



# 2005 Chevy Cobalt

## Technical Highlights

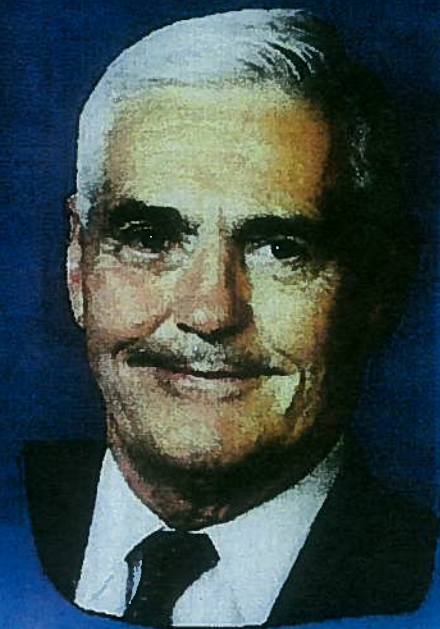
Gary Altman





# THE LUTZ CHALLENGE

- Initial Direction: We don't want "parity"
  - "We want to beat the competition"
- Focus areas:
  - Refinement
  - Ride & Handling
  - Noise Vibration & Harshness



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# THE "NO EXCUSES" PREMIUM SMALL CAR!

- We want Cobalt to dominate small cars
  - Coupes for the hot, fast, sporty minded
  - Sedans for the classic, timeless, tasteful buyers
  - Great interiors
  - Strong power
  - Dynamic performance
  - Ready to take on the World



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# How Did We Do It

- Used all the latest Best Practices & VDP
  - Math Based Development
  - Designing Engineering
  - Latest Analytical Tools
  - Virtual Builds
  - Perceived Quality Initiatives & Competitive Assessments
  - Craftsmanship
- Doug & Lori put Cobalt Lead Engineers in a room and asked “If you wanted to win, what would you do?”
- We told them and they let us do it.

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## Cobalt "Levels"

- Foundation -- not "Base"
- The "first impression" car
- A great package, not "stripped"
- LS/LT
- More upscale, luxury feel
- Small Car "Touring package"
- SS
- Fast, hot -- Coupe or Sedan
- Small sports car personality



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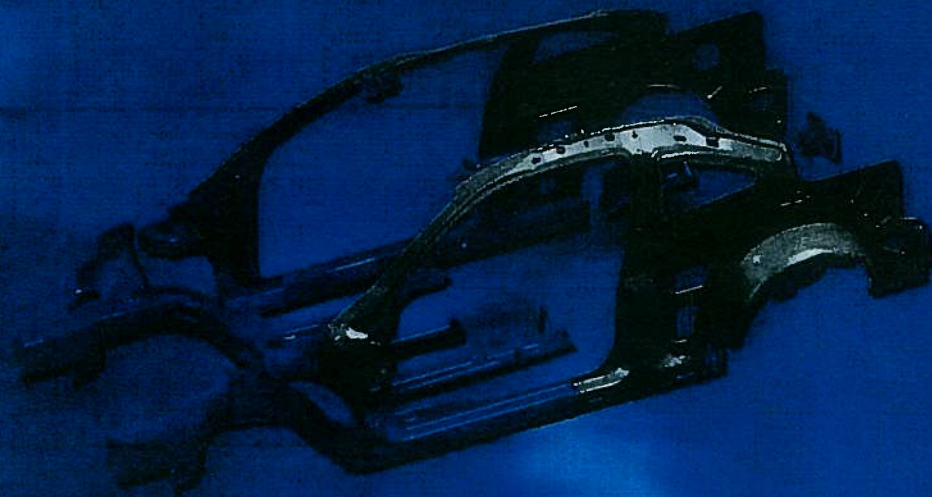
# BODY STRUCTURES AND CLOSURES

- Lower Dominant Structure – “The Foundation” Delta
- Extensive use of High Strength Steel (HSS) in strategic locations
  - Maximizes strength while reducing mass
  - Improves crashworthiness
  - Increased structural integrity
- One piece stamped tailor welded blanks
  - Increased strength/rigidity and reduced tooling costs

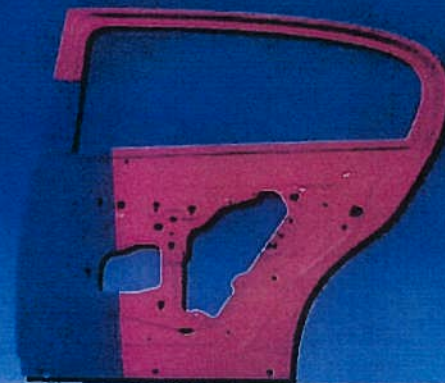
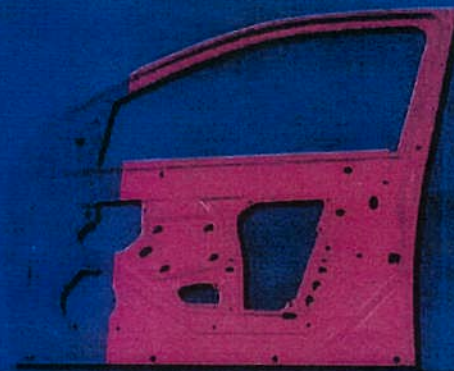
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# BODY STRUCTURES AND CLOSURES



High Strength Steel (shown in blue above)

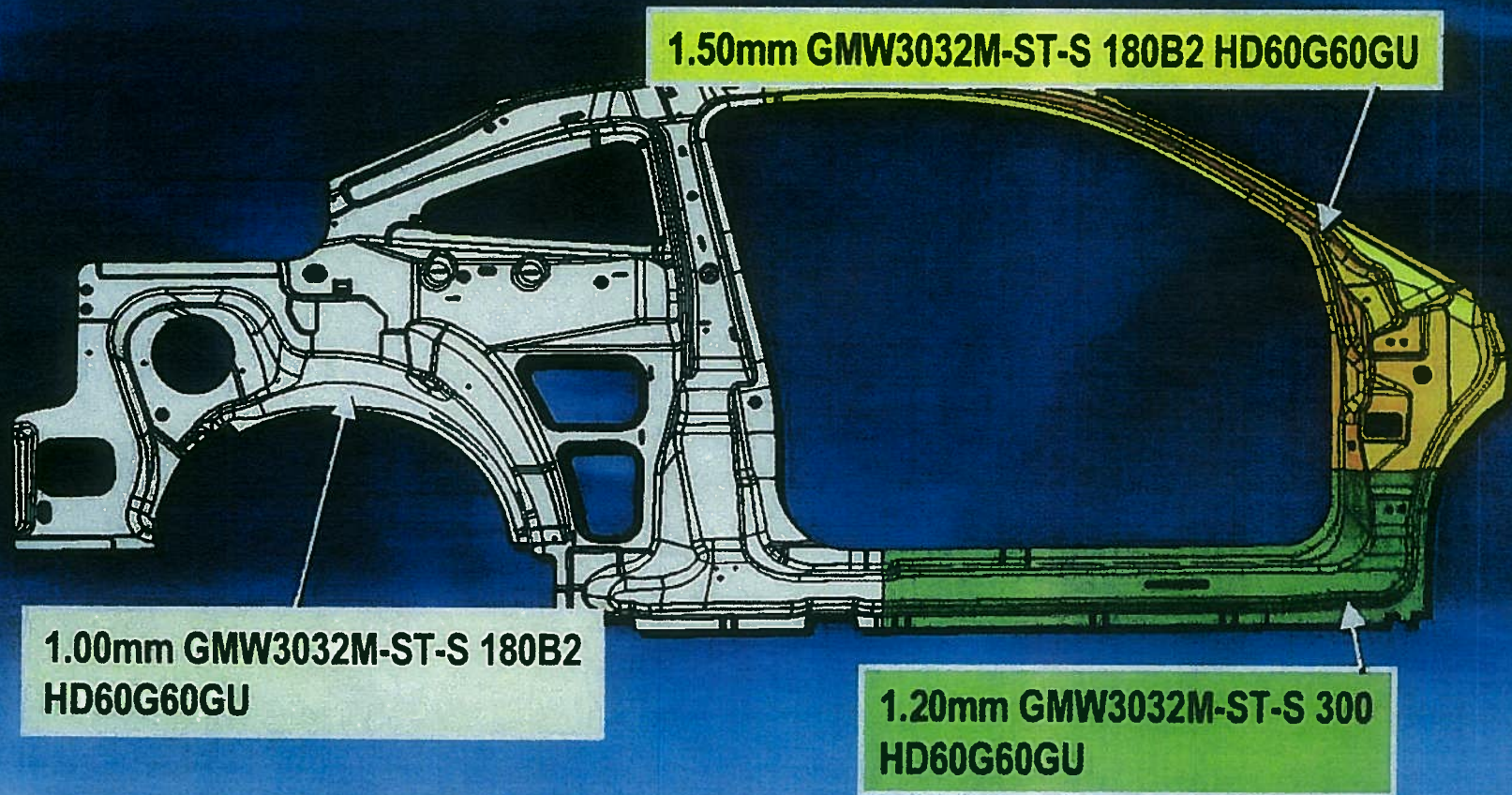


Tailor Welded Doors (Right)

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# GMX001 COUPE FRAME BODY SIDE INNER PANEL



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# BODY STRUCTURES AND CLOSURES

- Sound deadening sheet metal
  - Plenum and front of dash
  - Similar to what F-150 advertises
  - Includes Visco elastic material that keeps the panel from “resonating”
  - Shears and absorbs energy and sound
- Sealing and dampening materials in nearly every body opening, panel and mating surface

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# BODY STRUCTURES AND CLOSURES

- Door Systems
  - Full Frame Inner & Outers
  - Premium Primary & Secondary Sealing Systems
- Hood Strut
  - Only seen on more refined vehicles in the small car segment
  - Improves owner operation
- Deck Lid 4-bar hinge with gas struts
  - Increased strength and rigidity
  - Increase in usable trunk volume over conventional goose neck hinge systems

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# REFINEMENT

- Cobalt's Interior and Exterior, European Influenced with Chevrolet Inspiration
  - Clean "taut" surfaces with precise panel to panel fit
  - Premium materials with jewelry accents throughout
  - Driver oriented with flawless ergonomics
  - Spacious with ample storage

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# INTERIOR

- Designed to the latest Quality Initiatives that will Challenge the competition for segment lead
- Styling and Design Flexibility to provide model flexibility
- Enhanced Acoustic package
  - Cast Foam Dash mat and Carpet
  - I/P and Door pads
- Seat design achieving world class comfort while maintaining a feel of control
  - Comfort balanced with increased lateral support to make driver and passenger feel like an integral part of the vehicle. Complements "Fun-to drive" attribute.
- Steering Wheel position and hand grip design
  - Maximizing the European driver experience
- Damped Glove Box & Passenger Assist Handles
  - Increases the refinement of small cars in the market

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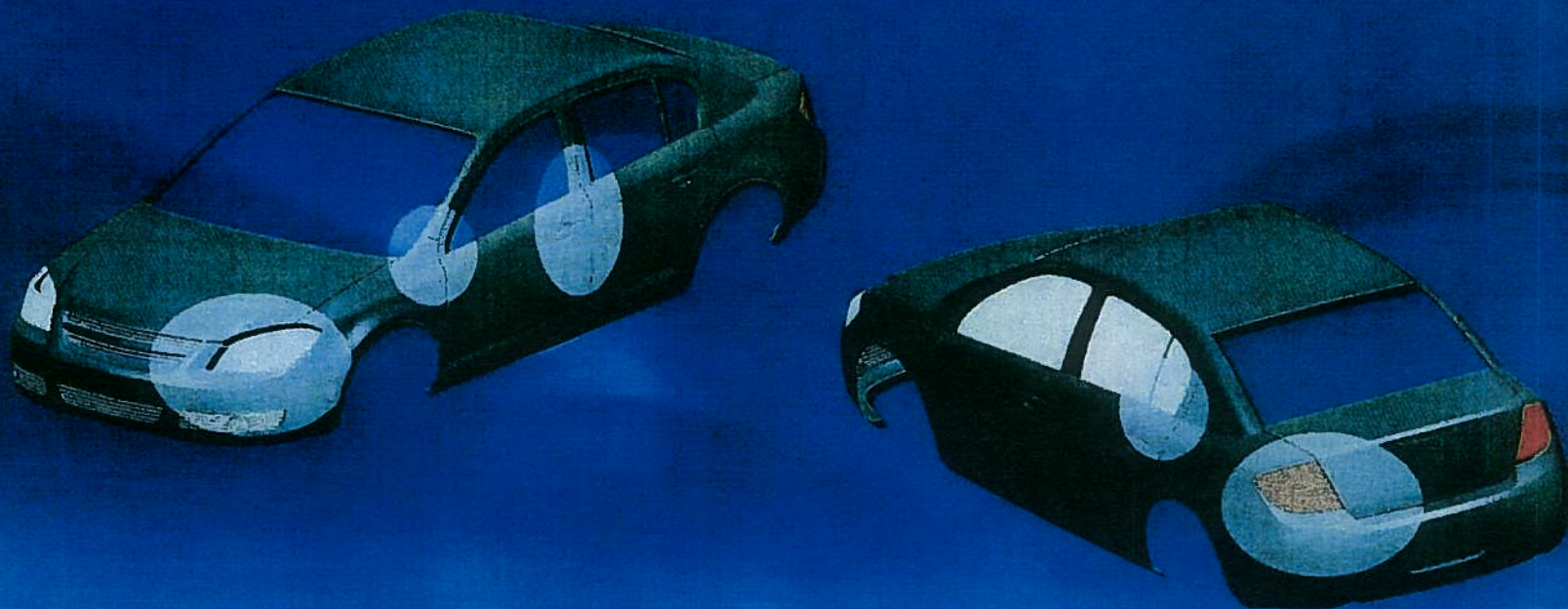
# EXTERIOR

- Designed for segment leading gap and flushness
- Premium, jewel-like appearance of headlamps and tail lamps
- Rocker sill appliques on all models
- Exposed glass edge on windshield and backlight
- Projector fog lamps available on LS, standard on LT and SS
- LT Exterior Chrome Package available
- SS and SS SC Race inspired appearance with lowered ground effects for fascias and added Rocker Molding

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# SEDAN GAP AND FLUSH SEGMENT LEADING



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# SAFETY FEATURE HIGHLIGHTS

<i>Standard / Optional</i>	<i>Feature Description</i>
Standard	Dual Stage Front Airbags
Standard	Front Seat Belt Pretensioners
Standard	Energy Absorbing Seat Belt Retractors
Standard	Rear Seat Belt Child Comfort Guides
Standard	Daytime Running Lamps
Standard	GM Quasi-Static Seat Strength Requirement
Standard	Rear Door Child Safety Locks
Optional	Side Curtain Airbag
Optional	Anti-Lock Braking System (ABS)
Optional	OnStar (w/ Auto Crash Notification & Vehicle Tracking)
Optional	Power Windows (Pull Open / Push Close) w/ Lockout
Optional	Front Fog Lamps

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# ELECTRICAL

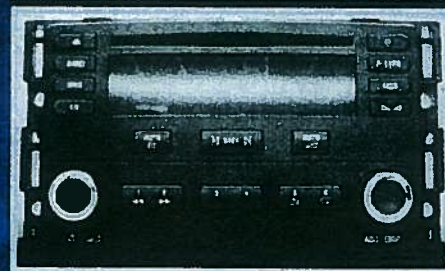
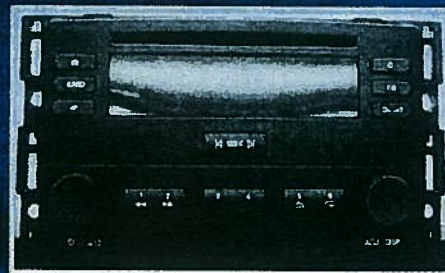
- GM LAN Serial Data Architecture
  - Links critical vehicle controls by high speed bus
  - Communicates information 50x the speed of conventional Class 2 systems
  - Most advanced electrical architecture used to date in the small car segment
  - Adds quality, reliability, convenience, safety, value
- Driver interfaces/controls engineered for human factors/interior harmony
  - Improving driver experience/ instantaneous feedback
  - Trip A/B, Range, Avg. Speed, Economy, Oil Life, Coolant, Outside Temp., and Odometer
  - Personalized Functions
    - Vehicle Security Notification, Door Locks, and Language

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# COBALT SOUND PACKAGES

- U1C – AM/FM/CD
- UN0 – AM/FM/CD/RDS
- US8 – AM/FM/MP3/RDS



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# 2005 GMX001 AUDIO CONTENT BASE (UQ4) & PREMIUM (UQ3)

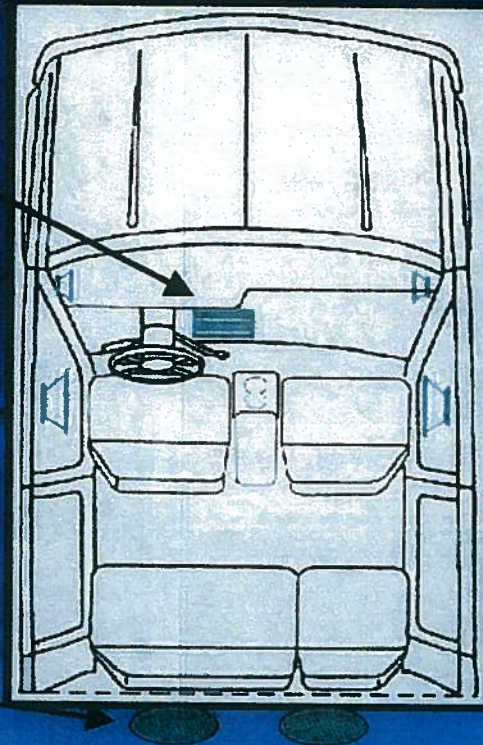
Amplifier (UQ3)  
6 Channel Analog

0.75" Tweeter (UQ3)  
Shark Fin

6" ERS Speaker (UQ4)  
6" HSS Speaker (UQ3)  
Front Door

6x9 ERS Speaker (UQ4)  
6x9 HSS Speaker (UQ3)  
Rear Shelf

10" Dual Voice Coil Subwoofer  
in 18L Enclosure  
Trunk Mounted



## Base System: 4 Speaker

Front Door 6" ERS Speakers  
Rear Shelf 6x9 ERS Speakers

## Premium System: 7 Speaker

Shark Fin 0.75" Tweeters  
Front Door 6" HSS Speakers  
Rear Shelf 6x9 ERS Speakers  
6 Channel Analog Amplifier  
Dual Voice Coil 10"  
Subwoofer



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# PIONEER® PREMIUM SOUND

- 7-Speaker Premium Sound System features
  - Independent 3/4-inch soft dome tweeters high on the door for improved music clarity and stereo separation
  - Front Door 6" HSS Speakers
  - Rear Shelf 6x9" ESS Injection-Molded Polypropylene Cone Woofers provide lighter mass and more rigid structure – critical for low distortion bass response
  - Trunk-mounted 10-inch dual voice cone , Subwoofer in a 17-liter sealed enclosure
    - Ensures bass response for the most demanding audio tracks

228-watt, 6-channel High Efficiency MOSFET  
Power Amplifier

- Very low distortion output across entire frequency spectrum

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# POWERTRAIN

- ECOTEC -- a “world” of technology
  - Used in other GM Vehicles in Europe & North America
- ECOTEC has undergone the toughest, most comprehensive durability tests ever conducted at GM Powertrain
  - Improves overall quality, reliability, dependability and performance

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# ECOTEC DETAIL

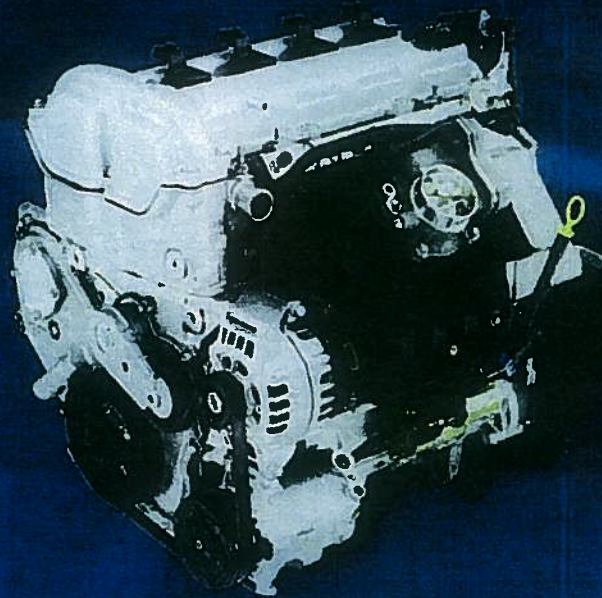
- Performance

- Base 2.2L engine

- 140 horsepower/150 lbs.-ft torque
    - 0 to 60 mph in under 9 seconds
    - 50–70 mph: in under 6 seconds
    - Top speed (governor limited): 120 mph - 16"

- SS 2.4L engine

- 170 horsepower/170 lbs.-ft torque
    - 0 to 60 mph in under 7.6 seconds



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# ECOTEC TECHNOLOGY

- Improved durability/performance technology
  - Special Polymer coating on pistons
    - Reduces friction and noise
  - Attachments between engine and transmission
    - Adds strength, stiffens powertrain, drops bending frequency noise
  - Structural Oil Pan on engine
    - Stiffens engine area
    - Reduces noise
  - Cam Chain and tensioner improvements
    - Reduces noise
  - SS 2.4L Engine
    - Variable Valve Timing – Intake & Exhaust
    - Individual Coil – on – Plug Ignition
    - Advanced Technology engine controller



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# TRANSMISSIONS

- Standard 5-Speed Manual Transmission,  
designed in Germany and built in Bari, Italy
  - Delivers world class smoothness and durability
- Automatic Transmission produced in GM  
Powertrain's Windsor Assembly Plant
  - One of highest quality/durability ratings in the world
  - IPTV Rating of 10

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# CHASSIS HIGHLIGHTS

- Specific chassis tuning for each model
- Steering System and Speed Sensitive EPS
- No Compromise tires
- Hydraulics/damping to suspension bushings & powertrain mounts
- Highly developed induction & exhaust systems
- SS and SS SC
  - Premium monotube shock absorbers
  - Four wheel disc brakes with standard ABS

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## SPEED SENSITIVE ELECTRONIC POWER STEERING

- Improves performance & efficiency over hydraulic systems
  - Increased Fuel Economy
  - Improved Parking Lot Maneuverability
  - Tuned for each different level of suspension and tire
  - Matches character of the system to the driver



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## TIRES, WHEELS & MATCHING SUSPENSIONS

- Developed for optimal ride and handling
  - 15" steel or on base level vehicles, 15" Aluminum on LS Models
    - 195/60R15 – Ride & Handling, Fuel Economy, Appearance
  - 16" machined alloy wheels on LT Models
    - 205/55R16 – Superb Ride/Touring, Appearance
  - 17" brushed alloy on SS Models
    - 205/50R17 – Performance Handling, Brake Cooling, Style
  - 18" midnight silver alloy on SS Supercharged Models
    - 215/45R18 – Extreme Handling, Brake Cooling, Style

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# SHOCKS AND MOUNTS

- Premium Powertrain Mounting System (All Levels)
  - Complete hydraulic system – optimal motion control and idle shake performance with maximum durability
  - Rear Axle to Body Ride Bushings (Levels 1,2 &3)
    - Eliminates high frequency road noise
    - Absorbs sharp impacts for improved ride isolation and excellent handling.
- Premium monotube shock absorbers –  
Level 3 and 4 Suspensions
  - Adds to vehicle ride and and handling with improved damping response during extreme handling events.

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# BRAKE SYSTEMS

- Disc/Drum for level 1 & 2, ABS optional
  - Optimized hardware for class leading noise & pulsation
- Larger Disc/Disc for levels 3 & 4, ABS standard
  - Class leading, track ready, pedal response, fade, stopping distance



## BRAKING (60-0mph)

Level 4: 120 ft

Level 3: 130 ft

Level 2: 135 ft

Level 1: 140 ft

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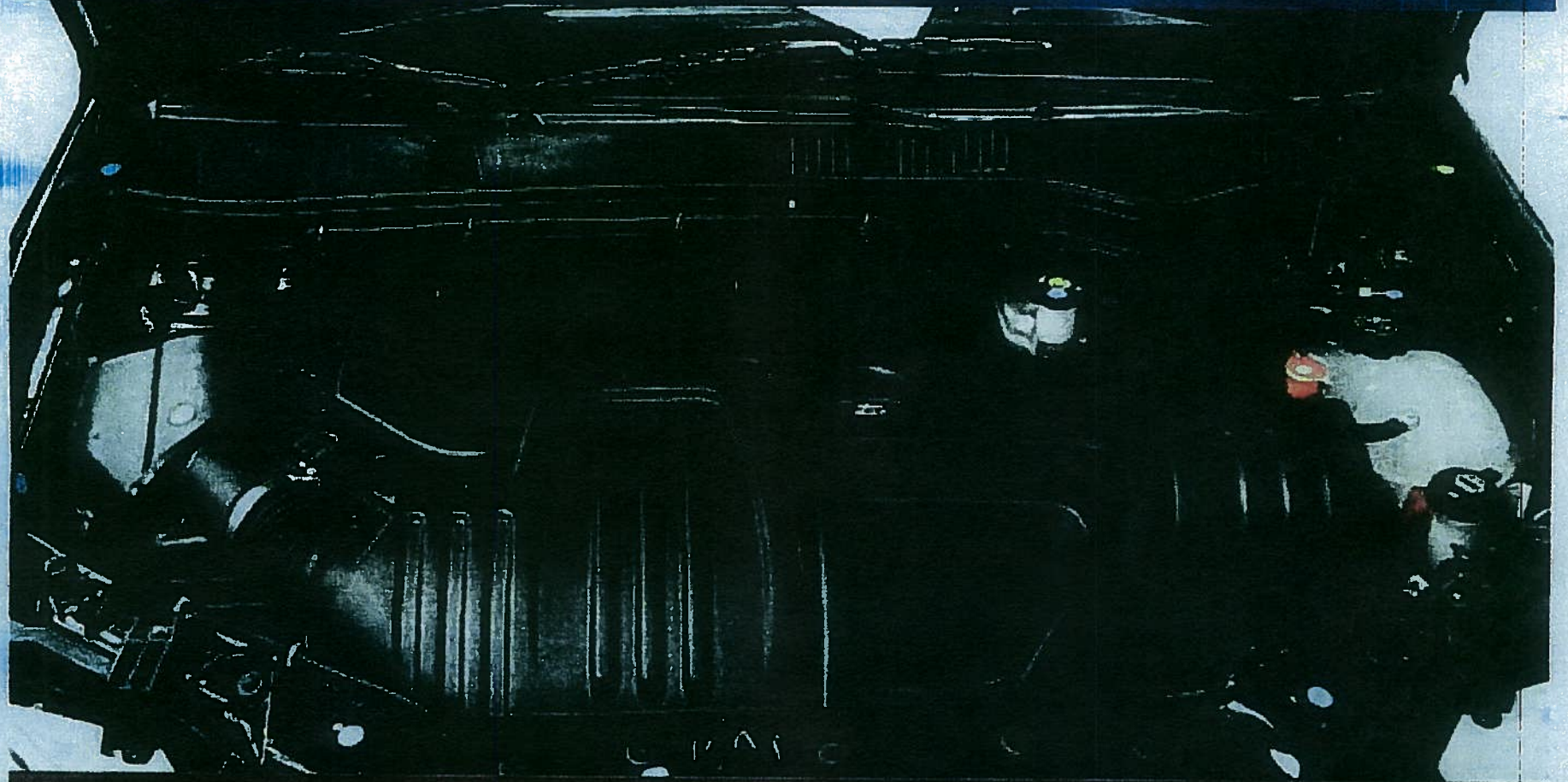
# INDUCTION AND EXHAUST SYSTEMS

- Optimized for flow performance, tonal quality & appearance
  - Premium integrated appearance
    - Stainless dual wall exhaust tips, integrally styled induction system
  - Premium tonal quality --
    - High volume stamped muffler, use of premium e-glass in exhaust and high volume, tuned, induction system
  - Base vehicles receive 2" exhaust and dyno-tuned induction
  - Levels 3 & 4 vehicles receive 2 ½" exhaust and unique induction systems for maximum horsepower and tonal quality.

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# COBALT INDUCTION SYSTEM & ENGINE ACOUSTIC COVER



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# SUMMARY

- Cobalt Engineered to beat the Competition
  - Refinement
  - Ride & Handling
  - Noise Vibration & Harshness

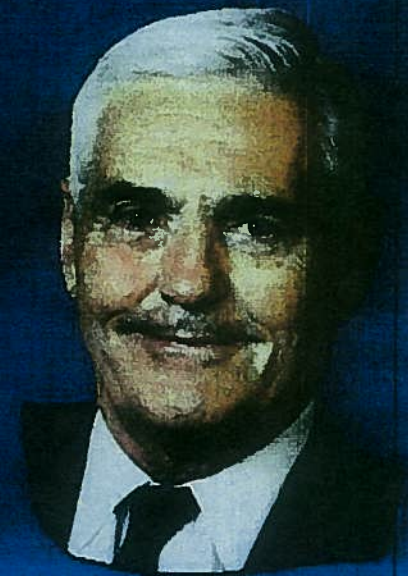


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# THE LUTZ CHALLENGE

- Initial Direction: We don't want "parity"
  - "We want to beat the competition"
- Initial Reaction to new Cobalt:
  - "Unbelievable driving experience"
- The Bottom Line:
  - We've created a car that's more than "fun to drive"... it's "great to drive"



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# PROVED IT LAST WEEK

## Media Ride and Drive in Phoenix

- "Quieter than the Civic"
- "Faster Acceleration than the Jetta"
- "Very Refined Engine Noise"
- "Very Good High Speed Steering Feel"

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