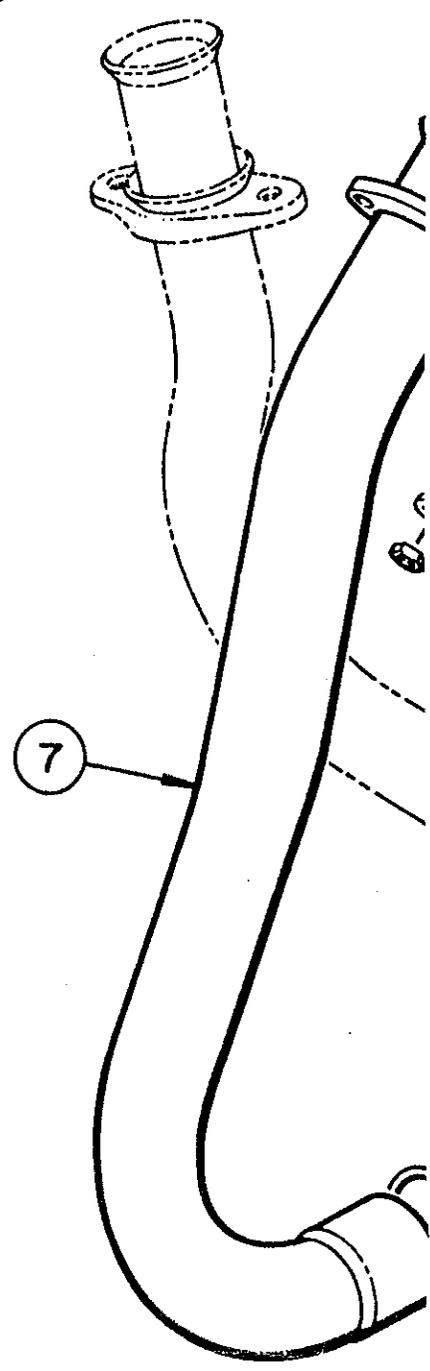


FUEL RETURN LINE
1983 & EARLY 84 MODELS ONLY.

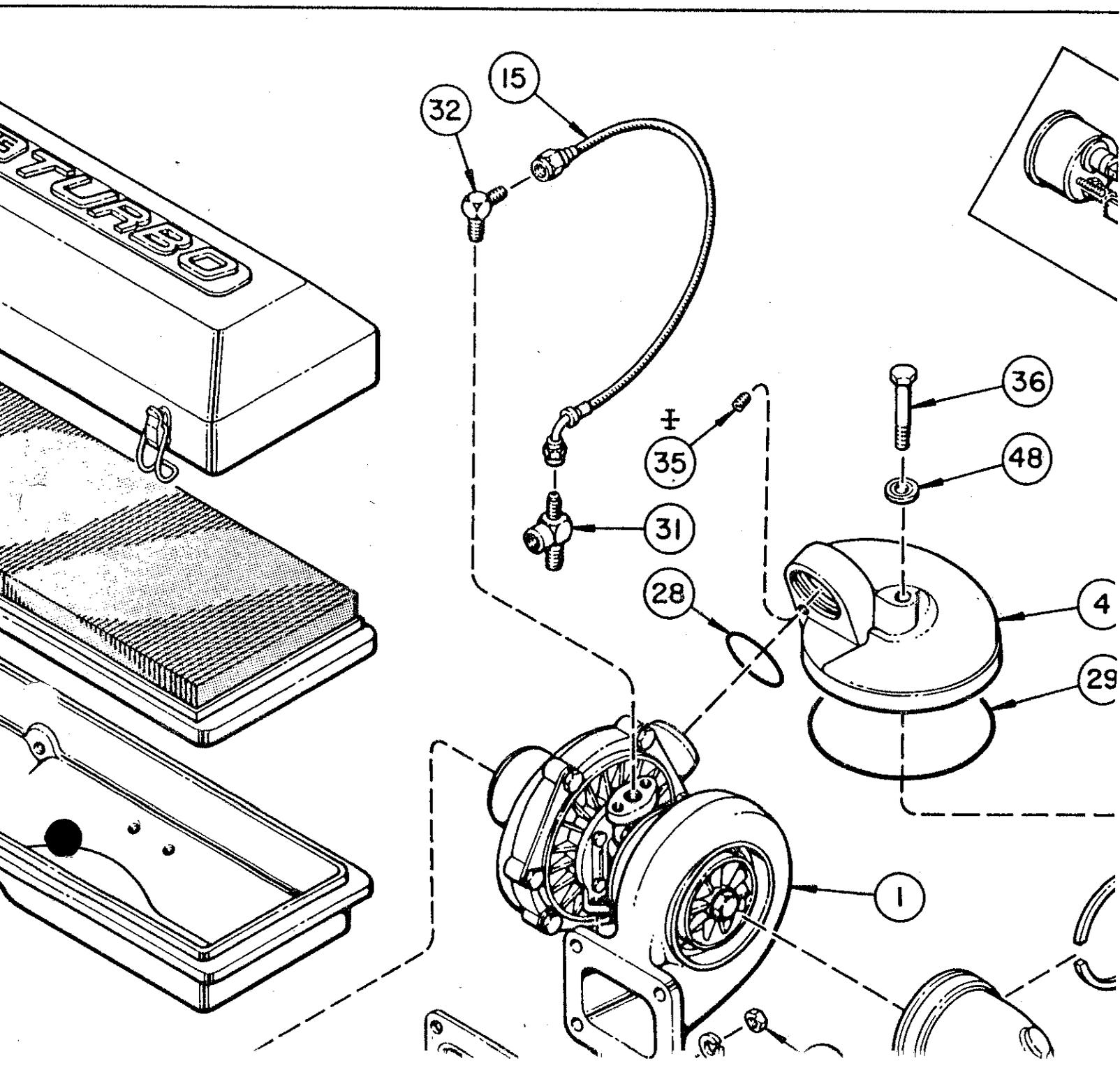


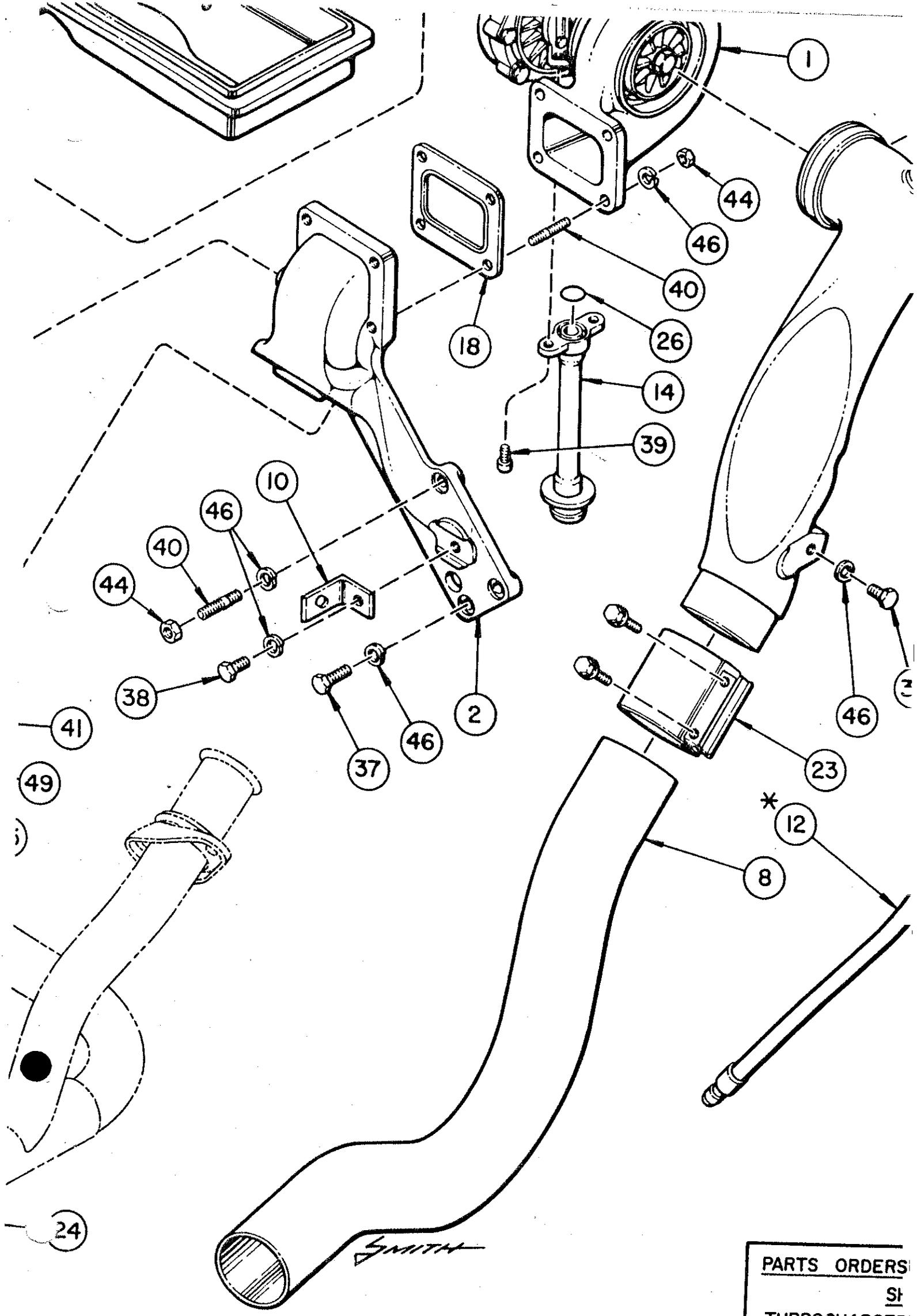
1. Disconnect both batteries at the negative terminals.
2. Remove air cleaner and air cleaner canister.
3. Remove rear engine lifting bracket and install new shorter cap screws provided (item #36). Reinstall bolts without the lifting bracket.

NOTE: Do not install fuel return line retaining clamp, if clamp is present.

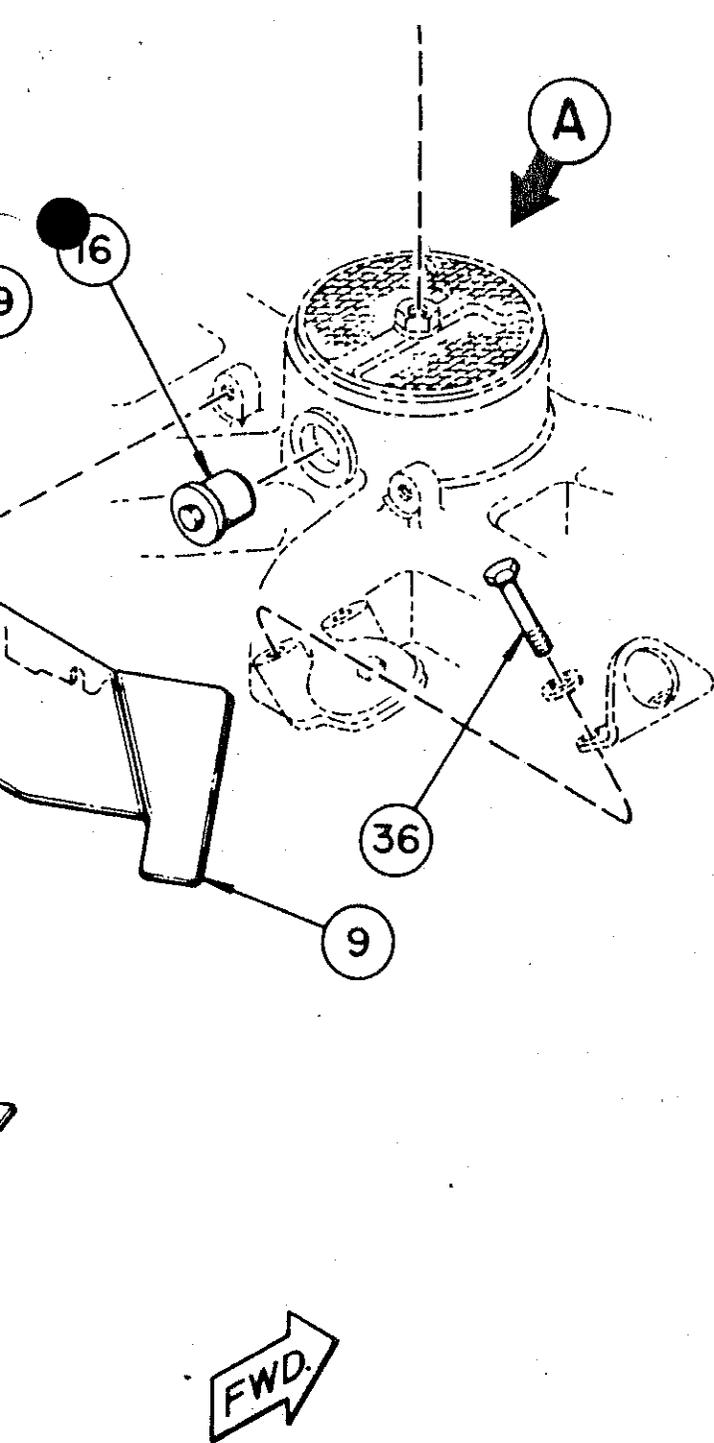
NOTE: Steps 4-6 only need to be followed if your vehicle is a 1983 or 1984 year model.

4. Remove the fuel return line, which was previously held in position with the rear engine lifting bracket bolt. Remove this line only from the passenger side near injector.
5. Cut $\frac{1}{8}$ " out of the return line between the third and fourth injector on the right bank (passenger side). Install the "T" fitting (item #33) supplied in the kit. Connect the fuel return line which was removed from the rear injector to this "T" fitting in such a manner the fuel line will lie on the intake manifold directly behind the air intake.
6. Install fuel return cap (item #34) supplied in kit on the rear injector where the fuel return line was previously located.
7. Remove transmission dipstick and dipstick tube. Cover hole in transmission where dipstick tube has been removed.
8. Vehicle with a sound insulating blanket covering the firewall, must cut and remove the passenger side half of the sound insulating blanket.
9. Remove oil pressure sending unit.
10. Using a pry bar or a piece of 2" pipe, bend the lip of the firewall upward directly behind the turbo mount exhaust inlet. The center of this bend is $1\frac{1}{2}$ " to the passenger side of the original location of the oil pressure sending unit.
11. Install the steel adapter (item #31) where oil pressure sending unit has been removed behind the intake manifold. Tighten fitting so that the $\frac{1}{4}$ " female pipe thread faces the firewall to the driver's side.
12. Install the oil pressure sending unit in this female pipe thread. Reconnect oil pressure sending unit lead wire.





PARTS ORDERS
 ST
 TURBOCHARGER



- 21. BOOST GAUGE KIT
- 22. AIR FILTER ELEMENT
- 23. BAND CLAMP
- 24. SADDLE CLAMP
- 25. INDICATOR, AIR FILTER
- 26. O-RING, TURBO OIL DRAIN
- 27. O-RING, AIR FILTER
- 28. O-RING, PRESSURE CHAMBER IN
- 29. O-RING, PRESSURE CHAMBER OF
- 30. HEX NIPPLE, INDICATOR
- 31. TEE, TURBO OIL FEED
- 32. ELBOW, TURBO OIL FEED
- ** 33. TEE, FUEL RETURN
- ** 34. CAP, FUEL RETURN
- ± 35. PIPE PLUG
- 36. CAP SCREW, HEX HEAD (3)
- 37. CAP SCREW, HEX HEAD (2)
- 38. CAP SCREW, HEX HEAD (2)
- 39. CAP SCREW, SOCKET HEAD (2)
- 40. STUD, NC/NF (5)
- 41. STUD, NC (2)
- 42. STUD, NC/NF (2)
- 43. STUD, NC/NF (2)
- 44. NUT, HEX, NF (5)
- 45. NUT, HEX, NC (2)
- 46. LOCK WASHER (9)
- 47. LOCK NUT, HEX, (4)
- 48. SEAL WASHER
- 49. FLAT WASHER (2)

** 1983 AND EARLY 1984 MODEL ONLY.
 ± WHEN BOOST GAUGE KIT, ITEM 21, IS
 IT REPLACES PIPE PLUG, ITEM 35.
 * OPTIONAL

6.9-085 TURBOSYS PARTS ASSEMBLY

ADVANCED TURBO SYSTEMS

P.O. BOX 7547, 5919 SOUTH 3500
 MURRAY, UTAH 84107
 TELEPHONE (801) 263-0900

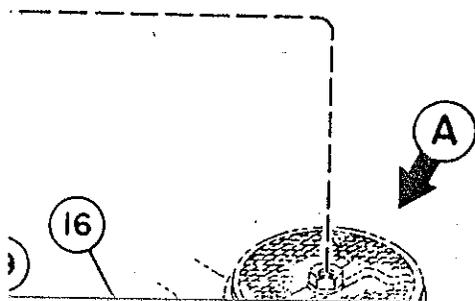
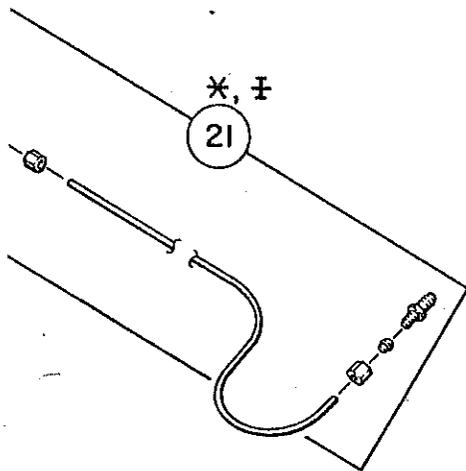
FOR PRICE QUOTATION
 THE FOLLOWING
 DESCRIPTION, AND ITEM NO.

13. Install turbo oil pressure line (item #15) onto the steel adapter (item #31) in such a manner that the "L" fitting connecting the oil line to the steel adapter faces the number three injector on the left bank (driver's side) when tightened.
14. Remove the anti-depression valve from the rear of the intake manifold. Retain capscrews for latter use.
15. Install rubber plug (item #16) in rear of intake manifold where anti-depression valve was removed. Do not over-tighten.
NOTE: The hole must be clean and dry.
16. Install one $\frac{3}{8}$ " x $1\frac{1}{2}$ " stud (item #40) in the upper rear threaded portion of the right bank (passenger side) cylinder head. Make sure stud is tightened in head.
17. Relocate the vacuum block on the firewall above the right bank (Passenger side) valve cover. Two new holes will need to be drilled. The location of this vacuum block should be two inches more to the passenger side and two inches higher than the original location.
18. Relocate the power brake vacuum hose to the retaining hangers just below the hood in the center of the engine compartment. This moves the vacuum hose away from the turbine housing of the turbo.
19. Vehicles with automatic transmissions, must move the transmission vacuum line from the passenger side to the driver's side of the transmission, using the top bellhousing retaining bolt.
20. Mount the stainless heat shield (item #9) to the back of the intake manifold using capscrews which were removed in step #14.

NOTE: Steps 21-27 are done on a work bench.

21. Assemble turbocharger (item #1) to turbo mount (item #2), using studs (item #40), turbo flange gasket (item #18), nuts (item #44), and lock washers (item #46) provided in kit.
22. Install O-ring seal (item #26) in oil drain assembly (item #14). Attach oil drain assembly to turbo using allen head cap screws (item #39).
23. At this time, check to make sure the $\frac{1}{8}$ " pipe plug (item #35) or a manifold pressure adapter (item #21) is tightened into the pressure chamber (item #4).

PARTS



1. TURBOCHARGER
2. TURBO MOUNT CASTING
3. TURBINE EXHAUST CASTING
4. PRESSURE CHAMBER
5. AIR FILTER BASE CASTING
6. AIR FILTER COVER CASTING
7. FEED PIPE ASSEMBLY
8. FINAL EXHAUST PIPE
9. HEAT SHEILD
10. SUPPORT BRACKET, TURBINE EXHA
11. SUPPORT BRACKET, AIR FILTER
- * 12. DIPSTICK TUBE, AUTOMATIC TRANS
13. HOSE SUB-ASSEMBLY, CRANKCASE
14. HOSE SUB-ASSEMBLY, TURBO OIL [
15. HOSE, TURBO OIL FEED
16. PLUG, INTAKE MANIFOLD
17. GROMMET, CRANKCASE VENT
18. GASKET, TURBO MOUNT
19. SEAL RING, TURBO EXHAUST
20. PYROMETER KIT
- * 21. BOOST GAUGE KIT
22. AIR FILTER ELEMENT
23. BAND CLAMP
24. SADDLE CLAMP
25. INDICATOR, AIR FILTER
26. O-RING, TURBO OIL DRAIN
27. O-RING, AIR FILTER

24. Lubricate the 2" I.D. O-ring seal (item #28) and install O-ring seal in the pressure chamber (item #4). With O-ring seal lubricated, push pressure chamber over turbo discharge of turbo compressor housing.
25. Install 90° adapter fitting (item #32) in the female pipe threaded portion of the turbo. When fitting is tight, the fitting should be facing the radiator.
26. Install the pyrometer thermocouple adapter (item #20) in the ¼-18 NPT threaded portion.
27. At this time, the final exhaust brace (item #10) must be checked for proper alignment. Bolt the final exhaust brace (item #10) to the turbo mount (item #2) using capscrew and lock washer (item #38, 46). Without the piston ring seal (item #19) installed, install the final exhaust (item #3) into the turbo (item #1), holding the casting flat against the inside of the turbine housing. Rotate the final exhaust casting (item #3) towards the brace (item #10) that has been mounted to the turbo mount (item #2). If the two holes do not line up exactly, the brace hole must be elongated so that a proper alignment is obtained. After proper alignment is obtained, remove the final exhaust casting (item #3). Do not remove the brace (item #10) from the turbo mount (item #2).
28. Install the large O-ring seal (item #29) over the intake manifold where the air cleaner gasket was located. Be sure the O-ring seal is well lubricated.
29. With steps 21-27 completed on a work bench, install the assembly on the engine using the one stud (item #40) and two capscrews (item #37), lock washer (item #46) and nut (item #44).
30. Install the base of the oil drain line in the grommet where the anti-depression valve was removed. Be sure that the fuel return line is forward (toward radiator) of the oil drain line.
31. Secure pressure chamber (item #4) with the O-ring washer (item #48) and capscrew (item #36).
32. Route the oil supply line (item #15), so that the throttle cable, cruise control cable, and plastic wire assembly are under the oil supply line. This helps keep the cables and wire assembly away from the turbine housing of the turbo.
33. Route the oil supply line to the driver's side of the oil drain line. Now route the line between the turbo and the pressure chamber. Connect the straight end of the oil supply line to the fitting onto the fitting in the turbo and tighten securely.
CAUTION: If this oil line is not routed correctly, serious damage will result to the turbocharger!
34. Remove the entire exhaust system.
35. With the exhaust system removed, cut the exhaust approximately 1¼" to the rear of the stock "Y" assembly. The rear portion of the stock "Y" assembly must be rounded. This is most easily done by using a tubing expander and a hammer. If you don't have a tubing expander, you can use a solid piece of stock that is approximately 2¼" to 2-3/16" in diameter and a hammer.
36. Using a file, clean and remove any burrs from the inside and outside of the stock "Y" assembly.
37. Reinstall the stock "Y" assembly, but do not tighten.
38. Install feed pipe assembly (item #7). Slide the exhaust flange of the feed pipe assembly over studs (item #41) and use flat washers (item #49) and nuts (item #45), only hand tighten at this time. Slide the expanded portion of the feed pipe assembly over the rounded stock "Y" assembly. Make sure that the expanded portion of the feed pipe comes all the way onto the stock "Y" assembly.
39. Tighten exhaust flange to turbo mount securely.
40. Install exhaust clamp (item #24) over expanded portion of feed pipe assembly and tighten securely.
41. Tighten stock "Y" assembly to exhaust manifolds securely.
42. Install piston ring seal (item #19) in final exhaust casting (item #3). Install final exhaust assembly using a ⅝" x ⅝" cap screw (item #38) and lock washer (item #46).
43. Install exhaust down pipe (item #8) by using the 3" band clamp (item #23) as shown in the parts assembly.
NOTE: On four wheel drive models it is necessary to remove the transmission crossmember brace to install the down pipe.
44. Vehicles with automatic transmission should now install the optional dipstick tube (item #12). Use the same O-ring from the original dipstick tube. Lubricate the O-ring. Secure the new dipstick tube by using the rear valve cover bolt.
45. Remove the left bank (driver's side) valve cover, being careful not to harm the valve cover gasket.
46. Using a ⅝" hole saw, put a hole in the rear most round flat portion of the valve cover and install the grommet (item #17) in this hole. Lubricate the inside of the grommet.
47. Reinstall valve cover in engine and tighten bolts.
CAUTION: Do not over-tighten bolts.
48. Install pyrometer lead wire and thermocouple into thermocouple adapter in turbo mount casting.
49. Install air cleaner brace bracket (item #11) in the front of intake manifold using long 5/16" studs (item #42) and hex lock nut (item #47). Install bracket with long portion of angle running from the intake toward the radiator. Level bracket and tighten securely.
50. Install crankcase vent assembly (item #13) in air cleaner base casting (item #5). Do not over-tighten.
51. Install short 5/16" studs (item #43) in air cleaner base casting (item #5).
52. Install air cleaner restriction indicator (item #25) in air cleaner base casting (item #5) in using ⅝" NPT coupler (item #30).
53. Lubricate O-ring seal (item #27) and install in air cleaner base casting (item #5). With O-ring seal lubricated, push air cleaner base casting assembly over turbo inlet and locate air cleaner base against angle bracket. Secure air cleaner base assembly to angle bracket using two 5/16" hex lock nuts

- #42) and hex lock nut (item #47). Install bracket with long portion of angle running from the intake toward the radiator. Level bracket and tighten securely.
50. Install crankcase vent assembly (item #13) in air cleaner base casting (item #5). Do not over-tighten.
 51. Install short 5/16" studs (item #43) in air cleaner base casting (item #5).
 52. Install air cleaner restriction indicator (item #25) in air cleaner base casting (item #5) in using 1/8" NPT coupler (item #30).
 53. Lubricate O-ring seal (item #27) and install in air cleaner base casting (item #5). With O-ring seal lubricated, push air cleaner base casting assembly over turbo inlet and locate air cleaner base against angle bracket. Secure air cleaner base assembly to angle bracket using two 5/16" hex lock nuts (item #47).
 54. Install crankcase vent fitting into lubricated valve cover grommet.
 55. Install air cleaner element (item #22) in air cleaner cover casting (item #6). Secure air cleaner cover to air cleaner base by first centering the cover length-wise and the latching the over center latches.
NOTE: A small amount of grease should be used on the underside of the air cleaner element gasket surface.
 56. Reconnect both battery cables.
 57. Install 3" mandrel bend exhaust system with 3" diameter straight through muffler.
 58. To realize the benefit from turbocharging your diesel engine, the injection pump maximum fuel delivery should be increased. This should be done at this time. For instructions as to increase the injection pump's maximum fuel delivery, read INJECTION PUMP SETTING PROCEDURE.
 59. Start engine and check for any exhaust leaks, air leaks or oil leaks.
CAUTION: NEVER REV THE ENGINE UNTIL OIL PRESSURE IS OBTAINED!

INJECTION PUMP FUEL SETTING PROCEDURE

To realize the benefit from turbocharging your diesel engine, the injection pump maximum fuel delivery should be increased. This is done by removing the timing cover on the passenger side of the injection pump. Remove the top capscrew of the timing cover by using a 1/4" wrench. Loosen the bottom capscrew and let the timing cover plate rotate to the bottom with the rubber gasket. Now rotate the engine using a 15/16" socket and ratchet on the alternator belt pulley nut until the allen head leaf spring screw is centered in the opening. Using a 5/32" allen wrench, turn the allen head screw inward (clockwise) 1/4" of a turn. The injection pump output will determine maximum exhaust temperature.

CAUTION: Never exceed 1150 degrees exhaust temperature.

MAINTENANCE

1. GIVE YOUR ENGINE A GOOD WARM-UP PERIOD BEFORE YOU WORK YOUR ENGINE HARD.
2. GIVE YOUR ENGINE A COOL-DOWN PERIOD AFTER WORKING THE ENGINE. LET IT COOL TO AT LEAST 300 DEGREES FAHRENHEIT.
3. CHANGE OIL AT INTERVALS OF NOT MORE THAN 2,500 MILES. CHANGE OIL FILTER WITH EACH OIL CHANGE.
4. KEEP AIR FILTER ELEMENTS CLEAN. WHEN THE ELEMENT GETS DIRTY, CHANGE IT! A DIRTY AIR CLEANER ELEMENT WILL CAUSE EXCESSIVE EXHAUST TEMPERATURE AND EXCESSIVE OIL CONSUMPTION.
5. KEEP FUEL FILTERS CLEAN. DRAIN WATER FROM FUEL REGULARLY. CLEAN DIESEL FUEL WILL ASSURE LONG TROUBLE-FREE INJECTION PUMP AND INJECTOR LIFE.
6. NEVER REV YOUR ENGINE UNTIL OIL PRESSURE IS OBTAINED!
7. NEVER SHUT OFF YOUR ENGINE AFTER WORKING IT HARD WITHOUT GIVING YOUR ENGINE A COOL-DOWN PERIOD!