MANUFACTURERS MOTOR VEHICLE SPECIFICATIONS

METRIC (U.S. Customary)

1989

Manufacturer

Oldsmobile Division General Motors Corporation

Mailing Address

920 Townsend Street Lansing, Michigan 48921

Vehicle Line

Cutlass Calais

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.



Motor Vehicle Manufacturers Association of the United States, inc.

Blank Forms Provided by Technical Affairs Division

MYMA Specifications Form

METRIC (U.S. Customary)

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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.

 - 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 (e)
 9-88

 \varnothing Vehicle Origin

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

 \varnothing Vehicle Models

| Model Description & Drive Introduct (FWD / RWD / AWD / 4WD)* Date | | 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 Internatio | ona l | | |
| Series Coupe | 3NK27 | 2/3 | 60 (132) |
| Cutlass Calais Internatio | ona l | | |
| Series Sedan | 3NK69 | 2/3 | 60 (132) |

MVMA Specifications Form METRIC (U.S. Customary)

Vehicle Line <u>Cutlass Calais</u>

Model Year <u>1989</u> Issued <u>6-88</u> Revised (•) <u>9-88</u>

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.

| | | | ENGI | NE | | | E | <u> </u> | |
|------------------------|------|---------------------------|--------------------------|-----------------|---------------------------|------------------------------|----------------|------------------------------------------------------|------------------------------|
| SERIES AVAILABILITY | | Induction |) | | AE Net at RPM | | TRANSMISSION/ | AXLE RATIO | |
| | Code | Dispi. Liters (in³) | (FI, CARB/ 88L, etc.) | Compr. Ratio | Power kW (bhp) | Torque N • m (lb. ft.) | s t S/D* | TRANSAXLE | (std. first) |
| NA00 (Std.) | L68 | 2.5L (151) L4 | EFI | 8.3:1 | 82 (110) @ 5200 | 183 (135) @ 3200 | | (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 | | (Std.) Manual/ 5-Speed (Opt.) Auto/ 3-Speed | 3.61 Std. 2.84 Std. |
| NKOO | LGO | 2.3L (138) L4 | MF1 | 10.0:1 | 134 (180) @ 6200 | 217 (160) @ 5200 | S | 5-Speed Manua 1 | 3.61 |

^{*} Single / Dual

Vehicle Line <u>Cutlass</u> Calais MVMA Spesifications Form Model Year __1989 6-88 Revised (e) 9-88 **METRIC (U.S. Customary)** 2.3L Engine Description/Cart. Engite Code LD2 (138) L4 ENGINE - GENERAL Type & description (inline, V, angle, flat, location, front, mid, rear, transverse, longitudinal, sono, dono, offv, hemi, wedge, pre-camber, etc.) Inline, Front, Transverse, Pent Roof Manufacturer B-O-C Powertrain, Lansing No. of cytingers 4 Bore 92 (3.62) Stroke 85 (3.35) Bore spacing (C/L to C/L) 100 (3.94) Cylinder block material & mase 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) Cylinder head material & mass kg (lbs.) Aluminum Alloy 8.60 (18.96) Cylinder head volume (cm²) 49.379 ± 1.5 Cylinder liner material None Head gasket thickness (compressed) 1.03 - 1.13 (.040 - . .044) Minimum combustion chamber total volume (cm²) 66.433 Cyl. no. system L. Bank 1-2-3-4 (front to rear)" R. Benk None Firing order 1-3-4-2 intake manufold material & mase (kg (lbs.))** <u>Alumi</u>num Per GM 3950-M 3.06 (6.75) Exhaust manifold material & mass (log (lbs.))** Stainless Steel Tube, Steel Flanges 3.72 (8.2) Fuel required unleaded, diesel, etc. <u>Unleaded</u> Fuel entitinock index (R + M) + 287 Ø Number 3 Material and type (elestomeric, hydroelestic, hydroelestic, hydraulic damper, etc. Engine 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 (weight, oz.) - pieton anty <u> Aluminum 396 (12.8)</u> Engine - Camsheft Location <u>Overhead</u>

Cast Iron

Chain

22.86

Drive type

Material & mass kg (weight, Ibs.)

Chain / belt

Width / pitch

Intake 3.045 (6.713)

<u> Exhaust 2.948 (6.499)</u>

375)

Duplex - 130 Pitches

9.525

^{*} Rear of engine - drive takeoff, View from drive takeoff and to determine left & right side of engine.

^{**} Finished state

^{***} Dresest engine mass (weight) includes the following:

Cutlass Calais **MVMA Specifications Form** Vehicle Line _ 1989 Model Year. Issued 6-88 9-88 Revised (*) . **METRIC (U.S. Customary)** Engine Description/Carb. 3.3L V6 **Engine Code** (204 CID) LG7 **ENGINE - GENERAL** Type & description (inline, V, angle, flat, location, front, mid, reer, transverse, longitudinal, soho, doho, ony, 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 specing (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) .02 (0.040) Above Cylinder head material & mass kg (lbs.) Cast Iron 13.18 (29.0) each Cylinder head votume (cm²) <u>37.36 (2.28 Cubic Inches)</u> Cylinder liner material None Head gasket thickness (compressed) 1.26 (0.049) Minimum combustion chamber total volume (cm³) 69.53 (4.243 Cubic Inches) Cyl. no. system L. Bank 1-3-5 (front to reer)* R. Bank 2-4-6 Firing order 1-6-5-4-3-2 intake manifold material & mass [kg (lbs.)]*** <u> Aluminum 5.53 (12.17)</u> Exhaust manifold material & mass (kg (lbs.))** <u> Stainless Steel Left - 2.04 (4.49); Right - 3.23</u> Fuel required unleaded, diesel, etc. <u>Unleaded</u> Fuel antiknock index (R + M) + 287 Number 3 Material and type (elastomeric, hydroelastic, hydraulic damper, etc. Engine 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 5150 Steel 2.99 (6.58) | |
|----------------|----------------------|--------------------------------------------------------|--|
| Meterial & mar | ss kg (weight, lbs.) | | |
| 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 specing (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 (cm²) | 45,62 (2.76) |
| Cylinder liner material | None |
| Head gasket thickness (compressed) | 1.12 (0.044) |

| Cyl. no. system | L. Bank | 1-2-3-4 | |
|---------------------------------------|----------------------------------------------------------------------|--------------------------------------|--|
| (front to rear)* | R. Benk | | |
| Firing order | | 1-3-4-2 | |
| Intake manifold m | naterial & mass (kg (lbs.))** | Aluminum 3.70 (8.14) | |
| Exhaust manifold | material & mass [kg (lbs.)]** | Stainless Steel 1.72 (3.79) Unleaded | |
| Fuel required unit | eaded, diesel, etc. | | |
| Fuel antilmock in | dex (R + M) + 2 | 87 | |
| | Number | 3 | |
| Engine mounts | 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) | |

70.82 (4.32)

Engine -- Pistons

Minimum combustion chamber

total volume (cm²)

| Material & mass, g (weight, oz.) - piston only | Cast Alum Alloy 530.0 (18.7) |
|---------------------------------------------------|---------------------------------|
| | 1_330.0_(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 Engine Code

2.3 LITER L4 (138 CID)

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.) | | l, rear. l, sohc. dohc. | |
|----------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------|--------------------------------------------------|
| | | | Inline, Front, Transverse, Pent House |
| Manufactur | rer | | B-O-C Lansing Automotive Division |
| N cylin | nders | | 4 |
| Bore | | | 92 mm (3.63 in.) |
| Stroke | | | 85 mm (3.35 in.) |
| Bore spacii | ng (C/L to C | /L) | 100 mm (3.94 in.) |
| Cyl blck ma | eti & mass kg | (lbs.)(machined) | Cast Iron 42.83 (94.226) |
| Cylinder bi | ock deck he | ight | 222 mm (8.74 in.) |
| Cylinder bl | ock length | | 499.5 (19.66) |
| | Deck clearance (minimum) (above or below block) | | o |
| Cyl. head n | naterial & ma | ss kg (lbs.) | Aluminum Alloy 8.60 (18.96) |
| Cylinder he | ad volume (| cu. cm.) | 47.0 +/- 1.5cc |
| Cylinder lin | er material | | None |
| Head gasks (compresse | et thickness ed) | | 1.03 - 1.13 mm (.040044 in.) |
| Minimum co total volum | ombustion c a (cm. cu.) | hamber | 62.8 |
| Cyl. no. sys | stem | L. Bank | 1-2-3-4 |
| | <u> </u> | R. Bank | None |
| Firing order | <u></u> | | 1-3-4-2 |
| Intake mani | fold mati & n | nass[kg(ibs.)]" | Aluminum Per GM 3950-M 4.80 (10.56) |
| Exh. manife | old matl & ma | 155 (kg (lbs.)]** | Cast fron 6.74 (14.86) |
| Fuel require | ed unicaded. | diesel, etc. | Unleaded |
| Fuelantikno | ock index (R | + M) / 2 | 87 |
| | Quantit | y | 3 |
| Engine mounts | Mati and hydroel damper | d type (elastomeric, astic, hydraulic , etc.) | Elastomeric (2) Hydraulic-Elastomeric (1) |
| | Added i crossme | solation (sub-frame, ember, etc.) | Isolated Cross Member Supporting the Front Mount |

Engine - Pistons

Total dressed engine mass (wt) dry

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

Aluminum .423 (14.88

177.8 (391.16)

Engine Camshaft

| Location Material & mass kg (weight, lbs.) | | Overhead | |
|---------------------------------------------|-------------|-----------|------------------------------------------|
| | | | Intake 3.045 (6.713) |
| | | Cast Iron | 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:

| | Specification | Model Year 1989 Issued6_88 Revised (e)9_88 |
|---------------------------------------------------|----------------------------------------------------------------------------|----------------------------------------------------|
| METRIC | (U.S. Customary) | |
| Engine Deec Engine Code | ription/Cerb. | 2.3L (138) 14 1D2 |
| Engine ' | Valve System | · |
| Hydraulic lifter | s (std., opt., NA) | Standard |
| | Number intake / exhaust | 8/8 |
| Valves | Head O.D. intake / exhaust | 35.63 (1.40)/30.14 (1.19) |
| Engine - (| Connecting Rods | |
| Material & mar | ss [kg., (weight, (bs.)]* | Carbon Steel S.A.E. #1141 Modified .673 (1.5) Each |
| Length (axes4 | | 147.5 (5.81) |
| | | 1147.3 (3.81) |
| | <u>Crankshaft</u> | |
| | ss (kg., (weight, lbs.))* | Nodular Iron GM6129 18.8 (41.4) |
| | on by bearing (no.) | #3 |
| Length & numb | ber of main bearings | #1, 2, 4 & 5 21.25 (.84) #3 27,25 (1.09)/5 |
| Seel (material, | | One Piece, Viton |
| piece design, e | Reer Reer | One Piece, Viton |
| Normal oil pres | Lubrication System Laure [kPe (psi) at engine rpm] (floating, stationary) | 207 (30) @ 2000 RPM |
| | (full flow, part, other) | Stationary Pick-up |
| | ase, less filter-refil-L (qt.) | Full |
| | | 13.79 (4) |
| | Plesel Information | |
| Diesel engine r | | |
| Glow plug, curr | ent drain at 0°F | |
| Injector | Туре | |
| | Opening pressure [kPa (psi)] | |
| Pre-chamber d | | |
| Fuel in- | Manufacturer | |
| Evel injection o | | |
| | ump drive (belt, chain, gear) | |
| Fuel heater (ye | vacuum source (type) | |
| | | |
| (std., opt.) | r, description | |
| Turbo manufacturer | | |
| Turbo manufac | | |
| | (oil to engine coolant; ir) | |
| Oil cooler-type | (oil to engine coolant; ir) | |
| Oil cooler-type oil to ambient a Oil filter | (cil to engine coolant; ir) ntake System | |
| Oil cooler-type oil to ambient a Oil filter | ntake System | |

^{*}Finished State

| Specifications | Model Year 1989 Issued 6-88 Revised (*) 9-88 |
|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (U.S. Customary) | |
| cription/Carb. 9 | 3.3L V6 (204 CID) LG7 |
| Valve System | |
| rs (std., opt., NA) | Standard (Roller) |
| Number intake / exhaust | 6/6 |
| Head O.D. intake / exhaust | 43,40 (1.71)/38.10 (1.5) |
| Connecting Rods | |
| ss (kg., (weight, lbs.))* | Pearlitic Malleable 0.61 (1.34) each |
| € to•€) mm | 135.66 (5.341) |
| Crankshaft | |
| ss [kg., (weight, lbs.)]* | Nodular Iron 15.12 (33.26) |
| en by bearing (no.) | Two |
| ber of main bearings | 21.9 (0.864) Four |
| , one, two Front | One Piece Rubber Lip |
| etc.) Rear | Two Piece Rope |
| Lubrication System | 210 (45) 0 0000 |
| | 310 (45) @ 2000 Stationary |
| | Full Flow |
| case, less filter-refill-L (qL) | 3.78 (4) |
| Diesel Information | |
| manufacturer | |
| rrent drain at OTF | |
| Туре | |
| Opening pressure [kPa (psi)] | |
| design | |
| Manufacturer | |
| Туре | |
| | |
| pump drive (belt, chain, gear) | X |
| y vacuum source (type) | |
| y vacuum source (type) es/no) | |
| y vacuum source (type) es/no) or, description | |
| y vacuum source (type) es/no) | |
| y vacuum source (type) es/no) or, description | |
| y vacuum source (type) es/no) for, description cturer e (oil to engine coolant; | |
| y vacuum source (type) es/no) for, description cturer e (oil to engine coolant; | |
| y vacuum source (type) es/no) or, description cturer e (oil to engine coolant; eir) | |
| | Valve System rs (std., opt., NA) Number intake / exhaust Head O.D. intake / exhaust Connecting Rods as [kg., (weight, lbs.)]* E to-R) mm Crankshaft as [kg., (weight, lbs.)]* an by bearing (no.) an beer of main bearings to one, two etc.) Front Rear Lubrication System assure [kPa (psi) at engine rpm] o (floating, stationary) m (full flow, part, other) case, less filter-refill-L (qt.) Diesel information manufacturer ment drain at 0°F Type Opening pressure [kPa (psi)] design Manufacturer |

^{*}Finished State

| MVM | A Specifications | Form | Vehicle Line_ | | ss Calai | <u>s</u> | | |
|------------------------------|--------------------------------------|---------------------------------------|---------------------------------------|--------------|--------------|---------------------------------------|--------------|---------------|
| | C (U.S. Customary) | | Model Year_ | 1989 | issued _ | 6~88 | Revised (*) | 9-88 |
| Engine De Engine Co | ecription/Carb. de | 2.5L (1 | .51) L4 L | 68 | | · · · · · | | . • |
| Engine - | - Valve System | | | | | | | |
| Hydrautic litt | ters (std., opt., NA) | Standard (| Roller Li | fters) | | | | |
| 1/01 | Number intake / exhaust | 4/4 | | | | · · · · · · · · · · · · · · · · · · · | | |
| Valves | Head O.D. intake / exhaust | 43.69 (1.7 | 2)/38.10 | (1.50) | _ | | | |
| Engine - | - Connecting Rods | · · · · · · · · · · · · · · · · · · · | | - | - | | | |
| Material & m | nass [kg., (weight, !bs.)]* | Cast Arma | Steel | | | ··· | | |
| Length (axe | e€ to€) mm | | J J J J J J J J J J J J J J J J J J J | | | | | |
| Engine - | - Crankshaft | | | | | | | |
| Material & rr | nass (kg., (weight, lbs.))* | Nodular Ca | st Iron 1 | 3.77 (30 | .3) | | | |
| End thrust to | aken by bearing (no.) | 5 | <u> </u> | 9.77 100 | , | | | |
| Length & nu | mber of main bearings | 5 | | | | | | |
| Seal (materi | al, one, two Front | One Piece | Radial Li | p-Viton | | | | |
| piece design | t, etc.) Rear | One Piece | | | | | | |
| Engine - | - Lubrication System | | · · | <u>-</u> | | | " | |
| Normal oil p | ressure (kPa (psi) at engine rpm) | 259.0 (37 | 5) @ 2000 | | | | | |
| | ke (floating, stationary) | Stationary | | | | | | |
| Oil filter syst | em (full flow, part, other) | Full Flow | | | | | | - |
| Capacity of c | c/case, less filter-refill-L (qt.) | 3.78 (4.0 | | · | | | | |
| Engine - | Diesel Information | | | | | | | |
| Diesel engin | e manufacturer | | · · · · · · · · · · · · · · · · · · · | | | | | |
| Glow plug, c | urrent drain at 0°F | | | . | | | | |
| Injector | Туре | | | | | | | |
| nozzie | Opening pressure [kPa (psi)] | | | | | · | | |
| Pre-chamber | r design | | $\overline{}$ | | | | | |
| Fuel in- | Manufacturer | | | | | | | |
| jection pump | 1,300 | | | | | / | | |
| Fuel injection | pump drive (belt, chain, gear)- | | | | | | | |
| Supplement | ary vacuum source (type) | | | | | | | |
| Fuel heater (| yes/no) | | | | | | | |
| Water separa (std., opt.) | ator, description | | | | | | | |
| Turbo menuf | acturer | | | | | | | |
| Oil cooler-typ | pe (oil to engine coolant; t zir) | | | | | | | |
| Oil filter | | | | | | | | $\overline{}$ |
| Engine - | Intake System | | | | | | | |
| | r - manufacturer | | | | | | | |
| | r - manufacturer | | | | | | | |
| | - ''' | ī | | | | | | |

^{*}Finished State

| MVMA | Specific | ations | Vehicle Line | CUTI | ASS CALAIS | | |
|------------------------------------------|---------------------------|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-----------------------|-------------|-------------|
| • | | | Model Year | 1989 | Issued | Revised(*) | |
| METRIC (| U.S. Custom | ary) | | | - | | |
| Engine Desc | aription | | 2.3 LITER L4 (13 | 8 CID) | | | |
| Engine Code | • | | MULTI-PORT FUE | • | ON RPO LGO | | |
| Engine - | Valve Syste | <u>m</u> | | | | | |
| Hydrauhe hfters | (std., opt., NA) | | Standard | | | | |
| Valves | Number intake/ | exhaust | 8/8 | | | | |
| | Head O.D. intak | e/exhaust | 36.50 mm (1.44 in.) | / 31.50 mm | 1 (1.24 in.) | | |
| Engine - | Connecting | Rods | | | | | |
| Material & mass | (kg., (weight, lbs.)] | • | Carbon Steel S.A.E. | #1141 Mo | dified .673 (1.5) Eac | :h | |
| Length(axes cer | nterline to centerlin | e)mm | 147.5 (5.81) | | | | |
| Engine - | Crankshaft | | | | | | |
| Material & mass | (kg., (weight, lbs.)] | • | Nodular Iron GM612 | 9 19.0 (41. | 9) | | |
| End thrust take | n by bearing (no.) | | #3 | | | | |
| Length & numbe | er of main bearings | | #1, 2, 4, & 5 21,25 n | nm (.84 in.) | #3 27.25 mm (1.09 | in.)/5 | |
| Seal (material, o piece design, et | | Front | One Piece, Viton | | | | |
| | , | Rear | One Piece, Viton | | | | |
| Engine - 1 | Lubrication 5 | System | | | | | |
| Normal oil press | ure[kPa(psi) 👁 eng | rpm) | 207 (30) @ 2000 | | | | - |
| Type oil intake (| lloating, stationary) | | Stationary Pick-up | | | | |
| Oil filter sys. (fu | ll flow,part, other) | | Full | | | | |
| Capacity of c/ca fitter-refill-L (g) | | | 3.79 (4) | _ | | | |
| Engine - I | Diesel Inform | nation | NOT APPLICABLE | | | | |
| Diesel engine m | enufacturer | | | | | | |
| Glow plug, curre | nt drain at 0 deg. F | | | | | | |
| injector Nozzie | Туре | | | | | | |
| | Opening pressure | e(kPa(psi)) | | | | | |
| Pre-chamber de | sign | | | | | | |
| Fuel in- ection pump | Manufacturer | | | | | | |
| | Туре | | | | | | |
| uelin), pump dr | ive (beit,chain,gear | <u> </u> | | | | | |
| Supplementary v | acuum source (type |) | | | | | |
| uel heater (yes | (no) | | | | | | |
| Water separator, std., opt.) | description | | | | " | | - |
| urbo manufactu | rer | | | | | | |
| Oil cooler-type (i oil to ambient air | oil to engine coolen) | ; | | | | | |
| Oil fifter | | | | | | | |
| Engine – li | ntake Syster | <u> </u> | NOT APPLICABLE | | | | · · · · |
| urbo charger - I | | | The state of the s | | | | |
| uper charger - r | nanufacturer | | | | • | | |
| | | | | | | | |

^{*}Finished State

MVMA Specifications Formage

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

| METRIC (U.S. C | ustomary) |
|----------------|-----------|
|----------------|-----------|

Engine Description/Carb. Engine Code

2.5L (151) L4 L68

| Coolant fill loca | ery system (std., opt., n.s.) ation (rad., bottle) elief valve pressure [kPa (psi)] Type (choke, bypass) Starts to open at "C ("F) Type (centrifugal, other) GPM 1000 pump rpm | Surge Tank System Surge Tank 103.4 (15) (On Surge Tank) Choke 91° (195°) |
|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Coolant fill local Radiator cap in Circulation | ation (rad., bottle) elief valve pressure [kPa (psi)] Type (choke, bypass) Starts to open at °C (°F) Type (centrifugal, other) | Surge Tank 103.4 (15) (On Surge Tank) Choke |
| Circulation | Type (choke, bypass) Starts to open at "C ("F) Type (centrifugal, other) | 103.4 (15) (On Surge Tank) Choke |
| | Starts to open at "C ("F) Type (centrifugal, other) | Chake |
| therrnostat | Type (centrifugal, other) | |
| | | 4 |
| | GPM 1000 purps | |
| | Car or I non british thus | * |
| | Number of pumps | |
| Water | Drive (V-belt, other) | |
| pump | Bearing type | |
| ſ | Impeller material | |
| | Housing material | |
| By-pess recirci | ulation [type (inter,. ext.)] | External - Thru Heater Core |
| Cooling | With heater-L(qt.) | 7.4 (7.8) |
| system capacity | With air condL(qL) | 7.4 (7.8) |
| - | Opt. equipment (specify-L(qt.)) | None |
| Water jackets t | full langth of cyl. (yes, no) | TOTAL CONTRACTOR OF THE PROPERTY OF THE PROPER |
| Water all arour | nd cylinder (yes, no) | |
| Water jackets o | open at head face (yes, no) | |
| | Std., A/C, HD | A/C |
| | Type (cross-flow, etc.) | Cross Flow |
| Radiator | Construction (fin & tube mechanical, braze, etc.) | Serpentine Fin and Tube |
| core | Material, mass (kg (wgt, tbs.)) | Copper/Brass 5.36 (11.8) |
| | Width | 600 (23.6) |
| Γ | Height | 387 (15.2) |
| | Thickness | 25 (.98) |
| | Fins per inch | 20 |
| Radiator end ta | ank material | Brass |
| | Std., elec., opt. | Flectric |
| | 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 |
| an _ | 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 <u>Cutlass Cal</u>ais 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 reo | overy system (std., opt., n.a.) | Surge Tank System |
| Coolant fill i | ocation (rad., bottle) | Surge Tank |
| Redistor ca | p retief valve pressure (kPa (psi)) | 103.5 (15) (On Surge Tank) |
| Circulation | Type (choke, bypess) | Bypass |
| thermostat | Starts to open at "C ("F) | 89 (192) |
| | Type (centrifugal, other) | Centrifugal |
| | GPM 1000 pump rpm | 6.5 |
| | Number of pumps | One |
| Water | Drive (V-belt, other) | Chain |
| ритр | Bearing type | 2 Row Ball |
| | Impeller material | Sheet Metal |
| | Housing material | Die Cast Aluminum |
| By-pass rec | irculation (type (inter,. ext.)] | External - Heater Water Flow |
| Cooling | With heater-L(qt.) | 7.20 (7.6) |
| system capacity | With air condL(qt.) | 7.20 (7.6) |
| Capacity | Opt. equipment [specify-L(qt.)] | None |
| Water jacke | ts full length of cyl. (yes, no) | Yes |
| | ound cylinder (yes, no) | No |
| Water jacke | ts open at head face (yes, no) | Yes |
| | Std., A/C, HD | Standard |
| | Type (cross-flow, etc.) | Cross Flow |
| Radiator | Construction (fin & tube mechanical, braze, etc.) | Serpentine Fin and Tube Vacuum Brazed |
| соге | 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 | i tank material | Nylon 66, 33% Mineral Filled |
| | 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 cranicshaft rev.) | Not Applicable |
| Fan | 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 stroud (material) | None |
| | | |

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

MVMA Specifications Form

Vehicle Line <u>Cutlass, Calais</u>

Model Year <u>1989</u> Issued <u>6-88</u> Revised (e) <u>9-88</u>

METRIC (U.S. Customary)

| Engine | Description/Carb. |
|--------|-------------------|
| Engine | Code |

| | · | |
|---------------|-------|--|
| 3.3L | | |
| J.JL | | |
| (204 CID) LG7 | | |
| (ZU4 CID) LG/ | | |
| | | |

| Engine - | Cooling System | |
|--------------------|----------------------------------------------------|--------------------------------------------------------|
| Coolant reco | wery system (std., opt., n.a.) | Surge Tank System |
| Coolent fill lo | cation (rad., bottle) | Surge Tank |
| Rediator cap | relief valve pressure [kPa (psi)] | 103.4 (15.0) (On Surge Tank) |
| Circulation | Type (choke, bypass) | Bypass |
| thermostat | Starts to open at *C (*F) | 91°C (195°F) |
| | Type (centrifugal, other) | Centrifugal |
| | GPM 1000 pump rpm | 8.0 |
| | Number of pumps | One |
| Water | Drive (V-bett, other) | Poly V-Belt |
| pump | Bearing type | Two Row Ball |
| | Impeter material | Aluminum |
| | Housing material | Aluminum |
| By-pass recir | rculation (type (inter,. ext.)) | External - Thru Heater Core and Internal Thru Manifold |
| Cooling | With heater-L(qL) | 9.4 (10.0 Ots.) |
| system capacity | With air cond.—L(qt.) | 9.8 (10.3 Qts.) |
| Сарилиу | Opt. equipment (specify-L(qt.)) | None |
| Water jackets | s full length of cyl. (yes, no) | Yes |
| Water all aro | und cylinder (yes, no) | Yes |
| Water jackets | s open at head face (yes, no) | No |
| | Std., A/C, HD | A/C |
| | Type (cross-flow, etc.) | Cross Flow |
| Redistor | Construction (fin & tube mechanical, braze, etc.) | Serpentine Fin and Tube Vacuum Brazed |
| core | 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 and | tank material | Plastic |
| | Std., elec., opt. | Electric |
| | Number of blades & type (flex, solid, material) | 6 |
| | Diameter & projected width | 381 |
| | Ratio (fan to crankshaft rev.) | Not Applicable |
| Fan | Fen 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 Goolant Temperature or 260 PSI A/C Head Pressure.

MVMA Specifications

| Vehicle Line | CUTU | ASS CALAIS | <u> </u> |
|--------------|------|------------|------------|
| 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

| CODIANTIFECT | ery system (std, opt, n.a.) | Surge Tank System |
|------------------|---------------------------------------------------|------------------------------------------------------------------------|
| Copiant fell loc | ation (rad., bottle) | Surge Tank |
| Radiator cap r | phof valve pressure | |
| [kPa (psi)] | | 103.5 (15) (On Surge Tank) |
| Circulation | Type (choks, bypass) | Bypass |
| thermostat | Starts to open @ deg's C(F) | 89 (192) |
| | Type (centrifugal, other) | Centrifugal |
| | GPM 1000 pump rpm | 6.5 |
| Vater | Number of pumps | One |
| ump | Drive (V-beit, other) | Chain |
| | Bearing type | 2 Row Ball |
| | Impeller material | Sheet Metal |
| | Housing material | Die Cast Aluminum |
| By-pass recirc | ulation (type (inter., | |
| | | External - Heater Water Flow & Throttle Body Water Flow |
| Cooking | With heater - L (qt.) | 7.20 (7.6) |
| ystem apacity | With air conditioner-L(qt.) | 7.20 (7.5) |
| | Opt. equip.(specify-L(qt.)) | None |
| Vater jackets f | uli length of cyl(yes.no) | Yes |
| Vater all aroun | d cylinder (yes, no) | No |
| Vater jackets o | pen at head face (yes.no) | Yes |
| | Std., A/C, HD | A/C |
| | Type (cross-flow, etc.) | Cross Flow |
| | Construction (fin & tube mechanical, braze, etc.) | Sometime Fire and Tube Version B |
| ladiator pre | Mati., mass (kg(wgt.,ibs.)) | Serpentine Fine and Tube Vacuum Brazed Aluminum 3.65 (8.04) |
| | Width | |
| | Height | 600 (23.6) |
| | Thickness | 382 (15.0) |
| | Fins per inch | 23.5 (.93) |
| adiator end ta | · | |
| | Std., elec., opt, | Nylon 66, 33% Mineral Filled |
| | Number of blades & type | Electric |
| | (flex, solid, material) | 6 - Nylon 6/6 Mineral Filled |
| | Diameter & projected width | 381 (15.0), 37.3 (1.5) |
| | Ratio(fan to critishft.rev.) | Not Applicable |
| ın | 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.) | |
| | Switch point (temp., pressure) (elec.) | ECM |
| | Fan shroud (material) | On at 106 deg. (223) Coolant Temperature or 295 PSI A/C Head Pressure. |

| IAI A U | MA Specifications | S FUIII | Vehicle Line _ Model Year | 1989 | issued | 6-88 | Revised (e) _ | 9-88 |
|-------------------------|-----------------------------------------------------------|-------------------------|------------------------------|----------------|---------------------------------------|---------------|---------------------------------------|---------------------------------------|
| METR | IC (U.S. Customary) | | | • | | | | |
| Engine C | Description/Carb. Code | 2.5L (151) | L4 L68 | | | | | · · · |
| Engine | - Fuel System (See supple | mental page for detail: | s of Fuel Injection. S | upercharger. T | urbocharner en | if used) | | |
| Induction | type: carburetor, fuel | | | | | × 11 0350) | | |
| Manufacti | rystem, etc. | | | | | | | |
| ~ — | r no, of barrels | | | | | | | |
| Idle A/F m | | | | | | | | |
| ICIO AVE III | | | | | | | | |
| Fuei | Point of injection (no.) | | _ | | | | , | |
| injection | Constant, pulse, flow | | | | | | | |
| | Control (electronic, mech.) | | | | | | | |
| Idle spdr | System pressure [kPa (psi)] | | | | - | | | |
| Spec. | pm Mandai | | | | | | <u> </u> | |
| neutral or drive and | futo made | | | · | | | | |
| propane if used) | Automatic | | | | | | | |
| | nifold heat control (exhaust | | | | · · · · · · · · · · · · · · · · · · · | | · · · · · · · · · · · · · · · · · · · | |
| or water th | nermostatic or fixed) | | | | | | | |
| Air cleane | rtype | | - | | | , | | |
| Fuel filter | (type/location) | Replaceable | /Inline Re | ar of Ta | ank | | | |
| 7 Fuel | Type (elec. or mech.) | Electric | | | | | | |
| pump | Location (eng., tank) | Tank | | | | | | |
| | Pressure range [kPa (psi)] | Not Applica | able | | | | | |
| ð | Flow rate at regulated pressure (L (gai)/ hr @ kPa (psi)) | ', - | .5) @ 83 () | 12) | | | | |
| Fuel Ta | nk | | <u> </u> | | | | · | |
| Capacity [| refill L (gailons)] | 51.5 (13.6 |) | <u> </u> | | | | • |
| Location (| | Rear Cente | | RH | Rear Oua | rter Par | اما | |
| Attachmer | ıt | Underbody | | ., | neur qua | CEI I GII | <u> </u> | |
| Material & | Mass (kg (weight ibs)) | Steel | <u> </u> | | - · · | | | |
| Filler | Location & material | Right Rear | Quarter Pa | 2 - [ann | teel | _ | | |
| pipe | Connection to tank | Hoses | <u> </u> | <u> </u> | <u>cce i</u> | | | |
| Fuel line (| naterial) | Steel GM12 | 4M | | | | | |
| Fuel hose | (material) | | astomer G | M6163M | | | | |
| Return line | (material) | Steel GM12 | | <u> </u> | | | | · · · · · · · · · · · · · · · · · · · |
| Vapor line | (material) | Steel GM12 | | | | | | |
| | Opt., n.a. | NA NA | | | | | | |
| Extended range | Capacity (L (gallons)) | | | | | | | · · · · · · |
| tank | Location & material | | | | | | | |
| | Attachment | | . | | | | ~~ | |
| | Opt., n.a. | NA | | | | | | |
| | Capacity [L (gallons)] | 114 | | | - | - | | |
| Auxiliary tank | Location & material | | - | | | | ·· | |
| NEW TO | Attachment | | | | | | | |
| | Selector switch or valve | | | | | | · | |

Separate fill

| | MVM | A Specification: | s Form | Vehicle Line_ | Cutlass | Calais | | | |
|----------|-----------------------------------------------|----------------------------------------------------------|------------------------|---------------------------------------|------------------|-----------------|-------------|---------------------------------------|-----------------------------------------------------|
| | | | J . O | Model Year_ | <u> 1989 </u> | issued | 6-88 | Revised (*) | 9-88 |
| - | METRIC | (U.S. Customary) | | | | | | | |
| | Engine Der Engine Cor | i Cription /Carb. le | 2.3L (138) L4 | LD2 | . <u> </u> | | | | <u> </u> |
| | Engine - | Fuel System (See supple | mental page for detail | ls of Fuel Injection, S | Supercharger, Tu | irbocharger, et | c. if used) | | |
| | Induction typ | e: carburetor, fuel tem, etc. | Port Fuel | Injection | , | | | | |
| | Manufacture | <u> </u> | Rochester | | | | | _ | |
| Ø | Carburetor n | o. of barrels | None | 11000003 | | | | | |
| | idle A/F mix. | | ECM Contro | 1104 | | | | | |
| | | Point of injection (no.) | | s at Ports | in Cylin | dan Haa | 4 | | |
| | Fuel injection | Constant, pulse, flow | Pulse | 3 46 10163 | TII CYTTI | idei, uea | <u>u</u> | | |
| | injection | Control (electronic, mech.) | Electronic | - | ··· | | | | |
| | | System pressure [kPa (psi)] | 300 (43 PS | | | | _ | | |
| | Idle spdrpm | | 900 Neutra | | | | | | |
| | (spec. neutral or | | 200 Hearta | · | | | | | |
| | drive and | Automatic | 900 Both | | | | | <u> </u> | • |
| | propane if used) | | JOO BOCII | | | | | | |
| | | old heat control (exhaust mostatic or fixed) | None | | | · | | | _ |
| | Air cleaner ty | pe | | e Paper Ele | ement | | | | |
| | Fuel filter (typ | ne/location) | None | | | | | | |
| α | Fuel | Type (elec. or mech.) | See Page 6 | | | | | | - |
| V | briud Linel | Location (eng., tank) | | | | | | | |
| | | Pressure range [kPa (psi)] | | | | | · | | |
| Ø | | Flow rate at regulated pressure (L (gal)/hr @ kPa (psi)) | 58.28 (15 | 5.4) @ 350 | (51) | | | • | |
| | Fuel Tani | S | See Page 6 | | | | | | - , _ , _ , _ , _ , _ , _ , _ , _ , _ , |
| | Capacity (refi | I L (gallons)) | <u> </u> | - | | | | | |
| | Location (des | cribe) | | - | | | | | |
| | Attachment | | | · - | | | | | |
| | Material & Ma | ss (kg (weight lbs)) | | | | | | | · · · · · · · · · · · · · · · · · · · |
| | Filler | Location & material | | | | | | _ | |
| | pipe | Connection to tank | | | | | | _ | |
| | Fuel line (mat | enal) | | | | | | | |
| | Fuel hase (mi | Iterial) | | | | | | · · · · · · · · · · · · · · · · · · · | |
| | Return line (m | latorial) | | | | | | | |
| | Return line (material) Vapor line (material) | | | | | | | | |
| | | Opt., n.a. | | | | | | | |
| | Extended range | Capacity [L (gallons)] | | · · · · · · · · · · · · · · · · · · · | | | | | |
| | tank | Location & material | | | | | | | |
| | | Attachment | | | | | | | · <u> </u> |
| , | | Opt., n.a. | | | | | | | |
| | | Capacity [L (gallons)] | | | | | | | |
| | Auxiliary tank | Location & material | | | | | | | |
| • | ,, | Attachment | | | | : | | | |
| | | Selector switch or valve | | | | | | | |

Separate fill

Cutlass Calais **MVMA Specifications Form** Vehicle Line 1989 Model Year_ Issued ____6-88___ Revised (*) 9-88 **METRIC (U.S. Customary)** 3.3L (204) Engine Description/Carb. **Engine Code** 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 Point of injection (no.) Port Fuel Constant, pulse, flow <u>Pulse</u> injection Control (electronic, mech.) Electronic System pressure (kPa (psi)) 36 - 43 PSI idle spd.-rpm Manual N/A (Spec. neutral or N/A drive and **Automatic** 675 RPM Drive propane if used) 800 RPM Neutral Intake manifold heat control (exhaust or water thermostatic or fixed) Air cleaner type Fuel filter (type/location) Type (elec. or mech.) See Page 6 Location (eng., tank) Pressure range [kPa (psi)] Ø Flow rate at regulated pressure (L (gai) / hr @ kPa (psi)) 58.28 (15.4) @ 350 (51) **Fuel Tank** See Page 6 Capacity (refill L (gailons)) Location (describe) Attachment Material & Mass [kg (weight lbs)] Location & material Filler pipe Connection to tank Fuel line (material) Fuel hose (material) Return line (material) Vapor line (material) Opt., n.a. Extended Capacity (L (gallons)) range tank Location & material

Auxiliary

tank

Attachment Opt., n.a.

Attachment

Separate fill

Capacity [L (gailons)]

Selector switch or valve

Location & material

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

| <u>Engine</u> – F | uel System (See sup | plemental page for details of Fuel Inj. Supercharger, Turbocharger, etc. if used) |
|-------------------------------------|---------------------------------------------------------|-----------------------------------------------------------------------------------|
| Induction type: ca | rburstor, fuel | delinental page for octains of Fociati, Supercharger, Turbocharger, etc. if used) |
| injection system, | €tc. | Port Fuel Injection |
| Manufacturer | | Rochester Products |
| Carburetor no. of | barreis | None |
| Idle A/F mix. | | ECM Controlled |
| | Point of inj. (no.) | 4 Injectors at Ports in Cylinder Head |
| Fuel Injection | Constant, pulse, flow | Pulse |
| njecton | Control (elec., mech.) | Electronic |
| | Sys. press. (kPa (psi)) | 300 (43) |
| tale cod -com | Manuai | 900 |
| Idle spdrpm (spec. neutral | | |
| or drive and propane if used) | Automatic | |
| useo) | | |
| intake manifold he | eat control (exhaust | |
| or water thermost | atic or fixed) | None |
| Air cleaner type | | Replaceable Paper Element |
| Fuel filter (type/lo | cation) | None |
| | Type (elec. or mach.) | See Page 6 |
| . . | Location (eng., tank) | |
| Fuel pump | 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 (g | ailons)) | |
| Location (describe |) | |
| Attachment | · · · · · · · · · · · · · · · · · · · | |
| Materiai & Mass (ki | g (weight lbs.)] | |
| Filler | Location & material | |
| pipe | Connection to tank | |
| Fuer line (material) | | |
| Fuel hose (material |) | |
| Return line (materia | 11) | |
| Zapor line (material | 1 | |
| | Opt., n.a. | |
| Extended ange | Capacity [L (gallons)] | |
| ank | Location & material | |
| | Attachment | |
| | Opt., n.a. | |
| | Capacity (L (gallons)) | |
| luxiliary | Location & material | |
| ank | Attachment | |
| | Sictr switch or valve | |
| | Separate fill | |
| | 1 | |

Venicle Line Cutlass Calais Model Year 1989 Issued 6-88 Revised (*) 9-88 MVMA Specifications Form

METRIC (U.S. Customary)

| Engine Dec | eription/Car | b. . | 2.5L |
|-----------------------|----------------------------------------------------------|------------------------------------------------------------------|------------------------------|
| . • | | | L4 (151 CID) L68 |
| Vehicle ! | Emission | Control | |
| | Type (air in modification | jection, engine ns, other) | Computer Command Control |
| | | Pump or pulse | None |
| | A | Driven by | |
| | Air Injection | Air distribution (head, manifold, etc.) | |
| Exhaust Emission | | Point of entry | |
| | Exhaust Ges | Type (controlled flow, open orifice, other) | Controlled Flow |
| Emission Control | Recircula- | Exhaust source | Cylinder Head |
| | tion | Point of exhaust injection (spacer, carburetor, manifold, other) | Intake Manifold |
| | | Туре | Single Bed Pellet |
| | | Number of | One |
| | Catalytic | Location(s) | Underfloor |
| | | Volume [L (in²)] | 2623.0 CM ³ (160) |
| | Converter | Substrate type | Alumina Pellet |
| | | Noble metal type | |
| | | Noble metal concentration (g/cm²) | · |
| | Type (ventilates to atmosphere, induction system, other) | | Induction_System |
| Crankcase Emission | Energy source (manifold vacuum, carburetor, other) | | Manifold Vacuum |
| Control | Discharges (manifold, of | (to intake ner) | Intake Manifold |
| | Air inlet (bre | ather cap, other) | TBL Air Cleaner |
| Evapora- | Vapor vente (cranicase. | d to Fuel tank | Canister |
| mission | (cranticase, carrister, other) Carburetor | | None |
| Control | Vapor storag | | Canister |
| lectronic | Closed loop | <u> </u> | Yes |
| ystem | Open loop (y | ree/no) | No |

| Type (single, single with cross-over, duel, other) | | Tri-Flow with Single Tailpipe | | | |
|----------------------------------------------------|------------------------------------------------------------------------------------|----------------------------------------|--|--|--|
| Muffler no. a Separate rea | & type (reverse flow, straight thru, ecnator) Material & Mass [kg (weight lbs)] | Reverse Flow 8.13 (17.92) | | | |
| Resonator r | no. & type | None | | | |
| Exhaust | Branch o.d., wall thickness | None | | | |
| pipe pipe | 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) | | | |
| Inter- mediate | o.d. & wall thickness | 50.8 0.D. x 1.37 (2 0.D. x .054) | | | |
| pipe | Material & Mass (log (weight lbs)) | GM 6178-M Aluminized Steel 3.64 (8.02) | | | |
| Tail | o.d. & wall thickness | 50.8 0.D. x 1.09 (2 0.D. x .043) | | | |
| pipe | Material & Mass (log (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

| | | | | |
|-----------------------|----------------------------------------------------------|--------------------------------------------|----------------------------------------|-------------------------------------------------------------------------------------|
| | Type (air in modification | jection, engir ns, other) | w | C3 Engine Modification |
| | | Pump or pulse | | None |
| | 1 | Driven by | | |
| | Air Injection | Air distribut (head, mar | | |
| | <u></u> | Point of en | try | |
| Exhaust | Exhaust | Type (cont open orifice | rolled flow, a. other) | None |
| Emission Control | Gas Recircula- | Exhaust so | LIFTON | |
| 00.00 | tion | Point of ext (spacer, ca manifold, o | haust injection irburetor, ther) | |
| | | Туре | | Single Bed |
| | | Number of | | One |
| | | Location(s) | | Under Floor |
| | Catalytic | Volume (L (in³)) | | 2.786 (170) |
| | Converter | Substrate type | | Monolith - Ceramic |
| | | Noble mets | il type | Platinum/Paladium/Rhodium |
| | | Nobie meta concentrati | | .00102/ - /.00010 |
| | Type (ventilates to atmosphere, induction system, other) | | phere, | Orifice + Bypass. No PCV Valve. Closed - Ventilates to Induction System. |
| Crankcase Emission | Energy source (menifold vacuum, carburetor, other) | | r) | Orificed Connection to Manifold Vacuum. Open Hose Connection to Clean Side of A/C. |
| Control | Discharges (to intake manifold, other) | | | Induction System |
| | Air intet (bre | ether cap, of | her) | None |
| Evapora- | Vepor vente (cranticase. | nd to | Fuel tank | Canister |
| tive Emission | canister, oth | 197) | Carburetor | None |
| Control | Vecor store | ge provision | | Charcoal Canister |
| Electronic | Closed loop | (yee/no) | | Yes |
| system | Open loop (| yee/no) | | No |

Engine - Exhaust System

| Type (single, duel, other) | , single with cross-over, | 4 into 2 into (TRI-Y) |
|-------------------------------|------------------------------------------------------------------------------------|--------------------------------------|
| Multier no. & separate ree | i type (reverse flow, straight thru, constor) Material & Mess (kg (weight lbs)) | |
| Reconstor n | o. & type | None |
| Entrans | Branch o.d., well thickness | 44.5 x 1.0 (1.75 x .04) |
| Exhaust pipe | Main a.d., well thickness | 63-5 x 1.5 (2.50 x .059) |
| | Material & Mass (kg (weight fbs)) | 409 Stainless 2.75 (6.06) |
| Inter- mediate | o.d. & wall thickness | 57.2 O.D. x 2.08 (2.25 O.D. x .081) |
| pipe | Material & Mase (kg (weight lbs)) | GM 6178-M Aluminized Steel |
| Tail | o.d. & wall thickness | 44.45 O.D. x 1.09 (1.75 O.D. x .043) |
| Pipe | Meterial & Mass [log (weight the)] | Aluminized Steel |

Total Weight of Complete Exhaust System 7.950 (17.5)

MVMA Specifications Form

| Vehicle Line_ | Cutlass | <u>Calais</u> | | | |
|---------------|---------|---------------|------|---------------|------|
| Model Year | 1989 | issued | 6-88 | _ Revised (*) | 9-88 |

METRIC (U.S. Customary)

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

Vehicle Emission Control

| | Type (air injection, engine modifications, other) | | | Port Fuel Injection |
|----------------------------|----------------------------------------------------------|-------------------------------|--------------------------------------|--------------------------------|
| | | Pump or | pulse | None |
| | | Driven b | y | |
| | Air Injection | Air distrii (head, m | bution nanifold, etc.) | |
| | | Point of | entry | |
| Exhaust | Exhaust Gas | | introlled flow, fice, other) | None |
| Emission Control | Recircula- | Exhaust | Source | |
| U | tion | | exhaust injection carburetor, other) | · |
| | ļ | Туре | | Single Bed Monolith |
| | • | Number | of | One |
| | , | Location(s) | | Under Floor |
| | Catalytic | Volume (L (in ³)] | | 110 in |
| | Converter | Substrate type | | Cordierite Monolith |
| Ø | | Noble m | stal type | Platinum/Rhodium |
| | | Noble me concentr | stal etion (g/cm³) | .00121 Platinum/.00017 Rhodium |
| | Type (ventilates to atmosphere, induction system, other) | | nosphere, r) | Induction System |
| Crankcase Emission | Energy source (manifold vacuum, carburetor, other) | | ild ther) | Manifold Vacuum |
| Control | Discharges (to intake manifold, other) | | | Intake Manifold |
| | Air Inlet (bre | eather cap, | other) | Inlet Duct to Rocker Cover |
| Evapora- tive | Vapor vente (crankcase. | id to | Fuel tank | Canister |
| Emission | canister, oth | | Carburetor | None |
| Control | Vapor stora | | <u>n</u> | Charcoal |
| Electronic system | Closed loop | | | Yes |
| | _ obert 100b (| Open loop (yes/no) | | No |
| Engine - | Exhaust S | System | | |
| Type (single, dual, other) | single with cro | esa-over, | | Tri-Flow with Single Tailpipe |
| | nator) Materia | flow, straig d & Mass (i | nt thru, cg (weight lbs)] | Reverse Flow |
| Resonator no | . & type | | | None |
| | Oreson a d | | | |

Total Weight of Complete Exhaust System 7.950 $(\overline{17.5})$

Exhaust

pipe

Inter-

pipe

Tail

pipe

Branch o.d., wall thickness

Material & Mass (kg (weight lbs))

Material & Mass [kg (weight lbs)]

Material & Mass [kg (weight lbs)]

Main o.d., wall thickness

o.d. & well thickness

o.d. & wail thickness

50.8 0.D. x 1.02 (2.0 O.D. x .040)

50.8 0.D. x 1.09 (2 0.D. x .043)

50.8 O.D. x 1.09 (2 O.D. x .043)

Stainless Steel Per GM 6125-M 2.72 (5.99)

Steel SAE 1008 or 1010 Aluminum Coated

Steel SAE 1008 or 1010 Aluminum Coated

<u>None</u>

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

| | | | MIDENT-PORT FOEL INJECTION RPO LGO |
|-----------------------|--------------------------------------|----------------------------------------------------------|--------------------------------------------|
| Vehicle | Emission | Control | |
| | Type (air inje | | |
| | modification | s. other) | C3 Engine Modification |
| | | Pump or pulse | None |
| | Air | Driven by | |
| | injection | Air distribution (head, manifold, etc.,) | |
| | | Point of entry | |
| | Exhaust Gas Recircu- | Type (controlled flow, open orifice, other) | None |
| Exhaust | lation | Exhaust source | |
| Emission Control | | Point of exh.inj. (spacer, carb., manifold, other) | |
| | | Туре | Single Bed |
| | 1 | Number of | One |
| | Catalytic | Location(s) | Under Floor |
| | Converter | Volume (L(cu.in)) | 2.786 (170) |
| | | Substrate type | Monolith - Ceramic |
| | | Nobie metal type | Platinum/Paladium/Rhodium |
| | | Noble metal concentration (g/cu. cm.) | .00102/ - /.00010 |
| | Type (ventilat | es to | Orifice + Bypass. No PCV Valve. |
| | atmosphere, induction system, other) | | Closed - Ventilates to Induction System. |
| Crankcase Emission | Energy source | (manifold | Orificed Connection to Manifold Vacuum. |
| Control | vacuum, carbu | retor, Other) | Open Hose Connection to Clean Side of A/C. |
| | Discharges (to | | |
| | amiloig. Othi | er | Induction System |
| | Air init(breath | er Cap,other) | None |
| Evapora- tive | Vapor vented : | to Fuel tank | Canister |
| Emission Control | canister.other |) Carburetor | None |
| | Vapor storage | provision | Charcoal Canister |
| Electron- | Closed loop (y | 8\$/no} | Yes |
| System | Open loop (yes | i/no) | No |

Engine - Exhaust System

| Type (single dual, other) | s single with cross-over, | | |
|------------------------------|----------------------------------------------------------------------------|------------------------------------------------------|-------------|
| | | Tri-Flow with Dual Tail Pipes | |
| straight thri | & type (reverse flow, u. separate resonator) Aass [kg (weight lbs.)] | Reverse Flow | |
| Resonatorr | 10. & type | (1) Bottle | |
| Exnaust | Branch o.d., well thickness | None | |
| pipe | Main o.d., well thickness | 57.15 x 2.2 mm (2.25 x .090 in.) (1.1/1.1 Laminated) | |
| | Mati. & Mass [kg(wght.lbs.)] | 409 Stainless 3.22 (7.1) | |
| nter- negiate | o.d. & wall thickness | 57.15 x 1.37 mm (2.25 O.D. x .054) | _ |
| ipe | Mati. & Mass (kg(wght.lbs.)) | Steel SAE 1008 or 1010 Aluminum Coated | |
| Tari pipe | o.d. & wall thickness | 50.8 O.D. x 1.09 (2.0 O.D. x .043) | |
| | Matt. & Mass [kg(wght.lbs.)] | Steel SAE 1008 or 1010 Aluminum Coated | |

| | ~ pher | ifications | 5 PUIII | • | Model Year | 1989 | Issued | 6-88 | Revised (*) _ | 9~88 |
|---------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------|----------------------------------|-------------|-------------|---------------|--------------|
| METRIC | C (U.S. Cu | stomary) | | | 110001 1001 | | | | 04 360 (4) _ | |
| | • | | 0.5 | | | | | | | |
| Engine De Engine Co | ecription/Car | b. | 2.5L | | 60 | | | | | |
| | | | (151) | | .08 | | | | · | |
| Transmi | issions/Tra | insaxle (Std., (| Opt., N.A.) |) | | | | | | |
| Manual 3-sp | peed (manufact | urer/country) | Not Av | ailab | le e | | | | | |
| Manuai 4-sp | peed (manufact | urer/country) | | ailab | | | | | | |
| Manual 5-sp | peed (manufact | urer/country) | Std | Isuz | u M200 (| MT2) | | | | |
| | manufacturer/c | - 77 | Opt. | ydram | atic (MD | 9) | | | | |
| Automatic o | werdrive (manu | facturer/country) | Not Av | ailab | le | | | | | |
| | | | <u>L</u> | | | | ··· | · | | |
| Manual ' | Transmiss | ion/Transaxie | | | | | | | | |
| Number of f | lorward speeds | | 5 | | | | | | | |
| | 1st | | 3.73 | | | | | | | |
| | 2nd | | 2.04 | | | | | | | |
| Gear | Зго | <u> </u> | 1.45 | | | | | | | |
| ratios | 4th | | 1.03 | | | ·· | | | | <u></u> . |
| | 5th | | 74 | | | | | | | - <u>-</u> - |
| 0 | Reverse | | 3.58 | | | | | | | |
| | is meshing (spe | icity geers) | | | Gears | | | | | |
| Shift lever location | | | | | | | | | | |
| | | | Floor | | SOIE | | | | | |
| Trans. case | mat1. & mass I | <u> </u> | Alumin | um | <u> </u> | | | | | |
| | Capacity (L Type recom | (pt.)] | Alumin 1.9_(4 | um O) | | ransmiss | ion Fluid | # 12345 | 349 | |
| Lubricant | Capacity (L Type recom | (pt.)] imended | Alumin 1.9_(4 | um O) | | ransmiss | ion Fluid | # 12345 | 349 | |
| Lubricant Clutch (I | Capacity (L Type recom | (pt.)] | Alumin 1.9 (4 STF - | um 0) Synch | romesh T | | ion Fluid | # 12345 | 349 | - |
| Lubricant Clutch (I | Capacity (L. Type recom | (pt.)] imended trismission) | Alumin 1.9 (4 STF - | um 0) Synch | romesh T | | ion Fluid | # 12345 | 349 | |
| Clutch (I | Capacity (L Type recom | (pt.)] imended trismission) . multiple disc) | Alumin 1.9 (4 STF - Borg W | um .0) Synch arner ingle | romesh T | | ion Fluid | # 12345 | 349 | |
| Clutch (I Clutch man Clutch type Linkage (hyd | Capacity (L. Type recom Manual Tra Infacturer (dry, wet; single draulic, cable, re | (pt.)] imended trismission) | Alumin 1.9 (4 STF - | um .0) Synch arner ingle | romesh T | | ion Fluid | # 12345 | 349 | |
| Clutch (I Clutch manu Clutch type Linkage (hyx Max. pedal | Capacity (L Type recom | (pt.)] Imended Imend | Alumin 1.9 (4 STF - Borg W | um .0) Synch arner ingle | romesh T | | ion Fluid | # 12345 | 349 | |
| Clutch (I Clutch manu Clutch type Linkage (hyx Max. pedal spring load, | Capacity (L Type recom | (pt.)] imended trismission) trismission) trismission) trismission) trismission) trismission) trismission) trismission) | Alumin 1.9 (4 STF - Borg W | um .0) Synch arner ingle | romesh T | | ion Fluid | # 12345 | 349 | |
| Clutch (I Clutch manu Clutch type Linkage (hyo Max. pedal spring load, Assist (sprin | Capacity (L. Type recom Manual Tra utacturer (dry, wet; single drautic, cable, n effort (nom. new) N (lbs) | tnsmission) mended tnsmission) multiple disc) od, lever, other) Depressed Released rt, nominal) | Borg W Dry, S Hydrau | um 0) Synch arner ingle | romesh T Automot Disc | | ion Fluid | # 12345 | 349 | |
| Clutch (I Clutch manu Clutch type Linkage (hyo Max. pedal spring load, Assist (sprin Type pressu | Capacity (L. Type recom Manual Tra utacturer (dry, wet; single draulic, cable, re effort (nom., new) N (lbs) | (pt.)] imended trismission) p. multiple disc) od, lever, other) Depressed Released rt, nominal) | Borg W | um .0) Synch arner ingle lic | romesh T Automot Disc | | ion Fluid | # 12345 | 349 | |
| Clutch (I Clutch manu Clutch type Linkage (hyo Max. pedal spring load, Assist (sprin Type pressu | Capacity (L. Type recom Manual Tra Infacturer (dry, wet; single draulic, cable, neeffort (nom. new) N (lbs) Ing. power/perce ure plate springs load (nominal, | (pt.)] imended trismission) p. multiple disc) od, lever, other) Depressed Released rt, nominal) | Borg W Dry, S Hydrau None Bellev 5249 (| arner ingle lic ille 1180) | romesh T Automot Disc Spring | ive | ion Fluid | # 12345 | 349 | |
| Clutch (I Clutch manu Clutch type Linkage (hyo Max. pedal spring load, Assist (sprin Type pressu | Capacity (L Type recom Manual Tra Manual Tra utacturer (dry, wet; single draulic, cable, n effort (nom. new) N (lbs) ng, power/perce ure plate springs load (nominal, Facing mitgr | (pt.)] imended trismission) p. multiple disc) od, lever, other) Depressed Released rit, nominal) s new) N (lbs) | Borg W Dry S Hydrau None Bellev 5249 (Borg W | arner ingle lic ille 1180) arner | Automot Disc Spring Automot | ive | | | | 24 x 25 |
| Clutch (I Clutch manu Clutch type Linkage (hyo Max. pedal spring load, Assist (sprin Type pressu | Capacity (L. Type recom Manual Tra Infacturer (dry, wet; single drautic, cable, n effort (nom. new) N (lbs) Ing. power/perce are plate springs load (nominal, Facing mate Rivets per fi | trismission) a. multiple disc) od, lever, other) Depressed Released nt, nominal) s new) N (lbs) d. & material coding orial & construction scing | Borg W Dry. S Hydrau None Bellev 5249 (Borg W Molded 8 | arner ingle lic ille 1180) arner Wove | Automot Disc Spring Automot n Non-as | ive ive bestos - | ion Fluid | | | 24 x 25 |
| Clutch (I Clutch manu Clutch type Linkage (hyo Max. pedal spring load, Assist (sprin Type pressu | Capacity (L. Type recom Manual Tra Infacturer (dry, wet; single draulic, cable, netfort (nom. new) N (lbs) Ing. power/perce are plate springs load (nominal, Facing mitgracing mater fivets per fit. Outside x in | imended trismission) multiple disc) od, lever, other) Depressed Released nt, nominal) new) N (lbs) . & material coding side dis. (nominal) | Borg W Dry. S Hydrau None Bellev 5249 (Borg W Molded 8 216 x | arner ingle lic ille 1180) arner Wove | Automot Disc Spring Automot | ive ive bestos - | | | | 24 x 25 |
| Clutch (I Clutch manu Clutch type Linkage (hyx Max. pedal spring load, Assist (sprin Type pressu Total spring | Capacity (L. Type recom Manual Tra Infacturer (dry, wet; single draulic, cable, netfort (nom. new) N (lbs) Ing. power/perce are plate springs load (nominal, Facing mitgracing mater fivets per fit. Outside x in | trismission) a. multiple disc) od, lever, other) Depressed Released nt, nominal) s new) N (lbs) d. & material coding orial & construction scing | Borg W Dry. S Hydrau None Bellev 5249 (Borg W Molded 8 216 x | arner ingle lic ille 1180) arner Wove | Automot Disc Spring Automot n Non-as | ive ive bestos - | | | | 24 x 25 |
| Clutch (I Clutch manu Clutch type Linkage (hyo Max. pedal spring load, Assist (sprin Type pressu | Capacity (L Type recom Manual Tra Manual Tra Indicurer (dry, wet; single draulic, cable, n effort (nom. new) N (lbs) ng, power/perce ure plate springs load (nominal, Facing migr Facing mate Rivets per fi Outside x in Total eff. are | pressure plate side/ | Borg W Dry, S Hydrau None Bellev 5249 (Borg W Molded 8 216 x 370 (5 | arner ingle lic ille 1180) arner Wove | Automot Disc Spring Automot n Non-as | ive ive bestos - | | | | 24 x 25 |
| Clutch (I Clutch man Clutch type Linkage (hyx Max. pedal spring load, Assist (sprin Type pressu Total spring | Capacity (L. Type recom Manual Tra Infacturer (dry, wet; single draulic, cable, netfort (nom. new) N (lbs) Ing. power/perce are plate springs load (nominal, Facing mater flivets per fit. Outside x in Total eff. are Thickness (if fly wheel sic.) | trismission) trismission) trismission) trismission) trismission) trismission) trismission Depressed Released rit, nominal) trismission acing side dia. (nominal) trismission acing side dia. (nominal) trismission acing side dia. (nominal) trismission (pressure plate side/ te) (pressure plate side/ | Borg W Dry. S Hydrau None Bellev 5249 (Borg W Molded 8 216 x 370 (5 | arner ingle lic ille 1180) arner Wove 152 (6.9) | Automot Disc Spring Automot n Non-as 8.5 x 6. | ive ive bestos - | | | | 24 x 25 |
| Clutch (I Clutch man Clutch type Linkage (hyx Max. pedal spring load, Assist (sprin Type pressu Total spring | Capacity (L. Type recom Manual Tra Infacturer (dry, wet; single draulic, cable, nettort (nom. new) N (lbs) Ing. power/perce are plate springs load (nominal, Facing mitgracing mater fivets per fit. Outside x in Total eff. are Thickness (in the sing the sing mater fit.) | trismission) trismission) trismission) trismission) trismission) trismission) trismission Depressed Released rit, nominal) trismission acing side dia. (nominal) trismission acing side dia. (nominal) trismission acing side dia. (nominal) trismission (pressure plate side/ te) (pressure plate side/ | Borg W Dry. S Hydrau None Bellev 5249 (Borg W Molded 8 216 x 370 (5 3.18/3 | arner ingle lic ille 1180) arner Wove 152 (6.9) .18 (| Automot Disc Spring Automot n Non-as 8.5 x 6.4 | ive ive bestos - 0) 5) | Borg War | | | 24 x 25 |
| Clutch (I Clutch manu Clutch type inkage (hyd Max. pedal spring load, Assist (sprin Type pressu Total spring | Capacity (L. Type recom Manual Tra Infacturer (dry, wet; single draulic, cable, nettort (nom. new) N (lbs) Ing. power/perce are plate springs load (nominal, Facing mitgracing mater fivets per fit. Outside x in Total eff. are Thickness (in the sing the sing mater fit.) | (pt.)] imended imend | Borg W Dry. S Hydrau None Bellev 5249 (Borg W Molded 8 216 x 370 (5 3.18/3 1.52 (Driven | um .0) Synch arner ingle lic ille 1180) arner Wove 152 (6.9) .18 (| Automot Disc Spring Automot n Non-as 8.5 x 6.4 .125/.129 | ive ive bestos - 0) 5) poke Spri | Borg War | ner Auto | | |

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

| MVM | A-Specification | Vehicle Line <u>Cutlass Calais</u> Model Year 1989 Issued 6-88 Revised (e) | 9-88 |
|-----------------------------------------|----------------------------------------------------|--------------------------------------------------------------------------------|--------------|
| METRIC | C (U.S. Customary) | Model Year 1989 Issued 6-88 Revised (●) | , 00 |
| Engine De: Engine Co: | scription/Carb. de | 2.3L (138) L4 LD2 | |
| Transmi: | ssions/Transaxie (Std., | Opt., N.A.) | |
| Manual 3-sp | peed (manufacturer/country) | Not Available | - |
| Manual 4-sp | peed (manufacturer/country) | Not Available | |
| Manual 5-sp | seed (manufacturer/country) | Std. HM - 282 MG2 | |
| Automatic (n | manufacturer/country) | Opt. Hydramatic MD9 | |
| Automatic or | verdrive (manufacturer/country) | Not Available | |
| Manual 1 | Transmission/Transaxie | | - |
| Number of fo | orward speeds | 5 | |
| | 1st | 3.50 | |
| | 2nd | 2.05 | |
| | 3rd | 1,38 | |
| Gear ratios | 4th | 0.94 | _ |
| | 5th | 0.72 | - |
| | Reverse | 3.41 | |
| Synchronous | s meshing (specify gears) | All Forward Gears | |
| Shift lever lo | cation | 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 (A | Manual Transmission) | | |
| Clutch manu | facturer | Dajkin | |
| Clutch type (| (dry, wet; single, multiple disc) | Dry, Single | |
| Linkage (hyd | fraulic, cable, rod, lever, other) | Hydraulic | |
| Max. pedal e | effort (nom. Depressed | 151 (34) | |
| | new) N (lbs) Released | 0 (0) | |
| Assist (spring, power/percent, nominal) | | None | |
| Type pressu | re plate springs | Belleville Spring | |
| Total spring I | load (nominal, new) N (lbs) | 5892 (1325) | |
| | Facing mfgr. & material coding | | |
| | Facing material & construction | NC80 | |
| | Rivets per facing | 16 | |
| | Outside x inside dia. (nominal) | 225 x 150 (8.86 x 5.91) | |
| Otrada | Total eff. area (cm²(in.²)] | 442 (68.5) | |
| Clutch acing | Thickness (pressure plate side/ fly wheel side) | | - |
| | | 3.2 (.126) Pressure Plate 3.5 (.138) Flywheel | |

Rivet depth (pressure plate side/ fly wheel side)

Engagement cushion method

Release bearing type & method lub.

Torsional damping method, springs, hysteresis

Ball Thrust - Prepacked & Sealed

Coil Spring with Friction Washer

.6 (.06) Pressure Plate 1.5 (.06) Flywheel

Driven Plate Cushion

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

| | & Spacifications | s Form Vehicle Line | | Cutlass Calais | | | | |
|----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|---------------|---------------------------------------|----------|---------------|---------------|-------|
| | A Specifications | 101111 | Model Year_ | 1989 | !saued _ | 6-88 | Revised (*) _ | 9-88 |
| METRIC | C (U.S. Customary) | | | | | | | |
| ingine Dec Ingine Co | ecription/Carb. de | 3.3L (204 V6 LG7 |) | | | | | |
| Trensmi | ssions/Transaxie (Std., O | pt., N.A.) | | | <u> </u> | | | |
| Manual 3-ap | peed (manufacturer/country) | Not Avai | lable | | | | | |
| Manual 4-sp | peed (manufacturer/country) | Not Avai | | | | | | ····· |
| | peed (manufacturer/country) | Not Avai | | | | | | |
| Automatic (r | manufacturer/country) | | ramatic MD9 | | | | | |
| Automatic o | verdrive (manufacturer/country) | Not Avai | | | | | | |
| Manual 1 | Transmission/Transaxie | | | <u> </u> | | | - | |
| Number of to | orward speeds | | | - | | <u></u> | | |
| | 1st | | | | - | | | |
| | 2nd | | $\overline{}$ | | | | | |
| _ | 3rd | | | | | | | |
| Geer ratios | 4th | | | | | | | • |
| | 5th | | | | | | | |
| | Reverse | | | | | | | |
| Synchronou | s mashing (specify gears) | | | | X | | | |
| Shift lever lo | | | | | | | | |
| Trans, case | mat'i. & mass kg (lbs)* | | | _ | | | | |
| | Capacity (L (pt.)) | | | | | $\overline{}$ | $\overline{}$ | _ |
| Lubricant | Type recommended | | | | | | | |
| | | | | | | | | |
| | i | | | | | | | |
| | | | • | | | | | |
| | | | | | | · | | |
| Clutch (I | Manual Transmission) | | | | | | | |
| | | | | · · · · · | | | • | |
| Clutch manu | facturer | | | · · · · · · · · · · · · · · · · · · · | • | | | |
| Clutch manu Clutch type (| dry, wet; single, multiple disc) | | | | | | | |
| Clutch manu Clutch type (Linkage (hyd | dry, wet: single, multiple disc) fraulic, cable, rod, lever, other) | | | | • | | | |
| Clutch manu Clutch type (Linkage (hyd Max. pedal e | drecturer (dry, wet: single, multiple disc) fraulic, cable, rod, lever, other) effort (nom. Depressed | | | | | | | _ |
| Clutch manu Clutch type (Linkage (hyd Max. pedal e spring load, | dracturer (dry, wet; single, multiple disc) traulic, cable, rod, lever, other) affort (nom, new) N (lbe) Released | | | | | | | |
| Clutch manu Clutch type (Linkage (hyd Max. pedal e spring load, Assist (spring | reducturer (dry, wet; single, multiple disc) (resulic, cable, rod, lever, other) affort (nom. Depressed new) N (ibe) Released (g. power/percent, nominal) | | | | | | | |
| Clutch menu Clutch type (Linkage (hyd Max. pedal e spring load, i Assist (spring Type pressur | representation of the process of the | | | | | | | |
| Clutch menu Clutch type (Linkage (hyd Max. pedal e spring load, i Assist (spring Type pressur | discturer (dry, wet; single, multiple disc) fraulic, cable, rod, lever, other) inflort (nom, new) N (lbe) Released G, power/percent, nominal) re plate springs load (nominal, new) N (lbe) | | | | | | | |
| Clutch menu Clutch type (Linkage (hyd Max. pedal e spring load, i Assist (apring Type pressur | drecturer (dry, wet; single, multiple disc) freulic, cable, rod, lever, other) effort (nom, new) N (lbe) propersed Released g, power/percent, nominal) re piste springs load (nominal, new) N (lbe) Fecing migr. & material coding | | | | | | | |
| Clutch manu Clutch type (Linkage (hyd Max. pedal e spring load, Assist (spring 'ype pressur | dracturer (dry, wet; single, multiple disc) (rautic, cable, rod, lever, other) offort (nom, new) N (lbe) Percent (nominal) re plate springs load (nominal, new) N (lbe) Facing migr. & material coding Facing material & construction | | | | | | | |
| Clutch manu Clutch type (Linkage (hyd Max. pedal e spring load, Assist (spring 'ype pressur | dracturer (dry, wet; single, multiple disc) (retulic, cable, rod, lever, other) affort (nom. new) N (lbe) Released (p. power/percent, nominal) re pixte springs load (nominal, new) N (lbe) Facing migr. & material coding Facing material & construction Rivets per facing | | | | | | | |
| Clutch manu Clutch type (Linkage (hyd Max. pedal e spring load, Assist (spring 'ype pressur | recturer (dry, wet; single, multiple disc) (resulic, cable, rod, lever, other) (effort (nom. new) N (libe) (g. power/percent, nominal) (re pixte springs (load (nominal, new) N (libe) Facing migr. & material cooling Facing material & construction (Rivets per facing (Outside x inside die, (nominal) | | | | | | | |
| Clutch menu Clutch type (Linkage (hyd Max. pedal e spring load, i Assist (spring l'ype pressur | dracturer (dry, wet; single, multiple disc) (retulic, cable, rod, lever, other) affort (nom. new) N (lbe) Released (p. power/percent, nominal) re pixte springs load (nominal, new) N (lbe) Facing migr. & material coding Facing material & construction Rivets per facing | | | | | | | |
| Clutch manu Clutch type (inkage (hyd Max. pedal e spring loed, Assist (apring Type pressur Total spring i | recturer (dry, wet; single, multiple disc) (resulic, cable, rod, lever, other) effort (nom. Depressed Released g, power/percent, nominal) re piste springs load (nominal, new) N (ibe) Facing migr. & material coding Facing material & construction Rivets per facing Outside x inside dia. (nominal) Total eff. area {cm²(in.²)} Thickness (pressure piste side/ | | | | | | | |
| Clutch manu- clutch type (inkage (hyd fex. pedal e pring loed, ussist (spring type pressur otal spring i | dry, wet; single, multiple disc) fraulic, cable, rod, lever, other) affort (nom. new) N (ibe) Released G, power/percent, nominal) re pixte springs load (nominal, new) N (ibe) Facing migr. & material cooling 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) | | | | | | | |
| Clutch manu Clutch type (Linkage (hyd Max. pedal e spring load, Assist (spring Type pressur Total spring i | dracturer dry, wet; single, multiple disc) fraulic, cable, rod, lever, other) effort (nom. new) N (lbe) Released g, power/percent, nominal) re plate springs load (nominal, new) N (lbe) Facing migr. & 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) | | | | | | | |

* 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 Engine Code

2.3 LITER L4 (138 CID)

MULTI-PORT FUEL INJECTION RPO LGO

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

| | -11, 11, 11, 11, 11, 11, 11, 11, 11, 11, | |
|----------------------------------------|------------------------------------------|--|
| 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 |
|--------------------------|----------------------------|-----------------------------|
| | 1st | 3.50 |
| | 2nd | 2.19 |
| Gear atios | 3rd | 1.38 |
| 21103 | 4th | 1.03 |
| | 5th | .81 |
| | Reverse | 3.41 |
| Synchronou | is meshing (specify gears) | All Forward Gears |
| Shift lever I | ocation | Floor - Console |
| rans. case | mat'i. & mass kg (lbs)* | Aluminum 30.314 (13.75) |
| Lubricant | Capacity [L (pt.)] | 1.9 (4.0) |
| - S DITCELL | Type recommended | Standard Transmission Fluid |

Clutch (Manual Transmission)

| Clutch mar | nufacturer | | Daikin | |
|----------------------------|------------------------------------------------|-----------------|------------------------------------------------|--|
| Clutch type aisc) | Ciutch type (dry, wet; single, multiple alsc) | | Dry, Single | |
| Linkage (h) | yd., cable, rod, lever,ot | her) | Hydraulic | |
| | l effort (nom. I, new) N (lbs.) | Depressed | 151 (34) | |
| Spring load | . new) N (IBS.) | Released | 0 (0) | |
| Assist (spri | ng, power/percent, non | ninal) | None | |
| Type press | ure plate springs | | Belleville Spring | |
| Totalspring | g load (nominal, new) N(| ibs) | 5892 (1325) | |
| | Facing mfgr. & mat | II. coding | Daikin NC80 | |
| | Facing matt. & con | struction | NC80 | |
| | Rivets per facing | | 16 | |
| | Outside x inside di | a. (nom.) | 225 x 150 (8.86 x 5.91) | |
| Cluten | Total eff.area(sq c | m(sq in)) | 442 (68.5) | |
| racing | Thickness (pressure plate side/fly wheel side) | | 3.2 (.126) Pressure Plate 3.5 (.138) Fly Wheel | |
| | Aivet depth (press side/fly wheel side | ure plate e) | 1.6 (.06) Pressure Plate 1.5 (.06) Fly Wheel | |
| | Engagement cushi | on method | Driven Plate Cushion | |
| Refease De | aring type & method lub |). | Ball Thrust - Prepacked & Sealed | |
| Torsional di hysteresis | amping method, springs | s, | Coil Spring with Friction Washer | |

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

<u>Cutlass</u> Calais **MVMA Specifications Form** Vehicle Line_ Model Year 1989 Issued 6-88 Revised (*) 9-88 **METRIC (U.S. Customary)** Engine Description/Carb. Engine Code 2.51 (151) L4 L68 Automatic Transmission/Transaxie Turbo Hydramatic (THM 125C) (MD9) Type and special features (describe) 3-Speed with Torque Converter Location Floor Selector Ltr./No. designation PRND21 121 2.84 2nd 1.60 Gee ratios 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 (lawn (mph)) N/A (No 4th Gear) Number of elements Three Max. ratio at stall 2.48 Tarque conventer Type of cooling (air, liquid) Liquid Nominal diameter 245 (9.65) Ø Capacity factor "K" 203 Capacity (rafil L (pt.)) Lubricant 7.2 (15) With Cooler and Cooler Lines Full Type Recommended ATF Dexron II Oil cooler (std., opt., NA, internet, externet, air, liquid) Std. External, Oil to Engine Coolant Ø Transmission case material & mass kg (lbs)** <u> Aluminum 73.1 (161.16)</u> Axie or Front Wheel Drive Unit Type (front, reer) 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 Capacity [L (pt.)] N/A Lubricant Type recommended ATF Dexron Axie or Transaxie Ratio and Tooth Combinations (See Power Teams' for exie ratio usage.) Axie ratio (or overall top geer ratio) 2.84 **Pinion** No. of N/A Ring geer or geer

Transfer geer ratio

Final drive ratio

N/A

None

1.00

2.84

Ring geer o.d.

Transacio

^{*} input speed + V torque

[&]quot; includes shift linkage, lubricant, & clutch housing. If other specify.

MVMA Specifications Form Vehicle Line Cutlass Calais Model Year 1989 Issued 6-88 Revised (e)

METRIC (U.S. Customary)

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

Automatic Transmission/Transaxie

| Trade name | | Turbo Hyd amatic (THM 125C) (MD9) |
|--------------|------------------------------------------------|-----------------------------------------------|
| Type and sp | Decial features (describe) | 3-Speed with Torque Converter |
| Calasta- | Location | Floor |
| Selector | Ltr./No. designation | PRND21 |
| | 1st | 2.84 |
| Gear | 2nd | 1.60 |
| ratios | 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. kickdo | wn speed - drive range (km/h (mph)) | 85 MPH (3-2) |
| Min. overdri | ve speed [km/h (mph)] | N/A (No 4th Gear) |
| | Number of elements | Three |
| Torque | Max. ratio at stall | 2.48 |
| converter | Type of cooling (air, liquid) | Liquid |
| | Nominal diameter | 245 (9.65) |
| | Capacity factor "K" | 203 |
| Lubricant | Capacity [refif L (pt.)] | 7.2 (15) With Cooler and Converter Lines Full |
| | Type Recommended | ATF Dexron II |
| | 1., opt., NA, internal, external, air, liquid) | Std. External. Oil to Engine Coolant |
| Trensmissio | n case material & mass kg (lbs)** | Aluminum 73.1 (161.16) |

Axie or Front Wheel Drive Unit

| Type (front, | reer) | Front |
|----------------|------------------------------------------|----------------------------------|
| Description | | Integral with Transmission |
| Limited stip | differential (type) | None Available |
| Drive pinion | offset | N/A |
| Drive pinion | (type) | N/A |
| No. of differe | ential pinions | Two |
| Pinion/diffe | rential adjustment (shim, other) | N/A |
| Pinion/diffe | rential bearing adjustment (shim, other) | |
| Driving whe | ni bearing (type) | Integral Double Row Ball Bearing |
| Lubricant | Capacity [L (pL)] | N/A |
| | Type recommended | ATF Dexron II |
| | | |
| | | |

Axie or Transaxie Ratio and Tooth Combinations (See 'Power Teams' for axie ratio usage.)

| Axie ratio (o | r overall top geer ratio) | 2.84 | | | |
|---------------|---------------------------|------|-------------|---------------|-------------|
| No. of | Pinion | 35 | | | |
| teeth | Ring gear or gear | 35 | · · · · · · | | |
| Ring geer o. | d. | None | | - | |
| Transade | Transfer geer ratio | 1.00 | | | |
| | Final drive ratio | 2.84 | | | |

^{*} Input speed + V torque

^{**} Includes shift finkage, 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/Transaxie

| 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 | | |
| | 1st | 2.84 | | |
| Gear | 2nd | 1.60 | | |
| ratios | 3rd | 1.00 | | |
| | 4th | None | | |
| | Reverse | 2.07 | | |
| Max. upshift | speed - drive range [km/h (mph)] | 90 | | |
| Max. kickdon | wn speed - drive range [km/h (mph)] | 87 | | |
| Min. overdriv | ve speed (km/h (mph)) | l N/A | | |
| | Number of elements | 3 | | |
| Torque | Max. ratio at stall | 2.00:1 | | |
| converter | 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 (sta | d., opt., NA, internat, external, air, liquid) | Std External Oil to Engine Coolant | | |
| Trensmissio | n case material & mass kg (lbs)** | Aluminum 65.7 (144.8) | | |

Axie or Front Wheel Drive Unit

| | Front | |
|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Integral with Transmission | |
| fferential (type) | | |
| ffset | | |
| ype) | | |
| tial pinions | _ | |
| ntial adjustment (shim, other) | | |
| ntial bearing adjustment (shim, other) | | |
| bearing (type) | | |
| Capacity [L (pt.)] | | |
| Type recommended | | |
|) | Test ype) tial pinions ntial adjustment (shim, other) ntial bearing adjustment (shim, other) bearing (type) Capacity (L (pt.)) | Inset N/A Inset N/A Institut pinions Two Institut pinions Inset pinions Inset N/A Institut pinions Inset N/A Inset |

Axie or Transaxie Ratio and Tooth Combinations (See 'Power Teams' for axie ratio usage.)

| Axie ratio (d | or overall top gear ratio) | 2.39 (Integral with Transmission) |
|---------------|----------------------------|-----------------------------------|
| No. of | Pinion | 38 Sprockets |
| teath | Ring geer or geer | 32 Sprockets |
| Ring geer o | ı.d. | |
| Transaude | Transfer gear ratio | 38/32 |
| | Final drive ratio | 2.84 |

^{*} Input speed + \sqrt{torque}

^{**} Includes shift finkage, lubricant, & clutch housing. If other specify.

| | MVM | A Spec | ificatio | ane | Form | Vehicle Line_ | Cutlass | Calais | | | | |
|----------|--------------------------------|-----------------------------------------|--------------------------------------|------------------|-------------------|------------------|------------|---------------------------------------|-----------------|---------------------------------------|--------------|---|
| | | | | | | Model Year_ | 1989 | Issued _ | _6-88 | Revised (*) | 9-88 | _ |
| | METRIC | (U.S. Cus | stomary) |) | | | | | | | | |
| | Engine Des Engine Cod | ertption/Carb ie | • | | 2.5L (151) L4 | L68 | | | | | . • | |
| | Axie Sha | fts - Front | Wheel Di | rive | • | | | : | | | ** | _ |
| | Manufacture | and number u | sed | | Saginaw, | Two | | | | | | _ |
| | Type (straigh | t. solid her | <u>-</u> | Left | | Solid Bar | | | | ···· | | _ |
| | tubular, etc.) | | | Right | | Solid Bar | | - | | | | _ |
| Ø | ; | Manual trans | axie | Left | 27.2 x 308 | | x 12.13) |) | | | | _ |
| | Outer | <u> </u> | | Right | 27 2 x 665 | 0 (1.07 | x 26.18) | | | | · | _ |
| | diam. x length" x wali | Automatic tra | tnsaxie | Left | 23.9 x 302 | 2.0 (94) | x 11.89) | | | | | _ |
| | wall thickness | <u> </u> | | Flight | 23.9 x 364 | 1.3 (.94) | x 14.34) | | | | | |
| | | Optional tran | sade | Left | - | | | | | | | |
| | | | | Right | - | | | | | | · | |
| | | Туре | | | | | | | | | _ | |
| | | <u> </u> | | | None | | | | | | | |
| | Silp yoke | Number of te | eth | | l | | | | | | | |
| | , | | | _ | None | | | | | | | _ |
| | | Spline o.d. | | | No | | | | | | | |
| | | Make and -4 | | Inner | None Saginaw | - | | | | | | _ |
| | | Make and mi | g. no. | Outer | Saginaw | | | - | | · · · · · · · · · · · · · · · · · · · | | _ |
| | | Number used | 1 | | Two on eac | h drive s | haft | | | | | _ |
| | | Type, size, pt | 11700 | Inner | Tipot. 66. | | | Α | | | | - |
| | | . , , , , , , , , , , , , , , , , , , , | | Outer | RZEPPA-Fix | | <u>ung</u> | <u> </u> | | | | _ |
| | Universal | Attach (u-bott | , clamp, etc.) | | Retaining | | | | | | | - |
| | joints | | Type (plain, | | Ball and R | | ner) | | | - | | _ |
| | | | Type (plain, anti-friction) | , | Ball (Oute | | | | | | | |
| | | Bearing | Lubrication | | | | | | | | | _ |
| | | | (fitting, prep | eck) | Prepack | | <u> </u> | | | | | |
| | Drive taken th | rough (torque t | ube, | | | | | | - | | | |
| | arms or spring | | ·········· | | Wishbone L | <u>ower Cont</u> | rol Arm. | Upper | <u>McPherso</u> | on Strut | | |
| | Torque taken arms or spring | through (torque | tube, | | | | | | | | | |
| | | | | | <u>Engine Mou</u> | inting Sys | tem | ·· | | | | _ |
| 7 | All Wheel | /4 Wheel I | <u>Drive</u> | | | | | | | | | |
| | Description an while moving, | d type (part-time mechanical, elec | , full-time, 2/4 st., chain/gear, | shift , etc.) | | | | | | | | _ |
| | | Manufacturer | | | | | | | | | | _ |
| | Transfer Case | Туре | |] | | | | | | | - | _ |
| | | Model | | | | | | | | | | _ |
| • | Low-range ge | | | | | | | | | | | _ |
| | System discor | mect (describe) |) | | | | | | | | | - |
| | Center differential | Type (bevel, p | olanetary, w o torsen, etc.) | rw/0 | | | | • | | | | _ |
| | | T | <u> </u> | | | | | · · · · · · · · · · · · · · · · · · · | | | | |

^{*} Centerline to centerline of universal joints, or to centerline of attachment.

| | MVM | A Speci | ificatio | ons | Form | | Cutlass | | | · · · · · · · · · · · · · · · · · · · |
|---------------|------------------------------|---------------------------------------|---------------------------------------|----------------------------------------------|-----------------------|--------------------|---------------|---------------------------------------|-------------------|---------------------------------------|
| | | (U.S. Cus | | | | Model Year | 1989 | _ Issued | 6_88_ Revised (*) | 9-88 |
| | | (3.0. 00. | , , , , , , , , , , , , , , , , , , , | , | | | | | | |
| | Engine Des Engine Cod | cription/Carb le | • | | 2.3L (138) L4 | LD2 | | | | |
| | Axie Sha | fts – Front | Wheel Di | rtve | | <u></u> | | • | | |
| | Manufacture | and number u | sed | | Saginaw, | Two | | | | |
| | Type (straigh | t, solid bar. | | Left | | Solid Bar | | | | |
| | tubular, etc.) | , , | | Right | | Solid Bar | | | | |
| \mathcal{Q} | 5 | Manual trans | axie | Left | 27.5×30 | 02.0 (1.08 | x 11.89) | | | |
| | Outer | | | Flight | 27.5 x 30 | | x 12.13) | | | |
| | diam. x length* x | Automatic tra | ensaude . | Left | 23.9 x 30 | | 11.89) | | | |
| | wall thickness | | | Right | 23.9 x 36 | 54.3 (.94 x | 14.34) | <u>.</u> | | |
| | | Optional tran | saxie | Left | - | | | | | |
| | | | _ | Alight | _ | | | | | |
| | | Туре | | | None | | | | | |
| | Slip | Number of te | eth | | | | <u> </u> | - | | |
| | Slip yoke | | | | None | - | | | | |
| | | Spline c.d. | | , - | None | | | | | |
| | | Make and mi | g. no. | inner | Saginaw | | | · · · · · · · · · · · · · · · · · · · | | |
| | | | | Outer | Saginaw | | | | | |
| | | Number used | <u> </u> | · | | <u>ich Drive S</u> | <u>haft</u> | <u></u> <u>-</u> - | | |
| | | Type, size, pt | lunge | Inner | Cross Gro | | | <u> </u> | | |
| | | Attack (or batt | | Outer | RZEPPA-Fi | | | | | |
| | Universal joints | Attach (u-bott | . ciemp, etc.) | | Retaining | | | | | |
| | ,,,,,,, | | Type (plain anti-friction) | <u>. </u> | Ball and Ball (Out | Roller (In er) | ner) | | . 4 | |
| | | Bearing | Lubrication (fitting, prep | nack) | Prepack | | | | • | |
| | Drive taken the | rough (torque t gs) | ube, | | Vishbone | Lower Cont | rol Arm. | Upper Mc | Pherson Strut | |
| | Torque taken arms or spring | through (torque gs) | tube, | | Engine Mo | unting Sys | tem | · | | |
| Ø | All Wheel | /4 Wheel | Drive | | | | | | | |
| | Description an while moving, | d type (part-time mechanical, elec | , full-time, 2/4 st., chain/gear | shift , etc.) | | | | | | |
| | | Manufacturer | | | | | | | | |
| | Transfer case | Туре | - | | | | $\overline{}$ | | | |
| | | Model | | | | | | | | • |
| | Low-range ge | er ratio | | | · | | | \sim | | |
| | System discor | nnect (describe) |) | | | | | | | |
| | Center | Type (bevel, priscous bias, | planetary, w o torsen, etc.) | f W/O | | | <u> </u> | | | |

Torque split (% front/rear)

^{*} Centerline to centerline of universal joints, or to centerline of attachment.

| MVM | Spec | ification | ons | Form | Vehicle Line | | | ass Cal | | |
|-----------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------|-----------|----------------------|-------------------|-----------|------------|-------------------|---------------------------------------|---------------|
| | (U.S. Cus | | | | Model Year_ | 1989 | _ Issued . | - 6-88 | Revised (*) _ | 9-88 |
| MEINIO | (0.5. Cu) | stomary, | , | | | | | • | | |
| Engine Des Engine Cod | pription/Carb • | • | | 3.3L (204) V6 LG7 | | | | | | |
| Axio Sha | ts - Front | Wheel D | rive | | | | | | | |
| Manufacturer | and number u | sed | | Saginaw, | Two | | | | | |
| Manufacturer and number used Type (straight, solid ber, ubular, etc.) | | | Solid Bar | | | | | | | |
| ubular, etc.) | | | Right | | Solid Bar | | | | | |
| | Manual trans | umde | Left | - | | | | | | -, |
| Outer diam. x length* x wall | | | Right | _ | | | | | | |
| | Automatic tra | marrie | Left | 23.9 x 3 | 02.0 (.94 | x 11.89) | | · · · · · · | | |
| | | | Right | 23.9 x 3 | | x 14.34) | | | | |
| hickness | Optional tran | savie . | Left | | ,,,,,, | X 2110-11 | | | | |
| | -p | | Right | _ | | | | | | |
| · | Туре | | <u> </u> | | - | <u> </u> | - " | | | · · · · · · · |
| Siip roke | Number of te | eth | | None | | | | | | |
| | | | | None | - | | | | | |
| | Spline o.d. | | | None | | | | | | |
| | Make and mi | g. no. | inner | Saginaw | · · | | | | | |
| i | | | Outer | Saginaw | | | | | | |
| | Number used | 1 | • | Two on E | ach Drive | Shaft | | | | |
| | Type, size, pl | unge | Inner | Tripot - | 61.0. Plu | nge . | | - | | |
| | | | Outer | RZEPPA - | Fixed | _ | | | | |
| iniversal | Attach (u-bot | L, clamp, etc.) | | Retainin | a Rina | | | | · · · · · · · · · · · · · · · · · · · | |
| oints | | Type (plain anti-friction | () | | Roller (I | nner) | | | | |
| | Searing Lubrication (fitting, prepack) | | | Prepack | · | | · | | | |
| rive taken th rms or spring | rough (torque t 3) | ube, | | • | Lower Con | trol Arm. | Unner | McPhars | on Strut | |
| Torque taken through (torque tube, arms or springs) | | | | l | ounting St | | | | <u> </u> | |
| ui Wheel | /4 Wheel | Drive | | -5 | . | <u></u> | | | | |
| | | | | | | ···· | 7 | | | |
| Description and type (part-time, full-time, 2/4 shift while moving, mechanical, elect., chain/gear, etc.) | | | | | | | | | | |
| | Manufacturer | | | | | | | | | |
| ranster Rae | Туре | | | | | | | | | |
| | Model | | | | | | | | | |
| ow-range ge | er ratio | | | | | | | | | |
| ystem discor | nect (describe |) | | | | | | | | - |
| Center | Type (bevel, pviscous bias, | planetery, w o | w/0 | | | | · <u></u> | | | _ |

Torque split (% front/rear)

^{*} Centerline to centerline of universal joints, or to centerline of attachment.

| | , opc | citication | 3 | Model Year 1989 Issued Barranta |
|-----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| METRIC | 2010 0 | | | Model Year 1989 Issued Revised(*) |
| MEIMI | > (∪.3. C | ustomary) | | · · |
| Engine D | escription | | | 2.3 LITER L4 (138 CID) |
| Engine C | ode | | | MULTI-PORT FUEL INJECTION RPO LGO |
| o Axie Ra | tio and | Tooth Combi | nations | |
| | al drive ratio | | ialions | S (See 'Power Teams' for axle ratio usage) |
| top gear rati | 0) | , | | |
| Trasfr ratio | and method(c | :hain,gear.etc) | | |
| | Ring gear | | | |
| Front drive unit | No. of | Pinion | | |
| | | Ring gear | | |
| - F1 B | | | | |
| o <u>Front D</u> | rive Unit | <u> </u> | | |
| Description | (integral to tr | ens., etc.) | | |
| Lamited she | differential (t | | | |
| Cimited 3ap | | ype) | | |
| Orive pinion | <u> </u> | faet | | |
| No. of differ | ential pinions | | | |
| Pinion/ | | ljustment (shim, etc.) | | |
| differential | | lanng adjustment. | | |
| Driving whe | el bearing (tyr | | | |
| Lubassa | Capacity | [L (pL)] | | |
| Lubricant | Type reco | mmended | | |
| | | | | |
| | | | | |
| | | | | |
| Ania Ch | -4 | | _ | |
| | | ont Wheel Di | ive | |
| Manufacture | r and number | | | Saginaw Division (Two) |
| | r and number | | Left | Straight - Solid |
| Manufacture Type (straigh | r and number | | Left Right | Straight - Solid Straight - Solid |
| Manufacture Type (straigh | r and number | used | Left Right Left | Straight - Solid Straight - Solid 27.1 X 302.0 |
| Manufacture Type (straigh tu buiar, etc.) Outer diam, x length* x wall | r and number it, solid bar, Manual tra | used | Left Right Left Right | Straight - Solid Straight - Solid |
| Manufacture Type (straightubular, etc.) Outer diam, x length* x | r and number it, solid bar, | used | Left Right Left Right Left | Straight - Solid Straight - Solid 27.1 X 302.0 |
| Manufacture Type (straigh tu buiar, etc.) Outer diam, x length* x wall | r and number It, solid bar, Manual tra Automatic | used intexie transaxie | Left Right Left Right | Straight - Solid Straight - Solid 27.1 X 302.0 |
| Manufacture Type (straigh tu buiar, etc.) Outer diam, x length* x wall | r and number it, solid bar, Manual tra | used intexie transaxie | Left Right Left Right Left Right | Straight - Solid Straight - Solid 27.1 X 302.0 |
| Manufacture Type (straightubular, etc.) Outer diam. x length' x wall thickness | r and number It, solid bar, Manual tra Automatic | used intexie transaxie | Left Right Left Right Left Right Left Right | Straight - Solid Straight - Solid 27.1 X 302.0 |
| Manufacture Type (straigh tu buiar, etc.) Outer diam, x length* x wall | r and number it, solid bar, Manuel tra Automatic Optional tr | used intexie transaxie | Left Right Left Right Left Right Left Right | Straight - Solid Straight - Solid 27.1 X 302.0 |
| Manufacture Type (straightubular, etc.) Outer diam, x length x wall thickness | r and number It, solid bar, Manual tra Automatic Optional to | used intaxie transaxie ansaxie | Left Right Left Right Left Right Left Right | Straight - Solid Straight - Solid 27.1 X 302.0 |
| Manufacture Type (straightubular, etc.) Outer diam, x length x wall thickness | Manual tra Automatic Optional tr Type Number of Spine o.d. | used intaxie transaxie ansaxie | Left Right Left Right Left Right Left Right | Straight - Solid Straight - Solid 27.1 X 302.0 27.1 X 308.0 Saginaw Division |
| Manufacture Type (straightubular, etc.) Outer diam, x length x wall thickness | Automatic Optional tr Type Number of Spline o.d | used intexie transaxie ansaxie teeth | Left Right Left Right Left Right Left Right | Straight - Solid 27.1 X 302.0 27.1 X 308.0 Saginaw Division Saginaw Division |
| Manufacture Type (straightubular, etc.) Outer diam, x length x wall thickness | Manual tra Automatic Optional tr Type Number of Spine o.d. | used intexie transaxie ansaxie teeth | Left Right Left Right Left Right Left Right Left Outer | Straight - Solid 27.1 X 302.0 27.1 X 308.0 Saginaw Division Saginaw Division Inboard & Outboard on Each Axle Shaft |
| Manufacture Type (straigh tubular, etc.) Outer diam: x length x wall thickness Slip yoke | Automatic Optional tr Type Number of Spline o.d | used insaxie transaxie ansaxie teeth mfg. no. | Left Right Left Right Left Right Left Right Left Content Left Right Left Right | Straight - Solid 27.1 X 302.0 27.1 X 308.0 Saginaw Division Saginaw Division Inboard & Outboard on Each Axle Shaft Cross Groove - 61.2 Stroke |
| Manufacture Type (straightubular, etc.) Outer diam, x length x wall thickness | Automatic Optional tr Type Number of Spline o.d Number us Type, size | used transaxie transaxie teeth mfg. no. | Left Right Left Right Left Right Left Right Left Outer | Straight - Solid 27.1 X 302.0 27.1 X 308.0 Saginaw Division Saginaw Division Inboard & Outboard on Each Axle Shaft Cross Groove - 61.2 Stroke Rzeppa - Fixed Center |
| Manufacture Type (straightubular, etc.) Outer diam, x length'x wall thickness Slip yoke | Automatic Optional tr Type Number of Spline o.d Number us Type, size | used transaxie transaxie teeth mfg. no. sed plunge bott, clamp, etc.) | Left Right Left Right Left Right Left Right Left Content Left Right Left Right | Straight - Solid 27.1 X 302.0 27.1 X 308.0 Saginaw Division Saginaw Division Inboard & Outboard on Each Axle Shaft Cross Groove - 61.2 Stroke Rzeppa - Fixed Center Retaining Ring |
| Manufacture Type (straightubular, etc.) Outer diam, x length'x wall thickness Slip yoke | Automatic Optional tr Type Number of Spline o.d Number us Type, size | used transaxie transaxie teeth mfg. no. | Left Right Left Right Left Right Left Right Left Content Left Right Left Right | Straight - Solid 27.1 X 302.0 27.1 X 308.0 Saginaw Division Saginaw Division Inboard & Outboard on Each Axle Shaft Cross Groove - 61.2 Stroke Rzeppa - Fixed Center Retaining Ring Inner - Bali |
| Manufacture Type (straightubular, etc.) Outer diam, x length'x wall thickness Slip yoke | Automatic Optional tr Type Number of Spline o.d Number us Type, size | transaxie transaxie teeth mfg. no. sed plunge bott, clamp, etc.) Type (plain, | Left Right Left Right Left Right Left Right Left Content Left Right Left Right | Straight - Solid 27.1 X 302.0 27.1 X 308.0 Saginaw Division Saginaw Division Inboard & Outboard on Each Axle Shaft Cross Groove - 61.2 Stroke Rzeppa - Fixed Center Retaining Ring |
| Manufacture Type (straightubular, etc.) Outer diam, x length'x wall thickness Slip yoke | Automatic Optional tr Type Number of Soline o.d Number us Type, size | transaxie transaxie tansaxie teeth mfg. no. sed plunge bott, clamp, etc.) Type (plain, anti-friction) | Left Right Left Right Left Right Left Right Left Content Left Right Left Right | Straight - Solid 27.1 X 302.0 27.1 X 308.0 Saginaw Division Saginaw Division Inboard & Outboard on Each Axle Shaft Cross Groove - 61.2 Stroke Rzeppa - Fixed Center Retaining Ring Inner - Ball Outer - Ball |
| Manufacture Type (straightubular, etc.) Outer diam, x length's wall thickness Slip yoke Universal joints | Automatic Optional to Type Number of Spine o.d Make and Number us Type, size Attach (u- | transaxie transaxie ansaxie teeth mfg. no. sed plunge bolt, clamp, etc.) Type (plain, anti-friction) Lubrication (fitting, prepack) | Left Right Left Right Left Right Left Right Left Content Left Right Left Right | Straight - Solid 27.1 X 302.0 27.1 X 308.0 Saginaw Division Saginaw Division Inboard & Outboard on Each Axle Shaft Cross Groove - 61.2 Stroke Rzeppa - Fixed Center Retaining Ring Inner - Bali |
| Manufacture Type (straightubular, etc.) Outer diam, x length* x wall thickness Slip yoke Universal joints | Automatic Optional to Type Number of Spine o.d Make and Number us Type, size Attach (u- | transaxie transaxie ansaxie teeth mfg. no. sed plunge bolt, clamp, etc.) Type (plain, anti-friction) Lubrication (fitting, prepack) | Left Right Left Right Left Right Left Right Left Content Left Right Left Right | Straight - Solid 27.1 X 302.0 27.1 X 308.0 Saginaw Division Saginaw Division Inboard & Outboard on Each Axle Shaft Cross Groove - 61.2 Stroke Rzeppa - Fixed Center Retaining Ring Inner - Ball Outer - Ball Outer - Ball |
| Manufacture Type (straightubular, etc.) Outer diam, x length's wall thickness Slip yoke Universal joints | Automatic Optional tr Type Number of Spine o.d. Make and Number us Type, size Attach (u- Bearing | transaxie transaxie ansaxie teeth fg. no. det plunge bolt, clamp, etc.) Type (plain, anti-friction) Lubrication (fitting, prepack) e tube, | Left Right Left Right Left Right Left Right Left Content Left Right Left Right | Straight - Solid 27.1 X 302.0 27.1 X 308.0 Saginaw Division Saginaw Division Inboard & Outboard on Each Axle Shaft Cross Groove - 61.2 Stroke Rzeppa - Fixed Center Retaining Ring Inner - Ball Outer - Ball |

^{*} Centerine to centerline of universal joints, or to centerline of attachment.

MVMA Specifications Form

Vehicle Line <u>Cutlass Calais</u>

Model Year <u>1989</u> Issued <u>6 88</u> Revised (*) <u>9-88</u>

METRIC (U.S. Customary)

| 1 | |
|-----------------------------------------|-----|
| Body Type And/Or Engine Displacement | ALL |

| | Sta | ndard/optional/not avail. | NA |
|------------------------------|--------|----------------------------------------------------|-------------------------------------------------------------|
| _ | Ma | nual/automatic control | NA NA |
| | Typ | oe (air/hydraulic) | NA |
| Car leveling | Pris | mary/assist spring | |
| | Re | er only/4 wheel leveling | |
| | Sin | gle/dual rate spring | |
| | Sin | gle/dual ride heights | |
| | Pro | vision for jacking | Body Jack & Pads on Rocker |
| | Sta | ndard/option/not avail. | |
| | Ma | nual/automatic control | |
| | Nu | mber of damping rates | |
| Shock absorber damping | Typ | ne of actuation (manual/ ctric motor/air, etc.) | |
| contols | 3 | Lateral acceleration | |
| | ļ ņ | Deceleration | |
| | 0 | Acceleration | |
| | s s | Road surface | |
| Shock | Тур | × | Front - MacPherson Strut; Rear - Telescopic (Double-Acting) |
| absorber (front & | Ma | ke | Delco Products |
| (HORK & | Pis | ton diameter | Front 32 (1.26): Rear 25 (.98) |
| | Roc | d diameter | Front 22 (.87): Rear 13 (.51) |

 \varnothing Suspension – Front

| icription | |
|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | MacPherson Strut with Coil Spring |
| Full jounce | 95 (3.74) (From Design) |
| Full rebound | 84 (3.31) (From Design) |
| 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) |
| Type (link, linkless, frameless) | Link |
| Material & bar clameter | Steel: 24 (Base Car) |
| | Full jounce Full rebound Type (coil, leaf, other) & material insulators (type & material) Size (coil design height & i.d., bar length x dis.) Spring rate [N/mm (lb./in.)] Rate at wheel [N/mm (lb./in.)] Type (link, linkless, frameless) |

\varnothing Suspension – Rear

| | | | · · · · · · · · · · · · · · · · · · · |
|---------------|----------------------------------|-------------------------------------------------------|-------------------------------------------------------|
| Type and de | ecription | | Trailing Crank Arm with Twist Beam |
| | Full jour | nce | 134 (5.28) |
| Travel* | Full reb | | 68 (2.68) |
| | Туре (о | oil, leaf, other) & material | Coil - Steel |
| Spring | Size (le height & | ngth x width, coil design i.d., bar length & dia.) | Spring Computer Selected - Varies with Option Content |
| -pg | Spring rate (N/mm (lb./in.)) | | 23 @ Curb - Variable |
| | Rate at wheel [N/mm (lb./in.)] | | 11.1 @ Curb - Variable |
| | Insulato | rs (type & material) | Top & Bottom - Rubber |
| | If | No. of leaves | NA NA |
| | leaf | Shackle (comp. or tens.) | L NA |
| Stabilizer | Type (link, linkless, frameless) | | NA (Base Car) |
| CALUNIZOT | Materia | & bar diameter | NA (Base Car) |
| Track bar (ty | rpe) | | NA NA |

^{*} Define load condition:

METRIC (U.S. Customary)

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

| Body | Туре | And/ | Or |
|-------|-------|-------|-------|
| Login | e Die | oloce | then! |

ALL

| Description Power Assisted Hydraulic Brakes | Brakes | - Service | | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|--------------------------------------|-------------------------|------------------------------------|-------------|--------------------------------------------------|
| Power Assisted Hydraulic Brakes | Description | n | | | | |
| Manufacture and create type (cells, opt. n.A.) Received fromise (set, opt. n.A.) Rec | | | | | | Power Assisted Hydraulic Brakes |
| Std Drum | Manufactu | rer end | | Front (disc or dn | um) | Std - Disc |
| Valving type (proportion, disky, meaning, other) Proportioning, Diagonal Split Circuit Prover brake (etc., opt., n.t.) Social (prover prover) Source (relians in) and source (prover) None Purply (selection of prover) Proportioning (prover) Source (relians in) and source (prover) None Purply (selection of prover) Proportioning (prover) None Purply (selection of prover) None Purply (selec | | | L, r.a.) | | | |
| Std. | Valving typ | ре (ргорог | rtion, dela | | | |
| | | | | | | Std |
| Vacuum Passeroir (volume n., n., net.) In line | Booster tyr | pe (remot | e. integra | I, vac., hyd., etc.) | | |
| Passencer (volume in-?) and source | | | | | | |
| Pump-type (elec, gear driven, but driven) NA | Vacuum | Resi | Proir (vo | tume in. ⁵) and source | | |
| Treation Control Type angine intervention (electronic, mech.) Type angine intervention (electronic, mech.) Anti-flootic device Register of electronic, mach.) NA Namber sensors or circuits Integral or add-on-system Yew control (yes., no) Hydraulic power source (elect., vic. mir., per. strp.) Effective stree [cm²(n, 1)** Gross integral are deformed (yes., no) Hydraulic power source (elect., vic. mir., per. strp.) Effective stree [cm²(n, 1)** Gross integral are gen*(n, 1)** Type and material PFR Thorn 1 - 247 (9, 72) Integrating dismeter FFR Thorn 2 - 24 (, 88) Material 8 type (vented/solid) FFR Front - 247 (9, 72) Integrating dismeter FFR Thorn 2 - 200 x 45 (7, 87 x 1, 77) Type and material FFR Front - 200 x 45 (7, 87 x 1, 77) Type and material FFR Front - 57 (2, 24) Rear - 15 (, 63) Material 8 type (vented/solid) FFR Rore - 22 2 (, 874) Stroke 35 .7 (1, 41) 3, 7:1 Line pressure of 445 N(100 bit) pecial local (he's (pes)) Lineng clearence Bonded or nested (hvelsates) Inboard Integrally Molded - Inboard and Outboard NA Nanufacturer Del co Moraline Front Nanufacturer Front Nanufacturer Front Nanufacturer Front Front - 218 FE Nest size Nanufacturer Front Nanufacturer Fro | | Pum | p-type (e | iec, geer driven, belt d | riven) | |
| Type argine intervention (electronic, mech.) Front/rear (ed., opt., n.a.) Anti-look Anti-look Type (electronic, mech.) NA Anti-look Namutae ansivor in circusts Number ansivor in ricusts Number ansivor in ricusts Number operator or circusts Number operator or circust | Traction | | | | | |
| Front / res (ed., opt. n.a.) Manufacturer Type (electrone, mech.) NA | control | Тура | engine i | mervention (electronic, | mech.) | |
| Arti-dock devices Pype (electronic, mech.) Number sensions or circulas Integral or add-on system Yew control (yes, no) Hydratile power source (select, vic. mir., pier. stry.) Effective area (cm²(n.²))* Profession and consultation and cons | | | | | | |
| Number sensors or circuits Number sensors | | Mani | ulecturer | | | |
| Number envisors or circuits Number envisors (vex. no.) Number envisors (vex. no.) Number envisors (vex. no.) Ny decoration system Year control (vex. no.) Ny decoration system Interverse (cm²(n.²))**(F/R) Sangla see (cm²(n.²))**(F/R) Sangla see (cm²(n.²))**(F/R) Interverse (cm²(n.²))**(Interverse (cm²(n.²))**(Interve | Anti-lock | Hock Type (electronic, mech.) | | | NA | |
| Integrat or add-on system Yew control (yee, no) Yew control (yee, no) Yew control (yee, no) Yew control (yee, no) Yew also gover accessed, yee, ner, per, serg.) | | | | | | |
| Yew control (yes, no) Price (yes, no) Pric | • | Num | ber anti-k | ock hydraulic circuits | | |
| Priority | | Integ | gral or add-on system | | | |
| Size Secondary or un-board 16.7 x 47 x 10.9 c 10.3 x 1.4 x 10.9 c 10.3 x 1.4 x 10.9 c 10.3 x 1.4 x 10.9 c 10.3 x 10.9 c 10.3 x 1.4 x 10.9 c 10.3 x 1.4 x 10.9 c 10.3 x 1.4 x 10.9 c 10.3 x 10.9 x 10. | | Yew control (yes, no) | | res, no) | | |
| Gross lining area [cm²(n-²)]""(F/R) 381 (5.9.1) Swept area [cm²(n-²)]""(F/R) 1624 (251.8) Cutarworking diameter F/R Front - 247 (9.72) Irriar working diameter F/R Front - 22.4 (.88) Material & type (vented/solid) F/R Front - 20.0 x 45 (7.87 x 1.77) Thickness F/R Front - 20.0 x 45 (7.87 x 1.77) Drum Diameter & worth F/R Front - 20.0 x 45 (7.87 x 1.77) Type and material F/R Cast Iron Wheel cylinder bore Fr/R Bore - 22.2 (.874) Stroke 35.7 (1.41) Master cylinder Borestoke F/R Bore - 22.2 (.874) Stroke 35.7 (1.41) Line pressure at 445 N(100 fb.) pedal load (NPa (psi)) 10.,900 Line pressure at 445 N(100 fb.) pedal load (NPa (psi)) 10.,900 Bonded or rivetad (rivetariseg) Inboard Integrally Molded - Inboard and Outboard NA Material See Primary or out-board 128 FE Semi - Metallic Semi - | | Hydra | mije bowe | source (elect., vec. mtr., | pwr. strg.) | |
| Gross Fining area (cm²(fin.*))" (F/R) Swept area (cm²(fin.*))" (F/R) Cuterworking diameter F/R Front - 247 (9.72) Thickness F/R Front - 22.4 (.88) Material & type (vented/solid) F/R Front - 200 x 45 (7.87 x 1.77) Drum Diameter & working filemeter F/R Front - 200 x 45 (7.87 x 1.77) Type and material F/R Cast Iron Front - 57 (2.24) Rear - 16 (.63) Master oylinder bore Fr/R Rore - 22.2 (.874) Stroke 35.7 (1.41) All predal are ratio 3.7:1 Line pressure at 445 N(100 lb.) pedal load (lcPa (psi)) 10.900 Lining clearance F/R Both - Self Adjusting Bonded or reveted (riveta/seg.) Inboard Integrally Molded - Inboard and Outboard NA Manufacturer Delco Moraine Line goder*** Delco Moraine Line goder*** Semi-Metallic Semi-Metallic | Effective as | res (cm²(i | n. ^a)]* | | | 309 (47 9) |
| Swept area (cm²(n-1)) FFR Front - 247 (9.72) Front - 247 (9.72) | Gross lining | Gross lining area (cm²(in.²))**(F/R) | | | | |
| Curarvorking diameter F/R Front - 247 (9.72) | Swept area | Swept area (cm²(in.²))***(F/R) | | | | |
| Inner working diameter F/R | | Oute | rworking | diameter | F/A | |
| Material & type (vented/solid) F/R Front - 22.4 (88) Front - Vented Cast Iron Drum Diameter & woth 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 Front - 57 (2.24) Rear - 16 (.63) Master cylinder Borestroke F/R Bore - 22.2 (.874) Stroke 35.7 (1.41) Pedal arc ratio 10.900 Liming clearance F/R Both - Self Adjusting Bonded or riveted (rivete/seg.) Inboard Integrally Molded - Inboard and Outboard NA Manufacturer Delco Moraine Front Wheel Material Semi-Metallic Semi-Met | Rotor | Inner | er working diameter F/R | | | |
| Material & type (vented/solid) F/R Front - Vented Cast Iron | | Thick | hickness F/R | | | Front - 22 4 (88) |
| Diameter & westing F/R | | Mate | rial & typ | (vented/solid) | F/A | |
| Type and material F/R Cast Iron | O | Diam | eter & wa | #th | F/A | |
| Wheel errors bore Front - 57 (2.24) Rear - 16 (.63) | | Туре | and mate | irial | F/R | |
| Masterial Bore sylinder Borestroke F/R Rore = 22.2 (.874) Stroke 35.7 (1.41) 3.7:1 Line pressure at 445 N(100 lb.) pedal load (kPa (pel)) 10.900 Lining clearance F/R Both - Self Adjusting Bonded or riveted (riveta/seg.) Inboard Integrally Molded - Inboard and Outboard NA Manufacturer Lining coder**** Semi-Metallic | Wheel cylin | oder bore | | | | |
| Size Secondary or in-board Size S | Master cytir | nder | Borers | troke | F/A | |
| Bonded or riveted (inveta/seg.) Front Uning code**** Wheel Size Secondary or in-board 125 x 47 x 10.92 Shoe thickness (no lining) Bonded or riveted (inveta/seg.) Front Uning code*** Wheel Size Secondary or in-board 125 x 47 x 10.92 Shoe thickness (no lining) Bonded or riveted (inveta/seg.) Rive ted Inland Division Lining code*** Reservines Maceries Organic ***ene Primary or out-board 167.7 x 43.9 x 6 mm Size Secondary or in-board 194 x 43.9 x 7 mm | | | | | | 3.7:1 |
| Bonded or riveted (riveta/seq.) Rivet size NA Manufacturer Lining code**** Wheel Material Brake iring Brake iring Bonded or riveted (riveta/seq.) Inboard Integrally Molded - Inboard and Outboard NA Delco Moraine Lining code*** Semi-Metallic Semi-M | Line pressu | re et 445 | N(100 lb |) pedal load (kPa (pei) |) | 10,900 |
| Bonded or riveted (riveta/seg.) Rivet size NA Manufacturer Delco Moraine Liring code**** Vines* Material Semi-Metallic Semi-Metallic Semi-Metallic Semi-Metallic Semi-Metallic Size Secondary or in-board Size Secondary or in-board Shoe thickness (no lining) Bonded or riveted (riveta/seg.) Riveted Manufacturer Uning code*** Riveted Manufacturer Uning code*** NA NA Namufacturer Inland Division Lining code*** Vines* NA Size Secondary or out-board 167.7 x 43.9 x 6 mm Size Secondary or in-board 194 x 43.9 x 7 mm | Lining clear | ance | | | F/A | Both - Self Adjusting |
| Hivet size NA Manufacturer Delco Moraine Lining code**** | | İ | Bonde | d or riveted (rivets/seg. | .) | Inboard Integrally Molded - Inboard and Outboard |
| Front wheel Material Semi-Metallic Semi-Metallic Semi-Metallic Semi-Metallic Size Secondary or in-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) Bonded or invetsd (rivets/seg.) Riveted Manufacturer Inland Division Lining code/secondary or out-board 167.7 x 43.9 x 6 mm Size Secondary or in-board 194 x 43.9 x 7 mm Size Secondary or in-board 194 x 43.9 x 7 mm Size Secondary or in-board 194 x 43.9 x 7 mm Size Secondary or in-board 194 x 43.9 x 7 mm Size Secondary or in-board 194 x 43.9 x 7 mm Size Secondary or in-board 194 x 43.9 x 7 mm Size Secondary or in-board 194 x 43.9 x 7 mm Size Secondary or in-board 194 x 43.9 x 7 mm Size Secondary or in-board 194 x 43.9 x 7 mm Size Secondary or in-board 194 x 43.9 x 7 mm Size Secondary or in-board 194 x 43.9 x 7 mm Size Secondary or in-board 194 x 43.9 x 7 mm Size Secondary or in-board 194 x 43.9 x 7 mm Size Secondary or in-board 194 x 43.9 x 7 mm Size Secondary or in-board 194 x 43.9 x 7 mm Size Secondary or in-board 194 x 43.9 x 7 mm Size Secondary or in-board 194 x 43.9 x 7 mm Size Secondary or in-board 194 x 43.9 x 7 mm Size Secondary or in-board 194 x 43.9 x 7 mm Size Secondary or in-board 194 x 43.9 x 7 mm Size Secondary or in-board 194 x 43.9 x 7 mm Size Secondary or in-board 194 x 43.9 x 7 mm Size Secondary or in-board 194 x 43.9 x 7 mm Size Secondary or in-board 194 x 43.9 x 7 mm Size Secondary or in-board 194 x 43.9 x 7 mm Size Secondary or in-board 194 x 43.9 x 7 mm Size Secondary or in-board 194 x 43.9 x 7 mm Size Secondary or in-board 194 x 43.9 x 7 mm Size Secondary or in-board 194 x 43.9 x 7 mm Size | | | Rivet a | 20 | | NA |
| Front wheel Material Semi-Metallic Semi-Metallic Semi-Metallic | | | Manuf | icturer | | Delco Moraine |
| State Secondary 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) Bonded or riveted (rivetarseq.) Riveted Manufacturer Inland Division Fleer wheel Material Organic | | | Lining | code***** | | 128 FE |
| Size Secondary or in-board 125 x 47 x 10.92 Shoe thickness (no lining) 4.72 IB (.186). 3.14 OB (.123) Bonded or revoted (rivetaresg.) Riveted Manufacturer Inland Division Lining code**** 235 FE Meterial 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 | | wheel | Materia | <u> </u> | | Semi-Metallic |
| Shoe thickness (no lining) Bonded or riveted (rivetarseg.) Riveted Manufacturer Lining code**** Wheel Material Size Secondary or in-board 123 x 47 x 10.2 4.72 IB (.186). 3.14 OB (.123) Riveted Riveted Inland Division 235 FF Organic *** Organic 167.7 x 43.9 x 6 mm 194 x 43.9 x 7 mm | | | | Primary or out-board | | 116.7 x 47 x 10.92 |
| Bonded or riveted (rivets/seq.) Riveted Manufacturer Inland Division Conganic Con | | | | | 1 | 125 x 47 x 10.2 |
| Bonded or riveted (rivetarseg.) Rive ted Manufacturer Inland Division Lining code***** Uriganic Primary or out-board Size Secondary or in-board 194 x 43 9 x 7 mm | | ļ | _ | | | 4.72 IB (.186), 3.14 OB (.123) |
| 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 | प्र वासु | | Bonder | or inveted (riveta/aeg. |) | Riveted |
| Hear wheel Lining code**** Code | | | Manute | cturer | | |
| Primary or out-board 167.7 x 43.9 x 6 mm Size Secondary or in-board 194 x 43.9 x 7 mm | | | Lining | xxde ^{poure} | | |
| Size Secondary or in-board 167 7 x 43 9 x 6 mm | | wheel | | <u> </u> | | Organic |
| Size Secondary or in-board 194 x 43.9 x 7 mm | |] | **** | Primary or out-board | | |
| | | | | | 1 | |
| | | | Shoe th | ricioness (no lining) | | |

^{*}Excludes rivet holes,grooves, chamlers, etc.

^{**}Includes rivet holes, grooves, chamfers, etc.

| | MVM | A Snacifi | cations F | | Vehicle Line | | s Calais | | | | |
|---|-----------------------------------------|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|--------------|-------------|---------------------------------------|---------------------------------------|--------------|--|--|
| | | | | Orill | Model Year | 1989 | Issued | 6-88 Revised (*) _ | 9-88 | | |
| | METRIC | (U.S. Custo | mary) | | | | | | | | |
| | Body Type . Engine Ols; | | | ALL | | | | | . • | | |
| | Tires And | d Wheels (Stz | ndard) | | | | | | | | |
| | | Size (load range, | ply) | P185/80F | R13 | | <u> </u> | | | | |
| | Type (bias, radial, steel, nylon, etc.) | | | Radial | | | | | | | |
| | Tires | Inflation pree- sure (cold) for recommended | Front (kPa (pei)) | 240 (35 | PSI) | | | | | | |
| | | max. vehicle | Reer [kPa (pei)] | 240 (35 | PSI) | | | · | | | |
| | | Rev./mile-et 70 k | m/h (45 mph) | 526 | | | | | | | |
| | | Type & material | | Stamped | | | | | | | |
| | | Rim (size & flang Wheel offset | e type) | 13×5.5 | 5 JB | | | · · · · · · · · · · · · · · · · · · · | | | |
| | Wheels | AALIESE OIISSE | Time (belt as must) | 48 mm | | | | | | | |
| | | Attachment | Type (bolt or stud) Circle diameter | Stud | | | | | | | |
| | | | Number & size | 100 mm | | | | | • | | |
| _ | | | THE RESIDENCE OF THE PARTY OF T | <u>5 - 12 π</u> | All | | -,-,- | | | | |
| Ø | Scare | Tire and wheel | | T125/700 |)14 Wheel I | 4 x 4T | <u>Inflation</u> | 415 (60 PSI) | | | |
| | Storage position & location (describe) | | | eck of Lugo | | <u> </u> | | | | | |
| | Tires And | i Wheels (Opt | ionel) | | | | | | | | |
| | Tire size (lose | | | P215/60R | 14 | | - | | | | |
| | | idel, steel, nyton, et | E.) | Radial | 114 | | | · | | | |
| | Wheel (type & | | | Cast Alu | min.m | | *. | | | | |
| | | nge type and offset) | | |) JJ 47 mm | Offcot | · · · · · · · · · · · · · · · · · · · | | | | |
| | Tire size (loed | i range, ply) | | P195/70R | | MITSEL. | | <u> </u> | | | |
| | Type (blas, ra | idial, steel, nylon, et | c.) | Radial | | | | | | | |
| | Wheel (type 6 | k material) | | Stamped Steel | | | | | | | |
| | Pilm (size, flar | nge type and offset) | | | . J.J. 47 mm | Offset | | | | | |
| | Tire size (loss | | | P205/55R | | | | | | | |
| | | idial, steel, nylon, et | c.) | Radial | | | | | | | |
| | Wheel (type & | | | <u>Aluminum</u> | l | | | | | | |
| | | nge type and offeet) | | <u> 16 x 6 J</u> | IJ 47 mm Qf | <u>fset</u> | | | | | |
| | Tire size (load | i range, ply) Idiel, steel, nylon, et | _ | | | | | · | | | |
| | Wheel (type 8 | | E.J | 81 | | | 7 114 | | | | |
| | | nge type and offset) | | Aluminum | | £4 | | | | | |
| _ | Spere tire and | | | 14 X 0 U | J 47 mm Of | rset | | | | | |
| | road tire or soptional spe | tion is different then wheel, describe are tre and/or wheel torage position) | | T125/70D15 Wheel 15 x 4T Inflation 415 (60 PSI) Storage Under Deck of Luggage Compartment | | | | | | | |
| | Brakes - | Parking | | | | | | | | | |
| | Type of contro | <u> </u> | · | Grip Han | ıdle | | | | | | |
| | Location of co | introl | | | Front Seat | S | | | | | |
| | Operates on | | | | vice Brake | | | · · · · · · · · · · · · · · · · · · · | | | |
| | - 7 | Type (internal or e | octornal) | NA | | | | | | | |
| | If separate from service | Drum diameter | | NA | · | | | | | | |
| | braikes | Lining size (length width x thickness | x | NA | | | | | | | |

MVMA Specifications Form Vehicle Line Cutlass Calais Model Year 1989 Issued 6-88 Revised (*) 9-88 METRIC (U.S. Customary)

| 1 | Body Type And/Or Engine Displacement | | | | ALL | | | | |
|----|-----------------------------------------|-----------------------------------|---------------------------|-------------|---------------------------------------------|--|--|--|--|
| ; | Steering | | | | | | | | |
| į | Manual (std., | oot, n.e.) | | | N/A | | | | |
| | Power (std., o | | | | Std. | | | | |
| • | | | Туре | | Tilt | | | | |
| | Adjustable steering whee | Vcolumn | Manufacturer | | Saginaw Division | | | | |
| (| (tilt, telescope | , other) | (Std., opt., n.: | a.) | Opt. | | | | |
| , | Wheel diamet | | Manual | | 375 mm (14.8) | | | | |
| | (W9) SAE J11 | | Power . | | 375 mm (14.8) | | | | |
| | Outside | | Wall to wall (I | . & r.) | 11.54 (37.8) 12.3 (40.5) | | | | |
| | Turning front diameter | | Curb to curb | (l. & r.) | 10.79 (35.4) 11.53 (37.8) | | | | |
| | m (fL) | Inside | Wall to wall (I | . & r.) | 5,9 (19.6) 6.9 (22.9) | | | | |
| | | rear | Curb to curb (l. & r.) | | 6.0 (19.9) 7.0 (23.0) | | | | |
| | Scrub Radius* | | | | · | | | | |
| | | | Туре | | N/A | | | | |
| | Gear | | Manufacturer | | N/A | | | | |
| ١ | Manual | | Ration | Geer | N/A | | | | |
| | | | | Overali | N/A | | | | |
| a. | | | turns (stop to : | | N/A | | | | |
| Ø` | | Type (coaxial, elec., hyd., etc.) | | | Rack & Pinion w/Integral Unit | | | | |
| | | Manufact | T | | Saginaw Division | | | | |
| | Power | | Туре | | Rack & Pinion | | | | |
| | · • • • • • • • • • • • • • • • • • • • | Geer | Ratios Geer | | | | | | |
| | | | | Overall | 16.0:1 | | | | |
| | | Pump (dri | | | Belt Off Crankshaft Pulley | | | | |
| | | | turns (stop to | stop) | 2.88 | | | | |
| | | Туре | | | Center Take-off Tie Rods. Rack & Pinion | | | | |
| ı | Linkage | Location (of wheels, | front or rear , other) | | Rear | | | | |
| | | Tie rods (d | one or two) | | Two | | | | |
| • | | | at camber (de | g.) | 13 40 | | | | |
| | Steering | | Upper | | Ball Bearing | | | | |
| | axis | Bearings | Lower | | Rall Joint | | | | |
| | | (type) | Thrust ' | | Incorporated in Upper Bearing | | | | |
| 3 | Steering spino | de & joint ty | pe | | MacPherson Strut | | | | |
| • | | | Inner bearing | | N/A | | | | |
| | Wheel | Diameter | Outer bearing | | N/A | | | | |
| | spindle/hub | Thread (si | | | M20 x 1.5 | | | | |
| | | Bearing (t | ype) | | Integral Double Row Ball, Permanently Lubed | | | | |

[&]quot;The horizontal distance in the front elevation between wheel centerline and kingpin (ball joint) axis at ground.

[&]quot;See Page 22

 Vehicle Line
 CULTASS CATATS

 Model Year
 1989

 Issued
 6-88

 Revised (*)
 9-88

METRIC (U.S. Customary)

Body Type And/Or Engine Displacement

ALL

Wheel Alignment

| • | Service | Caster (deg.) | $1.7^{\circ} +/- 1.0^{\circ}$ Cross Car Must be Within 1.0° |
|-----------------------|----------------------|---------------------------------|----------------------------------------------------------------------|
| | checking | Camber (deg.) | .8° +/6° Cross Car Must be Within 1.0° |
| | L | Toe-in (outside track-mm (in.)) | 0 +/20 |
| Front | | Caster | -0.8° to 4.2° Cross Car Must be Within 0.75° |
| wheel at curb mass | Service reset* | Camber | -2.0° to 1.8° Cross Car Must be Within 1.0° |
| (wt.) | | Toe-in | 2° to +.2° Degrees Per Wheel |
| | Periodic | Caster | Not Applicable |
| | M.V. In- | Camber | Not Applicable |
| | spection | Toe-in | Not Applicable |
| | Service | Camber (deg.) | Not Applicable |
| Rear | checking | Toe-in (outside track-mm (in.)) | Not Applicable |
| wheel at curb mass | Service | Camber | Not Applicable |
| (WL) | reset* | Toe-in | Not Applicable |
| | Periodic M,V, in- | Camber | Not Applicable |
| | Spection | Toe-in | Not Applicable |

^{*} Indicates pre-set, adjustable, trend set or other.

Electrical - Instruments and Equipment

| Speed- | Type (analog, digital, std., opt.) | Analog (Dial W/Pointer, Quartz Movement) | | | | | | |
|------------------|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|
| ometer | Trip odometer (std., opt., n.a.) | Standard | | | | | | |
| EGR mainten | ance indicator | N/A | | | | | | |
| Charge | Туре | Indicator Lamp Gage Opt. | | | | | | |
| indicator | Warning device (light, audible) | Indicator Lamp Gage Opt. | | | | | | |
| Temperature | Туре | Indicator Lamp Temp. Sensor Ont. | | | | | | |
| indicator | Warning device (light, audible) | Indicator Lamp Gage Opt. | | | | | | |
| Oil pressure | Туре | Indicator Lamp Press Sensor Ont. | | | | | | |
| indicator | Warning device (light, audible) | Indicator Lamp Gage Opt. | | | | | | |
| Fuel Type | | Dial W/Pointer (Electric Gage) | | | | | | |
| indicator | Warning device (light, audible) | N/A | | | | | | |
| } - | Type (standard) | Electric 2-Speed | | | | | | |
| Wind- shield | Type (optional) | Controlled Cycle Pulse | | | | | | |
| wiper | Blade length | 482.6 (19.0) | | | | | | |
| | Swept area [cm²(in.²)] | 5583.7 (865.5) | | | | | | |
| Wind- | Type (standard) | Electric Pump Mounted on Reservoir Bottle | | | | | | |
| shield washer | Type (optional) | N/A | | | | | | |
| | Fluid level indicator (light, audible) | | | | | | | |
| Rear window | wiper, wiper/washer (std., opt., n.a.) | None | | | | | | |
| | Туре | Electric Vibrating | | | | | | |
| Horn | Number used | 2 Standard | | | | | | |
| Other | | Indicator Lamps for Parking Brake & Brake Failure, Up-Shir Fasten Belts, Low Coolant & Service Engine Soon. Also, High Beam, Left and Right Turn. | | | | | | |

| MVMA | \ Spec | cifications F | Form | Vehicle Line | 1000 | | | |
|---------------------------|-----------------------------|-------------------------------------------------|---------------------------------------|--------------------|--------------|--------------|-----------------------------------------|---------------|
| • | • - | | | Model Year_ | 1303 | Issued _6_88 | Revised (*) | 9-88 |
| MEIIIA | (0.0.0 | seconies à l | | | | | | |
| Engine Deer Engine Cod | Supply System | | | | | | | |
| Electrical | | | | | | | | |
| | Manufactu | rer | Delco R | lemv | | | - | |
| | Model, std | ., (opt.) | | | | | · · · · · · · · · · · · · · · · · · · | |
| | | | | · | | | | |
| Battery | Amps at 0 | F cold crank | | | | - | | |
| | Minutee-re | serve capacity | | | | | | |
| | Amp/hrs | 20 hr. rate | | | | | | |
| | Location | | | od Front | | | | |
| | Manufactu | rer | | | | | | |
| | Rating (idle | Ymax. rpm) | | | | | | |
| Alternator | Ratio (alt. o | crank/rev.) | | | | | | |
| | Output at is | Sie (rpm, perk) | 48 Amps | at 27°C 95 | O RPM | | | : |
| | Optional (t) | rpe & rating) | | | | | | |
| Regulator | Туре | | | | | | | |
| Electrical | <u> — Startin</u> | g System | | | - | - | | |
| | Manufactur | | | | | | | |
| Start, motor | Current dra | in at - 20° f | <u> 1045502</u> | 2 417 Amps | . == | | | |
| | | | | | | | | |
| Motor | Engageme | nt type | Solenoi | <u>d with Posi</u> | tive Shi | ft | | |
| trive | Pinion engi from (tront, | iges rear) | Front | | | | | |
| Electrical | – ignitio | n System | | | | | · | |
| | | | | | | | • • • • • • • • • • • • • • • • • • • • | |
| Гуре | Other (spec | xfy) | | | | | • | |
| | Manufactur | tr . | | | | | | • |
| coii . | Model | | | | | | | |
| | Current | Engine stopped - A | | | _ | | · | |
| | | Engine idling - A | | | | | | |
| 1 | Manufactur | er <u>, </u> | | | | | | |
| L | Model | | | | | | | |
| Spark | | | | - | | | | |
| ping | | torque (N-m (lb, ft)) | · · · · · · · · · · · · · · · · · · · | | | | | |
| - | Gep | | | | | | | |
| | | | | · | | | | |
| Distributor | | - | <u> </u> | | | | | |
| | Model | | | | | | | |
| Electrical | – Suppre | esion | | | | | | |
| | | | <u></u> | | | | | |
| neethnes & ba | ~ | _ | | | | | | |
| .ocetions & typ | 1-0 | · | | | | | | |
| | | | | | | | | |

| MVM | A Spe | cifications l | Form | Vehicle Line | <u>Cutlass</u> 1989 | | 6-88 | | 9-88 |
|-----------------------------|-------------------------------|-----------------------|-------------------|--------------|---------------------------------------|---------------------------------------|----------------|-----------------|------|
| | | ustomary) | | Model Year | 1303 | _ Issued | 0-00 | _ Revised (+) _ | 9-00 |
| Engine Dee Engine God | eription/Ca ia | * . | 2.3L (138) L4 | LD2 | | | | | · |
| Electrica | i – Suppi | y System | | | | | | | |
| | Manufactu | rer | Delco Rem | v | | | | | |
| | Model, std | ., (opt.) | 1981601 S | | | | | _ | |
| | Voltage | <u> </u> | 12V | | | | | | |
| Battery | Amps at 0 | F cold crank | 630 CCA | <u> </u> | - | | | | |
| • | Minutee-re | eerve capacity | 90 Min | | | | | | |
| | Amp/hrs. | 20 hr. rate | 54 AH | | | | | - | |
| | Location | | Underhood | Front | | | | | |
| | Manufactu | ret* | Delco Rem | y | | | | | |
| | Rating (idle | ⊌max. rpm) | 30/85 or | 36/100 | | | | | |
| Alternator | nator Ratio (alt. crank/rev.) | | 2.56:1 | | | | | | |
| | Output at it | de (rpm, perk) * | 900 RPM - | 60 Amps | | | = | | |
| Optional (type & rating) ** | | 1101277 (| <u>85) 110127</u> | 8 (100) | | | | | |
| Regulator Type | | <u>Integral</u> | <u>to Alterna</u> | tor | | | <u>=</u> | <u>.</u> | |
| Electrical | - Startir | g System | | | | | | | |
| | Manufacturer | | | | _ | | | | |
| Start, motor | Current dra | en at 20°F | 373 Amps | 10455015 | | | | | |
| | Power ratir | ng (kw (hp)) | | | | | | | |
| 1 dentes | Engageme | nt type | Solenoid | Positive S | hift | | · - | | |
| Motor drive | Pinion engi from (front, | | Front | | | | | | |
| Electrical | – Ignitio | n System | | | | | | | |
| Time | Electronic (| std., opt., n.a.) | Std./Direc | t Ignitio | n System | | | <u>-</u> | |
| Туре | Other (spec | cify) | None | | • | | | | |
| | Manufactur | ** | Delco Remy | <i>i</i> (2) | | | | | |
| Coii | Model | | | | · · · · · · · · · · · · · · · · · · · | | | | |
| | Current | Engine stopped – A | 300 MA | | | | | | |
| | | Engine idling - A | Peak 9.5 / | Amps | | | | | |
| | Manufactur | * | A/C Spark | Plug | | | | | |
| | Model | | FR 3LS | = | | | | | |
| Spark | Thread (mr | | 14 x 1.25 | | | · · · · · · · · · · · · · · · · · · · | | | |
| plug | | torque (N-m (lb, ft)) | | 15 - 18) | | ·· | | | |
| | Geo | | .8 89 (.03 | 5) | | | | | |
| | Number pe | | Опе | | | | | | |
| Distributor | Manufactur | er | Delco Remy | | | | | <u> </u> | |
| | Model | | <u> </u> | | | | | | |
| Electrical | - Suppr | ession | | | | | | | |
| Locations & ty | / po | | | | | | | | |

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

 $^{^{**}}$ 1101277 for vehicles with heater only, 1101278 is for vehicles equipt with air conditioning.

| | | | = = | | C++1 | . 0.1.2. | | |
|-------------------------------------------------|------------------------|-----------------------|--------------------|--------------------------------|--------------|---------------------------------------|--------------------------------------------------|--------------|
| MVMA | Spe | cifications l | Form | Vehicle Line _ Model Year _ | 1989 | S Calais | 6-88 Revised (●) | 9-88 |
| METRIC | (U.S. C | ustomary) | | | | | | |
| Engine Desc Engine Code | | rts. | 3.3L (20 V6 LG7 | 4) | | | | |
| Electrical | – Suppi | v Svstem | | | | | | |
| | | | D-1 Po- | | | | | - |
| | Manufactu Madel etc | | Delco Rem | <u> </u> | | <u>-</u> | | |
| | Model, std Voltage | ., (opt.) | 1981601 | | | <u> </u> | - | |
| | | *F cold crank | 12V | | | - | | |
| Bettery | | | 630 CCA | | | | | |
| Amp/hrs 20 hr. rate | | | 90 RC | | | | | |
| | | ZU IV. I atte | 54 AH | | | | | |
| | Manufactu | | Underhood | | | <u> </u> | | |
| | | | Delco Rem | | | | | · |
| Rating (idle/max. rpm) Ratio (alt. crank/rev.) | | 1101483 | 28/74 Amp | <u>s</u> | | | | |
| Alternator | | | 2.97:1 | · 4 . 4 | 2796 | | | |
| | | dle (rpm, park) | | 4 Amps at | | | · | |
| Decidates | | ype & rating) | | Duty Option | | | | |
| Regulator | Туре | · | <u> Internal</u> | to Altern | ator | | | |
| Electrical | - Startlı | ng System | | | | | | |
| | Manufactu | rer | | | | | | |
| Start, motor | Current drain at | | 10455024 | 431 Amps | at -20°F | | | |
| | Power ratio | ng [kw (hp)] | | | | | | |
| • • • | Engageme | int type | Solenoid | w/Positiv | e Shift | | | |
| Motor drive | Pinion eng | ages , rear) | Front | | | | | |
| Flectrical | _ lanitle | on System | I F I UII L | _ | | | | |
| | | | T | · | | | - | |
| Туре | | (std., opt., n.a.) | Standard | | | | | |
| | Other (spe | | <u> </u> | | | · · · · · · · · · · · · · · · · · · · | | |
| | Manufactu | rer | Delco Re | | | | | |
| Coil | Model | | Direct I | gnition | | | | |
| | Current | Engine stopped - A | 9 Amps | . | • | | | . <u></u> |
| | | Engine idling - A | 1.0 | | | | | |
| | Manufactu | | A/C | | | | | |
| | Model | | R44-LTS6 | | | | <u> </u> | |
| Spark | Thread (m | | 14 | | | <u> </u> | · · · · | |
| plug | | torque [N·m (lb, ft)] | 27 (20) | | | - <u>-</u> | ·· | |
| | Gap | | 1.5 (.06 | 0) | | | | |
| | Number po | | One | | | | | |
| Distributor | Manufactu | rer | N/A | | | | | , |
| | Model | | <u> </u> | | | | | |
| Electrical | – Suppr | ession | , | | | | | |
| | | | | <u> </u> | | | | |
| Locations & ty | /pe | | | | | | | |

| MVMA Specifications | | Vehicle Line | CUT | LASS CALAIS | | | | | |
|---------------------|-----------------------------|----------------------------|-----------------------|-------------|----------------------------------------|---------------------------------------|---|--|--|
| | opoo. | .ioations | Model Year | 1989 | Issued | Revised(*) | | | |
| METRIC (L | J.S. Cus | tomary) | | | | | | | |
| Engine Descr | iption | | 2.3 LITER L4 (1: | 38 CID) | | | _ | | |
| Engine Code | | | MULTI-PORT FUI | | ON RPO LGO | · · · · · · · · · · · · · · · · · · · | | | |
| Electrical - | - Supply | System | | | | | | | |
| | Manufactu | rer | Delco Remy | | | | _ | | |
| | Model, std | l., (opt.) | 1981601 | | | | _ | | |
| | Voltage | | 12V | | | | | | |
| Battery | Amps at 0 | deg F cold crnk | 630 CCA | - | | · · · · · · · · · · · · · · · · · · · | | | |
| | Minutes-re | eserve capacity | 90 RC | | · | | _ | | |
| | Amps/hrs. | - 20 hr. rate | 54 AH | | | | | | |
| | Location | | Underhood Front | | | | | | |
| | Manufactu | rer | Delco Remy | | | | _ | | |
| | Rating (idle | e/max.rpm) ± | 1101277 / 85 Amps | or 110127 | 8 / 100 Amps | | | | |
| Alternator | Ratio (alt. o | crank/rev.) | 2.08:1 | | ······································ | | _ | | |
| | Output at idle(rpm,park) ** | | 900 RPM 60 Amps, | 68 Amps | · · · · · · · · · · · · · · · · · · · | | _ | | |
| | Optional (type & rating) | | | tion | <u> </u> | | _ | | |
| Regulator | Type | | Internal to Alternato | | | | _ | | |
| Electrical - | - Startin | g System | | | | | | | |
| | Manufacturer | | Delco Remy | | | | _ | | |
| Motor | | | 378 Amps 1045504 | 4 | | | _ | | |
| | Power ratir | ng [kw (hp)] | 1.5 kw | | | | | | |
| | Engageme | nt type | Solenoid with Posit | ive Shift | | | _ | | |
| Motor drive | Pinion enga from (front | ages , rear) | Front | | | | | | |
| Electrical - | - Ignitior | n System | | | | | | | |
| Tunn | Electronic | (std, opt,n.a.) | Standard/Direct Ign | ition Syste | m | | _ | | |
| Туре | Other (spec | cify) | None | | | | | | |
| | Manufactu | rer | Delco Remy (2) * | | | | | | |
| Con | Model | | | | · · · · · · · · · · · · · · · · · · · | | _ | | |
| Con | C | Engine stopped-A | 300 MA | | | | _ | | |
| | Current | Engine idling – A | Peak 9.5 Amps | | | | _ | | |
| | Manufactui | rer | A/C Spark Plug | | | | | | |
| | Model | | FR 3LS | | | | _ | | |
| C | Thread (mm | n) | 14 x 1.25 | | | | _ | | |
| Spark plug | Tightening [Newton mi | torque eters (lb. ft.)} | 21 - 24 (15 - 18) | | | | _ | | |
| | Gap | | .889 mm (.035 in.) | | | | | | |
| | Number per | r cylinder | One | | | | | | |
| _ | Manufactur | rer | Delco Remy | | | | | | |
| Distributor | Model | | | | | | | | |
| Electrical - | Suppre | ession | | | | | | | |
| 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.

| MA MIN | A Specifi | cations Forr | Vehicle Models Cutlass Cal | | | | | |
|-----------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|--|--|--|--|
| | • | | Model Year 1989 Issued | 6-88 Revised (•) 9-88 | | | | |
| METHIC | (U.S. Custo | omary) | | | | | | |
| Body Type | • | | | | | | | |
| Body | | | | | | | | |
| | | | | | | | | |
| Structure | | | Unitized body construction in with bolted-on fenders and he | | | | | |
| Bumper syst front - rear | am | | Azdel impact bar. Delco hydraulic energy absor Functional rubber rub strips Body Colored fascias. Phase 1 - 5 MPH. | | | | | |
| Anti-corrosio | n 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. | | | | | |
| | liscellaneous | | Acrylic Lacquer or Base Coat, | (Class Cost Engal | | | | |
| · ypo o | Material & mass | <u> </u> | ACTIVITE Lacquer or base coat, | Clear Coat Ename! | | | | |
| | Hinge location (fi | mont rearr) | Donn | | | | | |
| Hood | Type (counterbe | | Rear Prop Rod - Single Pivot Hinge | | | | | |
| | | (internal, external) | Internal | <u> </u> | | | | |
| | Material & mass | (| Incernal | | | | | |
| Trunk lid | Type (counterba | lance, other) | Hinge Mounted in Sail Area W | Extension Spring Counter Bal | | | | |
| | | control (elec., mech., n.a.) | Electrical Solenoid (Opt.) | Execusion opining dodnes but | | | | |
| | Material & mess | (0.000 | Ziecti icai solelloia (opc.) | | | | | |
| Hatch- back lid | Type (counterbal | lance other) | | | | | | |
| DOCK HU | | control (elec., mech., n.a.) | | | | | | |
| | Material & mass | to the total index, index, index | | | | | | |
| T-: | Type (drop, lift, d | innel | | | | | | |
| Tailgate | | ontrol (elec., mech., n.s.) | | | | | | |
| | | Front | 1170 | | | | | |
| | control (crank, power) | | N/A | | | | | |
| friction, pivot, power) | | Retir | N/A | | | | | |
| | Window regulator type Front | | _ N/A | | | | | |
| | cable, tape, flex, drive, etc.) Rear | | N/A | | | | | |
| | flex, drive, etc.) | | | | | | | |
| (cable, tape, | type | Front | Foam | | | | | |
| Seat cushion (e.g., 60/40, I | type bucket, bench, | Front Reer | Foam | | | | | |
| Seat cushion (e.g., 60/40, I | type bucket, bench, | Front | ······································ | | | | | |
| Seat cushion (e.g., 60/40, I wire, foam et | type bucket, bench, c.) | Front Reer | Foam | | | | | |
| (cable, tape, Seat cushion (e.g., 60/40, wire, foam et Seat back tyl (e.g., 60/40, | type bucket, bench, C.) De bucket, bench, | Front Rear 3rd seat | Foam N/A | | | | | |
| (cable, tape, Seat cushion (e.g., 60/40, I wire, foam et | type bucket, bench, C.) De bucket, bench, | Front Rear 3rd seat Front | Foam N/A Foam | | | | | |
| (cable, tape, Seat cushion (e.g., 60/40, wire, foam et Seat back tyl (e.g., 60/40, | type bucket, bench, C.) De bucket, bench, | Front Rear 3rd seat Front Rear | Foam N/A Foam Foam | | | | | |

MVMA Specifications Form METRIC (U.S. Customary)

 Vehicle Line
 Cutlass Calais

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

| Body | Туре | |
|------|------|--|

ALL

| Ø | Restraint System | n |
|---|------------------|---|
|---|------------------|---|

| Seating Pos | tition | | | Left | Center | Right | |
|-------------------------------------------------------------------------------------|-----------------------------------------|------------------------------------------|--------------------|-----------------------------|---------------|-----------------------------|--|
| | Type & description (lab & shoulder helt | Type & description (lsp & shoulder belt, | | Not Available | Not Available | Not Available | |
| Active | lap bett, etc.) | | Second seat | Lap/Shoulder Combination | Lap Belt | Lap/Shoulder Combination | |
| Standard / optional | | | Third seat | | | | |
| Type & description | | | First seat | 3 Point Manual | Not Available | 3 Point Manual | |
| (air beg, motorized - 2-point bet, fixed be knee bolster, manual lap bett) | Mt. | Second sect | Not Available | Not Avialable | Not Available | | |
| Standard / options | | | Third seat | | | | |
| iess | | SAE Ref. No. | | 27 | | 69 | |
| indshield g riace area | plass exposed (cm²(in.²)) | S1 | 8464 | (1312) | | 8464 (1312) | |
| de glass er es (cm²(in. | xposed surface .*)] - total 2-sides | S2 | 7177 | (1112) | 10018 (1553) | | |
| ncklight gla Irlace area | iss exposed (cm²(in.²)] | S3 | 3418 | (530) | 3418 (530) | | |
| Total glass exposed surface S4 urea (cm²(in.²)) | | | 9 (2954) | 21900 (3395) | | | |
| Windshield glass (type) | | | ed - Laminated Flo | at | 21900 (3393) | | |
| de giass (h | ype) | | | ed - Tempered Floa | | | |
| Sacklight glass (type) | | | | - | | | |

\varnothing Lamps and Headlamp Locations

| 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 |
| | Shape Lo-beam type (2A1, 2B1, 2C1, etc.) Quantity Hi-beam type (1A1, 2A1, 1C1, 2C1, etc.) |

Frame

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

Unitized Frame

| 141/14 | A Specifications For | Vehicle Line <u>Cutlass</u> Calais |
|-------------------------------|---------------------------------------------------|-------------------------------------------------|
| | A Specifications Form (U.S. Customary) | Model Year 1989 Issued6_88_ Revised (e) 9-88 |
| Body Type | • | |
| Conveni | ence Equipment (standard, optic | onal, n.a.) |
| Air condition auto, temp o | ning (manual, control) | |
| | <u> </u> | (C60) Opt. Manual |
| Clock (digita | il, analog) | Part of Radio Package |
| Compass/ti | hermometer | |
| Console (flor | or, overhead) | (D55) Opt. |
| Defroster, el | ec. becklight | (C49) Opt. |
| | Diagnostic monitor (Integrated, individual) | |
| | instrument cluster (list instruments) | (UB3) Opt. Oil, Temp, Volts, Trip Odom. & Tach. |
| K | Keyless entry | (003) Ope. Off, Temp, Votes, Trip Odom. & Tach. |
| Electronic | Tripminder (avg. spd., fuel) | (U23) Std. |
| | Voice alert (list items) | |
| | Other | |
| | | |
| Fuel door loc | k (remote, key, electric) | |
| | Auto head on/off delay, dimming | |
| | Cornering | |
| | Courtesy (map, reading) | (U29) Std. (C96) Std. NT Opt. NF |
| , | Door tock, ignition | 7 |
| | Engine compartment | (TR9) Std. NT Opt. NF |
| .amps | Fog | (T37) Std. NK Only |
| | Glove compartment | |
| | Trunk | (U25) Std. |
| | Illuminated entry system (list lamps, activation) | |
| | Other | |
| | | |
| | Day/night (auto. man.) | Std. Manual |
| | L.H. (remote, power, heater) | (D35) Ctd Dt- (DC0) O-+ D |

Navigation system (describe)

Parking brake-auto release (warning light)

R. H. (convex, remote, power, heated)

Visor vanity (RH / LH, illuminated)

(D35) Std. Direct (D68 Opt. Remote

(D64) Std. RH Illuminated on NT Opt. on NF

| | - | cifications Form ustomary) | Vehicle Lir Model Yea | eCutlas: 1989 | | | Revised (*) | 9-88 |
|-------------------------------------------------|-----------|--------------------------------------|-----------------------------|------------------|----------|---------------------------------------|------------------|--------------|
| Body Type | ı | | _ | | | · · · · · · · · · · · · · · · · · · · | | <u> </u> |
| Conveni | ence Equ | ilpment (standard, optional, | n.a.) | | | • | | |
| - | | raisess, pull down) | (A90) Opt. Release Electric | | | | | |
| Door locks (manual, automatic, describe system) | | 8 (manual, automatic, system) | (All3) Opt | Electric | | | | |
| | | 2 - 4 - 6 way, etc. | | 6 Way (Al | H3) Std. | NT 4 Wa | v Opt. NF | |
| | | Reclining (R.H., L.H.) | (AR9) Std | | | | .J 0P 0. III | |
| | Seats | Memory (R.H., L.H., preset, rectine) | | | | - | | |
| Power | | Lumber, hip, thigh, support | | | | | | |
| | | Heated (R.H., L.H., other) | | | | | · - - | |
| | Side wind | OWS | (A31) Opt. | Electric | | | | |
| | 14 | | | | | | | |

*RH Front Fender

Equalizer

(AD3) Opt. Hinged

(K34) Ont.

(UB3) Ont.

(US6) Std. Fixed RH Front Fender (U57) Opt. Power*

(UM6) Opt. AM/FM Stereo, Seek/Scan, Clock, ETR & Cassette (UX1) Opt. AM/FM Stereo, Seek/Scan, Clock, ETR, Cassette

(UM7) Std. AM/FM Stereo. Seek/Scan. Clock & ETR

(U64) Std. 4 Front Dash & REar Quarter (U66) Opt. 4 Front Dash & Rear Quarter

Rear windows

Standard

Optional

Roof open air fixed (flip-up, sliding, "T")

Speed warning device (light, buzzer, etc.)

Speed control device

Telephone system (describe)
Theft deterrent system

Tachometer (rpm)

Speaker (number, location)

Ø

Redio

Antenna (location, whip. w/shield, power)

AM, FM, stereo, tape, compact disc, graphic equalizer, theft deterrent, radio prep package,

headphone jacks, etc.

Cutlass Calais Vehicle Models 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 J1 100 "Motor Vehicle Dimensions." unless otherwise at

| SAE Ref. no. refers to the definition publ | | 211601111111111111111111111111111111111 | o United States, United States Specified. |
|------------------------------------------------------------------------|-------------|-----------------------------------------|-------------------------------------------|
| Body Type | SAE Ref. | ALL OR COUPE | SEDANS |
| Width | No. | ALL OR COUPE | JEDANS |
| Fread (front) | W101 | 55.6 | 55.6 |
| Tread (reer) | W102 | 55.2 | 55.2 |
| Vehicle width | W103 | 66.7 | 66.7 |
| Body width at Sg RP (front) | W117 | 1690 (66.5) | |
| /ehicle width (front doors open) | W120 | 3723 (146.6) | 3195 (125.8) |
| /ehicle width (rear doors open) | W121 | Not Applicable | 3133 (123.0) |
| ront fender overall width | W106 | | |
| Rear funder overall width | W107 | 1657 (65.2) | |
| umble-home (deg.) | W122 | 22° | |
| /ehicle width including mirrora | * | 66.7 | |
| ength | | | |
| Vhoelbese | L101 | 103.7 | 103.7 |
| /ehicle length | L103 | 178.8 | 178.8 |
| Overhang (front) | L104 | | |
| Overhang (rear) | L105 | | |
| pper structure length | L123 | 2284 (89.9) | |
| ear wheel C/L "X" coordinate | L127 | | |
| owl point "X" coordinate | L125 | 194 (7.6) | |
| ront end length at centerline | L126 | | |
| ear and length at centerline | L129 | 685 (27 ₋ 0) | ······································ |
| leight * * | | | |
| assenger distribution (front/reer) | PD1.2.3 | 2/0 | • • |
| runk/cargo load | | 0 | •• |
| shicle height | H101 | 1331 (52.4) | |
| owl point to ground | H114 | | |
| eck point to ground | H138 | | |
| ocker panel-front to ground | H112 | | |
| attern of door closed-front to ground | H133 | | <u> </u> |
| ocker panel-reer to ground | H111 | | |
| ottom of door closed-reer to ground | H135 | Not Applicable | |
| Andshield slope angle | H122 | _60° | |
| acklight slope angle | H121 | 330 | |
| round Clearance ** | | | |
| ront bumper to ground | H102 | 214 (8.4) | |
| eer bumper to ground | H104 | 323 (12.7) | |
| umper to ground (front curb mass (wt.)) | H103 | 229 (9.0) | |
| umper to ground [reer umper to ground [reer | H105 | 354 (13.9) | |
| ngle of approach (degrees) | H106 | 150 | |
| ngle of departure (degrees) | H107 | 170 | |
| amp breaktiver angle (degrees) | H147 | 14° | |
| (| | | |
| de differential to ground (frant / reer) | M152 | 1 / / / / \ | |
| rie differential to ground (front / rear) in. running ground clearance | H153 | 166 (6.5) 147 (5.8) | |

^{**} 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 Accesones Whic Weigh Three Pounds Or More And Which Are Sold On At Least 33% Of The Car Line, Plus Two Occupants.

34

| MVMA Specificati METRIC (U.S. Customary |) | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|
| Vehicle Dimensions See | Key St | neets 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) | 1.34 | 1090 (42.9) | |
| SgRP to heel point | H30 | 234 (9.2) | |
| SgRP to heel point | L 53 | 895 (35.2) | |
| Beck angle | L40 | 26_5° | |
| lip angle | 1.42 | 100 5° | |
| Knee engle | L44 | 132° | |
| Foot angle | L46 | 87° | |
| Design H-point front travel | L17 | 192 (7.6) | |
| Normal driving & riding seat track trvi. | L23 | 171 (6.7) | |
| Shoulder room | W3 | 1386 (54.6) | 1379 (54.3) |
| Tip room | W5 | 1240 (48.8) | 1227 (48.3) |
| Joper body opening to ground | H50 | | |
| Steering wheel maximum diameter* | W9 | _ 376 (14.8) | |
| Steering wheel angle | H18 | | |
| Accel, heel pt. to steer, whi, cntr | L11 | | |
| Accel, heel pt, to steer, whi, ontr | H17 | | |
| Steering wheel to C/L of thigh | H13 | 107 / 4 0 \ | |
| | | 107 (4.2) | · |
| Steering wheel torso clearance | L7 | 379 (14.9) | · · · · · · · · · · · · · · · · · · · |
| leadlining to roof panel (front) | L7 H37 | 379 (14.9) 17 | |
| | L7 H37 H67 | 379 (14.9) 17 17 | |
| leadlining to roof panel (front) | L7 H37 H67 | 379 (14.9) 17 17 Front Compettment interior Dimension | ons Are Measured With The Seating Reference Point (SgRP) |
| leadlining to roof panel (front) Indepressed floor covering thickness | L7 H37 H67 | 379 (14.9) 17 17 Front Compettment interior Dimension | |
| leadlining to roof panel (front) Indepressed floor covering thickness Rear Compartment | L7 H37 H67 | 379 (14.9) 17 17 Front Compertment Interior Dimensic Forward And mm Upward | |
| leadlining to roof panel (front) Undepressed floor covering thickness Rear Compartment Sig RP Point couple distance | L7 H37 H67 | 379 (14.9) 17 17 Front Compertment Interior Dimensic Forward Andmm Upward 769 (30.3) | |
| leadlining to roof panel (front) Undepressed floor covering thickness Rear Compartment Sig RP Point couple distance Effective head room | L7 H37 H67 L50 H63 | 379 (14.9) 17 17 Front Competement Interior Dimension Forward And mm Upward 769 (30.3) 942 (37.1) | |
| leadlining to roof panel (front) Undepressed floor covering thickness Rear Compartment Sig RP Point couple distance Effective head room Vin. effective leg room | L50 H63 L50 H63 L51 | 379 (14.9) 17 17 Front Compertment Interior Dimensic Forward And mm Upward 769 (30.3) 942 (37.1) 870 (34.3) 267 (10.5) 5 (.2) | |
| leedlining to roof panel (front) Indepressed floor covering thickness Rear Compartment Sg RP Point couple distance Effective head room Min. effective leg room Sg RP (second to heal) | L50 H63 L50 H63 L51 H31 | 379 (14.9) 17 17 Front Compertment Interior Dimensic Forward And mm Upward 769 (30.3) 942 (37.1) 870 (34.3) 267 (10.5) 5 (.2) 666 (26.2) | |
| Rear Compartment Rear Compart | L50 H63 L51 H31 L48 | 379 (14.9) 17 17 Front Compertment Interior Dimensic Forward And mm Upward 769 (30.3) 942 (37.1) 870 (34.3) 267 (10.5) 5 (.2) | |
| leadining to roof panel (front) Indepressed floor covering thickness Rear Compartment Sg RP Point couple distance Effective head room Afn. effective leg room Sg RP (second to heal) Cree clearance Compartment room | L50 H67 L50 H63 L51 H31 L48 L3 | 379 (14.9) 17 17 Front Compertment Interior Dimensic Forward And mm Upward 769 (30.3) 942 (37.1) 870 (34.3) 267 (10.5) 5 (.2) 666 (26.2) | of Rearmost Position. |
| leadlining to roof panel (front) Undepressed floor covering thickness Rear Compartment Sig RP Point couple distance Effective head room Mn. effective leg room Sig RP (second to heal) Cree clearance Compartment room Shoulder room | L50 H67 L50 H63 L51 H31 L48 L3 W4 | 379 (14.9) 17 17 Front Compertment Interior Dimension Forward And mm Upward 769 (30.3) 942 (37.1) 870 (34.3) 267 (10.5) 5 (.2) 666 (26.2) 1403 (55.2) 1281 (50.4) | af Rearmost Position. 1375 (54.1) |
| leadlining to roof panel (front) Undepressed floor covering thickness Rear Compartment Sig RP Point couple distance Effective head room Min. effective leg room Sig RP (second to heal) Gree clearance Compartment room Shoulder room | L7 H37 H67 L50 H63 L51 H31 L48 L3 W4 | 379 (14.9) 17 17 Front Compertment Interior Dimension Forward And mm Upward 769 (30.3) 942 (37.1) 870 (34.3) 267 (10.5) 5 (.2) 666 (26.2) 1403 (55.2) | af Rearmost Position. 1375 (54.1) |
| Rear Compartment GREP Point couple distance Effective head room Min. effective leg room GRP (second to heal) Compartment room Shoulder room Shoulder room | L50 H67 L50 H63 L51 H31 L48 L3 W4 W5 H51 | 379 (14.9) 17 17 Front Compertment Interior Dimensic Forward And mm Upward 769 (30.3) 942 (37.1) 870 (34.3) 267 (10.5) 5 (.2) 666 (26.2) 1403 (55.2) 1281 (50.4) Not Applicable | af Rearmost Position. 1375 (54.1) |
| Rear Compartment GRE RP Point couple distance Effective head room Min. effective leg room GRP (second to heat) Cree clearance Compartment room Bhoulder room Ipper body opening to ground Back angle | L50 H67 L50 H63 L51 H31 L48 L3 W4 W6 H51 L41 | 379 (14.9) 17 17 Front Compertment Interior Dimensic Forward And mm Upward 769 (30.3) 942 (37.1) 870 (34.3) 267 (10.5) 5 (.2) 666 (26.2) 1403 (55.2) 1281 (50.4) Not Applicable 25° | af Rearmost Position. 1375 (54.1) |
| Rear Compartment Rear Rear Com Rear Rear Rear Rear Rear Rear Rear Rear | L50 H67 L50 H63 L51 L31 L48 L3 W4 W6 H51 L41 L43 | 379 (14.9) 17 17 Front Compettment Interior Dimension Forward And mm Upward 769 (30.3) 942 (37.1) 870 (34.3) 267 (10.5) 5 (.2) 666 (26.2) 1403 (55.2) 1281 (50.4) Not Applicable 25° 82.5° | 1375 (54.1) |
| leadining to roof panel (front) Indepressed floor covering thickness Rear Compartment Sig RP Point couple distance Effective head room Mn. effective leg room Sig RP (second to heat) Cree clearance Compartment room Shoulder room Spoulder room | L50 H67 H67 L50 H63 L51 H31 L48 L3 W4 W5 H51 L41 L43 L43 L43 | 379 (14.9) 17 17 Front Compertment Interior Dimension Forward And mm Upward 769 (30.3) 942 (37.1) 870 (34.3) 267 (10.5) 5 (.2) 666 (26.2) 1403 (55.2) 1281 (50.4) Not Applicable 25° 82.5° 88.75° | af Rearmost Position. 1375 (54.1) |
| leadining to roof panel (front) Indepressed floor covering thickness Rear Compartment Sig RP Point couple distance Effective head room Afn. effective leg room Sig RP (second to heal) Gree clearance Compartment room Shoulder room Spoulder ro | L7 H37 H67 H63 L51 H31 L48 L3 W4 W5 H51 L41 L43 L45 L47 | 379 (14.9) 17 17 Front Compertment Interior Dimension Forward Andmm Upward 769 (30.3) 942 (37.1) 870 (34.3) 267 (10.5) 5 (.2) 666 (26.2) 1403 (55.2) 1281 (50.4) Not Applicable 25° 82.5° 88.75° 120° | 1375 (54.1) |
| Rear Compartment oom Rear Compartment Rear C | L7 H37 H67 L50 H63 L51 H31 L48 L3 W4 W5 H51 L41 L43 L43 L45 L47 H38 | 379 (14.9) 17 17 Front Compertment Interior Dimension Forward And mm Upward 769 (30.3) 942 (37.1) 870 (34.3) 267 (10.5) 5 (.2) 666 (26.2) 1403 (55.2) 1281 (50.4) Not Applicable 25° 82.5° 88.75° 120° 8 (.3) | af Rearmost Position. 1375 (54.1) |
| leadining to roof panel (front) Indepressed floor covering thickness Rear Compartment Sig RP Point couple distance Effective head room Mn. effective leg room Sig RP (second to heal) Gree clearance Compartment room Shoulder room Spoulder roo | L7 H37 H67 L50 H63 L51 H31 L48 L3 W4 W5 H51 L41 L43 L43 L45 L47 H38 | 379 (14.9) 17 17 Front Compertment Interior Dimension Forward And mm Upward 769 (30.3) 942 (37.1) 870 (34.3) 267 (10.5) 5 (.2) 666 (26.2) 1403 (55.2) 1281 (50.4) Not Applicable 25° 82.5° 88.75° 120° 8 (.3) | 1375 (54.1) |
| leadining to roof panel (front) Indepressed floor covering thickness Rear Compartment Sig RIP Point couple distance Effective head room Afts, effective leg room Sig RIP (second to heal) Cree clearance Compartment room Shoulder room Shoulder room Special second second | L7 H37 H67 L50 H83 L51 H31 L48 L3 W4 W6 H51 L41 L43 L45 L47 H38 H73 | 379 (14.9) 17 17 Front Compertment Interior Dimension Forward And mm Upward 769 (30.3) 942 (37.1) 870 (34.3) 267 (10.5) 5 (.2) 666 (26.2) 1403 (55.2) 1281 (50.4) Not Applicable 25° 82.5° 88.75° 120° 8 (.3) | 1375 (54.1) |
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| leadining to roof panel (front) Indepressed floor covering thickness Rear Compartment Sig RP Point couple distance Effective head room Min. effective leg room Sig RP (second to heat) Cree clearance Compartment room Shoulder room It poor body opening to ground Sack angle floor angle Cree angle Coot angle Readining to roof panel (second) Depressed floor covering thickness Luggage Compartment Isable luggage capacity (L (cu. ft.)) Litover height | L7 H37 H67 H67 L50 H63 L51 H31 L48 L3 W4 W5 H51 L41 L43 L45 L47 H38 H73 | 379 (14.9) 17 17 Front Compertment Interior Dimension Forward And mm Upward 769 (30.3) 942 (37.1) 870 (34.3) 267 (10.5) 5 (.2) 666 (26.2) 1403 (55.2) 1281 (50.4) Not Applicable 25° 82.5° 88.75° 120° 8 (.3) 20 (.8) | af Rearmost Position. 1375 (54.1) |
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Vehicle Models

Cutlass Calais

MVMA Specifications Form

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

Vehicle Line <u>Cutlass Calais</u> **MVMA Specifications Form** 9-88 Model Year, ssued 6 - 88Revised (*) **METRIC (U.S. Customary)** Vehicle Dimensions See Key Sheets for definitions **Body Type** SAE Ref. No. Station Wagon - Third Seat Seat facing direction SD1 Sg RP couple distance L85 Shoulder room W85 Hip room W86 Effective leg room LBS Effective head room H86 Sg RP to heal 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 [m³(ft.3)] V2 Hidden cargo volume index (m3(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 (m3(ft,3)) V3 Hidden cargo volume index (m3(ft.3)) **V4** Cargo volume index-rear of 2-seat V11 Aerodynamics* Wheel lip to ground, front Wheel lip to ground, rear Frontal area (m²(ft²)) Drag coefficient (Cd)

EPA Loaded Vehicle Weight, Loading Conditions

MVMA Specifications Form METRIC (U.S. Customary)

| Vehicle LineC | utlass | <u>Calais</u> | | | | |
|---------------|--------|---------------|------|-------------|------|--|
| Model Year 19 | 989 - | ssued | 6-88 | Revised (*) | 9-88 | |

Body Type

ALL

| <u>Vehicle</u> | Fiducial | Marks |
|----------------|----------|-------|
|----------------|----------|-------|

| | | Define Coordinate Location |
|----------------------------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Front | х | 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. |
| | 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). |
| Rear | 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 Vank Vumber | | |
| T | W21* | 505 (19.9) |
| ļ | L54° | 2761 (108.7) |
| ront | H81° | 246 (9.7) |
| | H161* | 293 (11.5) |
| •• | H163° | 272 (10.7) |
| | W22° | 440 (17.3) |
| | L55° | 4953 (195.0) |
| • | HG2° | 362 (14.3) |
| - 1 | H162° | 413 (16.3) |
| •• | H164* | 382 (15.0) |
| | 1 | |

^{*} Reference - SAE Recommended Practice, J182, Motor Vehicle Fiducial Marks.

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

<u>Cutlass Calais</u> Vehicle Line_ 9-88 6-88 Revised (*) . 1989 _ lesued . Model Year.

| | | | | ٧ | 'ehicle N | lass (w | eight) | | · · · · · · · · · · · · · · · · · · · |
|-------------|-------|------------------|--------------------------------------------------|--------------------------------------------------|--------------------------------------------------|------------------------------------------------------|--------------------------------------------------|--------------------------------------------------|--------------------------------------------------|
| | | | CURB MASS. | kg. (lb.)* | | % PASS. MASS DISTRIBUTION Pass in Front Pass in Reer | | | |
| | | ļ | | | | n Front | | | ETWC** |
| Code | Model | Front | Rear | Total | Front | Rear | Front | Reer | 1104 |
| 3NF 27 | Coupe | 737.8 | 401.8 | 1139.6 | | | | | (2434) |
| <u> </u> | | (1627) | (886) | (2512) | | } | | | 1 |
| | | | <u> </u> | | | | -} | | 1116 |
| 3NT27 | Coupe | 738.8 | 412.6 | 1151.4 | | ├ | | | (2460) |
| | | (1627 | (910) | (2538) | | | | | |
| | | | 100 | 1243.0 | | | | | 1183 |
| 3NK27 | Coupe | 811.1 | 431.9 | | | <u> </u> | | | (2608) |
| | | 117/88 | (952) | (2190) | | | | | <u> </u> |
| | · | 745 7 | 421.2 | 1166.9 | | | | | 1131 |
| 3NF69 | Sedan | /1544 | (929) | | | | | _ | (2493) |
| | | - \ ID44 | 4 13631 | | | | | | 1242 |
| 24760 | Sedan | 747 1 | 431.1 | 1178.2 | | | | | 1143 |
| 3NT69 | | (1647 | (950) | | | | | | (2520) |
| | | 11197 | | | | | | | 1212 |
| 3NK69 | Sedan | 819.0 | 452.7 | 1271.7 | | | | | (2672) |
| <u> </u> | | (1806 | (998) | (2804) | | | | | (20/6) |
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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.

METRIC (U.S. Customary)

Vehicle Line <u>Cutlass Calais</u> Model Year 1989 Issued 6_88 Revised (*) 9_88

| | | | Optional Equipment Differential Mass (weight)* | | | | |
|---------------------------------------------|----------------------------|--------------|--------------------------------------------------|--------|----------------------------|--|--|
| | | | MASS, kg. | (lb.) | Remarks | | |
| Code | Equipment | Front | Rear | Total | Restrictions, Requirements | | |
| Door Locks, Power | AU3 | 6_ | 1.0 | 1.6 | Coupe | | |
| | | (1.3) | (2.2) | (3.5) | | | |
| | | <u> </u> | <u> </u> | | | | |
| | | 1.0 | 1.4 | 2.4 | Sedan | | |
| | | (2.2) | (3.1) | (5.3) | | | |
| Minder Book Hi | 124 | | | | | | |
| 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 | Course | | |
| WINDOW: POWER | A31 | (4.0) | (2.2) | (6.2) | Coupe | | |
| | | 1-14-111 | | (0-2) | | | |
| | - | 2.6_ | 2.5 | 5.1 | Sedan | | |
| | | (5.7) | | (11.2) | Sedan | | |
| | | 1 | \ 3.57 | | | | |
| 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 | 168 | | |
| | | (49.8) | (-4.4) | (45.4) | | | |
| C | | - | | | | | |
| Suspension | FE3 | 2.1 | 3.5 | 5-6 | | | |
| | | (4.6) | (7.7) | (12_3) | | | |
| | FE2 | 2.0 | 3.4 | 5.4 | | | |
| | <u>FEZ</u> | (4.4) | (7.5) | (11.9) | | | |
| | | 14.41 | 17.37 | 111-41 | | | |
| Cruise Control | K34 | 1.9 | 0.0 | 1.9 | | | |
| | | (4.2) | (0.0) | (4.2) | - | | |
| | | 1 2 | <u> </u> | -\9-2/ | | | |
| Engine V6 3.3L | LG7 | 40.0 | -1.9 | 38.1 | | | |
| | | | (-4.2) | | | | |
| | | | | | | | |
| Engine L4 2.3L | LD2 | 23.1 | -1.1 | 22.0 | | | |
| | | | (-2.4) | (48.5) | | | |
| | | | | | | | |
| Transmission. Auto | MD9 | 17.4 | -1.0 | 16.4 | | | |
| | - | (38.4) | (-2.2) | (36.2) | | | |
| | | 1 | | | | | |
| Wheel, Aluminum | PD8 | 3.6 | 3.6 | 7.2 | | | |
| Engine L4 2.3L | - FRA | (7.9) | | (15.9) | | | |
| | LGO | (35.3) | (-18) | (33.5) | <u> </u> | | |
| * Also see Engine - General Section for dre | seed engine mass (weight). | (00.0) | (-1.0) | (33.3) | | | |

METRIC (U.S. Customary)

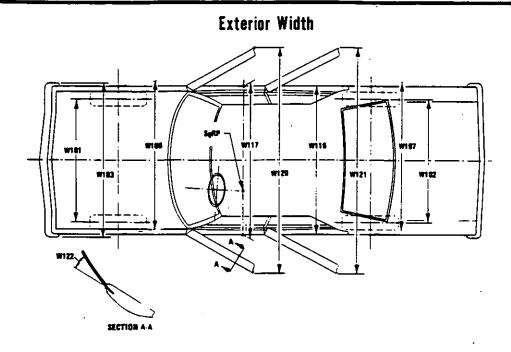
| Vehicle Line_ | <u>Cutlass</u> | <u>Calais</u> | | | |
|---------------|----------------|---------------|------|---------------|------|
| Model Year | 1989 | Issued | 6-88 | _ Revised (*) | 9-88 |

| | | | Optional Equipment Differential Mass (weight)* | | | | |
|---------------------------------------|---------------------------------------------------|--------------------------------------------------|------------------------------------------------|-------|--------------------------------------------------|--|--|
| | | | MASS, kg. | (IP') | Remarks | | |
| Code | Equipment | Front | Rear | Total | Remarks Restrictions, Requirements | | |
| Cover. Wheel | N91 | 1.2 | 1.2 | 2.4 | | | |
| | | (2.6) | (2.6) | (5.2) | | | |
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| Also see Engine - General Section for | | | | | <u> </u> | | |

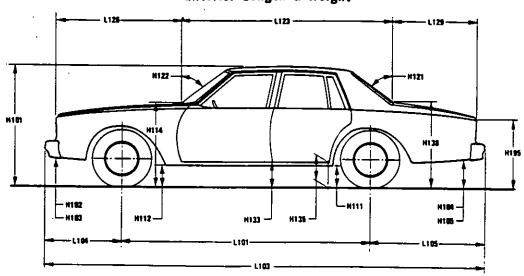
^{*} Also see Engine - General Section for dressed engine mass (weight).

METRIC (U.S. Customary)

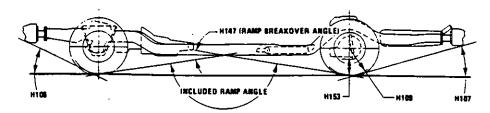
Exterior Vehicle And Body Dimensions – Key Sheet



Exterior Length & Height

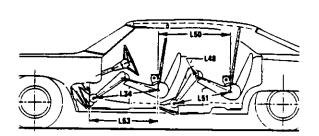


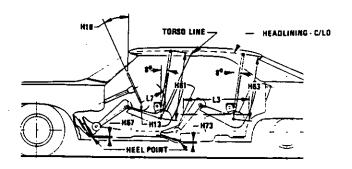
Exterior Ground Clearance

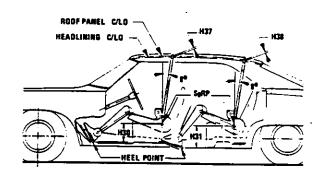


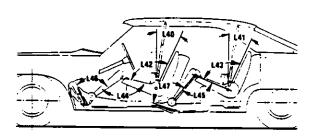
METRIC (U.S. Customary)

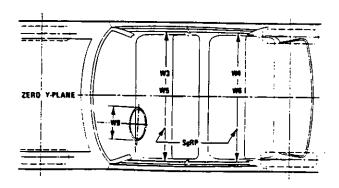
Interior Vehicle And Body Dimensions – Key Sheet

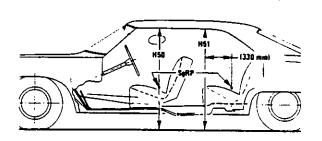








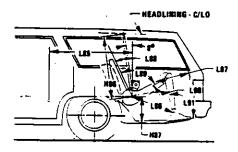


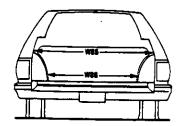


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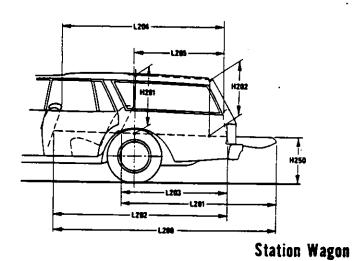
Interior Vehicle And Body Dimensions - Key Sheet

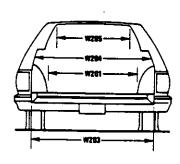
Third Seat

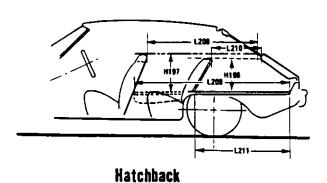




Cargo Space







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,

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 tongitudinally 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 cowf 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 and positions.

cal 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.

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.

METRIC (U.S. Customary)

Interior Vehicle And Body Dimensions - Key Sheet **Dimensions Definitions**

- 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
- H105 RÉAR 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.
- ANGLE OF DEPARTURE. The angle measured between H107 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.
- RAMP BREAKOVER ANGLE. The angle measured be-H147 tween 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.
- REAR AXLE DIFFERENTIAL TO GROUND. The minimum dimension measured from the rear axie differential to ground.
- MINIMUM RUNNING GROUND CLEARANCE. The mini-H156 mum dimension measured from the sprung vehicle to ground. Specify location.

Glass Areas

- St Windshield area.
- 52 Side windows area. Includes the front door, rear door, vents, and rear quarter windows on both sides of the vehide.
- S3 Backlight areas.
- Total area. Total of all areas (S1 + S2 + S3).

Fiducial Mark Dimensions

Fiducial Mark - Number 1

- "X" coordinate.
- "Y" coordinate. W21
- "Z" coordinate. H81
- Height "Z" coordinate to ground at curb weight. H161
- Height "Z" coordinate to ground. H163 Fiducial Mark - Number 2
- L55 "X" coordinate.
- "Y" coordinate. W22
- "Z" coordinate. W82
- Height "Z" coordinate to ground at curb weight. H162
- Height "Z" coordinate to ground. H164

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
- DESIGN H-POINT-FRONT TRAVEL. The dimension mea-L17 sured 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.

 KNEE ANGLE-FRONT. The angle measured between L44 thigh centerline and lower leg centerline measured on the right leg.
- FOOT ANGLE-FRONT. The angle measured between the L48 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.
- SHOULDER ROOM-FRONT. The minimum dimension W3 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.
- HIP ROOM-FRONT. The minimum dimension measured **W5** 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.
 STEERING WHEEL MAXIMUM OUTSIDE DIAMETER. W9 Define if other than round.
- STEERING WHEEL TO CENTERLINE OF THIGH. The H13 minimum dimension measured from the bottom of steering wheel, with front wheels in the straight position, to the thigh
- 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.
- STEERING WHEEL ANGLE. The angle measured from a H18 vertical to the surface plane of the steering wheel.
- H30 SgRP-FRONT TO HEEL. The dimension measured verti-
- cally from the SgRP-front to the accelerator heel point.
 HEADLINING TO ROOF PANEL-FRONT. The dimension **H37** measured from the intersection of the headlining and the extended effective head room line normal to the sheet metai.
- H50 UPPER BODY OPENING TO GROUND-FRONT. The dimension measured vertically from the trimmed body open-
- ing to the ground on the SgRP-front "X" plane. EFFECTIVE HEAD ROOM-FRONT. The dimension mea-H61 sured along a line 8 deg. rear of vertical from the SgRPfront to the headlining plus 102 mm (4.0 in.). FLOOR COVERING THICKNESS-UNDEPRESSED-
- H67 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

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.

METRIC (U.S. Customary)

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.
- 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).
- 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.
- W8 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 dimeasured 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 head-lining 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.
- 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.

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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. REAR OPENING WIDTH ABOVE BELT. The minimum di-W205 mension 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. REAR OPENING HEIGHT. The dimension measured verti-H202 cally 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: W4 x H201 x L204 = ft 3 1728 Measured in mm: W4 x H201 x L204 = m³ (cubic meter) 10⁹ **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: L506 x W500 x H503 1728 Measured in mm: L506 x W500 x H503 = m3 (cubic meter) 10⁹ **V6** TRUCKS AND MPV'S WITH CLOSED AREA. Measured in inches: L204 x W500 x H505 1728 Measured in mm: L204 x W500 x H505 = m3 (cubic meter) 109 **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. STATION WAGON CARGO VOLUME INDEX. V10 Measured in inches: H201 x L205 x W4 + W201 Measured in mm: H201 x L205 x W4 + W201

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:

Measured in mm:

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

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:

$$\frac{\frac{\text{L210} + \text{L211}}{2} \times \text{W4} \times \text{H198}}{2} = \text{ft}^{3}$$
Measured in mm:
$$\frac{\text{L210} + \text{L211}}{2} \times \text{W4} \times \text{H198}$$

$$\frac{2}{2} = \text{m}^{3} \text{ (cubic meter)}$$

-= m³ (cubic meter)

MVMA Specifications Form METRIC (U.S. Customary)

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| Engine Dec Engine Cod | coription/Ca de | irt. | 2.5L (151) L4 | L68 | | | | |
| Electrica | ti – Suppi | y System | | | | • | | |
| | Manufact | | Delco Re | mv | | | | |
| | Model, st | | 1981601 | :111 <u>.</u> Y | | | | |
| | Voltage | | 120 | | | <u> </u> | | |
| Battery | | PF cold crank | 630 CCA | | | | | |
| , | Minutes-re | serve capacity | 90 RC | | | | <u> </u> | - |
| | | 20 hr. rate | 54 AH | | | | · · · · · · · · · · · · · · · · · · · | |
| | Location | | Underhoo | d Front | * | | | |
| • | Manufactu | Y-9/ | Delco Re | | | | | |
| | Rating (Idi | e/mex.rpm) | 28/74 11 | | | | | |
| Atternator | Ratio (alt. | Crank/rev.) | 2.55:1 | <u> </u> | | | | |
| | Output at i | idle (rpm, perk) | | at 27°C 95 | O RPM | | | |
| | Optional (t | ype & rating) | | Duty Opti | | · · | | |
| leguiator | Туре | | | to Altern | | | | |
| Electrica | i — Startiı | ng System | | | | | | - |
| | Manufactu | rer | | | | | | |
| Start, motor | Current din | ein at - 20°1 | 10455022 | 417 Amps | | | | • |
| | Power ratio | ng [kw (hp)] | | | | | | <u></u> |
| Anton | Engageme | int type | Solenoid | with Posi | tive Sh | ift | <u></u> | |
| Actor Irive | Pinion eng from (front | agee , reer) | Front | | | | | • |
| Electrica | l – Ignitic | n System | | | | | <u> </u> | |
| уре | Electronic | (std., opt., n.a.) | _ | | | | | |
| 71 | Other (spe | city) | Direct | | | | | |
| | Manufactu | rer . | Delco Re | mv | | | | |
| Coil | Model | | | - 1103745 | | | | |
| | Current | Engine stopped – A | d | | | | · | |
| | | Engine idling - A | 8-10 | | | | | |
| | Manufactur | | AC | • | | | | |
| | Model | | R44TSX | | · | | | |
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| lug | | torque (N-m (ib, it)) | 75 (50) | | | | | |
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| latributor | Manufacturer | | | | | | | |
| | Model | | None | | | | | |
| lectrical | - Suppr | esion | | | | | | 13 |
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| * ¹ . • | - abacilications Le | | | | Re | evised (e) | | | | |
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| Engine Co | | L68 | | | | | | | | |
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| Coolent reco | wery system (std., opt., n.e.) | Surge Tank | System | | | | | | | |
| Coolant fill to | ocation (rad., bottle) | Surge Tank | | | | | | | | |
| Rediator cap | relief valve pressure (ldPa (psi)) | 103.4 (15) | | e Tank) | | | | | | |
| Circulation | Type (choke, bypass) | Choke | | | | | | | | |
| thermostst | Starts to open at °C (°F) | 91° (195°) | | | | • | | | | |
| | Type (centrifugal, other) | Centrifuga | 7 | | | | | | | |
| | GPM 1000 pump rpm | 8.0 | · · · · · · · · · · · · · · · · · · · | | | | | | | |
| | Number of pumps | 0ne | | | | | | | | |
| Water | Drive (V-bett, other) | V-Belt | | | | | | | | |
| pump | Bearing type | Ball | | | | | | | | |
| | Impeller material | Powdered Metal | | | | | | | | |
| | Housing material | Die Cast A | lum | | | | | | | |
| By-pess reci | roulation (type (inter,. ext.)) | External - | Thru Hea | ter Core | | | | | | |
| Cooling | With heater-L(qL) | 7.4 (7.8) | | | | | | | | |
| system capacity | With air cond.—L(qt.) | 7.4 (7.8) | | | | | | | | |
| | Opt. equipment (specify-L(qt.)) | None | | | | | | | | |
| | s full length of cyl. (yes, no) | Yes | | | | | | | | |
| | und cylinder (yes, no) | Yes | | | | | | | | |
| Water acket | s open at heed face (yes, no) | Yes | | | | | | | | |
| | Std., A/C, HD | A/C | | | · | | | | | |
| | Type (cross-flow, etc.) | Cross Flow | <u> </u> | | | | | | | |
| Redistor | Construction (fin & tube mechanical, braze, etc.) | Serpentine | Fin and | Tube | <u> </u> | | | | | |
| core | Material, mass (kg (wgt, lbs.)) | Copper/Bras | | | | 4 | | | | |
| | Width | 600 (23.6) | 33 3.30 (| 11.01 | | | | | | |
| | Height | 387 (15.2) | | | | · · · · · · · · · · · · · · · · · · · | | | | |
| | Thickness | 25 (98) | | | | | | | | |
| | Fins per inch | 20 | | | | | | | | |
| Redietor end | tank material | Brass | | | | | | | | |
| | Std., elec., opt. | Electric | | | | | | | | |
| | Number of blades & type (flex, solid, material) | | | | | | | | | |
| | Diameter & projected width | 6 Plastic | 272 /14 | 71 | | | | | | |
| | Ratio (fan to crankshaft rev.) | 290 (11.4). | | | | | | | | |
| Fen | Fan cutout type | Not Applica | | lo (ECH) | | <u> </u> | | | | |
| ren | Drive type (direct, remote) | Engine Cont | | ic Motor (A | 111 | | | | | |
| | | - DICPCL DELV | /P FIRES.T | ic motor la | | | | | | |

Direct Drive Electric Motor (All)

2200 1900

150W

Plastic

100W

None

RPM at idle (elec.)

Fan shroud (material)

Motor rating (wattage) (elec.)

Motor switch (type & location) (elec.) Switch point (temp., pressure) (elec.)

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

| | MVM | & Specification | s Form | Vehicle Line Model Year | Cutlass 1989 | Calais !ssued | | | |
|----|-------------------------------|------------------------------------------------------------|---------------------------------|----------------------------|-------------------|------------------------|---------------------------------------|-------------|--|
| | METRIC | (U.S. Customary) | • | 110001 1001 | | :88000 | Revised (*) | | |
| | Engine De: Engine Co | eription/Carb, de | 2.5L (151) | L4 L68 | | · · | | | |
| | Engine - | Fuel System (See supple | emental page for details | of Fuel Injection, S | upercharger, T | urbocharger, etc. if (| ised) | | |
| | induction typinjection sys | e: carburetor, fuel tern, etc. | Throttle Boo | dv Injecti | on | | | | |
| | Manufacture | r | Rochester | | | | | | |
| Ø | Carburetor n | o. of barrets | | | | | | | |
| | ktie A/F mix. | | ECM Control | | · | | | | |
| | <u> </u> | Point of injection (no.) | Throttle Boo | dv - Sinal | e Point | | | | |
| | Fuel injection | Constant, pulse, flow | Pulse | <u> </u> | <u> </u> | | | | |
| | - 100001 | Control (electronic, mech.) | Electronic | | | | | | |
| | | System pressure [kPa (psi)] | 83 KPA (12 F | 120 | | · | | | |
| | Idle spdrpm | | OJ NEW TITE | rgi/ | | | | | |
| | (spec. neutral or | | | | | | | | |
| | drive and | Automatic | | | | | | | |
| | propane if used) | | | | | | | | |
| | lestedan ana a di | | | | | | | | |
| | or water then | old heat control (exhaust mostatic or fixed) | Water | _ | | | | | |
| | Air cleaner ty | | Replaceable Paper Element | | | | | | |
| | Fuel filter (type / location) | | Replaceable/Inline Rear of Tank | | | | | | |
| Ø | Erad. | Type (elec. or mech.) | Electric | _ | | | | | |
| | pump pump | Location (eng., tank) | Tank | | | | | - | |
| | | Pressure range [kPa (psi)] | Not Applicat | ole | | | · · · · · · · · · · · · · · · · · · · | - | |
| Ø. | | Flow rate at regulated pressure (L (gal) / hr @ kPa (psi)) | 4.21 (1.11) | | | | | | |
| | Fuel Tani | <u> </u> | · | | | | | | |
| | Capacity [refi | I L (gallons)] | 51.5 (13.6) | | , | | | | |
| i | Location (des | cribe) | Rear Center | Underside | D H 1 | Doan Ouanto | n Danal | | |
| | Attachment | | Underbody St | | <u>, K. II. I</u> | Near Quarte | rane i | | |
| 1 | Material & Ma | iss [kg (weight lbs)] | Steel | c. up | | | | | |
| • | Filler | Location & material | Right Rear (| Duanton Da | no] [ca | too? | | | |
| | pipe | Connection to tank | Hoses | Juanter Pa | <u> 1181 - 31</u> | <u>Lee I</u> | | | |
| i | Fuel line (mat | | Steel GM124N | <u> </u> | | | | | |
| i | uel hose (material) | | | | | | | | |
| • | Return line (material) | | Rubber GM616 | 0.3M | | | | | |
| - | /apor line (material) | | Steel GM124N | | · | | ** | | |
| - | • | Opt., n.a. | Steel GM124N | М | | | | | |
| | Extended | Capacity [L (gallons)] | NA | | | | | | |
| | ange ank | Location & material | | | | | | | |
| | | Attachment | | | | | | | |
| - | | Opt., n.e. | | _ | | | | | |
| | | | NA | | | | | | |
| - | L uxil iery | Capacity (L (gallons)) | | | | | | | |
| | ank . | Location & material | | <u> </u> | | | | | |
| | , | Attachment | | | | | | | |
| | , | Selector switch or valve | | | | | | | |
| | 1 | Separate fill | | | | | | | |