SECTION D

Cadillac 355 V-8 Supplementary Sales Data

Presentation Outline	Sales Data

EXTERNAL APPEARANCE STORY

Side View	
Balance	Large quarter windows. Small overhang of body.
Hood, Cowl	Well proportioned. Hoods have door ports. Leather corner pads on hood.
Fenders and Running Boards	18-gauge metal. Wire reinforced in rolled edge. Stainless steel moulding. Fender shelf one-piece construction.
Head-on-View	
Head Lamps	10¼-inch lens.
Wiring	Chromium supports.
Bumpers	Unusually strong. Bumper brackets integral with frame.

COMFORT—THE PASSENGER STORY

Comfort	
Rear Door	Door width, 29¾ inches. Opening and closing action cushioned by spring in door check.
Head Room	Height, 49 inches (from floor).
Upholstery	Seven optional cloths—three Broadcloths, two Mohairs, two Whipcords. Shoulder support—seat back 21 inches high.
Leg Room	Ample space for baggage if required. Quarter lights for convenience and comfort at night.
Hardware	Strong and durable. Ternstedt make. All doors can be locked.
Radio	All Sedan and Coupe bodies wired for radio installation.

THE OWNER-DRIVER STORY

Front Seat	
Door	Width 36½ inches. Front seat frame covered with upholstery. No exposed metal.
Adjustment	4 inches maximum adjustment.
Comfort	Shoulder support—seat back 21 inches high.
Vision	Unobstructed by left middle pillar.
Steering Wheel	18 inches diameter. Moulded Bakelite wheel with steel core prevents splintering.
Steering Type	Hourglass type worm provides more contact surface with sector.
Controls	
Instrument Board	Well lighted by 2 lights. Oil gauge pressure 30 lbs. at 30 M. P. H. Shutters open at 155 degrees. Full open at 180 degrees.
Windshield	Seven-degree angle. Glass channels chrome plated.
Double Wiper	Greater safety with wiping of entire windshield for bad weather driving.
Ignition—Transmission Lock	Turning off ignition automatically locks car.

EXTERNAL FEATURES STORY

Wheel base	134 inches.
Turning Radius	23 feet 10 inches (right and left). Over-all length (fender wells) 202 $\frac{31}{32}$ inches. Over-all length of car with rear tire carrier (Sedans) 203 $\frac{15}{16}$ inches.
Wheels	
Quality	12 spokes, of second growth hickory, set under hydraulic pressure. Lateral lacing of spokes in wire wheels provides greater strength.

EXTERNAL FEATURES STORY—*Cont.*

Optional Equipment	5-wheel. Wire $. Demountable wood $. Disc $. 6-wheel (including fender wells, 2 spare tires and trunk rack). Wire $. Demountable wood $. Disc $. Tires in fender wells supported by frame bracket do not chafe from rubbing against metal.
Ball Bearings	Make—New Departure.
Tires	Size wood wheels standard 6.50 x 19. Demountable wood or wire or disc 7.00 x 18. Optional tires—United States, Firestone and Goodyear. Pressure 40 lbs. rear, 45 lbs. front. No extra charge for larger tires on optional wheel equipment.
Springs	
Construction	Silico-Manganese steel. Semielliptical (rolled point).
Sizes:	
(a) Front	9 leaves 38″ x 2″ } Underslung.
(b) Rear	11 leaves 58″ x 2″ } Underslung.
Lubrication	Graphite and grease lubricant used in metal covers. Alemite system for shackles.
Covers	Metal with spring clips on rear springs.
Spring Shackles	Compression type.
Duodraulic Shock Absorbers	
Adjustments	Varying sizes of metering pins.
Lubrication	Alemite nipples.

Presentation Outline	Sales Data

EXTERNAL FEATURES STORY—*Cont.*

Frame	
Strength	Size—Depth 8 inches; thickness $\frac{5}{32}$ inches; pressed carbon steel; width top flange 3 inches; bottom flange $2\frac{1}{4}$ inches.
Cross Members	Seven.

FISHER BODY STORY

Wood and Steel	
Strength	
Preparation	After milling, wood seasons for three months. Then it is kiln dried to 5 per cent moisture content and cut to size. Curved pieces are cut, not steam bent. After cutting, pieces are again stored for seasoning. (Steam bent process allows wood to warp, lose shape.)
Body Frames	
Paneling	
Body Features	
Roof	Assembled separately from body.
Doors	Resist weaving.
Body Mounting	Anti-squeak, nonhardening paste is used.
Safety Glass	
Construction	Center layer of pyroxalin is coated with cementing substance (cellulose acetate) and two pieces of heavy plate glass are pressed to either side under a pressure of 360 lbs. per square inch.
Ability	
Manufacturing Control	

Presentation Outline	Sales Data

GENERAL MOTORS STORY

General Motors leadership and affiliation helps Cadillac	
Purchasing Economy Means Added Value	
Value of Research	
Accomplishments	Valve silencer, 2-plane crankshaft, vacuum assister brake, intake muffler, Duco, ethyl compound, harmonic balancer.
Proving Ground	
Purpose	A yardstick to measure all cars, even foreign makes and competitors.
Size	1245 acres.
Parts Quality	
Control	Such firms as Harrison Radiator Corp., A. C. Spark Plug, Delco Products, Delco-Remy Corp., Hyatt Bearings Div., New Departure Mfg. Company, etc.
Service	Uniform and national service through United Motors.
GMAC	
Rates	Lower rates than other companies.

GENERAL MOTORS STORY—*Cont.*

Protection	Greater protection to policy holders.
Cooperation	Being a unit of General Motors it has a friendly interest in dealer and purchaser.
Summary	

Mechanical Features

THE V-8 ENGINE STORY

Engine Improvements	
Model and Serial No.	Model 355. Engine numbers start at 800,001.
Engine Size	Bore $3\frac{3}{8}$ inches, stroke $4\frac{15}{16}$ inches. Displacement 355 cubic inches. Compression 108 lbs. at 1000 R.P.M. Compression ratio 5.35 to 1. Optional 5.26 to 1.
Horsepower	N.A.C.C. rating 36.45 actually develops more than 95 H.P. at 3000 R.P.M. Maximum R.P.M. about 4200.
Gear Ratios	(Sizes) 4 to 1; 4.40 to 1; 4.75 to 1.
Intake Muffler	Resonance type.
Strong Crankcase	Silicon aluminum. Non-resonant. Heavily ribbed for strength and strong support to bearing bridges. Separate from engine block. Reduces service costs in case of accident. Lower half is pressed-steel oil pan. 5-point suspension.
Reasons for Superiority of V-type Principle Engines	
Torsional Vibration Cancelled	Known also as twist, whip, crankshaft wind up.

THE V-8 ENGINE STORY—*Cont.*

Short Crankshaft	Length $23\frac{25}{32}$ inches (outer ends of front to rear bearings). High carbon steel. Completely machined all over. Compensators bolted to shaft and spot welded to insure rigidity. Weighs 68 lbs. 2 oz. Diameter $2\frac{3}{8}$ inches.
Main Bearings	Three main bearings. Babbitt-bronze backed. Clearance .001 inch to .0015 inch. Dimensions: Front, $1\frac{15}{16}$ inches by $2\frac{3}{8}$ inches; center, $1\frac{5}{8}$ inches by $2\frac{3}{8}$ inches; rear, $2\frac{7}{8}$ inches by $2\frac{3}{8}$ inches (combined length $6\frac{7}{32}$ inches). Rear bearing takes thrust. Bearing area $48\frac{1}{8}$ square inches. Replacement cost $39.85. Compares with $115.50 on Packard 8.
Complete Engine Ventilation	Positive circulation of air through crankcase lubricates valve springs in valve chamber. Compensators on crankshaft when turning act as air pump, drawing air through inlet breather at side of left block and discharging it through two vent tubes one each at front of left block and rear of right block.
Engine Parts	
Connecting Rods	Material—Drop-forged chrome Molybdenum steel. Bearing material poured Babbitt. No shims used. Bearing clearance .001 to .0025. Rods can be removed through bottom of engine without taking off cylinder head. Diameter of rifle-drilled passage $\frac{7}{32}$ inches. Set of 8 rods balanced within $\frac{1}{8}$ ounce each. Journal width and length $2\frac{3}{8}$ inches by $1\frac{3}{8}$ inches. Length center to center $10\frac{1}{2}$ inches. Both ends diamond bored.

Presentation Outline	Sales Data

THE V-8 ENGINE STORY—*Cont.*

Camshaft	Morse chain drive from crankshaft. Chain 1¾ inches wide, 27 inches long. Material high carbon steel forging. Drilled from end to end for oil passage. Four bearings: No. 1, 1⅛ inches by 1 13/16 inches; No. 2, 2 11/32 inches by 1 inch; No. 3, 2 11/32 inches by 1⅛ inches; No. 4, 1⅝ inches by 1 11/16 inches. Weight 9½ lbs. Turns at one half crankshaft speed. Distributor drive gear separate on shaft. Can be replaced without installing new camshaft.
Pistons	Material—Close-grained nickel-iron piston. 3 times harder than aluminum. 3 compression rings above piston pin. 1 oil ring below pin. Lightweight—tapered skirt. Piston weight, without rings, pin or bushing, 24 ounces. Hand fitted to limits of .003 inches. Piston pin locked by set screw—in piston boss. Piston pin length 3 1/32 inches, diameter ⅞ inch. Piston ring make—perfect circle. Pistons and rods each held to 1/16-ounce limit in weight.
Cylinder Heads	Cover plates protect wiring.
Cylinders	Cast en bloc of 4. Machined, reamed and honed to finish. Honing gives glasslike finish to cylinder walls and adds life to pistons and rings. Blocks are staggered to permit use of side-by-side connecting rods. Crankcase cast separately from blocks. Blocks are interchangeable.

Presentation Outline	Sales Data

THE V-8 ENGINE STORY—*Cont.*

Manifolds	Expansion joints at front of motor.
Exhaust	Porcelain finish. Two 4-port cast iron, Y connection.
Intake	Two two-port cast-iron; diameter 1½ inches.
Chains	Morse. Timing chain drives camshaft from crankshaft. Generator and pump driven from crankshaft. Two chains distribute load, longer life. Adjustment of position of water pump and generator mounting takes up chain stretch.
	Timing chain width 1¾ inches. length 27 inches.
	Generator and pump chain width 1¼ inches.
Valves	16 valves operated by single camshaft. Valve action through rollers on cam slide. Diameter valve lifter 1 1/16 inches.
Inlet	Inlet valve Tungsten. Diameter 1½ inches (clear). Valve seat angle 30 degrees.
Exhaust	Exhaust valve silichrome. Diameter 1½ inches (clear). Valve seat 45 degrees.
	Valve lift 23/64-inch valve guides—removable. Lubricated through ports in cylinder walls. Valve spring pressure open 160 lbs. Closed 79 lbs.
	Valve springs retained by split tapered bushing and not by pin which is liable to shear off.

COOLING SYSTEM

Cooling System

Capacity	6 gallons.
Pump	Impeller type. Connected to generator with laminated couplings. Safety pin in shaft sheers off if pump is frozen, and protects chain. Location on outside of engine. Greater accessibility. Has positive nozzle action. Better design than agitator type mounted in cylinder block. Pump delivers 5880 gallons per hour (41,000 lbs.) at 3200 R. P. M. (98 gallons per minute).
Circulation	Cylinder blocks interconnected by brass tubes cast integral with crankcase providing equal distribution of water. One drain plug on inlet elbow on the right-hand cylinder block accessible from above. Water is changed approximately 1175 times per hour in engine at 65 M.P.H. taking heat out of engine quickly.
Radiator	Make—Harrison cellular with copper core because it is an efficient conductor of heat and resists corrosion. Pressed steel casing is copper plated and polished, then nickel plated twice and polished, then chrome plated.
Shutters	Built in. Opens 155 degrees to 165 degrees. Closes 175 degrees to 165 degrees.
	Thermostat controlling shutters mounted in radiator in direct path of water flow from engine. Assist in quick warming up of engine in cold weather starting.

COOLING SYSTEM—*Cont.*

Fan	Own make—six blades—Diameter 21 inches. Automatically lubricated by oil pump in engine. Fan belt 7/8 inches wide, 9½ inches long, endless V-type design. Driven from pulley on crankshaft. Fan belt drives fan only. Belt adjustment by raising or lowering fan bracket.
Advantages of V-type Cadillac cooling over Straight-8 Design	6 advantages.

Engine Lubrication

Importance	Determines life of car. Protects the precision of the parts.
Pressure System	Capacity, 8 quarts. Pressure by gear type oil pump. 8 quarts of oil pass through oil passage in 43 seconds at 3000 R. P. M. Pump driven by lower end of distributor shaft from spiral gear on camshaft.
Filter and Screen	AC filter located on by-pass in oil line. No danger of stopping circulation to engine. Oil screen covers oil pan, strains oil returning from engine; prevents sediment collection at pump.
Regulator	Accessible location on outside at front of engine. Oil flows over timing and water pump chains. Automatic pressure type. Valve opens at 11 lbs. pressure approximately 10 M.P.H. Normal oil pressure 30 lbs. at 30 M.P.H.
Gauge	Float type. Positive reading. Located at rear of engine.
	Change oil every 2000 miles.

Presentation Outline	Sales Data

CHASSIS LUBRICATION

System	
Lubricants	Alemite—High pressure. Lubricant must reach bearing to accomplish purpose. 4 kinds are necessary and supplied in Cadillac: Engine Oil—Differential and Transmission Grease — Chassis Lubricant — Rear Axle Grease.
Pressure System	Ordinary hand grease gun pressure 500 lbs. to square inch, higher pressure with service station equipment insures distribution of lubricant to bearing surface and expels dirt. Positive protection regardless of weather. So-called automatic systems use only low pressure in line, 45 lbs. and oil reaches bearing points through drip oilers. Some systems use capillary action only, caused by movement of car when in operation.
Schedule and Charges	Cadillac standard lubrication schedule specifies visit to service station 30 day periods (or every 1000 miles). Charge for positive lubrication of all points on car costs no more than partial service necessary with centralized systems.
	No possible chance of forgetting universal joint lubrication on Cadillac.
Manual Lubrication also necessary with automatic system	Variable mileage periods when different parts need attention supplemented by necessity to remember daily operation of plunger makes so-called automatic systems less efficient when compared with Cadillac standard lubrication service at same cost.

Presentation Outline	Sales Data

ELECTRICAL SYSTEM

Ignition	Delco-Remy
Distributor	Two contact arms—4-lobe cam. Jump spark type. Firing order 1L; 4R; 4L; 2L; 3R; 3L; 2R; 1R. A.C. Metric (18 m.m.) spark plugs. Wiring in insulated cable in metal conduits. Rechecking timing through hole in flywheel cover on transmission case.
Starter	Ratio between starter and flywheel 25 to 1 (approx.). Engine cranking speed 90-100 R.P.M.
Battery	120 amp. hour, 6-volt. Positive terminal grounded.
Generator	2-pole. 19 M.P.H. maximum normal charging speed. Thermostat opening temperature 175 degrees F. Positive chain driven instead of through fan belt.
Breaker	Short circuit indicated by buzzing. Nothing to replace. No fuses to use or replace.
Spark Control	Automatic advance 28 degrees. Manual advance (on dash) 19 degrees.
Ignition Lock	Greater protection against car theft than cars with only ignition switch.

FUEL SYSTEM

Fuel System	
Tank	21-22 gallons.
Fuel Feed and Vacuum Pump	Stewart - Warner vacuum tank. Driven by camshaft located at rear of engine. Assures engine adequate fuel supply regardless of speed or hill climbing.

FUEL SYSTEM—*Cont.*

Carburetor

Type	Own make. Air valve single jet type. 2-inch throat. One adjustment.
Features	Thermostatic control of vapor and air volumes. Thermostats in auxiliary air valve open at 65 degrees to 85 degrees. 2 thermostats to relieve bowl pressures. First, opens at 74 degrees to 78 degrees. Second, opens at 125 degrees to 130 degrees.
Plunger Pump	To provide carburetor with extra gas for quick acceleration.
Intake Muffler	Developed by General Motors Research (see engine improvements).

POWER TRANSMISSION SYSTEM

Clutch

Type	Plate type. Dry. Own make. 3 driving plates. 2 driven discs. Outside diameter 10 inches. Inside diameter 7 inches. Balanced statically and dynamically, 12 springs.
Release	Very light driven discs and hub, giving very little inertia, reduce the spinning action. No drag permits quick, smooth engagement.
Design	Facings of woven asbestos material. Thickness .135 inch to .145 inch ($\frac{9}{64}$ inch). Clutch facing area 160 square inches.

Transmission

Design	Synchro-Mesh 3 speeds forward, 1 reverse. Selective. Oil capacity, 3 quarts. Unit with power plant.
Superiorities	Anybody who can drive can change gears without clashing. Less complicated than any 4-speed transmission.

POWER TRANSMISSION SYSTEM—*Cont.*

Gear Reductions in Transmission	Reverse 3.0 to 1 Second 1.5 to 1 Low 2.5 to 1 High 1.0 to 1

Rear Axle

$\frac{3}{4}$-Floating Type	Cadillac make. $\frac{3}{4}$-floating. Spiral bevel gears. Propeller shaft tubular, 2-inch diameter. Road clearance under center of rear axle $7\frac{33}{32}$ inches. Oil capacity 3 quarts.
Torque Tube Drive	Strong tube enclosing drive shaft. One universal joint only. Relieves springs of driving strains and stresses.
Bearings	Two tapered roller in differential carrier. 2 ball in pinion shaft. 1 ball on each rear wheel.
Universal Joints	X-type Spicer make. Only one is used. No worry about lubrication as on other cars.
Axle Shafts	$1\frac{3}{8}$-inch diameter enclosed in strong housing with welded inner sleeve. Wheels mounted on bearings on outside of axle housing, taking load off axle shafts.
Ring Gears and Pinions	All pinions and ring gears are manufactured by Cadillac, matched and adjusted in final assembly in soundproof room.
Tread	59½ inches.
Ratios	4 to 1; 4.40 to 1; 4.75 to 1.

Presentation Outline	Sales Data

BRAKING SYSTEM

Brakes

Design	Internal expanding. Safety mechanical brakes. Aluminum brake shoes operated with articulated linkage by cam, assures full contact of shoes with drums at all times. Brake lining 2 inches wide, length 21⅝ inches per wheel. Total braking area 173 square inches (1.2 square feet). 100 per cent effective when used.
Self-centering Cams and Articulated Link	
Drums	Pressed steel. Machined to close limits, fully assembled with hub. (7/1000-inch limits.) Rear wire wheel hubs have two flanges reducing possibility of wheel collapse from skidding or accident.
Roller Bearings	Cadillac only company to use roller bearings (15 sets) to reduce friction in braking system. Ordinarily 50 per cent braking effort is lost between pedal and the wheels, because of friction in brake shafts.
Adjustment	Micrometer adjustment, made by turning one nut on outside of each dust shield. Complete adjustment and testing operation in 30 minutes.
Competitors' 2-Shoe Brakes do not match Cadillac	Competitors using 2-shoe brakes, do not have articulated linkage, self-centering cams, aluminum shoes or roller bearings.
General	Braking power division 50-50. Lead plates on tips of large brake shoes lubricate inside drum braking surface to prevent scoring. Mechanism fully enclosed against weather and dirt.

Presentation Outline	Sales Data

HARMONIZED STEERING

Design

Type	Hourglass design gives more surface contact with sector and provides easier steering.
Wheel	18 inches in diameter. Moulded Bakelite with steel insert reduction 17 to 1. 3⅝ turns of wheel for full left turn.
Modulator	Mounted on same side as steering mechanism. It dampens road shocks before they travel from frame to steering gear.

FRONT AXLE

Type	Reverse Elliott I-beam construction.
Bearings	Wheels—Double ball bearing each wheel (New Departure). King Pin—Upper and lower ball bearings (New Departure).
Tread	57¼ inches.

CADILLAC ACHIEVEMENTS STORY

Leadership

Firsts and Car Improvements

Before 1914		1912 Cadillac introduced electric starting, lighting and ignition. Recognized trend to closed bodies. First large order (150) for closed bodies was placed with Fisher in 1910.
Model 51	1914	First 90-degree, V-type, high-speed engine.
	1916	Introduced thermostatic control of cooling medium.