SPEARCO
PERFORMANCE PRODUCTS, INC.

10936 SOUTH LA CIENEGA BOULEVARD, INGLEWOOD, CA 90304 • (213) 649-4863

for what year VW?

INSTALLATION INSTRUCTIONS
VW DIESEL TURBO KIT - PART NUMBER 9830

Tools Required:

Metric hand tools with end wrenches sockets, etc. It is necessary to elevate the car, so jack stands are necessary along with a jack, preferably a floor jack.

Special tools required:

1. 6 mm Hex Driver (For intake manifold bolts)
2. 37/64" diameter drill and 3/8" national pipe thread tap.
3. Thread sealant or teflon tape
4. Stud removing tool. (Helpful, but not essential)

NOTE: Please read the instructions and familiarize yourself with the various steps before starting installation. Extra care must be used in installation of Boost Pressure Enrichment Device.

(1) Place the vehicle on jack stands with the rear wheel hanging freely down. This will simplify the removal of the stock exhaust system.

(2) A. Remove the following components: air cleaner cover and air cleaner element

B. Remove the intake manifold. Use a 6 mm Hex Driver. Save the bolts and washers. They will be reused.

C. Disconnect the exhaust system from the exhaust manifold (13 mm box end wrench or sockets). Remove the exhaust pipe braces (17 mm wrench or socket). Disconnect the rubber donuts on the exhaust pipe.

D. If during removal of the exhaust pipe from the exhaust manifold the two center studs remain in place at this time they must be removed. (Note the adaptor that bolts to the manifold is held in place with only 4 bolts). Use a stud removing tool or lock two hex nuts on to the stud and screw out. Take care not to break off the studs. If they do not want to turn out use penetrating oil and or heat from an acetylene torch or blow torch, heat the area adjacent to the stud and remove. Take care that no combustible material is ignited.

E. Disassemble the exhaust system at the 3 bolt flange and at the slip joints in the pipe so the pipe can be withdrawn from the car.

(3) Locate the exhaust manifold to turbo adaptor and 3 bolt gasket and attach the adaptor to the turbo as shown, (Photo 1) with the three 5/16 - 18 x 3/4" long bolts and lock washers.

(Con't)

Note in Photo #1 that one bolt is a special small hex head bolt. Locate the 10mm-1.5 x #4AN adaptor and self aluminum sealing washer, and install into the tapped oil supply hole in the turbocharger. Do Not overtighten. Locate the oil drain and gasket and attach with two 6mm 1.0 x 15mm long hex bolts and lock washers. See Photo #1. Clamp the cast aluminum turbocharger inlet ell into position on the inlet side of the turbo. Use one of the short 1-3/4" diameter hoses and clamps provided. Orient as shown in Photo #1. Install a 3/8" pipe plug in the threaded hole in the iron adaptor.

(4) Clean the mounting surface of the exhaust manifold where the exhaust pipe was formerly mounted and attach the turbo and adaptor using the gasket supplied. The turbo and adapter assembly must be negotiated into position from beneath the car. If during the removal of the exhaust pipe, the studs come out of the manifold, bolt into place with the 8 mm-1.25 x 20mm long bolts and lock washers provided. Tighten securely. (If the stud remains, use the nuts and lock washers provided.)

(5) Locate the exhaust turbo down pipe and gasket and bolt into place with the four 8 mm 1.25 x 15 mm long bolts and lock washers provided. Do not fully tighten until next step is complete. The two top bolts are most accessible from the top.

(6) Turbo pipe braces and bellows pipe mounting. See Photo #2. Attach the two braces as shown. They are attached at the engine and transaxle with the bolts and mounting points that were used for the factory brace. Hold the flanged bellows section into position and, with gasket provided, use the 1" long 3/8-16 bolts, nuts and lock washers for the holes of the flange. If difficulty is encountered fitting the engine to pipe brace, tap the down pipe forward or backward to secure clearance. Use a washer as a spacer if required. Fully tighten the four bolts that hold the downpipe to the turbo and the three exhaust flange bolts.

(7) Assemble the remaining sections of exhaust into position as shown in Photo #2 and #3. Use existing rubber donuts for support. Adjust so pipe does not interfere with any part of the vehicle. Clamp together with four 2¼" clamps provided.

(8) Check all underside work to make sure no interference exists and double check for tightness and lock washers.

(9) Installation of oil drain.
An oil fitting must be installed in the oil pan. In order to do this, the pan must be removed. Removal is accomplished by removing all the 6 mm bolts (10mm socket

(Con't)

size.) Carefully pry the oil pan loose from the cylinder block and remove. A 37/64" diameter hole must be drilled in the oil pan. Locate per drawing and photo. Use care, as it is difficult to drill large holes in the sheet metal. We suggest drilling a small (1/4" diam.) hole first and then using larger drills until a 37/64" hole is secured. Now, carefully turn the 3/8" tap into the hole, making sure it enters the metal straight and parallel. Screw in until approximately half the length of threads are in. Then, remove and check to see if the 3/8" NPT 45° hose barb will screw in. It should go in approximately two turns by hand. If it will not start, reinstall tap and tap several turns deeper. When proper depth, thoroughly clean area around fitting with lacquer thinner or equivalent solvent, apply silicone sealant around the outside of the fitting. After a complete cleaning and gasket scraping, if required, the pan is ready for installation. Note: an alternate installation method is to have the fitting brazed into the oil pan. If brazing is used, take care that a minimum amount of heat is used to prevent warping of the oil pan. Reinstall the pan using the new gasket provided. Locate the 1/2" diameter x 13" long hose and connect to the oil drain on the turbo and the oil pan fitting. Secure with clamps provided.

(10) Locate the new intake manifold and install the 3/8" NPT bushing and tee into the end. Install the hose barb fittings into the tee. Use a thread sealant and rotate the tee as shown in Photo # 5 . Make sure the mating flange on the cylinder head is clean and free of the old gasket and install the new manifold with the gasket provided. Use existing mounting bolts and washers tighten.

(11) Locate the 1-3/4" Ø compressor discharge tube and install between the turbo and the new intake manifold. Use the two 1-3/4" Ø x 2" long hoses and four clamps provided.

(12) Oil supply installation-Remove the oil sending unit from the left end of the cylinder head. Locate the tee adaptor and install into the cylinder head. See Photo # 5 Install the sending unit in one port of the tee. In the remaining port screw in the male threader end of the oil hose supplied. Attach the other end of the hose to the fitting at the turbo. When installing the hose onto the fitting previously installed in the turbocharger, hold the fitting with a wrench when tightening, to prevent damaging the sealing washer. IMPORTANT: the tee fitting provided in the kit is 1/8"NPT. The threads in the head are metric. They are compatible; however, do not overtighten. Use a thread sealant and turn approximately four turns after finger tight. The same applies for the oil sending unit. Caution: Make sure the oil hose does not come in close proximity to the exhaust manifold.

(13) Installation of Fuel Enrichment Control (see enclosed instructions.

(14) BOOST GAUGE INSTALLATION
A boost gauge and mounting bezel is supplied, and should be mounted for convenient viewing. Perforate the firewall and run a length of vacuum hose from the gauge to the remaining hose barb on the intake manifold.

(15) TUNING: SPECIAL PERFORMANCE AND GENERAL OPERATION

The power of any diesel engine is determined by the fuel injection rate and if turbocharged, by the intake manifold pressure. By increasing either boost pressure or fuel injection rate, power can be increased, sometimes, to the point where mechanical failure or head gasket failure is the limiting factor. The waste gate adjustment is factory set at approximately 9 psi of boost pressure. If when operating your vehicle, boost pressure exceeds nine pounds, we would recommend resetting the waste gate by turning the hex-shaped adjusting nut as shown on Photo #6. One turn of this nut changes boost pressure approximately one and one-half pounds. Turning the direction indicated reduces boost.
Operating your vehicle with over nine pounds of boost pressure in all likelihood will cause head gasket failure. Always monitor the coolant level in the coolant tank to make sure no water is being passed into the engine by a blown or seeping head gasket.

The second parameter of increasing power is additional fuel injection rate. The pressure enrichment device supplied in this kit allows the injection pump to increase its injection rate as boost pressure increases. If due to tolerances in manufacturing or the selection of too long a rod, when installing the device, it is possible that the injection rate is excessive. Excessively high fuel injection rates can cause exhaust temperatures to go above 1200°. Diesel engines should not be operated with exhaust temperatures above 1200° for more than intermittant periods. If the vehicle is to be utilized for towing, or driven to its maximum potential up long hills, we would suggest the installation of an exhaust temperature gauge or pyrometer. These are available from Shelby Spearco and carry Part No. 1-118.

Conversely, if the vehicle seems more sluggish than stock, and never produces smoke, the next longer rod should be used.

Exhaust temperatures of about 1200° can be permitted for intermittent periods, but they should never exceed 1350° maximum, intermittent. Operating diesel engines over a prolonged period at elevated temperatures could cause serious damage, piston failure and seizure, and exhaust valve failure.
Other evidence of excessive injection rate is smoking during acceleration and wide open operation, particularly during wide open operation, under full load at mid-range RPM lugging condition. If excessive smoking is observed under these modes of operation, we would suggest switching to the next shorter rod in your fuel injection enrichment device. For additional details and information in regard to any components of this kit, contact SPEARCO.

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PART NUMBER 9830 — VOLKSWAGEN DIESEL RABBIT TURBOCHARGER KIT

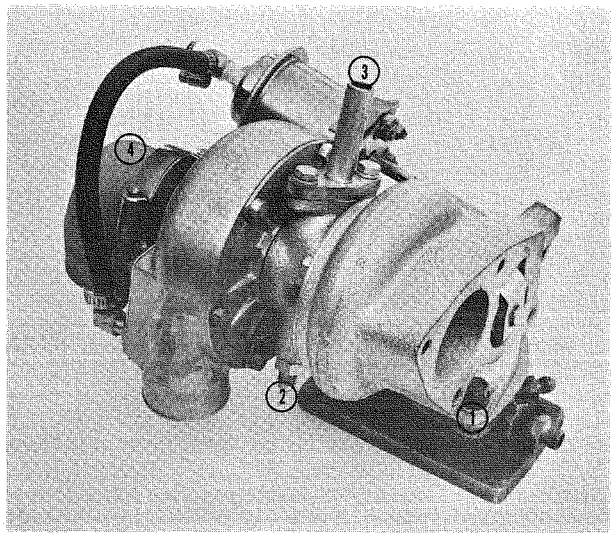


PHOTO #1

1. Special small 5/16-18 x 3/4 hex head bolt with lock washer.
2. Special 10mm-1.0 x #4AN Adaptor and "O" Ring washer.
3. Oil drain
4. Turbo Inlet ell casting

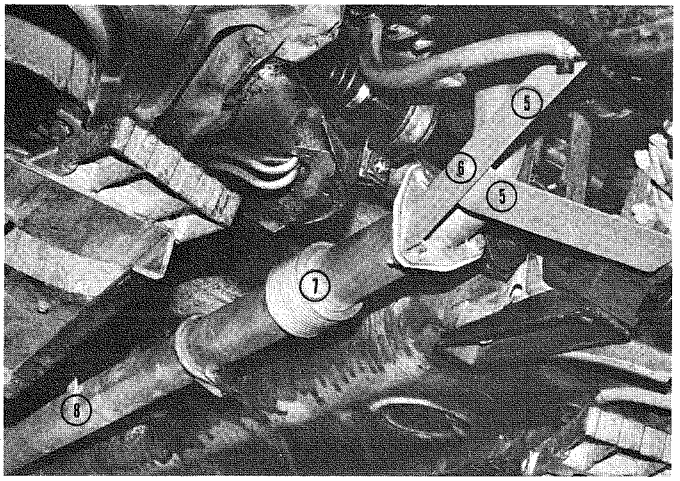


PHOTO #2

5. Exhaust mounting braces
6. 3/8-16 x 1" bolt, nut and lock washer.
7. Bellows pipe with flange
8. Attach bracket to rubber pipe hangar

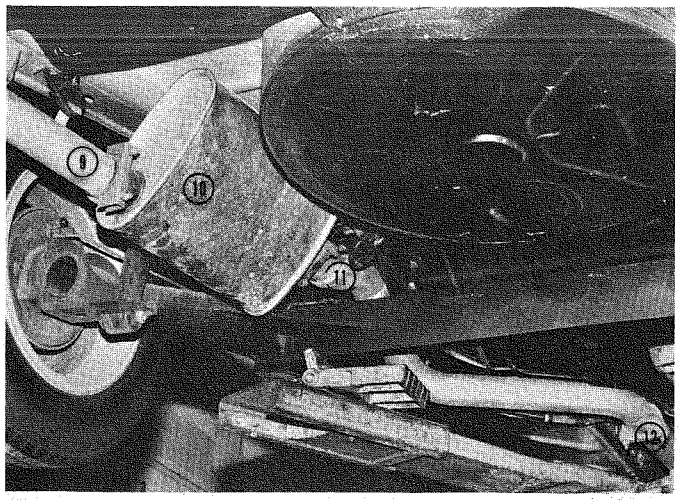


PHOTO #3

9. Muffler, tail pipe & bracket
10. Muffler
11. Front muffler supports
12. Clamp.

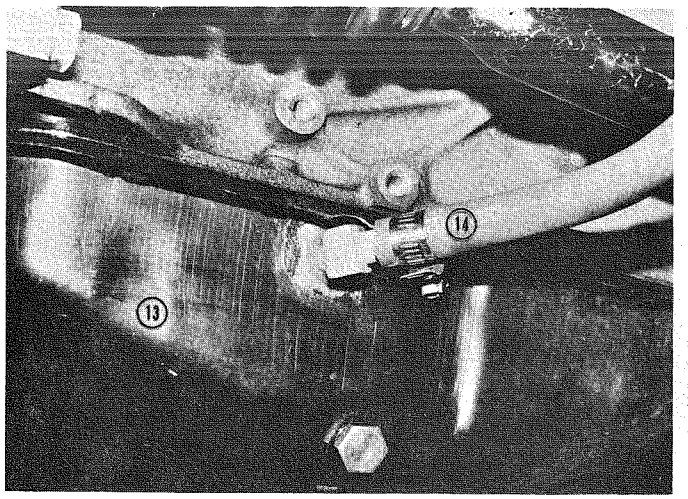


PHOTO #4

13. Oil pan
14. Oil pan fitting & oil drain hose.

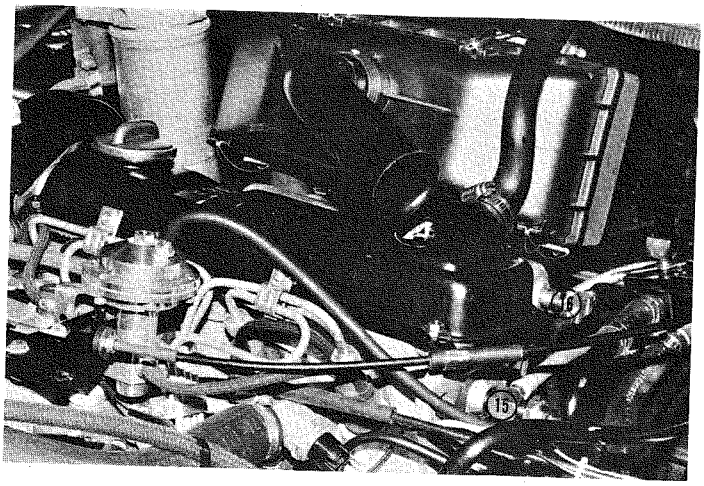


PHOTO #5

15. Oil fitting adaptor tee for oil supply line and sending unit.
16. Connection point for enrichment sensing line and boost gauge

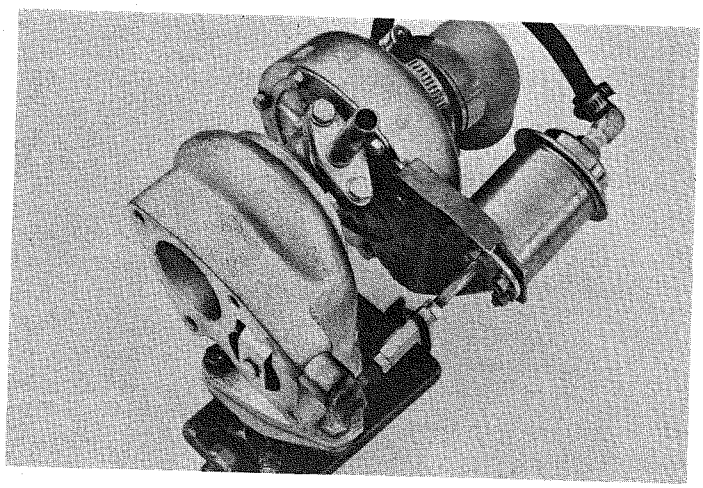
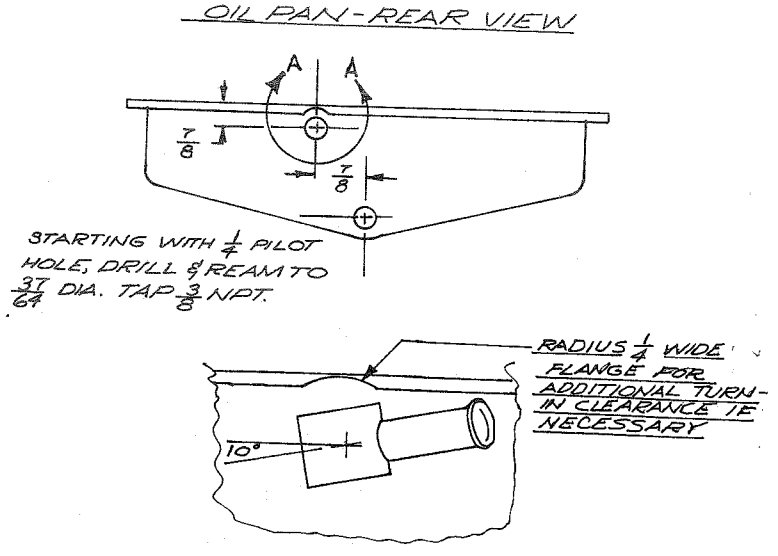


PHOTO #6

Waste-gate adjusting nut



VW OIL DRAIN DETAIL

SPEARCO
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SHELBY SPEARCO DISTRIBUTING COMPANY INC
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INSTALLATION INSTRUCTIONS
FUEL ENRICHMENT CONTROLLER
VW RABBIT DIESEL

CAUTION: This controller assembly consists of precision machined parts. Exercise care during installation to prevent knicks or burrs on machined surfaces, and keep dirt or other foreign material from entering the system. Read these instructions thoroughly before attempting to install this controller.

1. Disconnect the throttle cable from the fuel pump arm, and remove the two bolts that secure the throttle cable bracket to the pump.

2. Locate the fuel adjusting screw on the pump (see Photo No. 1 for location) using a feeler gauge, measure and record the distance between the jam nut and the retaining sleeve. Back off the jam nut and remove the adjusting screw from the pump housing.

3. An assortment of actuator rods have been provided that measure 2.060 to 2.120 inches long in .010 increments. Using the procedure described below and Photo #2 will determine which rod to use.

   A. Readjust the dimension between the retaining sleeve and the jam nut to that which was previously recorded.
   B. Starting with the shortest actuator rod inserted into the assembled control unit, compare its length with the stock adjusting screw assembly as shown. Photo #2
   C. Repeat the above step with succeedingly longer rods until the compared lengths are equal. This will be the actuating rod you will use.

4. Remove the threaded adaptor from the actuator housing and install the small "O" ring from the original adjusting screw. Install the adaptor into the injector pump and tighten with a ¼" Allen Wrench. See Photo #3.Install the actuator rod determined in #3.

5. Unscrew the regulator assembly from the actuator housing and install the provided "O" ring. Use a light coat of grease to retain in place.

6. Install the bullet shaped stylus into the adapter housing with the flat side facing upwards. Carefully screw the adapter housing to the threaded adapter previously installed in the injector pump, making sure the actuator rod engages in the end of the stylus. Be especially careful that the actuator rod does not become bent or distorted. When tightened, the adaptor housing should be referenced in a vertical position, or within 90° past the vertical position.

If necessary, back the housing off until it is in the vertical position (do not back off more than 90 degrees, i.e., ¼ turn). If you cannot achieve the proper position within these limits, remove the adaptor housing and loosen the adaptor in the fuel pump, with the 3/16" allen wrench, 1/4 turn (90 degrees). Re-install the adaptor housing and tighten until it is in the vertical position.

7. Using a flat headed screwdriver, depress the stylus inwards towards the pump until the lower bore of the actuator housing is uncovered. Be careful not to knick the bore or other machined surfaces. Lock the stylus in this position with the small set screw as shown in Photo #5.

8. Screw the regulator assembly into the actuator housing until it stops, taking care not to pinch the "O" ring.

9. Fasten the support bracket to the regulator housing, and reinstall the throttle cable bracket. Line up the brackets and scribe the location for a mounting bolt hole into the throttle cable bracket. NOTE: It may be necessary to unscrew the regulator assembly slightly from its seated position in order to line up the brackets. Remove the throttle cable bracket and drill a 9/32 inch hole for the bracket mounting bolt. Reinstall the bracket and bolt to the support bracket with a ¼-20 x ½ inch long bolt and lock nut. See Photo #6.

10. Remove the set screw holding the stylus and install the threaded plug in its place.

11. Install the 1/16 NPT fitting in the actuator housing and connect the 8 inch length of fuel line from this fitting to the capped fitting on the end fuel injection nozzle.

    Check the operation of the installed controller as follows: Remove the hose barb from the top regulator cover. Insert a screw driver or other tool into the hole and press downward on the metal diaphragm washer inside the hole. Using a medium amount of pressure (approx 6 lbs), quickly depress several times. The diaphragm unit should immediately return to position with no binding or hesitation. If there appears to be any binding, sticking or something other than instant action, it will be necessary to remove the mounting bracket and rotate the regulator housing 1/6th turn counter-clockwise. Reinstall the bracket and check operation.

12. Connect a length of 7/32 vacuum hose from the fitting in the end of the intake manifold to the fitting on top of the regulator.

SPECIAL NOTES

A. On airconditioned models make sure that the auxiliary alternator ground strap has been reinstalled to the bolt on the injector pump or other suitable ground. Failure to do so will result in damage to the alternator.
B. An extra set of "O" rings have been supplied with this controller for customer convenience in case any are damaged during installation.
C. If the idle speed cannot be adjusted low enough with the idle stop bolt, remove the controller and install the next shorter actuator rod.

PHOTO KEY - FUEL ENRICHMENT CONTROL

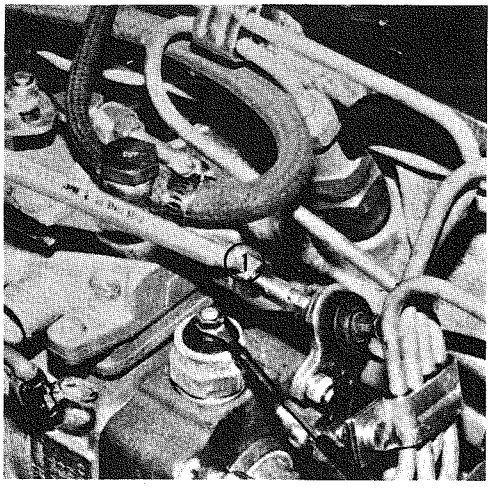

PHOTO #1
1. Fuel adjustment screw

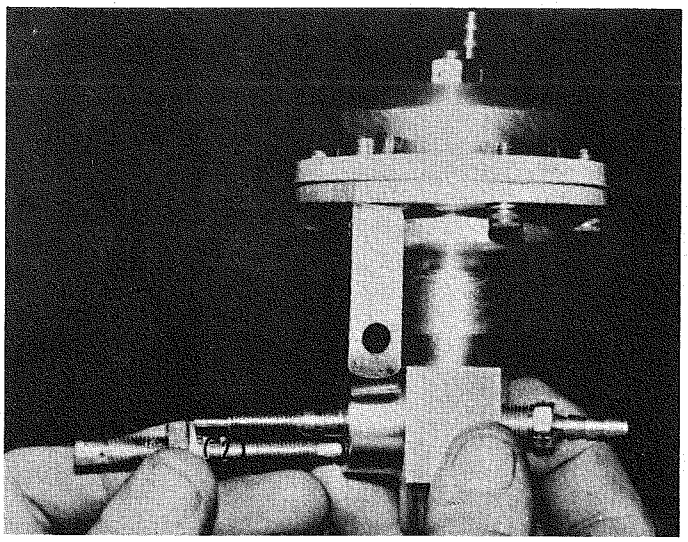

PHOTO #2
2. Adjusting screw previously removed from pump

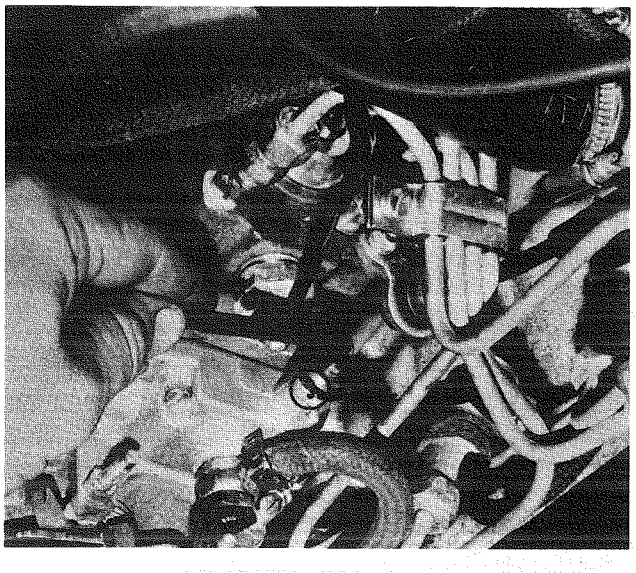

PHOTO #3
3. Threaded adaptor

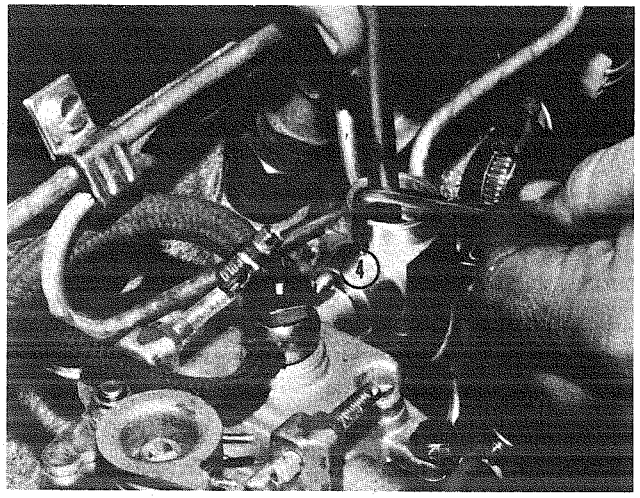

PHOTO #4
4. Adjust and lock stylus into position with allen set screw.

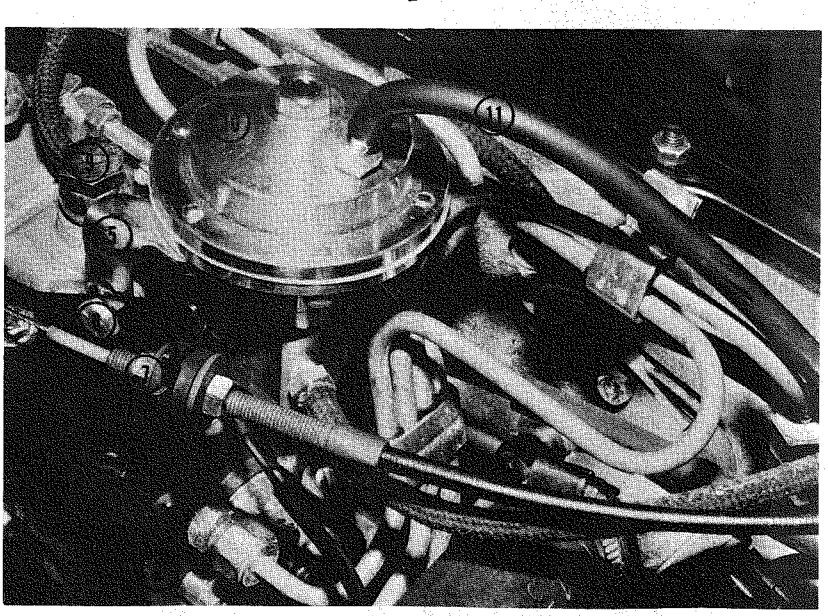

PHOTO #5
5. Controller support bracket
6. 1/4-20 x 1/2 bracket mounting bolt
7. Throttle cable bracket
8. Injector pump
9. Throttle idle stop adjustment
10. Fuel controller assembly
11. Hose to intake manifold