

NOTE: READ ALL INSTRUCTIONS AND
ASSEMBLE ALL TOOLS BEFORE
BEGINNING INSTALLATION

Rapido

INSTALLATION INSTRUCTIONS – MERKUR 2.3 LITRE TURBO INTERCOOLER SYSTEM

Tools Required: A standard complement of mechanics' hand tools will be necessary, including end wrenches, sockets, ratchets, screwdrivers, pliers, etc. Although not essential, it is convenient to be able to lift the vehicle on an automobile lift for installation of the intercooler core assembly, and for attaching the intercooler tubes to the core assembly. In lieu of an automobile lift, a floor jack or lift ramps will suffice.

1. Removal of aluminum discharge casting. Remove the cast aluminum discharge neck bolted to the compressor outlet on the turbo by removing the two mounting bolts and loosening the hose clamp on the convoluted hose.
2. Installation of new aluminum discharge casting. Mount the new curved aluminum casting on the turbo, utilizing the existing gasket and existing bolts. Tighten securely. Refer to the detailed drawing on the anti-surge valve and wastegate hose routing and install the $\frac{1}{2}$ " pipe thread by 1" hose barb. Use sealing tape or silicone sealant and tighten into position.
3. Installation of anti-surge valve in compressor inlet casting. Disconnect the hose and the threaded fitting, which is screwed into the adapter on the compressor inlet casting attached to the front of the turbocharger. Release the hose clamp on the convoluted hose and retract it back off the casting. Remove the two mounting bolts and separate the casting from the front of the turbo, being careful not to injure the gasket. Refer to the drawing entitled Turbo Drilling Detail and drill and tap the casting as shown. Install the brass adapter and 1" elbow into the threaded, tapped hole, using Teflon tape or thread sealant and orient the fitting as shown on the detail sketch. Make absolutely certain there are no burrs or foreign material on the inside of the casting and reinstall it on the front of the turbocharger. Reinstall the convoluted rubber hose and reattach the ground wire to the outboard mounting bolt. Using the proper hoses supplied, install the anti-surge valve into position as shown in the drawing. Connect the length of $\frac{5}{32}$ " hose supplied to the top of the valve, connect the other end of the existing capped $\frac{1}{4}$ " barb on the left side of the firewall. A short piece of $\frac{1}{4}$ " hose and a $\frac{1}{4}$ x $\frac{5}{32}$ " plastic reducer are provided for this connection. If this barb is in use, connect into the existing hose with the $\frac{1}{4}$ x $\frac{1}{4}$ x $\frac{5}{32}$ " tee provided. Route this hose so that it is not in close proximity to the exhaust manifold.
4. Turbocharger wastegate hose connection. Locate the appropriate hoses as shown in the drawings, disconnect from the electric control valve and connect together utilizing the $\frac{1}{4}$ " nylon dual barb connector.
5. Modification of bottom radiator rubber flap. In order to secure clearance for the intercooler and casting, it is necessary to cut the rubber flap as shown in the detail. Use tin snips or scissors.

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6. Installation of Fan Guard. This provides the proper space between the intercooler and the fan and, on lowered vehicles, helps to prevent fan damage if the vehicle is bottomed out on the intercooler. Install as shown in the drawing. It may be necessary to cut the lower center web for additional clearance, since the intercooler will now sit farther forward.

7. Installation of Intercooler Assembly. Put the vehicle on an automobile lift and/or lift with a floor jack and floor stands and proceed as follows. In order to secure space to insert the intercooler between the bottom of the radiator and the valance panel, it is necessary to remove the two spring clips mounted on the end of the swing rods that retain the bottom fascia into position. These are located up underneath the fascia approximately 1 foot in from the side of the vehicle. Remove the clips and pry the plastic material off the swing rods so that the plastic fascia can be pulled down to accept the entrance of the intercooler.

Once these swing rods are free, have an assistant help you deflect and pull down the front valance and, from the back, insert the intercooler up and at an angle between the valance and the bottom of the intercooler core assembly. It will neatly slip into position. It is temporarily held by the center web of the fascia. It can now be permanently mounted with the brackets provided. The longer bracket is the left hand bracket, the shorter bracket is the right hand bracket. They are attached to the intercooler with four $\frac{1}{4}$ -20 x $\frac{1}{2}$ " cap screws and lock washers. In turn, the brackets are attached to the chassis by inserting $\frac{1}{4}$ -20 x $\frac{3}{4}$ " long cap screws from the bottom and securing at the top by utilizing the rectangular $\frac{1}{8}$ " thick washers, lock washers and nuts provided.

Tighten all bolts securely and then, from the bottom side of the vehicle, look upward between the back of the intercooler and the large front fan shroud. Make certain there is approximately $\frac{1}{4}$ " clearance between the end castings of the intercooler and the fan blades or fan shroud. If sufficient clearance exists, grab the intercooler firmly and pull forward and twist for position as required. Retighten the bolts again, if necessary. Reinstall swing rods in fascia holes and install clips.

8. Installation of Intercooler tubes. Install the intercooler tubes as shown in the photograph and in the following sequence. Insert #1 tube from the top side, install the bump hose on the ell casting, and insert the tube into the bump hose. At the bottom side, connect to the outboard intercooler connection with a 2 $\frac{1}{4}$ " hose and clamps provided. Check the clearance between the air conditioning pulley and air conditioning belt. There should be between $\frac{1}{8}$ " and $\frac{3}{16}$ " clearance. If insufficient clearance exists, reposition the tube slightly by inserting further into the intercooler at the bottom or pulling out slightly at the top until additional clearance exists. If more clearance is necessary, mark the area, remove the tube, dent slightly and reinstall.

Locate the #3 tube, install a $\frac{1}{8}$ " plug into the coupling welded to the top, and install the tube into position from the top side. Rotate the existing rubber bellows slightly, and insert the flared end into the bellows. Clamp tightly. From the bottom side of the

vehicle, attach the #2 tube to #3 tube, utilizing the 2" diameter hose and clamps provided, and attach the remaining tube end to the intercooler connection.

IMPORTANT NOTE: When installing this tube, #3 tube must be oriented in such a manner that it lifts the tube assembly up for clearance between the tube and the fan belt. Push up as required and check that approx. 1/2" - 3/4" clearance exists and retighten hose clamps as necessary.

9. Installation of fitting for Factory Cruise Control. When installing this system on a 2.3 Turbo with Ford/Lincoln-Mercury "Vacuum" Cruise Control, you must also drill and tap a second hole.

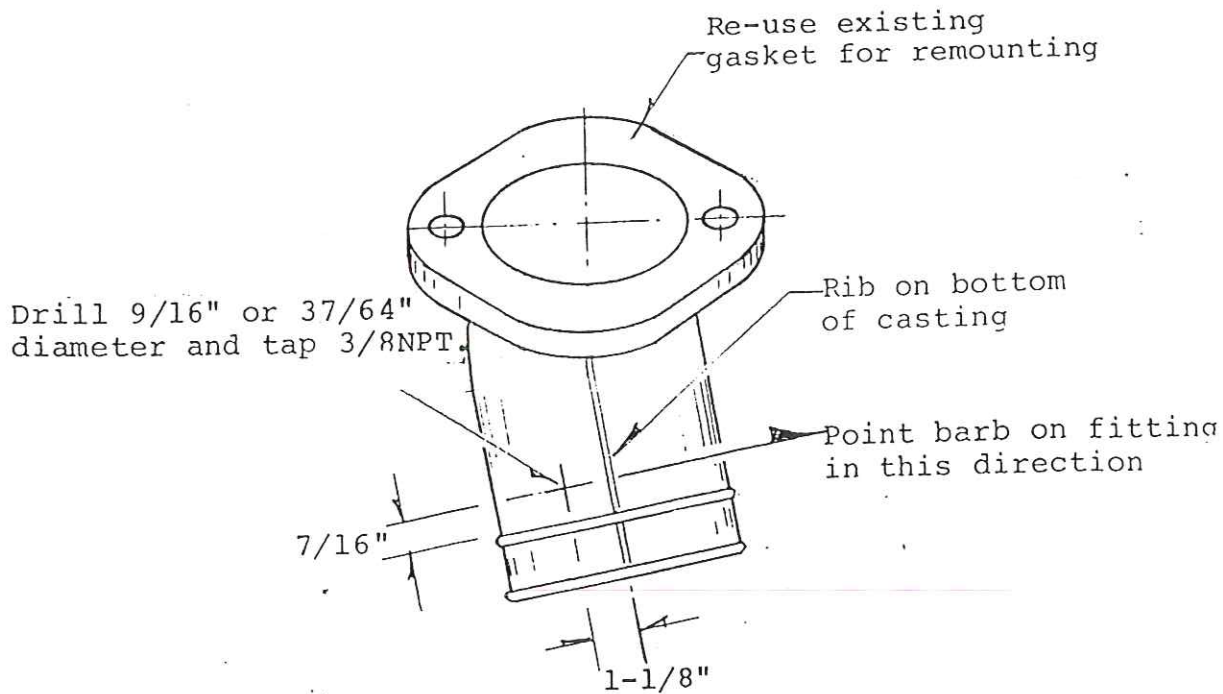
Using the same drill and tap you used in installing the by-pass valve fitting (into the turbo inlet casting), drill and tap the elbow fitting supplied in the system. See Drawing. This will allow you to install the cruise control fitting into the new elbow.

10. Final Check. Double check to make sure all attachments that have been removed and reinstalled are properly tightened, that sufficient clearance exists between the tubes and the fan belt, and that the anti-surge valve is correctly installed. Double check that the wastegate hose modification is correctly made. Start the engine and determine that there are no leaks or abnormal behavior. Your vehicle is now ready for operation.

11. Driving tips, theory of operation, etc. This intercooler system will reduce the temperature of the air charge between 120° and 140° depending on boost pressure, compressor discharge temperature, and ambient temperature. This reduction in charge temperature increases the air density with the resultant increase in horsepower. Make sure that the ambient surface of the intercooler core does not become clogged with insects and dirt, clean occasionally as required by flushing with a high-pressure jet of water. Although the intercooler is most effective in removing air that is heated by the turbocharger during boost pressure operation, it will, in addition, substantially reduce the temperature of the air entering the engine at cruise modes, which can contribute to increased mileage and overall efficiency at cruise.

12. Anti-surge valve. The anti-surge valve prevents the vehicle from surging when operated in a trailing throttle mode after transition from boost mode. This occurs as a result of pressure stored in the intercooler and tubes and discharged in reverse. This disturbs the air flow meter operation. If the system is installed without this valve, it could produce an annoying surge.

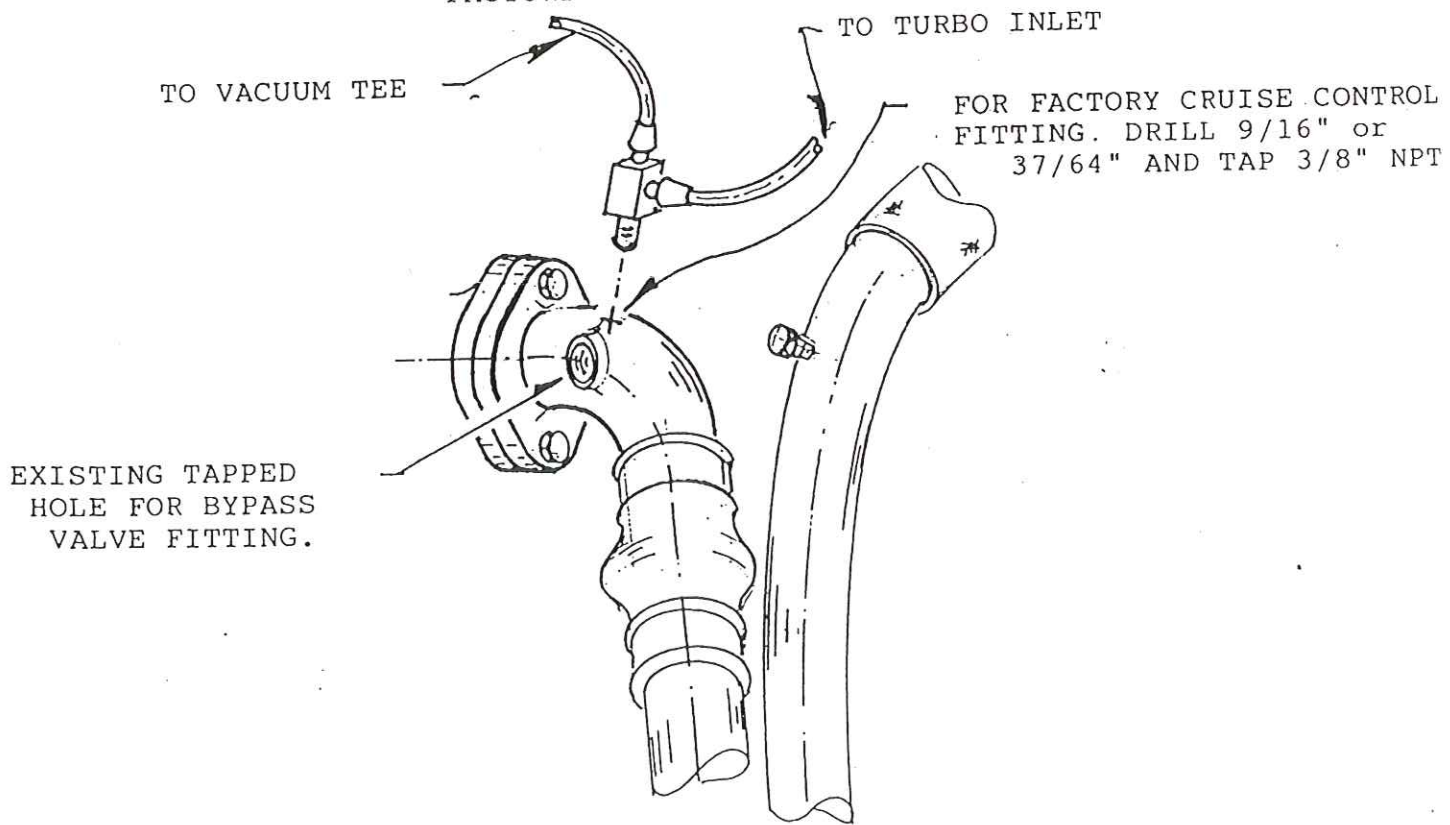
13. Exemption sticker. Attach the C.A.R.B. exemption sticker in a prominent location in the engine compartment.



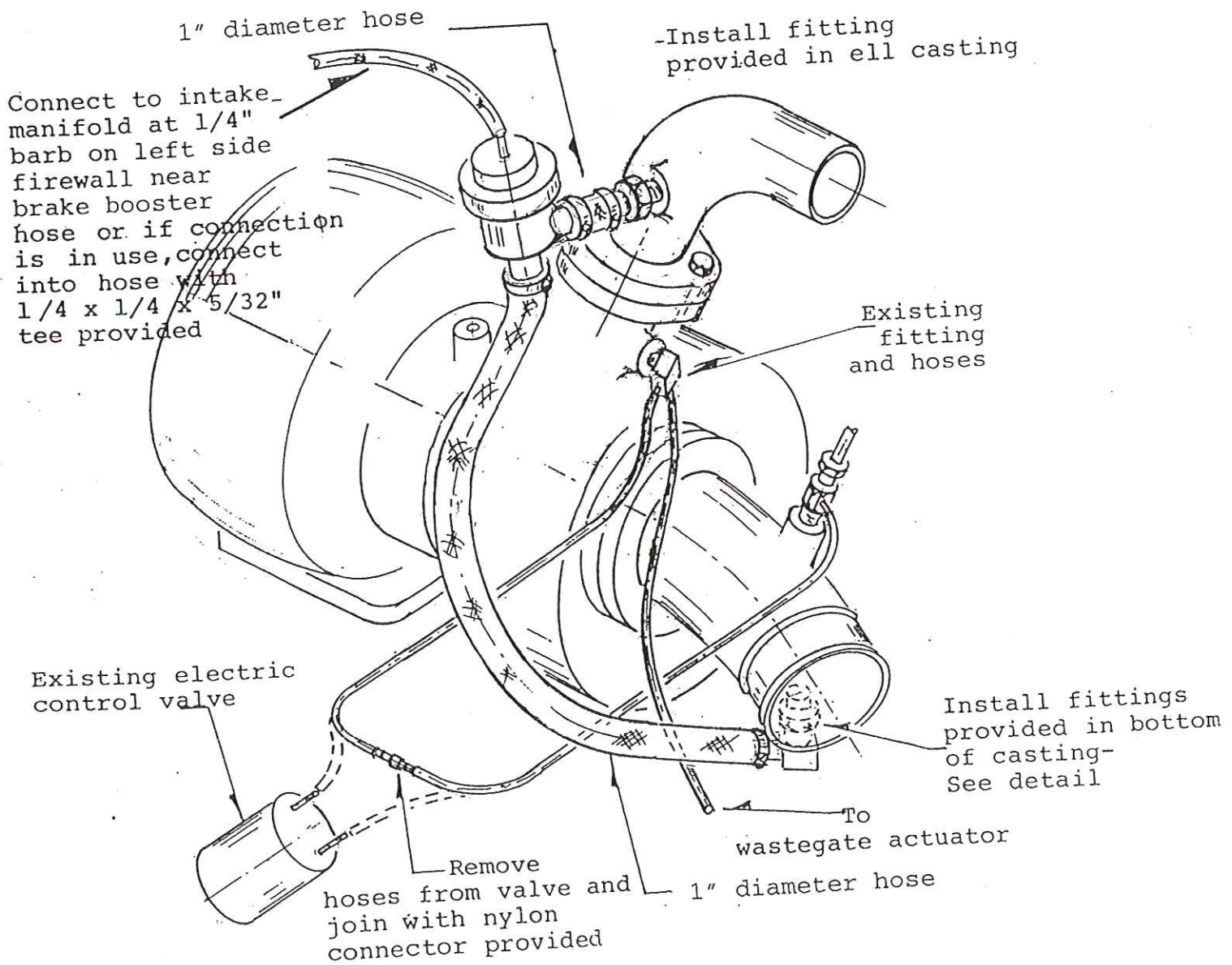
TURBO INLET CASTING DRILLING DETAIL (Bottom View)

CAUTION: Be sure no foreign material enters the turbocharger during this operation.

INSTALLATION OF FITTING FOR
FACTORY CRUISE CONTROL



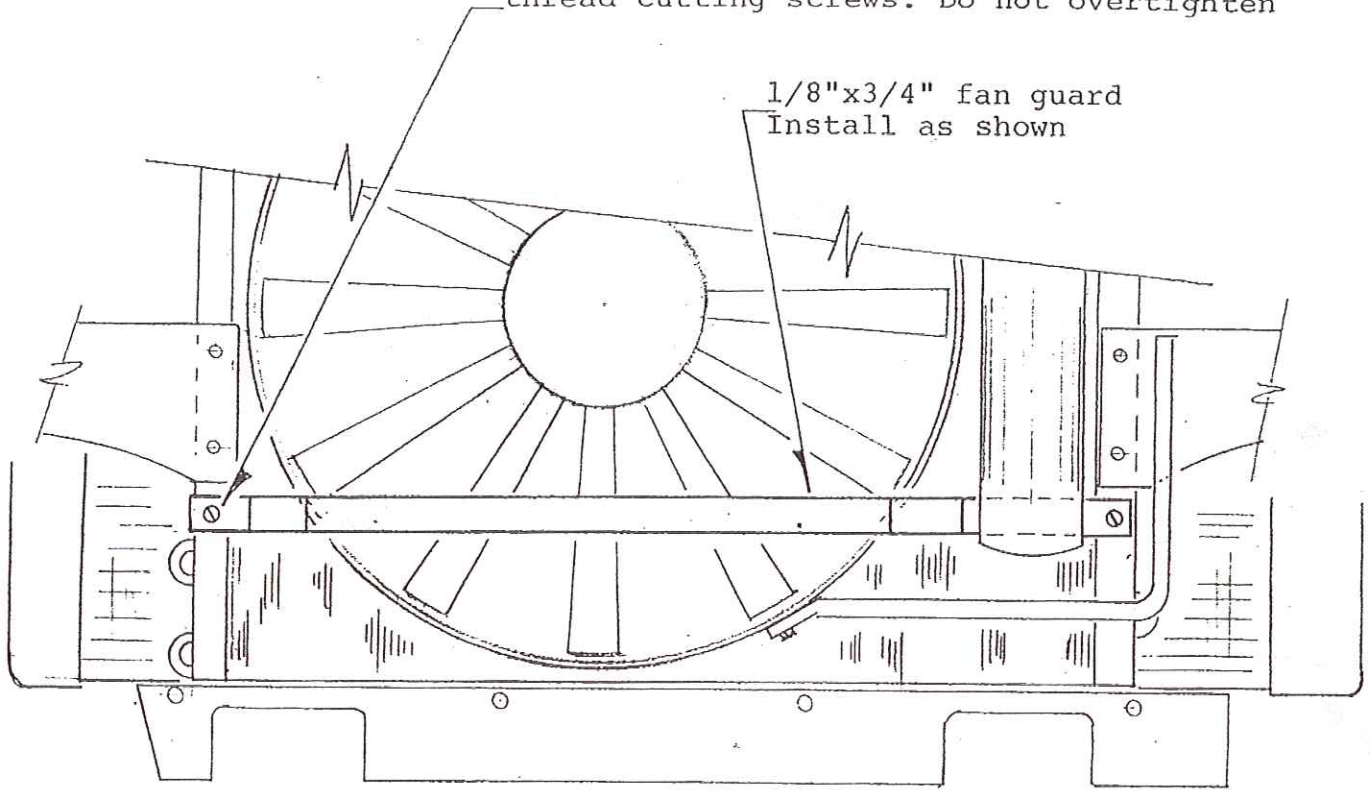
VIEW LOOKING DOWN ON ENGINE



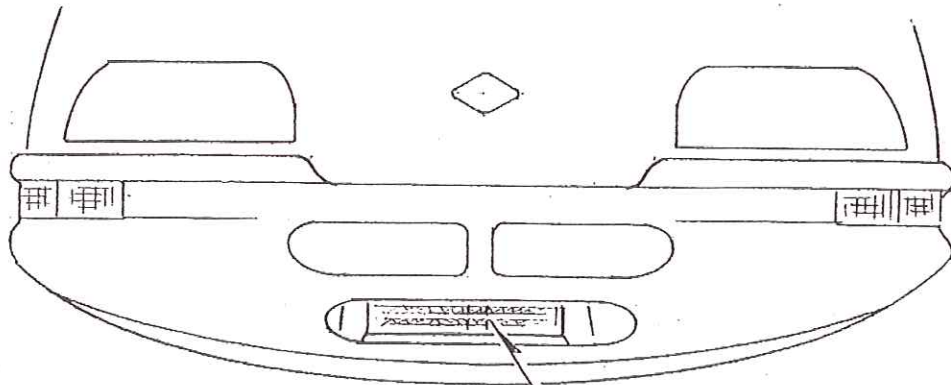
ANTI-SURGE VALVE AND WASTEGATE HOSE ROUTING

Mount in existing hole with two 10/32x1/2" thread cutting screws. Do not overtighten

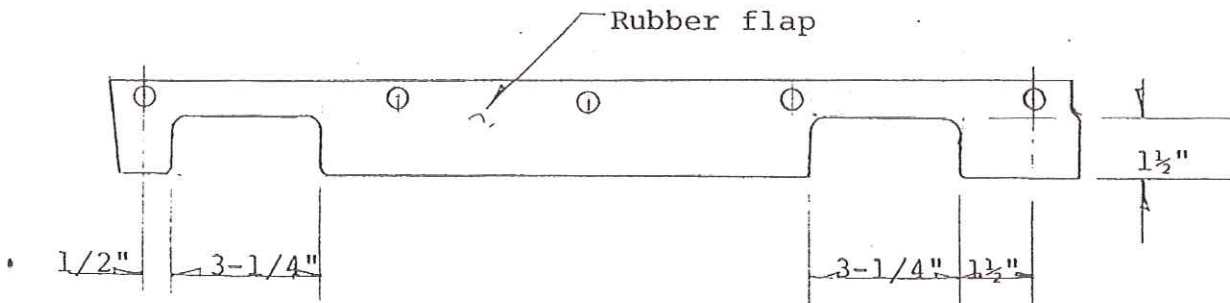
1/8"x3/4" fan guard
Install as shown



FRONT VIEW OF FRONT MOUNTED FAN
WITH FAN GUARD IN POSITION



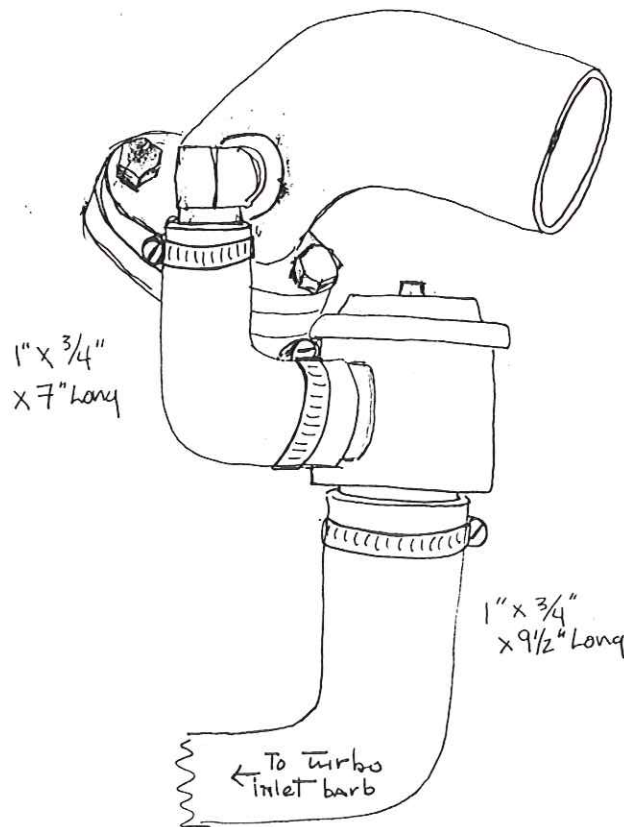
Cut web in front facia as
required to provide clearance
at bottom front edge of
intercooler

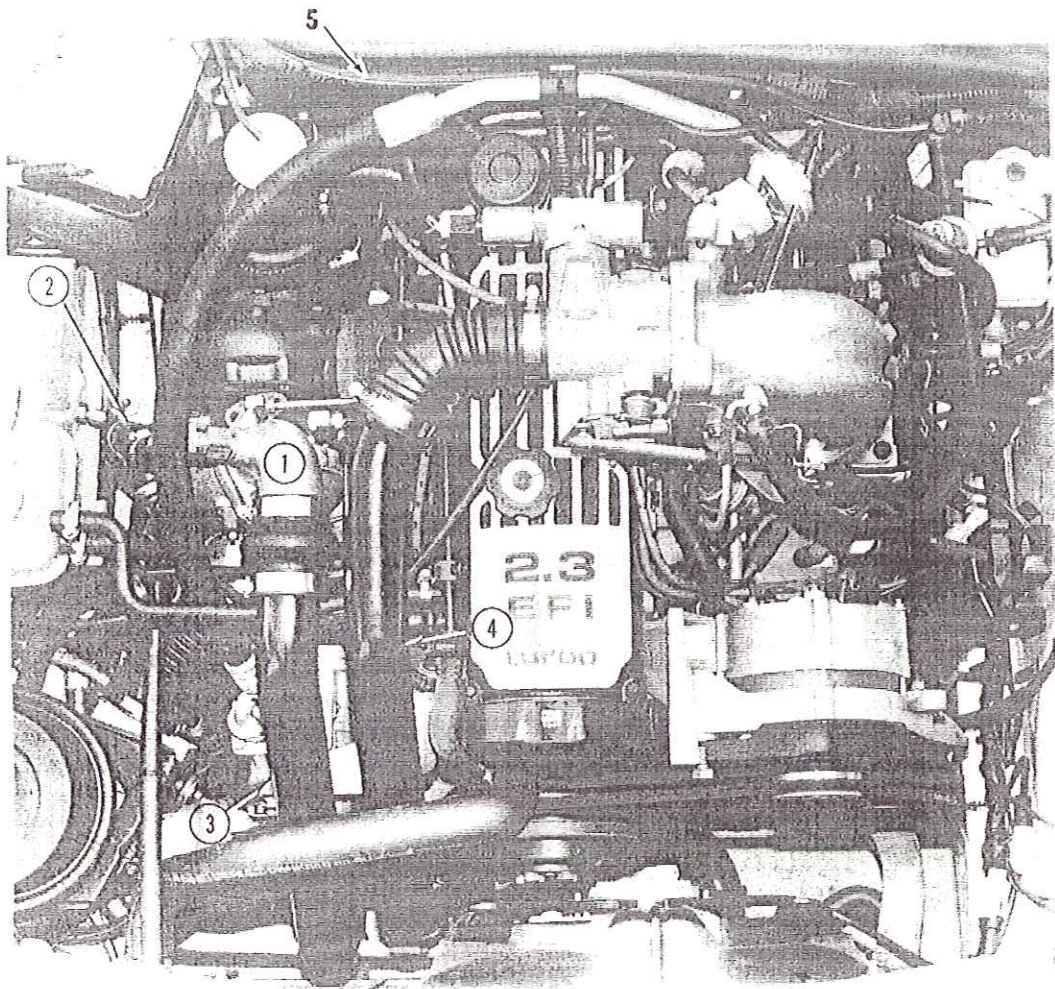


MODIFICATION TO RADIATOR FLAP (Front View)

ByPass Valve Revision

Note: All new Rapido XR4Ti Intercooler Kits are being provided with a new and larger bypass valve. The function is still the same as the old valve but the orientation of the valve and its connecting hoses (relative to the turbo charger) are slightly different. In general, when installed the new valve will be situated more toward the intake of the turbo charger, and further away from the radiant heat of the exhaust section. You will find it easier to clamp the hoses to the 90o elbow hose barbs (installed in steps 2 & 3) and then install the by-pass valve to those hoses. The shorter 90o hose connects to the new 90o aluminum elbow and the longer hose connects to the 90o hose barb you will have installed in the turbo inlet casting. The supplemental drawing (attached) should clarify the orientation of the valve & hoses.





1. NEW ELL CASTING
2. ANTI-SURGE VALVE
3. #1 TUBE
4. #3 TUBE
5. CONNECTION POINT FOR ANTI-SURGE VALVE HOSE
6. #2 TUBE
7. INTERCOOLER
8. RIGHT HAND BRACKET
9. LEFT HAND BRACKET
10. MOUNTING POINT AT CHASSIS, LEFT AND RIGHT

