

State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER D-180-1
Relating to Exemptions under Section 27156
of the Vehicle Code

THE TURBO SHOP
TURBOCHARGER KIT MODEL 6.9L/7.3L

Pursuant to the authority vested in the Air Resources Board by Section 27156 of the Vehicle Code; and

Pursuant to the authority vested in the undersigned by Sections 39515 and 39516 of the Health and Safety Code and Executive Order G-45-5;

IT IS ORDERED AND RESOLVED: That the installation of the add-on turbocharger kit model 6.9L/7.3L manufactured by The Turbo Shop has been found not to reduce the effectiveness of required motor vehicle pollution control devices and, therefore, is exempt from the prohibitions of Section 27156 of the Vehicle Code for installation on 1983-1987 model-year Ford Motor Company vehicles powered by a 6.9L Navistar International heavy-duty diesel engine and 1988-1989 model-year Ford Motor Company vehicles powered by a 7.3L Navistar International heavy-duty diesel engine.

This Executive Order is valid for The Turbo Shop's turbocharger kit using one of the following turbochargers with area ratio (A/R) of 1.0:

1. Rayjay turbocharger model E-FLOW;
2. Schwitzer turbocharger model T04B25;
3. Roto-Master model R-11;
4. Roto-Master model V-2;
5. Roto-Master model S-4;
6. AiResearch model H-3.

Modifications to the OEM emission-related parts due to the installation of the turbocharger kit include replacement of air cleaner assembly and replacement of the OEM exhaust system with a 3" diameter exhaust system. The positive crankcase ventilation (PCV) valve is relocated to allow the turbocharger installation.

This Executive Order is valid provided that installation instructions for this device will not recommend tuning the vehicle to specifications different from those listed by the vehicle manufacturer.

Changes made to the design or operating conditions of the device, as exempted by the Air Resources Board, that adversely affect the performance of a vehicle's pollution control system shall invalidate this Executive Order.

Marketing of this device using an identification other than that shown in this Executive Order or marketing of this device for an application other

than those listed in this Executive Order shall be prohibited unless prior approval is obtained from the Air Resources Board. Exemption of a kit shall not be construed as an exemption to sell, offer for sale, or advertise any component of a kit as an individual device.

This Executive Order does not constitute any opinion as to the effect that the use of this device may have on any warranty either expressed or implied by the vehicle manufacturer.

THIS EXECUTIVE ORDER DOES NOT CONSTITUTE A CERTIFICATION, ACCREDITATION, APPROVAL, OR ANY OTHER TYPE OF ENDORSEMENT BY THE AIR RESOURCES BOARD OF ANY CLAIMS OF THE APPLICANT CONCERNING ANTI-POLLUTION BENEFITS OR ANY ALLEGED BENEFITS OF THE TURBO SHOP TURBOCHARGER KIT MODEL 6.9L/7.3L.

No claim of any kind, such as "Approved by Air Resources Board" may be made with respect to the action taken herein in any advertising or other oral or written communication.

Section 17500 of the Business and Professions Code makes untrue or misleading advertising unlawful, and Section 17534 makes violation punishable as a misdemeanor.

Section 43644 of the Health and Safety Code provides as follows:

"43644. (a) No person shall install, sell, offer for sale, or advertise, or, except in an application to the state board for certification of a device, represent, any device as a motor vehicle pollution control device for use on any used motor vehicle unless that device has been certified by the state board. No person shall sell, offer for sale, advertise, or represent any motor vehicle pollution control device as a certified device which, in fact, is not a certified device. Any violation of this subdivision is a misdemeanor."

Executive Order D-180, dated June 16, 1988, is superseded and of no force and effect.

Any apparent violation of the conditions of this Executive Order will be submitted to the Attorney General of California for such action as he deems advisable.

Executed at El Monte, California, this 17th day of March, 1989.


K. D. Drachand, Chief
Mobile Source Division

State of California
AIR RESOURCES BOARD

EVALUATION OF THE TURBO SHOP ADD-ON TURBOCHARGER KIT
MODEL 6.9L/7.3L FOR INSTALLATION IN 1983-1987 MODEL-YEAR
FORD MOTOR COMPANY VEHICLES POWERED BY A 6.9L
NAVISTAR INTERNATIONAL HEAVY-DUTY DIESEL ENGINE AND
1988-1989 MODEL-YEAR FORD MOTOR COMPANY VEHICLES POWERED BY
A 7.3L NAVISTAR INTERNATIONAL HEAVY-DUTY DIESEL ENGINE

March, 1989

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1988-1989 MODEL-YEAR FORD MOTOR COMPANY VEHICLES POWERED BY
A 7.3L NAVISTAR INTERNATIONAL HEAVY-DUTY DIESEL ENGINE

by

Mobile Source Division

State of California
AIR RESOURCES BOARD
9528 Telstar Avenue
El Monte, CA 91731

(This report has been reviewed by the staff of the California Air Resources Board and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the Air Resources Board, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.)

SUMMARY

The Turbo Shop has applied for an update to Executive Order D-180 which exempts their add-on turbocharger kit model 6.9L/7.3L from the prohibitions in Vehicle Code Section 27156 for 1983-1987 Ford Motor Company vehicles powered by the Navistar International 6.9L heavy-duty diesel engine and 1988 model-year Ford Motor Company vehicles powered by a 7.3L Navistar International heavy-duty diesel engine. The update request is to include in the exemption 1989 model-year Ford Motor Company vehicles powered by a 7.3L Navistar International heavy-duty diesel engine and to be permitted an option of using one of the following turbochargers with their kit:

1. Rajay turbocharger model E-FLOW;
2. Schwitzer turbocharger model T04B25;
3. Roto-Master model R-11;
4. Roto-Master model V-2;
5. Roto-Master model S-4;
6. AiResearch model H-3.

Based on the following: (1) the fact that the 1989 7.3L Navistar International heavy-duty diesel engine is identical to the 1988 7.3L Navistar International heavy-duty diesel engine; (2) the fact that the turbocharger units manufactured by additional sources have the same area ratio ($A/R=1.0$) as the exempted turbocharger; and (3) that the test data from previous comparative exhaust emission tests performed for exempting the kit did not show any significant increases in exhaust emissions, the staff believes that the add-on turbocharger kit will have no adverse effects on

the exhaust emissions from the vehicles for which exemption update is requested.

The staff recommends that The Turbo Shop be granted an update as requested and that Executive Order D-180-1 be issued.

CONTENTS

	<u>Page Number</u>
<u>SUMMARY</u>	i
<u>CONTENTS</u>	ii
I. <u>INTRODUCTION</u>	1
II. <u>CONCLUSION</u>	1
III. <u>RECOMMENDATIONS</u>	2
IV. <u>TURBOCHARGER KIT DESCRIPTION</u>	2
V. <u>DISCUSSION</u>	3
APPENDIX Installation Instructions	5

EVALUATION OF THE TURBO SHOP ADD-ON TURBOCHARGER KIT
MODEL 6.9L/7.3L FOR INSTALLATION IN 1983-1987 MODEL-YEAR
FORD MOTOR COMPANY VEHICLES POWERED BY A 6.9L
NAVISTAR INTERNATIONAL HEAVY-DUTY DIESEL ENGINE AND
1988-1989 MODEL-YEAR FORD MOTOR COMPANY VEHICLES POWERED BY
A 7.3L NAVISTAR INTERNATIONAL HEAVY-DUTY DIESEL ENGINE

I. INTRODUCTION

The Turbo Shop of 940 West Manchester, Inglewood, California 90301, has applied for an update to Executive Order D-180 which exempts their add on turbocharger kit model 6.9L/7.3L from the prohibitions in Vehicle Code Section 27156 for 1983-1987 Ford Motor Company vehicles powered by the Navistar International 6.9L heavy-duty diesel engine and 1988 model-year Ford Motor Company vehicles powered by a 7.3L Navistar International heavy-duty diesel engine. The update request is to include 1989 model-year Ford Motor Company vehicles powered by a 7.3L Navistar International heavy-duty diesel engine and to be permitted an option of using one of the following turbochargers with their kit:

1. Rajay turbocharger model E-FLOW;
2. Schwitzer turbocharger model T04B25;
3. Roto-Master model R-11;
4. Roto-Master model V-2;
5. Roto-Master model S-4;
6. AiResearch model H-3.

II. CONCLUSION

Based on the following: (1) the fact that the 1989 7.3L Navistar International heavy-duty diesel engine is identical to the 1988 7.3L Navistar International heavy-duty diesel engine; (2) the fact that the turbochargers manufactured by additional sources have the same area ratio ($A/R=1.0$) as the exempted turbocharger; and (3) that the test data from

previous comparative exhaust emission tests performed for exempting the kit did not show any significant increases in exhaust emissions, the staff believes that the add-on turbocharger kit will have no adverse effects on the exhaust emissions from the vehicles for which exemption update is requested.

III. RECOMMENDATIONS

The staff recommends that The Turbo Shop be granted an update as requested, and that Executive Order D-180-1 be issued.

IV. TURBOCHARGER KIT DESCRIPTION

The purpose of the Turbo Shop turbocharger system is to increase the power output of the engine by compressing the intake charge to pressures above that of the atmosphere. This increased pressure allows a greater charge density to enter the combustion chamber and increases the volumetric efficiency. The maximum fuel delivery is slightly increased (1/4 of a turn) in order to maintain proper air-fuel ratios when the turbocharger is providing positive manifold pressure (boost).

The Turbo Shop offers the following six (6) turbochargers with area ratio (A/R) of 1.0, with their kit:

1. Rajay turbocharger model E-FLOW;
2. Schwitzer turbocharger model T04B25;
3. Roto-Master model R-11;
4. Roto-Master model V-2;
5. Roto-Master model S-4;
6. AiResearch model H-3.

The major components of the system include a turbocharger, custom intake adaptors, 3" diameter exhaust tubing, air cleaner assembly, brackets, hoses and the hardware necessary to complete the installation.

Maximum positive manifold pressure is limited to 10 psig by the size of the turbine and the compressor. The maximum engine speed is regulated by the OEM fuel injection governor. Therefore, by controlling maximum engine speed, maximum turbine speed and corresponding boost pressures are also controlled.

Modification to the OEM emission-related parts due to the installation of the turbocharger kit include replacement of the air cleaner assembly and replacement of the OEM exhaust system with a 3" diameter exhaust system. The positive crankcase ventilation (PCV) valve is relocated to allow the turbocharger installation. No other OEM emission controls are removed or disconnected when the turbocharger kit is installed.

Installation instructions, included in every kit, show how to install the turbocharger system and adjust the maximum fuel delivery properly (see Appendix).

IV. DISCUSSION

The Turbo Shop add-on turbocharger was originally designed for installation on 1983-1987 model-year Ford Motor Company vehicles powered by a 6.9L Navistar International heavy-duty diesel engine and 1988 model-year Ford Motor Company vehicles powered by a 7.3L Navistar International heavy-duty diesel engine. The exemption was granted on the basis that the effectiveness of the vehicle's pollution control system was not reduced. Evaluation consisted of comparative (baseline versus turbocharger) steady state tests. The applicant is making available the add-on turbocharger kit for 1989 model-year Ford Motor Company vehicles powered by a 7.3L Navistar International heavy-duty diesel engine.

Based on the following: (1) the fact that the 1989 7.3L Navistar International heavy-duty diesel engine is identical to the 1988 7.3L Navistar International heavy-duty diesel engine; (2) the fact that the turbochargers manufactured by additional sources have the same area ratio (A/R=1.0) as the exempted turbocharger; and (3) that the test data from previous comparative exhaust emission tests performed for exempting the kit did not show any significant increases in exhaust emissions, the staff believes that the add-on turbocharger kit will have no adverse effects on the exhaust emissions from the vehicles for which exemption update is requested.

APPENDIX

THE TURBO SHOP
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90301
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7.3/6.9 FORD/INC PICKUP TRUCK INSTRUCTIONS

*
* IMPORTANT *
*
* READ ALL INSTRUCTIONS BEFORE STARTING INSTALLATION *
*

INSPECT ALL COMPONENTS FOR ANY FOREIGN MATERIAL THAT MAY HAVE ENTERED DURING SHIPPING AND HANDLING. INSPECT ALL COMPONENTS FOR DAMAGE FROM SHIPPING. CHECK ALL MACHINED SURFACES FOR NICKS AND FLAWS OR OTHER DAMAGE. DETERMINE WHAT TOOLS WILL BE NECESSARY FOR THE INSTALLATION.

WHEN THE VEHICLE IS TO BE RAISED OFF ITS WHEELS, IT MUST BE SUPPORTED BY JACK STANDS OR RAMPS WITH ADEQUATE CAPACITY TO HOLD THE VEHICLES WEIGHT. NEVER PERFORM ANY WORK ON A VEHICLE SUPPORTED ONLY BY A JACK!

USE THREAD SEALANT OR TEFLON TAPE ON ALL PIPE THREAD CONNECTIONS. HOLD TAPE BACK FROM FIRST TWO THREADS WHEN TAPING THE THREADS, SO TAPE WILL NOT COME OFF DURING INSTALLATION OF FITTING. ANY THREADS TO BE SECURED WITH LOCTITE MUST BE CLEAN AND DRY.

PAY ATTENTION TO THE ROUTING OF ALL HOSES AND WIRING, KEEPING THEM AWAY FROM EXHAUST HEAT, MOVING PARTS AND SHARP EDGES THAT MAY CAUSE DAMAGE. REROUTE OR TIE HOSES AND WIRING AWAY FROM CRITICAL AREAS. KEEPING ALL A MINIMUM OF ONE (1) INCH FROM HOT EXHAUST PARTS, MORE IS RECOMMEND WHENEVER POSSIBLE.

ANY DEBRIS IN THE EXHAUST OR THE INTAKE SYSTEM COULD CAUSE TURBO FAILURE. TURBO FAILURE DUE TO DEBRIS WOULD NOT BE COVERED UNDER ANY WARRANTY. FOR WARRANTY TO BE VALID, INSTRUCTIONS MUST BE READ AND FOLLOWED CAREFULLY.

* INSTALLATION PROCEDURE *

1. Locate the exhaust pyrometer gauge. Install gauge in suitable place in drivers compartment per manufactures instructions. Drill and tap the driverside exhaust manifold between the 3rd and 4th exhaust ports for the gauge probe. After the gauge has been connected start the engine and allow to idle for several minutes. This will blow any chips from the drilling and taping of the manifold out of the manifold, stop engine and disconnect the negative battery cables at both batteries.

(This is for safety only)

2. Remove air cleaner assembly.
3. Remove right rear engine lifting bracket and bolts, save bolts.
 1. Remove positive crankcase ventilator valve from rear of intake manifold, save as it will be used later.

NOTE: On 1987 and later vehicles it will be necessary to move the glowplug control relay on the back of the engine. Locate the "T" shaped bracket and mount it between the third and fourth injector on the passengerside of the engine on the intake manifold. Mount the relay to the bracket on the center mounting holes. The outer holes are to tie the wireloom too. You may have to cut one wire and extend it to move the wireloom.

5. Remove oil sender from rear of the engine.
6. If vehicle is equipped with acoustic shield on the firewall it must be removed from the area between the left and right heads.
7. Locate the lip where the firewall is attached to the floorpan in the transmission tunnel. Bend this lip toward the rear of vehicle and upward as far as possible. See fig. #1 for location of the area to be bent. It may be necessary to slightly reshape the heatshield on the passengerside floorboard for proper exhaust pipe clearance. Use the exhaust pipes to check for clearance.
8. Install oil sender adapter fittings where oil sender was removed from. Install the 1/4" pipe elbow and tighten so that the opening faces rearward and slightly toward the passengerside. Next install the oil sender into the outlet of the fitting. Install the 1/8" pipe to -4 fitting into the oil outlet on the driverside of the block next to the exhaust outlet. You will have to remove a pipe plug from the block at this location. Install the oil supply line and run along the driverside of block behind the head and toward the center of the intake manifold.

9. Clean hole in rear of intake manifold where positive crankcase ventilator was removed. Install rubber plug supplied with kit into the hole and tighten. DO NOT OVER TIGHTEN!

10. Relocate the vacuum block on the firewall above the passengerside valve cover 2" to the left and 2" upward from the original location.

11. Reroute the vacuum hose that goes to the powerbrake unit thru the retaining hangers located on the top of the firewall.

12. Vehicles equipped with automatic transmission must rebend the steel vacuum line at the rear of the engine to run along the top edge of the passengerside valvecover next to the intake manifold.

13. Locate the 3" exhaust pipe and round 4 bolt flange. Slide the flange onto the pipe with the beveled edge first. Install the pipe and flange into the vehicle behind the passengerside head toward bottom of vehicle. It maybe necessary to rotate the pipe on the way between the engine and firewall. Check for proper clearance around the pipe, pay attention to the area of the firewall that was bent back. There must be a minimum of 1/4" between the pipe and firewall.

14. Locate the 1/2" long spacers, 3/8-16 x 3 1/4" bolts and the turbo mounting pipe. Install 3/8-16 bolts into holes on the bracket on pipe. Install pipe into vehicle from behind intake manifold downward toward driverside of vehicle. Using the 1/2" long spacers mount the pipe to intake manifold where lifting bracket was removed DO NOT TIGHTEN BOLTS.

15. Raise vehicle and remove stock exhaust system. Cut the head pipes and remove the exhaust flanges.

16. Locate the new head pipes, 2 1/4" muffler clamp, 2 1/2" muffler clamp and a flange removed from the stock head pipes. Install the flange onto the new head pipe and slide pipe into the slipjoint on the other pipe. Install assembly into the vehicle using the two muffler clamps and the stock nuts from the exhaust manifolds. The head pipes must fit into the slipjoint on the turbo mount pipe before bolting to the exhaust manifolds. Check for clearance around all pipes and tighten all connections as well the two bolts holding turbo mount pipe to the intake manifold. There must be a minimum clearance of 3/8" between turbo mount pipe and the firewall where it was bent!

APPENDIX (CONTINUED)

17. Vehicles with automatic transmission must remove the dipstick tube and replace it with a new tube. (sold separately) Install per instructions with tube. You may rebend the stock tube so that it clears the exhaust pipe and comes up behind the passengerside head. Also check that the linkage clears pipes when shifted to low gear, you may need to bend linkage inward towards transmission slightly.

18. Locate turbocharger, oil drain pipe, oil drain fitting, oil drain hose, drain gasket and four (4) 3/8" header bolts. Loosen the twelve (12) bolts in the center of turbocharger. Remove the plug from oil drain in turbocharger. Install oil drain pipe to turbocharger with gasket and two (2) header bolts. Slide oil drain hose and fitting on end of drain pipe. Install assembly onto the turbo mount pipe with two (2) header bolts making sure oil drain fitting fits into hole in the valley of the engine where positive crankcase ventilator was removed. Tighten two (2) of the bolts holding the center of the turbocharger to the exhaust housing. Set the discharge hat onto the intake manifold and align the compressor housing outlet with the hat inlet, tighten two (2) of the bolts holding the compressor housing to the turbocharger. Remove the turbocharger assembly from pipe and tighten the remaining bolts per manufactures instructions. Install two (2) tie wraps to hold drain hose to drain pipe and drain fitting. See fig. #2

19. Reroute the injector return hose, throttle cable, cruise control cable and wiring loom at the rear of the intake manifold. It will be necessary to cut the tape holding the oil sender wire into the loom. Pull wire out of the loom and route along passengerside valvecover to rear of engine and onto sender. Using the ties provided tie the cables and wire loom to the mounting lugs where the positive crankcase ventilator was mounted. Now tie the injector return hose to the wire loom, be careful not to pull the ties to tight and pinch line off! See fig. #3

20. Locate heatshield, eight (8) header bolts, turbocharger flange gasket, turbocharger assembly, 2" dia. silicone hose, #02 hose clamps, bolts from engine lift bracket, 1/4 to -4 hose fitting, discharge hat and safety wire. Install the -4 hose fitting into the turbocharger facing the -4 connection to the front when on the vehicle. Clean intake manifold where air cleaner used to mount and run a bead of silicone around manifold. Install discharge hat using bolt and washer from lifting bracket and use silicone to seal bolt and washer in place. Install 2" silicone hose and hose clamps to the inlet of hat. Install turbo assembly into the vehicle with four (4) header bolts and gasket, making sure oil drain fitting goes into the hole in valley pan. Connect the turbo discharge to the discharge hat with hose and clamps. Tighten the clamps and hat hold down bolt. Take safety wire and connect one end to the button on the rear of heatshield. Place heatshield in position on turbo and secure with safety wire. Attach oil supply line to turbo fitting, with 15 degree -4 fitting. With four (4) remaining header bolts attach 3" exhaust pipe, check for proper clearance and tighten.

1/89

21. Locate air cleaner housing, turbo connecting tube, 3" silicone hose, #48 hose clamps. Using 5/16 bolts and washers mount the air cleaner housing to the discharge hat. Put silicone sealer on the threads and under the washers before installing. Install the turbo connecting tube using the 3" silicone hose and #48 clamps.
22. Locate the oil fill adapter, oil vent tube, 1" rubber hose, 5/16" x 1 3/4 bolts. Remove o-ring and plastic washer from the positive crankcase ventilator and install the 1" rubber hose on early valves. On late style remove the plastic adapter and clamp. Mount the oil fill adapter to the front of the injector pump cover. On early model engines this will be between the oil fill tube and cover, on late model engines there is just a flat plate to remove on the cover. Install the oil vent tube into the adapter with silicone sealer and the other end into the rubber hose on the ventilator. Install ventilator to turbo connecting tube with bolts from front cover plate.
23. Install air cleaner into air cleaner cover and attach to air cleaner housing.
24. Do a final inspection of your installation making sure all connections are tight and properly position. All hoses and lines are away from hot exhaust and turbocharger. Use extra heat blanket to shield anything that cannot be moved or is close to hot parts.
25. Reconnect negative battery cables and start vehicle. DO NOT REV ENGINE, ALLOW TO IDLE FOR A FEW MINUTES. During this time check all connections for leaks and proper operation of gauges installed. Stop engine and repair as necessary.

EXHAUST SYSTEM

We have designed an exhaust system to give you maximum performance with the turbo system. The next best possible exhaust system would be a 3" exhaust with a quality low restriction muffler.

CAUTION

Excessive backpressure will result in high exhaust temperature. Under no conditions should the exhaust temp. rise above 1150 deg. F. serious engine damage may occur!

INJECTOR PUMP ADJUSTMENT

To obtain maximum performance from your turbo system it is necessary to make an injector pump adjustment. This adjustment increases the total amount of fuel delivery to the engine. This with the increased supply of air provided by the turbocharger will give you power gains of as much as 60%.

Cleanliness is the most important thing to remember when the pump is being adjusted. Do not allow any foreign material to enter the injector pump during this adjustment.

First place a drippan under the vehicle under the flywheel inspection cover area to catch the fuel released during adjustment. Locate the cover on the passengergside of the injector pump, it is secured by two screws. Using a 1/4" wrench loosen the lower screw and remove the upper. This will allow you to rotate the cover and gasket out of the way for access to the adjusting screw. Rotate the engine in a clockwise direction by **HAND ONLY** until the allen head screw appears inside the pump. Center the screw in the opening before trying to adjust it, using a light and mirror will make seeing the screw much easier.

Using a 5/32" allen wrench adjust the screw inward (clockwise when looking at the screw) will increase fuel flow and increase exhaust temp. , outward (counterclockwise) to decrease fuel flow and lower exhaust temp. . Under no circumstance should the screw be rotated inward more than 1/3 of a turn from it's original setting. **WE RECOMMEND AN INCREASE OF 1/4 TURN INWARD. THIS IS THE ONLY SETTING LEGAL IN THE STATE OF CALIFORNIA.** Increases of more than 1/4 of a turn up to 1/3 turn are for **HIGH PERFORMANCE USE ONLY.**

Exhaust temperature must not exceed 1150 degree fahrenheit as shown on the pyrometer furnished with this kit. If this temperature approaches under heavy uphill load reduce speed and use a lower gear. If vehicle continually reaches this temperature a reduction in the injector pump setting is necessary!

THINGS TO REMEMBER

1. Keep air cleaner element clean. When the element becomes dirty remove from holder and clean per manufactures instructions. A dirty air cleaner will cause excessive oil consumption and high exhaust temperatures.
2. Change oil and filter every 2500 miles.

3. Before shutting engine off make sure exhaust temperature is below 300 degrees fahrenheit.

4. When starting your engine do not rev the engine! Allow the engine to idle and warm up before driving.

Following these easy directions will give you many trouble free miles of enjoyment from your turbo system.

APPENDIX (CONTINUED)

7.3/6.9 FORD TRUCK PARTS LIST

ITEM	QUANTITY	PART NO.	DESCRIPTION
1	1	1-001	PYROMETER
2	1	S/N	TURBOCHARGER
3	1	1-002	EXHAUST PIPE
4	1	1-003	TURBO MFG. PIPE
5	1	1-004	Y-PIPE #1
6	1	1-005	Y-PIPE #2
7	1	1-006	INTAKE PIPE
8	1	1-007	DISCHARGE HAT
9	1	1-008	AIR CLEANER
10	1	1-009	AIR FILTER
11	1	1-010	OIL DRAIN PIPE
12	1	1-011	OIL DRAIN FITTING
13	1	1-012	OIL DRAIN HOSE
14	1	1-013	1/4 PIPE TO -4 90
15	1	1-014	-4 OIL LINE
16	1	1-015	1/8 PIPE TO -4 90
17	1	1-016	1/4 PIPE ELBOW
18	2	1-017	3" HOSE
19	4	1-018	3" HOSE CLAMP
20	1	1-019	2 1/2" MUFFLER CLAMP
21	1	1-020	2 1/4" MUFFLER CLAMP
22	1	1-021	INTAKE PLUG
23	2	1-022	1/2" LONG SPACERS
24	2	1-023	3 1/4" LONG BOLTS
25	1	1-024	3/8" FLAT WASHER
26	1	1-025	TURBO HEATSHIELD
27	1	1-026	2" HOSE
28	2	1-027	2" HOSE CLAMP
29	10	1-028	HEADER BOLTS
30	1	1-029	DRAIN GASKET
31	2	1-030	5/16" X 1 3/4" BOLT
32	2	1-031	5/16" FLAT WASHER
33	2	1-032	5/16" LOCK WASHER
34	1	1-033	EXHAUST FLANGE
35	1	1-034	VENTILATOR HOSE
36	1	1-035	VENTILATOR TUBE
37	1	1-036	VENTILATOR FITTING
38	1	1-037	3" SAFETY WIRE
39	14	1-038	MISC. TIE WRAPS
40	2	1-042	1/4-18 NUT
41	2	1-039	HEATSHIELD BANNER
42	1	1-044	RELAY BRACKET
43	1	1-041	INSTRUCTION MANUAL

FIG. 1

APPENDIX (CONTINUED)

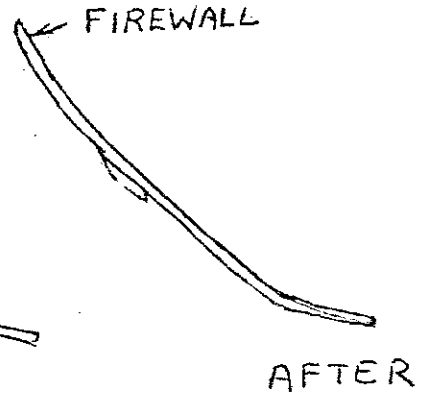
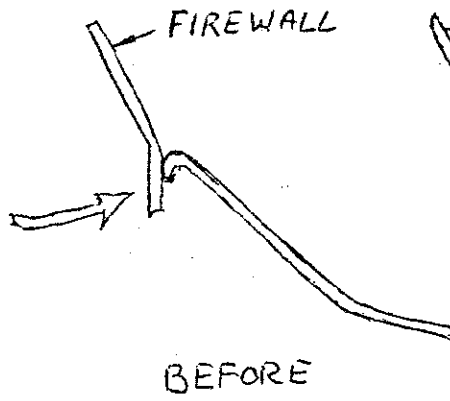
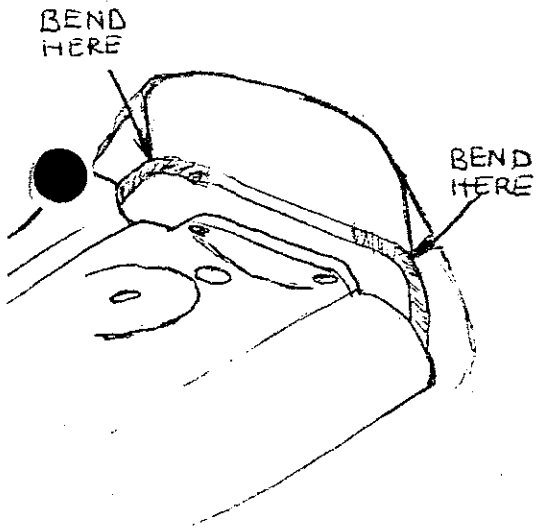
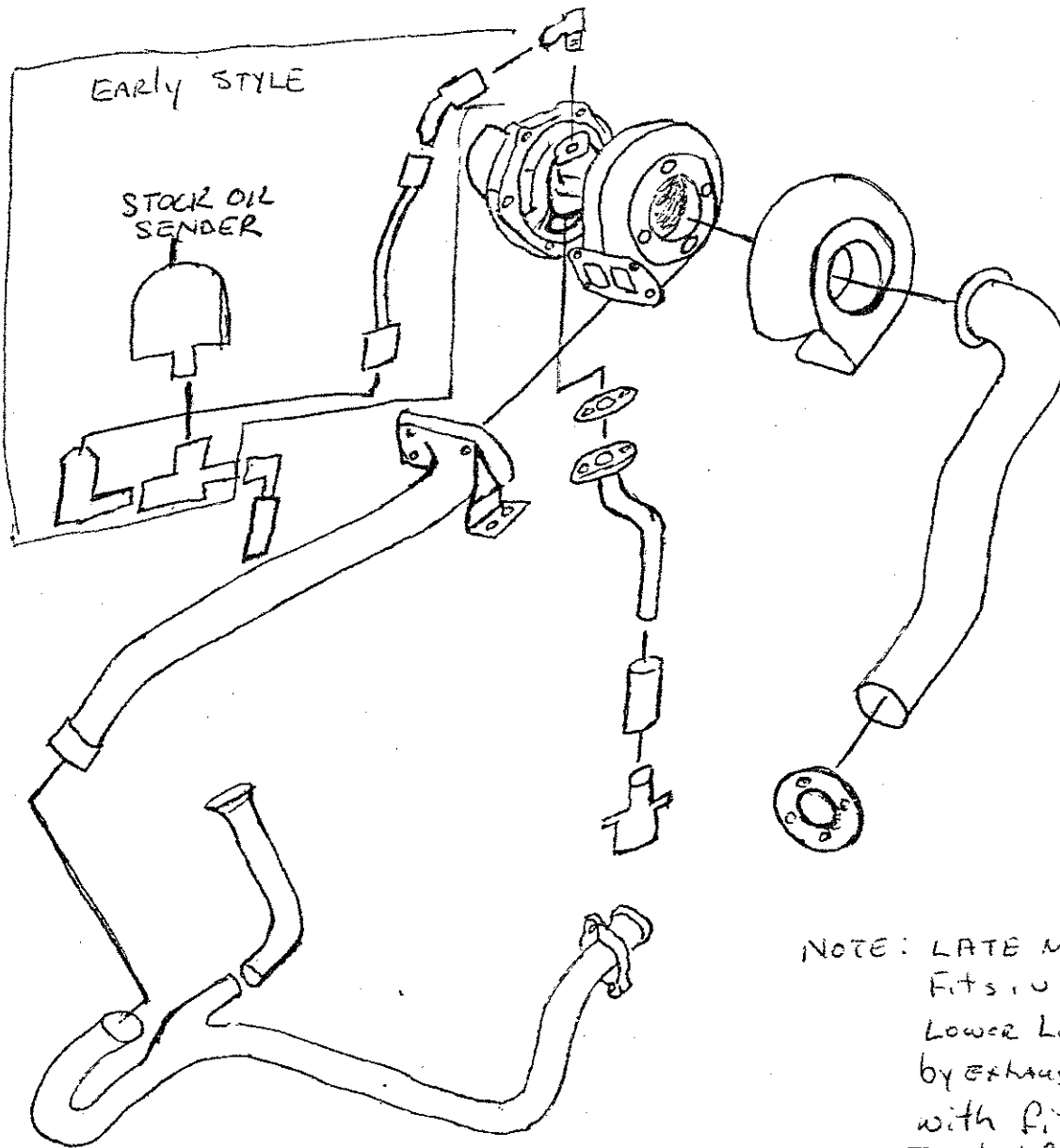


FIG. 2



NOTE: LATE MODEL OIL LINE
 Fits into oil hole on
 Lower Left side of block
 by exhaust pipe outlet
 with fitting & hose.
 Install fitting in turbocharger
 facing front of vehicle.

TIE WRAP TO POSTS

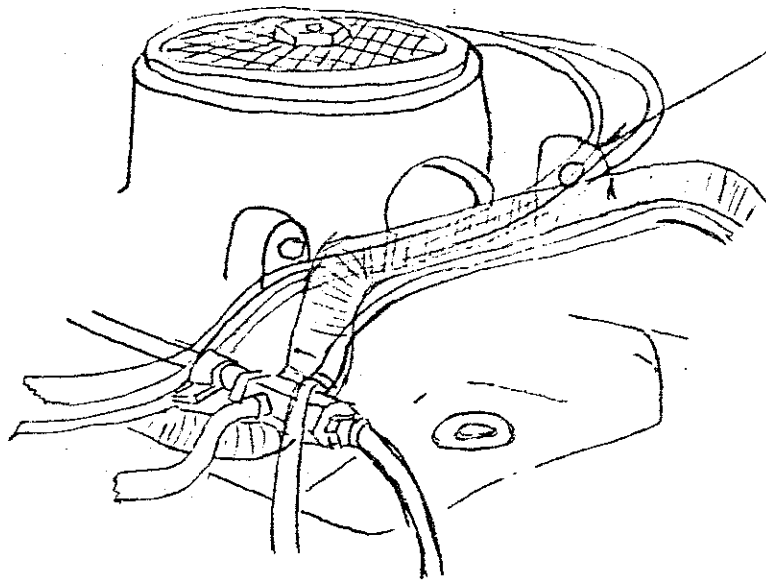


FIG. 4

