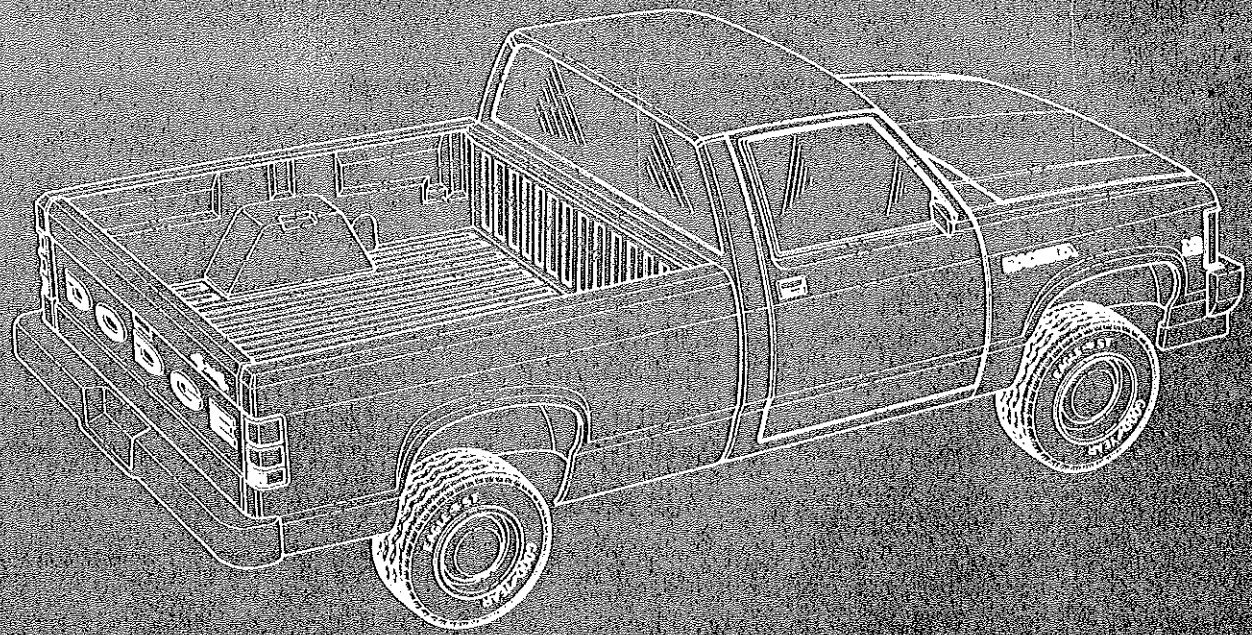
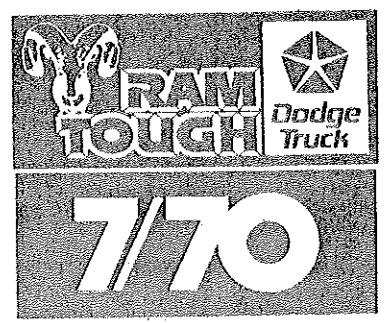




Δ π EXHIBIT 2
Deponent Viergutz
Date 6-15-11 Rptr. Jan
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N-BODY TRUCK PROGRAMS



*ENGINEERING PROGRAM
REVIEW MEETING*

Thursday, February 11, 1988, 1:00 PM
Executive Conference Room

CONFIDENTIAL

JEEP AND TRUCK ENGINEERING

AGENDA
N-BODY DAKOTA TRUCK
ENGINEERING PROGRAM REVIEW

Thursday, February 11, 1988 - 1:00 P.M.
Executive Conference Room - Chrysler West

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11.	- RWAL (1989)		
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12.	- A500 (1988 1/2)		
	. Ride & Drive Review/Recommendation	D. C. Winn/	54
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13.	- Extended Cab (1989 3/4)		
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14.	- Dual Rear Wheel Chassis-Cab (1991)	G. A. House	65-66
	• Other N-Body Program Issues	All	

MEETING MINUTES

N-BODY DAKOTA
ENGINEERING PROGRAM REVIEW

JANUARY 14, 1988

Attendees:

C. R. Acker	R. S. Anderson	R. F. Bauer
F. J. Castaing	G. J. Cilibrise	S. W. Crater
T. M. Creed	T. deBoer	J. R. Dickerson
L. C. Dong	C. W. Ewing	G. A. House
T. E. Johnson	J. C. Miller	K. A. Miller
D. A. Nelson	P. C. Pellerito	D. D. Perrine
D. N. Renneker	L. D. Schmidt	E. R. Schneider
I. P. Shadko	P. V. Sheridan	J. J. Serritella
G. W. Smith	C. P. Theodore	G. R. Thorley
O. J. Viergutz	D. C. Winn	

5.2L V8 Program

Timing

Component timing for a 1990 1/2 and a 1990 3/4 launch was reviewed. Timing to standard MTS remains late. JTE will continue to review timing compression opportunities and is presently supporting a 1990 3/4 launch.

Sourcing status for critical components including an analysis of timing compression opportunities vs. standard MTS timing was requested for presentation by next meeting.

Director-by-Director meetings with Purchasing to determine opportunities on critical components is required.

Design/Development Status

Body

- Bumper and exterior surfaces release to JTE Body Engineering will commence 1/29/88. EMD release to Die Modeling to be on an ongoing basis. Firm commitments need to be confirmed.
- Management of die models for 1990 3/4 N-Body will be handled by Highland Park engineering (joint JTE/Manufacturing die model management begins with ZJ program). Typical timing for die model construction, duplication (for die maker) and inspection: 13 weeks.

Responsibility

Engrg. Directors

Engrg. Directors

P. V. Sheridan/
Engrg. Directors

P. Sawchuk/
S. W. Crater

R. M. Cooper

Design/Development Status

Responsibility

Body (Cont'd)

- Radiator enclosure panel is critical part. Presently sourced to Budd. Testing will be conducted on pre-program vehicles. D. N. Renneker/
D. C. Winn
- Manufacturing to report on stamping and enclosure panel assembly and new welding line timing for radiator enclosure panel by next meeting. T. G. Tomezak
- Meetings to conduct ongoing reviews of front end buck packaging studies was requested. Stamping & Assembly involvement also requested. J. E. Kent/
P. C. Pellerito
- Outside rearview mirrors not considered critical to 1990 3/4 timing; mirror mechanicals could be carryover. Other styling revisions that may need PDM approval should be resolved. T. M. Creed
- Present direction is not to use a counter balance for longer hood. Resulting lift efforts above corporate standard. D. N. Renneker

Drivetrain/Chassis

- Data analysis for front axle decision (8 1/4 vs. 7 1/4) not yet finalized. Review of tooling timing between Purchasing/Detroit Axle requested. (Required for C1 pilot). O. J. Viergutz/
R. J. Matton
- Remaining chassis components are on time to support a 1990 3/4 launch. O. J. Viergutz
- Representative upgraded brakes will be available for a June 1988 vehicle build. O. J. Viergutz
- Brake system will be upgraded to accomodate V-8 and V-6 extended cab 4x4 applications. An analysis of upgraded system commonization with I-4/other V-6 vehicles and associated complexity issues to be presented at next meeting. T. G. Tomezak/
O. J. Viergutz
- A 1990 3/4 launch would require the use of a manual shift transfer case for a production period of three months until the electric shift transfer case becomes available in 1991. An analysis of pullahead of the electric shift transfer case, overhead console and required cowl side inner panel was requested. D. N. Renneker/
O. J. Viergutz/
R. S. Moser/
J. J. Serritella

Engine

- Engine with representative/new accessory drive will not be available until June, 1989 (vs. December, 1988). Confirmation/durability testing will be compressed for 1990 3/4 launch. (Early pre-program vehicles will be supported with engines that do not have representative accessory drive).

Responsibility

C. P. Theodore

Electrical

New underhood mounting brackets may be required. Other components require minor modifications or are carryover. Underhood temperature increases due to V-8 and the impact on ECU will be analyzed.

R. S. Moser

Development

A detailed prototype vehicle development plan will be presented at the next meeting.

D. C. Winn

Technical Cost

The vehicle cost estimates for the items being changed to accomodate the V8 were reviewed. An updated V8 program cost (including trim package, electric transfer case, etc.) is requested for next meeting. An update of V8 cost impact on non-V8 vehicles also requested.

E. R. Schneider/
Engrg. Directors

- The definition of a "base vehicle" is required in view of the LAI request to reduce the vehicle line cost by 10%. A volume weighted average Dakota was proposed.

E. R. Schneider/
P. V. Sheridan

OTHER N-BODY PROGRAMS

A500 Launch Readiness (1988 1/2)

- Vehicle is ready for February launch. Ongoing efforts to resolve hardshifting, etc. requested.

D. C. Winn

- The 3.90 axle ratio with the 14 inch tire has unacceptable highway engine speed and resultant NVH. Proposed launch restrictions to be defined by 1/21/88. 3.90 axle ratio restricted to the 15 inch tire under evaluation.

O. J. Viergutz/
G. A. House/
D. C. Winn

- Development issues including axle complexity (3.2, 3.5, 3.9) to be addressed at the next meeting.

D. C. Winn

RWAL Brakes (1989)

- No design/timing problem identified. Reliability mileage accumulation not complete. Some axle failures noted. In process of comparing data to those of non-RWAL vehicles. Need to summarize development issues by next meeting. O. J. Viergutz/
D. C. Winn

2.5L TBI Launch Readiness (1989)

- Testing is on schedule; no major launch issues identified to date. C. P. Theodore
- A management Ride & Drive is scheduled for Tuesday, 1/26/88. D. C. Winn
- JTE requested that need for 2.5L I4 powertrain be clarified. Proposed that 3.9L V6 be made the base powertrain with 5.2L V8 the option. Program Management/Product Planning to present at next meeting. T. deBoer/
G. A. House
- An update of all development issues to be presented at the next meeting. C. P. Theodore/
D. C. Winn

Extended Cab (1989 3/4)

- All program vehicles are completed. No major durability problems identified after 5,000 miles of testing. Rear seat and access ease awaiting parts for evaluation. Development issues to be summarized at the next meeting. D. C. Winn

<p>The next N-Body Program Review is scheduled for 1:00 p.m. on Thursday, February 11, 1988 in the JTE Executive Conference Room.</p>

- cc: D. F. Buser R. S. Moser
R. M. Cooper E. C. Pearson
D. E. Dawkins P. Sawchuck
G. F. Ingram T. G. Tomezak
J. E. Kent J. F. Wurster
J. E. MacAfee H. C. von Rusten
R. J. Matton
M. J. McGrane

Paul V. Sheridan
Engrg. Program Control
January 20, 1988

TRAY	80113	117	WBVP
F LOT	40207	20	WBVP
P LOT	90725	28	WBVP
C1 PILOT	91106	22	WBVP
VOL PRD	00409		

COMPONENT TIMING FORECAST
 1990 3/4 'N' BODY PICK-UP (PROPOSAL) (1Q) DODGE CITY

THEME SELECTION PDM	THEME APPROVAL PDM	START PROD DESIGN	EMD COMPLETE	DIE MODEL COMPLETE	PROD SAMPLE AVAILABLE	WEEKS + OR - TO MTS**
FCST NA WBVP	NA	70626A 146	44 80429 101	NIR	60 90629 41	+0
FCST NA WBVP	NA	70626A 145	51 80617 94	NIR	60 90811 34	+7
FCST NA WBVP	NA	80315 107	28 80930 79	NA	60 91124C 19	-8
FCST 70619 WBVP 146	8 70613A 138	26 80212 112	43 81209 69	12 90303 57	28 90915C 29	-14
FCST 70619 WBVP 146	8 70613A 138	26 80212 112	44 81216 68	13 90317 55	32 91027C 23	-11
FCST 70619 WBVP 146	8 70613A 138	24 80129 114	30 80826 84	13 81125 71	41 90908C 30	-11
FCST 70619 WBVP 146	8 70613A 138	26 80212 112	34 81007 78	13 90106 65	36 90915C 29	-5
FCST 70717 WBVP 142	22 71218A 120	22 80520 98	30 81216 68	12 90310 56	29 90929C 27	-7
FCST NR WBVP	71218A 120	12 80314 108	40 81219 68	8 90213 60	27 90821C 33	-1

** NOTE: ALL + OR - WEEKS ARE TO LAST SAMPLE SUBMISSION FOR ENGINEERING FUNCTIONAL TESTING, OR CLEAN-UP REQUIREMENT FOR PURCHASED PARTS, OR TO LAST MTS PERMISSIBLE SHIP CODE DATE FOR CERTIFIED CORPORATE PARTS.

COMPONENT TIMING FORECAST

TODAY	80113	117	WBVP
P1 PILOT	90807	25	WBVP
P2 PILOT	90925	28	WBVP
C1 PILOT	91106	22	WBVP
VOL PROD	00409		

1990 3/4 'N' BODY PICK-UP (PROPOSAL) (1Q) DODGE CITY

THEME SELECTION PDM	THEME APPROVAL PDM	START PROD DESIGN	EMD COMPLETE	DIE MODEL COMPLETE	PROD SAMPLE AVAILABLE	WEEKS + OR - TO MTS**
NA	70813A 138	38 80506 100	34 81230 66	13 90331 53	21 80825C 32	-2
	70813A 138	17 71207A 121	25 80603 96	11 80819 85	48 90616 42	+8

AIR DAM-FRT BMRP (PREM) FCST NA WBVP
OKMON204

Head - Du TER

** NOTE: ALL + OR - WEEKS ARE TO LAST SAMPLE SUBMISSION FOR ENGINEERING FUNCTIONAL TESTING, OR CLEAN-UP REQUIREMENT FOR PURCHASED PARTS, OR TO LAST MTS PERMISSIBLE SHIP CODE DATE FOR CERTIFIED CORPORATE PARTS.

PROGRAM TIMING OFFICE

COMPONENT TIMING FORECAST

TODAY	80208	127	WBVP
P1 PILOT	9/1/83	36	WBVP
P2 PILOT	00/02	28	WBVP
C1 PILOT	002/2	22	WBVP
VOL PROD	00716		

		1991		'N' BODY PICK-UP		DODGE CITY		WEEKS + OR - TO MTS**	
		THEME SELECTION PDM	THEME APPROVAL PDM	START PROD DESIGN	EMD COMPLETE	DIE MODEL COMPLETE	PROD SAMPLE AVAILABLE		
FRAME ASSY OKM1N510	FCST WBVP	NA	NA	70626A 159	44 80429 115	0 80429 115	60 90623C 55	+14	
FRONT AXLE OKM1N500	FCST WBVP	NA	NA	80315 121	28 80930 93	NA	60 91124C 33	+11	
KNUCKLE & KNUCKLE ARM OKM1N505	FCST WBVP	NA	NA	70626A 159	51 80617 108	0 80617 108	60 90811C 48	+20	
HEADLAMP ASSY-AERO OKM1N301	FCST WBVP	70619 160	8 70813A 152	26 80212 126	17 80613 109	38 90303 71	28 90915C 43	+0	
PARK/TURN LAMP OKM1N303	FCST WBVP	70619 160	8 70813A 152	26 80212 126	44 81216 82	13 90317 69	32 91027C 37	+3	
BUMPER - FRONT OKM1N200	FCST WBVP	70619 160	8 70813A 152	24 80129 128	30 80826 98	13 81125 85	41 90908C 44	+3	
GRILLE OKM1N304	FCST WBVP	70619 160	8 70813A 152	26 80212 126	34 81007 92	13 90106 79	36 90915C 43	+9	
MIRROR - O/S DOOR LT OKM1N400	FCST WBVP	70717 156	22 71218A 134	22 80520 112	30 81216 82	12 90310 70	29 90929C 41	+7	
MOLDING - FENDER OKM1N404	FCST WBVP	NR	71218A 134	12 80314 122	40 81219 82	8 90213 74	27 90821C 47	+13	

** NOTE: ALL + OR - WEEKS ARE TO LAST SAMPLE SUBMISSION FOR ENGINEERING FUNCTIONAL TESTING, OR CLEAN-UP REQUIREMENT FOR PURCHASED PARTS, OR TO LAST MTS PERMISSIBLE SHIP CODE DATE FOR CERTIFIED CORPORATE PARTS.

PROGRAM TIMING OFFICE

COMPONENT TIMING FORECAST

TODAY	80208	127 WBVP
P1 PILOT	9/1/83	35 WBVP
P2 PILOT	00/02	28 WBVP
C1 PILOT	002/2	22 WBVP
VOL PROD	00716	

DODGE CITY

'N' BODY PICK-UP

1991

THEME SELECTION PDM
 THEME APPROVAL PDM
 START PROD DESIGN
 EMD COMPLETE
 DIE MODEL COMPLETE
 PROD SAMPLE AVAILABLE
 WEEKS + OR - TO MTS**

	FCST. NA	70813A	17	71211	39	80909	12	81202	35	90804C	+14
RADIATOR CLOSURE OKM1N100	NA	152		135		96		84		49	
AERO HEAD LAMP ASSY - O.D.D. KM 91N.305		70813A	26	80212	25	80808		NA	48	90710	+10
		152		126		101				53	
Hood DATER - PNL		70813A	17	71207A	25	80603	12	80826	43	90623	+21
		152		135		110		98		55	

** NOTE: ALL + OR - WEEKS ARE TO LAST SAMPLE SUBMISSION FOR ENGINEERING FUNCTIONAL TESTING, OR CLEAN-UP REQUIREMENT FOR PURCHASED PARTS, OR TO LAST MTS PERMISSIBLE SHIP CODE DATE FOR CERTIFIED CORPORATE PARTS.

PROGRAM TIMING OFFICE

N-BODY TRUCK LRPLRP OVERVIEW

- 1989 M.Y.
 - Add 2.5L TBI & A/T, Drop 2.2L
 - Add RWAL Brake System
 - Add Dodge Convertible (89-1/2)
 - Add 4 x 2 Dodge Club Cab (89-3/4)
- 1990 M.Y.
 - Add Split Bench and High Back Bucket Seats Plus Sport Model to Club Cab
- 1991 M.Y.
 - Add V-8, GLO, Front Corner Strengthening, Wheels
 - Add 4 x 4 Dodge Club Cab
 - Add 4 x 2 Dodge Dual Rear Wheel Chassis - Cab
 - Add Electric Shift Transfer Case Option
 - Add Full Line Jeep Comanche Regular and Extended Cabs (91-1/2)
- 1992 M.Y.
 - Add New I/P, Interior Trim
- 1993 M.Y.
 - C/O
- 1994 M.Y.
 - Major Reskin

OPEN ISSUES

- M.Y. designation (1990 vs. 1989) for 89-3/4 extended cab & launch timing
- 89-1/2 convertible Program Approval (3/7/88 PPC)
- 91-1/2 Jeep derivatives Program Approval (3/28/88 PPC) & sourcing implications
- 94 major reskin definition

N - BODY DAKOTA TRUCK

ENGINEERING PROGRAM REVIEW

5.2L V-8/FESM PROGRAM

MANUFACTURING ISSUES

- TIMING
- ASSEMBLY/LAUNCH
- COMPLEXITY

- INFORMATION TO BE PROVIDED AT MEETING

RESPONSIBILITY: T. G. TOMEZAK

MANUFACTURING FEASIBILITY DEPARTMENT

N-TRUCK 5.21 V8 - OPEN ITEMS

SUMMARY SHEET

AREA	ITEMS		
	<u>OPEN</u>	<u>CLOSED</u>	<u>TOTAL</u>
STAMPING	1	2	3
B.I.W.	3	3	6
PAINT	-	-	-
EXTERIOR TRIM	4	2	6
INTERIOR TRIM	5	4	9
CHASSIS/ENGINE	16	4	20
TOTAL	29	15	44

February 2, 1988

MANUFACTURING FEASIBILITY

1991 N-BODY OPEN ITEMS
RENEWAL PROGRAM

ITEM NO. AREA	COMPONENT	ISSUE/DATE	MFG. POSITION/DATE	STATUS/DATE	ASSNG'D TO
1. CHASSIS	Front Axle Pinion Brkt. 7 1/4 & 8 1/4	10/9/87 Mfg. hole for alignment to trans. support is too small.	10/9/87 Mfg. requests that hole be increased to .375 to improve tool life in plant.	10/9/87 OPEN	Nelson/ Winde
2. CHASSIS	Front Axle Disconnect Hsg. 7 1/4 & 8 1/4	10/9/87 Alignment of right side trans. strut to disc. Hsg.	10/9/87 Mfg. request that Engr'g. provide hole in Hsg. strut for alignment purpose.	10/9/87 OPEN	Nelson/ Winde
3. CHASSIS	Axle Isolator R/L	10/9/87 Engr'g. indicates isolators will be unique to axle size, but similar in appearance.	10/9/87 Mfg. request that brackets be color coded to prevent mis-build	10/9/87 OPEN 11/2/87 Eng. indicates bolt ctr. will be unique on lt. isolator. Rt. side under development.	Diwan/ Nelson/ Winde
4. CHASSIS	Axle Vent Fitting	10/9/87 Fitting to be relocated from disconnect Hsg. to axle tube. Hose routing undefined.	10/9/87 Mfg. requires routing to be similar to present process to prevent entrapment at engine deck.	10/9/87 OPEN	Nelson/ Winde
5. CHASSIS	Axle Shaft Flange Joint	10/9/87 Tool access to fasteners. Current design requires universal drive.	10/9/87 Mfg. requires increased access for direct sockets engagement.	10/9/87 OPEN 10/22/87 Engr'g. indicates (1/2) shafts are currently used by G.M. Mfg. req. Engr'g. to identify current G.M. tooling.	Nelson/ Johnson/ Winde

(1133c/0030c)

ISSUED: 01/30/88
REVISED: 02/05/88

MANUFACTURING FEASIBILITY

1991 N-BODY OPEN ITEMS
RENEWAL PROGRAM

ITEM NO. AREA	COMPONENT	ISSUE/DATE	MFG. POSITION/DATE	STATUS/DATE	ASSNG'D TO
6. FINAL	Fasteners Front. Bumper Mtg. to Frame	11/30/87 Nut & Bolt application requires special tools for securing.	11/30/87 Mfg. wants tapping plate to assembly front bumper. This will eliminate the need for special tooling.	11/30/87 OPEN Engr'g. investigating.	Stewart/ Parkenson/ Winde
7. FINAL	Premium Air Dam	11/30/87 Air Dam vertical attaching bolts are in- accessible for direct air tool securing.	11/30/87 Mfg. considers use of universal extension wrench unacceptable.	11/30/87 OPEN	Stewart/ Parkenson/ Winde
8. TRIM	Aero Head Lamp	11/30/87 Proposed design does not allow for sufficient clearance for adjustment.	11/30/87 Mfg. requires adjustment on common plane with direct tool access.	11/30/87 OPEN	L. Wu/ Winde

(1133c/0030c)

ISSUED: 01/30/88
REVISED: 02/05/88

MANUFACTURING FEASIBILITY

1991 N-BODY OPEN ITEMS
RENEWAL PROGRAM

ITEM NO.

AREA	COMPONENT	ISSUE/DATE	MFG. POSITION/DATE	STATUS/DATE	ASSNG'D TO
9.	CHASSIS				
	Frame	10/28/87 Access to Mfg. hole regarding chassis o/head carrier.	10/28/87 Mfg. withholds feas. until tryout at Dodge City is complete.	10/28/87 OPEN	Pruett/ Groszewski/ Gottschalk/ Simmons/ Wreford
				11/11/87 Engr'g. mock up of frame at Carron to be delivered at Dodge City week 11/16/87.	
				1/11/88 HOLD N-4x2 Mocked up frame was rec. by plant. Changes to trim edge of frt. sec. will be req. Reviewing with O.D.M.T.C.	
10.	CHASSIS				
	Front Axle Half Shaft	11/10/87 8 1/4" axle may require unique half shafts-added complexity.	11/10/87 Mfg. request common half shafts between 7 1/4" and 8 1/4" axles.	11/10/87 OPEN	Johnson/ Groszewski
				1/19/88 HOLD N-4x4 pending shipment of frame from plant to Carron.	
11.	TRIM				
	Wire Harness (Electronic Transfer Case Shift)	10/15/87 Wire routing in area of sun visor - possible entrapment with visor and/or screw.	10/15/87 Mfg. withholds feasibility until tryout on buck.	10/15/87 OPEN	Shen/ Groszewski
12.	TRIM				
	Shift Overhead Console Mtg. Brkt. (Electronic Transfer Case Shift)	11/4/87 Fastener quantity.	11/4/87 Mfg. request reduction of attaching screws.	11/4/87 OPEN	Ahmed/ Groszewski
	(1133c/0030c)				

ISSUED: 01/30/88
REVISED: 02/05/88

MANUFACTURING FEASIBILITY

1991 N-BODY OPEN ITEMS
RENEWAL PROGRAM

ITEM NO. AREA	COMPONENT	ISSUE/DATE	MFG. POSITION/DATE	STATUS/DATE	ASSNG'D TO
13. TRIM	Electronic Transfer Case Shift Switch	11/4/87 Switch as shown requires sub-assembly.	11/4/87 Mfg. requests snap-in design eliminating the necessity of sub-assembly.	11/4/87 OPEN	Ahmed/ Groszewski
14. TRIM	Electronic Transfer Case Trim Bezel for Header Switch	10/8/87 Preliminary design shows only 2 mm overlap between bezel & headliner. This is not acceptable to Mfg.	10/8/87 Mfg. requires a minimum 7 mm overlap.	10/8/87 OPEN Design office indicates final design should im- prove fit condition. <u>HOLD pending review.</u>	Brown/ Winde
15. TRIM	Electronic Transfer Case Switch	10/8/87 Attachment of switch to bezel is threaded fastener.	10/8/87 Mfg. requests that switch be designed for snap-in assy. to eliminate off- line sub-assembly.	1/5/88 CLOSED. This is <u>direction.</u> 10/8/87 OPEN 2/5/88 CLOSED. <u>Duplication of Item 13.</u>	Palmgren/ Winde
16. TRIM	Electronic Transfer Case Module	10/8/87 Design location un- defined.	10/8/87 Mfg. withholds feasibility until design is disclosed.	10/8/87 OPEN 1/28/88 Design reflects 2 mm clearance between upr. mtg. tab and dash panel upr. Mfg. requires 5 mm for build variation.	Aglamishian/ Winde

(1133c/0030c)

ISSUED: 01/30/88
REVISED: 02/05/88

MANUFACTURING FEASIBILITY

Page 5

1991 N-BODY OPEN ITEMS
RENEWAL PROGRAM

ITEM NO. AREA	COMPONENT	ISSUE/DATE	MFG. POSITION/DATE	STATUS/DATE	ASSNG'D TO
17. TRIM	Headliner	10/8/87 Headliner surface compatibility to Overhead	10/8/87 Mfg. requires common surface for headliner to prevent increased assy. plant complexity when consoles are scheduled.	10/8/87 OPEN	Brown/ Knight/ Groszewski
18. TRIM	Aero Headlamp	11/13/87 Design indicates use of "J" nuts for attachment to closure panel.	11/13/87 Mfg. requests use of conical extrusion in closure panel to reduce cost and complexity.	11/13/87 OPEN	Pruett/ Winde/ L. Wu
19. TRIM	Aero Headlamp	11/13/87 Lamp assy. upr. attachment design indicates assy. will be loose until grill is installed. Vulnerable to damage.	11/13/87 Mfg. requests toy tab be added to lamp assy., creating interference fit.	11/13/87 OPEN	Pruett/ Winde/ L. Wu
20. TRIM	Fuse Link/Relay Module	11/5/87 Currently design has cost penalty.	11/5/87 Mfg. supports modular relay vs. separate modular assemblies. Reduce plant labor and warranty reduction.	11/5/87 OPEN 12/7/87 CLOSED Plant labor cost study reflects labor cost reduction. This is design direction.	Groszewski/ Aglamishian
21. TRIM	Door Wiring	11/5/87 Routing feasibility.	11/5/87 Mfg. requires mock-up review.	12/7/87 OPEN 1/26/88 Drawing received. Mfg. investigation.	Groszewski/ Rudinski

(1133c/0030c)

ISSUED: 01/30/88
REVISED: 02/05/88

MANUFACTURING FEASIBILITY

1991 N-BODY OPEN ITEMS
RENEWAL PROGRAM

Page 6

ITEM NO. AREA	COMPONENT	ISSUE/DATE	MFG. POSITION/DATE	STATUS/DATE	ASSNG'D TO
22. B.I.W.	Front Closure	11/5/87 Timing of automation changes. Downtime.	11/5/87 Mfg. requires timing Timing plan.	11/5/87 OPEN	Jensen/ Lang/ Giangrande
23. STAMP	Front Closure	11/5/87 Drawability.	11/5/87	11/5/87 OPEN	Istenes/ Pruitt
24. B.I.W. PAINT	Carrier Changes	11/5/87 Front closure moves approx. 2" forward.	11/5/87 Interfers with A-275 details.	11/5/87 OPEN	Kleppert/ Giangrande
25. CHASSIS	Heater Hose V-8 (5.2)	2/2/88 Attachment of heater hose to water pump.	2/2/88 Mfg. requires that hose attachment be common with current hose routing use on V-6 (3.9) engine.	2/2/88 OPEN	Gardner/ Groszewski
26. CHASSIS	Accessory Drive Mtd. Brkt. V-8 (5.2)	2/2/88 Attachment of brkt. utilizes existing water pump bolts. Unacceptable to Mfg.	2/2/88 Mfg. wants brkt. to have its own unique mtg. surface (bossies) Reason: reduce labor burden & warranty on water pump leaks.	2/2/88 OPEN	Gardner/ Groszewski
27. CHASSIS	Temp Sensor	2/2/88 Temp. sensor is located under A/C compressor. Service of sensor would require removal of compressor.	2/2/88 Mfg. wants sensor re- located to improve service and eliminate sensor dictating sequence of assy.	2/2/88 OPEN	Gardner/ Groszewski

(1133c/0030c)

ISSUED: 01/30/
REVISED: 02/05/

MANUFACTURING FEASIBILITY

1991 N-BODY OPEN ITEMS
RENEWAL PROGRAM

ITEM NO. AREA	COMPONENT	ISSUE/DATE	MFG. POSITION/DATE	STATUS/DATE	ASSNG'D TO
28. CHASSIS	Oil Dip Stick Tube V-8 (5.2)	2/2/88 Access for installing tube is unacceptable to Mfg.	2/2/88 Current design requires tube be installed first and all bracketry to follow. Mfg. wants tube to be assembled after brkts. are installed. Reason: reduce damage and prevention of oil leaks.	2/2/88 OPEN	Gardner/ Groszewski
29. CHASSIS	Alternator Pivot Bolt V-8 (5.2)	2/2/88 No power tool access for securing bolt.	2/2/88 Mfg. wants direct power tool access without use of swivel socket.	2/2/88 OPEN	Gardner/ Groszewski
30. CHASSIS	Front Crossmember V-8 (5.2)	2/5/88 Design undefined.	2/5/88 Mfg. wants crossmember to be bolt in design. Reduced frame complexity.	2/5/88 OPEN	Wolf/ Wreford/ Winde

(1133c/0030c)

ISSUED: 01/30/88
REVISED: 02/05/88

1991 N-BODY

February 8, 1988

DESIGN OFFICE APPROVAL/RELEASE SCHEDULE

MAJOR COMPONENTS	PDM APPROVAL	STUDIO RELEASE	LEAD BODY RELEASE	+/- WEEKS TO PILOT
<u>EXTERIOR</u>				
FRONT END SHEET METAL	08/13/87 (A)	09/11/87 (A)	12/04/87 (A)	+18
FRONT BUMPER	08/13/87 (A)	09/11/87 (A)	01/29/88 (A)	+ 3
AERO HEADLAMP	08/13/87 (A)	12/04/87 (A)	02/12/88	+ 2
GRILLE	08/13/87 (A)	12/04/87 (A)	02/12/88	+11
O/S REAR VIEW MIRROR	12/18/87 (A)	02/01/88 (A)	RELEASE DIRECT TO SUPPLIER	+ 7
ORNAMENTATION				
WHEEL LIP MOLDINGS	12/18/87 (A)	01/19/88 (A)	03/25/88	+17
OTHER MOLDINGS	12/18/87 (A)	01/19/88 (A)	03/14/88	+13
ALUMINUM WHEEL	04/01/88	04/15/88	NOT REQUIRED	+25
MODIFIED STEEL WHEEL	04/01/88	04/15/88	NOT REQUIRED	+ 0
<u>INTERIOR</u>				
O/HEAD TRANSFER CASE MODULE	12/11/87 (A)	01/19/88 (A)	03/25/88	+ 5
HEADLINER (MODIFIED)	12/11/87 (A)	02/05/88 (A)	03/25/88	+27
COWL TRIM PANEL & A-PILLAR COVER	12/11/87 (A)	01/22/88 (A)	03/25/88	+10

(revised)

1991 N-BODY V-8 ENGINE - BODY ISSUES

All major components in the body area are plus to the MTS. The Design Office has handed off the hood and front bumper surface and we are now proceeding with the final production design layouts. The front closure panel has 90% stamping feasibility and should be 100% by next week with the concessions that have been granted. These concessions have been incorporated into the soft tool program to allow us to start using drawn panels in the preproto vehicles in mid-March. The battery location still needs to be finalized.

S. W. Crater
2-8-88

N - BODY DAKOTA TRUCK

ENGINEERING PROGRAM REVIEW

5.2L V-8/FESM PROGRAM

DRIVETRAIN/CHASSIS

CRITICAL COMPONENT TIMING/SOURCING REVIEW

- INFORMATION TO BE PROVIDED AT MEETING

RESPONSIBILITY: O. J. VIERGUTZ

1991, 5.2L, V-8

DAKOTA

ENGINE ENGINEERING
CRITICAL COMPONENTS

Front Accessory Drive (Serpentine)

- A/C Bracket - New source for A/C compressor needs to be identified.
Design proceeding with current Dayton A590 compressor.
 - Correct hood dimension for clearance to bracket required.
 - Design complete target 2/29/88
 - Belt - Presource in process,
AC belt is Daco
Non A/C belt is Goodyear
 - Auto Tensioner - Need source identified
 - Non A/C Bracket- To follow A/C bracket target complete 4/1/88.
- Water Pump - Source is ACECO
Finalization of design enhancement dependant on A/C bracket.
- Chain Case Cover - Source is ACECO for castings and UNIBORING for machining (prototype).
Enhanced design for improved assembly processing and service dependant on A/C bracket.
- Cam Shaft - Use current source
Dependant on chain case cover for finalization.

Dodge Truck
Engine Program Management
D. D. Perrine

1991 5.2L V-8DAKOTAENGINE ENGINEERING
COMMONIZATION EFFORTS

- Air Cleaners - Common metal air cleaner 3.9L & 5.2L
- Oil Pan - - Common rear seal radius on all 'V' engines.
New pan for Dakota
- Oil Filter - SAE thread for all Jeep and Truck engines.

OTHER ITEMS

- Exhaust System - Less restrictive, common V-6 and V-8 'N' truck exhaust except for catalyst loading and muffler tuning.
- Catalytic Convertor - Packaging study for 212 cu. in. cat. on 4 X 4 extended cab continues. Packaging is feasible, next to xfer case. Temperature impact needs to be assessed.
- New location also applicable to V-6, 4 X 4, extended cab.
- Engine Mounts - New design. 4 X 2 will use flat mount, 4 X 4 will use spool mount.
- Engine angle of V-8 in N truck effect to fuel/air distribution needs to be assessed.

Dodge Truck
Engine Program Management
D. D. Perrine

N - BODY DAKOTA TRUCK

ENGINEERING PROGRAM REVIEW

5.2L V-8/FESM PROGRAM

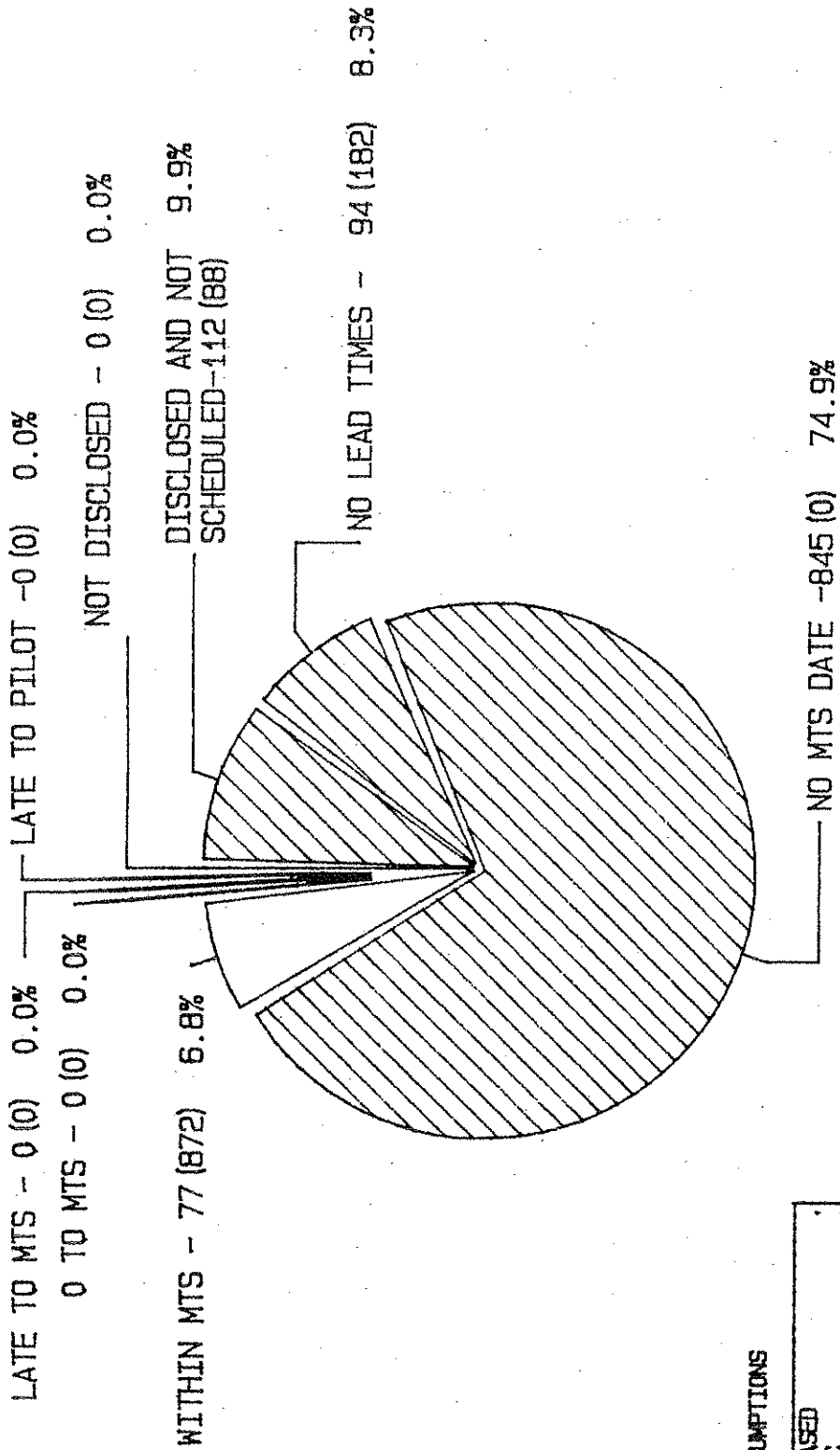
ELECTRICAL/ELECTRONICS

CRITICAL COMPONENT TIMING/SOURCING REVIEW

- INFORMATION TO BE PROVIDED AT MEETING

RESPONSIBILITY: R. S. MOSER

1991 MODEL YEAR REPORT
PURCHASED PARTS PROGRAM STATUS
 ALL TRUCK AND JEEP LINES



DATA ASSUMPTIONS
 0-1, AE, A1, RELEASED
 00VAA0, 32A0, PEL, PIC
 EXCLUDES COLOR EXPLOSION
 CORPORATE LEAD TIME TRACKING REPORT
 FOR THE PERIOD 02/08/88
 PROGRAM FORECAST: N/A-E VS 1128A
 PRIOR REPORT 02/03/88 -TOTAL IN
 PARENTHESES ()
 PREPARED BY B. L. HENDRIETH (6-2134)

FORWARD MODEL TIMING
 PURCHASING PLANNING
 FEBRUARY 10, 1988

1991 M1 - VEHICLE FAMILY SUMMARY
ALL TRUCK AND JEEP LINES

BODY STYLE DESIGNATOR	AB	AD	AN	AT	MJ	SJ	KJ	YJ	ZJ	TOTAL
ENGINEERING ESTIMATED PROGRAM (actual, in lieu of estimated)	15	57	76	0	0	0	0	0	980	1128
NOT DISCLOSED	/	0	0	0	0	0	0	0	0	0
	/ PCT	0%	0%	***	***	***	***	***	0%	0%
DISCLOSED BUT NOT SCHEDULED (NDP'S)	1	46	11	0	0	0	0	0	54	112
	/ PCT	7%	81%	***	***	***	***	***	6%	10%
LEAD TIME NOT ASSESSED (NLT'S)	0	2	11	0	0	0	0	0	81	94
	/ PCT	0%	4%	***	***	***	***	***	8%	8%
NO MTS DATE	0	0	0	0	0	0	0	0	845	845
	/ PCT	0%	0%	***	***	***	***	***	85%	75%
WITHIN MTS	14	9	54	0	0	0	0	0	0	77
	/ PCT	93%	16%	***	***	***	***	***	0%	7%
ZERO CRITICALITY	0	0	0	0	0	0	0	0	0	0
	/ PCT	0%	0%	***	***	***	***	***	0%	0%
LATE TO MTS	0	0	0	0	0	0	0	0	0	0
	/ PCT	0%	0%	***	***	***	***	***	0%	0%
TOTAL (PIE CHART)	15	57	76	0	0	0	0	0	980	1128
PROGRAM AT RISK	1	48	22	0	0	0	0	0	980	1051
	/ PCT	7%	84%	***	***	***	***	***	***	93%
OVER DISCLOSED	0	0	0	0	0	0	0	0	0	0
	/ PCT	0%	0%	***	***	***	***	***	0%	0%

LONG LEAD DISCLOSURES HISTORICALLY REPRESENTS 45% OF TOTAL NEW PART REQUIREMENTS
117 MBVP = 4/18/88 FOR AB,AD,AN; 4/25/88 FOR AN (EXT CAB),XJ,YJ; 7/18/88 FOR ZJ
* SUM OF PERCENTAGES MAY NOT EXACTLY = 100% , DUE TO ROUNDING.
* THESE DISCLOSURES ARE 98.8% IN THE 1990 ESDS/PMC AND HAVE NOT BEEN LOADED IN THE 1991 CMC APIS SYSTEM
WHERE THEY WILL BE TIMED WITHIN 5 DAYS BY THE APPROPRIATE SUPPLY ACTIVITY.

FORWARD MODEL TIMING
PURCHASING PLANNING
DATE: 02/03/88

N - BODY DAKOTA TRUCK

ENGINEERING PROGRAM REVIEW

5.2L V-8/FESM PROGRAM

PROTOTYPE VEHICLE DEVELOPMENT PLAN

- INFORMATION TO BE PROVIDED AT MEETING

RESPONSIBILITY: D. C. WINN

ACTION LETTER NO. 7163BULLETIN NO. 1-88-91NDATE February 2, 1988FROM Paul V. Sheridan**CONFIDENTIAL****JTE PROGRAM DESCRIPTION BULLETIN/
ENGINEERING OFFICE ACTION LETTER**PROGRAM TITLE: 1991 N-Body 5.2L V-8/FESM Program (PPCT 15300-700)MCIS NUMBER: 0A1SJ38, 1A1SJ39, 1A1SJ40, 1A15P11Review for effect on compliance with () Safety Standards, () Emission Standards,
() Consumer Information, () State Regulations, () Canadian Regulations

QUALIFICATIONS/REMARKS:

This Action Letter documents the tentative timing and specifications for the preprototype vehicle builds previously approved by the Highland Park Vehicle Planning Committee on May 11, 1987 for the 1991 N-Body 5.2L V8/FESM Program. The complete build program consists of 42 vehicles; 32 during 1988 CY and 10 Emissions Certification in 1989 CY. The 32 vehicle builds for 1988 CY are detailed below; the 10 Certification builds in 1989 will be administered by a subsequent Action Letter.

1. General Vehicle Descriptions

Regular (three-man) cab preprototypes on 112" or 124" WB will initially use 1988 MY production vehicles as the base unit; 4K builds will use 1989 MY base units. Regular production bodies and trim will be mounted on modified frames. Regular cab units are shown as N1 (4x2) and N5 (4x4) on Attachment I.

Club Cab (131" WB extended body) preprototypes must be built from "the ground up" with prototype frames and program level cabs/trim. Production vehicles will be used for C/O parts. Club Cab units are shown as N1E (4x2) and N5E (4x4) on Attachment I.

BIW modifications include a new front closure panel and extended hood. Grille, bumper and air dam are new and modified production parts will suffice for preprototypes. Carryover headlamps will be used until the new conventional headlamp/bezel or aerodynamic lamps are available.

N-body 5.2L V8 TBI engines will have new serpentine accessory drive, new water pump, chain case cover, exhaust manifolds, oil pan and other new components required for the N-Body installation. Transmission will be A500 4-speed automatic - Phase II or PTR/production level. Overdrive lock-out switch will be in the instrument panel; shift levers with OD switches for the presently planned 1990 corporate programs should not be used in these preprototypes, except as specified below.

(continued)

Until deemed otherwise by Transmission and Final Drive Engineering (J.E. MacAfee, tieline 733-2568), all 4x4 preprototypes will have modified 7 1/4 front axles and C/O 8 1/4 rear axles (pending data acquisition analysis). Transfer case will be NPG 231 or NPG 231 H.D. with electric actuated shift system including overhead push-button controls.

Front corner upgrade will be installed on all 4x4s. This upgrade includes brakes, knuckle, hub unit bearing, halfshafts, modified control arms and 6 stud wheels. All 4x2 units will include new front brakes and 6 stud wheels.

RWAL brake systems are planned for all vehicles using 1989 pilot rear axles with modified shafts for 6 stud wheels.

Fuel system and vapor recovery will be C/O 1988 level for initial builds. Changing specification to "On-Board" is subject to Emissions policy and planning. Fuel tanks will be C/O 15 and 22 gallon capacity. Fuel line routing will be revised at rear of engine to eliminate front cross-over lines.

Exhaust "Wye" pipe will be C/O 3.9L V6 except for 2.5 inch diameter collector and clearanced for 4x4 prop shaft. Catalyst assemblies will be D-Body type 212 inch C/O 5.2L V8 with 2.5 inch diameter inlet/outlet including the N1E and N5E (4x4 Club Cab). The primary muffler is the E89-201 Walker with reduced back pressure. (Low cost Arvin design as secondary source will be package protected.) Muffler inlet is 2.5 inches, outlet is 2.5 inches, tailpipe is 2.5 inches. (Vehicles 779NS and 785NS were deemed not required by Engine Engineering - D.D. Perrine, tieline 733-3008 - due to the recent 212 inch catalyst usage decision.)

Engine front supports on 4x2 models will initially be C/O 3.9L brackets and insulator. The production intent system will consist of an added crossmember improved insulator that is targeted for initial build on Vehicle 770NS. The NVH development vehicle 764NS is moved from January to March so that the intended engine mounts can be installed.

Cooling System components for the 5.2L V8 will include the C/O N-Body 26" radiator with modified top tank and new hoses. Fan and shroud will initially be C/O 18" components. Engine cooling tests will determine need for 20" fan/shroud and preprototypes will be selectively updated as necessary. Vehicle 777NS is the target for initial build with updated cooling system prior to running durability.

(continued)

Future MY features to be selectively incorporated on the 1991 preprototypes are as follows:

- Electronic Speed Control to 1989 level on all vehicles so specified. This requires new servos, speedometer cables, and appropriate wiring for compatibility with EFI engine controller.
- Toledo Machining Plant 1990 level tilt steering columns on selected units. 1990 level steering wheel with speed control buttons in the wheel go with TMP columns. Impact vehicles will have the 90 degree fully articulated U-joints.
- Gas Shocks - 1989; selective vehicle usage.

It should be emphasized that the information presented here is general and is meant to accommodate the "transition" aspects of this program. Exceptions and details, including the total vehicles planned for build-up and the responsible individuals, are hereby subject to the ongoing review process provided by the Prototype Build meetings which are coordinated by JTE Vehicle Development (R. F. Bauer, tie line 733-2305). Final approval of the recommendations formulated by the Prototype Build meeting is the responsibility of JTE Engineering Program Control (Paul V. Sheridan, tie line 733-2404), and will be officially documented by subsequent Action Letter issuance.

2. Prototype Vehicle Specifications/Build Schedule

See Attachment I.

3. Prototype Vehicle Usage Summary (Primary Supporting Departments/Custodians and previous Highland Park References)

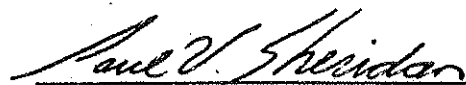
See Attachment II.

4. Prototype Components Summary

See Attachment III.

5. Vehicle Funding

Funding for the build program should be provided in the revised 1987 CY and initial 1988 CY JTE Engineering Departments' budgets. The vehicle list was initially documented in the May 15, 1987, Engineering Work Plan which was the original basis for the JTE budget submissions.


Paul V. Sheridan, Program Manager
JTE Engineering Program Control
February 2, 1988

 PROTOTYPE VEHICLE SPECIFICATIONS/BUILD SCHEDULE

VEHICLE NUMBER	USAGE	BODY STYLE	ENG	TRANS	MATL DUE	VEH COMP	WHEEL BASE	PAY-LD PKG	TIRE SIZE	AXLE RATIO	TRIM LEVEL	COLOR	A/C	F/T	S/C
GENERAL DEVELOPMENT															
759NS	BRAKE SYSTEM DEV.	N5E	EHB	DGG	80120	80210	131	2000	P235	3.90	STD		YES	22	YES
760NS	BRAKE SYS. DEV.	N1	ELG	DGN	80127	80217	112	2550	LT215	3.90	SE		YES	22	YES
767NS	COOLING DEV.	N1	ELG	DGN	80203	80224	124	2550	LT215	3.90	LE		YES	22	NO
765NS	SUSP/STEERING	N1E	ELG	DGN	80210	80302	131	2000	LT215	3.90	LE		YES	22	YES
768NS	A/C DEVELOPMENT	N1E	ELG	DGN	80217	80309	131	2000	LT215	3.55	LE	WHITE	YES	15	NO
770NS	FINAL DRIVE DEV.	N1E	ELG	DGN	80224	80316	131	2000	LT215	3.90	LE		YES	22	YES
764NS	NVH DEV.	N1	ELG	DGN	80309	80330	124	1800	P205	3.90	LE		YES	22	YES
777NS	K2-ENDURANCE	N5E	ELG	DGN	80316	80406	131	1800	P235	3.90	STD	WHITE	YES	22	YES
766NS	FINAL DRIVE DEV.	N5E	ELG	DGN	80323	80413	131	1800	P235 M/S	3.90	LE		YES	22	YES
783NS	K1-ENDURANCE	N1E	ELG	DGN	80330	80420	131	2000	LT215	3.90	SE	SILVER	NO	15	NO
769NS	FINAL DRIVE DEV.	NS	ELG	DGN	80413	80504	124	2000	P235	3.90	LE		YES	22	YES
772NS	STRUCTURAL EVAL	N5E	ELG	DGN	80420	80511	131	1800	P235	3.55	STD	WHITE	YES	22	YES
782NS	ENGINE SYS DEV.	N1	ELG	DGN	80427	80518	112	1800	P215	3.90	STD		YES	15	NO
774NS	180 CAT DEV.	N1	ELG	DGN	80511	80601	112	1800	P215	3.55	LE		YES	22	YES
776NS	90/90 CAT DEV.	N5	ELG	DGN	80518	80608	112	2000	P235	3.55	LE		YES	22	YES
789NS	90/90 CAT DEV.	N5	ELG	DGN	80525	80615	112	1450	P195	3.90	SE		YES	22	YES
784NS	FUEL & EXHAUST	N5E	ELG	DGN	80601	80622	131	1450	P215	3.55	STD		YES	22	YES
778NS	90/90 CAT DEV.	N5	ELG	DGN	80615	80706	112	2000	P235	3.90	LE		YES	22	YES
779NS	180 CAT DEV.	N1	ELG	DGN	80622	80713	112	1800	P205	3.55	SE		YES	22	YES
785NS	180 CAT DEV.	N1	ELG	DGN	80629	80720	112	2550	LT215	3.90	STD		YES	22	YES
780NS	GENERAL DEV.	N1	ELG	DGN	80720	80810	112	1800	P205	3.55	SE		YES	15	YES
781NS	ELECTRONIC DEV.	N5	ELG	DGN	80803	80824	124	2000	P235 M/S	3.90	LE	RED	YES	22	YES
771NS	ENDURANCE PTE	N1E	ELG	DGN	80817	80907	131	2000	LT215	3.90	STD		NO	22	YES
775NS	ENDURANCE PTE	N5E	ELG	DGN	80831	80921	131	1800	P235	3.55	SE		YES	15	YES
786NS	K2-ENDURANCE	N5E	ELG	DGN	80907	80928	131	1800	P235 M/S	3.55	LE	CREAM	YES	22	YES
773NS	ENDURANCE PTE	N5	ELG	DGN	80921	81012	124	2000	P235	3.90	SE		YES	22	YES
787NS	ENDURANCE PTE	N1	ELG	DGN	80928	81019	112	1800	P205	3.55	LE		YES	15	YES
788NS	AIR FUEL & EMISS.	N5	ELG	DGN	81005	81026	112	1450	P205	3.55	STD		YES	15	YES
790NS	GENERAL DEV.	N1	EDA	DGN	81012	81102	124	1250	P195	3.90	STD		YES	22	YES
791NS	FINAL DRIVE DEV.	N5E	EHB	DDE	81019	81109	131	1800	P235	3.90	LE		YES	22	YES
792NS	AIR FUEL & EMISS.	N5E	EHB	DGN	81026	81116	131	1800	P235	3.90	STD		YES	22	YES

IMPACT DEVELOPMENT

D62NS	IMPACT TEST	N1	ELG	DGN	80302	80323	124	2550	LT215	3.55	STD	ORANGE	YES	22	YES
D61NS	IMPACT TEST	N5E	ELG	DGN	80406	80427	131	1800	P235	3.55	STD	ORANGE	YES	22	NO
D63NS	IMPACT TEST	N1	ELG	DGN	80504	80525	112	1800	P205	3.55	STD	LIGHT BLUE	YES	22	YES

Notes:

- All vehicles to have RWAL.
- All vehicles to have 6 stud/15" wheels (4 1/2" B.C.).
- All vehicles to have 1991 program FESM except 759NS.
- All 4x4's to have upgraded front corner.
- All club cabs to have program level bodies.
- All 4x4's to have elec. shift t/case except 759NS.
- All vehicles have power steering and power brakes.
- All speed control - 1989 electronic except 759NS.

Codes:

- Models:
 - N1 = 4x2 (112 or 124 WB)
 - N5 = 4x4 (112 or 124 WB)
 - N5E = 4x4 Club Cab (131 WB)
 - N1E = 4x2 Club Cab (131 WB)
- Engine:
 - EHB = 3.9L V6 TBI
 - ELG = 5.2L V8 TBI
 - EDA = 2.5L 4 cylinder TBI
- Transmission:
 - DGG = A999 3-speed automatic
 - DGN = A500 4-speed automatic
 - DDE = A535 5-speed manual
- Options:
 - A/C = Air conditioning
 - F/T = Fuel tank capacity
 - S/C = Speed control

PROTOTYPE VEHICLE USAGE SUMMARY

JTE TEST RESPONSIBILITY
(PRIMARY SOURCE)

HIGHLAND PARK ENGINEERING
(REFERENCE ONLY)

VEHICLE NUMBER	VEHICLE PRIMARY USAGE	DEPT. #	NAME	PHONE	DEPT. #	NAME	PHONE
759NS	BRAKE SYSTEM DEV.	1660	P. B. HELLENS	733-8531	5720	B. E. SWANSON	876-3125
760NS	BRAKE SYS. DEV.	1660	P. B. HELLENS	733-8531	5720	B. E. SWANSON	876-3125
767NS	COOLING DEV.	1670	T. F. FLYNN	733-3902	3760	R. C. SHULZE	876-3332
765NS	SUSP/STEERING	1700	C. R. WREFORD	733-8762	5710	D. R. HANNUM	876-6733
768NS	A/C DEVELOPMENT	1250	L. K. McDONALD	733-2075	3740	R. J. RYSZIEWSKI	876-4686
770NS	FINAL DRIVE DEV.	1600	J. E. MACAFEE	733-2568	1720	R. N. HAIKIO	733-2199
764NS	NVH DEV.	1130	D. H. MOOTHART	733-3363	5420	F. P. MCINTEE	876-4888
777NS	K2-ENDURANCE	1100	R. F. BAUER	733-2305	5340	G. K. SESTOK	836-3421
766NS	FINAL DRIVE DEV.	1600	J. E. MACAFEE	733-2568	1720	R. N. HAIKIO	733-2199
783NS	K1-ENDURANCE	1100	R. F. BAUER	733-2305	5340	C. K. SESTOK	836-3421
769NS	FINAL DRIVE DEV.	1600	J. E. MACAFEE	733-2568	1720	R. N. HAIKIO	733-2199
772NS	STRUCTURAL EVAL.	1260	S. W. CRATER	880-5300	3560	R. J. NOWINSKI	876-6286
782NS	ENGINE SYS DEV.	1490	R. J. GREEN	733-2408	7750	J. D. WEHRLY	876-3850
774NS	180 CAT DEV.	1440	J. A. SANTIAGO	733-2065	7870	R. O. GEISS	836-3591
776NS	90/90 CAT DEV.	1440	J. A. SANTIAGO	733-2065	7870	R. O. GEISS	836-3591
789NS	90/90 CAT DEV.	1440	J. A. SANTIAGO	733-2065	7870	R. O. GEISS	836-3591
784NS	FUEL & EXHAUST	1680	L. C. MILLER	733-3450	7890	G. E. LEWANDOWSKI	876-2622
778NS	90/90 CAT DEV.	1440	J. A. SANTIAGO	733-2065	7870	R. O. GEISS	836-3591
779NS	180 CAT DEV.	1440	J. A. SANTIAGO	733-2065	7870	R. O. GEISS	836-3591
785NS	180 CAT DEV.	1440	J. A. SANTIAGO	733-2065	7870	R. O. GEISS	836-3591
780NS	GENERAL DEV.	1100	R. F. BAUER	733-2305	1260	D. A. NELSON	733-3186
781NS	ELECTRONIC DEV.	1910	W. W. BUSHMAN	733-3269	9120	W. R. KISSEL	876-1934
771NS	ENDURANCE PTE	1100	R. F. BAUER	733-2305	5340	C. K. SESTOK	836-3421
775NS	ENDURANCE PTE	1100	R. F. BAUER	733-2305	5340	C. K. SESTOK	836-3421
786NS	K2-ENDURANCE	1100	R. F. BAUER	733-2305	5340	C. K. SESTOK	836-3421
773NS	ENDURANCE PTE	1100	R. F. BAUER	733-2305	5340	C. K. SESTOK	836-3421
787NS	ENDURANCE PTE	1100	R. F. BAUER	733-2305	5340	C. K. SESTOK	836-3421
788NS	AIR FUEL & EMISS.	1420	S. R. BRUECKNER	733-8737	7850	J. T. RILLY	876-4077
790NS	GENERAL DEV.	1100	R. F. BAUER	733-2305	1260	D. A. NELSON	733-3186
791NS	FINAL DRIVE DEV.	1600	J. E. MACAFEE	733-2568	1720	R. N. HAIKIO	733-2199
792NS	AIR FUEL & EMISS.	1420	S. R. BRUECKNER	733-8737	7850	J. T. RILLY	876-4077
D62NS	IMPACT TEST	1140	E. A. ZYLICK	733-2074	5320	W. L. SHOLLENBERGER	836-2621
D61NS	IMPACT TEST	1140	E. A. ZYLICK	733-2074	5320	W. L. SHOLLENBERGER	836-2621
D63NS	IMPACT TEST	1140	E. A. ZYLICK	733-2074	5320	W. L. SHOLLENBERGER	836-2621

1991 N-BODY 5.2L TBI ENGINE & 4X4/4X2 EXTENDED CAB

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Prototype Components Summary

COMPONENT GROUP	DEPT #	RESPONSIBLE		REQUIRED PROTOTYPE PARTS
		JTE DESIGN	TITLELINE	
=====	=====	ENGINEER	=====	=====
Truck Body Engrg	1260	S. W. Crater	880-5300	Modified front bumper, air dam and grille, Club Cab bodies, extended hood, new closure panel
Climate Control	1250	L. K. MacDonald	733-2075	A/C compressor assembly, A/C & Heater Lines
Cooling Systems	1670	T. F. Flynn	733-3902	Radiator cores, fans, shrouds, hoses, trans. cooler tubes
Suspension & Chassis Structure	1700	C. R. Wreford	733-8762	Frames, control arms, springs, knuckles, gas shocks
Brake Systems	1660	P. B. Helliens	733-8531	Twin piston caliper, rotors, M/cyl., boosters, rear drums, brake lines, RWAL valve, parking brake cables
Steering/Wheels/Tires	1690	D. R. Helebrant	733-3814	Wheels (6-stud), steering linkage, P/steering pumps, steering gears, steering column & wheels
Auto Trans Engrg	1620	W. J. Greening	733-2939	A500 trans., torque converter
Final Drive	1600	J. E. MacAfee	733-2568	Front and rear axles (RWAL/6-stud), elec. shift transfer cases, hub unit brg., driveshafts, CV joints, propshafts
Engine Design/Dev.	1490	R. J. Green D. E. Gardner	733-2408 733-3356	5.2L TBI engines, new accessory drive brackets/belts
Air, Fuel, Emission	1420	S. R. Brueckner	733-8737	Air cleaners, intake ducting, throttle bodies, throttle linkage, speed control, canister bracket, vacuum harness, air injection pumping, air pump, EGR valves
Fuel & Exhaust/Engine Mounts	1680	L. C. Miller	733-3450	Fuel lines, exhaust pipes, catalyst/engine support brackets, insulators, mufflers
Motors, Charging & Cranking	1910 1910	D. Gardner W. W. Bushman	733-3356 733-2369	Starters, alternators, batteries
Powertrain & Chassis Controls	1600 1910	J. E. MacAfee W. W. Bushman	733-2568 733-2369	SMEC (5.2 TBI w/A500), RWAL control module, elec. shift T/case control module
Sensors, Actuators, Ignition	1920	G. Wist	733-7703	Elec. shift T/case switch assy. & I/P A500 overdrive switch
Wiring Systems	1920	G. Wist	733-7703	Engine, body and chassis wiring harnesses for 5.2L, A500, RWAL, elec. shift T/case, electronic speed control

1991 N BODY V-8
PACKAGING ISSUES

As a result of several Buck Reviews, 14 major packaging issues have been identified and resolution is in process. These items will be resolved via the bi-weekly "N" Body Packaging Issues Buck Meeting".

No major issues require Executive action at this time.

L. D. Schmidt

Design Aids
LDS00

ANTCE366
 TECHNICAL COST PLANNING
 CONTROLLER'S OFFICE
 9 FEBRUARY, 1988

 318 CID V-8 IN 1991 N-BODY TRUCK PIECE COST ESTIMATES
 VERSUS
 1988 239 CID V-6 EQUIPPED N-BODY TRUCK

1988 239 CID V-6 EQUIPPED N-BODY TRUCK

 ///
 SUMMARY SHEET

DATA BASED ON 1988 (10/'87) ECONOMICS BRACKETED DATA, (XXXX), DENOTES "WORSE THAN"

UFG	DESCRIPTION	BASE COST 1988 PCS 4X2 RWD 2.2L I-4	COST DELTA 4X2 RWD 1991 VS 1988 3.9L V-6 5.2L V-8	COST DELTA 4X4 AWD 1991 VS 1988 3.9L V-6 5.2L V-8	REMARKS
11	BODY IN WHITE(BIW)\$728 PLUS \$38 OTHER	\$762	(\$5)	(\$5)	AFFECTS ALL VEHICLES
30, 31, 32, 33, 34, 35, 36	DRIVETRAIN/CHASSIS	\$917	(\$30)	(\$69)	BRAKE, FRAME & AXLE CHANGES.
30A	ENGINE, INCL CLUTCH, FLYWHL/TORQ CONV	\$464	BASE	\$0	V-8 ENGINE OPTION COST.
30C	ELECTRICAL, ENGINE COMP. WIRING	\$59	\$0	\$0	POTENTIAL WIRING COMMONIZATION PENALTY TO BE DETERMINED
	@ TOTAL	\$2,202	(\$35)	(\$74)	
	FRONT BRAKES (TWIN PISTON)	\$45	\$28	\$28	RELEASE UNIQUE SINGLE PISTON FOR V-6
	FRONT DRIVESHAFTS (HIGH CAPACITY)	-	NOT APP	\$10	RELEASE LOWER CAPACITY FOR V-6
	FRONT BEARING HUB (HIGH CAPACITY)	-	NOT APP	\$18	RELEASE UNIQUE FOR V-6
	@ TOTAL OPPORTUNITIES		\$28	\$56	
	@@ NET COST WITH ALL OPPORTUNITIES		(\$7)	(\$18)	

MEMORANDUM:
 POTENTIAL COST REDUCTION BY NOT COMMONIZING
 MAJOR COMPONENTS ON THE V-6 EQUIPPED VEHICLES

NOTE: 1) A V-8 COST DELTA REPRESENTS THE COST INCREASE TO PLACE A V-8 ENGINE IN THE N-BODY VEHICLE.
 2) A V-6 COST DELTA REPRESENTS INCREASED COST TO A V-6 EQUIPPED N-BODY VEHICLE DUE TO V-8 ACCOMMODATION.
 3) AMOUNTS LESS THAN \$0.50 ROUND TO 0, AMOUNTS \$0.50 OR GREATER ROUND TO \$1.00
 4) ESTIMATES ARE BASED ON HARDWARE CHANGES ONLY. ASSEMBLY LABOR AND VARIABLE BURDEN COSTS ARE NOT INCLUDED.
 5) CHGS TO 11 JAN. ARE: ADDED REF. COL. 2.2L COSTS, -\$2 FOR PLASTIC TO STEEL AIRCLEANER & RETOOLED EXH MAN LINE(MARKED BY #).

 1991 5.2L TBI V-8 POWERTRAIN COST COMPARISON VS 1988 3.9L TBI V-6

 DATA AT 1988 (10/'87) ECONOMICS BRACKETED DATA, (XXXX), DENOTES "WORSE THAN"

DRIVE/CHASSIS	BASE COST 1988 PCS 4X2 RWD 2.2L I-4	COST DELTA 1991 VS 1988 4X2 RWD 3.9L V-6 5.2L V-8	COST DELTA 1991 VS 1988 4X4 AWD 3.9L V-6 5.2L V-8	REMARKS
DRIVE/CHASSIS:				
DRIVE/CHASSIS:				
31C FRONT AXLE				
31B REAR AXLE				
31C01 FRONT DRIVE SHAFTS	\$317			
33A01C FRONT BEARING HUB	\$41			
30F03 TRANSFER CASE				
① SUBTOTAL	\$358	\$0	\$28	
CHASSIS:				
36A WHEELS	\$204	\$0	\$0	
34B STEERING LINKAGE	\$45	(\$5)		
35B01 FRONT BRAKES	\$45	(\$28)	(\$28)	
35B02 REAR BRAKES		(\$1)	(\$1)	
35C02 MASTER CYLINDER	\$12	(\$1)	(\$1)	
32A02 FRAME: FRT ENGINE MTG XMR.	\$4	\$0	(\$15)	
SWAY BAR MTG BRKT				
AXLE MOUNTING BRACKETS				
SWAY BAR XMR.				
SIDE ENG. MTG. BRKTS.				
SUSPENSION:				
33A01A LOWER CONTROL ARM	\$40			
33A02,33B03 SWAY BAR				
SWAY BAR OUTER CLAMP				
33A01C KNUCKLES				
36F02 FUEL LINES	\$77			
36E01A EXHAUST PIPES	\$5	\$1	\$1	
36E01C MUFFLER	\$26	(\$4)	(\$4)	
30B04A RADIATOR, INCLUDES SHROUD	\$18	\$5	(\$8)	
FAN SHROUD	\$41			
30B04B RADIATOR HOSES		(\$1)	(\$1)	
80J02B HEATER HOSES	\$5	(\$0)	(\$0)	
30B05A FAN	\$6			
	\$14	(\$1)	(\$1)	
① SUBTOTAL	\$559	(\$30)	(\$59)	
② TOTAL	\$917	(\$30)	(\$69)	

NOTE: 1) * INCL IN = COST INCLUDED IN AN ASSEMBLY

 1991 5.2L TBI V-8 POWERTRAIN COST COMPARISON VS 1988 3.9L TBI V-6

 DATA AT 1988 (10/'87) ECONOMICS BRACKETED DATA, (XXXX), DENOTES "WORSE THAN"

	BASE COST 1988 PCS 4X2 FWD 2.2L I-4	COST DELTA 1991 VS 1988 4X2 FWD 3.9L V-6 5.2L V-8	COST DELTA 1991 VS 1988 4X4 AWD 3.9L V-6 5.2L V-8	REMARKS
ENGINE AS SHIPPED - MOUND ROAD ENGINE				
	\$405	\$560 (\$18)	\$560 (\$18)	
o INTAKE MANIFOLD	EAS *	\$0 #	EAS \$0 #	UNIQUE-ADD 2 BOSSES, RELOC T'STAT
o EXHAUST MANIFOLD	EAS	EAS (\$1)	EAS (\$1)	UNIQUE-REV TO 3.9 TYPE OUTLET, RETOOLED MACHINING LINE NEGATES OFFLINE COST.
o CHAIN CASE COVER	EAS	EAS (\$3)	EAS (\$3)	UNIQUE-REDUCES OVERALL LENGTH
o TIMING INDICATOR	EAS	EAS (\$1)	EAS (\$1)	UNIQUE
o CAMSHAFT	EAS	EAS (\$5)	EAS (\$5)	UNIQUE- SHORT NOSE, ASSUMES MRE MOD
o WATER PUMP	EAS	EAS (\$5)	EAS (\$5)	UNIQUE- SHORTER
o OIL LEVEL INDICATOR TUBE	EAS	EAS (\$1)	EAS (\$1)	UNIQUE
o OIL PAN	EAS	EAS (\$5)	EAS (\$5)	UNIQUE
o WATER OUT ELBOW	EAS	EAS (\$1)	EAS (\$1)	UNIQUE
o CYLINDER BLOCK	EAS	EAS \$0	EAS \$0	ADD 3 BOSS, MAY BE COMMON CASTING
e SUB-TOTAL				
	\$405	\$560 (\$40)	\$560 (\$40)	
ENGINE ACCESSORIES				
o SERPENTINE DRIVE SYSTEM	-	BASE (\$8)	BASE (\$8)	WEIGHTED AVERAGE OF HIGH VOLUME USE
o HEAT RISER VALVE	\$2	BASE (\$1)	BASE (\$1)	
o ENGINE ELECTRONIC CONTROLS	\$39	BASE (\$10) #	BASE (\$10) #	SAME AS 5.2L IN D-TRUCK
o AIR CLEANER	\$18	BASE \$2	BASE \$2	METAL VS PLASTIC ON V-6
e SUB-TOTAL				
	\$59	BASE (\$17) #	BASE (\$17) #	
ee ENGINE AND ACCESSORIES TOTAL				
	\$464	\$560 (\$57) #	\$560 (\$57) #	

NOTE: 1) FUTURE UPGRADES TO THE V-6 ENGINE HAVE NOT BEEN INCLUDED IN THIS ANALYSIS.
 2) * EAS = COST IN ENGINE AS SHIPPED

 1991 5.2L TBI V-8 POWERTRAIN COST COMPARISON VS 1988 3.9L TBI V-6

 DATA AT 1988 (10/'87) ECONOMICS BRACKETED DATA, (XXXX), DENOTES "WORSE THAN"

UFG	ENGINE ELECTRICAL	BASE COST 1988 PCS 4X2 RWD 2.2L I-4	COST DELTA 1991 VS 1988 4X2 RWD 3.9L V-6 5.2L V-8	COST DELTA 1991 VS 1988 4X4 AWD 3.9L V-6 5.2L V-8	REMARKS
79A	ENGINE COMPARTMENT WIRING HARNESS	\$59	\$75	TBD	THE POTENTIAL EXISTS FOR ASSEMBLY PLANT SIM- PLIFICATION THROUGH V-6 / V-8 COMMONIZATION.

N - BODY DAKOTA TRUCK

ENGINEERING PROGRAM REVIEW

5.2L V-8/FESM PROGRAM

COST REVIEW

- AVERAGE VEHICLE DEFINITION

- INFORMATION TO BE PROVIDED AT MEETING

RESPONSIBILITY: T. E. JOHNSON



Inter Company Correspondence

Telephone

Date February 10, 1988

41

To — Name & Department

CIMS Number

J. B. York

From — Name & Department

CIMS Number

F. J. Castaing

Subject:

1989 MODEL N TRUCK-APPLICATION
OF 2.5L ENGINE

Assessments have been conducted on the subject program with manual five speed and A500 automatic transmissions (reference attachments).

It has been concluded that the manual transmission combination would be satisfactory for launch if significant improvement for noise/vibration can be developed.

Regarding the automatic transmission combination, major improvements are necessary to improve performance, to reduce the constant upshift/downshift necessary to reasonably maintain cruising speed, and to address the noise/vibration disturbance. Jeep and Truck Engineering position on this program is to aggressively pursue noise/vibration improvements for the manual transmission package for planned 89 MY launch, and to withdraw the automatic transmission package, since major improvements in the above-noted area would require long-term actions.

This position will enhance development of the manual transmission package by focusing available resources, and will maintain our policy of providing customers with very satisfying products.

F. J. Castaing

/mcl

Attachments

cc: Messrs. M. A. Cumo
R. E. Dauch
D. E. Dawkins
R. A. Lutz
J. C. Miller
D. R. Platt
D. C. Winn

PROGRAM ASSESSMENT

PROGRAM: 1989 2.5L N-BODY

LAUNCH DATE: Job 1, 1989

COMPONENT TEST SUMMARY: (Bench Test, etc.)

- Battery of standard dynamometer tests to be completed by 5/88
- Engine is identical to passenger car 2.5L except for lack of balance shaft, and manifolding and accessory drive differences for packaging. Warranty for passenger car engine is 13 C/100, which ranks third out of seven.

VEHICLE TEST SUMMARY: (Endurance, Cold Tests, etc.)

- 2 K1, 20K complete
- 1 PTE 50K complete (did not have improved piston design; no customer issue resulted).
- Cold/altitude evaluation completed week of 2/1/88

VEHICLE EVALUATION SUMMARY: (NVH, Ride/Handling, Mgt. Ride/Drive, etc.)

- Adequate performance, good driveability with manual transmission
- Acceptable driveability with automatic transmission, however performance is marginal and transmission shifts too frequently up/down to maintain cruising speeds.
- Various NVH disturbances (see attached report/work plan)
 - ° Idle boom is unacceptable, idle shake objectionable
 - ° Noise at WOT is unacceptable
 - ° Intake noise is marginal, particularly on grades
 - ° Objectionable boom at 3000-3500 RPM
 - ° Power steering pump heat shield buzz over wide engine speed range is unacceptable

JTE ASSESSMENT:

- Currently non-commercial from NVH view point, based on limited preprototype exposure.
- Automatic transmission package expected to result in customer annoyance/dissatisfaction.

JTE WORK PLAN & TIMING:

- 2 50K PTE complete 6/88
- 1 20K K1 complete 4/88
- NVH testing/development 6-8 weeks, start estimated later 2/88.

JTE RECOMMENDATION:

- Release 2.5L with manual transmission only to preclude customer dissatisfaction (drop automatic)
- Reassess launch date in view of NVH test/development timing.

(2/8/88)



Inter Company Correspondence

Telephone

Date

43

493-2943

December 10, 1987

To — Name & Department

GIMS Number

R. F. Bauer - N-Truck Development/JTE

514-00-00

From — Name & Department

GIMS Number

L. J. Achram - Ride/Handling/NVH Development-JTE

514-00-00

Subject:

Preliminary Review of 1989 2.5L N-Truck with A-500 Transmission

A 2.5L N-Truck with an A-500 transmission was made available for subjective review on November 24, 1987. Several significant NVH concerns contribute to making this vehicle unacceptable at its current level. Attached is a list of observations recorded by L. Achram, J. DeGroot and D. Moothart.

Since this powertrain combination is a 1989 program, development should begin immediately to address these concerns. However, current effort is being directed toward evaluation of the 3.9L/A500 system for the 1988-1/2 launch. After completion of the 3.9L issues, the 2.5L can be more aggressively addressed. A proposed development plan for the 2.5L implementation is attached.

L. J. Achram

/js

Attachment

cc: K. S. Bagga
D. F. Buser
J. E. MacAfee
F. P. McIntee
D. H. Moothart
L. W. Neal
P. R. Shefferly
C. P. Theodore
O. J. Viergutz
D. C. Winn

LJA08.

Ride Date: November 24 & 25, 1987
Vehicle No.: -004
Engine: 2.5L Transmission: A500

General NVH

- * Idle boom is unacceptable
- . W.O.T. interior noise is unacceptable
 - Potential "bottoming" in engine mounting
 - Heat shield resonances
- * Marginal intake noise (particularly on grades)
- * High dash transparency
- * Objectionable idle shake
- * Poor impact boom performance
- * Objectionable low frequency shake (due to engine mounts?)
- * Loud water splash noise (wet weather)
- * Moderate-occasional brake squeal (front/rear undetermined)
- * Front jounce can be felt during ride motion regularly
- * Several small and one major 'boom' peaks during NERU

Specific Items

- * Power steering pump heat shield buzzes wildly across a wide RPM range culminating into a very loud peak. (Unacceptable for noise and durability)
- * Drive belts have extremely active resonances with large displacements on the longer spans. (The A/C belt contacts the transverse engine mounting bracket.) This is a durability and noise issue.
- * The air cleaner was not attached to the body and did not appear to have a planned mounting. (Potential rattle)
- * Accessory brackets do not appear to meet the JTE target of >200 Hz. Data required.
- * O/D button difficult to find. Also, does not remember shut off setting for restart.
- * Outside mirrors are excellent. Little or no vibrations distortion was observed. (Should be reviewed as replacement for XJ style "low-rider" mirrors.)
- * Shift schedule was exceedingly busy. Particularly at freeway speeds. Slight throttle position change causes downshift.
- * Shifting into O/D causes objectionable jerk.

PROPOSED NVH DEVELOPMENT PLAN FOR 2.5L/A500

(Several items in the list can be handled concurrently.)

Note: JTE/NVH Project Management will initialize this work with the cooperation of the Sound and Vibration Lab and the related design activities.

- 1.) Develop/redesign the power steering pump heat shield.
- 2.) Belt Study:
 - Investigate additional idler pulleys
 - Investigate options to move resonances out of potential steady speed RPM ranges
- 3.) Evaluate natural frequencies of accessory drive mounting system. (JTE design criteria is >200 Hz.) This study should include acceleration loading and critical speeds for engine dyno durability testing.
- 4.) Determine cause of idle boom and develop 'fix'.
- 5.) Evaluate dash insulation/sealing to improve transparency.
- 6.) Retune engine mounting to optimize bounce control and to soften W.O.T. entry.
- 7.) Based on S&V Lab problem log, optimize location and rates of exhaust hangers.
- 8.) Identify sources and possible reductions to peaks observed in NERU. Particularly the very broad band peak which appears to range between 3000-3500 RPM.
- 9.) Develop improvements to wheelhouses and body/box to reduce splash noise.

2.5L TBI I-4 (T)1989 MODEL YEAR
DEVELOPMENT TESTING

- o Vehicle Testing
Three (3) vehicles with updated pistons & new oil pan in process.
- o Dyno Testing
One (1) engine complete (845 hrs), another scheduled for start mid February, scheduled for completion mid-April.

Dodge Truck Engine Program Management
D. D. Perrine
2/10/88

1989 2.5L N-S ENGINE DEVELOPMENT VERIFICATION TESTING STATUS

		TARGET			TARGET
General durab. and wear			Oil aeration	---	3/88
Dyno testing	---	7/88	Oil pullover	*	
Vehicle testing	---	7/88	Oil level verification	---	3/88
Cold weather operation	*		Oil pick-up durability	---	8/88
Engine/vehicle NVH	---	3/88	Oil seal leakage	*	
Access belt	---	10/88	Oil pan curb impact	*	
Crank	*		Flywheel attachment	*	
Idle N&V	*		Piston, pin scuff resis.	---	1/88
Piston	*		Piston structure	---	1/88
Timing belt	*		Piston contact pattern	*	
Overall engine	---	3/88	Piston ring performance	---	1/88
Low ambient oil pmpabty.	*		Blow-by testing	---	2/88
High temp tests	*		Cylinder bore lub.	*	
Oil sump temperature	*		Oil economy	---	1/88
Crankshaft torsion	*		Conn rod/bolt strength	*	
Crankshaft strength	*		Valve train lubrication	*	
Thrust bearing load	*		Valve train dynamics	*	
Cylinder block strength	---	6/88	Valve rotation	*	
Main bearing cap strength	---	6/88	Valve component strength	*	
Cylinder head strength	*		Exhaust valve temp.	---	6/88
Head & block core			P.S. fluid test	*	
plug blowout	*		Timing belt perf.	*	
Intake manifold end.	*		Hydraulic tappet char.	*	
Exhaust manifold end.	*		Valve spring durability	*	
Intake manifold sealing	*		Valve spring surge	*	
Soft gasket sealing	*		Valve seal & shield perf.	*	
Stamped comp. deflection	*		Hyd. tappet oil reqmts.	*	
Alum. parts			Valve requirements	*	
- bolt brinnelling	*		Valve seat requirements	*	
Fastener torque verif.	*		Valve guide requirements	*	
Oil fill cap torque	*		Retainers & locks	*	
Gaskets	*		Valve train durability	*	
Hose blow-off/			Combustion parameters	---	3/88
pull-off resis.	*		Accessory brackets verif.	---	10/88
Oil pan stress	---	8/88	Accessory belt durability	---	10/88
Oil demand	*		Accessory pulley dura.	---	10/88
Oil pump performance	*		Serviceability	*	
Oil/water pump strength	---	8/88	Engine compartment app.	*	
Water pump performance	---	6/88	Weight to target	*	
Engine cooling verif.	---	3/88	Production validation	---	10/88
Cooling sys. malfunction	*				
Critical oil level	---	3/88			

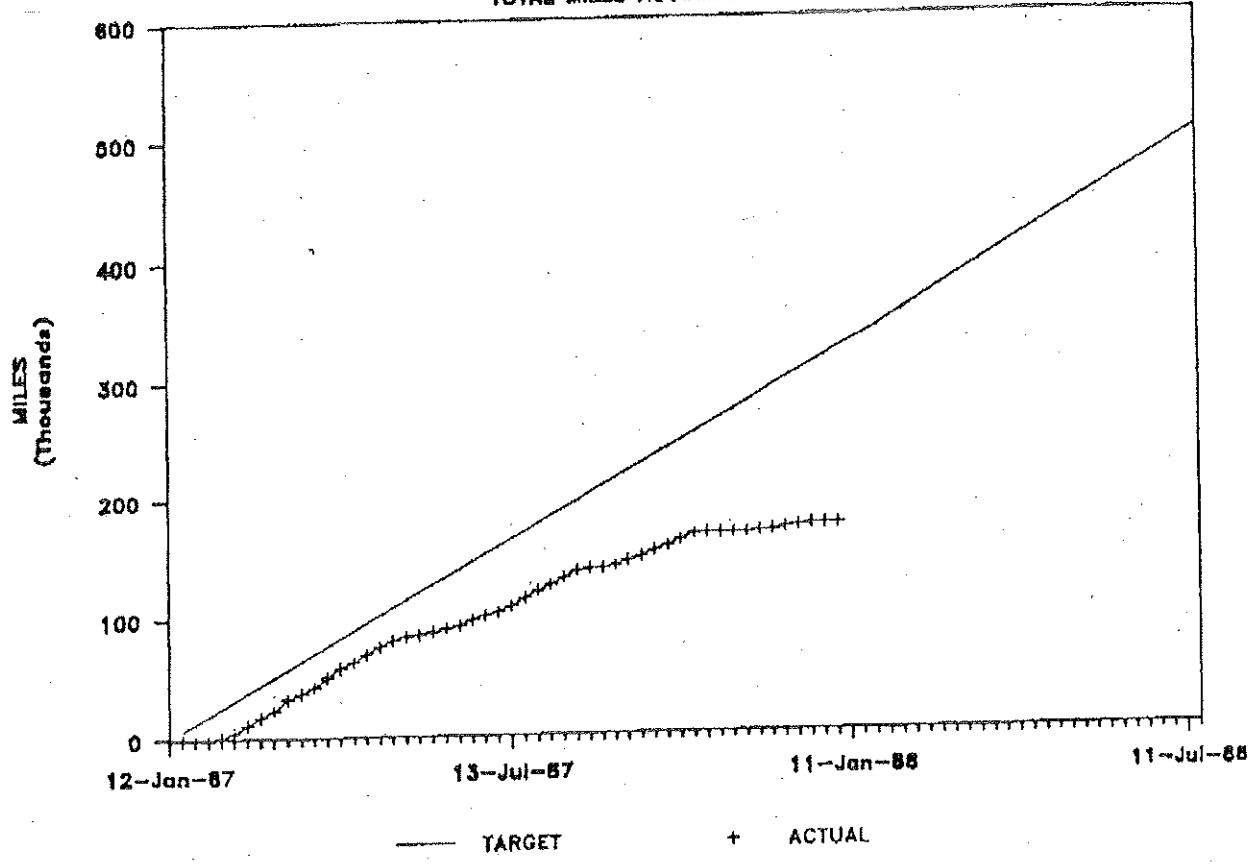
* - Testing completed

Casting sample date: 8/24/87
 Purchased ISIR: 10/5/87
 SHETF engines due: 11/30/87
 C'1 Pilot: 2/15/88
 PVP: 6/6/88
 V-1: 7/5/88

J. D. Warner
 February 2, 1988

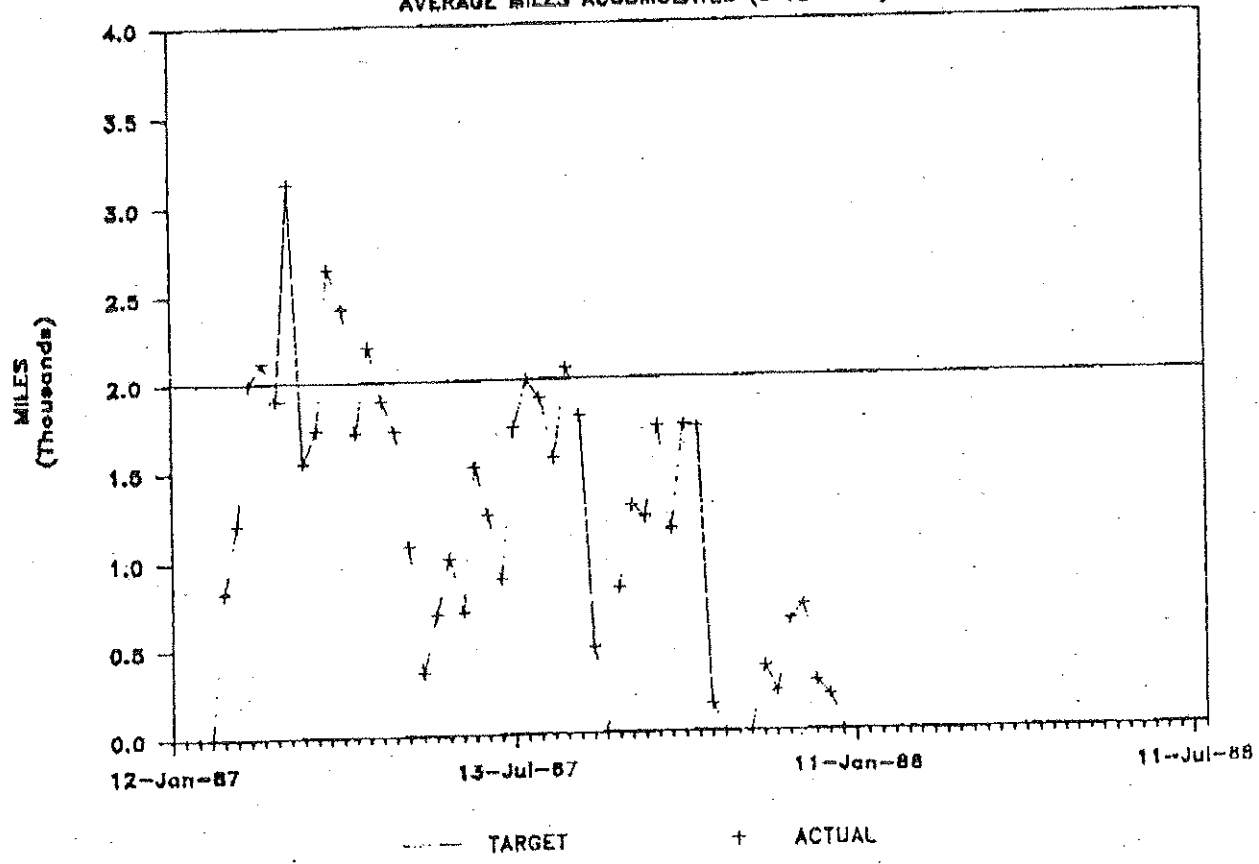
1989 2.5L LPTBI N-TRUCK ENDURANCE

TOTAL MILES ACCUMULATED



1989 2.5L LPTBI N-TRUCK ENDURANCE

AVERAGE MILES ACCUMULATED (3 VEH AVG)



DAKOTA 4-CYLINDER ENGINE

1987 M.Y. SMALL PICKUP 4-CYLINDER ENGINE RATES

	TOTAL 4 CYL. %	% M/T	% A/T
Chevy S-10	46	56	44
Ford Ranger	45	75	25
Jeep Comanche	48	73	27
Dodge Dakota	16 (1)	100	-
Nissan	87	90	10
Toyota	100	81	19

(1) Available only on 2WD, rate there is 21%.

PROJECTED 1989 M.Y. 2.5L DAKOTA RATES

2.5L Engine	23% (31% of 2WD)
. Manual Transmission	66%
. Automatic Transmission	34%

OTHER DETERMINATIONS

- 4 cylinder engine mandatory for price leader Dakota S model (13,000 units annually).
- 4 cylinder engine necessary to compete in the under \$8500 purchase price segment (35%) of the small pickup market.
- 4 cylinder engine is specified on Dakota Government fleet bids ranging from 900 to 2,000 units annually.
- 4 cylinder powertrain required for protection of Dakota volumes in the event of a fuel supply or economic crisis.
- The Dodge Car and Truck Brand Management Division will not concur to any cancellation of the 4 cylinder powertrain from the Dakota product line-up.

DAKOTA 4-CYLINDER ENGINE

COMPETITIVE COMPARISON

	<u>DISPL.</u>	<u>HP</u>	<u>CURB WEIGHT POUNDS</u>	<u>WEIGHT POWER LBS./HP</u>	<u>EPA F.E. MPG M5</u>	<u>0-60 SEC.</u>	<u>OWNER RATING % EX/V.C.</u>
● Dakota							
- 2.2L T (Current)	2.2L	91	2910	32	23/28	17.0	42
- 2.5L T (1989)	2.5L	98	2910 E	30 E	-	14.9E	-
● Comanche							
- 2.5L K (Current)	2.5L	121	2912	24	21/24		75
- 2.5L K (1991 MPI)	2.5L	125	2912 E	23 E	-		-
● Ranger							
- 2.0L	2.0L	80	2688	34	22/26		
- 2.3L	2.3L	90	2688	30	24/28	14.9	76
● S10	2.5L	92	2568	28	24/30	14.2	68
● Toyota	2.4L	103	2760	27	21/25		85
	2.4L	116	2760	24	23/27		
● Nissan	2.4L	106	2715	26	22/26		83

Notes:

- Owner satisfaction based on 1987 Rogers First Quarter overall engine performance % excellent or very good. Where two four cylinder engines are available, it is a combined rating.
- EPA Fuel Economy are published numbers for base M5 versions.
- Vehicles Specifications are for 1988 Model Year.
- E = Estimated Values Pending Actual Weight Data.
- 0-60 Data is from Proving Ground Testing except 1989 Dakota is calculated.

N - BODY DAKOTA TRUCK

ENGINEERING PROGRAM REVIEW

1989 RWAL PROGRAM

RIDE & DRIVE REVIEW/RECOMMENDATION

- INFORMATION TO BE PROVIDED AT MEETING

RESPONSIBILITY: D. C. WINN

89 D AND N RWAL
PROGRAM REVIEW

TIMING

C1 PILOT - ALL PARTS AVAILABLE

AXLES, MODULE AND REAR HOSE

SPECIAL MEANS - LATE ISIR.

ALL PAPERWORK IN PLACE FOR

OPEN ISSUES

RELIABILITY

EMI/EMC TESTING COMPLETED SUCCESSFULLY

VEHICLE RELIABILITY PROGRAM AT
150K MILES, FAILURES TO DATE:

- o HIGH TEMPERATURES 'GREEN AXLE'
- o AXLE SIDE GEAR
- o MODULE FUSE
- o CONNECTOR WATER CONTAMINATION

ALL BUT AXLE ISSUE ARE COVERED BY
INCLUDED OR TO BE INCLUDED CHANGES

MANUFACTURING FEASIBILITY

1989 N-BODY OPEN ITEMS
Chassis

ITEM NO. AREA	COMPONENT	ISSUE/DATE	MFG. POSITION/DATE	STATUS/DATE	ASSNG'D TO
F-6. CHASSIS	R.W.A.L. Sensor Shield	6/17/87 New Shield design undefined.	6/17/87 Mfg. withholds feasibility.	6/17/87 OPEN Engr'g. reviewing for a common design.	Mienko/ Winde
			8/31/87 Mfg. request to review drawing.	8/31/87 HOLD Engr'g. indicates there will be only one bracket.	
F-7. CHASSIS	R.W.A.L. Sensor Shield	9/4/87 Method used for anti- rotation.	9/4/87 Sample part does not pro- vide for sufficient anti- rotation. Unable to make connector engagement at sensor. Mfg. requests in- creased part ingaugement.	1/18/88 CLOSED Direction is one bracket. 9/4/87 OPEN Engr'g. to investigate. 9/8/87 HOLD Sample part not to print. Engr'g. drawings show sufficient clearance. Hold for review on axle.	Mienko/ Winde
F-8. CHASSIS	Distance Sensor	8/31/87 Clearance between sensor and vac. switch on NP231 Transfer Case with 3.9 axle.	8/31/87 By design, clearance (min) between sensor and switch is 1.15M. Mfg. request verification that with production build no inter- ference will exist.	2/2/88 CLOSED Review shows acceptable condition. 8/31/87 OPEN 1/6/88 HOLD	A212/ Nowak/ Groszewski

(1141c/0030c)

ISSUED: 12/28/87
REVISED: 02/09/88

Telephone

Date

2/5/88

To — Name & Department

CIMS Number

See List

From — Name & Department

CIMS Number

F. J. Castaing

8-733-2617

Subject:

Launch Readiness - A500 Automatic Transmission for 88½ Model N-Body/B-Body

Assessments have been made for the application of the A500 four speed automatic transmission in the N-Body and B-Body vehicles for 1988 model mid-year release. The Jeep and Truck Engineering position regarding launch readiness is noted below.

N-Body

Required evaluations, design, development and testing work has been completed to a satisfactory level. The application of the A500 automatic transmission is acceptable for production launch as planned. Required improvements, targeted for 89 model year, include elimination of a mild beat disturbance in third gear and shift quality improvements. Engineering programs are being implemented to address these issues.

B-Body

Required evaluations, design, development and testing work will be completed within the next month. However, evaluations have identified unacceptable noise/vibration disturbance levels on the 3.9L A500 combination. The 3.9L application of the A500 transmission must be deferred from launch until corrective action can be identified and implemented. Engineering is aggressively pursuing this development. The 5.2L application of the A500 transmission is considered on track for planned launch, given successful completion of remaining tests.

F. J. Castaing

/plm


0010PS



1989-3/4 N-BODY EXTENDED CAB - BODY ISSUES

There are no open B.I.W. manufacturing issues on this vehicle. On 2-15-88 we are reviewing the B.I.W. and trim assembly for Brampton and Manufacturing representatives at Carron, Inkster. This will be an opportunity for them to see "hands-on" how this vehicle is assembled.

S. W. Crater
2-18-88



212 CUBIC IN. CATALYTIC CONVERTER PACKAGING

1991 N-BODY V8 4x4 CLUB CAB STATUS

The Design Study initially focused on the 4x4 extended cab with V8 and V6 engines since this frame/body combination is the most difficult packaging job.

Work to date has resulted in a high degree of feasibility by locating the 212 can between the engine support and torsion bar crossmembers just to the right of the transfer case.

Distance to engine for "Lite Off" is improved vs. today's 180 converter by approximately 21 inches.

The following concerns are in the process of being finalized:

- Pipe routing over the frame crossmembers; minimum radius bends with some local depressions will be required for clearance.
- Thermal protection; space for converter mounted heat shield and a body mounted shield is being provided for transfer case protection and passenger side front foot well protection.
- Air injection tube; design of a welded tube to the converter is in process.

No basic chassis or body changes are necessary for the 4x4 Club Cab. Tooling is anticipated for front and rear convertor pipes and U/Body heat shield. Basic 212 convertor can halves and environmental heat shield are c/o from "D" Truck.

Next priority will be 4x2 Club Cab packaging. Revisions to the perimeter park brake cable system are anticipated on 4x2 models.

Pre-Program Engineering and Chassis Engineering are coordinating design studies for regular and Club Cab.

D. A. Nelson

2/4/88
DAN008

MANUFACTURING FEASIBILITY DEPARTMENT

1989 3/4 "N" EXTENDED CAB

SUMMARY SHEET

<u>AREA</u>	<u>ITEMS</u>		
	<u>OPEN</u>	<u>CLOSED</u>	<u>TOTAL</u>
STAMPING	0	0	0
B.I.W.	0	4	4
PAINT	0	0	0
EXTERIOR TRIM	0	0	0
INTERIOR TRIM	3	14	17
CHASSIS/ENGINE	0	0	0
<u>TOTAL</u>	<u>3</u>	<u>18</u>	<u>21</u>

February 9, 1988

MANUFACTURING FEASIBILITY

1989 3/4: N-CLUB CAB OPEN ITEMS
Interior Trim

ITEM NO. AREA	COMPONENT	ISSUE/DATE	MFG. POSITION/DATE	STATUS/DATE	ASSNG'D TO
E-12. INT. TRIM	Seat Back	10/27/86 Alignment of seat back to back bolster.	10/27/86 Mfg. requires seat back interference to back bolster to prevent un- parallel condition between back bolster & seat back.	10/27/86 OPEN 11/20/86 Unchanged 1/15/87 Layout Prom. 3/87 HOLD	Draplin/ Winde/ Knight/ Cote
				9/8/87 HOLD Eng. will provide for inter- ference fit. Layout prom. 9/87.	
				1/22/88 CLOSED Production layout shows line to line surface with 3/8" clearance between seat and bolster back board.	

(1143c/0030c)

ISSUED: 12/28/87
REVISED: 02/09/88

MANUFACTURING FEASIBILITY

1989 3/4. N-CLUB CAB OPEN ITEMS
Interior Trim

ITEM NO. AREA	COMPONENT	ISSUE/DATE	MFG. POSITION/DATE	STATUS/DATE	ASSNG'D TO
E-13. INT.	Qtr. Trim Panel R/L	10/27/86 Qtr. panel pull away gap to A-Post.	10/27/86 Mfg. requires interference fit to prevent gap.	10/27/86 OPEN 11/20/86 Unchanged	Knight/ Jones/ Winde
				1/15/87 OPEN Present "B" Post garnish mldg. on reg. cab is poly- propylene mat'l. and did require tune in after launch because of its flexibility. Both Club Cab Qtr. Inr. & present "A" Post garnish are ABS mat'l which is much stiffer and as such Trim Engr'g. feels separation will not occur.	
				6/5/87 HOLD Pending <u>demonstration</u> tryout 6/87.	
				9/10/87 Trim demonstration review T.B.D.	

MANUFACTURING FEASIBILITY

1989 3/4 N-CLUB CAB OPEN ITEMS
Interior Trim

ITEM NO. AREA	COMPONENT	ISSUE/DATE	MFG. POSITION/DATE	STATUS/DATE	ASSNG'D TO
E-17. INT. TRIM	Qtr. Trim Panel	10/27/86 Clearance to qtr. window seal.	10/27/86 Mfg. recommends copying T-115 system due to build variations.	10/27/86	Knight/ Jones/ Winde
				11/13/86 Trim Dept. pursuing P-Body Trim per PDM direction.	
				12/18/86 Trim Engr'g. presented build variation dwg's. to their management for possible acceptance of T-115 system. Decision was to follow <u>PDM</u> decision.	
				1/15/87 Mfg. requires that build variations of qtr. window seal to qtr. inner trim panel be called out on graphic as acceptable condition.	
				2/5/87 OPEN Review of qtr. pnl. table top model revealed gross misalignment of seal to qtr. pnl. trim. Meeting to be called to resolve. TBD	
				3/2/87 OPEN Chiefs' Review of qtr. trim to qtr. wd. seal. Maintained Engr'g. position not to carry trim pnl. over qtr. wd. seal.	

(1143c/0030c)

ISSUED: 12/28/8
REVISED: 02/09/8

MANUFACTURING FEASIBILITY

1989 3/2 N-CLUB CAB OPEN ITEMS
Interior Trim

ASSNG'D
TO

ITEM NO. AREA	COMPONENT	ISSUE/DATE	MFG. POSITION/DATE	STATUS/DATE	ASSNG'D TO
E-17.	Qtr. Trim Panel (cont'd)			5/13/87 HOLD Pending receiving graphic showing trim panel tolerance. Disposition to window fret.	
				8/17/87 HOLD Tolerance stack indicates build variation will be +/- 4.5mm to 1/4 window seal.	
				1/22/88 HOLD Pending review of graphics.	
E-32.	Speaker Cover	7/24/87 Complexity of "1/4" Trim Speaker Grille regarding APEI.	7/24/87 Mfg. request that speaker grille be received PIA in 1/4 trim panel.	7/24/87 OPEN 9/8/87 Unchanged.	Galasso/ Knight/ Winde
				1/22/88 HOLD Engr'g. issuing PCN #71013-197 to incorporate speaker grille in qtr. trim. Awaiting signatures.	
E-33.	Carpet	8/26/87 Clearance holes for bucket seat attachment.	8/26/87 Mfg. request that carpet be gated. Eliminating	8/26/87 OPEN 1/22/88 CLOSED Clearance holes will be punched 100% in 89 1/2. Gating will occur in '90 when seat options change.	Knight/ Winde

MANUFACTURING FEASIBILITY

1989 3/4 N-CLUB CAB CLOSED ITEMS
Interior Trim

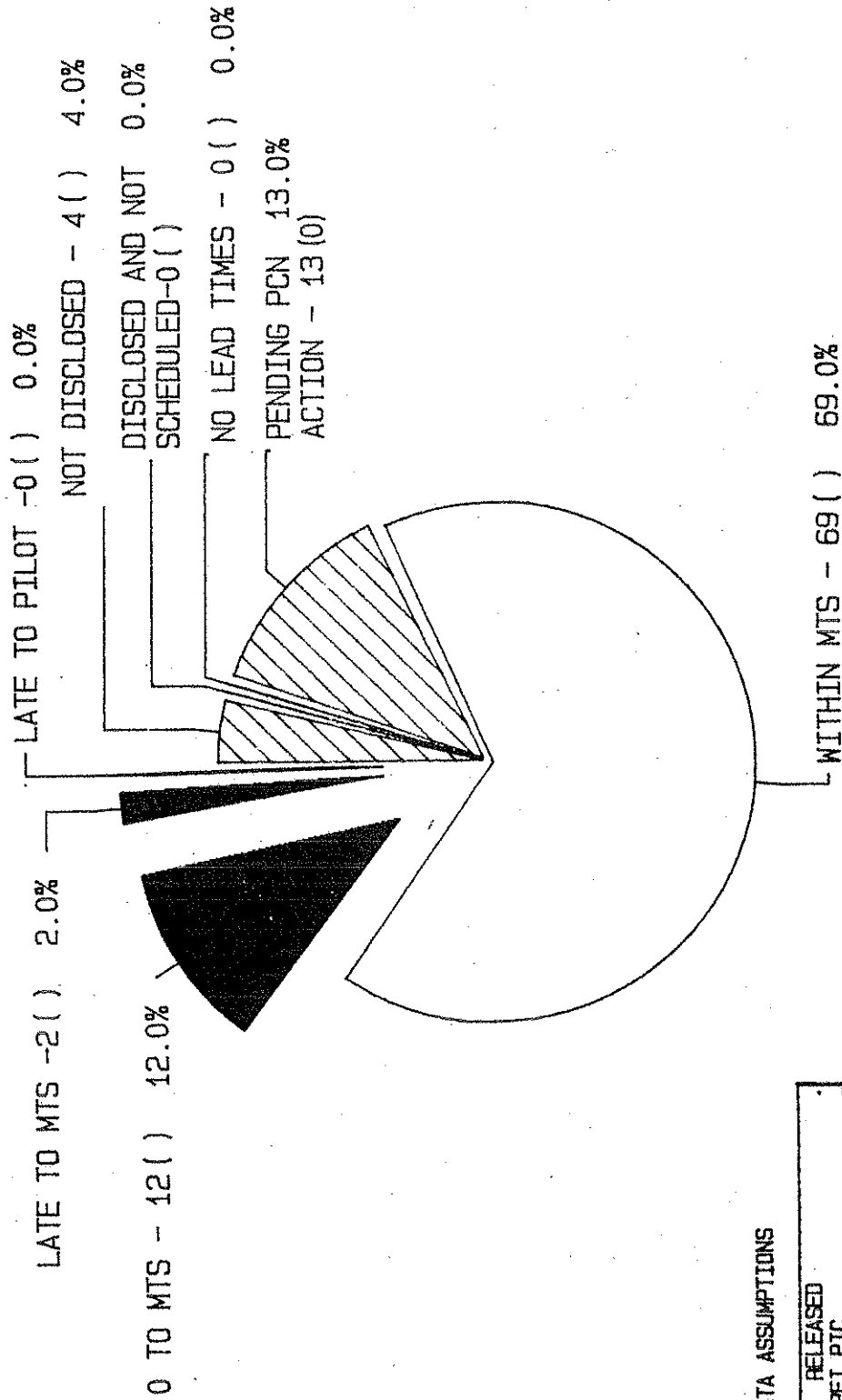
ITEM NO. AREA	COMPONENT	ISSUE/DATE	MFG. POSITION/DATE	STATUS/DATE	ASSNG'D TO
E-34. INT. TRIM	Body Wire Harness	9/8/87 Wire routing along roof for dome lamp.	9/8/87 Mfg. request clips be added to harness in area of coat hook protrusion to prevent entrapment by headliner.	9/8/87 OPEN 1/22/88 Unchanged. 2/9/88 <u>CLOSED</u>	Shen/ Kucharek/ Winde

(1143c/0030c)

ISSUED: 12/28/
REVISED: 02/09/

1989 3/4 MODEL YEAR REPORT PURCHASED PARTS PROGRAM STATUS

AN - BODY EXTENDED CAB



DATA ASSUMPTIONS

0-1, AE, A1, RELEASED
 00VAA0, 32A0, PEI, PIC
 EXCLUDES COLOR EXPLOSION
 CORPORATE LEAD TIME TRACKING REPORT
 FOR THE PERIOD 02/08/88
 PROGRAM FORECAST: 100E VS 98A
 PRIOR REPORT / -TOTAL IN
 PARENTHESES ()
 PREPARED BY B. L. HENDRIETH (6-2134)

FORWARD MODEL TIMING
 PURCHASING PLANNING
 FEBRUARY 10, 1988

3/4 YEAR ... JUDY ... JB
 PURCHASED PARTS PROGRAM STATUS
 PREPAREDNESS REPORT

PILOT
 P1: 09/19/88
 P2: 11/07/88
 C1: 12/19/88
 PMP: 04/10/89
 LAUNCH: 05/22/89

PAGE 1

SPR/ BUYER PART CODE NUMBER	DESCRIPTION	SUPPLIER	DRAWING	PILOT BUILD DATE	DIM. SAMPLE PROMISE	TEMP TOOL CODE	REMARKS
/	4522080 PKG-6/80X, LWD FLR LK CYC		03/14/88	11/07/88			LINE-UP WAS 02 80
2/229	K634-5 PANEL ASSY-RTR TRM (4432908-9)		01/25/88A	11/07/88			ADV REQ 12/10/87
(NO PARTS LATE TO PILOT)							
(P2 PILOT)							
2/229	H829 BULSTER ASSY-CAB BK (4432933)	DAVIDSON INT	02/15/88	12/19/88	10/10/88 S		
3/513	L458 CUSH COMP RR ST RT (4482192)	DOUGLASALOWSON	03/18/88	12/19/88	10/24/88 X		A1 PCN 71025-153, MCN 01/08/88; COMPONENT PARTS N/A
3/513	L457 CUSH COMP RR ST LT (4482189)	DOUGLASALOWSON	03/18/88	12/19/88	10/24/88 X		A1 PCN 71025-153, MCN 01/08/88; COMPONENT PARTS N/A
3/513	L440 ST COMP FRT BKT RT (4482174)	DOUGLASALOWSON	03/18/88	12/19/88	10/24/88 X		A1 PCN 70625-152, MCN 10/19/87; COMPONENT PARTS N/A
3/513	L455 BK COMP RR ST (4482191)	DOUGLASALOWSON	03/18/88	12/19/88	10/24/88 X		A1 PCN 71025-153, MCN 01/08/88; COMPONENT PARTS N/A
3/513	L456 CUSH COMP RR ST RT (4482188)	DOUGLASALOWSON	03/18/88	12/19/88	10/24/88 X		A1 PCN 71025-153, MCN 01/08/88; COMPONENT PARTS N/A
3/513	L447 ST COMP FRT BKT LT (4482183)	DOUGLASALOWSON	03/18/88	12/19/88	10/24/88 X		REL'D 01; COMPONENT PARTS N/A
3/513	L446 ST COMP FRT BKT RT (4482182)	DOUGLASALOWSON	03/18/88	12/19/88	10/24/88 X		A1 PCN 70625-152, MCN 10/19/87; COMPONENT PARTS N/A
3/513	L459 CUSH COMP RR ST LT (4482193)	DOUGLASALOWSON	03/18/88	12/19/88	10/24/88 X		A1 PCN 71025-153, MCN 01/08/88; COMPONENT PARTS N/A
3/513	L454 BK COMP RR ST (4482190)	DOUGLASALOWSON	03/18/88	12/19/88	10/24/88 X		A1 PCN 71025-153, MCN 01/08/88; COMPONENT PARTS N/A
3/513	L441 ST COMP FRT BKT LT (4482175)	DOUGLASALOWSON	03/18/88	12/19/88	10/24/88 X		A1 PCN 70625-152, MCN 10/19/87; COMPONENT PARTS N/A

---GPA CODES---
 1- M. H. KERBY
 2- M. P. CICCONE
 3- G. N. ANDREWS
 4- J. A. SORENSEN
 5- D. D. McDAVID

---DMG CODES---
 A-ACTUAL
 F-FULLY COMPRESSED
 M-ESTIMATED RMK
 P-PRE-SOURCE
 X-CONFIRMED
 Z-ODD BOX

---TOOL TIME CODES---
 S-STANDARD
 N-NON STANDARD
 ODD-ODD BOX

---SAMPLE PROMISE CODES---
 AC-IN PROCESS
 B-INTERIM PROCESS
 E-ESTIMATE
 F-FULLY COMPRESSED
 09/09/99-S/P/D N/A

---TEMP TOOL CODES---
 1-UNDER REVIEW
 2-NO REQUIREMENT
 3-P/C REC COST/TIME
 4-T/TOOL PURCHASED
 5-SHIP FUNC PRIOR S/P
 6-SHIP WITH SAMPLE
 7-ENGR, SUPPLIED
 8-USE SUB TSA
 9-NO T/T AVAIL
 0-S/P MEETS PILOT BUILD

B. L. HENDRIETH (6-2134)
 FORWARD MODEL TIMING
 PURCHASING PLANNING
 DATE: 02/09/88

1991 N-TRUCK DUAL REAR WHEEL CHASSIS-CABMAIN PURPOSE

- Develop a platform for sale to the body builders, and Mini/Micro Motor Home-Camper market.
- Opportunity for incremental vehicle sales.
- Total market segment is 12,000 units annually (Motor Home) with additional commercial cab usage.
- Toyota is presently the only other manufacturer of vehicles in this market.

GENERAL OUTLINE

- 142" wheelbase, fits within A. O. Smith tooling capability.
- 6500 lbs. GVW maximum
- 3.9L engine and automatic transmission standard
- 4x2 configuration at 2800 lbs. payload
- Optional 5.2L V-8 engine
- Product details on following page
- Brampton is the indicated assembly plant.

FINANCIALS

- Volume is at 3,000 units per 12/8/88 FPV, significant upscale potential is anticipated with a superior product to the Toyota chassis-cab.
- Cost projection is +\$410 over N, LWB base unit
- Base unit variable profit increase is +\$ 350 over base LWB, N-pickup (option profit not included).

Base Vehicle - Same as Regular Cab N-Truck with Content/Configuration Changes Noted Below:

- o Model Designation N1L66
- o Wheelbase 142 inch
- o Cab Back to Axle Centerline 69 inch
- o Cab Style 3 man, regular cab
- o Payload 2800 lbs.
- o GVWR Max. 6500 lbs.
- o Configuration 4 x 2
- o Rear GAWR 3650 lbs.
- o Frontal Area 42 ft.² (certifiable to 54 ft.²)
- o Rear Track 68.8 inch
- o Front Track 58.5 inch
- o Engine 3.9L, V-6 EFI; optional 5.2L, V-8 EFI
- o Transmission 4-speed automatic (A500)
- o Tires Seven (7) LT 215/75 R15
- o Axle/Hubs/Brake 8-1/2 Dana 44/new hubs/11-1/2 brake
- o Brake System Twin Piston front brake, larger master cylinder (V-8 program)
- o Wheels New dual rear wheels 15"; carryover front heavy duty wheels (6 bolt pattern per general front end upgrade.)
- o Suspension Front and rear carryover at 2550 payload level
- o Frame Modified regular cab LWB frame to accommodate 142" wheelbase flanged lip rail rear, with added crossmember.
- o Fuel Systems 22 gallon tank std.; modify filler tube.
- o Propshaft Two-piece with center bearing; lengthened existing LWB components
- o Rear Axle Ratio 3.55 (V-8), 3.90 (V-6)
- o Documents Incomplete vehicle documents
- o Rear Lights D-Model utiline rear brake lamps, existing
- o Package(s) Heavy duty package, maximum cooling, heavy duty battery--existing components
- o Options Offer existing options including: carpet, radio upgrades, premium front end ornamentation, etc.