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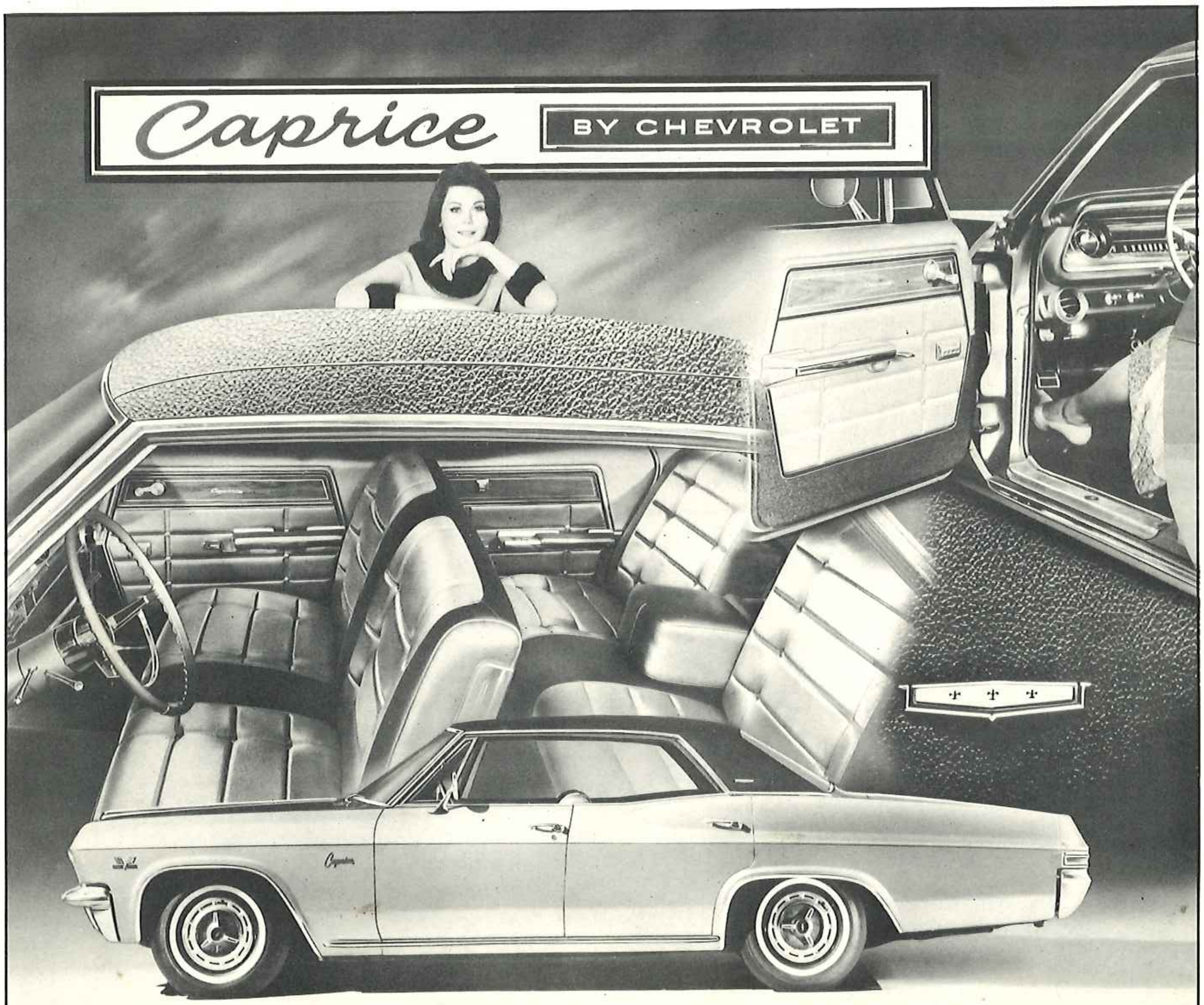


Chevrolet Introduces The Caprice Custom Sedan

- LUXURIOUS INTERIOR
- SMOOTH QUIET RIDE
- DISTINCTIVE EXTERIOR
- THE FINEST SELECTION OF POWER TEAMS

REVISIONS IN 1965 PASSENGER CAR EQUIPMENT AVAILABILITY

CHEVROLET

The big change in engine availability in Chevrolet Series cars is the replacement of the Turbo-Fire 409-cubic-inch V8 by the new 396-cubic-inch V8 engine which is available in 325- and 425-hp versions. Restricted to Impala, Impala SS and Caprice option, the 325-hp Turbo-Jet 396 can be teamed with either automatic or manual transmissions. The higher-output 425-hp version is available in all models except Caprice and is teamed with a choice of 3- or 4-speed fully synchronized manual transmissions. A fully synchronized 3-Speed transmission is now available for all extra-cost V8 engines. A new Turbo Hydra-Matic transmission teamed with a 2.73:1 axle is obtainable with the 325-hp Turbo-Jet 396 V8. Only limited availability of the 300-hp 327 V8 (RPO L74) is expected for the balance of the model year.

Dual Exhaust (RPO N10) is available for the new 325-hp Turbo-Jet 396 engine.

The Powerglide now has an oil cooler as standard equipment when teamed with the 6 cyl. engine.

CHEVELLE

Added to the engine lineup is the 350-hp Turbo-Fire 327 V8 (RPO L79). It is available with the standard 3-speed or the optional 4-speed transmission (RPO M20).

A 3.08:1 rear axle replaces the 2.73:1 "General Purpose" axle on Chevelle 300 Sedans for the 6 cyl. 194 cu. in. engine equipped with Powerglide.

Stereo Multiplex (986376) previously available on all but Convertible models can now be installed on Convertibles, by using Speaker Adapter 986384.

CHEVY II

The new fully synchronized 3-speed transmission can be ordered at extra cost for use with the 250- or 300-hp Turbo-Fire 327 V8 engines.

(Continued on page 20)

TURBO-JET 396 V-8 ENGINES

A completely new 396 cu. in. V8 engine is introduced in two versions. One version, a "street" type engine with hydraulic lifters and rated at 325 horsepower, is available on the Chevrolet passenger car.

The other version is a higher performance engine with solid lifters that is rated at 425 horsepower. It is available on both the Chevrolet and Corvette, with minor differences required for vehicle installation.

Engine Features

- The oil pump has unusual durability and pressure pulses are not as deep because the wider gears have more teeth.
- The 325 hp. engine uses heavy, wide-base main bearing caps, with 2 bolt attachment. Additional sturdiness is provided in the 425 hp. engine by the use of 4 bolts in each extra wide main bearing cap.
- The 425 hp. engines have an oil pan baffle mounted on extensions from the main bearing cap bolts. Pan capacity without filter change is 4 qts. for both the 325 and the 425 hp. versions, except on Corvette which has a 5 qt. oil pan.
- Aluminum pistons used on the 425 hp. engine are impact extruded, have solid skirt and higher dome than the cast aluminum pistons used on the 325 hp. engine.
- The valves in each wedge-shaped chamber are tilted toward each other to improve engine breathing. An umbrella-type oil seal is mounted on each valve stem.
- Corvair-type push rod guide plates are used. The valve rocker studs thread into the cylinder head, and sealer must be used on the threads whenever a stud is being installed.
- These engines use a permanently sealed, large capacity fuel pump which has the actuating arm return spring mounted in the housing, concentric with the diaphragm rod. In case of pump-malfunction, the pump would be replaced as a unit—component parts are not serviceable.
- On the 325 hp. engine, the Rochester 4MV Quadra-Jet and the Holley 4160 four barrel carburetor are used optionally. The Holley 4150 carburetor is installed on all 425 hp. engines.

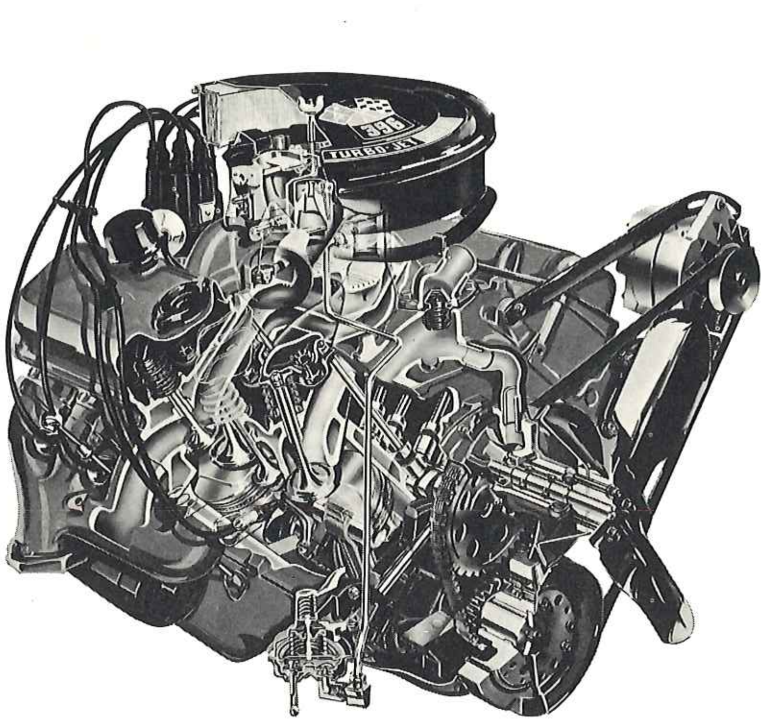


Fig. 1—396 Turbo-Jet V-8 Engine—Phantom View

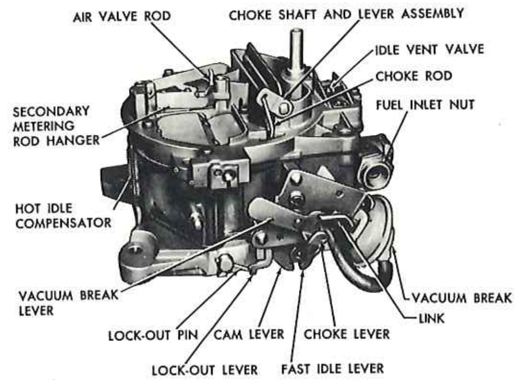


Fig. 2—Rochester Quadra-Jet Carburetor—Model 4MV

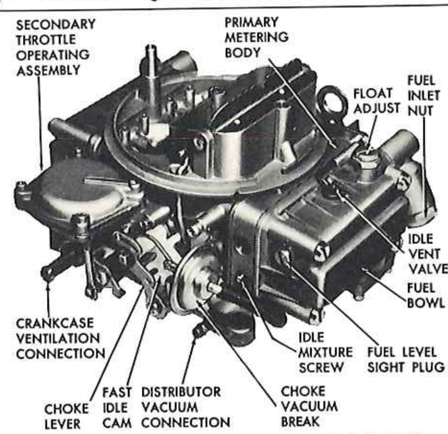


Fig. 3—Holley Carburetor—Model 4160

QUADRA-JET CARBURETOR (MODEL 4MV)

The Rochester "Quadra-Jet" carburetor (Fig. 2) is unique in that it has a centrally located float chamber with a single float. The fuel bowl is centered between the primary bores, adjacent to the secondary bores. This design assures adequate fuel supply to all carburetor bores regardless of car incline or severity of turns.

The primary (fuel inlet) side has small bores with a triple venturi set-up equipped with plain tube nozzles. The triple venturi stack up, plus the smaller primary bores, provide better atomization and tailoring of fuel mixture in the idle and economy ranges of operation.

The primary side of the carburetor has six operating systems. They are float, idle, main metering, power, pump, and choke. Fuel metering in the primary side is provided by stepped metering rods that are positioned by a vacuum responsive piston.

The float needle valve is diaphragm assisted so that regardless of incoming fuel pump pressure, additional float buoyancy will not be needed to hold the valve closed and shut off fuel flow.

The secondary bores use an "air valve" principle, in which fuel is metered in direct proportion to the air passing through. At a calculated angle of primary throttle opening, connecting linkage to the secondary throttle shaft lever begins to open the secondary throttle valves. As air flows through the secondary bores it creates a low pressure area beneath the "air valve." Atmospheric pressure on top of the "air valve" then forces the "air valve" open against spring tension. When the "air valve" begins to open, it rotates a plastic cam attached to the center of its shaft. The cam pushes on a lever attached to the secondary main metering rods, lifting the rods and delivering fuel into the secondary bores.

HOLLEY CARBURETORS

Two different model Holley 4-Bbl. carburetors are used for the Turbo-Jet 396 cubic inch engines. Model 4160 is used optionally on the 325 H.P. engine, and the Model 4150 is used with the 425 H.P. engine.

Due to the fact that these two Holley carburetors, which are used with the 396 cu. in. engines, are basically similar to a version of the Model 4150 that has been used for the past couple of years; only the differences between the two models will be covered in the following paragraphs.

The Holley Model 4160 carburetor has a single fuel inlet with a fuel transfer tube between fuel bowls and a remote choke thermostat coil and diaphragm type choke vacuum break unit.

The Holley Model 4150 (Fig. 3) has a fuel inlet fitting at each fuel bowl with no transfer tube. It also has an integral choke housing mounted on the main body section.

NEW FULLY SYNCHRONIZED 3-SPEED MANUAL TRANSMISSION

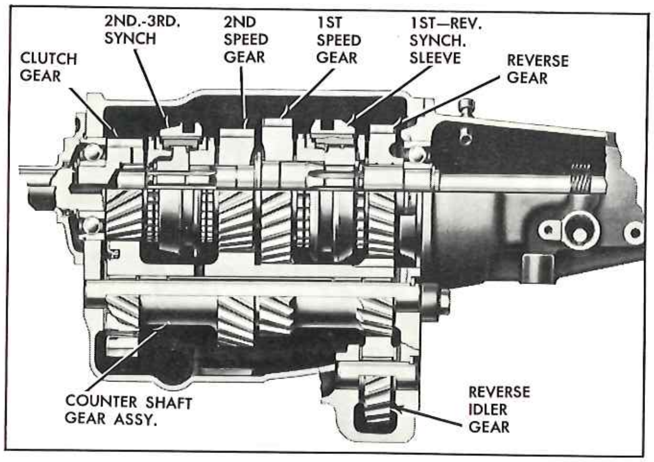


Fig. 4—Fully Synchronized 3-Speed Transmission

All gears of the new Borg-Warner heavy duty 3-speed transmission (including separate first and reverse gears) are in constant mesh. As each forward speed gear is selected, it is locked to the mainshaft through sliding clutch sleeves, with blocker-type synchronizers. The reverse, first, and second speed gears are mounted on bushings on the mainshaft.

The countergear assembly is preloaded against the main drive gear by a torsion spring loaded plate. External teeth on the plate hold the countergear against the drive side of the main drive gear teeth and eliminate countergear rattle in direct drive. The countergear has 4 rows of loose needle bearings with a tanged thrust washer at each end of the shaft. The reverse idler gear has one row of loose needle bearings with a thrust washer at each end.

TURBO HYDRA-MATIC 3-SPEED AUTOMATIC TRANSMISSION

The Turbo Hydra-Matic transmission (Fig. 5) is a fully automatic unit consisting primarily of a 3-element hydraulic torque converter and a compound planetary gear set. Three multiple-disc clutches, two sprag units, and two bands provide the friction elements required to obtain three forward speeds and reverse from a compound planetary gear set. The selector quadrant has six selector positions: P, R, N, DR, L_2, L_1.

This transmission does not use throttle valve linkage. A sensitive vacuum modulator system is utilized to provide properly timed smooth shifts. An electric solenoid provides detent downshifts below approximately 70 mph, when activated by a switch at the carburetor linkage. The vehicle cannot be push-started because the transmission has no rear oil pump.

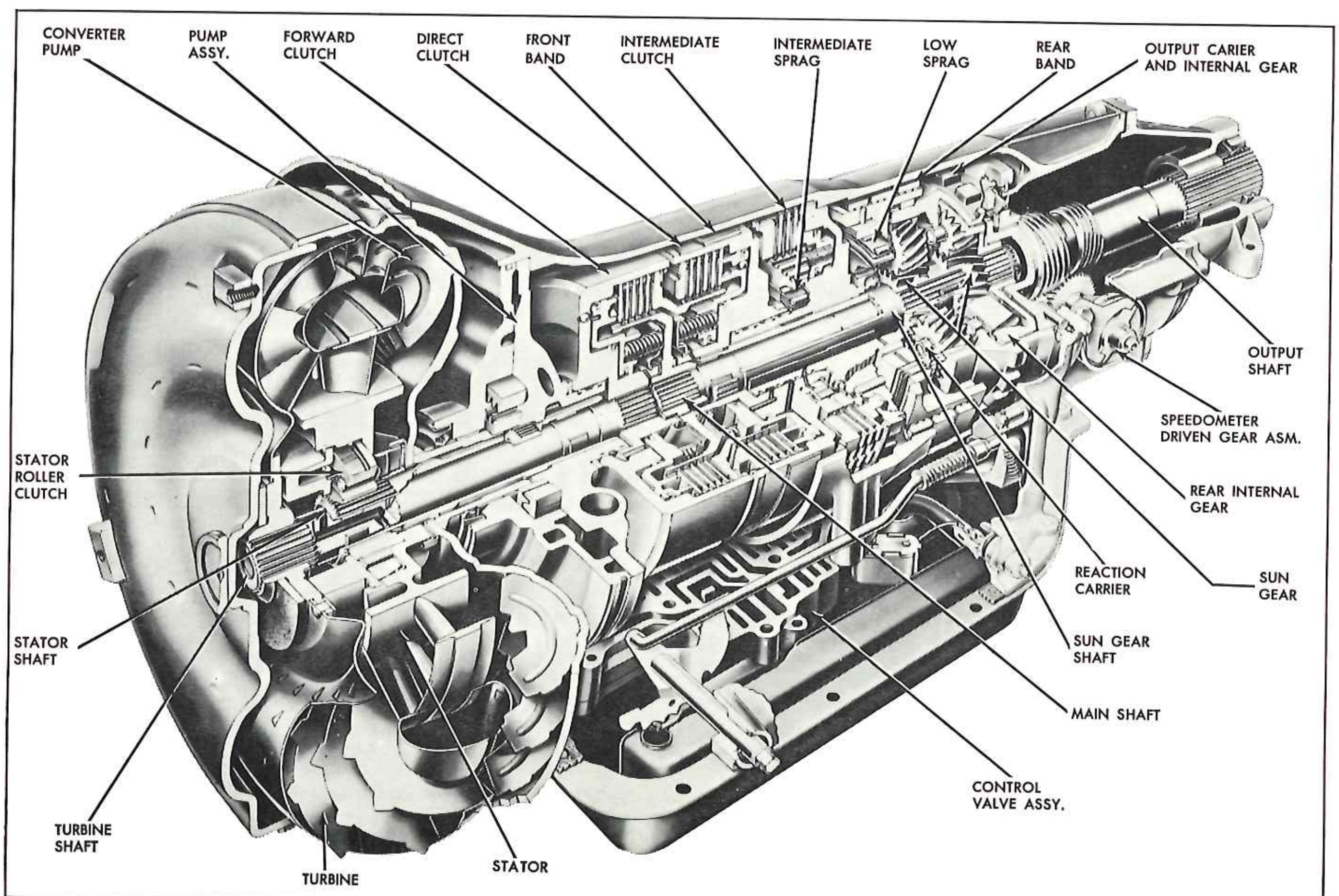


Fig. 5—Turbo Hydra-Matic 3-Speed Automatic Transmission

396 V-8 ENGINE DATA

Tune-Up Chart

HORSEPOWER			325	425
COMPRESSION①			160 psi	
Spark Plug	Make and Number	Standard	AC-43N	
		Colder	AC-C42N	
	Gap		.035″	
Distributor	Point Dwell		28°-32°	
	Point Gap		.016″ (Used) .019″ (New)	
	Arm Spring Tension		19-23 Ounces	
	Condenser		18-23 mfd.	
	Timing (B.T.D.C.)②	Nominal	4°* 6°**	10°
		Range	2°-8°* 4°-10°**	8°-14°
Fan Belt			75 ± 5 lbs. (Used) 90 ± 5 lbs. (New)	
Air Cleaner			Paper Element③	
Valve Lash	Inlet		Hyd.③	.020″ (Hot)
	Exhaust		Hyd.④	.024″ (Hot)
Idle Rpm	Manual Trans.		450-550	750-850
	Auto. Trans.		⑤	X
Fuel Pump	Pressure lbs.		5-1/2 - 7/-12	
	Volume		1 pint (30-45 Sec.)	
Cooling System			15 psi CAP	
Crankcase Ventilation	Positive		6,000 Miles	X
	Closed Positive		12,000 Miles	

*Standard Ignition **Transistorized Ignition

①At cranking speed, throttle wide open—Maximum variation, 20 lbs. between cylinders.

②At idle speed with vacuum advance line disconnected and plugged.

③Service at 12,000 miles initially—Check every 6,000 miles thereafter until replaced.

④One turn down from no lash.

⑤As low as possible to obtain smooth idle and prevent creep in drive or harsh shifts during transmission operation.

Engine Specifications

Horsepower @ rpm			325 @ 4800	425 @ 6400
Torque @ rpm			410 @ 3200	415 @ 4000
Type			Valve-in-head V8	
Bore			4.094″	
Stroke			3.76″	
Firing Order			1-8-4-3-6-5-7-2	
Compression Ratio			10.25:1	11:1
CYLINDER BORE:				
Diameter			4.0925″-4.0955″	
Out-of-round			.002″ (Max.)	
Taper			.005″ (Max.)	
PISTON:				
Clearance To Bore	New		.0007″-.0013″	.0027″-.0033″
	Wear Limit		.0025″ (Max.)	.0055″ (Max.)
Oversize Available			.020″-.030″-.040″	.030″-.060″
PISTON RING:				
COMPRESSION	Groove Clearance	Production	.0012″-.0032″	.001″-.003″
		Service	.0042″ (Max.)	.004″ (Max.)
	Gap	Production	.010″-.020″	
		Service	.030″ (Max.)	
OIL	Groove Clearance	Production	.006″ (Max.)	
		Service	.007″ (Max.)	
	Gap	Production	.010″-.030″	
		Service	.040″ (Max.)	
PISTON PIN:				
Diameter			.9895″-.9898″	
Clearance (In Piston)	New		.00025″-.00035″	.00030″-.00040″
	Wear Limit		.001″ (Max.)	
Fit In Rod			Press	
CRANKSHAFT:				
Main Journal	Diameter		2.7487″ 2.7497″	2.7482″ 2.7492″
	Taper		.001″ (Max.)	
	Runout		.001″ (Max.)	
Crankpin	Diameter		2.1990″ 2.2000″	2.1985″ 2.1995″
	Taper		.001″ (Max.)	
	Runout		.001″ (Max.)	

Horsepower		325	425
CONNECTING ROD BEARING:			
Clearance	New	.0009"-.0025"	.0014"-.0030"
	Wear Limit	.004" (Max. Clearance)	
End Play		.0155"-.0205"	
MAIN BEARING:			
Clearance	New 1-4	.0006"-.0022"	.0013"-.0029"
	New 5	.0013"-.0029"	.0017"-.0033"
	Wear Limit	.004" (Max. Clearance)	
End Play		.006"-.010"	
CAMSHAFT:			
Lobe Lift	Intake	.234" ± .002"	.306" ± .002"
	Exhaust	.234" ± .002"	.306" ± .002"
Journal Diameter		1.9482"-1.9492"	
Journal Runout		.001" (Max.)	
VALVE SYSTEM:			
Lifter		Hydraulic	Mechanical
Rocker Arm Ratio		1.70:1	

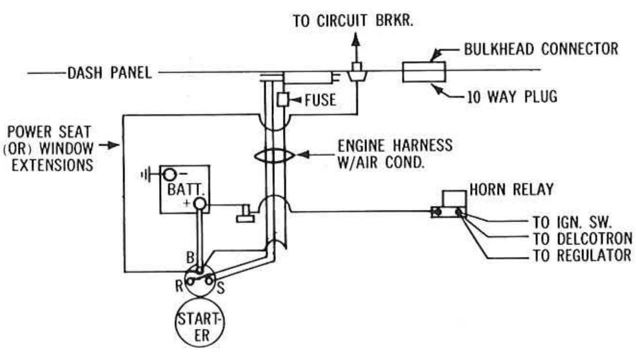
HORSEPOWER		325	425
Valve Lash	Intake	1 Turn Down From No Lash	.020" (Hot)
	Exhaust		.024" (Hot)
Face Angle	Intake	45°	
	Exhaust	45°	
Seat Angle	Intake	46°	
	Exhaust	46°	
Seat Runout	Intake	.002" (Max.)	
	Exhaust	.002" (Max.)	
Seat Width	Intake	1/32"-1/16"	
	Exhaust	1/16"-3/32"	
Lift (At Stem)	Intake	.398" ± .003"	.500" ± .003"
	Exhaust	.398" ± .003"	.496" ± .003"
Stem Clearance	Intake	.0005"-.0024"	
	Exhaust	.0012"-.0029"	
Valve Spring	Press. lbs. @ in.	84-96 @ 1.88"	94-106 @ 1.88"
	Press. lbs. @ in.	210-230 @ 1.46"	303-327 @ 1.38"
	Installed Height	1 7/8" ± 1/32"	
Valve Damper	Free Length	1.80"-1.92"	
	Number Coils	Approx. 3 1/2	

396 Engine Carburetors

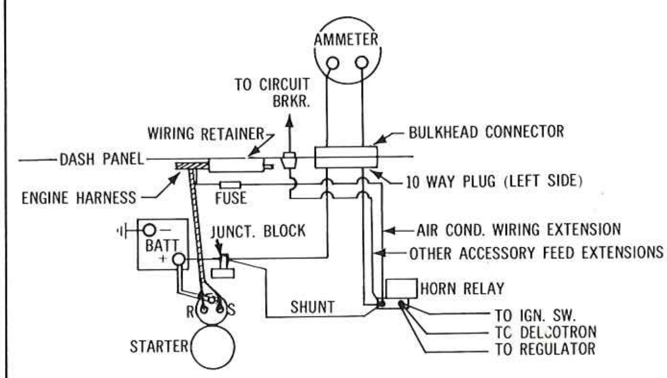
CARBURETOR	Model	ROCHESTER 4MV		HOLLEY 4150		HOLLEY 4160	
	Part No.	7025201	7025200	3869933 (R-3130A)	3868826 (R-3124A)	3874898 (R-3139A)	3868864 (R-3140A)
	Vehicle	Chevrolet		Chevrolet	Corvette	Chevrolet	
	Trans.	Syn.	Auto.	Syn.		Syn.	Auto.
Float Level	Preliminary			Prim. .275"	Sec. .400"	Prim. .060"	Sec. .310"
	Final	1/8"		Sight Plug		Sight Plug	
Accelerator Pump		7/32"		.015"		.015"	
Idle Vent		11/32"				.065"	
Air Valve		1 1/32"					
Fast Idle	Preliminary	3 Turn (After Contact)		.025"		.035"	
	Final	2000 rpm		2000 rpm		2000 rpm	
Choke Rod		.150"					
Vacuum Break		.245"	.180"			.180"	
Choke Unloader		.325"		.375"		.275"	
Secondary Stop				1/2 Turn (After Contact)		1/2 Turn (After Contact)	
Secondary Opening		75% Min. Contact					
Secondary Lockout		.015" (Max.)					
Choke		1/2-1 Rod Dia. Above Hole		2 Notches Lean		1/2-1 Rod Dia. Above Hole	
Main Metering Jet	Primary	#70		#72		#68	#67
	Secondary			#76			
Throttle Bore	Primary	1 3/8"		1 11/16"		1 9/16"	
	Secondary	2 1/4"		1 11/16"		1 9/16"	

Power Sources For Electrical Accessories—1965 Passenger Cars

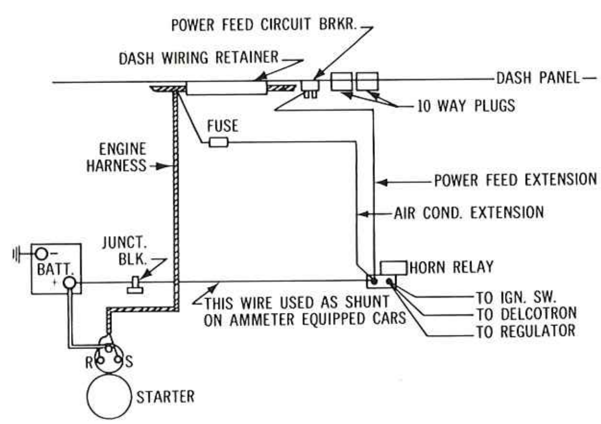
This article details important passenger car wiring changes that were initiated for certain accessory equipment after the 1965 Chassis Service Manual had been published. In the revised wiring diagrams provided below, it will be noticed that on ammeter equipped cars, the power tap for heavy load accessories is, in most cases, taken from the Delcotron side of the ammeter shunt—not from the battery side, as was common on previous models. These changes in accessory wiring were incorporated at start of 1965 Production to insure that heavy accessory current draw would be reflected in the ammeter reading.



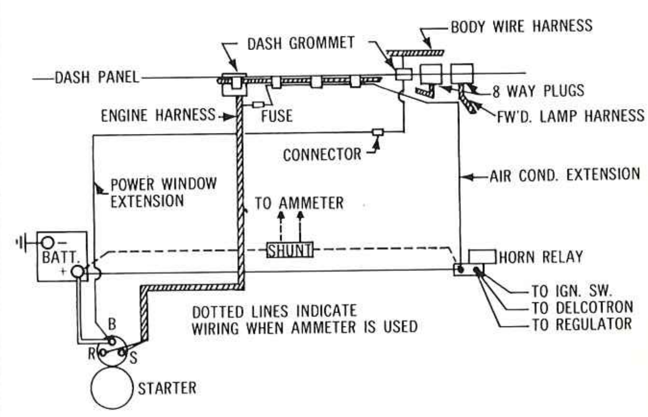
1965 Chevrolet Accessory Feed Circuits—On Cars with Generator Tell-Tale Lamp



1965 Chevrolet Accessory Feed Circuits—On Cars with Ammeter Installed



1965 Chevelle Accessory Feed Circuits



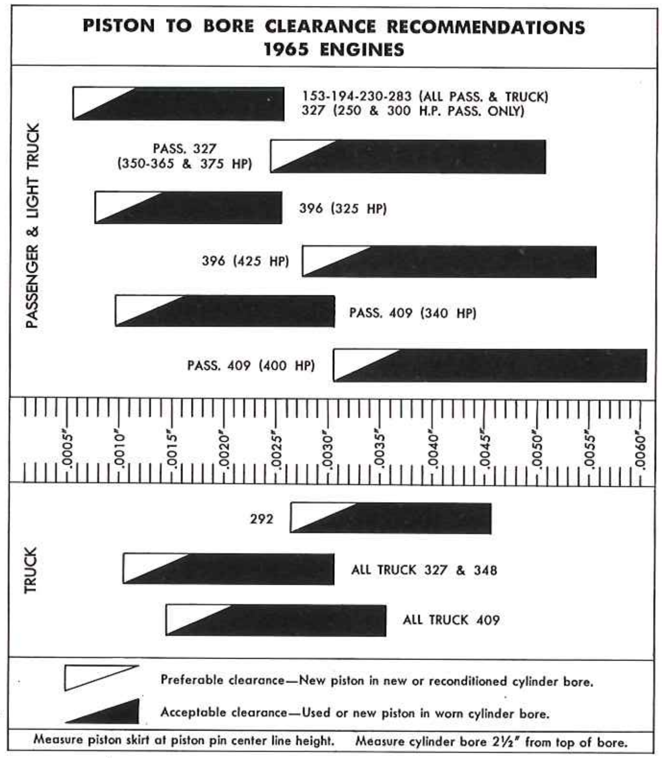
1965 Chevy II Accessory Feed Circuits

Fig. 6—Power Feed Wiring for Various Electrical Accessories

Piston Fitting 1965 Engines

When pistons are being fitted and honing is not necessary, the cylinder bores can be cleaned satisfactorily using hot water with household detergent added. After cleaning and drying the cylinder bores, they should be swabbed several times with light engine oil and then wiped with a clean dry cloth.

1. To check piston to cylinder bore fit of a used (worn) piston proceed as follows:
   a. Measure the cylinder bore diameter with a telescoping gauge (take this measurement approximately 2½" down from the top of cylinder bore).
   b. Measure the piston skirt diameter at piston pin centerline height.
   c. Subtract piston diameter from cylinder bore diameter to determine existing piston to bore clearance, and record this figure.
   d. In the chart to the right, compare recorded clearance to the clearance recommended for that particular engine, and determine if the piston is acceptable for further service.
2. If the used piston is not acceptable, check the Service Piston Chart at the bottom of this page to determine if a new piston can be selected to fit the cylinder bore within the acceptable range.
3. If the cylinder bore must be reconditioned, measure the diameter of the selected piston, then hone the cylinder bore to obtain a piston to bore final fit that will be within the clearance range shown as "preferable" for that engine in the clearance chart below.
4. Mark the piston with the cylinder number for which it was fitted.



DIAMETER RANGE CHART FOR AVAILABLE SERVICE PISTONS

ENGINE (Cu. In. Displacement)	STD.	OVERSIZE				
		.001"	.020"	.030"	.040"	.060"
ALL 153—230 & 283	3.8750" 3.8760"	3.8760" 3.8770"	3.8937" 3.8957"	3.9037" 3.9042"	3.9137" 3.9157"	—
ALL 194	3.5625" 3.5635"	3.5635" 3.5645"	3.5812" 3.5832"	3.5912" 3.5932"	3.6012" 3.6032"	—
327 (PASS. 250 & 300 HP)	4.0000" 4.0010"	4.0010" 4.0020"	4.0187" 4.0207"	4.0287" 4.0307"	—	—
327 (PASS. 350—365 & 375 HP)	3.9965" 3.9975"	3.9975" 3.9985"	—	4.0264" 4.0284"	—	—
396 (325 HP)	4.0920" 4.0930"	4.0930" 4.0940"	4.1130" 4.1150"	4.1230" 4.1250"	4.1330" 4.1350"	—
396 (425 HP)	4.0895" 4.0905"	4.0905" 4.0915"	—	4.1205" 4.1225"	—	5.1505" 4.1525"
409 (PASS. 340 HP)	4.3116" 4.3126"	4.3126" 4.3136"	4.3310" 4.3330"	4.3410" 4.3430"	4.3510" 4.3530"	—
409 (PASS. 400 HP)	4.3100" 4.3110"	4.3110" 4.3120"	—	4.3387" 4.3417"	—	4.3600" 4.3630"
292 TRUCK	3.8730" 3.8740"	3.8740" 3.8750"	3.8938" 3.8958"	3.9038" 3.9058"	3.9138" 3.9158"	—
327 TRUCK	3.9995" 4.0005"	4.0005" 4.0015"	4.0187" 4.0127"	4.0287" 4.0317"	—	—
348 TRUCK	4.1250" 4.1260"	4.1260" 4.1270"	Size stamped on piston top			—
409 TRUCK	4.3102" 4.3117"	4.3117" 4.3132"	Size stamped on piston top			—

Servicing The Spicer/Dana 7041 Series Auxiliary Transmission

Available as an option on Chevrolet Truck W80 models is a Spicer/Dana 4-speed auxiliary transmission Series 7041. The 7041 transmission is similar in design to the Spicer/Dana 6041 Series auxiliary that is available as an option on Chevrolet Truck M80 models, however, these two transmissions differ in ratios, input capacity, and shifter mechanism design.

To accommodate the higher operating torques of the 6V53 Diesel engine, the larger, higher capacity 7041 Series has heavier components used throughout the gear train. Ratios of the 7041 auxiliary transmission are as follows:

First 2.31:1
Second 1.21:1
Third (Direct) 1.00:1
Fourth (Overdrive) 0.83:1

Lubrication

The Series 7041 auxiliary transmission utilizes splash lubrication for all internal bearings, bushings, shafts and gears.

To insure proper lubrication and operating temperatures, the lubricant level in the housing should be checked at least every 6000 miles. With the unit at operating temperature the lubricant should be level with bottom of filler plug hole.

Either SAE 90 "Multi-Purpose" gear lubricant or SAE 90 Straight Mineral Oil may be used in this transmission. It is recommended that any additions required to bring up the lubricant level be made using the same type of lubricant that is in the transmission at that time.

The following Table shows lubricant viscosity recommendations.

LUBRICANT VISCOSITY SELECTION

Outside Temperature	Viscosity Lubricant To Be Used
BELOW 10°F	SAE 80
UP TO 100°F	SAE 90
ABOVE 100°F CONSISTENTLY	SAE 140

Transmission refill capacity is approximately 11 pints—do not overfill.

SERVICE OPERATIONS

SHIFT CONTROLS

Disassembly (Figure 7)

1. Remove retaining capscrews, locknuts and lockwashers. Separate cover (1) from case and gasket.
2. Remove the two poppet retainers (2) from side of case and use small magnet to remove poppet balls (4) and poppet springs (2).
3. Cut lockwire and remove set screws (5) from 3rd-4th speed shift fork (6), and 1st-2nd speed shift fork (7):
4. Use soft rod to tap (upper) 3rd-4th shift rod (8) and (lower) 1st-2nd shift rod (9) free of shift forks and out of case.

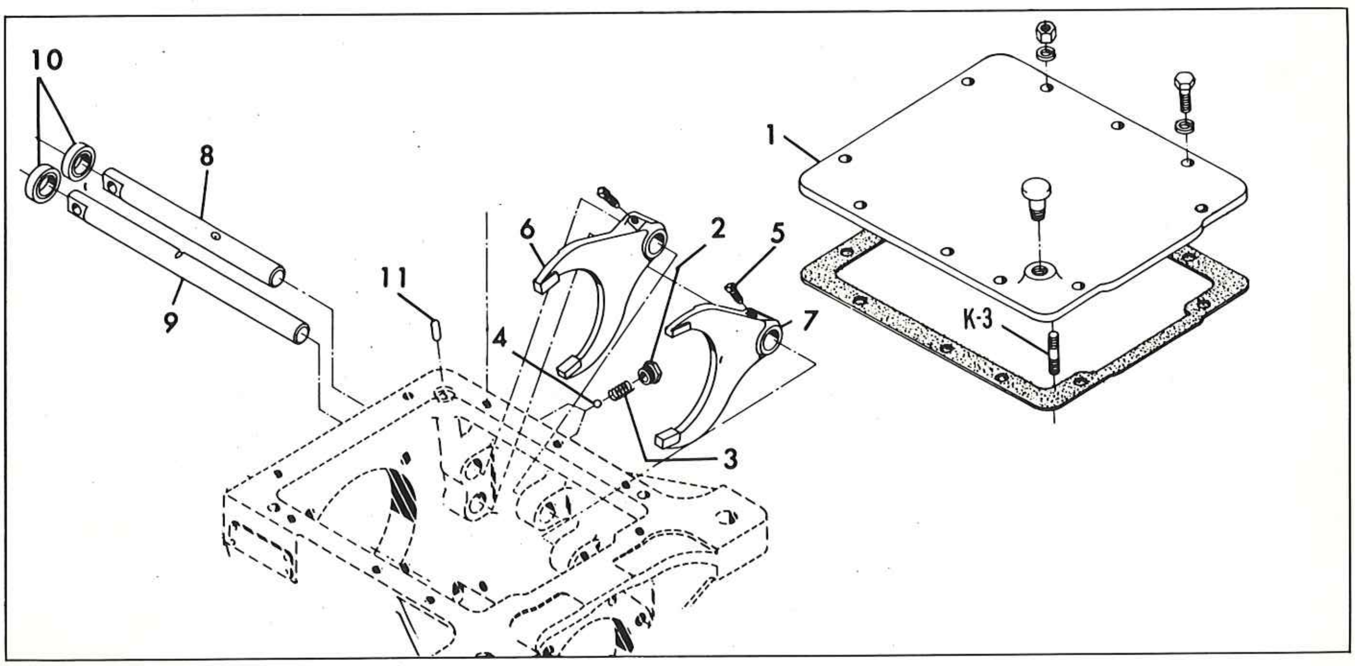


Fig. 7—Auxiliary Transmission Shift Controls and Cover

1. Transmission Cover
2. Poppet Retainers
3. Poppet Springs
4. Poppet Balls
5. Shifter Fork Lock Screws
6. 3-4 Shifter Fork
7. 1-2 Shifter Fork
8. 3-4 Shift Rod
9. 1-2 Shift Rod
10. Shift Rod Seals
11. Shift Rod Interlock

NOTE: *Use caution as shift rod (9) is removed from case to prevent loss of shift rod interlock (11).*

5. If shift rod oil seals (10) are damaged, pry out with large screwdriver and discard.
6. Remove old gaskets or sealing materials from machined surfaces and clean case cover.
7. Wash all shift control parts and examine thoroughly before reassembly.

Assembly

1. If shift rod oil seals (10) were discarded, use 1½" tubing and assemble new oil seals into bore of case.
2. Check both shift rods (8 & 9) in their proper position in case, to make sure they slide freely.
3. Remove shift rods and apply a light coat of grease to all case bores and rods as they are assembled.
4. Select the longer shift rod (1st-2nd shift rod 9) and enter into bottom shift rod opening.
5. With long hub toward the front, assemble 1st-2nd shift fork (7) to 1st-2nd speed clutch collar (7), Figure 4. Pass shift rod (90) through shift fork (7) and rear case boss.
6. Locate shift fork in its proper position and secure to shift rod with set screw (5). Tighten set screw securely in notch and torque to 50 lbs. ft. Secure with lockwire.
7. Locate 1st-2nd shift rod in neutral position and drop interlock pin (11) through hole provided in top right corner of case. Be sure interlock is seated in neutral notch of shift rod.
8. Enter 3rd-4th speed shift rod (8) in top shift rod opening.
9. With long hub toward the front, assemble 3rd-4th speed shift fork (6) in 3rd-4th speed clutch collar (19), Figure 10. Pass shift rod through shift fork and rear case boss.
10. Locate shift fork in its proper position and secure to rod with set screw (5). Tighten set screw securely in notch and torque to 50 lbs. ft. Secure with lockwire.
11. Assemble poppet ball (4), spring (3) and spring retainer (2) in lower hole on right side of transmission case.
12. In a similar manner, assemble poppet ball, spring and spring retainer in upper hole.
13. With 3rd-4th speed shift rod in 4th speed position, use large screwdriver and try to move 1st-2nd shift fork out of neutral position. If interlock is in place, 1st-2nd shift rod will be locked in neutral position.
14. Return 3rd-4th speed shift rod to neutral position. Rotate drive gear and check shifting of both rods to make sure the forks are free in clutch collars and move readily and completely into each gear position.
15. Use light coat of gasket cement and assemble cover gasket to transmission case.
16. Assemble transmission case cover (1) to case and secure with capscrews, lockwashers and stud nuts.
17. If breather was removed, use light coat of gasket cement on threads of breather and assemble to cover.

GEARS AND CASE DISASSEMBLY (Figure 8)

Drive Gear

1. Remove transmission cover, shift forks, and shift rods from transmission as outlined under shift controls disassembly.
2. Lock auxiliary transmission in two gears by engaging 3rd-4th speed shift collar (1) with 4th speed gear (2) and 1st-2nd speed shift collar (3) with 1st speed gear (4).
3. Pull cotter pins and use 2⅛" socket to remove drive gear and mainshaft companion flange nuts.
4. Use puller J-7804 or equivalent and remove drive gear and mainshaft companion flanges.
5. Remove capscrews and lockwashers from drive gear bearing cap (5). Use two puller screws ⅜-16 N.C. at least 2½" long and remove drive gear bearing cap with bearings (6 & 7) and drive gear (8) intact.
6. Support bearing cap assembly on flange and press drive gear free of bearing cap, bearings and spacer.
7. Move drive gear bearing spacer (9) aside and use drift to tap outer roller bearing and oil seal (10) out front of bearing cap. Remove bearing spacer.
8. Remove snap ring (11) and press drive gear rear bearing from bearing cap.
9. Remove old gasket and sealing compounds and wash all parts thoroughly.

Mainshaft

1. Use a suitable puller and remove drive gear pocket bearing (12) from front of mainshaft.
2. Remove retaining capscrews with lockwashers from mainshaft and countershaft rear bearing caps (13 & 14). Separate bearing caps from gaskets, shims and case. Tie countershaft shims (15) together for reassembly. Check and remove speedometer bushing if it is to be replaced. Remove bearing cap oil seal (16) if it is to be replaced.
3. Remove speedometer drive gear or spacer and rear bearing washer (17) from mainshaft.
4. Use a soft hammer and tap forward on rear of mainshaft to start rear bearing (18) off mainshaft.
5. Use two pry bars to slide mainshaft and gear assembly toward rear of case as far as possible. Remove mainshaft rear bearing (18) with puller that clamps on the snap ring of rear bearing.
6. Remove 1st speed gear thrust washer (19) from mainshaft.

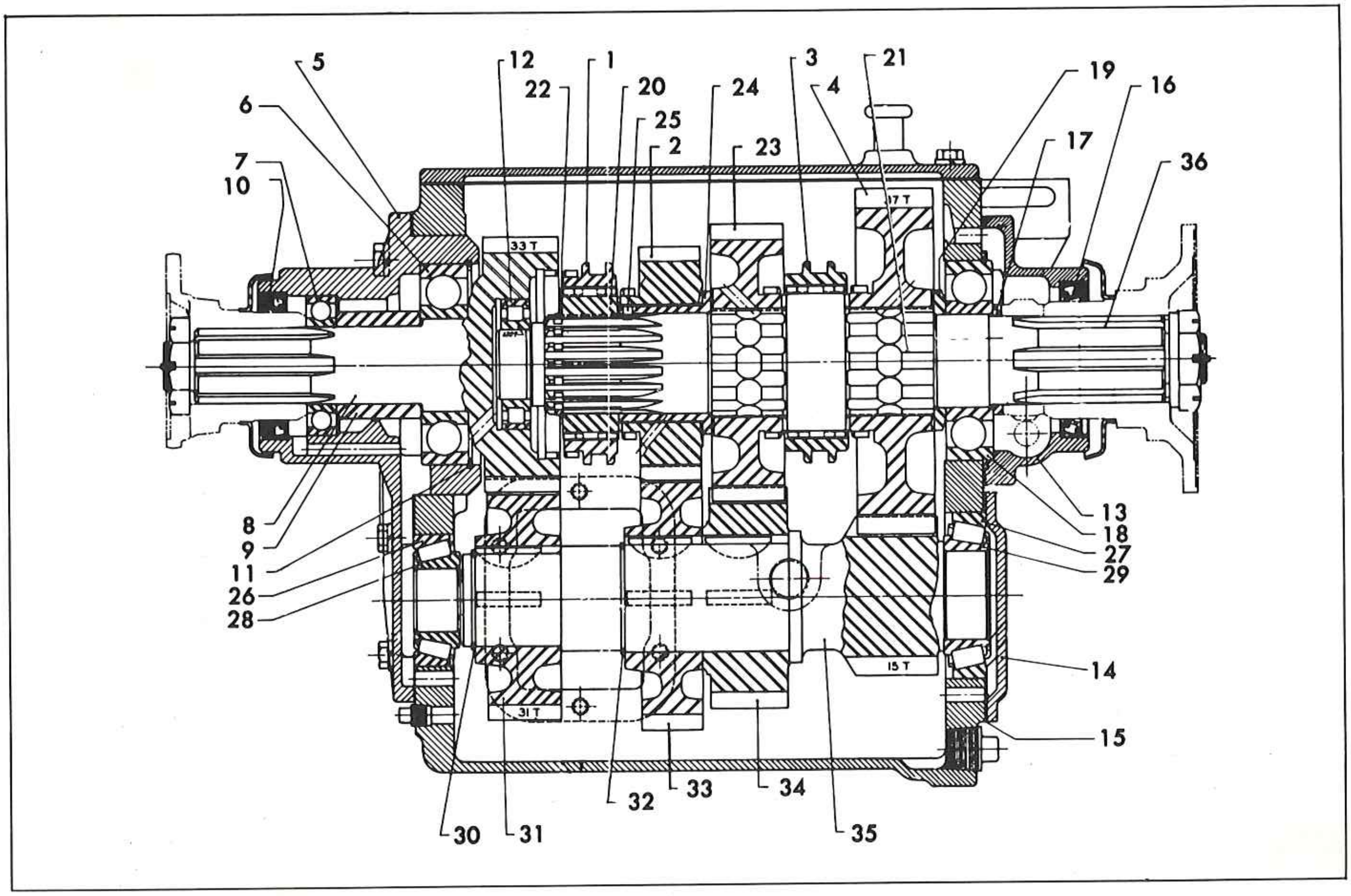


Fig. 8—Transmission Assembly (Cross-Section)

1. 3-4 Shift Collar
2. 4th Speed Gear
3. 1-2 Shift Collar
4. 1st Speed Gear
5. Drive Gear Bearing Cap
6. Drive Gear Rear Bearing
7. Drive Gear Front Bearing
8. Drive Gear
9. Drive Gear Bearing Spacer
10. Front Oil Seal
11. Drive Gear Rear Bearing Retainer Ring
12. Drive Gear Pocket Bearing
13. Mainshaft Rear Bearing Cap
14. Countershaft Rear Bearing Cap
15. Countershaft Shim Pack
16. Rear Oil Seal
17. Mainshaft Rear Bearing Washer
18. Mainshaft Rear Bearing
19. 1st Speed Gear Thrust Washer
20. 3-4 Speed Clutch Gear
21. 1st Speed Gear Sleeve
22. 3-4 Speed Clutch Gear Snap Ring
23. 2nd Speed Gear
24. 4th Speed Gear Sleeve
25. 4th Speed Gear Sleeve Lock Pin
26. Countershaft Front Bearing Cup
27. Countershaft Rear Bearing Cup
28. Countershaft Front Bearing
29. Countershaft Rear Bearing
30. Countershaft Drive Gear Snap Ring
31. Countershaft Drive Gear
32. Countershaft 4th Speed Gear Snap Ring
33. Countershaft 4th Speed (overdrive) Gear
34. Countershaft 2nd Speed Gear
35. Countershaft
36. Mainshaft

7. Remove 3rd-4th speed clutch gear collar (1) from clutch gear (20).
8. Remove mainshaft and gear assembly by lifting front of shaft upward and out through top of case.
9. Slide 1st speed gear (4) and 1st-2nd speed clutch collar (3) off rear of mainshaft.
10. Remove 1st speed gear sleeve (21) if sleeve did not come off with gear.
11. Remove 3rd-4th speed clutch gear snap ring (22).
12. Support under rear of 2nd speed gear (23) and press mainshaft free of 3rd-4th speed clutch gear (20), 4th speed gear (2) and sleeve (24).
13. Remove lock pin (25) from inside 4th speed gear sleeve.
14. Wash all parts, dry and examine thoroughly before assembly.

Countershaft

1. Use soft drift and hammer to tap countershaft forward; this will remove front bearing cup (26) from case.
2. Use soft drift and hammer to tap countershaft rearward to remove rear bearing cup (27) from case.
3. Remove countershaft and gear assembly by lifting countershaft up and out top of case.
4. Use a suitable puller and remove countershaft front (28) and rear (29) bearing cones.
5. Remove countershaft drive gear snap ring (30). Support countershaft drive gear (31) with parallel bars as close to hub as possible. Press countershaft free of gear.
6. Remove 4th speed gear snap ring (32). Support 4th speed (overdrive) gear (33) and press countershaft free of gear.
7. Support 2nd speed gear (34) and press countershaft free of gear.

GEARS AND CASE ASSEMBLY

Countershaft (Figure 9)

NOTE: *All countershaft gears should fit tight on the countershaft. As a shrink (or interference) fit of .0015" to .003" is built into new parts, it presents a field assembly problem.*

If heat is used to expand gear bores, boiling water, hot oil or steam are usually satisfactory. DO NOT EXCEED 250°F. Do not use hot plates, acetylene torches or other methods that will turn the steel blue or straw color and damage the heat treated gears.

If heat is not used, it is advisable to coat the gear bores heavily with white lead to prevent galling or seizing of parts.

When in doubt about which end of the hub to assemble on the shaft first, look for the chamfered end in the bore.

1. Assemble Woodruff Keys (1, 2 & 3) to countershaft (4). Seat keys securely and dress up with file, if necessary.
2. Support 2nd speed gear (5) in arbor press, with long hub down and chamfer up. Set countershaft into position, align keys with keyway, and press shaft into gear. Seat shoulder firmly against gear.
3. Support hub of 4th speed (overdrive) gear (6), with long hub down and chamfer up. Set countershaft into position, align key with keyway and press shaft into gear. Seat gear firmly against shoulder of 2nd speed gear.
4. Assemble snap ring (7) to lock 2nd and 4th speed gears in place.

NOTE: *Use caution when assembling snap ring to shaft to prevent overextending or distorting snap ring. All snap rings must seat firmly in grooves to give secure lock.*

5. Support drive gear (8) with long hub down and chamfer up. Set countershaft into position, align key with keyway and press shaft into gear until seated firmly against shoulder.
6. Assemble snap ring (9) to lock drive gear in place. Observe note following Step 4.
7. Support countershaft in arbor press. Use tubing to press and seat cones of front (10) and rear (11) tapered roller bearings against shoulders on countershaft.
8. Lower rear or small end of countershaft and gear assembly into case and slide end of shaft and 1st speed gear out through rear case bearing bore. Lower front of countershaft into its approximate position and maintain alignment with a cable support or by blocking up countershaft drive gear (8).
9. Use a soft hammer to tap front (12) and rear (13) roller bearing cups into bearing bores of case and over cones on countershaft.

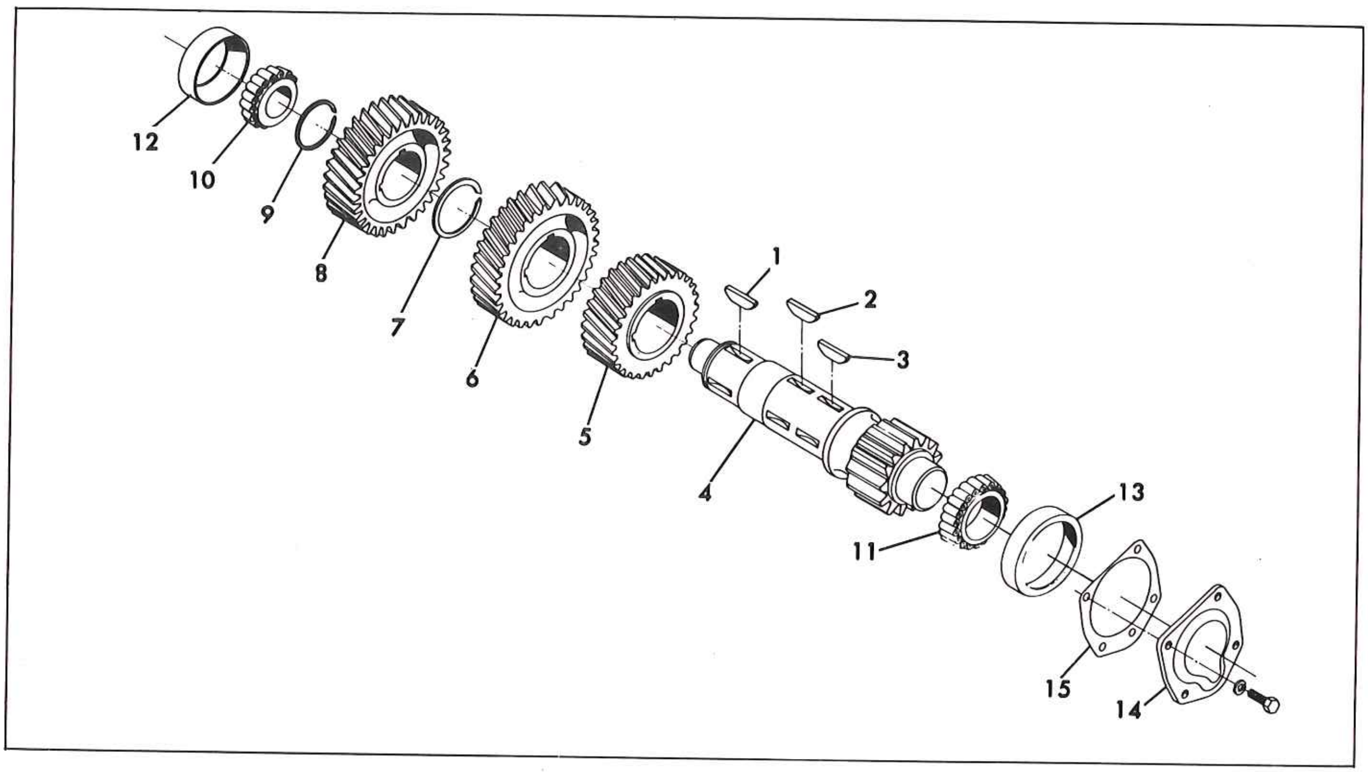


Fig. 9—Countershaft with Gears and Bearings

1. Woodruff Key
2. Woodruff Key
3. Woodruff Key
4. Countershaft
5. Countershaft 2nd Speed Gear
6. Countershaft 4th Speed (overdrive) Gear
7. Countershaft 4th Speed Snap Ring
8. Countershaft Drive Gear
9. Countershaft Drive Gear Snap Ring
10. Countershaft Front Bearing
11. Countershaft Rear Bearing
12. Countershaft Front Bearing Cup
13. Countershaft Rear Bearing Cup
14. Countershaft Rear Bearing Cap
15. Countershaft Shim Pack

10. Assemble drive gear bearing cap (5), Figure 8, and gasket to case with capscrews in the lower four holes. Torque to 40 lbs. ft.
11. Assemble countershaft rear bearing cap (14) and shim pack (15) to case with capscrews and lockwashers. Torque to 40 lbs. ft.
12. Check bearing preload of countershaft roller bearings. Add or remove shims (15) behind rear bearing cap to secure zero end play without preload. Shaft should roll free to slight drag of 2-3 pounds pull with cord wrapped around 2nd or 4th speed gear.
13. After adjustment is made, remove rear bearing cap and coat I.D. & O.D. of shimpack with gasket cement to give good oil seal. Secure rear bearing cap with capscrews and lockwashers and torque to 40 lbs. ft.
14. Remove drive gear bearing cap (5), Figure 8.

Mainshaft (Figure 10)

NOTE: *Lubricate all mainshaft free running gear bearing bores with light grease as gears are assembled to mainshaft.*

CAUTION: *Do not plug oil holes with grease.*

1. Position mainshaft (1) vertically in vise, using soft jaws to clamp on the output splines.
2. Assemble 2nd speed gear (2) to mainshaft, with clutch teeth down.
3. Insert new lock pin inside 4th speed gear fluted sleeve (3).
4. With flanged end of sleeve (3) down align lock pin with spline of mainshaft and tap or press, if necessary, fluted sleeve (3) onto mainshaft. Seat sleeve against shoulder on shaft.

NOTE: *Do not press or drive against ground thrust face of sleeve (3).*

5. Assemble 4th speed (overdrive) gear (4) to mainshaft with clutch teeth up.

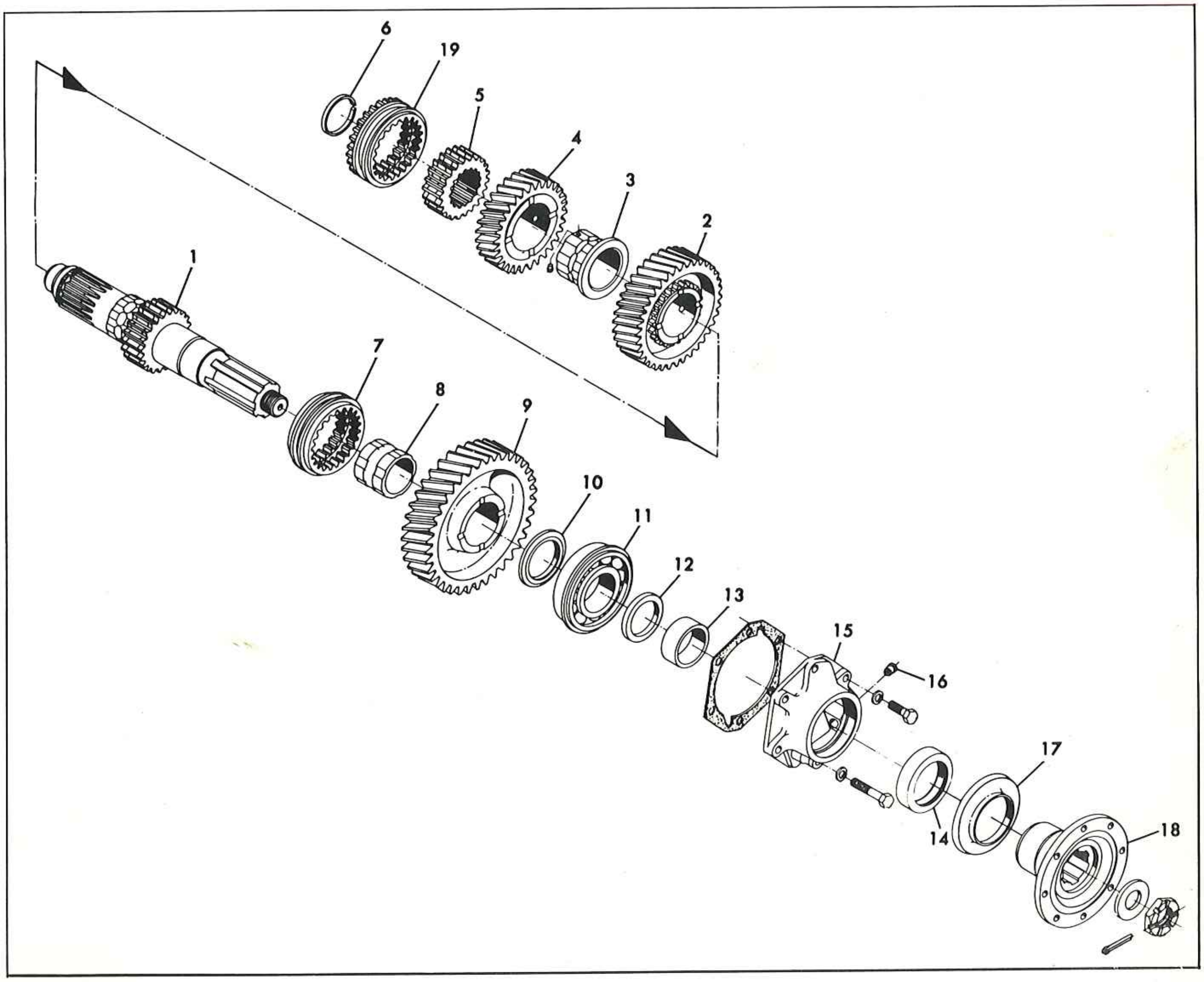


Fig. 10—Mainshaft and Rear Bearing Details

1. Mainshaft
2. 2nd Speed Gear
3. 4th Speed Gear Sleeve
4. 4th Speed (overdrive) Gear
5. 3-4 Speed Clutch Gear
6. 3-4 Speed Clutch Gear Snap Ring
7. 1-2 Speed Clutch Collar
8. 1st Speed Gear Sleeve
9. 1st Speed Gear
10. 1st Speed Gear Thrust Washer
11. Mainshaft Rear Bearing
12. Mainshaft Rear Bearing Washer
13. Speedo Gear or Spacer
14. Rear Oil Seal
15. Mainshaft Rear Bearing Cap
16. Speedometer Bushing
17. Slinger
18. End Yoke or Companion Flange
19. 3-4 Speed Clutch Collar

6. Assemble 3rd-4th speed clutch gear (5) to mainshaft and secure with snap ring (6). Snap ring must be seated in groove of mainshaft and not distorted. Assemble drive gear pocket bearing (12), Figure 8 to front of mainshaft. Since pocket bearing fits tight on mainshaft, use tubing to drive against inner race of bearing.

NOTE: *Assemble pocket bearing, so that snap ring is toward mainshaft.*

7. Turn mainshaft end for end in vise and clamp on 3rd-4th speed clutch gear (5).
8. Assemble 1st-2nd speed clutch collar (7) with longer hub down toward 2nd speed gear (2).
9. Slide 1st speed gear sleeve (8) in position on mainshaft and coat fluted area with light grease.
10. Assemble 1st speed gear (9) over gear sleeve with clutching teeth down toward front of mainshaft.
11. Remove mainshaft sub-assembly from vise and assemble to case by lowering rear of shaft into case and out through mainshaft rear bearing bore. Lower front of mainshaft into position and mesh all gears.
12. Coat thrust face of 1st speed gear thrust washer (10) with light grease and assemble on rear of mainshaft with flat face in toward 1st speed gear.
13. Use 3/4″ stock to block mainshaft across drive gear bearing cap opening at front of case. Position mainshaft rear bearing (11) on shaft with snap ring to rear. Use caution to align outer race of bearing with case bore. Use tubing to drive on inner race of bearing until bearing is seated against thrust washer (10). Remove 3/4″ stock and tap bearing into case until snap ring seats against case.
14. Coat rear bearing washer (12) with light grease and assemble next to rear bearing.
15. Assemble speedometer drive gear or spacer (13) on mainshaft.
16. If oil seal (14) was removed from rear bearing cap (15), use gasket cement on O.D. of seal and press into bearing cap. Caution: Use care to avoid distorting seal. Press in new speedometer bushing (16) if removed.
17. Apply gasket cement to mainshaft rear bearing cap gasket and install on rear bearing cap. Align the oil passage ports.
18. Apply gasket cement to other side of gasket and assemble bearing cap and gasket to rear of case with capscrews and lockwashers. Torque to 40 lbs. ft.
19. If slinger (17) has been removed from companion flange (18) replace at this time.
20. Assemble and yoke or companion flange (18) to rear of mainshaft with tool similar to J-7801-01. If proper tools are not available always block front of mainshaft with 3/4″ stock across drive gear bearing bore opening. Use tubing to assemble flange or yoke to mainshaft.
21. Assemble flat washer and locknut to mainshaft. Hand-tighten nut only at this time.
22. Assemble 3rd-4th speed clutch collar (19) on front of mainshaft, with external clutch teeth toward front of case. Shift clutch collar into mesh with 4th speed gear (4).

Drive Gear (Figure 11)

1. Position drive gear bearing cap (1) in press rear bearing (2) in bearing cap. Secure with snap ring (3).
2. Position drive gear (4) on bed of press with spline or front end up. Position drive gear bearing cap sub-assembly down over splines of drive gear. Assemble bearing spacer (5) to front of drive gear. Use tubing and press against spacer until bearing is seated against gear.
3. Assemble smaller bearing (6) over front of drive gear. Use tubing and press on inner race of bearing until seated against spacer.
4. Coat O.D. of oil seal (7) with Permatex and assemble to front of bearing cap.

CAUTION: *Use care to prevent distortion of seal.*

NOTE: *If slinger 8 has been removed from companion flange, replace at this time.*

5. Prelube lip of front seal and press end yoke or companion flange (9) on drive gear.
6. Rotate bearing cap assembly, under load of press, to see if all parts are seated properly. Bearing cap should rotate freely. Assemble front lock nut hand tight.
7. Apply gasket cement to drive gear bearing cap gasket (10) and install on bearing cap.
8. Apply gasket cement to other side of gasket and assemble drive gear and bearing cap to front of case. Use soft hammer and tap into position.
9. Secure front bearing cap assembly to case with capscrews and lockwashers. Torque to 40 lbs. ft.
10. Refer to Figure 8 and engage 3rd-4th speed shift collar (1) with drive gear (8) and 1st-2nd speed clutch collar (3) with 1st speed gear (4) to lock transmission in two gears.
11. Use 2 1/8″ socket and tighten drive gear and mainshaft flange nuts. Torque to 425 lbs. ft. and secure with cotter pin if castellated nuts are used.
12. Shift clutch collars back into neutral and make sure all shafts turn free.
13. Use pressure type oil can to force lubricant down the oil holes and end slots of all floating gears on mainshaft to flush out grease and insure initial lubrication of the over-running gear and bearings.
14. Install shift rods, shift forks and cover as outlined under shift controls assembly.

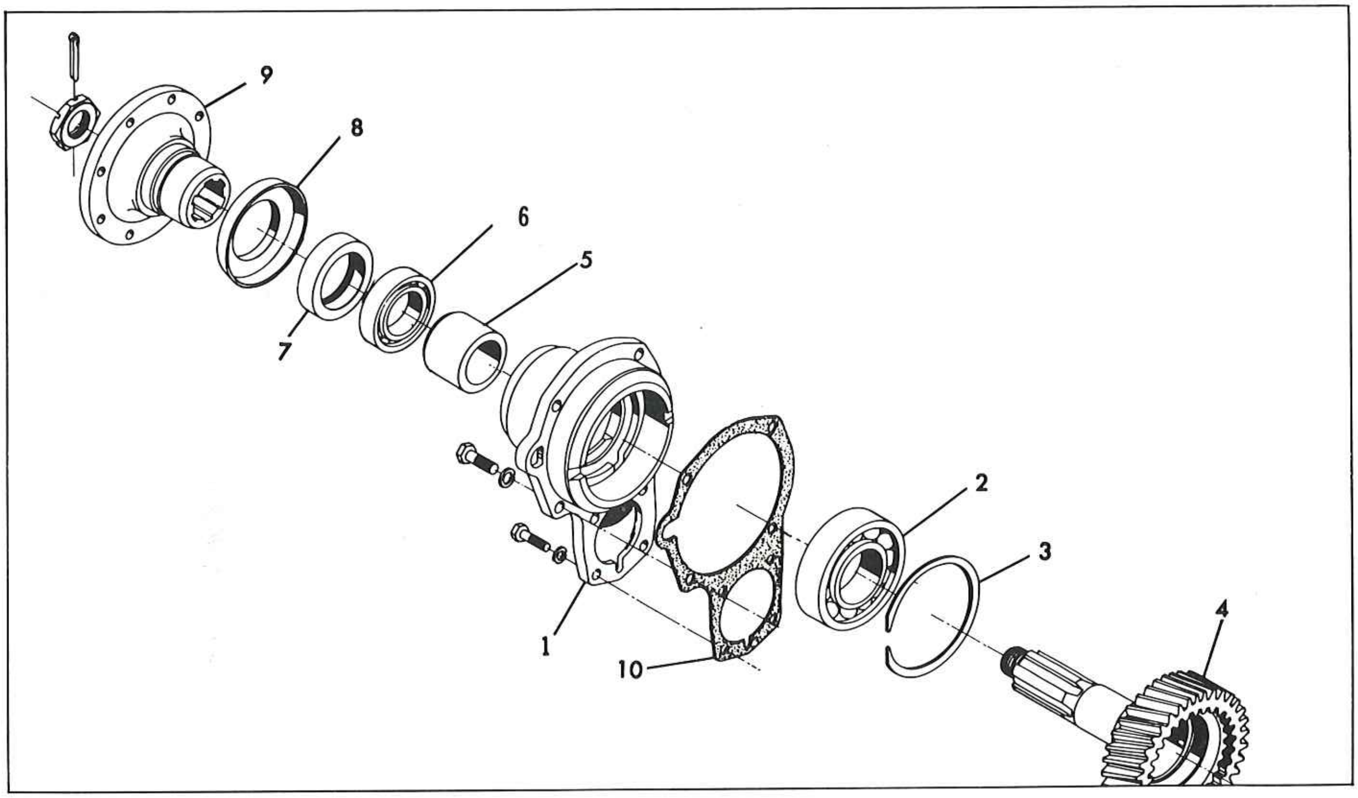


Fig. 11—Main Drive Gear and Bearing Details

1. Drive Gear Bearing Cap
2. Drive Gear Rear Bearing
3. Drive Gear Rear Bearing Snap Ring
4. Drive Gear
5. Bearing Spacer
6. Drive Gear Front Bearing
7. Front Oil Seal
8. Slinger
9. End Yoke or Companion Flange
10. Drive Gear Bearing Cap Gasket

Rough Idle with RPO G67 Level Control Installed

Engine rough idle may occur on 1965 passenger cars that have the Automatic Level Control System (RPO G67) installed on the Super Lift Rear Shock Absorbers. Rough idle is due to a pulsation in engine manifold vacuum caused by cycling of the vacuum operated air compressor used for the level control system.

To obtain the best possible idle on vehicles equipped with RPO G67, it will be necessary to add the following steps to the "Idle Speed and Mixture Adjustment", shown on page 6M-1 of the Chassis Service Manual.

Add after step 3—

(A) Adjust level control system air reservoir pressure to approximately 70 psi, using the Shrader valve on the compressor.

(B) With level control compressor operating, adjust carburetor idle mixture for best engine idle.

(C) With the compressor off, check engine idle speed and if necessary adjust speed setting.
(To eliminate a wait for air pressure build-up and compressor cut-out, shut off compressor vacuum usage either by crimping the vacuum hose or disconnecting the hose and blocking the vacuum source.

(D) Readjust idle mixture to obtain satisfactory compromise for both the compressor "operating" and "off" conditions.

1965 Chevrolet Rear Coil Spring Replacement

On 1965 Chevrolet series passenger cars, the following revised service procedures should be used for removal and installation of either or both rear suspension coil springs.

Spring Removal

1. Raise rear of vehicle and place jack stands under frame. Support vehicle weight at rear, using either a jack or post of twin-post hoist under axle.
2. Remove both rear wheels from vehicle.
3. With the car supported as in Step 1, so that the rear springs are compressed by weight of vehicle; perform the following:
   a. Disconnect both rear shock absorbers from the anchor pin lower attachment.
   b. Loosen the upper control arm (s) rear pivot bolt (do not remove the nut).

c. Loosen both the left and the right lower control arm rear attachment (do not disconnect from axle brackets).
d. Remove the rear suspension tie rod from the stud on the axle tube.

4. At the lower seat of both rear coil springs, slightly loosen the nut on the bolt that retains the spring and seat to the control arm. When the nut has been backed off the maximum permissible, all threads of the nut should still be engaged on the bolt.

CAUTION: *Under no condition should the nut, at this time, be removed from the bolt in the seat of either spring.*

5. Slowly lower the support (jack or hoist post) that has been in place under the rear axle, thereby allowing the axle to swing down, carrying the springs out of their upper seat and providing access for spring removal.
6. Remove the lower seat attaching parts from each spring, then remove the springs from the vehicle.

Spring Installation

1. Position the springs in their upper seat and install the lower seat parts on the control arm, with the nut finger tight on the spring retainer bolt.

NOTE: *Omit the lockwasher under the special high carbon bolt, so that sufficient bolt thread will be available to start the nut. The lockwashers will be installed later (in Step 4).*

2. By alternately raising the axle slightly and then re-snugging the nut on each spring lower seat bolt, move the axle upward until vehicle weight is fully supported on the jack. With the spring now compressed to approximately curb height, positively position the springs in the lower seats by torquing the nut on the lower seat bolt.
3. Re-connect shock absorbers, torque rear attachment of upper and lower control arms, and re-connect the axle tie rod at proper torque.
4. With the rear of vehicle still supported by jack under axle; remove the nut from the lower seat bolt of one rear spring, slide proper lockwasher on the bolt and reinstall the nut to proper torque. Similarly install a lockwasher at the lower seat of the other rear spring.
5. Install rear wheels and lower vehicle to floor.

Suction Throttling Valve Leak Test

A neoprene diaphragm is now used in production assembly of all air conditioner suction throttling valves. This neoprene diaphragm is also utilized in the piston—diaphragm assemblies furnished for Service replacement. The neoprene diaphragm has several important differences from the former polyurethane diaphragms.

(a) The physical appearance has changed from a circular design of the flange surface to a pentagon (5 sided) shape.
(b) When the diaphragm is assembled in the valve, the tabs at each of the five screw holes will protrude beyond the cover and body for ready identification.
(c) The permeation rate of Freon-12 thru the neoprene diaphragm is considerably greater than that of the former polyurethane diaphragm.

LEAK TEST

The normal leak rate of refrigerant thru the neoprene type diaphragm is sufficient to give a false indication on all commonly used leak detectors. Therefore, the following special leak test procedures are recommended for units equipped with the neoprene diaphragm.

EQUIPMENT REQUIRED

Propane Leak Test Torch
Vacuum Pump
Plastic Electrical Tape

Testing Procedure

1. Adjust the propane torch to obtain a cherry red color on the copper ring element.
   (a) Flame should be adjusted so it is approximately 1/4″ in height and has a light blue center cone.
2. Using the vacuum pump, with a section of hose connected to inlet; evacuate the interior of the diaphragm cover for a minimum of 15 seconds. (On a two-position type suction throttling valve, it will be necessary to temporarily close three of the four openings in the underside of the vacuum element, by covering the three holes with tape.)
   The hose from the vacuum pump should be applied to the one hole not taped for approximately 15 seconds. This will clear the cavity of any accumulation of Freon-12.
3. Wait for approximately two minutes, after the evacuation procedure described in Step 2, then apply the exploring tube of the leak test torch to the untaped opening in the vacuum head and observe the flame.
4. Should a rather deep green or bluish black color exist, it would indicate a leak greater than the normal permeation (leak rate) and would be cause for replacement of the diaphragm.
5. Before actually replacing the diaphragm, make certain that the screws in the cover to body are tight. (35-40 pound inches.)
6. Also check all the connections of inlet, outlet and oil bleed and expansion valve connections to be certain that a leak is not present at one of these connections.

Servicing The Turbo Hydra-Matic Transmission

PRESSURE REGULATOR VALVE IN-CAR REPLACEMENT

A special tool has been developed to facilitate in-car removal of the pressure regulator valve, boost valve and sleeve assembly from the Turbo Hydra-Matic transmission. This tool can be easily fabricated in the dealership by selecting a piece of bar stock approximately 1/4" x 1/2" x 2" and in it drilling two 11/32" thru holes—1" apart (see upper portion of Figure 12). In one of the drilled holes insert a 1/4" bolt that is 4" long and has approximately 3" thread length, then run a nut onto the bolt and the tool is ready for use.

To remove the pressure regulator valve unit from the transmission use tool as described below:

1. Attach the tool plate to the transmission case using a transmission pan bolt (see Figure 12).
2. Lower the 4" bolt into contact with the pressure regulator boost valve sleeve.
3. Run the nut up against the underside of the tool plate and hold nut while threading the bolt down until tension has been relieved from the valve sleeve retaining snap ring.
4. Remove snap ring from boost valve sleeve.
5. Back the 4" bolt out until it clears of the pressure regulator boost valve sleeve, then remove the tool from transmission. Remove valve components from transmission.

This same tool can also be used for installing the P. R. valve and sleeve and in this application could avert possible damage to parts or their loss within the transmission, which in some cases would require removal of the transmission from the car.

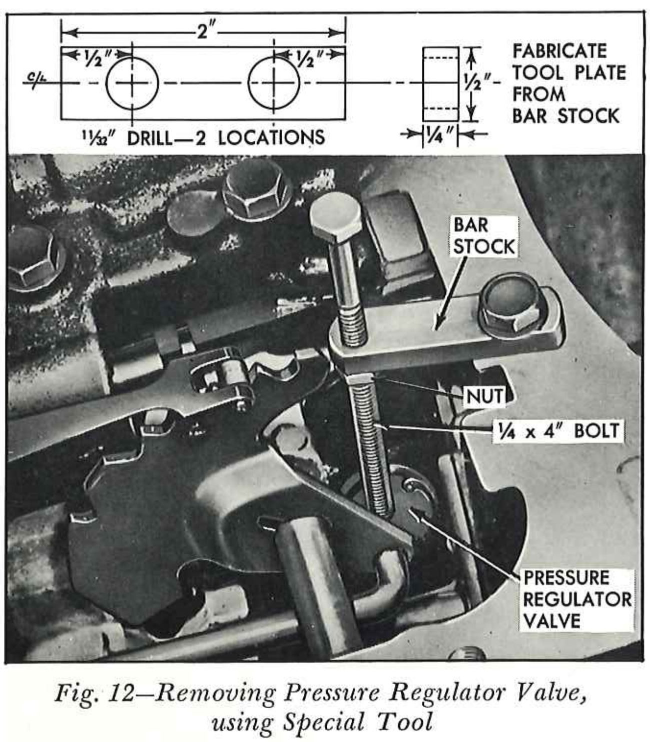


Fig. 12—Removing Pressure Regulator Valve, using Special Tool

READING THE DIPSTICK

Improper insertion of the oil level indicator (dipstick) into the Turbo Hydra-Matic transmission fill tube can result in incorrect oil level readings being obtained.

The dipstick should always be inserted into the oil filler tube positioned so that the oil level indicating markings are on the top surface of the stick (toward center of car).

As covered in 1965 Service publications, the transmission should be at normal operating temperature to obtain an accurate oil level check. If the transmission fluid level is checked cold, a reading at the "add oil" mark is normal and does not indicate a need for any addition of transmission fluid.

POSITIONING THE CASE CENTER SUPPORT—DURING OVERHAUL

To insure proper operation of a Turbo Hydra-Matic transmission after overhaul, technicians are recommended that the following operation always be performed during re-assembly of the transmission.

At the stage of transmission re-assembly where the case center support and planetary gear unit have just been installed in the case, it is important that the center support then be properly positioned in the case before support to-case lock bolt (allen head) is installed.

As shown in Figure 13, an existing tapped hole in the case permits installation of a screw that can be brought into contact with a lug on the case support. To correctly position the center support in the transmission case install special screw #8623498 in this hole and torque the screw to 4-5 ft. lbs. The

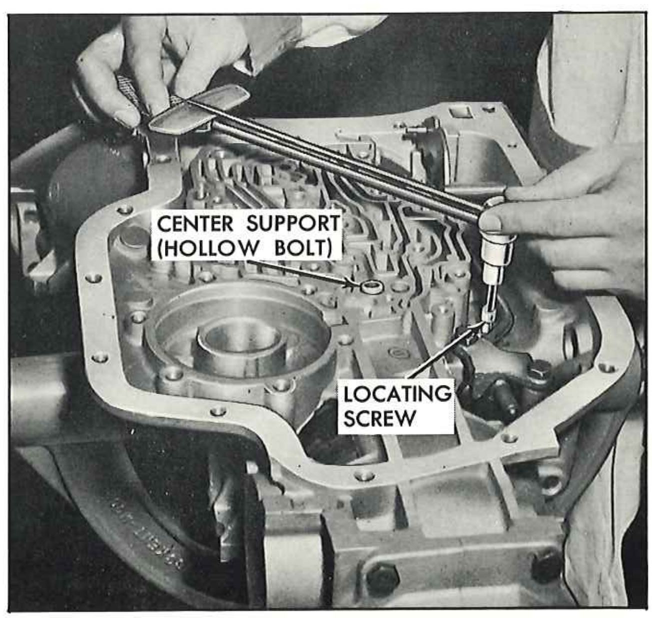


Fig. 13—Locating and Locking Case Center Support

case to center support bolt should then be installed and torqued to 20-25 ft. lbs., thereby securely locking the assembly in position. The special locating screw #8623498, should now be removed from the transmission and retained by the technician for re-use.

NOTE: *Special Screw, Part #8623498 is available through regular Chevrolet Parts channels.*

It is again emphasized that use of the special locating screw is essential during re-assembly of the transmission as this screw positions the center support in the case in the direction of thrust or torque. If the center support is not positioned in this manner, or if the center support bolt is not tightened properly after positioning, a chucking noise on coast 2-1 downshift and/or 1-2 upshift will be apparent during vehicle operation.

Corvair Engine Valve Guide Removal

Tool J-21280 is used for the removal of valve guides from the cylinder heads of Corvair engines. It has been found that occasionally a valve guide will become welded, so to speak, in the cylinder head and if an attempt is made to remove this guide with J-21280, the small shoulder on the tool may actually be driven slightly into the guide instead of driving the guide out of the cylinder head.

To eliminate this problem, it is recommended that whenever a Corvair valve guide is to be removed it should first be broken loose (started) with tool J-21281, which is presently used as the guide installer and has a wider shoulder than the J-21280 tool. After the guide is broken loose it can then be removed without a problem, using Remover J-21280.

Corvette 396 Engine Cooling System Refill

To avert possible engine damage due to overheating of 1965 Corvettes equipped with the 396 cu. in. engine, it is necessary that a special service procedure be followed for refilling the cooling system after it has been drained for any reason. In these particular Corvettes the engine water outlet is located at a higher level in the vehicle than the coolant supply tank. Due to this condition the following refill procedure must be used to assure that the system completely fills with coolant.

1. Disconnect heater hose from nipple at inlet manifold.
2. Add coolant to supply tank until coolant starts to flow from nipple, then re-install heater hose. Completely fill coolant supply tank.
3. Install pressure cap and run engine until engine normal operating temperature is reached to insure that thermostat has opened.
4. Observing usual precautions, remove pressure cap from supply tank and add coolant as necessary to maintain the tank normal one-half full level. Install pressure cap and tighten securely.

Chevy Van Radiator Hose

Rub-thru of the radiator lower hose can occur on some 1964 and early 1965 Chevy Vans due to contact of the hose with a boss on the right front of the engine block.

This clearance is more critical on the six cylinder engines because of the thicker radiator introduced on the 1965 model. Careful positioning of the hose will not always prevent interference, unless ½ to ¾ inch clearance to the engine boss can be attained.

On all vehicles built after mid-November 1964, to eliminate the hose interference the forward outboard corner of the engine boss has been removed by grinding and the lower end of the hose has also been cut off one inch. This Production modification will be in effect until engines are received without the large boss.

If hose interference is detected on vehicles built prior to the Production modification, remove the portion of the engine boss that is shown as a shaded area in Figure 14. This work can be done from above after disconnecting the heater hose and the lower radiator hose from the engine. A portable hand grinder with a three or four inch wheel is sufficient to do the job.

Reposition the lower hose as far onto the radiator outlet as possible and tighten the clamp. Position the upper end of the hose on the water pump to provide maximum clearance. Do not position the hose against the heater hose clip on the side of the engine housing.

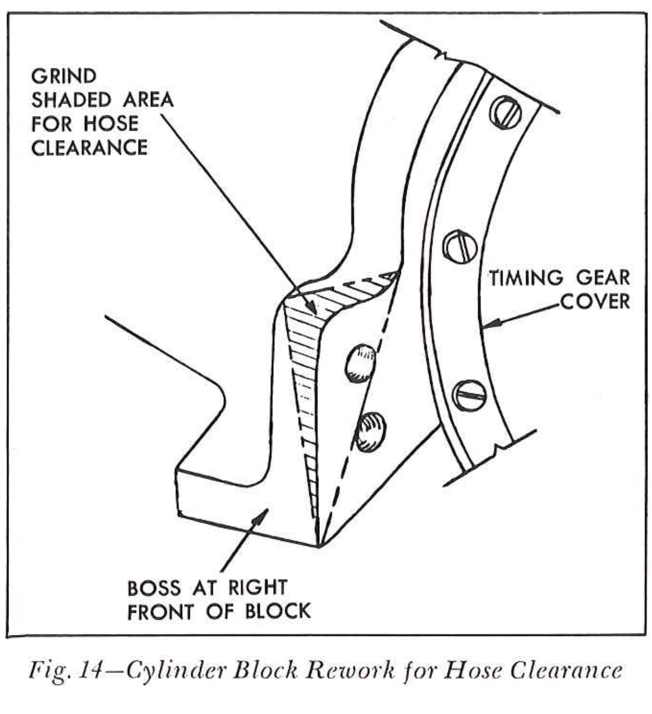


Fig. 14—Cylinder Block Rework for Hose Clearance

Fan Hub Locating Tool

Tool J-22162, shown in Fig. 15, is a gauge that is now available to permit accurate locating of the fan pulley hub on the shaft of any engine water pump. Before performing the press operation required for hub installation, the technician would lock the sliding collar on the scale of the J-22162 Tool at the proper hub locating dimension for that particular pump. The chart dimensions at the bottom of this page provides the "Hub Location" dimensions for all water pumps used on 1941 thru 1965 model year engines.

The J-22162 Tool can be used in place of all other special tools previously made available for fan hub locating.

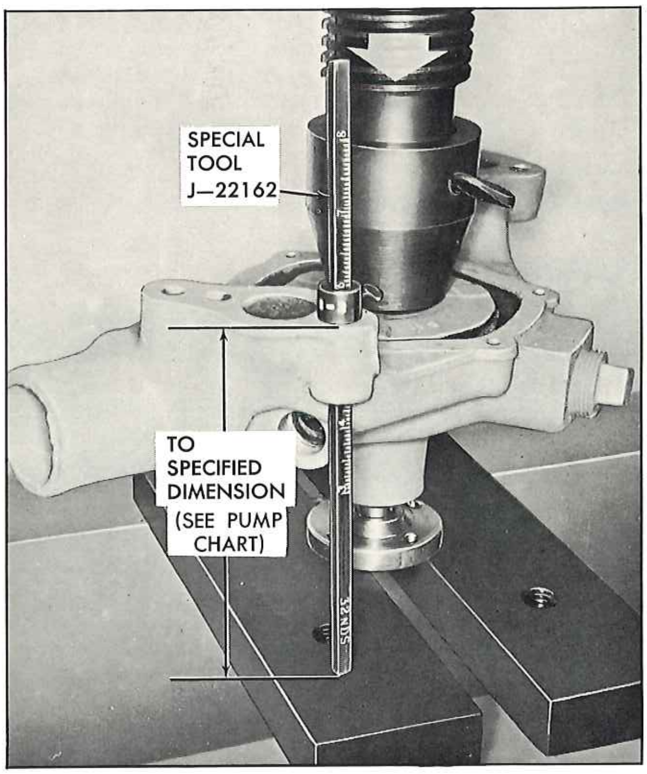


Fig. 15—Fan Hub Locating Tool

Truck 15 x 4 Twinplex Rear Brakes

Some 15 x 4 linings removed from Twinplex rear brakes on 1960-65 trucks exhibit excessive taper wear. It is normal for the lining to wear slightly faster at the inside edge (Flange Plate side), due to heat dissipation differences between the open and the closed sides of the brake drum. However, it has been found that lining taper will be greatly increased if the shoe hold-downs have not been properly adjusted. Insufficient brake shoe to flange plate clearance can cause poor shoe return, while excessive clearance can result in premature lining replacement due to excessive taper wear.

It is recommended that the following revised procedure for adjusting the rear brake shoe hold-downs on 1960-65 trucks with 15 x 4 brakes, be used in place of the adjustment procedure detailed for this same operation in the 1963 Chevrolet Truck Shop Manual, Section 5, Page 20.

1. Remove rear shoe retracting springs.
2. With hold-down cotter pins and nuts removed hold shoe assemblies *squarely* against the flange plate *end pads* (that is the pads adjacent to the wheel cylinders).

NOTE: *The center pads adjacent to hold-down studs may vary from .015" to .030" lower than the end pads and are not intended to support shoe.*

3. Install hold-down nuts finger tight (just obtaining zero clearance between nut and washer—and washer and shoe web).
4. Back off hold-down nut 1/2 turn (3 flats on nut) then install cotter pin. If pin cannot be inserted at this position, continue backing off nut to nearest hole line-up, then install pin.

NOTE: *Recheck to insure that shoe does not contact center pad at any time during steps 2, 3, and 4.*

5. Reinstall rear shoe retracting springs. Rear shoe to drum clearance should be readjusted in accordance with Shop Manual procedure.

FAN PULLEY HUB INSTALLED LOCATION ON ENGINE WATER PUMPS

ENGINE	CHEVROLET		CHEVELLE		CHEVY II		CORVETTE		TRUCK	
	Model	Hub Location*	Model	Hub Location*	Model	Hub Location*	Model	Hub Location*	Model	Hub Location*
348 & 409	1965 1964 (2nd)	5 3/4"							1960-65	6 7/32"
	1964 (1st) 1958-63	5 1/2"							1958-59	6 9/32"
265, 283 & 327	1955-61	5 11/16"	1964-65	5 9/16"	1964-65	5 9/16"	1955-65	5 11/16"	1955-65	5 11/16"
	1962-65	5 9/16"								
292									1963-65	4 15/32"
153	1963-65	3 7/8"	1964-65	4 11/32"	1962-65	3 7/8"			1963-65	3 7/8"
194 & 230									Chevy Van	4 11/32"
216, 235 & 261	1941-63	5 5/16"					1953-55	5 5/16"	1941-63	5 5/16"

*Distance from the front face of the hub to the pump housing machined surfaces that mate with engine.

Corvair Rear Suspension Front Strut Rod

Rear wheel alignment and vehicle handling characteristics can be affected on 1965 Corvairs, if the horizontally slotted bracket that connects the rear suspension front strut rod to the transmission support is improperly positioned on the support.

If it is obvious, with a vehicle supported on the wheels (at curb weight), that the grommet type insulators, used at each end of both front strut rods, are under unequal compression; it is likely that the strut rod bracket is mis-positioned. To correct this condition; loosen the front strut rod bracket while normal weight of the vehicle is on all four wheels, and let the slotted bracket float and re-position itself on the transmission support. Re-tighten the bracket retaining bolts to 25 ft. lbs. Check and re-set rear wheel alignment as necessary.

When replacing a rear suspension front strut rod, or any of its attaching parts, including the bracket at the transmission support; it is essential during bracket installation that normal weight of the vehicle be on all four wheels and that both the strut rod-to-control arm and the strut rod-to-bracket nuts be final torqued to 15 ft. lbs. before attaching the bracket to the transmission support. Check rear wheel alignment.

Corvair Wheel Alignment Specifications Changed

When checking the wheel alignment on any 1965 Corvair passenger car, technicians should use Shop Manual procedures and the revised alignment specifications provided below. These changes in service specifications reflect wheel alignment settings that are now in effect at assembly plants.

Front Wheels

*Caster	Positive 3° ± ½°
*Camber	Positive 1° ± ½°
Toe-in (total both wheels)	¼″ to ⅜″

Rear Wheels

*Camber	0 to Positive 1°
Toe-in (total both wheels)	⅛″ to ⅜″

set within ½° of opposite side

Tie Rod Clamp Positioning

On 1965 model C20 and C30 Trucks, to avert any possible linkage interference by the steering tie rod inner clamps as the wheels approach full turn condition, it is recommended that the inner clamp on both tie rods be positioned as follows:

On trucks without Power Steering:—Position the clamps so that the clamp opening is on the forward side of the rod and the clamp bolt is not tilted from vertical more than 45° in either direction.

On trucks with Power Steering:—Position the clamps with the clamp opening forward and horizontal, so that the clamp bolt will always be installed as close as possible to vertical.

REVISIONS IN 1965 PASSENGER CAR EQUIPMENT AVAILABILITY

(Continued from page 2)

The 300-hp Turbo-Fire V8 (RPO L74) is now available on all models including Station Wagons.

The 3.31:1 axle (RPO G94) is no longer available with the 250- and 300-hp 327 V8's.

A 2.73:1 axle replaces the 3.07:1 as standard axle for the 250-hp 327 V8 with Powerglide.

Rim width of 13″ wheels on Nova 6-cyl. Sedan and Sport Coupe has been changed from 5.5″ to 4″.

CORVETTE

The important mid-year change in engine lineup for Corvette is the addition of the extra-cost 425-hp Turbo-Jet 396 V8. Full-Transistor Ignition System (RPO K66) is mandatory equipment with the 425-hp V8. Limited availability of the 365-hp 327 V8 (RPO L76) is expected for the balance of the model year.

Goldwall 7.75 x 15-4 pr Special Nylon Tires are available as a factory-installed option (RPO T01).

Power Steering is now available with the 350-hp 327 V8 as well as with the 250- and 300-hp.

Ratios 3.36:1 and 4:56:1 in Positraction Axle option (RPO G81) are no longer available with the 350-hp Corvette V8 engine.

GENERAL CHANGES

The Full-Transistor Ignition System (RPO K66) is available for Chevrolet 325- and 425-hp Turbo-Jet 396 V8 engines and also for Chevelle 350-hp Turbo-Fire 327 V8.

Rear Antenna (RPO V78) will be available only with AM radios. The AM/FM radio will use only a new front antenna of fixed height, on all except Chevy II models. On Chevy II, a telescoping type antenna is used for all radios.

A Rear Window Air Deflector for station wagons is now available both as a factory-installed option (RPO C51) and a Dealer-installed Custom Feature.

Magnesium Simulated Wheels are now available as Dealer-installed covers; order 986416 for all 13-inch wheels, and 986417 for all 14-inch wheels.