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CORVAIR MAINTENANCE—ENGINE FUME ODOR DIAGNOSIS

INTRODUCTION

The National Highway Traffic Safety Administration, U. S. Department of Transportation, has issued a special consumer protection bulletin (No. 1-71) regarding the possibility that engine fumes may enter the passenger compartment of some 1961 through 1969 Corvair vehicles equipped with a direct air heater. The bulletin advised that operators of Corvair vehicles who notice any fume odors connected with the operation of the heater should seek repairs immediately and, until necessary repairs are made, keep a window open at all times during heater operation.

This *Chevrolet Service News* has been prepared to collect in one place information to further assist dealer personnel in diagnosing any reported fume odor problems, and includes a convenient inspection check list which should be used to aid in the diagnosis of any fume complaint.

No objectionable engine fumes will enter the passenger compartment of a Corvair that has been properly maintained and is in good working order. If a Corvair has not been properly maintained or is not in good working order, there is a possibility that objectionable engine fumes may enter the passenger compartment. The nature of such fumes would vary with the particular source of the fumes. For example, if the fumes are associated with combustion, they could contain a percentage of carbon monoxide. (Carbon monoxide by itself is odorless, tasteless and colorless, as well as poisonous.) Fumes resulting from a failed head gasket or from exhaust system leaks fall into this category. Fumes from vaporization of oil or gasoline fall into a different category because, while they may be noticeable and unpleasant, they do not contain carbon monoxide.

In addition to the items covered in this issue, other maintenance conditions and repair proce-

dures may be involved. Accordingly, you also should review the applicable sections of the appropriate Corvair Shop Manuals, which have not been reproduced in the following pages.

Information in this issue has been divided into the following basic categories:

1. CYLINDER HEAD AND GASKETS (Pages 3 and 4)
2. EXHAUST SYSTEM (Pages 4 and 5)
3. OIL FUMES (Pages 5, 6 and 7)
4. FUEL ODORS (Pages 8 to 12)
5. MISCELLANEOUS (Pages 12 and 13)

To eliminate a fume or odor, the source must be identified and corrected. It will assist greatly if the owner is able to describe the type of odor (oil, gasoline, or exhaust) and the operating conditions under which the problem occurs, such as initial start-up, when the engine is hot, under load, etc. **Any attempt to short-cut a thorough and complete inspection and repair may result in a continued owner complaint.** To avoid owner misunderstanding, it is suggested that when he brings his vehicle in for correction of a fume problem, all deficiencies determined from inspection, be indicated on the Corvair Diagnosis Check List and authorized repairs be itemized on the Repair Order. This will be particularly helpful should an owner elect to have only part of the corrections made.

If a vehicle is still within the new vehicle warranty period, applicable warranty provisions would apply; otherwise, any inspection and/or repairs are considered maintenance items and, therefore, at the owner's expense.

Appropriate dealer personnel should carefully review the information in this *Chevrolet Service News*. Included is a Corvair Diagnosis Check List which covers items that may be involved in fume complaints. Appropriate explanatory material also is included.

CORVAIR DIAGNOSIS CHECK LIST (ENGINE FUME ODORS)

Owner's Name _____
Address _____

Serial # _____
Mileage _____
Date _____

This check list is provided to assist in diagnosing the causes of any reported fume odors in the passenger compartment of 1961 through 1969 Corvaire models.

If any of the items on the check list require adjustment, repair, or replacement, refer to the referenced pages of the March 1971 issue of *Chevrolet Service News* and/or the appropriate Corvaire Service Manual.

It should be noted that the sections entitled "Cylinder Head and Gaskets" and "Exhaust System" are concerned with possible sources of fume odors which can contain carbon monoxide, a poisonous gas.

OK Satisfactory

Needs Attention

CYLINDER HEAD AND GASKETS

Refer to pages 3 and 4 of this issue of *Service News* for the test procedure.

__ CYLINDER HEAD GASKET LEAK TEST

Right Bank
Leaks Noted

Cyl. # _____
1 _____
3 _____
5 _____

Left Bank
Leaks Noted

Cyl. # _____
2 _____
4 _____
6 _____

EXHAUST SYSTEM

Refer to pages 3, 4 and 5 of this issue of *Service News* for the test procedure.

__ 1. LEAKS AT EXHAUST SYSTEM CONNECTIONS

- __ Manifold to cylinder exhaust sleeves
- __ Manifold to exhaust pipe
- __ Exhaust pipe to muffler
- __ Muffler to tailpipe

__ 2. TAILPIPE MISPOSITIONED

__ 3. EXHAUST PIPE AND/OR MUFFLER AND/OR TAILPIPE DETERIORATION

- __ 4. ENGINE SHIELD TO BODY SEAL LEAKS
- __ 5. LEAKS IN LOWER BODY PANELS AND/OR FLOOR PAN

OIL FUMES

Refer to pages 5, 6 and 7 of this issue of *Service News*.

- __ 1. OIL LEAKS
 - __ Rocker cover gaskets

OIL FUMES (Continued)

- __ Rocker arm stud and push rod tube seals
- __ Oil filler cap
- __ Oil pressure sending switch
- __ Crankcase cover gaskets
- __ Oil pan gasket
- __ Front and rear crankshaft seals
- __ Front and rear housing gaskets
- __ Oil filter and generator adaptor gaskets
- __ Engine oil cooler and adaptor gasket and seals
- __ Cylinder to crankcase gasket
- __ 2. CRANKCASE VENT SYSTEM
 - __ PCV valve or restrictor orifice clogged
 - __ Crankcase oil separator (between crankcase and crankcase cover) clogged
- __ 3. CRANKCASE OVERFULL

FUEL ODORS

Refer to pages 8 thru 12 of this issue of *Service News*.

- __ 1. FUEL SPILLAGE ON OR AROUND THE VEHICLE
- __ 2. FUEL LINE LEAK
- __ 3. FUEL LINE CONNECTION LEAK
- __ 4. CARBURETOR VAPORS
- __ 5. FUEL TANK VAPORS
- __ 6. IMPROPER CARBURETOR ADJUSTMENT
- __ 7. POOR CARBURETOR MAINTENANCE
- __ 8. FUEL PUMP LEAK
- __ 9. EXCESSIVE ENGINE HEAT

MISCELLANEOUS

Refer to pages 12 and 13 of this issue of *Service News*.

- __ 1. LEAKS IN THE HEATER INTAKE AND/OR OUTLET HOSES AND/OR CONNECTIONS
- __ 2. HEATER HOUSING LEAKS

Itemized Repairs Shown on R.O.# _____ Date _____ Inspected by: _____

Business Name _____

Address _____

For shop personnel convenience, local reproduction of this form is recommended.

CYLINDER HEAD AND GASKETS

The cylinder head gasket and related areas should be considered.

Generally, a failed head gasket and/or related area is apparent to the owner—from a hissing noise, offensive odor and/or poor engine performance. Where a leak is found, it must be corrected to prevent the possibility of engine fumes entering the passenger compartment. The following service procedure should assist in determining the condition of the cylinder head gasket area.

Inspect the vehicle using the following procedure:

- a. Raise vehicle on hoist.
- b. Remove lower engine shroud left and right sides.
- c. Lower vehicle, start engine and allow to operate until normal operating temperature is reached.

Using a cylinder leakage tester, perform a leakage test:

- Remove air cleaners and set the carburetor throttle valve to the high step of fast idle cam.
- Remove all spark plugs.
- Remove the oil filler tube cap.
- Turn the cylinder leak test (CLT) knob counterclockwise until it turns freely.
- Connect the tester hose to the cylinder connection fitting.
- Connect shop air supply to tester input air connection (minimum 70, maximum 200 PSI).
- Turn CLT regulator knob clockwise until the gauge reads zero. Momentarily connect then disconnect the test adaptor. The pointer should return to zero. If not, readjust CLT regulator and check adjustment.
- Using the 14 m.m. adaptor hose, install in the spark plug hole of number one (1) cylinder. Attach whistle to the cylinder adaptor hose and a voltmeter between the negative primary side of coil to ground. Turn ignition switch to "on" position.
- Rotate the engine until whistle sounds, then rotate slowly until the voltmeter indicates a voltage reading. This will be the T.D.C. on number one (1) cylinder.
- Connect tester hose to adaptor and note percent of leakage on the tester gauge. Listen for escaping air through the carburetor, tailpipe, crankcase oil filler tube, or cylinder head area.
- Disconnect tester hose from adaptor and rotate engine until the next piston reaches T.D.C. (voltmeter will drop to zero. When the voltmeter again indicates primary voltage T.D.C. of the cylinder has been reached). Remove the adaptor from the cylinder previously tested and install it in the cylinder now at T.D.C.

- Repeat last two steps until all cylinders have been tested through the firing order.

Results and Indications

Gauge reading should be comparatively even and less than 15%.

1. Air escaping through carburetor—inlet valve leaking.
2. Air escaping through exhaust—exhaust valve leaking.
3. High percent of leakage in crankcase—worn rings or cylinder walls, stuck or broken rings, cracked piston.
4. High percent of leakage at cylinder head—failed head gasket.

Analysis of ring and cylinder wall condition should be made with consideration to case history and mileage of the engine.

NOTE: *Approved Chevrolet Service annealed stainless steel gaskets or equivalent should be used if cylinder head gaskets are replaced.*

Cylinder Head Torque Procedure—1961-69 Corvair

When torquing Corvair cylinder heads, an accurate torque wrench is required and it is essential that the procedure outlined below be followed step by step in order that the gaskets will be properly compressed at the torque limits specified.

1. Install (or loosen if head had not been removed) all cylinder head nuts and studs to finger tight.
2. Using the sequence shown in Figure 1, tighten all cylinder head studs and nuts to 20 ft. lbs.
3. Repeat Step 2 to 30 ft. lbs.
4. Repeat Step 2 to 40 ft. lbs.
5. Repeat Step 2 to stabilize the torque at 40 ft. lbs.
6. Install rocker arms and adjust valves to specifications.
7. Install valve rocker covers.

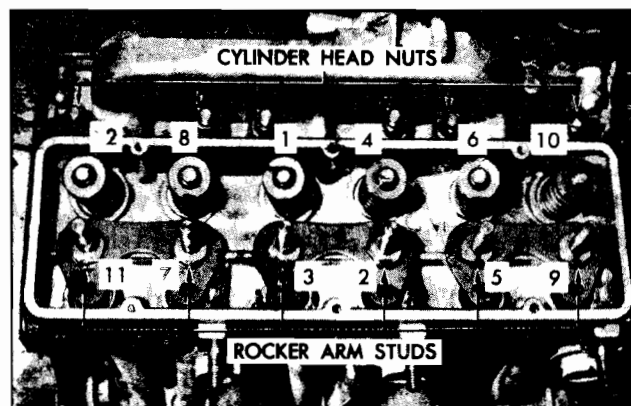


Fig. 1—Corvair Cylinder Head Torque Sequence

The following previously published articles deal with some of the conditions that have been encountered in the past.

Corvair Head Resurfacing Tool J-22395

(NOVEMBER, 1965 SERVICE NEWS)

A Corvair head cutter J-22395 (Fig. 2) is designed to service all Corvair heads through 1966 models. A snap ring is used to adapt the tool to the 1965-66 models as per special instructions with the tool. Care in cutting the first gasket area will insure a precision job on every operation.

CAUTION: As covered in the special instructions included with the tool, be careful to check the position when cutting starts and record the full cut depth so that the rest of the head may be cut to the exact same depth.

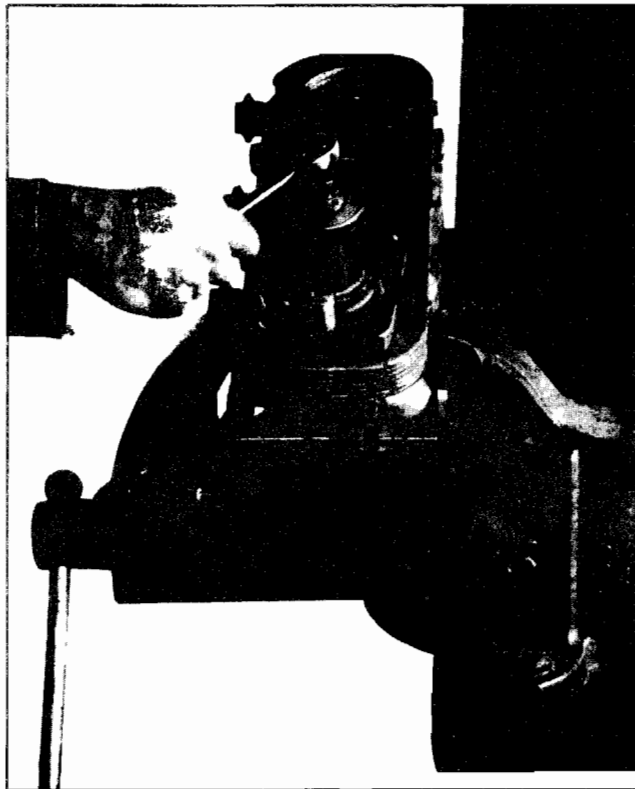


Fig. 2—Corvair Cylinder Head Resurfacing Tool—J-22395

Cylinder Head Nut Torque—1965 Corvair

(TSB #1073 DR #712 NOV. 19, 1964)

It has come to our attention that loss of torque on rocker arm studs and cylinder head stud nuts is an almost certainty on all Corvair engines produced from start of 1965 production until September 28, 1964. This will result in leakage at cylinder head gaskets and eventual gasket failures if corrective action is not taken.

This condition has been corrected in Produc-

tion by annealing (softening) of the two-fold design cylinder head gaskets and all service stock of gaskets will be of the late or annealed type.

Replacement of gaskets on these early engines is not required, however, a special cylinder head retorquer operation is necessary. Consequently, it is requested that all Corvair units built prior to serial numbers 5W120905 and 5L102680 be called in, checked and corrected as necessary. Any Corvair with an engine number lower than "928" (example T0919RB) must have the cylinder heads retorqued as outlined in Fig. 1. If an early production engine has already been retorqued, it will be identified with a daub of blue paint on the oil filter adapter.

This campaign is to include all units in dealers stock and sold that can be called in. If any vehicle is out of dealers area of operation, the dealer is requested to advise the Zone Service Manager of vehicle serial number, owners name and address.

Corvair Cylinder Head Retorque Procedure

NOTE: Please refer to the procedures set forth above entitled "CYLINDER HEAD TORQUE PROCEDURE—1961-69 CORVAIR."

EXHAUST SYSTEM

Consideration of exhaust system leaks must include any component and/or condition which can permit exhaust gases to enter the engine compartment.

In the investigation of owner complaints of fume odors, a thorough investigation of all components of the exhaust system must be made and corrected as required.

Possible sources of exhaust gas leaks are as follows:

- Exhaust manifold
- Cross-over or exhaust pipe
- Muffler
- Tailpipe

Many of the conditions in these areas are actually routine service operations and would be covered in shop manuals. As an assist, some of the significant normal service type items are covered here.

EXHAUST SYSTEM

The following inspection procedure is suggested:

- a. Raise vehicle on hoist and remove lower shrouds.
- b. Inspect the sleeves connecting the exhaust manifold to cylinder head for visual signs of leakage, using a mirror to view the inboard sides.
- c. Inspect the exhaust cross over pipe packings for visual signs of leakage and cross over pipe at the welded areas.

- d. Inspect muffler and tailpipe for signs of deterioration, including the cross over pipe, support clamp, and tailpipe attachment. The tailpipe should be intact, original equipment or equivalent, and extending for the proper discharge of exhaust gases past the rear valance or quarter panel, as applicable. It is highly recommended that an exhaust system sealer be used on all slip joints when the replacement of any component is performed.
- e. With the vehicle still on the hoist, start the engine and with the engine at idle speed, temporarily restrict the flow of exhaust gases at the tailpipe by using a hand held suitable cloth, listening for any audible exhaust leakage or "hiss" type noise.

Another area that must be thoroughly inspected and corrected as required relates to the underbody and engine compartment seals. Inspect all sheet metal in the bulkhead, floor pan, underbody and engine shield to body perimeter seal for damage or deterioration. Missing or damaged seals, holes, etc., can, under various conditions, permit exhaust fumes, dust, water, etc., to enter the vehicle.

The following is a previously published item covering Corvair exhaust manifold installation.

Installing Corvair Manifolds

(DECEMBER, 1960 SERVICE NEWS)

Exhaust manifolds on all 1961 Turbo-Air engines provide an increase in interference fit between the exhaust port sleeve gaskets and the manifold.

To assure full seating of the exhaust manifold on the sleeve gaskets, thereby insuring against exhaust gas leakage, the following revised procedure should be used for manifold installation.

1. Position the exhaust manifold on the sleeve gaskets, tap manifold lightly to insure alignment with the gaskets, then firmly seat manifold using a soft metal or plastic hammer.
2. Install manifold clamps and french locks. Torque attaching nuts to 23-27 ft. lbs., then bend tab on french locks.

OIL FUMES

Fume odor complaints can frequently be traced to spilled oil or oil leaks. Oil spilled as it is being added to the engine or when the oil filter is replaced, oil filler tube cap lost and/or gasket and seal leaks, can produce an odor when the oil is heated. These odors while harmless are very noticeable and can be objectionable.

The source of the oil, which is often quite obvious, must be determined and eliminated to correct the problem. The following articles cover some of the conditions that have been encountered in the past.

Cleaning Corvair Vent Valves

(JUNE, 1965 SERVICE NEWS)

All Corvair models have a .062" (.089" for Turbocharged) fixed orifice except those vehicles with air conditioning and R10 models which use the conventional CV-584-C ventilation valve.

Use a 1/16" drill size for cleaning the .062" orifice and a No. 43 drill (.089") should be used for cleaning the .089" orifice. Replace CV-584-C when plugged.

NOTE: *A plugged crankcase vent system can result in a pressurized crankcase which may produce oil leaks that would not normally be present. The crankcase oil separator (between the crankcase and crankcase cover) is part of the crankcase vent system and may become clogged as a result of improper maintenance (oil and filter changes).*

Incorrect 1965 Corvair Engine Oil Dip Stick

(PRODUCT CAMPAIGN 65-11 MAR. 16, 1965)

The Van Nuys Assembly Plant produced four hundred and eighty seven (487) 1965 Corvairs with incorrect engine oil dip sticks. An incorrect dip stick will indicate that the oil level is from one to two quarts low. The correct oil dip stick is Part #3860444.

NOTE: *An overfilled crankcase can result in engine oil leaks that would not normally be present.*

Engine Oil Level Reading Incorrect — 1964 Corvairs 500, 600, 700 and 900 Series

(TSB #987 MAR. 27, 1964)

A false engine oil level indication is possible on subject Corvairs with serial numbers between W148110 and W161610.

The erroneous reading is caused by the dip stick seal seating to the gauge tube before the stick bottoms. The air, thus trapped in the gauge tube, tends to push the oil level down the tube approximately 3/8" or the equivalent of 3/4 pint.

This condition could permit a 3/4 pint overflow by having the oil level at the add mark before it is a whole quart low. While a 3/4 pint overflow is not harmful to the engine, it could allow excessive smoking by drawing oil through the crankcase ventilation system.

The possibility of the seal causing a low reading was eliminated on all vehicles built after serial number W161610 by adding a 3/64" diameter air bleed hole in the dip stick gauge tube.

To install a dip stick gauge tube air bleed hole

on vehicles within the affected serial number range, use the following procedure.

1. Remove dipstick and gauge tube boot.
2. Remove the gauge tube using a tube flaring clamp as a handle.

CAUTION: *If the upper 1/2" of the tube is damaged, it will be necessary to replace the tube.*

3. Drill a 3/64" diameter hole through one wall of the tube 1 1/8" below the rolled bead.
4. Coat "press fit" end of the tube with anti-seize compound and reinstall the tube, using a piece of wood as a hammer block.
5. Reinstall the boot and the dipstick.

Oil Leaks at Crankshaft — 1960-63 Corvair and Corvair "95"

(TSB #935 DR #623 NOV. 21, 1963)

Clutch/Flywheel Housing—

Oil leaks at the clutch or flywheel housing on subject vehicles may be due to a worn housing seal allowing engine oil to seep past into the housing.

This problem may be corrected by installing Part No. 3851853 flywheel housing seal. This new seal incorporates a shield on the engine side to deflect oil away from the seal lip. On 1960 and some early 1961 engines equipped with a front oil slinger, it will be necessary to remove and discard the oil slinger and snap ring to provide sufficient clearance for the new seal.

Refer to the 1961 Corvair Shop Manual, Page 6A-46 for seal replacement instructions.

Engine Rear Housing—1962-63 Models

Oil leaks at the engine rear housing may be corrected by installing Part No. 6257477 crankshaft rear oil slinger originally used in 1960-61 Corvair engines. Install slinger as shown in the 1960 Corvair Shop Manual, Page 6A-45. Install new engine rear housing seal if necessary, as outlined in the 1961 Corvair Shop Manual, Page 6A-41.

Both a new flywheel housing seal and crankshaft rear oil slinger entered production early in the 1964 model year.

Corvair Clutch Housing Seal

(JUNE-JULY, 1964 SERVICE NEWS)

Due to the configuration of the metal case on the improved design Corvair engine Clutch Housing Seal now being serviced, the use of Installer

J-21768 is required in order to prevent distortion of this seal during installation.

Valve Rocker Cover Leakage —1960-63 Corvair and Corvair "95"

(TSB #939 DR #626 DEC. 4, 1963)

In the event that the valve rocker cover gasket replacement is necessary due to oil leakage or other causes, the late design rocker cover gasket Part No. 3850944 should be installed.

This gasket, when used with the 1964 design rocker cover bolt reinforcement springs and rocker cover bolts, will effectively reduce oil leakage due to gasket compression set, gasket misalignment or gasket tearing at bolt holes.

Replace existing rocker cover screw reinforcements and screws with Part No. 3850874 bolt spring and Part No. 180020 1/4"—20 bolts. Part No. 3850874 bolt spring should be assembled with curved ends upward, away from cover. Torque valve cover bolts to 40-60 in. lbs.

Corvair Rocker Arm Cover Attachment, Revised

(JANUARY, 1964 SERVICE NEWS)

The rocker arm cover gasket and spring type reinforcement shown in the 1964 Shop Manual have been revised, removing the inboard tabs on the gasket and the reinforcement and contours. The reinforcement spring must be installed with the radius contour toward the rocker cover to avoid the sharp ends cutting into the cover. This allows slide action of the reinforcement spring when torquing the bolt to 40-60 in. lbs.

Relocation and Revised Oil Pressure Sending Switch — 1961-62 Corvair and Corvair "95" Models

(TSB #801 DR #538 APR. 23, 1962)

On 1961 and early 1962 Corvair and Corvair "95" Models equipped with Direct Air Heaters, the oil pressure sending unit switch is subject to failure due to the diaphragm becoming brittle and fracturing from the high temperatures encountered in the air exhaust duct. Failure of the diaphragm results in oil leakage from the switch.

An improved oil pressure sending switch that incorporates a higher heat resistant diaphragm,

entered Production on 11/8/61.

In the event switch failure is encountered on any Corvair or Corvair "95" models, the new switch must be used for replacement and the switch should be relocated to the same location as on Corvair units equipped with Air Conditioning or the turbocharged engine. To relocate, follow the procedure as outlined below.

Oil Pressure Sending Switch Usage

The new switch Part No. 3818783, has an overall length of approximately 2" from connector tip to the end of the threads. The connector terminal is copper plated as an additional means of identification.

An early design oil pressure switch with an overall length of $2\frac{5}{8}$ ", was used on all Corvair and Corvair "95" engines built prior to 8/31/61, except vehicles equipped with air conditioning. Vehicles equipped with air conditioning used an interim switch which has the same overall length as the late design switch, except the connector terminal is brass or cadmium plated. This switch was also used on all Corvair and Corvair "95" engines built from 8/31/61 to 11/8/61.

Relocation Procedure

1. Rework the existing rear extension wiring harness by cutting the wire between the oil pressure and temperature sending switches and lengthening it to 19" overall with a spliced insert of 20 gauge standard plastic insulated wire similar to the existing wire. Solder and tape both joints and route wire to the new switch location.
2. Remove existing $\frac{1}{8}$ " pipe plug from top of oil filter adapter assembly, and install it in the hole formerly occupied by the oil pressure sending switch, using suitable sealer on threads.
3. Install new switch, Part No. 3818783 in the oil filter adapter assembly. Torque switch to 8-12 ft. lbs.

CAUTION: Use a $1\frac{1}{16}$ " 6 point socket to install the switch. The use of pliers or even a 12 point socket may distort the switch housing resulting in subsequent switch failure.

4. Bend switch terminal to 45° angle and attach wire.

Service Tip — Corvair Oil Filter Removal

(MARCH, 1968 SERVICE NEWS)

The oil filter on Corvairs equipped with air conditioning and all 1968 Corvairs is mounted horizontally rather than vertically. If the oil filter on these units is removed by itself, excessive oil spillage into the engine shroud will result. Oil in this area is hard to wipe up and leads to an undesirable

odor during operation until it is entirely evaporated. To avoid this spillage on these units remove the adapter with the filter making sure that the assembly (oil filter & adapter) is kept level. When this procedure is used however, it will be necessary to replace the adapter's inner (Part No. 557-5514) and outer (Part No. 3838401) gaskets each time the oil filter is replaced.

Corvair Oil Filter Mounting

(MAY, 1961 SERVICE NEWS)

Figure 3 shows the engine oil filter installation used on 1961 Corvair passenger cars equipped with air conditioning. To avoid spillage of oil in the engine compartment when replacing the oil filter element; as a unit, remove the element and filter adapter from the filter mount. At the bench, disassemble the element from the adapter casting. When installing the new element assembly use new gaskets at all three locations.

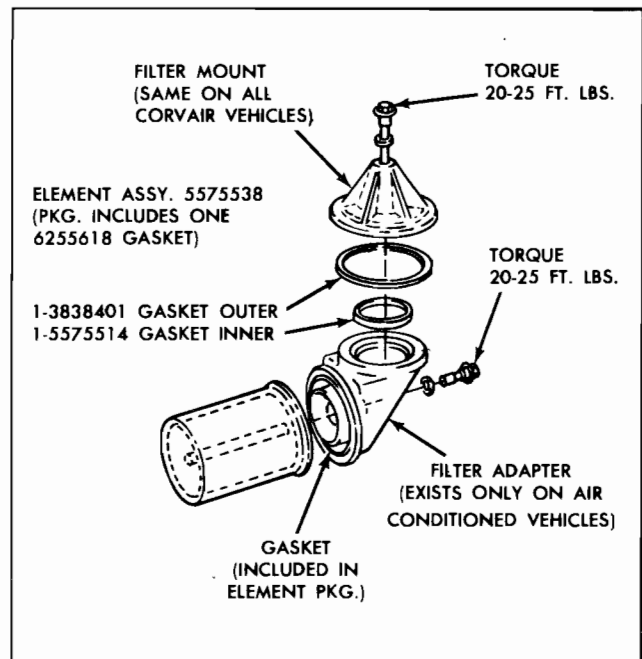


Fig. 3—Corvair Oil Filter

In addition to these specific areas, other possible sources for oil leaks are as follows:

1. ROCKER ARM PUSH ROD TUBE SEALS.
2. ENGINE CRANKCASE COVER GASKET.
3. ENGINE FRONT AND REAR HOUSING GASKETS.
4. ENGINE OIL PAN GASKET.
5. ENGINE OIL COOLER AND ADAPTOR GASKET AND SEALS.
6. CYLINDER TO CRANKCASE GASKET.
7. PLUGGED CRANKCASE OIL SEPARATOR.

FUEL ODORS

Gasoline odors are another cause of fume or odor complaints. The cause can involve odors picked-up from the outside air or by a vehicle's engine being flooded prior to starting. Any condition which could cause an abnormally **rich** fuel mixture could be the source of the odor. In addition to such things as an improperly operating choke, several of the following articles deal with situations which can cause a **rich** condition. These areas must be checked and correction made to eliminate odor complaints related to gasoline.

It must be recognized that a trace of a fuel odor for a brief period when first starting can sometimes be noticed after a short, hot soak (engine operated until normal operating temperature is reached, stopped, then restarted before engine components cool) in high ambient temperatures and is usually a normal condition. Obviously, an actual leak anywhere in the fuel system can produce an odor which could be detectable. Fuel lines and connections, the carburetor and fuel pump, all must be inspected and the cause corrected.

The following articles cover some of the conditions that have been encountered in the past.

1965 Corvair Fuel Pipe to Engine Shield Interference

(TSB #1138 DR #749 JULY 14, 1965)

On 1965 Corvairs built before June 15, 1965, the rear fuel pipe is subject to being cut by the front engine shield at the point where the pipe passes through the shield. This condition is due to weakness of the 4 hole rubber grommet, used up until this time, at its radial slits. Slight pressure of the fuel pipe in the direction of the slit allows the pipe to contact the engine shield. Relative movement between the parts then results in a cutting action of the sheet metal into the fuel pipe.

Vehicles built after this date are not subjected to this problem. Production corrections involve:

1. Shortening front fuel pipe by 5" and lengthening the rubber connecting hose to provide greater flexibility.
2. Flanging the shield hole that the grommet is held in.
3. Incorporation of a 3-hole grommet that is not radially slit at fuel pipe opening.

Fuel pipes on Corvairs in stock and those which come in for service that were built before the corrective date should be inspected for wear and contact with the engine shield. If a wearing condition exists, or if splitting of the grommet at the opening for the fuel pipe is noticed, correct the condition as outlined below.

If an examination of the rear fuel pipe at the grommet area shows a wearing condition of the pipe or a splitting of the grommet at the fuel pipe opening, correct the condition as follows:

1. If fuel pipe shows excessive damage from previous condition, replace fuel pipe.
2. Remove grommet from engine shield by pulling it directly rearward.
3. Replace 4-hole grommet with new design 3-hole grommet (Part No. 3877832).

NOTE: Make sure that fuel line passes through grommet opening that is not radially slit to the outer circumference.

Gasoline Fumes in Passenger Compartment—1965 Corvairs

(TSB #1086 DR #717 DATED JAN. 6, 1965)

1965 Corvair owners may experience gasoline fumes in the passenger compartment as a result of:

1. Gasoline overflow during filling of tank may flow into the left rocker tunnel causing prolonged fumes to enter the passenger compartment through the fresh air venting system.
2. Leakage at aluminum plug in carburetor bowl (either carburetor on base engine or primary carburetors on 4 x 1 engine) will result in fumes entering through the heater system.

The first condition has been corrected at the plants by revised front rocker tunnel sealing on vehicles built after approximate Serial No. 5L102-200 and 5W120200. Early vehicles can be corrected by sealing any possible openings below the overflow channel in the area where the fender, fender skirt and left rocker tunnel join.

The second condition was corrected at the plants by sealing the aluminum plug (Fig. 4) on

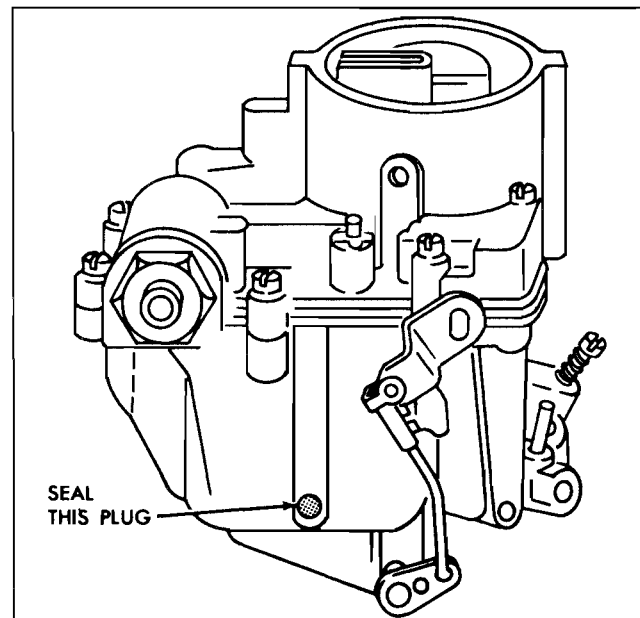


Fig. 4—Aluminum Plug Location

vehicles built after approximate Serial No. 5L-102489 and 5W120745. Early production vehicles can be corrected as follows:

1. Remove carburetor as outlined on Page 6M-2 of the 1965 Corvair Chassis Shop Manual.
2. Empty bowl of gasoline.
3. Remove existing plug by starting with a sharp chisel edge tool and then pulling out with diagonal wire cutters.
4. Clean and dry hole and surrounding area.
5. Coat new plug, Part No. 7012330, with gasoline resistant sealer such as non-hardening permatax and drive into place.
6. Reinstall carburetor and adjust idle speed and mixture.

Fuel Odors in Passenger Compartment—1965-66 Corvair

(TSB #66-68 DR #66-35 JUNE 15, 1966)

Any fuel leakage or seepage in the engine compartment on a 1965 or 1966 Corvair may cause gasoline odors in the passenger compartment. This is due to the fumes being picked up by the air heater.

To alleviate gasoline leaks and seepage, rubber coated aluminum fuel inlet nut gaskets entered production on 2-18-66 and Kaobestos air horn-to-bowl gaskets are used on all Corvair carburetors with date code "D" (April), or later, stamped on the identification tags. Also, the semi-porous brown laminated phenolic carburetor base insulators, used optionally in production, were discontinued on 4-18-66. Only the non-porous black resinoid plastic insulators are now used.

If a fuel odor complaint is encountered, the more obvious sources of leaks or seepage should be checked first. Typical of these are the fuel pump outlet tee, the fuel line flares and, on 1965 units, the condition of the fuel line where it passes through the engine bulkhead (DR. #749). The carburetor chokes should also be checked for proper adjustment and free operation. If this inspection does not reveal the source of odors, proceed as outlined below.

NOTE: *The fuel vapor vents, which are open when the throttle plates are closed and the chokes are off, are not considered to be of consequence in the cause of fuel odors. At most, there is only momentary odor present on initial start up after a hot soak. The function of the vents should not be hindered.*

Procedure for Correcting Fuel Odor Complaints

1. Inspect the carburetor base insulators. If the brown porous insulators are found, replace with Part No. 3826302 non-porous black insulators.

2. Inspect the carburetor fuel inlet nut gasket for seepage. If seepage is noted, replace both gaskets (or all 4 on the 140 h.p. equipped) with Part No. 7032508 rubber coated aluminum gaskets.
3. Remove the carburetor air horns and replace the air horn-to-bowl gaskets with Part No. 7033980, Kaobestos gaskets. When installing the air horns, torque the stud nuts to 13 lb.-ft.

CAUTION: *Overtorquing will cut the gasket and create an internal leak around the stud. The results are flooding, difficult starting, and gasoline odors.*

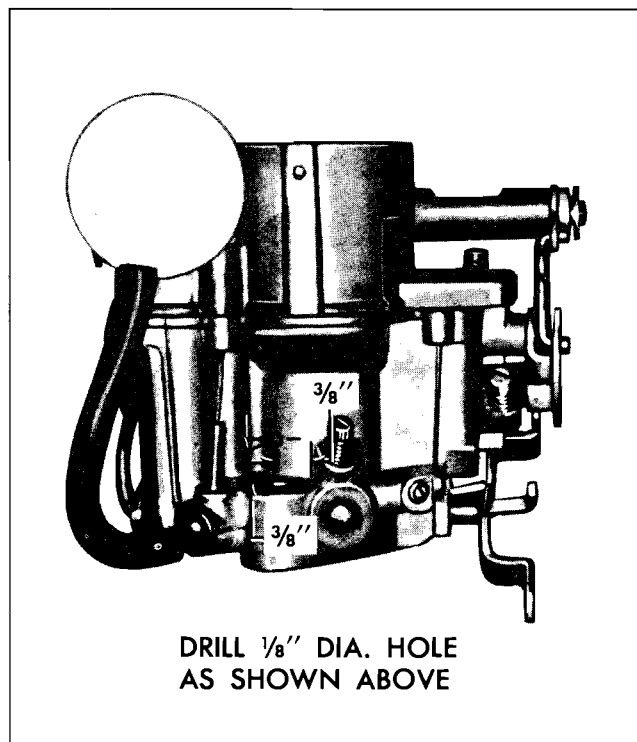
Difficult Hot Engine Re-Starting—1963 Corvair (Except Turbocharged Models) and Corvair "95"

(TSB #885 DR #589 MAY 1, 1963)

Corvair and Corvair "95" engines may be subject to difficult re-starting after the engine has been shut off when hot, for a short period of time. This condition is the result of fuel vapors accumulating in the induction system of the engine.

Hot starting time may be reduced considerably by drilling a $\frac{1}{8}$ " diameter hole through the body of each carburetor as illustrated in Figure 5 to provide a vent.

CAUTION: *This vent hole is not recommended for vehicles operating in extremely dusty areas.*



DRILL $\frac{1}{8}$ " DIA. HOLE AS SHOWN ABOVE

Fig. 5—Drilling Carburetor Vent Hole

Engine Starting Procedure:**INITIAL START:**

Depress accelerator to floor and release. This pre-sets the automatic choke.

RE-START HOT ENGINE:

Hold the accelerator part way down while cranking engine.

FLOODED ENGINE:

Depress accelerator to floor and hold while cranking engine. NEVER "pump" the accelerator pedal.

NOTE: Fuel vapors from this vent may be briefly detectable and should be considered normal.

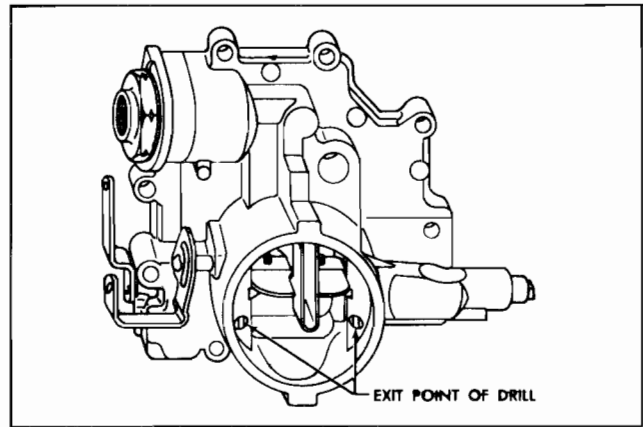


Fig. 7—Vent Hole Location (Outside View)

Hot Weather Idle—1961-62 Corvair and Corvair "95"

(TSB #823 DR #546 JULY 10, 1962)

Corvair or Corvair "95" carburetors may require additional internal venting to improve engine idle and prevent stalling immediately after hot weather and for under the above conditions, additional internal venting may be provided as follows:

If engine stalling is evident during extremely hot weather and/or under the above conditions, additional internal venting may be provided as follows:

1. Remove bowl covers from both carburetors.
2. Invert bowl covers and remove float, float needle and bowl cover gaskets.
3. Drill two (2) $\frac{3}{16}$ " diameter holes in each bowl cover located as shown in Figure 6 on the reverse side. Holes must be drilled straight

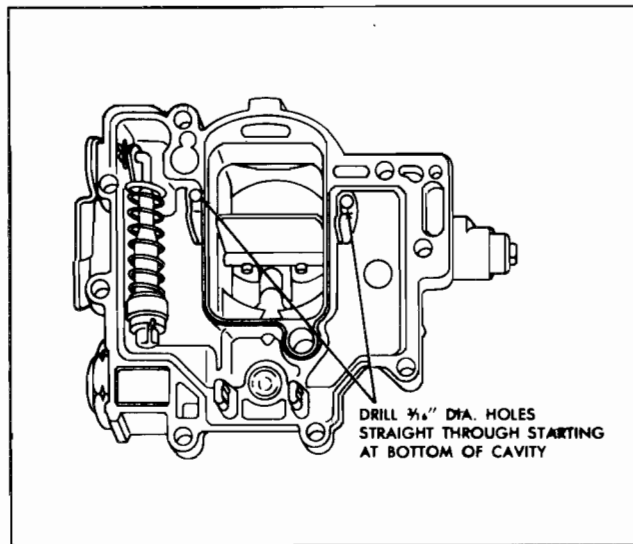


Fig. 6—Vent Hole Location (Inside View)

through to break out inside the air horn as shown in Figure 7.

4. Clean out all chips, remove burrs and reassemble the carburetors.

Hard Starting—1961 Corvair and Corvair "95" Engine—Hot Weather Operation

(TSB #741 DR #495 AUG. 30, 1961)

The following procedures will minimize hot engine restart on a Corvair or Corvair "95" during extreme hot weather operation.

1. To start a hot engine; (a) slowly depress accelerator pedal half way down, (b) turn ignition key to "start" position and crank until engine fires on all cylinders, (c) release ignition key to "on" position and accelerator to idle.

If engine fails to start in 10 seconds or less using the above procedures, do not release accelerator pedal but push it slowly all the way to the floor and continue cranking until engine fires on all cylinders. Do not operate starter more than 30 seconds continuously without a brief pause to allow starting motor to cool off. If it is necessary to wait for starter to cool, do not release accelerator pedal as additional "pumping" will only aggravate the hard starting condition.

2. Check and adjust carburetor synchronization and fuel mixture as outlined in the 1961 Corvair Shop Manual, page 9-4, Carburetor Synchronization. On page 9-5, paragraph C, the clearance between fast idle speed screws and pad on throttle levers should be .045" for both manual and automatic transmissions.
3. Check adjustment of cooling damper doors as shown on page 6A 12-14 in the 1961 Corvair Shop Manual.
4. Block off the two engine air recirculation slots. This will reduce the engine compartment temperature. **NOTE:** Cars with air conditioning will already have slots covered.

A. On engines not equipped with a 60° baffle over the recirculation slots, install covers (Part #3805294) on both slots. Use

10-24 x 7/16" self tapping screws, pointing cover tabs down and to the rear. Tabs are designed to hold damper doors open approximately 1¼ inches.

- B. On engines equipped with 60° baffles over the slots, bend the baffles to a closed position. This will seal off the slots sufficiently so that a cover is not required.

When cooler weather is again encountered in the fall or winter season, the slots should be opened up again to reduce the possibility of carburetor icing. Remove covers or bend baffles back to a 60° angle as required.

Corvair Engine Thermostat

(JUNE, 1961 SERVICE NEWS)

When adjusting Corvair engine thermostat linkage; the thermostat rod swivel, at both the left and right damper door, must always be assembled to the inboard side of the damper door bracket (Fig. 8). This means that the pin portion of the swivel, that goes through the door bracket, should always be pointed outboard.

If the swivel is, in error, assembled to the opposite side of the door bracket, thermostat expansion on vehicle operation would cause a bind at the thermostat stem, resulting in leakage and failure of the thermostat.

NOTE: Operation of the damper doors should be checked whenever a vehicle is in for service, since a damaged lower shroud can cause the door to bind and result in abnormally high engine operating temperatures. The door can easily be checked for binding by manually pulling the door to the full open position.

If damper door adjustment is required, refer to the appropriate Corvair Shop Manual.

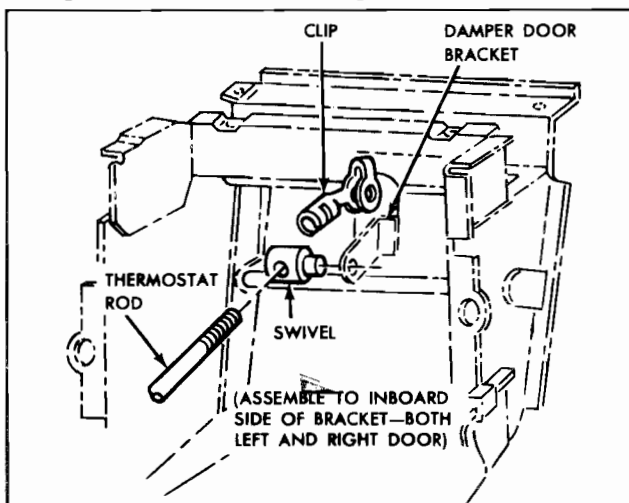


Fig. 8—Thermostat Damper Door—(L.H. Shown)

Restricted Engine Cooling on Corvair "95"

(FEBRUARY, 1965 SERVICE NEWS)

Reports have been received describing the loosening of noise insulation from the Corvair "95" body side inner panels which make up the inside wall of engine cooling air duct work. In some instances this insulation falls into the duct and restricts engine cooling.

This condition can be easily detected by looking through the side air inlet louvers with a flashlight. Any Corvair "95" vehicle with an excessively hot running engine should be checked.

The most reliable corrective action necessitates removal of the inner panel and repairing as follows:

1. Remove the interior tail light cover (7 screws).
2. Remove the rear upper interior body side cover (7 screws).
3. Remove the rear lower interior body side cover—this is the panel in question (19 screws).
4. Cement the insulation into position using good quality water-proof cement.
5. If further retention is desired, round head screws can be installed at critical points.

An alternative to re-installing the loosened insulation as described above, would be to remove and discard the insulation material. This should be satisfactory in trucking operations; however, the increased noise level in passenger vehicles might be objectionable to many owners.

Engine Cut-Out Right Turn 1961 Corvair and Corvair "95" Models

(TSB #739 DR #493 AUG. 3, 1961)

Engine cut-out on 1961 Corvair and Corvair "95" models equipped with 3 or 4 speed transmissions may occur on hard right turn due to fuel spilling out of the left carburetor float bowl through the internal vent passage into the carburetor throat.

This condition was corrected approximately 6/27/61 in Production by using carburetors which incorporate a new air horn gasket. This new gasket has small holes thru to vent each float chamber but is solid below the internal vent passage to the extent necessary to prevent fuel spill-over.

Service

In the event this condition is experienced on earlier units, install in the left hand carburetor only, a new air horn gasket. This gasket is included in Gasket Kit, Part No. 7033068.

1961 Corvair Fuel Pump and Push Rod

(TSB #687 DR #458 DEC. 13, 1960)

Three separate fuel pump and push rod combinations have been used in Production on 1961 Corvair Passenger and Corvair "95" Models.

The latest design fuel pump and push rod incorporate features for quieter operation and a shorter stroke to prevent over-stressing of the fuel pump diaphragm. The pump may be identified by the number 5594886 stamped on the cover. The new push rod can be identified by the black oxide coating on the spring guide.

The same push rod return spring has been used throughout 1961 Production; however, on the late design push rod, it must be installed from the Teflon seat end with the small diameter of the spring against the seat.

NOTE: Due to dimensional changes, fuel pumps and push rods are not interchangeable. If any failure occurs involving replacement of the fuel pump and/or push rod on units produced prior to the following serial numbers, then both fuel pump and push rod assembly should be replaced.

When new fuel pump and push rod are installed, the following procedure should be used to prevent the possibility of failure of the replacement pump.

Insert a straightened out paper clip or wire through vent hole in top of fuel pump cover and measure distance between cover and diaphragm. If distance measures less than 15/16", it is possible pump rod is not properly seated on Teflon seat of engine push rod. Fuel pump should be removed and installation corrected. Mismatch of the fuel pump and push rod will result in no pump action or an interference which could damage the crankshaft eccentric cam or tear the fuel pump diaphragm.

The latest design fuel pump and push rod entered Production at the following listed serial numbers:

F-102791		O-108789
K-106520	W-141650	S-107361

MISCELLANEOUS

To avoid possible entry of objectionable fume odors into the passenger compartment, the heater ducts, leading from the engine lower shrouds to the heater housing and from the heater housing to the passenger compartment, must be free from leaks and properly routed. The connections must be secure and the hoses properly routed to avoid chafing from other vehicle components, such as the starter motor or axle shafts. When inspecting the hoses for leaks, attention should be paid to possible weak points such as bends and at support brackets.

At the cool air intake, the rubber adapter must produce a tight seal between the heater housing and firewall.

In addition to any items noted as a result of a visual inspection, the following articles cover some other conditions that have been encountered in the past.

1961-69 Corvair Direct Air Heater Hose Replacement

(JANUARY, 1971 SERVICE NEWS)

It should be noted that it is important to use only the approved heater hose that was designed specifically for the Corvair heater.

Scattered reports indicate that some people are replacing the 4" I.D. heater hose with material other than the type specified for original equipment replacement. Random checks show that cloth base defroster hose and plastic household clothes dryer hose are the usual substitution.

This substitution may represent a less expensive replacement part, but it may deteriorate rapidly leading to customer dissatisfaction, which could have been prevented with the proper replacement hose.

The approved service replacement hose is located in the Corvair catalog in Group 9.786 under #3870283. This hose meets S.A.E. standard ASTM-SC 610, and should always be used when replacement is necessary.

Heater Hose Strap Rework (Right and Left Sides)—1965 Corvair

(TSB #1067 DR #708 NOV. 9, 1964)

Early production 1965 Corvairs may experience failures of the plastic retainer strap which supports the right heater hose (engine to blower) thus permitting the hose to drop and contact the axle shaft. In addition, the left heater hose, in its original position, may hang low enough to contact the solenoid battery terminal.

When these conditions exist, damage to both hoses is an almost certainty. However, more important, the reinforcing wires inside the heater hoses could cause damage to the axle shaft on the right side, or an electrical short with fire in the heater hose on the left side.

Assembly plants changed from a plastic strap on the right side to a metal strap effective with Serial No. W100343 and No. L100222. Vehicles built prior to the above serial numbers should have the plastic strap replaced with a metal strap as outlined below.

Relocation of the left heater hose retaining strap was effective with Serial No. W113656 and

L101348. The new location of this strap will pull the heater hose toward the centerline of the car and should provide adequate clearance to the solenoid terminals. Relocating instructions are outlined below.

All vehicles built prior to above serial numbers should have the appropriate modifications made to comply with the rework instructions as outlined as follows. This should include all such vehicles still in dealer stock and those sold locally that can be called in for these modifications.

Heater Hose Support Strap Replacement—Right Side

1. Fabricate a strap from 1/64" to 1/32" thick plated steel (Fig. 9).

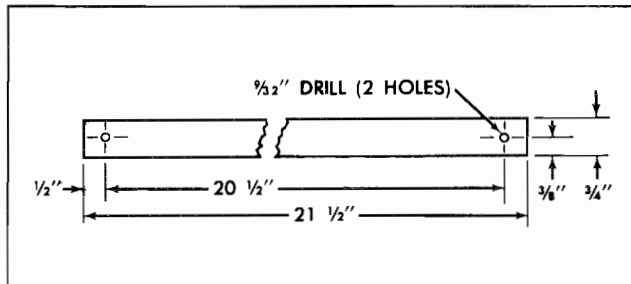


Fig. 9—Heater Hose Retaining Strap

2. Remove and discard the existing plastic hose strap from the right hand side.
3. Disconnect the heater hose from the engine shroud and slide a protective sleeve (Part No. 3786539) over the hose and reconnect the hose to the shroud.
4. Install the fabricated strap as shown in Figure 10.

Heater Hose Support Strap Relocation—Left Side

1. Drill a 9/64" diameter (No. 29 drill) hole upward through the plenum panel 4 1/4" rearward of the gage hole (Fig. 11).
2. Remove existing strap mounting screw and install it in the above hole.

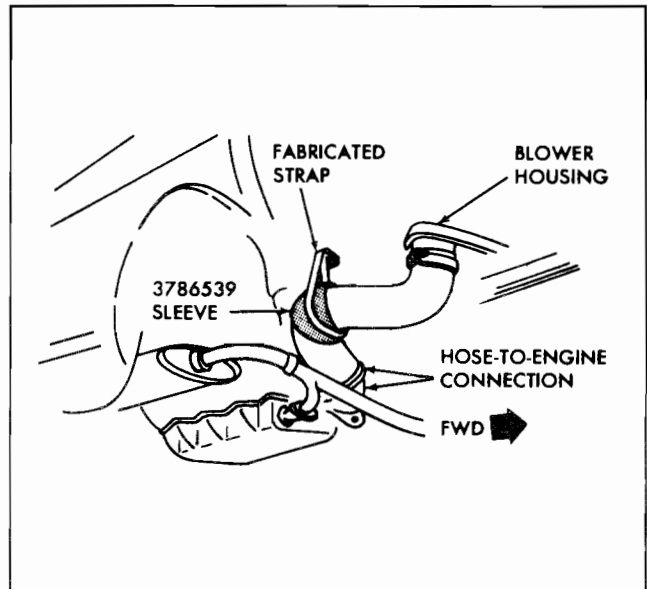


Fig. 10—Sleeve and Strap—Installed View

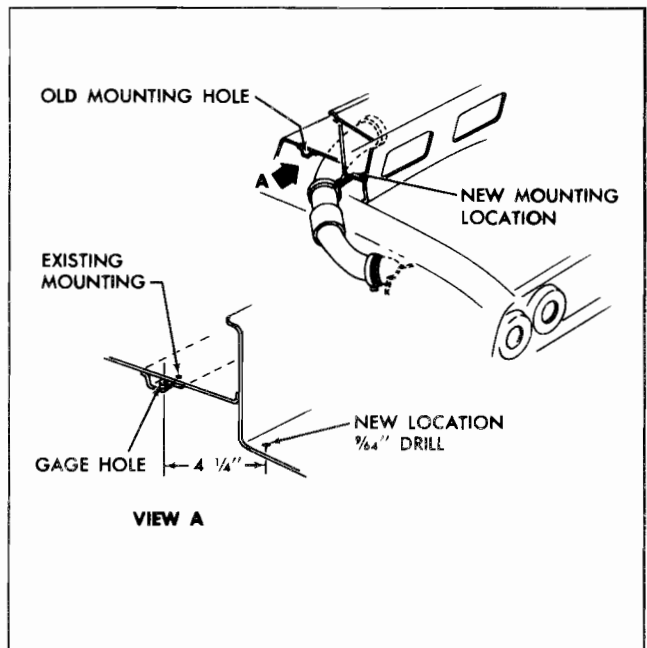


Fig. 11—Revised Strap Mounting