

Fig. 114—Installing Rear Housing Seal

Repairs

Seal Replacement

1. Tap seal out of rear housing assembly with a wood or fibre drift.
2. Clean rear housing seal surface with a suitable solvent and check surface for nicks or damage.
3. Lubricate seal outer surface (beaded area) with lubriplate or petrolatum and install with a suitable tool (fig. 114).

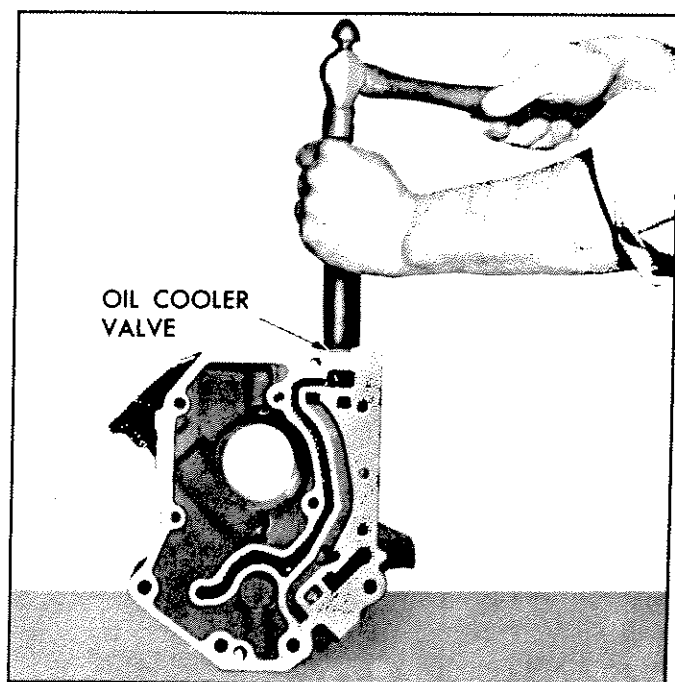


Fig. 115—Installing Oil Cooler By-Pass Valve

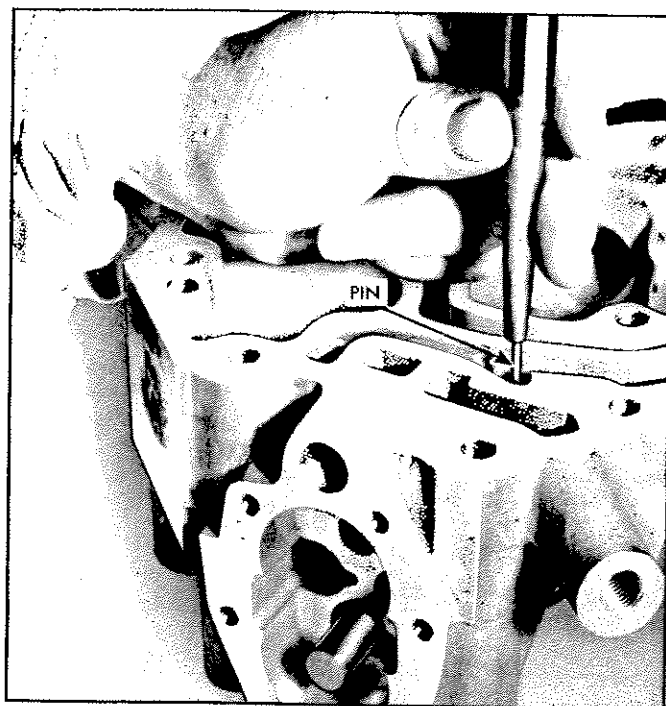


Fig. 116—Installing Pressure Regulator Groove Pin

NOTE: Seal is coated with a high melting (350°F) point cup grease between sealing lips on the inside diameter. Seal to be installed must have this cup grease, which is maintained for the life of the seal.

Oil Cooler By-Pass Valve Replacement

1. Remove oil cooler by-pass valve from the engine rear housing by catching the inner edge of the valve with a suitable hook or small screw driver.
2. Install a new oil cooler by-pass valve with the spring down (fig. 115).

Housing Replacement

When replacing the engine rear housing as a new unit, certain operations are required as outlined below.

1. Install groove pin (fig. 116) which holds oil pump pressure regulator valve in place (if so equipped).
2. Install oil pump gallery plug flush with the counter-bore using sealing compound (fig. 117).
3. Install a new rear housing seal as previously outlined.
4. Install distributor holding stud to a height of 7/8", measured from distributor pad on engine rear housing (fig. 114).

FLYWHEEL HOUSING

Cleaning and Inspection

1. Wash in cleaning solvent and dry with compressed air.
2. Inspect gasket surfaces for nicks or scratches.

Seal Replacement

1. Tap seal out of flywheel housing with a wood or fibre drift.
2. Clean flywheel housing seal surface with a suitable solvent and check this surface for nicks or damage.

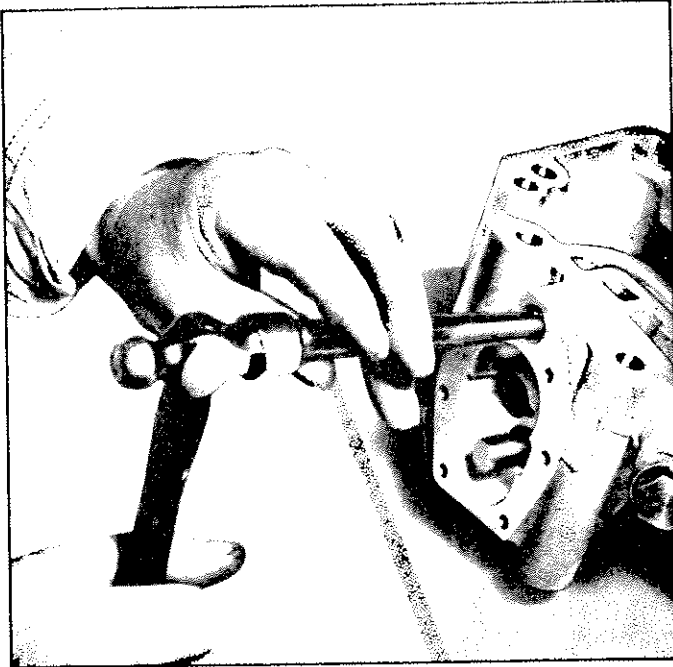


Fig. 117—Installing Oil Gallery Plugs

3. Lubricate seal outer surface (beaded area) with lubriplate or petrolatum and install with Tool J-21768 used with Tool J-8092 (fig. 118).

CRANKSHAFT

Cleaning and Inspection

1. Wash crankshaft in solvent and dry with compressed air.
2. Measure dimensions of main bearing journals and

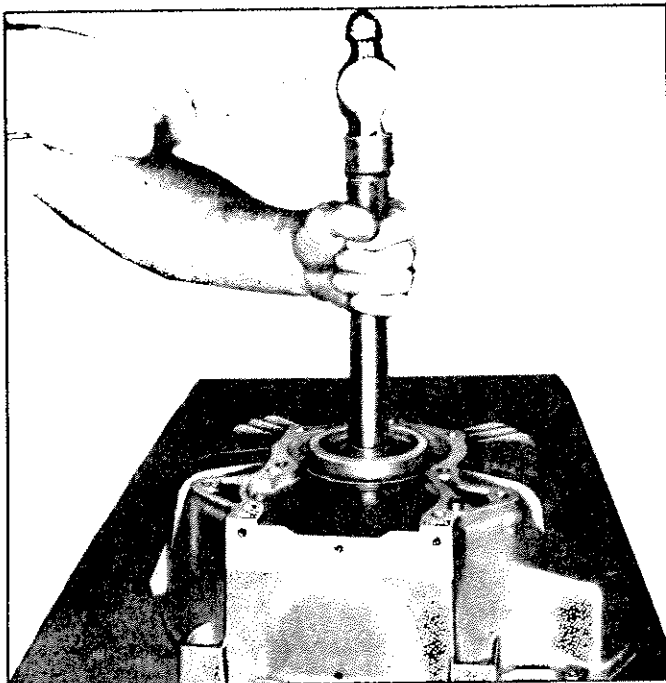


Fig. 118—Installing Flywheel Housing Seal

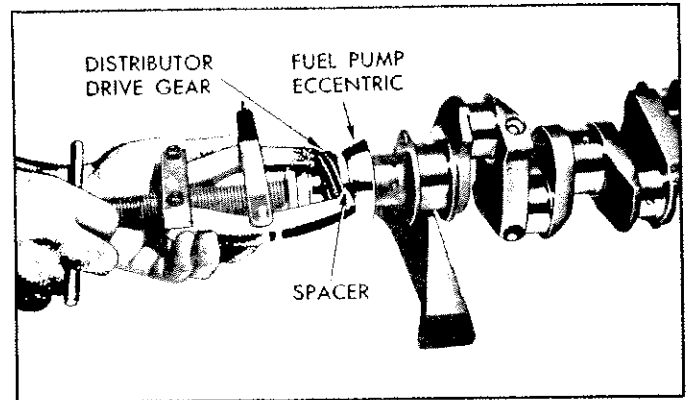


Fig. 119—Removing Distributor Gear

crankpin with a micrometer for out-of-round, taper or undersize (see specifications).

3. Check crankshaft for run-out by supporting at the front and rear main bearing journals in "V" blocks and check at the front and rear intermediate journals with a dial indicator (see specifications).
4. Replace or recondition the crankshaft if out of specifications.

Disassembly

NOTE: Crankshaft end thrust is taken at the rear bearing and crankshaft rear journal flange surfaces.

1. Remove distributor drive gear with Tool J-7112-1 with adapter Tool J-7112-2 (fig. 119).
2. Remove spacer and fuel pump eccentric.

NOTE: Be sure Tool J-7112-1 is on distributor gear solidly, so gear will not be damaged during removal operation.

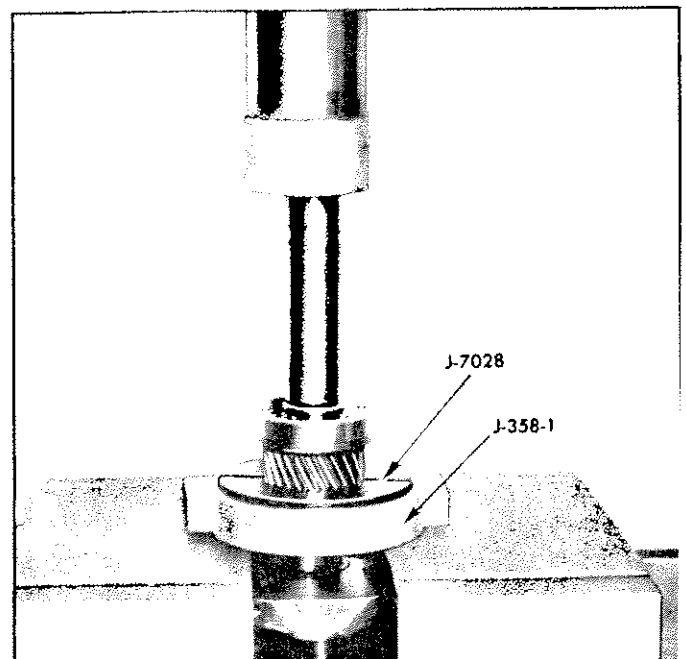


Fig. 120—Removing Crankshaft Gear

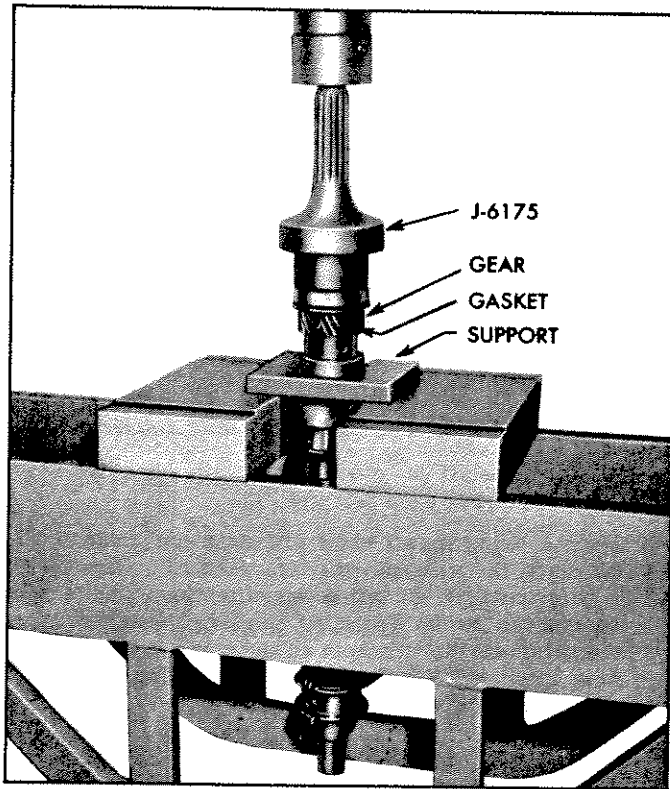


Fig. 121—Installing Crankshaft Gear

3. Remove crankshaft gear by placing each half of Tool J-7028 under gear.
4. Install crankshaft with Tool J-7028 into Tool J-358-1 on a hydraulic press (fig. 120).
5. Remove gear from crankshaft using a small piece of round steel to press crankshaft out of crankshaft gear, then remove and discard gasket.

Assembly

1. Place crankshaft in a hydraulic press and firmly support crankshaft between front crankshaft throw and front journal (fig. 121).

NOTE: Since the crankshaft gear to crankshaft uses a high press tolerance, a hydraulic press is required for removal and installation.

2. Install new gasket on crankshaft, then lubricate crankshaft with hypoid lubricant, and install woodruff key in shaft keyway.
3. Install crankshaft gear and press into place, using Tool J-6175.
4. Install woodruff keys (two) on rear end of crankshaft (Engine Rear Housing End), one for the fuel pump eccentric and distributor drive gear and the other for the crankshaft pulley. Position fuel pump eccentric and spacer on crankshaft. Lubricate crankshaft and distributor drive gear with engine oil and using Tool J-5590, install distributor drive gear until it bottoms. Install oil slinger with concave side away from distributor drive gear.

MAIN BEARINGS

Main bearings are of the precision insert type and do not utilize shims for adjustment. If clearances are

found to be excessive a new bearing, both halves, will be required. Bearings are available in standard size, .001", .002" and (No. 4 only) .003" undersize for use with new and used standard size crankshafts, and in .010" and .020" undersize for use with reconditioned crankshafts.

Inspection

Whenever the crankcase is parted, the bearing inserts and the crankshaft journals should be inspected.

If upon inspection bearing shows evidence of wear or fatigue, both halves should be replaced. Never should one-half be replaced without replacing the other half.

If the running clearance of a bearing is too great with used inserts, it will be necessary to install both bearing halves. Should this become necessary, the crankshaft journal should be checked with a micrometer for out-of-round, taper or undersize dimensions. Experience has shown that clearance increase from wear in main bearings is not only due to bearing wear, but is also due in part to crankshaft journal wear.

Checking Clearance

To obtain the most accurate results with Plastigage, (or its equivalent) a wax-like plastic material which will compress evenly between the bearing and journal surfaces without damaging either surface, certain precautions should be observed. All crankcase bolts must be torqued to specifications. The crankshaft journals and bearings must be wiped clean of oil and crankcase split line surfaces must be free of nicks or foreign matter.

1. Remove one-half of the crankcase, while the other is supported on its side, wipe oil from journal and bearings with a soft clean cloth.
2. Place a piece of gauging plastic the full width of the bearing parallel to the crankshaft on the journal (fig. 122).
3. Install other half of crankcase with bearings and evenly torque all crankcase bolts to specifications.

CAUTION: Do not rotate the crankshaft while the gauging plastic is between the bearing and journal.

4. Remove one-half of crankcase. The flattened gauging plastic will be found adhering to either the bearing shells or journals. On the edge of gauging plastic packing envelope there is a graduated scale which is correlated in thousandths of an inch.

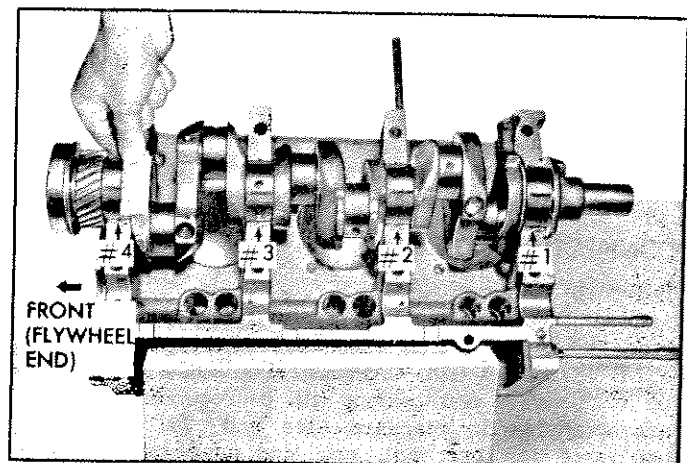


Fig. 122—Measuring Gauging Plastic on Journal

- Without removing the gauging plastic, check its compressed width (at the widest point) with the graduations on the envelope (fig. 122).

NOTE: Normally, main bearing journals wear evenly and are not out-of-round. However, if a bearing is being fitted to an out-of-round journal be sure to fit to the maximum diameter of the journal. If the bearing is fitted to the minimum diameter of the journal and the journal is out-of-round .001", interference between the bearing and journal will result in rapid bearing failure. If the flattened gauging plastic tapers toward the middle or ends, there is a difference in clearance indicating a taper, low spot or other irregularity of the bearing or journal. Be sure to measure the journal with a micrometer if the flattened gauging plastic indicates more than .001" difference.

- If the clearance is not within specifications, replace the bearing.

CAUTION: Do not install No. 4 main bearing in No. 2 or No. 3 bearing locations. The No. 4 main bearing halves are .0015" thicker than No. 2 and No. 3 main bearings at the ends which are located at the top half of the crankcase and are thinner by the same amount at the opposite ends. This has the effect of lowering the center line of the bearing .0015". The No. 4 main bearing is identified by a brown dye on edges of the bearing shell.

REPLACEMENT BEARINGS

If clearance with gauging plastic is	Install bearing sets
.0010	.000 (Std.)
.0015	.001 U/S
.0020	.001 U/S
.0025	.002 U/S
.0030	.002 U/S
.0035	.003 U/S
.0040	.003 U/S
If these undersize bearings do not produce the proper clearance, it will be necessary to regrind the crankshaft journal for use with the next undersize bearing.	

- Proceed to each bearing. After all bearings have been checked and installed, rotate the crankshaft to see that there is no excessive drag.

CONNECTING ROD BEARINGS

Inspection

Connecting rod bearings are of the precision insert type and do not utilize shims for adjustment. DO NOT FILE RODS OR ROD CAPS. If clearances are found to be excessive a new bearing will be required. Bearings are available in standard size and .001" and .002" undersize for use with new and used standard size crankshafts, and in .010", .020" and .030" undersize for use with reconditioned crankshafts.

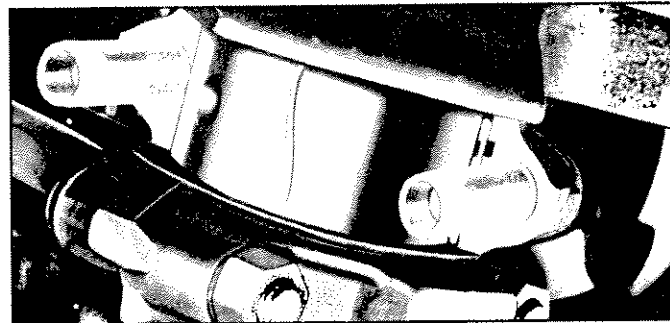


Fig. 123—Gauging Plastic on Crankpin

Checking Clearance

NOTE: Install a piece of plastic hose with 5/16" I.D. over each bolt (fig. 122).

- Wipe bearing insert shell and crankpin clean of oil.
- Measure the crankpin for out-of-round or taper with a micrometer. If within specifications and a new bearing is to be installed, measure the maximum diameter of the crankpin to determine new bearing size required. If not within specifications replace or recondition the crankshaft.
- Place a piece of Plastigage or its equivalent the full width of the bearing or crankpin, parallel to the crankshaft (fig. 123).

NOTE: If a bearing is being fitted to an out-of-round crankpin, be sure to fit to the maximum diameter of the crankpin. If the bearing is fitted to the minimum diameter and the crankpin is out-of-round .001", interference between the bearing and crankpin will result in rapid bearing failure.

- Reinstall the bearing cap and evenly torque the nuts to specifications.

CAUTION: Do not turn crankshaft with the gauging plastic installed.

- Remove the bearing cap and without removing gauging plastic, check its width at the widest point with the scale on the gauging plastic envelope (fig. 124).
- If the clearances are not within specifications, replace the bearing with the proper undersize bearings.

NOTE: The insert bearing shells are not adjustable and no attempt should be made to adjust by filing the bearing caps.

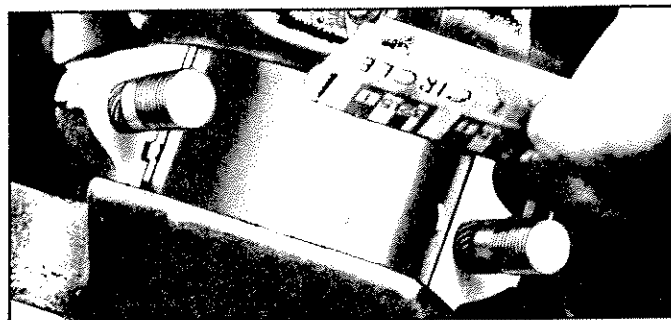


Fig. 124—Measuring Gauging Plastic

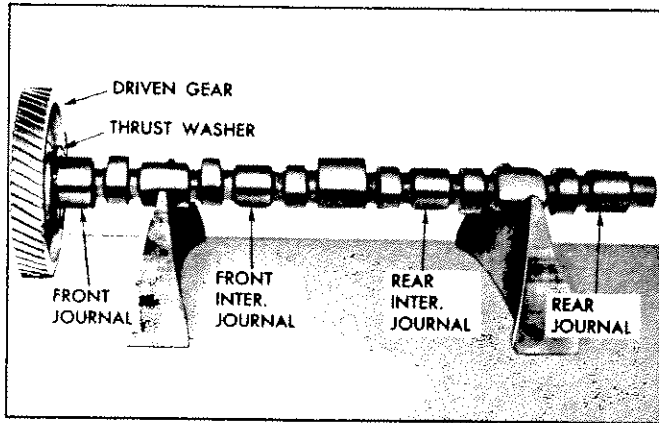


Fig. 125—Checking Camshaft Alignment

7. Rotate the crankshaft after bearing adjustment to be sure the bearings are not too tight.

CAMSHAFT AND TIMING GEAR

Inspection

NOTE: Each exhaust cam lobe serves two exhaust lifters, one on each bank.

1. Check the journals with a micrometer for an out-of-round condition. If the journals exceed .001" out-of-round, the camshaft should be replaced.
2. Check camshaft alignment. The best method is by use of "V" blocks and a dial indicator. The dial indicator will indicate the exact amount the camshaft is out of true. If it is out more than .002" dial indicator reading, the camshaft should be replaced (fig. 125).

NOTE: Camshaft journal clearance should be .0015" to .0035" (new) and .002" to .004" (used). If camshaft clearance is beyond these limits either the crankcase or camshaft should be replaced.

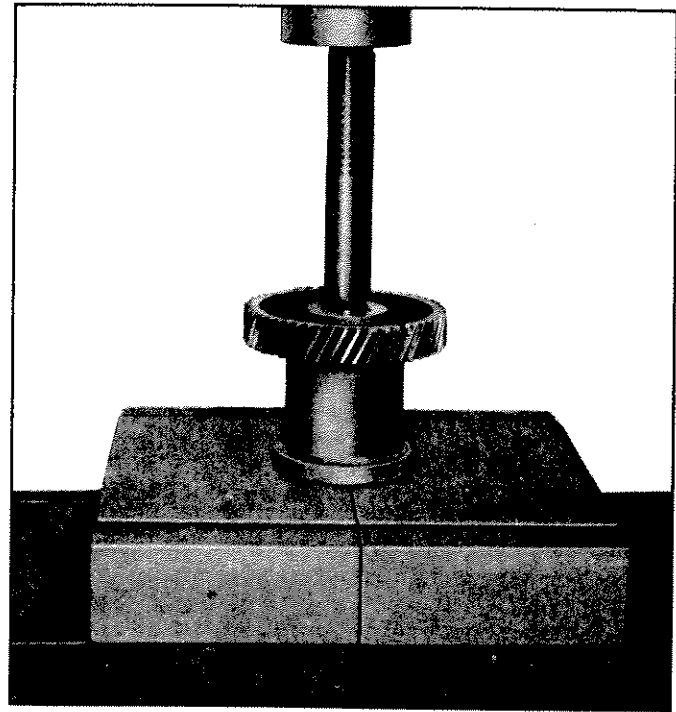


Fig. 126—Removing Camshaft Gear

Disassembly

1. Install Tool J-971 under camshaft gear and place assembly in an arbor press to remove camshaft gear (fig. 126).
2. Remove camshaft gear then remove woodruff key and thrust washer.

Assembly

1. Firmly support shaft at back of the front journal in an arbor press.
2. Place thrust washer over end of shaft, and install woodruff key in shaft keyway.
3. Lubricate camshaft with hypoid lubricant. Install camshaft gear on camshaft and press into place.

IGNITION SYSTEM

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GENERAL DESCRIPTION

The distributor and spark plugs are the only ignition system components that require periodic service. The remainder of the ignition system requires only periodic inspection to check operation of the units, tightness of the electrical connections, and condition of the wiring. When checking the coil, test with a reputable tester.

Distributors are equipped with a cam lubricator and should have the lubricator replaced at the same time the contact point set is replaced. It is not necessary to lubricate the breaker cam when using a cam lubricator however, the breaker cam should be wiped clean and lightly lubricated when installing a new lubricator. Do not attempt to lubricate the element - Replace when necessary. When installing a new lubricator, adjust its position so the circumference of the lubricator just touches the lobe of the breaker cam.

Distributor shaft lubrication is accomplished by a reservoir of lube around the mainshaft in the distributor body.

The distributor used on the turbo-supercharged engines is different from other engine model distributors in that a pressure retard unit replaces the ordinary advance unit. This unit retards the spark during the time the manifold is pressurized, partially opposing centrifugal advance at high engine rpm. The curve is as shown in Figure 1i.

Service operations are the same as on regulator distributor except for those operations relating to the vacuum advance unit.

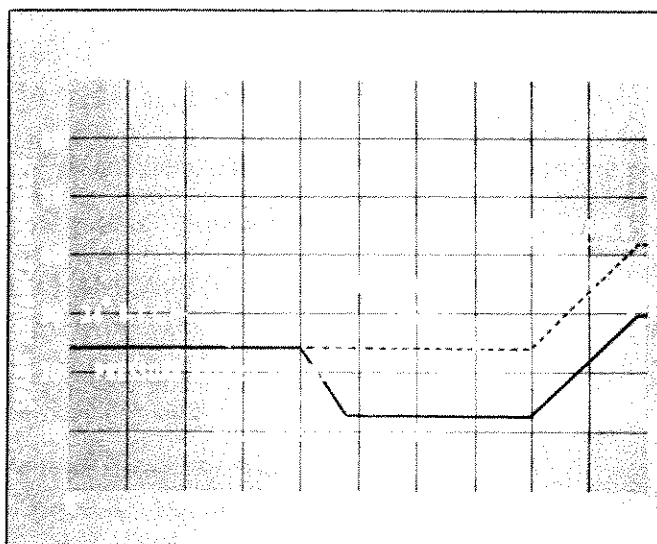


Fig. 1i—Distributor Spark Curve

Spark plugs - should be removed, inspected cleaned and regapped at tune-up. Defective plugs should be replaced see Servicing of Units Off the Vehicle.

MAINTENANCE AND ADJUSTMENT

CONTACT POINT REPLACEMENT

Refer to Figures 2i through 4i

1. Release distributor cap hold-down screws, remove cap and place it out of work area.
2. Remove rotor and dust shield.
3. Pull primary and condenser lead wires from contact point quick-disconnect terminal (fig. 2i).
4. Remove contact set attaching screw, lift contact point set from breaker plate (fig. 2i).
5. Clean breaker plate of oil smudge and dirt.
6. Place new contact point assembly in position on breaker plate, install attaching screw.

CAUTION: Carefully wipe protective film from point set prior to installation.

NOTE: Pilot on contact set must engage notching hole in breaker plate.

7. Connect primary and condenser lead wires to quick disconnect terminal on contact point set.
8. Check and adjust points for proper alignment and breaker arm spring tension (fig. 3i). Use an aligning tool to bend stationary contact support if points need alignment.
9. Set point opening (.019" for new points) (fig. 4i).
10. Rotate cam lubricator 90° (fig. 2i).

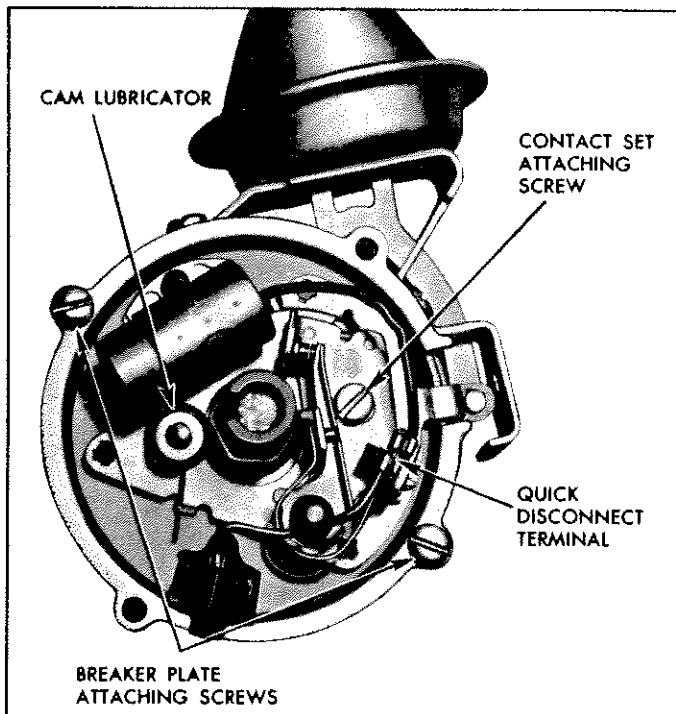


Fig. 2i—Breaker Plate and Attaching Parts

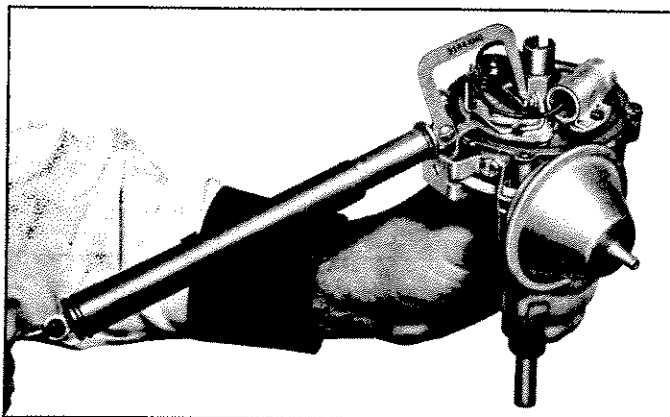


Fig. 3i—Checking Breaker Arm Spring Tension

11. Reinstall dust shield, rotor, position and lock distributor cap to housing.
12. Check and set ignition timing. (See Engine Tune-Up, Section 7.)

CONDENSER REPLACEMENT

Refer to Figure 2i

1. Release distributor cap hold-down screws, remove cap and place it out of work area.
2. Remove rotor and dust shield.
3. Disconnect condenser lead wire from contact point quick disconnect terminal.
4. Remove condenser attaching screw, lift condenser from breaker plate. Wipe breaker plate clean.
5. Install new condenser using reverse of procedure outlined above.

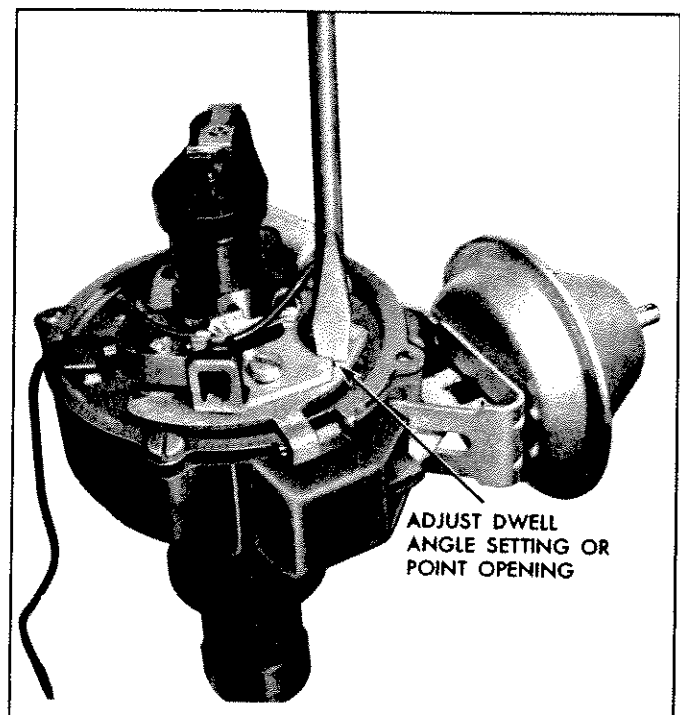


Fig. 4i—Setting Point Opening

SERVICE OPERATIONS

DISTRIBUTOR

REMOVAL

1. Release distributor cap hold-down screws, remove cap and place it out of work area.
NOTE: If necessary to remove secondary leads from distributor cap, mark position on cap tower for lead to No. 1 cylinder. This will aid in reinstallation of leads in cap.
2. Disconnect distributor primary lead from coil terminal.

3. Scratch a realignment mark on distributor in line with rotor segment (fig. 2i).
4. Disconnect vacuum line from vacuum control assembly (retard unit on turbo-charged engines), remove distributor hold-down bolt and clamp, remove distributor from engine. Note position of vacuum advance assembly relative to engine for correct reinstallation (fig. 5i).

CAUTION: Avoid rotating engine with distributor removed as ignition timing will be upset.

DISASSEMBLY

With the distributor removed from vehicle it is advisable to place it in a distributor testing machine or synchroscope.

CAUTION: When mounting the distributor in any distributor testing machine or synchroscope, extreme care must be taken not to score or otherwise damage the lower distributor shaft with the testing machine drive mechanism. A protective adapter, with bushing, available from the manufacturers of such testing machines for use with the Corvair distributor, must be used over the lower 1-3/8" of the distributor shaft.

Test the distributor for variation of spark, correct centrifugal and vacuum advance and condition of contacts. This test will give valuable information on distributor condition and indicate parts replacement which may be necessary. Check area on breaker plate just beneath breaker points. A smudgy line indicates that oil or crankcase vapors have been present between points.

Refer to Figure 6i for exploded view of distributor.

1. Remove rotor and dust shield.
2. Remove vacuum control assembly linkage cover and retaining screws, remove unit from distributor housing.
3. Disconnect primary and condenser leads from contact point quick disconnect terminal, remove contact point set attaching screw, condenser attaching screw, remove point set and condenser from breaker plate.
4. Remove breaker plate attaching screws, remove breaker plate from distributor housing (fig. 2i).

NOTE: Do not disassemble breaker plate any further.

5. Remove roll pins retaining driven gear and thrust washers to mainshaft, slide gear and washers from shaft.
6. Slide cam and mainshaft from distributor housing.
7. Remove weight cover and stop plate screws, remove cover, weight springs, weights, and slide cam assembly from mainshaft.

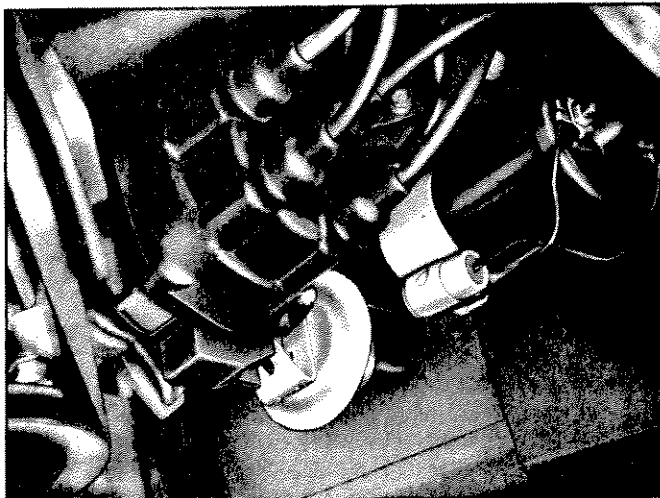


Fig. 5i—Distributor Installed

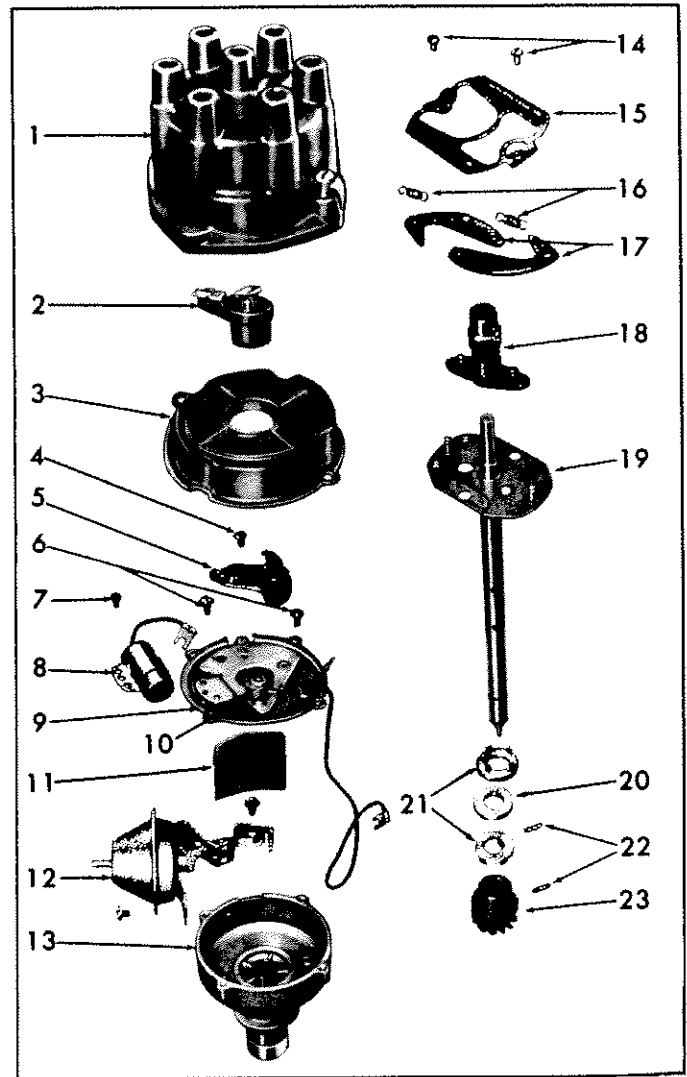


Fig. 6i—Distributor Exploded View

- | | |
|-----------------------------------|------------------------|
| 1. Cap | 13. Housing |
| 2. Rotor | 14. Weight Cover |
| 3. Dust Shield | 15. Attaching Screw |
| 4. Contact Point Attaching Screw | 16. Weight Cover |
| 5. Contact Point Assembly | 17. Weight Springs |
| 6. Breaker Plate Attaching Screws | 18. Advance Weights |
| 7. Condenser Attaching Screw | 19. Cam Assembly |
| 8. Condenser | 20. Mainshaft Assembly |
| 9. Breaker Plate Assembly | 21. Washer |
| 10. Cam Lubricator | 22. Thrust Washers |
| 11. Vacuum Advance Linkage Boot | 23. Roll Pins |
| 12. Vacuum Control Assembly | 24. Drive Gear |

CLEANING AND INSPECTION

1. Wash all parts in cleaning solvent except cap, rotor, condenser, breaker plate assembly, cam lubricator and vacuum control assembly. Degreasing compounds may damage condenser insulation or plastic insulators on the breaker plate assembly.
2. Inspect breaker plate assembly for damage or wear and replace if necessary.
3. Inspect mainshaft for wear, check its fit in the bushing in the distributor housing. If the shaft or

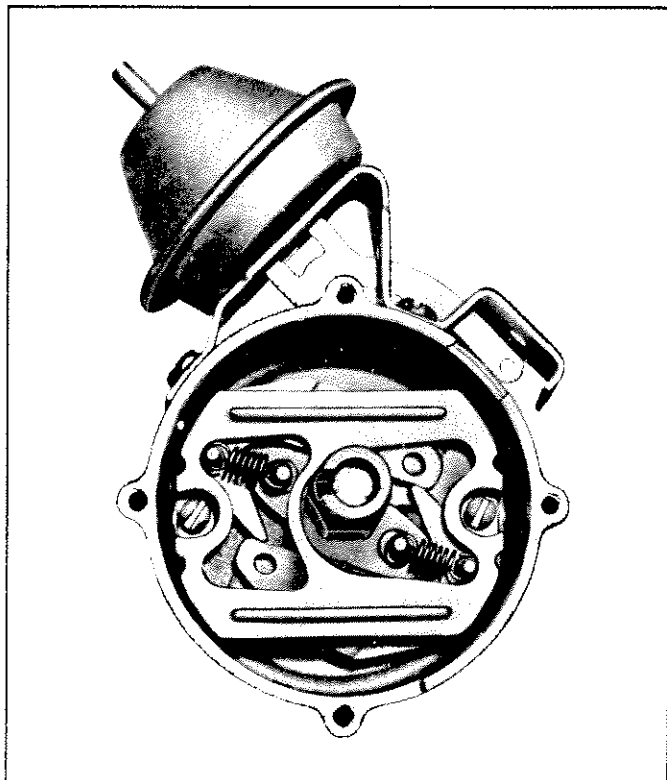


Fig. 7i—Weights, Weight Cover Installed

bushing is worn, the shaft and distributor body should be replaced.

NOTE: Distributor housing bushing not serviced separately.

4. Mount the shaft in "V" blocks and check the shaft alignment with a dial gauge. The runout should not exceed .002".
5. Inspect the governor weights for wear or burrs and free fit on their pins.
6. Inspect the cam for wear or roughness. Then check its fit on the end of the shaft. It should be absolutely free, without any looseness.
7. Inspect the condition of the distributor points (see Distributor Contact Points). Dirty points should be cleaned and badly pitted points should be replaced.
8. Test the condenser for series resistance, microfarad capacity (.18 to .23), leakage or breakdown, following the instructions given by the manufacturer of the test equipment used.
9. Inspect the distributor cap and spark plug wires for damage.

ASSEMBLY

Refer to Figure 6i for exploded view of distributor.

1. Replace cam assembly to mainshaft.

NOTE: Lubricate top end of shaft with light engine oil prior to replacing.

2. Install weights on their pivot pins, replace weight springs. Install weight cover and stop plate (fig. 7i).

3. Lubricate mainshaft, install it in distributor housing.
4. Install thrust washers and driven gear to mainshaft, insert retaining roll pins. Check to see that shaft turns freely.

NOTE: Install driven gear with mark on hub in line with rotor segment.

5. Position breaker plate assembly in housing and attach retaining screws (See Figure 2i).
6. Attach condenser and contact point set in proper location with appropriate attaching screws. Connect primary and condenser leads to contact set quick disconnect terminal.

NOTE: Contact point set pilot must engage matching hole in breaker plate.

7. Attach vacuum control or retard unit assembly to distributor housing using upper mounting holes and install vacuum advance linkage cover.
8. Install cam lubricator.
9. Install dust shield and rotor to cam assembly.

INSTALLATION—ENGINE NOT DISTURBED

1. Turn rotor approximately 1/8 turn counter-clockwise past mark previously scratched on distributor housing.
2. Work distributor down into position in engine block with distributor positioned as noted prior to removal—vacuum control unit in same relative position to engine.

NOTE: It may be necessary to move rotor slightly to start gear into mesh with crankshaft gear, but rotor should line up with the mark when distributor is down in place.

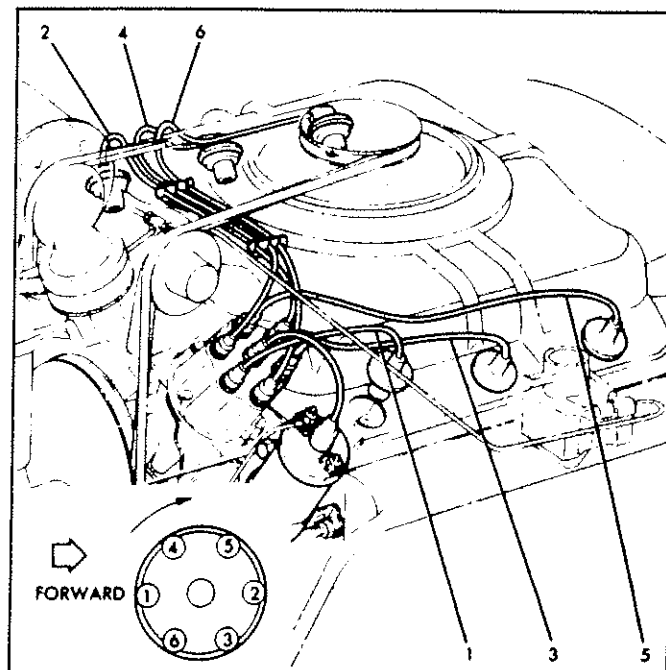


Fig. 8i—Distributor, Spark Plug Wires Installed

3. Replace distributor hold-down clamp and bolt. Connect primary lead to coil terminal. Replace distributor cap. Also install spark plug and coil secondary wires if removed (fig. 8i).

CAUTION: Care should be used in tightening distributor cap screws to prevent cracking the cap.

NOTE: Wires must be installed as indicated to prevent cross-firing.

4. Set points and time ignition as outlined under Engine Tune-Up, Section 7.
5. Connect vacuum hose to control unit.

INSTALLATION—ENGINE DISTURBED

1. Locate Number 1 piston in firing position by either of two methods described below.
 - a. Remove Number 1 spark plug and with compression gauge on plug hole crank engine until compression is indicated in Number 1 cylinder. Continue cranking until crankshaft pulley timing notch lines up with "O" timing mark on engine rear housing or . . .
 - b. Remove right bank rocker cover and crank engine until Number 1 intake valve closes and continue to crank slowly until "O" pointer lines up with timing notch on crankshaft pulley.
2. Position distributor to opening in block in normal installed attitude.
3. Position rotor to point toward harmonic balancer of engine (with distributor housing held in installed attitude), then turn rotor clockwise approximately 1/8 turn more toward left cylinder bank and push distributor down to engage crankshaft. It may be necessary to rotate rotor slightly until crankshaft engagement is felt.
4. While pressing firmly down on distributor housing, kick starter over a few times to make sure oil pump shaft is engaged. Install hold-down clamp and bolt and snug up bolt.
5. Turn distributor body slightly until points just open and tighten distributor clamp bolt.
6. Place distributor cap in position and check to see that rotor lines up with terminal for Number 1 spark plug.
7. Install cap, check all high tension wire connections and connect spark plug wires if they have been removed (See Figure 8i). It is important that the wires be installed in their proper location in the supports.
8. Connect vacuum line to distributor and distributor primary wire to coil terminal.
9. Start engine and set timing as described under Tune-up in Section 7.

COIL REPLACEMENT

1. Disconnect ignition switch and distributor leads from terminals on coils.
2. Pull high tension wire from center terminal of coil.
3. Remove the two coil support mounting bolts or loosen friction clamp screw and remove coil.
4. Place new coil in position and install attaching bolts or tighten clamp screw.
5. Place high tension lead securely in center terminal

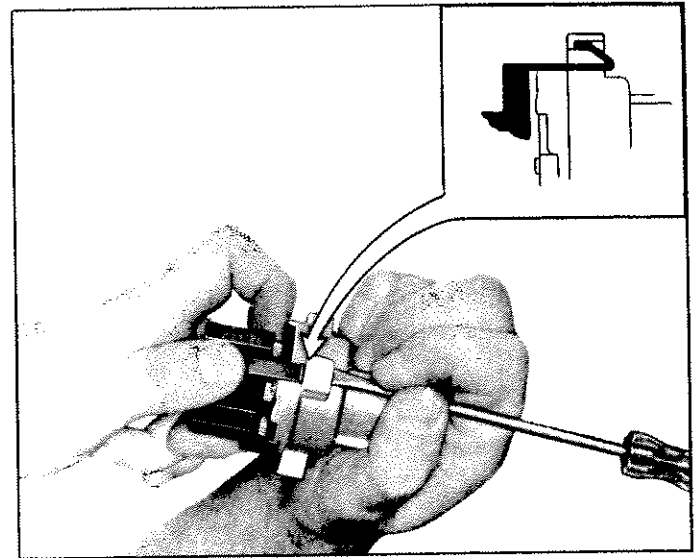


Fig. 9i—Unlocking Ignition Switch Connector

of coil and connect ignition switch and distributor primary leads to terminals on coil.

6. Start engine and test coil operation.

IGNITION SWITCH

Removal and Installation

1. Raise engine compartment lid and disconnect negative battery cable from battery.
2. Remove lock cylinder by positioning switch in "OFF" position and inserting wire in small hole in cylinder face. Push in on wire to depress plunger and continue to turn key counter-clockwise until lock cylinder can be removed.
3. Using suitable spanner wrench (Tool J-7607), remove the front attaching nut.
4. Pull the ignition switch out from under the dash and remove the wiring connectors.
5. To remove the "theft resistant" connector, the

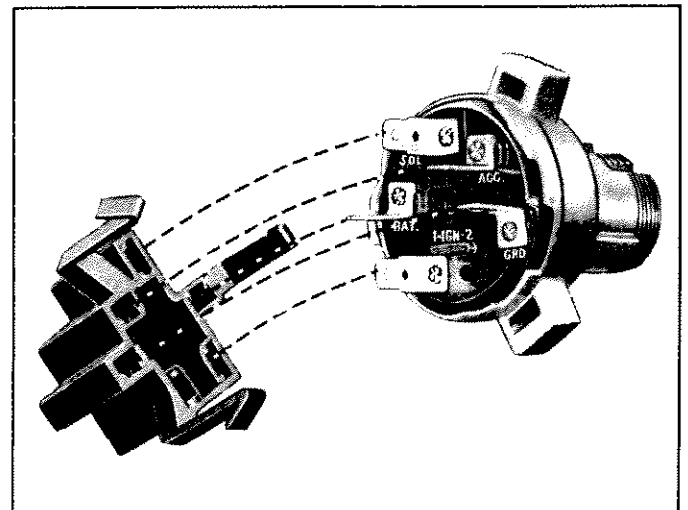


Fig. 10i—Switch and Connector Unplugged

switch must be out from under the dash as outlined in Step 4. Using a screw driver unsnap the locking tangs on the connector from their position on the switch as shown in Figure 9i. Unplug the connector.

6. Snap the connector into place on a new ignition switch (fig. 10i).
7. Place the switch into position from behind the dash and install the metal ignition switch nut.
8. Install the lock cylinder.
9. Install the battery cable to the battery and lower the engine compartment lid.

SPARK PLUGS

Removal

1. Remove spark plug wires.
2. Remove any foreign matter from around spark plugs by blowing out with compressed air.
3. Using a 13/16" spark plug socket, remove the spark plugs.

NOTE: To remove or loosen the center spark plugs, it will be necessary to disconnect or remove carburetor throttle rod and use a universal drive on spark plug socket. It may be desirable to use a special spark plug socket that is equipped with an internal "O" ring seal to grip the spark plug and avoid the possibility of dropping spark plugs into engine shroud assembly.

Cleaning and Regapping

Clean the spark plugs thoroughly, using an abrasive-type cleaner. If the porcelains are badly glazed or blistered, the spark plugs should be replaced. All spark plugs must be of the same make and number or heat range. Use a round feeler gauge to adjust the spark plug gaps to .035" (fig. 11i).

CAUTION: Before adjusting gap, file center electrode flat. In adjusting the spark plug gap, never bend the center electrode which extends through the porcelain center. Always make adjustment by bending the ground or side electrode.

Installation

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

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

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

NOTE: Do not use any "anti-seize" compound on spark plug threads as this will act as an insulator and not allow proper spark plug cooling. Be careful when installing plug to prevent gasket from falling into engine shroud assembly.

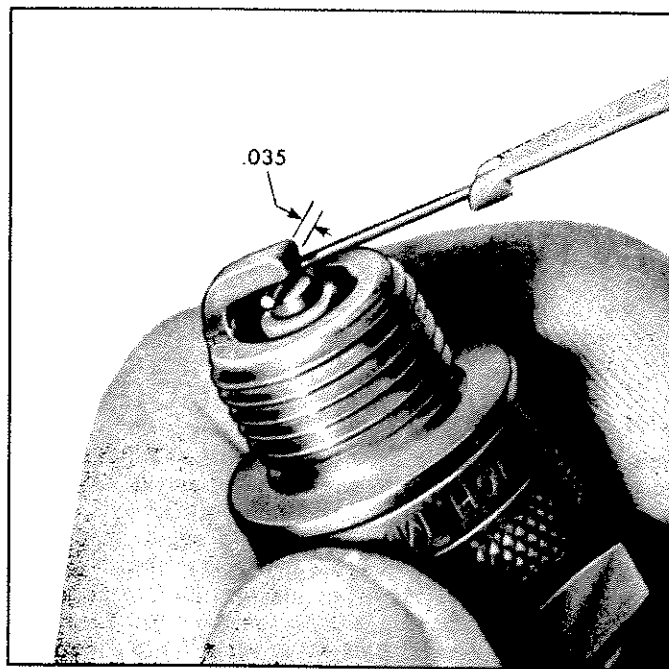


Fig. 11i—Setting Spark Plug Gap

It may be desirable to use a spark plug socket that is equipped with an internal "O" ring seal to grip the spark plug to start the plug into the cylinder head to avoid the possibility of dropping plugs into engine shroud assembly.

3. Secure wires and access covers.

NOTE: Be certain spark plug access covers are tightly in place. If as many as two are loose, all air pressure in cooling system will be lost and engine will overheat. In addition, a whistling sound may develop that could be difficult to locate.

4. Reconnect carburetor throttle rod.

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

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

Failure to install plugs properly will cause them to operate at excessively high temperatures and result in reduced operating life under mild operation or complete destruction under severe operation where the intense heat cannot be dissipated rapidly enough. Always remove corrosion deposits in hole threads before installing plugs. When corrosion is present in threads, normal

BRAKES

(SECTION 5)

Main Cylinder Diameter		Thickness	
Organic	1.0"	Primary . . . . .	.17"
Wheel Cylinder Diameter		Secondary . . . . .	.20"
Front . . . . .	.875"	Minimum Serviceable . . . . .	.030"
Rear . . . . .	.9375"		
Brake Lining (Bonded)		Length (Front and Rear)	
Width		Primary	9.01"
Front	2.5"	Secondary	9.75"
Rear	2.0"		

ENGINE

(SECTION 6)

ENGINE MECHANICAL

ENGINE			Base	Hi-Perf.	4 x 1	Turbo-Charged
GENERAL DATA:						
Horsepower @ rpm			95 @ 3600	110 @ 4400	140 @ 5200	180 @ 4000
Torque @ rpm			154 @ 2400	160 @ 2800	160 @ 3600	265 @ 3200
Type			Flat Opposed			
Number of Cylinders			6			
Bore			3-7/16"			
Stroke			2-15/16"			
No. System (Rear to Front)	Left Bank		2-4-6			
	Right Bank		1-3-5			
Firing Order			1-4-5-2-3-6			
Compression Ratio			8.25:1	9:1	9:1	8:1
CYLINDER BORE:						
Out of Round (max.)			.002"			
Taper (max.)			.005"			
Diameter (base)			3.4370"			
PISTONS:						
Clearance Limits to Cylinder	Top Land		.022"-.031"			
	Skirt		.0011"-.0017"			
Ring Groove Depth	Compression		.1785"-.1865"			
	Oil		.1717"-.1750"			
PISTON RINGS:						
Compression	Width		.064"-.065"			
	Clearance in Groove		.0017"-.004"			
	Gap		.013"-.025"			
Oil Ring	Width		.126"± .0005"			
	Clearance in Groove		.0012"-.005"			
	Gap		.015"-.055"			
PISTON PINS:						
Length			2.630"-2.650"			
Diameter			.7999"-.8002"			
Clearance	In Piston	New	.00015"-.00025"			
		Wear Limit	.001"			
	In Rod		Press Fit			

CONT'D.

ENGINE			Base	Hi-Perf.	4 x 1	Turbo-Charged
CONNECTING RODS:						
Bearing	Clearance	New	.0007"- .0027"			
		Max.	.003"			
	End Play	New	.005"- .010"			
CRANKSHAFT:						
End Play			.002"- .006"			
End Thrust Taken By			#1) Rear Main Bearing			
Main Bearing Journal	Diameter		#1 & 2 (2.0978"-2.0988")			
			#3 & 4 (2.0983"-2.0993")			
	Clearance	#1 & 2 (.0012"- .0027")				
		#3 & 4 (.0007"- .0022")				
Crankpin Journal	L. Runout (max.)	.001"				
	Taper (max.)	.001"				
	Diameter	1.799"-1.800"				
	Taper	.001"				
	Runout	.001"				
	CAMSHAFT:					
Lobe Lift Measured at Push Rod	Intake	.257"	.260"			
	Exhaust	.257"	.260"			
Journal Diameter	Front	1.440"				
	All Others	1.200"				
Journal Runout (max.)			.0015"			
VALVE SYSTEMS:						
Lifters Type			Hydraulic			
Rocker Arm Ratio			1.5:1			
Valve Lash Intake & Exhaust			1 Turn down from "NO LASH"			
Intake	Face Angle	45°				
	Seat Runout (max.)	.002"				
	Seat Angle	45°				
	Recommended Seat Width	1/32"-1/16"				
	Stem to Guide Clearance	New .001"- .0027" Used .001"- .004"				
	Lift at Valve Stem	.385"	.390"			
Exhaust	Face Angle	44°			45°	
	Seat Runout (max.)	.002"				
	Seat Angle	45°				
	Recommended Seat Width	1/16"-3/32"				
	Stem to Guide Clearance	New .0014"- .0029" Used .002"- .005"				
	Lift at Valve Stem	.385"	.390"			
Valve Springs	Outer Spring Press. and Length	Free Length	2.08"			
		Pressure lb. @ in.	78 to 86 @ 1.660"			
		Pressure lb. @ in.	170 to 180 @ 1.260"			
	Inner Spring Damper	Size	.045" x .250"			
		Type	Flat Wound			
		No. Coils	Approx. 4			
	Installed Height		1-21/32" ± 1/32"			

ENGINE COMPONENT TORQUES

Size	Usage	Torque
1/4-20	Oil Pan	85-105 in. lbs.
	Oil Pump Cover	60-80 in. lbs.
	Oil Cooler to Cylinder Head	40-60 in. lbs.
	Shroud Attachment	60-80 in. lbs.
	Valve Rocker Cover	40-60 in. lbs.
	Oil Suction Screen Pipe Clamp	30-50 in. lbs.
5/16-18	Crankcase L.H. to R.H. (One in Oil Sump).	7-13 ft. lbs.
	Crankcase Cover	7-13 ft. lbs.
	Oil Cooler Adapter to Crankcase	7-13 ft. lbs.
	Oil Filter and Delcotron Adapter	7-13 ft. lbs.
	Rear Housing	7-13 ft. lbs.
	Clutch Cover and Pressure Plate	15-20 ft. lbs.
11/32-24	Flywheel (Syn. Transmission)	40-50 ft. lbs.
	Flex Plate (P/G Transmission)	20-30 ft. lbs.
3/8-16	Oil Cooler to Adapter	8-12 ft. lbs.
	Shroud Attachment	10-20 ft. lbs.
	Skid Plate	15-20 ft. lbs.
	Flywheel or Clutch Housing	20-30 ft. lbs.
	Crankshaft Pulley to Balancer	25-35 ft. lbs.
7/16-20	Crankcase L.H. to R.H.	50-55 ft. lbs.
	Oil Filter	15-20 ft. lbs.
1/2-20	Crankshaft Pulley or Balancer	40-50 ft. lbs.
5/16-24	Connecting Rod	20-26 ft. lbs.
3/8-16	Exhaust Manifold Clamp	22-27 ft. lbs.
	Rear Mounting Bracket	40-50 ft. lbs.
3/8-16	Stud - Cylinder Head to Crankcase	10-30 ft. lbs.
	Switch - Cylinder Head Temperature	10-15 ft. lbs.
3/8-24	Cylinder Head Nut	32-38 ft. lbs.
	Valve Rocker Arm Stud	32-38 ft. lbs.
	Adjusting Nut - Valve Rocker Arm	55-125 in. lbs.
	Distributor Clamp Nut	8-12 ft. lbs.
	Sending Unit - Cylinder Head Temperature	5-10 ft. lbs.
	Switch Cylinder Head Temperature	10-15 ft. lbs.
1/2-20	Oil Pan Drain Plug	30-35 ft. lbs.
1/8-27	Oil Pressure Switch	45-65 in. lbs.
9/16-18	Oil Pressure Regulator Valve Plug	10-20 ft. lbs.
14 mm.	Spark Plug	15-20 ft. lbs.

ENGINE MOUNT TORQUES

Attaching Part	Torque
Front Mount Nuts	60-80 ft. lb.
Bracket-to-Transmission	20-30 ft. lb.
Front Mount-to-Crossmember	20-30 ft. lb.
Rear Mount Nuts	50-60 ft. lb.
Rear Mount-to-Frame	14-22 ft. lb.

CARBURETORS**(SECTION 6M)**

APPLICATION	CARBURETOR
95 H.P. Engine Syn. or P/G	7025023 *
110 H.P. Engine Syn.	7025023 *
110 H.P. Engine P/G	7025024 *
140 H.P. Engine Primary	7025023
140 H.P. Engine Secondary	7025226
All With Air Conditioning	7025025
180 H.P. Engine Turbocharged	3856713

*Not Used with Air Conditioning

Carburetor	Rochester HV			Rochester H	Carter YH
	7025023	7025024	7025025	7025026	3856713
Float Level	1-1/16"				5/8"
Float Drop	1-1/2"				2-3/8"
Pump Rod	Index Line				
Choke	2 Turns Up from Free Entry to Lever				Index
Unloader	.312"				7/16"
Fast Idle	.078"				
Vacuum Break	.180"-.195"				
Main Jet	.051"	.050"	.051"	.050"	.098"
Idle Tube	.024"				.031"
Bowl Vents	2 Internal	1 External Idle		2 Internal	1 Internal
Metering Rods					.057" .048"
Pump Discharge Jets	Two @ .022"				One @ .028"
Throttle Bore	1-1/4"				1-1/2"
Main Venturi	1"				1-3/8"

ENGINE ELECTRICAL

(SECTION 6Y)

BATTERY 1980007		
Ground	Neg	
Plates	54	
Ampere Hour	44	
GENERATOR	1100639	1100698
Application	Base	Optional
Cold Output amps	35	45
Cold Output Volts	14	14
Field Current Draw @ 12 V. 80° F	2.2-2.6	2.8-3.2
VOLTAGE REGULATOR	1119515	
Application	All*	
Voltage Regulator		
Air Gap . . . . .	.067	
Setting @ 85° F	13.8-14.8	
Point Opening . . . . .	.014	
Field Relay		
Air Gap . . . . .	.015	
Point Opening . . . . .	.030	
Closing Voltage	1.5-3.2	
STARTING MOTOR	1108306	1108307
Application	Std. Trans.	Auto. Trans.
Brush Spring Tension (oz.)	35	35
Free Speed		
Volts	10.6	10.6
Amperes	58	58
rpm	6750-10,500	6750-10,500
Resistance Test		
(Armature Locked)		
Volts	4.0	4.0
Amperes	280	280
Torque-Mounting Pad Bolts (ft.-lbs.)	20-30	20-30
Solenoid		
Hold-in Windings	10.5-12.5 Amperes @ 10V 42-49 Amperes @ 10V	
Both Windings		
IGNITION COIL		
Application	All	
Primary Resistance, ohms	1.28-1.42	
Secondary Resistance, ohms	7200-9500	
IGNITION RESISTOR		
Type	Special Wire—Part of Harness	
Resistance	1.8 ohms	
SPARK PLUGS	AC-44FF	AC-46FF
Application	110, 140 and 180 hp	95 hp
Size	14 mm.	14 mm.
Plug Gap . . . . .	.030"	.035"
Torque	15-20 lb. ft.	

*External Field Discharge Diode Circuit with Generator 1100698.

DISTRIBUTOR	1110310	1110311	1110319	1110329	1110330
Application	95 HP Std. Trans.	95 HP Powerglide	110 HP (All)	180 HP Turbo-Charged	140 HP 4 x 1 BBL
Rotation-View from Drive End	CCW	CCW	CCW	CCW	CCW
Breaker Point Gap . . .	.019" New—.016" Used				
Breaker Arm Tension . .	19-23 oz. (Measured just behind points)				
Condenser Capacity . . .	.18-23 Micro Farads				
Firing Order	1-4-5-2-3-6				
Ignition Timing @ Idle . .	6° BTDC	14° BTDC	14° BTDC	24° BTDC	18° BTC
Cam Angle (Dwell)	31°-34°				
Centrifugal Advance Start	0° @ 700 rpm	0 @ 1700 rpm	0° @ 800 rpm	0° @ 4000 rpm	0° @ 800 rpm
Intermediate	4° @ 1200 rpm				
Maximum	28° @ 4200 rpm	24° @ 4200 rpm	20° @ 4800 rpm	18° @ 4900 rpm	18° @ 2800 rpm
Vacuum Advance Start	0° @ 6" Hg	0° @ 7" Hg	0° @ 7" Hg	0° @ 2 psi*	0° @ 6" Hg
Full Advance (+Engine).	24° @ 14" Hg	24° @ 15" Hg	24° @ 15" Hg	12° @ 4.5 psi*	22° @ 14" Hg

*Retard