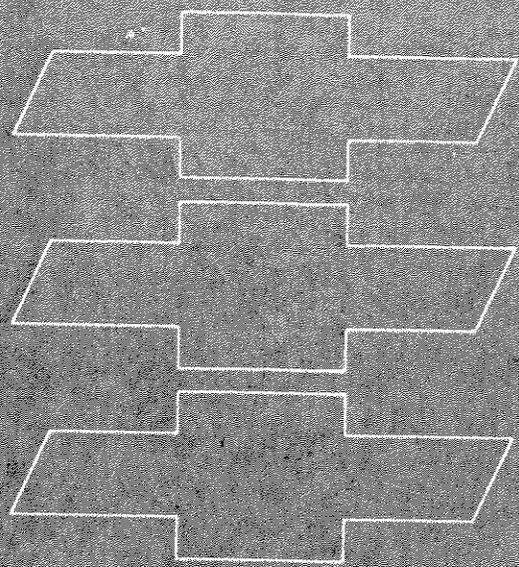
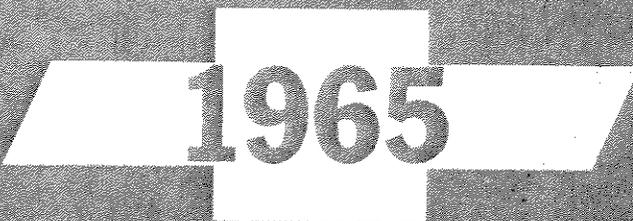
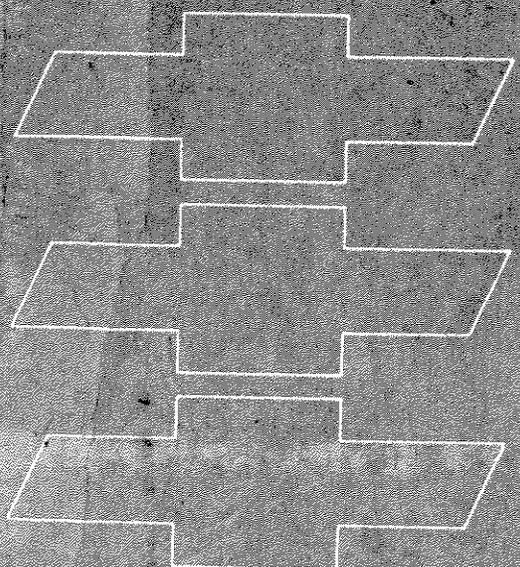


2225



CORVAIR



CHASSIS SHOP MANUAL

T37 8810 For ST59

Stop engine and remove spark plugs.

NOTE: A piece of 7/16 I.D. soft rubber or soft plastic tubing approximately 8" long may be used to remove the spark plugs after they have been loosened.

Compression

Block throttle and choke in wide open position. Hook up starter remote control cable and insert compression gauge firmly in spark plug port (fig. 1).

CAUTION: Whenever the engine is cranked remotely at the starter, with a special jumper cable or other means, the primary distributor lead must be disconnected from the negative post on the coil and the ignition switch must be in the "ON" position. Failure to do this will result in a damaged grounding circuit in the ignition switch.

NOTE: Unless special adapters are available, it will be necessary to remove carburetors to perform the compression test.

Crank engine through at least four compression strokes to obtain highest possible reading.

1 and Inspect Spark Plugs

Inspect each plug individually for badly worn electrodes, glazed, broken or blistered porcelains and replace plugs where necessary. Refer to spark plug diagnosis information Section 6Y for an analysis of plug conditions. Use new spark plug gaskets with cleaned plugs.

1 Spark Plugs and Torque to Specifications

Check Ignition System

Replace brittle or damaged spark plug wires. Install all wires to proper spark plug.

Tighten all ignition system connections.

Replace or repair any wires that are frayed, loose or damaged.

Remove distributor cap, rotor, and dust shield. Clean cap and inspect for cracks, carbon tracks and burned or corroded terminals. Replace cap where necessary.

Clean rotor and inspect for damage or deterioration. Replace rotor where necessary.

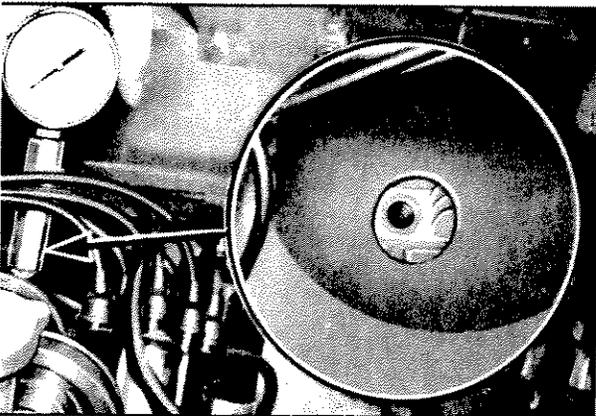


Fig. 1—Checking Compression

6. Check the distributor centrifugal advance mechanism by turning the distributor cam to see if the springs return it to its retarded position. If the cam does not return readily, the distributor must be disassembled and the cause of the trouble corrected.
7. Check to see that the vacuum spark control operates freely by turning the movable breaker plate to see if the spring returns it to the retarded position. Any stiffness in the operation of the vacuum spark control will affect the ignition timing. Correct any interference or binding condition noted.
8. Examine distributor points and clean or replace if necessary.
 - Contact points with an overall gray color and only slight roughness or pitting need not be replaced.
 - Dirty points should be cleaned with a clean point file.
 - Use only a few strokes of a clean, fine-cut contact file. The file should not be used on other metals and should not be allowed to become greasy or dirty. Never use emery cloth or sandpaper to clean contact points since particles will embed and cause arcing and rapid burning of points. Do not attempt to remove all roughness nor dress the point surfaces down smooth. Merely remove scale or dirt.
 - Replace points that are burned or badly pitted.
9. Clean cam lobe with cleaning solvent, lubricate cam lobe with "Delco Remy Cam and Ball Bearing Lubricant" or its equivalent and rotate cam lubricator wick 1/2 turn.

NOTE: Where prematurely burned or badly pitted points are encountered, the ignition system and engine should be checked to determine the cause of trouble so it can be eliminated. Unless the condition causing point burning or pitting is corrected, new points will provide no better service than the old points. Refer to Section 6Y for an analysis of point burning or pitting.
10. Adjust distributor contact point gap to .019" (new points) or .016" (used points), using a feeler gauge or dial indicator (fig. 2). Breaker arm rubbing block should be on extreme top of cam lobe during adjustment.

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

 - Check alignment of distributor points with points closed (fig. 3). Align new points where necessary, but do not attempt to align used points. Instead, replace used points where serious misalignment is observed.
 - If necessary, align points by bending fixed contact support. Use an alignment tool if available. Do not bend breaker arm.
 - After alignment, readjust point gap.
11. Make sure all distributor wire terminals are clean and tight.
12. Install dust shield, rotor and distributor cap. Press all wires firmly into cap towers.

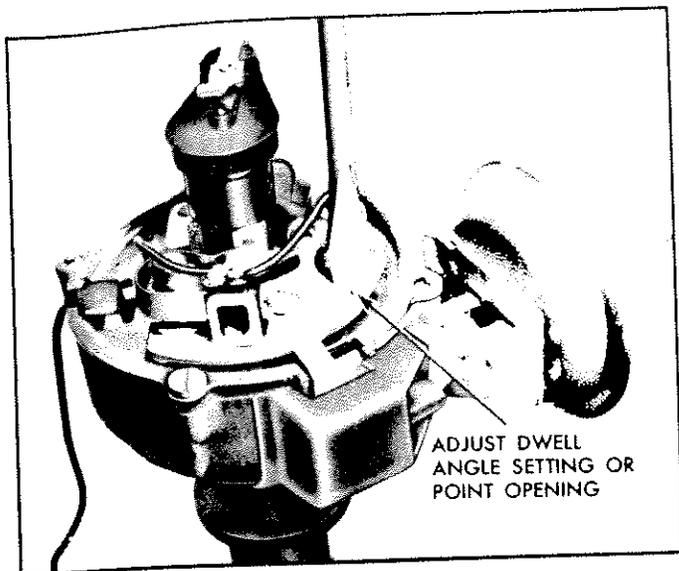


Fig. 2—Point Adjustment

NOTE: Cap must be installed with notch to vacuum advance lever opening on housing.

Service Battery and Battery Cables

Inspect battery and cables and perform necessary service on these components. See Additional Checks and Adjustments for battery tests.

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

The top of the battery should be clean and the battery hold-down bolts properly tightened. Particular care should be taken to see that the tops of batteries are kept clean of acid film and dirt. For best results when cleaning batteries, wash first with a dilute ammonia or soda solution to neutralize any acid present and then flush off with clean water. Care must be taken to keep vent plugs tight so that the neutralizing solution does not enter the cell. The hold-down bolts should be kept tight enough to prevent the battery from shaking around in the holder, but they should not be tightened to the point where the battery case will be placed under a severe strain.

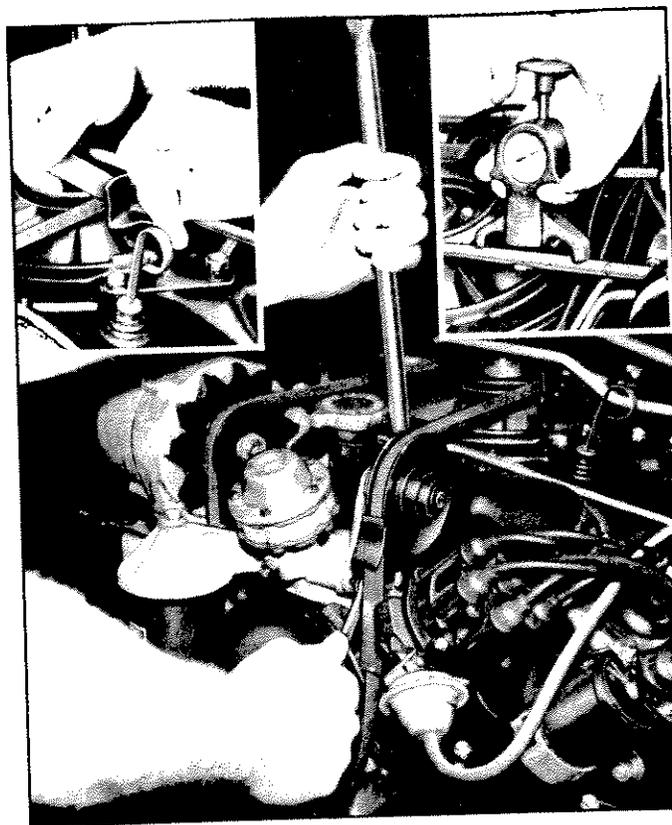


Fig. 4—Blower Belt and Guide Adjustment

To insure good contact, the battery cables should be tight on the battery posts and fully bottomed. To remove or install spring type cable clamps, a suitable pliers must be used to spread the ends of the clamps. Oil battery terminal felt washer. If the battery posts or cable terminals are corroded, the cables should be cleaned separately with a soda solution and a wire brush. It is NOT recommended that the battery posts and cable clamps be greased prior to installing cables to battery as this may contribute to slippage of the calmps from the battery posts.

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

If the battery has been using too much water the voltage output (regulator setting) of the Delcotron is too high.

Service Blower Belt and Delcotron

1. Inspect blower belt condition and check deflection of belt.

If belt damage is noted, replace the belt. A slightly damaged belt must be replaced to prevent premature failure. Install blower belt over pulleys (Delcotron pulley last).

2. Adjust blower belt and guides as follows:

- Place a 1/16" shim between belt and rear guide (fig. 4), then using a bar and a strand tension gauge adjust blower belt. Fifty-five lbs. \pm 5 lbs. (used belt), 75 lbs. \pm 5 lbs. (new belt) and tighten securely.
- Remove shim from between blower belt and rear guide and using shim as a gauge adjust upper guide (fig. 4) and tighten securely.

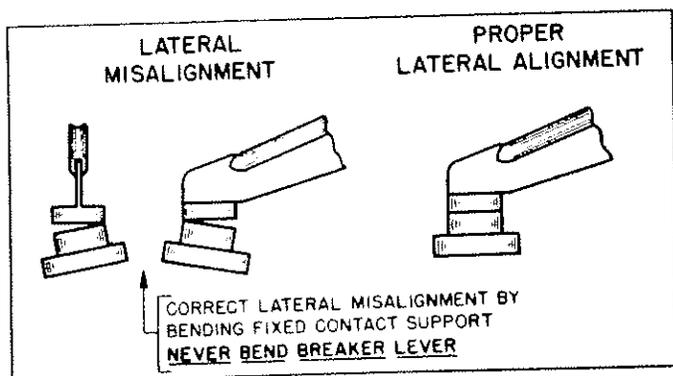


Fig. 3—Point Alignment

a new belt was installed run belt in at 1500 rpm for at least two minutes, then recheck deflection.

NOTE: If a strand tension gauge is not available adjust belt to give a 3/8" deflection between driver and idler pulley under a 15 pound load and have belt set with a strand tension gauge as soon as possible.

Replace or repair frayed or broken Delcotron wires and tighten all wire connections.

Fuel Lines and Fuel Filter

Inspect fuel lines for kinks, bends or leaks and if there has been flooding, replace fuel inlet filter.

NOTE: If a complaint of poor high speed performance exists on the vehicle, fuel pump tests should be performed.

Air Cleaner

Refer to Engine Fuel, Section 6M.

Crankcase Ventilation (Fig. 5)

Disconnect hose from vent pipe.

Inspect for deteriorated or plugged hoses.

Obtain positive ventilation orifice, using a 5/64" drill (inserted through orifice in vent pipe and held by hand).

Connect hose to vent pipe, then inspect all connections.

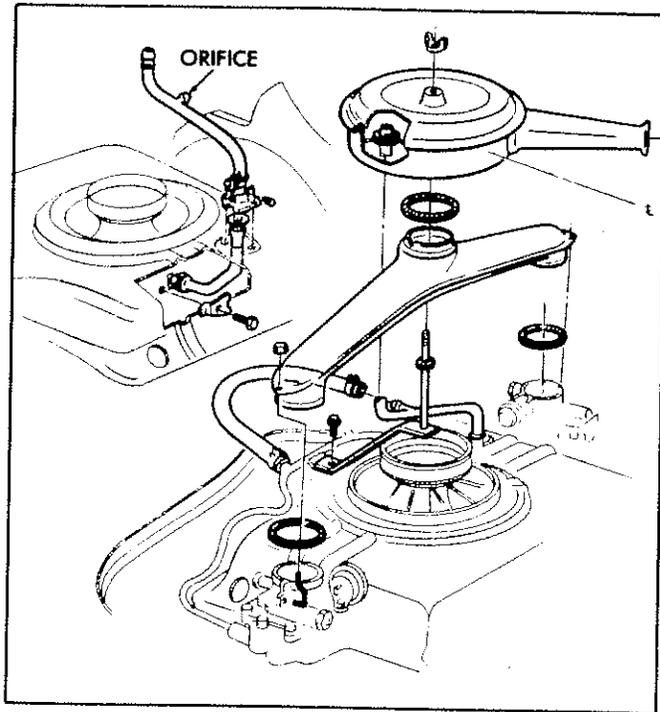


Fig. 5—Crankcase Ventilation

CARBURETOR SYNCHRONIZATION

Initial Adjustments

Disconnect accelerator control rod swivel at cross shaft lever and connect accelerator pull back spring swivel hole in cross shaft lever "A" (fig. 6).

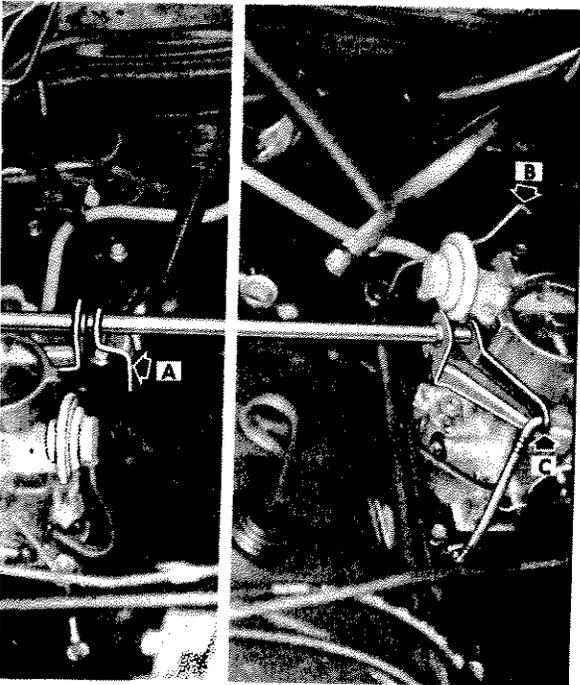


Fig. 6—Carburetor Linkage

2. Disconnect choke rods at choke shaft levers on both carburetors and open choke valves "B" (fig. 6), then tighten carburetor hold down nuts.
3. Back idle screws away from throttle shaft levers on both carburetors (2-1/2 turns should be sufficient) to leave clearance between the throttle shaft levers and idle screws.
4. Disconnect throttle rod from cross shaft lever on R/H carburetor "C" (fig. 6).

NOTE: A strip of paper approximately 3/8" wide and 8" long should be used in the following step. Feeler gauge stock will not provide a SENSITIVE feel and should not be used.

5. Set idle screw on L/H carburetor by placing strip of paper between idle screw and throttle shaft lever and turning screw in until a firm drag is felt on the paper. Turn idle screw in 1-1/2 additional turns (fig. 7).

NOTE: This will give an initial idle speed of 500-600 rpm.

6. Connect throttle rod to cross shaft lever on R/H carburetor and disconnect throttle rod from cross shaft lever on L/H carburetor "D" (fig. 6).
7. Set idle screw on R/H carburetor in the same manner as L/H carburetor.
8. Adjust throttle rod on L/H carburetor by holding up on rod (so throttle shaft lever is against idle screw) and turning rod in lower swivel until rod freely enters hole in cross shaft lever (fig. 8).
9. Connect throttle rod on L/H carburetor to cross shaft lever.

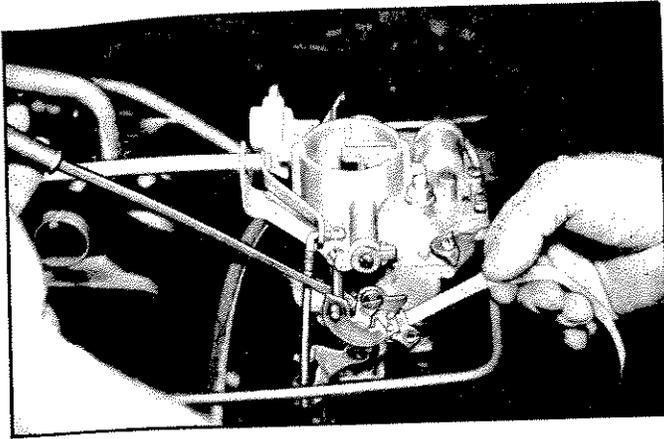


Fig. 7—Adjusting Idle Speed Screw

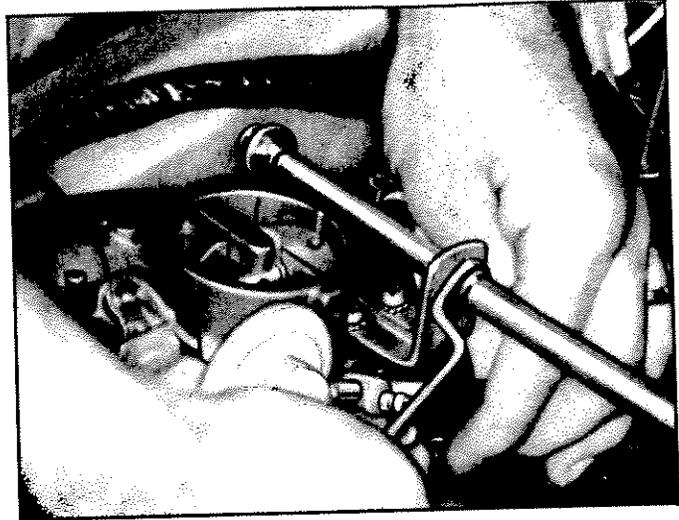


Fig. 9—Adjusting Accelerator Rod

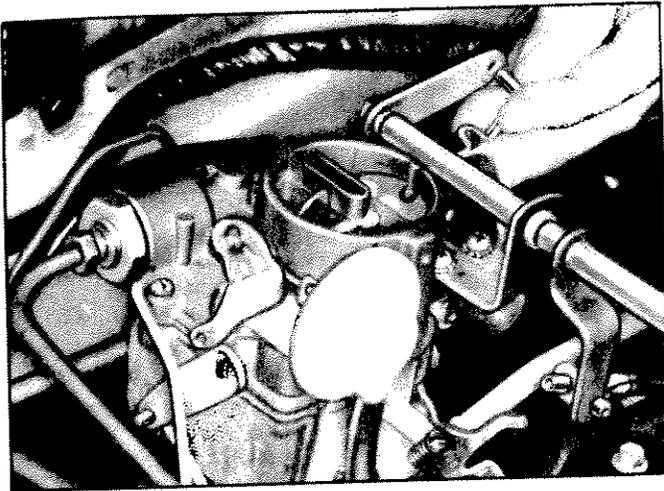


Fig. 8—Adjusting Throttle Rod

10. Remove accelerator pull back spring from cross shaft lever, hold cross shaft lever in the full throttle position and pull accelerator control rod rearward (on vehicles equipped with Powerglide, pull through detent), and adjust swivel on accelerator control rod until it freely enters hole in cross shaft lever (fig. 9). Then connect swivel and pull back spring and be sure carburetors return to idle position (idle screws against throttle levers).
11. Turn idle mixture screws on both carburetors lightly to its seat and back out 1-1/2 turns.

INSTRUMENT CHECK-OUT

Instrument Hook-Up

1. Remove distributor vacuum advance hose from R/H carburetor spark port tube and plastic cap from L/H carburetor spark port tube.
2. Connect vacuum gauge, dwell meter, tachometer and timing light.

NOTE: The vacuum gauge must be connected to both carburetor spark port tubes. A windshield washer tee makes this possible (fig. 10).

Ignition Dwell

1. Start engine and check ignition dwell.
If dwell is not within specifications, recheck point gap, check for wrong point assembly, defective or misaligned point, worn rubbing block or worn distributor cam.
2. Check dwell variation.

Slowly accelerate engine to 1500 rpm and note dwell reading. Return engine to idle and note dwell reading. If dwell variation exceeds specifications, check for worn distributor shaft, worn distributor shaft bushing or loose breaker plate.

CAUTION: Accelerate engine at accelerator rod only. Do not open throttle by grasping other portions of linkage.

Set Ignition Timing

1. Adjust timing as required by loosening distributor clamp bolt and rotating distributor body until specified timing is indicated at tab (fig. 11), then tighten distributor clamp bolt.

NOTE: Timing should be advanced as far as possible (within specifications) unless detonation (spark-knock) occurs.

2. Check operation of centrifugal advance mechanism by accelerating engine and watching clockwise (advance) movement of timing mark.

Check Carburetor Synchronization as Follows:

1. Accelerate engine to 1100 to 1200 rpm and hold steady.

NOTE: A tool to hold engine rpm steady may be manufactured with a small turn buckle and

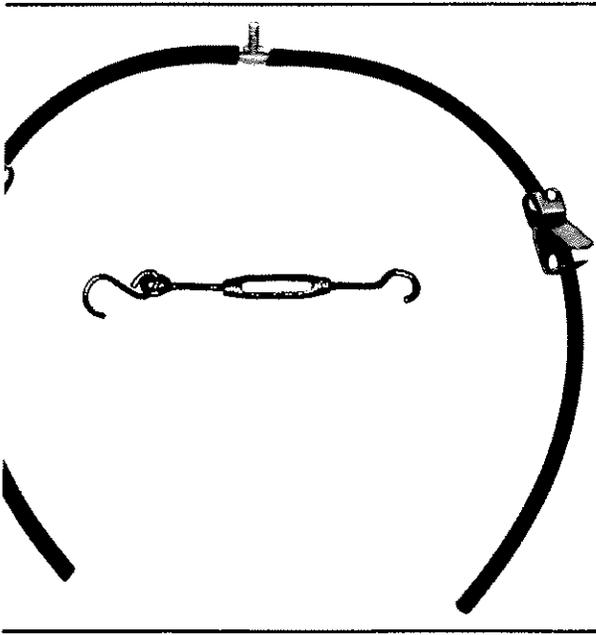


Fig. 10—Vacuum Gauge Adapter and Turnbuckle

ooks (fig. 10). When this tool is installed between the accelerator rod and fuel line the rpm can be adjusted by turning turnbuckle.

With rpm set to 1100 to 1200 and steady, note vacuum reading. Pinch shut vacuum gauge hose to L/H carburetor and note vacuum reading. If vacuum decreases, return engine to idle and lengthen throttle rod (one turn) on L/H carburetor, then recheck.

If vacuum increases, return engine to idle and shorten throttle rod (one turn) on L/H carburetor, then recheck.

If vacuum remains steady ($\pm 1''$) open hose to R/H carburetor and pinch shut vacuum gauge hose to L/H carburetor. Vacuum should remain steady ($\pm 1''$). Disconnect vacuum gauge from spark port tubes and install distributor vacuum advance hose on R/H carburetor and plastic cap on L/H carburetor.

Idle Advance

Check operation of vacuum advance by accelerating and watching movement of vacuum advance arm.

Idle Speed and Mixture Adjustment

Disconnect choke diaphragm hoses from both carburetor bases and connect vacuum gauge at these locations.

Adjust idle speed (duplicate adjustment on both carburetors) to obtain specified engine idle.

Adjust idle mixture screws on both carburetors to obtain peak, steady vacuum at specified idle speed.

Fast Idle Cam Clearance (Fig. 12)

Stop engine.

With throttle lever on next to the highest step of fast idle cam, bend tang to obtain .078" clearance between the speed screw and throttle lever.

Vacuum Diaphragm (Fig. 13)

Hold choke valve closed with a rubber band.

Hold vacuum diaphragm arm squarely against diaphragm.

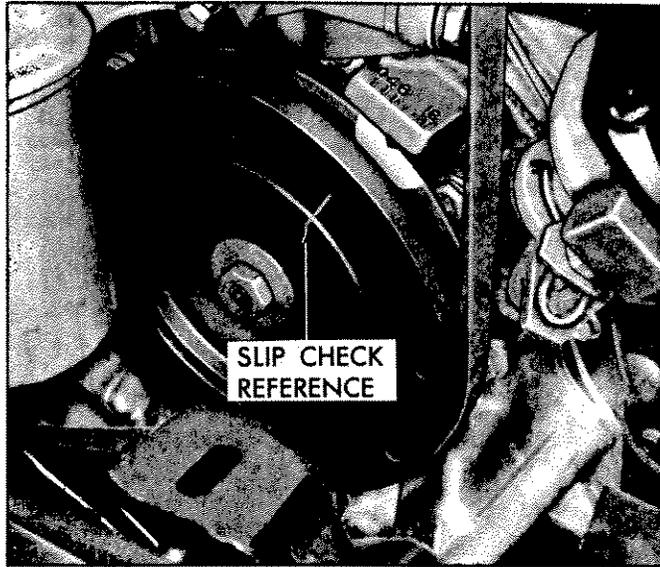


Fig. 11—Ignition Timing

3. Measure clearance between lower edge of choke valve and wall of bowl cover. Clearance should be .180" to .195".
4. If necessary to adjust, disconnect and bend diaphragm link.
5. At this setting, throttle lever fast idle tang should rest on next to the highest step of fast idle cam. If not, adjust by bending outer choke shaft lever tang.

Adjust Vapor Vent (Fig. 14)

The vent should just start opening when idle screw is on high step of fast idle cam. The valve will then be open at idle setting. If necessary, adjust by bending throttle lever tang.

NOTE: It is hard to see this valve when carburetor is installed. A mirror will aid in making this adjustment.

Adjust Choke (Fig. 15)

Hold choke valve closed and, while holding the control rod up against the stop in choke thermostat bracket, adjust upper choke control rod until it freely enters hole in choke shaft lever, then lengthen rod two turns and connect.

CAUTION: To minimize the possibility of deforming the control rod while adjusting, always turn the vertical portion. Do not "crank" the rod using offset portion.

Adjust Choke Unloader (Fig. 16)

Check unloader adjustment by holding throttle valve in wide open position and insert a .312" wire gauge between choke valve lower edge and wall of bowl cover. To adjust, if necessary, bend tang on throttle lever.

Final Adjustment

1. Install air cleaner assembly.
2. Start engine, and if necessary, readjust carburetor idle speed and mixture.
3. Shut engine off, remove instruments, then connect choke vacuum break hoses, and install spare tire.

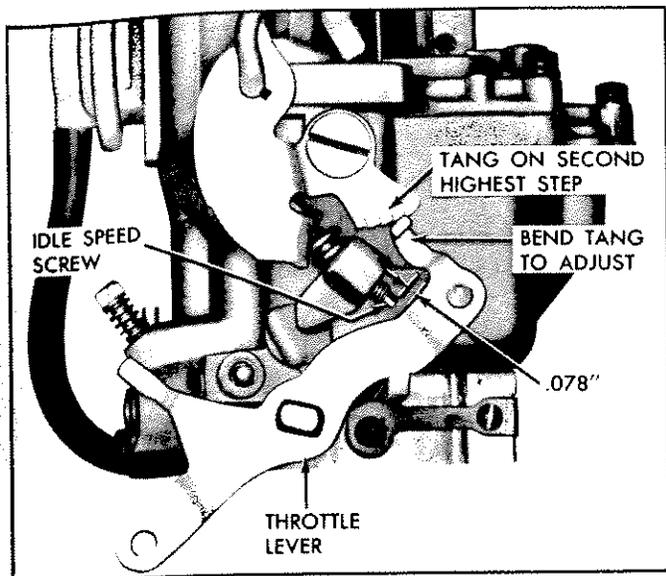


Fig. 12—Fast Idle Cam Adjustment

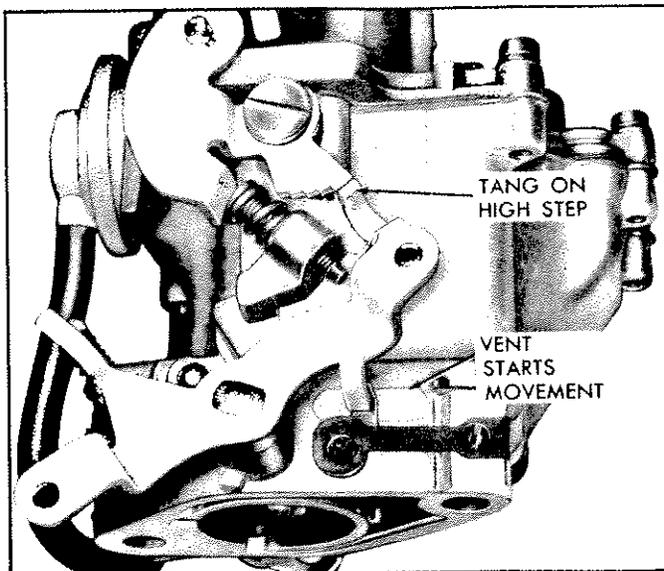


Fig. 14—Vapor Vent Adjustment

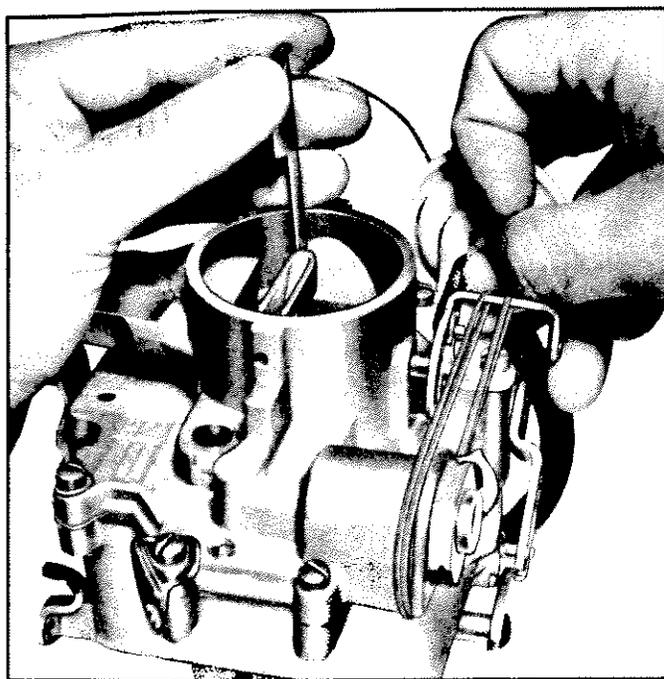


Fig. 13—Vacuum Diaphragm Adjustment

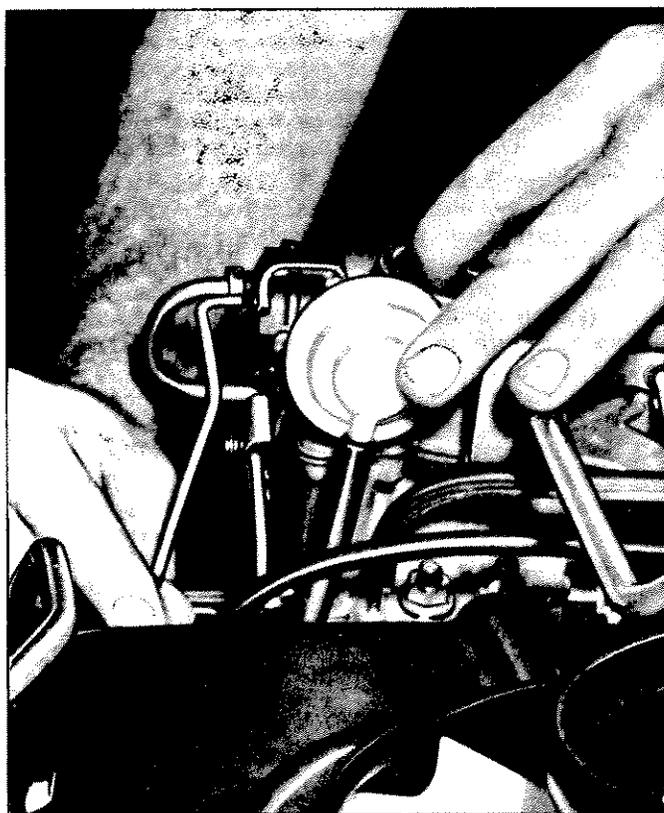


Fig. 15—Choke Control Rod Adjustment

ADDITIONAL CHECKS

Cylinder Balance Test (Fig. 17)

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

With the cylinder balance test, the power output of one cylinder may be checked against another, using a set of

grounding leads. When the power output of each cylinder is not equal, the engine will lose power and run roughly. Tool J-7412 is available to perform this test.

Perform a cylinder balance test as follows:

1. Connect the tachometer and vacuum gauge.
2. Start engine and run at 1500 rpm.

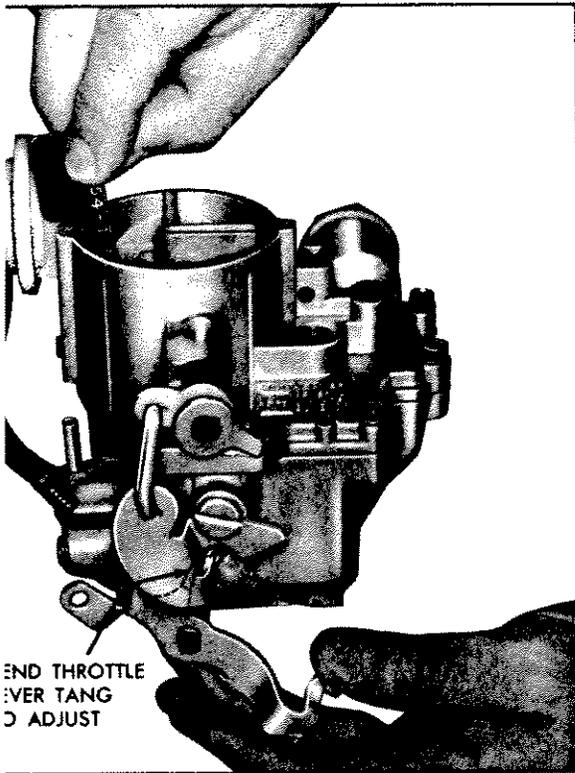


Fig. 16—Choke Unloader Adjustment

and large clip of grounding leads and connect individual leads to all spark plugs except the pair being tested. Divide the firing order in half and arrange one-half over the other. The cylinders to be tested together appear one over the other, i.e.,
 Firing Order=1-4-5-2-3-6= $\begin{matrix} 1-4-5 \\ 2-3-6 \end{matrix}$ =1-2, 4-3, 5-6.

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

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

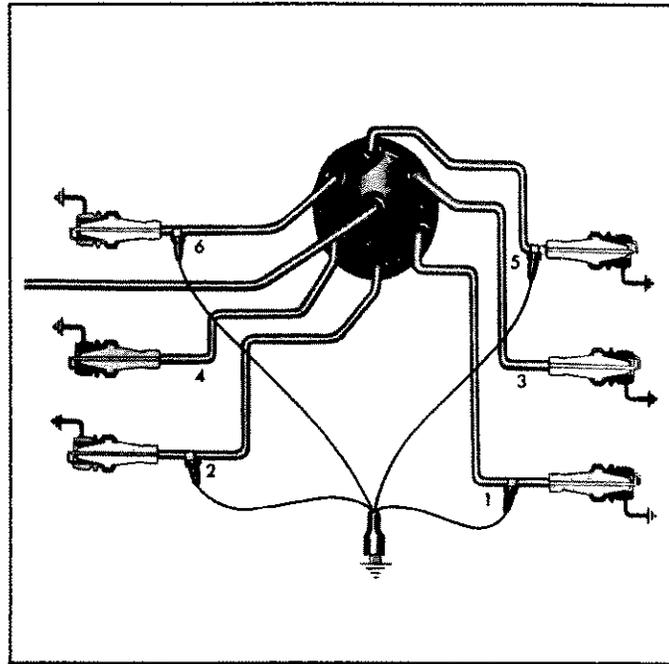


Fig. 17—Cylinder Balance Test

Starting Circuit Checks

See Engine Electrical—Section 6Y, for a description of these checks.

Charging Circuit Checks

See Engine Electrical—Section 6Y, for a description of these checks and regulator adjustments.

Ignition Circuit Checks

See Engine Electrical—Section 6Y, for a description of these checks.

Fuel Pump Tests

If the owner has complained of poor high speed performance, the fuel pump may be at fault. Too low a pump pressure or volume will cause a high speed miss because of lack of fuel delivered to the carburetors, while too high a pressure will cause carburetor flooding. See Engine Fuel—Section 6M for a description of fuel pump checks.

ENGINE MECHANICAL

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GENERAL DESCRIPTION

The six cylinder, over head valve, engines covered in this section are the 164 cu. in. engines used in the Corvaire 10100 and 10500 series vehicles (fig. 18). The engine is horizontally opposed, air cooled and has two opposing, aluminum cylinder heads that incorporate integral intake manifolds.

The aluminum crankcase is vertically divided into two halves, each having three pilot openings for individual cast iron cylinders. The crankshaft and camshaft are located between the split halves of the crankcase. The crankshaft, supported by the crankcase halves, has four

main bearings. The camshaft journals, having no bearings, ride directly on the crankcase halves.

The cylinders are numbered rear to front: 1-3-5 on the right bank, and 2-4-6 on the left bank. Firing order is 1-4-5-2-3-6. Crankshaft rotation as viewed from the rear is counter-clockwise.

Full pressure lubrication, through a full flow oil filter and an air cooled oil cooler is furnished by a gear-type oil pump located in the engine rear housing. The distributor, driven by a helical gear on the crankshaft, drives the oil pump. The main oil gallery feeds oil

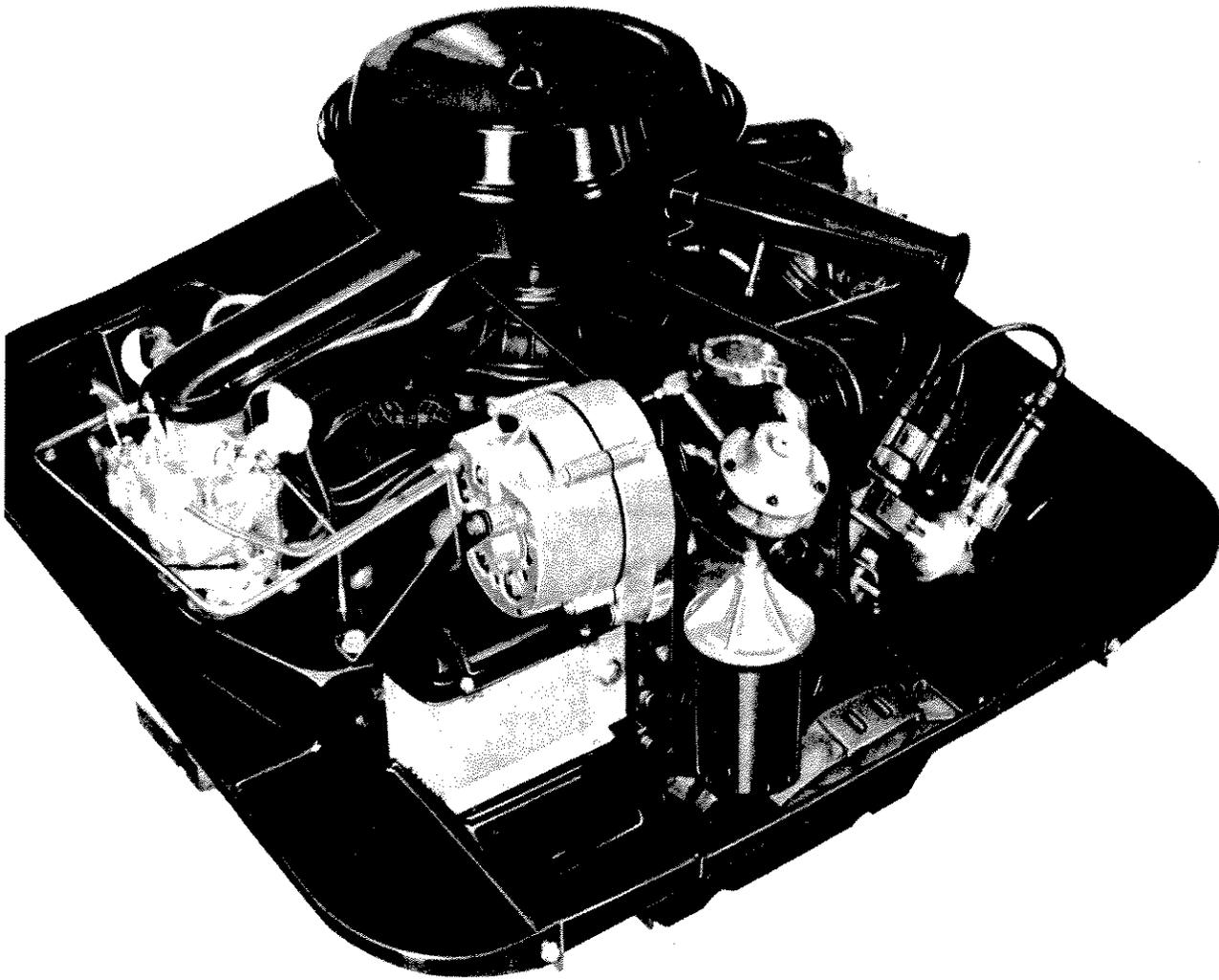


Fig. 18—Corvair Engine

drilled passages to the camshaft and crankshaft. The main oil gallery also feeds the hydraulic lifters, which through hollow push rods feed the ally mounted rocker arms (fig. 19).

Engine cleanliness is very important, oil leaks, exhaust leaks or foreign material within the engine shrouding may result in objectionable fumes within the passenger compartment.

COMPONENT REPLACEMENT AND ADJUSTMENTS

SEAL AND SHIELDS

Oil Retainer (Fig. 20)

Remove spare tire, then remove air cleaner assembly.

Remove retainer to body attaching screws. Disconnect seal from engine shields by pushing groove of seal off shield flange. Remove seal and retainer assembly.

Installation
Lubricate groove of seal with liquid soap or silicone grease. Place seal and retainer assembly in position over engine shields.

2. While guiding groove of seal on shield flange, (with one hand), press seal in place using a block of wood or a hammer handle.
3. Install all retainer attaching screws finger tight, then tighten screws securely.

Front Shield (Fig. 21)

Removal

1. Disconnect battery positive cable.
2. Remove spare tire, then remove air cleaner assembly.
3. Remove vacuum balance tube.
4. Disconnect heater hose at upper shroud.

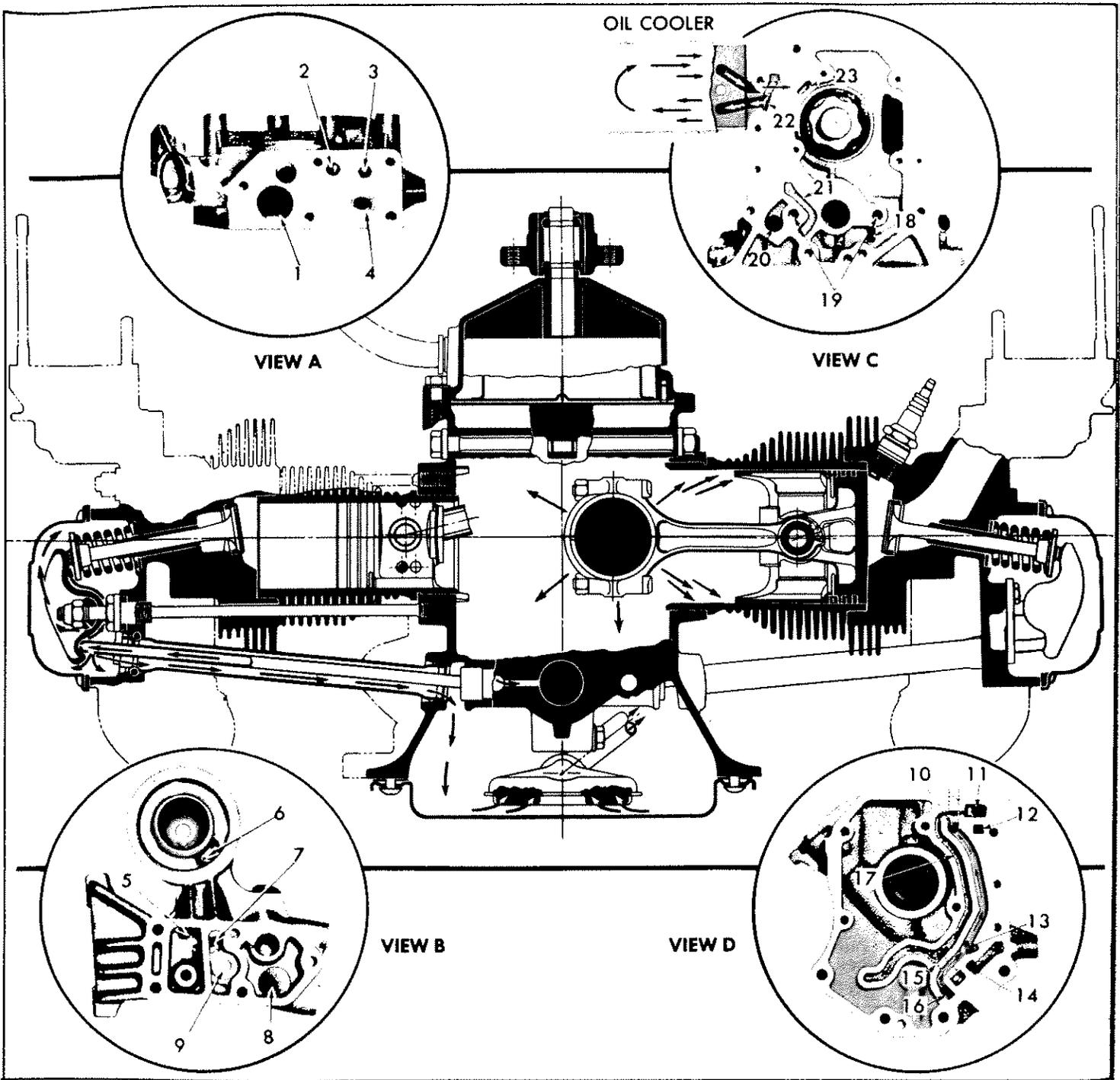


Fig. 19—Engine Lubrication

View A Top face of engine rear housing

View B Bottom face of oil filter and Delcotron adapter

View C Rear of engine crankcase

View D Front face of engine rear housing

NOTE: • Face of oil filter and Delcotron adapter shown in View "B" mounts to top face of engine rear housing shown in View "A."
 • Front face of engine rear housing shown in View "D" mounts to rear face of engine crankcase shown in View "C."

- | | | | |
|-----------------------------|---------------------------------------|---|---------------------------------------|
| 1. Oil Filler Inlet | 8. Oil Filler Inlet | 13. Oil Pressure Regulator Entrance | 18. Entrance to Crankcase Sump |
| 2. To Oil Filter | 9. Oil Filter Inlet | 14. Oil Pump Inlet | 19. Main Oil Galleries |
| 3. To Oil Cooler | 10. To Oil Filter | 15. Oil Passage to Main Oil Gallery Left Side | 20. Oil Pump Suction |
| 4. Oil Cooler By-Pass Valve | 11. Oil Cooler By-Pass Valve Exit | 16. Oil Pump Outlet | 21. Oil Pump Outlet Cavity |
| 5. Oil Filter Outlet | 12. To Oil Cooler from the Oil Filter | 17. Oil from Oil Cooler | 22. Oil Cooler Inlet |
| 6. Oil Filter Element Inlet | | | 23. Oil from Cooler to Main Galleries |
| 7. Oil Filter Inlet | | | |

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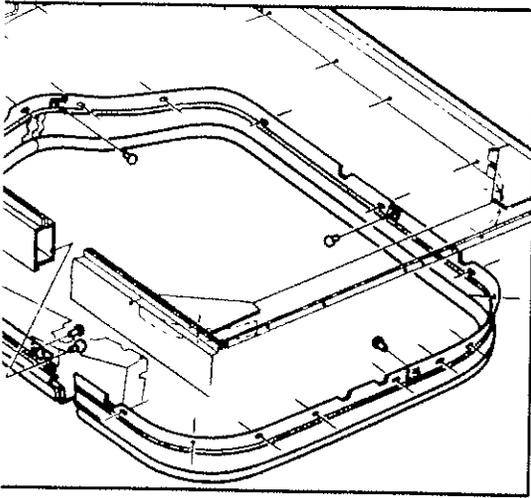


Fig. 20—Engine Seal and Retainer

grommet for Powerglide dip stick tube (if equipped).

Disconnect seal from flange of front shield.

Install grommet (for starter wiring and fuel line) on front shield.

Connect starter wiring (engine side).

On the underside of vehicle: disconnect accelerator cable at transmission bellcrank and disconnect cable at flexhose (plug fuel line from fuel tank), disconnect axle dip stick tube at differential.

Disconnect accelerator rod at carburetor cross shaft. Then remove rod and bellows from front shield. Disconnect grommet from front shield and remove dip stick tube assembly.

Disconnect fuel line at fuel pump, then remove fuel line from front shield.

Remove bolts attaching front shield, then remove front shield.

Install front shield by guiding shield over starter cable and Powerglide dip stick tube (if so equipped). Tighten all bolts attaching front shield finger tight, then tighten bolts securely.

Connect fuel line through front shield, then connect fuel line at fuel pump.

Insert accelerator rod through front shield, then connect bellows to front shield and connect accelerator cable at carburetor cross shaft.

Insert axle dip stick tube assembly through front shield and connect grommet in front shield.

Connect starter wiring.

Install grommet (for starter wiring and fuel line) in front shield.

Lubricate the groove of seal with liquid soap or silicone, then while guiding groove of seal onto shield flange (with one hand), press seal in place with a block of wood or a hammer handle.

Install grommet for Powerglide dip stick tube (if so equipped).

Connect heater hose at upper shroud.

Connect vacuum balance tube.

On the underside of vehicle: connect fuel line at fuel pump, connect accelerator rod at transmission

bellcrank and connect axle dip stick tube at differential carrier.

13. Connect battery positive cable.

14. Install air cleaner assembly, then install spare tire.

Left Shield (Fig. 21)

Removal

1. Remove bolts attaching left side of upper shroud and left shield to cylinder head.
2. Remove bolts attaching left shield to left exhaust duct.
3. Remove bolt attaching left shield and oil cooler to cylinder head.
4. Remove bolts attaching left shield to front shield and (if so equipped) remove screw from ground strap.
5. Disconnect seal from flange of left shield.
6. Remove left shield, by pulling from under upper shroud, front shield and oil cooler flange.

Installation

1. Place left shield in position under upper shroud, front shield and oil cooler flange.
2. Install all bolts attaching left shield finger tight, then tighten bolts securely.
3. Lubricate groove of seal with liquid soap or silicone, then while guiding groove of seal onto shield flange (with one hand), press seal in place with a block of wood or a hammer handle.
4. Connect ground strap (if so equipped).

Right Shield (Fig. 21)

Removal

1. Remove spare tire then, remove bolts attaching right side of upper shroud and right shield to cylinder head.
2. Remove bolts attaching right shield to right exhaust duct.
3. Remove ignition coil and bracket.
4. Remove bolts attaching right shield to front shield and (if so equipped) remove screw from ground strap.
5. Disconnect seal from flange of right shield.

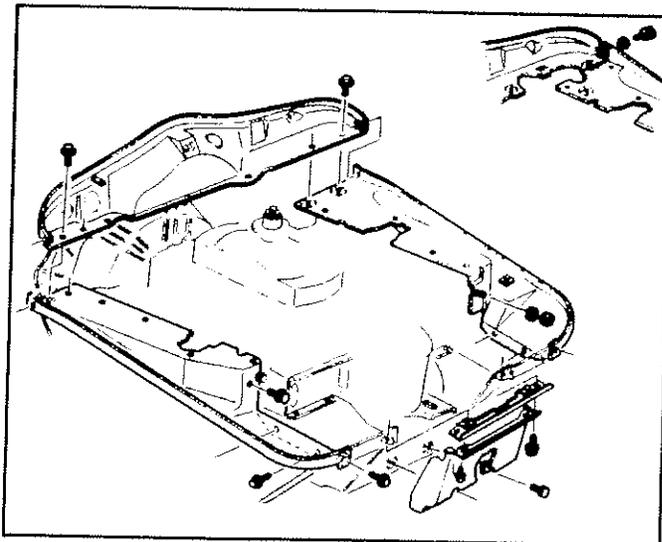


Fig. 21—Engine Shields

6. Remove bolt attaching muffler bracket to right shield.
7. Remove muffler.
8. Remove right shield by pulling from under upper shroud and front shield.

Installation

1. Place right shield in position under upper shroud and front shield.
2. Install all bolts attaching right shield finger tight, then tighten bolts securely.
3. Lubricate groove of seal with liquid soap or silicone, then while guiding groove of seal onto shield flange (with one hand), press seal in place with a block of wood or a hammer handle.
4. Connect ground strap (if so equipped).
5. Install ignition coil and bracket, then install spare tire.

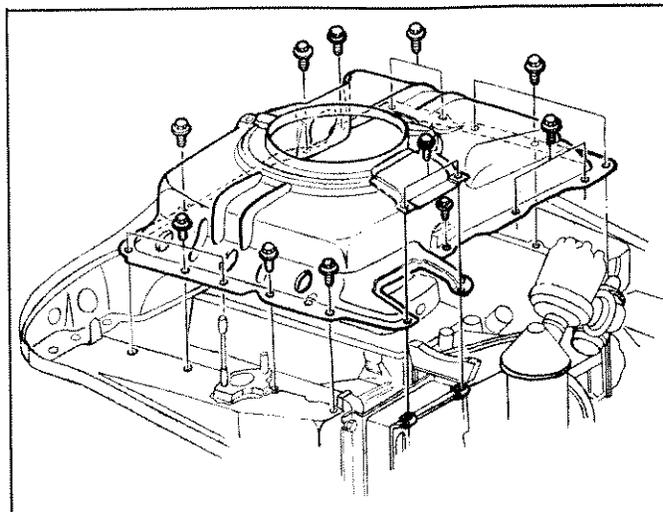


Fig. 23—Upper Shroud

Rear Center Shield (Fig. 21)

NOTE: The rear center shield is two pieces. The engine seal is connected to the upper half, which need not be removed under normal conditions.

Removal and Installation (Lower Half)

1. Remove bolts attaching rear center shield to skid plate and exhaust ducts.
2. Remove rear center shield.
3. Place rear center shield in position with attaching bolts fingertight, then tighten bolts securely.

Removal and Installation (Upper Half)

1. Remove lower half as outlined.
2. Disconnect seal from flange of rear center shield.
3. Remove bolts and remove upper half.
4. Install upper half and tighten securely.
5. Install lower half as outlined.
6. Lubricate groove of seal with liquid soap or silicone, then while guiding groove of seal onto shield flange (with one hand) press seal in place with a block of wood or a hammer handle.

Muffler Heat Shield (Fig. 22)

Removal

1. Remove two bolts attaching heat shield to muffler hanger.

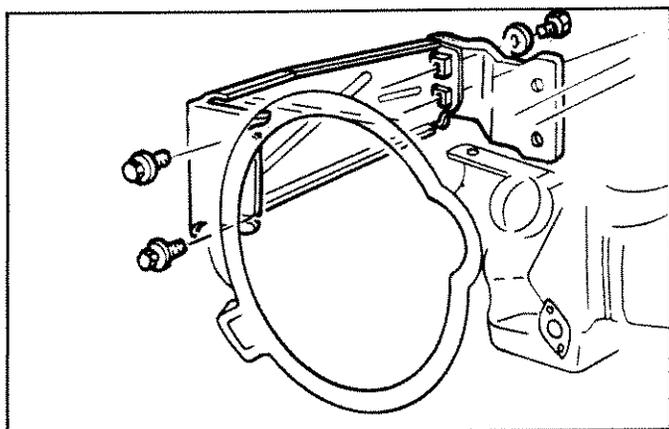


Fig. 22—Muffler Heat Shield

2. Loosen two bolts attaching rear of heat shield and right rear shroud to cylinder head.
3. Remove heat shield.

Installation

1. Install heat shield in position under head of two bolts in rear of cylinder head.
2. Install bolts attaching heat shield to muffler hanger and tighten securely.
3. Tighten two bolts attaching rear of heat shield and right rear shroud to cylinder head.

ENGINE COOLING COMPONENTS

Upper Shroud (Fig. 23)

Removal

1. Remove spare tire then remove air cleaner assembly.
2. Disconnect fuel lines at fuel pump and carburetors, then remove fuel lines to carburetors.
3. Disconnect vacuum advance hose at right carburetor.
4. Disconnect accelerator rod at carburetor cross shaft and disconnect choke control rods at choke levers then remove upper choke control rods.
5. Remove carburetors with cross shaft and linkage attached.
6. Remove blower belt.
7. Disconnect crankcase ventilation tube at upper shroud, then disconnect vacuum balance tube at bracket and cylinder heads.
8. Remove vacuum balance tube and crankcase ventilation tube and hoses as an assembly.
9. Remove Delcotron with bracket attached.
10. Disconnect heater hose at upper shroud.
11. Remove oil cooler access hole cover and oil dip stick.
12. Remove distributor cap, then remove spark plug wires and distributor cap as an assembly.
13. Remove bolts attaching upper shroud, then remove shroud by raising front of shroud and rotating clockwise to clear oil filter and Delcotron adapter.

- on
- the upper shroud in position and install all attaching bolts finger tight then rotate blower checking clearance while tightening bolts securely.
- Install oil cooler access hole cover and oil dip stick, install spark plug wires and distributor cap assembly.
- Connect heater hose at upper shroud.
- Install Delcotron and Delcotron bracket.
- Install vacuum balance tube and crankcase ventilation and hoses.
- Install blower belt and adjust as outlined.
- Install carburetors and cross shaft then connect vacuum advance hose at right carburetor.
- Adjust, adjust and connect upper choke control rods, adjust and connect accelerator rod as outlined Engine Tune-Up.
- Install and connect fuel lines.
- Install air cleaner assembly, then install spare tire.

Lower Shrouds and Thermostats (Fig. 24)

- Remove bolts attaching lower shroud to crankcase, cylinder head, front shroud and exhaust duct.
- Remove lower shroud until swivel on thermostat rod is disconnected from exhaust duct damper.
- Disconnect swivel and remove lower shroud and thermostat assembly.

Replacement

- Note: In the event of a failed thermostat assembly, the exhaust duct damper will remain in the open position allowing a maximum air flow over the engine to prevent overheating.

- Remove lower shroud as outlined.
- Use an open end wrench, on the flat provided, hold thermostat and remove thermostat actuating rod and damper assembly.
- Remove nut attaching thermostat to bracket, then remove thermostat.
- Install new thermostat and tighten securely.
- Install thermostat actuating rod and swivel assembly and tighten securely.

NOTE: To prevent damage to the thermostats while tightening actuating rod, hold thermostat with an open end wrench.

Adjustment

- Remove lower shroud assembly with two bolts (one to crankcase and one to cylinder head).
- Move exhaust duct damper in the fully open position.
- Install the thermostat actuating rod out the maximum travel (thermostat against bracket stop).
- Adjust the swivel until it just enters the hole provided on the exhaust duct damper.
- Reinstall lower shroud assembly and connect retaining bolts then install lower shroud as outlined.

- Adjust swivel to exhaust duct damper then install upper shroud attaching bolts and tighten securely.
- Make adjustment verifying that thermostat bottoms against damper before damper hits stop.

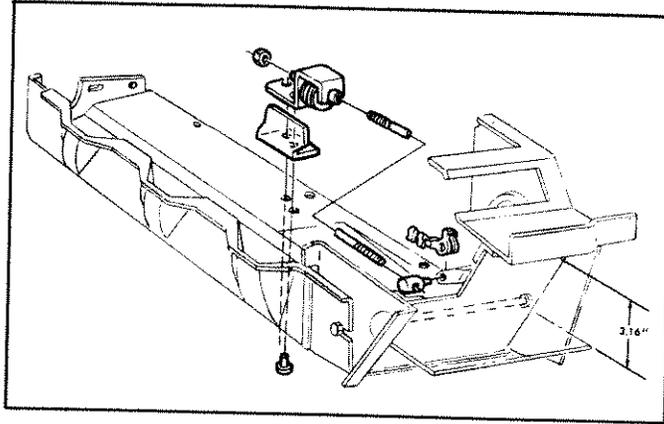


Fig. 24—Lower Shroud and Thermostat

Front Shrouds (Fig. 25)

Removal

1. Remove lower shroud as outlined.
2. Remove exhaust manifold as outlined.
3. Disconnect heater hose at elbow on front shroud.
4. Remove bolts attaching front shroud to cylinder head and upper shroud, then remove front shroud and heater elbow as an assembly.

NOTE: On left front shroud, one attaching bolt (to cylinder head) is reached through heater elbow.

Installation

1. Install front shroud and tighten securely.
2. Connect heater hose.
3. Install exhaust manifold as outlined.
4. Install lower shroud as outlined.

Exhaust Ducts (Fig. 25)

Removal

1. Disconnect seal from flange of exhaust duct and rear center shield.
2. Remove ignition coil and bracket (for right exhaust duct).
3. Remove grille, then, remove rear center shield as outlined.
4. Remove lower shroud as outlined.
5. Remove exhaust duct attaching bolts, then remove exhaust duct.

Installation

1. Install exhaust duct with all bolts finger tight, then tighten bolts securely.
2. Install lower shroud as outlined.
3. Install rear center shield as outlined, then, install grille.
4. Lubricate groove of seal with liquid soap or silicone, then while guiding groove of seal onto rear center shield and exhaust duct flange (with one hand), press seal in place with a block of wood or a hammer handle.
5. Install ignition coil and bracket (if removed).

Rear Shrouds (Fig. 25)

Removal

1. Remove oil cooler (for left rear shroud) or remove ignition coil and bracket (for right rear shroud).

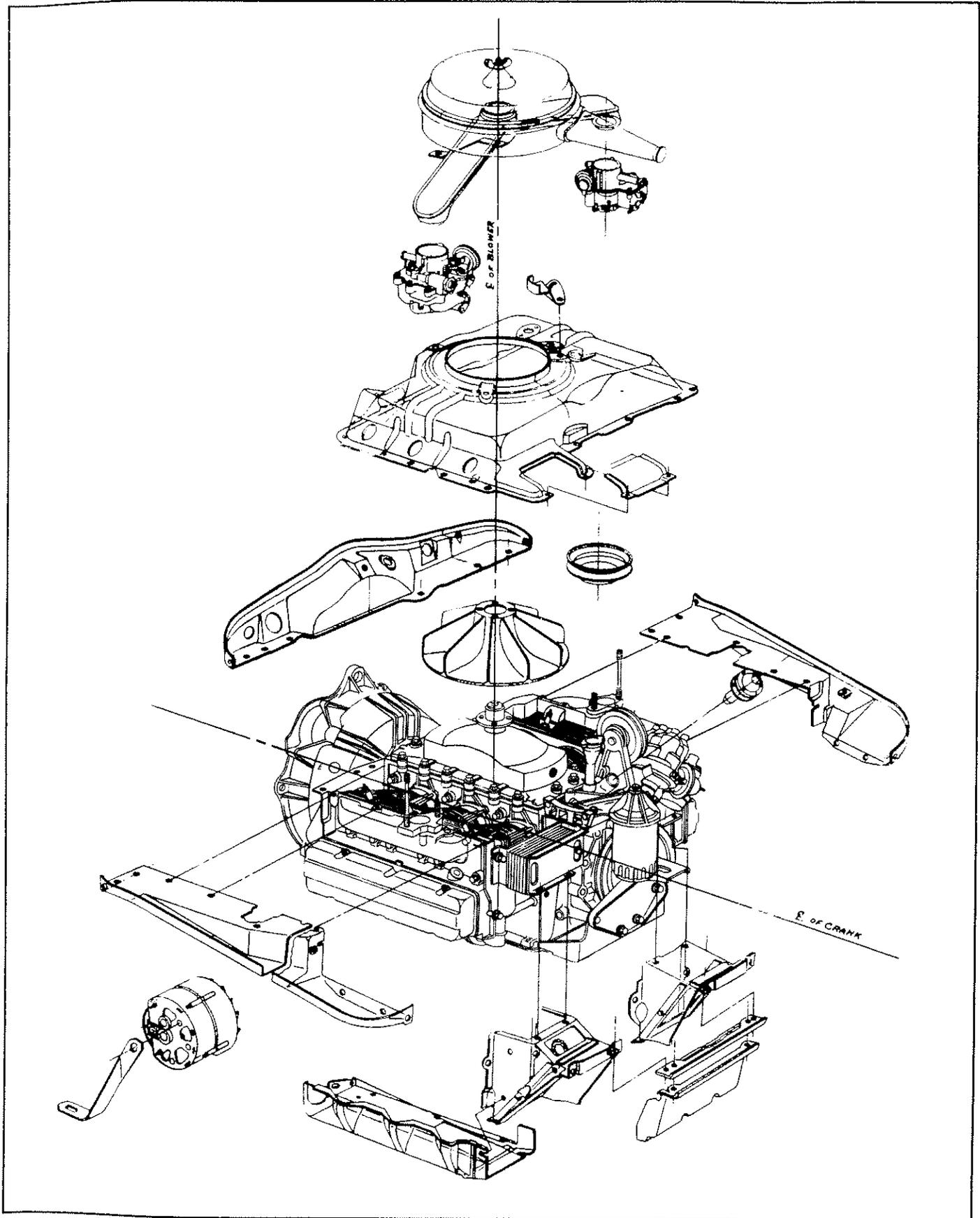


Fig. 25—Engine Sheet Metal—Exploded View