SAFETY COMPLIANCE TESTING FOR FMVSS NO. 202 HEAD RESTRAINTS – STATIC REQUIREMENTS

KIA MOTORS CORPORATION 2008 KIA SPORTAGE, MPV NHTSA NO. C80506

GENERAL TESTING LABORATORIES, INC. 1623 LEEDSTOWN ROAD COLONIAL BEACH, VIRGINIA 22443



FEBRUARY 25, 2009

FINAL REPORT

PREPARED FOR

U. S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
1200 NEW JERSEY AVE., SE
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SECTION 1

PURPOSE OF COMPLIANCE TEST

1.0 PURPOSE OF COMPLIANCE TEST

A 2008 Kia Sportage MPV was subjected to Federal Motor Vehicle Safety Standard (FMVSS) No. 202 testing to determine if the vehicle was in compliance with the requirements of the standard. The purpose of this standard is to establish requirements for head restraints to reduce the frequency and severity of neck injury in rear end and other collisions.

- 1.1 The test vehicle was a 2008 Kia Sportage MPV. Nomenclature applicable to the test vehicle are:
 - A. Vehicle Identification Number: KNDJF724587490403
 - B. NHTSA No.: C80506
 - C. Manufacturer: KIA MOTORS CORPORATION
 - D. Manufacture Date: 10/07

1.2 TEST DATE

The test vehicle was subjected to FMVSS No. 202 testing on November 24, 2008.

SECTION 2

COMPLIANCE TEST RESULTS

2.0 <u>TEST RESULTS</u>

All tests were conducted in accordance with NHTSA, Office of Vehicle Safety Compliance (OVSC) Laboratory Procedures, TP-202-08 dated 12 Oct. 1989.

Based on the test performed, the 2008 Kia Sportage MPV appeared to meet the requirements of FMVSS 202 testing.

SECTION 3

COMPLIANCE TEST DATA

3.0 <u>TEST DATA</u>

The following data sheets document the results of testing on the 2008 Kia Sportage MPV.

DATA SHEET 1 SUMMARY OF RESULTS

VEH.	MOD YR/MAKE/MODEL/BODY STYLE: 2008 KIA SF	PORTAGE M	PV	
VEH.	NHTSA NO.: <u>C80506</u> ; VIN: <u>KND</u>)JF72458749	0403	
VEH.	BUILD DATE: 10/07; TEST DATE: Nov	ember 24, 20	800	
TEST	LABORATORY: GENERAL TESTING LABORAT	ORIES		
OBSE	ERVERS: <u>G. FARRAND, J. LATANE</u>			
Α.	VISUAL INSPECTION OF TEST VEHICLE			
	Upon receipt for completeness, function, and discrep influence the testing.	ancies or dar	nage whi	ch might
	RESULTS: OK for testing.			
В.	DIMENSIONAL REQUIREMENTS	PASS	FAIL	N/A
	Driver's Side	X		
	Passenger's Side	X		
C.	HEAD FORM DISPLACEMENT	PASS	FAIL	
	Driver's Side	X		
	Passenger's Side	X		
D.	HEAD RESTRAINT STRENGTH	PASS	FAIL	N/A
	Driver's Side	X		
	Passenger's Side	X		
RECC	DRDED BY: <u>G. FARRAND</u> DATE	E: <u>11/2</u>	4/08	
APPR	OVED BY: <u>D. MESSICK</u>			

DATA SHEET 2 PRETEST PREPARATION

VEH. MOD YR/MA	KE/MODEL/BO	DY STYLE: <u>20</u>	08 KIA SPOF	RTAGE MPV	
VEH. NHTSA NO.:	C80506	; VIN:	KNDJF	724587490403	
VEH. BUILD DATE	E: <u>10/07</u>	; TEST DA	TE: Novem	ber 24, 2008	
TEST LABORATO	RY: <u>GENEF</u>	RAL TESTING L	ABORATOR	IES	
OBSERVERS:	G. FAR	RAND, J. LATA	NE		
MANUFACTURER	'S DATA FOR L	OCATING SEA	TING REFE	RENCE POINT	(SRP)
NOTE: Dimensions laboratory by the C		rom the vehicle i	manufacturer	and provided t	o the test
			ſ	DRVR SIDE	PSGR SIDE
Manufacturer's Tor	rso Line Angle (degrees)	_	23°	23°
SRP Location (inch	nes)				
(Measured from Dr	river's Front Out	board Seat Trac	ck Anchorage	e Location)	
X (Longitudi	nal)		_	345 mm	344 mm
Y (Lateral o	r Transverse)		_	224 mm	940 mm
X (Vertical)			_	262 mm	264 mm
For rearward simul adjusters(tracks) s	•	•			seat
REMARKS:					
RECORDED BY: _	G. FARRAND		DATE: _	11/24/08	
APPROVED BY:	D MESSICK				

DATA SHEET 3 DIMENSIONAL REQUIREMENTS

VEH. MOD YR/MAKE/MO	DEL/BODY STYLE: 2008	KIA SPORTAGE MP\	<u>/</u>	
VEH. NHTSA NO.: <u>C8</u>	0506 ; VIN:	KNDJF7245874904	03	
VEH. BUILD DATE: <u>10</u>	; TEST DATE	: November 24, 2008	3	
TEST LABORATORY:	GENERAL TESTING LAB	ORATORIES		
OBSERVERS:	G. FARRAND, J. LATANE	<u> </u>		
TEST REQUIREMENT	DEMONSTRATION REQUIREMENT	TEST RESULT	Pass	Fail
Provide Head Restraints	Driver's Side	<u>YES</u>	X_	
	Passenger's Side	<u>YES</u>	X_	
Height Above SRP	≥698 mm	Drvr Side- <u>848 mm</u> Psgr Side- <u>841 mm</u>	<u>X</u> X	
•	Not Less Than A. 254 mm(Bench Seat)	Driver's Side A. N/A	<u>N/A</u>	<u>N/A</u>
OR 635 mm Above SPR (whichever is greater)	B. 158 mm (Bucket Seat)	B. 260 mm Passenger's Side	X_	
		A. <u>N/A</u>	N/A	N/A
REMARKS:		B. <u>260 mm</u>	<u>X</u>	
RECORDED BY: <u>G. FAI</u>	RRAND	DATE:11/24/0)8	
APPROVED BY: D. ME	ESSICK			

DATA SHEET 4 (1 of 2) **HEAD FORM DISPLACEMENT**

VEH. MOD YR/MAKE/MODEL/BODY STYLE: 2008 KIA SPORTAGE MPV

VEH. NHTSA NO.: <u>C80506</u>; VIN: <u>KNDJF724587490403</u> VEH. BUILD DATE: 10/07; TEST DATE: November 24, 2008 TEST LABORATORY: GENERAL TESTING LABORATORIES OBSERVERS: G. FARRAND, J. LATANE **TEST DEMONSTRATION TEST DATA** Fail **Pass** REQUIREMENT REQUIREMENT Torso Line Angle Measure Using Test Drvr Side 23° <u>N/A</u> N/A (Unloaded) Device OR Data Provided by COTR N/A Psgr Side 23° N/A Displaced Torso Drvr Side 31° S202, 5.2(b) N/A N/A Line Angle Psgr Side 32° N/A N/A

Displacement of Head Form Rearward of Displaced Torso Line when loaded to 373Nm Moment 65 mm below Top of Head Restraint

Shall not be displaced more than 102 mm rearward of Displaced Extended Torso Line

Distance from SRP to

Load Application on Back Pan (meters)

Force(lbs) req'd to

Provide 373Nm Moment to Back Pan

Distance from SRP to Point on Head Form where load is applied (meters)

Psgr Side .29 M N/A Drvr Side 72 mm X

Drvr Side<u>1286 N</u>

Psgr Side1286 N

Drvr Side .29 M

Drvr Side <u>.84 M</u>

Psgr Side <u>.84 M</u>

Psgr Side 35 mm X

N/A

N/A

N/A

N/A N/A N/A

N/A

N/A

N/A

N/A

N/A

DATA SHEET 4 (2 of 2) HEAD FORM DISPLACEMENT

TEST REQUIREMENT	DEMONSTRATION REQUIREMENT	TEST DATA	Pass	Fail
Displacement of Head Form Rearward of	Force applied to head form to produce 373 Nm	Drvr Side 444 N	<u>N/A</u>	N/A
Displaced Torso Line when loaded to 373Nm Moment 65 mm below top of head restraint	moment (lbs)	Psgr Side <u>444 N</u>	<u>N/A</u>	<u>N/A</u>

REMARKS:

TEST # 6129 – Driver Side Back Pan

6130 – Driver Side Head Form 6131 – Passenger Side Back Pan 6132 – Passenger Side Head Form

RECORDED BY: G. FARRAND DATE: 11/24/08

APPROVED BY: D. MESSICK

DATA SHEET 5 OWNER'S MANUAL

VEH. MOD YR/MAKE/MODEL/BODY STYLE: 2008	KIA SPORTAGE MPV
VEH. NHTSA NO.: <u>C80506</u> ; VIN:	KNDJF724587490403
VEH. BUILD DATE: 10/07; TEST DATE	E: November 24, 2008
TEST LABORATORY: GENERAL TESTING LAB	BORATORIES
OBSERVERS: G. FARRAND, J. LATANI	E
Results of increased load application to 199.5 lbs. O	R until failure occurs:
Head Restraint Failure at	lbs
Seat or Seat Belt Failure at	lbs
X Application of 185 N WITHOUT failure	
Describe failure, if encountered, below. If permanen observed, describe below. REMARKS:	t head restraint or seat back deformation is
RECORDED BY: <u>G. FARRAND</u>	DATE:11/24/08
APPROVED BY: <u>D. MESSICK</u>	

SECTION 4 INSTRUMENTATION AND EQUIPMENT LIST

TABLE 1 – INSTRUMENTATION & EQUIPMENT LIST

EQUIPMENT	DESCRIPTION	MODEL/ SERIAL NO.	CAL. DATE	NEXT CAL. DATE
HRMD	RONA KINETICS & ASSOCIATES LTD.	HRMD 0-62	N/A	N/A
J826 MANIKIN	ALDERSON RESEARCH LABS	3 DM/92	N/A	N/A
DIGITAL PROTRACTOR	MITUTOYO	950-315 PRO 360	BEFORE USE	BEFORE USE
RULE/SCALE	STARRET	C331		
TORPEDO LEVEL	SANDS	500	BEFORE USE	BEFORE USE
FORCE GAUGE	CHATILLON	DPPN-50 870	BEFORE USE	BEFORE USE
CALIPER	STARRET	N/A	BEFORE USE	BEFORE USE
LEVEL, LASER	BLACK & DECKER	360	BEFORE USE	BEFORE USE
LEVEL, LASER	SEAN & STEPHEN CORP	90°, 45°	BEFORE USE	BEFORE USE
LEVEL, LASER	GAERTNER	2789-A	BEFORE USE	BEFORE USE
ACCELEROMETER	ENDEVCO	F209	11/08	11/09
LOAD CELL	SENSOTEC	257818	01/08	01/09
LOAD CELL	INTERFACE	27246	05/08	05/09
STRING POT	WALDALE	102	BEFORE USE	BEFORE USE
STRING POT	CELESCO	69	BEFORE USE	BEFORE USE

SECTION 5 PHOTOGRAPHS



2008 KIA SPORTAGE NHTSA NO. C80506 FMVSS NO. 202a

FIGURE 5.1 LEFT SIDE VIEW OF VEHICLE



2008 KIA SPORTAGE NHTSA NO. C80506 FMVSS NO. 202a

FIGURE 5.2 RIGHT SIDE VIEW OF VEHICLE



2008 KIA SPORTAGE NHTSA NO. C80506 FMVSS NO. 202a

FIGURE 5.3 % FRONTAL VIEW FROM LEFT SIDE OF VEHICLE



2008 KIA SPORTAGE NHTSA NO. C80506 FMVSS NO. 202a

FIGURE 5.4 ¾ REAR VIEW FROM RIGHT SIDE OF VEHICLE

FL The combined Le poids comb

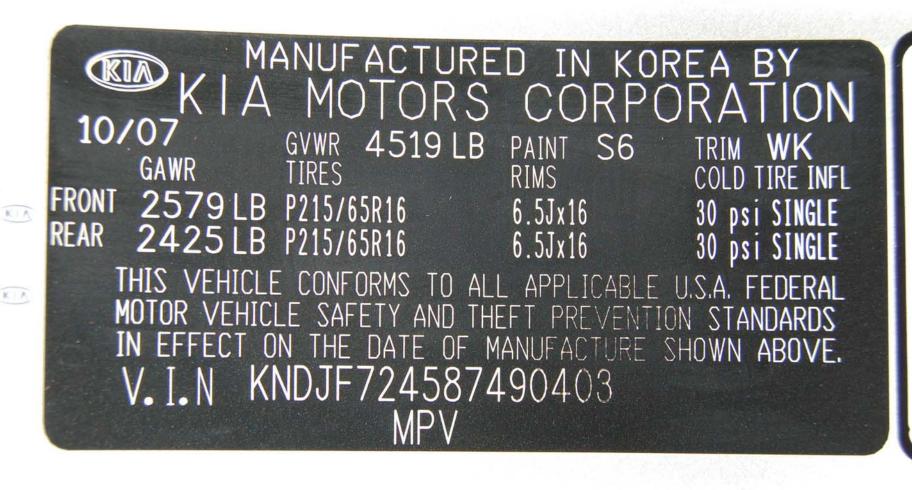
TIRE AND LOADING INFORMATION PNEUS ET CHARGE-INFORMATION

SEATING CAPACITY	TOTAL 5	FRONT 2	REAR 3
NOMBRE DE SIÈGES	TOTAL 5	AVANT 2	ARRIÈRE 3

The combined weight of occupants and cargo should never exceed 390kg or 860lbs. Le poids combiné des occupants et du chargement ne doit jamais excéder 390kg ou 860lb.

TIRE / PNEU	SIZE / DIMENSION	COLD TIRE PRESSURE / PRESSION À FROID		CONSULTER LE
FRONT / AVANT	P215/65R16	210kPa, 30psi	SEE OWNER'S MANUAL FOR	GUIDE DU PROPRIÉTAIRE
REAR / ARRIÈRE	P215/65R16	210kPa, 30psi	ADDITIONAL	POUR OBTENIR DES
SPARE / SECOURS	T155/90D16	420kPa, 60psi	INFUNIVIATIUN	RENSE IGNEMENTS ADDITIONNELS

2008 KIA SPORTAGE NHTSA NO. C80506 FMVSS NO. 202a FIGURE 5.5 VEHICLE CERTIFICATION LABEL



2008 KIA SPORTAGE NHTSA NO. C80506 FMVSS NO. 202a FIGURE 5.6 VEHICLE TIRE INFORMATION LABEL



2008 KIA SPORTAGE NHTSA NO. C80506 FMVSS NO. 202a

FIGURE 5.7 DRIVER SIDE HEAD RESTRAINT



2008 KIA SPORTAGE NHTSA NO. C80506 FMVSS NO. 202a

FIGURE 5.8 TYPICAL HEAD RESTRAINT ADJUSTMENT BUTTON



2008 KIA SPORTAGE NHTSA NO. C80506 FMVSS NO. 202a

FIGURE 5.9 PASSENGER SEAT HEAD RESTRAINT



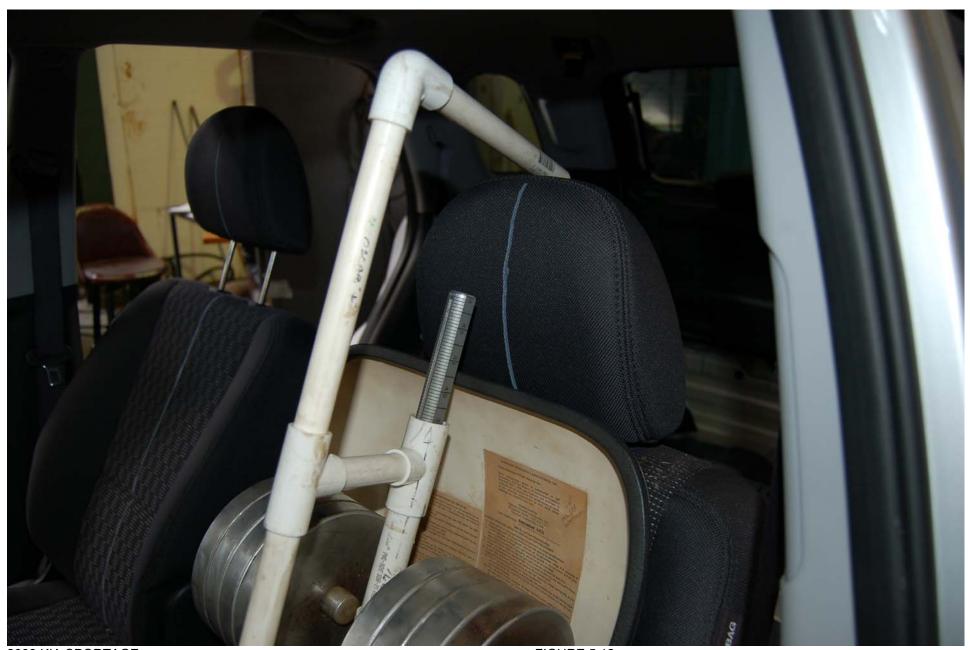
2008 KIA SPORTAGE NHTSA NO. C80506 FMVSS NO. 202a

FIGURE 5.10 J826 MANIKIN POSITIONED IN DRIVER SEAT



2008 KIA SPORTAGE NHTSA NO. C80506 FMVSS NO. 202a

FIGURE 5.11 DRIVER HEAD RESTRAINT IN HIGHEST POSITION



2008 KIA SPORTAGE NHTSA NO. C80506 FMVSS NO. 202a

FIGURE 5.12 DRIVER HEAD RESTRAINT IN LOWEST POSITION



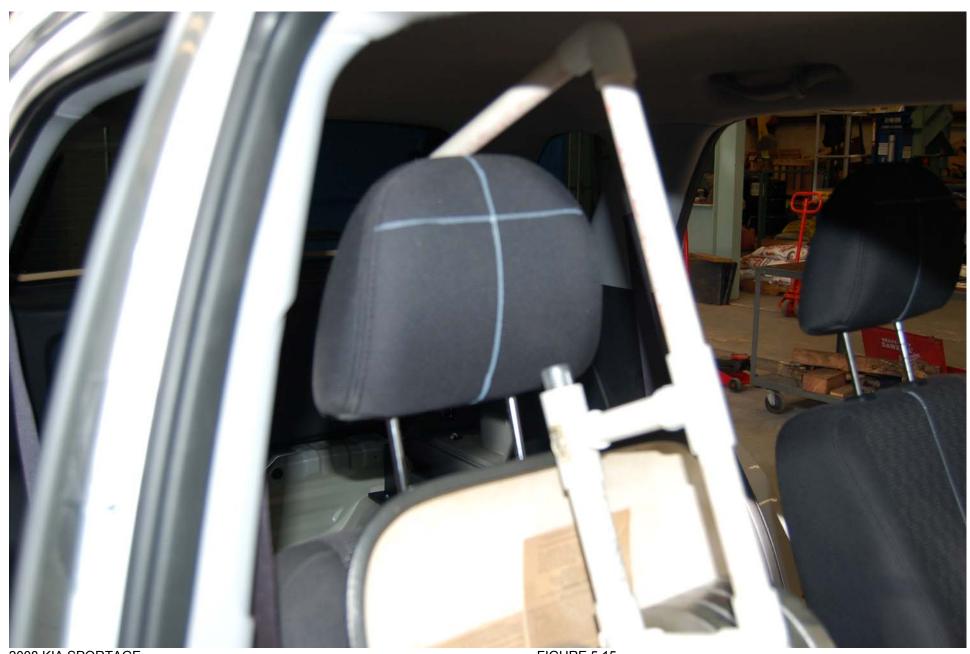
2008 KIA SPORTAGE NHTSA NO. C80506 FMVSS NO. 202a

FIGURE 5.13 DRIVER HEAD RESTRAINT WIDTH MEASUREMENT



2008 KIA SPORTAGE NHTSA NO. C80506 FMVSS NO. 202a

FIGURE 5.14 J826 MANIKIN POSITIONED IN PASSENGER SEAT



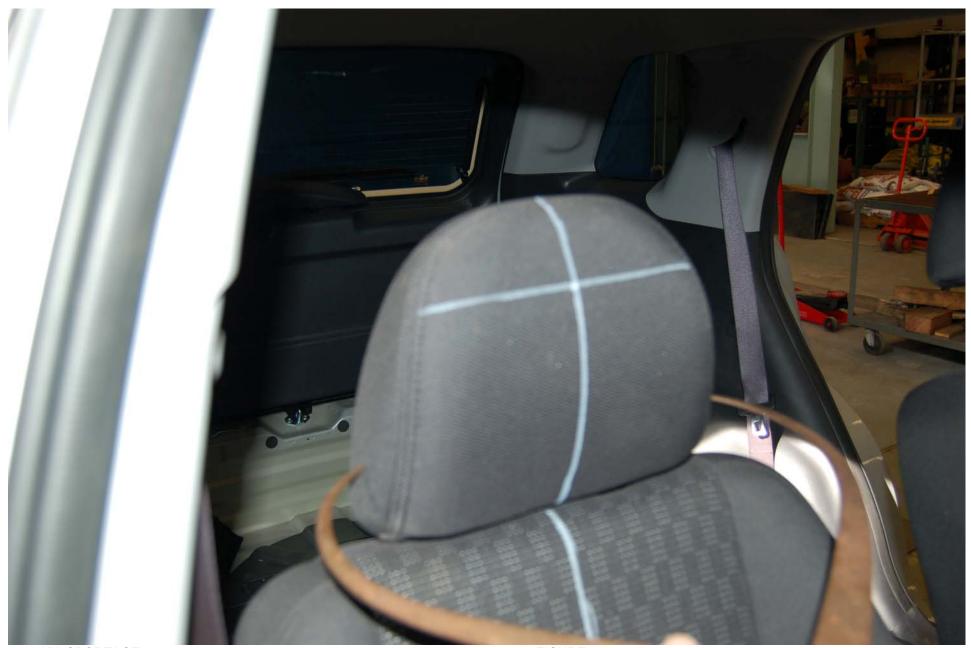
2008 KIA SPORTAGE NHTSA NO. C80506 FMVSS NO. 202a

FIGURE 5.15 PASSENGER HEAD RESTRAINT IN HIGHEST POSITION



2008 KIA SPORTAGE NHTSA NO. C80506 FMVSS NO. 202a

FIGURE 5.16 PASSENGER HEAD RESTRAINT IN LOWEST POSITION



2008 KIA SPORTAGE NHTSA NO. C80506 FMVSS NO. 202a

FIGURE 5.17 PASSENGER HEAD RESTRAINT WIDTH MEASUREMENT



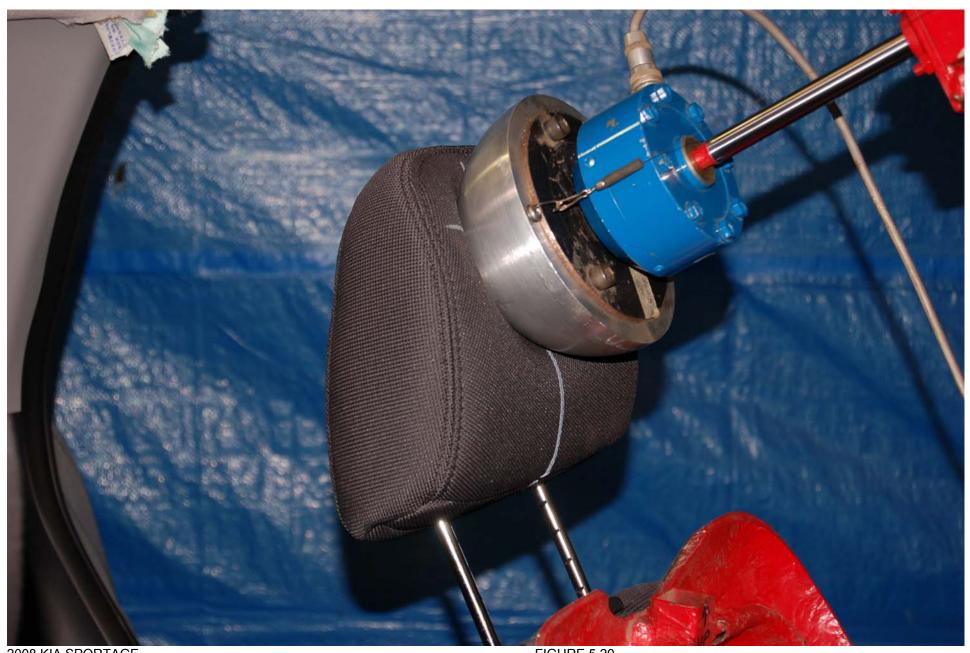
2008 KIA SPORTAGE NHTSA NO. C80506 FMVSS NO. 202a

FIGURE 5.18
PRE-TEST SET-UP FOR BACKSET RETENTION DRIVER
SIDE



2008 KIA SPORTAGE NHTSA NO. C80506 FMVSS NO. 202a

FIGURE 5.19 BACK PAN LOADED FOR DISPLACED TORSO LINE



2008 KIA SPORTAGE NHTSA NO. C80506 FMVSS NO. 202a

FIGURE 5.20 HEAD RESTRAINT LOADED TO 373 Nm



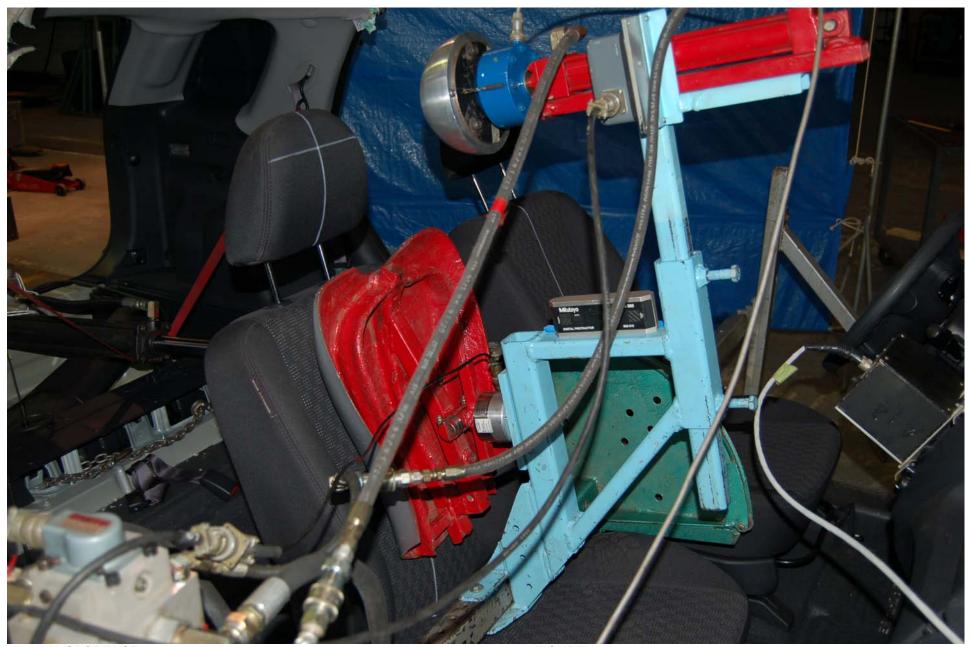
2008 KIA SPORTAGE NHTSA NO. C80506 FMVSS NO. 202a

FIGURE 5.21 HEAD RESTRAINT LOADED TO 895 NEWTONS



2008 KIA SPORTAGE NHTSA NO. C80506 FMVSS NO. 202a

FIGURE 5.22 HEAD RESTRAINT POST TEST 895 NEWTON LOAD



2008 KIA SPORTAGE NHTSA NO. C80506 FMVSS NO. 202a

FIGURE 5.23 PRE-TEST SET-UP FOR BACKSET RETENTION PASSENGER SIDE



2008 KIA SPORTAGE NHTSA NO. C80506 FMVSS NO. 202a

FIGURE 5.24 BACK PAN LOADED FOR DISPLACED TORSO LINE



2008 KIA SPORTAGE NHTSA NO. C80506 FMVSS NO. 202a

FIGURE 5.25 HEAD RESTRAINT LOADED TO 373Nm



2008 KIA SPORTAGE NHTSA NO. C80506 FMVSS NO. 202a

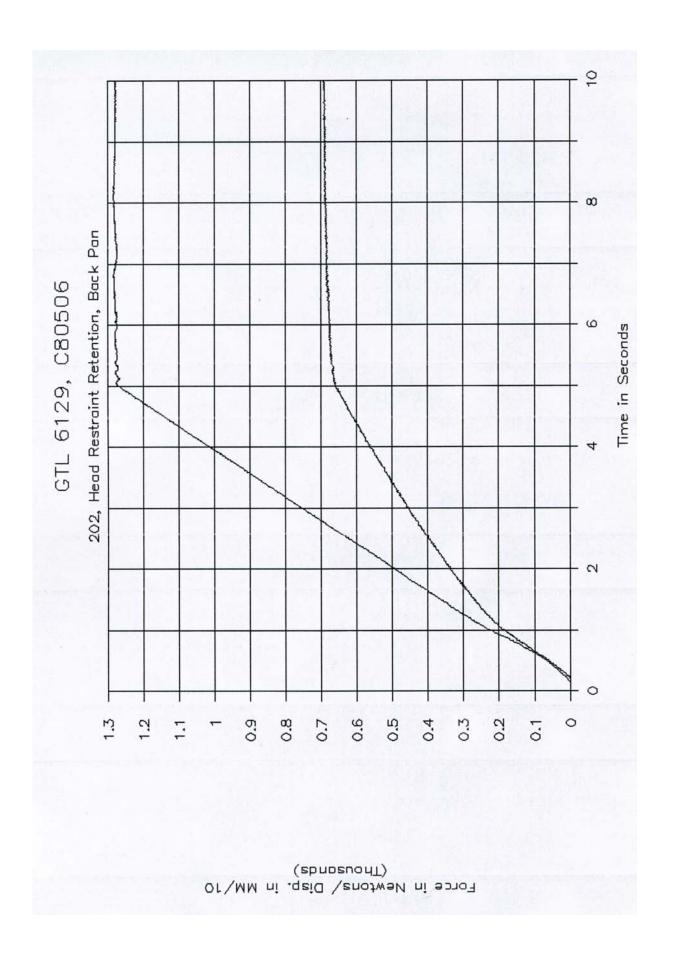
FIGURE 5.26 HEAD RESTRAINT LOADED TO 895 NEWTON'S

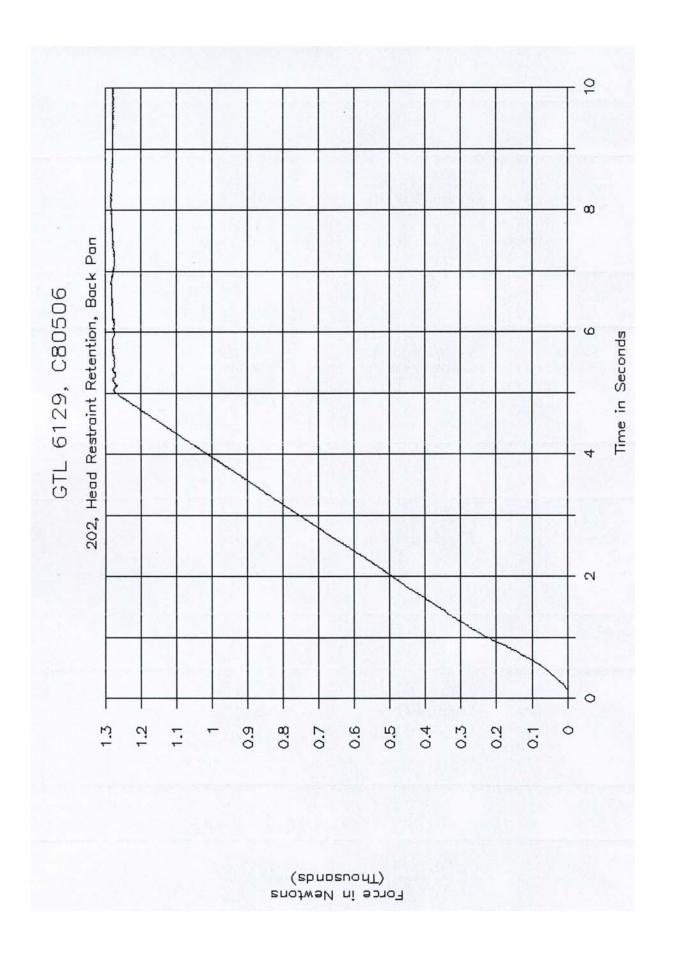


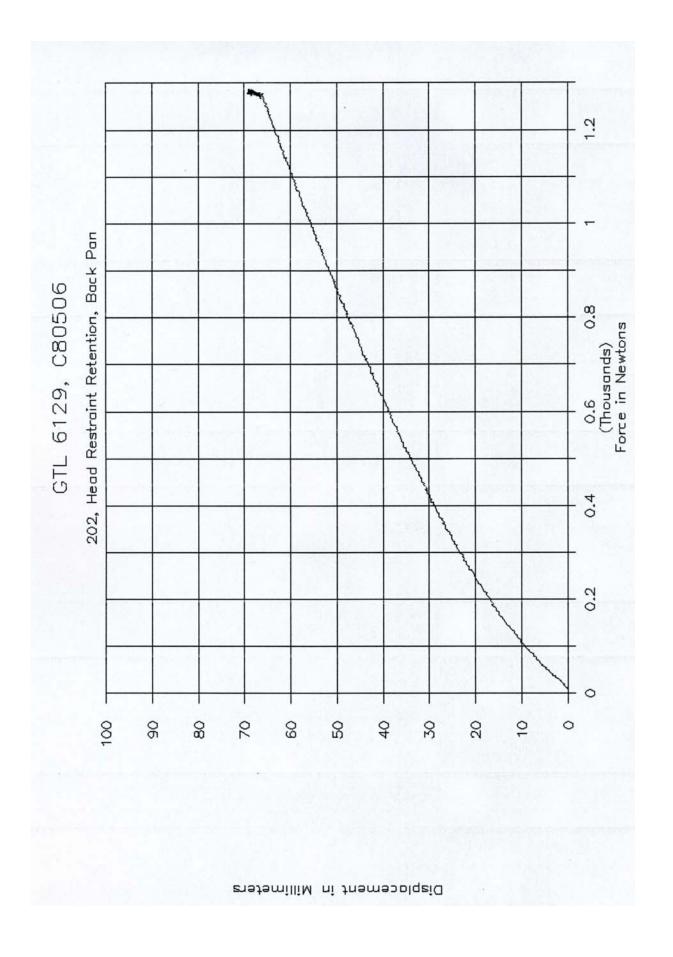
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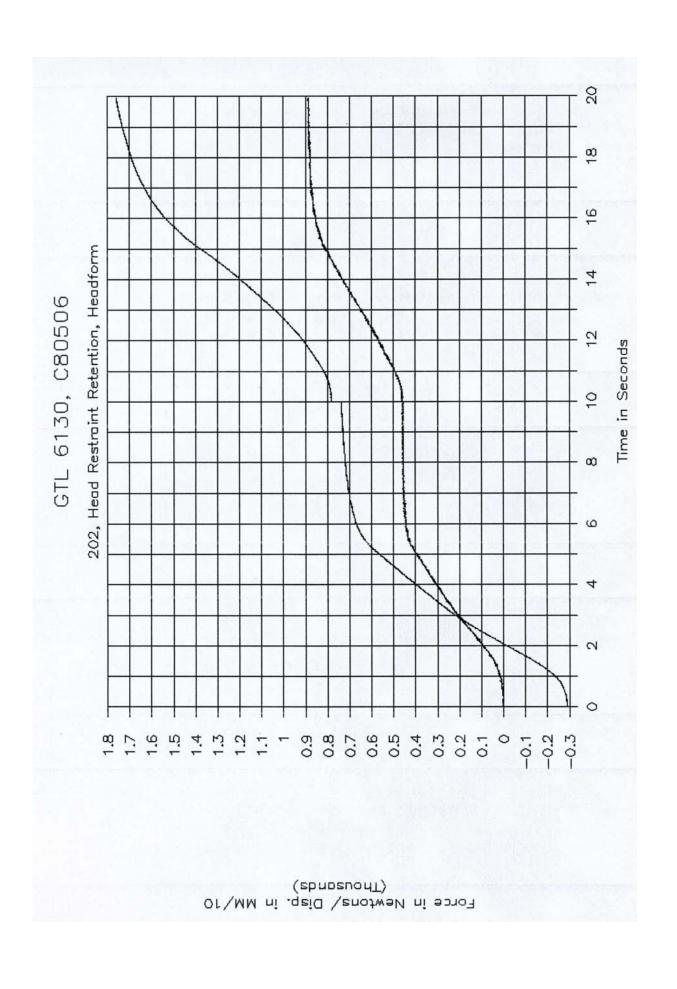
FIGURE 5.27 HEAD RESTRAINT POST TEST 895 NEWTON LOAD

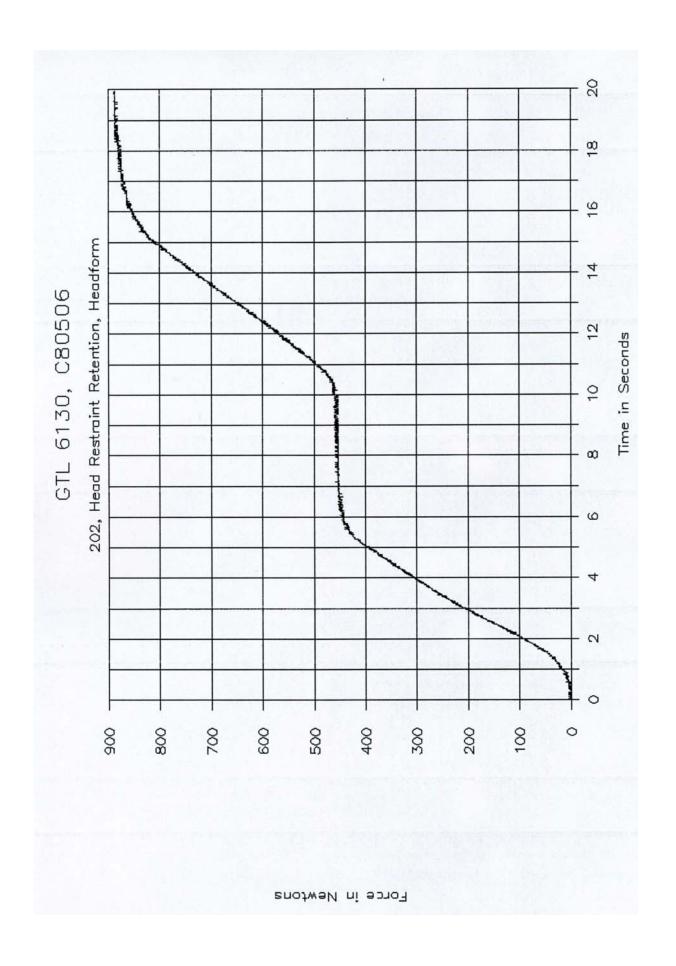
SECTION 6 TEST PLOTS

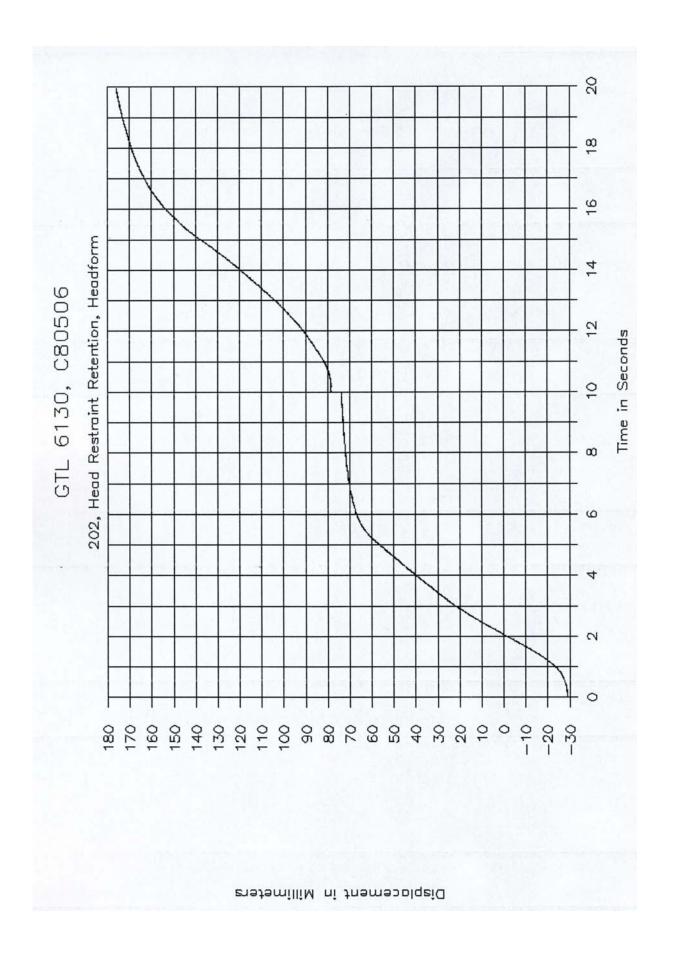


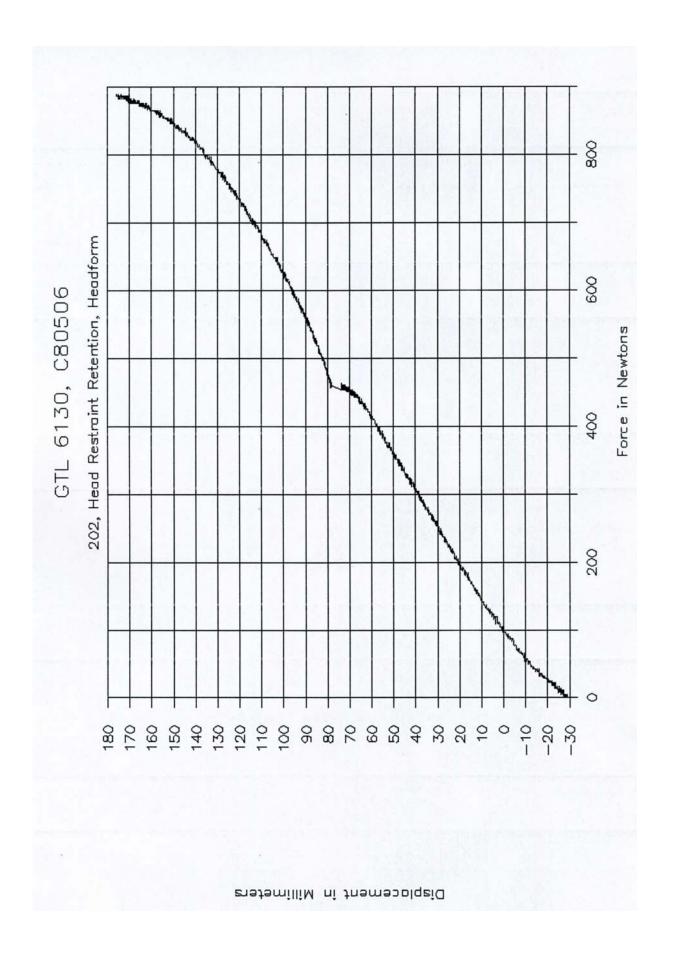


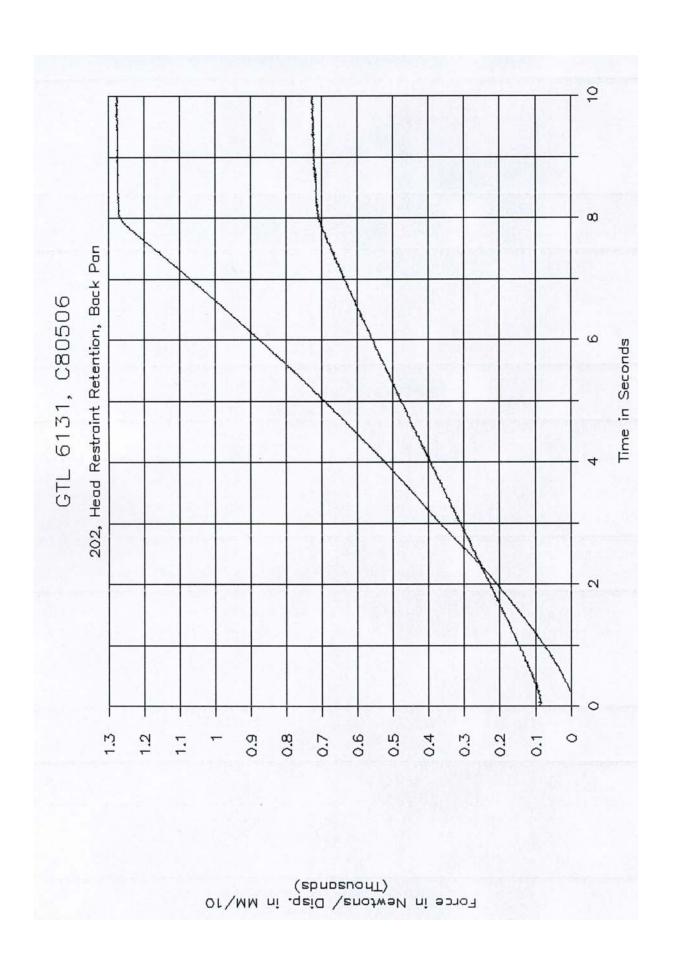


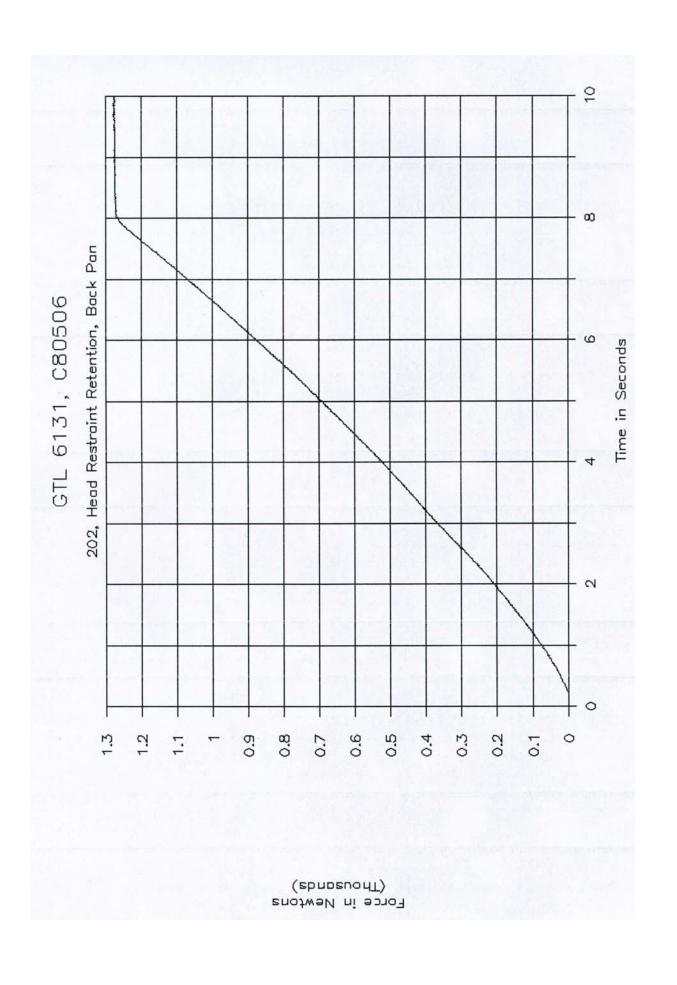


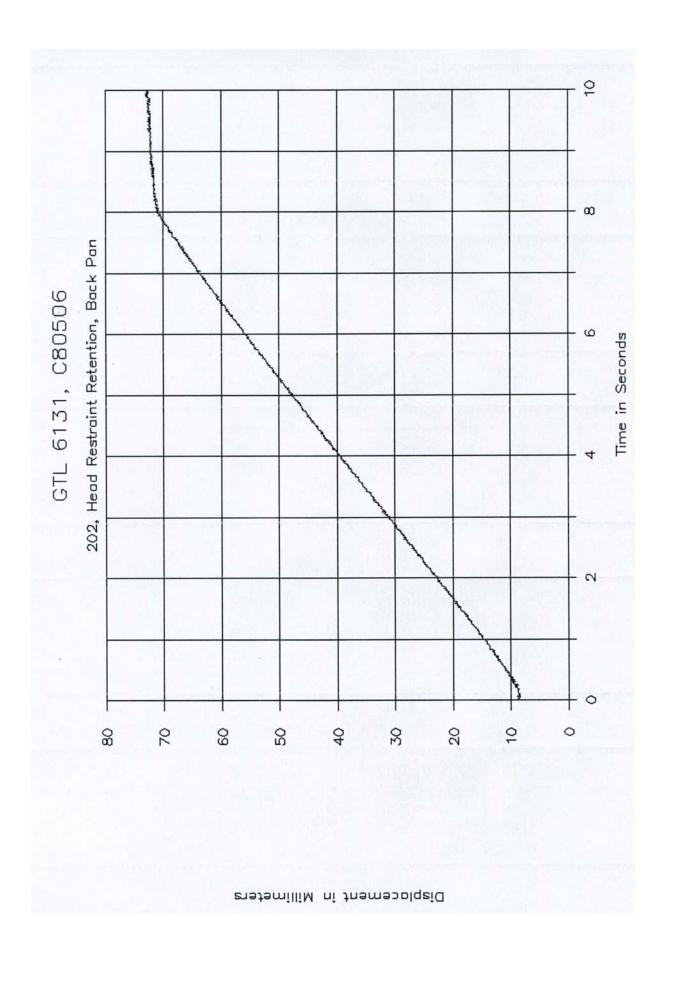




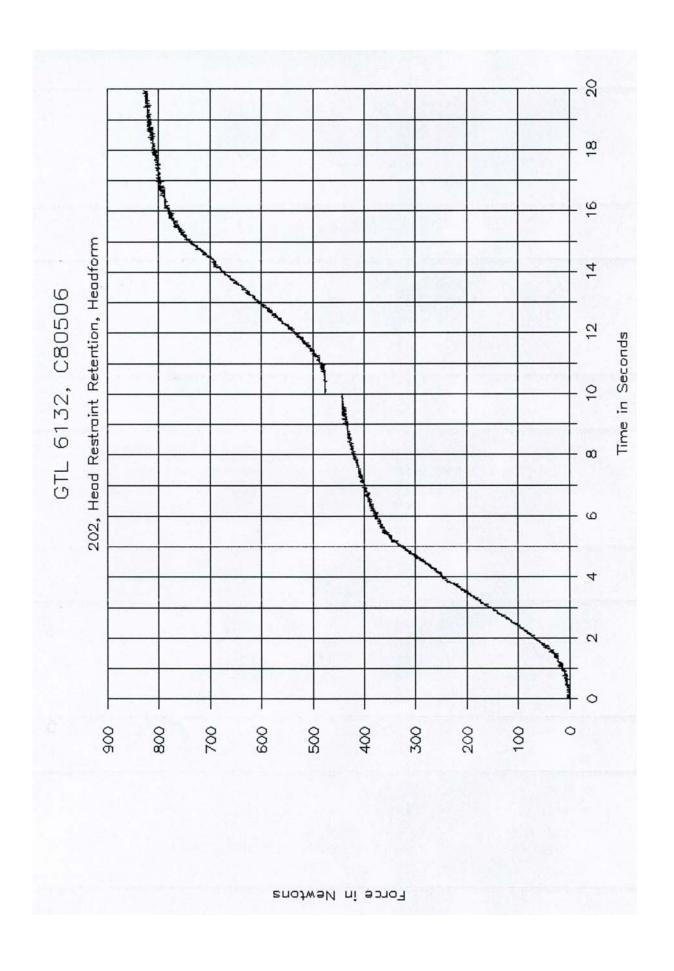


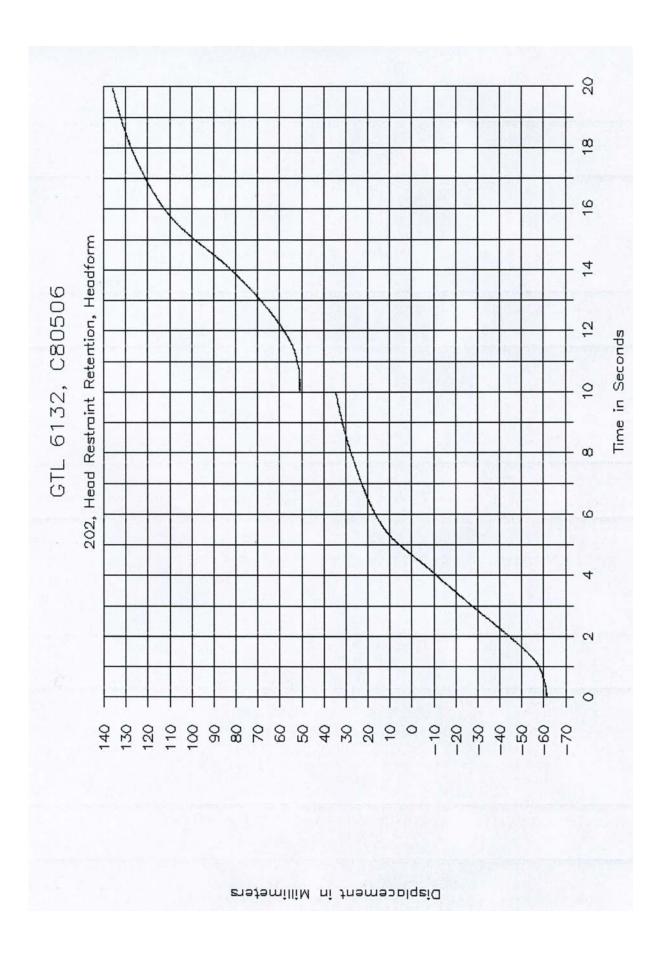


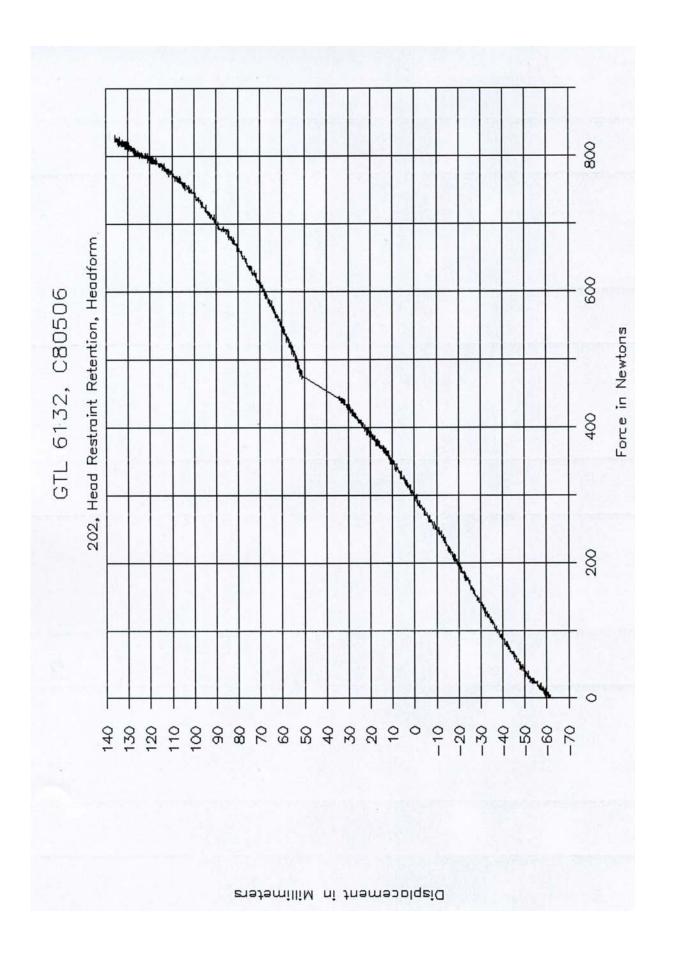




20 $\frac{2}{2}$ 16 202, Head Restraint Retention, Headform 4 GTL 6132, C80506 7 Time in Seconds 10 9 N 4:1-4:1-6:00 6:00 6:00 6:00 7:00 Force in Newtona \ Diap. in MM 10 (Thousands)





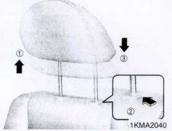


SECTION 7 OWNER'S MANUAL INFORMATION





3

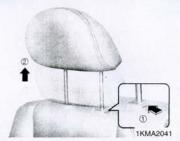


Front headrest adjustment

Adjusting the height up and down

The headrest not only provides comfort for the driver and passengers, but also helps to protect the head and neck in the event of a collision.

To raise the headrest, pull it up to the desired position (①). To lower the headrest, push and hold the release button (②) on the headrest support and lower the headrest to the desired position (③). For best protection, adjust the headrest so its center is as high as your ears. Also adjust the headrest so its distance from the head is as wide as your fist.



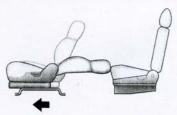
Removal

To remove the headrest, raise it as far as it can go then press the release lever (①) while pulling upward (②).

★ WARNING - Headrest positioning

To reduce the risk of head and neck injuries, each occupant headrest must be properly adjusted. Do not drive the vehicle with the headrest removed or improperly positioned.

Do not adjust the driver's headrest while driving, or else loss of control and an accident is possible



1KMA2045

Full flat seat (if equipped)

When the vehicle is parked, you can place the front seat in a reclined position, nearly flat.

- 1. Remove the headrest.
- Move the front seat to the farthest forward position.
- Recline the seatback as far as it can go to allow the rear seat passenger to support their legs in the reclined position.

3 24