

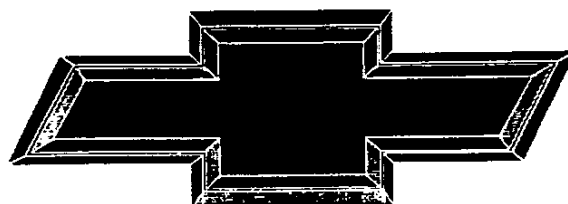
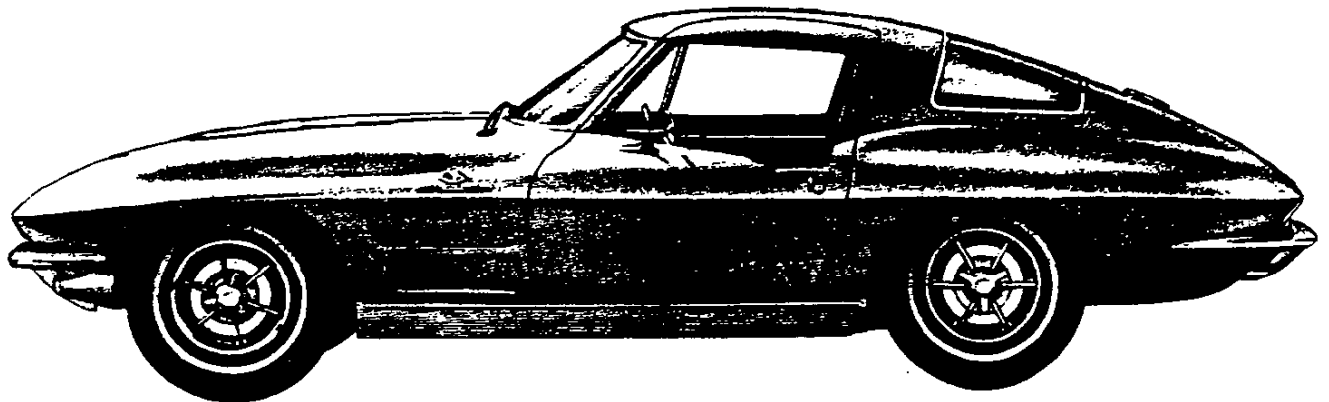




1963

CORVETTE

SPECIFICATIONS



GENUINE CHEVROLET™



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1963 CORVETTE

Production: 10,594 coupe, 10,919 convertible, 21,513 total.

1963 NUMBERS

Vehicle: 30837S100001 through 30837S121513

• For convertibles, fourth digit is a 6.

Suffix: RC: 327ci, 250hp, mt RF: 327ci, 360hp, mt
RD: 327ci, 300hp, mt SC: 327ci, 250hp, at
RE: 327ci, 340hp, mt SD: 327ci, 300hp, at

Block: 3782870: All

Head: 3795896: 327ci, 250hp
3782461: 327ci, 300hp, 340hp, 360hp

Carburetor: Carter 3460S #3826006: 327ci, 300hp, at
Carter 3461S #3826004: 327ci, 300hp, 340hp, mt
Carter 3500S #3826005: 327ci, 250hp, at
Carter 3501S #3826003: 327ci, 250hp, mt

Fuel Injection: Rochester 7017375

Distributor: 1111022: 327ci, 360hp
1111024: 327ci, 250hp, 300hp, 340hp

Alternator: 1100628: All without ac
1100633: All with ac

Ending Vehicle: Sep 62: 100675 Jan 63: 107976 May 63: 116409
Oct 62: 102756 Feb 63: 109814 Jun 63: 118524
Nov 62: 104047 Mar 63: 111833 Jul 63: 120990
Dec 62: 105972 Apr 63: 114128 Aug 63: 121513

Abbreviations: ac=air conditioning, at=automatic transmission,
ci=cubic inch, hp=horsepower, mt=manual transmission.

1963 FACTS

- In 1963, the Corvette's body and chassis were completely redesigned. For the first time, a coupe body was available. A center wind split on the coupe roof flowed through the rear glass creating a "split window."
- Knock-off aluminum wheels were introduced as a 1963 option, but actual availability is questionable. Porosity of the aluminum and rim seal difficulty in early wheels caused tubeless tires to leak. Delivery of a 1963 with knock-off wheels to a retail customer has not been confirmed, but wheels were sold over-the-counter. Two bar (early) and three-bar spinner styles were available. Finish between the fins was natural.
- The 1963 exterior doors had raised pads for the door handles. Also, coupes had stainless steel trim forward of the vent window.
- All 1963 Corvettes had built-in adjusting mechanisms for the bottom seat cushions. Early 1963s had under-seat depressions, possibly for tool storage. This feature was removed about midway during the model year.
- Most 1963 Corvettes had fiberglass headlight buckets. Late 1963s and all 1964-67 models had metal buckets.
- Early 1963 models used roller-type catches for the gas filler doors. Later production used nylon slide catches.
- The glove box door in the 1963 Corvette was fiberglass and its face was covered with clear plastic. In early 1963s, the dash surface around the radio and speaker bezel was painted instead of vinyl-covered.
- 1963 hoods had rectangular trim panels glued in two forward recesses.
- 4-speed manual transmissions changed from Borg-Warner manufacture to Muncie during the 1963 model year.
- The outside rearview mirror was revised to a taller design with a shorter base at about the midpoint of 1963 production.

1963 OPTIONS

RPO #	DESCRIPTION	QTY	RETAIL \$
837	Base Corvette Sport Coupe	10,594	\$4,257.00
867	Base Corvette Convertible	10,919	4,037.00
898	Genuine Leather Seats	1,114	80.70
941	Sebring Silver Exterior Paint	3,516	80.70
A01	Soft Ray Tinted Glass, all windows	629	16.15
A02	Soft Ray Tinted Glass, windshield	470	10.80
A31	Power Windows	3,742	59.20
C07	Auxiliary Hardtop (for convertible)	5,739	236.75
C48	Heater and Defroster Deletion (credit)	124	-100.00
C60	Air Conditioning	278	421.80
G81	Positraction Rear Axle, all ratios	17,554	43.05
G91	Special Highway Axle, 3.08:1 ratio	211	2.20
J50	Power Brakes	3,336	43.05
J65	Sintered Metallic Brakes	5,310	37.70
L75	327ci, 300hp Engine	8,033	53.80
L76	327ci, 340hp Engine	6,978	107.60
L84	327ci, 375hp Engine (fuel injection)	2,610	430.40
M20	4-Speed Manual Transmission	17,973	188.30
M35	Powerglide Automatic Transmission	2,621	199.10
N03	36 Gallon Fuel Tank (for coupe)	63	202.30
N11	Off Road Exhaust System	—	37.70
N34	Woodgrained Plastic Steering Wheel	130	16.15
N40	Power Steering	3,063	75.35
P48	Cast Aluminum Knock-Off Wheels (5)	—	322.80
P91	Blackwall Tires, 6.70x15, (nylon cord)	412	15.70
P92	Whitewall Tires, 6.70x15 (rayon cord)	19,383	31.55
T86	Back-up Lamps	318	10.80
U65	Signal Seeking AM Radio (earlier)	11,368	137.75
U69	AM-FM Radio (later)	9,178	174.35
Z06	Special Performance Equipment	199	1,818.45

- A 327ci, 250hp engine, 3-speed manual transmission, vinyl interior trim, and a soft top (convertible) were included in the base price.
- Z06 was first a coupe-only option. Revision to \$1,293.95 excluded knock-off wheels and 36 gallon tank, and was available with convertibles.
- The 5,739 C07 quantity included 1,099 in lieu of soft tops at no extra cost.
- The 2,621 M35 quantity was split 1,116 with 250hp, 1,505 with 300hp.
- RPO U69 radios were phased in around March 1963, but these and RPO U65 radios were available simultaneously as supplies permitted.

1963 COLORS

CODE	EXTERIOR	QTY	SOFT TOP	WHEELS	INTERIORS
900	Tuxedo Black	—	Bk-W-Bg	Bk	Bk-R-S
912	Silver Blue	—	Bk-W-Bg	Bk-Si	Bk-Db
916	Daytona Blue	3,475	Bk-W-Bg	Bk-Db	Db-R-S
923	Riverside Red	4,612	Bk-W-Bg	Bk-R	Bk-R-S
932	Saddle Tan	—	Bk-W-Bg	Bk-S	Bk-R-S
936	Ermine White	—	Bk-W-Bg	Bk	Bk-Db-R-S
941	Sebring Silver	3,516	Bk-W-Bg	Bk-Si	Bk-Db-R-S

- Suggested interiors shown. Other combinations were possible.
- When whitewall tires were ordered, the standard wheels were painted black. With blackwalls, wheels were painted body color (except with white exteriors which may have had black wheels regardless of tire type).

Interior Codes: Std/Blk=Bk, 490A/J/S/XE/XG=Db/V-cpe, 490B/K/T/XF/XH=Db/V-con, 490C/L/Q/XA/XC=R/V-cpe, 490D/M/R/XB/XD=R/V-con, 490E/N/U/XJ/XL=S/V-cpe, 490F/P/V/XK/XM=S/V-con, 898A/E/Q/G/S=S/L-cpe, 898B/F/R/H/T=S/L-con.

- With the exception of "std" or "blk" for black vinyl, codes had three numbers followed by a one or two alpha-character suffix. This was the first year for coding to trim tags and inconsistencies exist.

Abbreviations: Bg=Beige, Bk=Black, con=convertible, cpe=coupe, Db=Dark Blue, L=Leather, R=Red, S=Saddle, Si=Silver, V=Vinyl, W=White.

The Corvette Black Book

1983-1993

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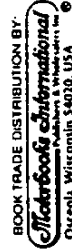
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CORVETTE

1963 MODEL CORVETTE WITH STANDARD EQUIPMENT (250-hp Corvette V8 Engine—98" Wheelbase)

Model Description	Price at which Dealer is Invoiced (List Price)	List Price	Factory D & H	Mfr's Sgt'd Dealer D & H	Mfr's Sgt'd Retail Price*	Destination Charge	Total
837 Corvette Sport Coupe 2-door—2-passenger					54252.00		
867 Corvette Convertible—2-passenger With manually operated soft top					4037.00		

† Base discount is 25% with the 2% difference retained for dealer's account in accordance with Dealer Price List.
* Manufacturer's Suggested Retail Price does not include state and local taxes, license fees, options or accessories.

FACTORY INSTALLED REGULAR PRODUCTION TUBELESS TIRES

Description	1963 Option Number	Dealer Net	List Price	Factory D & H	Mfr's Suggested Retail Delivered Price [◇]
(5) 6.70-15/4-ply Regular Highway Blackwall	Std				N.C.
(5) 6.70-15/4-ply Regular Highway Whitewall	P92				\$31.55
(5) 6.70-15/4-ply Nylon Highway Blackwall	P91				15.70

◇ State and local taxes not included.

OPTIONS AND ACCESSORIES WHEN INSTALLED BY CHEVROLET

Description	1963 Option Number	Dealer Net	List Price	Factory D & H	Mfr's Suggested Retail Delivered Price [◇]
Air Conditioning, Four Season: with 250-hp or 300-hp engine only	C60				\$421.80
Axle, Rear: 3.08 ratio (4-spd trans with 250-hp or 300-hp engine)	G91				2.20
Axle, Positraction Rear: See Power Teams Chart for availability					
3.08 ratio	G81				43.05
3.36 ratio	G81				43.05
3.55 ratio	G81				43.05
3.70 ratio	G81				43.05
4.11 ratio	G81				43.05
4.56 ratio	G81				43.05
Back-up Lamps	T86				10.80
Brakes, Special: Metallic facings. Not available when special performance package is ordered.	I65				37.70
Brakes: Vacuum power. Not available when special performance package is ordered.	J50				43.05
Engine: 327-cu-in displacement					
300-hp Corvette V8—large 4-barrel carburetor (Regular camshaft)	L75				53.80
340-hp Corvette V8—large 4-barrel carburetor (High-lift camshaft)	L76				107.60
360-hp Corvette V8—Fuel Injection (High-lift camshaft)	L84				430.40
Glass, Soft Ray Tinted: All windows	A01				16.15
Windshield only	A02				10.80
Heater and Defroster Deletion	C48				100.00 CR.
Paint, Exterior: Solid colors only. See Color and Trim chart					
Sebring Silver					80.70
All other colors					N.C.
Radio, AM-FM: Fully Transistorized					
Pushbutton control (Price does not include antenna installation)	U69				174.35
Special Performance Package: Includes power brakes with dual circuit master cylinders; special metallic brakes, HD stabilizers, HD front and rear shock absorbers, HD front and rear springs. Price also includes Positraction rear axle, four-speed transmission and 360-hp fuel injection engine which must be shown separately on order form.	Z06				1293.35
Steering: Hydraulic. Not available with 340-hp engine or 360-hp engine.	N40				75.35
Steering Wheel: Wood grained plastic rim	N34				16.15
Tank, Fuel: Model 837 only (Capacity 36.5 gal)					
Also includes wheel house filler panel	N03				202.30
Top, Auxiliary: Hard top; Model 867 only					
In place of folding top	C07				N.C.
In addition to folding top	C07				236.75
Top, Folding: Model 867 only. White or beige (Standard color is black)	C05				N.C.
Transmission: See Power Teams Chart for availability					
4-speed synchromesh	M20				188.30
Powerglide (With 250-hp or 300-hp engine only)	M35				199.10
Trim Combinations: See Color and Trim chart					
Saddle (Genuine leather seats)	898				80.70
All other trims	490				N.C.
Wheels: Five cast aluminum 15 x 6L quick knock-off type	P48				322.80
Windows, Power: Electric control	A31				59.20

◇ State and local taxes not included.

CORVETTE POWER TEAMS

ENGINE, TRANSMISSION & REAR AXLE COMBINATIONS

ENGINE			REAR AXLES			
			Standard	Optional Rear Axle Ratio		
Option Number	Description	TRANSMISSION	General Purpose▲	Special Purpose or Mountain★	Performance Cruise	High Performance★
Standard	250 HP 327-cu-in displacement 4-barrel carburetor Hydraulic lifters 10.5:1 compression ratio	3-speed	3.36:1	—	—	—
		4-speed with 2.54:1 low gear ratio			3.08:1 (RPO G91)▲	
		Powerglide			—	
L75	300 HP 327-cu-in displacement Large 4-barrel carburetor Hydraulic lifters 10.5:1 compression ratio	3-speed	3.36:1	—	—	—
		4-speed with 2.54:1 low gear ratio			3.08:1 (RPO G91)▲	
		Powerglide			—	
L76	340 HP 327-cu-in displacement Large 4-barrel carburetor Special camshaft Mechanical lifters 11.25:1 compression ratio	3-speed	3.36:1	—	—	—
		4-speed with 2.20:1 low gear ratio	3.70:1	3.36:1 3.55:1	3.08:1★	4.11:1 4.56:1
L84	360 HP 327-cu-in displacement Fuel injection Special camshaft Mechanical lifters 11.25:1 compression ratio	3-speed	3.36:1	—	—	—
		4-speed with 2.20:1 low gear ratio	3.70:1	3.36:1 3.55:1	3.08:1★	4.11:1 4.56:1

★ Available as Positraction only (RPO G81)

▲ Also available as Positraction (RPO G81)

1963 CORVETTE
 COLOR AND TRIM COMBINATIONS

		INTERIOR TRIMS										FOLDING TOP COLORS		
		837					867							
		BLACK (VINYL)	RED (VINYL)	BLUE (VINYL)	SADDLE (VINYL)	SADDLE (LEATHER)▲	BLACK (VINYL)	RED (VINYL)	BLUE (VINYL)	SADDLE (VINYL)	SADDLE (LEATHER)▲	BLACK	BEIGE	WHITE
EXTERIOR COLOR & OPTIONAL HARDTOP	OPT NO	STD	490C	490A	490E	898A	STD	490D	490B	490F	898B	STD	C05A	C05B
TUXEDO BLACK	900	X	X		X	X	X	X		X	X			
SILVER BLUE (MED)	912	X		X			X		X					
DAYTONA BLUE (DK)	916		X	X	X	X		X	X	X	X			
RIVERSIDE RED	923	X	X				X	X						
SADDLE TAN	932				X	X				X	X			
ERMINE WHITE	936	X	X	X	X	X	X	X	X	X	X			
SEBRING SILVER	941	X	X	X			X	X	X					
												ALL TOPS AVAILABLE WITH ANY EXTERIOR COLOR		

▲ LEATHER SEATS ONLY



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AMA Specifications – Passenger Car

The information contained herein is prepared, distributed by, and is solely the responsibility of the automobile manufacturing company to whose products it relates. Questions concerning these specifications should be directed to the manufacturer whose address is shown below. This uniform specification form was developed by the automobile manufacturing companies under the auspices of the Automobile Manufacturers Association.

MANUFACTURER Chevrolet Motor Division General Motors Corporation	CAR NAME Corvette	
MAILING ADDRESS Chevrolet Engineering Center Box 7346, N. End Station, Detroit 2, Mich.	MODEL YEAR 1963	ISSUED: 10-1-62 REVISED (*)

NOTES:

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

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BODY—TYPES AND STYLE NAMES—

Body type, number of passenger & style names; use manufacturer's code for series & body style.

Model 0867 2-door convertible, 2-passenger
 Model 0837 2-door sport coupe, 2-passenger



AMA Specifications – Passenger Car

Page

MAKE OF CAR Chevrolet MODEL YEAR 1963 DATE ISSUED 10-1-62 REVISED(*)

GENERAL SPECIFICATIONS

(All dimensions in inches unless otherwise indicated)

MODEL	Corvette	Additional Information Page No.	0867	0837
Wheelbase (L101)		23	98.0	
Tread	Front (W101)	22	56.3	
	Rear (W102)	22	57.0	
Maximum Overall Dimensions	Length (L103)	23	175.3	
	Width (W103)	22	69.6	
	Height (H101)	24	Soft Top 49.8 Hard Top 49.3	49.8
Transmission— (Specify trade name - opt., not available)	Manual	15	3-speed std. with all engines; 4-speed opt. with all engine	
	Overdrive	16	Not available	
	Automatic	16	Powerglide opt. with 250 and 300 HP engines	
Std. conventional Axle ratio	Manual 3-speed	17	3.36:1	
	Overdrive	17	Not available	
	Automatic	17	3.36:1	
Tire size		18	6.70 x 15	
Standard Engine	Type, no. cyl., valve arr.	2	90° V-8, Valve-In-Head	
	Fuel system (Carb., other)	8	carburetor	
	Bore and stroke	2	4.00, 3.25	
	Piston displ., cu.in.	2	327	
	Std. compression ratio	2	10.5:1	
	Max. bhp at engine rpm (GROSS)	2	250 @ 4400	
	Max. torque at rpm (GROSS, lb-ft)	2	350 @ 2800	



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AMA Specifications—Passenger Car

MAKE OF CAR <u>Chevrolet</u>	MODEL YEAR <u>1963</u>	DATE ISSUED <u>10-1-62</u>	REVISED ^(*)
MODEL <u>Corvette</u>	250 HP	300 HP	340 HP
			360 HP

ENGINE—GENERAL

Type, no. cyls., valve arr.	90° V-8 Valve-In-Head			
Bore and stroke (nominal)	4.00, 3.25			
Piston displacement, c.u. in.	327			
Bore spacing (C/L to C/L)	4.40			
No. system (front to rear)	L. Bank	1-3-5-7		
	R. Bank	2-4-6-8		
Firing order	1-8-4-3-6-5-7-2			
Compres. ratio (nominal)	10.5:1		11.25:1	
Cylinder Head Material	cast iron alloy			
Cylinder Block Material	cast iron alloy			
Cylinder Sleeve—Wet, dry, none	None			
Number of mounting points	Front	2		
	Rear	1 (on transmission extension)		
Engine installation angle	+3°			
Taxable horsepower	51.2			
	Dia. ² x No. Cyl. 2.5			
Published max. bhp* @ eng. RPM (gross)	250 @ 4400	300 @ 5000	340 @ 6000	360 @ 6000
Published max. torque* (lb. ft. @ RPM) (gross)	350 @ 2800	360 @ 3200	344 @ 4000	352 @ 4000
Recommended fuel regular - premium	premium			
Idle speed (spec. neutral or drive)	Manual	500 RPM (neutral)		700 RPM (neutral)
	Automatic	475 RPM (drive)		---

ENGINE—PISTONS

Material	aluminum alloy		
Description and finish	flat head slipper skirt with machined relief for valve clearance	impact extruded, domed	
Weight (piston only) oz.	21.34		19.82
Clearance (Hmits)	Top land	.0365-.0455 (Diameter)	
	Skirt	Top	.0005-.0011
		Bottom	.0024-.0030
Ring groove depth	No. 1 ring	.2218-.2283	
	No. 2 ring	.2218-.2283	
	No. 3 ring	.2038-.2103	
	No. 4 ring	None	

* Max. bhp (brake horsepower) and max. torque corrected as defined by SAE Engine Test Code.

AMA Specifications – Passenger Car

MAKE OF CAR Chevrolet MODEL YEAR 1963 DATE ISSUED 10-1-62 REVISED (a)

POWER TEAMS

(Indicate whether standard or optional)

MODEL AVAILABILITY Corvette Engines	ENGINE					TRANSMISSION	AXLE RATIO (Std. first)	
	Displ. cu. in.	Carburetor	Compr. Ratio	BHP @ RPM	Torque @ RPM		Axle	
							Con- ventional	Positraction optional
250 HP Standard	327	4-bbl.	10.5:1	250 @ 4400	350 @ 2800	3-speed	3.36:1(a)	3.36:1
						4-speed opt.		3.08:1
						Powerglide opt.		3.36:1
						3-speed		3.36:1
						4-speed opt.		3.08:1
						Powerglide opt.		3.36:1
300 HP Optional	327	Large 4-bbl. (AFB)	11.25:1	300 @ 5000	360 @ 3200	3-speed	3.36:1	3.36:1
						4-speed opt.		3.08:1
						Powerglide opt.		3.36:1
						3-speed		3.36:1
						4-speed opt.		3.70:1
						4-speed opt.		3.70:1
340 HP Optional	327	Large 4-bbl. (AFB)	11.25:1	340 @ 6000	344 @ 4000	3-speed	3.36:1	3.08:1
						4-speed opt.		3.36:1
						4-speed opt.		3.55:1
						4-speed opt.		3.70:1
						4-speed opt.		3.70:1
						4-speed opt.		4.56:1
360 HP Optional	327	Fuel Injection	11.25:1	360 @ 6000	352 @ 4000	3-speed	3.36:1	3.36:1
						4-speed opt.		3.08:1
						4-speed opt.		3.36:1
						4-speed opt.		3.55:1
						4-speed opt.		3.70:1
						4-speed opt.		4.56:1

(a) 3.08:1 opt. with 4-speed

AMA Specifications – Passenger Car

MAKE OF CAR Chevrolet MODEL YEAR 1963 DATE ISSUED 10-1-62 REVISIONS (a)

MODEL Corvette All engines except as noted (a)

ENGINE—RINGS

Function (top to bottom)	No. 1, oil or comp.	compression
	No. 2, oil or comp.	compression
	No. 3, oil or comp.	oil
	No. 4, oil or comp.	none
Compression	Description - material, type, coating, etc.	inside bevel cast iron alloy chrome plated OD
	Width	upper .0775-.0780; lower .0770-.0775
	Gap	upper .0013-.0023; lower .0013-.0025
Oil	Description - material, type, coating, etc.	Multi-piece (2 rails and spacer expander) rails - spring steel, chrome plated OD Spacer - expander - steel alloy (high chrome)
	Width	.184-.189
	Gap	.015-.055
Expanders		in oil ring assembly

ENGINE—PISTON PINS

Material	Steel Alloy (high chrome)	
Length	2.990-3.010	
Diameter	.9270-.9273	
Type	Locked in rod, in piston, floating, etc.	Locked in rod
	Bushing	In rod or piston
		Material	None
Clearance	In piston	.00015-.00025
	In rod	None
Direction & amount offset in piston	major thrust side, .055-.065 (a)	

ENGINE—CONNECTING RODS

Material	drop forged steel	
Weight (oz.)	20.32	
Length (center to center)	5.699-5.701	
Bearing	Material & Type	premium aluminum, removable
	Overall length	.807 (effective length)
	Clearance (limits)	.0007-.0028
	End play	.009-.013

(a) Pin on center in 340 and 360 HP engines.

AMA Specifications—Passenger Car

MAKE OF CAR Chevrolet **MODEL YEAR** 1963 **DATE ISSUED** 10-1-62 **REVISED** (e)

MODEL Corvette All engines except as noted (a)(b)

ENGINE—CRANKSHAFT

Material		forged steel	
Vibration damper type		inertia, rubber mounted	
End thrust taken by bearing (No.)		5	
Crankshaft end play		.002-.006	
Main bearing	Material & type		
	Clearance		
	Journal dia. and bearing overall length	No. 1	All except upper rear, premium aluminum, removable; upper rear, steel backed babbit, removable
		No. 2	
		No. 3	
		No. 4	
		No. 5	
No. 6	2.3009 (theoretical), 0.752 (effective length)		
No. 7	2.3006 (theoretical), 1.1824 (effective length)		
Dir. & amt. cyl. offset		None	
Crankpin journal diameter		1.999-2.000	

ENGINE—CAMSHAFT

Location		In block above crankshaft
Material		cast iron alloy
Bearings	Material	extra-life steel-backed babbit
	Number	5
Type of Drive	Gear or chain	
	chain	
	Crankshaft gear or sprocket material	
	Steel sprocket	
	Camshaft gear or sprocket material	
cast iron alloy		
Timing chain	No. of links	40
	Width	.875
	Pitch	.500

ENGINE—VALVE SYSTEM

Hydraulic lifters (Std, opt, NA)		Hydraulic std. for 250 and 300 HP engines (a)
Valve rotator, type (intake, exhaust)		none
Rocker ratio		1.5:1
Operating tappet clearance (Indicate hot or cold)	Intake	Zero for 250 and 300 HP engines (b)
	Exhaust	Zero for 250 and 300 HP engines (b)
Timing marks on flywheel, damper, other		damper

(a) Mechanical std. for 340 and 360 HP engines.

(Continued)

(b) For 340 and 360 HP engines, .008 intake (hot), .018 exhaust (hot).

AMA Specifications—Passenger Car

MAKE OF CAR	Chevrolet	MODEL YEAR	1963	DATE ISSUED	10-1-62	REVISED ^(*)
MODEL	Corvette	250 HP	300 HP	340 HP	360 HP	

ENGINE—VALVE SYSTEM (cont.)

Timing (a) (b)	Intake	Opens (°BTC)	32° 30'	35°
		Closes (°ABC)	87° 30'	72°
		Duration - deg.	300°	287°
	Exhaust	Opens (°BBC)	74° 30'	76°
		Closes (°ATC)	45° 30'	31°
		Duration - deg.	300°	287°
Valve opening overlap		78°	66°	
Intake	Material		carbon steel	steel alloy
	Overall length		4.902-4.922	4.870-4.889
	Actual overall head dia.			1.935-1.945
	Angle of seat & face			46°, 45°
	Seat insert material			none
	Stem diameter			.3410-.3417
	Stem to guide clearance			.001-.0027
	Lift (@ zero lash)		.3987	.39375
	Outer spring press. and length	Valve closed (lb. @ in.)	78-86 @ 1.66	
		Valve open (lb. @ in.)	170-180 @ 1.26	
	Inner spring press. and length	Valve closed (lb. @ in.)	valve spring damper 5-10 lb.	
		Valve open (lb. @ in.)		
	Exhaust	Material		valve steel (aluminized faces)
		Overall length		4.913-4.933	4.891-4.910
Actual overall head dia.				
Angle of seat & face			46°, 45°	
Seat insert material			None	
Stem diameter			.3410-.3417	
Stem to guide clearance			.001-.0027	
Lift (@ zero lash)		.3987	.39975	
Outer spring press. and length		Valve closed (lb. @ in.)	see intake	
		Valve open (lb. @ in.)	see intake	
Inner spring press. and length	Valve closed (lb. @ in.)	see intake		
	Valve open (lb. @ in.)	see intake		

ENGINE—LUBRICATION SYSTEM

Type of lubrication (splash, pressure, nozzle)	Main bearings	pressure
	Connecting rods	pressure
	Piston pins	splash
	Camshaft bearings	pressure
	Tappets	pressure
	Timing gear or chain	nozzle spray
	Cylinder walls	pressure, jet cross spray

(a) Including cam ramps.

(Continued)

(b) With .008 intake lash (hot) and .018 exhaust (hot) lash for 340 and 360 HP engines.

AMA Specifications – Passenger Car

MAKE OF CAR Chevrolet MODEL YEAR 1963 DATE ISSUED 10/1/62 REVISED ^(*)

MODEL _____

ENGINE—LUBRICATION SYSTEM (cont.)

Oil pump type	gear
Normal oil pressure (lb. @ engine rpm)	50 @ 2000
Oil pressure sending unit (elect. or mech.)	direct pressure to bourdon tube
Type oil intake (floating, stationary)	stationary
Oil filter system (full flow, partial, other)	full flow
Filter replacement (element, complete)	element
Capacity of crankcase, less filter-refill (qt.)	4 for 250 and 300 HP engines (a)
Oil grade recommended (SAE viscosity and temperature range)	32° F and warmer - SAE 20W, 20, 10W-30 0° F and warmer - SAE 10W, 10W-30 colder than 0° F - SAE 5W, 5W-20 sustained high speed warmer than 90° F - SAE 30
Engine Service Requirement (MM, MS, etc.)	MS or DG

ENGINE—EXHAUST SYSTEM

Type (single, single with cross-over, dual, other)	dual
Muffler No. & type (reverse flow, straight thru, separate resonator)	two, reverse flow, no resonators
Exhaust pipe dia. (O.D. Branch wall thickness) Main	250 HP engine, and 300 HP engine with Powerglide
Tail pipe diameter (O.D. & wall thickness)	2.00, .023

ENGINE—CRANKCASE VENTILATION SYSTEM

Type (ventilates to atmos., Induction system, other)	Standard	positive - closed
	Optional	(air cleaner to crankcase, crankcase to induction system)
Control unit	Make and model	AC
	Location	carburetor base
	Energy source (manifold vacuum, carburetor air stream, other)	manifold vacuum
	Control method (variable orifice, fixed orifice, other)	variable orifice
Complete system	Discharges (to intake manifold, carb. air intake, air cleaner intake, other)	carburetor base (intake manifold)
	Air inlet (breather cap, carburetor air cleaner, other)	filtered side of carburetor air cleaner
	Flame arrestor (screen, check valve, other)	Check Valve

- (a) 5 qts. for 340 and 360 HP engines.
- (b) 2.50, .07 for 300, 340 and 360 HP engines with 3 and 4-speed.
- (c) See Supplementary Information to page 8 on fuel injection for fuel injection ventilation system.

AMA Specifications— Passenger Car

MAKE OF CAR Chevrolet MODEL YEAR 1963 DATE ISSUED 10-1-62 REVISED ^(*)

MODEL Corvette All engines, except fuel injection

ENGINE—FUEL SYSTEM

(See Supplement to Page 8 for Details of Fuel Injection, Supercharger, etc. if used)

Induction type: Carburetor, fuel injection, supercharger.		carburetor, downdraft	
Fuel Tank (a)	Capacity (gals.)	20	
	Filler location	center of rear deck	
Fuel Pump	Type (elec. or mech.)	mechanical	
	Location	lower right front of engine	
	Pressure range	5.25-6.50 psi	
Vacuum booster (std., optional, none)		none	
Fuel Filter (b)	Type	sintered bronze for 250 HP engine (c)	
	Locations	carburetor inlet for 250 HP engine (c)	
Carburetor	Choke type	automatic	
	Intake manifold heat control (exhaust or water)	exhaust	
	Air clnr. type	Standard	oil wetted, polyurethane
		Optional	none

CARBURETOR SUPPLEMENTARY INFORMATION

Model Usage	Engine Displ.	Transmission	Carburetors		No. Used and Type	Throttle Bore	
			Make	Model			
Standard 250 HP	327	3-speed	3826003	Carter	1 4-bbl.	1.4375 (p)	
		4-speed Powerglide				1.4375 (s)	
Optional 300 HP		3-speed	3826004	Carter	1 Large 4-bbl. (AFB)	1.5625 (p)	
		4-speed	3826004			1.6875 (s)	
		Powerglide	3826006				
Optional 340 HP		3-speed	3826004	Carter	1 Large 4-bbl. (AFB)	1.5625 (p)	
		4-speed				1.6875 (s)	

(a) See Page 19A for special performance equipment.

(b) Additional plastic mesh filter in fuel tank.

(c) In line with paper element, between fuel pump and carburetor for 300 and 340 HP eng

AMA Specifications – Passenger Car

MAKE OF CAR Chevrolet MODEL YEAR 1963 DATE ISSUED 10/1/62 REVISED^(e)

MODEL Corvette All engines except as noted (a)(b)(c)

ENGINE—COOLING SYSTEM

Type system (pressure, pressure vented, atmospheric, other)		pressure with surge tank	
Radiator cap relief valve pressure		13 psi ± 1 psi	
Circulation thermostat	Type (choke, bypass)	choke	
	Starts to open at (°F)	167 - 172	
Water pump	Type (centrifugal, other)	centrifugal	
	GPM @ 1000 pump rpm	1	
	Number of pumps	1	
	Drive (V-belt, other)	V-belt	
Bearing type		Permanently lubricated, single row ball	
By-pass recirculation type (internal, external)		Internal for 250 and 300 HP engines; External for 340 and 360 HP engines	
Radiator core type (cellular, tube and fin, other)		aluminum, cross-flow	
Cooling system capacity	With heater (qt.)	16.5	
	Without heater (qt.)	15.5	
	Opt. equipment—specify (qt.)	none	
Water jackets full length of cylinder (yes, no)		yes	
Water all around cylinder (yes, no)		yes	
Radiator hose	Lower	Number and type (molded, straight)	one, molded
		Inside diameter	1.75
	Upper	Number and type (molded, straight)	one, molded
		Inside diameter	1.50
	By-pass	Number and type (molded, straight)	none
		Inside diameter	
Fan	Number of blades & Spacing		5; from vertical, 22-1/2°, 115°, 180°, 245°, 337-1/2°
	Diameter		17, 12
	Ratio—fan to crankshaft rev.		.95
	Fan cutout type		thermo-modulated fluid coupling
	Bearing type		see Water Pump
* Drive belts (indicate belt used by letter)	Fan		AB CD
	Generator		A C
	Water Pump		AB CD
	Power Steering		B
	Air Conditioning		
	Idler		D

* Drive Belt Dimensions	A (a)	B (a)	C (b)	D (b)
Angle of V	40°	40°	40°	40°
Nominal length (SAE)	55.0	35.0	55.5	38.5
Width @ PL	3/8	3/8	3/8	3/8

- (a) A and B for 250 and 300 HP engines.
- (b) C and D for 340 and 360 HP engines.
- (c) External for 340 and 360 HP engines.

AMA Specifications - Passenger Car

MAKE OF CAR Chevrolet MODEL YEAR 1963 DATE ISSUED 10/1/62 REVISED (*)

MODEL Corvette All engines except as noted (a) (b)

ELECTRICAL—SUPPLY SYSTEM

Battery	Make and Model		Delco, 1980558	
	Voltage Rtg. & Total Plates		12V, 66	
	SAE Designation & Amp Hr. Rtg		2, SND, 61 @ 20 HR	
	Location		Engine compartment, in cavity to rear of right front wheel house	
Terminal grounded		Negative		
Generator	Make		Delco-Remy	
	Model		1100628	
	Type		Diode rectified	
	Ratio—Gen. to Cr/s rev.		2, 30:1 for 250 and 300 HP engines (a)	
Gen. cut-in (hot)—engine rpm		391 for 250 and 300 HP engines (b)		
Regulator	Make		Delco-Remy	
	Model		1149512	
	Type		Vibrator	
	Cutout relay	Closing voltage @ generator rpm	None	
		Reverse current to open		
	Regulated	Voltage	13.8-14.8 @ 85° F	
		Current	33-37	
	Voltage test conditions	Temperature	Operating	
Load		3-8 amp		
Other		None		

ELECTRICAL—STARTING SYSTEM

Starting motor	Make		Delco-Remy	
	Model		1107242	
	Rotation (drive end view)		Clockwise	
	Engine cranking speed			
	Test conditions		Engine at operating temperature	
	Lock test	Amps	435	
		Volts	5.8	
		Torque (lb. ft.)	10.5 lb-ft min	
No load test	Amps	65-100		
	Volts	10.6		
	RPM (min.)	3600		
Motor control	Switch (solenoid, manual)		Solenoid	
	Starting procedure		<u>3 and 4-speed</u> - Place gearshift in neutral and depress clutch to floor	
			<u>Powerglide</u> - Place control lever in N or P	
		<u>To Start</u> - Depress accelerator pedal to floor once and release. Turn ignition switch to start; release wheel once engine starts.		

(Continued)

(a) 2.0:1 for 340 and 360 HP engines.

(b) 450 for 340 and 360 HP engines.

AMA Specifications – Passenger Car

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MODEL Corvette All engines except as noted (a) (b)

ELECTRICAL—STARTING SYSTEM (cont.)

Motor Drive	Engagement type		Positive shift solenoid
	Pinion meshes (front, rear)		Rear
	Number of teeth	Pinion	9
		Flywheel	153
Flywheel tooth face width		.4375	

ELECTRICAL—IGNITION SYSTEM

Coil	Make		Delco-Remy
	Model		1115091
	Amps	Engine stopped	4.0
Engine idling		1.8	
Distributor	Make		Delco-Remy
	Model		111124 for 250, 300 and 340 HP engines (a)
	Cent'gal adv. in crankshaft degrees @ engine rpm (nominal)	Start (rpm)	700
		Intermediate points deg. @ rpm	11° @ 1600 rpm
		Max deg. @ rpm	24° @ 2400 rpm
	Vacuum adv. in crankshaft degrees @ in. Hg. (nominal)	Start (in Hg)	8
		Intermediate points, deg @ in Hg	
		Max. deg. in. Hg.	15° @ 15.5
	Breaker gap (in.)		.016-.019
	Cam angle (deg.)		28-32
Breaker arm tension (oz.)		19-23	
Timing	Crankshaft deg. @ rpm.	4° BTC @ 500 rpm for 250 HP engine; 8° BTC @ 500 rpm for 300 HP (engine (b))	
	Mark location	Harmonic balancer	
	Cylinder numbering system (see page 2)	Front	Right bank 2-4-6-8
			Left bank 1-3-5-7
Firing order (see page 2)		1-8-4-3-6-5-7-2	
Spark Plug	Make and model		AC 44
	Thread (mm)		14
	Tightening torque (lb. ft.)		25
	Gap		.033-.038
Cable	Conductor type		Linen core impregnated with electrical conducting material
	Insulation type		Rubber with neoprene jacket
	Spark plug protector		Hypalon jacket

ELECTRICAL—SUPPRESSION

Locations & type	Non-metallic high tension ignition cable
------------------	--

(a) 1111022 for 360 HP engines.

(b) 10° BTC @ 700 rpm for 340 and 360 HP engines.

AMA Specifications – Passenger Car

MAKE OF CAR Chevrolet MODEL YEAR 1963 DATE ISSUED 10/1/62 REVISED (*)

MODEL Corvette All models unless otherwise indicated

ELECTRICAL—INSTRUMENTS AND SWITCHES

Speedometer	Make	AC
	Trip odometer (yes, no)	Yes
Charge indicator—type		Ammeter
Temperature indicator—type		Electric, Gauge
Oil pressure indicator—type		Bourdon tube, gauge
Fuel indicator—type		Electric, gauge
Other		Tachometer (mechanical)
Ignition switch	Identify positions in order and circuits controlled	2nd position CCW from vertical ----- Accessory 1st position CCW from vertical ----- Lock Vertical ----- Off (unlock) 1st position CW from vertical ----- Start (spring) 2nd position CW from vertical ----- return to 0
	Provision for illumination	1 53 bulb
	Location	Right side of steering column, on instrument panel
Main lighting switch	Identify positions and lamps controlled	Depressed - Off 1st notch-instru. panel, parking, clock, tail, license lamps 2nd notch-instru. panel, head, tail, license lamps Rotate clockwise to dim or turn off instru. panel lamps, counter-clockwise to turn on or brighten panel lamps and turn on dome lamp (837 only)
Other light switches	Locations and lamps controlled	Dimmer-----Toe panel, headlamp beams and indicator lamps Turn signal ----- Steering column, front and rear turn signal lamps and indicator lamps Door jam - Hinge pillars, instru. panel courtesy & rear compartment lamps Stop ----- Brace below instru. panel, stop lamp Parking brake alarm ----- Parking brake lever, under instru. panel Glove compartment lamp ----- Glove compartment
	Locations and devices controlled	Radio volume dial ----- Radio Headlamps position flasher ----- At headlamp motor Headlamp motors ----- Instru. panel W/S wipers ----- Instru. panel Heater blower ----- Center console Radio * ----- Center console Power windows * ----- Center console Transmission safety switch * -----
Windshield wiper	Make	Delco
	Type	Electric, 2-speed
	Vacuum booster provision	None
	Washer provision	Co-ordinator and vacuum reserve tank
Horn	Type	Vibrator
	Number used	2
	Amp draw (each)	8.0-11.0 @ 12.5V

* - Optional equipment

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MODEL Corvette All models unless otherwise indicated

ELECTRICAL—LAMP BULBS

Give quantity used and trade number, e.g., Headlamp 2-5400 S, dual headlight 2-4001, 2-4002.
Indicate accessories which are not standard equipment by an asterisk following the numbers.

Headlamps & arrangement		Dual, 2-4002 (outer), 2-4001 (inner), horizontal
Headlamp beam indicator		1-53
Parking		2-1034
Tail		4-1034
Stop		4-1034
Direction signal	Front	2-1034
	Rear	4-1034
	Indicator	2-1816
License plate		1-67
Instrument		3-1816
Ignition lock		1-53
Back up		None
Dome		1-90, model 837 only
Clock		2-1816
Radio		1-1816*
Glove compartment		1-57
Courtesy		
Instrument panel		2-90
Rear compartment		1-90
Cig. lighter		1-53
Fuel and batt. gages		1-1816 (shared)
Headlamps position flasher		1-257
Parking brake flasher		1-257
Speedometer		1-1816
Tachometer		1-1816
Temperature and oil gages		1-1816 (shared)

AMA Specifications - Passenger Car

MAKE OF CAR Chevrolet MODEL YEAR 1963 DATE ISSUED 10/1/62 REVISED (*)

MODEL Corvette

ELECTRICAL-FUSE & CIRCUIT BREAKER DATA

Use trade number of fuse, e.g., SFE-10. Indicate circuit breaker by ampere capacity suffixed by letters "C.B.", e.g., 30 C.B. Where fuse or circuit breaker protects multiple circuits indicate first use by a letter and repeat the same letter for all units protected by the same fuse or circuit breaker, e.g., Parking lamp SFE-10 (a), Direction indicator same as (a).

	15 C. B. (a)	Headlamp position
Headlamp	(a)	Flasher - (g)
Headlamp beam indicator	(a)	Power windows - 40 C. B.
Parking lamp	AGC-10 (c)	Windshield wiper- thermal
Tail lamp	AGC-20 (d)	overload
Stop lamp	Interrupter	
Direction indicator	(c)	
License plate lamp	AGC-4 (b)	
*Instrument lamp	(b)	
Ignition lamp	Not available	
Back up lamp	(d)	
Dome lamp (Model 887 only)	(d)	
Clock	(b)	
Clock lamp	AGC-7.5	
Radio and radio dial lamp	(d)	
Glove compartment lamp	* Cigarette lighter, fuel and battery gages, general lighting, speedo., tach., temperature and oil gages	
Parking brake flasher	AGC-10 (e)	
Fuel gage	(e)	
Courtesy-instrument panel	(d)	
Courtesy-rear compartment	(e)	
Temp. gage	Interrupter	
Direction lamps	AGC-1 (f)	
Deluxe heater	C. B. (g)	
Headlamp position motors		

ELECTRICAL-LOCATION OF OUTSIDE LAMPS

		Lowest	21.76	
			Highest	21.76
Height above ground to center of bulb	Stop		21.76	
	Backup		---	
	License, rear		21.30	
	Directional	Front		15.05
		Rear		21.76
	Headlamp	Inside		24.36
		Outside*		24.36
Distance from C/L of car to center of bulb	Tail	Inside	19.00	
		Outside	24.00	
	Stop		19.00 and 24.00	
	Backup		---	
	License, rear		.32	
	Directionc	Front		28.32
		Rear		19.00 and 24.00
Headlamp	Inside		15.36	
	Outside*		21.66	

* If single headlamps are used enter here.

AMA Specifications – Passenger Car

MAKE OF CAR Chevrolet **MODEL YEAR** 1963 **DATE ISSUED** 10-1-62 **REVISED** (a)²

MODEL Corvette All models except as noted (a)

DRIVE UNITS—CLUTCH (Manual Transmission)

Make & type	Chevrolet, single disk, dry plate, centrifugally assisted	
Type pressure plate springs	Diaphragm	
Effective plate pressure (lb.)	2300-2600	
No. of clutch driven discs	one with two facings	
Clutch facing	Material	premium woven asbestos composition
	Outside & inside dia.	10.0 x 6.5
	Total eff. area (sq.in.)	90.7 (gross)
	Thickness	.135 ea.
	Engagement cushioning method	flat springs
Release bearing	Type & method of lubrication	ball bearing, sealed
Torsional damping	Methods: springs, friction material	coil springs

DRIVE UNITS—TRANSMISSIONS

Manual (std. or opt.)	3-speed std.; 4-speed opt.
Manual with overdrive (std. or opt.)	not available
Automatic (std. or opt.)	optional with 250 and 300 HP engines

DRIVE UNITS—MANUAL TRANSMISSION

Number of forward speeds	3-speed - 3	For 250 and 300 HP engines (a)	
Transmission ratios	In first	2.54:1	
	In second	1.89:1	
	In third	1.51:1	
	In fourth	1.00:1	
	In reverse	2.61:1	
Synchronous meshing, specify gears	2nd and 3rd	all forward gears	
Shift lever location	floor		
Lubricant	Capacity (pt.)	2.0 2.5	
	Type recommended	Military MIL-L-2105-B	
	SAE viscosity number	Summer	---
		Winter	---
	Extreme cold	---	

(a) For 340 and 360 HP engines, 2.20:1, 1.64:1, 1.31:1, 1.00:1 and 2.26:1.

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MODEL Corvette

DRIVE UNITS—MANUAL TRANSMISSION WITH OVERDRIVE - Not Available

For transmission data see manual transmission section

Overdrive	Type (planetary or other)		
	Manual lockout (yes, no)		
	Downshift accelerator control (yes, no)		
	Minimum cut-in speed		
	Gear ratio		
Lubricant	Capacity (pt.) (Overdrive only)		
	Separate filler (yes, no)		
	Type recommended		
	SAE viscosity number	Summer	
	Winter		
	Ext. cold		

DRIVE UNITS—AUTOMATIC TRANSMISSION

Trade name	Powerglide	
Type describe	torque converter with planetary gears	
Method of Selection (Lever, Push Button or other)	lever	
Selector Pattern	$\begin{matrix} P \\ R \\ N \\ D \\ L \end{matrix}$	
List gear ratios Selector Pattern and indicate which are used in each selector position	drive $\begin{matrix} P \\ R \\ N \\ D \\ L \end{matrix}$ 1.76:1 and 1:1 low and reverse 1.76:1	
Max. upshift speeds—drive range	67 mph	
Max. kickdown speeds—drive range	64 mph	
Torque convertor	Number of elements	3
	Max. ratio at stall	2.10:1
	Type of cooling (air, water)	none
Lubricant	Capacity—refill (pt.)	3
	Type recommended	A suffix A
Special transmission features	No cooling	

DRIVE UNITS—PROPELLER SHAFT

Number used	1	
Type (exposed, torque tube)	tubular, exposed	
Outer diameter x length* x wall thickness	Manual transmission 3 & 4 speed	2 x 26.5 x .095
	Overdrive transmission	not available
	Automatic transmission	2 x 26.5 x .095

*Center to center of universal joints, or to centerline of rear attachment.

(Continued)

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MAKE OF CAR Chevrolet MODEL YEAR 1963 DATE ISSUED 10/1/62 REVISED (*)

MODEL Corvette All Engines except as noted (a)

DRIVE UNITS—PROPELLER SHAFT (cont.)

Intermediate bearing	Type (plain, anti-friction)	none
	Lubrication (fitting, prepack)	
Universal joints	Make	Chevrolet
	Number used	2
	Type (ball and trunnion, cross, other)	yoke and yoke trunnion
	Bearing	Type (plain, anti-friction)
Lubric. (fitting, prepack)		prepack
Drive taken through (torque tube or arms, springs)		Torque control arms
Torque taken through (torque tube or arms, springs)		Torque control arms

DRIVE UNITS—REAR AXLE

Description (see instructions)	conventional-semi-floating, overhung pinion gear		
Limited Slip differential, type	conventional with disk clutches		
Drive Pinion Offset	1.5		
No. of differential pinions	conventional-2; limited slip-4		
Gear ratios (Std. equip.)	Manual transmission	3-speed-3.36:1; 4-speed-3.36:1 for 250 and 300 HP engines (a)	
	Overdrive transmission	not available	
	Automatic transmission	3.36:1	
Ring gear O.D. (std. ratio)	8.375		
Pinion adjustment (shim, other)	shim		
Pinion bearing adj. (shim, other)	none		
Wheel bearing type	taper roller		
Lubricant	Capacity (qt.)	3.7	
	Type recommended	MIL-L-2105-B	
	SAE viscosity number	Summer	-
		Winter	-
Extreme cold		-	

REAR AXLE RATIO TOOTH COMBINATIONS

(See page 3 for axle ratio usage)

Axle ratio	conventional	3.08:1 (optional)	3.36:1 (standard)	3.70:1 (standard)
No. of teeth	Pinion	12	11	10
	Ring gear	37	37	37

(a) 3.70:1 with 340 and 360 HP engines.

AMA Specifications - Passenger Car

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MODEL Corvette

DRIVE UNITS—WHEELS

See Supplement to Page 19 for Special Performance Wheels

Type & material		short spoke spider, steel (a)
Rim (size and flange type)	Std.	15 x 5.5K
	Opt.	15 x 6L
Attachment (b)	Type (bolt or stud)	stud
	Circle diameter	4.75
	Number and size	5 hex nuts, 7/16-20 UNF-2B

DRIVE UNITS—TIRES

Standard (List option below)	Size & ply	6.70 x 15-4 Ply
	Type - Nylon, etc.	Blackwall rayon tubeless
Rev./mile at 50 mph.		760
Inflation press. (cold)	Front	24 psi
	Rear	24 psi
Optional tires - size and ply		6.70 x 15 - 4 Ply Highway nylon tubeless (b/wall) 6.70 x 15 - 4 Ply Highway rayon tubeless (w/wall)

BRAKES—SERVICE

See Supplementary Information to page 18 for metallic brake
See Supplement to Page 19 for Special Performance Brakes

Type (duo-servo, disc, balanced, etc.)		duo-servo, 4 wheel hydraulic
Self adjusting (std., opt., N.A.)		std.
Hydraulic system type (single, dual, etc.)		single
Power brake make & type (remote, integral, etc.)		Bendix, Delco-Moraine, vacuum power unit integral with an assisting master cylinder; integral.
Effective area (sq. in.)*		185.2
Gross lining area (sq. in.)**		200.4
Swept drum area (sq. in.)***		328.0
Percent brake effectiveness—front		58.5
Drum	Diameter	11.0
		11.0
Type and material		composite, web (steel) cast into rim (cast iron)
Wheel cylinder bore	Front	1.1875
	Rear	1.00
Master cylinder bore		8.75
Available pedal travel		5.00 W/O Power; 4.12 with Power
Line pressure at 100 lb. pedal load		
Shoe clearance adjustment		

(Continued)

- * Excludes rivet holes, grooves, chamfers, etc.
- ** Includes rivet holes, grooves, chamfers, etc.
- *** Total swept areas for four brakes

Widest lining contact width for each brake x its drum circumference.

- (a) Ribbed integral casting, aluminum, available optionally
- (b) For opt. wheel, adapter and spinner cap (2-5/8 - 8 UN 2B)

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SUPPLEMENTARY INFORMATION

MODEL Corvette

BRAKES - SERVICE

METALLIC - Same as BRAKES-SERVICE except as follows:

Effective area (sq. in.)	134.9
Gross lining area (sq. in.)	134.9
Shoe clearance adjustment	Self-adjusting
Brake lining	
Bonded or rivet	Welded
Front shoe	
Material	Sintered iron segments
Size (LxWxT)	
Front wheel	1.64 x 1.37 x .175
Rear wheel	2.00 x 1.00 x .175
Segments per shoe	6
Rear shoe	
Material	Sintered iron segments
Size (LxWxT)	
Front wheel	1.64 x 1.37 x .295
Rear wheel	2.00 x 1.00 x .295
Segments per shoe	
Front wheel	12
Rear wheel	10

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MODEL Corvette

BRAKES—SERVICE (cont.)

Brake lining	Bonded or riveted		bonded		
	Front Shoe	Material		full molded asbestos composition	
		Size (length x width x thickness)	Front wheel	9.34 x 2.75 x .168	
			Rear wheel	9.34 x 2.00 x .168	
		Segments per shoe		1	
	Rear Shoe	Material		full molded asbestos composition	
		Size (length x width x thickness)	Front wheel	11.75 x 2.75 x .168	
			Rear wheel	11.75 x 2.00 x .168	
Segments per shoe		1			

BRAKES—PARKING

Type of control	Hand operated pull rods and cables
Location of control	T handle at right of steering column
Operates on	Rear service brakes
If separate from service brakes	Type (Internal or external)
	Drum diameter
	Lining size (length x width x thickness)

FRAME or UNITIZED CONSTRUCTION

Type and description All welded, full-length, ladder constructed frame with 5 cross-members. Front section flat; rear section contoured over rear axle. Side rails and intermediate crossmembers box construction. Rear crossmember "C" shaped; front crossmember concaved for engine clearance.

SUSPENSION—GENERAL (See Supplemental page 19 for details on Air Suspension)* (a)

Provision for car leveling	Front stabilizer bar	
Provision for brake dip control	mounting angle of front upper control arms	
Provision for acc. squat control	none	
Special provisions for car jacking	Front-5 inches forward of front edge of door opening, under frame; Rear-3 inches forward of wheel opening, under frame.	
Shock absorber front & rear	Type	Direct, double acting, hydraulic, with freon envelope
	Make	Delco
	Piston dia.	1.0
Other special features	full independent rear suspension	

SUSPENSION—FRONT

Type and description	Independent, each wheel spherically-jointed to frame-hinged upper and lower control arms. Frame-secured coil spring and shock absorber (inside coil spring) attached to lower control arm
----------------------	---

* Air Suspension: Normal operating pressures
 Air spring type spring rates
 Compressor data leveling data
 type
 make
 drive ratio

(Continued)

(a) See page 19A for Special Performance equipment.

AMA Specifications – Passenger Car

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SUPPLEMENTARY INFORMATION

MODEL 837

SPECIAL PERFORMANCE EQUIPMENT

Items shown same as items listed in report proper except as follows:

ENGINE FUEL SYSTEM

Fuel Tank
Capacity, gallons ----- 36.5

DRIVE UNITS - WHEELS

Type and Material ----- Ribbed integral casting,
Aluminum
Rim (size and flange type) ----- 15 x 6L
Attachment ----- Adapter and
Spinner Cap (2-5/8-8 UN 2B)

SPECIAL PERFORMANCE BRAKES

Type ----- Provisions for cooling, divided output master cylinder
(to front and rear brakes) assisted by vacuum power unit
Hydraulic system type ----- Dual
Effective area (sq. in.) ----- 144.9
Gross lining area (sq. in.) ----- 144.9
Swept drum area (sq. in.) ----- 334.3
Drum
Diameter
Front ----- 11.2
Rear ----- 11.2
Type and material ----- Composite, steel web and cast iron alloy rim, finned
Master cylinder bore ----- 1.00 each
Line pressure at 100 lb. pedal load -----
Shoe clearance adjustment ----- Self-adjusting
Brake linings
Bonded or riveted ----- Welded
Front Shoe
Material ----- Sintered iron segments
Size (LxWxT)
Front wheel ----- 1.64 x 1.37 x .388
Rear wheel ----- 2.00 x 1.00 x .388
Segments per shoe ----- 6

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SUPPLEMENTARY INFORMATION

MODEL 837

SPECIAL PERFORMANCE BRAKES - (cont'd)

Rear Shoe
 Material ----- Sintered iron segments
 Size (LxWxT)
 Front wheel ----- 1.64 x 1.37 x .388
 Rear wheel ----- 2.00 x 1.00 x .388
 Segments per shoe
 Front wheel ----- 12
 Rear wheel ----- 10

SUSPENSION-GENERAL

Shock absorber, front and rear
 Piston dia.
 Front ----- 1.00
 Rear ----- 1.375

SUSPENSION-FRONT

Spring
 Size (Design height and ID; Bar length and dia.) ----- 8.56;
 3.80; 100.16, .680
 Spring rate ----- 550
 Rate at wheel -----
 Design load ----- 1255 @ 8.56

STABILIZER

Material and bar dia. ----- Steel, .94

AMA Specifications – Passenger Cars

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MODEL Corvette

SUSPENSION FRONT (cont.)

Spring	Type		Coil
	Material		Steel alloy
	Size (coil design height & I.D.; bar length x dia.)		8.56 x 3.80 96.982 x .552
	Spring rate (lb. per in.)		260
	Rate at wheel (lb. per in.)		80.5
	Design load (lb. @ design height)		1340 @ 8.56
Stabilizer	Type (link, linkless, frameless)		Link
	Material & bar diameter		Steel, .6875

STEERING

Provision for road or street, or fast ratio with mechanical; three-inch axial steering column adjustment

Mechanical (std., opt., NA)		Standard	
Power (std., opt., NA)		Optional with 250 and 300 HP engines	
Wheel diameter		16.0 in.	
Turning diameter	Outside front	Wall to wall (l. & r.)	Left, 41.3 ft.; Right, 41.9 ft.
		Curb to curb (l. & r.)	Left, 39.4 ft.; Right, 40.4 ft.
	Inside rear	Wall to wall (l. & r.)	Left, 25.1 ft.; Right, 26.2 ft.
		Curb to curb (l. & r.)	Left, 25.1 ft.; Right, 26.2 ft.
Outside wheel angle with inside wheel at 20°			

Mechanical	Gear	Type	Semi-reversible, recirculating ball		
		Make	Saginaw		
		Ratios	Gear	16:1	
			Overall	20.2:1 road or street; 17:6:1 fast	
No. wheel turns		3.4 lock to lock, road or street; 2.92 fast			
Power	Type (coaxial, linkage, etc.)		Hydraulic, power cylinder in linkage		
	Make		Saginaw		
	Trade name		None		
	Gear	Type	Semi-reversible, recirculating ball		
		Ratios	Gear	16:1	
			Overall	17:6:1	
	Pump driven by		Belt from crankshaft		
	Number wheel turns		2.92 lock to lock		
Linkage	Type		Relay, damped		
	Location (front or rear of wheels, other)		Rear		
	Drag link (trans. or longit.)		None		
	Tie rods (one or two)		Two		

(Continued)

AMA Specifications – Passenger Car

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MODEL Corvette

STEERING (cont)

Steering Axis	Inclination of camber (deg.)		7° 11'
	Bearings (type)	Upper	ball stud with non-metallic liner
		Lower	ball stud with non-metallic liner
	Thrust		none required
Wheel alignment (range and preferred)	Caster (deg.)		+2° ± 0° 30' (Design)
	Camber (deg.)		+0° 30' ± 0° 30' (Design)
	Toe-in (outside tread-inches)		± 1/16, per wheel (Design)
Steering spindle & joint type			forged steel with integral brake cyl. mtg., detach. steer. arm
Wheel spindle	Diameter	Inner bearing	1.2493 - 1.2498
		Outer bearing	.7492 - .7497
	Thread size		3/4-20 NEF-3 (modified)
	Bearing type		taper roller

SUSPENSION—REAR

Type and description			(a)
Drive and torq. taken through (see page 17)			torque control arms
Spring	Type		multi-leaf
	Material		chrome carbon steel
	Size (length x width, in.)		46.36 X 2.25
	Spring rate (lb. per in.)		162
	Rate at wheel (lb. per in.)		
	Design load (lb. at design height)		1360 at - .352 camber
	Mounting insulation type		solid at differential: free at shackles
	If leaf	No. of leaves		9
Inserts		Type and size	7 liners; 2.25(wide) X, 44.58, 39.08, 33.58, 29.08, 24.58, 20.0
		Material	polyethylene with graphite
Shackle (comp. or tens.)		restricts movement to vertical only	
Stabilizer	Type (link, linkless, frameless)		none
	Material		
Track bar type			none

(a) Full independent with fixed differential, transverse multi-leaf spring, lateral struts and universally-jointed axle drive shafts.
 Camber (Design), (-) 1° 30' ± 30'
 Toe-in (Per wheel, Design), ± 1/16

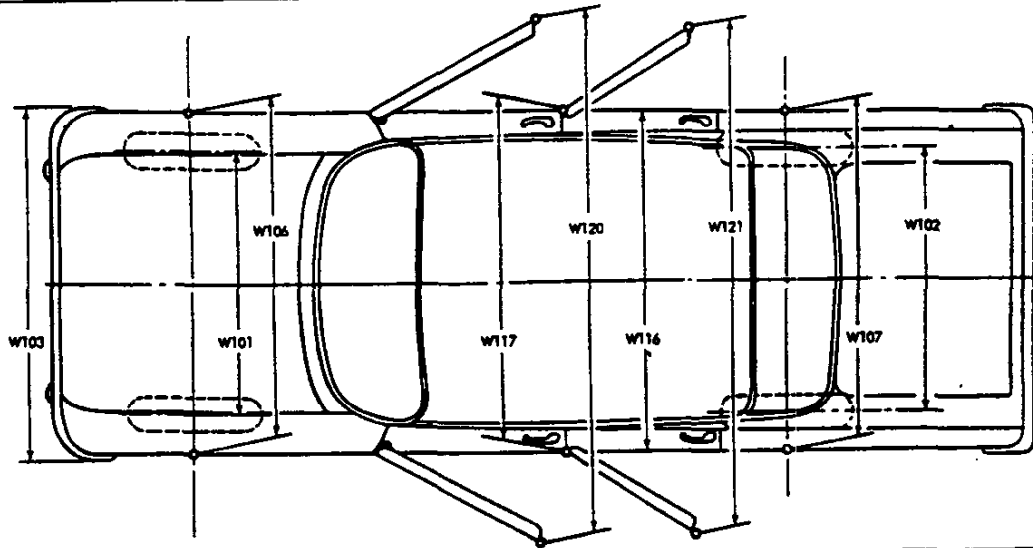
MAKE OF CAR Chevrolet MODEL YEAR 1963 DATE ISSUED 10/1/62 REVISED (*)

CAR AND BODY DIMENSIONS—GENERAL

NOTE: Included in the dimension definitions listed on pages 34–36 are those which have been adopted by SAE. These are indicated by a number following the type of dimension, e.g., L3. Additional dimensions have been added by the AMA Specifications Review Committee. These are shown by an additional letter, e.g., H67a. The symbol "a" has been added as a suffix to denote a dimension adopted by the AMA and submitted to the SAE for approval. The dimensions are developed from the following basic points:

1. Body dimensions are for all body styles.
2. All interior dimensions are taken with manikin 15.0 inches outboard of car centerline unless otherwise stated.
3. All interior dimensions are measured with the front seat in the lowest and rearmost position.
4. Unless otherwise specified, all exterior height dimensions are taken with a full design load which consists of 5 passengers, 300 lbs. front, 450 lbs. rear; includes spare wheel, tire and tools, and full complement of gas, oil, water and tires to recommended pressure, etc.
5. The SAE manikin with 90th percentile leg length will be used for recording purposes.
6. The H Point is the pivot center of the manikin's torso and thigh.
7. The Torso Line is a line parallel to the small of manikin's back and extending through the H Point.

EXTERIOR WIDTH DIMENSIONS

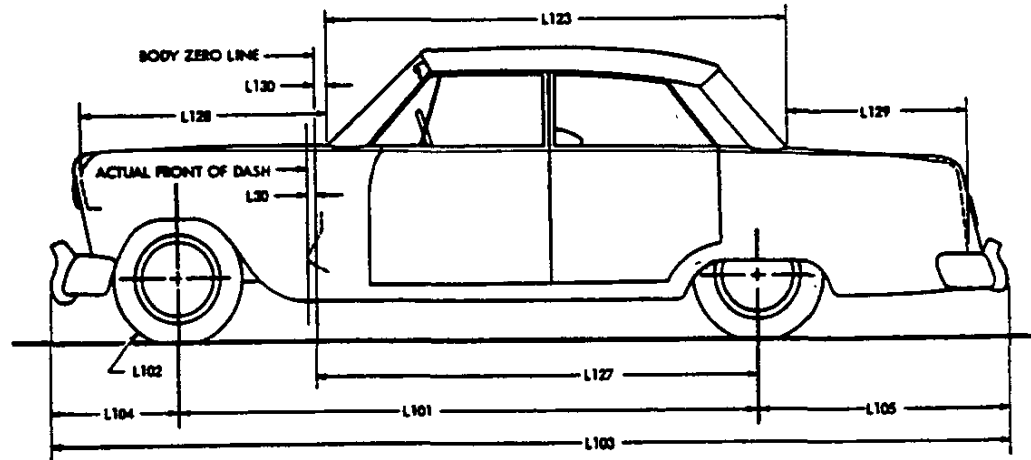


MODEL	Corvette	Ref. No.	0867	0837
Tread - front		W101		56.3
Tread - rear		W102		57.0
Maximum overall front bumper width		W103		69.2
Maximum overall body width		W116		see W106
Maximum body width at 1/2 pillar		W117		---
Front fender overall width		W106		69.6 (maximum width of body)
Rear fender overall width		W107		67.3
Maximum overall car width - front doors open		W120a		139.3
Maximum overall car width - rear doors open		W121a		---

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EXTERIOR LENGTH DIMENSIONS

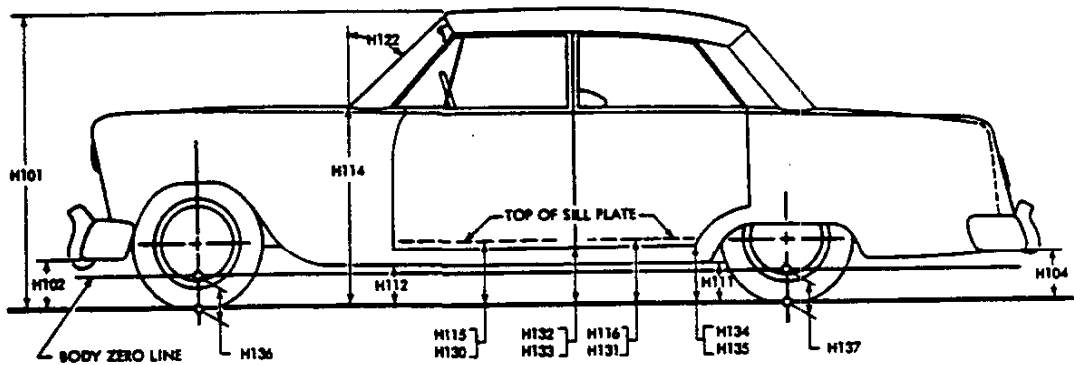


MODEL	Corvette	Ref. No.	0867	0837
Body zero line to actual front of dash		L30	2.57 (zero line fore of dash)	
Wheelbase		L101	98.0	
Overhang - front		L104	32.0	
Overhang - rear		L105	45.3	
Overall length		L103	175.3	
Hood length at car centerline		L128a	52.6	
Body upper structure length at car centerline		L123	66.8 convertible 69.2 hardtop	77.9
Deck length at car centerline		L129a	39.7 convertible 37.3 hardtop	28.6
Body zero line to centerline of rear wheels		L127	72.0	
Body zero line to windshield cowl point		L130a	8.98	
Tire size		L102	6.70 x 15	

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EXTERIOR HEIGHT DIMENSIONS

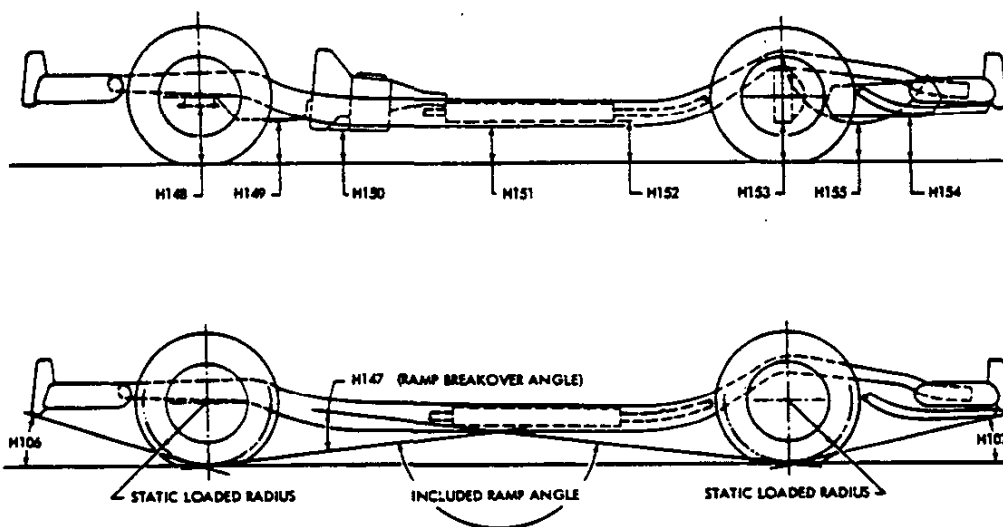


MODEL	Corvette	Ref. No.	0867	0837
Overall height		H101	Soft top 49.8 Hard top 49.3	49.8
Hood at rear to ground		H114		34.9
Rocker panel to ground - front		H112a		7.95
Rocker panel to ground - rear		H111		7.95
Step height - front (design load)		H115		14.0
Step height - rear (design load)		H116		---
Step height - front (curb load)		H130		16.2
Step height - rear (curb load)		H131		---
Bottom of door to ground, open - front		H132		13.5
Bottom of door to ground, closed - front		H133		12.5
Bottom of door to ground, open - rear		H134		---
Bottom of door to ground, closed - rear		H135		---
Front bumper to ground		H102		18.0 (excluding guards)
Rear bumper to ground		H104		16.6 (excluding guards)
Windshield slope angle		H122		56° 30'
Body zero to ground - front		H136a		7.7
Body zero to ground - rear		H137a		7.7

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GROUND CLEARANCE DIMENSIONS

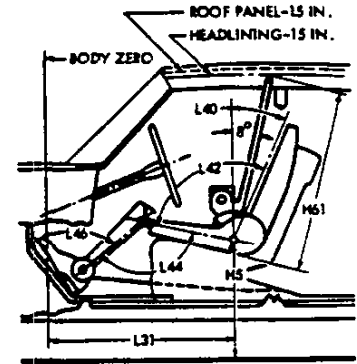
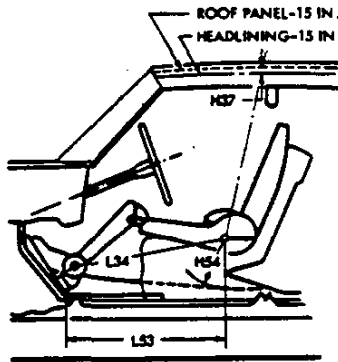
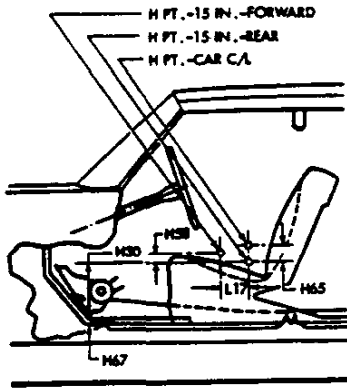


MODEL	Ref. No.	0867	0837
Angle of approach	H106		26° 39'
Angle of departure	H107		17° 21'
Ramp breakover angle	H147		11° 45'
Front suspension to ground	H148		8.0
Oil pan to ground	H149		6.0
Flywheel housing to ground	H150		5.9
Frame structure to ground	H151		5.5
Exhaust system to ground	H152		5.0
Rear axle differential to ground	H153		7.8
Fuel tank to ground	H154		
Spare tire well to ground	H155		6.1
Minimum running ground clearance	H156		5.0

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FRONT COMPARTMENT DIMENSIONS

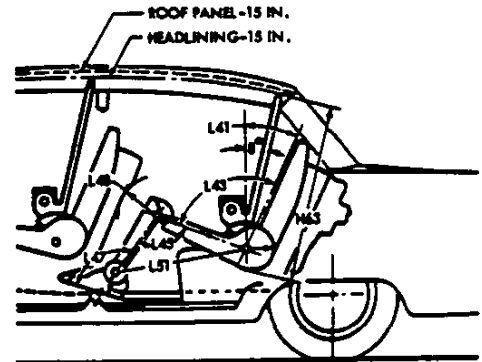
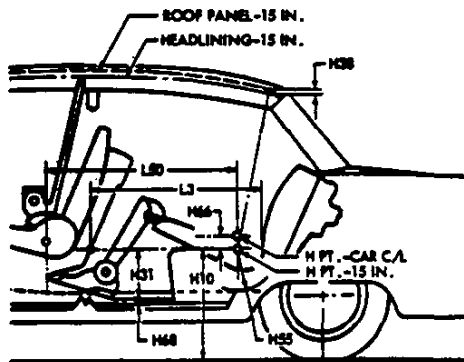


MODEL	Corvette	Ref. No.	0867	0837
H Point to body zero line		L31a		44.2
H Point to ground		H5a		15.8
Effective head room		H61a	Soft top 38.1 Hard top 36.9	37.0
Headlining to roof height		H37		
Maximum effective leg room - accelerator		L34a		41.6
H Point to heel point		H30a		8.3
Depressed floor covering thickness		H67a		
Back angle		L40a		25°
Hip angle		L42a		95°
Knee angle		L44a		126°
Foot angle		L46a		71°
H Point differential, side to center		H65a		--
H Point to tunnel		H54a		2.47
H Point to accelerator floor point		L53a		34.9
H Point travel		L17a		4.0
H Point rise		H58a		.32

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REAR COMPARTMENT DIMENSIONS

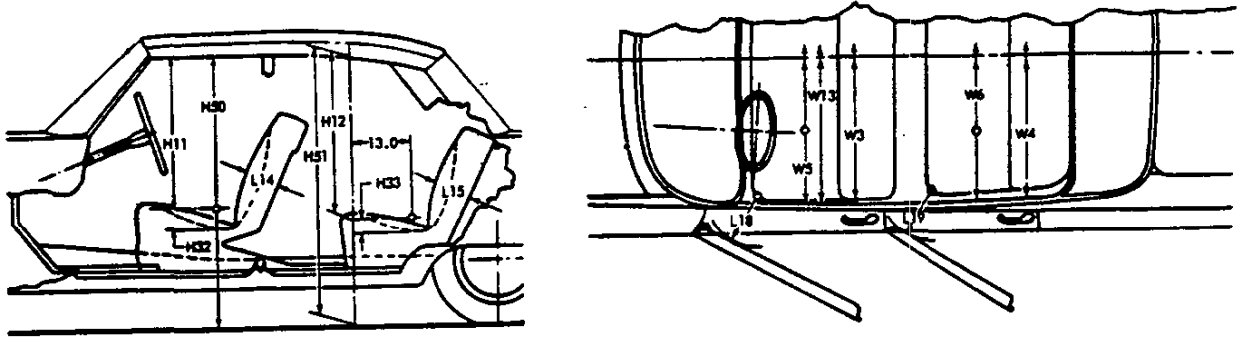


MODEL	Corvette	Ref. No.	
H Point couple distance	L50a		Does not apply
H Point to ground	H10a		
Effective head room	H63a		
Headlining to roof height	H38		
Minimum effective leg room	L51a		
H Point to heel point	H31a		
Depressed floor covering thickness	H68a		
Minimum knee room	L48a		
Rear compartment room	L3		
Back angle	L41a		
Hip angle	L43a		
Knee angle	L45a		
Foot angle	L47a		
H Point differential, side to center	H66a		
H Point to tunnel	H55a		

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SEAT AND ENTRANCE DIMENSIONS

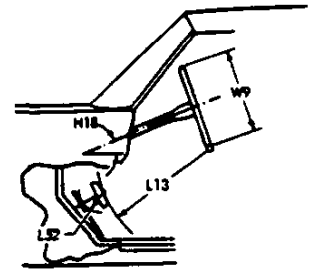
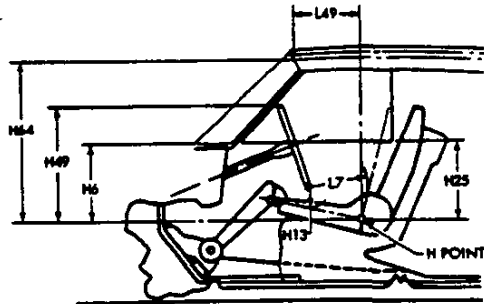


MODEL	Corvette	Ref. No.	0867	0837
Shoulder room - front		W3a	48.2	
Hip room - front		W5a	52.4	
Seat width - front		W16a	20.8 (each bucket seat)	
Upper body opening to ground - front		H50a	45.6	46.8
Entrance height - front		H11a	29.8	32.0
Entrance foot clearance - front		L18		
Seat cushion deflection - front		H32a	2.98	
Seat back thickness - front		L14	4.25	
Shoulder room - rear		W4a	Does not apply	
Hip room - rear		W6a		
Upper body opening to ground - rear		H51a		
Entrance height - rear		H12a		
Entrance foot clearance - rear		L19		
Seat cushion deflection - rear		H33a		
Seat back thickness - rear		L15		

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VISION AND CONTROL DIMENSIONS



MODEL Corvette	Ref. No.	0867	0837
H Point to windshield bottom DLO	H6a		19.8
H Point to windshield upper DLO	H64a		30.5
H Point to windshield upper DLO	L49a		16.9
Belt height - front	H25a		17.6
Steering wheel center to centerline of car	W7		12.9
Steering wheel maximum outside diameter	W9		16.0
Steering column angle - horizontal	H18		15° 23'
H Point to top of steering wheel	H49a		27.5
Steering wheel torso clearance	L7a		12.2
Steering wheel high clearance	H13a		2.82
Brake pedal knee clearance	L13		24.5
Brake pedal to accelerator	L52a		1.48
Tumble-home	W122a		

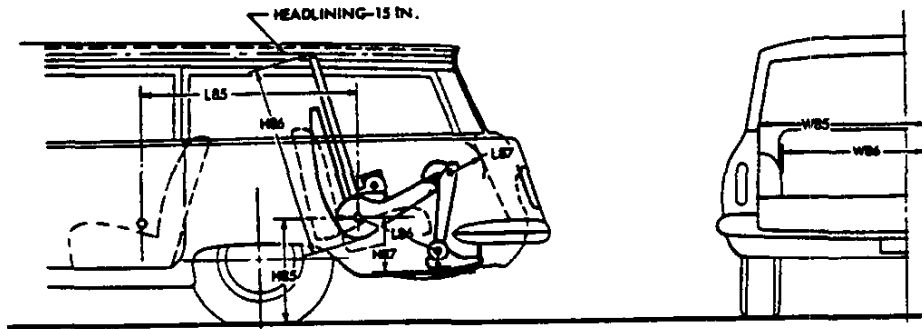
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LUGGAGE COMPARTMENT

MODEL <u>Corvette</u>	Ref. No.	867	837
Usable luggage capacity (See instructions)		8.4FT ³	10.5FT ³
Liftover height*	H301a	Under Fuel Tank	
Position of spare tire storage		Under Fuel Tank	
Method of holding lid open			

THIRD SEAT DIMENSIONS



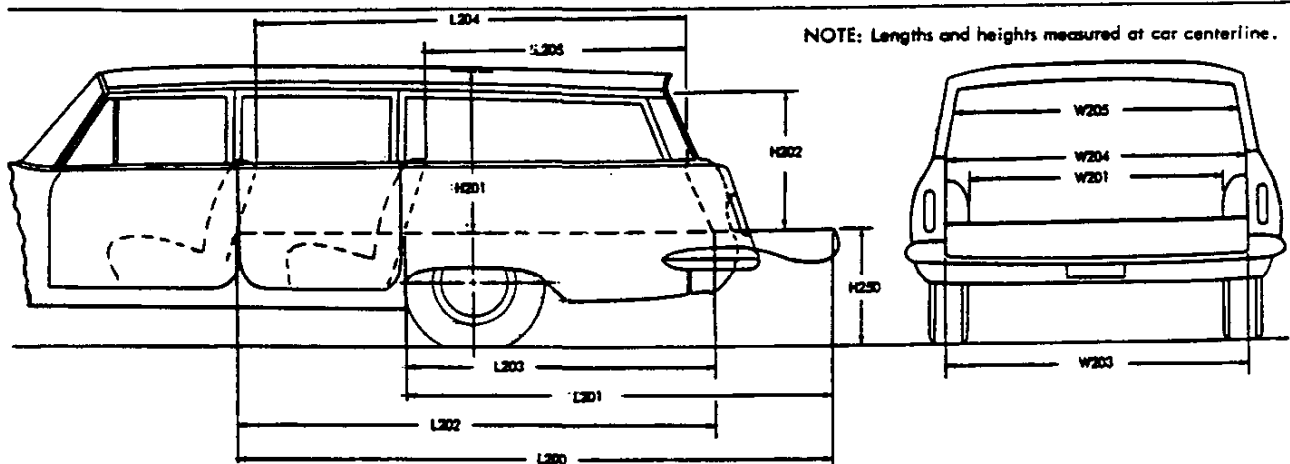
MODEL <u>Corvette</u>	Ref. No.		
Seat facing direction		Does not apply	
Shoulder room	W85a		
Hip room	W86a		
H Point couple distance	L85a		
H Point to ground	H85a		
Effective head room	H86a		
Effective leg room	L86a		
H Point to heel point	H87a		
Knee room	L87a		
Back angle	L88a		
Hip angle	L89a		
Knee angle	L90a		
Foot angle	L91a		↓

* Vertical dimension from luggage compartment lower opening to ground.

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STATION WAGON—CARGO SPACE DIMENSIONS



MODEL	Corvette	Ref. No.	
Floor length from back of front seat at floor level to end of lowered tail gate or floor	L200		Does not apply
Floor length from back of second seat at floor level to end of lowered tail gate or floor	L201		
Floor length from back of front seat at floor level to inside of closed tail gate	L202		
Floor length from back of second seat at floor level to inside of closed tail gate	L203		
Minimum horizontal distance from top rear of front seat back to inside of tail gate at belt	L204		
Minimum horizontal distance from top rear of second seat back to inside of tail gate at belt	L205		
Maximum width of cargo space at floor - specify location	W200a		
Minimum distance between wheel houses at floor level	W201		
Rear end opening width at floor	W203		
Rear end opening width at belt	W204		
Maximum width of rear opening above belt	W205		
Maximum height - floor covering to headlining at centerline of rear axle	H201		
Maximum height of rear opening - tail and lift gates open	H202		
Platform height from ground to top of tail gate floor covering at rear most edge of tail gate - curb weight	H250		
Rear end closure (e.g., one piece door, hinged left - sliding glass, drop tail gate)			↓
Cargo volume index (cu. ft.) W4 x L204 x H201			
1728			

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MODEL Corvette 867 837

BODY—MISCELLANEOUS INFORMATION

Drs. hinged (front, rear)	Front doors	front
	Rear doors	---
Type of finish (lacquer, enamel, other)		Acrylic Lacquer
Hood hinge location (front, rear)		front
Hood counterbalanced (yes, no)		no
Hood release control (internal, external)		internal
Vehicle (Serial) No. Location	1) Right hand side of hinge pillar cross brace, under glove box 2) With engine no.	
Engine No. Location	Front right side of cylinder block	
Theft protection - type	outside door key locks	
Vent window control method (crank, friction pivot)	Front	crank
	Rear	---
Seat cushion type	Front	Bucket, polyurethane padding
	Rear	---
Seat back type	Front	Bucket, polyurethane padding
	Rear	---
Windshield type (single curved, compound curved, other)		Single, curved
Rear window type (flat curved, one piece, three piece)		867 - convert: flat, 1 867 - hardtop: curved 1 837 - sport coupe: compound curved, 2
Side glass type (curved, flat)		compound curved
Side glass exposed surface area	550.1 Sq. In.	620.1 Sq. In.
Windshield glass exposed surface area		789.7 Sq. In.
Backlight glass exposed surface area	Soft top 440.5 Sq. In.	724.1 Sq. In.
Total glass exposed surface area	Soft top 1780.3 Sq. In.	2133.9 Sq. In.

AMA Specifications – Passenger Car

MAKE OF CAR Chevrolet MODEL YEAR 1963 DATE ISSUED 10/1/62 REVISED (e)

MAJOR OPTIONAL ITEMS - WEIGHTS

	CURB WEIGHT - POUNDS			% PASS. WEIGHT DISTRIBUTION				SHIPPING * WEIGHT
	Front	Rear	Total	Pass. In Front		Pass. In Rear		
				Front	Rear	Front	Rear	
Model Corvette								
867 convertible	1610	1427	3037					2881
867 hardtop	1613	1430	3043					2887
837 sport coupe	1598	1417	3015					2859
Accessories & Equipment Differential Weights				Remarks				
Powerglide			+ 19.5					
4-speed			+ 1.9					
300 HP engine			+ 4.7					
340 HP engine			+ 12.8					
360 HP engine			+ 10.5					
Power Brakes			+ 12.7					
Power Steering			+ 27.2					
Optional Wheels			+ 10.8					
Positraction Axles			+ 8.9					
Spec. Perform. Equip.								
Auxiliary Top			+ 6.2					
Radio								
Less heater								

* These are weights that are reported to states for licensing purposes. Form Rev. 3-6

DIMENSION DEFINITIONS

- W3a** SHOULDER ROOM - FRONT. The minimum lateral dimension between the door garnish moldings or nearest interference. Measured at H Point station.
- W4a** SHOULDER ROOM - REAR. Measured in the same manner as W3a.
- W5a** HIP ROOM - FRONT. The lateral dimension through H Point to trimmed surfaces.
- W6a** HIP ROOM - REAR. Measured in the same manner as W5a.
- W7** STEERING WHEEL CENTER TO CENTERLINE OF CAR. Measured horizontally from steering wheel center to centerline of car. The point at steering wheel center is located in the surface plane of wheel.
- W9** STEERING WHEEL MAXIMUM OUTSIDE DIAMETER. Define if other than round.
- W16a** SEAT WIDTH - FRONT. The maximum trimmed width of front seat cushion.
- W85a** SHOULDER ROOM - THIRD SEAT. Measured in the same manner as W3a.
- W86a** HIP ROOM - THIRD SEAT. Measured in the same manner as W5a.
- W101** TREAD - FRONT. Measured at centerline of tires, with nominal camber, at ground.
- W102** TREAD - REAR. Measured at centerline of tires at ground.
- W103** MAXIMUM OVERALL CAR WIDTH. Include bumpers, moldings, or sheet metal protrusions.
- W106** FRONT FENDER OVERALL WIDTH. Measured at centerline of front wheels, excluding moldings.
- W107** REAR FENDER OVERALL WIDTH. Measured at centerline of rear wheels, excluding moldings.
- W116** MAXIMUM OVERALL BODY WIDTH. Measured across body, excluding hardware and applied moldings, but including fenders when integral with body.
- W117** MAXIMUM BODY WIDTH AT #2 PILLAR. Measured across body at #2 pillar, excluding hardware and applied moldings.
- W120a** MAXIMUM OVERALL CAR WIDTH, FRONT DOORS OPEN. Measured with front doors in maximum hold-open position.
- W121a** MAXIMUM OVERALL CAR WIDTH, REAR DOORS OPEN. Measured in same manner as W120a.
- W122a** TUMBLE-HOME. The angle from vertical to the front door glass outer surface or the chord of a curved door glass, measured at the front H Point station.
- L3** REAR COMPARTMENT ROOM. The horizontal dimension from the back of front seat to front of rear seat back at a height tangent to the top of rear seat cushion.
- L7a** STEERING WHEEL TORSO CLEARANCE. The minimum distance from the back edge of steering wheel, in straight-ahead position, to the Torso Line.
- L13** BRAKE PEDAL KNEE CLEARANCE. The minimum dimension from the lower edge of the steering wheel to the brake pedal face centerline.
- L14** SEAT BACK THICKNESS - FRONT. The maximum thickness of the seat back, excluding bolsters.
- L15** SEAT BACK THICKNESS - REAR. Measured in the same manner as L14.
- L17a** H POINT TRAVEL. The horizontal dimension between the H Point in the most forward and rearward seat positions.
- L18** ENTRANCE FOOT CLEARANCE - FRONT. The minimum horizontal dimension between seat and normal line of door or pillar at a height between the sill plate bead and 4.0 inches above the bead. Door should be in the maximum hold-open position.
- L19** ENTRANCE FOOT CLEARANCE - REAR. Measured in the same manner as L18 on four-door models. On two-door styles, the minimum dimension between rear corner of front seat, with front seat back tilted forward, and trimmed lock pillar, built-in quarter armrest panel, or rear seat cushion at a height between the sill plate bead and 4.0 inches above the bead.
- L30** BODY ZERO LINE TO ACTUAL FRONT OF DASH. If actual front of dash is to the rear of Body Zero Line, it is identified by a minus (-) sign.
- L31a** H POINT TO BODY ZERO LINE - FRONT. Horizontal dimension.
- L34a** MAXIMUM EFFECTIVE LEG ROOM - ACCELERATOR. Measured along a diagonal line from ankle pivot center to H Point plus a constant of 10.0 inches. Measured with the right foot on accelerator pedal.
- L40a** BACK ANGLE - FRONT. The angle between a vertical line through the H Point and the Torso Line.
- L41a** BACK ANGLE - REAR. Measured in the same manner as L40a.
- L42a** HIP ANGLE - FRONT. The angle between Torso Line and a line extending from knee pivot center to H Point.
- L43a** HIP ANGLE - REAR. Measured in the same manner as L42a.
- L44a** KNEE ANGLE - FRONT. The angle between a line from H Point to knee pivot center and a line from the knee pivot center to the ankle pivot center.
- L45a** KNEE ANGLE - REAR. Measured in the same manner as L44a.
- L46a** FOOT ANGLE - FRONT. The angle between a line extended from the knee pivot center through the ankle pivot center and a line tangent to the sole and heel of manikin bare foot.
- L47a** FOOT ANGLE - REAR. Measured in the same manner as L46a.
- L48a** MINIMUM KNEE ROOM - REAR. The minimum dimension from the knee pivot center to the back of front seat back.
- L49a** H POINT TO WINDSHIELD UPPER DLO. The horizontal dimension from H Point to the point of tangency of horizontal line of vision (described in dimension H64a) with body upper structure.

DIMENSION DEFINITIONS (cont.)

- L50a H POINT COUPLE DISTANCE.** The horizontal dimension from the front seat H Point to the rear seat H Point.
- L51a MINIMUM EFFECTIVE LEG ROOM - REAR.** Measured along a diagonal line from ankle pivot center to H Point plus a constant of 10.0 inches. Measured with the foot positioned to nearest interference between seat structure and toe, instep or lower leg.
- L52a BRAKE PEDAL TO ACCELERATOR.** The minimum dimension from center of brake pedal face to accelerator. Measured in the side view.
- L53a H POINT TO ACCELERATOR FLOOR POINT.** The horizontal dimension from intersection of accelerator and depressed floor covering to the H Point.
- L85a H POINT COUPLE DISTANCE - THIRD SEAT.** The horizontal dimension from the second seat H Point to the third seat H Point.
- L86a EFFECTIVE LEG ROOM - THIRD SEAT.** Measured in the same manner as L51a. With rear-facing third seat, foot is positioned in foot well or to nearest interference with rear end or rear closure.
- L87a KNEE ROOM - THIRD SEAT.** Measured in the same manner as L48a. With rear-facing third seat, dimension is measured to rear closure.
- L88a BACK ANGLE - THIRD SEAT.** Measured in the same manner as L40a.
- L89a HIP ANGLE - THIRD SEAT.** Measured in the same manner as L42a.
- L90a KNEE ANGLE - THIRD SEAT.** Measured in the same manner as L44a.
- L91a FOOT ANGLE - THIRD SEAT.** Measured in the same manner as L46a.
- L101 WHEELBASE.**
- L102 TIRE SIZE.**
- L103 OVERALL LENGTH.** Include bumper guards if standard equipment.
- L104 OVERHANG - FRONT.** Measured from C/L of front wheels to front of car, including bumper guards if standard equipment.
- L105 OVERHANG - REAR.** Measured from C/L of rear wheels to rear of car, including bumper guards if standard equipment.
- L123 BODY UPPER STRUCTURE LENGTH AT CAR CENTERLINE.** The horizontal dimension from the theoretical intersection of extended windshield glass plane and normal cowl surface to the theoretical intersection of extended back window glass plane and normal deck surface; or in the case of a Fastback roof or Station Wagon, to back glass lower reveal molding, or rubber when molding is not used.
- L127 BODY ZERO LINE TO CENTERLINE OF REAR WHEELS.** A horizontal dimension.
- L128a HOOD LENGTH AT CAR CENTERLINE.** The horizontal dimension from the foremost point on sheet metal hood surface, excluding series identification or ornamentation, to the theoretical intersection of extended windshield glass plane and normal cowl surface.
- L129a DECK LENGTH AT CAR CENTERLINE.** The horizontal dimension from the rearmost point of the body sheet metal (visible above bumper), excluding series identification or ornamentation, to the theoretical intersection of extended back window glass plane and normal deck surface.
- L130a BODY ZERO LINE TO WINDSHIELD COWL POINT.** The horizontal dimension from body zero line to the theoretical intersection of extended windshield glass plane and normal cowl surface.
- H5a H POINT TO GROUND - FRONT.** Vertical dimension.
- H6a H POINT TO WINDSHIELD BOTTOM DLO.** Vertical dimension.
- H10a H POINT TO GROUND - REAR.** Vertical dimension.
- H11a ENTRANCE HEIGHT - FRONT.** The vertical dimension from H Point to upper trimmed body opening.
- H12a ENTRANCE HEIGHT - REAR.** The vertical dimension from H Point to the upper trimmed body opening at a section 13.0 inches forward of the H Point.
- H13a STEERING WHEEL THIGH CLEARANCE.** The minimum dimension from the bottom of steering wheel, in straight-ahead position, to centerline of thigh.
- H18 STEERING COLUMN ANGLE - HORIZONTAL.** The angle the centerline of steering column makes with the horizontal.
- H25a BELT HEIGHT - FRONT.** The vertical dimension from H Point to bottom of side window DLO.
- H30a H POINT TO HEEL POINT - FRONT.** The vertical dimension from the H Point to the manikin accelerator heel point on the depressed floor covering.
- H31a H POINT TO HEEL POINT - REAR.** The vertical dimension from the H Point to the manikin heel point on the depressed floor covering.
- H32a SEAT CUSHION DEFLECTION - FRONT.** The vertical dimension from a point on the undepressed seat cushion to the depressed seat cushion. Measured at the H Point station.
- H33a SEAT CUSHION DEFLECTION - REAR.** Measured in the same manner as H32a.
- H37 HEADLINING TO ROOF HEIGHT - FRONT.** The dimension from the intersection of the headlining and the extended effective head room line to the roof panel. Measured perpendicularly to the roof panel.
- H38 HEADLINING TO ROOF HEIGHT - REAR.** Measured in the same manner as H37.
- H49a H POINT TO TOP OF STEERING WHEEL.** The vertical dimension from the H Point to top of steering wheel, in straight-ahead position.
- H50a UPPER BODY OPENING TO GROUND - FRONT.** The vertical dimension from a point on the trimmed body opening to the ground. Measured at the H Point station.

DIMENSION DEFINITIONS (cont.)

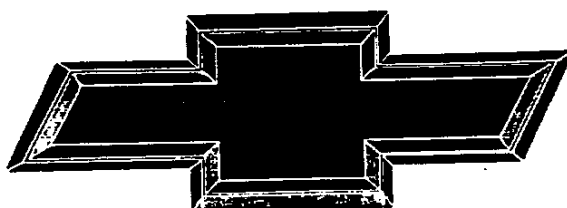
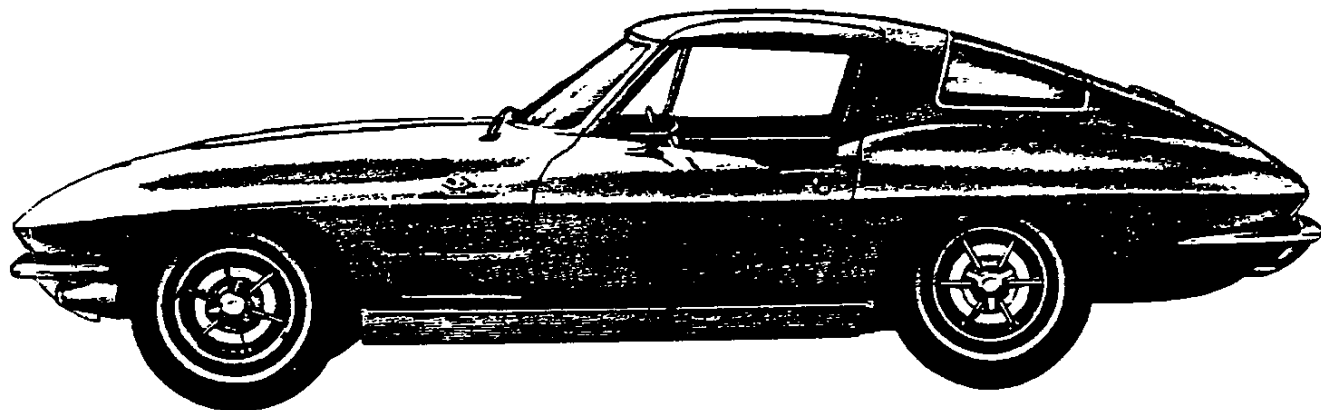
- H51a UPPER BODY OPENING TO GROUND - REAR.** The vertical dimension from a point on the trimmed body opening to the ground. Measured 13.0 inches forward of the H Point.
- H54a H POINT TO TUNNEL - FRONT.** The minimum dimension from the H Point, at car centerline, to top of tunnel.
- H55a H POINT TO TUNNEL - REAR.** Measured in the same manner as H54a.
- H58a H POINT RISE.** The vertical dimension between the H Point in the most forward and rearward seat positions.
- H61a EFFECTIVE HEAD ROOM - FRONT.** The dimension from H Point to the headlining, plus a constant of 4.0 inches. Measured along a line 8° to rear of vertical.
- H63a EFFECTIVE HEAD ROOM - REAR.** Measured in the same manner as H61a.
- H64a H POINT TO WINDSHIELD UPPER DLO.** Vertical dimension from H Point to highest horizontal line of vision through windshield at 15 inch section.
- H65a H POINT DIFFERENTIAL, SIDE TO CENTER - FRONT.** The vertical dimension from side occupant H Point to center occupant H Point.
- H66a H POINT DIFFERENTIAL, SIDE TO CENTER - REAR.** Measured in the same manner as H65a.
- H67a DEPRESSED FLOOR COVERING THICKNESS - FRONT.** The vertical dimension from manikin accelerator heel point normally to underbody sheet metal immediately below heel point.
- H68a DEPRESSED FLOOR COVERING THICKNESS - REAR.** Measured same as H67a.
- H85a H POINT TO GROUND - THIRD SEAT.** Vertical dimension.
- H86a EFFECTIVE HEAD ROOM - THIRD SEAT.** Measured in the same manner as H61a.
- H87a H POINT TO HEEL POINT - THIRD SEAT.** Measured in the same manner as H31a.
- H101 OVERALL HEIGHT.** Measured with full design load.
- H102 FRONT BUMPER TO GROUND.** Minimum dimension.
- H104 REAR BUMPER TO GROUND.** Minimum dimension.
- H106 ANGLE OF APPROACH.** Minimum angle between ground and a line tangent to arc of front tire static loaded radius and touching the limiting point of interference on front bumper, bumper guard, or gravel deflector.
- H107 ANGLE OF DEPARTURE.** Minimum angle between ground and a line tangent to arc of rear tire static loaded radius and touching the limiting point of interference on rear bumper, bumper guard, gravel deflector, tail pipe, fender or other interfering structure.
- H111 ROCKER PANEL TO GROUND - REAR.** The vertical dimension from ground to bottom of rocker panel, excluding flanges. Measured at front of rear wheel opening.
- H112a ROCKER PANEL TO GROUND - FRONT.** The vertical dimension from ground to bottom of rocker panel, excluding flanges. Measured at foremost point of rocker panel.
- H114 HOOD AT REAR TO GROUND.** Measured from hood opening line on shroud, exclusive of moldings.
- H115 STEP HEIGHT - FRONT (DESIGN LOAD).** The vertical dimension from top of sill plate bead, at C/L of front door sill plate, to ground.
- H116 STEP HEIGHT - REAR (DESIGN LOAD).** Measured in same manner as dimension H115.
- H122 WINDSHIELD SLOPE ANGLE.** The angle between a vertical line and the windshield surface at car centerline. On compound-curved windshields the chord of the arc is used and limited to that section of the windshield comprehended by an 18-inch chord.
- H130 STEP HEIGHT - FRONT (CURB LOAD).** The vertical dimension from top of sill plate, at C/L of front door sill plate, to ground.
- H131 STEP HEIGHT - REAR (CURB LOAD).** Measured in same manner as H130.
- H132 BOTTOM OF DOOR TO GROUND, OPEN - FRONT.** Measured from bottom outside corner of door with door in maximum hold-open position.
- H133 BOTTOM OF DOOR TO GROUND, CLOSED - FRONT.** Same point on door as H132 dimension, with door closed.
- H134 BOTTOM OF DOOR TO GROUND, OPEN - REAR.** Measured in same manner as H132.
- H135 BOTTOM OF DOOR TO GROUND, CLOSED - REAR.** Measured in same manner as H133.
- H136a BODY ZERO TO GROUND - FRONT.** A vertical dimension measured at front wheel centerline.
- H137a BODY ZERO TO GROUND - REAR.** A vertical dimension measured at rear wheel centerline.
- H147 RAMP BREAKOVER ANGLE.** Supplement of included ramp angle (180° minus included ramp angle) over which car can pass without interference; measured with car sitting on a level surface, using lines tangent to arcs of front and rear static loaded radii and intersecting at point on underside of car which defines the smallest angle.
- H148 FRONT SUSPENSION TO GROUND.** Minimum clearance measured from lower control arm inner shaft or lowest point on the car centerline.
- H149 OIL PAN TO GROUND.** Minimum clearance measured from sheet metal or drain plug.
- H150 FLYWHEEL/CONVERTER HOUSING AND TRANSMISSION ASSEMBLY TO GROUND.** Minimum clearance.
- H151 FRAME STRUCTURE TO GROUND.** Minimum clearance measured approximately midway between front and rear axles. In this measurement, cross bars and X-members shall be considered part of frame.
- H152 EXHAUST SYSTEM TO GROUND.** Minimum clearance. Specify location.
- H153 REAR AXLE DIFFERENTIAL SYSTEM TO GROUND.** Minimum clearance.
- H154 FUEL TANK TO GROUND.** Minimum clearance measured from sheet metal or drain plug, but excluding supports or straps.
- H155 SPARE TIRE WELL TO GROUND.** Minimum clearance.
- H156 MINIMUM RUNNING GROUND CLEARANCE.** Location of measurement on the car is to be clearly recorded.



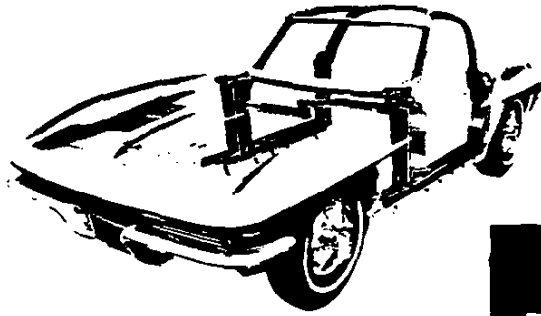
1963

CORVETTE

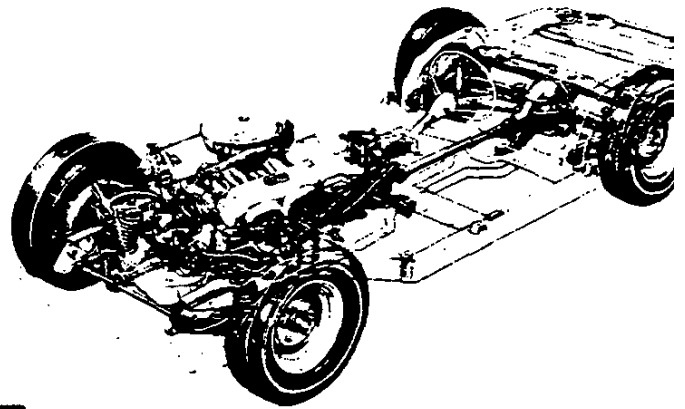
SPECIFICATIONS



GENUINE CHEVROLET™

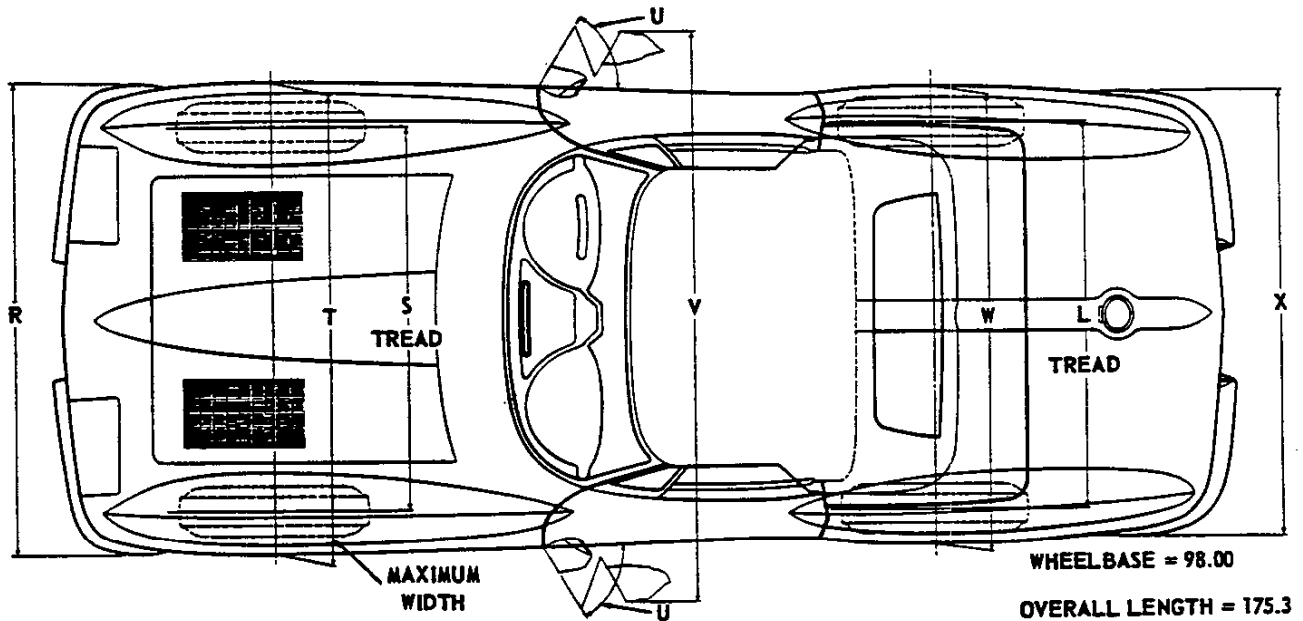
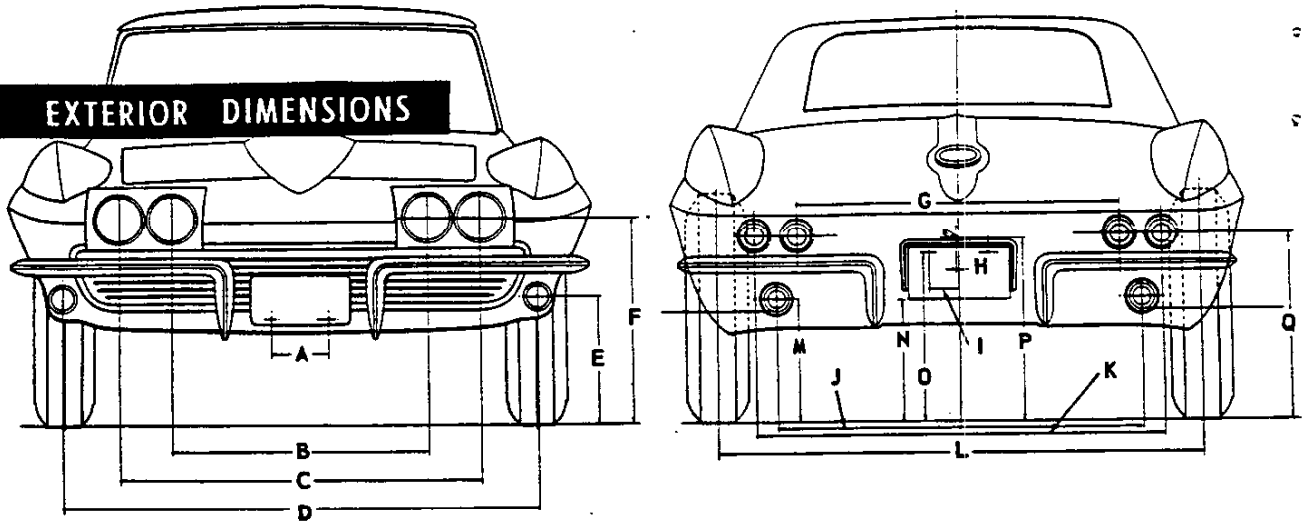


CORVETTE

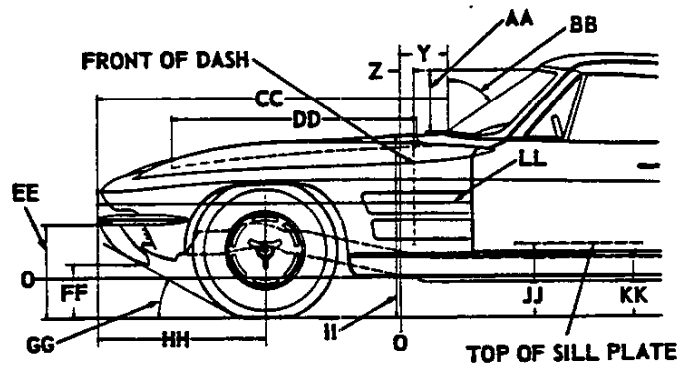


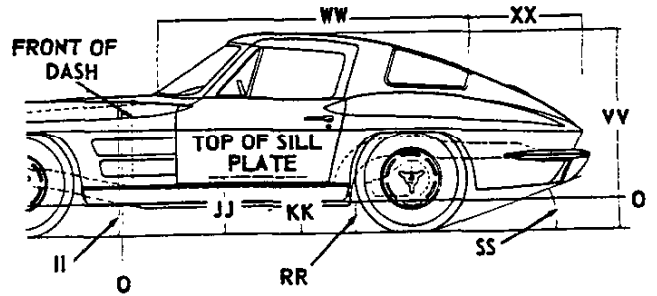
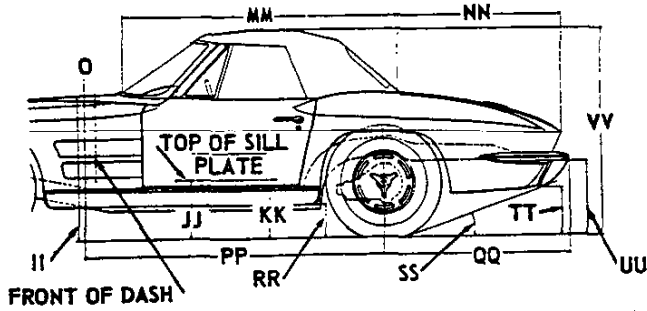
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EXTERIOR DIMENSIONS

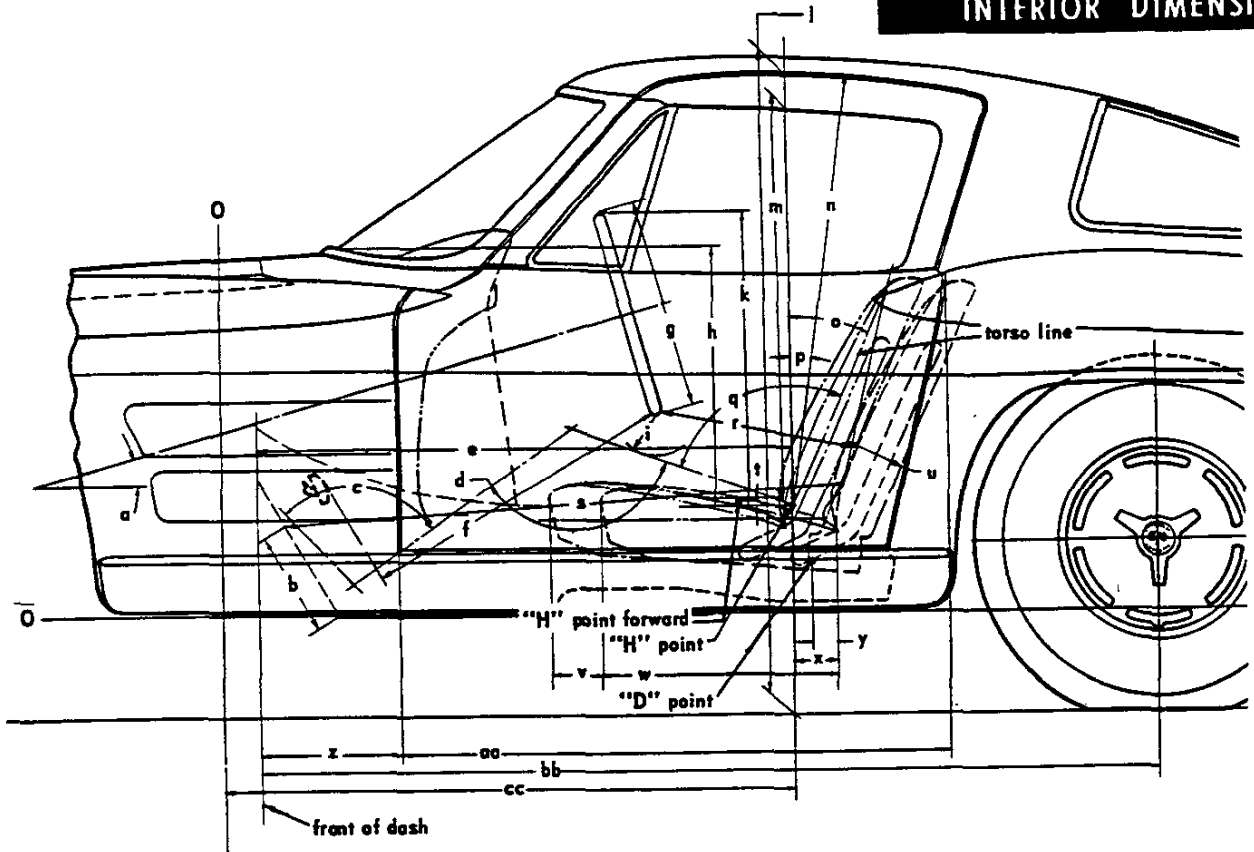


A=7.00	T =69.60	KK =12.54, closed	WW = 77.87
B=30.72	U =60°	LL =71.92	XX = 28.59
C=43.32	V =139.30	MM=77.87, Mod. 837	
D=56.64	W =67.20	MM=66.77, Mod. 867	
E=15.05	X =65.60	MM=69.18, Mod. 867	
F=24.36	Y =8.98	hardtop	
G=38.00	Z =2.57	NN =28.59, Mod. 837	
H=.32	AA=11.52	NN =39.69, Mod. 867	
I =3.50	BB=56° 30'	convertible	
J =43.00	CC=67.00	NN =37.28 Mod. 867	
K=48.00	DD=46.70	hardtop	
L=57.00	EE=17.96	PP =72.00	
M=14.38	FF=10.18	QQ =45.29	
N=14.20	GG=26° 39'	RR =7.95	
O=19.60	HH=32.00	SS =17° 21'	
P=21.30	II =34.84	TT =11.40	
Q=21.76	JJ =14.02, design	UU =16.62	
R=69.16	JJ =16.15, curb	VV =49.78	
S =56.25	KK=13.50, open		





INTERIOR DIMENSIONS



Symbol	867	837	Symbol	867	837	Symbol	867	837
a	15°23'		m (from "H" point)	29.81	30.98	t="H" point rise		.32
b	8.00		m (from "D" point)	33.81	34.98	u		3.98
c	99°		n (headlining to "H" point)	conv. -38.12	37.02	v=seat travel		4.00
d	126°		n (headlining to "D" point)	conv. -42.12	41.02	w (from backrest)		18.00
e	41.63		o (from torso line)	25°		x (from backrest)		4.06
f	24.50		p	8°		y		2.70
g	16.00		q (from torso line)	95°		z		10.93
h (from "H" point)	19.76		r (from backrest)	15.94		aa		42.60
i	2.82		S (from backrest)	43.90		bb		69.43
k (from "H" point)	22.18					cc		44.20
l (from door edge)	45.58	46.75						

REGULAR EQUIPMENT

EXTERIOR

		Model
Four retractable headlights with painted bezels		All
Parking and turn signal lights (amber lenses)		
Twin tail, stop and turn signal lights		
Rear license light		
Bright metal	Parking light bezels	
	Grille	
	Front & rear bumpers, integral guards	
	Hood top simulated grilles	
	Windshield reveal moldings	
	Door push-button handles, key locks	
	Body sill moldings	
	Tail light bezels	
	Rear license bezel	
	Vent window channel	
	Tail pipes and bezels	
	Vent window assembly frame	867
	Rear window reveal	837
Hardtop additional moldings	Drip cap, front and side	867
	Rear window reveal	
Body front crossed flags ornament		All
Rear deck nameplate		
Outside rear view mirror, left side		
Wheel disks, 3-lug ornaments		
Fender side emblem		
Gas filler door and emblem		
License frames, front and rear		
Manual folding top			867
INTERIOR		Model
Courtesy lights under instrument panel		All
Luggage area light		
Glove box with key lock and light		
Bright metal	Floor tunnel trim panel	
	Ash tray	
	Transmission shift lever diagram plate	
	Sill plates	
	Door trim molding	
	Seat backrest side moldings	
	Top header release latches	
Windshield upper and side garnish moldings	867	

INTERIOR - Continued

		Model
Windshield washers		All
Crank-type vent windows		
Compound curved side glass		
Dual arm door hardware		
Glove box trim plate and emblem		
Instrument panel console	Console base trim molding, bright metal	
	Electric clock with second hand	
	Deluxe heater controls	
Radio provision		
Instrument cluster	160 MPH speedometer, odometer	
	Trip odometer	
	7000 RPM tachometer	
	Fuel, temperature, oil pressure gauges	
	Ammeter	
	Headlamp position warning light	
	Headlamp high beam indicator	
	Parking brake alarm	
	Turn signal indicators	
	Main light switch	
	Windshield wiper and washer control	
	Cigarette lighter	
	Ignition switch, 5-position	
	Headlamp rotation switch	
	Bright metal trim molding	
	Simulated vinyl face	
	Three-spoke competition-type steering wheel	
Vinyl covered instrument panel		
Cowl vent knobs		
Hood release lever		
Rear view mirror, bright back and support		
Roll-up door windows		
Twin reflectors in side wall, upper lock control		
Door and center arm rests		
Passenger assist grip		
Direction signal control		
Individually adjusted bucket seats		
Seat belts		
Ball-type door handle, black plastic		
Horn button		
Dual, padded sunshades		

REGULAR PRODUCTION OPTIONS

NAME		NUMBER	MODEL	
Body	Auxiliary top equipment	C07	867	
	Folding top equipment	C05	867	
	Less heater equipment	C48		
	Power windows	A31		
	Radio, signal seeking	U65		
Chassis	Brakes	Metallic brakes		J65
		Power brakes	J50	
	Rear axles	Positraction	G81	All
		3.08:1	G91	
	Tire equipment	6.70 x 15 nylon	P91	
		6.70 x 15 rayon, white wall	P92	
	Transmissions	4-speed	M20	
		Powerglide	M35	
	Power steering	N40		
	Special performance equipment	Z06	837	
Wheel equipment 15 x 6L	P48			
Engine	300 HP engine	L75	All	
	340 HP engine	L76		
	360 HP engine	L84		

DEALER INSTALLED ACCESSORIES

NAME	MODEL
Antenna - radio	All
Heater - deluxe	
Lamp - portable spot	
Radio - signal seeking	
Tool kit	

EXTERIOR-INTERIOR COLOR COMBINATIO

EXTERIOR		INTERIOR
Body Color, Wheels* and Optional Hardtop	Convertible Top	Trim and Paint
Tuxedo Black	Black, White, Beige	Black, Red, Saddle
Ermine White		Black, Red, Blue, Saddle
Riverside Red		Black, Red
Sebring Silver		Black, Red, Blue
Silver Blue		Black, Blue
Daytona Blue		Red, Blue, Saddle
Saddle Tan		Saddle

* Wheels are black when optional white-sidewall tires are factory-installed.

GENERAL CAR DATA

VEHICLE IDENTIFICATION

Production year code ----- 3
 Model codes ----- 0837, 0867
 St. Louis Assembly Plant code ----- S
 Unit code -- Actual unit number beginning with 100001

Example: The 2000th, 1963 Corvette produced (if it was a model 837) would be identified as "30837S102000"

ENGINE TYPE DESIGNATION

250 HP engine RC
 250 HP engine with Powerglide SC
 300 HP engine RD
 300 HP engine with Powerglide SD
 340 HP engine RE
 360 HP engine RF

REAR AXLE TYPE DESIGNATION

Conventional axles
 3.08:1 CZ
 3.36:1 CA
 3.70:1 CX

Positraction axles

3.08:1 CJ²
 3.36:1 CB
 3.55:1 CC
 3.70:1 CD
 4.11:1 CE
 4.56:1 CF

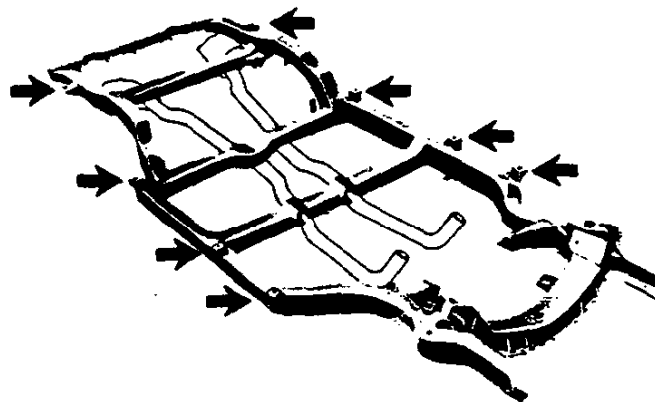
CURB WEIGHT, lb, with 250 HP engine

Model 867 soft top, 3-speed, 4-speed, Powerglide---
 ----- 3035, 3040, 3055, respectively
 Model 837, 3-speed, 4-speed, Powerglide -----3015,
 3015, 3035, respectively
 Model 867 hardtop ----- Add 6 lb to soft top values

BODY GLASS

Type --Solid safety plate except: windshield, laminated safety glass; soft top backlight, plastic; hard top backlight, plexiglass
 Windshield area (sq. inches) ----- 789.7
 Total area, sq. inches
 Model 867 soft top ----- 1780.3
 Model 837 ----- 2133.9

CHASSIS



FRAME

GENERAL

Description ----- All welded, full length, ladder constructed frame with 5 Crossmembers. Side rails and intermediate crossmembers box section; rear crossmember C section.

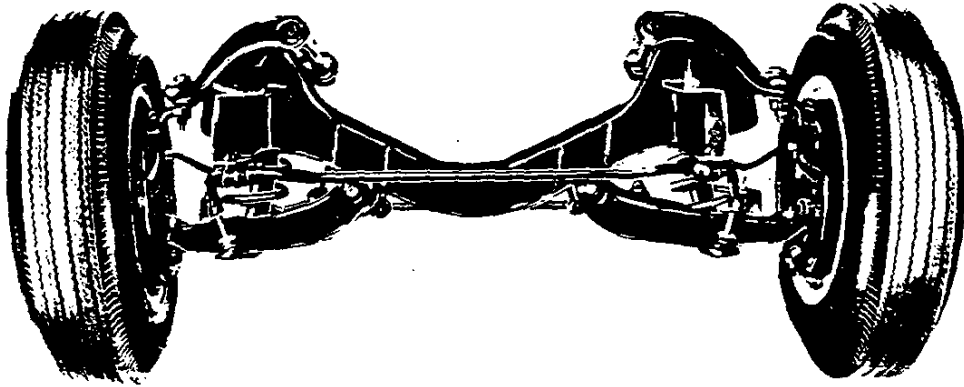
Overall dimensions

Length ----- 149.9
 Width ----- 54.5
 Height ----- 18.2

Mounting points

For body ----- 8
 For engine ----- 3
 Crossmember exhaust pipe hole diameters ----- 3.58

FRONT SUSPENSION



GENERAL

Description ----- Independent, each steering knuckle spherically-jointed to frame-hinged upper and lower control arms. Frame-secured coil spring and shock absorber (inside coil spring) attached to each lower control arm. Front end stability achieved with stabilizer bar hinged to frame front cross-member and each lower control arm. Front end dive when braking controlled by mounting angle of upper control arms.

Wheel travel, from design attitude

Jounce -----	3.75
Rebound -----	4.00
Wheel to spring ratio -----	1.80

CONTROL ARMS

Description

Upper ----- Stamped A frame rubber-bushed to pivot shaft which is bolted to extension welded to frame side rail. Front suspension geometry adjustments achieved with shimmed pivot shafts.

Lower ----- Stamped A frame rubber-bushed to pivot shaft which is bolted to frame front crossmember.

Bushings

Type ----- Pre-loaded, steel encased rubber.

STEERING KNUCKLES

Description ----- Forged steel with integral brake cylinder mounting, and detachable steering knuckle arm.

Spindle diameters

At inner bearing -----	1.2493-1.2498
At outer bearing -----	.7492-.7497

Spindle thread size ----- 3/4-20 NEF-3 (modified)

WHEEL BEARINGS

Type ----- Taper roller

Quantity ----- Two per spindle

OD

Inner -----	2.326-2.329
Outer -----	1.781-1.782

SPHERICAL JOINTS

Type ----- Ball studs, upper self-adjusting for wear.

Quantity ----- Two per steering knuckle

Ball studs

Material ----- HR steel, hardened and ground

Spherical diameters

Upper -----	1.304-1.308
Lower -----	1.246-1.250

● Bearing surfaces

Material

Upper ----- Two surfaces, both non-metallic: the upper surface, a teflon-coated phenolic; the lower surface, a teflon-cotton composition

Lower ----- One Upper surface, a teflon-cotton composition

Housings

Description

Upper ----- Welded, grease-tight stamped socket and retainer.

Lower ----- Steel forging

Seals

Description

Upper ----- Reinforced neoprene secured by retainers

Lower ----- Neoprene secured by retainers

Lubrication

Upper and lower ----- High pressure grease fitting

(continued on page 8)

FRONT SUSPENSION-Continued

SHOCK ABSORBERS

Type ----- Direct, double-acting, hydraulic;
 freon filled envelope in reservoir
 Code ----- C2.75 (43) J8/C1.25-82
 Secured (through coil spring) to -- Lower control arm
 and front suspension crossmember
 Piston diameter and travel (unassembled) - 1.00;5.25
 Piston rod plating ----- Chrome

Wire diameter ----- .552
 OD ----- 4.904
 PD ----- 4.352

● Height ----- 13.714
 Free -----
 Working (inches @ lb) ----- 8.56 @ 1340
 Deflection rate (lb per inch, between 7.50 and 10.50)
 At spring ----- 260
 At wheel (ride rate) -----

STABILIZER BAR

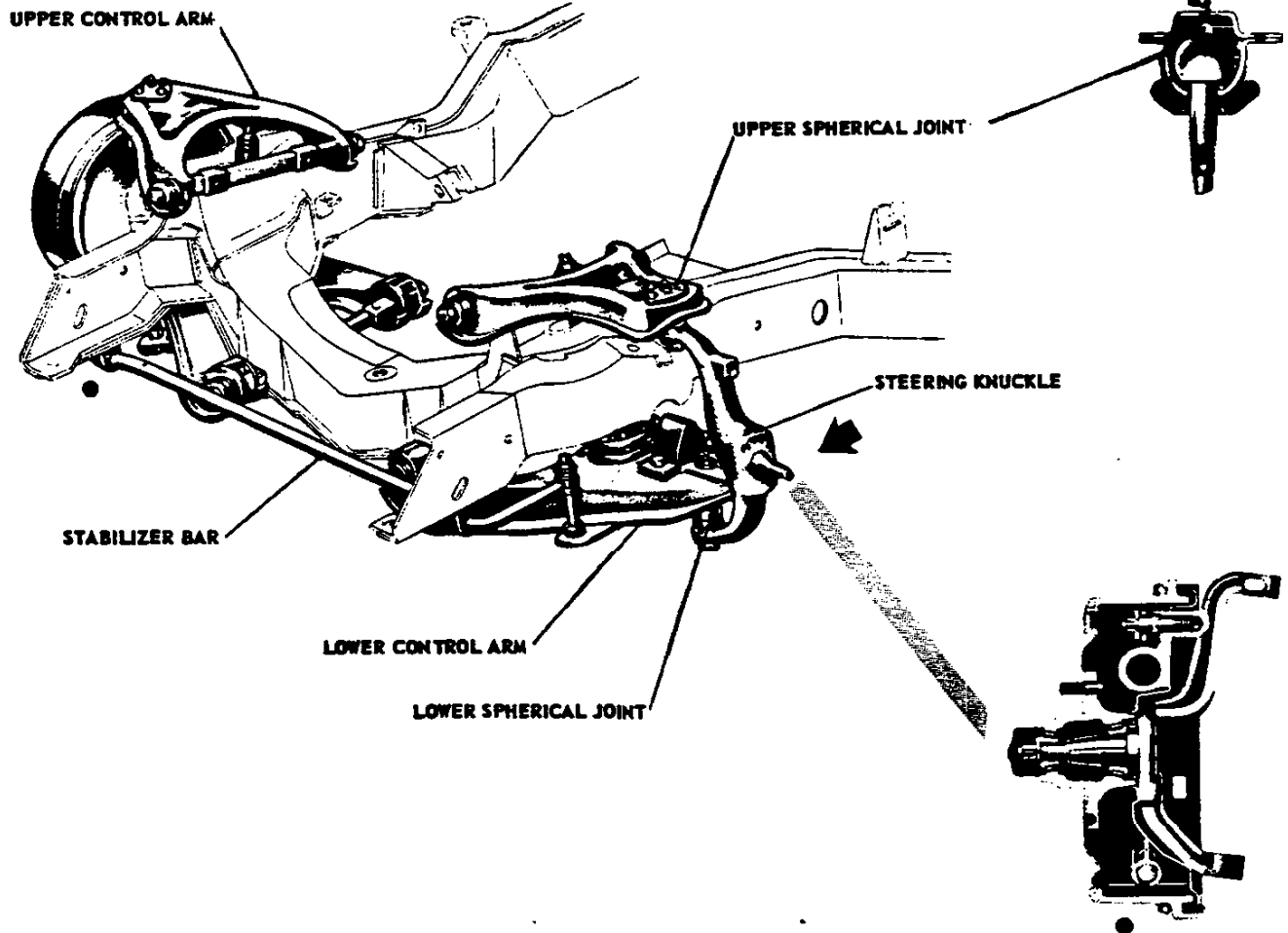
Type ----- Link
 Material ----- HR steel
 Diameter ----- .6875
 Bushing material ----- Natural or synthetic rubber

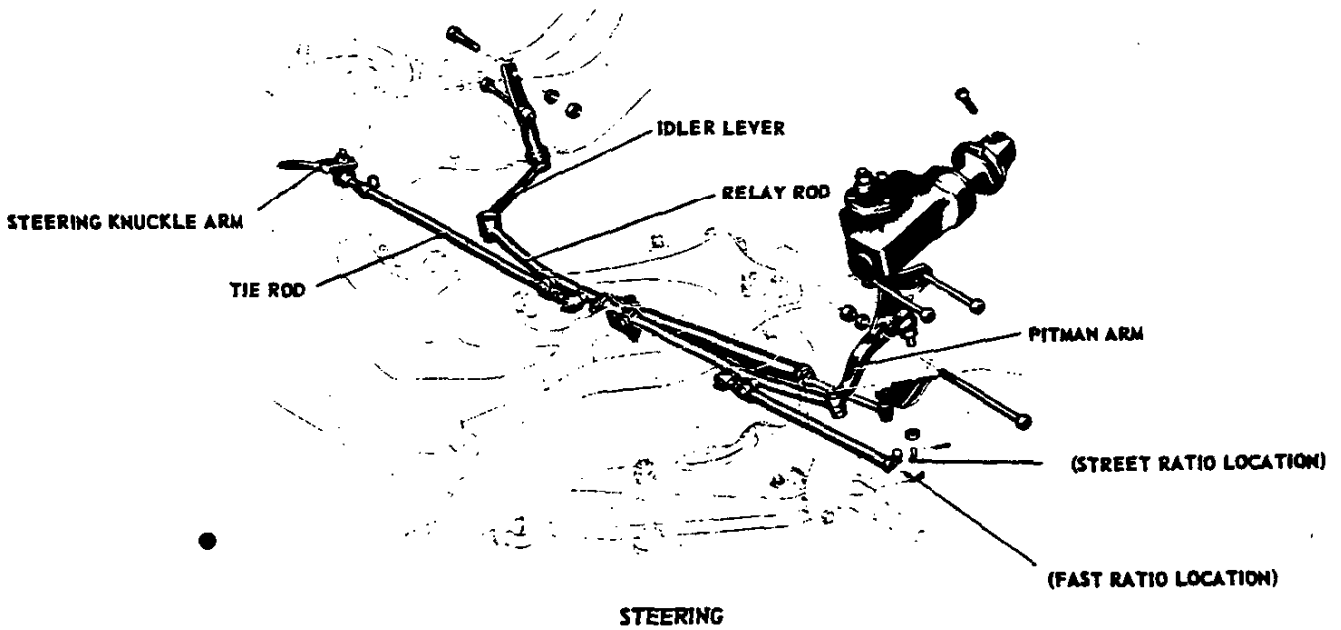
● FRONT WHEEL ALIGNMENT

In design attitude
 Camber ----- (+) $0^{\circ}30' \pm 0^{\circ}30'$
 Caster ----- (+) $2^{\circ} \pm 0^{\circ}30'$
 Toe-in, per wheel ----- 1/16
 In curb attitude
 Camber ----- (+) $0^{\circ}45' \pm 0^{\circ}30'$
 Caster ----- (+) $1^{\circ}45' \pm 0^{\circ}30'$
 Toe-in, per wheel ----- 3/32-5/32
 Steering axis inclination ----- $7^{\circ} \pm 0^{\circ}30'$

SPRING

● Part number ----- 3832684
 Type ----- Right hand helix
 Material ----- Steel alloy
 No. of coils (active, total) ----- 5.67, 7.094





GENERAL

Description ----- Semi-reversible, recirculating ball steering gear with three-inch axial column adjustment. Manual steering standard; power optional with 250 and 300 HP engines. Two-location steering arm-tie rod connection for street and fast ratio; adjustment available only with manual steering.

Steering gear
 Gear ratio ----- 16:1
 ● Overall ratio
 Manual
 Street ----- 20.2:1
 Fast ----- 17.6:1
 Power ----- 17.6:1

Turning characteristics
 Turning diameters (ft)
 Outside front
 Wall to wall
 Right ----- 41.9
 Left ----- 41.3
 Curb to curb
 Right ----- 40.4
 Left ----- 39.4
 Inside rear
 Wall to wall
 Right ----- 26.2
 Left ----- 25.1
 Curb to curb
 Right ----- 26.2
 Left ----- 25.1

Number of wheel turns, lock to lock
 Manual
 Street ----- 3.4
 Fast ----- 2.92
 Power ----- 2.92

● Outside wheel angle with inside wheel @ 20°
 Manual ----- 18.47°
 Power ----- 18.19°

Steering Shaft

Number ----- 1
 Diameter ----- .75
Steering wheel
 Type ----- Deep dished
 Diameter ----- 16.0
Linkage
 Type ----- Relay
 Location ----- Rear of wheels
 Number of tie rods ----- 2
 Lubrication points ----- 5: one at each end of each tie rod; one at pitman arm-relay rod connection

POWER STEERING, RPO 2-N40

Description ----- Hydraulic; pump powered cylinder in linkage. Fluid capacity, 2.3 pints.

Drive

Type ----- V-belt from crankshaft
Pump pulley
 PD ----- 5.60
 "V" Angle ----- 36°
 Width @ PD ----- .38
Crankshaft pulley
 PD ----- 6.64
 "V" angle ----- 36°
 Width @ PD ----- .38

Belt

Pitch line length ----- 35.0

Cylinder

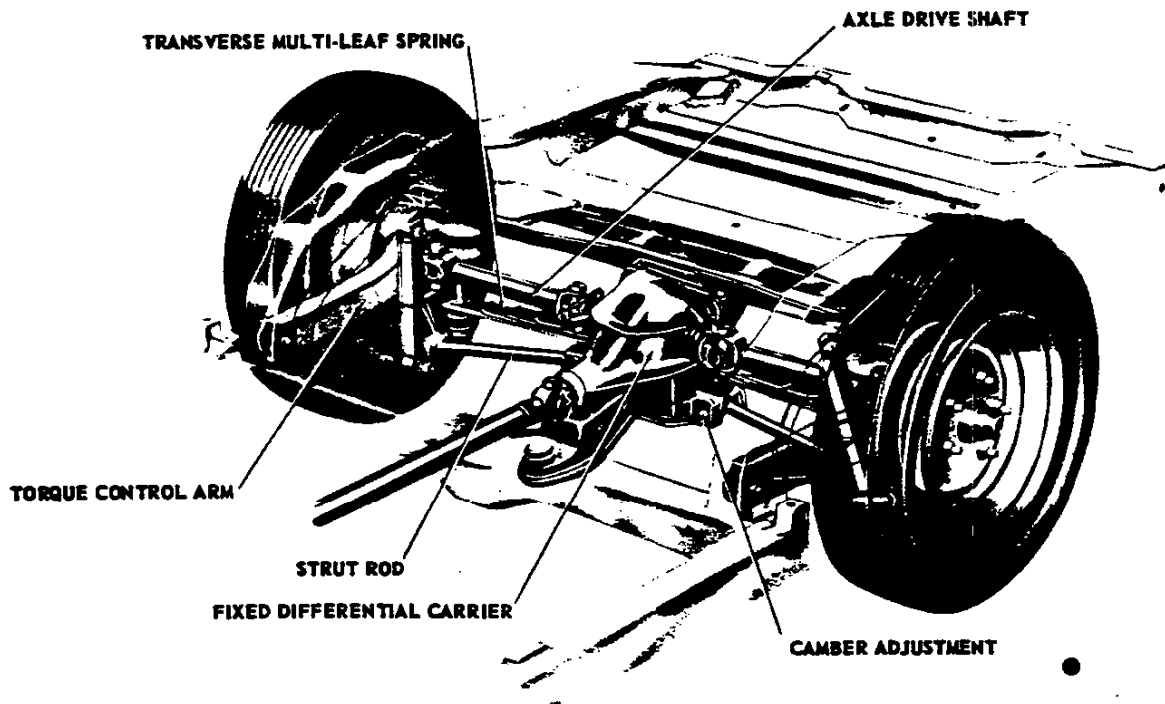
Bore ----- 1.375
 Piston travel (unassembled) ----- 8.44
 Lubrication points ----- One fitting at cylinder piston rod ball stud

DRIVELINE

PROPELLER SHAFT

Type	Exposed, unsupported
Quantity	1
Construction	Welded
	steel tubing incorporating yoke at each end
Tube	
OD	1.995-2.003
Length	26.52
Wall thickness .....	.092-.097
Length between axis of yoke bores	29.90

REAR SUSPENSION



GENERAL

Description	Full independent with frame-anchored differential. Locus of each wheel established by 3 links: universally-jointed axle drive shaft and adjacent strut, and torque control arm pivoted at frame side rail. Vertical suspension loads taken by shock absorbers and transversely-positioned leaf spring. Built-in camber adjustment at struts
Wheel travel, from design attitude	
Jounce	Min. 3.17
Rebound	4.00
Wheel to spring ratio	

LEAF SPRING

Number of leaves	9
Material	Chrome carbon steel, hardened and tempered
Dimensions	
Length, flat	46.36
Width, all leaves	2.25
Height, at \mathcal{C}	2.121
Deflection rate, lb per inch (design load, -.352 camber)	162
Spring liners	
Number	7
Location	Between all but two shortest leaves
Material	Polyethylene with graphite

SHOCK ABSORBER

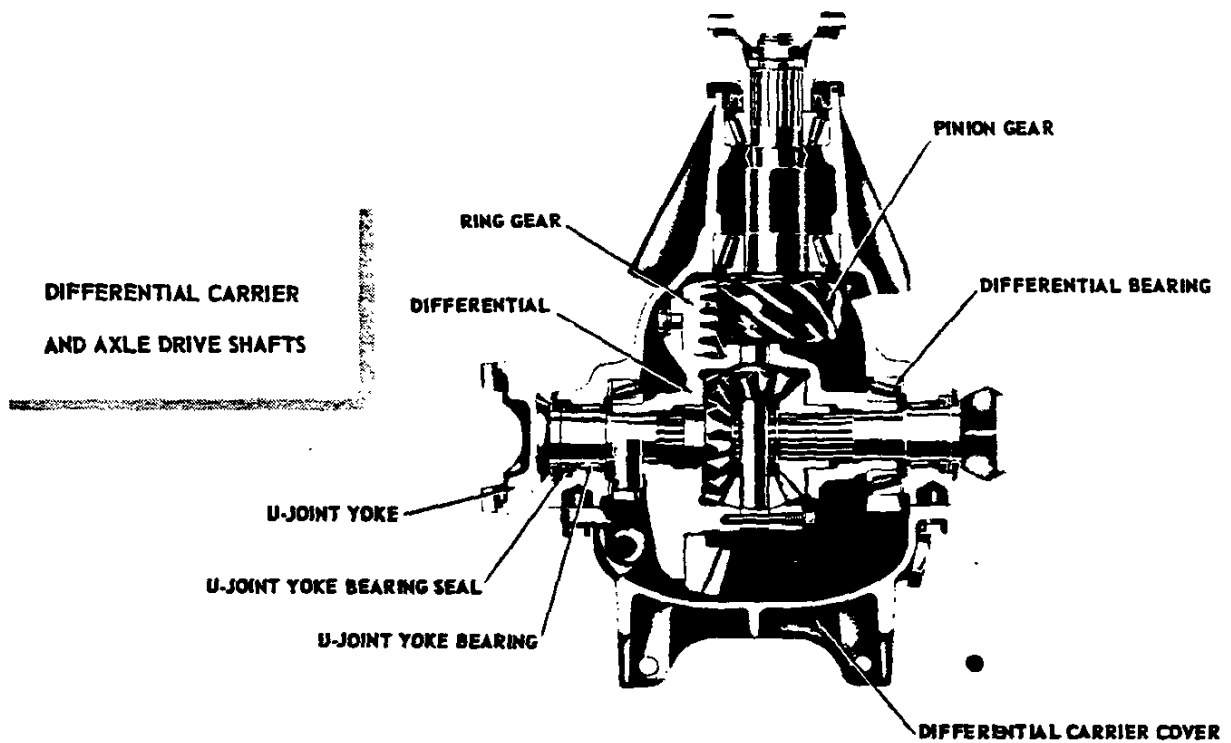
Type -- Direct, double acting, hydraulic, freon filled envelope in reservoir
 Secured between -----Bracket welded to underside of frame rail and strut shaft at wheel spindle support
 Piston diameter ----- 1.00
 Piston travel (unassembled) ----- 5.00
 ● Code ----- C2 (6) N10/A2-67
 Piston rod plating ----- Chrome

STRUT

Material ----- Forged steel
 Diameter ----- .75
 Length between attaching centers ----- 16.58
 Bushings
 Description ----- Rubber on steel serrated at each end
 ID ----- .627-.635

REAR WHEEL ALIGNMENT

In design attitude
 Camber ----- (-) 1°30'±0°30'
 Toe-in, per wheel ----- 1/16
 In curb attitude
 Camber ----- (-) 0°20'±0°30'
 ● Toe-in, per wheel ----- 0-1/16



GENERAL

Description ----- Semi-floating with overhung pinion gear supported by two taper roller bearings.
 Lubricant
 Type ----- Military MIL-L-2105-B
 Capacity (pts) ----- 3.7
 Filler plug ----- 1-3/8 hex, 1-20 AN thread
 ● Viscosity ----- SAE 80
 Regular production ratio ----- 3.36:1

DIFFERENTIAL CARRIER

General
 Offset
 Vertical ----- 1.5
 Horizontal ----- .575
 Differential
 Type ----- Two pinion in cast nodular iron case

(continued on page 12)

DIFFERENTIAL CARRIER AND AXLE DRIVE SHAFTS—Continued

Bearings	
Type	Taper roller
OD	3.0625-3.0626
Hypoid drive (ring) gear	
PD and OD	8.375
Number of teeth	37
U joint yoke	
Material	Forged steel, heat treated
Diameter at bearing	1.3745-1.3750
U joint yoke bearing	
Type	Needle
OD	1.7495-1.7505
U joint yoke bearing seal	
Type	Spring loaded rubber encased in steel

OD	2.002-2.006
Cover	
Material	Cast iron

AXLE DRIVE SHAFTS

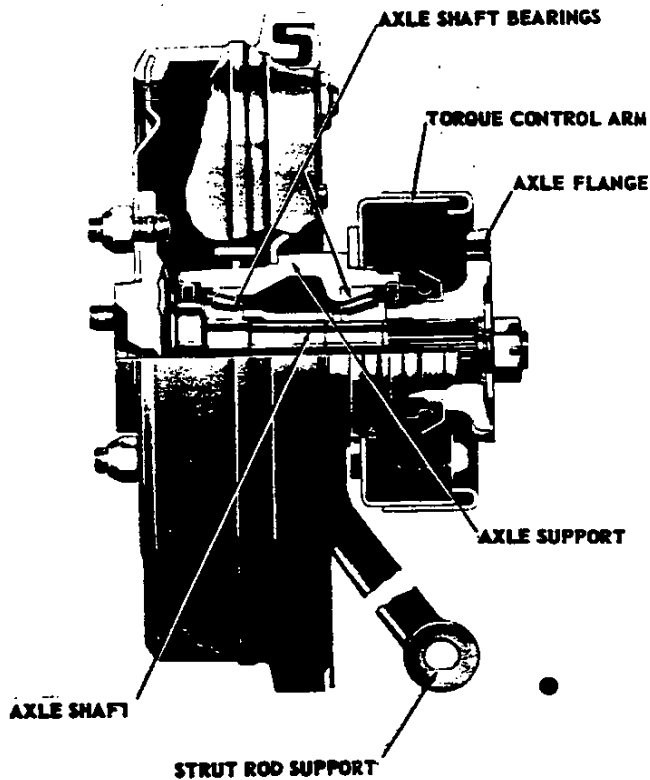
Type	Tubular, exposed, incorporating universal joint at each end
Length between yoke bores	13.833
Tubing	
● Material	Welded steel tubing
OD	2.495-2.503
Wall thickness .....	.117-.123

REAR WHEEL ASSEMBLY

GENERAL

Description

Brake drum flange integral with axle which is universally-jointed (thru splined axle flange) to axle drive shaft; torque control arm bolted to axle support. Axle supported by two taper roller bearings.



AXLE SHAFT

Material	Steel forging, heat treated
Diameter at outer bearing	1.3743-1.3748
Diameter at inner bearing	1.1868-1.1873

AXLE SHAFT BEARINGS

Type	Taper roller
Quantity	2
OD	
Outer bearing	2.5625-2.5635
Inner bearing	2.5312-2.5322
Bearing seals	
Description, outer and inner	Steel encased rubber

AXLE FLANGE

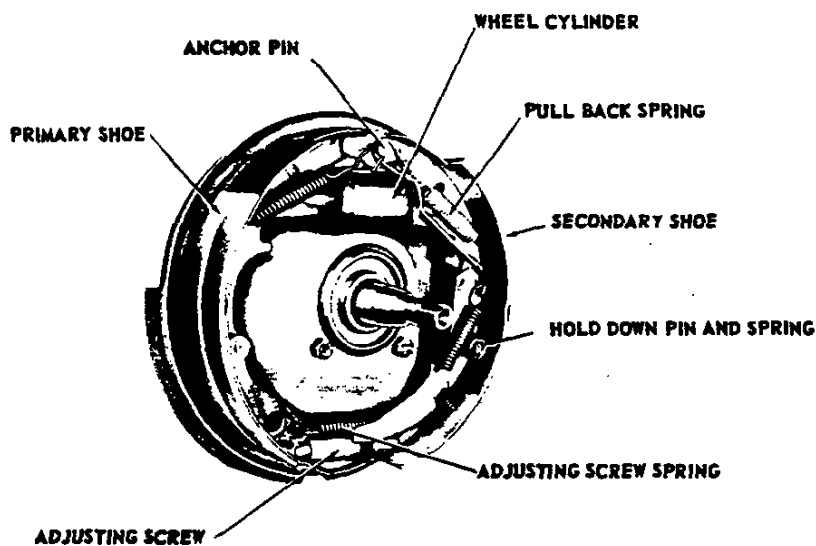
Material	Cast nodular iron
----------------	-------------------

AXLE SUPPORT

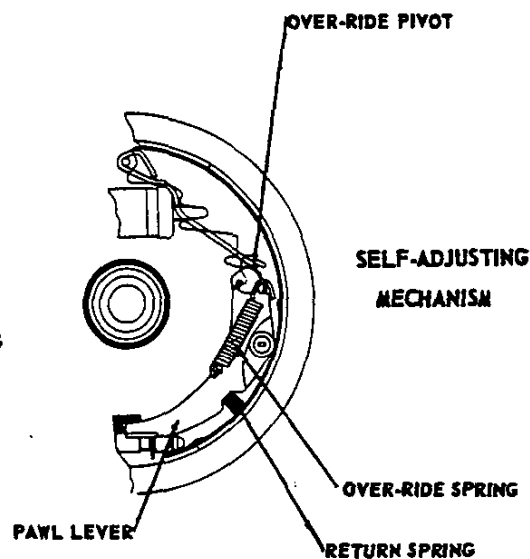
Material	Cast nodular iron
Torque control arm bolt circle dia	4.312

TORQUE CONTROL ARM

Description	Box section, welded
Material	Steel
Length between attaching centers	17.37
Pivot bushing diameter after assembly, min. ....	.44



1. 3-1/2" x 1-1/2" x 1-1/2"
LEFT FRONT
 1. 3-1/2" x 1-1/2" x 1-1/2"



BRAKES ●

SERVICE BRAKES, Regular Production

General

Type	Duo servo, 4-wheel Hydraulic, reverse self-adjusting
● Brake system fluid capacity (pts) .....	.6
Line pressure, psi, @ 100 lb pedal load	
Braking ratios	
Pedal	4.54
Hydraulic	6.30
Overall	28.60
Distribution of braking effort (theoretical, percent)	
Front wheels	58.5
Rear wheels	41.5
Clearance adjustment	Self-adjusting

Brake drum

Construction	Composite, web cast into rim
Material	
Web	HR steel
Rim	Cast iron alloy
Web thickness	
Front .....	.109-.119
Rear .....	.095-.105
Swept drum area, sq. inches	328
Diameter, front and rear	11.0

Brake lining

Material	Full molded asbestos composition
Length	
Per wheel	21.09
Primary shoe	9.34
Secondary shoe	11.75
Width	
Front shoes	2.75
Rear shoes	2.00
Thickness, minimum @ C .....	.168

Method of attachment	Bonded
Total effective area, sq. inches	185.2
Gross lining area, sq. inches	200.4
Master Cylinder	
Location	Engine compartment on dash panel
Piston diameter .....	.875
Piston travel (with available pedal travel) ---	1.10
Wheel cylinders	
Location	
Front	Steering knuckle
Rear	On backing plate
Piston diameter	
Front	1.1875
Rear	1.00
Foot pedal	
Type	Pendant
Travel	5.00
Mounting	On dash brace

PARKING BRAKE

Type	Mechanical pull rods and cables operate two rear service brakes
Total effective area, sq. inches	77
Control	Apply and release by pawl-type lever at right of steering column under instrument panel. Axial clockwise turning of T handle releases brake.

STOPLIGHT SWITCH

Type	Mechanical, make-break, normally on
Location	On dash panel brace
Activation	Brake pedal

(continued on page 14)

BRAKES-Continued

SERVICE BRAKES, METALLIC, RPO 2-J65

Same as SERVICE BRAKES, Regular Production, except as follows

Brake drum	
Web thickness	
Front .....	.125-.135
Brake lining	
Material	Sintered iron segments
Size	
Front wheel segments	
Primary	1.64 x 1.37 x .175
Secondary	1.64 x 1.37 x .295
Rear wheel segments	
Primary	2.00 x 1.00 x .175
Secondary	2.00 x 1.00 x .295
Segments per shoe	
Primary, front and rear	6
Secondary	
Front	12
Rear	10
Method of attachment	Welded
Total effective area, sq. inches	134.9

POWER BRAKES, RPO 2-J50

Same as SERVICE BRAKES, Regular Production, except as follows

General	
Type	Vacuum power unit added to assist regular production master cylinder
Pedal load to actuate power brakes (lb)	
Braking assistance (percent)	
By vacuum power unit	40
By foot pedal	60
Braking ratios	
Pedal	3.43
Hydraulic	6.30
Overall	21.60
● Braking system fluid capacity (pts)	
Line pressure, psi, @ 100 lb pedal load	
Master cylinder	
Piston travel (with available pedal travel)	1.20
Foot pedal	
Travel	4.12

WHEELS AND TIRES

WHEELS, Regular Production

Type	Short spoke spider
Attachment to hub	5 hex nuts, 7/16-20 UNF-2B, arranged on a 4.75 dia bolt circle
Offset .....	.44
Rim Size	15 x 5.5K

WHEEL, RPO 2-P48

Type	Quick take-off
Material	Cast aluminum
Rim size	15 x 6L
Offset .....	.61
Method of retention	Adapter and lock nut (2-5/8-8 UN 2B)

TIRES, Regular Production

Type	Rayon tubeless, blackwall
Construction	4 ply
Size and ply rating	6.70 x 15-4
Specifications	
Loaded rolling radius	13.40
Loaded rev/mi	760
Capacity (lb @ psi)	1065 @ 24
Recommend inflation, all tires, psi	24

SPARE TIRE

Location	Under gasoline tank, accessible from underside of vehicle, shielded with cover.
----------------	---

ELECTRICAL

LAMPS	NO. REQUIRED AND TRADE NO.	CANDLE POWER PER LAMP
Clock	2-1816	2
Courtesy		
Instrument panel	2-90	6
Rear compartment	1-90	6
Dome		
Roof center	1-90	6
Glove compartment	1-57	2
Headlamps		
Outer	2-4002	High beam - 37.5W Low beam - 50W
Inner	2-4001	High beam - 37.5W
Instrument cluster		
Cigarette lighter	1-53	1
Turn signal indicator	2-1816	2
Fuel and battery gauges	1-1816	2
General lighting	3-1816	2
Headlamp position flasher	1-257	2
Headlamp hi-beam indicator	1-53	1
Ignition switch	1-53	1
Parking brake flasher	1-257	2
Radio dial	1-1816	2
Speedometer	1-1816	2
Tachometer	1-1816	2
Temperature and oil gauges	1-1816	2
License plate, rear	1-67	4
Park and turn	2-1034	Park - 4 Turn - 32
Tail, stop and turn	4-1034	Tail - 4 Stop and turn - 32

DEVICE PROTECTED	TYPE OF PROTECTION	LOCATION *
Clock lamps	AGC 4 fuse	FB
Clock motor	SAE 20 fuse	FB
Courtesy lamps	SAE 20 fuse	FB
Dome lamp	SAE 20 fuse	FB
Glove compartment lamp	SAE 20 fuse	FB
Headlamps and parking lamps	15 amp. circuit breaker	Light switch
Headlamps position motors	40 amp. circuit breaker	Motor
Heater blower motor	AGC 10 fuse	FB
Instrument cluster		
Cigarette lighter lamp	AGC 4 fuse	FB
Fuel and battery gauges lamp	AGC 4 fuse	FB
Fuel gauge	AGC 10 fuse	FB
General lighting lamps	AGC 4 fuse	FB
Ignition switch	AGC 4 fuse	FB
Parking brake flasher	AGC 10 fuse	FB
Speedometer lamp	AGC 4 fuse	FB
Tachometer lamp	AGC 4 fuse	FB
Temperature and oil gauges lamp	AGC 4 fuse	FB
Temperature gauge	AGC 10 fuse	FB
License plate lamp, rear	AGC 10 fuse	FB
Power windows	40 amp. circuit breaker	Hinge pillar brace
Radio and radio dial lamp	AGC 7.5 fuse	FB
Stop lamps	SAE 20 fuse	FB
Tail lamps	AGC 10 fuse	FB
Windshield wiper motor	SAE 20 fuse	FB
Turn signal interrupter	14 amp. circuit breaker	Motor switch
		FB

* FB = fuse block

SPECIAL PERFORMANCE EQUIPMENT RPO 2-Z06

Some as Regular Production Specifications except as follows

FRONT SUSPENSION

SHOCK ABSORBERS

Code ----- C .25 (8)V10/L2
Piston travel (unassembled) ----- 5.00

STABILIZER BAR

Diameter ----- .940

SPRING

Part number ----- 3832518
Number of coils (active, total) ----- 5.67, 7.093
Wire diameter ----- .680
OD ----- 5.160
PD ----- 4.480
Height
Free ----- 10.842
Working (inches @ lb) ----- 8.56@1255
Deflection rate (lb per inch, between)
At spring ----- 550
At wheel (ride rate) -----

REAR SUSPENSION

LEAF SPRING

Part number ----- 3828811
Number of leaves ----- 7
Dimensions
Height at \mathcal{C} ----- 2.059
Deflection rate, lb per inch
(design load, -.290 camber) ----- 270
Spring liners
Number ----- 5

SHOCK ABSORBERS

Piston diameter and travel (unassembled)-- 1.375, 4.75
Code ----- 1 (1) L10/D4

BRAKES

SERVICE BRAKES

General

Type ----- Duo servo, 4-wheel
Hydraulic, forward self-adjusting. Also features
provisions for cooling, and master cylinder as-
sisted by vacuum power unit
Brake system fluid capacity (pts) ----- .7
Line pressure, psi, @ 100 lb pedal load -----
Braking ratios
Pedal ----- 3.43
Hydraulic ----- 4.82
Overall ----- 16.53

Braking assistance (percent)

By vacuum power unit -----

By foot pedal -----

Pedal load to actuate unit -----

Brake drum

Construction --Composite, web cast into rim, finned

Web thickness, front and rear ----- .1295

Swept drum area (sq. in.) ----- 334.3

Diameter, front and rear ----- 11.2

Brake linings

Material ----- Sintered iron

Size

Front wheel segments

Primary and secondary -----1.64 x 1.37 x .388

Rear wheel segments

Primary and secondary ----- 2.00 x 1.00 x .388

Segments per shoe

Primary, front and rear ----- 6

Secondary

Front ----- 12

Rear ----- 10

Method of attachment ----- Welded

Total effective area (sq. in.) ----- 144.9

Gross lining area (sq. in.) ----- 144.9

Master cylinder

Type ----- Divided output

Diameter of pistons ----- 1.00

Piston travel (with available pedal travel) ----- 1.20

Foot pedal

Travel ----- 4.12

Cooling ----- Achieved

with finned drums and vented backing plates for each

brake, assisted by an air scoop attached to each

front brake and cooling fans mounted inside each

brake drum

WHEELS AND TIRES

WHEELS

Type ----- Quick take-off

Material ----- Aluminum

Rim size ----- 15 x 6L

Offset ----- .61

Method of retention ----- Adapter

and lock nut (2-5/8-8 UN 2B)

FUEL AND EXHAUST SYSTEM

FUEL TANK

Capacity (gallons) ----- 36

POWER TEAM COMBINATIONS

ENGINE	TRANSMISSION	CONVENTIONAL AXLES	POSITRACTION AXLES
250 HORSEPOWER	3-SPEED	3.36:1*	3.36:1
	4-SPEED AUTOMATIC		
300 HORSEPOWER	3-SPEED	3.36:1	3.08:1
	4-SPEED AUTOMATIC		3.36:1
340 HORSEPOWER	3-SPEED	3.70:1	3.55:1
	4-SPEED		3.70:1
360 HORSEPOWER	3-SPEED	3.70:1	4.11:1
	4-SPEED		4.56:1

* - 3.08:1 AVAILABLE OPTIONALLY WITH 4-SPEED.

MANUAL TRANSMISSION MULTIPLICATION FACTORS

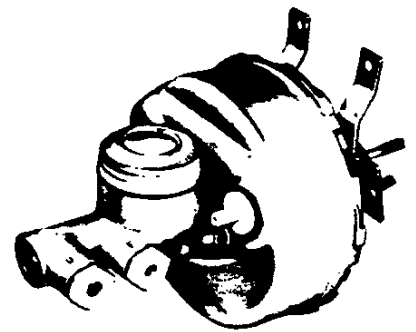
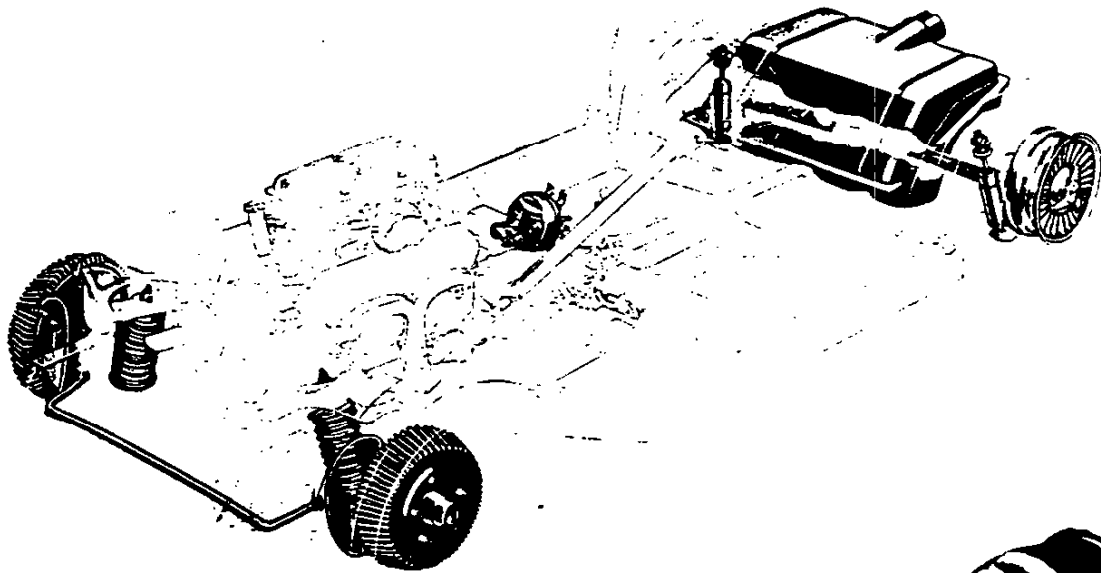
Engine	Transmission	Axle Ratio	Total Gear Reduction					⊙ Max Axle Torque-Low Gear (lb-ft)
			1st	2nd	3rd	4th	Rev	
250 HP	3-speed 2.47 1st	3.36:1	8.30	5.14	3.36	3.36	9.41	2222
300 HP								
340 HP								
360 HP								
250 HP	4-speed (2.54 1st)	3.36:1	8.53	6.35	5.07	3.36	8.77	2294
300 HP								
340 HP	4-speed (2.20 1st)	3.70:1	8.14	6.07	4.85	3.70	8.36	
360 HP								

AUTOMATIC TRANSMISSION MULTIPLICATION FACTORS

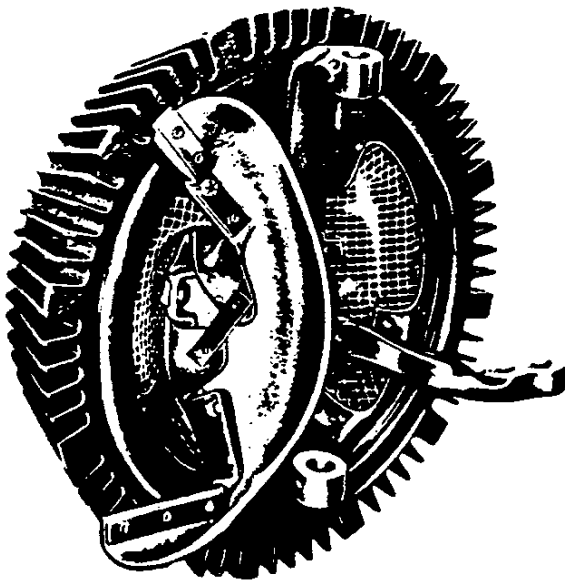
Engine	Transmission	Selector Position	* Total Torque Multiplication	Axle Ratio
250 HP	Powerglide	Drive	12.43:1-3.36:1	3.36:1
300 HP		Low and reverse	12.43:1- 5.93:1	

⊙ - Gear reduction x maximum net engine torque x efficiency (.9 direct drive, .85 all others).

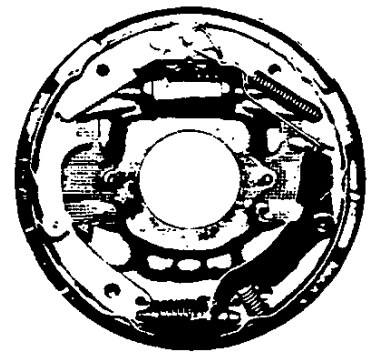
* - Axle ratio x transmission ratio.



DIVIDED OUTPUT MASTER CYLINDER



RIGHT FRONT BRAKE DRUM WITH AIR SCOOP



RIGHT REAR BRAKE DRUM FLANGE AND LINING

CORVETTE ENGINES

GENERAL ENGINE DATA

ENGINE		TRANSMISSION		
		3-Speed	4-Speed	Automatic
Displacement, cubic inches		327		
Type		V-8, valve in head		
Bore and stroke		4.00 x 3.25		
Compression ratio		10.5:1, 250 and 300 HP; 11.25:1 for 340 and 360 HP		
SAE taxable horsepower		51.2		
Idling speed		500 in neutral (a)		475 in drive
Compression pressure, psi, cranking speed, engine hot		160		
Crankshaft inclination		+3°		
Lubrication		Full pressure		
Power plant mounting		Three point, two front, one rear (at transmission); compression type		
Overall measurements	Length (without transmission)			
	Width			
	Height			
Cylinder	Designation	← FRONT	2-4-6-8	Right bank
	Firing order		1-3-5-7	Left bank
			1-8-4-3-6-5-7-2	

(a) - 700 in neutral for 340 and 360 HP engines

ADVERTISED MAXIMUM ENGINE PERFORMANCE

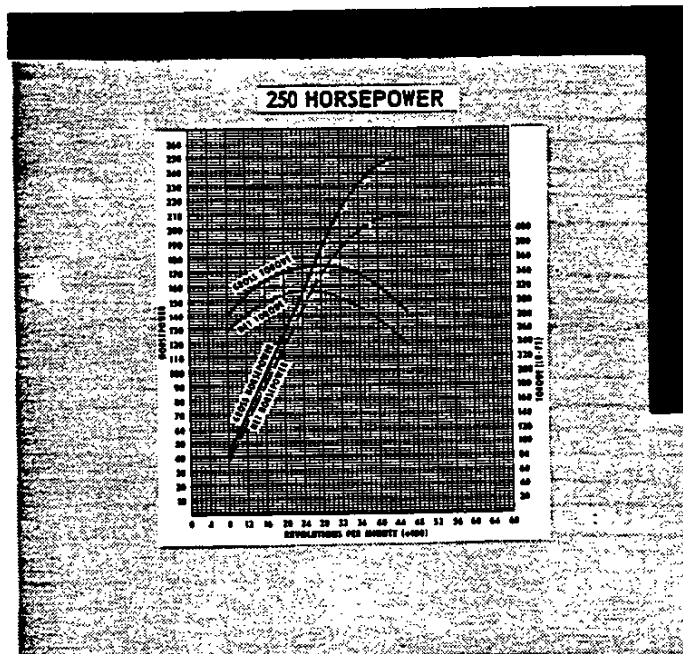
Engine		Standard	300 HP	340 HP	360 HP
Brake	Net	210 @ 4400 RPM			
	Gross	250 @ 4400 RPM	300 @ 5000 RPM	340 @ 6000 RPM	360 @ 6000 RPM
Torque (Lb-Ft)	Net	315 @ 2600 RPM			
	Gross	350 @ 2800 RPM	360 @ 3200 RPM	344 @ 4000 RPM	352 @ 4000 RPM

ENGINE SPEED AND PISTON TRAVEL

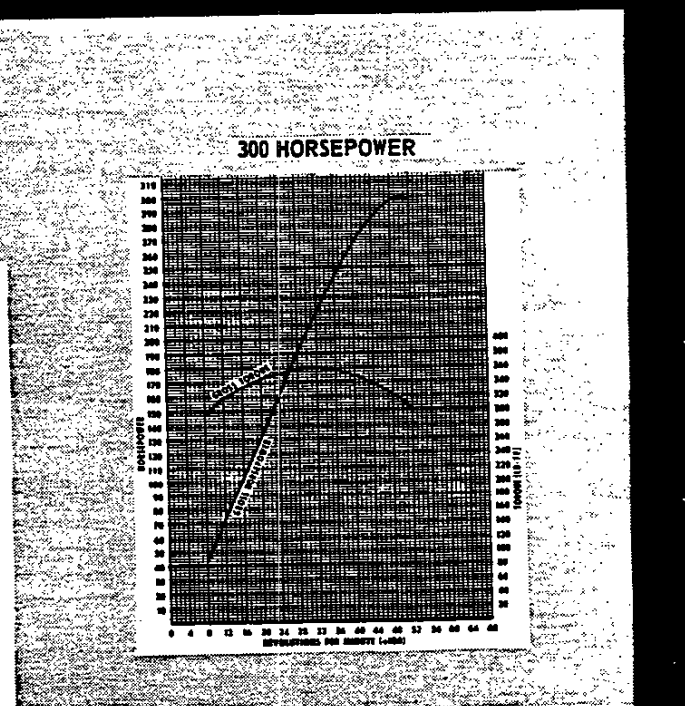
Transmission		3-Speed	Powerglide*	4-Speed (2.54 Low)	
Rear Axle Ratio		3.36:1	3.36:1	3.08:1	3.36:1
Tire Size		6.70 x 15-4 PR			
Crankshaft Rev/Mile in Direct Drive		2553.6	2553.6	2347.0	2553.6
Crankshaft Rev/Min @ 1 Mile/Hr	Low	105.1	77.5	99.1	108.1
	Second	65.1		73.74	80.44
	Third	42.6	Direct 42.6	58.9	64.3
	Fourth			39.0	42.6
	Reverse	119.2	77.5	101.8	111.1
Piston Travel Ft/Mile in Direct Drive		1383.3	1383.3	1271.4	1383.3

Transmission		4-Speed (2.20 Low)					
Rear Axle Ratio		3.08:1	3.36:1	3.55:1	3.70:1	4.11:1	4.56:1
Tire Size and Rev/Mile		6.70 x 15,760					
Crankshaft Rev/Mile in Direct Drive		2347.0	2553.6	2698.0	2812.0	3123.6	3465.6
Crankshaft Rev/Min @ 1 Mile/Hour	Low	85.8	93.4	98.9	103.1	114.6	127.1
	Second	64.0	69.8	73.7	76.9	85.4	94.7
	Third	51.1	55.8	58.9	61.4	68.2	75.7
	Fourth	39.0	42.6	45.0	46.9	52.1	57.8
	Reverse	88.2	96.2	101.6	105.9	117.7	130.5
Piston Travel Ft/Mile in Direct Drive		1271.4	1384.1	1461.5	1523.3	1692.1	1877.3

* - Zero slippage assumed.



POWER CURVES



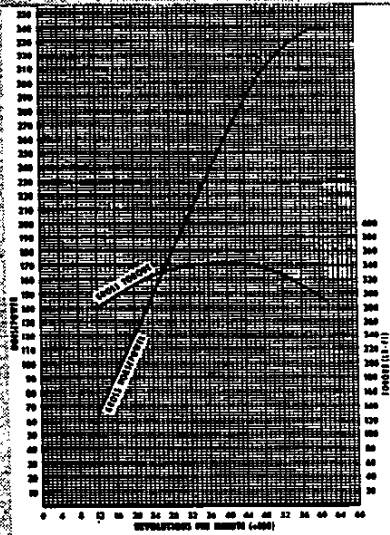
The engine performance curves represent full throttle performance as obtained from dynamometer test data corrected to standard barometric pressure 29.92 inches of mercury and standard temperature of 60°F.

GROSS POWER and TORQUE were obtained in a regular dynamometer test with the dynamometer exhaust

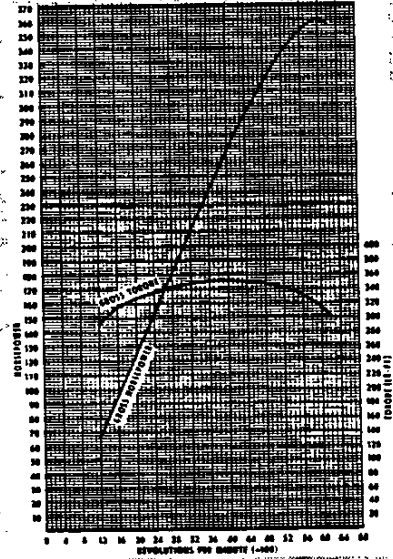
system, no fan, generator not charging, optimum spark advance, and optimum fuel setting.

NET POWER and TORQUE were obtained from a dynamometer test simulating actual operating conditions when the engine is in its vehicle, except the generator is not charging.

340 HORSEPOWER



360 HORSEPOWER



**ADVERTISED CAR PERFORMANCE FACTORS
MODEL 847 SOFT TOP**

Engine, gross horsepower	250 HP	300 HP	340 HP	360 HP
--------------------------	--------	--------	--------	--------

3-Speed transmission

3.36:1 AXLE

Performance weight, lb	3335	3340	3350	3350
Perform. weight per gross HP	13.34	11.13	9.85	9.31
Perform. weight per cu. in. displ.	10.20	10.21	10.24	10.24
Gross HP per cu. in. displ.	.765	.917	1.040	1.101
Power displacement, cu. ft. per mile			241.6	
Displacement factor, cu. ft. per ton per mile	144.9	144.7	144.2	

4-Speed transmission

3.36:1

3.70:1

Performance weight, lb	3340	3345	3350	3350
Perform. weight per gross HP	13.36	11.15	9.85	9.31
Perform. weight per cu. in. displ.	10.21	10.22	10.24	10.24
Gross HP per cu. in. displ.	.765	.917	1.040	1.101
Power displacement, cu. ft. per mile			241.6	
Displacement factor, cu. ft. per ton per mile	144.7	144.5	158.8	

Powerglide transmission

3.36:1

Performance weight, lb	3355	3360
Perform. weight per gross HP	134.2	112.0
Perform. weight per cu. in. displ.	10.26	10.28
Gross HP per cu. in. displ.	.765	.917
Power displacement, cu. ft. per mile		241.6
Displacement factor, cu. ft. per ton per mile	144.0	143.8

Performance Weight = $\frac{\text{Curb Weight plus 300 Lb}}{\text{(weight of two 150 Lb passengers)}}$

Power Displacement = $\frac{\text{Crankshaft Revs/Mi} \times \text{Piston Displacement}}{2 \times 1728}$

Displacement Factor = $\frac{\text{Power Displacement}}{\text{Performance Wt (tons)}}$

PRINCIPAL COMPONENTS—Continued

			Excluding ramps	Including ramps
Oil shields				
Type	-----	Steel cups		
VALVES				
Inlet				
Material				
250 HP engine	-----	Carbon steel		
300, 340 and 360 HP engines	-----	Steel alloy		
Head diameter				
● 250 HP engine	-----	1.715-1.725		
300, 340 and 360 HP engines	-----	1.935-1.945		
Exhaust				
Material				
Except tip	-----	Steel alloy		
Tip	-----	Silichrome #1		
● Head diameter	-----	1.495-1.505		
Coating				
250 and 300 HP engines	-----	None		
340 and 360 HP engines	-----	Induction aluminized head and face		
VALVE LIFT				
Inlet				
250 and 300 HP engines	-----	.3987		
340 and 360 HP engines	-----	.39375		
Exhaust				
250 and 300 HP engines	-----	.3987		
340 and 360 HP engines	-----	.39975		
VALVE TRAIN LASH				
Inlet				
250 and 300 HP engines	-----	Zero		
● 340 and 360 HP engines	-----	.008 (hot)		
Exhaust				
250 and 300 HP engines	-----	Zero		
340 and 360 HP engines	-----	.018 (hot)		
VALVE TRAIN TIMING				
	Excluding ramps	Including ramps		
Inlet valve				
250 and 300 HP engines				
Opens	12°30' BTC	32°30' BTC		
Closes	57°30' ABC	87°30' ABC		
Duration	250°	300°		
340 and 360 HP engines				
● (.008 lash hot)				
Opens		35° BTC		
Closes		72° ABC		
Duration		287°		
Exhaust valve				
250 and 300 HP engines				
Opens	54°30' BBC	74°30' BBC		
Closes	15°30' ATC	45°30' ATC		
Duration	250°	300°		
340 and 360 HP engines				
(.018 lash hot)				
Opens		76° BBC		
Closes		31° ATC		
Duration		287°		
PISTON				
Material				
250 and 300 HP engines	----	Aluminum alloy, cast		
340 and 360 HP engines	----	Aluminum alloy, impact extruded		
Head type				
250 and 300 HP engines	-----	Flat, notched		
● 340 and 360 HP engines	-----	Domed		
Skirt type				
250 and 300 HP engines	-----	Slipper		
● 340 and 360 HP engines	-----	Slipper		
Top land clearance (on diameter)	-----	.0365-.0455		
Skirt clearance (on diameter)				
250 and 300 HP engines	-----	.0005-.0011		
340 and 360 HP engines	-----	.0024-.0030		
Compression ring groove depth	-----	.2218-.2283		
Oil ring groove depth	-----	.2038-.2103		
Pin bore offset				
250 and 300 HP engines	-----	.055-.065		
		(major thrust side)		
340 and 360 HP engines	-----	On center		
COMPRESSION RING, UPPER, SINGLE PIECE				
Construction	-----	30° inside bevel, OD slightly tapered, chamfered and flash chromed		
Material	-----	Cast iron alloy		
Dimensions				
Width (ground)	-----	.0775-.0780		
Wall thickness	-----	.190-.200		
Gap (@ 4.00 OD)	-----	.013-.023		
COMPRESSION RING, LOWER, TWO PIECE				
Ring				
Construction	-----	30° inside bevel, OD slightly tapered; wear resistant coating		
Material	-----	Cast iron alloy		
Dimensions				
Width (max. after coating)	-----	.0780		
Wall thickness	-----	.164-.170		
Gap (@ 4.00 OD)	-----	.013-.025		
Expander				
Construction	-----	Crimped		
Material	-----	Heat treated steel		
Dimensions				
Width	-----	.068-.074		
Wall thickness	-----	.02075		
Gap (@ 3.551 OD)	-----	.25-.50		

PRINCIPAL COMPONENTS

CYLINDER BLOCK

Material ----- Cast iron alloy
 Bore diameter ----- 4.00
 Number of bulkheads ----- 5
 Water jackets ----- Full length around each cylinder
 Cylinder numbering arrangement (front to rear)
 Left bank ----- 1-3-5-7
 Right bank ----- 2-4-6-8

CYLINDER HEAD

Material ----- Cast iron alloy with high chrome
 ● Bolts
 Number used ----- 16 short, 14 long, 4 medium
 Length (under head to end of threads)
 Short ----- 1.72-1.75
 Long ----- 3.70-3.73
 Medium ----- 3.03-3.06
 Thread ----- 7/16-14 UNC-3A
 Combustion chamber volume, cubic inches
 250 HP engine ----- 4.43
 300 HP engine ----- 4.49
 340 and 360 HP engines ----- 3.97

INLET MANIFOLD

Material
 250 and 300 HP engines ----- Cast iron alloy
 340 and 360 HP engines ----- Aluminum
 Type
 250, 300 and 340 HP engines -- Individual passages,
 2 decks of 4 each
 360 HP engine ----- Chamber
 Method of heating
 250, 300 and 340 HP engines - Exhaust gas passages
 ● 360 HP engine ----- None

EXHAUST MANIFOLD

Material ----- Cast iron alloy
 Type ----- Low resistance flow
 ● Outlet diameter, nominal
 250 HP engine, all transmissions, and 300 HP
 engine with Powerglide ----- 2.00
 300 HP, 340 HP and 360 HP engines with 3-and
 4-speed transmissions ----- 2.50

CRANKSHAFT

Material ----- Forged steel
 End play ----- .002-.006
 Number of counterweights ----- 6
 Crank arm length ----- 1.625
 Type of vibration damper --- Rubber mounted inertia
 Timing gear
 Type ----- Sprocket (and chain)
 Material ----- Steel

MAIN BEARINGS

Material
 All except upper rear ----- Premium aluminum
 Upper rear ----- Steel backed babbit
 Type ----- Precision removable
 End thrust taken by ----- Number 5 bearing
 Clearance
 Bearing numbers 1 through 4 ----- .0008-.0034
 Bearing number 5 ----- .0010-.0036

Dimensions

Inner diameter (theoretical)
 Bearing numbers 1 through 4 ----- 2.3009
 Bearing number 5 ----- 2.3006
 Effective length
 Bearing numbers 1 through 4 ----- .752
 Bearing number 5 ----- 1.1824
 Projected area
 Bearing numbers 1 through 4 ----- 1.7309
 Bearing number 5 ----- 2.7209

CAMSHAFT

Material ----- Cast iron alloy
 Lobe lift
 250 and 300 HP engines
 Inlet ----- .2658
 Exhaust ----- .2658
 340 and 360 HP engines
 Inlet ----- .2625
 Exhaust ----- .2665

Bearings

Material ----- Extra-life steel backed babbit
 Dimensions
 Ream diameter
 Bearing numbers 1 through 4 ----- 1.8711
 Bearing number 5 ----- 1.8711
 Effective length
 Bearing numbers 1 through 4 ----- .740
 Bearing number 5 ----- .940
 Projected area
 Bearing numbers 1 through 4 ----- 1.384
 Bearing number 5 ----- 1.758

VALVE TRAIN

Type ----- Individual mounted, push rod
 operated overhead rocker arms
 Lifters
 250 and 300 HP engines ----- Hydraulic
 340 and 360 HP engines ----- Mechanical
 Push rods
 Material
 Shank ----- Hollow steel
 Shank ends
 250 and 300 HP engines ----- Hardened
 340 and 360 HP engines ----- Rocker arm ends
 has welded-on hardened tip

ROCKER ARMS

Type ----- Stamp
 Material ----- Steel
 Ratio ----- 1.5:

VALVE SPRINGS

I D ----- .872-.88
 Installed length, inches @ lb
 Valve closed ----- 1.66 @ 78-80
 Valve open ----- 1.26 @ 170-180
 Free length ----- 2.0
 Damper
 Type ----- 4 coil
 Material ----- Steel

(continued on page 24)

FUEL AND EXHAUST SYSTEM—Continued

EXHAUST SYSTEM

Type	Dual with no resonators
Exhaust pipes	
OD	
250 HP engine, all transmissions, and 300 HP engine with Powerglide	2.00
300 HP engine with 3-and 4-speed transmissions, and 340 and 360 HP engines, all transmissions	2.50
Wall thickness	
Front section	
250 HP engine, all transmissions, and 300 HP engine with Powerglide .....	.067-.081
300 HP engine with 3-and 4-speed transmissions, and 340 and 360 HP engines, all transmissions .....	.072-.092
Intermediate section .....	.076-.092
Tail pipes	
Material	Stainless Steel
OD	2.00
Wall thickness .....	.023
Mufflers	
Type	Reverse flow
Construction	Oval, heads and body jointed by rolled lock seam; insulator of embossed asbestos crepe
Dimensions	
Length	17.00
Width (approx.)	9.32
Height (approx.)	5.32

Left hand muffler	Anti-corrosive measures
Aluminized parts	
All	
Right hand muffler	
Aluminized parts	
Front pipe baffle	
Front tube	
Front pipe	
Front resonator	
Center resonator	
Rear tube resonator	
Rear baffle	
Shell	
Cover	
Stainless steel parts	
Front head	
Front outer baffle	
Rear outer baffle	
Rear tube	
Rear head	

CRANKCASE VENTILATION

Type	
250, 300 and 340 HP engines	Closed-positive: road draft to control valve at rear of carburetor throttle body base; filtered side of air cleaner to oil filler tube
360 HP engine	Closed-positive: road draft to control valve at rear of inlet manifold; filter side of air cleaner duct to oil filler tube

LUBRICATION SYSTEM

GENERAL

System type	Controlled pressure, full flow
Camshaft bearings	Pressure
Connecting rod bearings	Pressure
Cylinder walls	Pressure, jet cross sprayed
Main bearings	Pressure
Piston Pins	Splash
Rocker arms	Pressure
Timing gears	Nozzled sprayed
Valve lifters	Pressure
Capacity (qts)	
250 and 300 HP engines	
Refill	4
Refill with filter	5
340 and 360 HP engines	
Refill	5
Refill with filter	6
Lubricant grades and temperatures	
32°F and warmer SAE 20W, SAE 20 or SAE 10W-30	
0°F and warmer	SAE 10W or SAE 10W-30
Colder than 0°F	SAE 5W or SAE 5W-20
Sustained high speed warmer than 90°F	SAE 30
Oil pressure sending unit	
Type	Bourdon tube
Actuation	Oil pressure

Oil filler	
Cap	Solid
Location	Intake manifold at front

OIL PUMP

Type	Gear
Capacity	Delivery 4.3 gpm at 2000 engine rpm and nominal pressure of 50 psi
Intake type	Fixed
Regulator valve	Opens at 40-45 lb

OIL FILTER

Type	Full flow, replacement element
Location	Left rear underside of engine
Capacity (qts)	1
By-pass valve	Opens at 9-11 psi drop in pressure

OIL PAN DRAIN SCREW

Type	Hex head
Specifications	
Hex size, across flats .....	.860-.875
Thread	1/2-20 UNF-2A
Length, from under head .....	.81
Location	Rear of pan

OIL CONTROL RINGS

Construction ----- Multi-piece unit consisting of 2 rails and 1 spacer
Rails ----- Curved OD and ID, wear resistant coating
Spacer ----- Humped and vented
Material
Rails ----- Flat spring steel
Spacer ----- Steel alloy (high chrome)
Assembled dimensions
Width (maximum) ----- .189
Wall thickness (maximum) ----- .166
Gap (@ 4.00 OD) ----- .015-.055

PISTON PIN

Material ----- Steel alloy (high chrome)
Dimensions
Length ----- 2.990-3.010

Diameter ----- .9270-.9273
Clearance in piston ----- .00015-.00025
Clearance in connecting rod ----- None; locked in rod by shrink fit

CONNECTING RODS

Material ----- Drop forged steel
Length, center to center ----- 5.699-5.701

CONNECTING ROD BEARINGS

Type ----- Precision removable
Material ----- Premium aluminum
Clearance between bearings and crankshaft .0007-.0028
ID (theoretical) ----- 2.0017
Effective length ----- .807
End play ----- .009-.013

FUEL AND EXHAUST SYSTEM

FUEL TANK

Capacity (gallons) ----- 20
Location ----- In body cavity at rear of deck lid
Filler location ----- Center of deck lid at rear; cap secured directly to tank, accessible through door affixed to deck lid
Gage ----- AC, Electric

FUEL FILTER

Tank unit ----- Plastic mesh strainer
Carburetor unit
250 HP engine ----- Sintered bronze element in carburetor inlet
300 and 340 HP engines ----- In-line (between fuel pump and carburetor) with paper element
● 360 HP engine ----- In-line (between fuel pump and fuel meter assembly) with paper element

FUEL PUMP

Type ----- Diaphragm
Drive ----- Camshaft eccentric
Location ----- Lower right front of engine
Pressure range, psi ----- 5.25-6.50

● AIR CLEANER

250 and 300 HP engines ----- Low silhouette with forward-directed snouts extending from opposite sides; oil-wetted, polyurethane element
340 HP engine ----- Low silhouette, louver, chrome-plated cannister; oil-wetted, polyurethane element
360 HP engine ----- Conical, located in air intake ducting; oil-wetted polyurethane element.

CARBURETOR

Type
250 HP engine ----- 4-bbl downdraft
300 and 340 HP engine -- Aluminum 4-bbl downdraft
SAE carburetor size (throttle body) ----- 1.50
Venturi diameter
250 HP engine
Primary ----- 1.06
Secondary ----- 1.25
300 and 340 HP engines
Primary ----- 1.25
Secondary ----- 1.5625
Throttle bore
250 HP engine
Primary ----- 1.4375
Secondary ----- 1.4375
300 and 340 HP engines
Primary ----- 1.5625
Secondary ----- 1.6875
Secondary throttle actuation ----- Linkage, approximately when primary valve are open half way between closed and full open

(continued on page 26)

ELECTRICAL SYSTEM

SUPPLY SYSTEM

BATTERY

Make ----- Delco-Remy
 Voltage ----- 12
 Capacity (SAE) ----- 61 amp. hr. @ 20 hr. rate
 Total number of plates ----- 66
 Number of cells ----- 6
 Terminal grounded ----- Negative
 Location ----- Rear of right wheelhouse

GENERATOR

Make ----- Delco-Remy
 Type ----- Diode rectified
 Rating
 Amp ----- 9.37
 Volts ----- 10-15

REGULATOR

Make ----- Delco-Remy
 Type ----- Two unit; vibrator
 Voltage regulator
 Voltage ----- 13.8-14.8 @ 85° F
 Field relay (combination light & field relay)
 Closing voltage ----- 1-3 volts @ 80° F
 Location ----- Left side front eng. compartment

STARTING SYSTEM

STARTING MOTOR

Make ----- Delco-Remy
 Rotation (drive end view) ----- Clockwise
 No load test (engine at operating temperature)
 Amps ----- 65-100
 Volts ----- 10.6
 RPM ----- 3600-5100
 Motor drive
 Engagement ----- Solenoid
 Pinion meshes at ----- Rear
 Pinion tooth no ----- 9
 Flywheel tooth no ----- 153
 Mounting ----- Bolted to clutch housing

STARTING

Ignition switch ----- Five (5) positions; ACCESSORY
 LOCK, OFF, ON, START
 Starting procedure
 Synchronesh ----- Place gearshift lever in neutral
 and depress clutch pedal to floor
 Powerglide ----- Place control lever
 in N or P position

Initial start ----- Depress accelerator pedal to
 floor and release. Turn ignition
 to START and release as soon as
 engine starts. When engine is
 warm or outside temperature is
 below 0° F hold accelerator about
 half way open

IGNITION SYSTEM

COIL

Make ----- Delco-Remy
 Type ----- 12 Volt
 Amperes drawn
 Engine stopped ----- 4.0
 Engine idling ----- 1.8

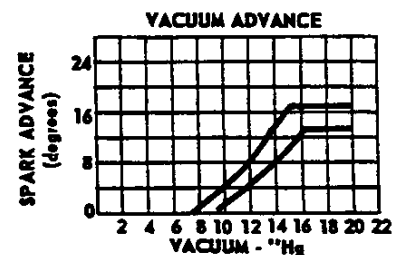
DISTRIBUTOR

Make ----- Delco-Remy
 Type ----- Single breaker
 Cam angle ----- 28°-32°
 Breaker gap (new) ----- .019
 Breaker arm tension, oz ----- 19-23
 Centrifugal advance begins (RPM) ----- 700
 Max degrees @ RPM ----- 24 @ 4600
 Vacuum advance begins (inches hg) ----- 8
 Max degrees at inches hg ----- 15° @ 15.5
 Timing (initial design setting, vacuum disconnected)
 Crankshaft degrees @ RPM
 250 HP engine ----- 4° BTC @ 500
 with 3-or 4-speed; with Power-
 glide, 4° BTC @ 475
 300 HP engine ----- 8° BTC @ 500
 with 3-or 4-speed; with Power-
 glide, 4° BTC @ 475
 340 and 360 HP engines ----- 10° BTC
 @ 700 with 3-or 4-speed
 Timing mark location ----- On harmonic balancer
 Firing order ----- 1-8-4-3-6-5-7-2

SPARK PLUGS

Make ----- AC 44
 Thread size (mm) ----- 14
 Gap ----- .033-.038
 Torque ----- 25 lb-ft

CABLE ----- Linen core impregnated with electrical
 conducting material and insulation of
 rubber with neoprene jacket



COOLING SYSTEM

●GENERAL

Type---Liquid, pressurized, Internal by-pass for 250 & 300 HP engines; external for 340 & 360 HP engines.

Capacity, qts
 With heater ----- 16.5
 Without heater ----- 15.5

Drains
 Location
 Engine block ----- Right and left side, center
 Type ----- Plug
 Radiator ----- Left side, bottom tank
 Type ----- Petcock

RADIATOR

Type ----- Cross flow
 Material ----- Aluminum
 Core constant ----- ~~18~~ .556
 Front area, sq. inches ----- 315.4
 Cap relief valve characteristics ----- Opens at 13 psi
 Hose ID's
 Outlet ----- 1.75
 Inlet ----- 1.50

FAN

Description ----- 5 bladed, staggered
 OD ----- 17.12
 Drive
 Type ----- Thermo modulated fluid coupling
 Performance ----- At 4000 rpm input and
 135°F-150°F ambient, fan speed 3200-3500 rpm;
 at 12°F ambient and cooler, fan speed
 800-1600 rpm.

WATER PUMP

Type ----- Centrifugal
 Capacity ----- 55 gpm @ 4400 rpm
 Bearing ----- Permanently lubricated
 double row ball

PULLEYS

250 and 300 HP engines
 Type ----- Single
 PD
 Crankshaft ----- 6.64
 Water pump and fan ----- 7.00
 Generator ----- 2.88

Width at PD ----- .
 Ratio
 Water pump and fan to engine speed, rpm-- .94
 Generator to engine speed, rpm ----- 2.30
 340 and 360 HP engines
 Type
 Crankshaft, water pump and fan ----- Du
 Generator, water pump and fan idler ----- Sing
 PD
 Crankshaft
 Actual ----- 6.
 Effective ----- 6.
 Water pump and fan
 Actual ----- 7.
 Effective ----- 6.
 Water pump and fan idler
 Actual ----- 3.
 Effective ----- 3.
 Generator
 Actual ----- 3.
 Effective ----- 3.
 Width at PD ----- .
 Ratio
 Water pump and fan to engine speed, rpm--- .94
 Generator to engine speed, rpm ----- 2.0

BELTS

250 and 300 HP engines
 Number used -----
 "V" angle ----- 37°-4
 Pitch line length ----- 55
 Width at PD ----- .
 340 and 360 HP engines
 Number used -----
 "V" angle ----- 37°-4
 Pitch line length
 Crankshaft, water pump and fan & generator--55
 Crankshaft, water pump and fan, and idler--- 38
 Width at PD ----- .

SURGE TANK

Location in system ----- Between radiat
 top tank and return heater ho
 Capacity (qts) ----- 2
 Fill requirements ----- Fill 1/2 when weath
 is cc

CLUTCHES

FOR 3-AND 4-SPEED TRANSMISSIONS

General

Type ----- Single disk, dry plate
centrifugal

Clutch cover and pressure plate assembly

Effective plate load, lb ----- 2100-2300 ●

Type of drive ----- Steel straps

Pressure plate

Material ----- Perlitic or nodular iron

OD ----- 10.48

Clutch spring

Type ----- Circular plate diaphragm,
bent finger design

Material ----- Spring steel, heat treated

Attachment to flywheel --- 6 bolts, 3/8-16 UNC 3A, ●
1.00 long

Driven plate assembly

Type ----- Single disk, dual friction rings

Cushions ----- Flat spring steel
between friction rings

Dampers ----- 10 springs, 5 sets of 2

Friction rings

OD ----- 10.0

ID ----- 6.5

Total area (sq. inches) ----- 90.7

Material ----- Premium woven asbestos

Flywheel assembly

Flywheel

Material ----- Cast iron

OD ----- 12.54

Ring gear

Material ----- HR steel, heat treated

No. of teeth ----- 153

Width ----- .4010-.4130

PD ----- 12.75

Attachment ----- Shrink fit

● Bearings

Release

Type ----- Single row ball

Lubrication ----- Packed with high temperature,
high viscosity grease

Pilot

Type ----- Sintered powdered bronze bushing

Lubrication ----- Oil impregnated

● Controls

Clutch fork ----- Drop forged steel, pivot
mounted on ball

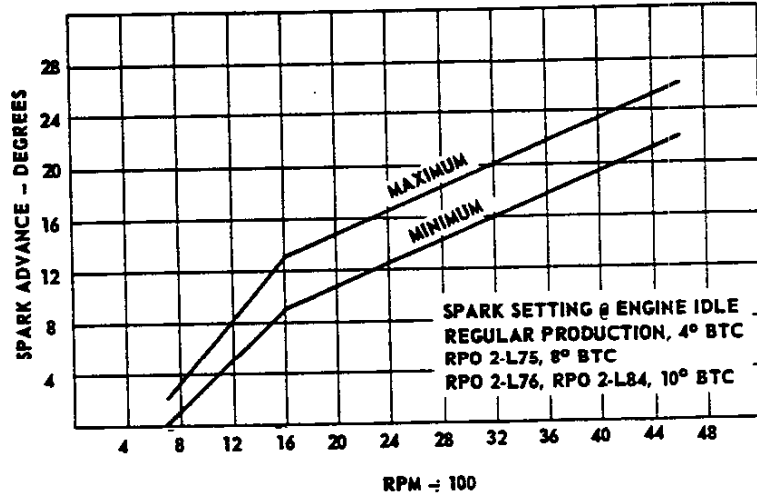
Pedal mounting ----- Pendent, from brace on dash

Clutch housing

Material ----- Aluminum alloy

Attachment to engine ----- 6 bolts, 3/8-16 UNC-
2A, 1.25 long

CENTRIFUGAL ADVANCE CHARACTERISTICS



TRANSMISSIONS

THREE-SPEED AND FOUR-SPEED

CASE

Material
3-Speed ----- Cast iron
4-Speed ----- Aluminum

GEARSHIFT

Type ----- Lever
Location ----- Floor mounted between seats
Control ----- Remote

GEARS

Type ----- Helical
Material ----- Forged steel, hardened
Synchronization

3-Speed ----- Second and third
4-Speed ----- All forward gears

Constant mesh gears

3-Speed ----- Second
4-Speed ----- First, second and third

Sliding gears

3-Speed ----- First and reverse
4-Speed ----- Reverse

Ratios

3-Speed
First ----- 2.47:1
Second ----- 1.53:1
Third ----- 1:1
Reverse ----- 2.80:1

4-Speed

250 and 300 HP engines

First ----- 2.54:1
Second ----- 1.89:1
Third ----- 1.51:1
Fourth ----- 1:1
Reverse ----- 2.61:1

340 and 360 HP engines

First ----- 2.20:1
Second ----- 1.64:1
Third ----- 1.31:1
Fourth ----- 1:1
Reverse ----- 2.26:1

LUBRICANT

Type ----- Military MIL-L-2105-B
Capacity, pts
3-Speed ----- 2
4-Speed ----- 2.5

EXTENSION

Material ----- Aluminum
Oil seal ----- Steel encased double
seal of spring loaded rubber or felt



GENERAL INFORMATION 0-2

MODEL IDENTIFICATION

Model No.	Identification
867	2 Door, 2 Passenger Convertible Coupe
837	2 Door, 2 Passenger Sport Coupe

UNIT AND SERIAL NUMBER LOCATIONS

For the convenience of servicemen when writing up certain business papers such as L.&M.R.'s, Product Information Reports, or reporting product failures in any way, we are showing below the location of the various unit numbers. These unit numbers and their prefixes are necessary on these papers for various reasons—such as accounting follow-up to production etc.

The prefixes on certain units identify the plant in which the unit was manufactured, and thereby permits proper follow-up of the plant involved to get corrections made when necessary.

Always include the prefix and suffix letters when reporting.

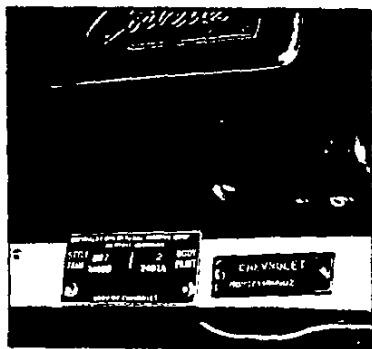


Fig. 2—Vehicle serial number and body style, body number trim and paint combination located on instrument panel brace under glove box.

KEYS AND LOCKS

Lock cylinders are furnished for service uncoded, this necessitates the coding of all replacement lock cylinders.

The side bar type lock (fig. 7) is used for the ignition, door and trunk lid on passenger cars. Glove compartment locks are wafer tumbler single bitted type having 4 tumblers on passenger cars. These locks are all coded the same allowing a usage of one key for all locks on the vehicle. To protect owners, automobile lock manufacturers stamp the lock numbers on the lock core, shaft, etc., where they will not show until the lock is removed.

To obtain the code number remove the door lock, the key number may be obtained from the lock core, shaft, etc., which will be the same on all of the other locks.

In addition, when a lock cylinder requires replacement the lock code number may be obtained either from the key, if available, or from the old lock cylinder which is being replaced.

Once the code number of the lock is obtained, look



Fig. 3—Engine unit number located on pad at front, right hand side of cylinder block.

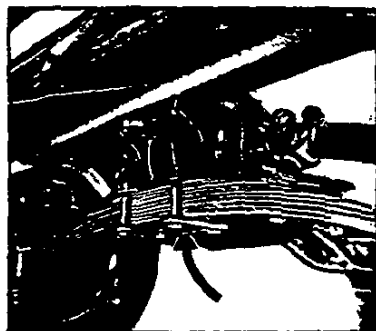


Fig. 4—Rear axle serial number located bottom surface of carrier at cover mounting flange.

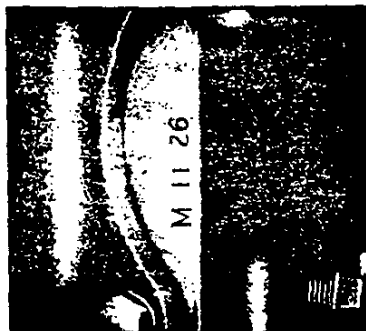


Fig. 5—Conventional transmission unit number located on rear face of case in the upper right corner.

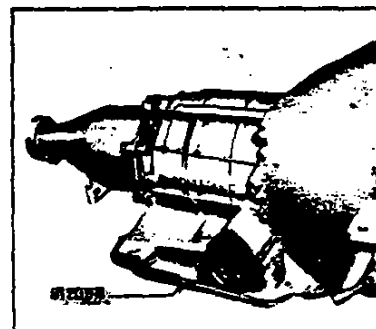


Fig. 6—Powerglide source data code stamped on bottom of oil pan.

SECTION 0

GENERAL INFORMATION AND LUBRICATION

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GENERAL INFORMATION

The 1963 Corvette Sting Ray (fig. 1) is an extensively redesigned vehicle incorporating two new body designs, a convertible coupe and a fastback sport coupe; redesigned frame and suspension and reduced

exterior dimensions. The following sections in this book provide detailed information for the service and proper maintenance of the vehicle and its separate components.

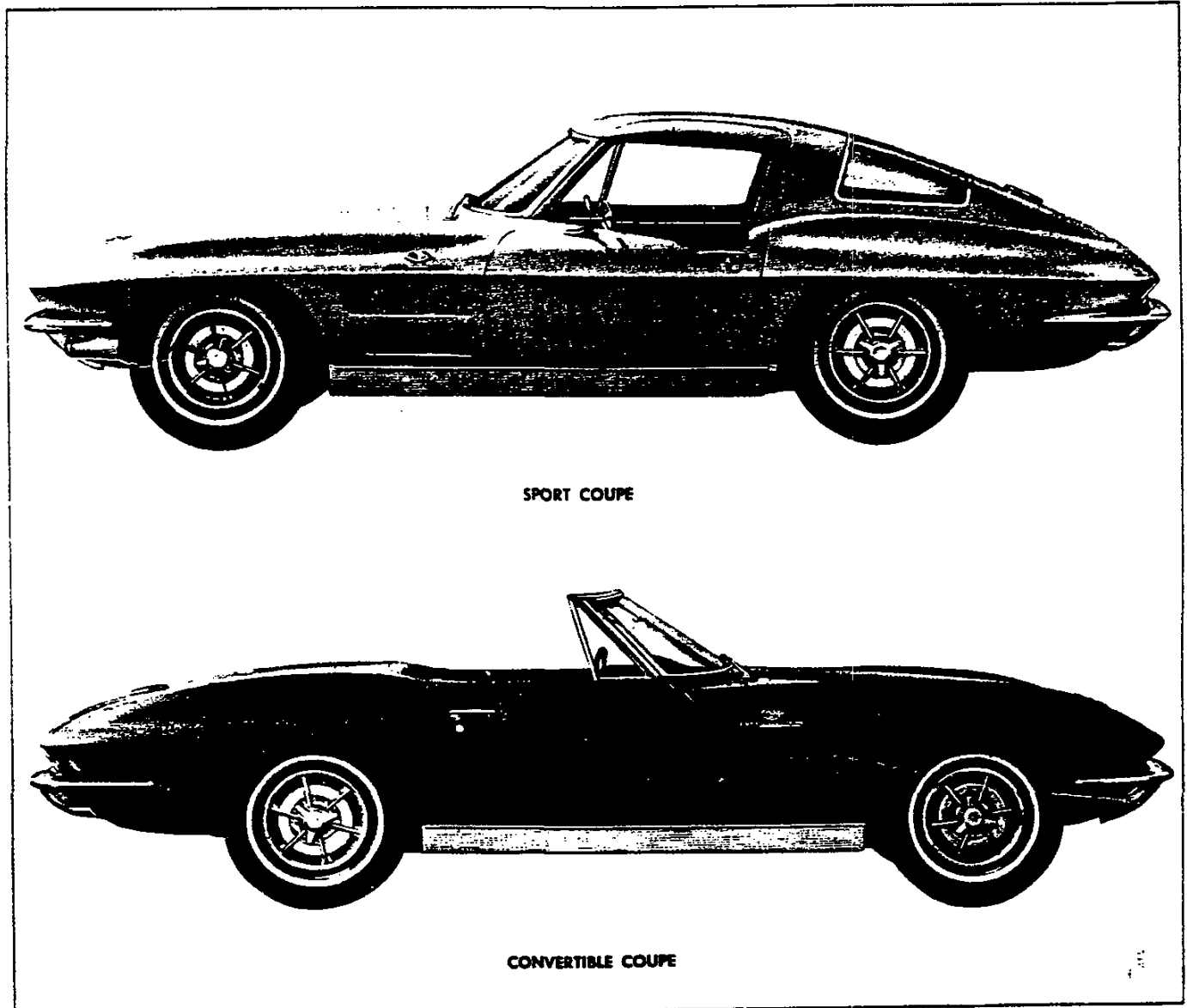


Fig. 1—1963 Corvette

GENERAL INFORMATION 0-4

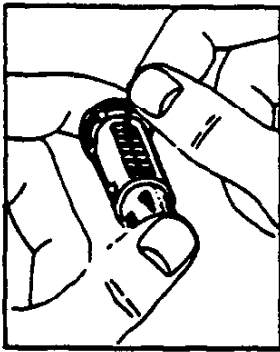


Fig. 11—Inserting Tumbler Springs

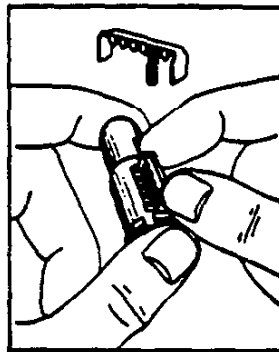


Fig. 12—Inserting Spring Retainer

Insert one tumbler spring in the space provided above each tumbler (fig. 11).

CAUTION: If the springs are tangled do not force them apart—unscrew them.

- Reverse the lock cylinders so that the head of the cylinder is now toward you. Insert the spring retainer so that one of its six prongs enters into

each of the springs and the two large end prongs slide into the slots at either end of the cylinder (fig. 12). Press the retainer down with one finger.

- To check, insert proper key and if tumblers are installed properly the side bar will be allowed to drop down. If bar does not drop down, remove the key spring retainer, springs and tumblers and reset them correctly.

NOTE: If the tumblers have not been assembled correctly and not according to the code, the tumblers can be removed from the cylinder by holding it with the tumbler slots down, pulling the side bar out with the fingers and jarring the cylinder to shake the tumblers out. This procedure is necessary because after the tumblers have been pressed down into the cylinder they are held in their slots by the cross bar.

- If after checking it is found that the lock is assembled properly, remove key and place cylinder in a vise using leather or wood on each side to prevent damage to the cylinder.

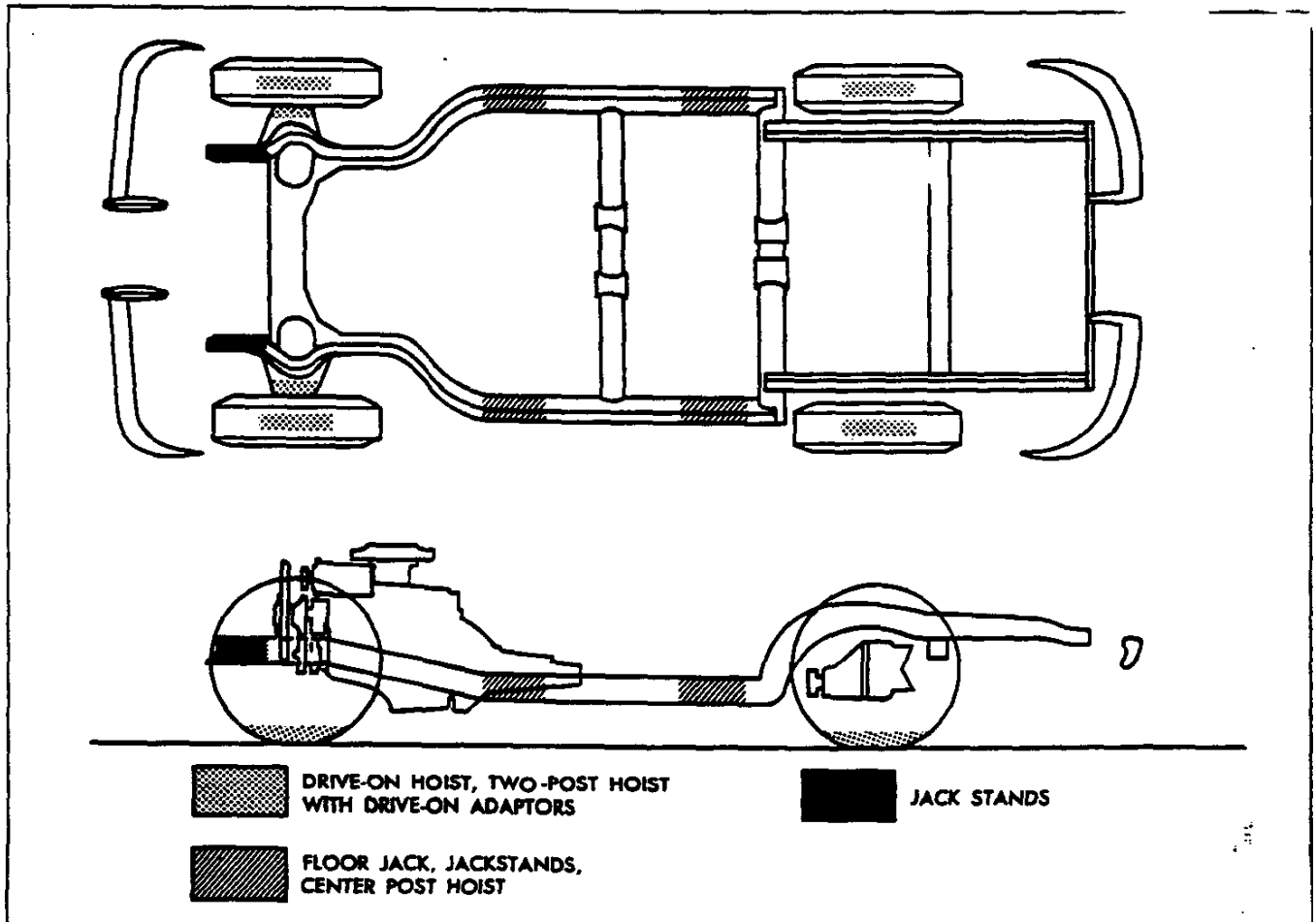


Fig. 13—Vehicle Lifting Points

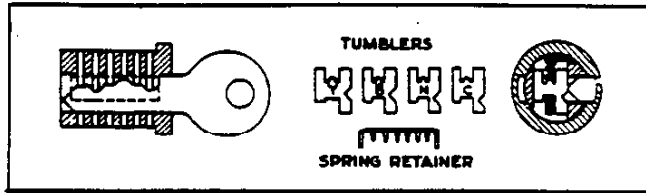


Fig. 7—Side Bar Type Lock

up this number in a key cutting book. There are two types of code booklets in general use, one which lists the cutting code by letter C, N, B and Y. Numbers or letters are always recorded from the head of the key to the end.

Numbers may be transposed to letters to numbers as follows:

Code Book—Numbers	Code Book—Letters
1	C
2	N
3	B
4	Y

All side bar locks furnished to the field by the Parts Department are un-coded, that is, they are furnished without tumblers, springs or spring retainers; these parts are serviced separately. The tumblers come in four different depths indicated by colors "C" for copper, "N" for nickel, "B" for black and "Y" for yellow.

The side bar locks have six tumbler positions, and in looking up the cutting code, the following may be used as an example. After key code number is determined, either from key or from number stamped on lock cylinder refer to your code book and record the key cutting information as follows:

Key of lock code Number	Key cutting code Number	Key cutting code Alphabetical
8109	2-3-2-1-2-4	N-B-N-C-N-Y
Cutting or Tumbler position from head of lock.	1-2-3-4-5-6	1-2-3-4-5-6

The numbers or letters (depending on code book) which are written above the cutting or tumbler position indicate the different color tumblers which are to be dropped into each tumbler slot of the lock: "C"—copper, "N"—nickel, "B"—black, "Y"—yellow.

NOTE: If code book used lists the key cutting code numerically, the numbers must be transposed to letters as previously stated in order to select proper color tumblers for installation into the lock.

In cases where a code book is not available, the diagram as shown in Figure 8 may be used to determine the tumblers required to assemble an un-coded lock cylinder.

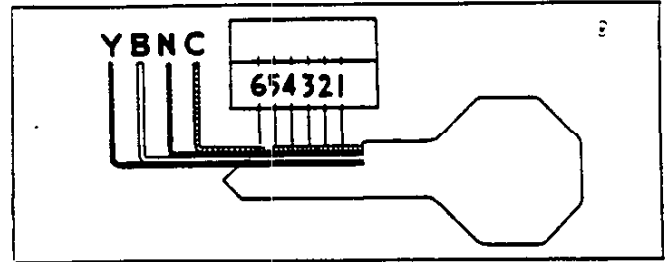


Fig. 8—Tumbler Requirement Diagram

1. Lay the key on the diagram (fig. 8) with the bottom of the key flush with the edge of the drawing head and point carefully lined up.
2. Read the code in letters C-N-B-Y from the head of key to the end from positions 1 to 6 inclusive. As each depth is determined write that letter in the blank space provided above the position numbers (1-2-3-4-5-6).
3. With the key properly lined up on the diagram, all cuts that show in the first section are to be marked "C".
4. Cuts that fall in the first black section, mark "N".
5. Cuts that fall in the White section, mark "B".
6. Cuts that fall in the second black section, mark "Y".

After the letters (C-N-B-Y) have been determined and written above the cutting positions the lock cylinder should be assembled as follows:

Lock Cylinder Assembly

1. Hold cylinder with head of cylinder away and starting at the head of the cylinder, insert the tumblers in their proper slots in the order called for by the code ribbed side toward you and long point down (fig. 9).
2. After all tumblers are in place, check for correctness with the code. Then press tumblers down with one finger (fig. 10).

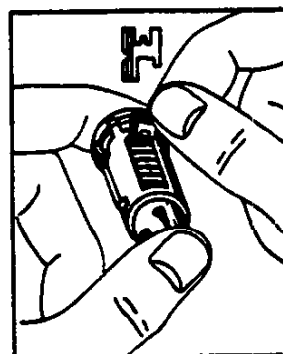


Fig. 9—Inserting Tumbler

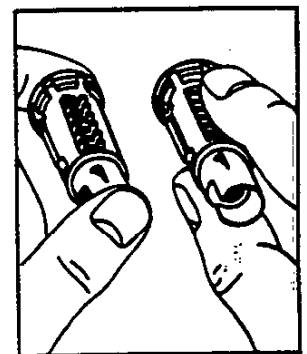


Fig. 10—Checking With Code

GENERAL INFORMATION 0-6

Check the state of charge regularly, especially in freezing weather when an undercharged battery may freeze and break.

ENGINE OIL

Engine oil should be changed at 60 day or 6,000 mile intervals, whichever occurs first. Under prolonged dusty driving conditions it may be necessary to change the engine oil more often.

CRANKCASE VENTILATION VALVE

At every oil change, more often under prolonged dusty driving conditions, the valve should be tested for proper function and replaced when necessary.

FAN BELT

Every 6,000 miles inspect fan belt for wear, fraying, cracking and tension. Belt should be retightened only when it deflects more than $\frac{1}{2}$ " with moderate thumb pressure applied midway between pulleys.

AIR CLEANER

Every 12,000 miles (more often under dusty or other adverse driving conditions) remove the polyurethane element from its support screen and clean in suitable solvent such as kerosene. Squeeze out all solvent, then soak in engine oil and squeeze out. Remove excess oil by then squeezing the element in a clean dry cloth.

OIL FILTER

The oil filter should be changed at 6,000 miles or 6 month intervals, whichever occurs first. During prolonged dusty driving conditions the filter should be changed more often.

DISTRIBUTOR

Change cam lubricator end for end at 12,000 mile intervals—Replace at 24,000 mile intervals.

FUEL FILTER

Carburetor Type Filter—Remove the fuel line and inlet fitting to replace the filter only if carburetor flooding occurs. Do not attempt to clean the filter. This filter is used on the 250 hp engine only.

In-Line Filter—Replace the entire filter every 12,000 miles. To replace: Remove inlet fitting and loosen filter bracket, then turn entire filter to remove. Observe the direction of fuel flow when installing the new filter.

BRAKES

Master Cylinder—Every 6,000 miles—Check fluid level and maintain $\frac{1}{4}$ " below filler opening with GM Hydraulic Brake Fluid, Super No. 11.

Parking Brake Cables and Linkage—Every 6,000 miles—Apply lubricant specified in Note 1

STEERING GEAR

Every 30,000 miles—Check lubricant level as follows:

1. Remove the forward and the outboard cover attaching screws.
2. Inject steering gear lubricant into the forward cover attaching screw hole until lubricant begins to come out of the inboard screw hole.
3. Replace both screws.

POWER STEERING PUMP

Check fluid level in pump reservoir every 6,000 miles or 6 months. Fill as required with Automatic Transmission fluid "Type A" with AQ-ATF-A mark. Oil should be at operating temperature and straight ahead when checking or when check operation is performed to ensure against overfilling.

FRONT SUSPENSION

Every 6,000 miles or 6 months, lubricate 4 fittings (2 fittings on each side) with lubricant specified in Note 1.

STEERING LINKAGE

Every 6,000 miles or 6 months—lubricate fittings shown below with lubricant specified in Note 1.

Manual—Fitting at each tie rod end and at relay rod (5 fittings).

Power—Fitting at each tie rod end and at power steering valve adapter and cylinder (6 fittings).

TRANSMISSION

3-Speed and 4-Speed—Every 6,000 miles—Check at operating temperature and fill as necessary to level of filler plug hole with lubricant specified in Note 1.

Powerglide—Every 6,000 miles—Check fluid level on dipstick with engine idling, selector lever in neutral "N" position, parking brake set and transmission at operating temperature. Add Automatic Transmission fluid "Type A" bearing the mark AQ-ATF, followed by a number and suffix letter "A" to "full" mark on dipstick. DO NOT OVERFILL.

7. Stake the retainer securely in place by staking the cylinder metal over both edges of the retainer ends using a suitable staking tool at right angles to the top of the retainer and from the case metal of the cylinder over the retainer at each corner.

PUSHING, TOWING AND LIFTING

Pushing Car To Start

If the battery is discharged to the point where the engine does not crank requiring a push start, the following procedure should be used: Turn off all electrical loads such as headlights, radio, heater, etc. Turn ignition key to "ON" position. After engine is started, all electrical loads may be turned on again.

Automatic Transmission

Turn ignition to ON, place selector lever in N (neutral) until a speed of 25 mph is obtained; then place selector lever in L (low).

When engine starts, move selector lever to D (drive) and proceed in normal manner.

Manual Transmission

Turn ignition to ON, depress clutch pedal, and place gearshift lever in neutral position.

As soon as car reaches approximately 15 mph, move gearshift lever to third position, and slowly release clutch pedal.

Emergency Towing

If a vehicle equipped with Powerglide becomes disabled and requires towing or pushing, speed must not exceed 30 mph. Drive shaft must be disconnected, if vehicle is to be towed at speeds above 30 mph.

Both manual and Powerglide transmissions should be towed in neutral only, with parking brakes fully released.

When towing a vehicle on its front wheels only, the

steering wheel should be secured to maintain a straight forward position.

LIFTING THE CORVETTE

Shaded areas in Figure 13 indicate recommended points for hoist or jack contact. When using a single post hoist place hoist on frame side rail behind kickup at front and forward of ≈ 3 body mount at rear. When using a twin-post hoist, two methods are recommended.

- a. If no rear axle or suspension work is contemplated, use either suspension adapters or drive-on adapters at the front, and drive-on adapters at the rear. If a need for axle work develops, use jack stands beneath the frame side rails on each side and lower rear post.
- b. If rear axle work is contemplated, use either suspension adapters or drive-on adapters at the front and frame lift adapters as shown in Figure 14. If frame lift adapters are not available, use jack stands.

NOTE: Wooden blocks bolted to steel beam shown in Figure 14 are necessary to allow beam to clear exhaust system.

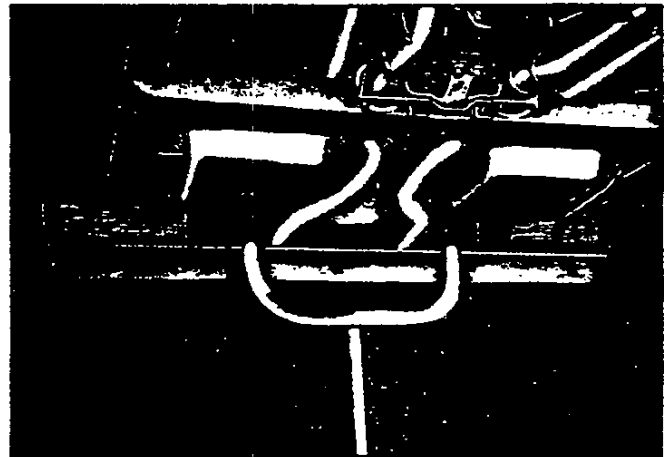


Fig. 14—Frame Lift Adapters

LUBRICATION

PERIODIC MAINTENANCE AND LUBRICATION

The time or mileage intervals on the following pages are intended as a guide for establishing regular maintenance and lubrication periods for your Corvette. Sustained heavy duty or high speed operations or operation under adverse conditions may necessitate more frequent servicing.

BATTERY

Check the fluid level in each cell of the battery regularly and keep filled with distilled water to the bottom of the split ring in the vent tube of each cell. **DO NOT OVERFILL.**

Clean and oil the battery terminals and oil the felt washer at each regular engine oil change.

Lubricate shift linkage with lubricant specified in Note 1.

WHEEL BEARINGS

Every 30,000 miles—Clean and repack front and rear bearings with a high melting point wheel bearing lubricant.

REAR AXLE

Every 6,000 miles—Check and keep filled to level of filler plug hole with lubricant specified in Note 2.

With Positraction, use only the special Positraction Rear Axle Lubricant available from your Chevrolet Dealer.

CLUTCH CROSS SHAFT

Every 6,000 miles or 6 months—Lubricate with lubricant specified in Note 1.

UNIVERSAL JOINTS

Every 30,000 miles, more often under prolonged dusty driving conditions, clean and repack with a high melting point wheel bearing lubricant.

BODY LUBRICATION POINTS

Lubricate the following items when possible.

Hood Latch Mechanism and Hinges—Apply light engine oil to pivot points. Don't oil lock pins or catch plates.

Rear Compartment Lid Release and Hinges—Apply light engine oil.

Side Door Hinge Pins—Apply light engine oil.

Door Lock Rotor and Striker Plate—Apply light engine oil or stainless stick lubricant.

Lock Cylinders—Lubricate with powdered graphite.

Window Regulators and Controls and Door Lock Remote Link—Apply light engine oil.

Gas Tank Filler Cap Hinge—Apply light engine oil.

Weatherstrips and Rubber Bumpers—Coat lightly with a rubber lubricant such as Chevrolet Spray-a-Squeak (G.M. Part No. 987883).

NOTE 1: Lubricate with water resistant EP lube (General Motors Standard GM 4751-M).

NOTE 2: Lubricate with SAE 80 or SAE 80-90 Multi-purpose Gear Lubricant meeting requirements of U. S. Ordnance Spec. MIL-L-2105B.

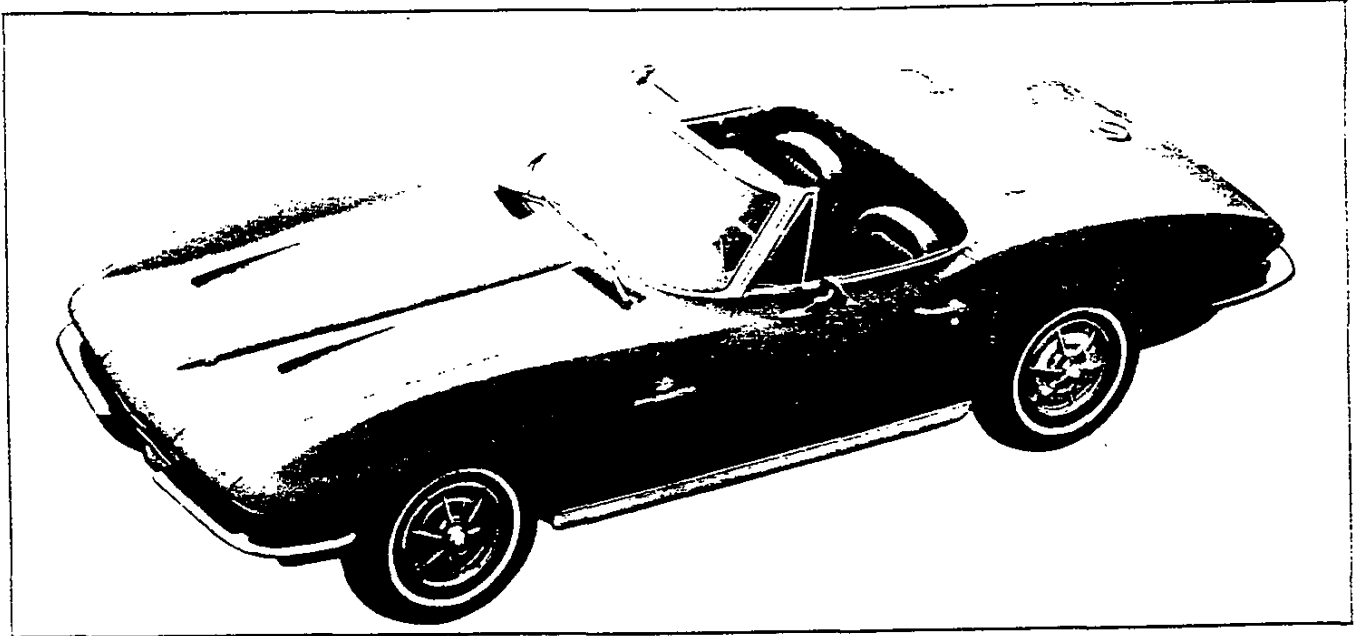


Fig. 1—Model 867 Convertible Coupe

framed in steel reinforced members (fig. 3). Door hinge and lock pillar steel members are tied as bases by longitudinal reinforcements under the door sills. Front pillars are joined by a lateral member under the instrument panel. Conventional windshield pillars and header, side roof rails and a rear cross bow lace the roof structure and connect to the lower reinforcements.

Due to absence of roof structural ties, the 867 model has sill and lock pillar reinforcement members that are effectively joined at the underbody level. Windshield header and pillars are similar to those of the 837 model.

The roof of the 867 model, completely new in contour, has provisions for the wrap-over of the window. The fiberglass roof panel is supported on all sides by

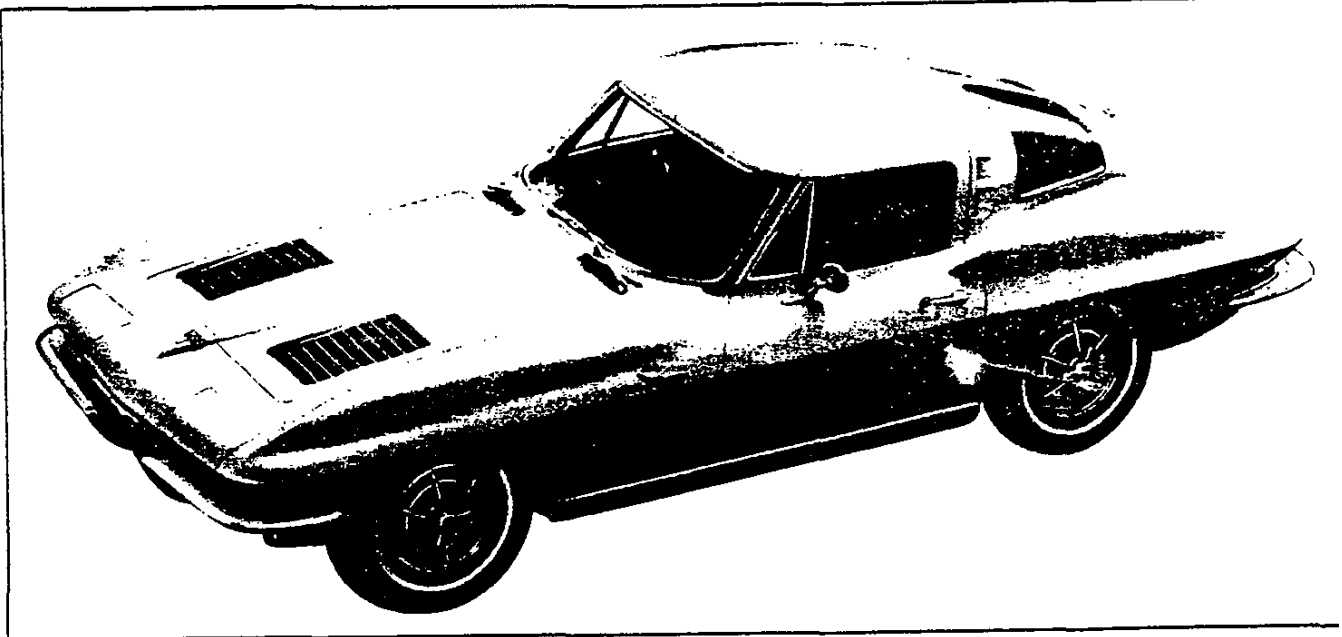


Fig. 2—Model 837 Sport Coupe

SECTION 1

BODY

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GENERAL DESCRIPTION

Two models are offered in the 1963 Corvette Sting Ray line: The two passenger Convertible Coupe, Model 867 (fig. 1) and the two passenger Sport Coupe, Model 837 (fig. 2).

A structural network of steel forms the backbone of

the new Corvette body. When combined with the fiberglass reinforced plastic body panels, the steel-plastic marriage results in a body with increased torsional rigidity and greater beaming strength.

837 model passenger compartments are completely

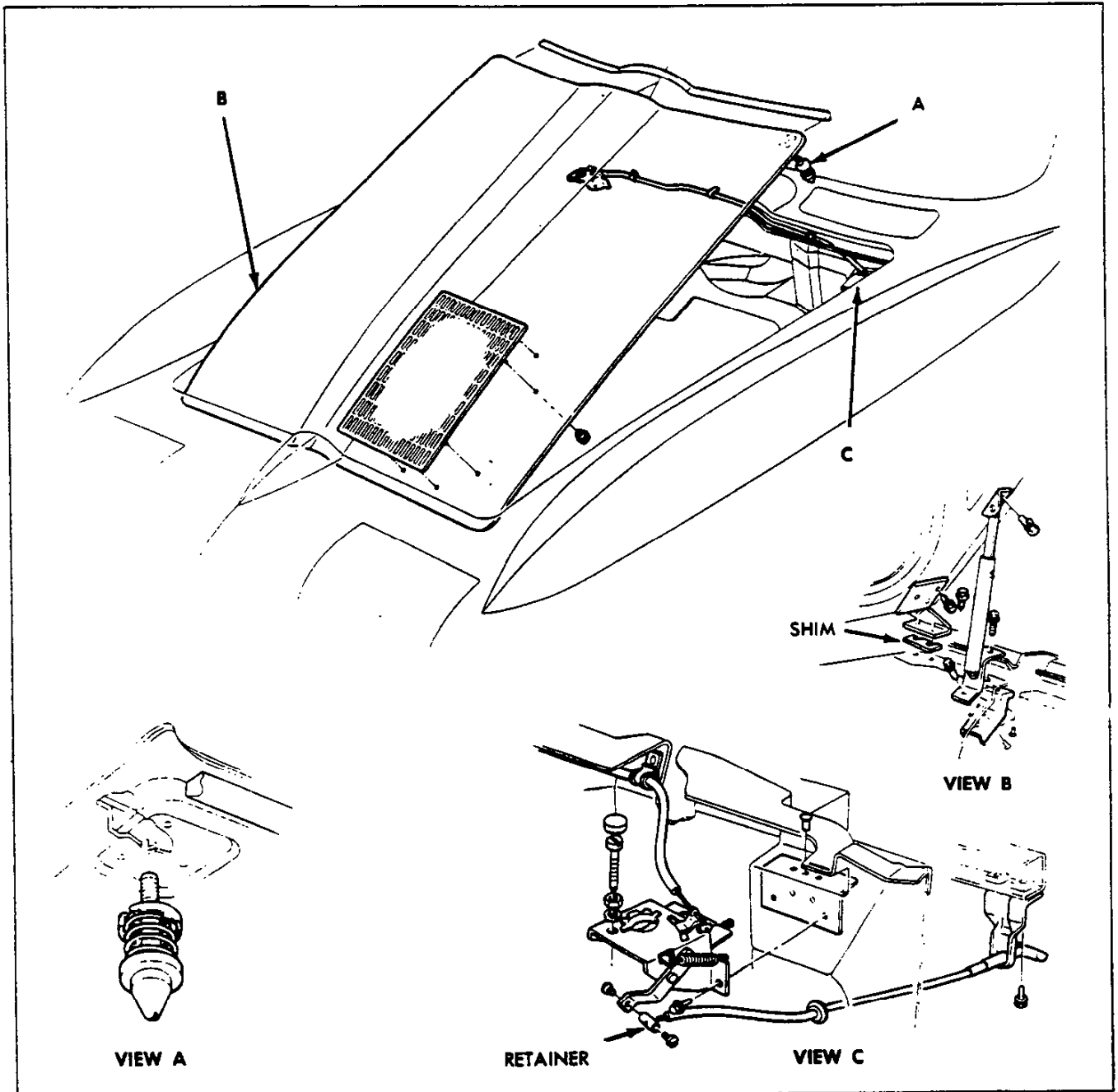


Fig. 4—Hood Hinge and Catch

as determined by the top selected as base equipment. A compartment lid opens to permit storage of the folded soft top behind the front seats.

The lid, with two strap hinges at the rear and a lock at each forward corner, is controlled with a latch type handle centered on the lid underside. The locking handle is connected to the outer locks with bowden cables that run to the side locks. Compartment lid hinges are spring loaded to facilitate opening. Springs,

under tension when the lid is closed, minimize the effort required to raise the lid. Improved sealing is obtained with the double lock arrangement as contrasted with the single center lock of last year's models.

Service procedures covering all major body components are outlined in this section along with special instructions for fiberglass body repair and refinishing. Outlines may be used for all Corvette models unless otherwise stated.

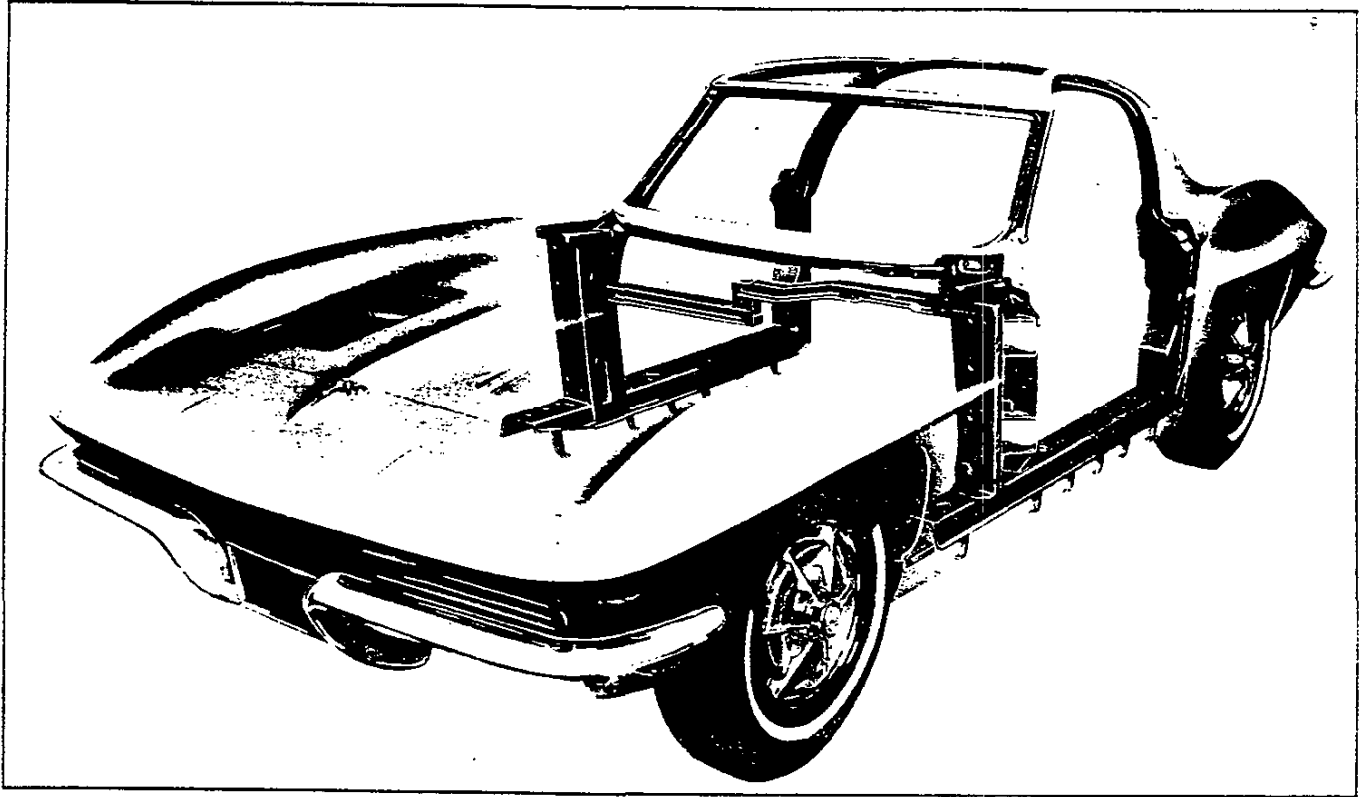


Fig. 3—Steel Inforcing Members

steel headers and side rails. A double panel fiberglass divider follows the vehicle centerline for separation of the wrap-over rear window. Rear glass is shaped to the body, each window starting at the belt line and ending at the center divider. Of note is the position of the side roof rails, inboard from the natural body outline to provide the wrap-over door opening.

The new underbody uses to best advantage all available space. Recessed areas drop below the frame level and outline in the crossmembers, transmission and propeller shaft. The underbody, including the rear wheelhouse inner panels and toe pan area, is made in one piece. Of interest is the vertical end of the underbody, rearward of the wheelhouses, that is bonded to the rear body top panel. The compartment interior ends at this point, and is effectively sealed from the fuel tank that occupies the space to the rear.

New "saddle bag" type ventilation, with cowl top air inlet and cowl side kick panel outlets, constitutes a functional as well as a structural improvement. Air drawn in through the cowl inlet with the ram-jet effect is routed to each side plenum chamber. Ventilation is controlled with valves in the interior outlets, through cable connected knobs located on the instrument panel.

Structural gains are achieved with the plenum chamber forming a "bridge" across the vehicle, spanning between steel sill reinforcements. Left and right hand and center plenum panels are bonded to the dash panel

to form this sturdy structure. Adding strength are the outer and rear sides of the plenum chambers that are integral with the dash panel. The lower edge of the dash is bonded to the underbody.

Doors for the convertible model are typical, with inner and outer panels of fiberglass reinforced with steel at hinge and lock locations. Both convertible and fastback models have new ventipanes and door locks. The handle operated ventipanes and side door glass are compound curved to continue the overall styling theme. New solid rubber weatherstripping forms the seal between the door glass and outer panel.

Door locks are the same as those used on the Chevrolet and feature improved locking for increased safety. Lock strikers and lock bolts have new double lips for more positive retention of the closed door.

Fastback model doors are of similar lower construction but have outer window frames of fiberglass and inner frames of steel. Of particular interest is the extension of the door into the roof for improved entry and exit. The top framing member of side glass is of wide section, and curves into the roof for a depth of approximately five inches. Weatherstripping and water run-off provisions are incorporated in the door and opening.

Convertible models continue with two roof styles: the folding top and the removable hardtop. In operation, both tops function similar to those of previous models. Either top is standard and both are optional

FRAME 2-2

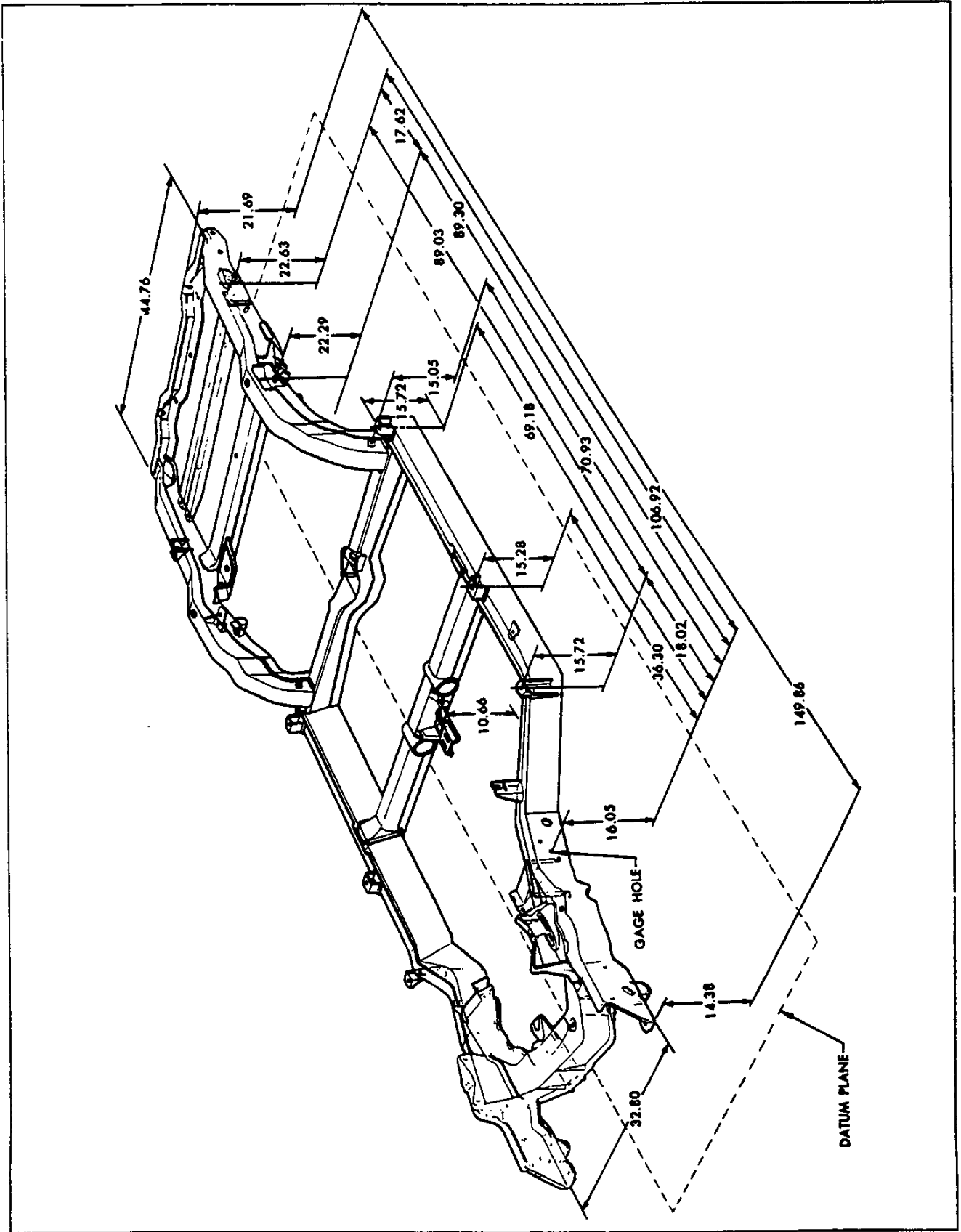


Fig. 1—Frame Dimensioned Drawing

SECTION 2

FRAME

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GENERAL DESCRIPTION

The new Corvette frame is a rigid perimeter unit, with five crossmembers. From the rear kick-up forward, trapazoidal shaped, closed side members outline and protect the passenger compartment. At the cowl area, the side members curve inward in a sweeping "S" shape, to provide a sturdy foundation for the en-

gine mounts and clearance for front wheel movement. From the kick-up rearward, box-sectioned side rails provide fore and aft support for the rear axle and suspension. Lateral support is provided by five variously shaped welded-in crossmembers, including the front unit, which formerly was bolted-in.

SERVICE OPERATIONS

CHECKING FRAME ALIGNMENT

Vehicles involved in an accident of any nature which might result in a "swayed" or "sprung" frame should always be checked for proper frame alignment in addition to steering geometry and wheel alignment.

CAR PREPARATION

Preparing the car for the frame alignment check involves the following:

1. Place the car on level surface.
2. The weight of the car should be supported at the wheel locations.
3. A visual damage inspection should be made to eliminate needless measuring. Obviously damaged or misaligned areas can often be located by sight.

TRAMMING SEQUENCE

When checking a frame for alignment in case of damage, the first step is horizontal "X" checking with a tram from similar given points on opposite sides of the frame.

Frame alignment checks on all models should be made with the tram points set at the center of each locating point indicated and the cross bar level to insure accuracy.

When "X" checking any section of the frame, the measurements should agree within $\frac{3}{16}$ ". If they do not, it means that corrections will have to be made.

If a tram gauge is not available, the "plumb bob" method of checking may be used. To assure any degree of accuracy when using this method, the vehicle should be on a level floor.

By using this method, it is only necessary to have a piece of cord attached to an ordinary surveyor's plumb bob. When measuring the distance between two points, the free end of the cord should be placed on the reference point allowing the plumb bob to hang on the floor. A check mark should be made on the floor just under the tip of the plumb bob. This operation should be repeated at all reference points. With these points located on the floor, they may easily be measured with a rule.

The second step is checking the vertical dimensions from the datum plane to the points to be trammed. As an example Figure 1 indicates that the measurement (calculated on a horizontal plane) between reference points of a dimension line, running from the front lower edge of the frame side rail to the top edge of the rear crossmember, is from the datum plane a vertical height difference of 7.31 inches between the forward location (14.38) and the rearward location (21.69). This means the vertical pointer used at the rearward location should be positioned so as to extend 7.31 inches further from the tram bar than the pointer used at the forward location. With the proper settings the tram bar will be on a plane parallel to that of the frame. The exception to this would be when one of the reference locations is included in the misaligned area; then the parallel plane between the frame and the tram bar may not prevail. After completion of the repairs, the tram gage should be set at the specified dimension to check the accuracy of the repair operation.

ALIGNMENT REFERENCE POINT DIMENSIONS

Dimensions to holes are measured to dead center of the holes and flush to the adjacent surface metal.

GENERAL DESCRIPTION

The 1963 Corvette front suspension is the short, long arm independent type with coil springs and rubber bushed, pivoting upper and lower control arms connected to the steering knuckles through pivoting ball joints. Wheel bearings are tapered roller.

The upper and lower control arm pivot shafts are bolted to a fixed suspension crossmember with shims provided between the upper pivot shaft and the crossmember for caster and camber angle adjustments. Control arm cross-shafts pivot in rubber torsion bushings pressed into the control arm.

The coil springs are located between the lower control arm and the suspension crossmember. The spring lower end is seated in the lower control arm, and the upper end extends into a formed housing in the cross-

member. The direct, double-acting shock absorbers are centered inside the spring and bolted to the lower control arm and the suspension crossmember.

The newly-designed ball joints contain a phenolic liner coated with a special resin which has an extremely low coefficient of friction. This design allows for extended lubrication periods on the ball joints. See General Information and Lubrication, Section O, for further lubrication information.

A transverse mounted stabilizer bar is linked to the lower control arms and rubber mounted to the suspension crossmember.

For specific data and specifications refer to Specifications, Section 14.

MAINTENANCE AND ADJUSTMENTS

FRONT WHEEL BEARINGS—ADJUST

The proper adjustment of the front wheel bearings is an important service operation that has a definite bearing on safety. A car with improperly adjusted front wheel bearings lacks steering stability, has a tendency to wander or shimmy and cause excessive tire wear. In an effort to provide for more accurate adjustments the spindles are drilled both vertically and horizontally and the adjusting nuts are slotted on all six sides.

1. Jack up front end of vehicle. Remove hub cap and dust cap. Remove cotter pin from end of spindle.
2. Tighten spindle nut to 15 ft. lbs. (or 180 in. lbs.) torque while rotating wheel.
3. Back off adjusting nut one flat and insert cotter pin.
4. If slot and cotter pin hole do not align, back off adjusting nut an additional $\frac{1}{2}$ flat or less as required to insert cotter pin.
5. Spin the wheel to make sure that it rolls freely. Properly lock the cotter pin by spreading the end and bending it around.

Install the dust cap and hub cap or wheel disc.

NOTE: These tapered roller wheel bearings should have zero preload and .000" to .007" end movement when properly adjusted.

6. Remove jack and lower vehicle.

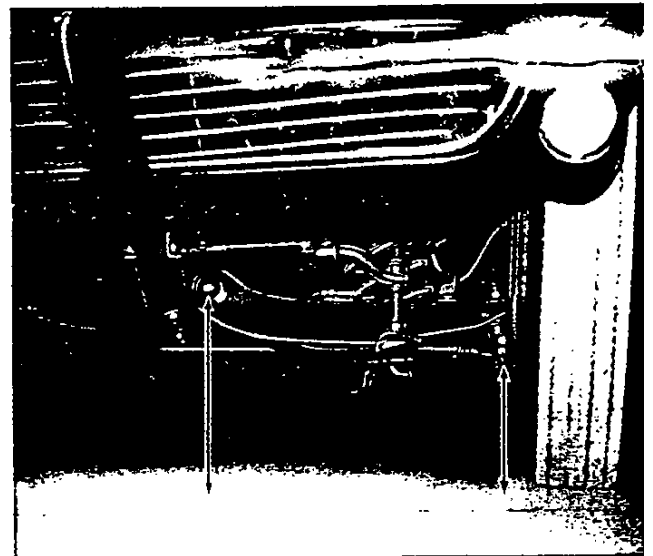
FRONT WHEEL ALIGNMENT

Front wheel alignment consists of the inspection, maintenance and adjustment of all the inter-related steering angles of the front suspension. The correct

adjustment of these angles (camber, caster, ball joint inclination, toe-out on turns and toe-in) must be maintained to assure ease and stability of steering and satisfactory tire life.

Alignment Preliminary Steps

There are several different types of front end alignment machines, all of which outline proper procedure for checking factors of front wheel alignment. The instructions furnished with each type of machine should be followed. All checks must be made with the



SECTION 3

FRONT SUSPENSION

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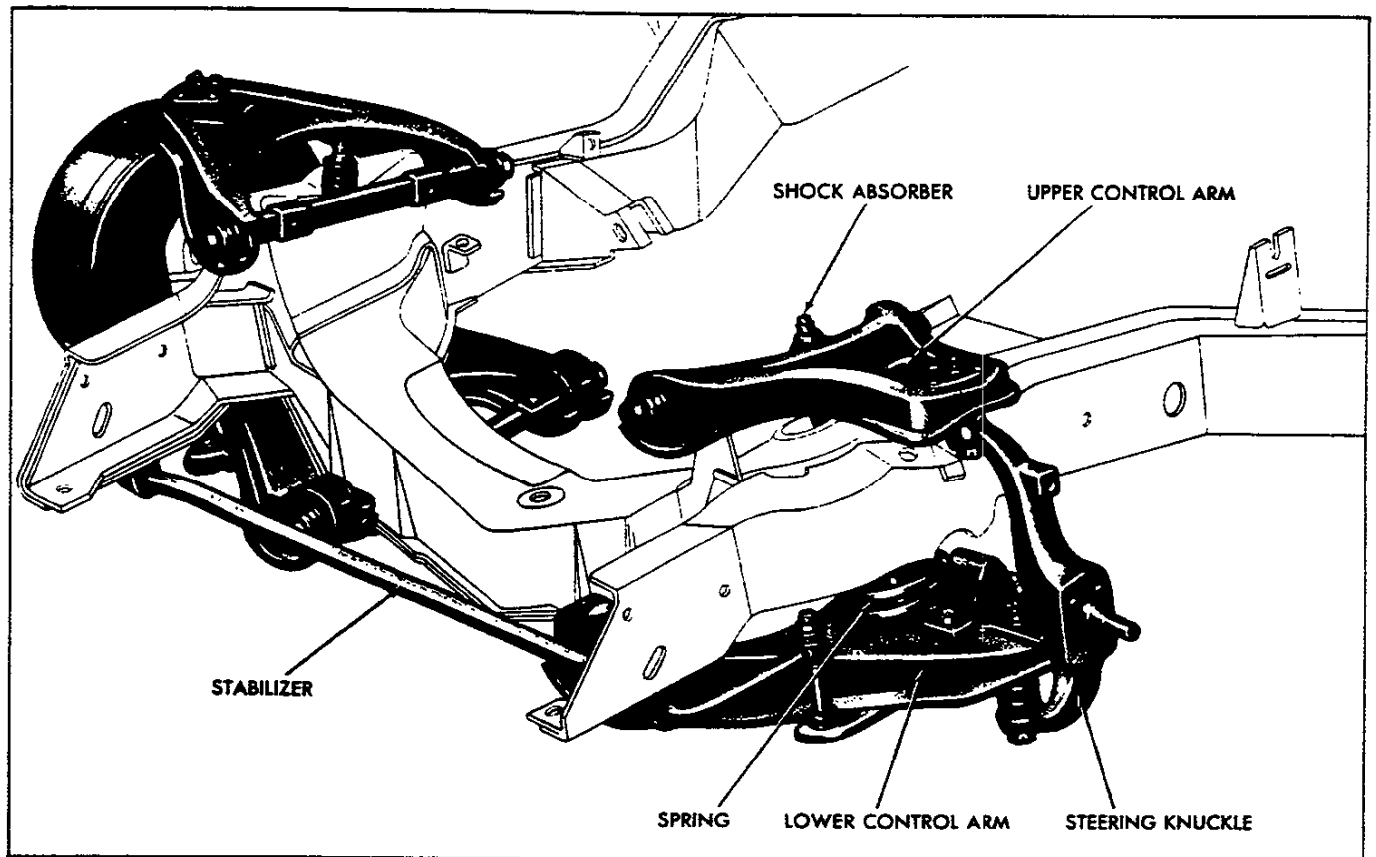


Fig. 1—Front Suspension Components

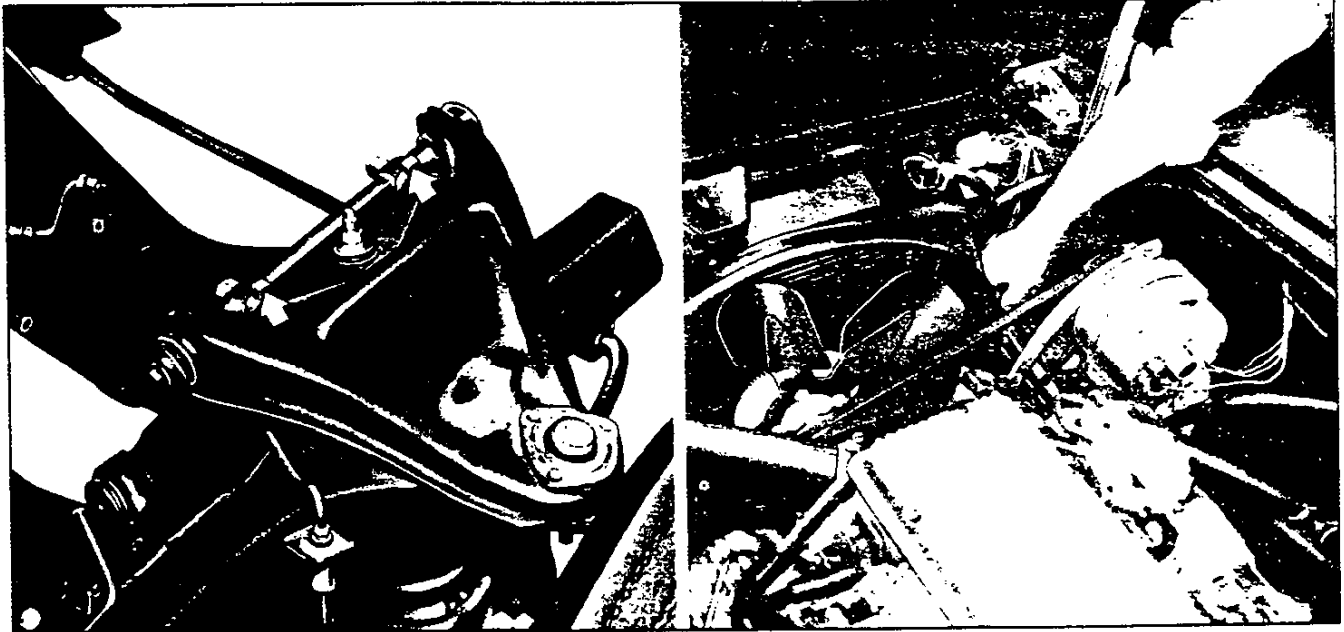


Fig. 4—Caster and Camber Adjustment

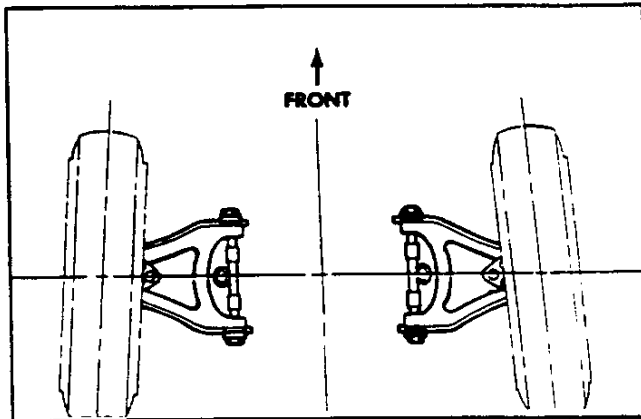


Fig. 5—Toe-In Diagram

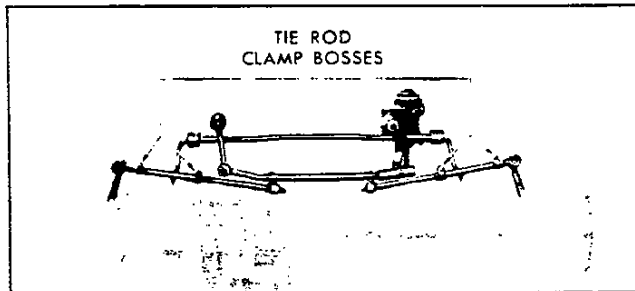


Fig. 6—Toe-In Adjustment

tilt of the steering knuckle. From this definition, and from the definition of camber (outward tilt of the wheels), it is evident that one cannot be corrected

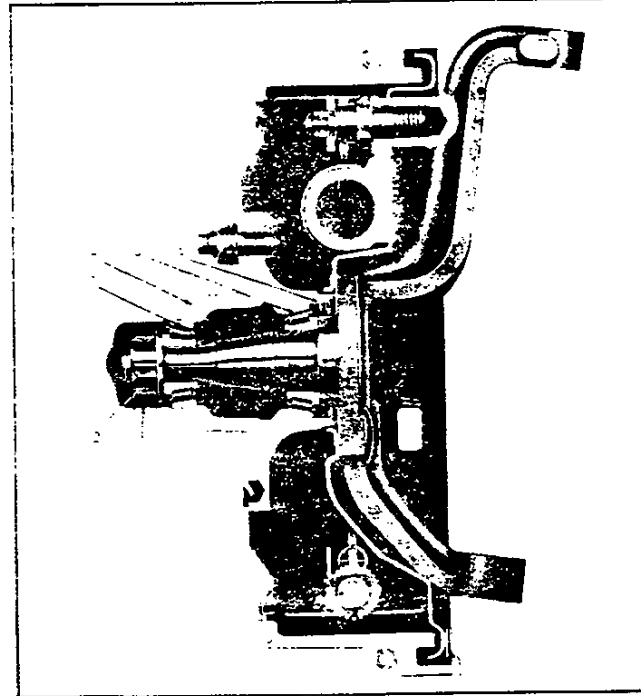


Fig. 7—Front Wheel Hub Cross-Section

Steering Axis Inclination

Steering axis inclination, comparable to king pin inclination in vehicles using king pins, is the inward

- 1. Dust Cap
- 2. Bearing Adjusting Nut
- 3. Outer Bearing

- 4. Wheel Hub
- 5. Inner Bearing
- 6. Seal

vehicle level and at curb weight. Preliminary inspection of the vehicle before checking front wheel alignment should include:

1. Loose or improperly adjusted steering gear.
2. Steering gear housing to frame mounting.
3. Excessive wear in spherical joints or steering shaft coupling.
4. Tie rod and steering connections.
5. Front riding heights. (See Figure 2)
6. Tire inflation.
7. Wheel and tire balance.
8. Wheel bearing adjustment.
9. Shock absorber operation.

Toe-out on turns should be checked only after caster, camber and toe-in have been checked and adjusted to specifications.

Riding Height and Front Coil Spring Sag

If the front suspension is visibly sagging during the alignment preliminary checks, the following procedure should be followed to determine whether the front spring heights are within correct limits.

1. Position car on smooth, level floor.
2. Bounce and rock the car several times and allow it to settle to a normal height.
3. Measure the distance from the floor to the center of the front inner pivot of lower control arm (fig. 2). Record this measurement.
4. Measure the distance from the floor to the lower face of the lower steering knuckle boss for the spherical joint on the same side of the vehicle. Record this measurement.
5. The difference between these two measurements, should be $3\frac{3}{8} \pm \frac{1}{2}$ ".

6. Measure the opposite side of the vehicle in a similar manner. It is essential that the two differences be within $\frac{1}{2}$ ".

Caster

NOTE: Before adjusting caster and camber angles after complaint of excessive tire wear or poor handling, the front bumper should be depressed and quickly released to allow car to return to its normal height.

The caster angle (fig. 3) is the angle measured between a true vertical line through the center of the wheel and the center line through the upper and lower ball joints. The correct caster angle or positive backward tilt should be $1\frac{3}{4}^\circ \pm \frac{1}{2}^\circ$. Caster adjustments are made by means of shims between the upper control arm inner support shaft and the frame side rail support bracket. The addition of shims at the front bolt or removal of shims at the rear bolt will decrease positive (backward) caster. A $\frac{1}{32}$ " shim will change caster angle $\frac{1}{4}^\circ$.

Camber

The camber angle (fig. 3) is the angle measured between a true vertical line and the centerline drawn through the vertical plane of the wheel and tire. The correct camber angle or outward tilt of the front wheels should be $\frac{3}{4}^\circ \pm \frac{1}{2}^\circ$. Adding or removing shims at both front and rear bolts of upper control arm support shaft will adjust camber. A $\frac{1}{32}$ shim will vary camber $\frac{1}{8}^\circ$.

NOTE: Both caster and camber can be adjusted in one operation.

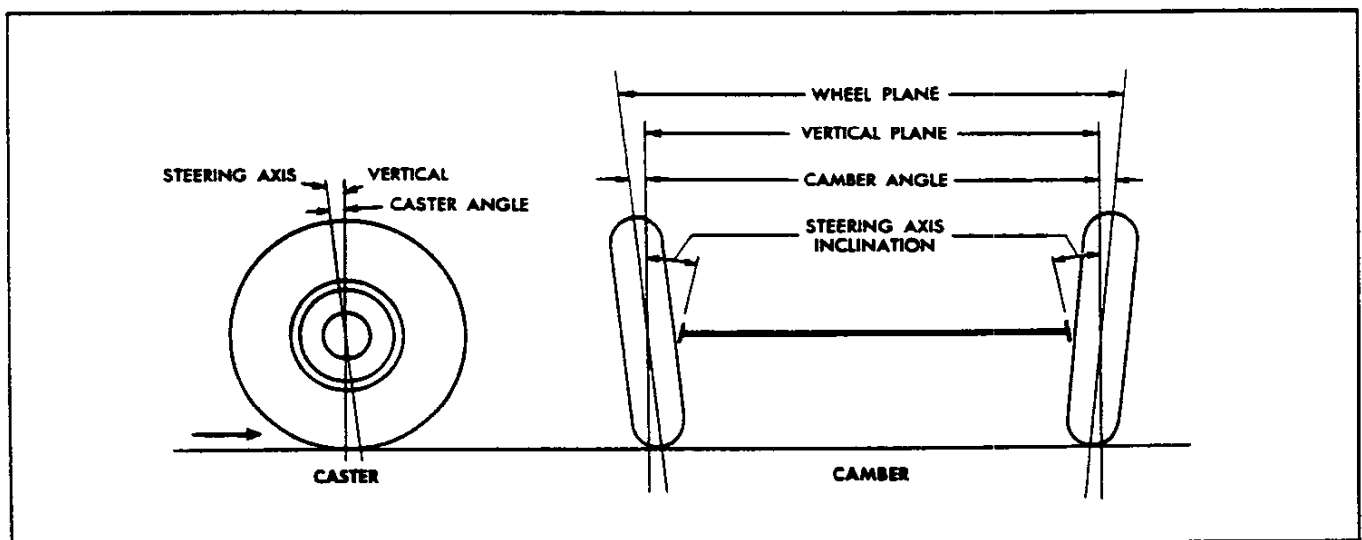


Fig. 3—Caster and Camber Diagram

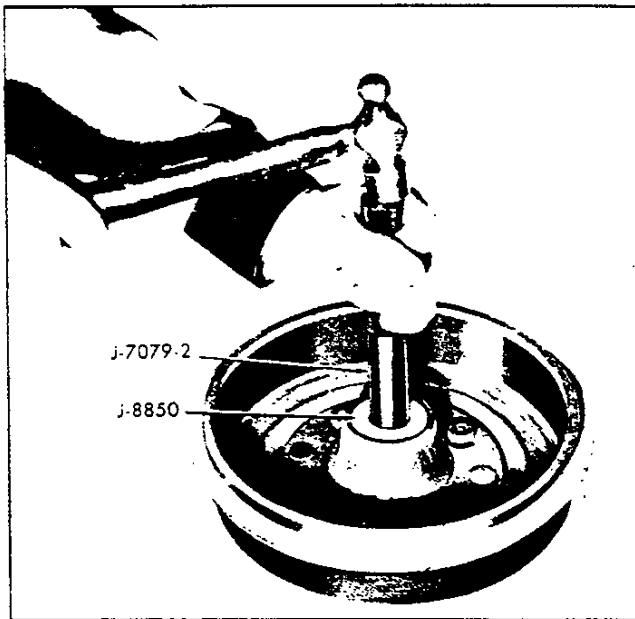


Fig. 9—Installing Front Hub Inner Bearing

Replacement of Wheel Hub

When replacement of wheel hub is necessary because of excessive distortion of the wheel flange, bearing bore diameter out-of-round, or damage to hub bolts, the hub is available as an assembly with bolts installed at the factory. Install wheel roller bearing cups as outlined under "Front Wheel Bearings—Repairs."

It may be necessary, however, to replace only damaged wheel hub bolts. In this case, service the hub in the following manner:

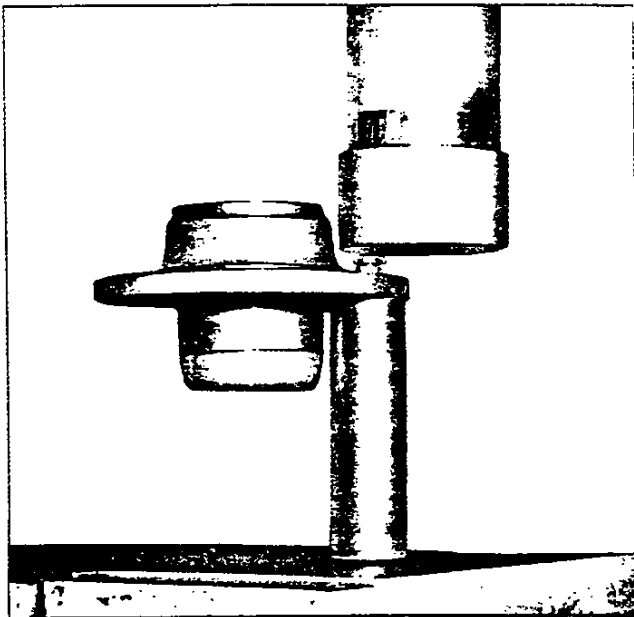


Fig. 10—Installing Front Wheel Hub Bolts

1. Remove the hub bolts with a press or hammer. These bolts are not peened into the hub. Do not damage wheel mounting surface on hub flange.
2. Install new serrated bolt into hole in hub. Tap lightly with a hammer to start bolt serrations in hole, making sure that bolt is square with hub flange.
3. Press bolt into flange until head is fully seated against hub flange (fig. 10).
4. If bearing cups have been removed, install new cups using Tool J-8849 on the outer and Tool J-8850 on the inner cup.

Installation

1. Pack both inner and outer bearings with high melting point wheel bearing lubricant.
2. Place inner bearing in hub, then install a new inner bearing felt seal assembly. Seal flange should face bearing cup.
3. Carefully install hub over steering spindle.
4. Install outer bearing, pressing it firmly into the hub by hand.
5. Install spindle washer and adjust drum nut tight and adjust wheel bearings as outlined under "Front Wheel Bearings—Adjust."
6. Install drum over hub bolts making sure alignment tab on drum web indexes with hole in wheel hub. This will assure proper drum alignment with hub bolts and hub pilot diameter.
7. Install wheel and partially tighten wheel nuts. Re-adjust brake shoes to original setting. It may be necessary to re-adjust brake shoes on both front and/or rear wheels to assure balanced brake adjustment. See Section 5 for brake adjustment procedure.
8. Lower vehicle to floor, tighten hub wheel nuts and install hub cap.

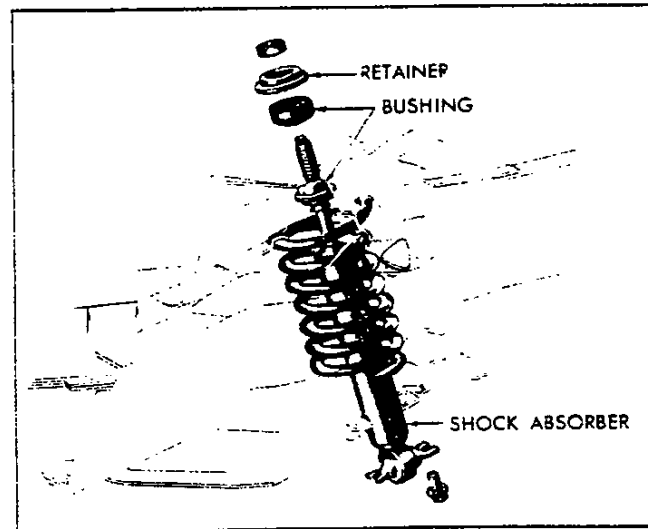


Fig. 11—Shock Absorber

without changing the other. The correct steering axis inclination should be $7\frac{1}{4}^\circ \pm \frac{1}{2}^\circ$.

Toe-In Adjustment

Toe-in, or the inward pointing of both front wheels, is checked with the wheels in a straight ahead position. It is the difference of the distance measured between the extreme front of both front wheels and the distance measured between the extreme rear of the wheels. Correct total toe-in should be $\frac{1}{8}$ " to $\frac{3}{8}$ ".

If the equipment being used measures the toe-in of each wheel individually, the following procedure should be used:

1. Set steering gear on high point, mark 12 o'clock position on steering shaft, and position steering wheel for straight ahead driving.
2. Loosen clamp bolt at each end of each tie rod and adjust to a total of $\frac{1}{8}$ " to $\frac{3}{8}$ " toe-in (fig. 6).
3. Position inner tie rod clamp bosses forward to 90° down to avoid stabilizer link bolt interference.

If a tram gauge is used, the following procedure should be used:

1. Set front wheels in a straight ahead position.
2. Loosen clamp bolts on one tie rod and adjust for $\frac{1}{8}$ " to $\frac{3}{8}$ " toe-in.
3. Loosen other tie rod clamp bolts. Turn both rods the same amount and in the same direction to place the steering gear on its high point and position the steering wheel for straight ahead driving.
4. Position inner tie rod clamps with bolt horizontal and down. Position outer clamps with bolt vertical and to the rear.

Cornering Wheel Relationship

Cornering wheel relationship, or toe-out on turns, is determined by the angle of the steering arms and is not adjustable. If this measurement does not fall within the limits shown in Specifications Section, it will be necessary to replace the steering arm on the wheel side that does not fall within limits.

SERVICE OPERATIONS

FRONT WHEEL HUB

Removal

1. Remove hub caps, partially loosen wheel nuts and raise vehicle from floor. Remove wheel nuts and wheel.
2. Remove brake drum. In some cases it may be necessary to back off brake adjustment because of scored drum or unevenly worn brake linings. Refer to Section 5, Brakes, for correct adjustment.
3. Check brake drum for concentricity, damaged pilot diameter or scored braking surface. Lightly sand braking surface and wipe clean.
4. Remove hub grease cap, cotter pin, spindle nut and washer. Remove hub.
5. Remove outer bearing from hub. The inner bearing will remain in the hub and can be removed by prying out the inner grease seal. Discard seal.
6. Wash bearings in solvent and air dry.

Inspection

1. Check bearings for cracked separators or worn or pitted rollers and races.
2. Check brake drum for out-of-round or scoring.
3. Check fit of bearing outer races in hub.

Repairs

Replacement of Bearing Races

1. Make two bearing cup removers out of $\frac{7}{16}$ " square steel stock as shown in Figure 8.
2. Insert removers through hub, indexing ends into

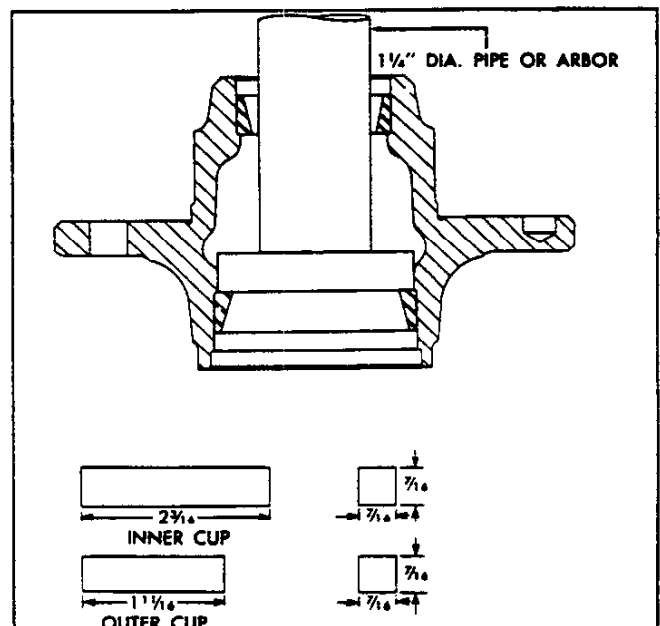


Fig. 8—Front Wheel Bearing Cup Removers

3. slots in hub shoulder behind bearing cup.
3. Using a suitable extension pipe or rod, press bearing cups from hub.
4. Install new bearing cup in hub using Tool J-8849 on the outer and Tool J-8850 on the inner cup (fig. 9). Use driver handle J-8092 with the installers. Make sure that the bearing cups are not cocked and are fully seated against shoulder in hub.

REAR SUSPENSION AND DRIVELINE 4-2

The 1963 Corvette independent three-link type rear suspension consists of a fixed differential carrier which is rubber mounted to the frame at three points, with the strut rods, drive shafts and torque control arms forming the three links at each wheel, and a transversely mounted multi-leaf spring (fig. 1).

The box section trailing torque control arms are mounted at the forward end into frame side member openings through pivot bolts and rubber bushings, and extend rearward to connect to the leaf spring. The wheel spindles and spindle supports are attached to the torque arms through four bolts pressed into the arm. Rear wheel toe-in angle is adjusted through the use of variable thickness shims inserted between the torque arm and the frame side member web at the forward pivoting joint.

The rear wheel spindles are driven through double U jointed, tubular driveshafts which are flange mounted to a splined spindle flange at their outboard end and U bolted to the differential side gear yokes at their inboard end. Wheel spindle support houses the inner and outer tapered roller bearings, two to each wheel. Bearing adjustment is made through the use of a spacer and variable thickness shims between the bearings.

The spindle supports also incorporate integrally forged, fork-shaped mounting brackets to accept the

outer ends of the rubber-bushed strut rods. The strut rods are mounted laterally from the spindle support to a bracket bolted to the lower surface of the axle carrier. The strut rod connection at this point is with an eccentric cam arrangement and provides for rear wheel camber adjustment.

The direct, double-acting shock absorbers are attached at the upper eye to a frame bracket and at the lower eye to the strut rod mounting shaft which incorporates a threaded stud for the shock absorber lower eye.

The transversely mounted multi-leaf spring is clamp bolted at the center section to a lower mounting surface on the differential carrier cover. The outer ends of the main leaf are provided with a hole through which the spring is link bolted to the rear of the torque control arms. The spring assembly is provided with full length liners.

This type of independent three-link parallel suspension reduces overall vehicle weight and more importantly in this type of vehicle design, greatly reduces unsprung weight while eliminating wheel tramp and torque steer. Drive reaction torques are absorbed through the rubber-mounted axle carrier and controlled by the trailing torque control arms, while vehicle sway is effectively controlled by the rubber-mounted strut rods and drive shafts.

MAINTENANCE AND ADJUSTMENTS

Periodic maintenance of the rear suspension consists of checking spring mounting bushings, spring leaf liners, torque control arm bushings and strut rod bushings. Camber and toe-in should be inspected and corrected where necessary if rear tires show unusual wear. Spindle bearings should be disassembled and re-packed as directed in Section 0—General Information and Lubrication.

WHEEL ALIGNMENT

Camber

Wheel camber angle is obtained by adjusting the eccentric cam and bolt assembly located at the inboard mounting of the strut rod (fig. 2). Place rear wheels on alignment machine and determine camber angle. To adjust loosen cam bolt nut and rotate cam and bolt assembly until $-0^{\circ}20' \pm 30'$ camber is reached. Tighten nut securely and torque 55-70 lb. ft.

Toe-Out

Wheel toe-out is adjusted by inserting slotted shims of varying thickness inside the frame side member on both sides of the torque control arm pivot bushing (fig. 3). Shims are supplied in thicknesses of $\frac{1}{32}$ ", $\frac{1}{8}$ " and $\frac{1}{4}$ ". To adjust toe-out when necessary, loosen torque arm pivot bolts until shims are free enough to remove. Position torque arm assembly to obtain total toe-in of 0" to $\frac{1}{8}$ ". Shim gap toward vehicle centerline between end of control arm bushing and frame side inner wall.

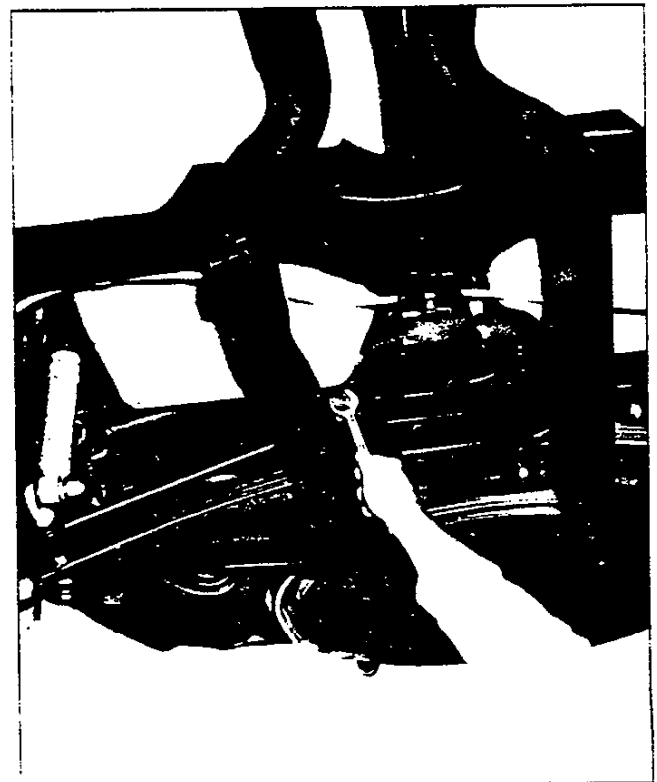


Fig. 2—Adjusting Rear Wheel Camber

SECTION 4

REAR SUSPENSION AND DRIVELINE

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REAR SUSPENSION

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GENERAL DESCRIPTION

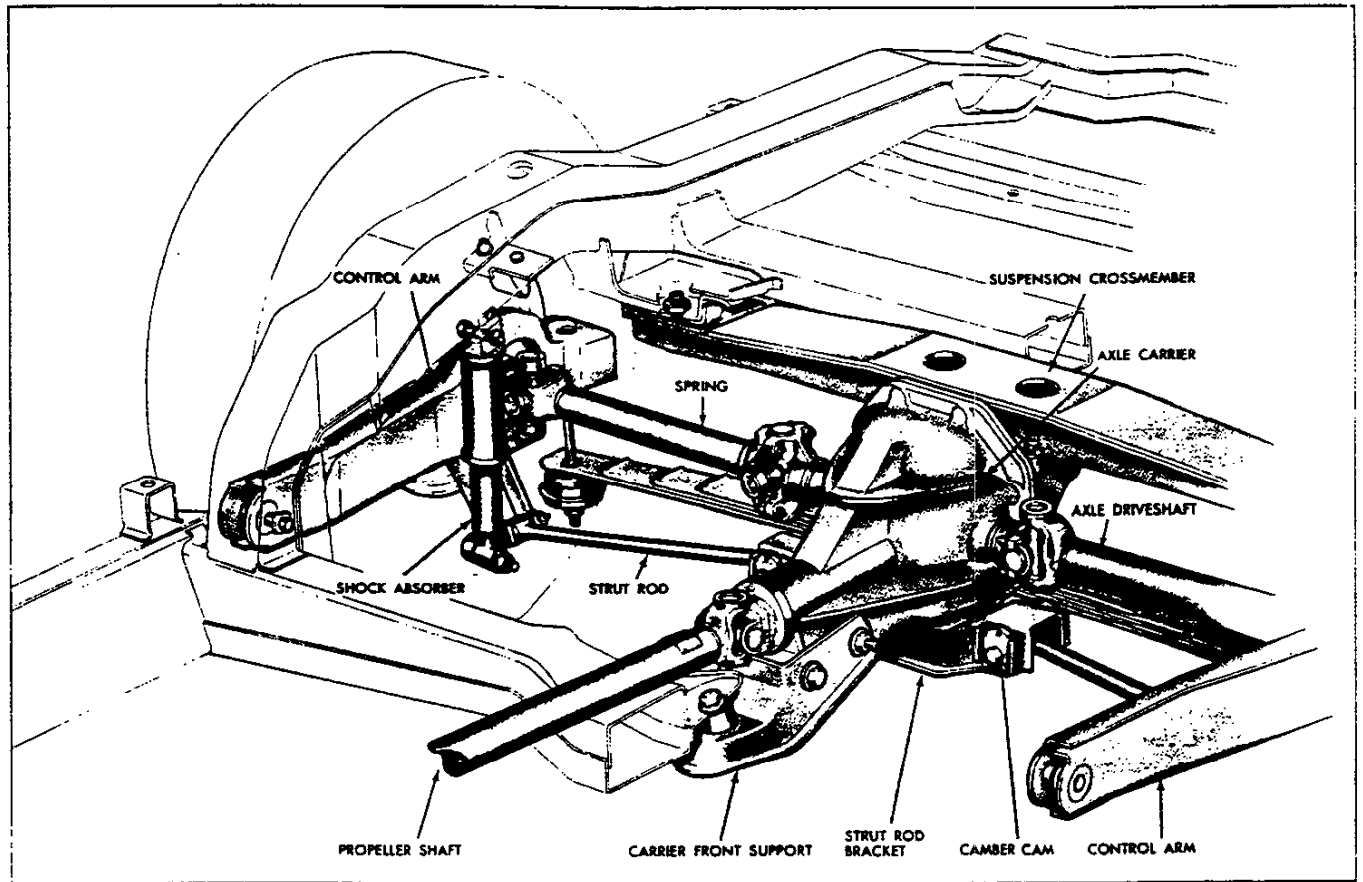


Fig. 1—Rear Suspension and Driveline Components

REAR SUSPENSION AND DRIVELINE 4-4

2. Remove spindle nut cotter pin, spindle nut and washer. Pull spindle drive flange off spindle.
3. Remove brake drum and pull spindle out of spindle support (fig. 6).
4. Pry out spindle support inner and outer seals and remove race and roller assemblies. Slide shim and bearing spacer out of spindle support.
5. Note size of shim used. If dial indicator reading obtained in Step 4 of Inspection was over .007", select a shim thinner by the amount needed to bring end play within limits. If dial indicator reading was less than .001", select thicker shim to bring movement within limits.

NOTE: Shims are furnished in thicknesses from .097" to .145" in increments of .006".

Example: Bearing end play reading = .011", .004" over limit.

Bearing shim now in use = .145".

New shim installed = .139", .006" smaller.

End play is now decreased by .006" and is .005", within the .001"-.007" limit.

6. After determining shim thickness, install spindle outer seal, outer bearing, bearing spacer and shim, and inner bearing. Tap new inner seal into position and install drive flange over spindle splines. Install spindle washer and nut, torque 50 lb. ft. and insert new cotter pin. Rotate spindle to check for free rotation.
7. Measure bearing end play as described in Steps 3

and 4 under Inspection. If shim thickness has been computed properly as described in Step 5 above, end play should be within limits. If not within limits, disassemble spindle and repeat procedure, varying shim thickness as necessary.

8. Reassemble axle driveshaft and install brake drum and wheel and tire assembly to wheel spindle. Adjust camber cam. Lower vehicle to original location and road test for bearing operation.

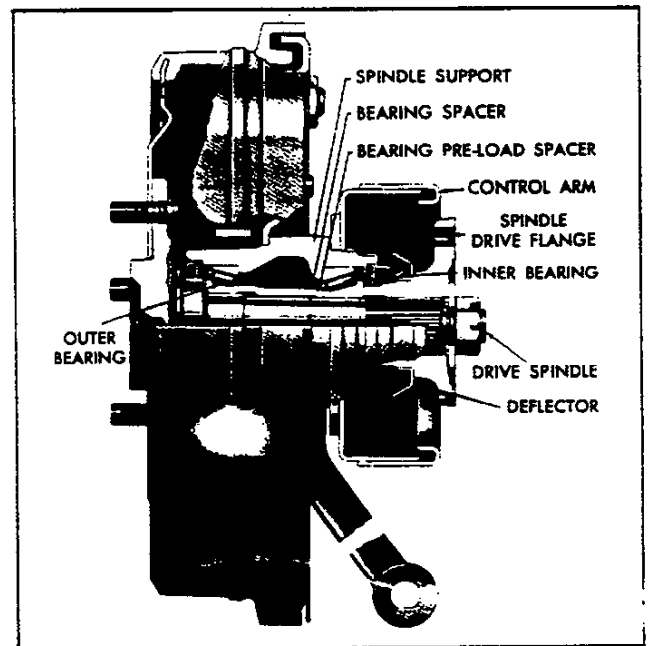


Fig. 7—Wheel Spindle and Support Cross-Section

SERVICE OPERATIONS

WHEEL SPINDLE AND SUPPORT—Figure 7

Removal

Remove and disassemble wheel spindle assembly as outlined in Wheel Bearing Adjustment, Steps 1-4.

Repairs

1. Out of 3/8" square steel bar stock, make bearing removers and use as shown in Figure 8.
2. Bearing cups may be removed while spindle support is still mounted to the torque arm, by inserting remover tool and tapping cup out. New bearing cups are installed using J-7817 cup installer and handle J-8092 (fig. 9).
3. To remove spindle support from torque arm, proceed as follows:
 - a. Remove brake line from wheel cylinder inlet. Remove four nuts securing brake backing plate and spindle support to torque arm.

- b. Withdraw backing plate and hang on frame or convenient bracket
- c. Disconnect shock absorber lower eye from strut rod mounting shaft. It may be necessary to support spring lower end before disconnecting shock absorber. Disconnect shock absorber lower eye from rebound control.
- d. Remove cotter pin and nut from strut rod mounting shaft, pull out shaft and drop strut rod.
- e. Spindle support may then be removed and bearing cups serviced as in Step 2 above.

Assembly

1. If original wheel bearing assemblies are reinstalled, pack bearings and place in spindle support in their original locations, separated by bearing spacer and original shim.
2. Tap new inboard and outboard seals into spindle support until they are firmly seated in bores.

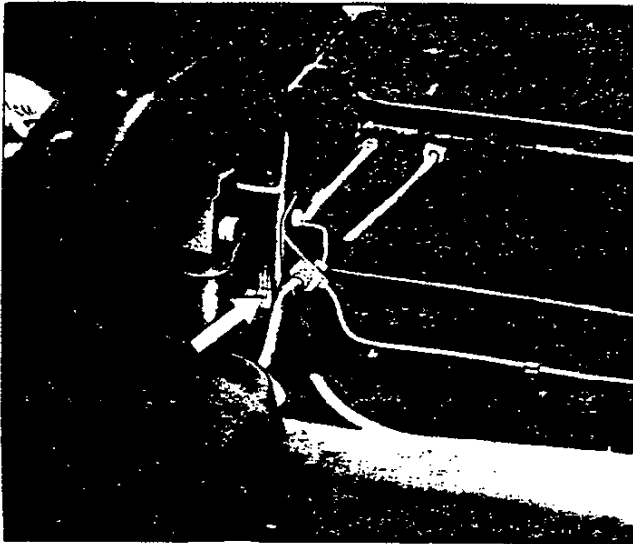


Fig. 3—Shim Location

NOTE: Do not use thicker shim than necessary, and do not use force when shimming inner side of control arm as this may cause toe setting to change.

Shim outboard gap as necessary to obtain solid stack-up between outer end of torque and bushing and inner wall of frame side member (fig. 4). After shims are securely installed, tighten pivot bolt and torque 40-60 lb. ft.

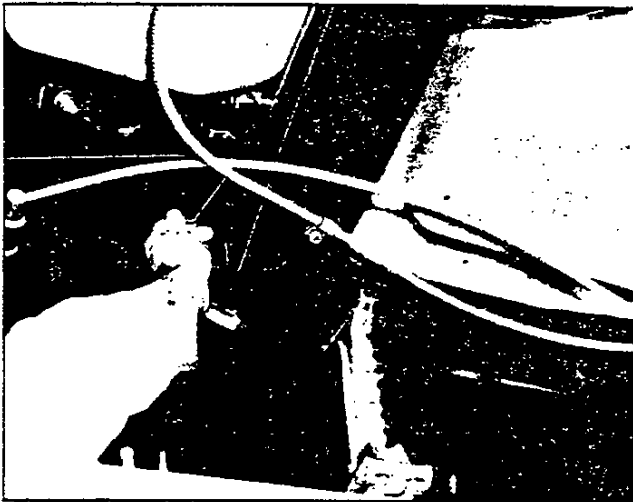


Fig. 4—Toe-In Adjustment—Shimming Outboard Gap

WHEEL BEARING ADJUSTMENT

Inspection

The tapered roller spindle bearings should have end play of .001"-.007". During inspection, check end play and, when necessary, adjust as follows:

1. Raise rear of vehicle until wheels clear ground.

2. Disconnect outboard axle driveshaft flange from wheel spindle.
3. Mark camber cam and bolt in relation to bracket. Loosen and turn camber bolt until strut rods are forced outboard. This will move control arm outward and provide clearance to drop axle drive shaft.
4. Mount dial indicator on torque arm inboard surface and rest pointer on spindle end (fig. 5).

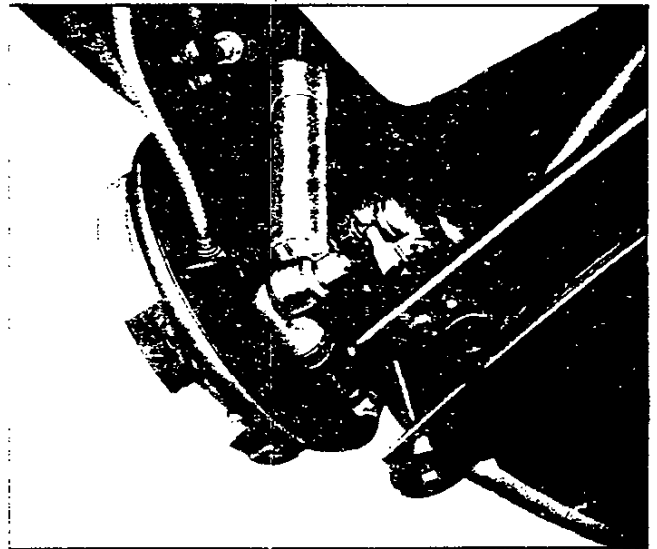


Fig. 5—Checking Spindle End Play

5. Grasp spindle and move axially (in and out) while reading movement on dial indicator. If end movement is within the .001"-.007" limit, bearings need no adjusting. If not within .001"-.007" limit, record reading for future reference and adjust bearings as outlined below.

Adjustment

1. Remove wheel and tire assembly.

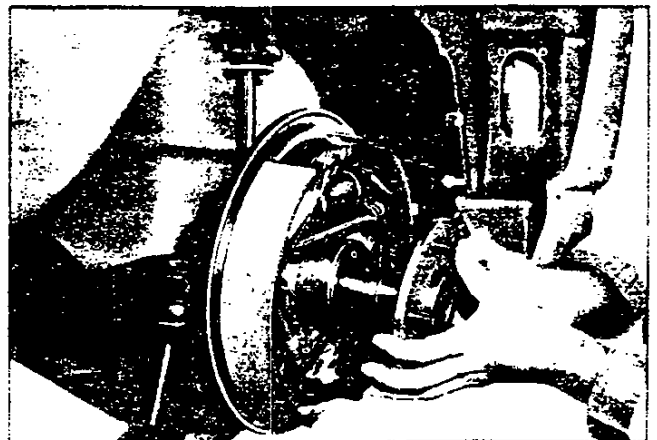


Fig. 6—Removing Wheel Spindle

SHOCK ABSORBER—Figure 10

Removal

1. Disconnect shock absorber upper mounting bolt.
2. Remove lower mounting nut and lockwasher.
3. Slide shock upper eye out of frame bracket and pull lower eye and rubber grommets off strut rod mounting shaft (fig. 11).
4. Inspect grommets and shock absorber upper eye for excessive wear.

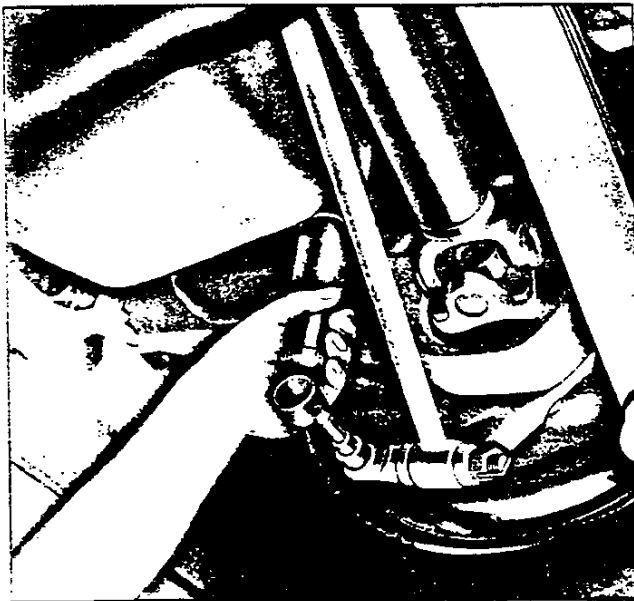


Fig. 11—Removing Shock Absorber

Installation

1. Slide upper mounting eye into frame mounting bracket and install bolt, lockwasher and nut.
2. Place rubber grommet, shock lower eye, inboard grommet, washers and nut over strut rod shaft.

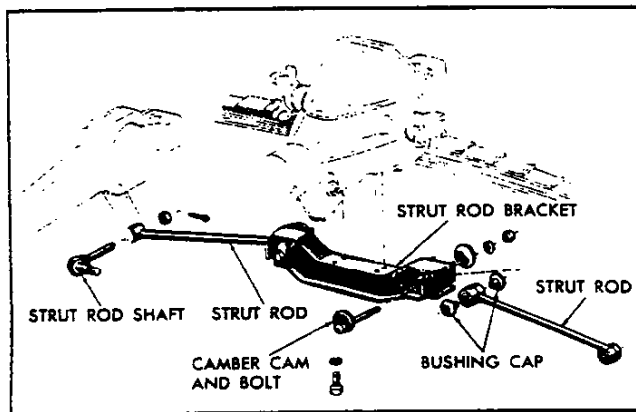


Fig. 12—Strut Rods

3. Torque upper nut 40-60 lb. ft., lower nut 50-60 lb. ft.

STRUT ROD AND BRACKET—Figure 12

Removal

1. Raise vehicle enough to provide working clearance.
2. Disconnect shock absorber lower eye from strut rod shaft.
3. Remove strut rod shaft cotter pin and nut. Withdraw shaft by pulling toward front of vehicle (fig. 13).

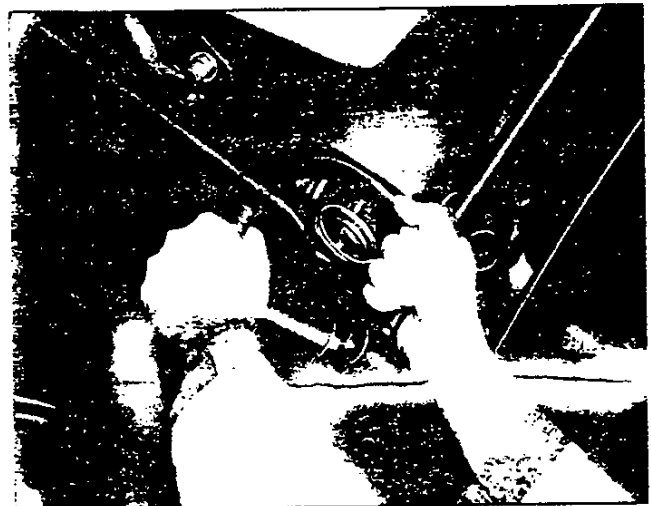


Fig. 13—Removing Strut Rod Shaft

4. Mark relative position of camber adjusting cam and bracket, so they may be reassembled in same location (fig. 14).

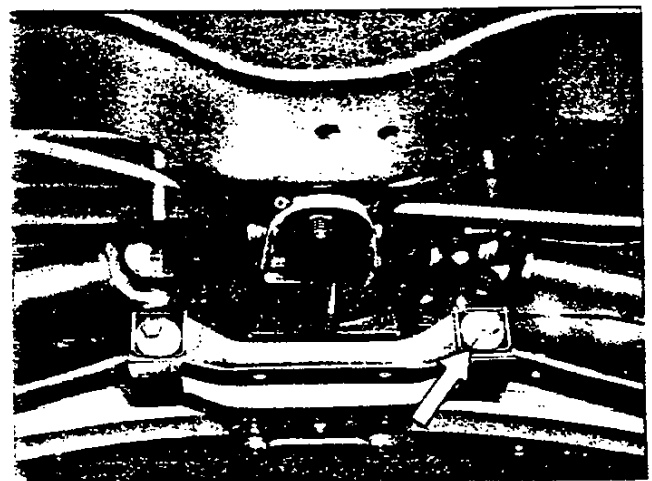


Fig. 14—Marking Camber Cam and Bracket

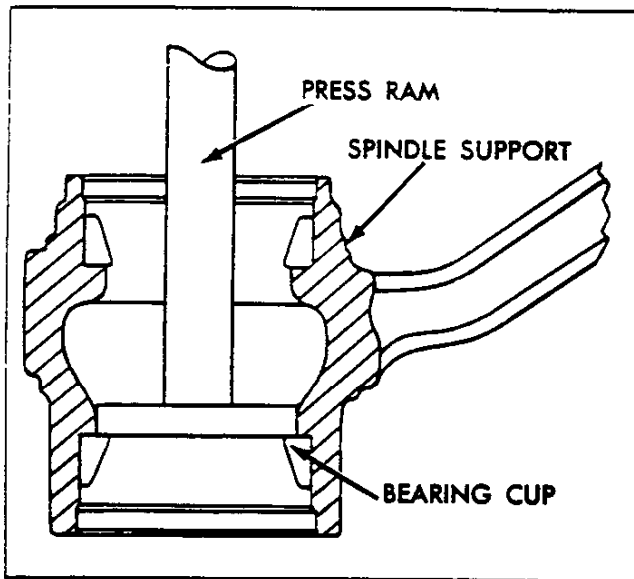


Fig. 8—Bearing Cup Tools

3. If support has been previously removed, place into position over torque arm bolts with strut rod fork inboard and down, and place brake backing plate over bolts. Install nuts and torque 25-35 lb. ft. Connect brake line to wheel cylinder. Reassemble strut rod to strut rod mounting shaft and tighten securely. Place shock absorber on strut rod shaft,

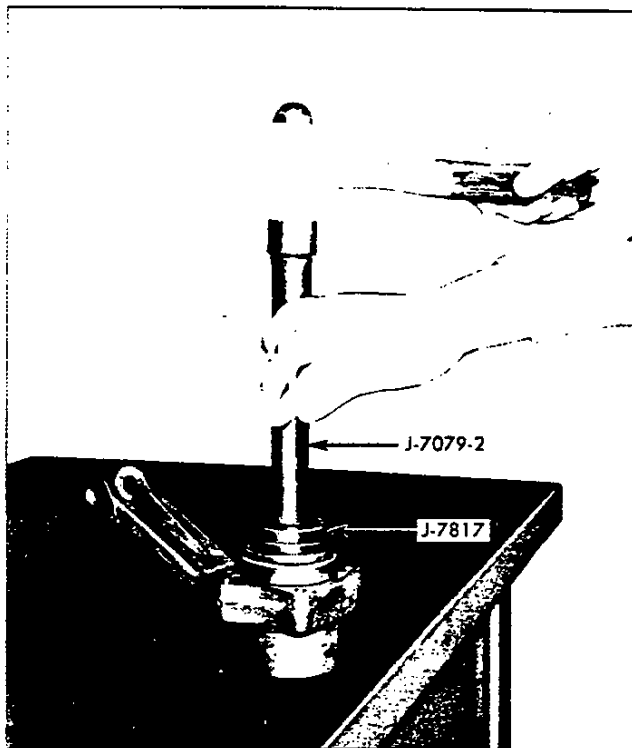


Fig. 9—Installing Spindle Bearing Cup

mounting stud and torque retaining nut 50-60 lb. ft.

4. Insert spindle into spindle support and install drive flange, washer and nut. Torque nut 50 lb. ft. and insert new cotter pin.
5. If new wheel bearings are installed, determine correct shim size as follows:
 - a. Assemble spindle, seals, bearings, spacer and a .145" shim into spindle support. Install drive flange, washer and nut. Torque nut 50 lb. ft.
 - b. Check bearing end play with dial indicator.
 - c. If end play does not fall within .001"-.007" range, add or subtract shim thickness to bring it within specifications.

Example: With .145" shim, end play is .011", .004" over limit.
Install .139" shim, .006" smaller.
End play is decreased by .006" and is now .005", within .001"-.007" limit.

6. Assemble spindle support assembly as outlined in Steps 2-4 above. Check spindle for free rotation and recheck end play.
7. Connect driveshaft flange to spindle drive flange.
8. Assemble brake drum and wheel and tire assembly to spindle. Bleed brakes as outlined in Section 5, Brakes. Lower vehicle and road test for bearing performance.

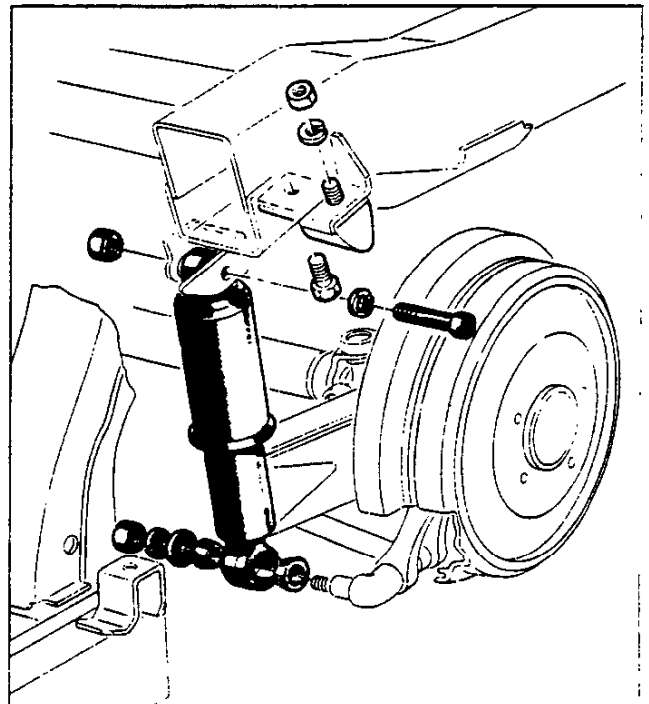


Fig. 10—Shock Absorber

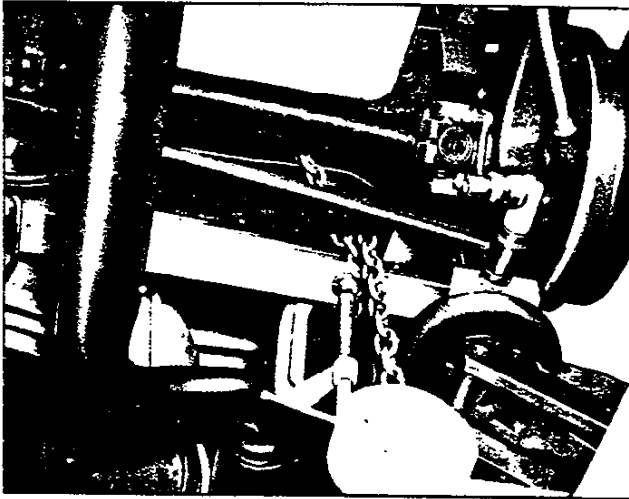


Fig. 18—Chain Installation

CAUTION: Use $\frac{1}{4}$ " or $\frac{3}{8}$ " chain only with a safe grab hook for this operation. Do not use rope, wire, cable or other method of retaining spring.

4. Lower jack to free link bolt and remove link bolt cotter pin, nut and rubber cushions.
5. Support and raise spring end as in Step 2 above, remove chain when loose.
6. Carefully lower jack until spring tension is completely released.
7. Repeat Steps 2-6 on other side.
8. Remove four bolts and washers securing spring center clamp plate (fig. 19).
9. Drop spring and slide out from under vehicle (fig. 20).

Repairs

1. Clamp spring center section in vise and remove center bolt (fig. 21).
2. Release vise, remove spring and separate leaves.
3. Replace worn or damaged liners as necessary and replace any broken leaves.
4. Replace main leaf spring cushion retainers by chiseling over flared portion until retainer may be knocked out of leaf. Place new retainers into position and flare over with a ball peen hammer or other suitable tool.
5. Insert drift into center bolt holes in leaves to align spring leaves (fig. 22). Install center bolt and tighten securely.

Installation

1. Place spring on carrier cover mounting surface, indexing center bolthead with hole in cover.

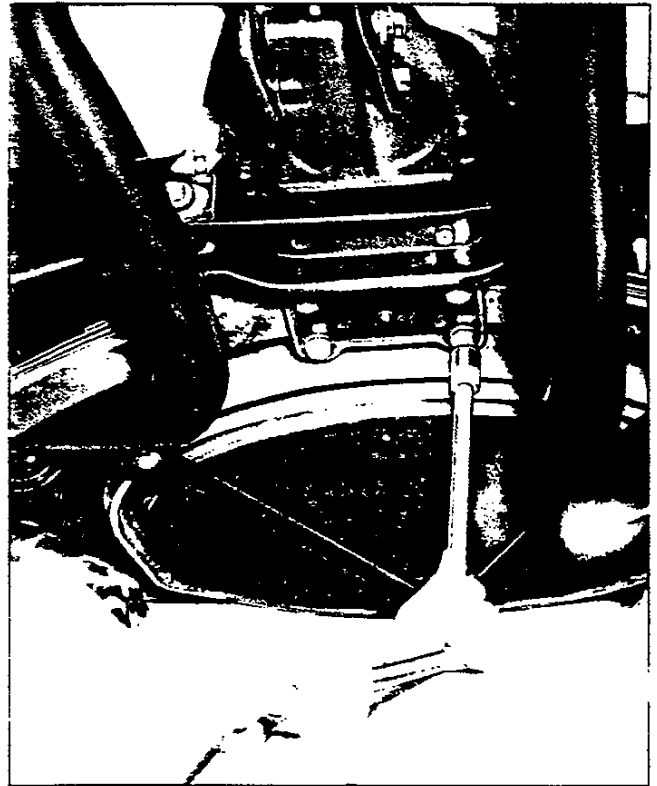


Fig. 19—Removing Clamp Plate

2. Place center clamp plate in position and install four bolts and washers. Tighten bolts and torque 55-75 lb. ft.
3. Raise spring outer end with floor jack until spring is nearly flat and secure with chain as in Step 3—Removal.

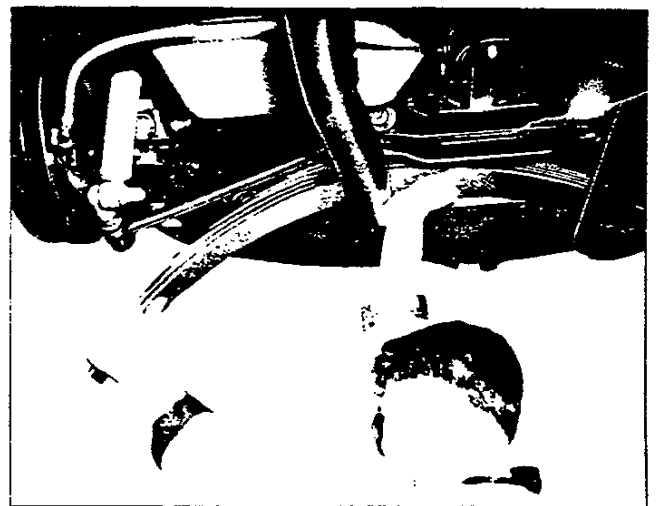


Fig. 20—Lowering Spring

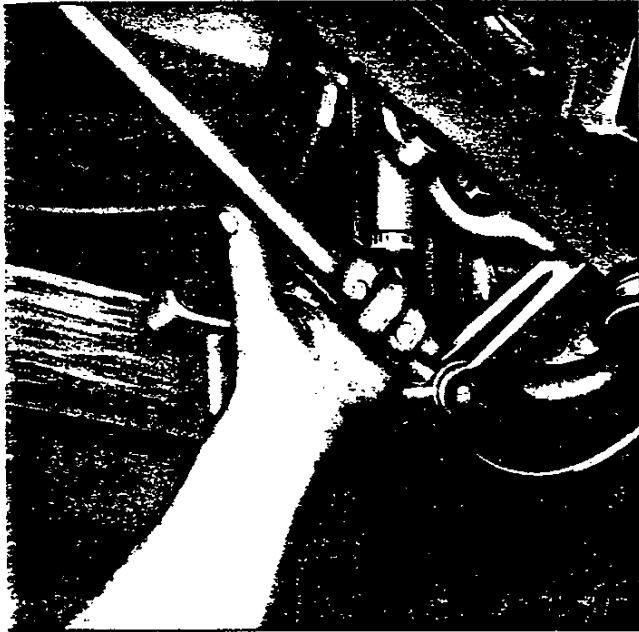


Fig. 15—Removing Strut Rod

5. Loosen camber bolt and nut. Remove four bolts securing strut rod bracket to carrier and lower bracket.
6. Remove cam bolt nut and cam and bolt assembly. Pull strut down out of bracket and remove bushing caps (fig. 15).
7. Inspect strut rod bushings for wear and replace where necessary. Replace strut rod if it is bent or damaged in any way.

Repairs

1. With strut rod bushing centered over Tool J-7877-2 and with strut rod supported horizontally, press or drive bushing from rod, using Tools J-7877-1 and J-7079-2 as shown in Figure 16.
2. With strut rod end centered over Tool J-7877-2 and rod supported horizontally, press or drive bushing into arm using Tools J-7877-3 and J-7079-2 as shown in Figure 16. Tool J-7877-3 should bottom on strut rod when bushing is fully installed.

Installation

1. Place bushing caps over inboard bushing and slide rod into bracket. Install cam and bolt assembly and adjust cam to line up with mark on bracket. Tighten nut but do not torque at this point.
2. Raise bracket and assemble to carrier lower mounting surface. Torque bolts 15-22 lb. ft.
3. Raise outboard end of strut rod into spindle support fork and insert strut rod shaft into fork so that flat on shaft lines up with corresponding flat in spindle fork.

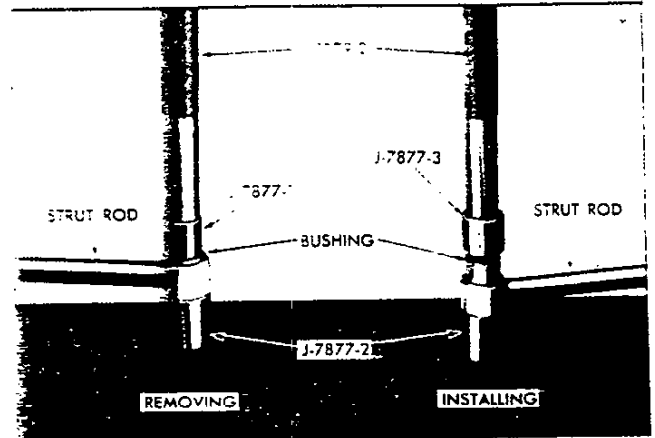


Fig. 16—Strut Rod Bushing Replacement

4. Place shock absorber lower eye and bushing over strut shaft, install nut and torque 50-60 lb. ft.
5. Lower vehicle to floor and torque camber cam nut 55-70 lb. ft. and strut rod shaft nut 80 lb. ft.
6. Check rear wheel camber and adjust where necessary.

SPRING—Figure 17

Removal

1. Raise rear of vehicle and support on frame slightly forward of torque control arm pivot points. Remove wheels and tires.
2. Place floor jack under spring at link bolt, and raise spring until nearly flat.
3. Wrap $\frac{1}{4}$ " or $\frac{5}{16}$ " chain with grab hook around suspension crossmember and spring, and hook chain securely with grab hook. Secure chain to spring with C clamp to prevent slipping (fig. 18).

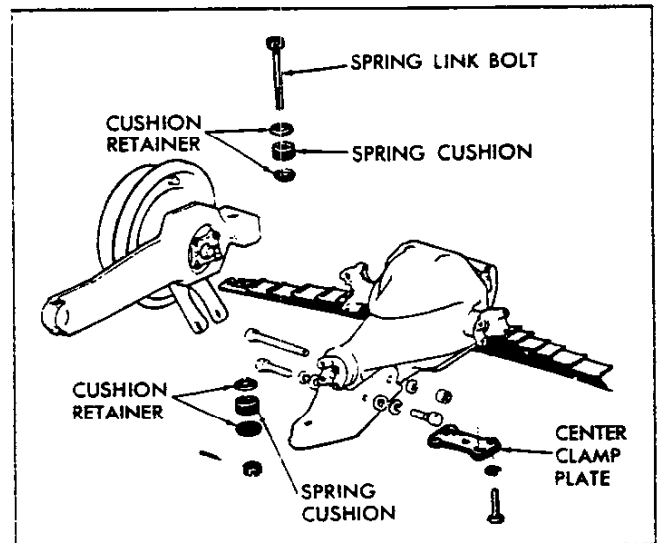


Fig. 17—Spring Mounting

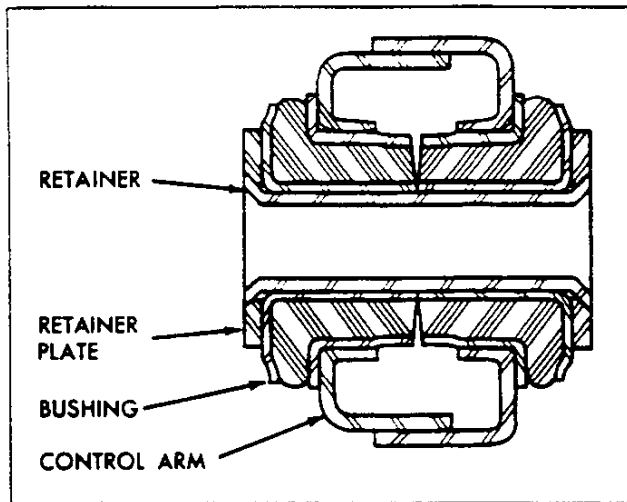


Fig. 24—Torque Control Arm Bushing Cross-Section

2. Remove special retainer plate and tap retainer out of bushing.
3. Remove bushings by spreading them apart with a chisel and tap out of arm (fig. 26).

NOTE: If bushing diameters are severely rusted in torque arm, and arm tends to spread during removal, clamp arm in a C-clamp to prevent spreading.

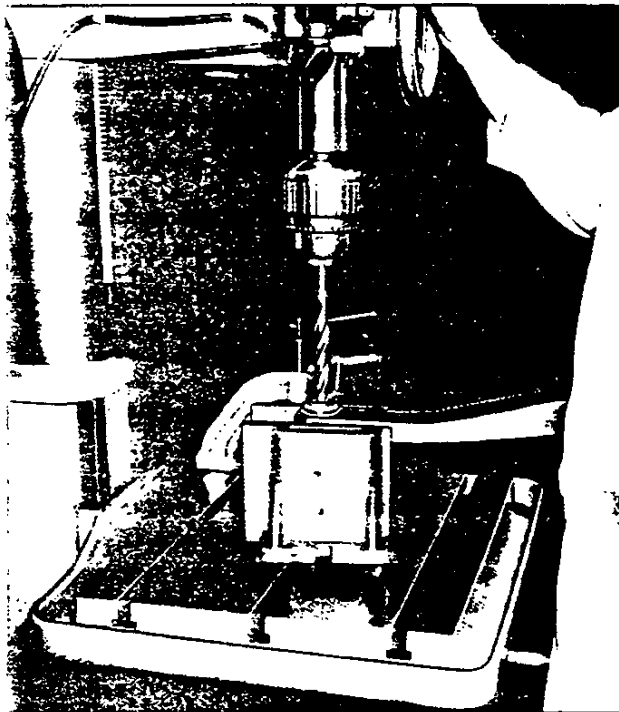


Fig. 25—Drilling Out Retainer Flare

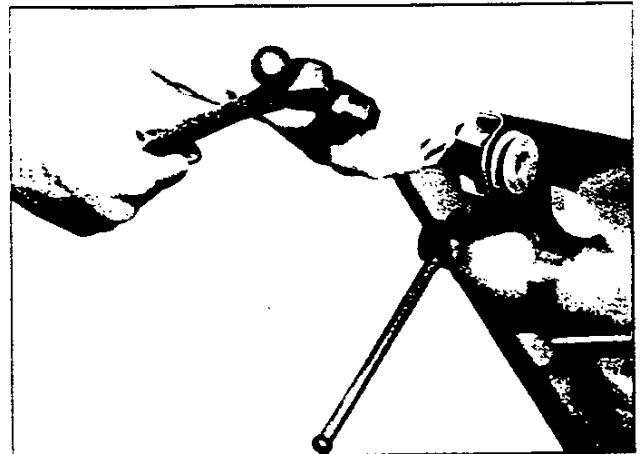


Fig. 26—Removing Bushings

4. Lightly oil new bushing diameters (not rubber portion) and start bushings squarely in arm.
5. Install Tool J-7055-1 as shown in Figure 27 and press bushings into place.
6. When bushings are fully installed, place special plate over flared portion of new bushing retainer and insert retainer into bushing.
7. Out of $\frac{5}{8}$ " thick steel plate $1\frac{1}{2}$ " wide make flaring tool support to the dimensions shown in Figure 28 and drill clearance holes as shown for $2-\frac{1}{2}$ " bolts.

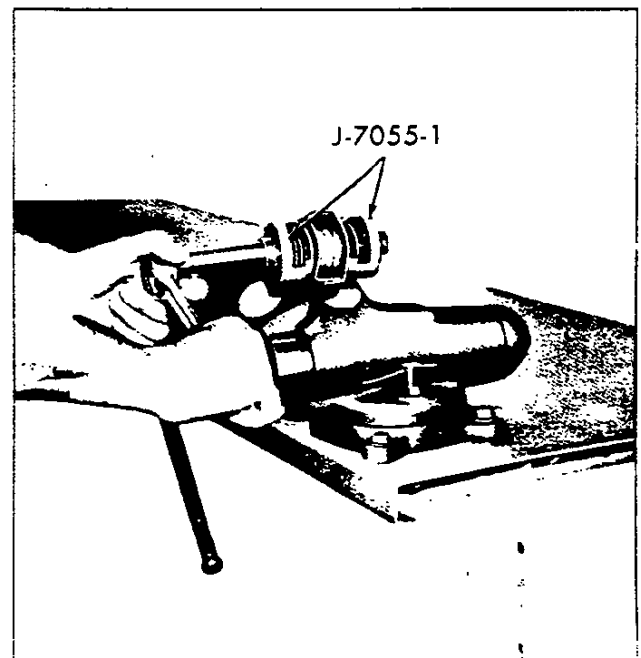


Fig. 27—Installing Bushings

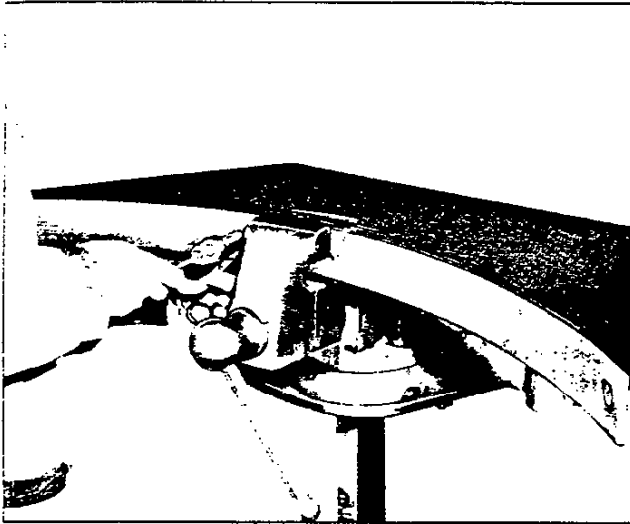


Fig. 21—Removing Center Bolt

4. Lower jack, align torque control arm with spring end and insert link bolt, rubber cushions and retainers. Install castellated nut on link bolt and tighten until cotter pin hole in bolt is visible. Insert new cotter pin and bend ends around.
5. Raise spring end with jack under link bolt, and remove chain and C clamp when loose.
6. Carefully lower jack, making sure rubber cushions remain indexed in retainers.
7. Remove jack and repeat on opposite side. Install wheels and tires, remove frame supports and lower vehicle to floor.

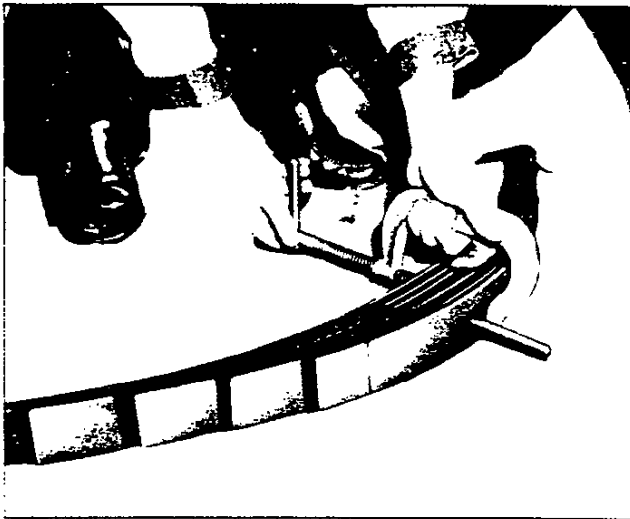


Fig. 22—Aligning Spring Leaves

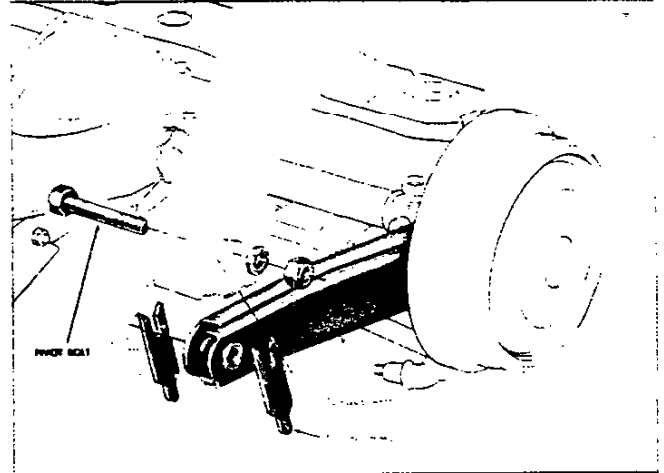


Fig. 23—Torque Control Arm

TORQUE CONTROL ARM—Figure 23

Removal

1. Disconnect spring on side torque arm is to be removed. Follow Steps 1-6, **Spring-Removal**.
2. Remove shock absorber lower eye from strut rod shaft.
3. Disconnect and remove strut rod shaft and swing strut rod down.
4. Remove four bolts securing axle drive shaft to spindle flange and disconnect drive shaft.

NOTE: It may be necessary to force torque arm outboard to provide clearance to drop drive shaft.

5. Disconnect brake hose from torque arm and disconnect parking brake cable.
6. Loosen torque arm pivot bolt and remove toe-in shims. Tape shims together and identify for correct reinstallation.
7. Withdraw pivot bolt and pull torque arm out of frame.

NOTE: For service operations pertaining to the spindle support assembly, refer to service operations under **Wheel Spindle and Support** earlier in this section.

Repairs—Figure 24

1. Using $\frac{11}{16}$ " drill, drill out flared end of bushing retainer (fig. 25.)

REAR SUSPENSION AND DRIVELINE 4-12

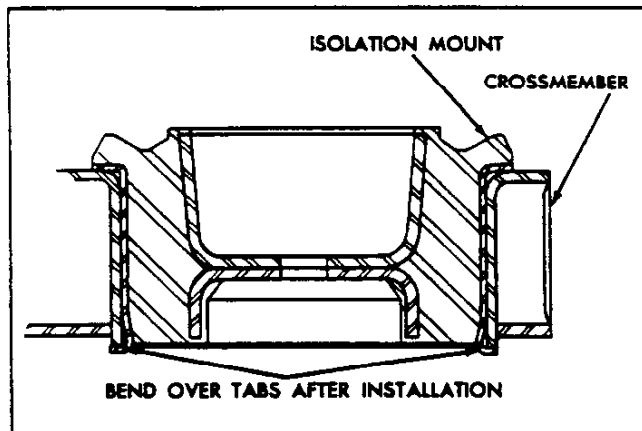


Fig. 31—Crossmember Mount Cross-Section

3. Place new mount into position on crossmember, compress outer sleeve and press mount into place until it is fully and squarely seated.
4. After installation, bend over locking tabs.

Installation

1. Install carrier cover to crossmember and torque bolts 25-35 lb. ft.
2. Raise crossmember into position and install mounting bolts. Torque bolts 20-30 lb. ft.
3. Install differential carrier assembly as outlined under **Differential Carrier-Installation** in this section.
4. Install wheels and tires, remove frame supports and lower vehicle.

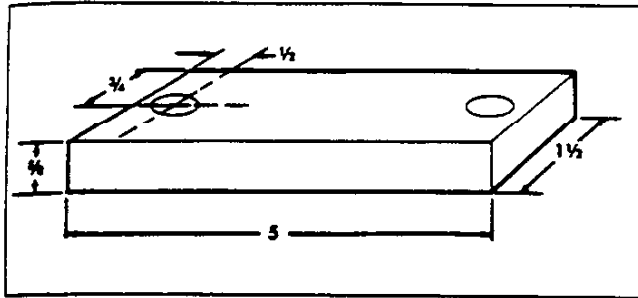


Fig. 28—Flaring Tool Back-Up Plate

8. Place fabricated back-up plate on flared end of bushing retainer and assemble Tool J-8111-23 to plate with 2- $\frac{1}{2}$ " bolts 5" long. Make sure threaded hole in J-8111-23 is centered over unflared end of bushing retainer and that chamfered retainer plate is centered over retainer tube.
9. Lightly oil pointed end of J-8880-5 screw and thread into J-8111-23 until pointed end contacts bushing retainer. Continue threading J-8111-23 until retainer is flared (fig. 29).

Installation

1. Place torque arm in frame opening. Insert pivot bolt and assemble.

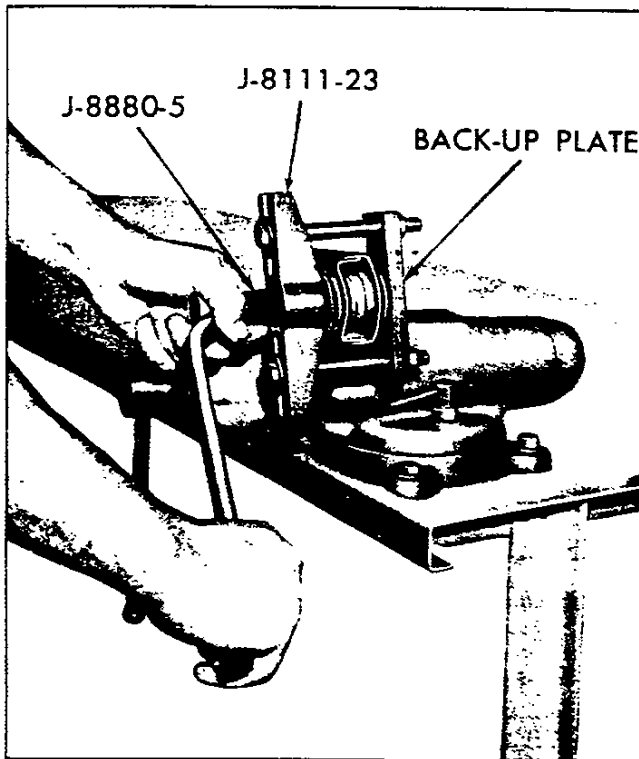


Fig. 29—Flaring Retainer

2. Place toe-in shims in original position on both sides of torque arm, tighten pivot bolt but do not torque at this point.
3. Raise axle drive shaft into position and install to drive flange. Torque bolts 25-35 lb. ft.
4. Raise strut rod into position and insert strut rod shaft so that flat lines up with flat in spindle support fork. Install nut and torque 80 lb. ft.
5. Install shock absorber lower eye and tighten nut 50-60 lb. ft.
6. Connect spring end as outlined under Spring-Installation, Steps 3-6.
7. Install brake drum, wheel and tire and lower vehicle. Tighten torque arm pivot bolt. Bleed brakes as outlined in Section 5-Brakes.

SUSPENSION CROSSMEMBER

Removal

1. Disconnect and remove spring as outlined under Spring-Removal, Steps 1-9.
2. Remove differential carrier assembly as outlined under Differential Carrier-Removal in this section.
3. Support crossmember, remove bolts securing crossmember isolation mounts to frame and lower crossmember (fig. 30).

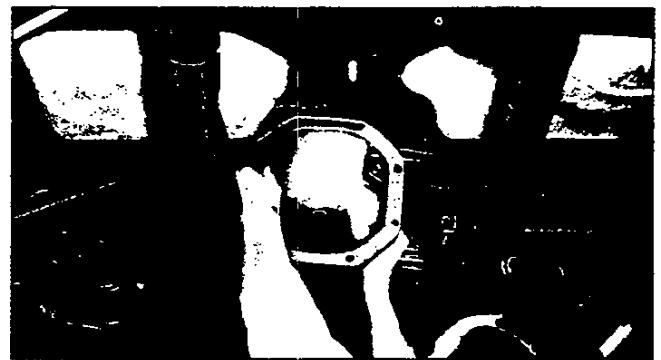


Fig. 30—Removing Crossmember

4. Remove bolts securing carrier cover to crossmember.
5. Inspect rubber isolation mounts for aging and replace where necessary.

Repairs—Isolation Mount

1. Bend back isolation mount tabs to allow mount removal.
2. Place crossmember on a suitable support and press mount out of arm using a piece of suitable size pipe or tubing on outer shell or inner insert.

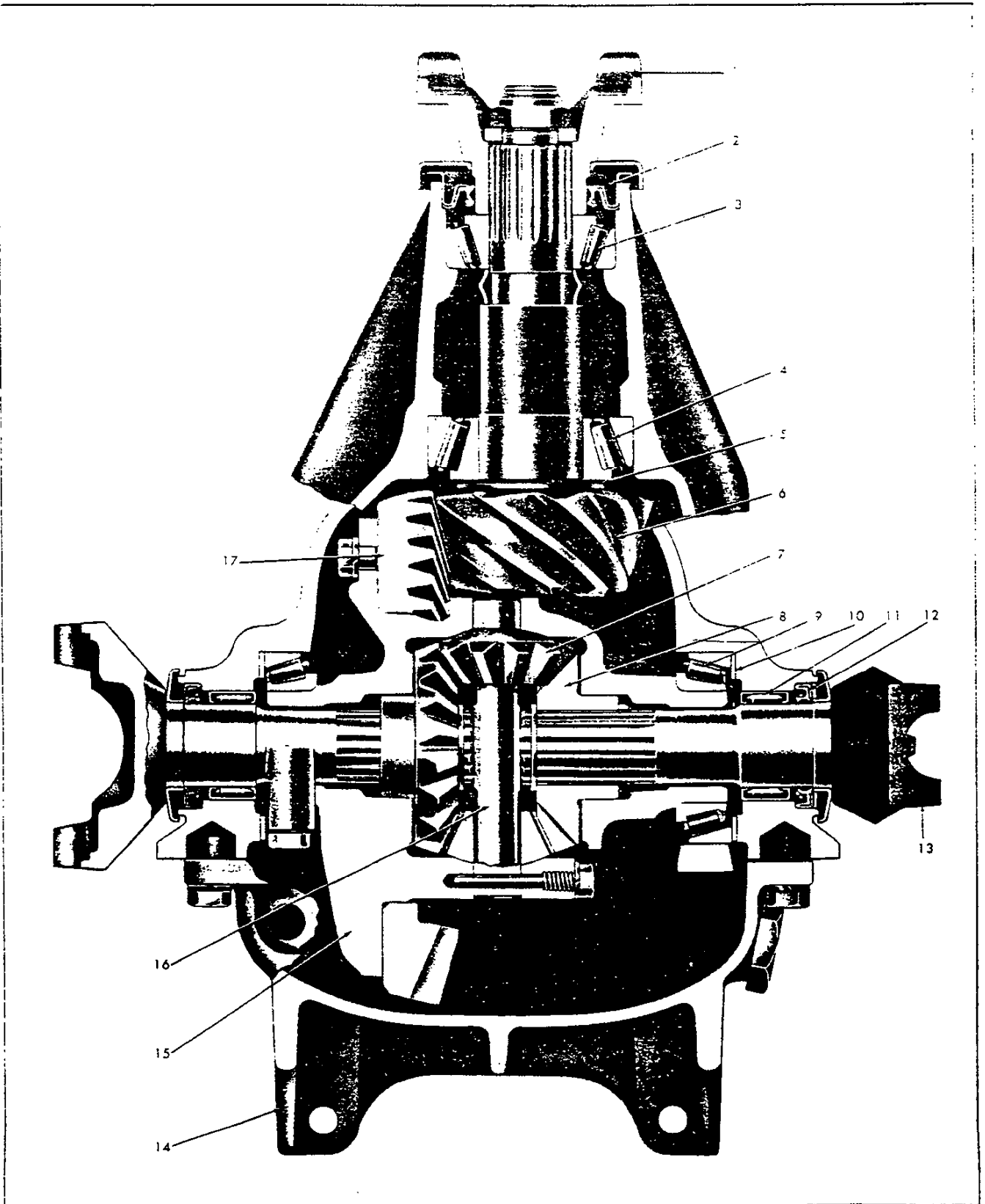


Fig. 32—Corvette Axle Cross-Section (see legend following page)

REAR AXLE

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MAINTENANCE AND ADJUSTMENTS

The 1963 Corvette rear axle is of the type where the differential carrier housing enclosing the differential and hypoid gears is supported on a crossmember mounted to the chassis frame. The differential is connected through universal joints to the drive shafts and wheels (fig. 32).

The internal components of the carrier are of conventional design, incorporating a hypoid gear set with an overhung pinion supported on two pre-loaded, tapered roller bearing assemblies, and a two-pinion differential assembly supported on tapered roller bearings. Pinion mounting distance adjustments are made through the use of shims, as are the differential bearing pre-load and backlash adjustments. The differential side gears drive two splined yokes which are retained laterally by snap rings located on the yoke splined end. The yokes are supported on caged needle bearings pressed into the carrier, adjacent to the dif-

ferential bearings. A lip seal, pressed in outboard of the bearings, prevents oil leakage and dirt entry. The carrier cover is bolted to the carrier and provides accessibility to the internal parts. The cover incorporates two integral, reinforced mounting pads which serve as the carrier attaching point to the suspension crossmember, and an attaching point for the spring center section. The filler plug is located on the right side of the cover near the bolting flange.

All service operations allow carrier removal without removing the carrier cover. Cover removal is not necessary in any of the following service procedures except in the case of complete carrier housing replacement, as the carrier and cover are serviced as an assembly.

Specifications Section includes further specific information such as available gear ratios.

GENERAL DESCRIPTION

LUBRICANT LEVEL

Oil level should be periodically checked and maintained at the filler hole level. The axle is filled with lubricant at the factory and is drained only when the differential carrier is removed. Periodic draining and refilling is not required. See Section O, for information

on lubricant level inspection intervals.

DRIVESHAFTS

Universal joints should be inspected and lubricated as necessary every 30,000 miles, with high melting-point wheel bearing lubricant.

ENGINE		DISPLACEMENT		327	327	327	327
		EQUIPMENT		WCFB	AFB	AFB & SPEC. CAM	F.I. & SPEC. CAM
PISTONS:							
Clearance Limits	Top Land					.036-.046	
	Skirt			.0006-.0010		.0028-.0035	
Ring Groove Depth	Compression					.2055-.2135	
	Oil					.1875-.1955	
PISTON RINGS:							
Compression	Width					.077-.078	
	Gap					.013-.023	
Oil Ring	Width					.184-.188	
	Gap					.015-.055	
Expanders						Integral with Spacer	
PISTON PINS:							
Length						2.990-3.010	
Diameter						.9270-.9273	
Clearance	In Piston	New			.00015-.00025		.00045-.00055
		Wear Limit					.001
In Rod						Press Fit	
CONNECTING RODS:							
Bearing	Clearance					.0007-.0028	
	End Play					.0017-.0038	
CRANKSHAFT:							
End Play						.002-.006	
End Thrust Taken by						Rear Main	
Main Bearing	Journal Diameter					2.2978-2.2988	
	Clearance					.0008-.0034	
Crankpin Journal Diameter						1.999-2.000	
CAMSHAFT:							
Lobe Lift Measured at Push Rod	Intake			.2658		.2625	
	Exhaust			.2658		.2665	
Cam Bearings	Journal Diameter					1.8682-1.8692	
Type of Drive						Timing Chain	
VALVE SYSTEMS:							
Lifters Type				Hydraulic		Mechanical	
Rocker Arm Ratio						1.5:1	
Valve Lash	Intake (Hot)			Zero		.008	
	Exhaust (Hot)			Zero		.018	
Intake	Face Angle					45°	
	Seat Angle					46°	
	Stem to Guide Clearance					.0010-.0027	
	Lift*			.3987		.3937	
Exhaust	Face Angle					45°	
	Seat Angle					46°	
	Stem to Guide Clearance					.0016-.0033	
	Lift*			.3987		.3997	
Valve Springs	Outer Spring Press. and Length	Free Length					2.08
		Pressure lb. @ in.			78-86 @ 1.66"		
		Pressure lb. @ in.			170-180 @ 1.26"		
	Inner Spring Damper	Free Length					2.00
No. of Coils						Approx. 4	
Recommended Valve Seat Width	Intake					1/16	
	Exhaust					3/32	
COOLING SYSTEM:							
Type						Liquid	
Radiator Cap Pressure						13 PSI	
Cooling System Capacity	W/Heater					Approx. 17	
	W/O Heater					Approx. 16	

*Measured at Valve Stem

ENGINE — FUEL

(SECTION 6M)

CARBURETOR MODEL	WCFB				AFB		AFB	
	250-H.P.—SYN.		250-H.P.—P.G.		300 & 340-H.P.—SYN.		300-H.P.—P.G.	
	3826003 (3501S)		3826005 (3500S)		3826004 (3461S)		3826006 (3480S)	
	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary
Float Level*	1/32"	1/4"	1/32"	1/4"	1/32"	1/32"	1/32"	1/32"
Float Drop*	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"
Pump Rod	1/2"	—	1/2"	—	1/2"	—	1/2"	—
Idle Vent	1/32"	—	1/32"	—	—	—	—	—
Automatic Choke Setting	Index	—	Index	—	1 Lean	—	1 Lean	—
Unloader	1/16"	—	1/16"	—	1/4"	—	1/4"	—
Fast Idle Setting	1750 RPM Hot on Car	—	1750 RPM Hot on Car	—	1750 RPM Hot on Car	—	1750 RPM Hot on Car	—
Throttle Lockout Adj.	.020	—	.020	—	.020	—	.020	—
Bowl Vents	5 Inside—1 External Idle		5 Inside—1 External Idle		1 Outside. 4 Inside		1 Outside. 4 Inside	
Choke Piston Vacuum Break Adj.	.060	—	.035	—	.070	—	.070	—
Main Metering Jet	.086	.0635	.086	.0635	.104	.0689	.104	.0689
Metering Rod (Sizes)	.042 .067	—	.042 .067	—	.060 .069	—	.060 .069	—
Throttle Bore	1 1/16"	1 1/16"	1 1/16"	1 1/16"	1 1/16"	1 11/16"	1 1/8"	1 11/16"
Main Venturi	1 1/16"	1 1/4"	1 1/16"	1 1/4"	1 1/4"	1 1/16"	1 1/4"	1 1/16"
Pump Discharge Jet	.021	—	.021	—	.028	—	.028	—
Idle Speed Jet	.031	—	.031	—	.035	—	.035	—

*Top of Float to Cover without Gasket

FUEL INJECTION

Power Stop @ .5" H ₂ O	1.2 (± .1 Hg.)
Economy Stop @ .5" H ₂ O	.8 (± .1 Hg.)
Fast Idle Speed (RPM—Hot Engine)	2000
Enrichment Diaphragm Clearance (Min.)	.040"
Cold Enrichment Housing Cover Index	Index
Cranking Signal Valve—Vacuum to Apply (" Hg. Max.)	1"
Enrichment Diaphragm— Vacuum to Apply (" Hg.)	Economy Stop 9"
	Power Stop 3"
Main Signal Diaphragm—Vacuum to Apply (" H ₂ O)	1/2" to 30" H ₂ O
Float Level	2 7/32
Float Drop	2 21/32

ENGINE TORQUE SPECIFICATIONS

ENGINE	LOCATION	SIZE	RANGE FT.-LBS.
	Camshaft Sprocket	1/2-18	15-20
	Connecting Rod	1 1/32-24	30-35
	Cylinder Head (Oiled)	7/16-14	60-70
	Exhaust Manifold	1/2-16	18-22
	Intake Manifold	3/8-16	25-35
	Flywheel to Crankshaft	7/16-20	55-65
	Flywheel Housing Plate Cover	1/4-20	6-8
	Flywheel Housing to Crankcase	3/8-16	25-35
	Main Bearing Caps (Oiled)	7/16-14	60-70
Oil Pan	Side	1/4-20	6-8
	Ends	1/2-18	9-12
	Oil Pan Drain Plug	1/2-20	20-25
	Oil Pump Cover to Body	1/4-20	6-8
	Oil Pump to Rear Bearing Cap	7/16-14	60-70
	Pulley to Balancer Hub	1/2-24	15-20
	Rocker Arm Cover	1/4-20	2-4
	Temperature Indicator	1/2-14 Pipe	15-20
	Spark Plugs	14mm	20-25
	Carburetor Nuts	3/8-24	35-45
	Water Pump Bolts	1/2-16	25-35
	Thermostat Housing	1/2-16	18-23
	Oil Filter Bolt	1/2-20	20-25

ENGINE ELECTRICAL

(SECTION 6Y)

BATTERY	1980558
Ground	Neg.
Plates	66
Amp. Hr.	61
GENERATOR	1100628
Field Amp. Draw	1.9-2.3
Cold Output	
Amp.	37
Volts	14
REGULATOR	1119512
Field Relay	
Air Gap.	.015
Point Opening	.030
Closing Voltage	2.3-3.7
Voltage Regulator	
Air Gap	.067
Point Opening	.014
Voltage Setting	13.5-14.4 @ 125° F. †
†Set Lower Contacts .1-.5 Volts lower than Upper	

*Includes Solenoid

CRANKING MOTOR	1107242	
Brush Spring Tension, oz.	35	
Free Speed		
Volts	10.6	
Amps	65-100*	
RPM	3600-5100	
Resistance Test		
Volts	3.5	
DISTRIBUTOR	1111024	1111022
Application	All Except Fuel Injection	Fuel Injection Only
Centrifugal Advance	0° @ 700 RPM 11° @ 1600 RPM 24° @ 4600 RPM	0° @ 700 RPM 11° @ 700 RPM 24° @ 4600 RPM
Vacuum Advance	0° @ 8" 15° @ 15.5"	0° @ 8" 15° @ 15.5"
Cam Angle	28°-32°	28°-32°
IGNITION COIL	1115091	
Application	All	
Primary Resistance—Ohms	1.02-1.13	
Secondary Resistance—Ohms	8000-10,500	
Ignition Resistor	Ballast	
Resistance—Ohms	1.4-1.62	

TRANSMISSION

(SECTION 7)

THREE AND FOUR SPEED TRANSMISSIONS

Make	Own, synchromesh, manual shift				
Type	3-Speed	4-Speed			
Gearshift	Control	Remote			
	Type	Lever			
	Location	On floor			
Gears	Type	All helical			
	Material	Forged steel, hardened			
	Synchronization	2nd and 3rd	1st, 2nd, 3rd, 4th		
	Constant mesh gears	2nd	1st, 2nd, 3rd		
	Sliding gears	1st and reverse	Reverse		
	Gear Ratios	First	2.47:1	2.54:1	2.20:1
		Second	1.53:1	1.89:1	1.64:1
Third		Direct	1.51:1	1.31:1	
Fourth				Direct	
Reverse		2.80:1	2.61:1	2.26:1	
Speedometer Gears	Tooth pitch	28			
	Teeth	Drive	8		
		Driven	20	20	19
Lubricant	Type recommended	SAE 90 transmission multi-purpose or mineral oil lubricant			
	Capacity	2 pints	2.5 pints		
Seal (transmission extension)	Steel encased double seal of spring loaded synthetic rubber and felt				

POWERGLIDE

General Data

Make and Type Own, automatic hydraulic torque converter with planetary gear system for reverse and low; converter maximum torque ratio (at stall) 2.1:1

Total Transmission Torque Multiplication (converter planetary gear ratio)

Maximum overall transmission ratio 3.70:1

Low gear drive or low range 3.70:1 to 1.76:1

Reverse range 3.70:1 to 1.76:1

Oil Type Automatic transmission fluid, type A Suffix "A".

Oil Capacity 9 quarts; refill 1½ quarts

Cooling Air

Selector Lever

Location On floor

Operation Actuates manual valve in hydraulic control system.

Position (indicated on Selector Plate) Five; Park-Reverse-Neutral-Drive-Low.

Parking Lock

Type Pawl and gear

Operation Applied by selector lever through spring actuated mechanism.

Flywheel .. Steel stamping with welded-on ring gear.

Hydraulic Torque Converter

Type Three element

Driving Member (pump) Inner and outer sheet steel shells separated by sheet metal vanes. Converter cover welded to outer shell (pump housing).

Driven Member (turbine) Sheet metal, multi-vane type supported by pilot in torque converter cover. Turns independently of housing. Splined to input shaft.

Reaction Member (stator) Aluminum air foil type supported on a stationary sleeve by an over-running clutch of cam and roller design.

High Clutch

Type Multiple-disc

Discs:

Driving; number and type Four, steel with non-metallic facings, bonded.

Driven; number and type Five, steel

Reverse Clutch

Type Multiple-disc

Discs:

Driving; number and type Six, steel with non-metallic facings, bonded.

Driven; number and type Six, steel

Planetary Gear Unit

Type Planetary

Gear Ratios

Cruising range (Direct drive) 1:1

Low range 1.76:1

Reverse 2.1:1

Low brake band Double wrapped design (linked circular segments)

Low band servo

Type Piston, one release spring and inner cushioning spring.

Reverse clutch servo

Type Piston with release springs

Hydraulic Controls

Manual valve

Type Spool

Pressure Regulator Valve

Type Spool

Governor

Type Centrifugal

Drive Transmission output shaft

Location In extension

Operation Regulates pump oil pressure to automatic shifting control valve body.

STEERING

(SECTION 9)

Steering Gear

Type	Semi-reversible, recirculating ball
Ratio	16:1
Overall Ratio (Fast)	17:1
(Road)	19.6:1
(with Power Steering)	17:1

Linkage:

Type	Relay
Location	To rear of wheels
Tie Rods	2

Provision on steering arms for adjusting for road or street, or fast steering ratio (manual steering feature only).

STEERING BOLTS TORQUES-lb. ft.

Steering Gear to Frame	25-35
Idler Arm to Frame	25-35
Tie Rod Stud Nut	25-35
Steering Damper to Frame Bracket	23-33
Steering Damper to Relay Rod	20-28
Damper Bracket to Relay Rod	20-28
Mast Jacket Spring Stop	20-25
Mast Jacket U-Bolt	10-15
Steering Wheel Hub Nut	35-40
Steering Coupling Pinch Bolts	25-35
Power Steering Pump Pulley	55-65
Power Steering Pump Mounting Nut	15-24
Pump Bracket Bolts	20-30
Power Cylinder to Relay Rod	42-47
Power Cylinder to Frame Bracket	20-26
Valve to Pitman Arm	42-47
Valve Clamp Bolt	15-22

CHASSIS ELECTRICAL

(SECTION 12)

BULB SPECIFICATIONS	CANDLE POWER	NUMBER
Headlamp Unit (Sealed Beam)		
Outer-High Beam	37½ W	4002
Low Beam	50 W	
Inner-High Beam Only	37½ W	4001
Parking Lamp and		
Directional Signal	4-32	1034
Tail and Stop and		
Turn Signal Lamps	4-32	1034
Directional Signal		
Indicator Lamps	3	1816
Headlamp Beam Indicator		
Lamp	1	53
Cigarette Lighter Lamp	1	53
Ignition Lock Lamp	1	53
Cluster Illuminating Lamps ...	3	1816
Courtesy or Dome Lamps	6	90
License Plate Lamp	4	67
Radio Dial Lamp	3	1816
Clock Lamp	3	1816
Parking Brake Alarm		
Lamp (Flashing)	2	257
Headlamp Motor Warning		
Lamp (Flashing)	2	257

FUSES AND CIRCUIT BREAKERS

A 15 ampere circuit breaker in the light control switch protects the headlamp circuit. The headlamp motor circuit and the power window circuit are protected by separate 40 ampere circuit breakers. Where current is too heavy, the circuit breaker intermittently

opens and closes, protecting the circuit until the cause is found and eliminated.

Fuses located in the junction block beneath the dash are:

Instrument, Radio and	
Clock Lamps	3AG/AGC-4 ampere
Tail Lamps	3AG/AGC-10 ampere
Radio	3AG/AGC-7½ ampere
Heater	3AG/AGC-10 ampere
Stop, License and Courtesy or	
Dome Lamps	SAE-20 ampere
Parking Brake Alarm and	
Gas Gauge	3AG/AGC-10 ampere

WIPER MOTOR

Operating Voltage	12 VDC
Gear Ratio	3.36:1
Crank Arm Rotation (Looking at	
Crank Arm)	Clockwise
Crank Arm Speed (No Load)	
Lo	34 RPM/min.
Hi	65 RPM/min.
Current Draw (amperes)	
No load (low speed)	3.6
Installed in Car (dry windshield)	4.5
Stall	12
Shunt Field Resistance (OHMS)	24
Washer Pump	
Number of Squirts at Full Pressure	12
Pressure (PSI)	11-15
Coil Resistance (OHMS)	20

DRILL SIZES

Letter Sizes	Drill Diam. Inches	Wire Gage Sizes	Drill Diam. Inches	Wire Gage Sizes	Drill Diam. Inches	Wire Gage Sizes	Drill Diam. Inches
Z	0.413	1	0.2280	28	0.1405	55	0.0520
Y	0.404	2	0.2210	29	0.1360	56	0.0465
X	0.397	3	0.2130	30	0.1285	57	0.0430
W	0.386	4	0.2090	31	0.1200	58	0.0420
V	0.377	5	0.2055	32	0.1160	59	0.0410
U	0.368	6	0.2040	33	0.1130	60	0.0400
T	0.358	7	0.2010	34	0.1110	61	0.0390
S	0.348	8	0.1990	35	0.1100	62	0.0380
R	0.339	9	0.1960	36	0.1065	63	0.0370
Q	0.332	10	0.1935	37	0.1040	64	0.0360
P	0.323	11	0.1910	38	0.1015	65	0.0350
O	0.316	12	0.1890	39	0.0995	66	0.0330
N	0.302	13	0.1850	40	0.0980	67	0.0320
M	0.295	14	0.1820	41	0.0960	68	0.0310
L	0.290	15	0.1800	42	0.0935	69	0.0292
K	0.281	16	0.1770	43	0.0890	70	0.0280
J	0.277	17	0.1730	44	0.0860	71	0.0260
I	0.272	18	0.1695	45	0.0820	72	0.0250
H	0.266	19	0.1660	46	0.0810	73	0.0240
G	0.261	20	0.1610	47	0.0785	74	0.0225
F	0.257	21	0.1590	48	0.0760	75	0.0210
E	0.250	22	0.1570	49	0.0730	76	0.0200
D	0.246	23	0.1540	50	0.0700	77	0.0180
C	0.242	24	0.1520	51	0.0670	78	0.0160
B	0.238	25	0.1495	52	0.0635	79	0.0145
A	0.234	26	0.1470	53	0.0595	80	0.0135
...	.....	27	0.1440	54	0.0550	...	.....

ELECTRICAL—BODY AND CHASSIS 12-28

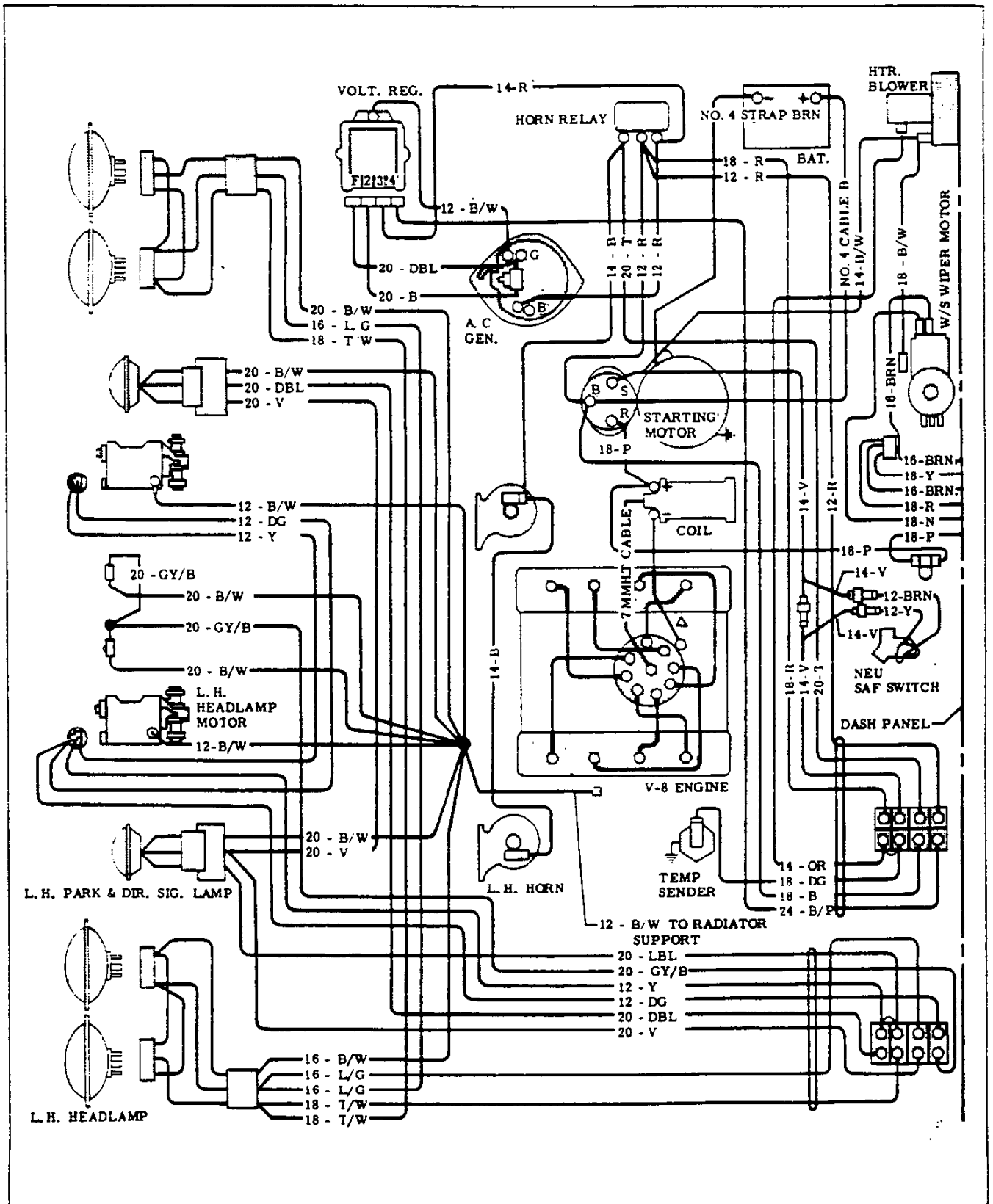


Fig. 41a—Engine Compartment Wiring

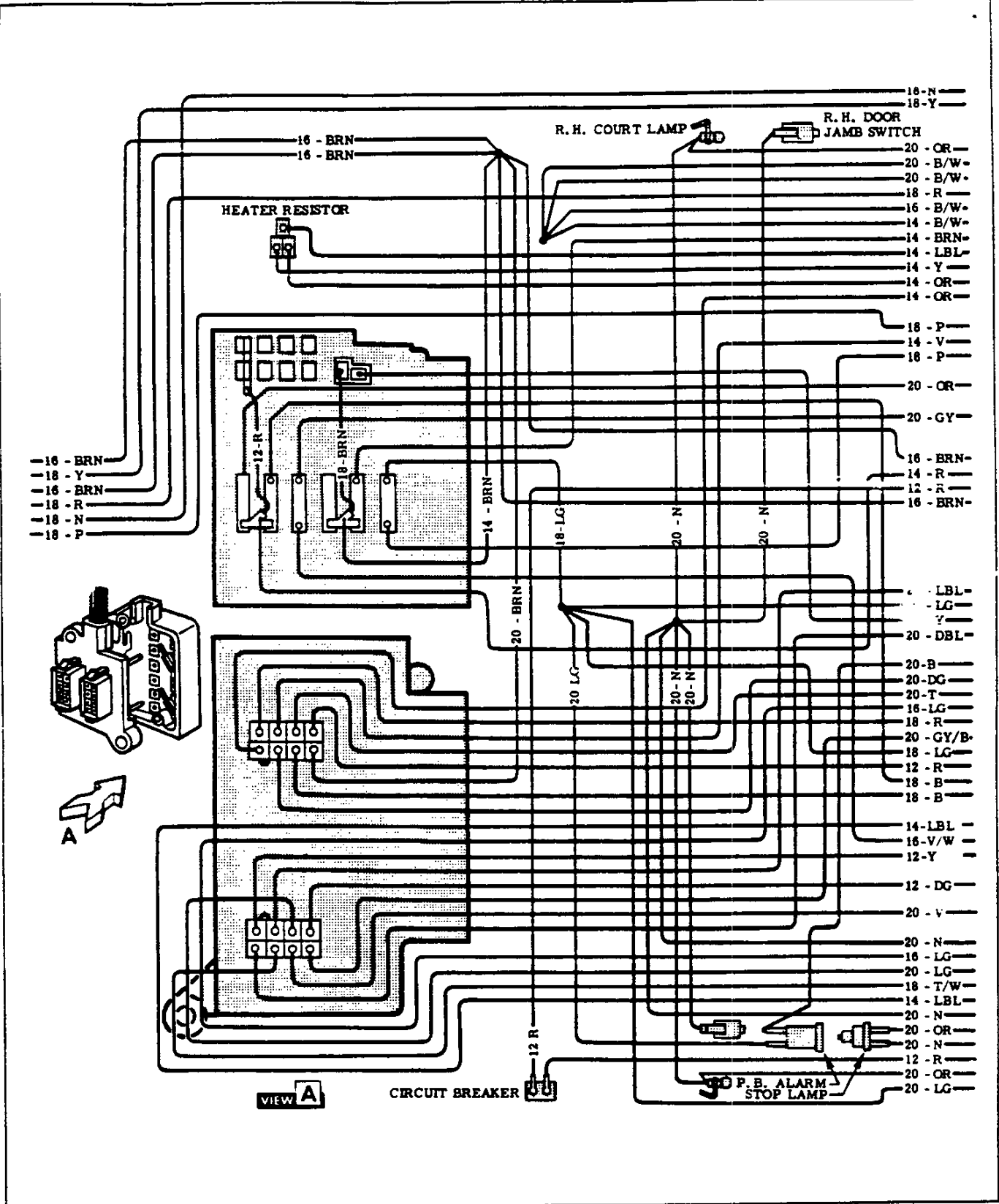


Fig. 41b—Fuse Panel Wiring

ELECTRICAL—BODY AND CHASSIS 12-30

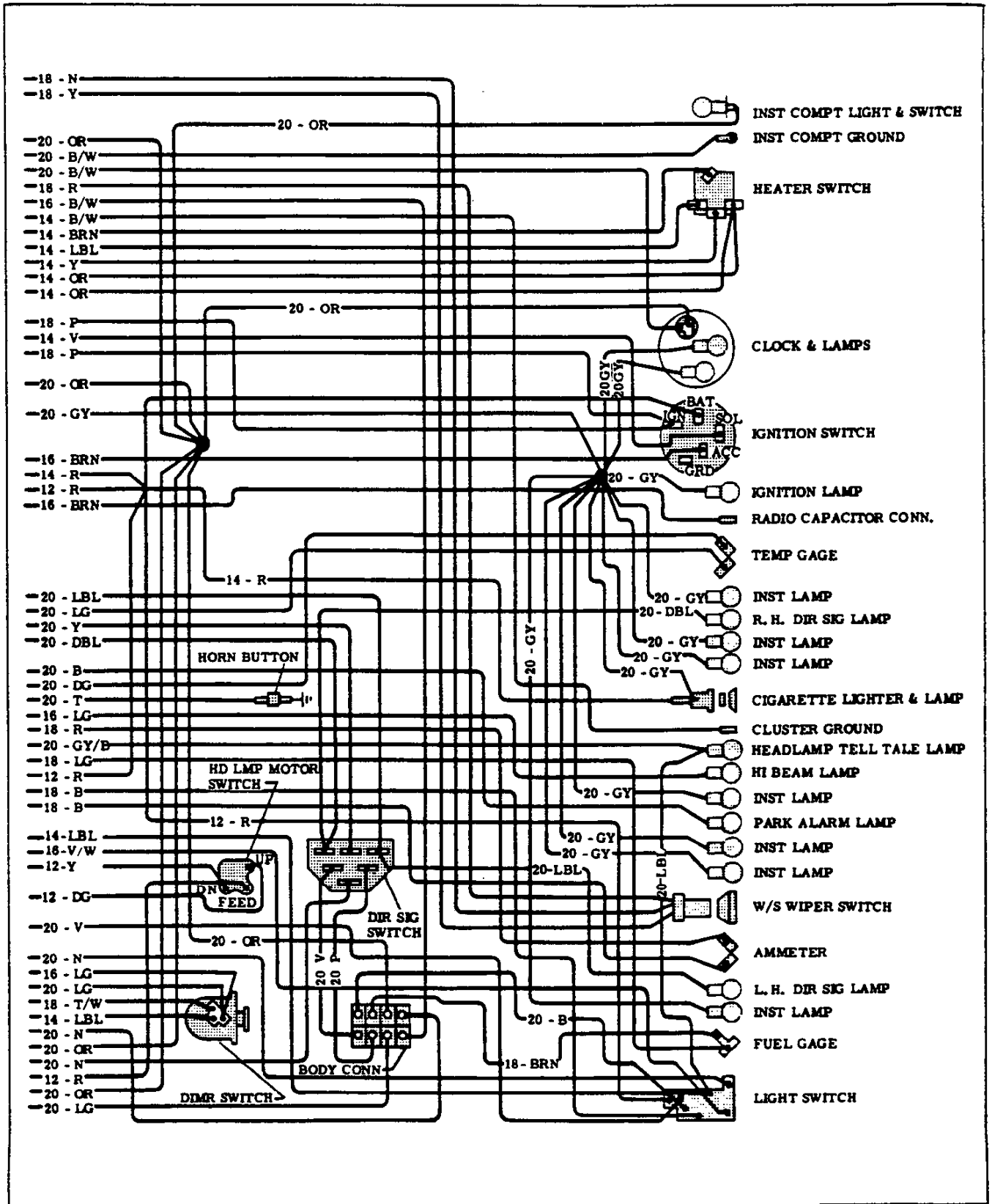


Fig. 41c—Instrument Panel Wiring

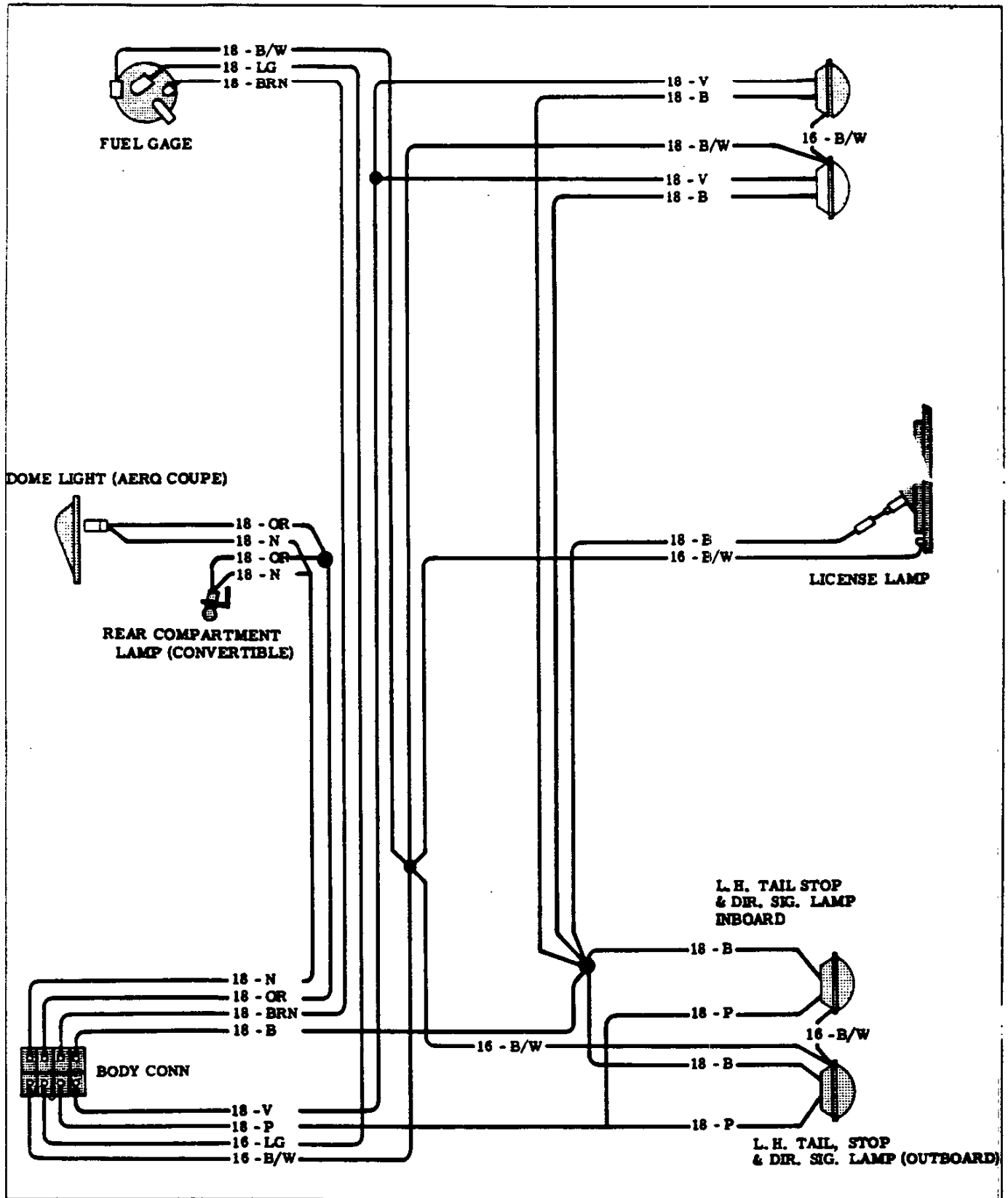


Fig. 41d—Body and Tail Lamp Wiring

GAGES

GAGE NO.	U. S. STANDARD GAGE* Approx. Thickness—Inches	AMERICAN WIRE or B & S GAGE Thickness—Inches
000000	0.490	
000000	.460	0.5800
00000	.429	.5165
0000	.398	.4600
000	.368	.4096
00	.337	.3648
0	.306	.3248
1	.2757	.2893
2	.2604	.2576
3	.2451	.2294
4	.2298	.2043
5	.2145	.1819
6	.1991	.1620
7	.1838	.1443
8	.1685	.1285
9	.1532	.1144
10	.1379	.1019
11	.1225	.0907
12	.1072	.0808
13	.0919	.0720
14	.0766	.0641
15	.0689	.0571
16	.0613	.0508
17	.0551	.0453
18	.0490	.0403
19	.0429	.0359
20	.0368	.0320
21	.0337	.0285
22	.0306	.0253
23	.0276	.0226
24	.0245	.0201
25	.0214	.0179
26	.0184	.0159
27	.0169	.0142
28	.0153	.0126
29	.0138	.0113
30	.0123	.0100
31	.0107	.00893
32	.0100	.00795
33	.0092	.00708
34	.0084	.00630
35	.0077	.00561
36	.0069	.00500
37	.0065	.00445
38	.0061	.00397
39	.0057	.00353
40	.0054	.00314
41	.0052	
42	.0050	
43	.0048	
44	.0046	

DECIMAL EQUIVALENTS

$\frac{1}{64}$ _____ .015625 $\frac{1}{32}$ _____ .03125 $\frac{3}{64}$ _____ .046875 $\frac{1}{16}$ _____ .0625 $\frac{5}{64}$ _____ .078125 $\frac{3}{32}$ _____ .09375 $\frac{7}{64}$ _____ .109375 $\frac{1}{8}$ _____ .125 $\frac{9}{64}$ _____ .140625 $\frac{5}{32}$ _____ .15625 $\frac{11}{64}$ _____ .171875 $\frac{3}{16}$ _____ .1875 $\frac{13}{64}$ _____ .203125 $\frac{7}{32}$ _____ .21875 $\frac{15}{64}$ _____ .234375 $\frac{1}{4}$ _____ .25 $\frac{17}{64}$ _____ .265625 $\frac{9}{32}$ _____ .28125 $\frac{19}{64}$ _____ .296875 $\frac{5}{16}$ _____ .3125 $\frac{21}{64}$ _____ .328125 $\frac{11}{32}$ _____ .34375 $\frac{23}{64}$ _____ .359375 $\frac{3}{8}$ _____ .375 $\frac{25}{64}$ _____ .390625 $\frac{13}{32}$ _____ .40625 $\frac{27}{64}$ _____ .421875 $\frac{7}{16}$ _____ .4375 $\frac{29}{64}$ _____ .453125 $\frac{15}{32}$ _____ .46875 $\frac{31}{64}$ _____ .484375 $\frac{1}{2}$ _____ .5	$\frac{33}{64}$ _____ .515625 $\frac{17}{32}$ _____ .53125 $\frac{35}{64}$ _____ .546875 $\frac{9}{16}$ _____ .5625 $\frac{37}{64}$ _____ .578125 $\frac{19}{32}$ _____ .59375 $\frac{39}{64}$ _____ .609375 $\frac{5}{8}$ _____ .625 $\frac{41}{64}$ _____ .640625 $\frac{21}{32}$ _____ .65625 $\frac{43}{64}$ _____ .671875 $\frac{11}{16}$ _____ .6875 $\frac{45}{64}$ _____ .703125 $\frac{23}{32}$ _____ .71875 $\frac{47}{64}$ _____ .734375 $\frac{3}{4}$ _____ .75 $\frac{49}{64}$ _____ .765625 $\frac{25}{32}$ _____ .78125 $\frac{51}{64}$ _____ .796875 $\frac{13}{16}$ _____ .8125 $\frac{53}{64}$ _____ .828125 $\frac{27}{32}$ _____ .84375 $\frac{55}{64}$ _____ .859375 $\frac{3}{8}$ _____ .875 $\frac{57}{64}$ _____ .890625 $\frac{29}{32}$ _____ .90625 $\frac{59}{64}$ _____ .921875 $\frac{15}{16}$ _____ .9375 $\frac{61}{64}$ _____ .953125 $\frac{31}{32}$ _____ .96875 $\frac{63}{64}$ _____ .984375 1 _____ 1.
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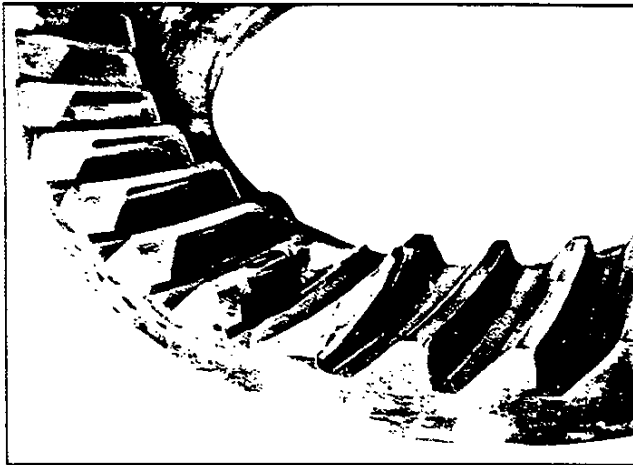


Fig. 34—Cracked Hypoid Ring Gear

Differential Gears

Common causes of differential gear failure are shock loading, extended overloading leading to fatigue failure, and overheating of gear thrust surfaces resulting

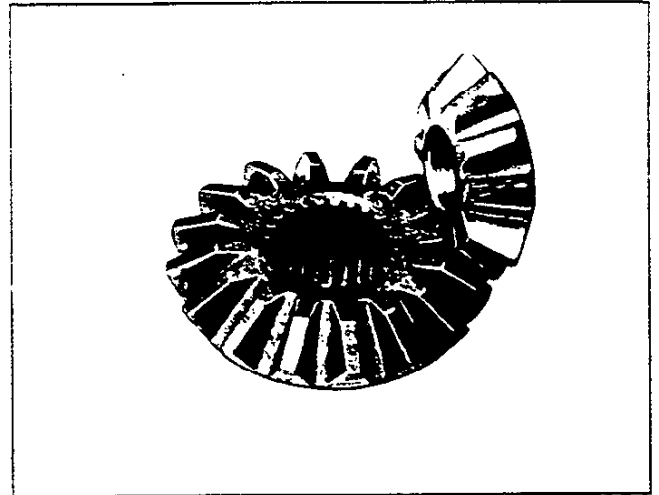


Fig. 35—Differential Gear Failure

from excessive wheel spin and consequent lubrication breakdown. Overheating will lead to seizing of thrust surfaces or tooth failure (fig. 35).

SERVICE OPERATIONS

AXLE DRIVESHAFTS—Figure 36

Removal

1. Disconnect inboard driveshaft trunnion from side gear yoke.
2. Remove four bolts securing shaft flange to spindle drive flange.
3. Pry driveshaft out of outboard drive flange pilot and remove by withdrawing outboard end first (fig. 38).

Repairs

1. Remove bearing lockring from trunnion yoke.
2. Support trunnion yoke on a piece of 1 1/4" pipe on arbor press bed.

3. Using suitable socket or rod, press trunnion down far enough to drive opposite bearing cup from yoke.
4. Remove trunnion and press other bearing cup from yoke, being careful not to drop cup or lose bearing rollers.
5. Remove trunnion and yoke from other joint in a similar manner.
6. Clean and inspect bearing rollers and trunnion. Relubricate with a high melting point wheel bearing type lubricant.

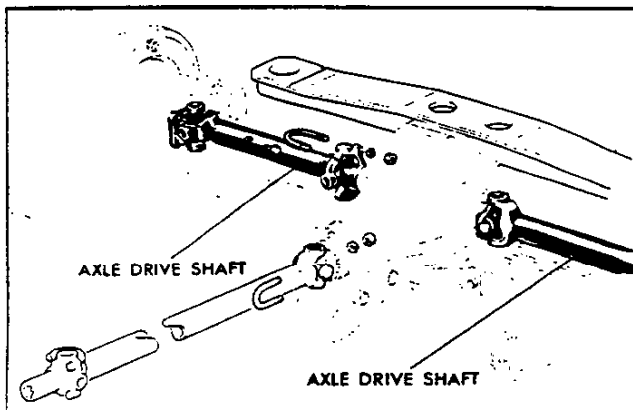


Fig. 36—Axle Driveshafts

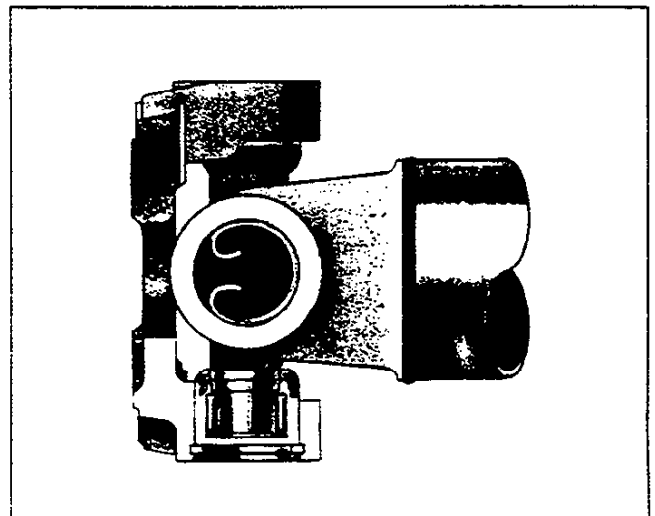


Fig. 37—Drive Shaft Cross Section

- | | |
|-------------------------|---------------------------|
| 1. Companion Flange | 6. Pinion |
| 2. Pinion Seal | 7. Differential Pinion |
| 3. Front Pinion Bearing | 8. Differential Side Gear |
| 4. Rear Pinion Bearing | 9. Differential Bearing |
| 5. Pinion Shim | |

- | | |
|-------------------------------|-------------------------------|
| 10. Differential Bearing Shim | 14. Carrier Cover |
| 11. Yoke Bearing | 15. Differential Case |
| 12. Yoke Bearing Seal | 16. Differential Pinion Shaft |
| 13. Side Gear Yoke | 17. Ring Gear |

REAR AXLE NOISE AND FAILURE ANALYSIS

Noise Analysis

The action of transmitting and multiplying torque through a right angle imposes heavy loads on the hypoid gear set and produces some noise. The difference between normal and abnormal axle noise, therefore must be established.

Slight axle noise heard at certain speeds in forward or reverse are considered normal. Gear noise tends to fluctuate and "peak" at certain speeds and this noise does not indicate failure.

If there is objectionable vehicle noise present at all speeds, an effort should be made to isolate this noise. Axle noise is often confused with tire noise, transmission noise, driveline vibration, or universal joint noise. Isolation of this noise at times requires skill and experience. Raising tire pressure to decrease tire noise, listening for noise at varying speeds on drive, float or coast, and under proper traffic conditions, swerving the vehicle from side to side to detect wheel bearing noise, will aid in detecting alleged axle noises. Axle noises fall into two categories: gear noise and bearing noise.

Gear Noise

Abnormal gear noise can be recognized by the pronounced characteristic cycling pitch it produces under either drive, float or coast conditions, or in extreme cases, under all conditions. This gear noise will cycle at various speed ranges while bearing noise tends to remain constant in pitch.

Bearing Noise

Defective bearings produce a rough whine or grinding noise which is constant in pitch and usually most noticeable under drive conditions. The following are three methods suggested for bearing noise diagnosis:

1. Pinion bearing failure can be identified by a constant rough sound. Pinion bearings rotate at propeller shaft speed, faster than the differential or spindle bearings. Test for noise with car on a smooth road and under varying speed conditions.
2. Differential side bearings will also produce a constant rough noise but slower than the pinion bearings. Drive the vehicle on a smooth road at various speeds, and with traffic permitting, swerve the vehicle from side to side. Differential bearing noise will remain constant under these conditions.
3. Defective spindle bearings will produce an uneven noise in test 2 above because of the heavy side to side loading induced during vehicle swerving. To further check and find the noisy bearing, jack up each wheel and check bearing for roughness while rotating each wheel provided car is not

equipped with Positraction.

Failure Analysis

The types of rear axle failures are hypoid gear tooth scoring and fracture, differential gear fracture, differential and pinion bearing failures, and yoke bearing failures.

Hypoid Gears

Hypoid gear tooth scoring (fig. 33) is caused generally by improper break-in, insufficient gear backlash or improper ring/pinion gear alignment. The scoring will progressively lead to complete erosion of the gear tooth, or gear tooth pitting and eventual fracture with possible attendant damage to bearings, if the initial scoring condition is not diagnosed in time and corrected. Hypoid gear scoring is easily recognized by its characteristic loud whine in either drive, coast or under both conditions. Another cause of hypoid tooth fracture (fig. 34) is extended overloading of the gear set which will produce fatigue fracture, or shock loading which will result in sudden failure.

Bearings

Failure of axle tapered roller bearings is due primarily to excessive wear caused by long service or foreign materials in the oil. The second most common cause of bearing failure is too tight or too loose preload adjustment leading to spalling and eventual failure. This failure may also lead to hypoid gear scoring due to the resultant misalignment of the hypoid gear set.

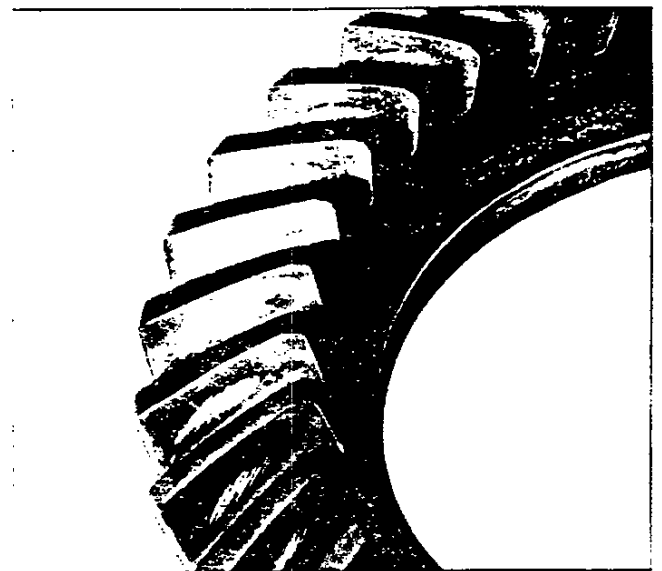


Fig. 33—Scored Hypoid Ring Gear

SECTION 6

ENGINE MECHANICAL

CONTENTS OF THIS SECTION

	<i>Page</i>
General Description.....	6-1
Engine Lubrication.....	See Section 0
Engine Tune-Up.....	6-2
Engine Service Operations.....	6-11
Troubles and Remedies.....	6-37
Specifications.....	(See Section 14)
Special Tools.....	6-42

GENERAL DESCRIPTION

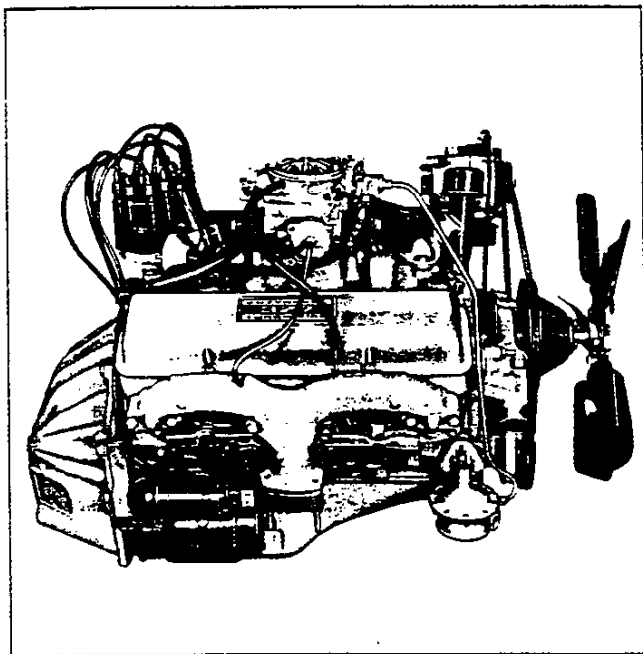


Fig. 1—Base Engine

Four 327 cubic inch V-8 engines are available on 1963 Corvette: (1) The base 250 HP engine with WCFB carburetor and hydraulic valve lifters; (2) A 300 Hp engine with AFB carburetor and hydraulic valve lifters; (3) A 340 Hp engine with AFB carburetor, special camshaft and solid lifters; and (4) A 360 Hp

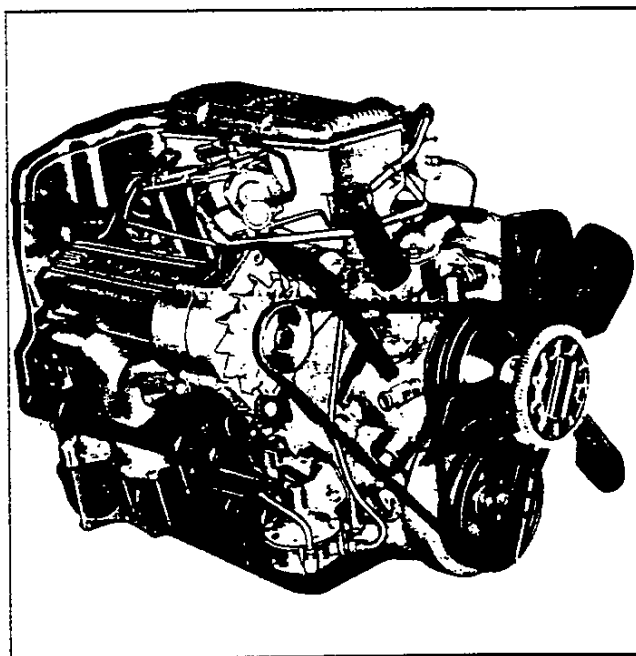


Fig. 2—Fuel Injection Engine

engine with Fuel Injection, special camshaft and solid lifters.

All engines are equipped with positive crankcase ventilation, Delcotron A.C. charging system, thermo-modulated fan hub and dual exhaust system.

ENGINE TUNE-UP

INTRODUCTION

Engine tune-up is diagnosis and maintenance performed at regular intervals to restore maximum performance and economy in an engine. This procedure is written in two parts: first, a regular tune-up procedure and second, additional checks and adjustments

to be used as needed to isolate malfunctions found during a regular tune-up.

It is advisable to follow a definite and thorough procedure of analysis and correction as suggested by the sequence-index below.

TUNE-UP SEQUENCE INDEX

	<i>Page</i>		<i>Page</i>
Spark Plugs—Removal	6-2	Valve Lash Adjustment	6-6
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Spark Plugs—Clean-Test-Install	6-3	Ignition Timing and Advance	6-7
Ignition System—Service and Repairs	6-3	Idle Speed and Mixture Adjustment	6-7
Battery and Battery Cables—Clean and Test	6-4	Crankcase Ventilation	6-8
Delcotron Generator and Regulator	6-5	Additional Checks and Adjustments	6-9
Fan Belt—Inspect and Adjust	6-5	Cylinder Balance Test	6-9
Manifold Heat Valve—Check Operation	6-5	Cranking Voltage Test	6-9
Intake Manifold Bolts—Tighten	6-5	Ignition Switch Test	6-10
Fuel Lines and Filter—Inspect and Service	6-5	Distributor Resistance Test	6-10
Coolant Level and Hoses—Check	6-5	Secondary Resistance and Polarity Test	6-10
Crankcase Oil Level—Check	6-6	Ignition Output and Secondary Leakage Test	6-10
Accelerator Linkage Adjustment	6-6	Carburetor Adjustments (See Section 6M)	
Choke Adjustment	6-6	Fuel Pump Tests	6-10
Cleaning and Testing Operations During Warmup	6-6	Cooling System Test	6-11
Cylinder Head Bolts—Tighten	6-6		

SPARK PLUG REMOVAL

- a. Remove spark plug shield wing bolts and remove shields (on Fuel Injection engines remove air cleaner cover and hose-to-air meter adapter to gain better access to shield).
- b. Remove any foreign matter from around spark plugs by blowing out with compressed air, then disconnect wires and loosen each plug one turn.
- c. Reconnect plug wires, start engine and accelerate to approximately 1000 rpm to blow out loose carbon.

NOTE: Cleaning carbon in this manner prevents chips from lodging under valves and giving a false compression reading or damaging valves.

- d. Stop engine, disconnect wires and remove plugs.

TEST COMPRESSION

- a. Remove air cleaner and block throttle and choke in wide open position.
- b. Hook up starter remote control cable and insert compression gauge firmly in spark plug port.
- c. Crank engine through at least four compression strokes to obtain highest possible reading.

- d. Check and record compression of each cylinder. Compression should be 160 lbs. and variation between highest and lowest reading cylinders should be less than 20 pounds.

- e. If one or more cylinders read low or uneven, inject about a tablespoon of engine oil on top of pistons in low reading cylinders through spark plug port. Crank engine several times and recheck compression.

- If compression comes up but does not necessarily reach normal, rings are worn.
- If compression does not improve, valves are sticking or seating poorly.
- If two adjacent cylinders indicate low compression and injecting oil does not increase compression, the cause may be a head gasket leak between the cylinders. Engine coolant and/or oil in cylinders could result from this defect.

The compression check is important because an engine with low or uneven compression cannot be tuned successfully to give peak performance. Therefore, it is essential that improper compression be corrected before proceeding with an engine tune-up. If a weak cylinder cannot be located with the compression check, see "Cylinder Balance Test" under "Additional Checks and Adjustments" in this section.

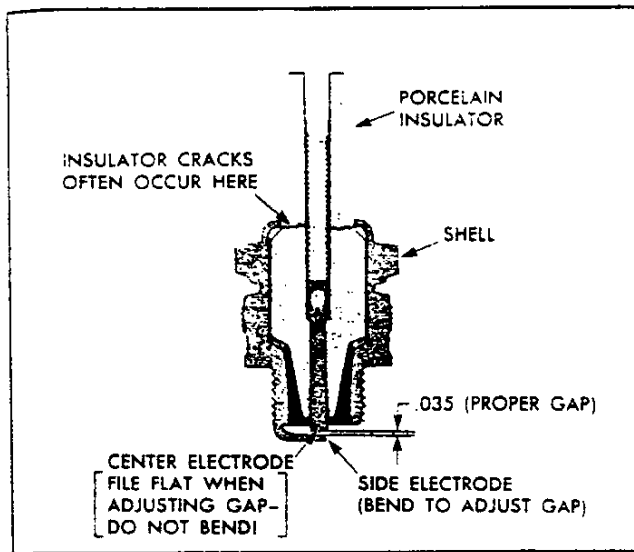


Fig. 3—Spark Plug Detail

CLEAN, SERVICE AND INSTALL SPARK PLUGS

NOTE: Refer to Figure 3.

- Inspect each plug individually for badly worn electrodes, glazed, broken or blistered porcelains and replace plugs where necessary. Refer to spark plug diagnosis information presented in "Engine Electrical," Section 6Y for an analysis of plug conditions.
- Clean serviceable spark plugs thoroughly, using an abrasive-type cleaner such as sand blast. File the center electrode flat.
- Inspect each spark plug for make and heat range. All plugs must be of the same make and number or heat range.
- Adjust spark plug gaps to .035" using a round feeler gauge.

CAUTION: Never bend the center electrode to adjust gap. Always adjust by bending ground or side electrode.

- If available, test plugs with a spark plug tester.
- Inspect spark plug hole threads and clean before installing plugs. Corrosion deposits can be removed with a 14 mm. x 1.25 SAE spark plug tap (available through local jobbers) or by using a small wire brush in an electric drill. Use plenty of grease on tap to catch any chips.

CAUTION: Use extreme care when using tap to prevent cross threading. Also crank engine several times to blow out any material dislodged during cleaning operation.

- Install spark plugs to engine with new gaskets and tighten to 20-25 ft. lbs. torque.

Improper installation is one of the greatest single causes of unsatisfactory spark plug performance. Improper installation is the result of one or more of the following practices:

- Installation of plugs with insufficient torque to fully seat the gasket.
- Installation of the plugs using excessive torque which changes gap settings.
- Installation of plugs on dirty gasket seal.
- Installation of plugs to corroded spark plug hole threads.

Failure to install plugs properly will cause them to operate at excessively high temperatures and result in reduced operating life under mild operation or complete destruction under severe operation where the intense heat cannot be dissipated rapidly enough.

Always remove corrosion deposits in hole threads before installing plugs. When corrosion is present in threads, normal torque is not sufficient to compress the plug gasket and early failure from overheating will result.

Always use a new gasket and wipe seats in head clean. The gasket must be fully compressed on clean seats to complete heat transfer and provide a gas tight seal in the cylinder. For this reason as well as the necessity of maintaining correct plug gap, the use of correct torque is extremely important during installation.

- Install spark plug shields.

SERVICE IGNITION SYSTEM AND MAKE NECESSARY REPAIRS

- Remove distributor shield.
- Replace brittle or damaged spark plug wires. Install all wires to proper spark plug. Proper positioning of spark plug wires in supports is important on V-8 engines to prevent cross-firing (see "Engine Electrical," Section 6Y).
- Tighten all ignition system connections.
- Replace or repair any wires that are frayed, loose or damaged.
- Remove distributor cap, clean cap and inspect for cracks, carbon tracks and burned or corroded terminals. Replace cap where necessary.
- Clean rotor and inspect for damage or deterioration. Replace rotor where necessary.
- Check the distributor centrifugal advance mechanism by turning the distributor rotor in a clockwise direction as far as possible, then releasing the rotor to see if the springs return it to its retarded position. If the rotor does not return readily, the distributor must be disassembled and the cause of the trouble corrected.
- Check to see that the vacuum spark control operates freely by turning the movable breaker plate counterclockwise to see if the spring returns to its retarded position. Any stiffness

in the operation of the spark control will affect the ignition timing. Correct any interference or binding condition noted.

- i. Examine distributor points and clean or replace if necessary.

- Contact points with an overall gray color and only slight roughness or pitting need not be replaced.

- Dirty points should be cleaned with a clean point file.

Use only a few strokes of a clean, fine-cut contact file. The file should not be used on other metals and should not be allowed to become greasy or dirty. Never use emery cloth or sandpaper to clean contact points since particles will embed and cause arcing and rapid burning of points. Do not attempt to remove all roughness nor dress the point surfaces down smooth. Merely remove scale or dirt.

- Replace points that are burned or badly pitted.

Where burned or badly pitted points are encountered, the ignition system and engine should be checked to determine the cause of trouble so it can be eliminated. Unless the condition causing point burning or pitting is corrected, new points will provide no better service than the old points. See "Engine Electrical," Section 6Y, for an analysis of point burning or pitting.

- Adjust distributor contact point gap to .019" (new points) or .016" (used points), using a feeler gauge or dial indicator. Breaker arm rubbing block should be on high point of lobe during adjustment.

NOTE: Contact points should be cleaned before adjusting with a feeler gauge if they have been in service.

- Check distributor point spring tension (contact point pressure) with a spring gauge hooked to breaker lever at the contact and pull exerted at 90 degrees to the breaker lever. The points should be closed (cam follower between lobes) and the reading taken just as the points separate. Spring tension should be 19-23 ounces. If not within limits, replace.

Excessive point pressure will cause excessive wear on the points, cam and rubbing block while weak point pressure permits bouncing or chattering, resulting in arcing and burning of the points and an ignition miss at high speed.

- j. Lubricate distributor.

- Fill hinge cap oiler with light engine oil.
- Turn cam lubricator wick end-for-end or

replace it. Do not lubricate an old lubricator wick.

- k. Install rotor and distributor cap. Press all wires firmly into cap towers.

SERVICE BATTERY AND BATTERY CABLES

State of Charge Test

1. Measure the specific gravity of the electrolyte in each cell (fig. 4). If it is below 1.230 (corrected to 80°F.) recharge with a slow rate charger, or if desired, further check battery.
2. Connect a voltmeter across the battery terminals and measure the terminal voltage of the battery during cranking (remove the coil secondary lead during this check to prevent engine from firing). If the terminal voltage is less than 9.0 volts at room temperature, approx. 80°±20°F.), the battery should be further checked. See Section 6Y for further tests.

Inspect for signs of corrosion on battery, cables and surrounding area, loose or broken carriers, cracked or bulged cases, dirt and acid, electrolyte leakage and low electrolyte level. Fill cells to proper level with distilled water or water passed through a "demineralizer."

The top of the battery should be clean and the battery hold-down bolts properly tightened. Particular care should be taken to see that the tops of the 12-volt batteries are kept clean of acid film and dirt because of the high voltage between the battery terminals. For best results when cleaning batteries, wash first with a dilute ammonia or soda solution to neutralize any acid present and then flush off with clean water. Care must be taken to keep vent plugs tight so that the neutralizing solution does not enter the cell. The hold-down bolts should be kept tight enough to prevent the battery from shaking around in its holder.

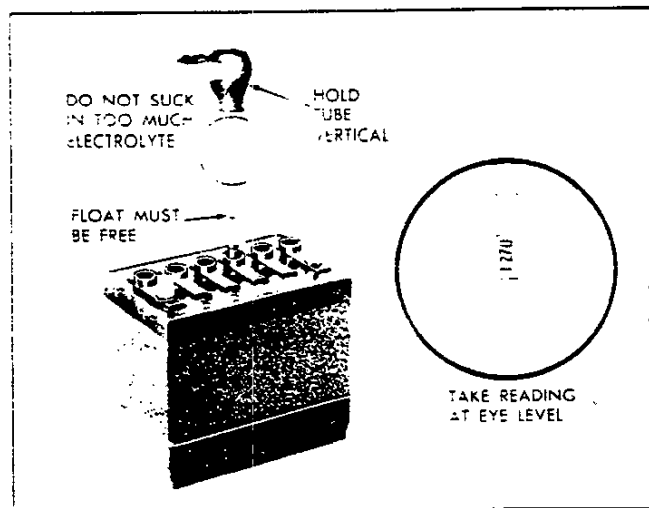


Fig. 4—Testing Specific Gravity of Battery

but they should not be tightened to the point where the battery case will be placed under a severe strain.

To insure good contact, the battery cables should be tight on the battery posts. Oil battery terminal felt washer. If the battery posts or cable terminals are corroded, the cables should be cleaned separately with a soda solution and a wire brush. After cleaning and before installing clamps, apply a thin coating of petrolatum to the posts and cable clamps to help retard corrosion.

If the battery has remained undercharged, check for loose generator belt, defective generator, high resistance in the charging circuit, oxidized regulator contact points, or a low voltage setting.

If the battery has been using too much water, the voltage regulator setting is too high.

DELCOTRON GENERATOR AND REGULATOR

The delcotron generator and regulator tests during tune-up consist of the above battery tests: the condition of the battery indicating further tests and adjustments as outlined in Section 6Y, "Engine Electrical."

FAN BELT

- a. Inspect fan belt condition.
- b. Check and adjust if necessary for correct tension of belt, as follows:
 1. Using a strand tension gauge, Figure 5, check the fan belt midway between the water pump pulley and generator pulley.
 2. Adjust generator on its mounting bracket until the tension of the fan belt is sufficient to read 90 lbs. for a new belt or 70 lbs. for a used belt.



Fig. 5—Checking Fan Belt Tension

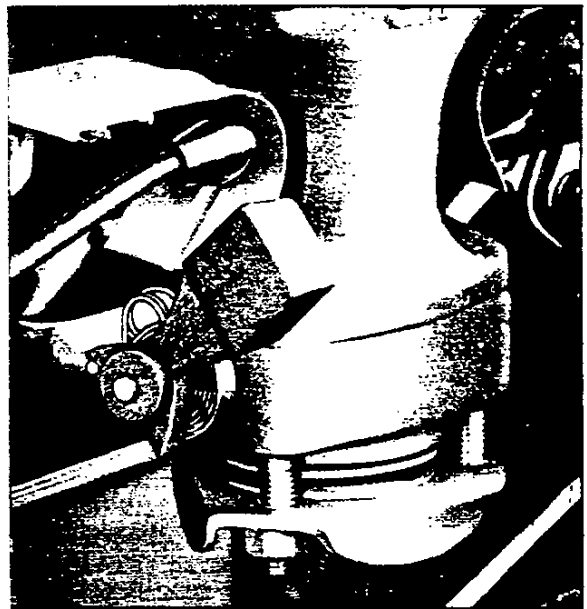


Fig. 6—Manifold Heat Control Valve

CHECK OPERATION OF MANIFOLD HEAT VALVE

Check manifold heat control valve (fig. 6) for freedom of operation. If shaft is sticking, free it up with G. M. Manifold Heat Control Solvent or its equivalent.

NOTE: It may be necessary to remove the heat control valve flange to free the inboard end of valve shaft.

TIGHTEN MANIFOLD BOLTS

Tighten all manifold bolts to specification and sequence outlined in Section 8. A slight leak at the manifold destroys engine performance and economy.

CHECK FUEL LINES AND SERVICE FUEL FILTER

- a. Inspect fuel lines for kinks, bends or leaks and correct any defects found.
- b. If equipped with fuel filter, clean filter.

NOTE: If a complaint of poor high speed performance exists on the vehicle, fuel pump tests described in "Additional Checks and Adjustments" in this section should be performed.

INSPECT AND SERVICE COOLING SYSTEM

Inspect cooling system for leaks, weak hoses, loose hose clamps and correct coolant level, and service as required.

NOTE: A cooling system pressure test, as described in "Additional Checks and Adjustments" in this section, may be performed to detect internal or external leaks within the cooling system.

CHECK LUBRICANT LEVEL AND INSPECT FOR OIL LEAKS

Check level of lubricant in crankcase and inspect engine for oil leaks.

ACCELERATOR LINKAGE

The length of the throttle linkage is adjustable to assure wide-open throttle with full accelerator pedal depression. To check, depress accelerator pedal fully and check to see if throttle is wide open. If not, adjust threaded swivel at throttle lever to suit. With the accelerator pedal fully depressed and the carburetor throttle valve fully open the threaded swivel should be adjusted for free entry into the throttle lever. The swivel should then be turned two full turns to lengthen the control rod.

AUTOMATIC CHOKE

Make sure the scribe mark on the coil cover is in line with the center notch in the choke housing and 3 notches lean on F.I.

CLEANING AND CHECKING OPERATIONS DURING WARMUP

- a. Set parking brake and place transmission in neutral, then start engine and run until normal operating temperature is reached. This should be approximately 10-15 minutes.
- b. Clean air cleaner.
- c. Check the following for proper operation:
 - Windshield wipers
 - Headlights
 - Parking lights
 - Tail lights.
 - Stop lights
 - Directional signals
 - Horns
 - Instruments and indicator lights
 - Brake and clutch pedal adjustment
 - Accessories

TIGHTEN CYLINDER HEAD BOLTS AND ADJUST VALVE LASH

On models equipped with solid lifters;

1. Normalize engine.
2. Remove automatic choke heat tube and remove rocker arm covers. Keep cover screws and reinforcements together on Fuel Injection

Engines, remove air cleaner hose and adapter to air meter then remove pirometer housing (fig. 7) to remove left rocker arm cover.

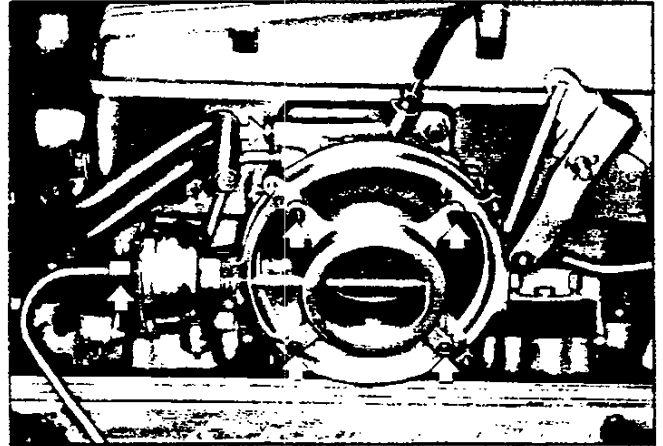


Fig. 7—Enrichment Housing Attaching Screws

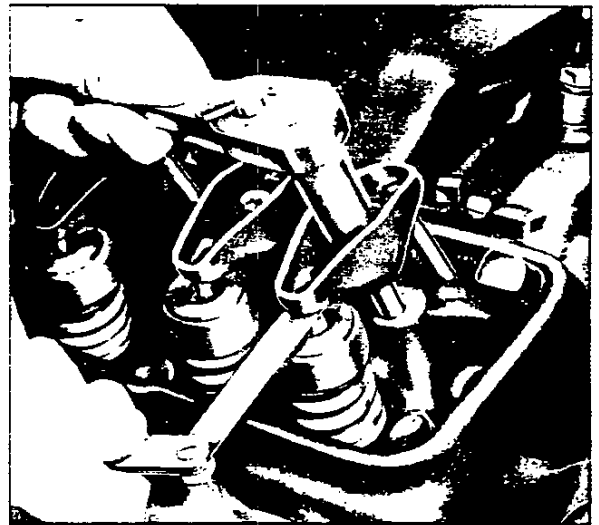


Fig. 8—Adjusting Valve Lash

On models equipped with hydraulic lifters;

The following procedure, performed with the engine running, should be performed only in case readjustment is required.

- a. After the engine has been normalized, remove valve cover and install a new valve cover gasket on cylinder head to prevent oil from running out.
- b. With the engine running at idle, back off valve rocker arm nut until the valve rocker arm starts to clatter.

- c. Turn rocker arm nut down slowly until the clatter just stops. This is the zero lash position.
- d. Turn nut down $\frac{1}{4}$ additional turn and pause 10 seconds until engine runs smoothly. Repeat additional $\frac{1}{4}$ turns, pausing 10 seconds each time, until nut has been turned down 1 full turn from the zero lash position.

NOTE: This 1 turn pre-load adjustment must be done slowly to allow the lifter to adjust itself to prevent the possibility of interference, between the inlet valve head and top of piston, which might result in internal damage and or bent push rods. Noisy lifters should be replaced.

- f. Repeat Steps b, c and d to adjust the rest of the valves.
- g. Install valve cover, using new gasket.

TEST DWELL AND DWELL VARIATION

Two methods are offered for dwell or point gap adjustment on the vehicle. Whenever possible, a dwell meter should be used for better accuracy. The engine must be thoroughly warmed up before proceeding.

- a. With engine running at idle, raise the adjusting screw window and insert an Allen wrench in the socket of the adjusting screw.
- b. With a dwell meter connected, turn the adjusting screw as required until a dwell reading of 30 degrees is obtained. A 2-degree variation is allowable for wear. If a dwell meter is not available, turn adjusting screw clockwise until engine starts to misfire, then turn screw one-half turn in the opposite direction to complete adjustment.
- c. Close access cover fully to prevent the entry of dirt into the distributor.

TEST IGNITION TIMING AND ADVANCE

1. Remove distributor shield and attach a timing light (using an adapter) to No. 1 spark plug wire terminal and connect tachometer.
2. Disconnect spark advance hose at carburetor and connect vacuum gauge there.
3. Set parking brake, start engine and run at idle speed (see tune-up chart).
4. Aim timing light at tab at harmonic balancer (see tune-up chart for specifications).
5. Adjust timing as required by loosening clamp bolt and rotating distributor until correct timing is indicated, then tighten clamp bolt.

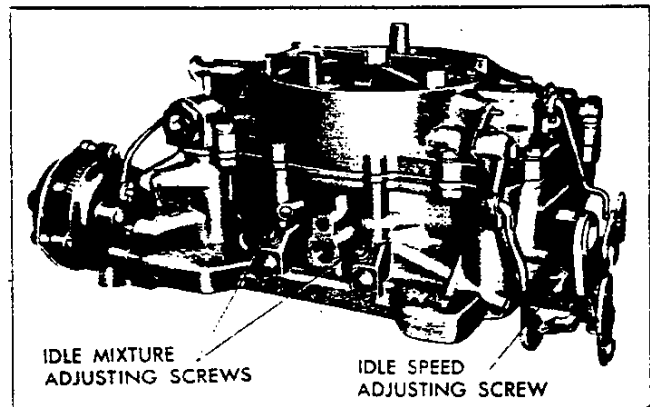


Fig. 9—Idle Speed and Mixture Screws

6. Disconnect timing light.
7. Reconnect distributor spark advance and vacuum gauge with a "T," then perform idle speed and mixture adjustment.

IDLE SPEED AND MIXTURE

Omit steps 1 and 2 when proceeding from timing procedure.

1. Connect tachometer and vacuum gauge to engine. Set parking brake. Start engine, allow to idle and place transmission in neutral.
2. With a thoroughly warmed-up engine, check to see that choke is fully off and carburetor is on slow idle.
3. Adjust idle speed adjustment screw (fig. 9) to give proper idle speed. See Specifications.
4. Adjust each idle mixture adjustment screw to give peak steady vacuum at given idle speed.

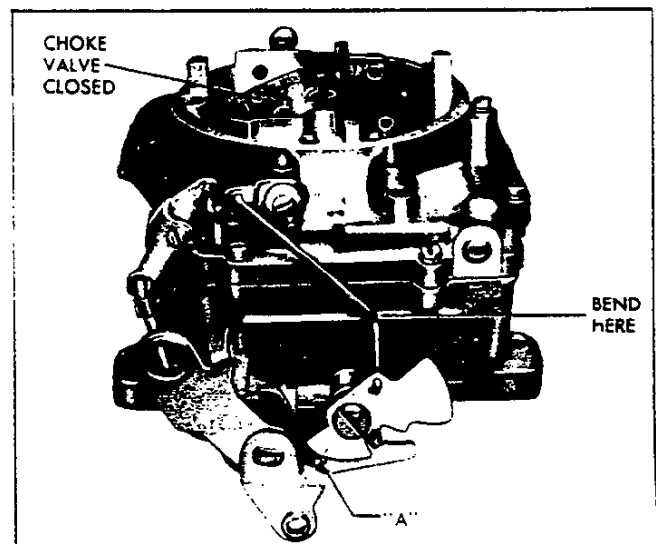


Fig. 10—Fast Idle Adjustment

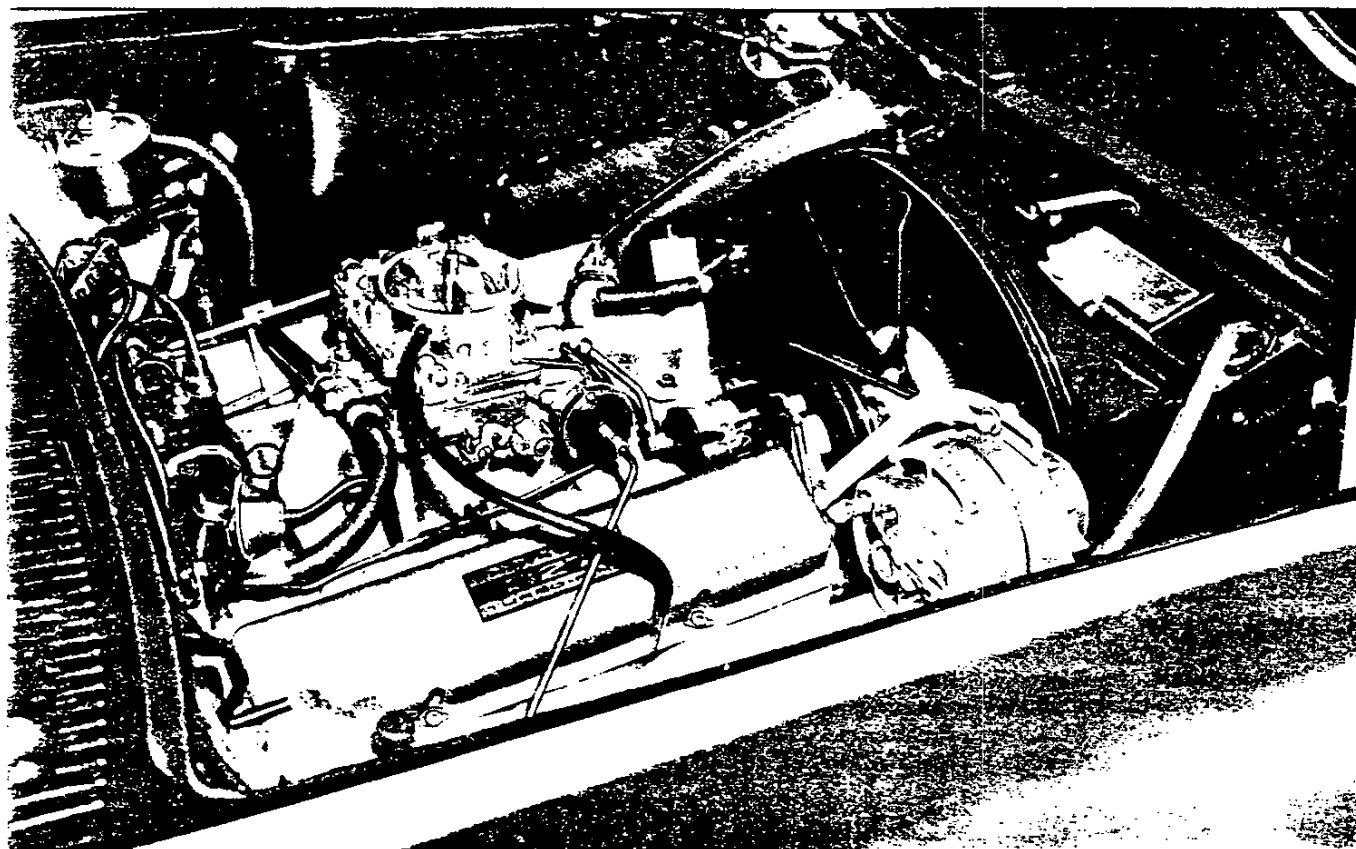


Fig. 11—Positive Crankcase Ventilation

FAST IDLE

(Refer to figure 10)

1. While holding choke valve closed, fast idle cam index mark should line up with fast idle adjustment screw. If necessary, bend fast idle rod at lower angle (using Tool J-5197) to adjust.
2. Start engine and attach tachometer. With fast idle screw on index of cam, adjust fast idle screw to obtain approximately 1750 rpm with warm engine.

POSITIVE CRANKCASE VENTILATION SYSTEM (fig. 11)

All 1963 Chevrolet engines have either "special" or "closed" positive ventilation systems utilizing manifold vacuum to draw fumes and contaminating vapors into the combustion chamber where they are burned. The crankcase ventilation system has an important function and should be understood and serviced properly.

In both positive and closed crankcase ventilation, air is drawn through the engine, through a regulating valve and into the manifold, drawing crankcase vapors

and fumes with it to be burned. Positive ventilation uses a vented-meshed oil filler cap for clean air intake to the engine, while closed positive ventilation system draws the clean air from the carburetor air cleaner and has a nonvented oil filler cap.

The positive ventilation valves are designed specifically for each engine to control the amount of air drawn from the crankcase to manifold. **VALVES SH NEVER BE CHANGED FROM ONE SIZE ENGINE TO ANOTHER.**

The crankcase ventilation valve and the vented oil filler cap will eventually become plugged and ineffective. The valve should be tested and the vented oil filler cap should be washed in solvent, blown dry with compressed air and then re-oiled at regular intervals (see Section "O").

Two methods for testing the ventilation are as follows:

Engine RPM Drop Method:

1. Connect tachometer and vacuum gauge as for idle speed and mixture adjustment.
2. Set parking brake and start engine.

3. Disconnect ventilation hose at valve on carburetor base, block opening of valve and read engine rpm change.
4. A change of less than 50 rpm indicates a plugged ventilation valve metering hole—replace the valve and adjust idle speed and mixture.

Crankcase Ventilation Tester Method: (AC Type CT-1 Tester)

1. Remove oil filler cap and install tester adapter with tube connector.
2. Remove oil gauge dipstick and seal the opening with a plug or tape.
3. (Closed Positive Ventilation System)—Disconnect air cleaner to oil filler tube hose at air cleaner and plug the end of hose with tape or a plug.
4. Connect rubber hose to tester base and to filler cap adapter, then adjust the selector knob (on base of tester) for valve being tested (CV-590—Setting 2).
5. Start engine and allow to run at normal idle.
6. Hold tester upright and make sure there are no kinks in the hose. Look directly into viewing windows and observe indicator color.
7. A reading of green indicates a proper functioning valve. Any other reading should be verified by installing a new valve and retesting to be sure the valve was at fault rather than engine seals. A green reading with new valve indicates first valve was bad—a duplicate reading with new valve indicates other engine trouble, the original valve was good.

ADDITIONAL CHECKS AND ADJUSTMENTS

The following tests are described herein for use as required where either an abnormal condition requiring further checking has been detected during Tune-Up or a specific customer complaint exists.

CYLINDER BALANCE TEST

It is often difficult to locate a weak cylinder, especially in an eight cylinder engine. A compression test, for example, will not locate a leaky intake manifold, a valve not opening properly due to a worn camshaft, or a defective spark plug.

With the cylinder balance test, the power output of one cylinder may be checked against another, using a set of grounding leads. When the power output of each cylinder is not equal, the engine will lose power and run roughly.

Perform a cylinder balance test as follows (see Figure 12):

1. Connect the tachometer and vacuum gauge.
2. Start engine and run at 1500 rpm.
3. Ground large clip of grounding leads and connect individual leads to all spark plugs except the pair being tested.

Divide the firing order in half and arrange one half over the other. The cylinders to be tested together appear one over the other: i.e.

Firing Order

1-8-4-3-6-5-7-2=1-8-4-3=1-6, 8-5, 4-7, 3-2
6-5-7-2

4. Operate engine on each pair of cylinders in turn and note engine rpm and manifold vacuum for each pair. A variation of more than 1 inch of vacuum or 40 rpm between pairs of cylinders being tested indicates that the cylinders are off balance.

5. To isolate one weak cylinder, short out one bank of cylinders at a time. The bank giving the lower readings will include the weak cylinder.

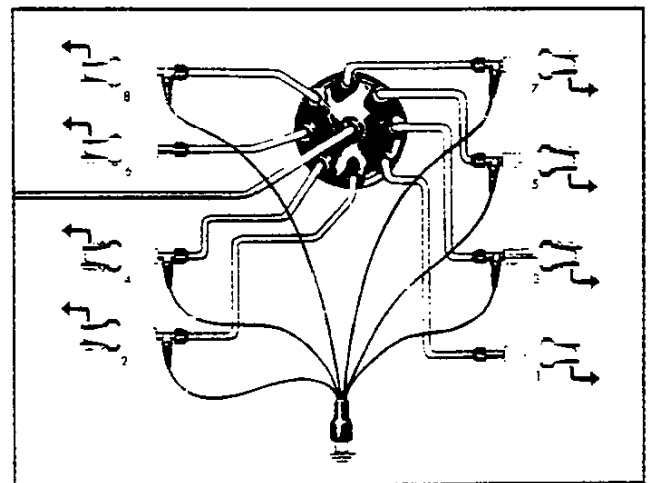


Fig. 12—Cylinder Balance Test Connections

CRANKING VOLTAGE

- a. Connect jumper lead from distributor primary terminal of coil to ground to prevent engine from firing during cranking.
- b. Connect voltmeter to primary terminal on side of coil and to ground (fig. 13).
- c. Operate starting motors, using ignition-starter switch.
 - If voltage is 9 volts or more and cranking speed is satisfactory, the battery, starter, cables, starter switch and bypass ignition circuit to coil are in good condition.

ENGINE TUNE-UP 6-10

- If below 9 volts, check circuit until difficulty is located.

Meter reading below specification—Weak battery; defective cables, connections, switch or starter; defective ignition circuit to coil.

Cranking speed below normal—Excessive resistance in cables or starting motor; excessive mechanical friction in engine.

Uneven cranking speed—uneven compression, defective starter or starter drive.

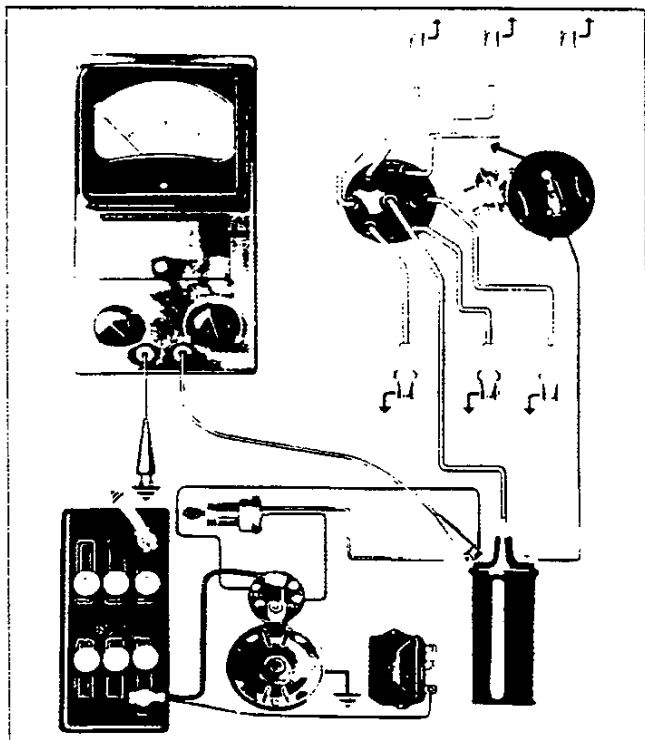


Fig. 13—Cranking Voltage Test Connections

IGNITION SWITCH

- With voltmeter connected as described for the Cranking Voltage Test (fig. 13), turn ignition switch to ON. Voltage should drop to 5 to 7 volts as current is now passing through high resistance wire connected between ignition switch and (+) positive terminal of coil. If battery voltage of 12 volts is obtained, the starter solenoid is by-passing the high resistance wire connected between ignition switch and (+) positive terminal of coil and thus the starter solenoid is not functioning properly to by-pass the ignition resistance wire or the ignition circuit is incorrectly wired.
- Remove jumper lead from distributor primary terminal of coil and ground.

DISTRIBUTOR RESISTANCE

Use equipment as directed by manufacturer. Excessive resistance in primary circuit must be eliminated before continuing with test procedure.

SECONDARY RESISTANCE

Use equipment as directed by manufacturer.

- Uniform "normal readings" as specified by manufacturer indicate all secondary circuit components are in good condition.
- If all readings are "below normal", check for corroded coil tower terminal, poorly connected or broken coil wire, center cap electrode or rotor tip burned, or an open secondary in coil.
- If readings are "higher than normal" at two or more plugs adjacent in firing order, cross firing is occurring in distributor cap or between spark plug cables concerned.
- If meter reads off scale to left, the coil polarity is reversed. Check for reversed coil primary wires, wrong coil or reversed vehicle battery connections.

IGNITION OUTPUT AND SECONDARY LINKAGE

Use equipment as directed by manufacturer.

- GOOD readings indicate both ignition output and secondary insulation is good.
- If all readings are BAD or if ignition test calibrator cannot be adjusted to Set Line, check for high resistance in primary circuit, defective distributor points, coil or condenser.
- If readings are BAD when certain plug wires are lifted off, check for cracks or carbon tracks in distributor cap or defective insulation on those plug wires being lifted.

FUEL PUMP

If owner has complained of poor high speed performance, the fuel pump may be at fault. Too low a pump pressure or volume will cause a high speed "miss" because of lack of fuel delivered to the carburetor, while too high a pressure will cause carburetor flooding.

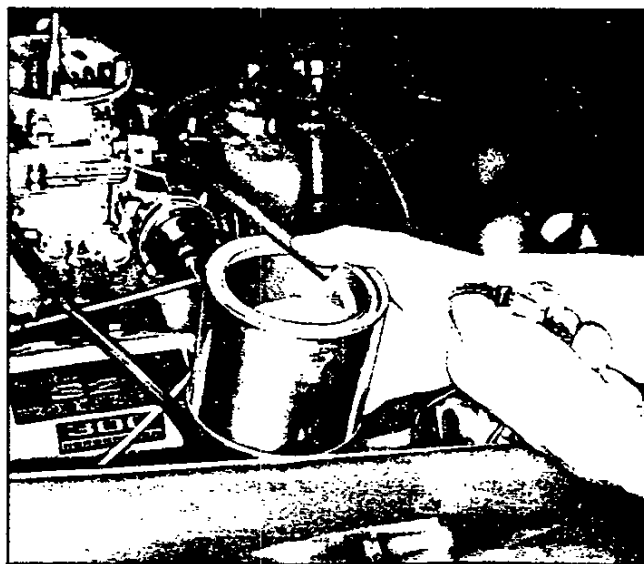


Fig. 14—Pump Volume Test

Pump Volume (fig. 14)

1. Disconnect fuel line at carburetor and direct it into a container, preferably one indicating the pint level.
2. Start engine and run at idle using fuel in carburetor bowl.
3. Measure the time required to deliver one pint of fuel, then shut off engine. At idle the pump should deliver one pint of fuel in 30 to 45 seconds.
 - If no gasoline or only a small amount flows from open end of pipe, then the fuel line is clogged or the pump is inoperative. Before removing pump, remove gas cap, disconnect both

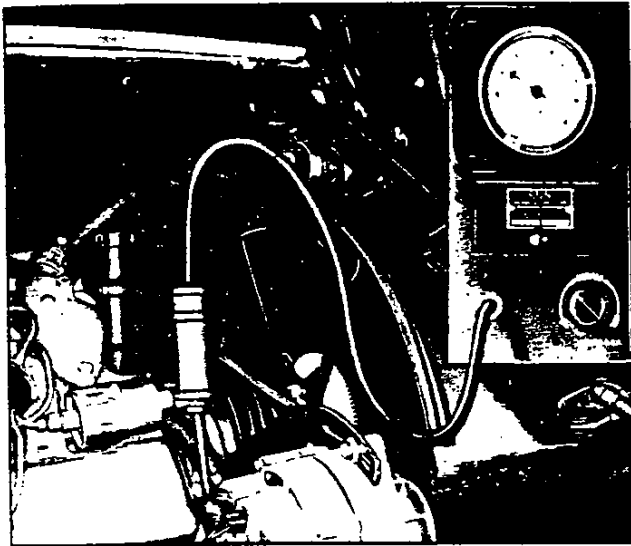


Fig. 15—Pump Pressure Test

inlet and outlet pipes and blow through them with an air hose to make sure they are clear. This will eliminate the possibility of a clogged gas strainer in the fuel tank. Reconnect pipes to pump and retest flow.

- If capacity is within limits, proceed with Pump Pressure Test below.

Pump Pressure (fig. 15)

1. Attach vacuum pressure gauge hose to fuel line.
2. Operate engine at idle and observe reading on gauge. Pressure should be $5\frac{1}{4}$ to $6\frac{1}{2}$ bs. on both engines and should remain constant at all speeds between idle and 1000 rpm.
 - If pressure is too low or too high or varies materially at different speeds, the pump should be removed for repairs or replacement.
 - If the fuel pump checks out correctly on a high speed complaint, overhaul the carburetor.
3. Remove gauge and reconnect fuel line to carburetor. Inspect fuel lines for kinks and bends, and check all connections for leaks.

COOLING SYSTEM PRESSURE TEST

The following test may be performed with pressure testing equipment available commercially for this purpose. This test provides an excellent means of detecting internal or external leaks within the cooling system.

1. Remove supply tank cap.
2. Apply a test pressure 3 pounds higher than the setting of the radiator cap, i.e. 16 pounds for a 13 pound cap.
3. If the pressure will not hold, there is either an internal or external leak within the system.

SERVICE OPERATIONS**INTAKE MANIFOLD (EXCEPT FUEL INJECTION)****Removal**

1. Drain radiator and remove air cleaner.
2. Remove distributor shielding and disconnect battery cables at battery.
3. Disconnect:
 - a. Upper radiator and heater hose at manifold.
 - b. Accelerator linkage at pedal lever.
 - c. Fuel line at carburetor.
 - d. Wires at temperature sending switch and coil (both sides).
 - e. Choke heat and clean air tubes at carburetor end.
 - f. Power brake hose at carburetor base.
 - g. Spark advance hose at distributor.
 - h. Tachometer cable at distributor.
4. Remove distributor cap from distributor; remove

distributor clamp then note rotor position and remove distributor, and position distributor cap rearward against firewall (tie there if necessary) for clearance.

5. Remove coil, then disconnect crankcase ventilation hose at adapter on block.
6. Remove manifold-to-head attaching bolts, then remove manifold (with carburetor on) from engine and discard gaskets and seals.
7. If manifold is to be replaced, transfer:
 - a. Carburetor and carburetor mounting studs.
 - b. Oil filler tube.
 - c. Temperature sending switch.
 - d. Water outlet and thermostat (use new gasket).
 - e. Heat hose adapter.

Installation

1. Clean gasket and seal surfaces of manifold, cylinder heads and block.

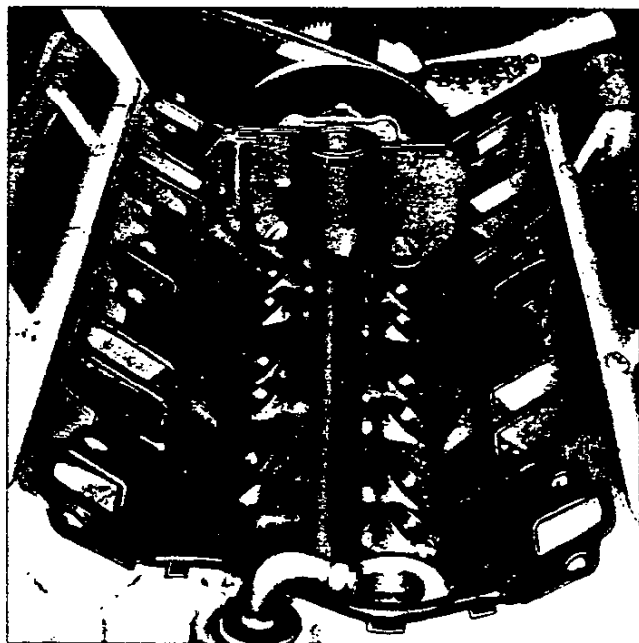


Fig. 16—Manifold Gasket and Seal Installation

2. Install manifold and seals on block with tabs as shown in Figure 16.
3. Install side gaskets on cylinder heads using sealing compound around water passages.

NOTE: When installing the intake manifold, any sliding to align bolt holes may roll the end seals out of position. A pilot (wood or metal) used in distributor opening of the block can be made to help install the manifold squarely.

Dimensions of pilot shown in Figure 17.

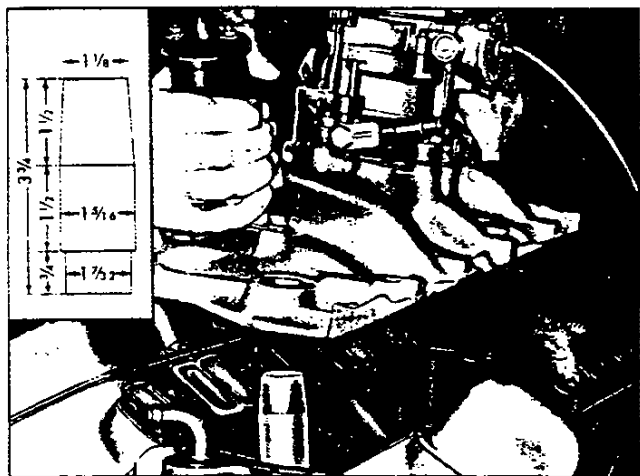


Fig. 17—Installing Manifold Using Pilot

4. Install pilot in distributor opening in block and install manifold over pilot to guide it squarely in place.

NOTE: If pilot is not used, be sure end seals stay in place. Check position of tabs that stick out.

5. Install manifold bolts, remove the pilot and torque in proper sequence (fig. 18) to a final torque of 25-35 ft. lbs.
6. Reverse Steps 1-5, except Step 2, of removal procedure to complete the installation (set distributor rotor in approximate same position as when removed).
7. Perform necessary tune-up procedures, and check for oil, water and air leaks.
8. Install distributor cap.

INTAKE MANIFOLD ADAPTER WITH FUEL INJECTION

Removal

1. Remove complete Fuel Injection unit as outlined in Section 6M.
2. Disconnect:
 - a. Upper radiator hose at water outlet.
 - b. Wire at temperature sending switch.
 - c. Tachometer cable at distributor.
3. Perform Steps 4 thru 7 of above procedure to remove adapter.

Installation

1. Perform Steps 1-5 of regular manifold installation procedure.
2. Connect:

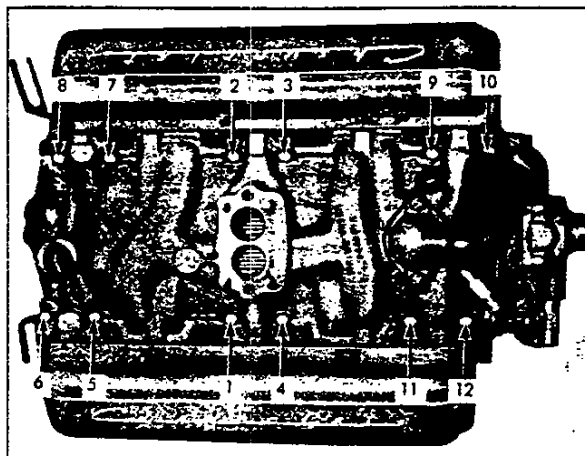


Fig. 18—Intake Manifold Bolt Torque Sequence (Typical)

SECTION 7

TRANSMISSIONS

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THREE-SPEED TRANSMISSION

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GENERAL DESCRIPTION

A three-speed synchromesh transmission (figs. 1 and 2) is used as standard equipment on Corvettes. This transmission incorporates all helical gears which are machined from drop forged steel gear blanks, heat treated and shot peened for strength and long life. The shafts are machined from high grade steel, heat treated and ground to close limits.

The rear end of the clutch gear is supported by a heavy duty ball bearing at the front end of the transmission case and is piloted at its front end in an oil impregnated bushing mounted in the engine crankshaft. The front end of the mainshaft is piloted in a double set of roller bearings set into the hollow end of

the clutch gear and the rear end is carried by a ball bearing.

The countergear is carried on roller bearings at both ends while thrust is taken on thrust washers located between each end of gear and the case. Roller bearing thrust washers are installed between the countergear thrust washers and the roller bearings.

The reverse idler gear is carried on ball-indented bronze bushings. Forward thrust of the gear is taken on a washer located between front of gear and the case, and rearward thrust is taken on a radial needle bearing and a washer located between rear of gear and case.

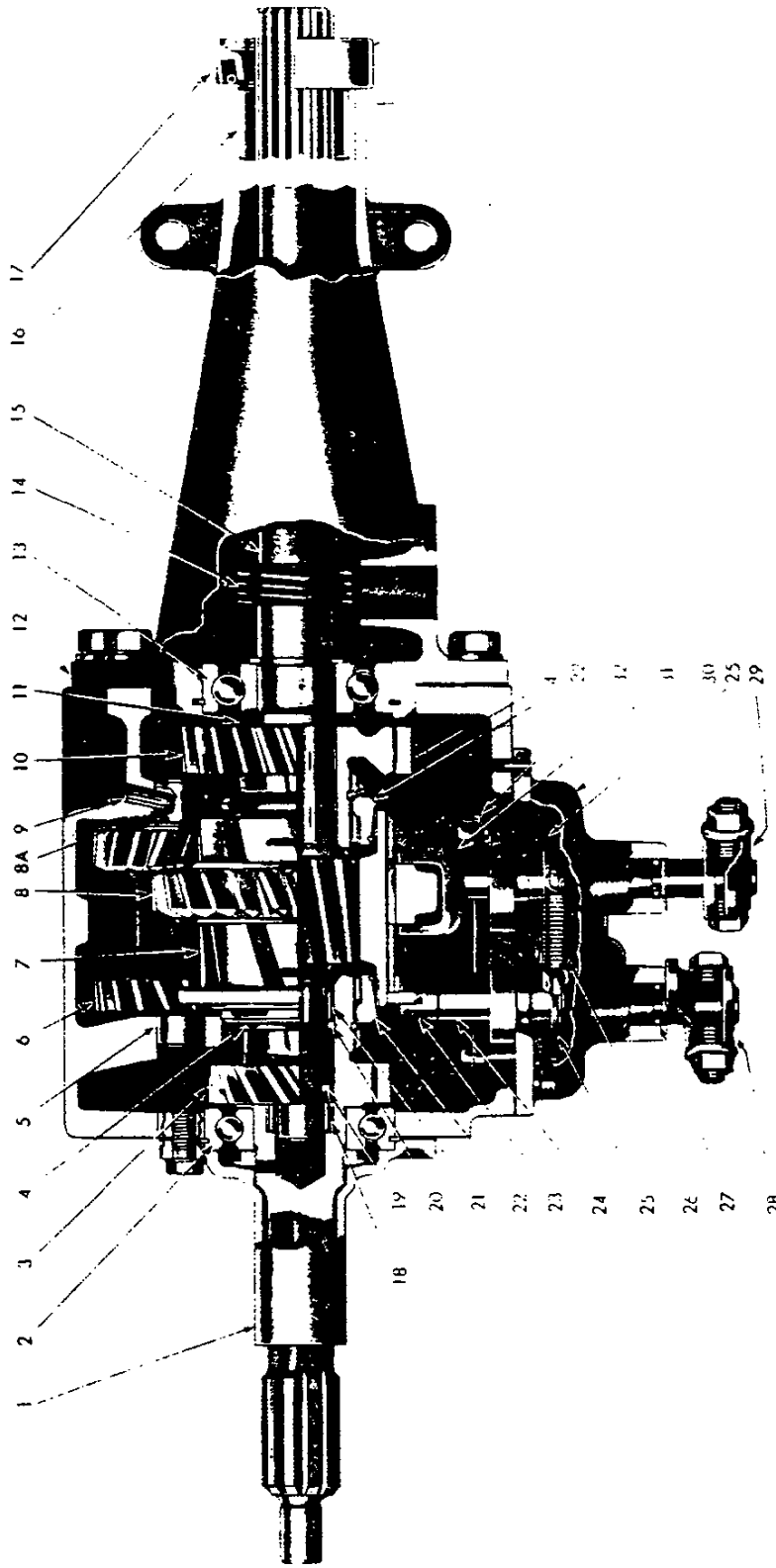


Fig. 1—Transmission Cross Section—Top View

- | | | | |
|----------------------------------|---------------------------------|------------------------------------|-------------------------------------|
| 1. Clutch Gear Bearing Retainer | 14. Speedometer Drive | 21. Rear Pilot Bearing Rollers | 28. Second and Third Shifter Lever |
| 2. Clutch Gear Bearing | 15. Mainshaft | 22. Synchronizer Ring | 29. First and Reverse Shifter Lever |
| 3. Clutch Gear | 16. Bushing | 23. Second and Third Shifter Fork | 30. Side Cover |
| 4. Energizing Spring | 17. Oil Seal | 24. Second and Third Shifter Shaft | 31. First and Reverse Shifter Fork |
| 5. Reverse Idler Shaft | 18. Front Pilot Bearing Rollers | 25. Detent Cam | 32. Interlock Retainer |
| 6. Reverse Idler Gear | 19. Thrust Washer | 26. Detent Cam Spring | |
| 7. Second and Third Speed Clutch | 20. Thrust Washer | 27. "O" Ring Oil Seal | |

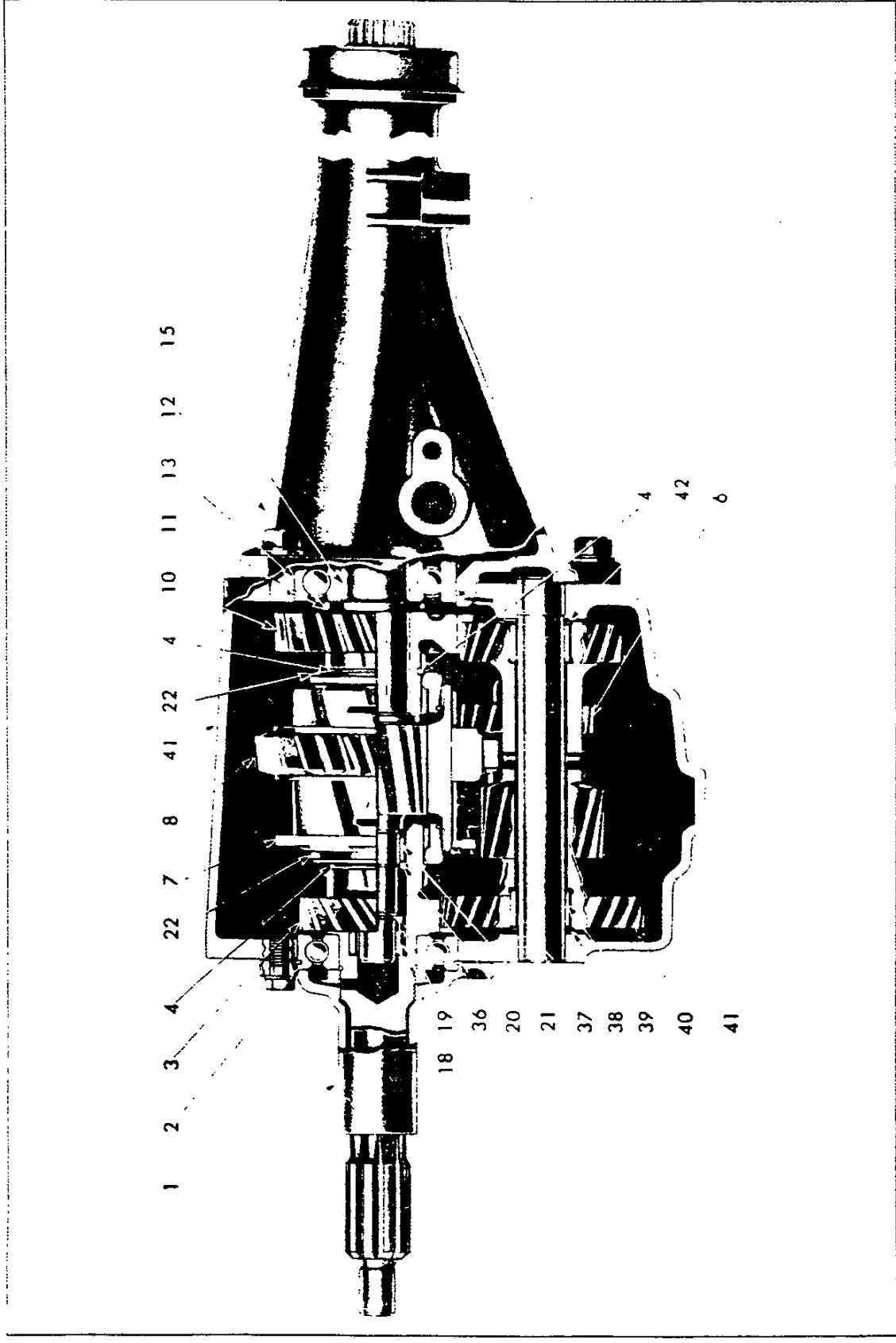


Fig. 2—Transmission Cross-Section (Side View)

- | | | |
|-----------------------------------|---------------------------------|--------------------------|
| 1. Clutch Gear Bearing Retainer | 18. Front Pilot Bearing Rollers | 37. Countershaft |
| 2. Clutch Gear Bearing | 19. Thrust Washer | 38. Thrust Washer |
| 3. Clutch Gear | 20. Thrust Washer | 39. Roller Bearing |
| 4. Energizing Spring | 21. Rear Pilot Bearing Rollers | 40. Countergear |
| 6. Reverse Idler Gear | 22. Synchronizer Ring | 41. Transmission Case |
| 7. Second and Third-Speed Clutch | 36. Snap Ring | 42. Roller Thrust Washer |
| 8. First and Reverse Sliding Gear | | |
| 10. Second Speed Gear | | |
| 11. Thrust Washer | | |
| 12. Case Extension | | |
| 13. Mainshaft Rear Bearing | | |
| 15. Mainshaft | | |

TRANSMISSION—3-SPEED 7-4

Gearshifting is manual through shift control rods to the transmission cover located on the side of the transmission. Two shifter control rods connect the

shifter levers on the transmission to the levers of the floor shift lever assembly attached to the extension housing (fig. 3).

MAINTENANCE AND ADJUSTMENTS

SHIFT LINKAGE ADJUSTMENT

In cases where the gearshift linkage has been disconnected, or if improper shift pattern is encountered, it should be adjusted as follows:

1. Set levers (A), (B), and (C) (fig. 3) in neutral detent position.

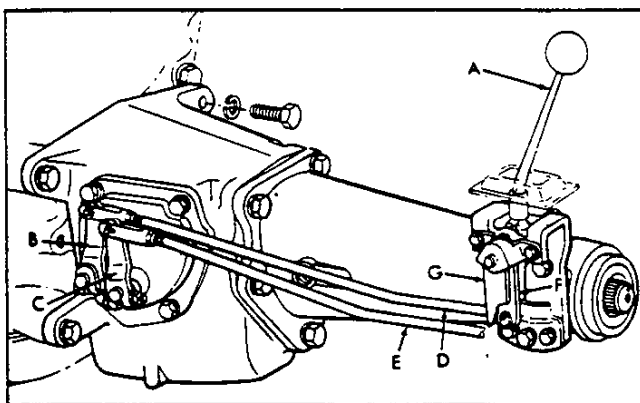


Fig. 3—Shift Linkage Adjustment

2. Install rod (D) on lever (F) and install clip.
3. Adjust clevis until clevis pin can be freely admitted through holes in clevis and lever (B).
4. Install clevis pin and cotter pin.
5. Move lever (A) to engage first and reverse lever (G) while maintaining lever (A) in neutral detent position.
6. Install rod (E) on lever (G) and insert clip.
7. Adjust clevis on rod (E) until clevis pin can be freely admitted through holes in clevis and lever (C).
8. Install clevis pin and cotter pin. Tighten jam nuts at clevis on rods (D) and (E).
9. Check shift pattern for proper operation.

SPEEDOMETER DRIVEN GEAR

Disconnect speedometer cable, remove lock plate to housing bolt and lock washer and remove lock plate. Insert screwdriver in lock plate slot in fitting and pry fitting, gear and shaft from housing. Pry "O" ring from groove in fitting.

Install new "O" ring in groove in fitting. Coat "O"

ring and driven gear shaft with transmission lubricant and insert shaft.

Hold the assembly so slot in fitting is toward lock plate boss on housing and install in housing. Push fitting into housing until lock plate can be inserted in groove and attach to housing.

MAINSHAFT OIL SEAL REPLACEMENT

1. Remove propeller shaft as outlined in Section 4 and disconnect any necessary items to obtain clearance.
2. Using a punch against exposed end of seal, drive seal out of extension.
3. Wash counterbore with cleaning solvent and inspect for damage.
4. Coat new seal with Permatex or equivalent and start straight in bore in case extension. Using Tool J-5154, tap seal into counterbore.
5. Reinstall propeller shaft and items removed to obtain clearance.

TRANSMISSION SIDE COVER

On any replacement of parts in the side cover assembly, it is necessary to remove cover from transmission case.

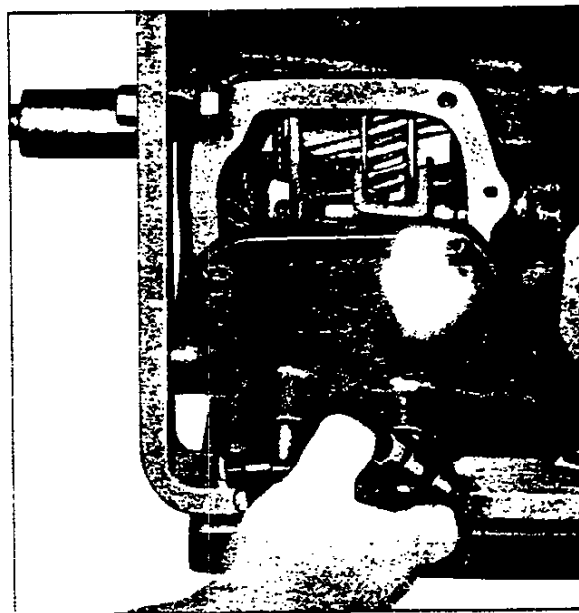


Fig. 4—Cover Assembly Installation

FOUR-SPEED TRANSMISSION

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GENERAL DESCRIPTION

The four-speed synchromesh transmission (fig. 17), incorporates helical gears specially designed to provide high torque capacity without additional weight, and gear teeth proportioned to operate at high speeds with neither excessive heat generation nor excessive fric-

tional losses. Shafts, bearings, high capacity clutches and other precision parts are held to close limits, providing proper clearances necessary for durability during extended heavy usage.

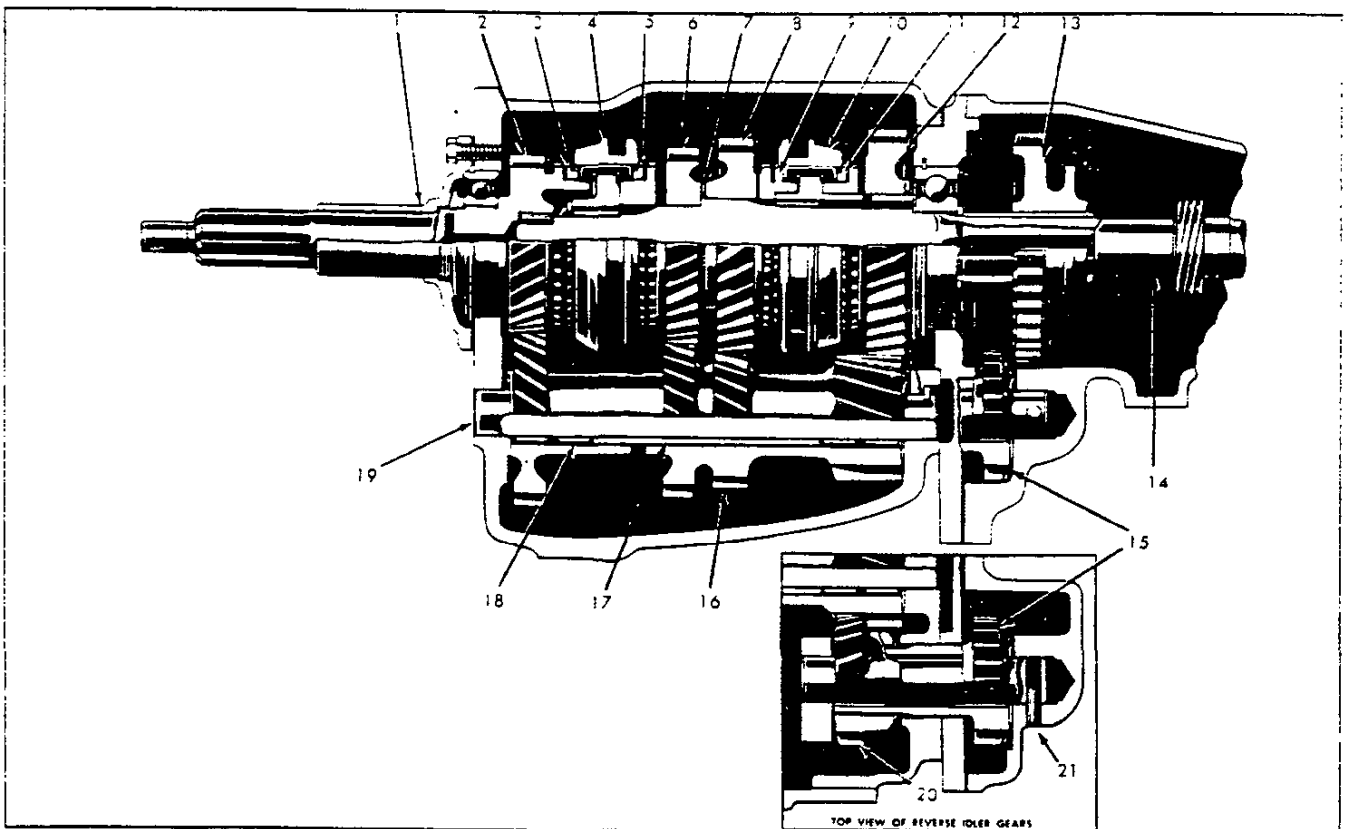


Fig. 17—Four-Speed Transmission

- | | | | |
|---|--|------------------------------------|--|
| 1. Bearing Retainer | 6. Third Speed Gear | 11. First Speed Synchronizing Ring | 17. Countershaft Bearing Roller Spacer |
| 2. Main Drive Gear | 7. Trust Bearing | 12. First Speed Gear | 18. Countershaft Bearing Roller |
| 3. Fourth Speed Synchronizing Ring | 8. Second Speed Gear | 13. Reverse Gear | 19. Countershaft |
| 4. Third and Fourth Speed Clutch Assembly | 9. Second Speed Synchronizing Ring | 14. Mainshaft | 20. Reverse Idler Gear (Front) |
| 5. Third Speed Synchronizing Ring | 10. First and Second Speed Clutch Assembly | 15. Reverse Idler Gear (Rear) | 21. Reverse Idler Shift Lock Pin |

The rear end of the main drive gear is supported by a heavy duty ball bearing at the front end of the transmission case and is piloted at its front end in an oil impregnated bushing mounted in the engine crankshaft. The front end of the mainshaft is piloted in a row of roller bearings set into the hollow end of the main drive gear and the rear end is carried by a heavy-duty ball bearing larger than the one which supports the main drive gear.

The counter gear is carried on a double row of rollers at both ends while thrust is taken on thrust washers located between the ends of the gear and the front and rear of the case.

The two-piece reverse idler gear is carried on bronze bushings while thrust is taken on thrust washers located between the front of the gear and the

back of the reverse idler thrust boss and between the rear of the gear and the reverse idler shaft boss in the case extension.

Gearshifting is manual through shift control rods to the transmission cover shifter levers for first through fourth gears, and to the reverse lever located in the case extension. The shifter lever to the rear of the transmission cover controls first and second gears while the lever to the front controls third and fourth gears. All four forward gears are provided with synchronizing clutches which can be engaged while the car is in motion.

The transmission may be used as an aid in deceleration by downshifting in sequence without double shifting or gear clashing due to all forward speeds being synchronized. Reverse is not synchronized.

MAINTENANCE AND ADJUSTMENTS

SHIFT LINKAGE ADJUSTMENT

The 4-speed transmission gear shift linkage (fig. 18), utilizes three shift rods and levers. A simple gauge block, shown in Figure 19, will aid in making the proper adjustments. The adjustments can be made without the gauge block by having an assistant hold the manual shift lever in the neutral positions.

1. Remove transmission gearshift lever seal from floor pan.
2. Place transmission in neutral and install gauge block in position shown in Figure 18.
3. Remove the cotter pin, anti-rattle washer and clevis pin at each shift lever.
4. On each shift rod, adjust the threaded clevis to permit free entry on the clevis pin into the hole in the transmission shift lever.
5. Reconnect the clevises to the shift levers.

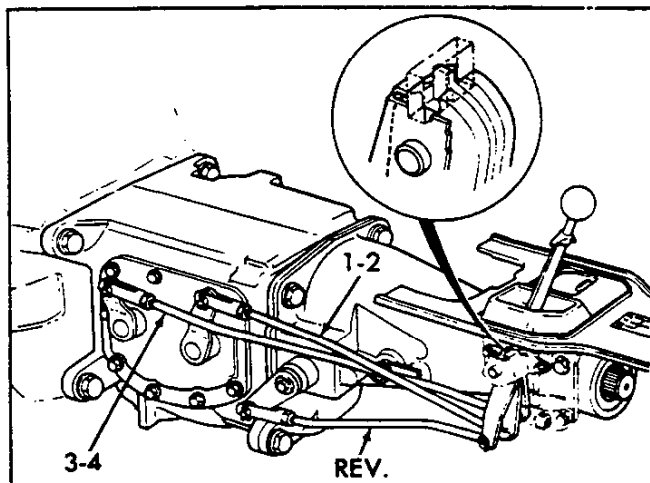


Fig. 18—Four-Speed Transmission Gearshift Linkage

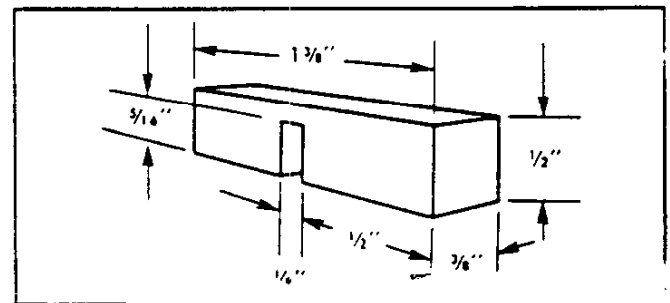


Fig. 19—Linkage Gauge block

6. Remove the gauge block and check the shifts. If any roughness still exists, one of the clevises may require adjustment of approximately one-half turn. Determine the rod and clevis requiring adjustment by sighting along the slot where the gauge block was used in Step 2.

SPEEDOMETER DRIVEN GEAR AND OIL SEAL

Replacement

Disconnect speedometer cable, remove retainer to housing bolt and lock washer and remove retainer. Insert screwdriver in slot in fitting and pry fitting, gear and shaft from housing. Pry "O" ring from groove in fitting.

Install new "O" ring in groove and insert shaft. Hold the assembly so slot in fitting is toward bottom on housing and install in housing. Push fitting into housing until retainer can be inserted in groove and lock-washer and install retainer bolt.

TRANSMISSION SIDE COVER

Removal

1. Disconnect control rods from levers.
2. Remove cover assembly from transmission case carefully and allow oil to drain.

TRANSMISSION—4-SPEED 7-16

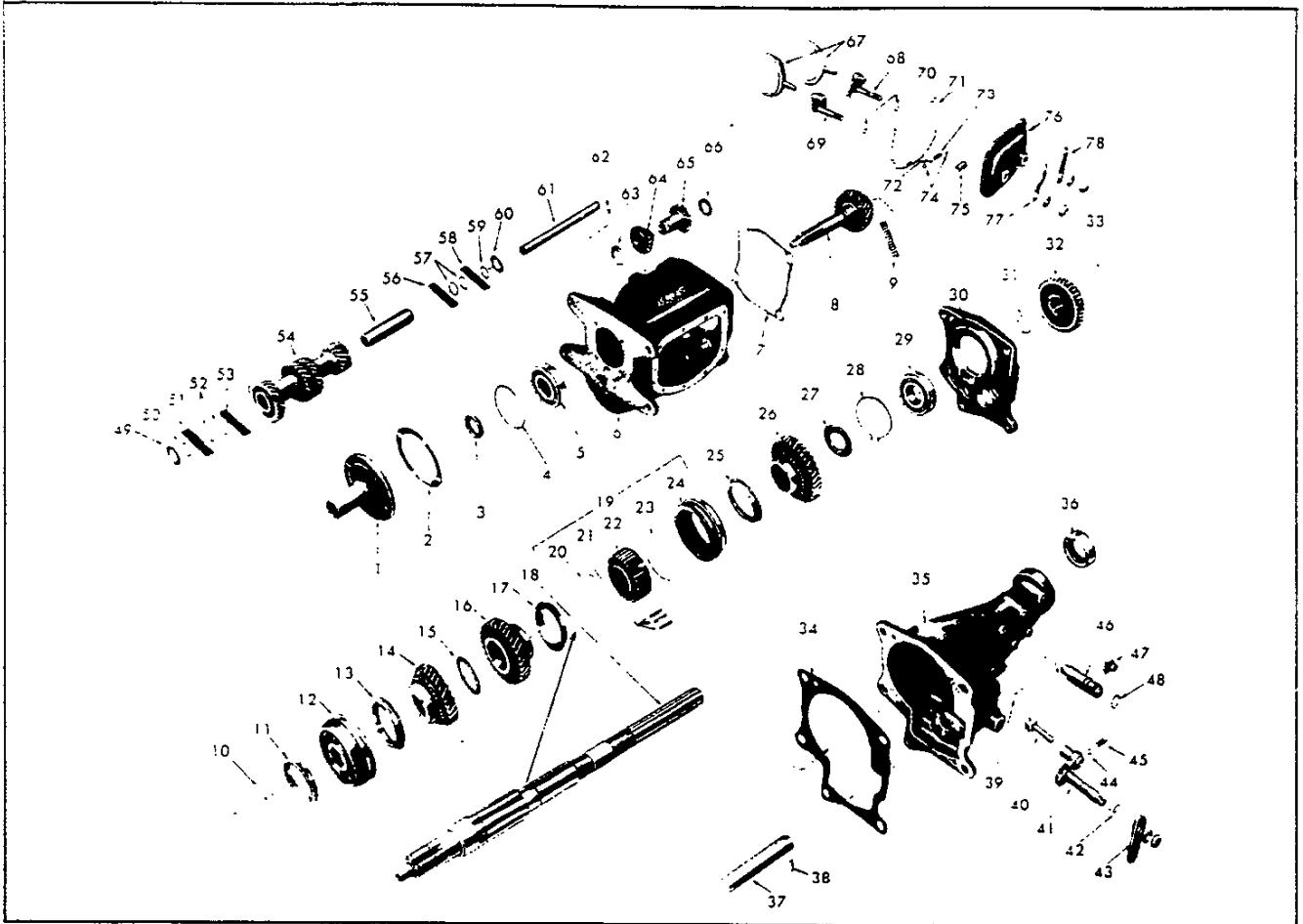


Fig. 20—Four-Speed Transmission—Exploded View

- | | | | |
|---|--|--|--|
| 1. Bearing Retainer | 20. Clutch Key Spring | 40. Reverse Shift Fork | 61. Countershaft |
| 2. Gasket | 21. Clutch Keys | 41. Reverse Shifter Shaft and Detent Plate | 62. Countershaft Woodruff Key |
| 3. Bearing Retaining Nut | 22. Clutch Hub | 42. Reverse Shifter Shaft "O" Ring Seal | 63. Reverse Idler Front Thrust Washer (Flat) |
| 4. Bearing Snap Ring | 23. Clutch Key Spring | 43. Reverse Shifter Lever | 64. Reverse Idler Gear (Front) |
| 5. Main Drive Gear Bearing | 24. First and Second Speed Clutch Sliding Sleeve | 44. Reverse Shifter Shaft Detent Ball | 65. Reverse Idler Gear (Rear) |
| 6. Transmission Case | 25. First Speed Gear Synchronizing Ring | 45. Reverse Shifter Shaft Ball Detent Spring | 66. Tanged Thrust Washer |
| 7. Rear Bearing Retainer Gasket | 26. First Speed Gear | 46. Speedometer Driven Gear and Fitting | 67. Forward Speed Shift Forks |
| 8. Main Drive Gear | 27. First Speed Gear Thrust Washer | 47. Retainer and Bolt | 68. First and Second Speed Gear Shifter Shaft and Detent Plate |
| 9. Bearing Rollers (14) | 28. Rear Bearing Snap Ring | 48. "O" Ring Seal | 69. Third and Fourth Speed Gear Shifter Shaft and Detent Plate |
| 10. Snap Ring (.086" to .088") | 29. Rear Bearing | 49. Tanged Washer | 70. "O" Ring Seals |
| 11. Fourth Speed Gear Synchronizing Ring | 30. Rear Bearing Retainer | 50. Spacer (.050") | 71. Gasket |
| 12. Third and Fourth Speed Clutch Sliding Sleeve | 31. Selective Fit Snap Ring | 51. Bearing Rollers (20) | 72. Interlock Pin |
| 13. Third Speed Synchronizing Ring | 32. Reverse Gear | 52. Spacers (2—.050") | 73. Poppet Spring |
| 14. Third Speed Gear | 33. Speedometer Drive Gear | 53. Bearing Rollers (20) | 74. Detent Balls |
| 15. Second and Third Speed Gear Thrust Washer (Needle Roller Bearing) | 34. Rear Bearing Retainer to Case Extension Gasket | 54. Countergear | 75. Interlock Sleeve |
| 16. Second Speed Gear Synchronizing Ring | 35. Case Extension | 55. Countergear Roller Spacer | 76. Transmission Side Cover |
| 17. Second Speed Gear Synchronizing Ring | 36. Rear Oil Seal | 56. Bearing Rollers (20) | 77. Third and Fourth Speed Shifter Lever |
| 18. Mainshaft | 37. Reverse Idler Shaft | 57. Spacers (2—.050") | 78. First and Second Speed Shifter Lever |
| 19. First and Second Speed Clutch Assembly | 38. Reverse Idler Shaft Lock Pin | 58. Bearing Rollers (20) | |
| | 39. Reverse Shifter Shaft Lock Pin | 59. Spacer (.050") | |
| | | 60. Tanged Washer | |

3. Remove the outer shifter lever nuts and lock-washer and pull levers from shafts.
4. Carefully push the shifter shafts into cover, allowing the detent balls to fall free, then remove both shifter shafts.
5. Remove interlock sleeve, interlock pin and poppet spring.
6. Replace necessary parts.

Installation

1. Install interlock sleeve and one shifter shaft. Place steel detent ball into sleeve followed by poppet spring and interlock pin.
2. Start second shifter shaft into position and place second detent ball on poppet spring. Compress ball and spring with screwdriver and push the shifter shaft fully in.
3. With transmission in neutral and shifter forks and levers in place, lower side cover into place. Install attaching bolts and tighten evenly.
4. Remove the filler plug and add SAE90 "Multi-Purpose Gear Lubricant." This quantity should bring the lubricant level with the filler plug hole.

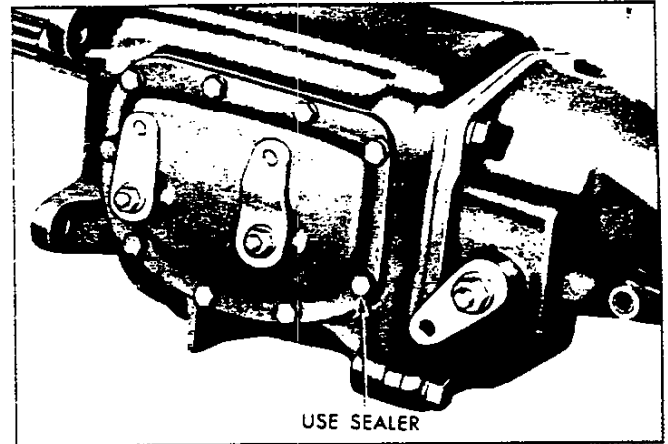


Fig. 21—Transmission Side Cover Assembly

MAINSHAFT OIL SEAL

Replacement

1. Remove propeller shaft as outlined in Section 4.
2. Remove the mainshaft oil seal.
3. Press new oil seal carefully into place in extension.

NOTE: Do not force the seal against the seat in the extension.

SERVICE OPERATIONS

REMOVAL FROM VEHICLE

1. Raise vehicle to desired working height and drain transmission lubricant.
2. Disconnect the speedometer cable from speedometer driven gear fitting and disconnect shift control rods from the shifter levers at the transmission.
3. Remove propeller shaft as outlined in Section 4, then support engine at the oil pan rail with a jack or other suitable support capable of supporting the engine when transmission is removed.
4. Disconnect shift lever and bracket assembly. Tie bracket and linkage out of the way.
5. Remove extension mount-to-center crossmember attaching bracket.
6. Remove the two upper transmission-to-clutch housing retaining bolts and install guide pins in these holes. Then remove the two lower retaining bolts.
7. Slide the transmission straight back on guide pins until the input shaft is free of splines in the clutch disc.

NOTE: The use of the guide pins during transmission removal will support the transmission and prevent damage to the clutch disc through springing.

8. Slide the transmission rearward to allow sufficient clearance of input shaft and clutch housing. Then tilt input shaft end of transmission downward and withdraw transmission from vehicle.

DISASSEMBLY

1. Remove transmission side cover as outlined under "Maintenance and Adjustments."
2. Remove four bolts from front bearing retainer and remove retainer and gasket.
3. Remove the main drive gear retaining nut (fig. 22) using Tool J-0933, after locking up transmission by shifting into two gears.
4. With transmission gears in neutral, drive lock pin from reverse shifter lever boss, as shown in Figure 23, and pull shifter shaft out about $\frac{1}{8}$ ". This disengages the reverse shift fork from reverse gear.
5. Remove five bolts attaching the case extension to the rear bearing retainer. Tap extension with soft hammer in a rearward direction to start. When the reverse idler shaft is out as far as it will go, move extension to left so reverse fork clears reverse gear and remove extension and gasket.

POWERGLIDE 7-26

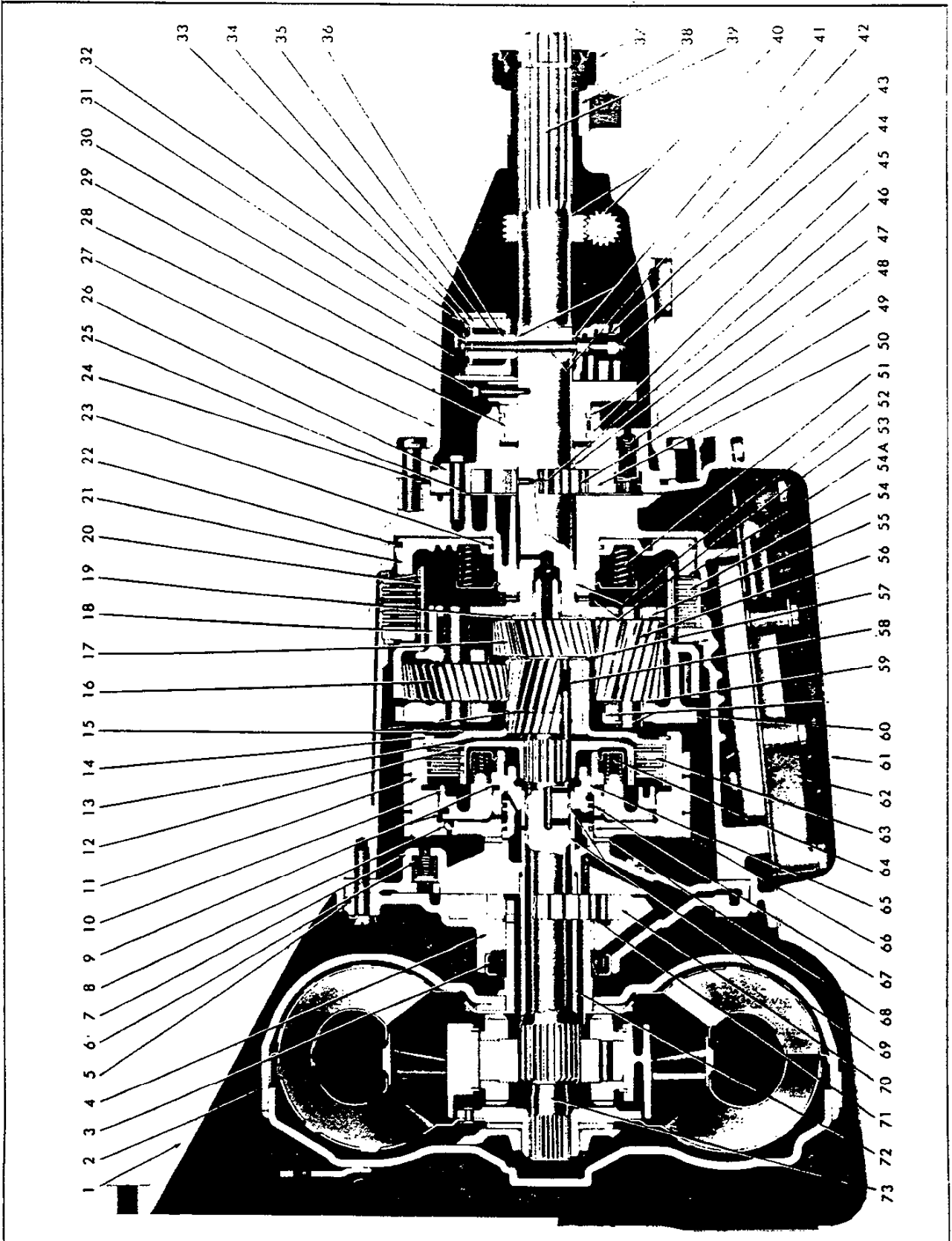


Fig. 1PG—Aluminum Powerglide—Sectional View

POWERGLIDE

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| 2. Welded Converter | 21. Reverse Piston | 41. Governor Shaft | 56. Planet Long Pinion |
| 3. Front Oil Pump Seal Assembly | 22. Reverse Piston Outer Seal | 41. Governor Shaft | 57. Low Sun Gear Thrust Washer |
| 4. Front Oil Pump Body | 23. Reverse Piston Inner Seal | Bellville Springs | 58. Low Sun Gear Bushing (Splined) |
| 5. Front Oil Pump Body Square Ring Seal | 24. Extension Seal Ring | 42. Governor Shaft | 59. Pinion Thrust Washer |
| 6. Lube Relief Valve | 25. Rear Pump Wear Plate | 43. Governor Valve | 60. Parking Lock Gear |
| 7. Front Oil Pump Cover | 26. Rear Pump | 44. Governor Valve Retaining Clip | |
| 8. Clutch Relief Valve Ball | 27. Extension | 45. Governor Hub Seal Rings | 63. High Clutch Fork |
| 9. Clutch Piston Inner and Outer Seal | 28. Governor Hub | 46. Rear Pump Drive Pin | 64. Clutch Piston Return Springs, Retainer and Retainer Ring |
| 10. Clutch Piston | 29. Governor Hub Drive Screw | 47. Rear Pump Bushing | 65. Clutch Drum Bushing |
| 11. Clutch Drum | 30. Governor Body | 48. Rear Pump Priming Valve | 66. Low Brake Band |
| 12. Clutch Hub | 31. Governor Shaft Retainer Clip | 49. Rear Pump Drive Gear | 67. High Clutch Seal Rings |
| 13. Clutch Hub Thrust Washer | 32. Governor Outer Weight Retainer Ring | 50. Rear Pump Driven Gear | 68. Clutch Drum Thrust Washer (Selective) |
| 14. Clutch Flange Retainer Ring | 33. Governor Inner Weight Retainer Ring | 51. Reverse Piston Return Springs, Retainer and Retainer Ring | 69. Turbine Shaft Seal Rings |
| 15. Low Sun Gear and Clutch Flange Assembly | 34. Governor Outer Weight | 52. Transmission Rear Case Bushing | 70. Front Pump Driven Gear |
| 16. Planet Short Pinion | 35. Governor Spring | 53. Output Shaft Thrust Bearing | 71. Front Pump Drive Gear |
| 17. Planet Input Sun Gear | 36. Governor Inner Weight | 54. Reverse Clutch Pack | 72. Stator Shaft |
| 18. Planet Carrier | 37. Extension Rear Oil Seal | 54a. Reverse Clutch Belleville Spring | 73. Input Shaft |
| 19. Planet Input Sun Gear Thrust Washer | 38. Extension Rear Bushing | | |
| | 39. Output Shaft | | |

Fig. 1PG—Aluminum Powerglide—Sectional View

GENERAL DESCRIPTION

The aluminum Powerglide transmission, available as the automatic transmission option on Corvette models, is a transmission embodying many of the proven features of previous Chevrolet transmissions. Use of a one piece aluminum case and an aluminum case extension allows a weight saving of about 35% over comparable cast iron components.

Driving characteristics of the transmission remain the same as found in the familiar cast iron Powerglide with the single shift occurring between low and drive.

The conventionally arranged torque converter is a welded unit, eliminating the possibility of internal servicing. Low (band clutch) and drive (disc clutch) functions are performed by the clutch drum assembly

which incorporates multiple release springs. The planetary gearset, except for the redesigned parking lock gear, is similar to and operates like the cast iron Powerglide gearset. The reverse clutch is of the disc type operated by a reverse clutch piston and incorporating multiple return springs. The governor, installed around the output shaft, spins with the shaft and utilizes the centrifugal forces thus produced to regulate governor pressure. The valve body is located at the bottom of the case where service operations on it may be performed without the necessity of removing the transmission from the vehicle.

As in the cast iron Powerglide, the converter, bolted to the engine flywheel, drives through the two-speed planetary gearset.

MAINTENANCE AND ADJUSTMENTS

OIL LEVEL

The transmission oil level should be checked periodically as recommended in Section O. Oil should be added only when the level is near the "ADD" mark on the dip stick with oil hot or at operating temperature. The oil level dip stick is located at the right rear of the engine compartment.

In order to check oil level accurately, the engine should be idled with the transmission oil hot and the control lever in neutral (N) position.

It is important that the oil level be maintained no higher than the "FULL" mark on the transmission oil level gauge. DO NOT OVERFILL, for when the oil level is at the full mark on the dip stick, it is just slightly below the planetary gear unit. If additional oil is added, bringing the oil level above the full mark, the planetary unit will run in the oil, foaming and aerating the oil. This aerated oil carried through the various oil pressure passages (low servo, reverse servo, clutch apply, converter, etc.) may cause malfunction of the transmission assembly, resulting in cavitation noise in the converter and improper band or clutch application.

If the transmission is found consistently low on oil, a thorough inspection should be made to find and correct all external oil leaks. Transmission oil leakage is now easily identified as all automatic transmission fluid used in Chevrolet production is dyed red. The mating surfaces of servo cover, converter housing, transmission case and transmission case extension should be carefully examined for signs of leakage. The vacuum modulator must also be checked to insure that the diaphragm has not ruptured as this would allow transmission oil to be drawn into the intake manifold. Usually, the exhaust will be excessively smoky if the diaphragm ruptures due to the transmission oil added to the combustion. The transmission case extension rear oil seal should also be checked. All test plugs

should be checked to make sure that they are tight and that there is no sign of leakage at these points. The converter underpan should also be removed. Any appreciable quantity of oil in this area would indicate leakage at the front pump square seal ring, front pump seal assembly, or front pump bolt "O" ring seals.

DRAINING AND REFILLING

Transmission fluid installed at the assembly plant is good for the life of the vehicle. It is not necessary to replace the fluid except to make additions when needed to bring it to the proper level.

When the transmission is to be removed from the vehicle for repairs, drain and refill as follows:

To drain the transmission, carefully loosen the oil pan bolts. Position a pan or can to catch the draining oil. If the transmission is to be removed from the vehicle for repairs, the draining operation may be performed after removal if desired.

To refill the transmission, remove dipstick from oil filler tube and refill transmission with Automatic Transmission Fluid Type A with an AQ-ATF-A mark using filler tube and funnel J-4264. Then, after shifting into all ranges at idle speed to fill all oil passages, the engine should be run at 800-1000 rpm with the transmission in Neutral until the oil warms up, then add oil as required to raise the fluid level to the full mark on the dipstick.

ADJUSTMENTS

Service adjustments consist of shift linkage adjustment and throttle valve linkage adjustment. If incorrect linkage adjustment is suspected as being the cause of improper shifting (see "Diagnosis Guide"), check and adjust linkage as follows:

SHIFT LINKAGE

1. Check shift linkage for proper adjustment as follows: With the engine stopped, move the selector lever to the position where transmission DRIVE is felt. Slowly release the lever to feel if the shaft lever tang freely enters the lock plate. Check REVERSE range in a similar manner. If the tang does not freely enter the lock plate in both DRIVE and REVERSE ranges, it will be necessary to perform the linkage adjustment.
2. Disconnect control rod (V) (fig. 2PG) at control shaft lever (S) by removing clip retainer from control rod. Loosen clevis nut at bell crank end of control rod.
3. Set control rod bell crank (U) in park position.
4. Set control shift lever (S) in park position.

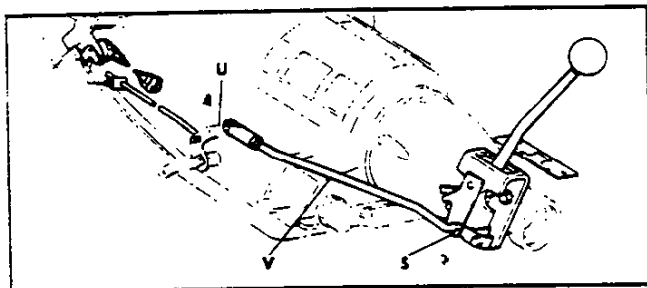


Fig. 2PG—Shift Linkage Adjustment

5. With both bell crank and lever held in park position, adjust control rod (V) at clevis so that easy entry into lever (S) is obtained.
6. Tighten nut at clevis, and install retaining clip at lever.
7. Check shift pattern as indicated in Step 1.

THROTTLE VALVE LINKAGE

1. Place lever (A) (fig. 3PG) in wide open position and pull rod (H) forward until it is stopped by transmission internal stop. Adjust swivel on rod

(H) for easy entrance into lever (A), and then readjust the swivel three turns, lengthening the rod by that quantity. Secure rod in lever (A).

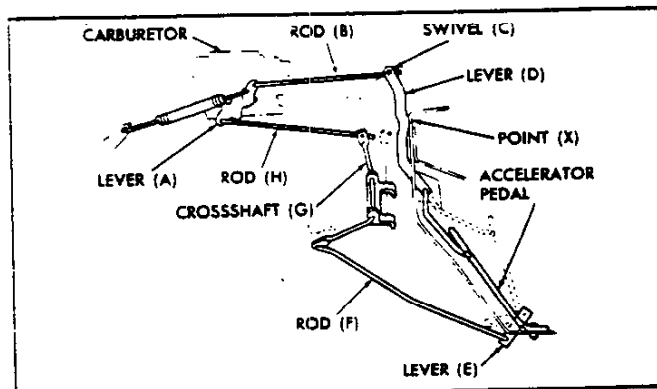


Fig. 3PG—Throttle Valve Linkage Adjustment

2. Remove carpeting from toe panel. Depress accelerator pedal so that lever (D) contacts point (X) on toe panel. With pedal depressed and lever (A) rotated to wide open position, adjust swivel on rod (B) for free entry into lever (D). Before securing swivel to lever (D), rotate swivel three turns toward carburetor.
3. Check adjustment by placing linkage in idle position, then return to wide open position by rotating lever (A). Push downward on lever (E) and note if rod (H) deflects. If rod (H) deflects, or lever (A) will not reach wide open position, repeat adjustment 1.
4. Check adjustment by releasing, then depressing accelerator pedal. Check lever (A) for wide open position. If lever (A) will not reach wide open position, repeat adjustment 2.

NEUTRAL SAFETY SWITCH

The neutral safety switch adjustment is made by varying the length of the bell crank (U) to switch control rod. A swivel is provided at one end of this rod to permit the adjustment (fig. 2PG).

SERVICE OPERATIONS

TRANSMISSION REMOVAL

1. Remove shift lever knob and disconnect neutral safety switch wiring at quick-disconnect.
2. Raise vehicle to desired working height.
3. Disconnect vacuum modulator line and speedometer drive cable fitting at the transmission.
4. Disconnect throttle valve linkage at valve actuating lever.
5. Remove both exhaust pipes (exhaust manifold-to-frame crossmember).

6. Remove propeller shaft (refer to Section 4).
7. Remove converter underpan, scribe flywheel-converter relationship for reassembly, then remove the flywheel-converter attaching bolts.

NOTE: The "light" side of the converter is denoted by a "blue" stripe painted across the ends of the converter housing. This marking should be aligned as closely as possible with the "white" stripe painted on the engine side of the flywheel outer rim (heavy side of the engine) to maintain balance.

SECTION 10

WHEELS AND TIRES

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GENERAL DESCRIPTION

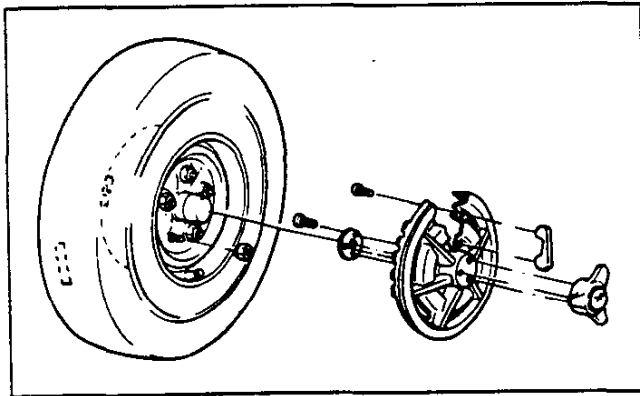


Fig. 1—Standard Wheel Assembly

The 1963 Corvette is mounted as regular equipment with rayon, tubeless 6.70 x 15-4 ply rating tires. A 6.70 x 15-4 ply rating nylon tubeless tire is available as an extra option. Both tire sizes are also furnished in thin-line whitewalls.

The standard wheel is a short spoke, spider type design, 15 x 5.5K with a .44 inch offset (fig. 1). A 15 x 6L cast aluminum quick take-off wheel is available as an option, with knock-off locking nuts and

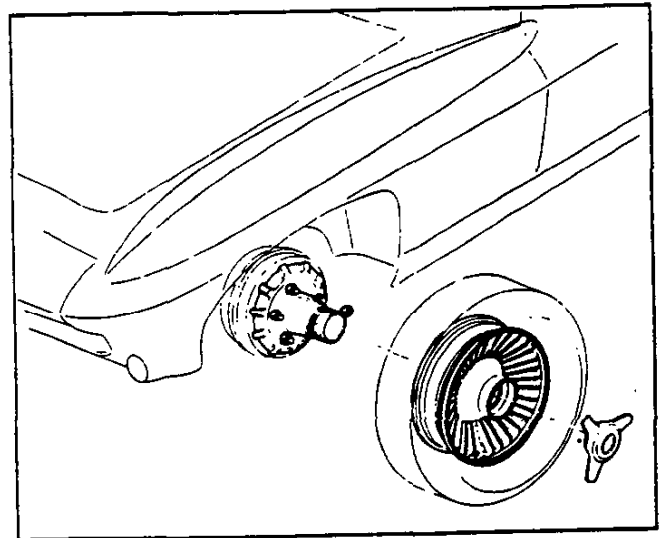


Fig. 2—Quick Take-Off Wheel Assembly

wheel adapters which bolt to the existing wheel hub bolts (fig. 2).

The spare tire is located below the fuel tank in an inverted well with an attached hinged drop lid.

MAINTENANCE

CHECKING TIRE PRESSURE

Low pressure tires should be checked frequently as a variation of a few pounds air pressure makes an appreciable difference in riding qualities, handling, and tire wear. Tire valve cap should be reinstalled on the valve stem as they keep air in the tire in case of a valve core failure, and keep dust, water and other foreign matter out of the valve core.

Tire pressures should be as follows:

Cold (after standing 3 hours or driving less than a mile)	24 lbs.
Hot (3 miles or more below 40 mph)	26 lbs.
(3 miles or more above 40 mph)	28 lbs.

For sustained high-speed driving, a starting pressure of 36 lbs. is recommended.

PUNCTURE INSPECTION AND REPAIR

Tires should be inspected every 1000 miles for sharp objects imbedded in the tread, or more often under severe driving conditions. Inspect also for excessive tread wear or sidewall cracks. If tire is punctured, it should be repaired using one of several repair kits available through tire manufacturers' outlets.

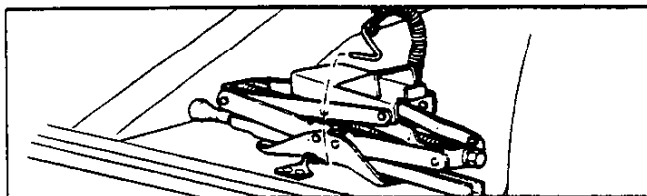


Fig. 3—Jack Stowage

CHANGING ROAD WHEELS

A scissors jack is located in the luggage compartment in a jack stowage well. The well is accessible by folding down the driver seat back and lifting floor panel (fig. 3). To change wheels, use the following procedure:

Bolt-On Wheels

1. Loosen and disconnect latch on hinged spare tire compartment drop lid and lower lid and spare tire. Slide spare tire out of compartment (fig. 4).
2. Set hand brake and, if possible, block diagonally opposite wheel.
3. Remove wheel disc and break wheel nuts loose.

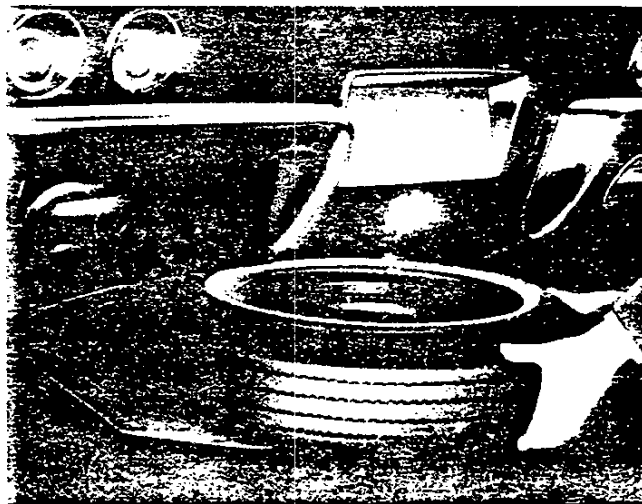


Fig. 4—Removing Spare Tire

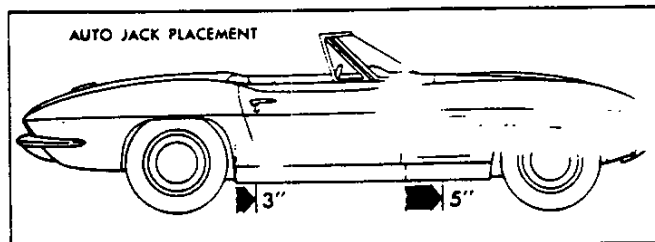


Fig. 5—Jacking Points

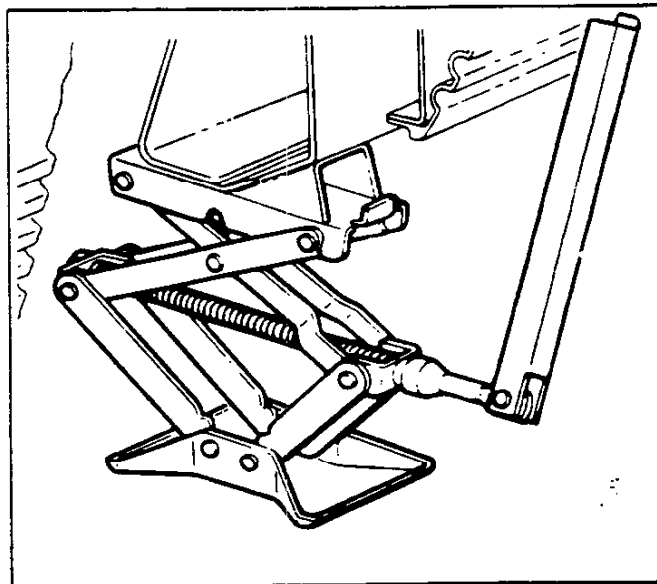


Fig. 6—Correct Jack Positioning

4. Place jack as shown in Figures 5 and 6.
5. Raise jack and remove wheel nuts and wheel.
6. Install spare tire, tighten wheel nuts and lower jack.
7. Install wheel disc and remove and stow jack.
8. Place tire on compartment lid. Raise lid to shut and assemble and tighten lid latch.

Quick Take-Off Wheels

All operations are the same as for bolt-on wheels except for wheel removal. Vehicle is supplied with a special mallet which is used for knock-off locking nut removal (fig. 7). Note that left hand locking nuts are removed in a counterclockwise direction, right hand locking nuts in a clockwise direction.

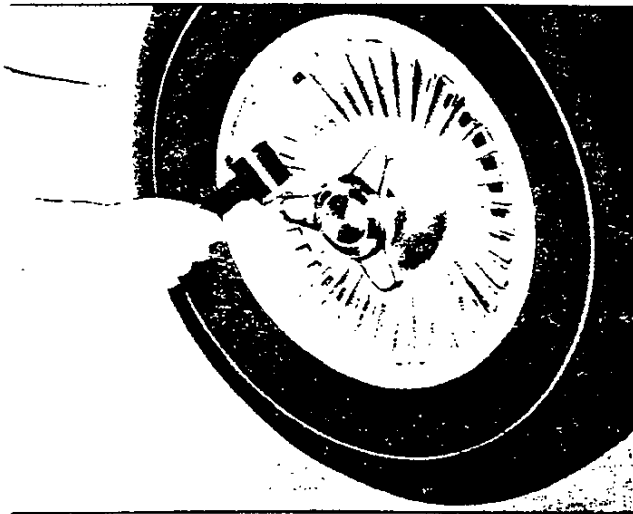


Fig. 7—Removing Quick Take-Off

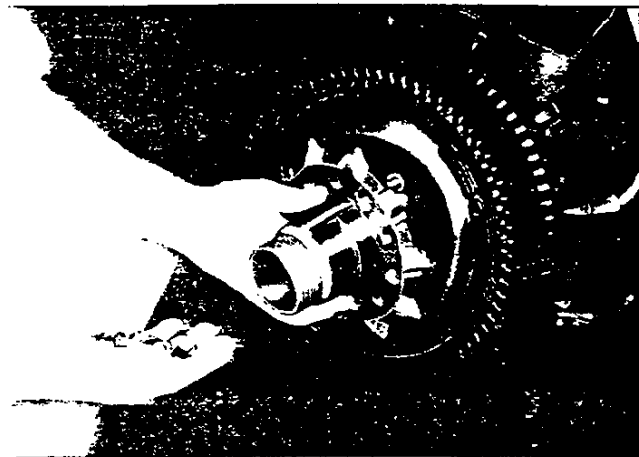


Fig. 8—Removing Quick Take-Off Adapters

Quick Take-Off Wheel Adapters

Adapters are pivoted on wheel flange and secured with hub bolts. To remove adapters remove wheel and tire assemblies and remove wheel nuts securing adapters to wheel flanges (fig. 8).

INTERCHANGING TIRES

To minimize the possibility of tire noise and to equalize tire wear, it is recommended that tires be interchanged every 4000 miles as shown in Figure 9 or more frequently in the case of extremely heavy wear. Interchanging tires will effectively prevent undue wear on any particular tire. If tire interchanging is followed as recommended above, all tires will have the same number of miles in each wheel position at the end of the fourth change. The car will have been driven 20,000 miles but each tire will have only 16,000 miles of use. When interchanging tires, inspect for signs of abnormal wear, bulging, etc., and stones, glass, and nails should be removed before reinstallation.

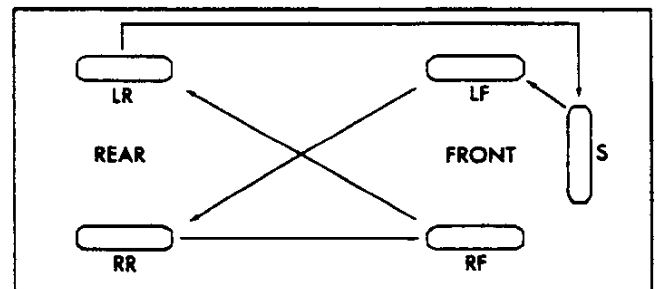


Fig. 9—Tire Rotation Plan

CLEANING WHITEWALL TIRES

A great deal of ordinary road dirt which collects on white sidewall tires may be sponged off with clear water or a mild soap solution.

Chevrolet Whitewall Tire Cleaner, however, is a quicker and more effective cleaner for removing dirt and stains from whitewall tires and in many cases it will remove stains and discoloration that the simpler method of soap and water will not remove.

Under no circumstances should gasoline, kerosene or any cleaning fluid containing a solvent derived from oil be used to clean whitewall tires. Oil in any form is detrimental to rubber and a cleaner with an oil base will discolor or injure whitewall tires.

CLEANING QUICK TAKE-OFF WHEELS

Do not use wire brush or abrasive cleaners when cleaning quick take-off wheels, and use only cleaners which will not react with aluminum.



1
2
3



SECTION 14

SPECIFICATIONS

FRONT SUSPENSION

(SECTION 3)

WHEEL ALIGNMENT

Caster	+ 1 $\frac{3}{4}$ ° ± ½°
Camber	¾° ± ½°
Toe-In (Total)	½" to ¾"

Riding Height..... Measured from center of lower control arm pivot to floor; lower face of lower steering knuckle boss to floor.

Difference should be..... 3 $\frac{5}{8}$ " ± ½"

Bolt Torques (lb. ft.)

Shock Absorber	
Upper	15-25
Lower	9-11
Stabilizer Link Bolt and Bracket.....	9-12
Control Arm—Upper	65-75
Lower Nut	120-150
Lower Bolt	65-75
Ball Stud—Upper	42-47
Lower	60-94
Control Arm Cross-Shaft.....	30-40

REAR SUSPENSION AND DRIVELINE

(SECTION 4)

Rear Wheel Alignment

Camber	- 0° 20' ± 30'
Toe-In (Total)	0" to ½"

Rear Axle

Pinion Bearing Preload

New	20-25 in. lb.
Used	5-15 in. lb.

Hypoid Backlash .003"- .010" (.005"- .008" Preferred)

Engine	Transmission	Standard Ratio	Positraction Ratio
250 Hp Std.	3-Speed	3.36:1	3.36:1
300 Hp Opt.	4-Speed	3.08:1*, 3.36:1	3.08:1, 3.36:1
	Powerglide	3.36:1	3.36:1
340 Hp Opt.	3-Speed	3.36:1	3.36:1
360 Hp Opt.	4-Speed	3.70:1	3.08:1, 3.55:1, 3.70:1, 4.11:1, 4.56:1

*Optional Ratio

Bolt Torques (lb. ft.)

Rear Suspension	
Shock Absorber—Upper	40-60
Lower	50-60
Strut Rod Bracket to Carrier.....	15-22
Strut Rod Shaft.....	80
Camber Cam Bolt.....	55-70
Spring Center Clamp Plate.....	55-75
Carrier Front Support Bracket to Crossmember	55-75
Carrier Front Support Bracket Front Bolts	55-65
Carrier Front Support Bracket Rear Bolt..	40-60

Rear Axle

Rear Axle Bolt Torques (lb. ft.)

Carrier to Cover.....	35-55
Differential Bearing Caps.....	50-60
Ring Gear	40-60

BRAKES (SECTION 5)

Service Brakes

Type.....Duo Servo, four wheel hydraulic, self-adjusting.

Brake system fluid capacity..... 0.65 pints

Brake Drum:

ConstructionWeb cast into rim
Diameter, front and rear..... 11

Brake Lining (dimensions after grinding):

Material.....Full molded asbestos composition
Width, front brakes..... 2.75
Width, rear brakes..... 2.00
Thickness (Minimum)168
Length per wheel..... 21.09
Length, primary shoe..... 9.34
Length, secondary shoe..... 11.75
Method of attachment to shoe.....Bonded

Total effective area..... 185.2 sq. in.*

Master Cylinder:

Mounting.....Under hood on dash panel
Diameter 1.0
Piston travel (Maximum)..... 1.329

Wheel Cylinders:

Mounting.....Front, on steering knuckle;
rear, on backing plate.
Front, inside diameter..... 1.1875
Rear, inside diameter..... 1.00

*Gross lining area is 200.4 square inches.

All primaries have .38 inch full length groove.

Parking Brake

Type.....Mechanical pull rods and cables operate the two rear service brakes.

Control.....Applied and released by handle below instrument panel right of steering column.

Power Brakes

TypeRegular production master cylinder assisted by vacuum power unit.

Power Unit Location..Mounted on dash under hood

Service Brakes—Metallic

Same as Service Brakes—Regular Production except as follows:

Web Thickness:

Front 125-135

Brake Facings:

Material.....Sintered iron segments

Size:

Front Wheel Segments:

Primary 1.64 x 1.37 x .205

Secondary 1.64 x 1.37 x .325

Rear Wheel Segments:

Primary 2.00 x 1.00 x .205

Secondary 2.00 x 1.00 x .325

Segments Per Shoe:

Primary, front and rear..... 6

Secondary:

Front 10

Rear 10

Method of attachment.....Welded

Total effective area (sq. inches)..... 134.9

Master Cylinder:

Diameter of piston..... .875

ENGINE MECHANICAL

(SECTION 6)

ENGINE	DISPLACEMENT	327	327	327	327
	EQUIPMENT	WCFB	AFB	AFB & SPEC. CAM	F.I. & SPEC. CAM
GENERAL DATA:					
Horsepower @ rpm		250 @ 4400	300 @ 5000	340 @ 5000	360 @ 6000
Torque @ rpm		350 @ 2800	360 @ 3200	344 @ 4000	352 @ 5000
Type	V-8 Valve-in-Head				
Number of Cylinders	8				
Bore	4.00				
Stroke	3.25				
Taxable Horsepower (A.M.A.)	51.2				
No. System (Front to Rear)	Left Bank	1-3-5-7			
	Right Bank	2-4-6-8			
Firing Order	1-8-4-3-6-5-7-2				
Compression Ratio	10.5:1			11.25:1	