shift lever at any intermediate point between gated Reverse and gated Park.

4.1.3. 1995 Ford Explorer (VIN: Not Recorded)

A cable interlock between the key switch and the shift lever, both of which were column-mounted, prevented the shift lever from moving when the key was in the lock position. The same cable also prevented the key from being removed when the shift lever was not in gated Park. A separate cable connected the shift lever to the transmission. When the ignition was in the "run" position, an interlock prevented the shift lever from being moved out of Park unless the brake pedal was depressed simultaneously as the shift lever was pulled toward the driver. The device did not affect any other shifting operations.

When the shift lever was slowly moved from Reverse to Park, the transmission remained in hydraulic Reverse until a distinct over-center condition was felt through the shift lever. After going over center, the shift lever could, with care, be placed in one specific position where

Reverse was not hydraulically engaged and the park pawl was not fully engaged. The range of travel of the shift lever over which this condition existed was minimal. With the shift lever in this position, a ratcheting sound could be heard from the transmission when the vehicle was pushed, indicating that the transmission was at the tick point. When left in this position for a period of time, the transmission did not engage Reverse and the vehicle did not exhibit UPR.

4.1.4. 1997 Jeep Cherokee (VIN: 1J4FJ6883VL [REDACTED])

This vehicle was equipped with a floor-mounted shift lever, ignition key interlock, and transmission shift cable that were very similar in looks and action to those used in the Grand Cherokee described in Section 4.1.1. Unlike the Grand Cherokee, however, there was a distinct over-center feel to the shift lever movement between Reverse and Park. When the shift lever was released from any position between gated Reverse and gated Park, spring loading caused it to be moved forcefully into either gated Reverse or gated Park, depending on which side of the over-center mechanism the lever was released. It was later determined that while the shift lever and shift cable are very similar, the peer Cherokees were equipped with transmissions manufactured by Asia Warner and the subject Grand Cherokees were equipped with transmissions manufactured by Chrysler.

4.2. Complaint Vehicle Inspections

The results of the field inspections of 11 "complaint" vehicles are discussed in the following sections.

4.2.1. 1998 Grand Cherokee (VIN: 1J4GZ58Y2WC [REDACTED])

This vehicle exhibited UPR when inspected. When the shift lever was moved from Reverse toward Park and released prior to fully engaging Park, the transmission at first hydraulically disengaged Reverse. However, after approximately 10 seconds the transmission gradually reengaged Reverse and the vehicle began to travel in powered Reverse. As the vehicle moved, a ratcheting sound could be heard from within the transmission and vibrations felt throughout the vehicle as the parking pawl lightly contacted the annulus gear. When force was then manually applied to the shift lever, moving toward Park, the park pawl attempted to engage the annulus gear with more force, causing a louder ratcheting noise and increased vehicle vibrations. The

vehicle was then slowed with the service brake to the point that the park pawl could engage the annulus gear and hold the vehicle with the transmission still in hydraulic Reverse. Some further movement of the shift lever, toward Park, was required from that point for hydraulic disengagement and full pawl engagement. Normal neutral safety switch operation was verified when the engine could not be started with the transmission in Reverse. When the shift lever was in gated Park, the pawl was fully engaged and the vehicle would not move.

4.2.2. 1994 Grand Cherokee (VIN: 1J4GZ78Y0RC [REDACTED])

This vehicle did not exhibit UPR when inspected. Although the shift lever could be placed at various positions between Reverse and Park, hydraulic Reverse remained engaged until after parking pawl engagement, which occurred at a point slightly before the shift lever reached gated Park. This was considered to be normal operation.

4.2.3. 1998 Grand Cherokee (VIN: 1J4GZ58S2WC [REDACTED])

The vehicle exhibited UPR when inspected. When parked on a level asphalt surface with the engine running and the shift lever at a position near the tick point, the vehicle remained motionless for approximately 30 seconds before it began to move in Reverse. Normal neutral safety switch operation was verified when the engine could not be started with the transmission in Reverse. When the shift lever was in gated Park, the pawl was fully engaged and the vehicle would not move.

4.2.4. 1995 Grand Cherokee (VIN: 1J4GZ58S1SC [REDACTED])

The vehicle exhibited UPR when inspected. When parked on a level asphalt surface with the engine running and the shift lever at a position near the tick point, the vehicle remained motionless for approximately 30 seconds before it began to move in Reverse, just like the previous vehicle. Normal neutral safety switch operation was verified when the engine could not be started with the transmission in Reverse. When the shift lever was in gated Park, the pawl was fully engaged and the vehicle would not move.

4.2.5. 1998 Grand Cherokee VIN: 1J4GZ58S6WC

The vehicle exhibited UPR when inspected. When parked on a level asphalt surface with the engine running and the shift lever at a position near the tick point, the vehicle remained motionless for approximately 10 seconds before it began to move in Reverse. Normal neutral safety switch operation was verified when the engine could not be started with the transmission in Reverse. When the shift lever was in gated Park, the pawl was fully engaged and the vehicle would not move.

4.2.6. 1994 Cherokee (VIN: not recorded)

Upon inspection, this vehicle was found to be a Cherokee rather than a Grand Cherokee. An inspection had been scheduled because it had been on the VOQ list with no VIN provided. In an interview, the owner claimed "The car took off in Reverse at a high rate of speed as soon as I started the engine and was still revving after it came to rest." The vehicle had been repaired before the inspection. As with the peer Cherokee described in Section 4.1.4, this vehicle had a strong over-center feel between Reverse and Park that appeared to prevent leaving the shift lever in anything but Reverse or Park. Normal neutral safety switch operation was verified when the engine could not be started with the transmission in Reverse. When the shift lever was in gated Park, the pawl was fully engaged and the vehicle would not move. The vehicle was found to be equipped with a functional brake interlock that prevented shifting from Park to Reverse unless the brake pedal was depressed. The owner stated that the interlock was not original on the vehicle and had been installed after the alleged incident.

4.2.7. 1999 Grand Cherokee (VIN: 1J4GW58S7XC

The odometer reading was 33,017 miles when this vehicle was inspected. The owner claimed that the vehicle started to move in Reverse as soon as the engine was started even though this vehicle was equipped with a brake interlock. The owner stated that the interlock had since been repaired. The vehicle still exhibited UPR when inspected. When parked on a level asphalt surface with the engine running and the shift lever at a position near the tick point, the vehicle remained motionless for approximately 30 seconds before it began to move in Reverse. Normal neutral safety switch operation was verified when the engine could not be started with the

transmission in Reverse. When the shift lever was in gated Park, the pawl was fully engaged and the vehicle would not move.

4.2.8. 1999 Grand Cherokee (VIN: 1J4GW38S9XC [REDACTED])

The odometer reading was 50,804 miles when this vehicle was inspected. The vehicle exhibited UPR when inspected. When parked on a level asphalt surface with the engine running and the shift lever at a position near the tick point, the vehicle remained motionless for approximately 20 to 30 seconds before it began to move in Reverse. Normal neutral safety switch operation was verified when the engine could not be started with the transmission in Reverse. When the shift lever was in gated Park, the pawl was fully engaged and the vehicle would not move.

4.2.9. 1994 Grand Cherokee LTD (VIN 1J4GZ78Y5RC [REDACTED])

The odometer reading was 93,110 miles when this vehicle was inspected. The vehicle did not exhibit UPR at the time of inspection. Hydraulic Reverse remained engaged until after pawl engagement. The owner stated that the vehicle did not currently have the same transmission that it had when the UPR occurred that prompted him to submit a VOQ. Normal neutral safety switch operation was verified when the engine could not be started with the transmission in Reverse. When the shift lever was in gated Park, the pawl was fully engaged and the vehicle would not move.

4.2.10. 1995 Grand Cherokee (VIN: 1J4GZ58S1SC [REDACTED])

The odometer reading was 72,753 miles when this vehicle was inspected. The vehicle did not usually exhibit UPR during the inspection. However, during a few trials, the vehicle did exhibit UPR after approximately 10 seconds. Normal neutral safety switch operation was verified when the engine could not be started with the transmission in Reverse. When the shift lever was in gated Park, the pawl was fully engaged and the vehicle would not move.

4.2.11. 1998 Grand Cherokee LTD (VIN: 1J4GZ78Y6WC [REDACTED])

The odometer reading was 60,026 miles when this vehicle was inspected. The vehicle exhibited UPR when inspected. When parked on a level asphalt surface with the engine running and the shift lever at a position near the tick point, the vehicle remained motionless for approximately 10

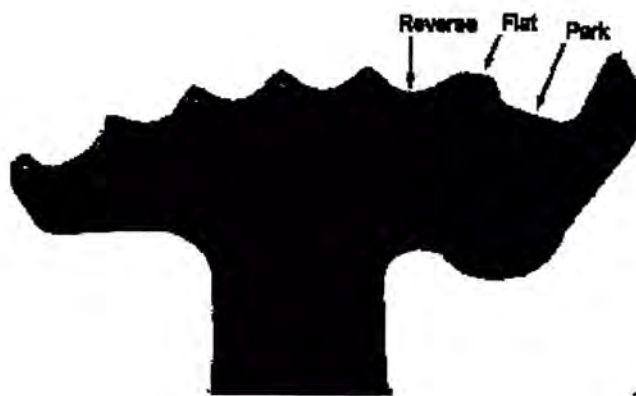
seconds before it began to move in Reverse. Normal neutral safety switch operation was verified when the engine could not be started with the transmission in Reverse. When the shift lever was in gated Park, the pawl was fully engaged and the vehicle would not move.

4.2.12. Summary of Inspections

Of the 11 vehicles inspected during this program, UPR occurred in all eight vehicles where there was early hydraulic disengagement of Reverse during the shift from Reverse to Park. In the two inspected vehicles where UPR did not occur, hydraulic disengagement occurred late during the shift, i.e. after pawl engagement. One inspected vehicle was not a Grand Cherokee and did not exhibit UPR. Based on these inspections, it was evident that the occurrence or non-occurrence of UPR was dependent on where during the shift from Reverse to Park hydraulic disengagement occurred. In every instance where hydraulic disengagement occurred early during the shift, hydraulic reverse re-engaged in 10-40 seconds, thus producing UPR. UPR never occurred where hydraulic disengagement occurred late during the shift.

4.3. Manual Detent Levers

A major factor for UPR appeared to be the significant differences in the shape of the manual detent levers between the subject Grand Cherokees and the peer vehicles. The Grand Cherokee manual detent lever had very shallow detent notches and a flat area between Reverse and Park whereas peer vehicles had deeper detent notches and no flat spot. This flat area allowed the Grand Cherokee transmission to be inadvertently mis-shifted, leaving it between Reverse and Park. UPR appeared to occur only when mis-shifted in this manner. Figure 4.1 shows the Grand Cherokee manual detent lever. Figure 4.2 shows a GM manual detent lever that was typical of the peer vehicles.



**Figure 4.1 – Transmission Manual
Detent Lever Models 42RE, 44RE & 46RE**



**Figure 4.2 – GM Manual
Detent Lever**

4.4. Results of Instrumented Testing for Phase I

4.4.1. General

Instrumented testing of the subject vehicles showed that the forces encountered by the operator when moving the shift lever from Reverse to Park were generated within the transmission rather than in the shift lever assembly. With the shift cable disconnected at the transmission, the required force to move the shift lever from Reverse to Park was approximately a constant $\frac{1}{2}$ lb. With the shift cable connected to the transmission, the required force varied from vehicle to vehicle but never exceeded approximately $4\frac{1}{2}$ lbs under any of the test conditions listed in Table 3.1.

Because the lever force required was greatest when the parking pawl was abutted against the annulus gear, this was determined to be the worst-case test condition. Only the results of this condition will be discussed in this report. Previous field inspections showed that the shift lever was always near a position correlating to the tick point in order for UPR to occur. Review of the test data showed that there was a decrease in force just before the tick point. Data plots for the pawl-abutted condition for Phase I testing are provided in Appendix II of this report.

On subject vehicles that exhibited UPR, hydraulic Reverse temporarily disengaged early, before the tick point. On vehicles that did not exhibit UPR, hydraulic Reverse disengaged after pawl engagement. It was noted that two separate problems were simultaneously required to cause UPR: 1.) the shape of the manual detent lever (flat area) had to allow the shift mechanism to be perched between Reverse and Park, and 2.) hydraulic Reverse had to disengage early, but temporarily, during the shift from Reverse to Park.

4.4.2. 1998 Grand Cherokee No. 2 (VIN: 1J4GZ58Y2WC [REDACTED])

Grand Cherokee No. 2 (No. 1 was only inspected as described in Section 4.1.1) was equipped with a 5.2L V8 engine and a Model 44RE transmission. The test data in Appendix II showed that with the engine running and the parking pawl abutted on the annulus gear, the force required to move the shift lever from just forward of Reverse, forward into gated Park, first peaked at approximately 4 lbs, then dropped off to approximately 2½ lbs just before the tick point, then climbed again to approximately 4 lbs, then dropped to zero, and then finally climbed again to between ½ and 1½ lb as the shift lever was firmly pushed fully into gated Park. Unlike peer vehicles, the spring loading was insufficient to force the transmission into gated Park.

4.4.3. 1998 Grand Cherokee No. 3 (VIN: 1J4GZ58S2WC [REDACTED])

Grand Cherokee No. 3 was equipped with a 4.0L I6 engine and a Model 42RE transmission. Testing yielded a force vs. displacement curve with a profile and values that were very similar to Grand Cherokee No. 2 described in Section 4.3.2.

4.4.4. 1995 Grand Cherokee No. 4 (VIN: 1J4GZ58S1S [REDACTED])

Grand Cherokee No. 4 was equipped with a 4.0L I6 engine and a Model 42RE transmission. Testing again yielded a force vs. displacement curve with a profile and values that were relatively similar to the previous two test vehicles. However, there was no force required at the end of the shift to fully engage gated Park.

5.0 DISCUSSION OF PHASE I

Following completion of Phase I, DaimlerChrysler (D/C) agreed to recall 1993 through 1998 Grand Cherokees (NHTSA # 02V053000) to install an auxiliary detent and spring at the bottom of the shift lever. D/C claimed that the addition of this detent and spring would force the shift lever, and thus the transmission, into either gated Reverse or gated Park, similar to peer vehicles, thus preventing inadvertent mis-shifting.

6.0 BACKGROUND FOR PHASE II

D/C claimed that design changes that significantly reduced the likelihood of UPR were incorporated in 1999 and later Grand Cherokees so that recall of only the 1993 - 98 models was necessary. D/C's claims for models starting in 1999 were 1) subject vehicles with V8 engines used a new transmission that did not use the same manual detent lever, and 2) the shift lever on all Grand Cherokees incorporated a small spring-loaded detent mechanism that provided a better "feel" for the driver. Phase II of this program was initiated to investigate D/C's claim that the above-described design changes precluded a recall of 1999 and newer Grand Cherokees. The goals of Phase II were:

- To determine whether the 1999 subject vehicles with I6 and V8 engines perform differently in terms of force vs. displacement characteristics when shifting from Reverse to Park.
- To determine whether the redesigned shift lever, incorporating a spring detent, was effective in preventing mis-shifting.
- To determine force vs. displacement characteristics of 1999 Grand Cherokees and compare these characteristics to earlier model Grand Cherokees and peer vehicles.

7.0 PROCEDURE FOR PHASE II

7.1. Comparison of Transmissions for I6 and V8 Engines

7.1.1. Transmission Model Number Determination

An investigation of transmission model designations was undertaken for all Grand Cherokee model years. It was determined that recalled subject vehicles with V8 engines were equipped with either a Model 44RE or Model 46RE transmission and that all models with I6 engines were equipped with a Model 42RE transmission. All of these transmissions utilized the same manual

detent lever, P/N 4617439, depicted previously in Figure 4.1. Starting with the 1999 models, the subject vehicles with V8 engines were equipped with a Model 45RFE transmission that utilizes a Manual Valve Cam Plate (Fig. 7.1) in place of a Manual Detent Lever. This design change would appear to help prevent UPR.



Figure 7.1 - Manual Valve Cam Plate for Model 45RFE Transmission

7.1.2. Force vs. Displacement Characteristics

Force vs. displacement tests were performed on six 1999 Grand Cherokees equipped with V8 engines and Model 45RFE transmissions, six 1999 Grand Cherokees equipped with I6 engines and Model 42RE transmissions, and one 2002 Grand Cherokee equipped with an I6 engine and a Model 42RE transmission. The force vs. displacement profiles were significantly different between the Model 45RFE and Model 42RE transmissions. Figure 7.2 shows that after an initial spike, the forces required to shift the Model 45RFE transmission decreased as lever travel progressed from Reverse to Park. The flat line with zero force at the end of the plots demonstrates that the movement to Park was completed without any additional force input.

Conversely, Figure 7.3 shows that the forces required to shift the Model 42RE transmission remained relatively constant as lever travel progressed from Reverse to Park. Forces on two Model 42RE transmissions dropped to zero near the end of the shifts but then required additional force input of 1 to 2 lb to reach gated park, similar to the pre-1999 vehicles tested during Phase I. Individual data plots for tests of the Model 45RFE transmission are provided in Appendix III. Individual data plots for tests of the Model 42RE transmissions are provided in Appendix IV.

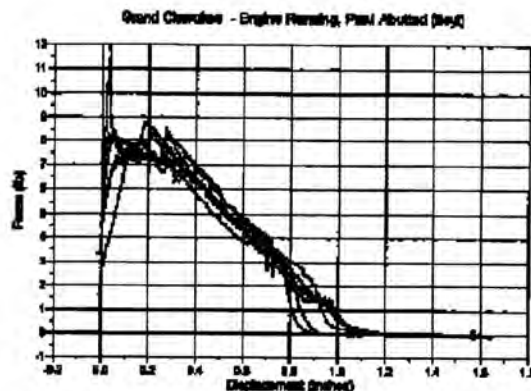


Figure 7.2 – Force/Displacement Curves for Model 45RFE Transmissions

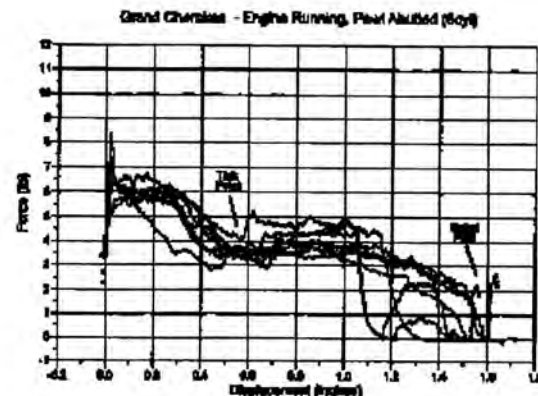
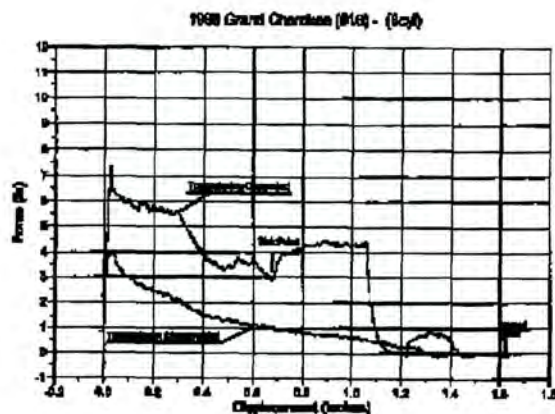


Figure 7.3 – Force/Displacement Curves for Model 42RE Transmissions

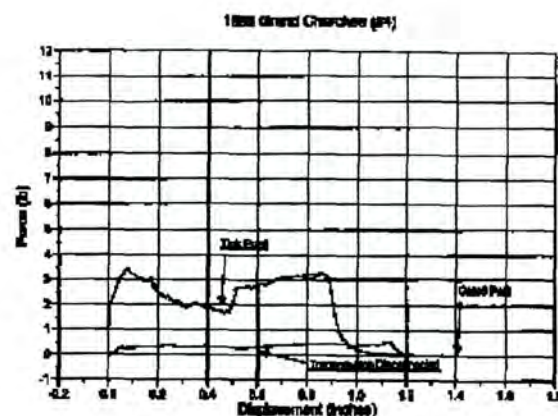
7.2 Evaluation of New Shift Lever Detent Mechanism

Force vs. displacement characteristics were determined and compared between a 1998 and a 1999 subject vehicle, each equipped with a Model 42RE transmission. The primary difference between the two vehicles was the newly designed shift lever detent and spring that became standard beginning with the 1999 model. Testing was performed with the shift cable both connected and disconnected from the transmission. The lower of the two force plots in Figures 7.4 and 7.5 show the force vs. displacement with the transmission disconnected while the upper force plots show the force vs. displacement with the transmission connected. The "disconnected" curve for the 1999 Model 42RE transmission (Fig. 7.4) shows a significantly higher peak force at the beginning of lever travel than the 1998 Model 42RE "disconnected" curve (Fig. 7.5) because of the additional force generated by the new detent and spring in the shift lever. While the magnitude of the forces in the "connected" curves was higher for the 1999

model, the overall profiles of both curves were somewhat similar. Both models exhibited a decrease in force midway through the shift, just before the tick point. It was possible to perch the transmission between Reverse and Park in both vehicles. Although the force vs. displacement curve profiles were somewhat similar between the two vehicles, the 1999 model did require higher shift forces which may be a factor in reducing mis-shifting from a human factors standpoint. However, the redesigned shift lever did not prevent the possibility of mis-shifting. Full size data plots are provided in Appendix V.



**Figure 7.4 – Force/Displacement
1999 Model 42RE Transmission**



**Figure 7.5 – Force/Displacement
1998 Model 42RE Transmission**

7.3 Peer Vehicle Comparison

7.3.1 Force vs. Displacement Characteristics of Peer Vehicles

Shift lever force vs. displacement characteristics of six peer vehicles were determined and compared to the results for the 1999 Grand Cherokee test vehicles. The peer vehicles were:

- 1995 Mitsubishi Montero
- 2000 Nissan Xterra
- 2001 Chevrolet Trailblazer
- 1997 Jeep Cherokee
- 1997 Chevrolet Blazer
- 1997 GMC Jimmy

7.3.2 Analysis of Force vs. Displacement Data for Peer Vehicles

The force vs. displacement plots for the peer vehicles were significantly different from the plots for subject vehicles with the Model 42RE transmission. The plots for peer vehicles (Figures 7.6 through 7.11) show a rapid drop-off of force followed by travel with no applied force to reach gated Park. In comparison, the plots for two of the six 1999 subject vehicles with the Model 42RE transmission (Figure 7.3) show that force must be continuously applied to reach gated Park. The primary reason for this difference was found to be that none of the manual detent levers for the peer vehicles (Figures 7.12 through 7.14) had the flat area between Reverse and Park found on the Model 42RE transmission manual detent lever. Full size data plots are provided in Appendix VI.

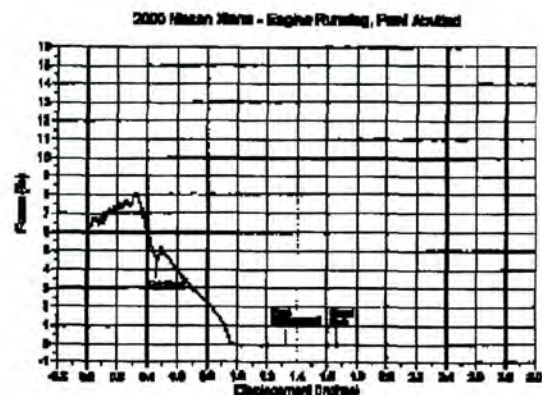
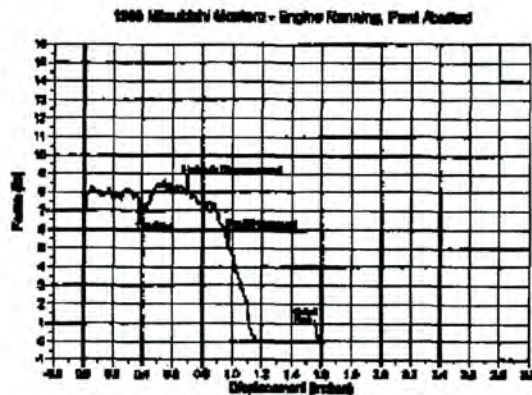


Figure 7.6 - 1995 Mitsubishi Montero

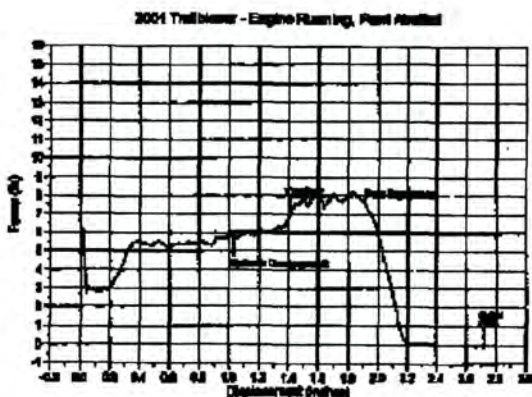


Figure 7.8 - 2001 Chevrolet Trailblazer

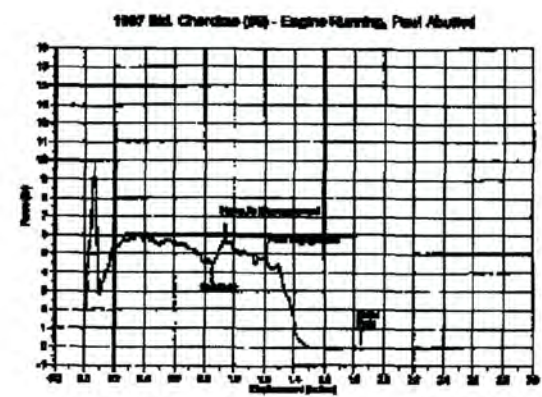


Figure 7.9 - 1997 Jeep Cherokee

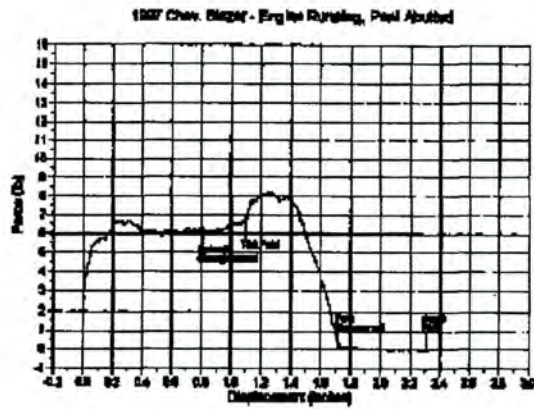


Figure 7.10 – 1997 Chevrolet Blazer

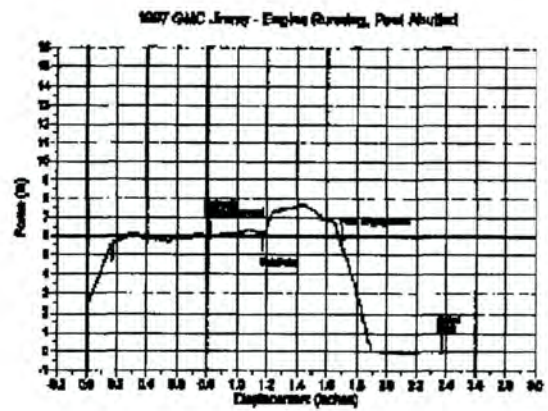


Figure 7.11 – 1997 GMC Jimmy

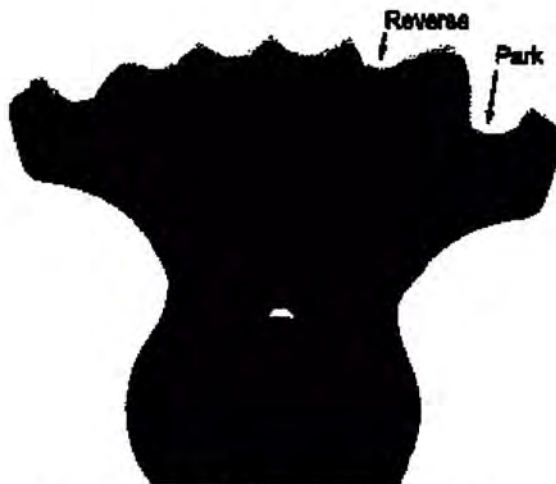


Figure 7.12 – Mitsubishi Montero and Jeep Cherokee



Figure 7.13 – GM Blazer, Jimmy, and Trailblazer

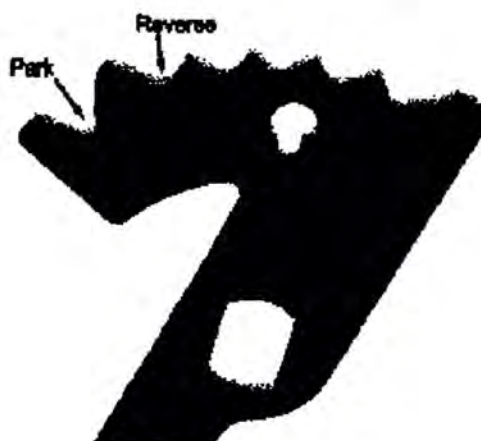


Figure 7.14 – Nissan Xterra

7.4 Comparison of 1999 Grand Cherokees to Recalled Models

Test results of the three pre-1999 subject vehicles tested in Phase I, all of which were equipped with Model 42RE transmissions, were compared to the test results for six 1999 subject vehicles equipped with Model 42RE transmissions tested in Phase II. As illustrated in Figures 7.15 and 7.16, with the exception of the higher initial peak force in the 1999 and later model vehicle data, the plot profiles of the two sets of vehicles were similar. Both sets of plots show a decreased force near the tick point and the need for the shift lever to be pushed completely into gated Park for two vehicles from each group.

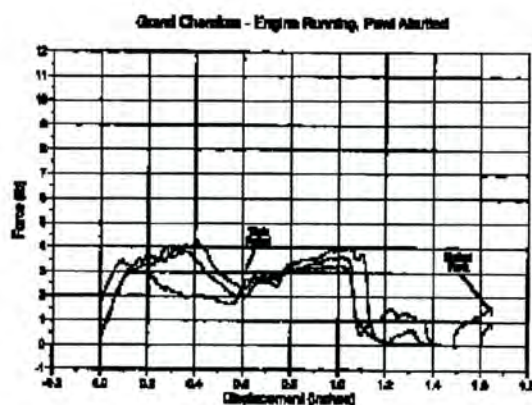


Figure 7.15 – Force vs. Deflection Curves for 1995 and 1998 Model 42RE Transmissions

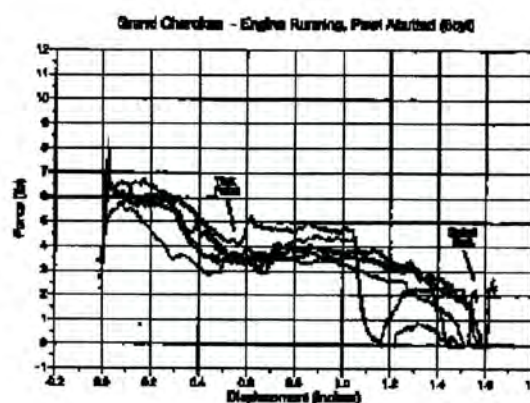


Figure 7.16 – Force vs. Deflection Curves for 1999 Model 42RE Transmissions

8.0 DISCUSSION OF PHASE II

UPR was found to occur only when the transmission was not properly shifted into gated Park and when hydraulic Reverse temporarily disengaged early during the shift process. A flat spot on the manual detent lever between Reverse and Park appears to be a major factor contributing to mis-shifting. The addition of a new shift lever detent and spring on the 1999 and later models may reduce the probability, but not eliminate the possibility, of mis-shifting the transmission. The new components have no effect on the occurrence of early hydraulic disengagement.

Near the tick point, the force vs. displacement plots for the Model 42RE transmission exhibited a decrease and then a rise in the force required to push the shift mechanism across the flat spot of the manual detent lever. This included the extra force at the end of the shift that was required to reach gated Park. If an operator does not apply sufficient force to push past the increase in required force, the transmission can remain mis-shifted between Reverse and Park.

Whether or not UPR occurs when the transmission is mis-shifted depends on where hydraulic Reverse disengages. With early disengagement, the operator might believe the transmission was in Park because of the lack of vehicle movement. Throughout this program, however, UPR was found to occur in all instances of early disengagement because that condition is only temporary. In every vehicle inspected or tested during this program, UPR was found to occur in every instance where the shift lever was mis-shifted and early hydraulic disengagement occurred.

If hydraulic Reverse remained engaged until after pawl engagement, the vehicle would remain in hydraulic Reverse when mis-shifted and begin to move in Reverse immediately upon release of the brake pedal, thus alerting the operator to having mis-shifted the transmission.

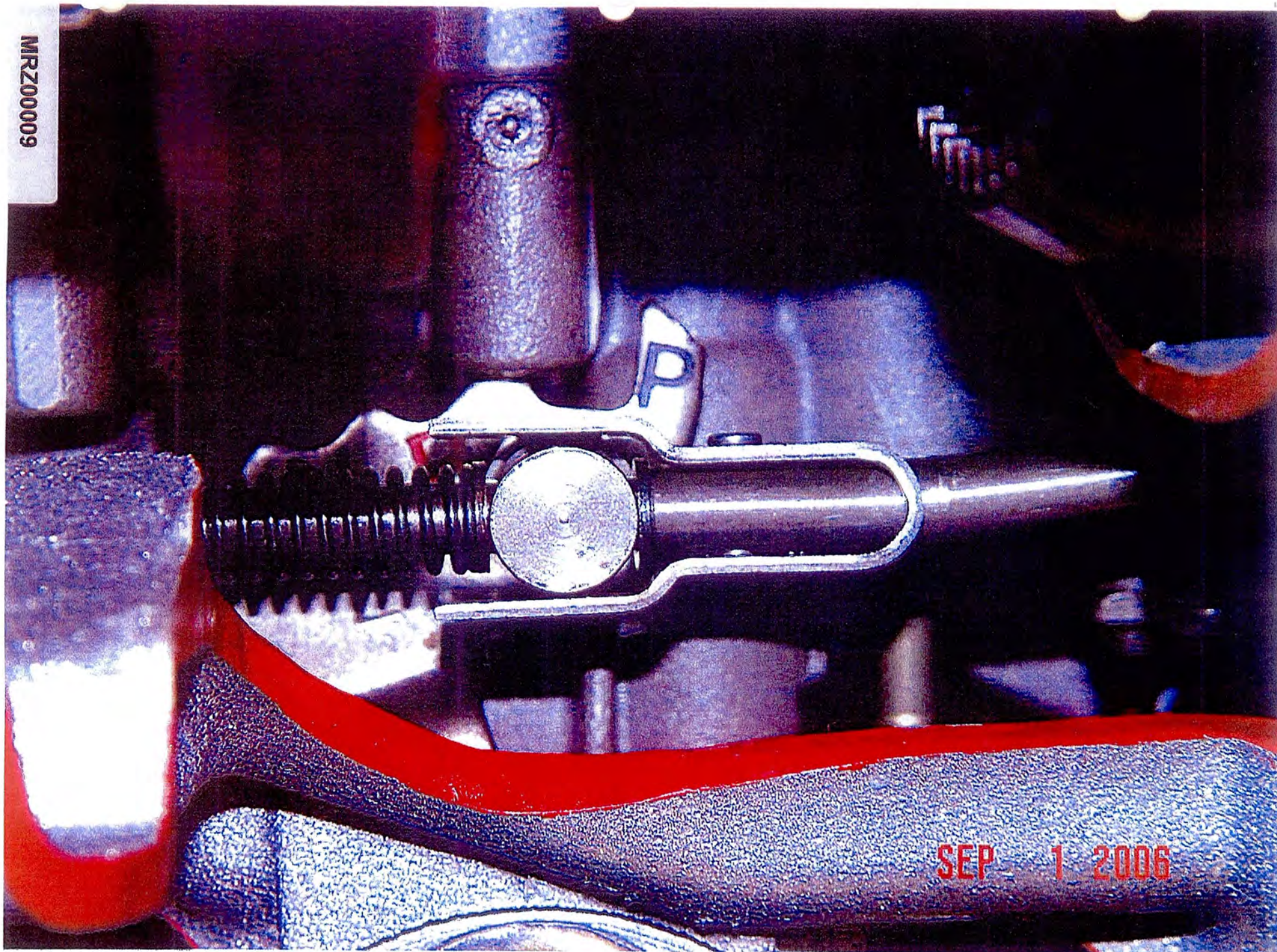
With the possible exception of the Ford Explorer, none of the peer vehicles tested during this program was found to exhibit the capability to be mis-shifted. No peer vehicle examined during this program exhibited the UPR phenomenon.

9.0 CONCLUSIONS

The following conclusions were drawn from this program:

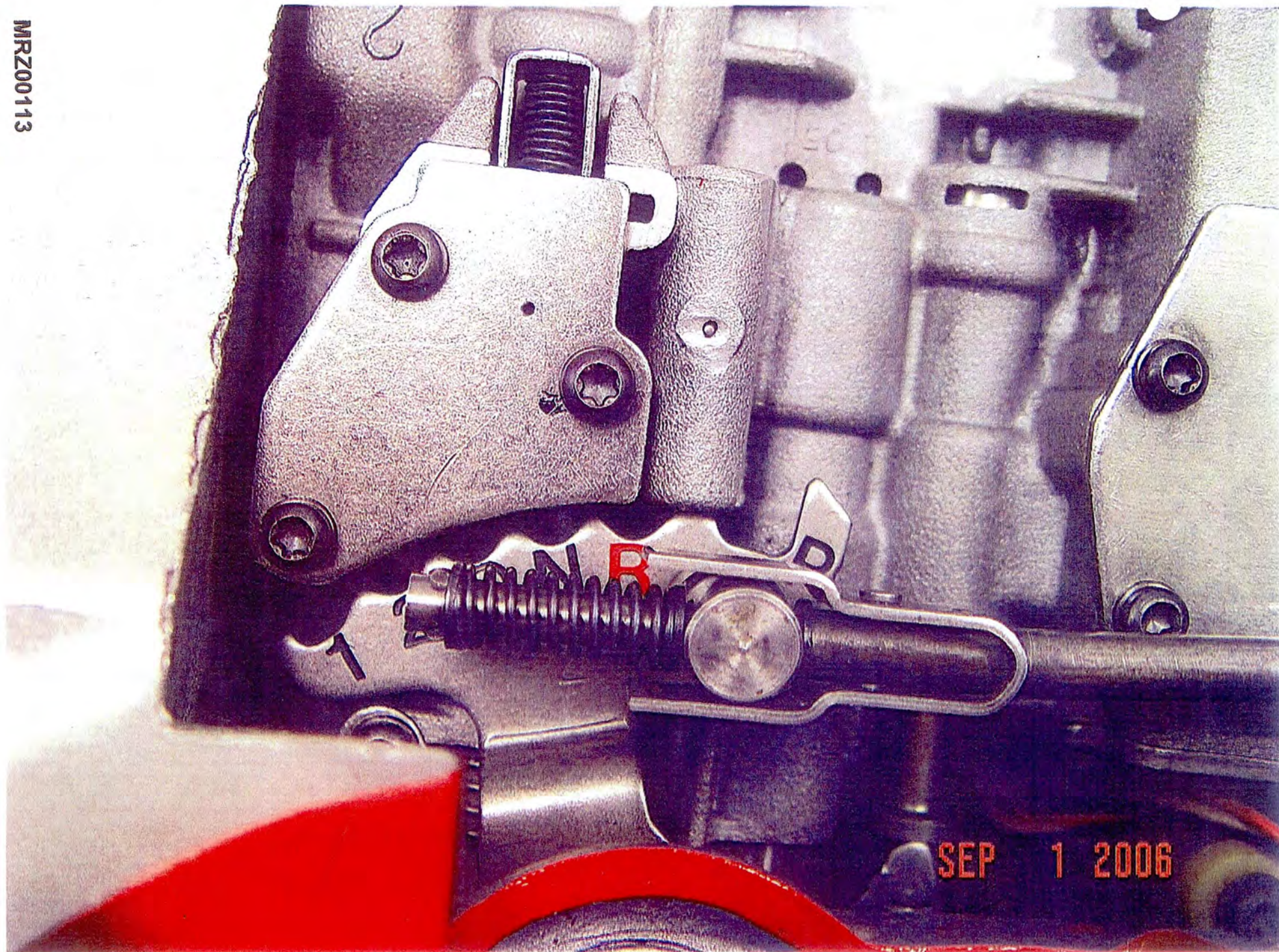
- Unintended Powered Rollaway in Reverse was demonstrated on the subject population of 1993 through 1998 Jeep Grand Cherokees. These vehicles were subsequently recalled.
- Unintended Powered Rollaway in Reverse was found to be possible on post-1998 Grand Cherokees with I6 engines and the Model 42RE transmission.
- Although UPR was also reported in Vehicle Owner Questionnaires for post-1998 models with V8 engines and the Model 45RFE transmission, VRTC's testing was unable to duplicate UPR on these vehicles.
- Although the recalled population and the post-1998 models with I6 engines use the same Model 42RE transmission, the post-1998 models had an added detent and spring in the shift lever which changed the shift lever "feel" for the operator.

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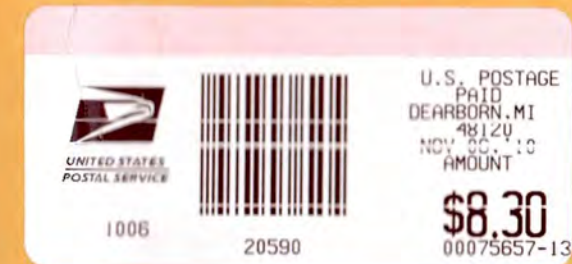


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