SHOP TIPS FROM Autolite Ford

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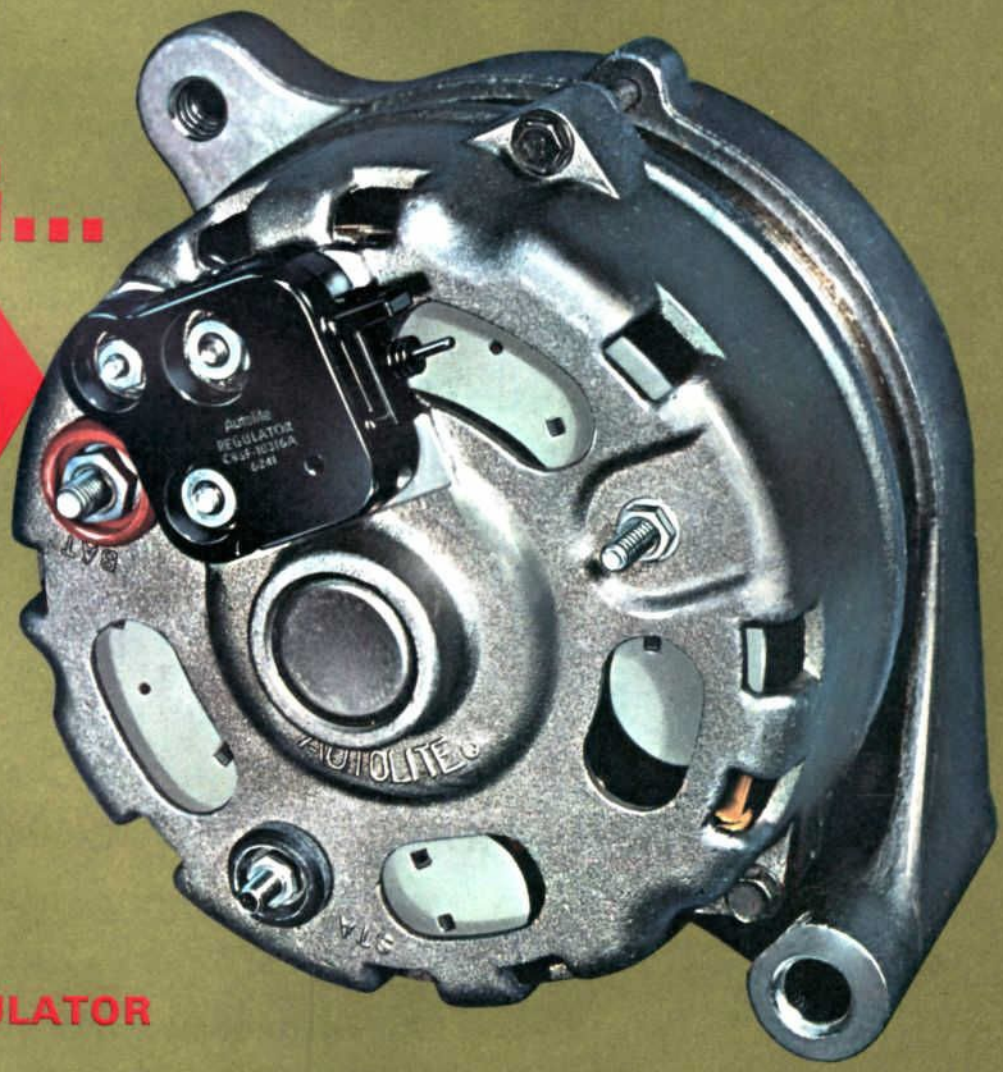
SERVICING...



AUTOLITE'S NEW INTEGRAL ALTERNATOR REGULATOR

Technical parts and service information published by the Autolite-Ford Parts Division and distributed by Ford and Lincoln-Mercury dealers to assist servicemen in Service Stations, Independent Garages and Fleets.

PLUS...
Other Timely Service Topics

See Pages 15-16 for Autolite Resistor Spark Plug Application Guide

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IN THIS ISSUE

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Autolite Ford

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1969 Thunderbird and Continental Mark III models use a new regulator that attaches integrally to the rear of the alternator. The integral regulator (Fig. 1) consists of solid state devices (transistors, diodes and resistors) fabricated within a single piece of silicon crystal, measuring about ⅛-inch square, to form integrated circuits (IC). Very small aluminum conductors interconnect each circuit. The regulator is completely sealed in a moulded plastic case. When the regulator is mounted to the alternator, the electrical connections are made. However, since the integral regulator is sealed in plastic, it can not be repaired or adjusted. It must be replaced if it does not produce 13.5 volts to 15.3 volts between 50° F. and 125° F.

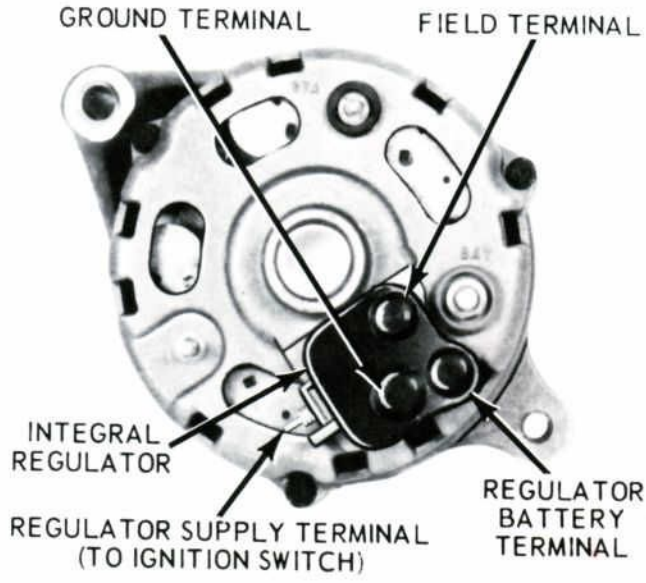

Figure 1-Alternator With Integral Regulator

Three studs and nuts secure the regulator to the alternator. These connections also serve as the electrical contacts between the regulator and the alternator. Figure 2 shows a simplified diagram of the IC regulator-alternator charging system. Terminal B connects the battery and alternator output to the regulator. A metal strip inside the alternator makes the actual connection between the B terminal of the alternator and the B terminal of the regulator, and the field coil. This point is hot at all times if the battery is connected. Connector F connects the regulator field terminal to the alternator F terminal. Field coil power is controlled by the regulator. The alternator field with the IC regulator is *not* grounded internally. Instead it's grounded through the regulator. The G terminal of the regulator is connected to the G ground terminal of the alternator. And the regulator is grounded through the alternator ground connector. But since the regulator is a permanently sealed unit no internal regulator circuit schematic to the ground is shown.

INTEGRAL ALTERNATOR REGULATOR

One wire, from the ignition switch, is connected to the regulator terminal. This is the wire that supplies the power to make the regulator operate. There's a 10 ohm resistor wire in the circuit. A rubber cap is moulded on the wire. The inside diameter of the cap is just the right size to seal the moulded ridges of the regulator terminal. A plastic cap with side hooks is designed to fit over the moulded cap. The side hooks catch on flanges moulded into the regulator. Use an ice pick or similar tool to release the side hooks when you remove the connector to test for power. Two wires from the harness are connected directly to the alternator. One is the wire that connects the alternator output or BAT terminal to the battery. Since this wire is connected to the battery, it is hot when the battery is connected. When this wire is connected to the alternator the BAT terminal of the regulator and the field terminal of the regulator become hot. The other wire from the harness is connected to the G, or ground terminal. A ground connection is also made from the wiring harness to the engine block. No electrical connection is made to the stator terminal on the alternator. The terminal is used to secure the wiring harness bracket.

Now, there is one significant difference in *system operation*. With the integrated circuit regulator the rotor field circuit is grounded through the regulator. While on the conventional alternator, the rotor field is grounded through the alternator. The regulator controls the field output rather than the field input, as with the mechanical regulator.

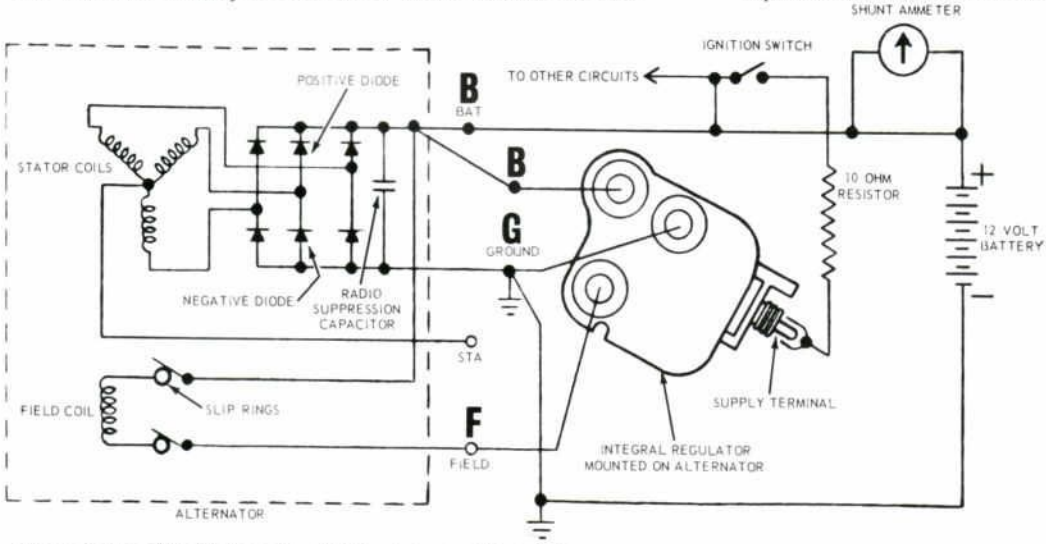

Figure 2-Simplified Schematic of Alternator and Regulator

NOTE: The voltage sensing circuit of the integral alternator regulator is permanently connected across the charging system and therefore, has a small (3-5 millivolts) but harmless current drain. Because of this circuitry, a voltmeter can not be connected in SERIES with the battery for charging system diagnosis. THE INTEGRAL ALTERNATOR REGULATOR IS NOT DEFECTIVE AND SHOULD NOT BE REPLACED BECAUSE OF LEAKAGE INDICATED BY A VOLTMETER CONNECTED IN SERIES WITH THE BATTERY OR REGULATOR.

Replacement

Removal

1. Disconnect the battery ground cable.

2. Loosen the alternator mounting bolts. Remove the belt and swing the alternator down so that the regulator will clear the engine.

3. Remove the terminal covers from the regulator (Fig 1), and remove the nuts from the alternator studs.

4. Remove the regulator from the alternator, press on the sides of the plastic retainer clip and remove the regulator voltage supply wire from the regulator.

Do not attempt to remove the connector by pulling on the wire. The plastic retainer clip must be disengaged from the regulator before the connector can be removed. Do not discard the retainer clip.

Installation

1. Connect the regulator voltage supply wire to the regulator supply terminal. Be sure that the retainer clip is secured in place.

2. Place the regulator in position on the alternator, install the nuts on the studs. Make certain that the regulator is seated flush to the alternator rear casting before tightening the nuts. Torque to specifications (ground and field terminal 15-25 in-lbs, battery terminal 10-15 in-lbs). Do not over-torque. Excessive torque on the nuts will damage the regulator.

3. Install the terminal covers. Reseal the brush retracting wire hole if necessary

4. Place the belt on the alternator pulley and adjust the belt tension to specification 110 lbs (used belt*),140 lbs (new belt). *Used belt is one that has been in operation more than 10 minutes. Apply pressure on the alternator front housing only when tightening the belt. Tighten the adjusting arm bolts and the mounting bolt.

5. Connect the battery ground cable.

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INTEGRAL REGULATOR ALTERNATOR TESTING

Except for the tests shown here, all other charging system checks are the same as for charging systems that have separate regulators and alternators Use a volt-amp alternator tester such as the Rotunda ARE 27-38 to test an integral regulator alternator.

VOLTAGE REGULATION TEST

Use a fully charged battery (1.250-1.280 specific gravity) when performing the following test. Turn off all lights and accessories. Make certain that the ignition switch is OFF. Connect the ARE 27-38 tester, and make the tester knob adjustments as shown in Fig. 3, Voltage Regulation Test. Open the battery adaptor switch. The ammeter should show zero amperes.

A discharge (2 amperes) indicates a malfunction in the alternator field coil or in the regulator. Refer to Field Circuit Tests. If the ammeter shows zero amperes, proceed as follows:

1. Place the transmission in neutral or park and apply the parking brake. Place the master control on the tester at the VOLTAGE REG. ¼ OHM RES. position.
2. Close the battery adapter switch and start the engine. Make sure that all lights and electrical accessories are off. Open the battery adapter switch.
3. Operate the engine at approximately 2000 rpm for 5 minutes. (Use a tachometer.)
4. Read the voltmeter on the tester. If the voltage is between 13.3 and 15.3 volts, the voltage regulator is functioning normally.
5. If the voltage does not rise above the battery voltage, perform a Regulator Supply Voltage Test. If the voltage exceeds 15.3 volts, perform the Field Circuit Tests.

REGULATOR SUPPLY VOLTAGE

The alternator regulator is turned on by the application of battery voltage from the ignition switch. A 10-ohm resistor wire is in series with this supply circuit. If the supply circuit is disconnected or defective there will be no regulator action and no alternator output.

Supply Voltage Test

1. Connect a 12-volt test light or voltmeter between the regulator supply lead and ground (Fig. 4 Supply Voltage Test). Turn the ignition switch to ON. The test light should glow or the voltmeter should show voltage.
2. If no voltage is indicated, the supply circuit is disconnected or broken.

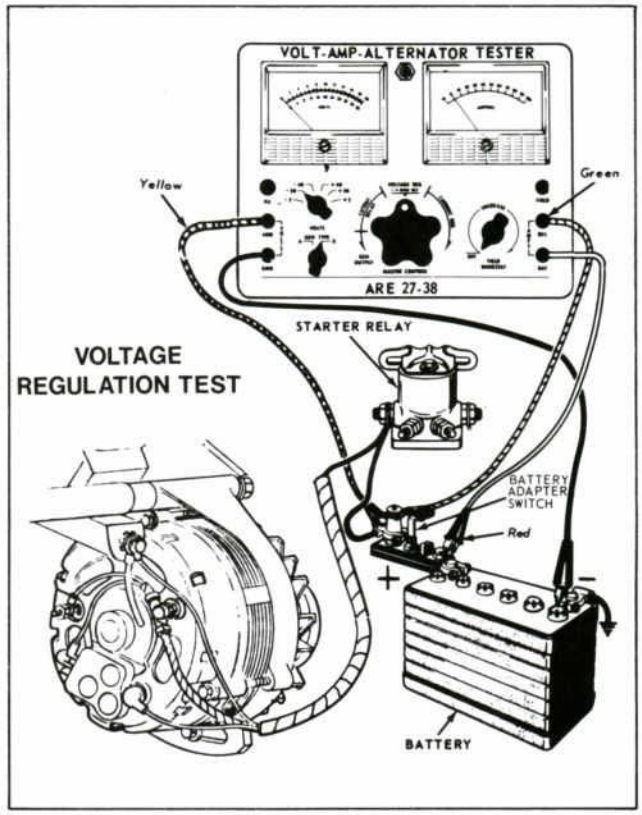


Figure 3-Voltage Regulation Test

3. If there is voltage at the terminal, perform an Alternator Output Test.

ALTERNATOR OUTPUT TEST—OFF VEHICLE

When the alternator output tests are conducted off the vehicle, a test bench must be used. Follow the procedure given by the test bench equipment manufacturer. When the alternator is removed from the vehicle for this purpose, always disconnect a battery cable as the alternator output connector is connected to the battery at all times.

ALTERNATOR OUTPUT TEST—ON VEHICLE

Use care when connecting the test equipment to the alternator as the alternator output terminal is connected to the battery at all times. Under no circumstances should the regulator battery terminal be connected to the regulator field terminal. To do so will permanently damage the regulator.

1. Check the alternator drive belt tension. Place the transmission in neutral or park and apply the parking brake. Make the tester connections as shown in Fig. 5 Volt-Amp-Alternator Tester, being sure to connect the jumper wire as shown. Be sure that it is securely clipped to the regulator field terminal and the field rheostat knob is OFF at the start of test.

INTEGRAL ALTERNATOR REGULATOR

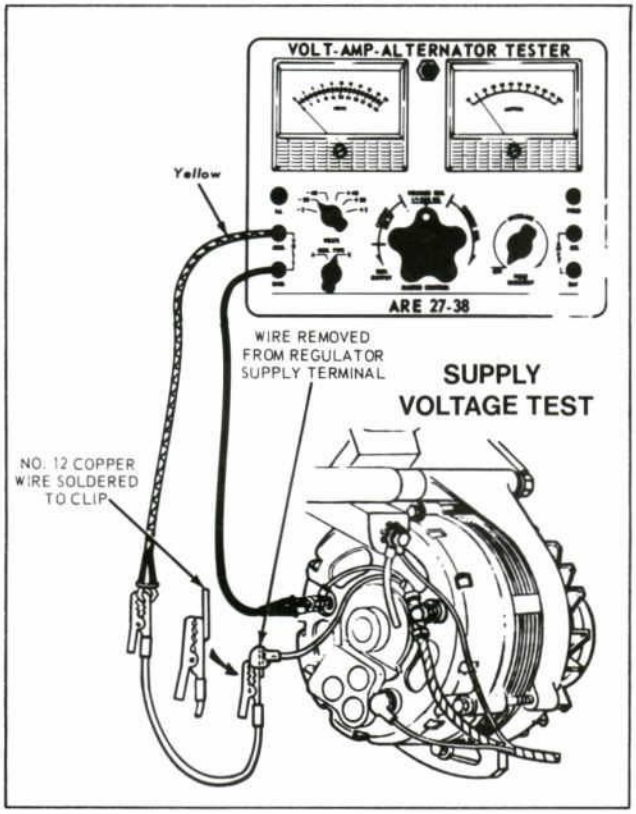


Figure 4—Supply Voltage Test

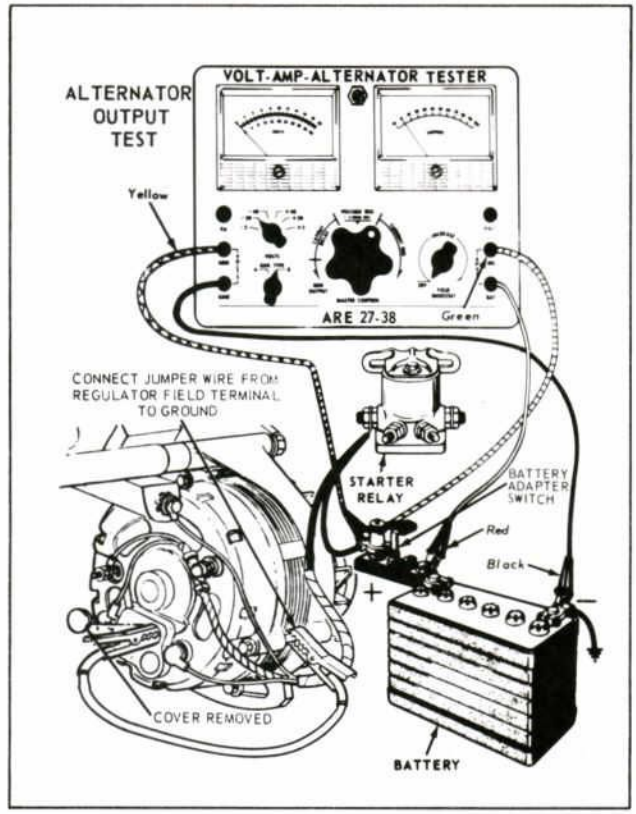


Figure 5—Alternator Output Test

2. Close the battery adapter switch. Start the engine, then open the battery adapter switch. The voltage reading must be maintained between 10 and 15 volts.

3. Increase the engine speed to approximately 2000 rpm. Turn off all lights and electrical accessories.

4. Turn the master control clockwise until the voltmeter on the tester indicates 15 volts. Observe the ammeter on the tester. The reading should be between 50 and 57 amperes. If the alternator performance is O.K., the trouble is in the regulator. The regulator is not serviceable. It must be replaced if it is not working properly.

5. Return the engine speed to idle before releasing the master control knob.

If the alternator output is not O.K. with the regulator bypassed, the problem is in the alternator. It will be necessary to remove the alternator from the vehicle and perform the necessary bench tests to locate the defect.

An output of 2 to 8 amperes below minimum specifications usually indicates an open diode rectifier. An output of approximately 10 to 15 amperes below minimum specifications usually indicates a shorted diode rectifier. An alternator with a shorted diode will usually whine, which will be most noticeable at idle speeds.

FIELD CIRCUIT TESTS—ON VEHICLE

Field Voltmeter Test

1. Turn the ignition switch to OFF. Remove the wire from the regulator supply terminal.

2. Connect the tester, and make the tester knob adjustments as shown in Fig. 6, Field Voltmeter Test. Open the battery adapter switch.

If there was an ammeter discharge that stopped when the regulator supply terminal was disconnected, an ignition switch or wiring problem is indicated.

If the ammeter discharge continues (2 or more amperes) proceed as follows:

3. The voltmeter reading should be 12 volts. If there is no voltage reading, the field circuit is open or grounded. Perform the Alternator Field Ohmmeter Tests.

4. If the ohmmeter tests show that the alternator field is O.K., the regulator is shorted and should be replaced.

SERVICING AUTOLITE'S NEW

5. If the voltmeter reading in Step 3 is more than one volt but less than battery voltage, there is an indicated partial ground in the alternator field circuit.

Perform the Alternator Field Ohmmeter Tests. If the ohmmeter tests show that the alternator field O.K., replace the regulator.

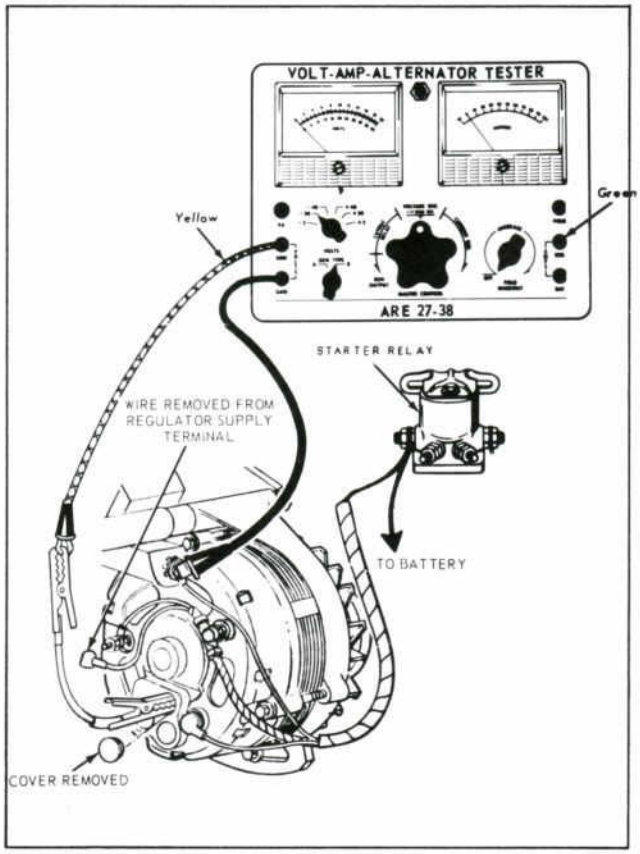


Figure 6—Field Voltmeter Test

Field Ohmmeter Test

1. Disconnect the battery ground cable from the battery.
2. Remove the regulator from the alternator.
3. Connect the leads of an ohmmeter, such as the Rotunda ARE 27-42, as shown in Fig. 7, Ohmmeter Field Circuit Tests. Set the ohmmeter multiply-by knob at 1, and calibrate the ohmmeter as indicated inside the ohmmeter cover.
4. Three conditions are checked in these tests as shown in Fig. 7: A grounded field; a shorted field and an open field.
5. If any of the above conditions are found, remove the alternator and repair or replace parts as necessary. If the alternator field circuit is O.K., replace the regulator.

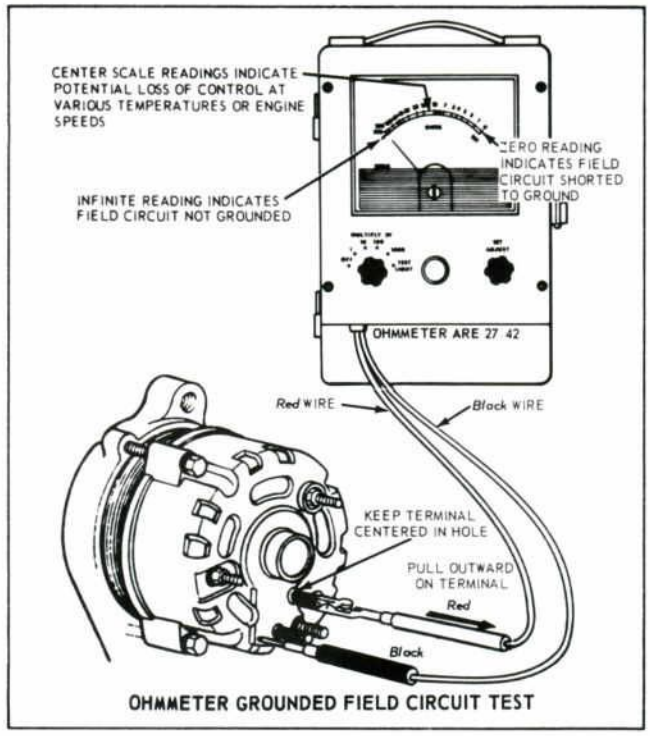


Figure 7—Ohmmeter Field Circuit Tests

DIODE TEST—ON BENCH

Disassemble the alternator and disconnect the diode assembly from the stator and make the test connections as shown in Fig. 8.

To test one set of diodes contact one probe to the diode plate as shown and contact each of the three stator lead terminals with the other probe. Reverse the probes and repeat the test. Test the other set of diodes in the same way.

All 6 tests should show a low reading of approximately 60 ohms in one direction and infinite reading (no needle movement) with the probes reversed. Be sure to use the Rotunda ohmmeter with the multiply-by knob at 10, and calibrate the ohmmeter as indicated inside the ohmmeter cover.

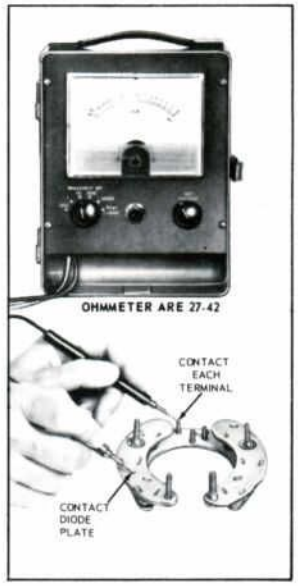
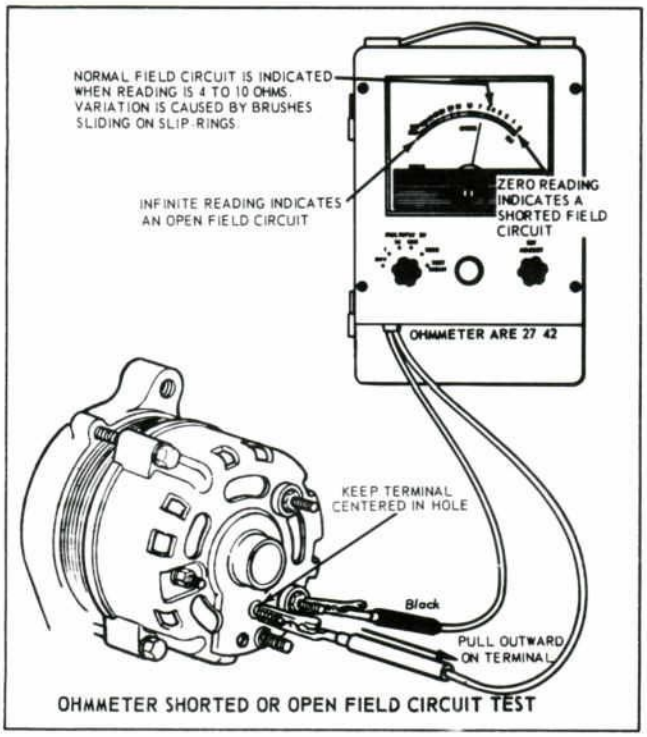


Figure 8—Diode Test

INTEGRAL ALTERNATOR REGULATOR



OPEN OR GROUNDED STATOR COIL TESTS—ON BENCH

These tests are made to determine if the stator coil is open or grounded. Disassemble the stator from the alternator and rectifier assembly for these tests.

Open Stator Test

Set the (Rotunda) ohmmeter multiply-by knob at 1. Connect the ohmmeter probes between each pair of stator leads. If the ohmmeter does not show equal readings between each pair of stator leads, the stator is open and must be replaced.

Grounded Stator Test

Set the (Rotunda) ohmmeter multiply-by knob at 1000. Connect the ohmmeter probes between one of the stator leads and the stator core. Be sure that the test lead makes a good electrical connection to the core. The ohmmeter should not show any continuity (no reading); if it does, the stator winding is grounded and must be replaced.

MAJOR REPAIR OPERATIONS

When disassembling an alternator with an integral regulator, remove the regulator from the alternator first. Figures 9 through 12 show changes in the alternator that is used with an integral regulator.

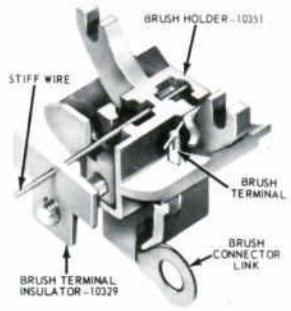


Figure 9—Brush Holder Assembly

Figure 10—Brush Lead Positions

Figure 11—Stator Lead Connections

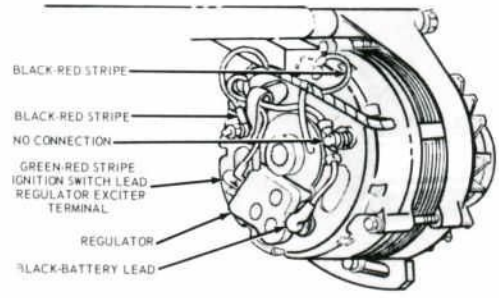


Figure 12—Alternator Mounting and Wiring Connections

SERVICING NEW

1969 Mustang, Fairlane, Cougar and Montego models with the 351 2V & 4V engines use a new FMX automatic transmission. It's basically the same as the FMX used in 1968 Ford models, and most service procedures still apply. This article covers the important service changes.

MANUAL LINKAGE ADJUSTMENT

Column Shift

New shift linkage is used on 1969 Ford, Fairlane, and Montego models (Fig. 1). However, it is adjusted the same as 1968 linkage.

1. Place the selector lever in the "D" position, tight against the stop.
2. Loosen the nut at point "A" enough to permit column shift lever to slide on the shift rod (Fig. 1).
3. Shift the manual lever at the transmission into the "D" detent position, third from the rear.
4. Make sure the selector lever has not moved from the "D" stop, then tighten the nut at point "A" to 10-20 ft-lbs.
5. Check the transmission operation at all selector lever detent positions.

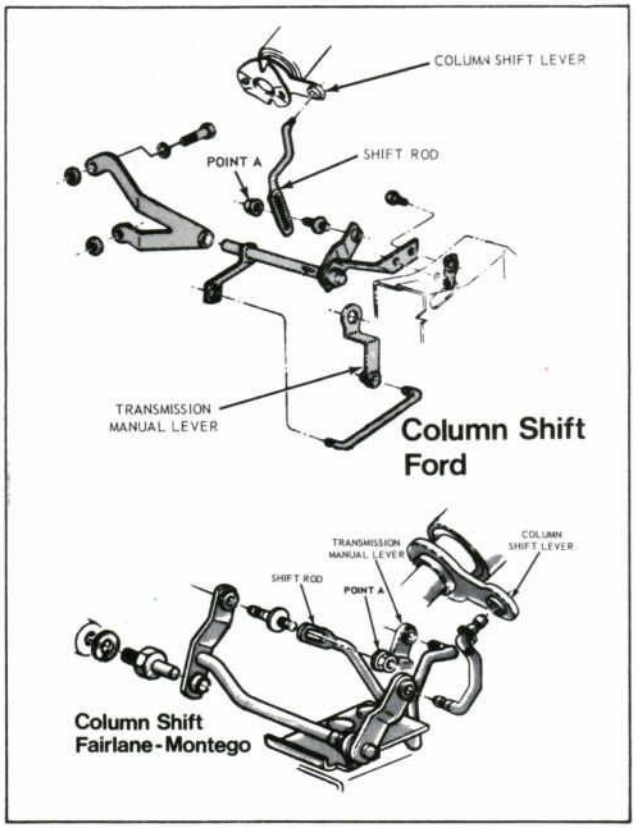


Figure 1–Column Shift Manual Linkage

Console Shift

1969 Mustang, Fairlane, Cougar and Montego employ new linkage (Fig. 2) that requires a new adjustment procedure.

1. Position the transmission selector lever in "D" position.
2. Raise the vehicle and loosen the manual lever shift rod retaining nut (Fig. 2). Move the transmission manual lever to the "D" position, fourth detent position from the back of the transmission.
3. With the transmission selector lever and manual lever in the "D" position, torque the attaching nut to 10-20 ft-lbs.
4. Check operation of the transmission in each selector lever position.

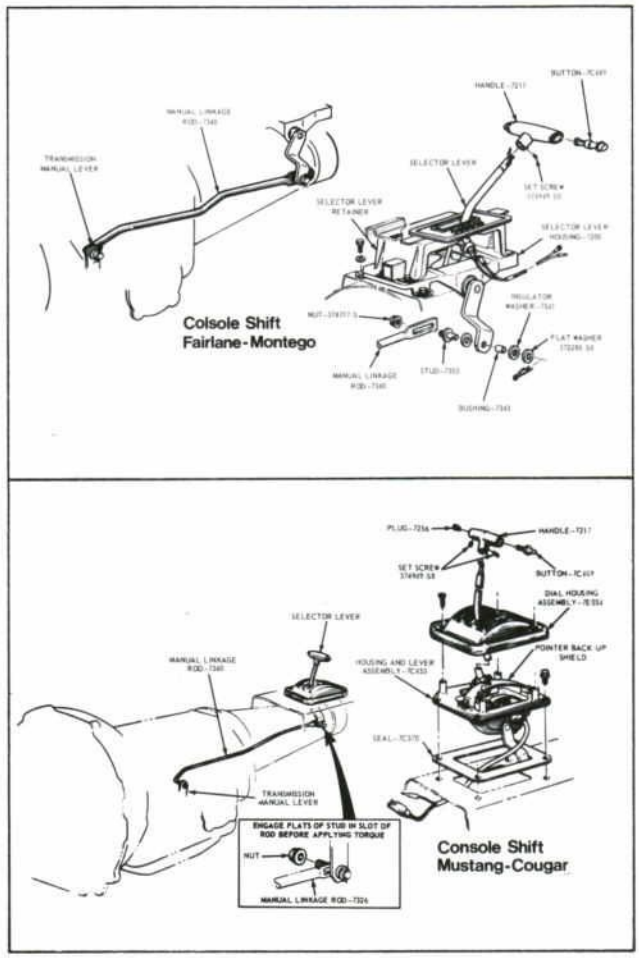


Figure 2–Console Shift Manual Linkage

FMX AUTOMATIC TRANSMISSION

NEUTRAL START SWITCH ADJUSTMENT

1969 neutral start switches have an "automatic" adjustment feature. Adjustment procedures for *column* shift models were covered in the September, 1968 issue of Shop Tips. Adjustment procedures for *console* shift models follow:

Fairlane-Montego

1. With the manual linkage properly adjusted, check the starter engagement circuit in all positions. The circuit must be open in all drive positions and closed in park and neutral.
2. Remove the selector lever handle from the lever.
3. Remove the trim panel from the top of the console.
4. Remove the cover and dial indicator as an assembly.
5. Remove the four screws that secure the selector lever retainer to the selector lever housing. Lift the retainer from the housing.
6. Loosen the two combination starter neutral and back-up light switch attaching screws (Fig. 3).
7. Move the selector lever back and forth until the gauge pin (No. 43 drill) can be fully inserted into the gauge pin holes (Fig. 3).
8. Place the transmission selector lever firmly against the stop of the neutral detent position.
9. Slide the combination starter neutral and back-up light switch forward or rearward as required, until the switch actuating lever contacts the selector lever.
10. Tighten the switch attaching screws and remove the gauge pin. Check for starting in the park position.

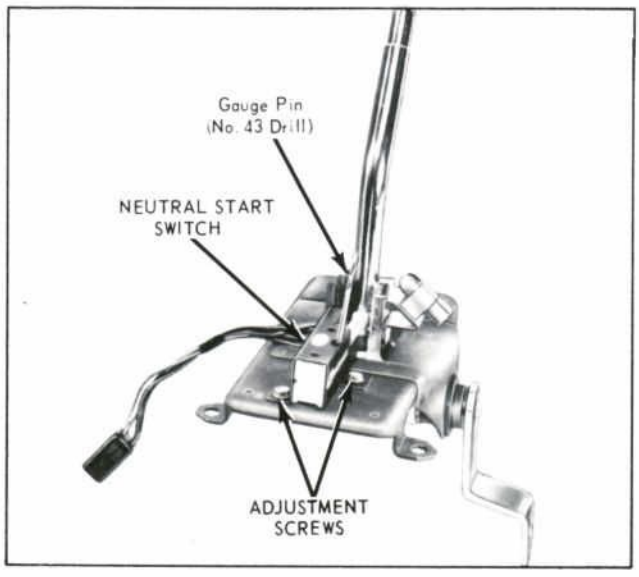


Figure 3—Console Shift Neutral Start Switch—Fairlane-Montego

11. Turn the ignition key to the ACC position and place the selector lever in the reverse position and check the operation of the back-up lights. Turn the key off.
12. Position the selector lever retainer to the selector lever housing. Install the four attaching screws.
13. Install the cover and dial indicator.
14. Install the trim panel on the top of the console. Install the selector lever handle.

Mustang-Cougar

1. With the manual linkage properly adjusted and the engine turned off, place the selector lever in the N (neutral) position. Then, shift the selector lever from neutral to 1, to P (park) and back to neutral. Shifting the selector lever through this shift pattern should adjust the switch automatically. If not, adjust it manually as follows:
2. With the selector lever in neutral, remove the selector lever handle attaching screw and remove the handle (Fig. 2).
3. Remove the dial housing attaching screws and remove the housing.
4. Remove the two pointer back-up shield attaching screws and remove the shield.
5. Remove the two screws securing the neutral start switch to the selector lever housing.
6. Lift the switch from the housing and move the actuator lever all the way to the left. Then, return the actuator lever to the neutral position as shown in Figure 4.
7. Position the neutral switch assembly to the selector lever housing, and secure with the two attaching screws.

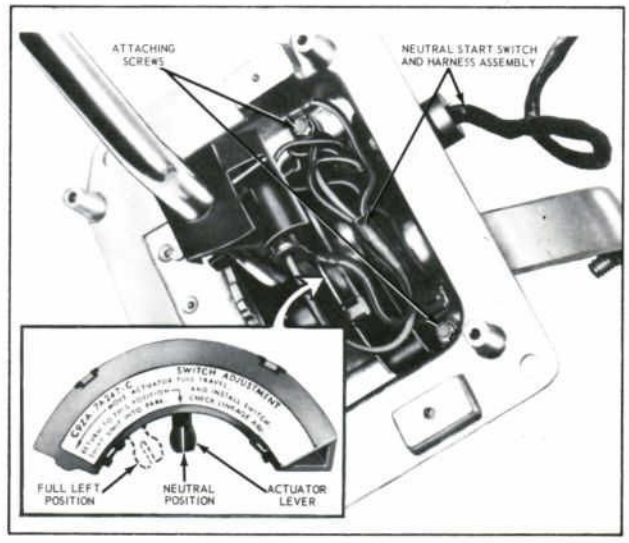


Figure 4—Console Shift Neutral Start Switch—Mustang-Cougar

8. Place the selector lever in the P (park) position and check the operation of the switch. The engine should start with the selector lever in the park position. If the engine does not start, replace the switch.

9. Install the pointer back-up shield on the housing and lever assembly.

10. Install the dial housing on the selector lever housing assemby.

11. Install the selector lever handle.

REAR BAND ADJUSTMENT

The rear band adjustment on 1969 Ford models is the same as for 1968 models. Likewise, the adjustment on 1969 Fairlane, Montego, Mustang and Cougar models is the same as 1968, except that the rear servo apply lever is pierced by an adjusting screw. This permits the rear band to be adjusted either internally or externally. Use the internal band adjustment procedures when making a normal (in-vehicle) band adjustment. Use the external adjustment procedure only when the transmission has been removed from the vehicle, or when all available internal adjustment has been taken up and a further band adjustment is required.

Internal Band Adjustment

1. Drain the fluid from the transmission. If the same fluid is to be used again in the transmission after the band adjustment, filter the fluid through a 100-mesh screen as it drains from the transmission. Re-use the fluid only if it is in good condition.

2. Remove and throughly clean the pan and filter. Discard the pan gasket.

3. Loosen the rear servo adjusting screw lock nut.

4. Pull the adjusting screw end of the actuating lever away from the servo body, and insert the Ford spacer tool shown in Fig. 5 (or similar special tool) between the servo accumulator piston and the adjusting screw. Be sure the flat surfaces of the tool are positioned squarely between the adjusting screw and the accumulator piston. The tool must not touch the servo piston and the tool handle must not touch the servo piston spring retainer.

5. Using a torque wrench with an Allen head socket (Fig. 5), tighten the adjusting screw to 24 in.-lbs. torque.

6. Back off the adjusting screw 1½ turns. Hold the adjusting screw stationary and tighten the adjusting screw lock nut securely. Remove the spacer tool.

7. Install the transmission fluid filter and clip. Install the pan using a new gasket.

8. Fill the transmission with fluid.

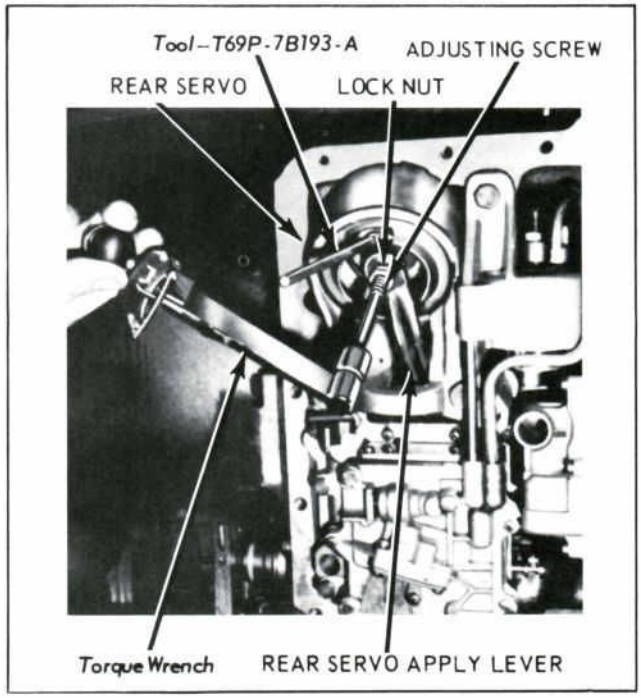


Figure 5—Adjusting Rear Band

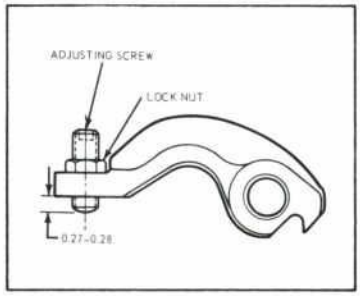
External Band Adjustment

1. With the transmission mounted in a holding fixture, loosen the internal rear servo adjusting screw lock nut (Fig. 6).

2. Set the internal adjusting screw to the dimension shown in Figure 6. Tighten the lock nut.

3. With the internal adjusting screw properly adjusted, loosen the external adjusting screw lock nut.

4. Using a torque wrench with an Allen head socket; tighten the adjusting screw to 10 ft-lbs torque.



5. Back off the adjusting screw 1½ turns.

6. Hold the adjusting screw from turning and torque the lock nut to specification.

Figure 6—Rear Servo Lever Adjusting Screw Dimension

FMX AUTOMATIC TRANSMISSION

FRONT SERVO ADJUSTMENT

All service procedures pertaining to the front servo are unchanged from 1968. However, front servo component identification and usage has been revised as shown in the chart in Figure 7.

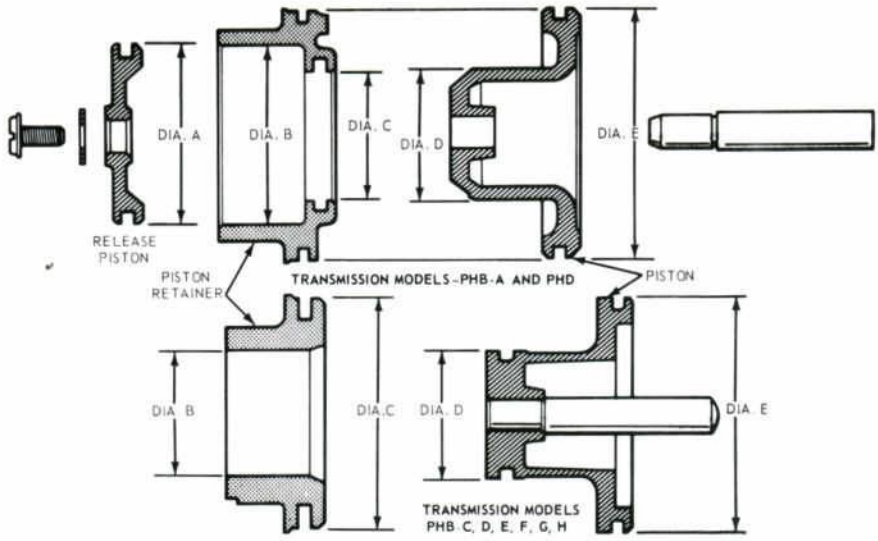


Figure 7–Front Servo Component Identification

MODELS	RELEASE PISTON	RETAINER	PISTON	DIAMETER–INCHES				
				A	B	C	D	E
PHB A	C8AP-7366-A	C8AP-7A269-C	PAN-77359-A	1.8010	1.438	2.3705	1.281	2.4915
PHB C, D, E, F, G, H	NONE	C9AP-7A269-A	C9ZP-7A260-A	.....	1.313	2.3705	1.2975	2.3585
PHD	PAN-7366-B	PAN-77364-A	PAN-77359-A	1.4090	1.4185	1.291	1.2885	2.4915

REAR CLUTCH PISTON INSTALLATION

The 1969 rear clutch piston seals have been changed to "lip-type" seals, from the "square-section rings" used in 1968. This requires a new service tool to install the piston in the rear clutch cylinder without damaging the seals. Install the piston as follows:

1. Lubricate piston seals and special Ford tool T6 8P-7D158-A (or similar tool) with clean transmission fluid.
2. Push the small fixture down over the cylinder hub.
3. Insert the piston into the large fixture with the seal toward the thin-walled end.
4. Hold the piston and large fixture together and insert as a unit into the cylinder (Fig. 8). Push down over the small fixture until the large tool stops against the shoulder in the cylinder; then push the piston down, out of the tool, until it bottoms in the cylinder.
5. Remove tools and proceed with transmission assembly.

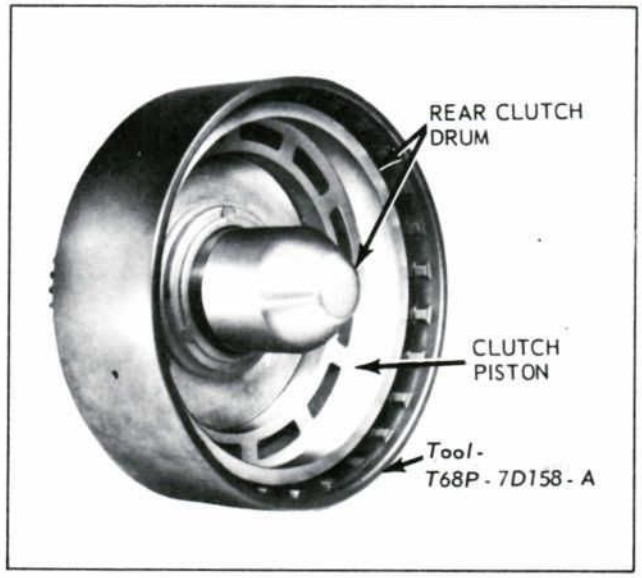


Figure 8–Installing Rear Clutch Piston

CLUTCH ADJUSTMENT

1967-68—F-100 through F-350 LIGHT TRUCK

If the clutch is improperly adjusted, hard shifting, high shift effort, or gear clashing on 1967-68 F-100 through F-350 light trucks may occur. Adjust the clutch as follows for proper operation.

Clutch Pedal Total Travel

Clutch total travel is measured from the centerline of the pedal pad to the floor mat. See Fig. 1 for specifications.

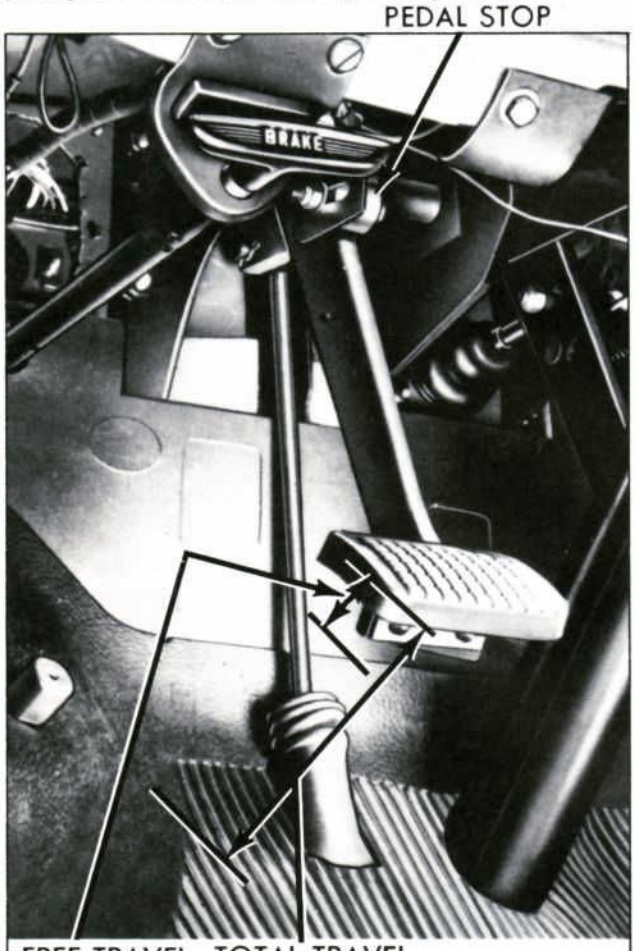


FIG. 1—MEASURING CLUTCH PEDAL TOTAL TRAVEL AND FREE TRAVEL

If the total is not up to specification, proceed as follows:

1. Loosen the through bolt that secures the pedal stop.
2. Move the pedal to the proper dimension and move the pedal stop until it contacts the pedal arm.
3. Tighten the through bolt. Again measure the total travel.

Clutch Pedal Free Travel

The clutch pedal free travel—that distance that the pedal travels before the clutch is encountered—should be 1-1/16" - 1¼" for F-100-250 4 x 2, and 1⅛" - 1⅜" for F-350 4 x 2 and F-100-250 4 x 4 from the full "up" position. See Fig. 1. If the free travel is not within specifications, the clutch release rod must be adjusted where it contacts the clutch release arm.

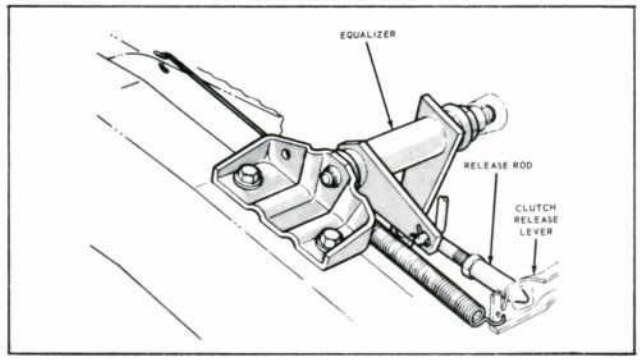


FIG. 2—CLUTCH RELEASE MECHANISM

1. Loosen the jam-nut that secures the adjustable bullet on the end of the clutch release rod. See Fig. 2.
2. Thread the bullet forward until it lightly contacts the clutch release arm. It must *not* move the arm.

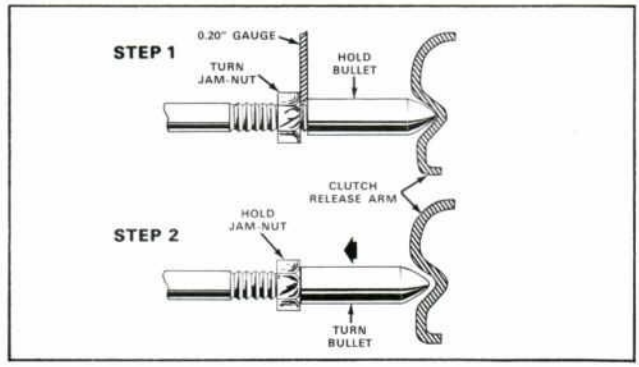


FIG. 3—ADJUSTING CLUTCH RELEASE ROD

3. With the bullet lightly contacting the clutch arm, hold a 0.20" gauge against the flat shoulder at the rear of the bullet. See Fig. 3, Step 1.
4. Gently thread the jam-nut against the gauge, so that clearance of 0.20" is obtained between the jam-nut and the bullet.
5. Now remove the gauge, hold the jam-nut from turning out of position, and thread the bullet back against the jam-nut. See Fig. 3, Step 2.
6. Tighten the jam-nut. This will give 0.20" clearance between the nose of the bullet and the clutch release arm.

With all the dimensions within specifications, the clutch operation should be acceptable. If not, check condition of clutch and associated mechanisms.

NEW ENGINE COMPRESSION CHECK

A new engine compression check procedure has been developed for all cars and trucks. It supersedes and replaces all previously published procedures and specifications. It should be performed as follows:

1. Be sure the crankcase oil is of the correct viscosity and make sure that the battery is properly charged. Operate the engine for a minimum of 30 minutes at 1200 rpm, or until the engine is at normal operating temperature. Turn the ignition switch off; then remove all the spark plugs.

2. Set the carburetor throttle plates in the wide-open position.

3. Install a compression gauge in No. 1 cylinder.

4. Disconnect the brown lead (No.1 terminal) and the red and blue lead (S terminal) at the starter relay. Install an auxiliary starter switch between the battery and S terminals of the starter switch. Crank the engine (with the ignition switch off) at least five (5) pumping strokes and record the highest reading indicated. Note the approximate number of compression strokes required to obtain the highest reading.

5. Repeat the check on each cylinder cranking the engine approximately the same number of compression strokes.

QUICK REFERENCE COMPRESSION PRESSURE LIMIT CHART

Maximum PSI	Minimum PSI	Maximum PSI	Minimum PSI
134	101	192	144
136	102	194	145
138	104	196	147
140	105	198	148
142	107	200	150
144	108	202	151
146	110	204	153
148	111	206	154
150	113	208	156
152	114	210	157
154	115	212	158
156	117	214	160
158	118	216	162
160	120	218	163
162	121	220	165
164	123	222	166
166	124	224	168
168	126	226	169
170	127	228	171
172	129	230	172
174	131	232	174
176	132	234	175
178	133	236	177
180	135	238	178
182	136	240	180
184	138	242	181
186	140	244	183
188	141	246	184
190	142	248	186
		250	187

Example

Cylinder No.	1	2	3	4	5	6	7	8
Compression Reading	134	128	140	127	122	135	100	129

The indicated compression pressures are considered normal if the lowest cylinder reading is within 75% of the highest. Refer to the following example, and the Compression Pressure Limit Chart.

Seventy-five (75%) percent of 140, the highest cylinder reading, is 105. Therefore, cylinder No. 7 being less than 75% of cylinder No. 3 indicates an improperly seated valve or worn or broken piston rings. If one, or more cylinders read low—squirt approximately one (1) tablespoon of engine oil on top of the pistons in the low reading cylinders. Repeat compression pressure check on these cylinders.

1. If compression improves considerably, the piston rings are at fault.

2. If compression does not improve, valves are sticking or poorly seated.

3. If two adjacent cylinders indicate low compression pressures and squirting oil on the pistons does not increase the compression, the cause may be a cylinder head gasket leak between the cylinders. Engine oil and/or coolant in the cylinders could result from this problem.

The quick reference chart should be used when checking cylinder compression pressures. The chart has been calculated so that the lowest reading number is 75% of the highest reading.

EXAMPLE

After checking the compression pressures in all cylinders, it was found that the highest reading obtained was 196 psi. The lowest pressure reading was 155 psi. By locating 196 in the maximum column it is seen that the lowest allowable pressure is 145 psi. Since the lowest cylinder reading was 155 psi, the engine is within specifications and the compression is considered satisfactory.

1968 SHOP TIPS...YEARLY INDEX

1969 AUTOLITE SPARK PLUG RECOMMENDATIONS

PASSENGER CARS	Standard Spark Plug	Resistor Spark Plug	Gap Setting
BRONCO			
1969 6 Cyl.	BF82	BRF82	.035"
1969 8 Cyl.	BF42	BRF42	.035"
BUICK (Special)			
1969 6 Cyl.	* AGR52		.035"
CADILLAC			
1969	* AGR32		.035"
CAMARO			
1969 6 Cyl.	* AGR52		.035"
1969 302 C.I.D.	* AR32		.035"
1969 307 C.I.D.	* AR52		.035"
1969 327, 350 C.I.D.	* AR42		.035"
1969 396 C.I.D. Head	* AGR31		.035"
CHECKER			
1969 6 Cyl.	* AGR52		.035"
1969 327, 350 C.I.D.	* AR42		.035"
CHEVELLE			
1969 6 Cyl.	* AGR52		.035"
1969 307 C.I.D.	* AR52		.035"
1969 350 C.I.D.	* AR42		.035"
1969 396 C.I.D. C.I. Head	* AGR31		.035"
CHEVROLET			
1969 6 Cyl.	* AGR52		.035"
1969 327, 350 C.I.D.	* AR42		.035"
1969 396 C.I.D. C.I. Head	* AGR31		.035"
1969 427 C.I.D.	* AGR31		.035"
CHEVY II			
1969 4 & 6 Cyl.	* AGR52		.035"
1969 307 C.I.D.	* AR52		.035"
1969 350 C.I.D.	* AR42		.035"
1969 396 C.I.D.	* AGR31		.035"
CHRYSLER			
1969 383 C.I.D. 2 Bbl.	A52	AR52	.035"
4 Bbl.	A32	AR32	.035"
1969 440 C.I.D. Std. Eng.	A42	AR42	.035"
Hi-Perf.	A32	AR32	.035"
COMET			
1969 6 Cyl.	BF82	BRF82	.035"
1969 302, 351 2 Bbl., 390 C.I.D.	BF42	BRF42	.035"
1969 351 4 Bbl., 428 C.I.D.	BF32	BRF32	.035"
CORVAIR			
1969 6 Cyl. 164 C.I.D.	* AER4		.035"
CORVETTE			
1969 350 C.I.D.	* AR42		.035"
1969 427 C.I.D. C.I. Head	* AGR31		.035"
COUGAR			
1969 302, 351 2 Bbl., 390 C.I.D.	BF42	BRF42	.035"
1969 351 4 Bbl., 428 C.I.D.	BF32	BRF32	.035"
DART			
1969 6 Cyl.	AG52	AGR52	.035"
1969 273, 318 C.I.D.	AG52	AGR52	.035"
1969 340 C.I.D.	AG22	—	.035"
1969 383 C.I.D.	A32	AR32	.035"
DODGE			
1969 6 Cyl.	AG52	AGR52	.035"
1969 273 C.I.D., 318 C.I.D.	AG52	AGR52	.035"
1969 383 C.I.D. 2 Bbl.	A52	AR52	.035"
1969 383, 440 C.I.D. 4 Bbl. Hi-Perf	A32	AR32	.035"
1969 440 C,I.D. 4 Bbl. Std.	A42	AR42	.035"
1969 340 C.I.D. 4 Bbl.	AG22	—	.035"
1969 426 C.I.D.	AG32	AGR32	.035"

PASSENGER CARS	Standard Spark Plug	Resistor Spark Plug	Gap Setting
FAIRLANE			
1969 6 Cyl.	BF82	BRF82	.035"
1969 302, 351 2 Bbl., 390 C.I.D.	BF42	BRF42	.035"
1969 351 4 Bbl., 428 C.I.D.	BF32	BRF32	.035"
FALCON			
1969 6 Cyl.	BF82	BRF82	.035"
1969 302 C.I.D.	BF42	BRF42	.035"
FORD			
1969 6 Cyl. Except Police & Taxi	BF42	BRF42	.035"
Police & Taxi	BTF6	BRF6	.030"
1969 302, 390, 429 C.I.D.	BF42	BRF42	.035"
1969 428 C.I.D.	BF32	BRF32	.035"
IMPERIAL			
1969 All	A42	AR42	.035"
LINCOLN			
1969 All	BF42	BRF42	.035"
MARK III			
1969 All	BF42	BRF42	.035"
MERCURY			
1969 390, 429 C.I.D.	BF42	BRF42	.035"
1969 428 C.I.D.	BF32	BRF32	.035"
MONTEGO			
1969 6 Cyl.	BF82	BRF82	.035"
1969 302, 351 2 Bbl., 390 C.I.D.	BF42	BRF42	.035"
1969 351 4 Bbl., 428 C.I.D.	BF32	BRF32	.035"
MUSTANG			
1969 6 Cyl.	BF82	BRF82	.035"
1969 302, 351 2 Bbl., 390 C.I.D.	BF42	BRF42	.035"
1969 351 4 Bbl., 428 C.I.D.	BF32	BRF32	.035"
OLDSMOBILE			
1969 350, 455 C.I.D. Low Comp.	* AR52		.035"
High Comp.	* AR42		.035"
1969 F85 6 Cyl.	* AGR52		.035"
1969 F85 350, 400 C.I.D.			
Low Comp.	* AR52		.035"
High Comp.	* AR42		.035"
PLYMOUTH			
1969 6 Cyl.	AG52	AGR52	.035"
1969 273, 318 C.I.D.	AG52	AGR52	.035"
1969 340 C.I.D.	AG22	—	.035"
1969 383 C.I.D. 2 Bbl.	A52	AR52	.035"
1969 383, 440 C.I.D. 4 Bbl. Hi-Perf	A32	AR32	.035"
1969 440 C.I.D. 4 Bbl. Std.	A42	AR42	.035"
1969 426 C.I.D.	AG32	AGR32	.035"
PONTIAC			
1969 400 C.I.D. 2 Bbl.	* AR52		.035"
1969 400 C.I.D. 4 Bbl.	* AR42		.035"
1969 428 C.I.D.	* AR42		.035"
RAMBLER			
1969 6 Cyl.	AG52	AGR52	.035"
1969 8 Cyl.	AG42	AGR42	.035"
TEMPEST			
1969 6 Cyl.	* AGR41		.035"
1969 350 C.I.D.	* AR52		.035"
1969 400 C.I.D.	* AR42		.035"
THUNDERBIRD			
1969 All	BF42	BRF42	.035"
VALIANT			
1969 All	AG52	AGR52	.035"

*1969 General Motors & Checker Motors vehicles use resistor as original equipment.

NOTE: GAP ALL RESISTOR SPARK PLUGS .035"

COMPLIMENTS OF

YOUR SOURCE FOR GENUINE FORD AND AUTOLITE ORIGINAL EQUIPMENT PARTS

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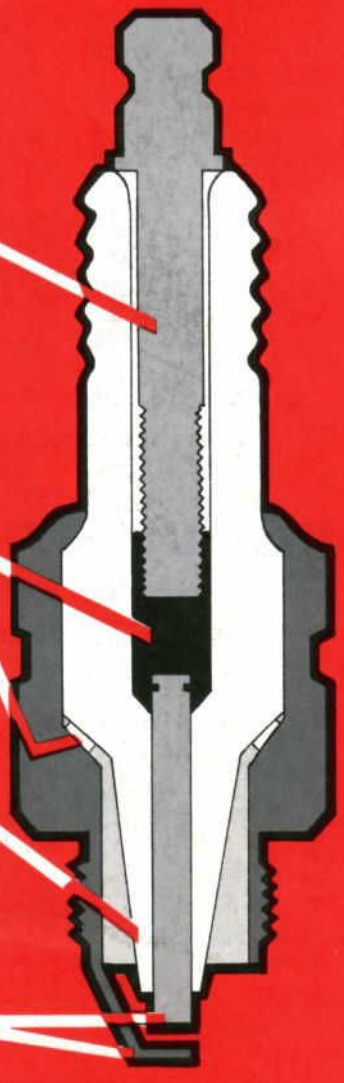

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3 Self-cleaning "Power Tip"—exploding gases burn away deposits—helps maintain peak performance.

4 Nickel-chrome alloy "Inconel" electrodes resist extreme heat and electrical erosion—plugs last longer.

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- See page 15 for Autolite spark plug usage on 1969 cars.