MANUFACTURERS MOTOR VEHICLE SPECIFICATIONS

METRIC (U.S. Customary)

1989

Manufacturer	Vehicle Line
Oldsmobile Division General Motors Corporation	Cutlass Calais
Mailing Address	
920 Townsend Street Lansing, Michigan 48921	
Issued June, 1988	**Revised** March, 1989

Direct questions concerning these specifications to the manufacturer listed above.

The information contained herein is prepared, distributed by, and is solely the responsibility of the vehicle manufacturing company to whose products it relates. This specification form was developed by the vehicle manufacturing companies under the auspices of the Motor Vehicle Manufacturers Association of the United States, Inc.

The General Specifications herein are those in effect at date of compilation and are subject to change without notice or incurring obligation by the manufacturer.

mvma
Motor Vehicle Manufacturers Association
of the United States, Inc.

Blank Forms Provided by Technical Affairs Division

MVMA Specifications Form

METRIC (U.S. Customary)

Table of Contents

Ø **Indicates Format Change From Previous Year**

NOTE:

1. This form uses both SI metric units and U.S. Customary units. The metric unit of measure is presented first, and the U.S. Customary unit follows in parentheses.
2. UNLESS OTHERWISE INDICATED:
   a. Specifications apply to standard models without optional equipment. Significant deviations are noted.
   b. Nominal design dimensions are used throughout these specifications.
   c. All linear dimensions are in millimeters (inches), and all mass (weight) specifications are in kilograms (pounds).
3. The General Specifications herein are those in effect at date of compilation and are subject to change without notice or incurring obligation by the manufacturer.
4. Additional Vehicle Dimensions (based in part on SAE J1100 "Motor Vehicle Dimensions") may be available from the manufacturer.

MVMA Specifications Form

METRIC (U.S. Customary)

Vehicle Line Cutlass Calais
Model Year 1989 Issued 6-88 Revised (•) 9-88

Ø Vehicle Origin

Design & development (company)	General Motors, L.A.D. Lansing
Where built (country)	United States
Authorized U.S. sales marketing representative	Oldsmobile Division

Ø Vehicle Models

Model Description & Drive (FWD/RWD/AWD/4WD)*	Introduction Date	Make, Vehicle Models, Series, Body Type (Mfgr's Model Code)	No. of Designated Seating Positions (Front/Rear)	Max. Trunk/Cargo Load–Kilograms (Pounds)
Cutlass Calais Notchback Coupe		3NF27	2/3	60 (132)
Cutlass Calais Notchback Sedan		3NF69	2/3	60 (132)
Cutlass Calais SL Coupe		3NT27	2/3	60 (132)
Cutlass Calais SL Sedan		3NT69	2/3	60 (132
Cutlass Calais International Series Coupe		3NK27	2/3	60 (132)
Cutlass Calais International Series Sedan		3NK69	2/3	60 (132)

Ø * FWD - Front Wheel Drive RWD - Rear Wheel Drive
AWD - All Wheel Drive 4WD - Four Wheel Drive

MVMA Specifications Form

METRIC (U.S. Customary)

Vehicle Line Cutlass Calais
Model Year 1989 Issued 6-88 Revised (•) 9-88

Power Teams (Indicate whether standard or optional)
SAE J1349 Net bhp (brake horsepower) and net torque corrected to 77°F/25° C and 29.61 in. Hg/100 kPa atmospheric pressure.

SERIES AVAILABILITY	ENGINE						Exhaust S/D*	TRANSMISSION/ TRANSAXLE	AXLE RATIO (std. first)
	Code	Displ. Liters (in^3)	Induction (FI, CARB/ BBL, etc.)	Compr. Ratio	SAE Net at RPM				
					Power kW (bhp)	Torque N • m (lb. ft.)			
NA00 (Std.)	L68	2.5L (151) L4	EFI	8.3:1	82 (110) @ 5200	183 (135) @ 3200	S	(Std.) Manual/ 5-Speed (Opt.) Auto/ 3-Spped	3.35 Std. 2.84 Std.
NA00 (Opt.)	LG7	3.3L (204) V6	MFI	9.0:1	119 (160) @ 5200	251 (185) @ 3200	S	(Std.) Auto/ 3-Speed	2.39 Std.
NA00 (Opt.)	LD2	2.3L (138) L4	MFI	9.5:1	112 (150) @ 5200	217 (160) @ 4000	S	(Std.) Manual/ 5-Speed (Opt.) Auto/ 3-Speed	3.61 Std. 2.84 Std.
NK00	LG0	2.3L (138) L4	MFI	10.0:1	134 (180) @ 6200	217 (160) @ 5200	S	5-Speed Manual	3.61

* Single / Dual

MVMA Specifications Form

Vehicle Line Cutlass Calais
Model Year 1989 Issued 6-88 Revised (•) 9-88

METRIC (U.S. Customary)

Engine Description/Carb. Engine Code	2.3L (138) L4 LD2

ENGINE – GENERAL

Type & description (inline, V, angle, flat, location, front, mid, rear, transverse, longitudinal, sohc, dohc, ohv, hemi, wedge, pre-camber, etc.)		Inline, Front, Transverse, Pent Roof
Manufacturer		B-O-C Powertrain, Lansing
No. of cylinders		4
Bore		92 (3.62)
Stroke		85 (3.35)
Bore spacing (C / L to C / L)		100 (3.94)
Cylinder block material & mass kg (lbs.) (machined)		Cast Iron 42.83 (94.226)
Cylinder block deck height		222 (8.74)
Cylinder block length		499.5 (19.66)
Deck clearance (minimum) (above or below block)		0
Cylinder head material & mass kg (lbs.)		Aluminum Alloy 8.60 (18.96)
Cylinder head volume (cm^3)		49.379 ± 1.5
Cylinder liner material		None
Head gasket thickness (compressed)		1.03 - 1.13 (.040 - .044)
Minimum combustion chamber total volume (cm^3)		66.433
Cyl. no. system (front to rear)*	L. Bank	1-2-3-4
	R. Bank	None
Firing order		1-3-4-2
Intake manifold material & mass [kg (lbs.)]**		Aluminum Per GM 3950-M 3.06 (6.75)
Exhaust manifold material & mass [kg (lbs.)]**		Stainless Steel Tube, Steel Flanges 3.72 (8.2)
Fuel required unleaded, diesel, etc.		Unleaded
Fuel antiknock index (R + M) ÷ 2		87
Engine mounts	Number	3
	Material and type (elastomeric, hydroelastic, hydraulic damper, etc.	Elastomeric
	Added isolation (sub-frame, crossmember, etc.)	Cross Member Supporting the Front Mount
Total dressed engine mass (wt) dry***		150.69 (332.2) SMT, 145.70 (321.21) AMT

Engine – Pistons

Material & mass, g (weight, oz.) - piston only	Aluminum 396 (12.8)

Engine – Camshaft

Location		Overhead	
Material & mass kg (weight, lbs.)		Cast Iron	Intake 3.045 (6.713) Exhaust 2.948 (6.499)
Drive type	Chain / belt	Chain	
	Width / pitch	22.86	9.525 (.375) Duplex - 130 Pitches

* Rear of engine – drive takeoff. View from drive takeoff end to determine left & right side of engine.
** Finished state.
*** Dressed engine mass (weight) includes the following:

MVMA Specifications Form

Vehicle Line Cutlass Calais
Model Year 1989 Issued 6-88 Revised (•) 9-88

METRIC (U.S. Customary)

Engine Description/Carb. Engine Code	3.3L V6 (204 CID) LG7

ENGINE – GENERAL

Type & description (inline, V, angle, flat, location, front, mid, rear, transverse, longitudinal, sohc, dohc, ohv, hemi, wedge, pre-camber, etc.)		90°V
Manufacturer		B-O-C Flint
No. of cylinders		6
Bore		93.98 (3.700)
Stroke		80.26 (3.16)
Bore spacing (C / L to C / L)		107.7 (4.24)
Cylinder block material & mass kg (lbs.) (machined)		Cast Iron 49.32 (108.5)
Cylinder block deck height		210.7 (8.295)
Cylinder block length		398 (15.67)
Deck clearance (minimum) (above or below block)		1.02 (0.040) Above
Cylinder head material & mass kg (lbs.)		Cast Iron 13.18 (29.0) each
Cylinder head volume (cm^3)		37.36 (2.28 Cubic Inches)
Cylinder liner material		None
Head gasket thickness (compressed)		1.26 (0.049)
Minimum combustion chamber total volume (cm^3)		69.53 (4.243 Cubic Inches)
Cyl. no. system (front to rear)*	L. Bank	1-3-5
	R. Bank	2-4-6
Firing order		1-6-5-4-3-2
Intake manifold material & mass [kg (lbs.)]**		Aluminum 5.53 (12.17)
Exhaust manifold material & mass [kg (lbs.)]**		Stainless Steel Left - 2.04 (4.49); Right - 3.23 (7.11)
Fuel required unleaded, diesel, etc.		Unleaded
Fuel antiknock index (R + M) ÷ 2		87
Engine mounts	Number	3
	Material and type (elastomeric, hydroelastic, hydraulic damper, etc.	Elastomeric
	Added isolation (sub-frame, crossmember, etc.)	No
Total dressed engine mass (wt) dry***		186.4 (410.9)

Engine – Pistons

Material & mass, g (weight, oz.) - piston only	Cast Aluminum Alloy 397 (14.0) each

Engine – Camshaft

Location		Above Crankshaft at Center of V
Material & mass kg (weight, lbs.)		5150 Steel 2.99 (6.58)
Drive type	Chain / belt	Chain
	Width / pitch	17.78 (.700)/9.53 (.375)

* Rear of engine – drive takeoff. View from drive takeoff end to determine left & right side of engine.
** Finished state.
*** Dressed engine mass (weight) includes the following:

MVMA Specifications Form

Vehicle Line Cutlass Calais
Model Year 1989 Issued 6-88 Revised (•) 9-88

METRIC (U.S. Customary)

Engine Description/Carb. Engine Code	2.5L (151) L4 L68

ENGINE – GENERAL

Type & description (inline, V, angle, flat, location, front, mid, rear, transverse, longitudinal, sohc, dohc, ohv, hemi, wedge, pre-camber, etc.)		In Line, Front, Transverse
Manufacturer		Pontiac
No. of cylinders		4
Bore		101.6 (4.00)
Stroke		76.2 (3.00)
Bore spacing (C / L to C / L)		111.8 (4.40)
Cylinder block material & mass kg (lbs.) (machined)		Cast Iron 41.64 (91.8)
Cylinder block deck height		236.1 (9.3) From Pan Rail
Cylinder block length		
Deck clearance (minimum) (above or below block)		.64 (.025) Below
Cylinder head material & mass kg (lbs.)		Swirl Port Cast Iron 18.27 (40.2)
Cylinder head volume (cm^3)		45.62 (2.76)
Cylinder liner material		None
Head gasket thickness (compressed)		1.12 (0.044)
Minimum combustion chamber total volume (cm^3)		70.82 (4.32)
Cyl. no. system (front to rear)*	L. Bank	1-2-3-4
	R. Bank	--
Firing order		1-3-4-2
Intake manifold material & mass [kg (lbs.)]**		Aluminum 3.70 (8.14)
Exhaust manifold material & mass [kg (lbs.)]**		Stainless Steel 1.72 (3.79)
Fuel required unleaded, diesel, etc.		Unleaded
Fuel antiknock index (R + M) ÷ 2		87
Engine mounts	Number	3
	Material and type (elastomeric, hydroelastic, hydraulic damper, etc.	Elastomeric
	Added isolation (sub-frame, crossmember, etc.)	No
Total dressed engine mass (wt) dry***		164.316 (361.5)

Engine – Pistons

Material & mass, g (weight, oz.) - piston only	Cast Alum Alloy 530.0 (18.7)

Engine – Camshaft

Location		Right Side of Block
Material & mass kg (weight, lbs.)		Cast Nodular Iron 3.375 (7.425)
Drive type	Chain / belt	Gear 54T/27T
	Width / pitch	22.23 (.88) NDP#10

*. Rear of engine – drive takeoff. View from drive takeoff end to determine left & right side of engine.
** Finished state.
*** Dressed engine mass (weight) includes the following:

MVMA Specifications

Vehicle Line CUTLASS CALAIS
Model Year 1989 Issued _____ Revised(*) _____

METRIC (U.S. Customary)

Engine Description	2.3 LITER L4 (138 CID)
Engine Code	MULTI-PORT FUEL INJECTION RPO LGO

ENGINE – GENERAL

Type & description (inline, V, angle, flat, location, front, mid, rear, transverse, longitudinal, sohc, dohc, ohv, hemi, wedge, pre-chamber, etc.)		Inline, Front, Transverse, Pent House
Manufacturer		B-O-C Lansing Automotive Division
No. of cylinders		4
Bore		92 mm (3.63 in.)
Stroke		85 mm (3.35 in.)
Bore spacing (C/L to C/L)		100 mm (3.94 in.)
Cyl blck matl & mass kg(lbs.)(machined)		Cast Iron 42.83 (94.226)
Cylinder block deck height		222 mm (8.74 in.)
Cylinder block length		499.5 (19.66)
Deck clearance (minimum) (above or below block)		0
Cyl. head material & mass kg (lbs.)		Aluminum Alloy 8.60 (18.96)
Cylinder head volume (cu. cm.)		47.0 +/- 1.5cc
Cylinder liner material		None
Head gasket thickness (compressed)		1.03 - 1.13 mm (.040 - .044 in.)
Minimum combustion chamber total volume (cm. cu.)		62.8
Cyl. no. system (front to rear)	L. Bank	1-2-3-4
	R. Bank	None
Firing order		1-3-4-2
Intake manifold matl & mass[kg(lbs.)]**		Aluminum Per GM 3950-M 4.80 (10.56)
Exh. manifold matl & mass [kg (lbs.)]**		Cast Iron 6.74 (14.86)
Fuel required unleaded, diesel, etc.		Unleaded
Fuel antiknock index (R + M) / 2		87
Engine mounts	Quantity	3
	Matl and type (elastomeric, hydroelastic, hydraulic damper, etc.)	Elastomeric (2) Hydraulic-Elastomeric (1)
	Added isolation (sub-frame, crossmember, etc.)	Isolated Cross Member Supporting the Front Mount
Total dressed engine mass (wt) dry***		177.8 (391.16)

Engine – Pistons

Material & mass, g (weight, oz.) – piston only	Aluminum .423 (14.88

Engine Camshaft

Location		Overhead	
Material & mass kg (weight, lbs.)		Cast Iron	Intake 3.045 (6.713) Exhaust 2.948 (6.499)
Drive type	Chain/belt	Chain	
	Width/pitch	22.86 mm	9.525 mm (.375 in.) Duplex - 130 Pitches

*Rear of engine – drive takeoff. View from drive takeoff end to determine left & right side of engine.
**Finished state.
***Dressed engine mass (weight) includes the following:

MVMA Specifications Form

Vehicle Line Cutlass Calais
Model Year 1989 Issued 6-88 Revised (●) 9-88

METRIC (U.S. Customary)

Engine Description/Carb. Engine Code	2.3L (138) 14 LD2

Engine – Valve System

Hydraulic lifters (std., opt., NA)		Standard
Valves	Number intake / exhaust	8/8
	Head O.D. intake / exhaust	35.63 (1.40)/30.14 (1.19)

Engine – Connecting Rods

Material & mass [kg., (weight, lbs.)]*	Carbon Steel S.A.E. #1141 Modified .673 (1.5) Each
∅ Length (axes ℄ to ℄) mm	147.5 (5.81)

Engine – Crankshaft

Material & mass [kg., (weight, lbs.)]*		Nodular Iron GM6129 18.8 (41.4)
End thrust taken by bearing (no.)		#3
Length & number of main bearings		#1, 2, 4 & 5 21.25 (.84) #3 27.25 (1.09)/5
Seal (material, one, two piece design, etc.)	Front	One Piece, Viton
	Rear	One Piece, Viton

Engine – Lubrication System

Normal oil pressure [kPa (psi) at engine rpm]	207 (30) @ 2000 RPM
Type oil intake (floating, stationary)	Stationary Pick-up
Oil filter system (full flow, part, other)	Full
Capacity of c/case, less filter-refill-L (qt.)	3.79 (4)

Engine – Diesel Information

Diesel engine manufacturer		
Glow plug, current drain at 0°F		
Injector nozzle	Type	
	Opening pressure [kPa (psi)]	
Pre-chamber design		
Fuel injection pump	Manufacturer	
	Type	
Fuel injection pump drive (belt, chain, gear)		
Supplementary vacuum source (type)		
Fuel heater (yes/no)		
Water separator, description (std., opt.)		
Turbo manufacturer		
Oil cooler-type (oil to engine coolant; oil to ambient air)		
Oil filter		

Engine – Intake System

Turbo charger - manufacturer	
Super charger - manufacturer	
Intercooler	

*Finished State

MVMA Specifications Form

Vehicle Line Cutlass Calais
Model Year 1989 Issued 6-88 Revised (•) 9-88

METRIC (U.S. Customary)

Engine Description/Carb. Engine Code	3.3L V6 (204 CID) LG7

Engine – Valve System

Hydraulic lifters (std., opt., NA)		Standard (Roller)
Valves	Number intake / exhaust	6/6
	Head O.D. intake / exhaust	43.40 (1.71)/38.10 (1.5)

Engine – Connecting Rods

Material & mass [kg., (weight, lbs.)]*	Pearlitic Malleable 0.61 (1.34) each
∅ Length (axes ℄ to ℄) mm	135.66 (5.341)

Engine – Crankshaft

Material & mass [kg., (weight, lbs.)]*		Nodular Iron 15.12 (33.26)
End thrust taken by bearing (no.)		Two
Length & number of main bearings		21.9 (0.864) Four
Seal (material, one, two piece design, etc.)	Front	One Piece Rubber Lip
	Rear	Two Piece Rope

Engine – Lubrication System

Normal oil pressure [kPa (psi) at engine rpm]	310 (45) @ 2000
Type oil intake (floating, stationary)	Stationary
Oil filter system (full flow, part, other)	Full Flow
Capacity of c/case, less filter-refill-L (qt.)	3.78 (4)

Engine – Diesel Information

Diesel engine manufacturer		
Glow plug, current drain at 0°F		
Injector nozzle	Type	
	Opening pressure [kPa (psi)]	
Pre-chamber design		
Fuel injection pump	Manufacturer	
	Type	
Fuel injection pump drive (belt, chain, gear)		
Supplementary vacuum source (type)		
Fuel heater (yes/no)		
Water separator, description (std., opt.)		
Turbo manufacturer		
Oil cooler-type (oil to engine coolant; oil to ambient air)		
Oil filter		

Engine – Intake System

Turbo charger - manufacturer	
Super charger - manufacturer	
Intercooler	

*Finished State

MVMA Specifications Form

Vehicle Line Cutlass Calais
Model Year 1989 Issued 6-88 Revised (e) 9-88

METRIC (U.S. Customary)

Engine Description/Carb. Engine Code	2.5L (151) L4 L68

Engine – Valve System

Hydraulic lifters (std., opt., NA)		Standard (Roller Lifters)
Valves	Number intake / exhaust	4/4
	Head O.D. intake / exhaust	43.69 (1.72)/38.10 (1.50)

Engine – Connecting Rods

Material & mass [kg., (weight, lbs.)]*	Cast Arma Steel
Ø Length (axes ℄ to ℄) mm	

Engine – Crankshaft

Material & mass [kg., (weight, lbs.)]*		Nodular Cast Iron 13.77 (30.3)
End thrust taken by bearing (no.)		5
Length & number of main bearings		5
Seal (material, one, two piece design, etc.)	Front	One Piece Radial Lip-Viton
	Rear	One Piece Radial Lip-Viton

Engine – Lubrication System

Normal oil pressure [kPa (psi) at engine rpm]	259.0 (37.5) @ 2000
Type oil intake (floating, stationary)	Stationary
Oil filter system (full flow, part, other)	Full Flow
Capacity of c/case, less filter-refill-L (qt.)	3.78 (4.0)

Engine – Diesel Information

Diesel engine manufacturer		
Glow plug, current drain at 0°F		
Injector nozzle	Type	
	Opening pressure [kPa (psi)]	
Pre-chamber design		
Fuel injection pump	Manufacturer	
	Type	
Fuel injection pump drive (belt, chain, gear)-		
Supplementary vacuum source (type)		
Fuel heater (yes/no)		
Water separator, description (std., opt.)		
Turbo manufacturer		
Oil cooler-type (oil to engine coolant; oil to ambient air)		
Oil filter		

Engine – Intake System

Turbo charger - manufacturer	
Super charger - manufacturer	
Intercooler	

*Finished State

MVMA Specifications

Vehicle Line CUTLASS CALAIS
Model Year 1989 Issued _____ Revised(*) _____

METRIC (U.S. Customary)

Engine Description
Engine Code

2.3 LITER L4 (138 CID)
MULTI-PORT FUEL INJECTION RPO LGO

Engine – Valve System

Hydraulic lifters (std., opt., NA)		Standard
Valves	Number intake/exhaust	8/8
	Head O.D. intake/exhaust	36.50 mm (1.44 in.) / 31.50 mm (1.24 in.)

Engine – Connecting Rods

Material & mass (kg., (weight, lbs.))*	Carbon Steel S.A.E. #1141 Modified .673 (1.5) Each
Length(axes centerline to centerline)mm	147.5 (5.81)

Engine – Crankshaft

Material & mass (kg., (weight, lbs.))*		Nodular Iron GM6129 19.0 (41.9)
End thrust taken by bearing (no.)		#3
Length & number of main bearings		#1, 2. 4. & 5 21.25 mm (.84 in.) #3 27.25 mm (1.09 in.)/5
Seal (material, one, two piece design, etc.)	Front	One Piece, Viton
	Rear	One Piece, Viton

Engine – Lubrication System

Normal oil pressure[kPa(psi) @ eng rpm]	207 (30) @ 2000
Type oil intake (floating, stationary)	Stationary Pick-up
Oil filter sys. (full flow,part, other)	Full
Capacity of c/case,less filter–refill–L (qt.)	3.79 (4)

Engine – Diesel Information

NOT APPLICABLE

Diesel engine manufacturer		
Glow plug, current drain at 0 deg. F		
Injector Nozzle	Type	
	Opening pressure[kPa(psi)]	
Pre-chamber design		
Fuel in-jection pump	Manufacturer	
	Type	
Fuel inj. pump drive (belt,chain,gear)		
Supplementary vacuum source (type)		
Fuel heater (yes/no)		
Water separator, description (std., opt.)		
Turbo manufacturer		
Oil cooler–type (oil to engine coolant; oil to ambient air)		
Oil filter		

Engine – Intake System

NOT APPLICABLE

Turbo charger – manufacturer	
Super charger – manufacturer	
Intercooler	

* Finished State

MVMA Specifications Form 1989

Vehicle Line Cutlass Calais
Model Year _____ Issued 6-88 Revised (●) 9-88

METRIC (U.S. Customary)

Engine Description/Carb. Engine Code	2.5L (151) L4 L68

Engine – Cooling System

Coolant recovery system (std., opt., n.a.)		Surge Tank System
Coolant fill location (rad., bottle)		Surge Tank
Radiator cap relief valve pressure [kPa (psi)]		103.4 (15) (On Surge Tank)
Circulation thermostat	Type (choke, bypass)	Choke
	Starts to open at °C (°F)	91° (195°)
Water pump	Type (centrifugal, other)	
	GPM 1000 pump rpm	
	Number of pumps	
	Drive (V-belt, other)	
	Bearing type	
	Impeller material	
	Housing material	
By-pass recirculation [type (inter., ext.)]		External - Thru Heater Core
Cooling system capacity	With heater–L(qt.)	7.4 (7.8)
	With air cond.–L(qt.)	7.4 (7.8)
	Opt. equipment [specify–L(qt.)]	None
Water jackets full length of cyl. (yes, no)		
Water all around cylinder (yes, no)		
Water jackets open at head face (yes, no)		
Radiator core	Std., A/C, HD	A/C
	Type (cross-flow, etc.)	Cross Flow
	Construction (fin & tube mechanical, braze, etc.)	Serpentine Fin and Tube
	Material, mass [kg (wgt. lbs.)]	Copper/Brass 5.36 (11.8)
	Width	600 (23.6)
	Height	387 (15.2)
	Thickness	25 (.98)
	Fins per inch	20
Radiator end tank material		Brass
Fan	Std., elec., opt.	Electric
	Number of blades & type (flex, solid, material)	6 Plastic
	Diameter & projected width	290 (11.4), 373 (14.7)
	Ratio (fan to crankshaft rev.)	Not Applicable
	Fan cutout type	Engine Control Module (ECM)
	Drive type (direct, remote)	Direct Drive Electric Motor (All)
	RPM at idle (elec.)	2200 1900
	Motor rating (wattage) (elec.)	100W 150W
	Motor switch (type & location) (elec.)	
	Switch point (temp., pressure) (elec.)	*
	Fan shroud (material)	None Plastic

* On at 108°C Coolant Temperature or 300 PSI A/C Head Pressure.

MVMA Specifications Form

Vehicle Line Cutlass Calais
Model Year 1989 Issued 6-88 Revised (•) 9-88

METRIC (U.S. Customary)

Engine Description/Carb. Engine Code	2.3L (138) L4 LD2

Engine – Cooling System

Coolant recovery system (std., opt., n.a.)		Surge Tank System
Coolant fill location (rad., bottle)		Surge Tank
Radiator cap relief valve pressure [kPa (psi)]		103.5 (15) (On Surge Tank)
Circulation thermostat	Type (choke, bypass)	Bypass
	Starts to open at °C (°F)	89 (192)
Water pump	Type (centrifugal, other)	Centrifugal
	GPM 1000 pump rpm	6.5
	Number of pumps	One
	Drive (V-belt, other)	Chain
	Bearing type	2 Row Ball
	Impeller material	Sheet Metal
	Housing material	Die Cast Aluminum
By-pass recirculation [type (inter,. ext.)]		External - Heater Water Flow
Cooling system capacity	With heater–L(qt.)	7.20 (7.6)
	With air cond.–L(qt.)	7.20 (7.6)
	Opt. equipment [specify–L(qt.)]	None
Water jackets full length of cyl. (yes, no)		Yes
Water all around cylinder (yes, no)		No
Water jackets open at head face (yes, no)		Yes
Radiator core	Std., A/C, HD	Standard
	Type (cross-flow, etc.)	Cross Flow
	Construction (fin & tube mechanical, braze, etc.)	Serpentine Fin and Tube Vacuum Brazed
	Material, mass [kg (wgt. lbs.)]	Aluminum 3.74 (8.25)
	Width	600 (23.6)
	Height	382 (15.0)
	Thickness	23.5 (.93)
	Fins per inch	12.7 Fins Per Inch
Radiator end tank material		Nylon 66, 33% Mineral Filled
Fan	Std., elec., opt.	Electric
	Number of blades & type (flex, solid, material)	6 - Nylon 6/6 Mineral Filled
	Diameter & projected width	381 (15.0), 37.3 (1.5)
	Ratio (fan to crankshaft rev.)	Not Applicable
	Fan cutout type	Engine Control Module (ECM)
	Drive type (direct, remote)	Electric - Direct
	RPM at idle (elec.)	1900
	Motor rating (wattage) (elec.)	150 Watts
	Motor switch (type & location) (elec.)	ECM
	Switch point (temp., pressure) (elec.)	*
	Fan shroud (material)	None

* On at 106° (223) Coolant Temperature or 275 PSI A/C Head Pressure.

MVMA Specifications Form

Vehicle Line Cutlass Calais
Model Year 1989 Issued 6-88 Revised (•) 9-88

METRIC (U.S. Customary)

Engine Description/Carb. Engine Code	3.3L (204 CID) LG7

Engine – Cooling System

Coolant recovery system (std., opt., n.a.)		Surge Tank System
Coolant fill location (rad., bottle)		Surge Tank
Radiator cap relief valve pressure [kPa (psi)]		103.4 (15.0) (On Surge Tank)
Circulation thermostat	Type (choke, bypass)	Bypass
	Starts to open at °C (°F)	91°C (195°F)
Water pump	Type (centrifugal, other)	Centrifugal
	GPM 1000 pump rpm	8.0
	Number of pumps	One
	Drive (V-belt, other)	Poly V-Belt
	Bearing type	Two Row Ball
	Impeller material	Aluminum
	Housing material	Aluminum
By-pass recirculation [type (inter., ext.)]		External - Thru Heater Core and Internal Thru Manifold
Cooling system capacity	With heater–L(qt.)	9.4 (10.0 Qts.)
	With air cond.–L(qt.)	9.8 (10.3 Qts.)
	Opt. equipment [specify–L(qt.)]	None
Water jackets full length of cyl. (yes, no)		Yes
Water all around cylinder (yes, no)		Yes
Water jackets open at head face (yes, no)		No
Radiator core	Std., A/C, HD	A/C
	Type (cross-flow, etc.)	Cross Flow
	Construction (fin & tube mechanical, braze, etc.)	Serpentine Fin and Tube Vacuum Brazed
	Material, mass [kg (wgt. lbs.)]	Aluminum 4.87 (10.7)
	Width	600 (23.6)
	Height	382 (15.0)
	Thickness	34.0 (1.3)
	Fins per inch	20
Radiator end tank material		Plastic
Fan	Std., elec., opt.	Electric
	Number of blades & type (flex, solid, material)	6
	Diameter & projected width	381
	Ratio (fan to crankshaft rev.)	Not Applicable
	Fan cutout type	ECM
	Drive type (direct, remote)	Direct Drive Electric Motor
	RPM at idle (elec.)	1900
	Motor rating (wattage) (elec.)	150W
	Motor switch (type & location) (elec.)	
	Switch point (temp., pressure) (elec.)	*
	Fan shroud (material)	None

* On at 100°C Coolant Temperature or 260 PSI A/C Head Pressure.

MVMA Specifications

Vehicle Line CUTLASS CALAIS
Model Year 1989 Issued _____ Revised(*) _____

METRIC (U.S. Customary)

Engine Description
Engine Code

2.3 LITER L4 (138 CID)
MULTI-PORT FUEL INJECTION RPO LGO

Engine – Cooling System

Coolant recovery system (std, opt, n.a.)		Surge Tank System
Coolant fill location (rad., bottle)		Surge Tank
Radiator cap relief valve pressure [kPa (psi)]		103.5 (15) (On Surge Tank)
Circulation thermostat	Type (choke, bypass)	Bypass
	Starts to open @ deg's C(F)	89 (192)
Water Pump	Type (centrifugal, other)	Centrifugal
	GPM 1000 pump rpm	6.5
	Number of pumps	One
	Drive (V-belt, other)	Chain
	Bearing type	2 Row Ball
	Impeller material	Sheet Metal
	Housing material	Die Cast Aluminum
By-pass recirculation (type (inter., ext.)]		External – Heater Water Flow & Throttle Body Water Flow
Cooling system capacity	With heater – L (qt.)	7.20 (7.6)
	With air conditioner–L(qt.)	7.20 (7.6)
	Opt. equip.(specify–L(qt.)]	None
Water jackets full length of cyl(yes,no)		Yes
Water all around cylinder (yes, no)		No
Water jackets open at head face (yes,no)		Yes
Radiator core	Std., A/C, HD	A/C
	Type (cross-flow, etc.)	Cross Flow
	Construction (fin & tube mechanical, braze, etc.)	Serpentine Fine and Tube Vacuum Brazed
	Matl., mass (kg(wgt.,lbs.)]	Aluminum 3.65 (8.04)
	Width	600 (23.6)
	Height	382 (15.0)
	Thickness	23.5 (.93)
	Fins per inch	12.7 Fins Per Inch
Radiator end tank material		Nylon 66, 33% Mineral Filled
Fan	Std., elec., opt.	Electric
	Number of blades & type (flex, solid, material)	6 - Nylon 6/6 Mineral Filled
	Diameter & projected width	381 (15.0), 37.3 (1.5)
	Ratio(fan to crnkshft.rev.)	Not Applicable
	Fan cutout type	Engine Control Module (ECM)
	Drive type (direct, remote)	Electric - Direct
	RPM at idle (elec.)	1900
	Motor rating(wattage)(elec)	150 Watts
	Motor switch (type & location) (elec.)	ECM
	Switch point (temp., pressure) (elec.)	On at 106 deg. (223) Coolant Temperature or 295 PSI A/C Head Pressure.
	Fan shroud (material)	None

MVMA Specifications Form

Vehicle Line Cutlass Calais
Model Year 1989 Issued 6-88 Revised (•) 9-88

METRIC (U.S. Customary)

Engine Description/Carb. Engine Code	2.5L (151) L4 L68

Engine – Fuel System

(See supplemental page for details of Fuel Injection, Supercharger, Turbocharger, etc. if used)

Induction type: carburetor, fuel injection system, etc.		
Manufacturer		
∅ Carburetor no. of barrels		
Idle A/F mix.		
Fuel injection	Point of injection (no.)	
	Constant, pulse, flow	
	Control (electronic, mech.)	
	System pressure [kPa (psi)]	
Idle spd.-rpm (spec. neutral or drive and propane if used)	Manual	
	Automatic	
Intake manifold heat control (exhaust or water thermostatic or fixed)		
Air cleaner type		
Fuel filter (type/location)		Replaceable/Inline Rear of Tank
∅ Fuel pump	Type (elec. or mech.)	Electric
	Location (eng., tank)	Tank
	Pressure range [kPa (psi)]	Not Applicable
∅	Flow rate at regulated pressure (L (gal)/hr @ kPa (psi))	85.16 (22.5) @ 83 (12)

Fuel Tank

Capacity [refill L (gallons)]		51.5 (13.6)
Location (describe)		Rear Center Underside, R.H. Rear Quarter Panel
Attachment		Underbody Strap
Material & Mass [kg (weight lbs)]		Steel
Filler pipe	Location & material	Right Rear Quarter Panel - Steel
	Connection to tank	Hoses
Fuel line (material)		Steel GM124M
Fuel hose (material)		Coupled Elastomer GM6163M
Return line (material)		Steel GM124M
Vapor line (material)		Steel GM124M
Extended range tank	Opt., n.a.	NA
	Capacity [L (gallons)]	
	Location & material	
	Attachment	
Auxiliary tank	Opt., n.a.	NA
	Capacity [L (gallons)]	
	Location & material	
	Attachment	
	Selector switch or valve	
	Separate fill	

MVMA Specifications Form

Vehicle Line Cutlass Calais
Model Year 1989 Issued 6-88 Revised (e) 9-88

METRIC (U.S. Customary)

Engine Description/Carb. Engine Code	2.3L (138) L4 LD2

Engine – Fuel System

(See supplemental page for details of Fuel Injection, Supercharger, Turbocharger, etc. if used)

Induction type: carburetor, fuel injection system, etc.		Port Fuel Injection
Manufacturer		Rochester Products
∅ Carburetor no. of barrels		None
Idle A/F mix.		ECM Controlled
Fuel injection	Point of injection (no.)	4 Injectors at Ports in Cylinder Head
	Constant, pulse, flow	Pulse
	Control (electronic, mech.)	Electronic
	System pressure [kPa (psi)]	300 (43 PSI)
Idle spd.-rpm (spec. neutral or drive and propane if used)	Manual	900 Neutral
	Automatic	900 Both
Intake manifold heat control (exhaust or water thermostatic or fixed)		None
Air cleaner type		Replaceable Paper Element
Fuel filter (type/location)		None
∅ Fuel pump	Type (elec. or mech.)	See Page 6
	Location (eng., tank)	
	Pressure range [kPa (psi)]	
∅	Flow rate at regulated pressure (L (gal)/hr @ kPa (psi))	58.28 (15.4) @ 350 (51)

Fuel Tank

See Page 6

Capacity (refill L (gallons))		
Location (describe)		
Attachment		
Material & Mass [kg (weight lbs)]		
Filler pipe	Location & material	
	Connection to tank	
Fuel line (material)		
Fuel hose (material)		
Return line (material)		
Vapor line (material)		
Extended range tank	Opt., n.a.	
	Capacity [L (gallons)]	
	Location & material	
	Attachment	
Auxiliary tank	Opt., n.a.	
	Capacity [L (gallons)]	
	Location & material	
	Attachment	
	Selector switch or valve	
	Separate fill	

MVMA Specifications Form

Vehicle Line Cutlass Calais
Model Year 1989 Issued 6-88 Revised (•) 9-88

METRIC (U.S. Customary)

Engine Description/Carb. Engine Code	3.3L (204) V6 LG7

Engine – Fuel System

(See supplemental page for details of Fuel Injection, Supercharger, Turbocharger, etc. if used)

Induction type: carburetor, fuel injection system, etc.		Port Fuel Injection
Manufacturer		RPD
∅ Carburetor no. of barrels		N/A
Idle A/F mix.		E.C.M. Control
Fuel injection	Point of injection (no.)	Port
	Constant, pulse, flow	Pulse
	Control (electronic, mech.)	Electronic
	System pressure (kPa (psi)]	36 - 43 PSI
Idle spd.-rpm (spec. neutral or drive and propane if used)	Manual	N/A
		N/A
	Automatic	675 RPM Drive
		800 RPM Neutral
Intake manifold heat control (exhaust or water thermostatic or fixed)		
Air cleaner type		
Fuel filter (type/location)		
∅ Fuel pump	Type (elec. or mech.)	See Page 6
	Location (eng., tank)	
	Pressure range [kPa (psi)]	
∅	Flow rate at regulated pressure (L (gal)/hr @ kPa (psi))	58.28 (15.4) @ 350 (51)

Fuel Tank

See Page 6

Capacity (refill L (gallons)]		
Location (describe)		
Attachment		
Material & Mass [kg (weight lbs)]		
Filler pipe	Location & material	
	Connection to tank	
Fuel line (material)		
Fuel hose (material)		
Return line (material)		
Vapor line (material)		
Extended range tank	Opt., n.a.	
	Capacity [L (gallons)]	
	Location & material	
	Attachment	
Auxiliary tank	Opt., n.a..	
	Capacity [L (gallons)]	
	Location & material	
	Attachment	
	Selector switch or valve	
	Separate fill	

MVMA Specifications

Vehicle Line CUTLASS CALAIS
Model Year 1989 Issued _____ Revised(*) _____

METRIC (U.S. Customary)

Engine Description
Engine Code

2.3 LITER L4 (138 CID)
MULTI-PORT FUEL INJECTION RPO LGO

Engine – Fuel System (See supplemental page for details of Fuel Inj. Supercharger, Turbocharger, etc. if used)

Induction type: carburetor, fuel injection system, etc.		Port Fuel Injection
Manufacturer		Rochester Products
Carburetor no. of barrels		None
Idle A/F mix.		ECM Controlled
Fuel injection	Point of inj. (no.)	4 Injectors at Ports in Cylinder Head
	Constant, pulse, flow	Pulse
	Control (elec., mech.)	Electronic
	Sys. press. (kPa (psi))	300 (43)
Idle spd.-rpm (spec. neutral or drive and propane if used)	Manual	900
	Automatic	
Intake manifold heat control (exhaust or water thermostatic or fixed)		None
Air cleaner type		Replaceable Paper Element
Fuel filter (type/location)		None
Fuel pump	Type (elec. or mech.)	See Page 6
	Location (eng., tank)	
	Press. range (kPa(psi))	
	Flow rate at regulated pressure (L (gal)/hr @ kPa (psi))	58.28 (15.4) @ 350 (51)

Fuel Tank (See Page 6)

Capacity (refill L (gallons))		
Location (describe)		
Attachment		
Material & Mass (kg (weight lbs.))		
Filler pipe	Location & material	
	Connection to tank	
Fuel line (material)		
Fuel hose (material)		
Return line (material)		
Vapor line (material)		
Extended range tank	Opt., n.a.	
	Capacity (L (gallons))	
	Location & material	
	Attachment	
Auxiliary tank	Opt., n.a.	
	Capacity (L (gallons))	
	Location & material	
	Attachment	
	Sletr switch or valve	
	Separate fill	

MVMA Specifications Form

METRIC (U.S. Customary)

Vehicle Line Cutlass Calais
Model Year 1989 Issued 6-88 Revised (•) 9-88

Engine Description/Carb. Engine Code	2.5L L4 (151 CID) L68

Vehicle Emission Control

Exhaust Emission Control	Type (air injection, engine modifications, other)		Computer Command Control
	Air Injection	Pump or pulse	None
		Driven by	
		Air distribution (head, manifold, etc.)	
		Point of entry	
	Exhaust Gas Recirculation	Type (controlled flow, open orifice, other)	Controlled Flow
		Exhaust source Point of exhaust injection (spacer, carburetor, manifold, other)	Cylinder Head Intake Manifold
	Catalytic Converter	Type	Single Bed Pellet
		Number of	One
		Location(s)	Underfloor
		Volume [L (in^3)]	2623.0 CM^3 (160)
		Substrate type	Alumina Pellet
		Noble metal type	
		Noble metal concentration (g/cm^3)	
Crankcase Emission Control	Type (ventilates to atmosphere, induction system, other)		Induction System
	Energy source (manifold vacuum, carburetor, other)		Manifold Vacuum
	Discharges (to intake manifold, other)		Intake Manifold
	Air inlet (breather cap, other)		TBI Air Cleaner
Evaporative Emission Control	Vapor vented to (crankcase, canister, other)	Fuel tank	Canister
		Carburetor	None
	Vapor storage provision		Canister
Electronic system	Closed loop (yes/no)		Yes
	Open loop (yes/no)		No

Engine – Exhaust System

Type (single, single with cross-over, dual, other)		Tri-Flow with Single Tailpipe
Muffler no. & type (reverse flow, straight thru, separate resonator) Material & Mass [kg (weight lbs)]		Reverse Flow 8.13 (17.92)
Resonator no. & type		None
Exhaust pipe	Branch o.d., wall thickness	None
	Main o.d., wall thickness	50.8 O.D. x 1.37 (2 O.D. x .054)
	Material & Mass [kg (weight lbs)]	GM 6125-M Stainless Steel 2.88 (6.34)
Intermediate pipe	o.d. & wall thickness	50.8 O.D. x 1.37 (2 O.D. x .054)
	Material & Mass [kg (weight lbs)]	GM 6178-M Aluminized Steel 3.64 (8.02)
Tail pipe	o.d. & wall thickness	50.8 O.D. x 1.09 (2 O.D. x .043)
	Material & Mass [kg (weight lbs)]	GM 6125-M Stainless Steel

MVMA Specifications Form

Vehicle Line Cutlass Calais
Model Year 1989 Issued 6-88 Revised (e) 9-88

METRIC (U.S. Customary)

Engine Description/Carb. Engine Code	2.3L (138) L4 LD2

Vehicle Emission Control

Exhaust Emission Control	Type (air injection, engine modifications, other)		C3 Engine Modification
	Air Injection	Pump or pulse	None
		Driven by	
		Air distribution (head, manifold, etc.)	
		Point of entry	
	Exhaust Gas Recirculation	Type (controlled flow, open orifice, other)	None
		Exhaust source Point of exhaust injection (spacer, carburetor, manifold, other)	
	Catalytic Converter	Type	Single Bed
		Number of	One
		Location(s)	Under Floor
		Volume [L (in^3)]	2.786 (170)
		Substrate type	Monolith - Ceramic
		Noble metal type	Platinum/Paladium/Rhodium
		Noble metal concentration (g/cm^3)	.00102/ - /.00010
Crankcase Emission Control	Type (ventilates to atmosphere, induction system, other)		Orifice + Bypass. No PCV Valve. Closed - Ventilates to Induction System.
	Energy source (manifold vacuum, carburetor, other)		Orificed Connection to Manifold Vacuum. Open Hose Connection to Clean Side of A/C.
	Discharges (to intake manifold, other)		Induction System
	Air inlet (breather cap, other)		None
Evaporative Emission Control	Vapor vented to (crankcase, canister, other)	Fuel tank	Canister
		Carburetor	None
	Vapor storage provision		Charcoal Canister
Electronic system	Closed loop (yes/no)		Yes
	Open loop (yes/no)		No

Engine – Exhaust System

Type (single, single with cross-over, dual, other)		4 into 2 into (TRI-Y)
Muffler no. & type (reverse flow, straight thru, separate resonator) Material & Mass [kg (weight lbs)]		One Tri-Flow with Dual Tailpipes
Resonator no. & type		None
Exhaust pipe	Branch o.d., wall thickness	44.5 x 1.0 (1.75 x .04)
	Main o.d., wall thickness	63.5 x 1.5 (2.50 x .059)
	Material & Mass [kg (weight lbs)]	409 Stainless 2.75 (6.06)
Intermediate pipe	o.d. & wall thickness	57.2 O.D. x 2.08 (2.25 O.D. x .081)
	Material & Mass [kg (weight lbs)]	GM 6178-M Aluminized Steel
Tail pipe	o.d. & wall thickness	44.45 O.D. x 1.09 (1.75 O.D. x .043)
	Material & Mass [kg (weight lbs)]	Aluminized Steel
		Total Weight of Complete Exhaust System 7.950 (17.5)

MVMA Specifications Form

Vehicle Line Cutlass Calais
Model Year 1989 Issued 6-88 Revised (●) 9-88

METRIC (U.S. Customary)

Engine Description/Carb. Engine Code	3.3L (204) V6 LG7

Vehicle Emission Control

Exhaust Emission Control	Type (air injection, engine modifications, other)		Port Fuel Injection
	Air Injection	Pump or pulse	None
		Driven by	
		Air distribution (head, manifold, etc.)	
		Point of entry	
	Exhaust Gas Recirculation	Type (controlled flow, open orifice, other)	None
		Exhaust source Point of exhaust injection (spacer, carburetor, manifold, other)	
	Catalytic Converter	Type	Single Bed Monolith
		Number of	One
		Location(s)	Under Floor
		Volume (L (in³))	110 in
		Substrate type	Cordierite Monolith
∅		Noble metal type	Platinum/Rhodium
		Noble metal concentration (g/cm³)	.00121 Platinum/.00017 Rhodium
Crankcase Emission Control	Type (ventilates to atmosphere, induction system, other)		Induction System
	Energy source (manifold vacuum, carburetor, other)		Manifold Vacuum
	Discharges (to intake manifold, other)		Intake Manifold
	Air inlet (breather cap, other)		Inlet Duct to Rocker Cover
Evaporative Emission Control	Vapor vented to (crankcase, canister, other)	Fuel tank	Canister
		Carburetor	None
	Vapor storage provision		Charcoal
Electronic system	Closed loop (yes/no)		Yes
	Open loop (yes/no)		No

Engine – Exhaust System

Type (single, single with cross-over, dual, other)		Tri-Flow with Single Tailpipe
Muffler no. & type (reverse flow, straight thru, separate resonator) Material & Mass [kg (weight lbs)]		Reverse Flow
Resonator no. & type		None
Exhaust pipe	Branch o.d., wall thickness	None
	Main o.d., wall thickness	50.8 O.D. x 1.02 (2.0 O.D. x .040)
	Material & Mass [kg (weight lbs)]	Stainless Steel Per GM 6125-M 2.72 (5.99)
Intermediate pipe	o.d. & wall thickness	50.8 O.D. x 1.09 (2 O.D. x .043)
	Material & Mass [kg (weight lbs)]	Steel SAE 1008 or 1010 Aluminum Coated
Tail pipe	o.d. & wall thickness	50.8 O.D. x 1.09 (2 O.D. x .043)
	Material & Mass [kg (weight lbs)]	Steel SAE 1008 or 1010 Aluminum Coated

Total Weight of Complete Exhaust System 7.950 (17.5)

MVMA Specifications

Vehicle Line CUTLASS CALAIS
Model Year 1989 Issued _____ Revised(*) _____

METRIC (U.S. Customary)

Engine Description
Engine Code

2.3 LITER L4 (138 CID)
MULTI-PORT FUEL INJECTION RPO LG0

Vehicle Emission Control

Exhaust Emission Control	Type (air injection, engine modifications, other)		C3 Engine Modification
	Air injection	Pump or pulse	None
		Driven by	
		Air distribution (head, manifold, etc.,)	
		Point of entry	
	Exhaust Gas Recircu-lation	Type (controlled flow, open orifice, other)	None
		Exhaust source Point of exh.inj. (spacer, carb., manifold, other)	
	Catalytic Converter	Type	Single Bed
		Number of	One
		Location(s)	Under Floor
		Volume [L(cu.in)]	2.786 (170)
		Substrate type	Monolith - Ceramic
		Noble metal type	Platinum/Paladium/Rhodium
		Noble metal concentration (g/cu. cm.)	.00102/ - /.00010
Crankcase Emission Control	Type (ventilates to atmosphere, induction system, other)		Orifice + Bypass. No PCV Valve. Closed - Ventilates to Induction System.
	Energy source (manifold vacuum, carburetor, other)		Orificed Connection to Manifold Vacuum. Open Hose Connection to Clean Side of A/C.
	Discharges (to intake manifold, other		Induction System
	Air inlt(breather cap,other)		None
Evapora-tive Emission Control	Vapor vented to crankcase, canister,other)	Fuel tank	Canister
		Carburetor	None
	Vapor storage provision		Charcoal Canister
Electron-ic System	Closed loop (yes/no)		Yes
	Open loop (yes/no)		No

Engine - Exhaust System

Type (single, single with cross-over, dual, other)		Tri-Flow with Dual Tail Pipes
Muffler no. & type (reverse flow, straight thru, separate resonator) Material & Mass [kg (weight lbs.)]		Reverse Flow
Resonator no. & type		(1) Bottle
Exhaust pipe	Branch o.d., wall thickness	None
	Main o.d., wall thickness	57.15 x 2.2 mm (2.25 x .090 in.) (1.1/1.1 Laminated)
	Matl. & Mass [kg(wght.lbs.)]	409 Stainless 3.22 (7.1)
Inter-mediate pipe	o.d. & wall thickness	57.15 x 1.37 mm (2.25 O.D. x .054)
	Matl. & Mass [kg(wght.lbs.)]	Steel SAE 1008 or 1010 Aluminum Coated
Tail pipe	o.d. & wall thickness	50.8 O.D. x 1.09 (2.0 O.D. x .043)
	Matl. & Mass [kg(wght.lbs.)]	Steel SAE 1008 or 1010 Aluminum Coated

MVMA Specifications Form

Vehicle Line Cutlass Calais
Model Year 1989 Issued 6-88 Revised (•) 9-88

METRIC (U.S. Customary)

Engine Description/Carb. Engine Code	2.5L (151) L4 L68

Transmissions/Transaxle (Std., Opt., N.A.)

Manual 3-speed (manufacturer/country)	Not Available
Manual 4-speed (manufacturer/country)	Not Available
Manual 5-speed (manufacturer/country)	Std. - Isuzu M200 (MT2)
Automatic (manufacturer/country)	Opt. Hydramatic (MD9)
Automatic overdrive (manufacturer/country)	Not Available

Manual Transmission/Transaxle

Number of forward speeds		5
Gear ratios	1st	3.73
	2nd	2.04
	3rd	1.45
	4th	1.03
	5th	.74
	Reverse	3.58
Synchronous meshing (specify gears)		All Forward Gears
Shift lever location		Floor - Console
Trans. case matl. & mass kg (lbs)*		Aluminum
Lubricant	Capacity (L (pt.))	1.9 (4.0)
	Type recommended	STF - Synchromesh Transmission Fluid # 12345349

Clutch (Manual Transmission)

Clutch manufacturer		Borg Warner Automotive
Clutch type (dry, wet; single, multiple disc)		Dry, Single Disc
Linkage (hydraulic, cable, rod, lever, other)		Hydraulic
Max. pedal effort (nom. spring load, new) N (lbs)	Depressed	
	Released	
Assist (spring, power/percent, nominal)		None
Type pressure plate springs		Belleville Spring
Total spring load (nominal, new) N (lbs)		5249 (1180)
Clutch facing	Facing mfgr. & material coding	Borg Warner Automotive
	Facing material & construction	Molded Woven Non-asbestos - Borg Warner Automotive 624 x 25
	Rivets per facing	8
	Outside x inside dia. (nominal)	216 x 152 (8.5 x 6.0)
	Total eff. area [cm^2(in.^{2})]	370 (56.9)
	Thickness (pressure plate side/ fly wheel side)	3.18/3.18 (.125/.125)
	Rivet depth (pressure plate side/ fly wheel side)	1.52 (.06)/1.27 (.05)
	Engagement cushion method	Driven Plate Wave Spoke Spring
Release bearing type & method lub.		Self Centering, Angular Contact Ball Bearing - Prepacked & Sealed
Torsional damping method, springs, hysteresis		Coil Springs & Metal to Metal Stops

* Includes shift linkage, lubricant, and clutch housing. If other specify.

MVMA Specifications Form

Vehicle Line Cutlass Calais
Model Year 1989 Issued 6-88 Revised (e) 9-88

METRIC (U.S. Customary)

Engine Description/Carb. Engine Code	2.3L (138) L4 LD2

Transmissions/Transaxle (Std., Opt., N.A.)

Manual 3-speed (manufacturer/country)	Not Available
Manual 4-speed (manufacturer/country)	Not Available
Manual 5-speed (manufacturer/country)	Std. HM - 282 MG2
Automatic (manufacturer/country)	Opt. Hydramatic MD9
Automatic overdrive (manufacturer/country)	Not Available

Manual Transmission/Transaxle

Number of forward speeds		5
Gear ratios	1st	3.50
	2nd	2.05
	3rd	1.38
	4th	0.94
	5th	0.72
	Reverse	3.41
Synchronous meshing (specify gears)		All Forward Gears
Shift lever location		Floor - Console
Trans. case mat'l. & mass kg (lbs)*		Aluminum
Lubricant	Capacity [L (pt.)]	1.9 (4.0)
	Type recommended	Std. Transmission Fluid GM Part # 12345349

Clutch (Manual Transmission)

Clutch manufacturer		Daikin
Clutch type (dry, wet; single, multiple disc)		Dry, Single
Linkage (hydraulic, cable, rod, lever, other)		Hydraulic
Max. pedal effort (nom. spring load, new) N (lbs)	Depressed	151 (34)
	Released	0 (0)
Assist (spring, power/percent, nominal)		None
Type pressure plate springs		Belleville Spring
Total spring load (nominal, new) N (lbs)		5892 (1325)
Clutch facing	Facing mfgr. & material coding	Daikin NC80
	Facing material & construction	NC80
	Rivets per facing	16
	Outside x inside dia. (nominal)	225 x 150 (8.86 x 5.91)
	Total eff. area [cm²(in.²)]	442 (68.5)
	Thickness (pressure plate side/ fly wheel side)	3.2 (.126) Pressure Plate 3.5 (.138) Flywheel
	Rivet depth (pressure plate side/ fly wheel side)	1.6 (.06) Pressure Plate 1.5 (.06) Flywheel
	Engagement cushion method	Driven Plate Cushion
Release bearing type & method lub.		Ball Thrust - Prepacked & Sealed
Torsional damping method, springs, hysteresis		Coil Spring with Friction Washer

* Includes shift linkage, lubricant, and clutch housing. If other specify.

MVMA Specifications Form

Vehicle Line Cutlass Calais
Model Year 1989 Issued 6-88 Revised (e) 9-88

METRIC (U.S. Customary)

Engine Description/Carb. Engine Code	3.3L (204) V6 LG7

Transmissions/Transaxle (Std., Opt., N.A.)

Manual 3-speed (manufacturer/country)	Not Available
Manual 4-speed (manufacturer/country)	Not Available
Manual 5-speed (manufacturer/country)	Not Available
Automatic (manufacturer/country)	Std. Hydramatic MD9
Automatic overdrive (manufacturer/country)	Not Available

Manual Transmission/Transaxle

Number of forward speeds		
Gear ratios	1st	
	2nd	
	3rd	
	4th	
	5th	
	Reverse	
Synchronous meshing (specify gears)		
Shift lever location		
Trans. case mat'l. & mass kg (lbs)*		
Lubricant	Capacity [L (pt.)]	
	Type recommended	
Ø		

Clutch (Manual Transmission)

Clutch manufacturer		
Clutch type (dry, wet; single, multiple disc)		
Linkage (hydraulic, cable, rod, lever, other)		
Max. pedal effort (nom. spring load, new) N (lbs)	Depressed	
	Released	
Assist (spring, power/percent, nominal)		
Type pressure plate springs		
Total spring load (nominal, new) N (lbs)		
Clutch facing	Facing mfgr. & material coding	
	Facing material & construction	
	Rivets per facing	
	Outside x inside dia. (nominal)	
	Total eff. area [cm²(in.²)]	
	Thickness (pressure plate side/ fly wheel side)	
	Rivet depth (pressure plate side/ fly wheel side)	
	Engagement cushion method	
Release bearing type & method lub.		
Torsional damping method, springs, hysteresis		

* Includes shift linkage, lubricant, and clutch housing. If other specify.

MVMA Specifications

Vehicle Line CUTLASS CALAIS
Model Year 1989 Issued _____ Revised(*) _____

METRIC (U.S. Customary)

Engine Description	2.3 LITER L4 (138 CID)
Engine Code	MULTI-PORT FUEL INJECTION RPO LG0

Transmissions/Transaxle (Std., Opt., N.A.)

Manual 3-speed (manufacturer/country)	Not Available
Manual 4-speed (manufacturer/country)	Not Available
Manual 5-speed (manufacturer/country)	Standard Muncie MG2
Automatic (manufacturer/country)	Not Available
Auto. overdrive (manufacturer/country)	Not Available

Manual Transmission/Transaxle

Number of forward speeds		5
Gear ratios	1st	3.50
	2nd	2.19
	3rd	1.38
	4th	1.03
	5th	.81
	Reverse	3.41
Synchronous meshing (specify gears)		All Forward Gears
Shift lever location		Floor - Console
Trans. case mat'l. & mass kg (lbs)*		Aluminum 30.314 (13.75)
Lubricant	Capacity [L (pt.)]	1.9 (4.0)
	Type recommended	Standard Transmission Fluid

Clutch (Manual Transmission)

Clutch manufacturer		Daikin
Clutch type (dry, wet; single, multiple disc)		Dry, Single
Linkage (hyd., cable, rod, lever,other)		Hydraulic
Max. pedal effort (nom. spring load, new) N (lbs.)	Depressed	151 (34)
	Released	0 (0)
Assist (spring, power/percent, nominal)		None
Type pressure plate springs		Belleville Spring
Total spring load (nominal, new) N(lbs)		5892 (1325)
Clutch facing	Facing mfgr. & matl. coding	Daikin NC80
	Facing matl. & construction	NC80
	Rivets per facing	16
	Outside x inside dia. (nom.)	225 x 150 (8.86 x 5.91)
	Total eff.area(sq cm(sq in))	442 (68.5)
	Thickness (pressure plate side/fly wheel side)	3.2 (.126) Pressure Plate 3.5 (.138) Fly Wheel
	Rivet depth (pressure plate side/fly wheel side)	1.6 (.06) Pressure Plate 1.5 (.06) Fly Wheel
	Engagement cushion method	Driven Plate Cushion
Release bearing type & method lub.		Ball Thrust - Prepacked & Sealed
Torsional damping method, springs, hysteresis		Coil Spring with Friction Washer

* Includes shift linkage, lubricant, and clutch housing. If other specify.

MVMA Specifications Form

Vehicle Line Cutlass Calais
Model Year 1989 Issued 6-88 Revised (•) 9-88

METRIC (U.S. Customary)

Engine Description/Carb. Engine Code	2.5L (151) L4 L68

Automatic Transmission/Transaxle

Trade name		Turbo Hydramatic (THM 125C) (MD9)
Type and special features (describe)		3-Speed with Torque Converter
Selector	Location	Floor
	Ltr./No. designation	PRND21
Gear ratios	1st	2.84
	2nd	1.60
	3rd	1.00 Converter Clutch Engagement
	4th	None
	Reverse	2.07
Max. upshift speed - drive range [km/h (mph)]		122 (76)
Max. kickdown speed - drive range [km/h (mph)]		117 (73)
Min. overdrive speed [km/h (mph)]		N/A (No 4th Gear)
Torque converter	Number of elements	Three
	Max. ratio at stall	2.48
	Type of cooling (air, liquid)	Liquid
	Nominal diameter	245 (9.65)
Ø	Capacity factor "K"*	203
Lubricant	Capacity [refill L (pt.)]	7.2 (15) With Cooler and Cooler Lines Full
	Type Recommended	ATF Dexron II
Oil cooler (std., opt., NA, internal, external, air, liquid)		Std. External, Oil to Engine Coolant
Ø Transmission case material & mass kg (lbs)**		Aluminum 73.1 (161.16)

Axle or Front Wheel Drive Unit

Type (front, rear)		Front
Description		Integral with Transmission
Limited slip differential (type)		None Available
Drive pinion offset		N/A
Drive pinion (type)		N/A
No. of differential pinions		Two
Pinion/differential adjustment (shim, other)		N/A
Pinion/differential bearing adjustment (shim, other)		N/A
Driving wheel bearing (type)		Integral Double Row Ball Bearing
Lubricant	Capacity [L (pt.)]	N/A
	Type recommended	ATF Dexron II

Axle or Transaxle Ratio and Tooth Combinations (See 'Power Teams' for axle ratio usage.)

Axle ratio (or overall top gear ratio)		2.84
No. of teeth	Pinion	N/A
	Ring gear or gear	N/A
Ring gear o.d.		None
Transaxle	Transfer gear ratio	1.00
	Final drive ratio	2.84

* Input speed ÷ $\sqrt{\text{torque}}$

** Includes shift linkage, lubricant, & clutch housing. If other specify.

MVMA Specifications Form

Vehicle Line Cutlass Calais
Model Year 1989 Issued 6-88 Revised (•) 9-88

METRIC (U.S. Customary)

Engine Description/Carb. Engine Code	2.3L (138) L4 LD2

Automatic Transmission/Transaxle

Trade name		Turbo Hydramatic (THM 125C) (MD9)
Type and special features (describe)		3-Speed with Torque Converter
Selector	Location	Floor
	Ltr./No. designation	PRND21
Gear ratios	1st	2.84
	2nd	1.60
	3rd	1.00 Converter Clutch Engagement
	4th	None
	Reverse	2.07
Max. upshift speed - drive range [km/h (mph)]		92 MPH (2-3) Wide Open Throttle
Max. kickdown speed - drive range [km/h (mph)]		85 MPH (3-2)
Min. overdrive speed [km/h (mph)]		N/A (No 4th Gear)
Torque converter	Number of elements	Three
	Max. ratio at stall	2.48
	Type of cooling (air, liquid)	Liquid
	Nominal diameter	245 (9.65)
∅	Capacity factor "K"*	203
Lubricant	Capacity [refill L (pt.)]	7.2 (15) With Cooler and Converter Lines Full
	Type Recommended	ATF Dexron II
Oil cooler (std., opt., NA, internal, external, air, liquid)		Std. External, Oil to Engine Coolant
∅ Transmission case material & mass kg (lbs)**		Aluminum 73.1 (161.16)

Axle or Front Wheel Drive Unit

Type (front, rear)		Front
Description		Integral with Transmission
Limited slip differential (type)		None Available
Drive pinion offset		N/A
Drive pinion (type)		N/A
No. of differential pinions		Two
Pinion/differential adjustment (shim, other)		N/A
Pinion/differential bearing adjustment (shim, other)		N/A
Driving wheel bearing (type)		Integral Double Row Ball Bearing
Lubricant	Capacity [L (pt.)]	N/A
	Type recommended	ATF Dexron II

Axle or Transaxle Ratio and Tooth Combinations (See 'Power Teams' for axle ratio usage.)

Axle ratio (or overall top gear ratio)		2.84
No. of teeth	Pinion	35
	Ring gear or gear	35
Ring gear o.d.		None
Transaxle	Transfer gear ratio	1.00
	Final drive ratio	2.84

* Input speed ÷ $\sqrt{\text{torque}}$

** Includes shift linkage, lubricant, & clutch housing. If other specify.

MVMA Specifications Form

Vehicle Line Cutlass Calais
Model Year 1989 Issued 6-88 Revised (•) 9-88

METRIC (U.S. Customary)

Engine Description/Carb. Engine Code	3.3L (204) V6 LG7

Automatic Transmission/Transaxle

Trade name		Turbo Hydramatic (THM 125C) (MD9)
Type and special features (describe)		3 Speed with Torque Converter and Clutch
Selector	Location	Floor or Column
	Ltr./No. designation	PRND21
Gear ratios	1st	2.84
	2nd	1.60
	3rd	1.00
	4th	None
	Reverse	2.07
Max. upshift speed - drive range [km/h (mph)]		90
Max. kickdown speed - drive range [km/h (mph)]		87
Min. overdrive speed [km/h (mph)]		N/A
Torque converter	Number of elements	3
	Max. ratio at stall	2.00:1
	Type of cooling (air, liquid)	Liquid
	Nominal diameter	245 (9.65)
∅	Capacity factor "K"*	140
Lubricant	Capacity [refill L (pt.)]	8.5 (16)
	Type Recommended	GM Dexron II
Oil cooler (std., opt., NA, internal, external, air, liquid)		Std. - External Oil to Engine Coolant
∅ Transmission case material & mass kg (lbs)**		Aluminum 65.7 (144.8)

Axle or Front Wheel Drive Unit

Type (front, rear)		Front
Description		Integral with Transmission
Limited slip differential (type)		None
Drive pinion offset		N/A
Drive pinion (type)		N/A
No. of differential pinions		Two
Pinion/differential adjustment (shim, other)		N/A
Pinion/differential bearing adjustment (shim, other)		N/A
Driving wheel bearing (type)		Integral Double Row Ball Bearing
Lubricant	Capacity [L (pt.)]	N/A
	Type recommended	ATF Dexron II

Axle or Transaxle Ratio and Tooth Combinations (See 'Power Teams' for axle ratio usage.)

Axle ratio (or overall top gear ratio)		2.39 (Integral with Transmission)
No. of teeth	Pinion	38 Sprockets
	Ring gear or gear	32 Sprockets
Ring gear o.d.		
Transaxle	Transfer gear ratio	38/32
	Final drive ratio	2.84

* Input speed ÷ $\sqrt{\text{torque}}$

** Includes shift linkage, lubricant, & clutch housing. If other specify.

MVMA Specifications Form

Vehicle Line Cutlass Calais
Model Year 1989 Issued 6-88 Revised (e) 9-88

METRIC (U.S. Customary)

Engine Description/Cars. Engine Code	2.5L (151) L4 L68

Axle Shafts – Front Wheel Drive

Manufacturer and number used			Saginaw, Two
Type (straight, solid bar, tubular, etc.)		Left	Straight Solid Bar
		Right	Straight Solid Bar
∅ Outer diam. x length* x wall thickness	Manual transaxle	Left	27.2 x 308.0 (1.07 x 12.13)
		Right	27.2 x 665.0 (1.07 x 26.18)
	Automatic transaxle	Left	23.9 x 302.0 (.94 x 11.89)
		Right	23.9 x 364.3 (.94 x 14.34)
	Optional transaxle	Left	-
		Right	-
Slip yoke	Type		None
	Number of teeth		None
	Spline o.d.		None
Universal joints	Make and mfg. no.	Inner	Saginaw
		Outer	Saginaw
	Number used		Two on each drive shaft
	Type, size, plunge	Inner	Tipot, 66.0 and 61.0, Plunge
		Outer	RZEPPA-Fixed
	Attach (u-bolt, clamp, etc.)		Retaining Ring
	Bearing – Type (plain, anti-friction)		Ball and Roller (Inner) Ball (Outer)
	Bearing – Lubrication (fitting, prepack)		Prepack
Drive taken through (torque tube, arms or springs)			Wishbone Lower Control Arm, Upper McPherson Strut
Torque taken through (torque tube, arms or springs)			Engine Mounting System

∅ All Wheel/4 Wheel Drive

Description and type (part-time, full-time, 2/4 shift while moving, mechanical, elect., chain/gear, etc.)		
Transfer case	Manufacturer	
	Type	
	Model	
Low-range gear ratio		
System disconnect (describe)		
Center differential	Type (bevel, planetary, w or w/o viscous bias, torsen, etc.)	
	Torque split (% front/rear)	

* Centerline to centerline of universal joints, or to centerline of attachment.

MVMA Specifications Form

Vehicle Line Cutlass Calais
Model Year 1989 Issued 6-88 Revised (●) 9-88

METRIC (U.S. Customary)

Engine Description/Carb. Engine Code	2.3L (138) L4 LD2

Axle Shafts – Front Wheel Drive

Manufacturer and number used			Saginaw, Two
Type (straight, solid bar, tubular, etc.)		Left	Straight Solid Bar
		Right	Straight Solid Bar
∅ Outer diam. x length* x wall thickness	Manual transaxle	Left	27.5 x 302.0 (1.08 x 11.89)
		Right	27.5 x 308.0 (1.02 x 12.13)
	Automatic transaxle	Left	23.9 x 302.0 (.94 x 11.89)
		Right	23.9 x 364.3 (.94 x 14.34)
	Optional transaxle	Left	-
		Right	-
Slip yoke	Type		None
	Number of teeth		None
	Spline o.d.		None
Universal joints	Make and mfg. no.	Inner	Saginaw
		Outer	Saginaw
	Number used		Two of Each Drive Shaft
	Type, size, plunge	Inner	Cross Groove 61.2
		Outer	RZEPPA-Fixed
	Attach (u-bolt, clamp, etc.)		Retaining Ring
	Bearing – Type (plain, anti-friction)		Ball and Roller (Inner) Ball (Outer)
	Bearing – Lubrication (fitting, prepack)		Prepack
Drive taken through (torque tube, arms or springs)			Wishbone Lower Control Arm, Upper McPherson Strut
Torque taken through (torque tube, arms or springs)			Engine Mounting System

∅ All Wheel/4 Wheel Drive

Description and type (part-time, full-time, 2/4 shift while moving, mechanical, elect., chain/gear, etc.)		
Transfer case	Manufacturer	
	Type	
	Model	
Low-range gear ratio		
System disconnect (describe)		
Center differential	Type (bevel, planetary, w or w/o viscous bias, torsen, etc.)	
	Torque split (% front/rear)	

* Centerline to centerline of universal joints, or to centerline of attachment.

MVMA Specifications Form

Vehicle Line Cutlass Calais
Model Year 1989 Issued 6-88 Revised (•) 9-88

METRIC (U.S. Customary)

Engine Description/Carb. Engine Code	3.3L (204) V6 LG7

Axle Shafts – Front Wheel Drive

Manufacturer and number used			Saginaw, Two
Type (straight, solid bar, tubular, etc.)		Left	Straight Solid Bar
		Right	Straight Solid Bar
Ø Outer diam. x length* x wall thickness	Manual transaxle	Left	-
		Right	-
	Automatic transaxle	Left	23.9 x 302.0 (.94 x 11.89)
		Right	23.9 x 364.3 (.94 x 14.34)
	Optional transaxle	Left	-
		Right	-
Slip yoke	Type		None
	Number of teeth		None
	Spline o.d.		None
Universal joints	Make and mfg. no.	Inner	Saginaw
		Outer	Saginaw
	Number used		Two on Each Drive Shaft
	Type, size, plunge	Inner	Tripot - 61.0, Plunge
		Outer	RZEPPA - Fixed
	Attach (u-bolt, clamp, etc.)		Retaining Ring
	Bearing – Type (plain, anti-friction)		Ball and Roller (Inner) Ball (Outer)
	Bearing – Lubrication (fitting, prepack)		Prepack
Drive taken through (torque tube, arms or springs)			Wishbone Lower Control Arm, Upper McPherson Strut
Torque taken through (torque tube, arms or springs)			Engine Mounting Strut

Ø All Wheel/4 Wheel Drive

Description and type (part-time, full-time, 2/4 shift while moving, mechanical, elect., chain/gear, etc.)		
Transfer case	Manufacturer	
	Type	
	Model	
Low-range gear ratio		
System disconnect (describe)		
Center differential	Type (bevel, planetary, w or w/o viscous bias, torsen, etc.)	
	Torque split (% front/rear)	

* Centerline to centerline of universal joints, or to centerline of attachment.

MVMA Specifications

Vehicle Line CUTLASS CALAIS
Model Year 1989 Issued _____ Revised(*) _____

METRIC (U.S. Customary)

Engine Description 2.3 LITER L4 (138 CID)
Engine Code MULTI-PORT FUEL INJECTION RPO LGO

○ Axle Ratio and Tooth Combinations (See 'Power Teams' for axle ratio usage)

Effective final drive ratio (or overall top gear ratio)			
Trnsfr ratio and method(chain,gear,etc)			
Front drive unit	Ring gear o.d.		
	No. of teeth	Pinion	
		Ring gear	

○ Front Drive Unit

Description (integral to trans., etc.)		
Limited slip differential (type)		
Drive pinion	Type	
	Offset	
No. of differential pinions		
Pinion/ differential	Adjustment (shim, etc.)	
	Bearing adjustment.	
Driving wheel bearing (type)		
Lubricant	Capacity [L (pt.)]	
	Type recommended	

○ Axle Shafts – Front Wheel Drive

Manufacturer and number used			Saginaw Division (Two)
Type (straight, solid bar, tubular, etc.)		Left	Straight - Solid
		Right	Straight - Solid
Outer diam. x length* x wall thickness	Manual transaxle	Left	27.1 X 302.0
		Right	27.1 X 308.0
	Automatic transaxle	Left	
		Right	
	Optional transaxle	Left	
		Right	
Slip yoke	Type		
	Number of teeth		
	Spline o.d.		
Universal joints	Make and mfg. no.	Inner	Saginaw Division
		Outer	Saginaw Division
	Number used		Inboard & Outboard on Each Axle Shaft
	Type, size, plunge	Inner	Cross Groove - 61.2 Stroke
		Outer	Rzeppa - Fixed Center
	Attach (u-bolt, clamp, etc.)		Retaining Ring
	Bearing: Type (plain, anti-friction)		Inner - Ball Outer - Ball
	Bearing: Lubrication (fitting, prepack)		Prepack
Drive taken through (torque tube, arms or springs)			Wishbone Lower Control Arm, Upper McPherson Strut
Torque taken through (torque tube, arms or springs)			Engine Mounting System

* Centerline to centerline of universal joints, or to centerline of attachment.

MVMA Specifications Form

Vehicle Line Cutlass Calais
Model Year 1989 Issued 6-88 Revised (•) 9-88

METRIC (U.S. Customary)

Body Type And/Or Engine Displacement	ALL

∅ Suspension - General Including Electronic Controls

Car leveling	Standard/optional/not avail.	NA
	Manual/automatic control	NA
	Type (air/hydraulic)	NA
	Primary/assist spring	
	Rear only/4 wheel leveling	
	Single/dual rate spring	
	Single/dual ride heights	
	Provision for jacking	Body Jack & Pads on Rocker
Shock absorber damping controls	Standard/option/not avail.	
	Manual/automatic control	
	Number of damping rates	
	Type of actuation (manual/electric motor/air, etc.)	
	sensors: Lateral acceleration	
	sensors: Deceleration	
	sensors: Acceleration	
	sensors: Road surface	
Shock absorber (front & rear)	Type	Front - MacPherson Strut; Rear - Telescopic (Double-Acting)
	Make	Delco Products
	Piston diameter	Front 32 (1.26); Rear 25 (.98)
	Rod diameter	Front 22 (.87); Rear 13 (.51)

∅ Suspension – Front

Type and description		MacPherson Strut with Coil Spring
Travel*	Full jounce	95 (3.74) (From Design)
	Full rebound	84 (3.31) (From Design)
Spring	Type (coil, leaf, other) & material	Coil - Steel
	Insulators (type & material)	Top & Bottom - Rubber
	Size (coil design height & i.d., bar length x dia.)	Spring Computer Selected - Varies with Option Content
	Spring rate [N/mm (lb./in.)]	20 (Base Car)
	Rate at wheel [N/mm (lb./in.)]	17.5 (Base Car)
Stabilizer	Type (link, linkless, frameless)	Link
	Material & bar diameter	Steel: 24 (Base Car)

∅ Suspension – Rear

Type and description			Trailing Crank Arm with Twist Beam
Travel*	Full jounce		134 (5.28)
	Full rebound		68 (2.68)
Spring	Type (coil, leaf, other) & material		Coil - Steel
	Size (length x width, coil design height & i.d., bar length & dia.)		Spring Computer Selected - Varies with Option Content
	Spring rate [N/mm (lb./in.)]		23 @ Curb - Variable
	Rate at wheel [N/mm (lb./in.)]		11.1 @ Curb - Variable
	Insulators (type & material)		Top & Bottom - Rubber
	If leaf	No. of leaves	NA
	If leaf	Shackle (comp. or tens.)	NA
Stabilizer	Type (link, linkless, frameless)		NA (Base Car)
	Material & bar diameter		NA (Base Car)
Track bar (type)			NA

* Define load condition:

MVMA Specifications Form

METRIC (U.S. Customary)

Vehicle Line Cutlass Calais
Model Year 1989 Issued 6-88 Revised (e) 9-88

Body Type And/Or Engine Displacement	ALL

Ø Brakes - Service

Description			Power Assisted Hydraulic Brakes
Manufacturer and brake type (std., opt., n.a.)	Front (disc or drum)		Std. - Disc
	Rear (disc or drum)		Std. - Drum
Valving type (proportion, delay, metering, other)			Proportioning, Diagonal Split Circuit
Power brake (std., opt., n.a.)			Std.
Booster type (remote, integral, vac., hyd., etc.)			Tandem Vacuum
Vacuum	Source (inline, pump, etc.)		Inline
	Reservoir (volume in.³) and source		None
	Pump-type (elec. gear driven, belt driven)		NA
Traction control	Operational speed range		NA
	Type engine intervention (electronic, mech.)		
Anti-lock device	Front/rear (std., opt., n.a.)		
	Manufacturer		
	Type (electronic, mech.)		NA
	Number sensors or circuits		
	Number anti-lock hydraulic circuits		
	Integral or add-on system		
	Yaw control (yes, no)		
	Hydraulic power source (elect., vac. mtr., pwr. strg.)		
Effective area [cm²(in.²)]*			309 (47.9)
Gross lining area [cm²(in.²)]**(F/R)			381 (59.1)
Swept area [cm²(in.²)]***(F/R)			1624 (251.8)
Rotor	Outer working diameter	F/R	Front - 247 (9.72)
	Inner working diameter	F/R	
	Thickness	F/R	Front - 22.4 (.88)
	Material & type (vented/solid)	F/R	Front - Vented Cast Iron
Drum	Diameter & width	F/R	Front - 200 x 45 (7.87 x 1.77)
	Type and material	F/R	Cast Iron
Wheel cylinder bore			Front - 57 (2.24) Rear - 16 (.63)
Master cylinder	Bore/stroke	F/R	Bore - 22.2 (.874) Stroke 35.7 (1.41)
Pedal arc ratio			3.7:1
Line pressure at 445 N(100 lb.) pedal load [kPa (psi)]			10,900
Lining clearance		F/R	Both - Self Adjusting
Brake lining — Front wheel	Bonded or riveted (rivets/seg.)		Inboard Integrally Molded - Inboard and Outboard
	Rivet size		NA
	Manufacturer		Delco Moraine
	Lining code*****		128 FE
	Material		Semi-Metallic
	**** Primary or out-board		116.7 x 47 x 10.92
	Size Secondary or in-board		125 x 47 x 10.2
	Shoe thickness (no lining)		4.72 IB (.186), 3.14 OB (.123)
Brake lining — Rear wheel	Bonded or riveted (rivets/seg.)		Riveted
	Manufacturer		Inland Division
	Lining code*****		235 FE
	Material		Organic
	**** Primary or out-board		167.7 x 43.9 x 6 mm
	Size Secondary or in-board		194 x 43.9 x 7 mm
	Shoe thickness (no lining)		2.75 (.11)

*Excludes rivet holes, grooves, chamfers, etc. **Includes rivet holes, grooves, chamfers, etc.
***Total swept area for four brakes. (Drum brake: Widest lining contact width for each brake x its contact circumference.)
(Disc brake: Square of Outer Working Dia. minus Square of inner Working Dia. multiplied by Pi/2 for each brake.)
****Size for drum brakes includes length x width x thickness. *****Manufacturer I.D., catalog or formulation designation and coefficient of friction classification.

MVMA Specifications Form

Vehicle Line Cutlass Calais
Model Year 1989 Issued 6-88 Revised (e) 9-88

METRIC (U.S. Customary)

Body Type And/Or Engine Displacement	ALL

Tires And Wheels (Standard)

Tires	Size (load range, ply)		P185/80R13
	Type (bias, radial, steel, nylon, etc.)		Radial
	Inflation pressure (cold) for recommended max. vehicle load	Front [kPa (psi)]	240 (35 PSI)
		Rear [kPa (psi)]	240 (35 PSI)
	Rev./mile–at 70 km/h (45 mph)		526
Wheels	Type & material		Stamped Steel
	Rim (size & flange type)		13 x 5.5 JB
	Wheel offset		48 mm
	Attachment	Type (bolt or stud)	Stud
		Circle diameter	100 mm
		Number & size	5 - 12 mm
Ø Spare	Tire and wheel		T125/70D14 Wheel 14 x 4T Inflation 415 (60 PSI)
	Storage position & location (describe)		Under Deck of Luggage Compartment

Tires And Wheels (Optional)

Tire size (load range, ply)	P215/60R14
Type (bias, radial, steel, nylon, etc.)	Radial
Wheel (type & material)	Cast Aluminum
Rim (size, flange type and offset)	14 x 6.0 JJ 47 mm Offset
Tire size (load range, ply)	P195/70R14
Type (bias, radial, steel, nylon, etc.)	Radial
Wheel (type & material)	Stamped Steel
Rim (size, flange type and offset)	14 x 6.0 JJ 47 mm Offset
Tire size (load range, ply)	P205/55R16
Type (bias, radial, steel, nylon, etc.)	Radial
Wheel (type & material)	Aluminum
Rim (size, flange type and offset)	16 x 6 JJ 47 mm Offset
Tire size (load range, ply)	
Type (bias, radial, steel, nylon, etc.)	
Wheel (type & material)	Aluminum
Rim (size, flange type and offset)	14 x 6 JJ 47 mm Offset
Ø Spare tire and wheel size (if configuration is different than road tire or wheel, describe optional spare tire and/or wheel location & storage position)	T125/70D15 Wheel 15 x 4T Inflation 415 (60 PSI) Storage Under Deck of Luggage Compartment

Brakes – Parking

Type of control		Grip Handle
Location of control		Between Front Seats
Operates on		Rear Service Brakes
If separate from service brakes	Type (internal or external)	NA
	Drum diameter	NA
	Lining size (length x width x thickness	NA

MVMA Specifications Form

Vehicle Line Cutlass Calais
Model Year 1989 Issued 6-88 Revised (•) 9-88

METRIC (U.S. Customary)

Body Type And/Or Engine Displacement	ALL

Steering

Manual (std., opt., n.a.)				N/A
Power (std., opt., n.a.)				Std.
Adjustable steering wheel/column (tilt, telescope, other)		Type		Tilt
		Manufacturer		Saginaw Division
		(Std., opt., n.a.)		Opt.
Wheel diameter** (W9) SAE J1100		Manual		375 mm (14.8)
		Power		375 mm (14.8)
Turning diameter m (ft.)	Outside front	Wall to wall (l. & r.)		11.54 (37.8) 12.3 (40.5)
		Curb to curb (l. & r.)		10.79 (35.4) 11.53 (37.8)
	Inside rear	Wall to wall (l. & r.)		5.9 (19.6) 6.9 (22.9)
		Curb to curb (l. & r.)		6.0 (19.9) 7.0 (23.0)
Scrub Radius*				
Manual	Gear	Type		N/A
		Manufacturer		N/A
		Ratios	Gear	N/A
			Overall	N/A
	No. wheel turns (stop to stop)			N/A
Power	Type (coaxial, elec., hyd., etc.)			Rack & Pinion w/Integral Unit
	Manufacturer			Saginaw Division
	Gear	Type		Rack & Pinion
		Ratios	Gear	- -
			Overall	16.0:1
	Pump (drive)			Belt Off Crankshaft Pulley
	No. wheel turns (stop to stop)			2.88
Linkage	Type			Center Take-off Tie Rods, Rack & Pinion
	Location (front or rear of wheels, other)			Rear
	Tie rods (one or two)			Two
Steering axis	Inclination at camber (deg.)			13.5°
	Bearings (type)	Upper		Ball Bearing
		Lower		Ball Joint
		Thrust		Incorporated in Upper Bearing
Steering spindle & joint type				MacPherson Strut
Wheel spindle/hub	Diameter	Inner bearing		N/A
		Outer bearing		N/A
	Thread (size)			M20 x 1.5
	Bearing (type)			Integral Double Row Ball, Permanently Lubed

*The horizontal distance in the front elevation between wheel centerline and kingpin (ball joint) axis at ground.

**See Page 22

MVMA Specifications Form

Vehicle Line Cutlass Calais
Model Year 1989 Issued 6-88 Revised (•) 9-88

METRIC (U.S. Customary)

Body Type And/Or Engine Displacement	
	ALL

Wheel Alignment

Front wheel at curb mass (wt.)	Service checking	Caster (deg.)	1.7° +/- 1.0 ° Cross Car Must be Within 1.0°
		Camber (deg.)	.8° +/- .6° Cross Car Must be Within 1.0°
		Toe-in [outside track-mm (in.)]	0 +/- .20
	Service reset*	Caster	-0.8° to 4.2° Cross Car Must be Within 0.75°
		Camber	-2.0° to 1.8° Cross Car Must be Within 1.0°
		Toe-in	-.2° to +.2° Degrees Per Wheel
	Periodic M.V. inspection	Caster	Not Applicable
		Camber	Not Applicable
		Toe-in	Not Applicable
Rear wheel at curb mass (wt.)	Service checking	Camber (deg.)	Not Applicable
		Toe-in [outside track-mm (in.)]	Not Applicable
	Service reset*	Camber	Not Applicable
		Toe-in	Not Applicable
	Periodic M.V. inspection	Camber	Not Applicable
		Toe-in	Not Applicable

* Indicates pre-set, adjustable, trend set or other.

Electrical – Instruments and Equipment

Speedometer	Type (analog, digital, std., opt.)	Analog (Dial W/Pointer, Quartz Movement)
	Trip odometer (std., opt., n.a.)	Standard
EGR maintenance indicator		N/A
Charge indicator	Type	Indicator Lamp Gage Opt.
	Warning device (light, audible)	Indicator Lamp Gage Opt.
Temperature indicator	Type	Indicator Lamp Temp. Sensor Opt.
	Warning device (light, audible)	Indicator Lamp Gage Opt.
Oil pressure indicator	Type	Indicator Lamp Press Sensor Opt.
	Warning device (light, audible)	Indicator Lamp Gage Opt.
Fuel indicator	Type	Dial W/Pointer (Electric Gage)
	Warning device (light, audible)	N/A
Windshield wiper	Type (standard)	Electric 2-Speed
	Type (optional)	Controlled Cycle Pulse
	Blade length	482.6 (19.0)
	Swept area [cm^2($in.^2$)]	5583.7 (865.5)
Windshield washer	Type (standard)	Electric Pump Mounted on Reservoir Bottle
	Type (optional)	N/A
	Fluid level indicator (light, audible)	
Rear window wiper, wiper/washer (std., opt., n.a.)		None
Horn	Type	Electric Vibrating
	Number used	2 Standard
Other		Indicator Lamps for Parking Brake & Brake Failure, Up-Shift Fasten Belts, Low Coolant & Service Engine Soon. Also, High Beam, Left and Right Turn.

MVMA Specifications Form

Vehicle Line Cutlass Calais
Model Year 1989 Issued 6-88 Revised (•) 9-88

METRIC (U.S. Customary)

Engine Description/Carb. Engine Code	2.5L (151) L4 L68

Electrical – Supply System

Battery	Manufacturer	Delco Remy
	Model, std., (opt.)	1981601
	Voltage	12V
	Amps at 0°F cold crank	630 CCA
	Minutes-reserve capacity	90 RC
	Amp/hrs. - 20 hr. rate	54 AH
	Location	Underhood Front
Alternator	Manufacturer	Delco Remy
	Rating (idle/max. rpm)	28/74 1101320
	Ratio (alt. crank/rev.)	2.55:1
	Output at idle (rpm, park)	48 Amps at 27°C 950 RPM
	Optional (type & rating)	No Heavy Duty Option
Regulator	Type	Internal to Alternator

Electrical – Starting System

Start. motor	Manufacturer	
	Current drain at -20°F	10455022 417 Amps
	Power rating [kw (hp)]	
Motor drive	Engagement type	Solenoid with Positive Shift
	Pinion engages from (front, rear)	Front

Electrical – Ignition System

Type	Electronic (std., opt., n.a.)		
	Other (specify)		
Coil	Manufacturer		
	Model		
	Current	Engine stopped – A	
		Engine idling – A	
Spark plug	Manufacturer		
	Model		
	Thread (mm)		
	Tightening torque (N•m (lb, ft)]		
	Gap		
	Number per cylinder		
Distributor	Manufacturer		
	Model		

Electrical – Suppression

Locations & type	

MVMA Specifications Form

Vehicle Line Cutlass Calais
Model Year 1989 Issued 6-88 Revised (*) 9-88

METRIC (U.S. Customary)

Engine Description/Carb. Engine Code	2.3L (138) L4 LD2

Electrical – Supply System

Battery	Manufacturer		Delco Remy
	Model, std., (opt.)		1981601 Std.
	Voltage		12V
	Amps at 0°F cold crank		630 CCA
	Minutes-reserve capacity		90 Min
	Amp/hrs. - 20 hr. rate		54 AH
	Location		Underhood Front
Alternator	Manufacturer		Delco Remy
	Rating (idle/max. rpm)		30/85 or 36/100
	Ratio (alt. crank/rev.)		2.56:1
	Output at idle (rpm, park)	*	900 RPM - 60 Amps
	Optional (type & rating)	**	1101277 (85) 1101278 (100)
Regulator	Type		Integral to Alternator

Electrical – Starting System

Start. motor	Manufacturer		
	Current drain at 20°F		373 Amps 10455015
	Power rating [kw (hp)]		
Motor drive	Engagement type		Solenoid Positive Shift
	Pinion engages from (front, rear)		Front

Electrical – Ignition System

Type	Electronic (std., opt., n.a.)		Std./Direct Ignition System
	Other (specify)		None
Coil	Manufacturer		Delco Remy (2)
	Model		
	Current	Engine stopped – A	300 MA
		Engine idling – A	Peak 9.5 Amps
Spark plug	Manufacturer		A/C Spark Plug
	Model		FR 3LS
	Thread (mm)		14 x 1.25
	Tightening torque [N•m (lb. ft)]		21 - 24 (15 - 18)
	Gap		.889 (.035)
	Number per cylinder		One
Distributor	Manufacturer		Delco Remy
	Model		

Electrical – Suppression

Locations & type	

* Maximum output at 27°C of 100 amp unit.

** 1101277 for vehicles with heater only, 1101278 is for vehicles equipt with air conditioning.

MVMA Specifications Form

Vehicle Line Cutlass Calais
Model Year 1989 Issued 6-88 Revised (•) 9-88

METRIC (U.S. Customary)

Engine Description/Carb.	3.3L (204)
Engine Code	V6 LG7

Electrical – Supply System

Battery	Manufacturer	Delco Remy
	Model, std., (opt.)	1981601
	Voltage	12V
	Amps at 0°F cold crank	630 CCA
	Minutes-reserve capacity	90 RC
	Amp/hrs. - 20 hr. rate	54 AH
	Location	Underhood Front
Alternator	Manufacturer	Delco Remy
	Rating (idle/max. rpm)	1101483 28/74 Amps
	Ratio (alt. crank/rev.)	2.97:1
	Output at idle (rpm, park)	800 RPM 54 Amps at 27°C
	Optional (type & rating)	No Heavy Duty Option
Regulator	Type	Internal to Alternator

Electrical – Starting System

Start. motor	Manufacturer	
	Current drain at	10455024 431 Amps at -20°F
	Power rating [kw (hp)]	
Motor drive	Engagement type	Solenoid w/Positive Shift
	Pinion engages from (front, rear)	Front

Electrical – Ignition System

Type	Electronic (std., opt., n.a.)		Standard
	Other (specify)		
Coil	Manufacturer		Delco Remy
	Model		Direct Ignition
	Current	Engine stopped – A	9 Amps
		Engine idling – A	
Spark plug	Manufacturer		A/C
	Model		R44-LTS6
	Thread (mm)		14
	Tightening torque [N•m (lb. ft)]		27 (20)
	Gap		1.5 (.060)
	Number per cylinder		One
Distributor	Manufacturer		N/A
	Model		

Electrical – Suppression

Locations & type	

MVMA Specifications

Vehicle Line CUTLASS CALAIS
Model Year 1989 Issued _____ Revised(*) _____

METRIC (U.S. Customary)

Engine Description	2.3 LITER L4 (138 CID)
Engine Code	MULTI-PORT FUEL INJECTION RPO LGO

Electrical – Supply System

Battery	Manufacturer	Delco Remy
	Model, std., (opt.)	1981601
	Voltage	12V
	Amps at 0 deg F cold crnk	630 CCA
	Minutes-reserve capacity	90 RC
	Amps/hrs. – 20 hr. rate	54 AH
	Location	Underhood Front
Alternator	Manufacturer	Delco Remy
	Rating (idle/max. rpm) *	1101277 / 85 Amps or 1101278 / 100 Amps
	Ratio (alt. crank/rev.)	2.08:1
	Output at idle(rpm,park) **	900 RPM 60 Amps, 68 Amps
	Optional (type & rating)	No Heavy Duty Option
Regulator	Type	Internal to Alternator

Electrical – Starting System

Motor	Manufacturer	Delco Remy
	Current drain –20 deg F	378 Amps 10455044
	Power rating [kw (hp)]	1.5 kw
Motor drive	Engagement type	Solenoid with Positive Shift
	Pinion engages from (front, rear)	Front

Electrical – Ignition System

Type	Electronic (std, opt,n.a.)		Standard/Direct Ignition System
	Other (specify)		None
Coil	Manufacturer		Delco Remy (2) •
	Model		
	Current	Engine stopped–A	300 MA
		Engine idling – A	Peak 9.5 Amps
Spark plug	Manufacturer		A/C Spark Plug
	Model		FR 3LS
	Thread (mm)		14 x 1.25
	Tightening torque [Newton meters (lb. ft.)]		21 – 24 (15 – 18)
	Gap		.889 mm (.035 in.)
	Number per cylinder		One
Distributor	Manufacturer		Delco Remy
	Model		

Electrical – Suppression

Locations & type	

* First Model # Listed is for Heater only, 2nd Model # is for Air Conditioning.

** Maximum Output at 93 deg. C. of 100 Amp unit. Park Idle Speed is with A/C off.

MVMA Specifications Form

Vehicle Models Cutlass Calais
Model Year 1989 Issued 6-88 Revised (•) 9-88

METRIC (U.S. Customary)

Body Type	

Body

Structure	Unitized body construction including front end structure with bolted-on fenders and hood.
Ø Bumper system front - rear	Azdel impact bar. Delco hydraulic energy absorbers. Functional rubber rub strips. Body Colored fascias. Phase 1 - 5 MPH.
Anti-corrosion treatment	Special anticorrosion materials are used on interior and exterior metal panel surfaces. Materials include one and two-sided galvanized and zincrometal steel. Special metal conditioners, primers, protective waxes and sealers are used on interior surfaces. Chip resistant primer or plastisol material is applied to exterior lower body.

Ø Body – Miscellaneous Information

Type of finish (lacquer, enamel, other)		Acrylic Lacquer or Base Coat/Clear Coat Enamel
Hood	Material & mass	
	Hinge location (front, rear)	Rear
	Type (counterbalance, prop)	Prop Rod - Single Pivot Hinge
	Release control (internal, external)	Internal
Trunk lid	Material & mass	
	Type (counterbalance, other)	Hinge Mounted in Sail Area W/Extension Spring Counter Balan
	Internal release control (elec., mech., n.a.)	Electrical Solenoid (Opt.)
Hatch-back lid	Material & mass	
	Type (counterbalance, other)	
	Internal release control (elec., mech., n.a.)	
Tailgate	Material & mass	
	Type (drop, lift, door)	
	Internal release control (elec., mech., n.a.)	
Vent window control (crank, friction, pivot, power)	Front	N/A
	Rear	N/A
Window regulator type (cable, tape, flex, drive, etc.)	Front	N/A
	Rear	N/A
Seat cushion type (e.g., 60/40, bucket, bench, wire, foam etc.)	Front	Foam
	Rear	Foam
	3rd seat	N/A
Seat back type (e.g., 60/40, bucket, bench, wire, foam etc.)	Front	Foam
	Rear	Foam
	3rd seat	N/A
		Left Topside of I/P

MVMA Specifications Form
METRIC (U.S. Customary)

Vehicle Line Cutlass Calais
Model Year 1989 Issued 6-88 Revised (•) 9-88

Body Type	ALL

∅ Restraint System

Seating Position			Left	Center	Right
Active	Type & description (lap & shoulder belt, lap belt, etc.) Standard/optional	First seat	Not Available	Not Available	Not Available
		Second seat	Lap/Shoulder Combination	Lap Belt	Lap/Shoulder Combination
		Third seat			
Passive	Type & description (air bag, motorized - 2-point belt, fixed belt, knee bolster, manual - lap belt) Standard/optional	First seat	3 Point Manual	Not Available	3 Point Manual
		Second seat	Not Available	Not Avialable	Not Available
		Third seat			

Glass	SAE Rel. No.	27	69
Windshield glass exposed surface area [cm^2($in.^2$)]	S1	8464 (1312)	8464 (1312)
Side glass exposed surface area [cm^2($in.^2$)] - total 2-sides	S2	7177 (1112)	10018 (1553)
Backlight glass exposed surface area [cm^2($in.^2$)]	S3	3418 (530)	3418 (530)
Total glass exposed surface area [cm^2($in.^2$)]	S4	19059 (2954)	21900 (3395)
Windshield glass (type)		Curved - Laminated Float	
Side glass (type)		Curved - Tempered Float	
Backlight glass (type)		Curved - Tempered Float	

∅ Lamps and Headlamp Locations

Headlamps	Description - sealed beam, halogen, replaceable bulb, etc.	Replaceable Bulb - 2 Lamps - 2 Bulbs Each
	Shape	Rectangular
	Lo-beam type (2A1, 2B1, 2C1, etc.)	9006
	Quantity	2
	Hi-beam type (1A1, 2A1, 1C1, 2C1, etc.)	9005
	Quantity	2

Frame

Type and description (separate frame, unitized frame, partially-unitized frame)	Unitized Frame

MVMA Specifications Form
METRIC (U.S. Customary)

Vehicle Line Cutlass Calais
Model Year 1989 Issued ~~6-88~~ Revised (•) 9-88

Body Type	

Convenience Equipment (standard, optional, n.a.)

∅ Air conditioning (manual, auto. temp control)		(C60) Opt. Manual
Clock (digital, analog)		Part of Radio Package
Compass/thermometer		
Console (floor, overhead)		(D55) Opt.
Defroster, elec. backlight		(C49) Opt.
Electronic	Diagnostic monitor (integrated, individual)	
	Instrument cluster (list instruments)	(UB3) Opt. Oil, Temp, Volts, Trip Odom. & Tach.
	Keyless entry	
	Tripminder (avg. spd., fuel)	(U23) Std.
	Voice alert (list items)	
	Other	
Fuel door lock (remote, key, electric)		
Lamps	Auto head on/off delay, dimming	
	Cornering	
	Courtesy (map, reading)	(U29) Std. (C96) Std. NT Opt. NF
	Door lock, ignition	
	Engine compartment	(TR9) Std. NT Opt. NF
	Fog	(T37) Std. NK Only
	Glove compartment	
	Trunk	(U25) Std.
∅	Illuminated entry system (list lamps, activation)	
	Other	
Mirrors	Day/night (auto. man.)	Std. Manual
	L.H. (remote, power, heated)	(D35) Std. Remote (D68) Opt. Remote
	R. H. (convex, remote, power, heated)	(D35) Std. Direct (D68 Opt. Remote
	Visor vanity (RH / LH, illuminated)	(D64) Std. RH Illuminated on NT Opt. on NF
∅ Navigation system (describe)		
Parking brake-auto release (warning light)		

MVMA Specifications Form

METRIC (U.S. Customary)

Vehicle Line Cutlass Calais

Model Year 1989 Issued 6-88 Revised (e) 9-88

Body Type

Convenience Equipment (standard, optional, n.a.)

Ø	Power equipment	Deck lid (release, pull down)	(A90) Opt. Release Electric
		Door locks (manual, automatic, describe system)	(AU3) Opt. Electric
		Seats — 2-4-6 way, etc.	(AC3) Opt. 6 Way (AH3) Std. NT 4 Way Opt. NF
		Seats — Reclining (R.H., L.H.)	(AR9) Std.
		Seats — Memory (R.H., L.H., preset, recline)	
		Seats — Lumber, hip, thigh, support	
		Seats — Heated (R.H., L.H., other)	
		Side windows	(A31) Opt. Electric
		Vent windows	
		Rear windows	
	Radio systems	Antenna (location, whip, w/shield, power)	(US6) Std. Fixed RH Front Fender (U57) Opt. Power* *RH Front Fender
Ø		Standard	(UM7) Std. AM/FM Stereo, Seek/Scan, Clock & ETR
		Optional — AM, FM, stereo, tape, compact disc, graphic equalizer, theft deterrent, radio prep package, headphone jacks, etc.	(UM6) Opt. AM/FM Stereo, Seek/Scan, Clock, ETR & Cassette (UX1) Opt. AM/FM Stereo, Seek/Scan, Clock, ETR, Cassette Equalizer
		Speaker (number, location)	(U64) Std. 4 Front Dash & REar Quarter (U66) Opt. 4 Front Dash & Rear Quarter
		Roof open air fixed (flip-up, sliding, "T")	(AD3) Opt. Hinged
		Speed control device	(K34) Opt.
		Speed warning device (light, buzzer, etc.)	
		Tachometer (rpm)	(UB3) Opt.
		Telephone system (describe)	
		Theft deterrent system	

MVMA Specifications Form

Vehicle Models Cutlass Calais
Model Year 1989 Issued 6-88 Revised (•) 9-88

METRIC (U.S. Customary)
Vehicle Dimensions See Key Sheets for definitions.

All dimensions to ground are for comparative purposes only. Dimensions are to be shown for all base body models of each vehicle line.
SAE Ref. no. refers to the definition published in SAE Recommended Practice J1100 "Motor Vehicle Dimensions," unless otherwise specified.

Body Type / Width	SAE Ref. No.	ALL OR COUPE	SEDANS
Tread (front)	W101	55.6	55.6
Tread (rear)	W102	55.2	55.2
Vehicle width	W103	66.7	66.7
Body width at Sg RP (front)	W117	1690 (66.5)	
Vehicle width (front doors open)	W120	3723 (146.6)	3195 (125.8)
Vehicle width (rear doors open)	W121	Not Applicable	
Front fender overall width	W106		
Rear fender overall width	W107	1657 (65.2)	
Tumble-home (deg.)	W122	22°	
Vehicle width including mirrors		66.7	
Length			
Wheelbase	L101	103.7	103.7
Vehicle length	L103	178.8	178.8
Overhang (front)	L104		
Overhang (rear)	L105		
Upper structure length	L123	2284 (89.9)	
Rear wheel C/L "X" coordinate	L127		
Cowl point "X" coordinate	L125	194 (7.6)	
Front end length at centerline	L126		
Rear end length at centerline	L129	685 (27.0)	
Height **			
Passenger distribution (front/rear)	PD1,2,3	2/0 **	
Trunk/cargo load		0 **	
Vehicle height	H101	1331 (52.4)	
Cowl point to ground	H114		
Deck point to ground	H138		
Rocker panel-front to ground	H112		
Bottom of door closed-front to ground	H133		
Rocker panel-rear to ground	H111		
Bottom of door closed-rear to ground	H135	Not Applicable	
Windshield slope angle	H122	60°	
Backlight slope angle	H121	33°	
Ground Clearance **			
Front bumper to ground	H102	214 (8.4)	
Rear bumper to ground	H104	323 (12.7)	
Bumper to ground [front at curb mass (wt.)]	H103	229 (9.0)	
Bumper to ground [rear at curb mass (wt.)]	H105	354 (13.9)	
Angle of approach (degrees)	H106	15°	
Angle of departure (degrees)	H107	17°	
Ramp breakover angle (degrees)	H147	14°	
Axle differential to ground (front / rear)	H153	166 (6.5)	
Min. running ground clearance	H156	147 (5.8)	
Location of min. run. grd. clear.		Front Suspension	

** *All Vehicle Height And Ground Clearance Are Made Using EPA Loaded Vehicle Weight, Loading Conditions.*

EPA Loaded Vehicle Weight is the Base Vehicle Weight Plus All Coolant And Fluids Necessary For Operation Plus 100% Of The Fuel Capacity, Plus The Weight Of All Options And Accesories Whic Weigh Three Pounds Or More And Which Are Sold On At Least 33% Of The Car Line, Plus Two Occupants.

MVMA Specifications Form

Vehicle Models Cutlass Calais

Model Year 1989 Issued 6-88 Revised (•) 9-88

METRIC (U.S. Customary)

Vehicle Dimensions See Key Sheets for definitions

Body Type

	Front Compartment	SAE Ref. No.	ALL - COUPE	SEDAN
	Sg RP front, "X" coordinate	L31	1128 (44.4)	
	Effective head room	H61	957 (37.7)	
	Max. eff. leg room (accelerator)	L34	1090 (42.9)	
	SgRP to heel point	H30	234 (9.2)	
	SgRP to heel point	L53	895 (35.2)	
	Back angle	L40	26.5°	
	Hip angle	L42	100.5°	
	Knee angle	L44	132°	
	Foot angle	L46	87°	
	Design H-point front travel	L17	192 (7.6)	
	Normal driving & riding seat track trvl.	L23	171 (6.7)	
	Shoulder room	W3	1386 (54.6)	1379 (54.3)
	Hip room	W5	1240 (48.8)	1227 (48.3)
••	Upper body opening to ground	H50		
	Steering wheel maximum diameter*	W9	376 (14.8)	
	Steering wheel angle	H18	19°	
	Accel. heel pt. to steer. whl. cntr	L11		
	Accel. heel pt. to steer. whl. cntr	H17		
	Steering wheel to C/L of thigh	H13	107 (4.2)	
	Steering wheel torso clearance	L7	379 (14.9)	
	Headlining to roof panel (front)	H37	17	
	Undepressed floor covering thickness	H67	17	

Front Compartment Interior Dimensions Are Measured With The Seating Reference Point (SgRP) 21 mm Forward And _____ mm Upward of Rearmost Position.

	Rear Compartment			
	Sg RP Point couple distance	L50	769 (30.3)	
	Effective head room	H63	942 (37.1)	
	Min. effective leg room	L51	870 (34.3)	
	Sg RP (second to heel)	H31	267 (10.5)	
	Knee clearance	L48	5 (.2)	
	Compartment room	L3	666 (26.2)	
	Shoulder room	W4	1403 (55.2)	1375 (54.1)
	Hip room	W6	1281 (50.4)	1278 (50.3)
••	Upper body opening to ground	H51	Not Applicable	
	Back angle	L41	25°	
	Hip angle	L43	82.5°	
	Knee angle	L45	88.75°	
	Foot angle	L47	120°	
	Headlining to roof panel (second)	H38	8 (.3)	
	Depressed floor covering thickness	H73	20 (.8)	

Luggage Compartment

	Usable luggage capacity [L (cu. ft.)]	V1	
••	Liftover height	H195	

Interior Volumes (EPA Classification)

Vehicle class		
Interior volume index (cu. ft.)		
Trunk/cargo index (cu. ft.)		

All linear dimensions are in millimeters (inches).

•• EPA Loaded Vehicle Weight, Loading Conditions

MVMA Specifications Form

Vehicle Line Cutlass Calais

Model Year _____ Issued 6-88 Revised (•) 9-88

METRIC (U.S. Customary)

Vehicle Dimensions See Key Sheets for definitions

Body Type

Station Wagon – Third Seat	SAE Ref. No.	
Seat facing direction	SD1	
Sg RP couple distance	L85	
Shoulder room	W85	
Hip room	W86	
Effective leg room	L86	
Effective head room	H86	
Sg RP to heel point	H87	
Knee clearance	L87	
Back angle	L88	
Hip angle	L89	
Knee angle	L90	
Foot angle	L91	

Station Wagon – Cargo Space		
Cargo length (open front)	L200	
Cargo length (open second)	L201	
Cargo length (closed front)	L202	
Cargo length (closed second)	L203	
Cargo length at belt (front)	L204	
Cargo length at belt (second)	L205	
Cargo width (wheelhouse)	W201	
Rear opening width at floor	W203	
Opening width at belt	W204	
• Min. rear opening width above belt	W205	
Cargo height	H201	
Rear opening height	H202	
Tailgate to ground height	H250	
Front seat back to load floor height	H197	
Cargo volume index [m^3($ft.^3$)]	V2	
Hidden cargo volume index [m^3($ft.^3$)]	V4	
Cargo volume. index-rear of 2-seat	V10	

Hatchback – Cargo Space		
Cargo length at front seatback height	L208	
Cargo length at floor (front)	L209	
Cargo length at second seatback height	L210	
Cargo length at floor (second)	L211	
Front seatback to load floor height	H197	
Second seatback to load floor height	H198	
Cargo volume index [m^3($ft.^3$)]	V3	
Hidden cargo volume index [m^3($ft.^3$)]	V4	
Cargo volume index-rear of 2-seat	V11	

Aerodynamics*	
Wheel lip to ground, front	
Wheel lip to ground, rear	
Frontal area [m^2(ft^2)]	
Drag coefficient (Cd)	

* EPA Loaded Vehicle Weight, Loading Conditions

MVMA Specifications Form

METRIC (U.S. Customary)

Vehicle Line Cutlass Calais
Model Year 1989 Issued 6-88 Revised (•) 9-88

Body Type ALL

Vehicle Fiducial Marks

Fiducial Mark Number*		Define Coordinate Location
Front	X	Fiducial mark to vertical base grid line - front, measured horizontally from base grid line to the front fiducial mark located on top of the front seat adjuster mounting bolt.
	Y	Fiducial mark to centerline of car - front, width measurement made from centerline of car to the fiducial mark located on top of the front seat adjuster mounting bolt.
	Z	Fiducial mark to horizontal base grid line - front, measured vertically from base grid line to front fiducial mark located on top of the front seat adjuster mounting bolt.
Rear	X	Fiducial mark to vertical base grid line - rear, measured horizontally from the base grid line to rear fiducial mark located on the rail (compartment pan - longitudinal).
	Y	Fiducial mark to centerline of car - rear, width measurement made from centerline of car to fiducial mark located on the rail (compartment pan - longitudinal).
	Z	Fiducial mark to horizontal base grid line - rear, measured vertically from base grid line to rear fiducial mark located on the rail (compartment pan - longitudinal).

	Fiducial Mark Number	
Front	W21*	505 (19.9)
	L54*	2761 (108.7)
	H81*	246 (9.7)
	H161*	293 (11.5)
**	H163*	272 (10.7)
Rear	W22*	440 (17.3)
	L55*	4953 (195.0)
	H82*	362 (14.3)
	H162*	413 (16.3)
**	H164*	382 (15.0)

* Reference – SAE Recommended Practice, J182, Motor Vehicle Fiducial Marks.

All linear dimensions are in millimeters (inches).
** EPA Loaded Vehicle Weight, Loading Conditions

MVMA Specifications Form

Vehicle Line Cutlass Calais
Model Year 1989 Issued 6-88 Revised (•) 9-88

METRIC (U.S. Customary)

Code	Model	Vehicle Mass (weight)								
		CURB MASS, kg. (lb.)*			% PASS. MASS DISTRIBUTION				ETWC**
					Pass In Front		Pass In Rear		
		Front	Rear	Total	Front	Rear	Front	Rear	
3NF27	Coupe	737.8 (1627)	401.8 (886)	1139.6 (2512)					1104 (2434)
3NT27	Coupe	738.8 (1627)	412.6 (910)	1151.4 (2538)					1116 (2460)
3NK27	Coupe	811.1 (1788)	431.9 (952)	1243.0 (2740)					1183 (2608)
3NF69	Sedan	745.7 (1644)	421.2 (929)	1166.9 (2573)					1131 (2493)
3NT69	Sedan	747.1 (1647)	431.1 (950)	1178.2 (2597)					1143 (2520)
3NK69	Sedan	819.0 (1806)	452.7 (998)	1271.7 (2804)					1212 (2672)

SHIPPING MASS (weight) = Curb Weight Less Kg. (lbs.)

* Reference – SAE J1100 Motor vehicle dimensions, curb weight definition.

** ETWC - Equivalent Test Weight Class - U.S. Environmental Protection Agency emission certifications are based on the ETWC's shown.
NA - Not Applicable - applies to model/series combinations not requiring testing.

MVMA Specifications Form

METRIC (U.S. Customary)

Vehicle Line Cutlass Calais
Model Year 1989 Issued 6-88 Revised (e) 9-88

Code	Equipment	Optional Equipment Differential Mass (weight)* MASS, kg. (lb.) Front	Rear	Total	Remarks Restrictions, Requirements
Door Locks, Power	AU3	.6	1.0	1.6	Coupe
		(1.3)	(2.2)	(3.5)	
		1.0	1.4	2.4	Sedan
		(2.2)	(3.1)	(5.3)	
Window, Roof Hinged	AD3	4.0	4.6	8.6	
		(8.8)	(10.1)	(19.0)	
Window, Power	A31	1.8	1.0	2.8	Coupe
		(4.0)	(2.2)	(6.2)	
		2.6	2.5	5.1	Sedan
		(5.7)	(5.5)	(11.2)	
Mats, Front & Rear	B37	1.2	1.2	2.4	
		(2.6)	(2.6)	(5.3)	
Molding, Body Side	B88	1.0	1.0	2.0	
		(2.2)	(2.2)	(4.4)	
Air Conditioning	C60	22.2	-2.0	20.2	LD2 & LG7
		(48.9)	(-4.4)	(44.5)	
Air Conditioning	C60	22.6	-2.0	20.6	LG8
		(49.8)	(-4.4)	(45.4)	
Suspension	FE3	2.1	3.5	5.6	
		(4.6)	(7.7)	(12.3)	
	FE2	2.0	3.4	5.4	
		(4.4)	(7.5)	(11.9)	
Cruise Control	K34	1.9	0.0	1.9	
		(4.2)	(0.0)	(4.2)	
Engine V6 3.3L	LG7	40.0	-1.9	38.1	
		(88.2)	(-4.2)	(84.0)	
Engine L4 2.3L	LD2	23.1	-1.1	22.0	
		(50.9)	(-2.4)	(48.5)	
Transmission, Auto	MD9	17.4	-1.0	16.4	
		(38.4)	(-2.2)	(36.2)	
Wheel, Aluminum	PD8	3.6	3.6	7.2	
		(7.9)	(7.9)	(15.9)	
Engine L4 2.3L	LG0	16.0	-.8	15.2	
		(35.3)	(-1.8)	(33.5)	

* Also see Engine - General Section for dressed engine mass (weight).

MVMA Specifications Form

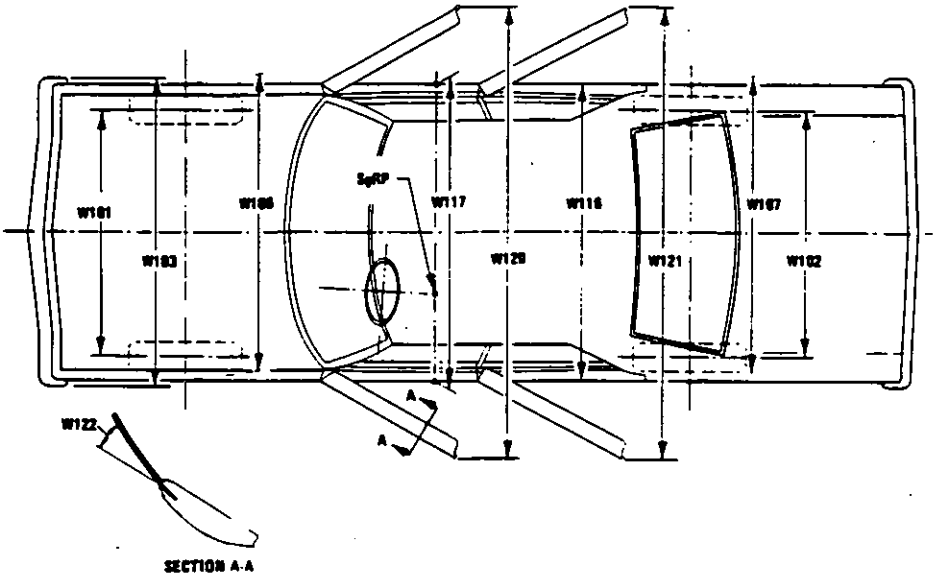
METRIC (U.S. Customary)

Vehicle Line Cutlass Calais
Model Year 1989 Issued 6-88 Revised (•) 9-88

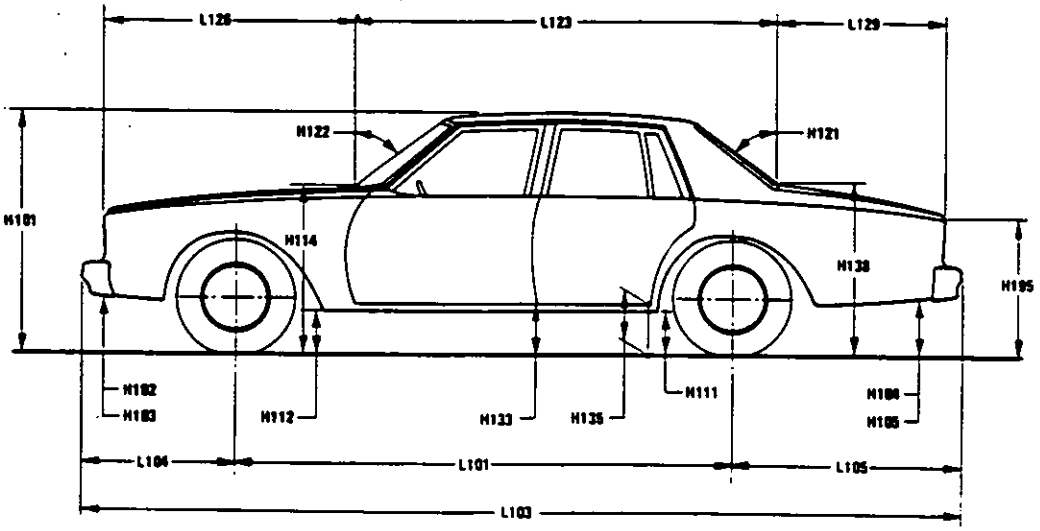
Code	Equipment	Optional Equipment Differential Mass (weight)* MASS, kg. (lb.) Front	Rear	Total	Remarks Restrictions, Requirements
Cover, Wheel	N91	1.2	1.2	2.4	
		(2.6)	(2.6)	(5.2)	

* Also see Engine - General Section for dressed engine mass (weight).

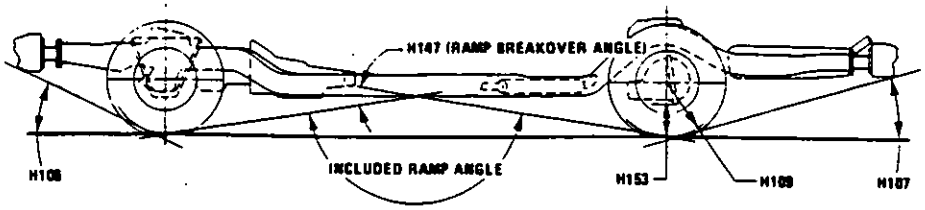
Exterior Width



Exterior Length & Height



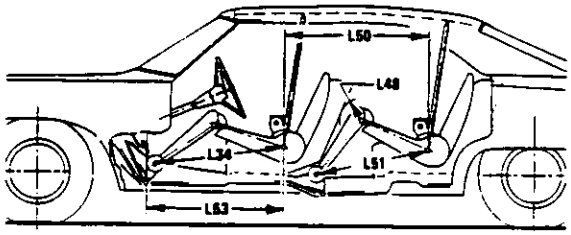
Exterior Ground Clearance

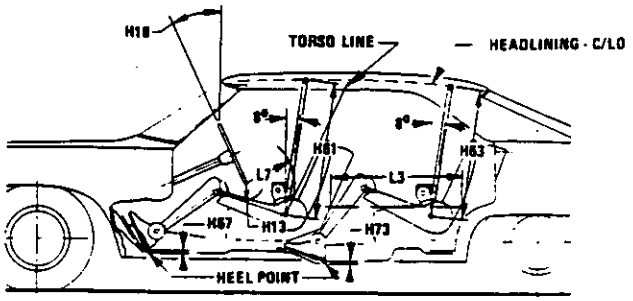


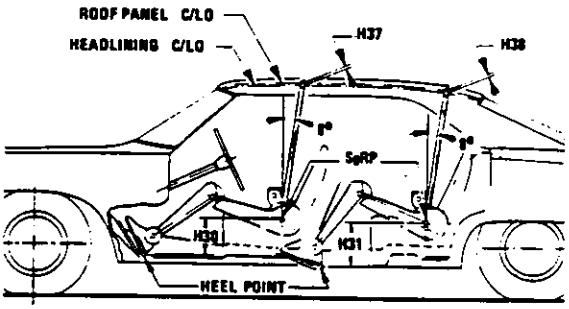
MVMA Specifications Form

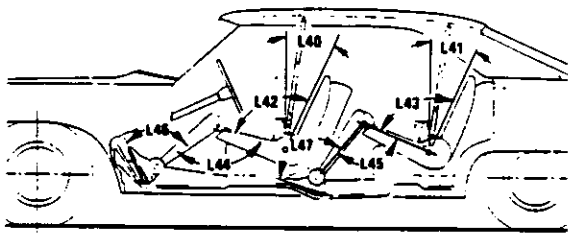
METRIC (U.S. Customary)

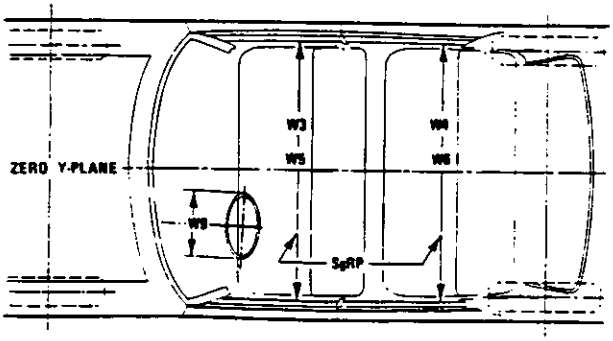
Interior Vehicle And Body Dimensions – Key Sheet

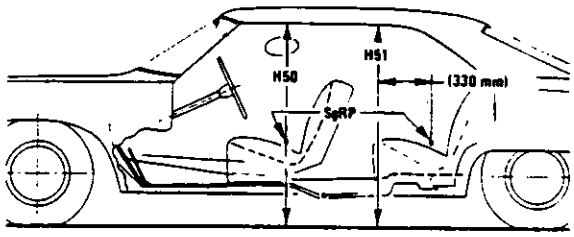




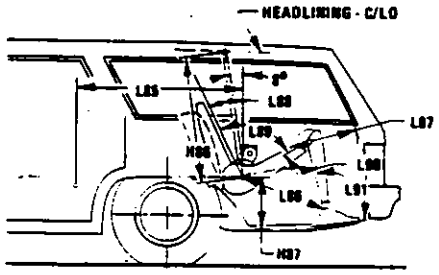


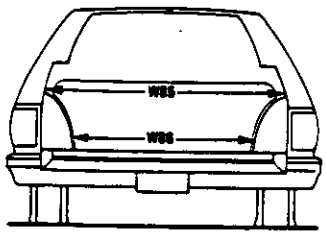




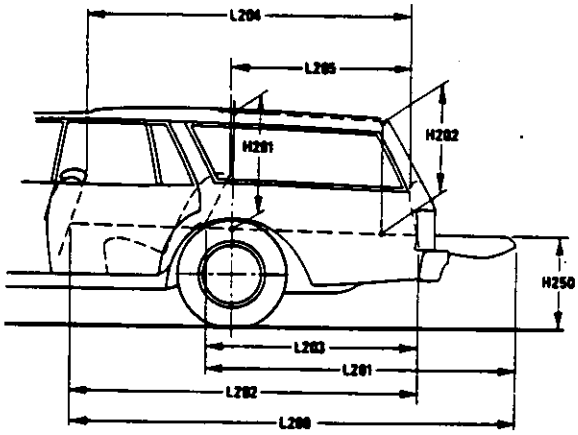


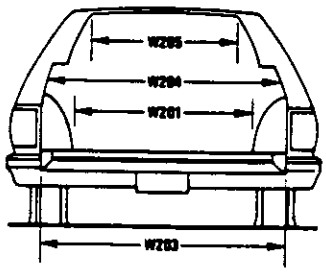
Third Seat



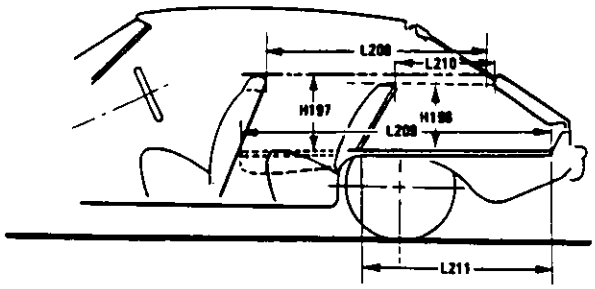


Cargo Space





Station Wagon



Hatchback

MVMA Specifications Form

METRIC (U.S. Customary)

Exterior Vehicle And Body Dimensions – Key Sheet
Dimensions Definitions

Seating Reference Point

SEATING REFERENCE POINT means the manufacturer's design reference point which –

(a) Establishes the rearmost normal design driving or riding position of each designated seating position in a vehicle;

(b) Has coordinates established relative to the design vehicle structure;

(c) Simulates the position of the pivot center of the human torso and thigh; and

(d) Is the reference point employed to position the two dimensional templates described in SAE Recommended Practice J826, "Devices for Use in Defining and Measuring Vehicle Seating Accommodations,".

Width Dimensions

W101 TREAD–FRONT. The dimension measured between the tire centerlines at the ground.

W102 TREAD–REAR. The dimension measured between the tire centerlines at the ground. In case of dual wheels, the dimension will be measured to the centerline of tire and wheel assemblies.

W103 VEHICLE WIDTH. The maximum dimension measured between the widest point on the vehicle, excluding exterior mirrors, flexible mud flaps, marker lamps, but including bumpers, moldings, sheet metal protrusions or dual wheels, if standard equipment.

W106 FRONT FENDER WIDTH. The dimension measured between the widest points at the front wheel centerline, excluding moldings.

W107 REAR FENDER WIDTH. The dimension measured between the widest points at the rear wheel centerline, excluding moldings.

W117 BODY WIDTH AT SgRP–FRONT. The dimension measured laterally between the widest points on the body at the SgRP-front, excluding door handles, applied moldings, or appliques.

W120 VEHICLE WIDTH–FRONT DOORS OPEN. The dimension measured between the widest point on the front doors in maximum hold-open position.

W121 VEHICLE WIDTH–REAR DOORS OPEN. The dimension measured between the widest point on the rear doors in maximum hold-open position. For vehicles with a rear door on only one side, this dimension is to the zero "Y" plane.

W122 TUMBLE–HOME. STRAIGHT SIDE GLASS. The angle measured from a vertical to the outside surface of the front door glass at the SgRP "X" plane.
CURVED SIDE GLASS. The angle measured from a vertical to a chord extending from the upper DLO to the lower DLO at the outside surface of the front door glass at the front SgRP "X" plane.

Length Dimensions

L101 WHEELBASE (WB). The dimension measured longitudinally between front and rear wheel centerlines. In case of dual rear axles, the dimension shall be to the midpoint of the centerlines of the rear wheels.

L103 VEHICLE LENGTH. The maximum dimension measured longitudinally between the foremost point and the rearmost point on the vehicle, including bumper, bumper guards, tow hooks and/or rub strips, if standard equipment.

L104 OVERHANG–FRONT. The dimension measured longitudinally from the centerline of the front wheels to the foremost point on the vehicle including bumper, bumper guards, tow hooks and/or rub strips, if standard equipment.

L105 OVERHANG–REAR. The dimension measured longitudinally from the centerline of the rear wheels; or in the case of dual rear axles, the dimension shall be the midpoint of the centerlines of the rear wheels, to the rearmost point on the vehicle including rear bumpers, bumper guards, tow hooks and rub strips, if standard equipment.

L123 UPPER STRUCTURE LENGTH. The dimension measured longitudinally from the cowl point to the deck point.

L125 COWL POINT "X" COORDINATE.

L126 FRONT END LENGTH. The dimension measured longitudinally from the cowl point to the foremost point on the vehicle at the zero "Y" plane excluding ornamentation or bumpers. In cases where bumpers and/or grills are integrated with the profile, measurement is made at the foremost point of front end contour.

L127 REAR WHEEL CENTERLINE "X" COORDINATE or in the case of dual rear axles, the coordinate shall be the midpoint of the distance between the rear axle centerlines.

L129 REAR END LENGTH. The dimension measured longitudinally from the deck point to the rearmost visible point of the body sheet metal at the zero "Y" plane, excluding ornamentation or bumpers.

Height Dimensions

H101 VEHICLE HEIGHT. The dimension measured vertically from the highest point on the vehicle body to ground.

H111 ROCKER PANEL–REAR TO GROUND. The dimension measured vertically from the bottom of the rocker or side quarter panel at the front of the rear wheel opening, excluding flanges, to ground.

H112 ROCKER PANEL–FRONT TO GROUND. The dimension measured vertically from the foremost point on the bottom of the rocker panels, excluding flanges, to ground.

H114 COWL POINT TO GROUND. Measured at zero "Y" plane.

H121 BACKLIGHT SLOPE ANGLE. The angle between the vertical reference line and the surface of backlight at vehicle zero "Y" plane. For curve backlight, the angle is to chord of backlight arc from lower DLO to upper DLO.

H122 WINDSHIELD SLOPE ANGLE. The angle between the vertical reference line and a chord of the windshield arc running from the lower DLO to the upper DLO at the vehicle zero "Y" plane. In the case of wrap over glass, the angle to be measured will be formed by a chord 457 mm (18.0 in) long drawn from the lower DLO to the intersecting point on the windshield.

H133 BOTTOM OF DOOR CLOSED–FRONT TO GROUND. The dimension measured vertically from the bottom outside corner of the door on the lock pillar side, in maximum closed position, to ground.

H135 BOTTOM OF DOOR CLOSED–REAR TO GROUND. The dimension measured vertically from the bottom outside corner of the door on the lock pillar side, in maximum closed position, to ground.

H138 DECK POINT TO GROUND. Measured at zero "Y" plane.

H109 STATIC LOAD–TIRE RADIUS–REAR. Specified by the manufacturer in accordance with composite TIRE SECTION STANDARD.

Ground Clearance Dimensions

H102 FRONT BUMPER TO GROUND. The minimum dimension measured vertically from the lowest point on the front bumper to ground, including bumper guards, if standard equipment.

H103 FRONT BUMPER TO GROUND–CURB MASS (WT.). Measured in the same manner as H102.

H104 REAR BUMPER TO GROUND. The minimum dimension measured vertically from the lowest point on the rear bumper to ground, including bumper guards, if standard equipment.

H105 REAR BUMPER TO GROUND – CURB MASS (WT.). Measured in the same manner as H104.

H106 ANGLE OF APPROACH. The angle measured between a line tangent to the front tire static loaded radius arc and the initial point of structural interference forward of the front tire to ground. The limiting structural component shall be designated.

H107 ANGLE OF DEPARTURE. The angle measured between a line tangent to the rear tire static loaded radius arc and the initial point of structural interference rearward of the rear tire to ground. The limiting component shall be designated.

H147 RAMP BREAKOVER ANGLE. The angle measured between two lines tangent to the front and rear tire static loaded radius and intersecting at a point on the underside of the vehicle which defines the largest ramp over which the vehicle can roll.

H153 REAR AXLE DIFFERENTIAL TO GROUND. The minimum dimension measured from the rear axle differential to ground.

H156 MINIMUM RUNNING GROUND CLEARANCE. The minimum dimension measured from the sprung vehicle to ground. Specify location.

Glass Areas

S1 Windshield area.

S2 Side windows area. Includes the front door, rear door, vents, and rear quarter windows on both sides of the vehicle.

S3 Backlight areas.

S4 Total area. Total of all areas (S1 + S2 + S3).

Fiducial Mark Dimensions

Fiducial Mark – Number 1

L54 "X" coordinate.

W21 "Y" coordinate.

H81 "Z" coordinate.

H161 Height "Z" coordinate to ground at curb weight.

H163 Height "Z" coordinate to ground.

Fiducial Mark – Number 2

L55 "X" coordinate.

W22 "Y" coordinate.

W82 "Z" coordinate.

H162 Height "Z" coordinate to ground at curb weight.

H164 Height "Z" coordinate to ground.

Front Compartment Dimensions

L7 STEERING WHEEL TORSO CLEARANCE. The minimum dimension measured in the side view from the rearmost edge of the steering wheel, with front wheels in the straight ahead position, to the torso line.

L11 ACCELERATOR HEEL POINT TO STEERING WHEEL CENTER. The dimension measured horizontally from the AHP to the intersection of the steering column centerline and a plane tangent to the upper surface of the steering wheel rim.

L17 DESIGN H-POINT–FRONT TRAVEL. The dimension measured horizontally between the design H-point–front in the foremost and rearmost seat track positions. (See SAE J1100)

L23 NORMAL DRIVING AND RIDING SEAT TRACK TRAVEL. The dimension measured horizontally between a point on the design H-point travel line from the SgRP to the displaced point on the design H-point travel line with the seat moved to the foremost seat position, but not to include seat track travel used for purposes other than normal driving and riding positions. (See SAE J1100)

L31 SgRP–FRONT. "X" COORDINATED.

L34 MAXIMUM EFFECTIVE LEG· ROOM–ACCELERATOR. The dimension measured along a line from the ankle pivot center to the SgRP–front plus 254 mm (10.0 in) measured with right foot on the undepressed accelerator pedal. For vehicles with SgRP to heel (H30) greater than 18 in., the accelerator pedal may be depressed as specified by the manufacturer. If teh accelerator is depressed, the manufacturer shall place foot flat on pedal and note the depression of the pedal.

L-40 BACK ANGLE–FRONT. The angle measured between a vertical line through the SgRP–front and the torso line. If the seatback is adjustable, use the normal driving and riding position specified by the manufacturer.

L-42 HIP ANGLE–FRONT. The angle measured between torso line and thigh centerline.

L44 KNEE ANGLE–FRONT. The angle measured between thigh centerline and lower leg centerline measured on the right leg.

L46 FOOT ANGLE–FRONT. The angle measured between the lower leg centerline and a line tangent to the ball and heel of the bare foot flesh line measured on the right leg. Ref SAE J826.

L53 SgRP–FRONT TO HEEL. The dimension measured horizontally from the SgRP–front to the accelerator heel point.

W3 SHOULDER ROOM–FRONT. The minimum dimension measured laterally between the trimmed surfaces on the "X" plane through the SgRP–front at height between the belt line and 254 mm (10.0 in.) above the SgRP–front, excluding the door assist strap and attaching parts.

W5 HIP ROOM–FRONT. The minimum dimension measured laterally between the trimmed surfaces on the "X" plane through the SgRP–front within 25 mm (1.0 in.) below and 76 mm (3.0 in.) above the SgRP–front and 76 mm (3.0 in.) fore and aft of the SgRP–front.

W9 STEERING WHEEL MAXIMUM OUTSIDE DIAMETER. Define if other than round.

H13 STEERING WHEEL TO CENTERLINE OF THIGH. The minimum dimension measured from the bottom of steering wheel, with front wheels in the straight position, to the thigh centerline.

H17 ACCELERATOR HEEL POINT TO THE STEERING WHEEL CENTER. The dimension measured vertically from the AHP–front to the intersection of the steering column centerline to a plane tangent to the upper surface of the steering wheel rim.

H18 STEERING WHEEL ANGLE. The angle measured from a vertical to the surface plane of the steering wheel.

H30 SgRP–FRONT TO HEEL. The dimension measured vertically from the SgRP–front to the accelerator heel point.

H37 HEADLINING TO ROOF PANEL–FRONT. The dimension measured from the intersection of the headlining and the extended effective head room line normal to the sheet metal.

H50 UPPER BODY OPENING TO GROUND–FRONT. The dimension measured vertically from the trimmed body opening to the ground on the SgRP–front "X" plane.

H61 EFFECTIVE HEAD ROOM–FRONT. The dimension measured along a line 8 deg. rear of vertical from the SgRP–front to the headlining plus 102 mm (4.0 in.).

H67 FLOOR COVERING THICKNESS–UNDEPRESSED–FRONT. The dimension measured vertically from the surface of the undepressed floor covereing to the underbody sheet metal at the accelerator heel point.

Rear Compartment Dimensions

L3 COMPARTMENT ROOM–SECOND. The dimension measured horizontally from the back of the front seat to the front of the second seatback at a height tangent to the top of the second seat cushion.

Interior Vehicle And Body Dimensions – Key Sheet
Dimensions Definitions

L-41 BACK ANGLE–SECOND. The angle measured between a vertical line through the SgRP–second and the torso line.

L43 HIP ANGLE–SECOND. The angle measured between torso line and thigh centerline.

L45 KNEE ANGLE–SECOND. The angle measured between thigh centerline and lower leg centerline.

L47 FOOT ANGLE–SECOND. The angle measured between the lower leg centerline and a line tangent to the ball and heel of the three-dimensional devices bare foot flesh line (Reference J826).

L48 KNEE CLEARANCE–SECOND. The minimum dimension measured from the knee pivot center to the back of the front seatback minus 51 mm (2.0 in.).

L50 SgRP COUPLE DISTANCE–SECOND. The dimension measured horizontally from the driver SgRP–front to the SgRP–second.

L51 MINIMUM EFFECTIVE LEG ROOM–SECOND. The dimension measured along a line from the ankle pivot center to the SgRP–second plus 254mm (10.0 in.).

W4 SHOULDER ROOM–SECOND. The minimum dimension measured laterally between door or quarter trimmed surfaces on the "X" plane through the SgRP–second at height between 254-406 mm (10.0-16.0 in.) above the SgRP–second, excluding the door assist straps and attaching parts.

W6 HIP ROOM–SECOND. Measured in the same manner as W5.

H31 SgRP–SECOND TO HEEL. The dimension measured vertically from the SgRP–second to the two dimensional device heel point on the depressed floor covering.

H38 HEADLINING TO ROOF PANEL–SECOND. The dimension measured from the intersection of the headlining and the extended effective head room line normally to the roof sheet metal.

H51 UPPER BODY OPENING TO GROUND–SECOND. The dimension measured vertically from the trimmed body opening to the ground on the "X" plane 330 mm (13.0 in.) forward of the SgRP–second.

H63 EFFECTIVE HEAD ROOM–SECOND. The dimension measured along a line 8 deg. rear of vertical from the SgRP to the headlining, plus 102 mm (4.0 in.).

H73 FLOOR COVERING–DEPRESSED–SECOND. The dimesnion measured vertically from the heel point to the underbody sheet metal.

Luggage Compartment Dimensions

V1 USABLE LUGGAGE CAPACITY–Total of volumes of individual pieces of standard luggage set plus H-boxes stowed in the luggage compartment in accordance with the procedure described in paragraph 8.2 of SAE-J1100a.

H195 LIFTOVER HEIGHT. The dimension measured vertically from the luggage compartment lower opening at the zero "Y" plane to ground.

Interior Volumes (EPA Classification)

The Interior Volume Index is listed for each body style except two seaters. The interior volume index estimates the space in a car. It is based on four measurements – head room, shoulder room, hip room, and leg room – for the front and rear seats, plus trunk capacity. The interior volume index is an estimate of the size of the passenger compartment.

The Trunk/Cargo Index is an estimate of the size of the trunk/cargo space. In station wagons and hatchbacks it is an estimate of the space behind the second seat.

Station Wagon – Third Seat Dimensions

L85 SgRP COUPLE DISTANCE–THIRD. The dimension measured horizontally from the SgRP–second to the SgRP–third.

L86 EFFECTIVE LEG ROOM–THIRD. The dimension measured along a line from the ankle pivot center to the SgRP–third plus 254 mm (10.0 in.).

L87 KNEE CLEARANCE–THIRD. The minimum dimension from the knee pivot center to the back of second seatback minus a constant of 51mm (2.0 in.). With rear-facing third seat, dimension is measured to closure.

L88 BACK ANGLE–THIRD. Measured in the same mannere as L41.

L89 HIP ANGLE–THIRD. Measured in the same manner as L43.

L90 KNEE ANGLE–THIRD. Measured in the same manner as L45.

L91 FOOT ANGLE–THIRD. Measured in the same manner as L47.

W85 SHOULDER ROOM–THIRD. Measured in the same manner as W4.

W86 HIP ROOM–THIRD. Measured in the same manner as W5.

H86 EFFECTIVE HEAD ROOM–THIRD. The dimension, measured along a line 8 deg. from the SgRP–third to the headlining rear of vertical plus a constant of 102 mm (4.0 in.).

H87 SgRP–THIRD TO HEEL POINT.

SD1 SEAT FACING DIRECTION–THIRD.

Station Wagon – Cargo Space Dimensions

L200 CARGO LENGTH–OPEN–FRONT. The minimum dimension measured longitudinally from the back of the front seatback at the height of the undepressed floor covering to the rearmost point on the undepressed floor covering on the open tailgate or cargo surface if the rear closure is a conventional door type tailgate at the zero "Y" plane.

L201 CARGO LENGTH–OPEN–SECOND. The dimension measured longitudinally from the back of the second seatback at the height of the undepressed floor covering to the rearmost point on the undepressed floor covering on the open tailgate or cargo floor surface if the rear closure is a conventional door type tailgate, at the zero "Y" plane.

L202 CARGO LENGTH–CLOSED–FRONT. The minimum dimension measured horizontally from the back of the front seat at the height of the undepressed floor covering to the rearmost point on the undepressed floor covering on the closed tailgate or taildoor for station wagons, trucks and mpv's at the zero "Y" plane.

L203 CARGO LENGTH–CLOSED–SECOND. The dimension measured horizontally from the back of the second seat at the height of the undepressed floor covering to the rearmost point on the undepressed floor covering on the closed tailgate or taildoor for station wagons, trucks and mpv's at the zero "Y" plane.

L204 CARGO LENGTH AT BELT–FRONT. The minimum dimension measured horizontally from the back of the front seatback at the seatback top to the foremost normal surface of the closed tailgate or inside surface of the cab backpanel at the height of the belt, on the zero "Y" plane.

L205 CARGO LENGTH AT BELT–SECOND. The minimum dimension measured horizontally from the back of the second seatback at the seatback top to he foremost normal surface of the closed tailgate at the height of the belt, on the zero "Y" plane.

W201 CARGO WIDTH–WHEELHOUSE. The minimum dimension measured laterally between the trimmed wheelhousings at floor level. For any vehicle not trimmed, measure to the sheet metal.

MVMA Specifications Form

METRIC (U.S. Customary)

Interior Vehicle And Body Dimensions – Key Sheet
Dimensions Definitions

W203 REAR OPENING WIDTH AT FLOOR. The minimum dimension measured laterally between the limiting interferences of the rear opening at floor level.

W204 REAR OPENING WIDTH AT BELT. The minimum dimension measured laterally between the limiting interferences of the rear opening at belt height or top of pick up box.

W205 REAR OPENING WIDTH ABOVE BELT. The minimum dimension measured laterally between the limiting interferences of the rear opening above the belt height.

H197 FRONT SEATBACK TO LOAD FLOOR HEIGHT. The dimension measured vertically from the horizontal tangent to the top of the seatback to the undepressed floor covering.

H201 CARGO HEIGHT. The dimension measured vertically from the top of the undepressed floor covering to the headlining at the rear wheel "X" coordinate on the zero "Y" plane.

H202 REAR OPENING HEIGHT. The dimension measured vertically from the top of the undepressed floor covering to the upper trimmed opening on the zero "Y" plane with rear door fully open.

H250 TAILGATE TO GROUND CURB MASS (WT.). The dimension measured vertically from the top of the undepressed floor covering on the lowered tailgate to ground on the zero "Y" plane.

V2 STATION WAGON
Measured in inches:

$$\frac{W4 \times H201 \times L204}{1728} = ft^3$$

Measured in mm:

$$\frac{W4 \times H201 \times L204}{10^9} = m^3 \text{ (cubic meter)}$$

V4 HIDDEN LUGGAGE CAPACITY–REAR OF FRONT SEAT. The total volumes of individual pieces of one set of standard luggage stowed in any hidden cargo area below the load floor rear of the front seat.

V5 TRUCKS AND MPV'S WITH OPEN AREA.
Measured in inches:

$$\frac{L506 \times W500 \times H503}{1728} = ft^3$$

Measured in mm:

$$\frac{L506 \times W500 \times H503}{10^9} = m^3 \text{ (cubic meter)}$$

V6 TRUCKS AND MPV'S WITH CLOSED AREA.
Measured in inches:

$$\frac{L204 \times W500 \times H505}{1728} = ft^3$$

Measured in mm:

$$\frac{L204 \times W500 \times H505}{10^9} = m^3 \text{ (cubic meter)}$$

V8 HIDDEN LUGGAGE CAPACITY–REAR OF SECOND SEAT. The total volume of individual pieces of one set of standard luggage stowed in any hidden cargo area below the load floor rear of the second seat.

V10 STATION WAGON CARGO VOLUME INDEX.
Measured in inches:

$$\frac{H201 \times L205 \times \frac{W4 + W201}{2}}{1728} = ft^3$$

Measured in mm:

$$\frac{H201 \times L205 \times \frac{W4 + W201}{2}}{10^9} = m^3 \text{ (cubic meter)}$$

Hatchback – Cargo Space Dimensions

All hatchback cargo dimensions are to be taken with the front seat in full down and rear position, and the rear seat folded down. The hatchback door is in the closed position. (For electrically adjusted seats, see the manufacturer's specifications for Design "H" Point).

L208 CARGO LENGTH AT FRONT SEATBACK HEIGHT. The minimum horizontal dimension from the "X" plane tangent to the rearmost surface of the driver's seatback to the inside limiting interference of the hatchback door on the vehicle zero "Y" plane.

L209 CARGO LENGTH AT FLOOR–FRONT–HATCHBACK. The minimum horizontal dimension measured at floor level from the rear of the front seatback to the normal limiting interference of the hatchback door on the vehicle zero "Y" plane.

L210 CARGO LENGTH AT SECOND SEATBACK HEIGHT–HATCHBACK. The minimum dimension measured from the "X" plane tangent to the rearmost surface of second seatback or the load floor which is stowed at least one half of the H198 dimension height above the rear load floor, to the rearmost inside limiting interference on the zero "Y" plane.

L211 CARGO LENGTH AT FLOOR–SECOND HATCHBACK. The minimum horizontal dimension measured at floor level from the rear of the second seatback or load floor panel to the normal limiting interference of the hatchback door on the vehicle zero "Y" plane.

H197 FRONT SEATBACK TO LOAD HEIGHT. The dimension measured vertically from the horizontal tangent to the top of the seatback to the undepressed floor covering.

H198 SECOND SEATBACK TO LOAD FLOOR HEIGHT: The dimension measured vertically from the second seat back to the undepressed floor covering.

V3 HATCHBACK.
Measured in inches:

$$\frac{\frac{L208 + L209}{2} \times W4 \times H197}{1728} = ft^3$$

Measured in mm:

$$\frac{\frac{L208 + L209}{2} \times W4 \times H197}{10^9} = m^3 \text{ (cubic meter)}$$

V4 HIDDEN LUGGAGE CAPACITY–REAR OF FRONT SEAT. The total volumes of individual pieces of one set of standard luggage stowed in any hidden cargo area below the load floor rear of the front seat.

V11 HATCHBACK CARGO VOLUME INDEX. Usable luggage (one (1) stand and luggage set) below floor:
Measured in inches:

$$\frac{\frac{L210 + L211}{2} \times W4 \times H198}{1728} = ft^3$$

Measured in mm:

$$\frac{\frac{L210 + L211}{2} \times W4 \times H198}{10^9} = m^3 \text{ (cubic meter)}$$

MVMA Specifications Form
METRIC (U.S. Customary)

∅ Index

MVMA Specifications Form

Vehicle Line Cutlass Calais
Model Year 1989 Issued _____ Revised (e) _____

METRIC (U.S. Customary)

Engine Description/Carb. Engine Code	2.5L (151) L4 L68

Electrical – Supply System

Battery	Manufacturer	Delco Remy
	Model, std., (opt.)	1981601
	Voltage	12V
	Amps at 0°F cold crank	630 CCA
	Minutes-reserve capacity	90 RC
	Amp/hrs. - 20 hr. rate	54 AH
	Location	Underhood Front
Alternator	Manufacturer	Delco Remy
	Rating (idle/max. rpm)	28/74 1101320
	Ratio (alt. crank/rev.)	2.55:1
	Output at idle (rpm, park)	48 Amps at 27°C 950 RPM
	Optional (type & rating)	No Heavy Duty Option
Regulator	Type	Internal to Alternator

Electrical – Starting System

Start. motor	Manufacturer	
	Current drain at -20°F	10455022 417 Amps
	Power rating [kw (hp)]	
Motor drive	Engagement type	Solenoid with Positive Shift
	Pinion engages from (front, rear)	Front

Electrical – Ignition System

Type	Electronic (std., opt., n.a.)		
	Other (specify)		Direct
Coil	Manufacturer		Delco Remy
	Model		1103646 - 1103745
	Current	Engine stopped – A	0
		Engine idling – A	8-10
Spark plug	Manufacturer		AC
	Model		R44TSX
	Thread (mm)		14
	Tightening torque [N-m (lb. ft)]		75 (50)
	Gap		1.5 (.060)
	Number per cylinder		One
Distributor	Manufacturer		
	Model		None

Electrical – Suppression

Locations & type	

MVMA Specifications Form 1989

Vehicle Line Cutlass Calais

Model Year _____ Issued _____ Revised (•) _____

METRIC (U.S. Customary)

Engine Description/Carb. Engine Code	2.5L (151) L4 L68

Engine – Cooling System

Coolant recovery system (std., opt., n.a.)		Surge Tank System
Coolant fill location (rad., bottle)		Surge Tank
Radiator cap relief valve pressure [kPa (psi)]		103.4 (15) (On Surge Tank)
Circulation thermostat	Type (choke, bypass)	Choke
	Starts to open at °C (°F)	91° (195°)
Water pump	Type (centrifugal, other)	Centrifugal
	GPM 1000 pump rpm	8.0
	Number of pumps	One
	Drive (V-belt, other)	V-Belt
	Bearing type	Ball
	Impeller material	Powdered Metal
	Housing material	Die Cast Alum
By-pass recirculation [type (inter,. ext.)]		External - Thru Heater Core
Cooling system capacity	With heater–L(qt.)	7.4 (7.8)
	With air cond.–L(qt.)	7.4 (7.8)
	Opt. equipment [specify–L(qt.)]	None
Water jackets full length of cyl. (yes, no)		Yes
Water all around cylinder (yes, no)		Yes
Water jackets open at head face (yes, no)		Yes
Radiator core	Std., A/C, HD	A/C
	Type (cross-flow, etc.)	Cross Flow
	Construction (fin & tube mechanical, braze, etc.)	Serpentine Fin and Tube
	Material, mass [kg (wgt. lbs.)]	Copper/Brass 5.36 (11.8)
	Width	600 (23.6)
	Height	387 (15.2)
	Thickness	25 (.98)
	Fins per inch	20
Radiator end tank material		Brass
Fan	Std., elec., opt.	Electric
	Number of blades & type (flex, solid, material)	6 Plastic
	Diameter & projected width	290 (11.4), 373 (14.7)
	Ratio (fan to crankshaft rev.)	Not Applicable
	Fan cutout type	Engine Control Module (ECM)
	Drive type (direct, remote)	Direct Drive Electric Motor (All)
	RPM at idle (elec.)	2200 1900
	Motor rating (wattage) (elec.)	100W 150W
	Motor switch (type & location) (elec.)	
	Switch point (temp., pressure) (elec.)	*
	Fan shroud (material)	None Plastic

* On at 108°C Coolant Temperature or 300 PSI A/C Head Pressure.

MVMA Specifications Form

Vehicle Line Cutlass Calais
Model Year 1989 Issued _____ Revised (•) _____

METRIC (U.S. Customary)

Engine Description/Carb. Engine Code	2.5L (151) L4 L68

Engine – Fuel System

(See supplemental page for details of Fuel Injection, Supercharger, Turbocharger, etc. if used)

Induction type: carburetor, fuel injection system, etc.		Throttle Body Injection
Manufacturer		Rochester
∅ Carburetor no. of barrels		
Idle A/F mix.		ECM Control
Fuel injection	Point of injection (no.)	Throttle Body - Single Point
	Constant, pulse, flow	Pulse
	Control (electronic, mech.)	Electronic
	System pressure [kPa (psi)]	83 KPA (12 PSI)
Idle spd.-rpm (spec. neutral or drive and propane if used)	Manual	
	Automatic	
Intake manifold heat control (exhaust or water thermostatic or fixed)		Water
Air cleaner type		Replaceable Paper Element
Fuel filter (type/location)		Replaceable/Inline Rear of Tank
∅ Fuel pump	Type (elec. or mech.)	Electric
	Location (eng., tank)	Tank
	Pressure range [kPa (psi)]	Not Applicable
∅	Flow rate at regulated pressure (L (gal)/hr @ kPa (psi))	4.21 (1.11) @ 83 (12)

Fuel Tank

Capacity [refill L (gallons)]		51.5 (13.6)
Location (describe)		Rear Center Underside, R.H. Rear Quarter Panel
Attachment		Underbody Strap
Material & Mass [kg (weight lbs)]		Steel
Filler pipe	Location & material	Right Rear Quarter Panel - Steel
	Connection to tank	Hoses
Fuel line (material)		Steel GM124M
Fuel hose (material)		Rubber GM6163M
Return line (material)		Steel GM124M
Vapor line (material)		Steel GM124M
Extended range tank	Opt., n.a.	NA
	Capacity [L (gallons)]	
	Location & material	
	Attachment	
Auxiliary tank	Opt., n.a.	NA
	Capacity [L (gallons)]	
	Location & material	
	Attachment	
	Selector switch or valve	
	Separate fill	