

HUDSON



1957

TECHNICAL SERVICE MANUAL SUPPLEMENT

F O R E W O R D

The following product information will provide Hudson Service Information for the "Hornet" V-8 Series when used in conjunction with the 1955 and 1956 Technical Service Manuals and the 1956 "Hornet" Special V-8 Supplement.

This product information should be kept in a convenient location together with the Service Manuals so that complete information will be available for prompt model and series reference.

AMERICAN MOTORS CORPORATION
AUTOMOTIVE TECHNICAL SERVICE
3280 South Clement Avenue
Milwaukee 7, Wisconsin

TECHNICAL SERVICE MANUAL

SUPPLEMENT 1957 Series

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ENGINE

(V-8)

For service procedures and general description of the V-8 engine, refer to the 1956 Special V-8 Technical Service Manual Supplement.

The engines are similar in design varying only dimensionally effecting increase in horsepower

ENGINE SPECIFICATIONS

Type	90° V-8 O.H.V.
Bore	4"
Stroke	314"
Displacement	327 Cu. In-
Compression Ratio	9.00:1
Carburetor	WCFB-Four Barrel
Brake Horsepower	255 @ 4700 R.P.M.
Torque	345 Lbs. Ft. @ 2600 R-P.M.
Taxable Horsepower	51.2
Fuel	Premium (95.9 Octane Research)

VALVES

Intake Valve Lift	.375"
Intake Valve Stem	
Standard Diameter	.3412"-.3417"
Intake Valve Face Angle	29°
Intake Valve Seat Angle	30°
Intake Valve Seat Width	.078"-.093"
Intake Valve Spring Tension	
Valve Closed	85-91 Lbs. @ 1-13/16"
Valve Open	150-160 Lbs. @ 1-7/16"
Intake Valve Stem to	
Guide Clearance	-.0013"-.0028"
Valve Guide I.D.	.3430"--.3440"
Exhaust Valve Lift	.375"
Exhaust Valve Stem	
Standard Diameter	.3407"--.3412"
Exhaust Valve Face Angle	44°
Exhaust Valve Seat Angle	45°
Exhaust Valve Seat Width	.093"--.104"
Exhaust Valve Spring Tension	
Valve Closed	85-91 Lbs- ((4 1-13/16"
Valve Open	150-160 Lbs. (a) 1-7/16"

ENGINE (V-8)

Exhaust Valve Stem to	
Guide Clearance	.0018"-.0033"
Exhaust Guide I.D.	.3430"-.3440"
Valve Timing	
Intake	
Opens	12° 30' B.T.D.C. 244°
Closes	51° 30' A.B.D.C. Duration

PISTONS AND RINGS

Piston to Bore Clearance	
Top Land	.028"-.032"
Skirt Top	.0009"-.0025"
Skirt Bottom	.0009"-.0015"
Piston Ring Gap Clearance	
Top	.010"-.020"
Center	.010"-.020"
Bottom (Steel Rail I	.015"-.055"
Piston Ring Side Clearance	
Top	.002"-.006"
Center	.002"-.006"
Bottom	.0001"-.0079"
Piston Pin to Connecting Rod	Press Fit
Piston Pin to Piston	Palm Press Fit in Piston at Room Temperature

CRANKSHAFT AND BEARINGS

Main Bearing Diameter	2.4983"-2.4990"
Main Bearing Clearance	.0006"-.0032"
Main Bearing Cap Torque (Except Rear)	80-85 Ft. Lbs.
Main Bearing Cap Torque (Rear Only)	50-55 Ft. Lbs.
Crankshaft End Play	.003"-.007"
Crankshaft End Thrust	Front Main Bearing
Connecting Rod Bearing Diameter	2.2483"-2.2490"
Connecting Rod Bearing Clearance	.0007"-.0028"
Connecting Rod Cap Torque	46-50 Ft. Lbs.(oiled)
Connecting Rod Side Clearance	.004"-.012"

CAMSHAFT

Camshaft End Play	.003"-.006"
Camshaft Bearing Clearance	.001"-.003"

OIL SYSTEM

Oil Pump Type	Gear
Normal Oil Pressure	10 Lbs. Min. Vii; 600 R.P.M.
Oil Pressure Release	55-60 Lbs.
Engine Oil Refill Capacity	5 Qts.

TUNE-UP DATA

Compression Pressure	
Cranking Speed	
(Throttle Wide Open)	140 P.S.I. Min. 0) 315 R.P.M.

Engine Idle R.P.M.	
Standard and Overdrive	550
Hydra-Matic—In Neutral	425
With Air Conditioning	475

NOTE: When equipped with air conditioning, adjust idle with air conditioning unit "ON".

Ignition Timing	
(Vibration Damped 1	5° B.T.D.C.
	(10° B.T.D.C. optional with Automatic Transmission or where local fuel octane permits)

Distributor Point Gap	.016"
Dwell or Cam Angle	28°-32°
Breaker Point Tension	19-23 Ozs.
Rotor Rotation	Left Hand
Spark Plugs	
Auto-Lite	AL-7
Champion	H-10
Gap	.035"
Torque	30 Ft. Lbs.
Cylinder Head Torque	60-65 Ft. Lbs.
Firing Order	1, 8, 4, 3, 6, 5, 7, 2

ELECTRICAL

DISTRIBUTOR (DELCO-REMY)

Model 1110887

(External Adjustment Type)

The external adjustment type distributor illustrated in Figure 1 is a 12 volt, 8 cylinder unit. The cap has a window for adjusting dwell angle while the cap is in mounted position. The circuit breaker plate is located below the centrifugal advance mechanism and uses the outer diameter of the main shaft bushing for its bearing surface. The movable plate is held into position by a retainer clip in the upper shaft bushing. The molded rotor serves as a cover for the centrifugal advance mechanism. The vacuum control unit is mounted under the movable breaker plate to the distributor housing. The contact set is attached to the movable breaker plate. The service replacement contact set has the BREAKER LEVER SPRING TENSION AND POINT ALIGNMENT prefactory adjusted and is serviced as one complete assembly. Only the point opening (dwell angle) requires adjusting after replacement.

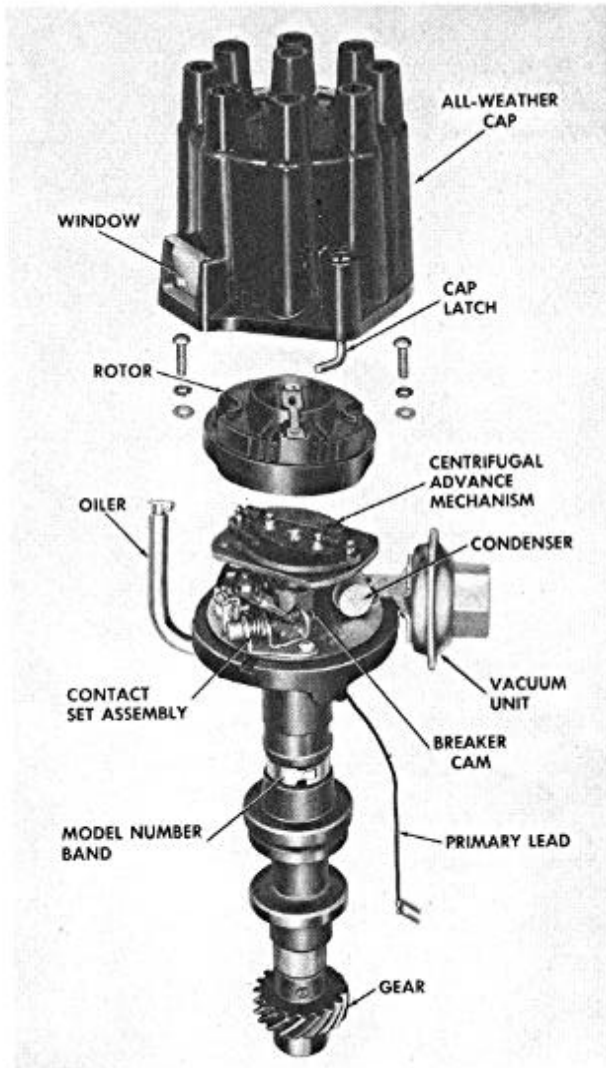


FIGURE 1—Distributor Assembly

Under part throttle operation, the intake manifold vacuum is sufficient to actuate the vacuum control diaphragm and cause the movable plate to move, thus advancing the spark and increasing fuel economy. During acceleration or when the engine is pulling heavy, the vacuum is not sufficient to actuate the diaphragm and the movable plate is held in the retarded position by a calibrated return spring which bears against the vacuum diaphragm.

The centrifugal advance mechanism consists of an automatic cam actuated by two centrifugal weights controlled by springs. As the speed of the distributor shaft increases with engine speed, the weights are thrown outward against the pull of the springs. This advances the cam causing the contact points to open earlier and thus advancing the spark.

Lubrication

The hinge cap oiler should be filled with SAE 20 oil at each vehicle lubrication period. When replacing the contact set assembly, add a trace of Ball Bearing Lubricant to the breaker cam. No other lubrication is required. The movable breaker plate is lubricated by oil from the upper shaft bushing. In addition to lubrication, the distributor requires periodic inspection of the cap and rotor, wiring, breaker points, and timing.

Adjustment of Dwell Angle on the Car

With the engine running at idle, the dwell is adjusted by first raising the window provided in the cap and inserting a "Hex" type wrench into the head of the adjusting screw as shown in Figure 2.

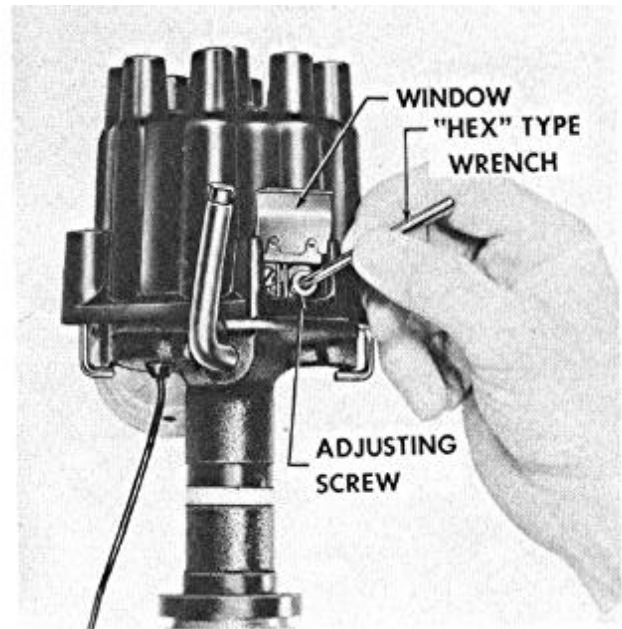


Figure 2—Adjusting Point Spacing (Dwell)

Preferred Method:

Turn the adjusting screw until the specified dwell is obtained as measured by a dwell meter. (See specifications.)

Alternate Method:

Turn the adjusting screw in (clockwise) until the engine begins to misfire, then give the wrench one-half turn in the opposite direction (counterclockwise) thus giving the approximate dwell angle required.

Removal of Distributor Cap

The cap is removed as shown in Figure 3. Place screw driver in slot head of the hatch, press down and turn 1/4 of a turn in either direction.

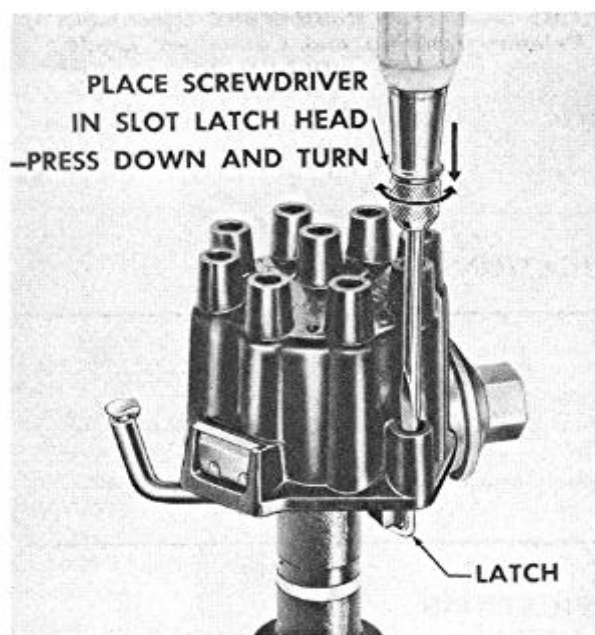


FIGURE 3—Distributor Cap Removal

Distributor Inspection and Checking

With the distributor removed from the vehicle, it is advisable to place the distributor in a distributor testing machine or synchroscope. When mounting distributor in tester, first secure the gear in the drive mechanism, then push distributor housing down toward the gear to take up end play between the gear and housing, and finally secure the housing in the tester. Test the distributor for variation of spark, correct centrifugal and vacuum advance, and condition of contacts. This test will give valuable information on the distributor condition and indicate parts replacement which may be necessary.

When checking the distributor condenser, it should be checked with a reliable make of condenser tester. The condenser should be checked for the following properties.

Insulation Resistance (or Leakage, Series Resistance, Break-down Test, and Capacity (mfd.).

Replacing Distributor Contact Set

The contact point set is replaced as one complete assembly (Fig. 4). The BREAKER LEVER SPRING TENSION and POINT ALIGNMENT on the service replacement contact set are factory adjusted. Only the POINT OPENING requires adjusting after replacement.



FIGURE 4—Removing Distributor Contact Set

Replacement of contact set is as follows:

Remove the two attaching screws (Fig. 4) which hold the base of contact set assembly in place.

Remove the condenser lead and primary lead from the nylon insulated connection by turning screw (Fig. 4) in contact set. Replacement is the reverse of removal.

CAUTION: At time of assembly, make sure the condenser lead and primary lead are located as in, Figure 5.

Leads must be properly located to eliminate lead interference between cap, weight base, and breaker advance plate.

Add a trace of Ball Bearing Lubricant to the breaker cam.

Adjusting Distributor Dwell Angle

Either of the following methods can be used to adjust the dwell angle to the proper setting off the vehicle:

Screw Adjustment Method—Distributor Mounted in Distributor testing Machine
Connect the dwell meter to the distributor primary lead.

Turn the adjusting screw to set the dwell angle to the proper setting of degrees (Fig. 2). (See Test Specifications.)
 Screw Adjustment Method Distributor Mounted in a Vise
 Connect a testing lamp to the primary lead.
 Rotate the shaft until one of the circuit breaker cam lobes is under the center of the rubbing block of the breaker lever.
 Turn the adjusting screw (clockwise) as shown in Figure 2 until the lamp lights, then give the wrench one-half turn in the opposite direction (counterclockwise) giving the proper dwell angle.

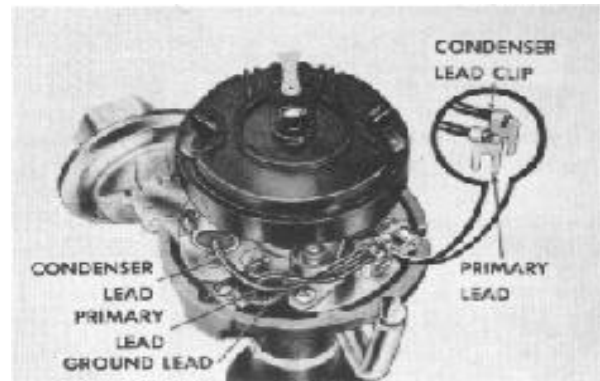


Figure 5—Correct Routing and Attachment of Primary Ignition and Condenser Leads

BATTERY SPECIFICATIONS

Make	Auto-lite
Model	11-HS-60
Rating	60 Ampere Hours
No. of Plates (Each Cell)	11

GENERATOR SPECIFICATIONS

	With Air Conditioning	Without Air Conditioning
Make	\Delco-Remy	\Delco-Remy
Model	1102070	1102018
Type	Shunt	Shunt
Rotation	CW. @ Drive End	CW. @ Drive End
Brush Spring Tension	28 Oz.	28 Oz.
Field Current	1.69-1.79 Amperes @ 12 Volts, 80°F.	1.48-1.62 Amperes @ 12 Volts, 80°F.
Cold Output	35 Amperes @ 14.0 Volts, 2510 R.P.M.	30 Amperes @ 14.0 Volts, 2210 R.P.M.

VOLTAGE AND CURRENT REGULATION

	With Air Conditioning	Without Air Conditioning
Make	Delco-Remy	Delco-Remy
Model	1119168	1119003
Cutout Relay Closing Voltage	11.8-13.5	11.8-13.5
Air Gap	.020"	.020"
Point Gap	.020"	.020"
Voltage Regulator Volts	13.8-14.8	13.8-14.8
Air Gap	.075"	.075"
Current Regulator Amperes	32-37	27-33
Air Gap	.075"	.075"

STARTING MOTOR SPECIFICATIONS

Make	Delco-Remy
Model	1107648
Brush Spring Tension	35 Oz. Min.
No Load Test Amperage Draw	75 Maximum
Volts	10.3
R.P.M.	6900

SOLENOID SWITCH

Model	1119760
Hold-in Winding	18-20 Amperes at 10 Volts
Both Windings	72-76 Amperes at 10 Volts

DISTRIBUTOR SPECIFICATIONS

Make	Delco-Remy	
Model	1110887	
Rotation	L.H. CCW.	
Point Opening	.016"	
Cam Angle	28°-32° (Set to 30°)	
Breaker Lever Tension	19-23 Ozs.	
Condenser Capacity	.18-.23 Mfd.	
Centrifugal Advance (Engine Degrees and R.P.M.)		
Start	0-4°	700 R.P.M.
Intermediate	15-19°	1550 R.P.M.
Intermediate	24-28°	2600 R.P.M.
Maximum	34-38°	3800 R.P.M.
Vacuum Control (Engine Degrees and Inches Mercury)	1116117 Delco-Remy	
Start	5"-7"	
Full Advance	14.25-15.75	
Maximum Engine Degrees	20°	

SPARK PLUG SPECIFICATIONS

Make	Auto-lite	Champion
Model	AL-7	H-10
Thread	14 M.M.	14 M.M.
Gap	.035"	.035"
Torque	30 Ft. Lbs.	30 Ft. Lbs.

BULB CHART

Trade Number and Candle Power	American Motors Part Number	Location
57 2 C.P.	127934	Glove Box and Hood Ornament Emblem
57 2 C.P.	127934	Instrument Illumination Clock Head Lamp Beam Indicator Directional Signal Indicator Generator Charge Indicator Oil Pressure Signal
1488 2 C.P.	3145931	Selector Lever Indicator Light
67 2 C.P.	142450	License
89 6 C.P.	142452	Dome and Courtesy Light
1034 32 & 4 C.P.	454645	Tail, Stop, and Direction Part and Direction
1073 32 C.P.	454646	Back-Up
5400 50 & 40W	456796	Head Light

FUEL—CARBURETION

CARTER MODEL WCFB-2593-S FOUR-BARREL CARBURETOR

The Carter Model WCFB carburetor is basically two (2) dual carburetors contained in one assembly. The section containing the metering rods, accelerating pump and choke is termed the primary side of the carburetor, the other section, the secondary side. It has five (5) conventional circuits. They are:

- 2—Float Circuits
- 1—Low Speed Circuit
- 2—High Speed Circuits
- 1—Pump Circuit
- 1—Climatic ® Control (Choke) Circuit

FLOAT CIRCUITS

The purpose of the float circuits is to maintain an adequate supply of fuel at the proper level in the bowls for use by the low speed, high speed, pump and choke circuits. Primary and secondary bowls are separated by a partition. The fuel line connection is on the primary side. Fuel is supplied to the primary and secondary intake needles and seats through a passage in the bowl cover. There are two fine mesh strainer screens in the bowl cover. They are located at the fuel inlet and at the secondary intake needle seat.

The bowls are vented to the inside of the air horn by vertical vent tubes and to atmosphere by drilled passages in the air horn. Bowl vents are calibrated to provide proper air pressure above the fuel at all times. The bowl cover gasket seals the fuel bowl, idle and vacuum passages. To assure a positive seal, always Use a new bowl cover gasket when reassembling. An air leak at this point can result in a performance or economy complaint.

A connecting passage along the outside of the body effects a balance of the fuel levels and air pressures be-

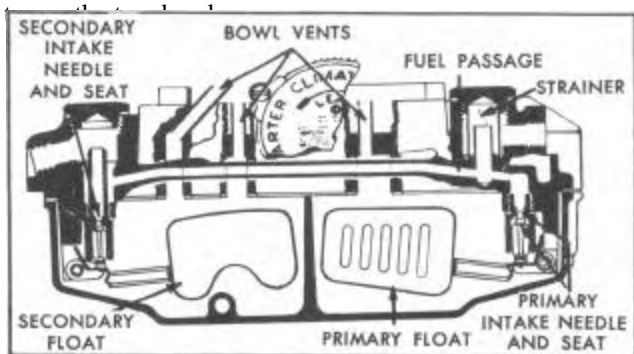


FIGURE 1—*Float Circuit*

LOW SPEED CIRCUITS

Fuel for idle and early part throttle operation is metered through the low speed circuit.

Fuel enters the idle wells through the metering rod jets on the primary side of the carburetor. No idle system is used in the secondary side of the carburetor.

The low speed jets measure the amount of fuel for idle and early part throttle operation. The air by-pass, economizers, and idle air bleeds are carefully calibrated and serve to break up the liquid fuel and mix it with air as it moves through the passages to the idle ports and idle adjustment screw ports. Turning the idle adjustment screws toward their seats reduces the quantity of fuel mixture supplied by the idle circuit.

The idle ports are slot shaped. As the throttle valves are opened more of the idle ports are uncovered allowing a greater quantity of the fuel and air mixture to enter the carburetor bores. The secondary throttle valves remain seated at idle.

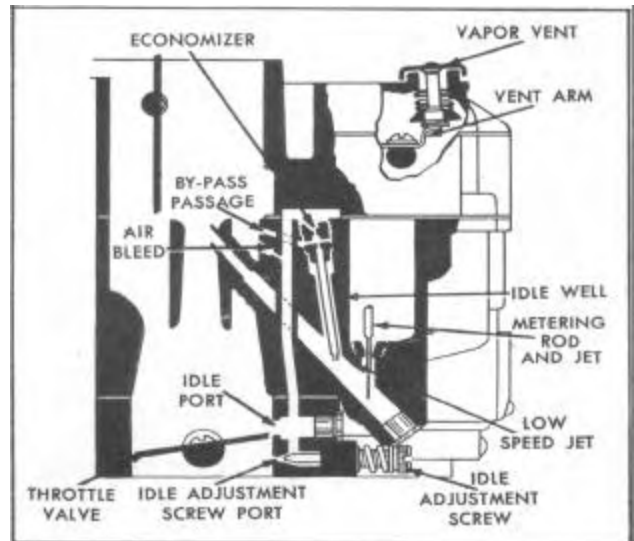


FIGURE 2—*Low Speed Circuit*

Throttle Bore Vapor Vent Passages

Under certain conditions of high, under-hood temperature, fuel vapor forms in the throttle bores when the engine is not operating. This vapor accumulation may retard hot engine starting until sufficient air is drawn into the carburetor to mix with the vapor to form a combustible mixture.

The throttle bore vapor vent passages vent the bores above the throttle valves to cavities in the underside of the carburetor flange. Air is admitted to these cavities through openings in the flange gasket. The air supplied by these vent passages, when mixed with the accumulated vapor, forms a more combustible mixture. This improves hot engine starting.

HIGH SPEED CIRCUITS

Fuel for part throttle and full throttle operation is

supplied through the high speed circuits. Main discharge nozzles are permanently installed and must not be removed in service.

Primary Side

The position of the metering rods in the metering rod jets control the amount of fuel flowing in the high speed circuit of the primary side of the carburetor. The position of the metering rods is dual controlled; mechanically by movement of the throttle, and by manifold vacuum applied to the vacuum piston on the vacuumeter link.

Mechanical Metering Rod Action

During part throttle operation, manifold vacuum pulls the vacuumeter piston, link and metering rod assembly down, holding the vacuumeter link against the metering rod countershaft arm. Movement of the metering rods will then be controlled by the metering rod countershaft arm which is connected to the throttle shaft. This is true at all times that the vacuum under the piston is strong enough to overcome the tension of the vacuumeter spring.

Vacuum Metering Rod Action

Under any operating conditions (acceleration, hill climbing, etc.), when the tension of the vacuumeter spring overcomes the pull of vacuum under the piston, the metering rods will move toward their wide-open throttle or power position.

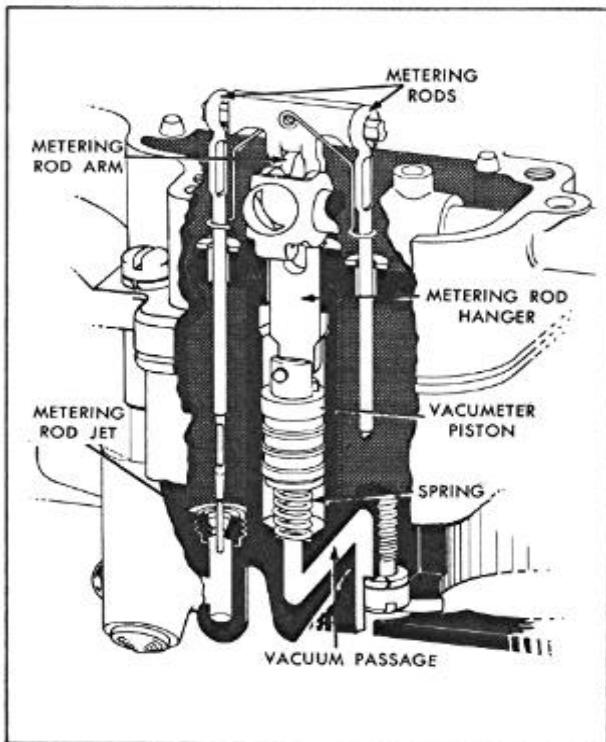


FIGURE 3—High Speed Circuit Metering Rods

Secondary Side

Fuel for the high speed circuit of the secondary side is metered at the main metering jets (no metering rods used).

Throttle valves in the secondary side of the carburetor remain closed until the primary throttle valves have been opened a predetermined amount. They arrive at wide open throttle position at the same time as the primary throttle. This is accomplished by linkage between the throttle levers.

The second set of counterweighted off-set throttle valves mounted above the secondary throttle valves are called "auxiliary throttle valves." Air velocity through the carburetor controls the position of the auxiliary throttle valves. When the accelerator is fully depressed, only the primary high-speed circuit will function until there is sufficient air velocity to overcome the weight of the counterweight on the auxiliary throttle lever and open the auxiliary throttle valves. When this occurs, fuel will also be supplied through the secondary highspeed circuit.

The secondary throttle valves are locked closed during choke operation, to insure faster cold engine starting and good "warm-up" performance.

Anti-Percolator

To prevent vapor bubbles in the nozzle passages and low speed wells from forcing fuel out of the nozzles, anti-percolator passages and calibrated plugs and bushings are used. Their purpose is to vent the vapors and relieve the pressure before it is sufficient to push the fuel out of the nozzles and into the intake manifold. Anti-percolator plugs and bushings are permanently installed and must not be removed in service.

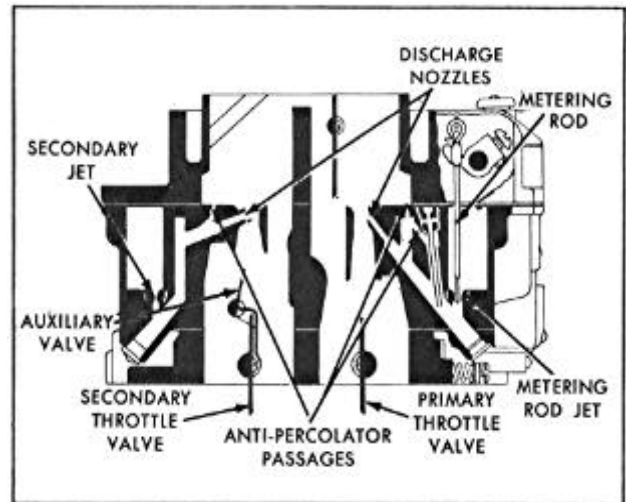


FIGURE 4—High Speed and Anti-Percolator Circuits

PUMP CIRCUIT

The pump circuit is located only in the primary side of the carburetor.

The accelerating pump circuit provides the measured amount of fuel necessary to insure smooth engine operation during acceleration at speeds below approximately 30 MPH.

When the throttle is closed, the pump plunger moves upward in its cylinder and fuel is drawn into the pump cylinder through the inlet passage. The discharge needle is seated at this time to prevent air being drawn into the cylinder. When the throttle is opened, the pump plunger moves downward forcing fuel out through the discharge passage, past the discharge needle, and out of the pump jets. When the plunger moves downward, the inlet valve is closed preventing fuel from being forced back into the bowl.

If the throttle is opened suddenly, the pump spring will be compressed by the plunger shaft telescoping, resulting in a smoother pump discharge of longer duration.

At speeds above approximately 30 MPH, pump discharge is no longer necessary to insure smooth acceleration. When the throttle valves are opened a predetermined amount, the pump plunger bottoms in the pump cylinder eliminating pump discharge.

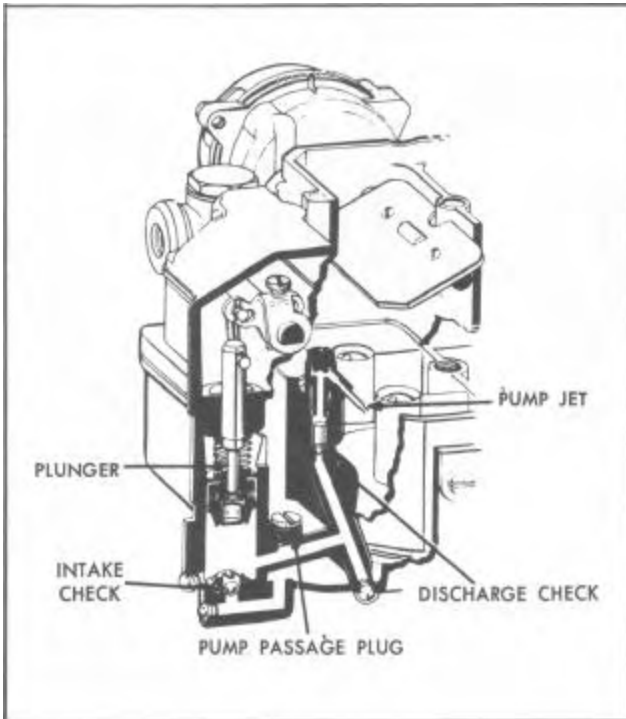


FIGURE 5—Accelerating Pump Circuit

CHOKE CIRCUIT

The Climatic ® control circuit provides a correct mixture necessary for quick cold engine starting and warm-up.

When the engine is cold, tension of the thermostatic coil holds the choke valve closed. When the engine is started, air velocity against the off-set choke valve causes the valve to open slightly against the thermostatic coil tension. Intake manifold vacuum applied to the choke piston also

tends to pull the choke valve open. The choke valve assumes a position where tension of the thermostatic coil is balanced by the pull of vacuum on the piston and air velocity on the off-set choke valve.

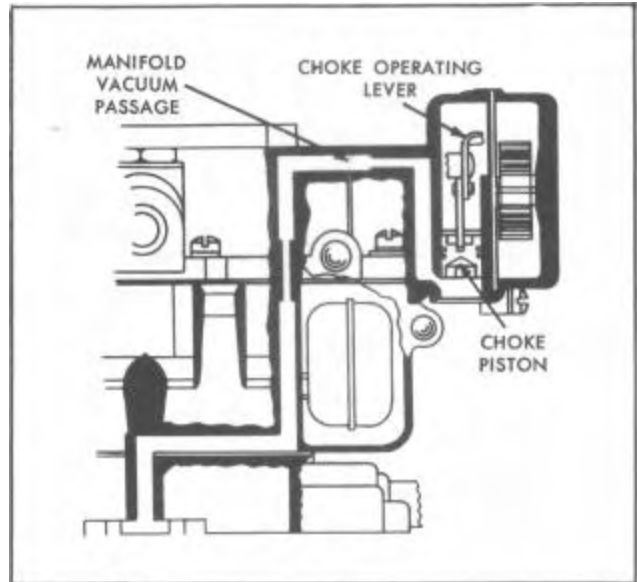


FIGURE 6—Choke Circuit

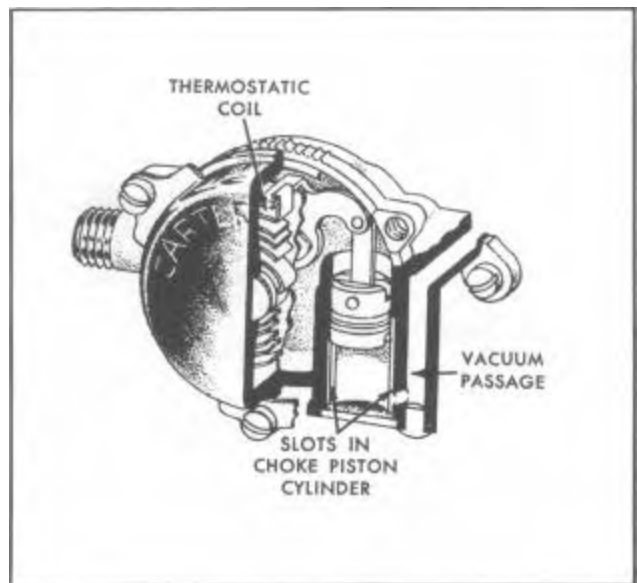


FIGURE 7—Choke Housing Assembly

When the engine starts, slots located in the sides of the choke piston cylinder are uncovered allowing intake manifold vacuum to draw air heated by the exhaust manifold, through the Climatic ® control housing. The flow of warm air heats the thermostatic coil and causes it to lose some of its tension. The thermostatic coil loses its tension gradually until the choke valve reaches wide open position.

When the engine is accelerated during the warm-up period, the corresponding drop in manifold vacuum allows the thermostatic coil to momentarily close the

choke, providing a richer mixture.

During the warm-up period, it is necessary to provide a fast idle speed to prevent engine stalling. This is accomplished by a fast idle cam which is rotated by a connector rod attached to the choke shaft. The fast idle cam prevents the primary throttle valves from returning to a normal warm engine idle position while the Climatic ® control is in operation.

During the starting period if the engine becomes flooded, the choke valve can be partially opened manually. This can be accomplished by depressing the accelerator pedal to the floor and engaging the starter. The projection on the throttle lever (unloader) will rotate the fast idle cam and in turn partially open the choke valve.

OVERHAUL AND ADJUSTING

Flooding, stumbling on acceleration, and other performance complaints in many cases are attributable to dirt, water, or other contaminants in the carburetor. Therefore, when removing a carburetor for inspection, do not drain the fuel bowl. The contents of the carburetor may be examined for evidence of contamination.

Whenever the carburetor is removed, use care when handling to prevent damage to the throttle valves. The lower edge of the throttle valves extend beyond the base of the carburetor when in the open position.

Figure 8 illustrates the locations and relative lengths of the air horn attaching screws.

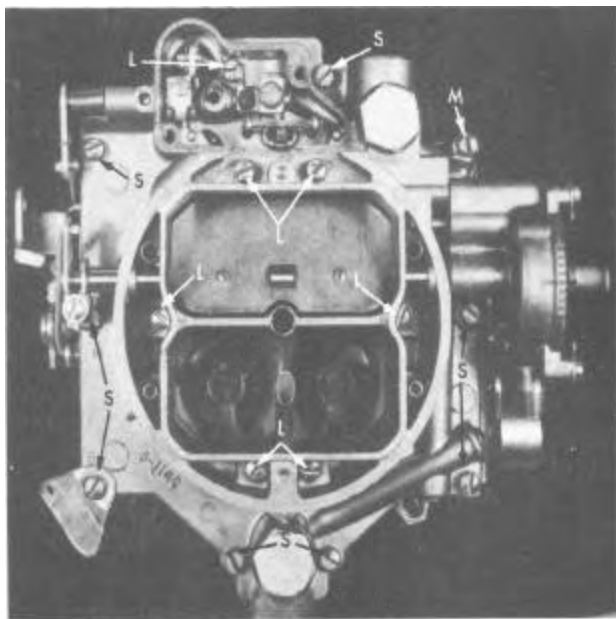


FIGURE 8—Location and Lengths of Air Horn Attaching Screws

Carefully remove the air horn assembly with the gasket and attaching parts. If the gasket sticks to the body casting, the floats may become bent.

The float needles and seats must not be interchanged, therefore, group the needles and seats with their respective float assemblies.

The accelerator pump discharge check needle is located in the passage below the pump jet cluster and may be removed by inverting the carburetor.

The primary metering rod jets have larger openings than the secondary jets. Therefore, do not mix the jets.

When cleaning the carburetor, follow the instructions for the cleaning solution being used.

Do not use drills or wire to clean jets or ports, this may result in inadvertent enlarging the openings or ports, affecting carburetor performance.

ASSEMBLY PROCEDURE

Assembling Throttle Flange

Install primary and secondary throttle shafts.

Assemble throttle valves on shafts with trade mark (C) toward idle ports on primary valves and away from center of carburetor on secondary valves when viewed from the bottom. (Use Oval head screws on secondary valves.)

Install idle mixture adjusting screws and springs finger tight, then loosen one turn.

NOTE: Do not tighten mixture screws tighter than finger tight.

Assemble secondary throttle return spring and throttle lever on secondary throttle shaft. Install and tighten retaining washer and screw.

Wind the return spring 1 1/2 turns and hook over secondary throttle lever.

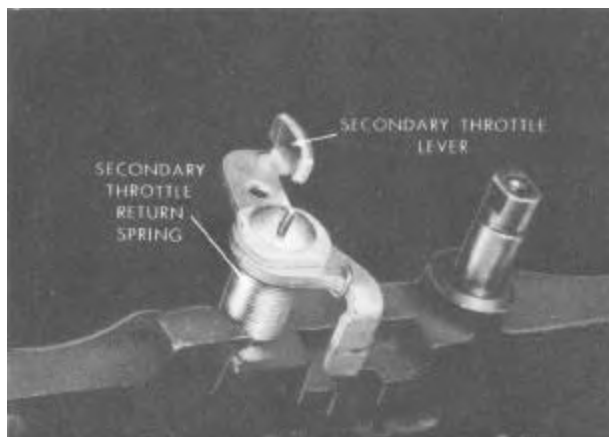


FIGURE 9—Assembling Secondary Throttle Lever and Spring

Install primary shaft wave washer, inner throttle shaft arm, and throttle shaft dog. Hook flex spring on outer throttle lever and throttle shaft dog and install outer lever on primary shaft. Install washer and screw.

Install primary to secondary connector rod using a flat washer on each side of the levers and retain with pin springs.

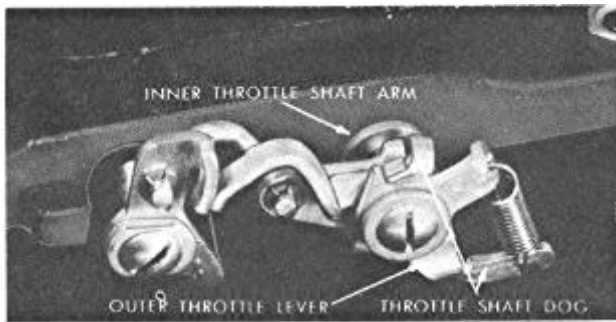


FIGURE 10—Primary Throttle Shaft Arm and Lever Assembly

Assemble fast idle cam and spring assembly and lower choke lever placing the assembly on the attaching screw.

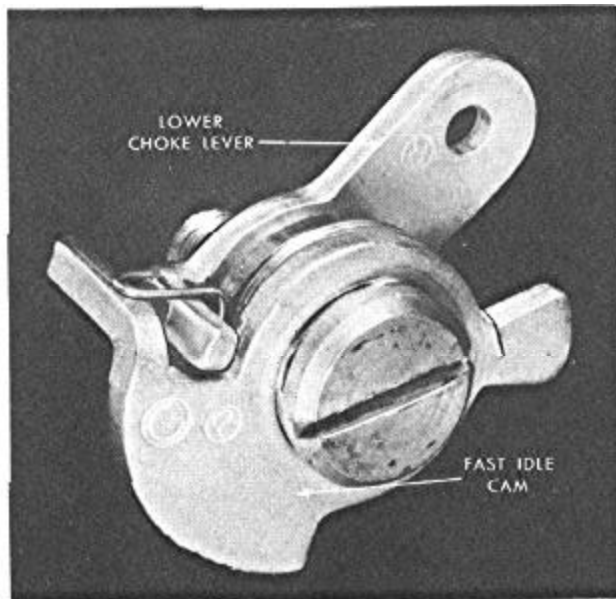


FIGURE 11—Fast Idle Cam and Spring Assembly

Place the secondary lockout lever against boss and install the fast idle cam assembly in position on the boss. The levers must operate freely.

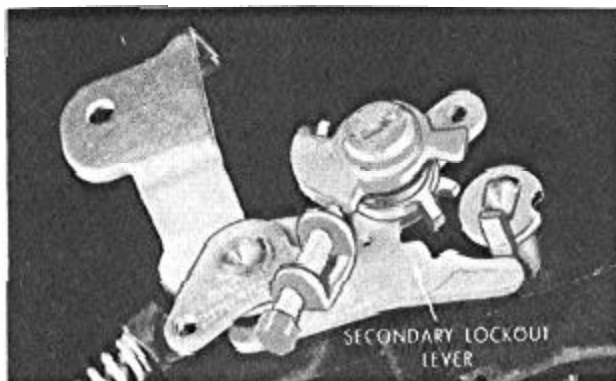


FIGURE 12—Secondary Lockout and Fast Idle Cam Assembled

Install auxiliary throttle shaft and auxiliary throttle valves.

Using a new gasket, assemble the throttle flange on the carburetor body. Assemble while holding auxiliary throttle valves closed.

CAUTION: Tighten the screws indicated in Figure 13 securely to prevent leakage between the body and throttle flange.

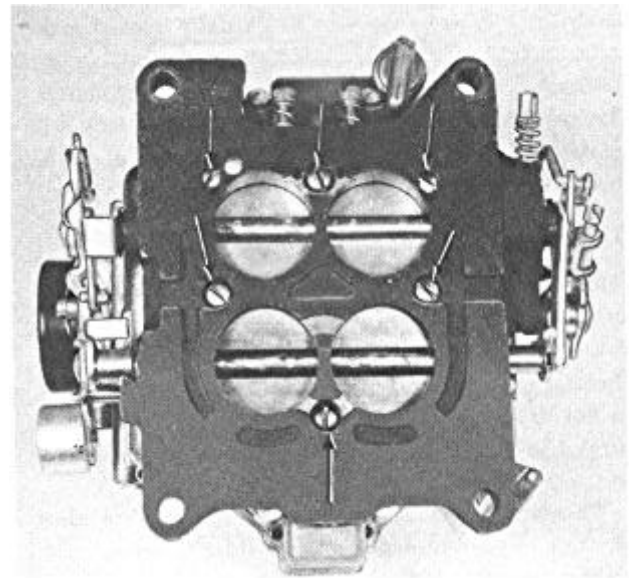


FIGURE 13—Location of Body to Flange Screws-

Assembling Carburetor Body

Install the primary metering rod jets, (jets with the large holes) in the accelerator pump side of the carburetor. Then install the secondary main jets.

Install the two low speed jets in the primary side of the body.

The steel pump inlet ball check and retainer is installed in the bottom of the accelerator pump cylinder. A 5A6" six point socket assists pressing into place.

Install pump passage screw plug and gasket.

The brass pump discharge check needle is installed point down in the passage below the pump discharge jet cluster.

Install the accelerator pump discharge cluster gasket and cluster assembly.

Inspect vacuometer spring. The vacuometer spring affects both economy and performance. If it appears damaged or distorted, replace. If there is any doubt, compare it with a new one. Place the spring in vacuometer bore.

Install lower pump spring in pump cylinder.

Assembling Air Horn

Using a new gasket, install the primary needle and seat; then install secondary needle and seat assembly.

NOTE: Intake needles and seats are carefully matched during manufacture. Do not use the primary needle in the secondary seat or vice versa. To avoid unnecessary bending, both floats should be reinstalled in their original positions and then adjusted.

Setting the floats to specifications assures an adequate supply of fuel in the bowls for all operating conditions. Float adjustments must be made with the bowl cover gaskets removed and should be checked vertically (specified distance between bowl cover and bottom of floats) and laterally (sides of floats should just clear the arms of gauge). Correct lateral adjustment is important. If the floats are misaligned, they may bind or drag against the inner walls of the bowl.

LATERAL ADJUSTMENT—Place primary float gauge T-109-232 and secondary float gauge T-109-222 under center of float with notched end of gauge fitted over edges of casting. Sides of floats must just clear vertical uprights of gauge. Adjust by bending arms.

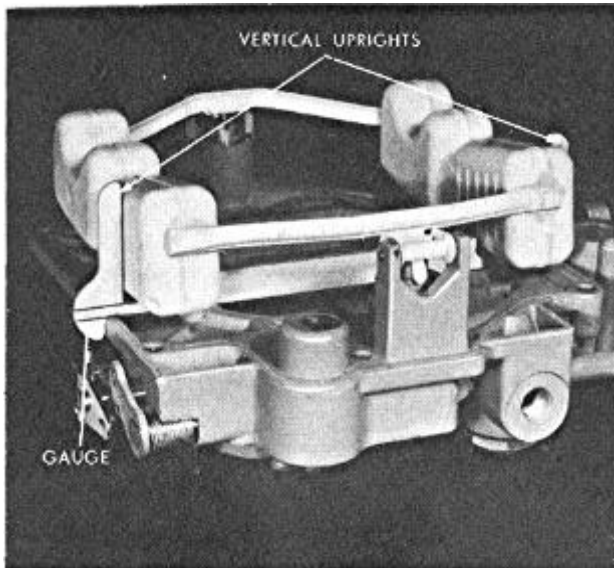


FIGURE 14—Float Gauge in Position

VERTICAL ADJUSTMENT—Check with gauge in position. Floats must just clear the horizontal part of the gauge. There must be $1/8$ " between top of floats and air horn for primary and $3/16$ " for secondary floats. Adjust by bending at center section of float arms.

FLOAT DROP ADJUSTMENT—Hold air horn assembly in normal upright position and measure between the top center of floats to air horn. It must be $7/8$ " for primary and $11/16$ " for secondary floats. Adjust by bending tabs on float brackets.

Remove float assemblies and install new air horn gasket.

Assemble vacuumer link and vacuumer piston with lip on link toward air horn.

Insert accelerator pump plunger shaft in air horn and

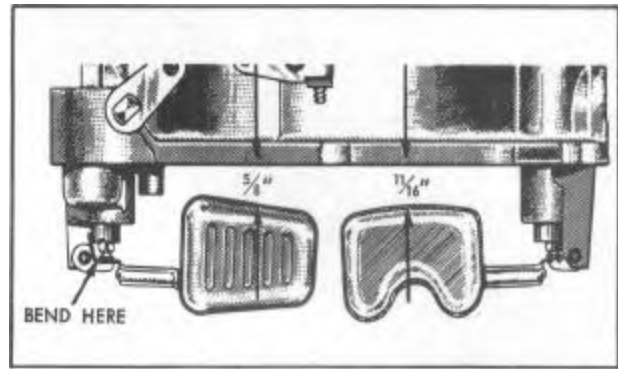


FIGURE 15—Checking Float Drop

retain with link and pump arm assembly.

Reassemble floats.

Install air horn assembly on carburetor body. Be sure vacuumer piston and pump plunger are properly aligned. Do not bend float arms while assembling. Refer to Figure 8 for correct location of different length screws.

Insert metering rods, catching spring loop with lower end before inserting. Start rods in jets; then twist eye of rod to engage vacuumer link assembly.

Install countershaft return spring on countershaft.

The pump countershaft is inserted into the pump operating arm and metering rod arm. Be sure metering rod arm is in slot of vacuumer link.

Install idle vapor vent lever and screw; then tighten pump arm screw.

Place washer on lower end of throttle connector rod. Install rod into throttle lever while holding lever in closed position and retain with spring and retainer.

Wind countershaft return spring one-half turn.

Install throttle connector rod in pump countershaft lever and retain with pin spring.

Install choke housing onto air horn using a new gasket.

Assemble choke piston on link and install shaft and piston, assembly through air horn while guiding piston in cylinder.

Place choke valve in position on choke shaft in air horn so that (C) is visible from the top. Center the valve and tighten screws. Be sure valve or shaft does not bind and valve opens freely of its own weight.

Position baffle plate on choke housing.

Install choke coil housing gasket on piston housing with index mark on plastic housing at the bottom and retain with three screws and retainers. Leave coil housing in this position while making other adjustments.

Install choke operating levers on shaft. Tighten screw only enough to permit lever to be moved.

The choke connector rod is installed in operating lever and choke lower lever. Retain lower end with pin spring.

Install strainer plug, gasket, and strainer in primary side and strainer plug and gasket on secondary side.

ADJUSTMENTS

Float Adjustment

Float adjustment is performed during assembly. "Refer to Assembling Air Horn."

Pump Adjustment

Back out idle speed screw, hold choke in wide open position, then close throttle valves tight in bores of carburetor.

Flat on top of pump arm must be parallel with dust cover gasket surface.

Bend throttle connector rod at lower angle to obtain adjustment.

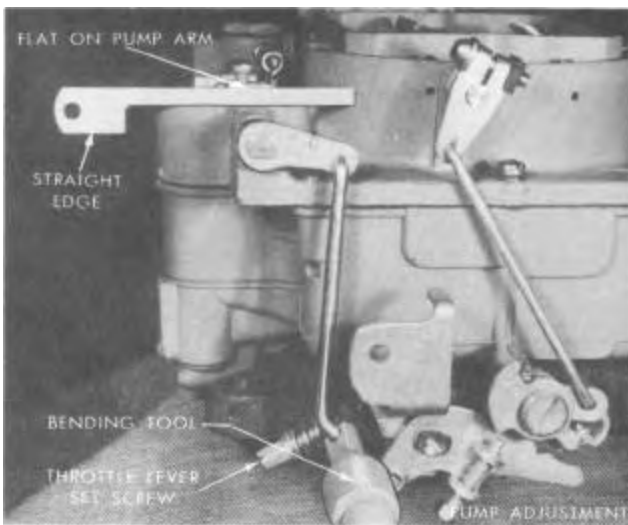


FIGURE 16—Accelerator Pump Adjustment

Metering Rod Adjustment

With throttle valves seated, press down on vacuumer link until metering rods are bottomed.

Holding rods down with throttle valves seated, rotate metering rod arm until it contacts lip on vacuumer link. Tighten metering rod arm clamp screw.

Vapor Vent Adjustment

Lubricate countershaft with oil and install dust cover and gasket.

With choke valve held in wide open position and throttle valves seated, there should be $1/32$ " between lower edge of bowl vapor vent valve and dust cover. To adjust, remove dust cover and bend vapor vent arm.

Rotate choke coil housing in direction opposite arrow until index mark on coil housing is aligned with center index on piston housing. Tighten retaining screws.

With choke lever clamp screw loose, hold choke valve closed.

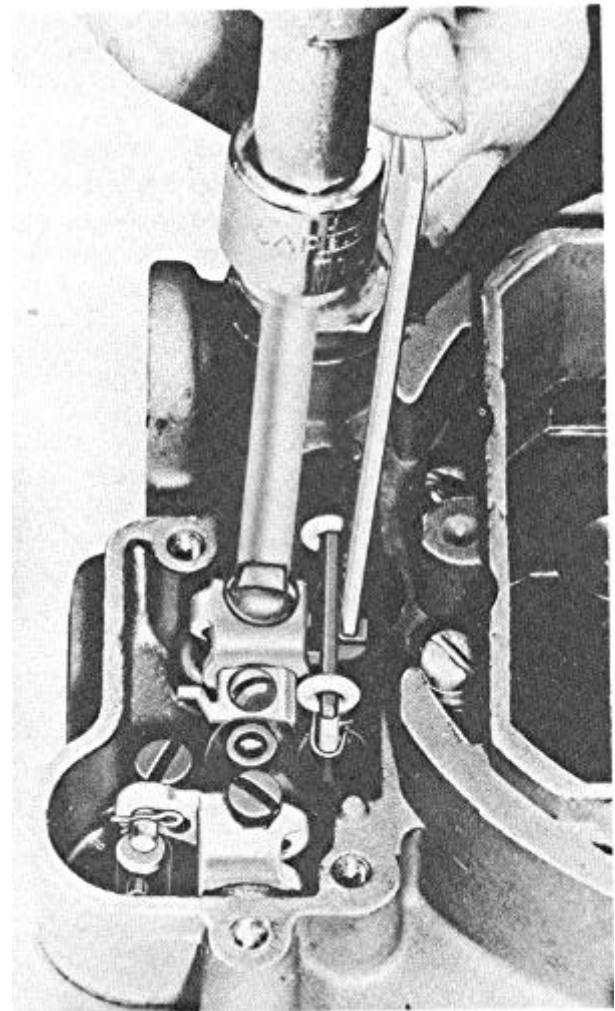


Figure 17—Metering Rod Adjustment

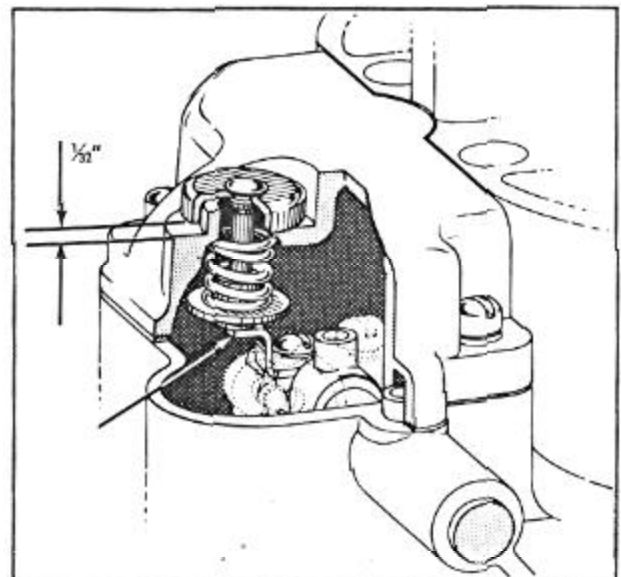


Figure 18—Vapor Vent Adjustment

Place wire gauge T-109.189 .023" on boss. Rotate choke lever on shaft until tang on fast idle cam contacts wire gauge

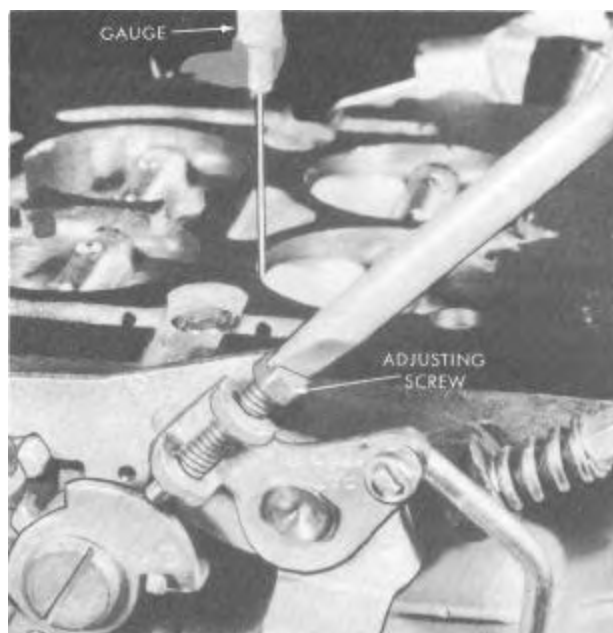


FIGURE 19—*Fast Idle Cam Clearance Adjustment*

Hold choke valve tightly closed.

Adjust fast idle screw on primary throttle shaft arm to obtain .023" (T-109-189) opening between the edge of the throttle valve and the bore of the carburetor (side opposite idle port). The fast idle speed lug must be on high step of cam while making this adjustment.

Unloader Adjustment

With throttle wide open, there should be $\frac{1}{2}$ " (T-109126) clearance between upper edge of choke valve and side of air horn. Adjust by bending unloader projection on throttle lever.

Secondary Throttle Lever Adjustment

Block choke valve open to unlock secondary throttle valves.

Place $\frac{11}{4}$ " gauge (T-109-166) between upper edge of primary throttle valve and bore (next to idle port) and adjust secondary operating rod (use bending tool T-109-213) until secondary throttle valves just start to open.

There should be .008" to .013" clearance (Gauge T-109-200) between the primary and secondary throttle positive closing shoes with throttle valves closed. Adjust by bending primary shoe (Figs. 22 and 23).

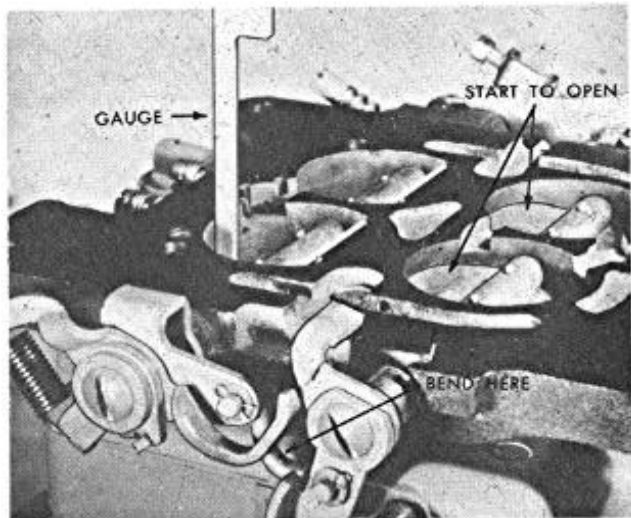


FIGURE 22—Secondary Throttle Lever
(First) Adjustment

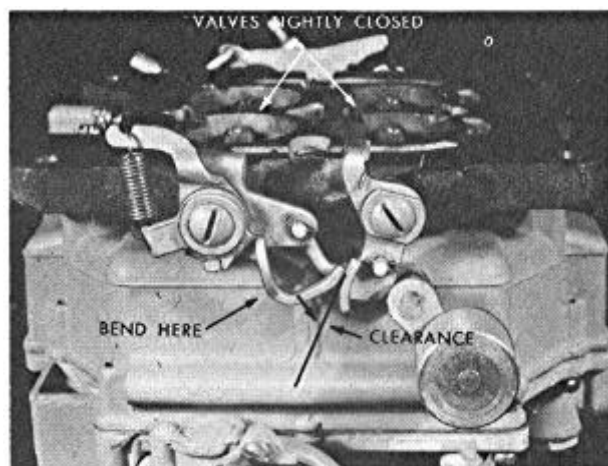


FIGURE 23—Secondary Throttle Lever
(Second) Adjustment

Lockout Adjustment

With choke wide open, hold throttle closed. Close choke slowly ; the lockout step on secondary lock-out-lever should freely engage tang on secondary throttle lever. Adjust by bending tang

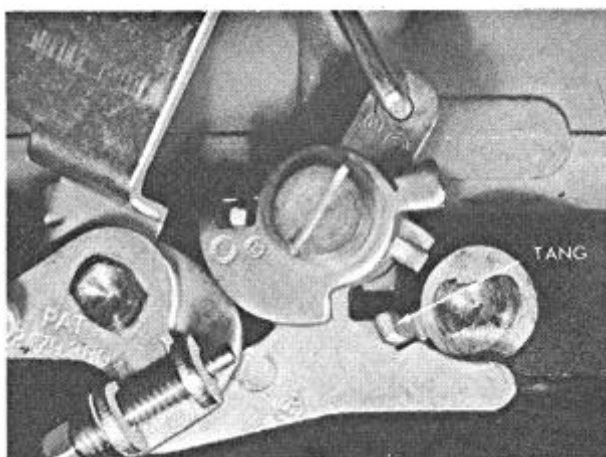


Figure 24—Secondary Throttle Lockout
Adjustment

CARBURETOR SPECIFICATIONS

DIMENSIONS:

Flange Four Bore-4 bolt type.
Throttle bore 17A 6".
Primary venturi size, 1½" I.D.
Main venturi size, 1-3/16" I.D.

VENTS:

Outside, 4. Inside, 5.

GASOLINE INTAKE

Size No. 42 (.0935") drill hole in needle seat.

:LOW SPEED JET TUBE:

(Primary side only). Jet, size No. 68 (.031") drill.
By-Pass, in body, size No. 54 (.055") drill.
Economizer, in screw plug, size .0492" diameter.
Idle Bleed, in body, size .065" diameter.

IDLE PORT:	(Upper) slot type. Primary, length .185"; width .030". Secondary, none.
IDLE PORT OPENING:	Primary, .130" to .136" above top edge of valve with valve tightly closed. Secondary, none.
LOWER PORT:	Primary (for idle adjustment screw), size No. 53 (.0595") drill. Secondary, none.
SET IDLE ADJUSTMENT SCREW:	3/4 to 13/4 turns open. For richer mixture, turn screw out. Do not idle engine below 425 RPM Automatic Trans. in Neutral (With Air Conditioning "ON" 475 RPM) ; 550 RPM for Standard and Overdrive Trans.
MAIN NOZZLE:	Installed permanently. NO NOT REMOVE. Antipercolating jet, primary size No. 70 (.028") drill, Secondary size No. 72 (.025") drill.
METERING ROD:	Primary economy step .074" diameter. Middle step tapers to .050" diameter. Power step, .044" diameter. Secondary, none.
METERING ROD JET:	Primary size .098"; secondary size .070" diameter.
ACCELERATING PUMP:	Discharge jet (Twin) primary side only, size No. 72 (.025") drill. Intake ball check seat, size .115" to .120" diameter. Discharge needle seat, size .070" diameter.
CHOKE:	Carter Climatic ® Control set on index. Choke heat suction hole in piston housing, No. 43 drill.
VACUUM SPARK PORT:	Horizontal slot .130" x .040". Top of port .040" to .046" above top edge of tightly closed throttle valve.

CLUTCH

A 10-1/2" clutch plate assembly is used with standard or overdrive transmissions. Refer to the 1955 Technical Service Manual for service procedures.

CLUTCH SPRING SPECIFICATIONS

Standard		Compressed	Identification	Location
Number of Springs (12)	Pressure	Length		
	148 ± 5 Lbs.	1-23/32"	No Paint	Adjacent to Clutch Release Levers
6				
6	167 ± 5 Lbs.	1-23/32"	Light Green	Two Springs Centrally Located Between Clutch Release Levers
Heavy		Compressed	Identification	Location
Number of Springs (12)	Pressure	Length		
3	182 ± 5 Lbs.	1-23/32"	Dark Blue	In a Clockwise Direction the Springs Should Be in the #3 Position from Each Clutch Release Lever
9	167 ± 5 Lbs.	1-23/32"	Light Green	Three Springs Located Between Clutch Release Levers

CLUTCH LEVER ADJUSTMENT

Clutch levers are adjusted to 1/8" below the hub of gauge plate J-1507 or J-5490.

CLUTCH PEDAL LINKAGE ADJUSTMENT

Adjustment for free pedal play is made by varying the length of the beam to the throwout lever rod. Lengthening this rod reduces the free pedal play. Shortening the rod increases the pedal play. In order to provide sufficient free movement of the clutch throwout bearing when the clutch is engaged and the clutch pedal fully released, free pedal play should be 1/2" to 3/4" at all times.

The clutch pedal to beam rod adjustment (adjusted in production) is made to provide proper leverage. The outer end of the lever projects 5A6" from the beam, toward the rear, with the clutch pedal against the floor board. The pedal to beam rod should never be disturbed in service.

LUBRICATION

To lubricate the linkage, disconnect the throwout lever spring and apply lubricate to the ends of the pedal rod and lever rod. The clutch beam lever pivot pin is pressure lubricated; the lubricating fitting is located at the bottom of the pin. Lubricate at 1,000 mile intervals.

TRANSMISSION—OVERDRIVE

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Electrical Circuits	24	Inspecting Transmission Parts	32
Diagnosing Overdrive Troubles	25	Reassembly	33
Transmission Removal	26	Lubrication	36
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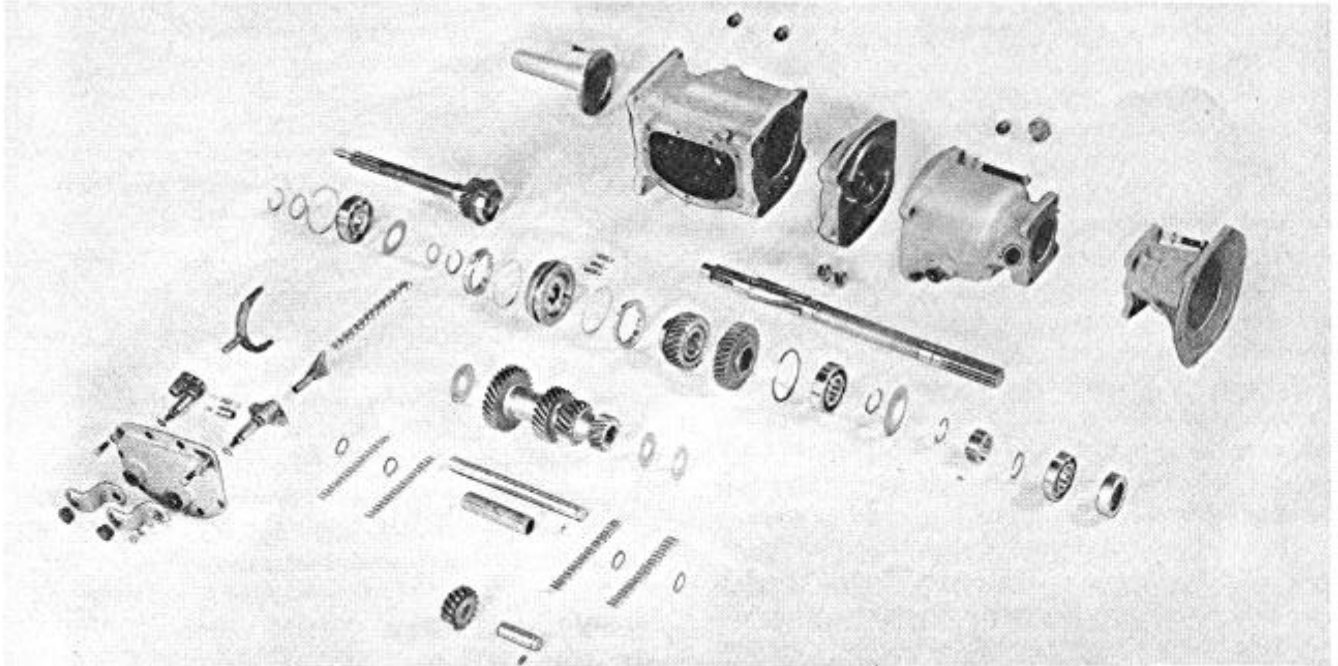


Figure 1—Standard Transmission

The standard transmission is supplied with or without the overdrive unit as optional equipment). The standard transmission without overdrive utilizes a overdrive adapter housing, case, and torque tube

and oil seal adapter for attachment to the torque tube. The transmission main shaft on the standard transmission is longer to compensate for the overdrive main shaft and overdrive operating parts which are not installed.

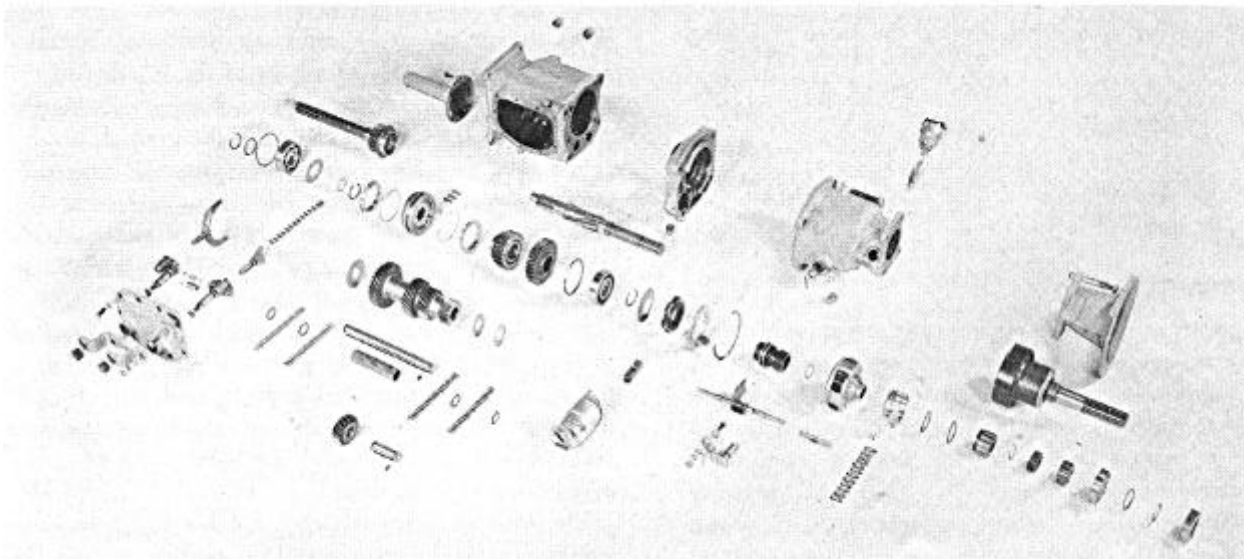


Figure 1—Overdrive Transmission

Due to the similarity between the two units, service procedures will only be outlined on overdrive equipped units.

OPERATION OF OVERDRIVE

The overdrive unit, when in operation above the governor cut-in speed, automatically reduces the engine to rear axle ratio approximately 30%.

When overdrive operation is desired, the control button is pushed to the forward position. The car speed is then increased to a point higher than the cut-in speed, which is determined by the point setting of the overdrive governor.

As the governor points close, at approximately 26 miles per hour, the solenoid is energized. This allows the locking pawl to engage the sun gear hub and balk ring assembly when the accelerator is momentarily released. When the accelerator is again depressed the overdrive is in operation. As this takes place, free wheeling becomes inoperative, since free wheeling is possible only below the cut-in speed determined by the overdrive governor.

To lock out the overdrive the control button must be pulled all the way out. This can be done either when the car is in motion or when it is parked. Locking out the overdrive while the car is in motion can be done while the car is in the free wheeling stage.

The accelerator is depressed slightly so that the engine is driving the car. The control button can then be pulled out without depressing the clutch. While still applying pressure to the control button, the accelerator should be momentarily released to complete the shift.

An alternate method permits pulling the control button back into conventional position during the time the accelerator pedal is fully depressed in the overtake position.

THE ELECTRICAL CIRCUITS

The electrical system consists of the three following circuits:

- Governor Circuit—Light Line
- Solenoid Circuit—Heavy Line
- Kickdown Circuit—Dotted Line

The governor, solenoid, and kickdown circuits are basically outlined in Figure 3.

Governor Circuit

The governor circuit starts from the armature terminal of the voltage regulator. It continues to terminal No. "2" (Ignition) on the overdrive relay. The current passes through the relay coil which magnetically controls the contact points of the solenoid circuit. It continues through terminal "C" (KD) of the relay through the normally closed contacts of the kickdown switch on to the governor terminal and its open contact points.

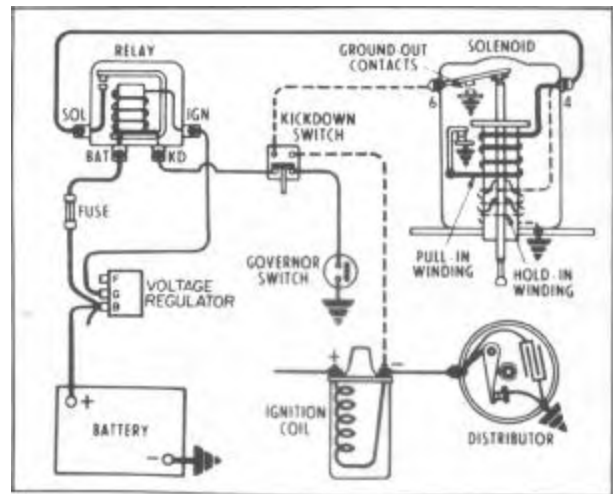


FIGURE 3—Schematic Drawing Overdrive Electrical Circuits

Solenoid Circuit

The solenoid circuit starts at the positive terminal of the battery and continues to the "B" terminal of the voltage regulator. At this point, it continues to the "Battery" terminal on the overdrive relay, through a 30 ampere fuse, and to the relay contacts. The circuit is resumed at the "Solenoid" terminal of the overdrive relay and continues to the No. "4" terminal of the solenoid and closed contacts to ground.

Kickdown Circuit

The kickdown circuit starts from the (—) or distributor side of the ignition coil. It continues to the applied side of the kickdown switch and resumes at the opposite terminal on to the No. "6" terminal of the solenoid.

The Circuits in Action

When the car attains a speed of approximately 26 miles per hour, the centrifugal action of the weights in the governor closes the contact points, thus completing the circuit from the ignition switch to the ground.

The relay coil, being energized, closes the relay contacts of the solenoid circuit now being completed and immediately energizes the actuating and holding coils of the solenoid moving the pawl into the balk ring and lock plate.

As soon as the solenoid plunger has been permitted to enter the lock plate, the pull-in winding contacts in the solenoid actuating circuit are opened, permitting a decreased flow of current through the holding coil to retain the plunger in position during the time when the overdrive is in operation.

The inward movement of the solenoid plunger, in addition to operating the pull-in winding contacts in the solenoid actuating circuit, also closes the ground-out contacts

in the kickdown circuit through the release of the spring lever on the outer end of the solenoid. The circuits are now in normal condition for continuing the overdrive operation.

In order to understand the overdrive control system, the first thing to remember is that any time there is an open switch in a circuit, that entire circuit is open and inactive.

When all three switches in the governor circuit are closed, the relay coil is energized, closing the relay points. This completes the solenoid circuit and energizes the solenoid, which through the locking pawl, locks the sun gear and places the overdrive in cruising gear. Also, any time any one of the three governor circuit switches is open, the relay coil is de-energized, the points open, and the solenoid circuit is broken.

At Speeds Below 26 Miles Per Hour

With the cruising gear control forward at speeds below 26 miles per hour, every switch in the governor circuit is closed except the governor switch. But this one open switch is enough to keep the entire governor circuit and the solenoid circuit open, and the solenoid remains de-energized.

At Speeds Above 26 Miles Per Hour

As the speed of car passes 26 miles per hour, the governor points automatically close. This completes the governor circuit, energizes the relay, and closes the relay points, thus energizing the solenoid.

Then, with the momentary release of the accelerator pedal, engine torque is released just long enough for the solenoid pawl to move off the step of the balk ring and engage the notch of the lock plate locking the sun gear.

This places the car in cruising gear.

Kickdown Operation

With the car in cruising gear at speeds above 26 miles per hour, depressing the foot accelerator all the way to the floor places the overdrive in overtake position.

The accelerator pedal now in the wide open position breaks the governor circuit and completes the kickdown circuit. The break in the governor circuit de-energizes the solenoid. The closing of the kickdown circuit momentarily "shorts out" the distributor (for approximately two crankshaft revolutions) releasing engine torque just long enough for the solenoid pawl to disengage. The instant the solenoid disengages, the solenoid ground-out points automatically open, restoring the distributor circuit. The car then remains in direct gear as long as the engine is kept under a pulling load.

DIAGNOSING OVERDRIVE TROUBLES

Since overdrive troubles may originate not only in the mechanical operation of the unit but also in the electrical circuit which controls that unit, the service man

should always check the control system before disassembling the overdrive.

If the trouble is not found after a thorough inspection of the control system, then the transmission and overdrive should be removed for examination.

Unsatisfactory Overdrive Operation. Look for:

Burnt relay fuse in solenoid circuit.

Loose terminals on any of the connecting wires. Incorrect terminal locations of connecting wires. Circuits grounded by water, dirt, or deformation. Defective solenoid points.

Dirty or sticking relay contacts.

Insufficient travel or unsatisfactory contacts in the kickdown switch. (Adjust or replace.)

Excessive end play in the governor shaft. Improper adjustment of governor control springs. Burnt contact points in governor.

Damage to cap and contacts.

Absence of rubber cover to exclude water and dirt.

Insufficient travel of shift rod. (Adjust control cable to operating lever.)

CHECKING INOPERATIVE OVERDRIVE

Mechanical Checks

Determine if the overdrive control button is pushed forward to the limit of travel.

Check to insure that the overdrive cable is adjusted to move the overdrive lever firmly against the stop on the overdrive housing in the engaged position.

Electrical Checks

With the ignition switch on, and the overdrive button pushed forward, use a test wire or a 12-volt test light as follows:

Check the 30 ampere fuse in the overdrive relay for live circuits and clean contacts.

Connect test lead directly from the "B" terminal on the voltage regulator to the terminal "SOL" on the overdrive relay mounted on the front of the cowl. This will supply current to the solenoid which should operate. If it does not, check for a possible defective connecting wire or connection at the solenoid terminal before condemning the solenoid.

Ground the relay terminal "KD" or "C". If the relay is functioning properly, the points of the relay will close and the solenoid will operate.

Ground the overdrive relay terminal on the kickdown switch. If all circuits are correct to this point, the solenoid should operate.

With the kickdown switch governor terminal grounded, push the plunger in. This breaks the circuit and the solenoid should release.

If the solenoid operates in the above tests, all circuits up to this point are correct and further investigation must be conducted underneath the car.

Ground the terminal on the governor. The solenoid should operate.

Governor Operation Inspection: Suspend the axle and operate the engine at low speed in high gear. Apply a test lamp across the governor contact from the live terminal to the ground strap. The test lamp should light. Now increase engine speed. The governor cut-in speed will be indicated when the light goes out.

Summary

By following the above procedure in the proper sequence, the defective portion of the electrical circuit can be readily located. If all the preceding items are functioning correctly, the trouble may lie in the solenoid itself, such as burned points, or the connecting wires may be grounded to the case.

The kickdown switch should be carefully inspected to see that none of its four terminals are touching each other. If the governor circuit is grounded at the kickdown switch, the grounded circuit will supply current to the relay, operating the solenoid without the possibility of disengagement. This is usually the case when the car will not free wheel or shift into reverse.

If the kickdown circuit is internally shunting to the governor circuit, the engine will not run upon reaching governor cut-in speed, as the ignition will obtain a shunt ground through the governor contact points.

A rubber boot has been provided to exclude water and dirt from the governor. Moisture or an accumulation of foreign matter may ground the line terminal on the governor and cause the solenoid to operate as soon as the ignition is turned on.

If the mechanical and operating checks do not reveal the difficulty, internal trouble should be suspected and the transmission and overdrive removed for examination.

TRANSMISSION REMOVAL

To remove the transmission, disconnect the hydraulic brake tube bracket that is fastened to the underside of the body; then disconnect the torque tube at the rear of the transmission.

Disconnect the hand brake cable at the bellcrank and the brake cable housing at the bellcrank bracket. Move the rear axle to the rear to separate the universal joint from the overdrive main shaft.

Disconnect the speedometer cable, shifter rods, overdrive control cable, and electrical control wires from the solenoid and governor.

When removing the transmission from the car, care must be taken not to damage the transmission clutch shaft. Always use two guide pins (Tool J-1434) in place of the two upper attaching cap screws so the transmission clutch shaft will slide out far enough to clear the clutch pilot bearing and clutch disc.

TRANSMISSION AND OVERDRIVE DISASSEMBLY

Secure the transmission assembly into a stand and completely drain its lubricant.

Removing the Torque Tube and Rear Oil Seal Adapter

Detach the adapter from the overdrive case by removing the four attaching cap screws. Note that the rear face of this adapter has a vent groove located on the bottom side. Separate the adapter and gasket from the overdrive case; discard the gasket.

Remove the rear oil seal from the adapter with Tool J-2626 (Fig. 4).

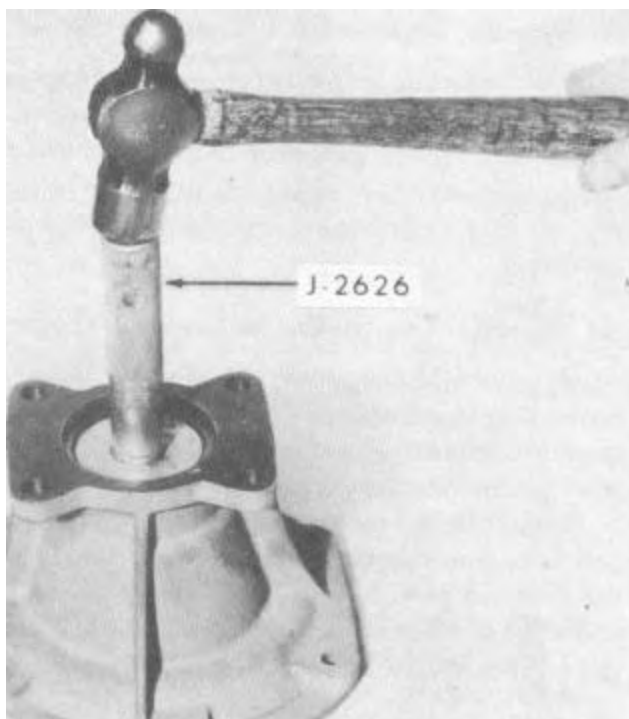


FIGURE 4—Removing Rear Oil Seal

Disengaging the Shift Shaft

Drive out the tapered lock pin which retains the overdrive shift shaft assembly in the overdrive case (Fig. 5).

After the lock pin has been removed, work the shaft assembly outward to disengage it from the shift rail. Do not remove the shaft assembly from the overdrive case unless the oil seal requires replacement. Pulling the shaft through the seal may damage the sealing lip.

Removing Governor and Solenoid

With a 1-3/8" open end wrench, remove the governor from the overdrive case.

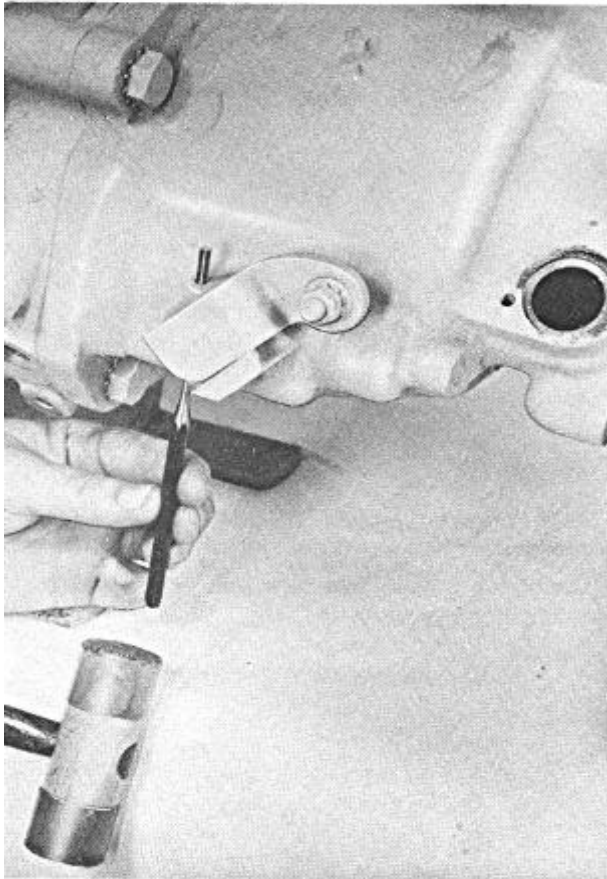


FIGURE 5—Drive Out Tapered Lock Pin

Detach the two solenoid attaching screws and turn the solenoid one-quarter turn clockwise to release the solenoid plunger from the overdrive locking pawl.

Removing the Overdrive Case

Remove the rear bearing snap ring and spacer washer from the overdrive main shaft (Fig. 6).

NOTE: On the standard transmission, the rear bearing is a press fit between the overdrive case and torque tube and oil seal adapter.

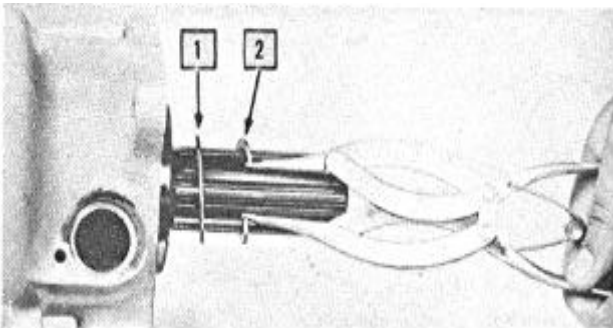


FIGURE 6—Removing Rear Bearing Snap Ring and Spacer Washer

Remove the four cap screws that hold the overdrive case to the transmission case. Separate the overdrive case from the transmission case at the rear of the overdrive bearing adapter housing (Fig. 7).

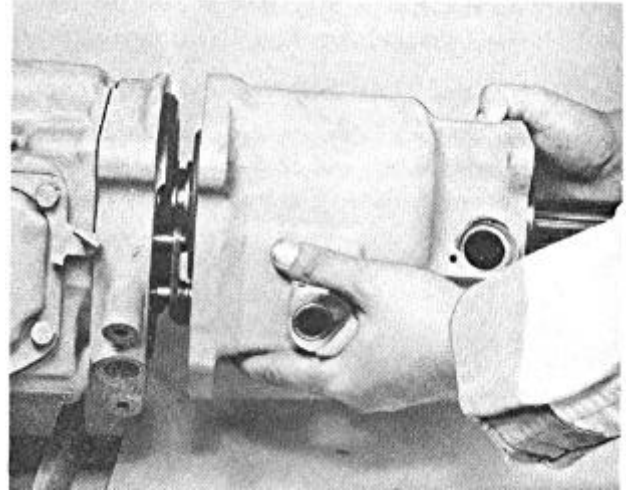


FIGURE 7—Removing Overdrive Case

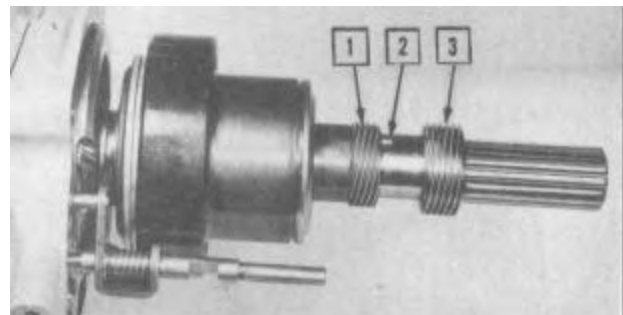
As the overdrive case is being removed, keep tapping the end of the overdrive main shaft with a plastic hammer. This will keep the shaft from coming out and will prevent the free wheeling rollers from dropping out of position.

NOTE: If the transmission does not require complete disassembly, insert a holding bolt through the adapter and thread it into the transmission case to retain the transmission main shaft and its components in position.

The rear bearing which remained in the overdrive case can now be removed, using a brass drift.

Removing Speedometer and Governor Drive Gears

The speedometer and governor drive gears which remained on the overdrive main shaft are retained by a Woodruff Key (Fig. 8). Removal only involves sliding them off the main shaft.



1. Governor Gear 3. Speedometer Gear
2. Woodruff Key

FIGURE 8—Removal of Governor and Speedometer Drive Gears

NOTE: On a standard transmission, the speedometer drive gear is retained in position by two lock rings in addition to the Woodruff Key.

The Woodruff Key is a pressed fit into the main shaft. It may be tapped out of position if necessary.

Removing the Main Shaft and Ring Gear

As the main shaft and ring gear is moved to the rear, the free wheeling rollers will drop out. Keep one hand underneath to catch them (Fig. 9).

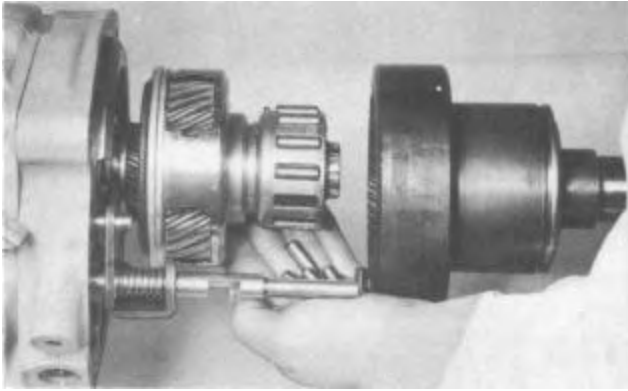


FIGURE 9—*Removing Main Shaft and Ring Gear*

To remove the ring gear from the main shaft, remove the large ring gear snap ring. The gear may then be separated from the main shaft (Fig. 10).



FIGURE 10—*Remove the Snap Ring to Separate the Ring Gear from the Main Shaft*

Removing the Cam and Pinion Cage

To remove the cam from the transmission main shaft, remove the cam snap ring with snap ring pliers (Fig. 11).

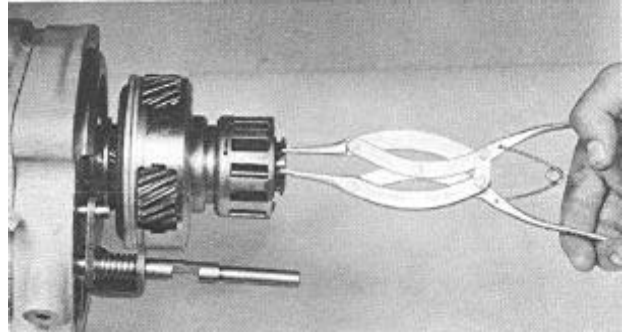


FIGURE 11—*Removing Cam Snap Ring*

The pinion cage at that time can also be removed from the transmission main shaft.

With snap ring pliers, remove the remaining lock ring on the transmission main shaft (Fig. 12).

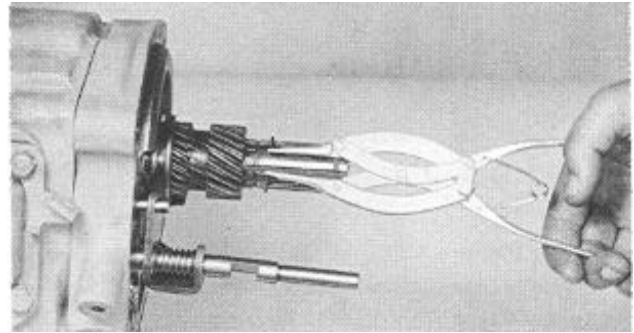


FIGURE 12—*Removing Pinion Cage Lock Ring*

Removing the Sun Gear and Shifter Rail Assembly

Remove the overdrive shifter rail and sun gear and collar from the main shaft as a unit. When the sun gear is free of the sun gear hub, the shifter rail assembly can be separated from the sun gear shifting collar (Fig. 13).

Removing the Cover Plate, Sun Gear Hub and Balk Ring Assembly, and Locking Pawl

Using a pair of pliers, remove the large snap ring that holds the sun gear cover plate, hub, and overdrive balk ring in place (Fig. 14).

Remove the cover plate and trough assembly and the sun gear hub assembly. Then the overdrive locking pawl can be lifted out (Fig. 15).

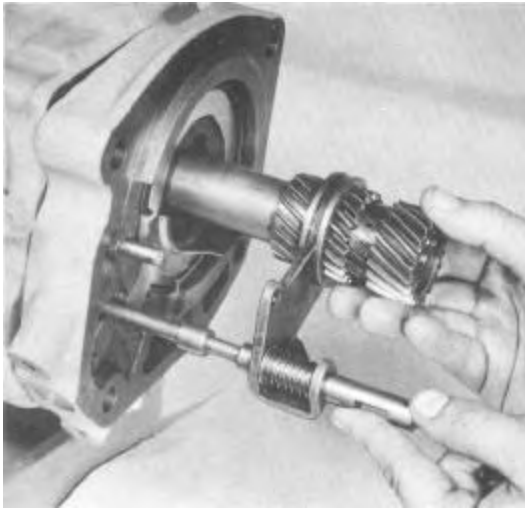


FIGURE 13—The Overdrive Shifter Rail Assembly and the Sun Gear and Collar are Removed Together

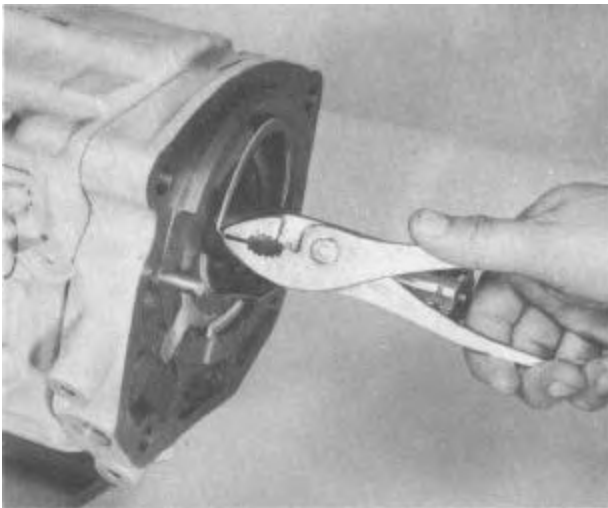
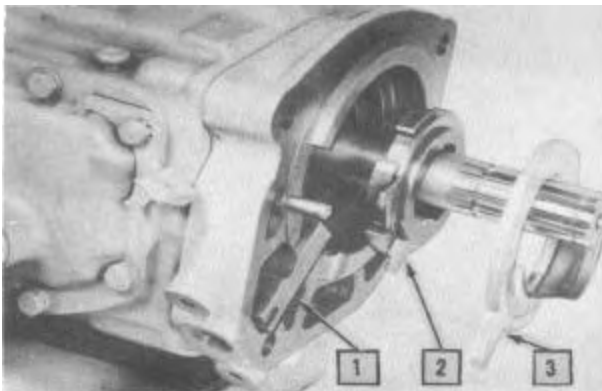


FIGURE 14—Removing Cover Plate Snap Ring



1. Locking Pawl
2. Sun Gear Hub and Balk
Ring Assembly

3. Cover Plate

FIGURE 15—Removing the Cover Plate Allows the Sun Gear Hub Assembly and the Locking Pawl to be Removed

Removing the Lockout Spring and Control Lever

If necessary, the control lever and shaft assembly may be removed from the overdrive case. Discard the oil seal; a new one will be used on reassembly. Remove the retracting spring from the overdrive case.

INSPECTING PARTS

There are no internal adjustments to be made in the overdrive. However, for assurance of good operation, every part should be inspected carefully to be sure it is in good condition. If all parts are up to standard and correctly assembled, the unit will operate properly.

Pinion Cage and Gears

Examine the pinion gears in the planetary pinion cage for worn, cracked, or chipped teeth. Rotate each gear to see that it does not bind on the pinion shaft. Then examine the oil slinger which is a part of the pinion cage. This slinger supplies lubrication to the pinion gears. If it is bent or otherwise damaged, it will not operate efficiently.

Sun Gear Hub and Balk Ring

Test the fit and tension of the balk ring on the sun gear hub. When pressure is applied in a direction that tends to close the ring, it should bind against the hub so that it will not turn. When pressure is applied on the end of the ring in a direction that tends to spread or open the ring, it should slide around the hub (Fig 16).

A spring scale may be used to measure balk ring tension—3-1/2 to 5-1/2 pounds pull required (Fig. 17).

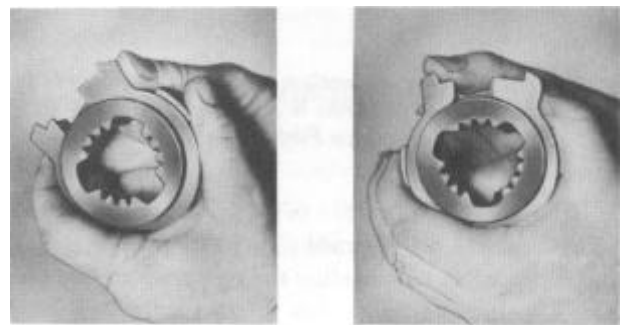


FIGURE 16—Testing Balk Ring Tension. Left: When You Push One End Toward the Other, the Ring Should Grab and Hold. Right: When You Push One End of the Ring Away from the Other, the Ring Should Slide Around the Hub

Free Wheeling Rollers, Housing, and Cam

Examine each of the free wheeling rollers and the overdrive main shaft housing in which they turn for wear, scoring, rough surfaces, or any indications that the rollers may be slipping in the housing. Inspect the roller cams on the free wheel hub for wear or grooving (Fig. 18).

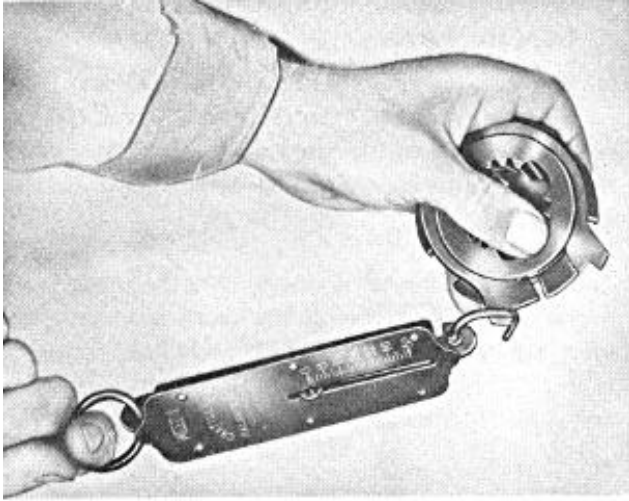


FIGURE 17—Measuring Balk Ring Tension with Spring Scale—3-1/2# to 5-1/2# Pull

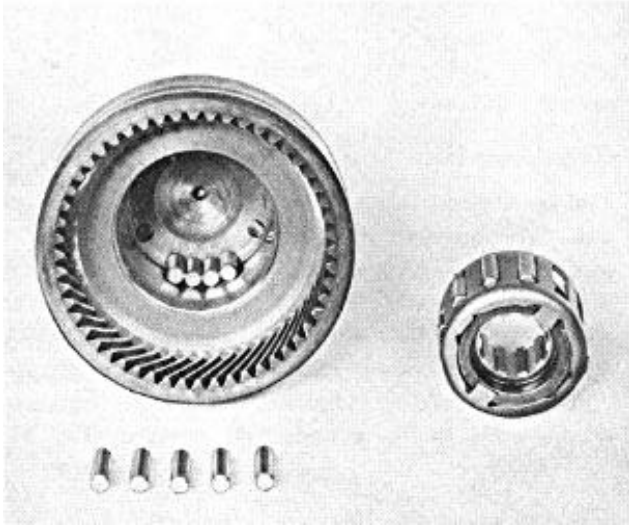


FIGURE 18—Inspection of Overdrive Parts is Important. The Free Wheeling Rollers Will Slip if these Parts Are Worn

Test the action of the two cam retaining springs. These springs are designed to twist the cam in a clockwise direction, thus holding the rollers up on the cam. If this spring action is slow or retarded, it will result in a loud thump whenever the free wheeling unit engages on acceleration. To test it, grasp the cam roller retainer and turn it counter-clockwise. Then release it suddenly. If the retainer springs quickly back in a clockwise direction, the springs are all right. If the action is sluggish, replace the springs (Fig. 19).

Transmission Cover and Shift Fork Assembly

To remove the transmission cover and shift fork assembly, simply remove the nine attaching cap screws and slide the assembly including the shift forks away from the transmission case. Remove the gasket and discard.



FIGURE 19—When You Twist the Cam Roller Retainer Counter-clockwise, the Two Springs Should Snap it Back Quickly

Interlock Sleeve End Clearance

Place one shift shaft in gear and with the other in the neutral position measure the clearance between the interlock sleeve and cam of the shift shaft at the in-gear side (Fig. 20).

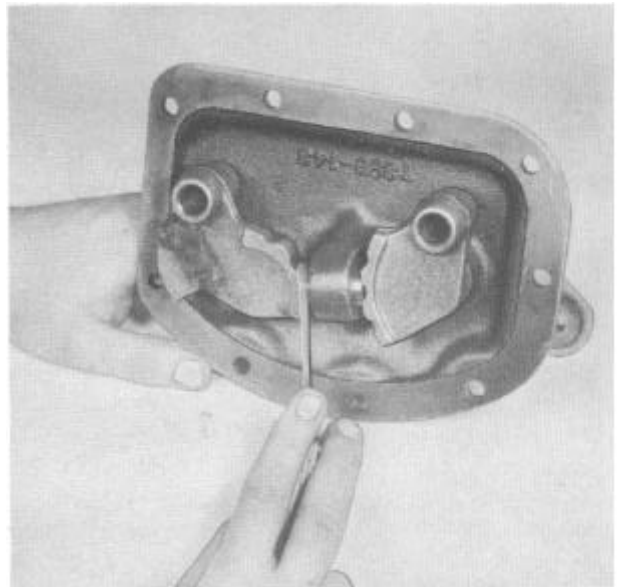


FIGURE 20—Measuring Interlock Sleeve End Clearance

This clearance should be maintained at .002" to .008". Four different length sleeves are serviced in .005" variations.

Disassembly of the cover and shift fork assembly

involves removal of the shift levers and forks and tapping out the shift shafts from the cover. Care should be taken to prevent, loss of interlock sleeve, balls, spring or pin (Fig. 21).

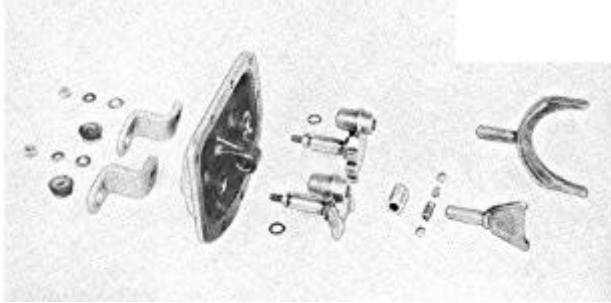
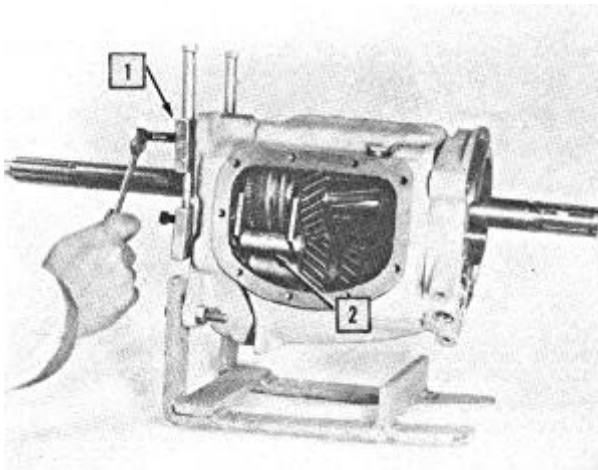


FIGURE 21—Transmission Cover and Shift Lock Assembly

Removing Clutch Shaft Bearing

After removing the bearing cap and gasket, remove the clutch shaft snap ring, spacer washer, and the bearing lock ring.

The front bearing can be removed from the clutch shaft by using bearing puller (J-6654) together with a thrust yoke (J-6652) to prevent damage to the synchronizer clutch (Fig. 22).



1. Bearing Puller (J-6654) 2. Thrust Yoke (J-6652)

FIGURE 22—Use Bearing Puller and Thrust Yoke to Pull the Front Bearing to Prevent Damage to the Synchro Clutch

Removing Transmission Main Shaft

With the front bearing removed from the clutch shaft, pull the shaft as far forward as possible.

NOTE: The clutch shaft cannot be removed from the front of the transmission case.

Grasp the main shaft and its components and separate the main shaft from the clutch shaft (Fig. 23). When separated, slide the main shaft and its components out the rear of the transmission case (Fig. 24).

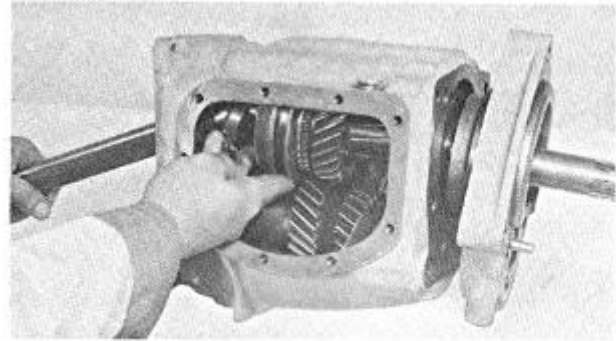


FIGURE 23—Separate Clutch Shaft and Main Shaft Assembly

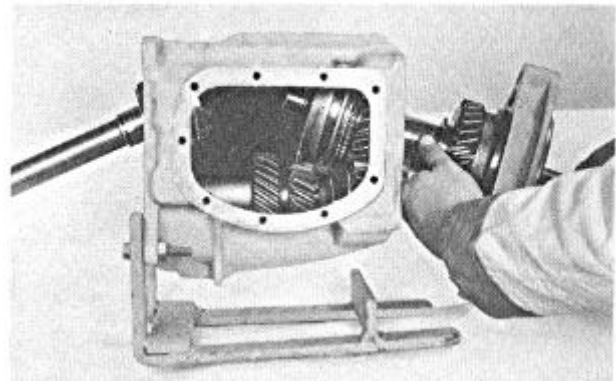


FIGURE 24—Removing Main Shaft Assembly from the Transmission Case

Disassembly of Transmission Main Shaft

Set the main shaft assembly on a bench and remove the synchro-clutch spacer washer and lock ring. The synchro-clutch, second speed, and first and reverse sliding gears may then be removed from the transmission main shaft (Fig. 25).

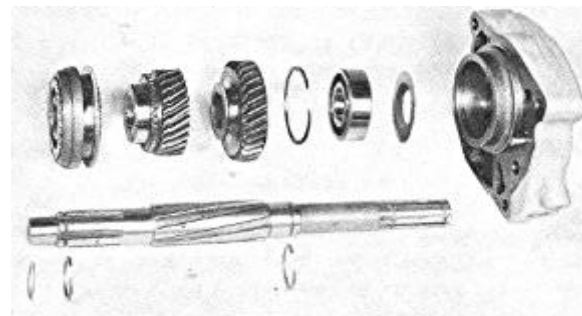


FIGURE 25—Transmission Main Shaft Assembly

Where the ball bearing in the adapter requires replacement, remove the large snap ring in the bearing adapter. Tap out the main shaft and bearing from the adapter. Remove the oil baffle from the adapter. Then remove the main shaft snap ring and press the bearing from the main shaft.

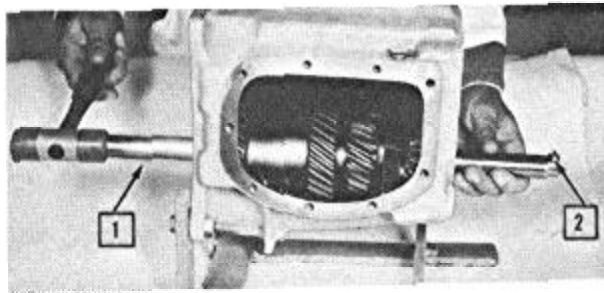
Removing the Clutch Shaft

Remove the clutch shaft from the rear of the transmission case and remove the 14 needle bearings and oil baffle.

Removing Countershaft and Reverse Idler Gears

The countershaft and reverse idler gear shaft are a press fit into the case. They are also locked into position at the rear by Woodruff Keys.

To maintain the position of the 80 needle bearings in the countershaft gear, drive the countershaft out of the rear of the case using a dummy shaft machined to .870" x 81/B" (Fig. 26).



1. Dummy Shaft

2. Woodruff Key

FIGURE 26—Removing Countershaft

With the countershaft removed, the countershaft gear will drop to the bottom of the case. The countershaft gear with needle bearings, spacer, washers, and thrust washers may then be removed through the rear of the transmission case as an assembly. If necessary, disassemble for inspection and parts replacement.

With the use of a brass drift, knock out the reverse idler gear shaft through the rear of case (Fig. 27).

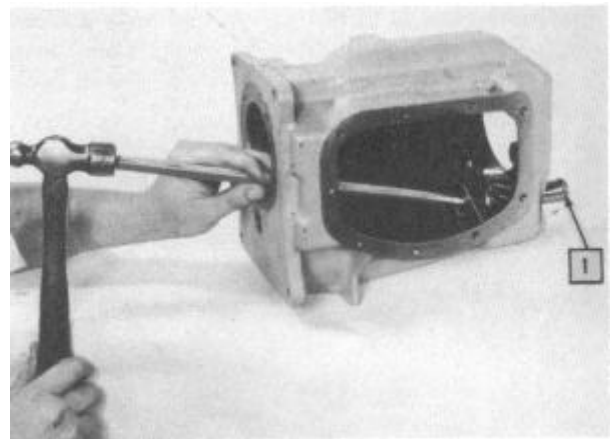
CLEANING AND INSPECTING PARTS

With the transmission completely disassembled, all parts should be carefully cleaned so that they can be thoroughly examined.

Gears

Wash all gears in a cleaning solution. Inspect for worn or chipped teeth. Slide each gear onto a new shaft. If it appears to be loose, it must be replaced.

NOTE: *Whenever any transmission gear requires replacement, the gear with which it meshes should be replaced also.*



1. Woodruff Key

FIGURE 27—Removing Reverse Idler Gear

Bearings

Bearings must be handled with great care. Wrap them in a clean cloth or paper until they can be washed.

To wash a bearing, submerge it in a cleaning solution that is absolutely free of dirt and rotate it to flush away all oil and dirt. Dry the bearing with care.

Carefully examine each bearing for cracked races, worn, or scored balls.

Main Shaft

Install the gears onto the main shaft to be sure they slide on and off easily. The should fit smoothly without excessive play between the splines. If the fit is tight, look for burred edges on the splines.

Synchro-Clutch and Friction Rings

Carefully inspect the synchro-clutch and friction rings. Slide the rings on the cones of the second speed gear and the clutch shaft. Replace rings if there is excessive wear on the taper.

Transmission Case

Examine the surfaces of the bearing recesses in the transmission case for wear or scoring which indicates that the bearing has been revolving in its housing. Examine the case for cracks or other defects.

Be certain that all parts of the case are thoroughly clean before and during assembly.

Clutch Housing.

Examine the housing for cracks or other defects.

Check the rear face of the clutch housing with a dial indicator. The total run-out should not exceed .005".

The total run-out of the clutch housing bore should not exceed .003".

REASSEMBLY

When reassembling the transmission, always use new gaskets and oil seals.

Reinstalling the Countershaft Gear and Shaft

To hold the countershaft needle bearings, spacer, and washers in place while installing the countershaft gear, use a dummy shaft machined to .870" x 8-1/16" (Fig. 28).



1. Needle Bearings 2. Dummy Shaft

FIGURE 28—*Reassembly Countershaft Gear Needle Bearings*

After installing the bearings in the countershaft gear and holding it in such a manner so as not to drop the dummy shaft, install the thrust washers. The two small projections on the face of the bronze rear thrust washer must index with the grooves in the countershaft gear. The front bronze thrust washer must index with the transmission case. Position the large thrust washer and install the assembly in the bottom of the case.

Reinstalling the Reverse Idler Gear

Install the reverse idler gear with the chamfered side of the teeth to the front of the case.

Align the gear and install the reverse idler gear shaft from the rear of the case. The shaft is a press fit into the case, therefore, care must be taken to prevent damage to the shaft. Install and align the Woodruff Key into the shaft prior to driving the shaft flush to the rear face of the case. Lift and properly align the countershaft gear. Prior to installing the shaft, check the front and rear thrust washers for proper alignment. The countershaft is a press fit into the transmission case,

the transmission case, therefore, care must be taken to prevent damage to the shaft. Install and align the Woodruff Key prior to driving the shaft flush to the rear face of the case.

Assembling Main Shaft Assembly

Install the transmission center bearing on the main shaft using Tool J-2995 (Fig. 29).

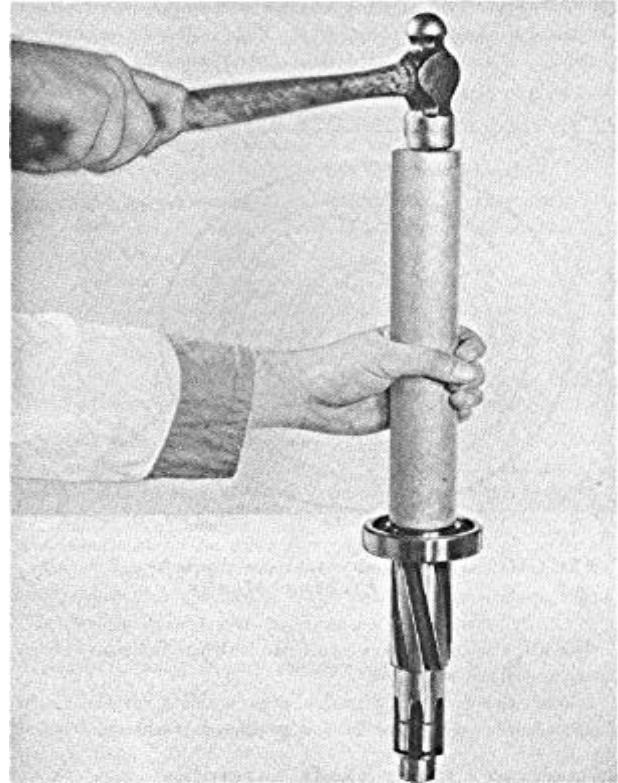


FIGURE 29—*Installing Center Bearing on Transmission Main Shaft*

Install the main shaft snap ring. This snap ring is serviced in four different sizes .087", .090", .093", and .096". Select the thickest ring which will fit into the retaining groove. Proper snap ring selection will reduce end play to a minimum.

Place the oil baffle into the overdrive adapter housing with concave side facing forward.

Tap the main shaft and center bearing assembly into the housing.

Install the large snap ring into the retaining groove of the adapter housing. This snap ring is serviced in five different sizes, .088", .091", .094", .097", and .100". Select the thickest ring which will fit into the retaining groove. Proper snap ring selection will reduce end play to a minimum.

Install the first and reverse sliding gear on the main shaft with the shifting collar to the front.

Install the second speed gear on the main shaft with the tapered cone to the front.

If the synchro-clutch was disassembled, check for proper assembly. The hub section and the outer ring of the synchro-clutch assembly are matched and lapped when fabricated by the manufacturer and are marked accordingly. The etching marks will correspond when properly assembled (Fig. 30). This will insure smooth sliding action when shifting into second and third speeds.

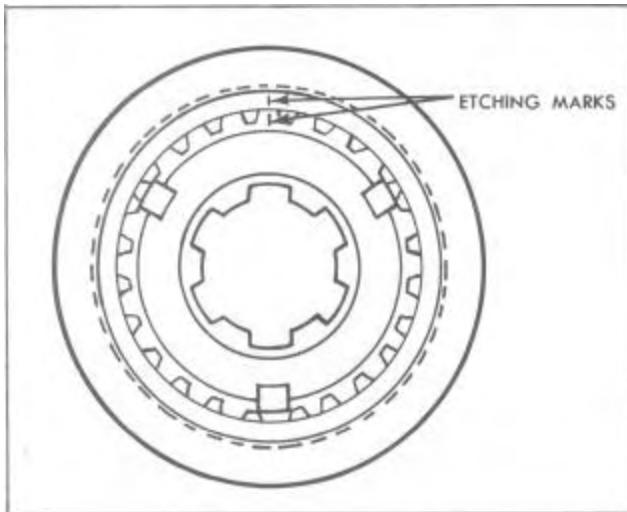


FIGURE 30—Transmission Synchro-Clutch Unit Etching Marks

Install the synchro-clutch including friction rings onto the main shaft.

Install the lock ring and spacer washer on the main shaft. Refer to Figure 25 for proper parts sequence.

Installing Clutch Shaft Assembly

Insert the fourteen clutch shaft needle bearings in the rear of the clutch shaft. A coating of heavy lubricant will retain them in proper position.

Insert the clutch shaft into the transmission case from the rear. Position the shaft as shown in Figure 31.

Installing Main Shaft Assembly

Insert the main shaft assembly from the rear of the transmission case. It will be necessary to tilt the rear portion of the assembly downward to provide the necessary clearance to allow the synchro-clutch and second speed gear to pass over the countershaft gear (Fig 31).

When the synchro-clutch just clears the countershaft gear, place the clutch shaft in a horizontal position and slide it onto the main shaft. Care must be taken to prevent mislocation of the clutch shaft roller bearings. At that time, place the clutch shaft and main shaft assembly in its proper position in the transmission case.

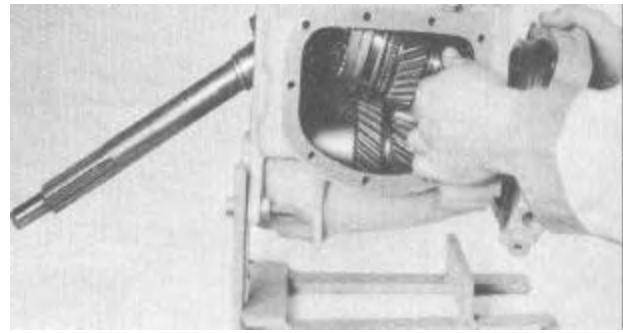


FIGURE 31—Installing Main Shaft Assembly

Check the synchro-clutch friction rings for proper location and freeness.

REASSEMBLING THE OVERDRIVE

When all parts have been carefully inspected the unit is ready for reassembly. As each part is assembled, be sure it is absolutely clean and lubricated with light engine oil. Always use new gaskets, oil seals and snap rings in reassembly.

Reinstalling the Hub and Balk Ring, Locking Pawl, and Cover Plate

Install the hub and balk ring assembly with the chamfered side of the ring against the sun gear hub.

Install the locking pawl, positioning the pawl and balk ring in the "locked-out" position, with the pawl on the step of the ring for correct installation of the solenoid.

Install the cover plate and trough in position and lock it in place with the large snap ring.

This snap ring is serviced in three different sizes .0625", .0665", and .0705". Select the thickest ring which will fit into the retaining groove. Proper selection of the snap ring will reduce end play to a minimum.

Reinstalling the Sun Gear and Shifter Rod Assembly

Install the fork of the shifter rod in the sun gear shift collar. Then hold them together as you slide the sun gear onto the main (spline) shaft and the shifter rod into the opening in the bearing adapter (Fig. 13).

Reinstalling the Pinion Cage and Cam

Install the pinion cage lock ring on the main shaft (Fig. 12).

Install the pinion cage assembly on the main shaft being careful not to distort the oil slinger. The pinion cage pinions mesh with the sun gear and the cage will butt up against the lock ring previously installed.

Position the free wheeling cam on the main shaft so that the counter bore of cam slides over the machined surface of the pinion cage.

Install the free wheeling cam snap ring on the main shaft. This snap ring is serviced in three different sizes .063", .068", and .073". Select the thickest ring which will fit into the retaining groove (Fig. 11). Proper selection of the snap ring will reduce end play to a minimum.

Reinstalling the Ring Gear and Main Shaft

Replace the ring gear on the overdrive main shaft and lock it in place with a snap ring (Fig. 10).

This ring is serviced in three different sizes .055", .057", and .059". Select the thickest ring which will fit into the retaining groove. Proper selection of the snap ring will reduce end play to a minimum.

The Free Wheeling Rollers

Replace the free wheeling rollers in the free wheeling cam retainer. A rubber band placed around the rollers will help to keep the rollers from dropping out while the main shaft and ring gear is being installed (Fig. 32).



FIGURE 32—A Rubber Band Serves to Hold the Free Wheeling Rollers in Position until the Ring Gear and Main Shaft can be Installed

Now rotate the cage and roller assembly counterclockwise so that the rollers will be at the bottom of the cams. This will permit the installation of the overdrive main shaft and ring gear assembly.

Installing Speedometer and Governor Drive Gears

Insert the Woodruff Key into the main shaft. Then the governor and speedometer drive gears. The governor drive gear which is smaller in diameter is installed against the shoulder on the main shaft.

NOTE: On a standard transmission, the speedometer drive gear is retained in position by two lock rings in addition to the Woodruff Key.

Reinstalling the Overdrive Case, Control Lever, and Shift Shaft Assembly

Install the shift shaft oil seal and retractor spring in the overdrive case.

Holding the bearing adapter to the transmission case work the overdrive case onto the overdrive assembly. Secure the assembly with the four attaching cap screws.

Push the shift shaft into the case so that the operating cam will engage with the slot in the shift rod. Then install the lock pin to hold the shaft in position.

NOTE: Inspect the operation of the shift lever as follows: With the lever against the machined stop on the boss of the case, a slight free movement with no tension should be evident. Excessive movement with no tension indicates that the shift rod is binding in the case.

Installing Solenoid and Governor

Insert the solenoid plunger in the opening in the bearing adapter and engage it with the notch in the locking pawl. Turn the solenoid one-quarter turn counterclockwise to lock the pawl and plunger together. Pull the solenoid to be sure the plunger is locked with the pawl. Then tighten the two cap screws.

Thread the governor unit into the overdrive case. Tighten sufficiently to prevent oil leakage.

Reinstalling Rear Bearing, Oil Seal, and Adapter

Install the rear bearing on the overdrive main shaft using Tool J-2995 (Fig. 33).

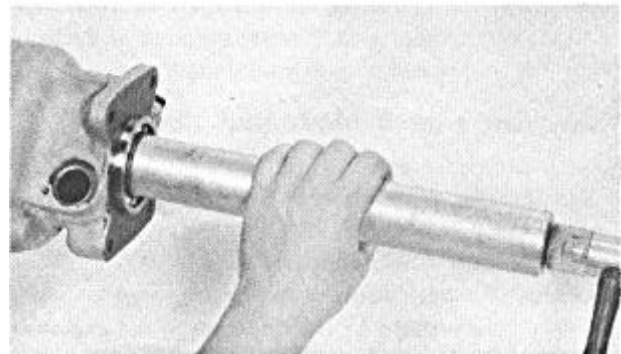


FIGURE 33—Installing Rear Bearing

Install the rear spacer washer and snap ring (Fig 6).

NOTE: On the standard transmission, the rear bearing is a press fit between the overdrive case and torque tube and oil seal adapter.

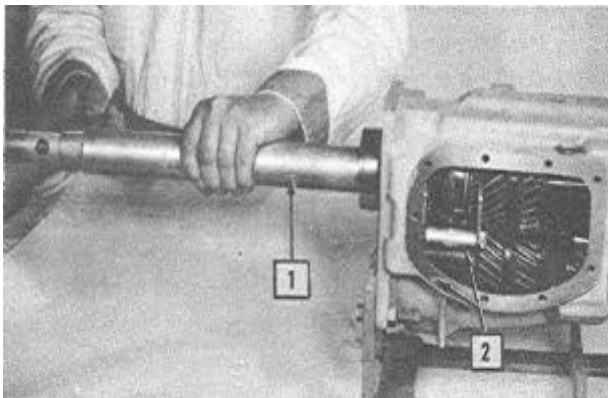
This snap ring is serviced in six different sizes .087", .090", .093", .096", .099", and .102". Select the thickest ring which will fit into the retaining groove. Proper selection of the snap ring will reduce end play to a minimum.

Install a new oil seal in the torque tube adapter (Fig. 4). Attach the adapter to the overdrive case with the four cap screws.

Reinstalling Clutch Shaft Bearing

Place the oil slinger on the clutch shaft with the concave side toward the rear. Install the large bearing lock ring on the bearing and place the bearing on the clutch shaft.

With the use of Tool J-2995 and thrust yoke J-6652, install the bearing on the clutch shaft and into the transmission case (Fig. 34).



1. J-2995

2. J-6652

FIGURE 34—Installing Clutch Shaft Bearing

When the bearing is properly seated, place the spacer washer against the bearing race. Install the clutch shaft bearing snap ring. This snap ring is furnished in six different sizes .087", .090", .093", .096", .099", and .102". Select the thickest ring which fits into the retaining groove. Proper selection of the snap ring will reduce end play to a minimum.

Checking Clutch Shaft End Play

Install the clutch shaft bearing cap without a gasket. Check the clearance between the bearing cap and case with a feeler gauge (Fig. 35).

The desired clutch shaft end play is .000". Therefore, the clearance between the bearing cap and case must be compensated by the thickness of the gasket or gaskets to be installed. This gasket is serviced in two sizes .010" and .015". Install the bearing cap and attach with four cap screws.

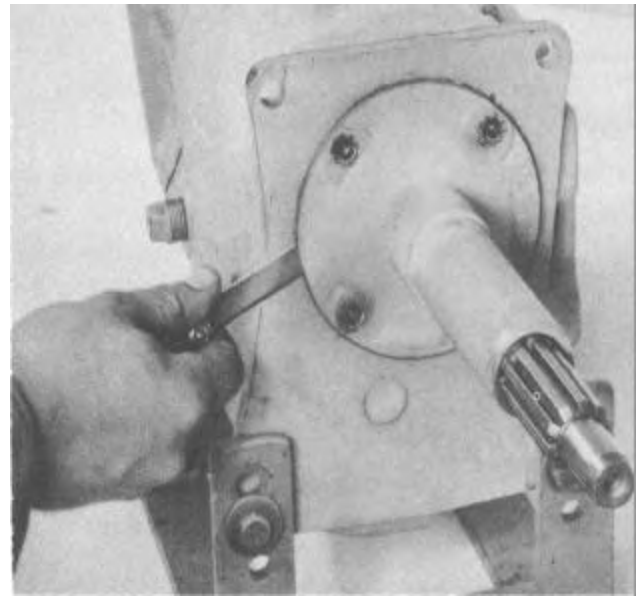


FIGURE 35—Measuring Clutch Shaft End Play

Transmission Cover and Shift Fork Assembly

Remove thrust yoke J-6652 from the synchro-clutch.

Place the synchro-clutch and first and reverse sliding gears in neutral. Place the shift shafts and forks in neutral and install the assembly to transmission case. Secure in position with the attaching cap screws.

The transmission requires a final check by shifting in all gears; check the operation carefully.

LUBRICATION OF THE TRANSMISSION AND OVERDRIVE

Check the lubricant level of the transmission and overdrive every 1,000 miles. Transmission and overdrive units should be filled to the drain plug level on the right side of both units.

Drain and clean twice a year, or every 10,000 miles, using only flushing oils. Do not use gasoline, kerosene, steam, etc.

For atmospheric temperatures above 32° Fahrenheit, use Mineral Oil Gear Lubricant SAE No. 90 in the transmission and overdrive.

Below 32° Fahrenheit, use SAE No. 80.

Where difficulty in shifting is experienced in subzero temperatures, dilute the transmission and overdrive oil as required, using light engine oil.

Transmission Capacity

Standard and/or overdrive 4 Pints.

SHIFTING

STANDARD AND OVERDRIVE TRANSMISSION

Refer to the 1955 Technical Service Manual for service procedures.

FLASHAWAY HYDRA-MATIC TRANSMISSION

Refer to the 1955 Technical Service Manual for disassembly instructions.

Selector Lever Linkage Adjustment

Place selector lever in the D-3 position and set the operating lever against the stop on the starter switch bracket.

Remove clevis pin from the gear shift control rod at side of transmission case and remove clevis from shift lever.

Place the transmission outer shift lever in the D-3 range position.

Adjust clevis so that clevis pin passes freely through hole in lever with the operating lever against the stop on the starter switch bracket. Then remove clevis and lengthen the control rod two full turns and replace clevis and clevis pin.

NOTE: This adjustment will insure proper detent location in the transmission with a full reverse engagement.

BRAKES AND WHEELS

BRAKE SPECIFICATIONS

Type of Mechanism	Lockheed Hydraulic
Make	Bendix Servo
Total Foot Braking Area	197 Sq. In.
Lining Size	
Width x	
Primary —Front	2-1/2" x 10-9/16"
Rear	2" x 9-5/16"
Secondary—Front	2-1/2" x 12"
Rear	2" x 12"
Pedal Free Play, Without Power Brakes	1/4" to 1/2"
Drum Diameter, Inches	11"
Front Wheel Cylinder Bore, Diameter	1-1/8"
Rear Wheel Cylinder Bore, Diameter	7/8"
Master Cylinder Bore, Diameter	1"
Piston Clearance, Inches Wheel and Master Cylinder	.001" to .003"
Master Cylinder Piston Rod Diameter, Inches (Power Brake Treadle-Vac)	21/32"

WHEELS AND TIRES

Wheel Size	14"
Tire Size	8.00 x 14"
Tire Pressure	
Front	24 Lbs.
Rear	20 Lbs.

REAR AXLE-PROPELLER SHAFT

PINION DEPTH ADJUSTMENT

The pinion depth adjustment procedure as outlined in the Rear Axle and Propeller Shaft Section of the 1956 Special V-8 Series Technical Service Manual Supple-

ment is used to adjust pinion depth.

The distance of the rear axle center line to the rear machined face of the pinion gear is 2.547". This measurement is to be used to check for the correct pinion depth.

REAR SPRING SPECIFICATIONS

	Free Height	Loaded Height	Rate Lbs. Per Inch After Loaded
Less Wheel Carrier	17-7/8"	10-9/16" at 870 Lbs. ± 25 Lbs.	125 Lbs.
With Wheel Carrier	17-1/2"	10-9/16" at 940 Lbs. ± 25 Lbs.	135 Lbs. ± 5 Lbs.
Heavy	16-3/4" Minimum	11-1/4" at 870 Lbs. ± 25 Lbs.	170 Lbs. ± 5 Lbs.

REAR AXLE SPECIFICATIONS

Type	Semi-Floating
Drive Gear Type	Hypoid
Ring Gear and Pinion Backlash	.002"-.006"
Axle Shaft End Play	.002"-.004"
Pinion Shaft Bearing Tension	15" Lbs.-18" Lbs.
Pinion Bearing Adjustment	Shims
Differential Side Bearing Preload	.004"-.008"
Lubrication Capacity	4 Pts.
Type of Lubricant	SAE 90 HYPOID*
Rear Axle Ratio (Standard or Overdrive)	4.1:1 (10-41)
Rear Axle Ratio (Automatic)	3.2:1 (13-41)

*NOTE: Rear Axles are filled at the factory with SAE 90 Hypoid Gear Lubricant. Lubricant change at regular drain and refill periods is not recommended. The container of factory Hypoid Lubricant furnished with service axle housings and gear sets should be used at time of replacement service. SAE 90 Hypoid Gear Lubricant is preferred when the addition of lubricant is necessary to bring it to the proper level. However, a SAE 90 Multi-purpose lubricant may be used after a break-in period (several thousand miles) as long as it is suitable for Hypoid Rear Axle Service. Naturally, the results of such use is the responsibility of the lubricant supplier or servicing dealer.

FRONT SUSPENSION— STEERING

FRONT SPRING REMOVAL

The front spring seats, upper and lower, have been designed with an ear to accept a hook tool for removal. The tool kit is available for use in service through the Field Parts Warehouse.

The spring is removed by raising the rear end of the car opposite from the side from which the front spring is to be removed. Additional compression may be gained by leaning on the fender over the spring.

Install hooks, Kit Number 3200377, in the holes on the ears of the spring seats. The hooks will hold the spring in a compressed position to enable removal from the car (Fig. 1)

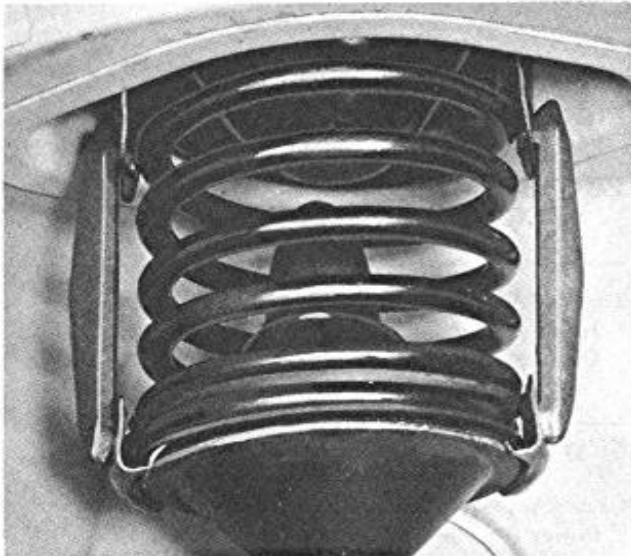


FIGURE 1—*Spring Hooks Installed on Spring Seat*

A service spring replacement may be installed by using the following procedure.

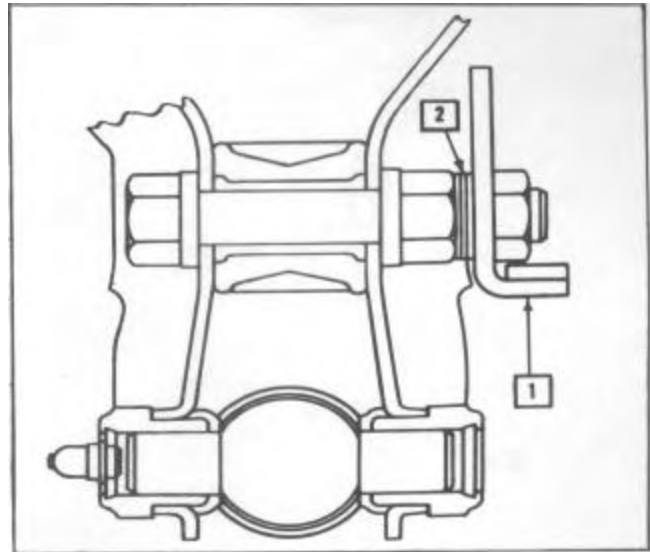
Install upper and lower cushions, upper and lower spring seats on the spring. Align the holes in the ears of upper and lower spring seats.

Compress the spring by suitable means, arbor press or hydraulic jack and install hooks on spring seats. The spring can then be installed on the front coil spring support. The hooks are released from the spring seat by raising the opposite rear end of the car.

STEERING GEAR STOPS

All Automatic transmission equipped cars WITHOUT POWER STEERING and all Standard and Overdrive Transmission

transmission equipped cars have the steering gear stops located on the lower control arms (Fig. 2) .



1. Steering Gear Stop

2. Shims

FIGURE 2—*Steering Gear Stops*

Production location of the steering gear stops is provided by installation of three 1/6" washer shims. In service, the amount of shims may be varied to provide adequate wheel turning radius and to prevent tires rubbing at any point when wheels are in full turn, full bump position.

All Automatic transmission equipped cars WITH POWER STEERING have adjustable steering stop screws located on the pitman arm.

Tool J-1374 or J-5566 is used to remove the pitman arm. It will be necessary to increase the depth of the opening 1/2" to adapt the tool for use on cars equipped with power steering. Figure 4 illustrates the revision required.

STEERING KNUCKLE PIN AND SPINDLE

The upper control arm trunion is provided with needle bearings and a thrust bearing is retained by a castellated nut. The steering knuckle pin is threaded into the lower control arm trunion.

At time of assembly; screw the steering knuckle pin into the lower trunion until it is bottomed; then unscrew it one turn. This will provide approximately 1/4" clearance between the shoulder on the knuckle pin and the trunion. The knuckle pin installed in this manner will prevent "bottoming" on extreme turns and insure maximum bearing on the thread area.

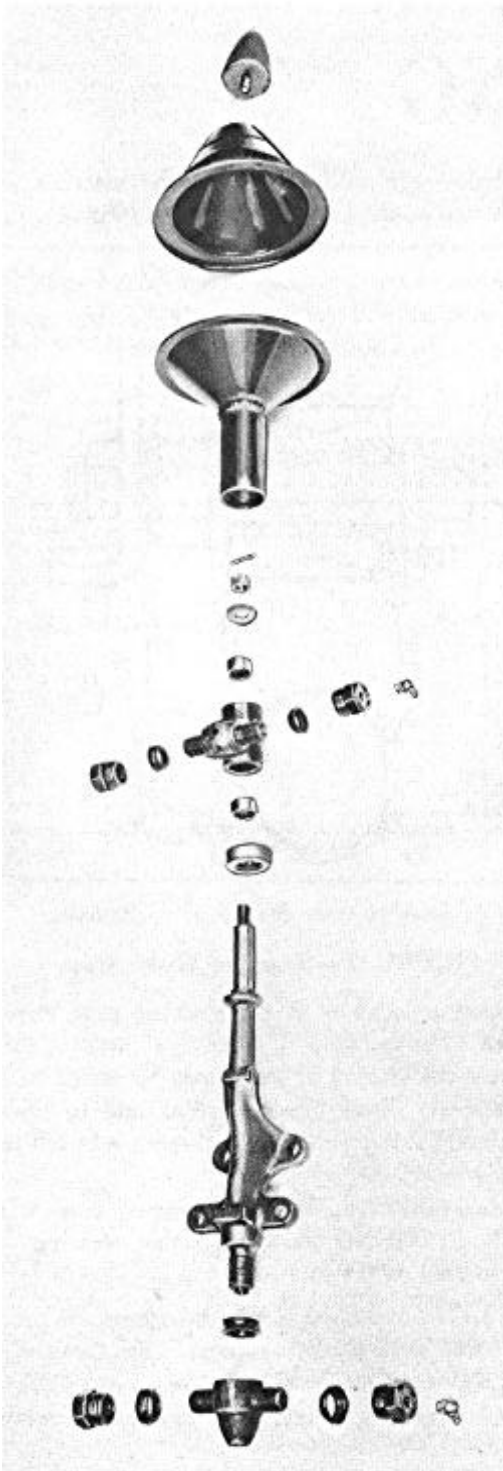


Figure 3—Steering Knuckle Pin and Spindle Assembly Sequence



Figure 3—Revision to Tool J-1374 or J-5566

FRONT WHEEL ALIGNMENT SPECIFICATIONS

Turning Angle Inside Wheel	25°
Turning Angle Outside Wheel	20-1/4° L/PS 21-3/4° W/PS
Kingpin Angle	61/2°
Caster Angle Without Power Steering	0° to 1/2° 1/2° Desired
Caster Angle With Power Steering	1/2° to 1° 1° Desired
Camber	1/4° Neg. to 1/4° Pos. 0° Desired
Toe-in	1/6" to 3/16"

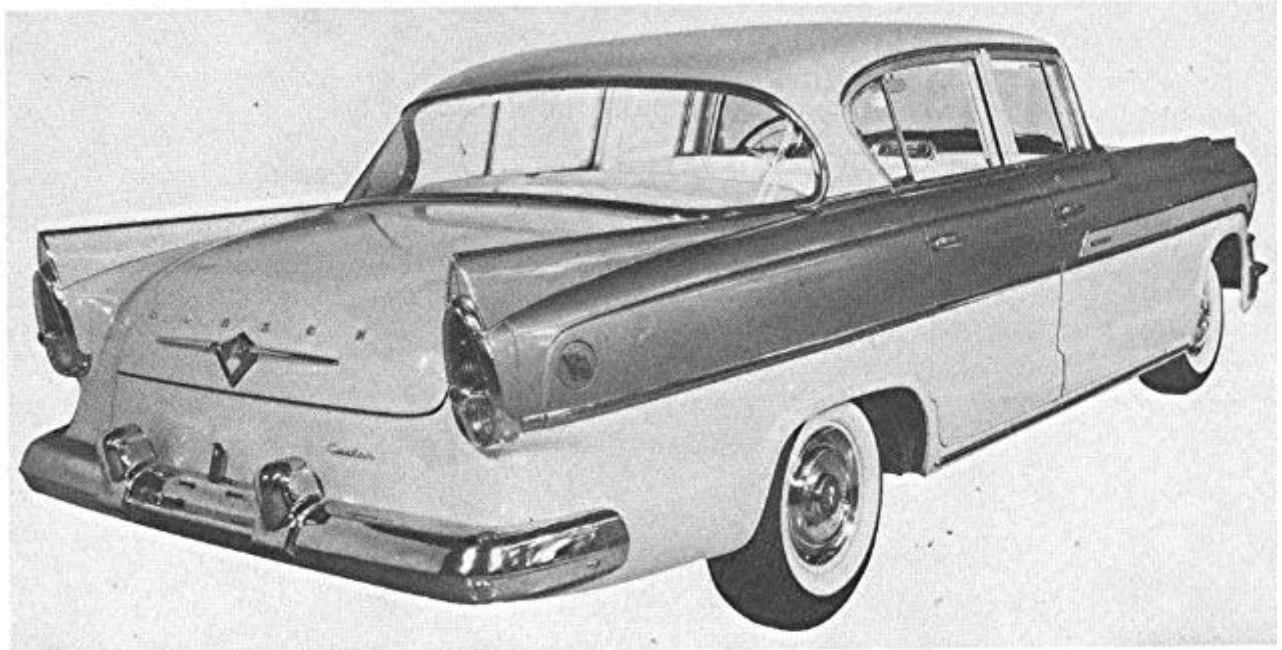
FRONT SPRING SPECIFICATIONS

	Free Height	Loaded Height	Rate Lbs. Per Inch After Loaded Weight
With Air Conditioning	21-5/6"	9-5/8" at 1125# ± 25#	96# ± 2#
Without Air Conditioning		9-5/8" at 1050# ± 25#	96# ± 2#
Left Side	20-9/16"	9-5/8" at 1125# ± 25#	96# ± 2#
Right Side	21-5/6"	± 25#	96# ± 2#

BODY



FIGURE 1—“Hornet” Custom Four Door Sedan



**FIGURE 2—“Hornet” Custom Four Door Sedan Without Continental
Tire Mounting**



FIGURE 3—“Hornet” Custom Hollywood Hardtop

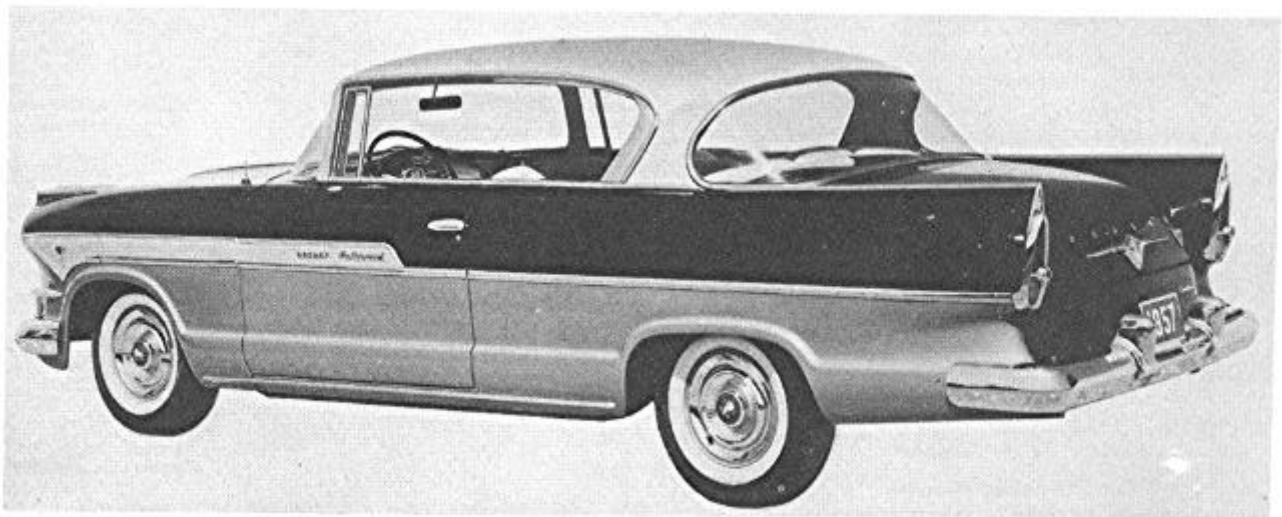


FIGURE 4—“Hornet” Custom Hollywood Hardtop Without Continental Tire Mounting

PAINT CODE NUMBERS AND CORRESPONDING COLORS

Exterior Colors

Code No.	Paint Name	Code No.	Paint Name	Code No.	Paint Name	Code No.	Paint Name
* 1	Classic Black	#85	Lagoon Blue Medium	#89	Avocado—Metallic	#94	Cinnamon Bronze —Metallic
* 67	Bermuda Green Light	#86	Plum—Metallic	#90	Mardi Gras Red	#95	Gotham Gray —Metallic
* 72	Frost White	#87	Berkshire Green Medium	#92	Mojave Yellow		
* 82	Pacific Blue Dark	#88	Oregon Green Dark	#93	Sierra Peach		
# 84	Glacier Blue Light						
					* Same as 1956		
					# New Color Added for 1957		

Interior Colors

Instrument Panel and Finish Mouldings

Satin Black Green Metallic Blue Metallic

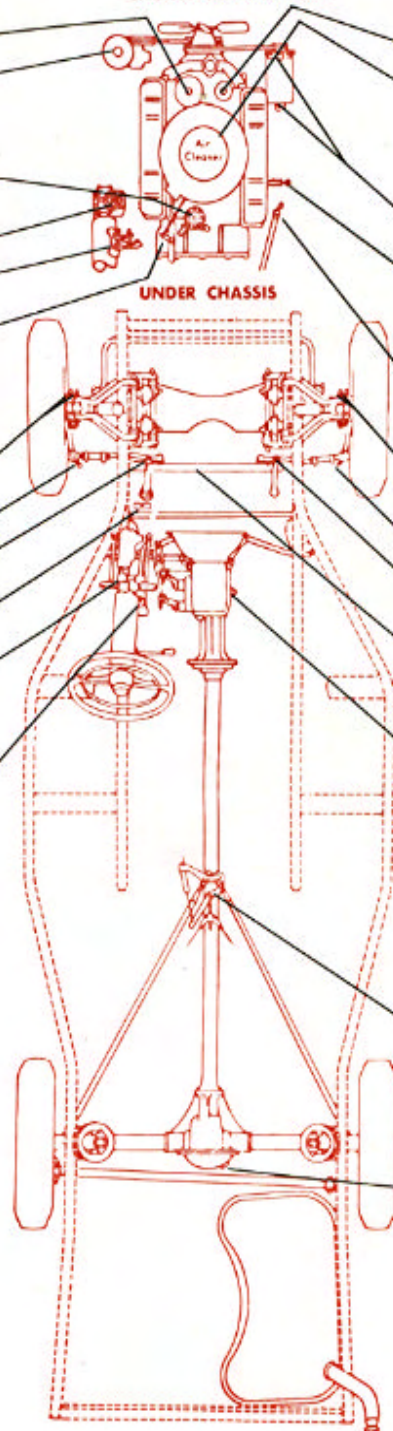
1957 Hudson "HORNET" V-8 Lubrication Service Chart

Lubricate at each arrow point every 1,000 miles except as noted

Consult your Hudson Dealer regarding service recommendations

ENGINE COMPARTMENT

- Oil Filter—Replace element every 4,000 miles
- Power Steering Reservoir (Check level) **ATF**
Fill to 1/2" from top
- Distributor
Shaft Oil Cup **EO**
Cam (coat surface lightly) upon replacing contact set **BBL**
- Steering Gear (plug)—SAE 90 **EPL**
- Gear Shift Control Lever (fitting) **CL**
Hydra-Matic models, no lubrication
- Throttle Linkage **EO**
Felt wick and all pivot points
- Control Arms (fitting on upper and lower front trunnions) **CL**
- Tie Rod (fitting) **CL**
- Pitman Arm (fitting) **CL**
Power Steering models only
- Clutch Beam Lever (fitting) **CL**
Not on Hydra-Matic models
- Clutch and Brake Pedal Shaft (2 fittings) **CL**
Hydra-Matic models (1 fitting)
- Brake Master Cylinder (check level) **HBF**
Accessible through hole in floor
- Power Brake Air Cleaner, clean every 10,000 miles



- Oil Cap Filler—every 2,000 miles **EO**
(Clean and re-oil)
- AIR CLEANER** **EO**
Clean and re-oil at crankcase drain intervals
Oil Bath
Capacity—1 pint
Summer—SAE 40 or 50
Winter—SAE 20
- Generator (2 oilers) SAE 20 **EO**
- CRANKCASE** (check level) **EO**
Multi-Viscosity
Above +32° F. SAE 20
Above +10° F. SAE 20W } 10W-30
Above -10° F. SAE 10W }
Below -10° F. SAE 5W } 5W-20
Drain and refill every 2,000 miles
- Hydra-Matic Transmission (dip stick check level)
- Control Arms (fitting on upper and lower front trunnions) **CL**
- Tie Rod (fitting) **CL**
- Steering Idler Arm (fitting) **CL**
None on cars equipped with Power Steering
- Drag Link (fitting on each side) **CL**
Power steering models—fitting on Tie Rod End
- TRANSMISSION** (check level)
Synchronesh and Overdrive **MGL**
Above +32° F. SAE 90
Below +32° F. SAE 80
Drain and refill every 10,000 miles
Overdrive drained and refilled through separate plugs
- Hydra-Matic—Drain and refill every 25,000 miles. . . **ATF**
- Hand Brake Bell Crank **EO**
- Wheel Bearings (repack) **WBL**
Front, every 10,000 miles
Rear, when dismantled for other service reasons
- DIFFERENTIAL** (check level) SAE 90 **HGL**
Drain and refill periods not recommended

LUBRICANT SYMBOLS

- ATF** Automatic Transmission Fluid, Type A, AQ, ATF
- BBL** Ball Bearing Lubricant
- CL** Chassis Lubricant
- EPL** Extreme Pressure Gear Lubricant
- MGL** Mineral Gear Lubricant
- HBF** Hydraulic Brake Fluid, Heavy Duty (SAE 70-R-1)
- HGL** Hypoid Gear Lubricant—Suitable Type
- EO** Engine Oil
- WBL** Wheel Bearing Lubricant
- PJ** Petroleum Jelly

TIRE PRESSURE (COLD)

- Front 24 Lbs.
- Rear 20 Lbs.

ALL-SEASON AIR CONDITIONING SYSTEM

Once a year—leak test, check oil level in compressor, recharge system if necessary

- Freon-12 3 1/2 lbs.

CAPACITIES

MEASURE SYSTEM	CRANKCASE	TRANSMISSION			DIFFERENTIAL	COOLING SYSTEM		GAS TANK
		Automatic	Synchronesh	Overdrive		Without Heater	With Heater	
	Quarts	Quarts	Pints	Pints	Pints	Quarts	Quarts	Gallons
U.S.A.	5*	11.5	4	4	4	19	20	20
British Imperial	4.2	9.6	3.3	3.3	3.3	15.8	16.7	16.7

* With Filter Change Add 1 Qt.

