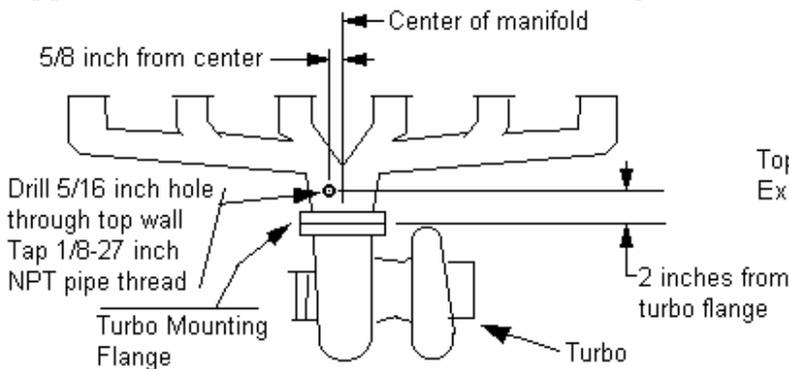


TST Products, Inc. Pyrometer Installation Instructions for 1989 and newer Ram Diesels

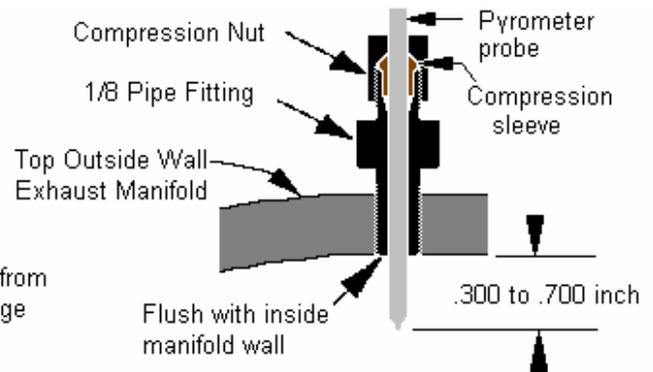
The pyrometer kit comes with all hardware needed to mount the pyrometer except for installation tools. The following tools will be required:

Medium #2 phillips screwdriver	5/16 inch or 8 mm wrench or socket	3/8 inch or 10 mm open end wrench
1/2 inch or 13 mm open end wrench	Center punch and hammer	Electric or air drill capable of 5/16 inch bit
5/16 inch drill bit	Small mechanic magnet	1/8 inch tapered NPT pipe tap and holder for tap

1. Determine a mounting location for the gauge readout unit and mounting cup. It is suggested that the gauge be mounted for easy viewing without the need of taking eyes a long way from the road, yet never let the gauge block forward view of the road. Remember that you also need an easy path to run the thermocouple and dash lighting wires to the unit. On top of the dash near the left side in the region not wiped by the driver side windshield wiper is recommended for both easy viewing and access to wiring. Place the gauge such that its face is in the same focal plane (about the same distance from the driver's eyes) as the other dash instruments. The mounting cup can be attached with the supplied adhesive or Velcro when mounted on top of the dash. If suspending the cup under the dash, screws are suggested rather than adhesive. NOTE: If you use the adhesive patch supplied, be sure you have the cup exactly where you want it before pressing the adhesive in place as it is nearly impossible to remove. Using Velcro allows easy removal for bulb/wiring service plus it allows easier repositioning of the gauge.
2. Next locate the point to install the thermocouple. The best place is to locate the thermocouple in the exhaust manifold about two inches before the turbo flange gasket surface toward the engine. The exhaust manifold is a split passage design with 3 cylinder feeding each passage and a vertical internal web separating the two passages in the center thus the manifold is solid in the center. Locate a point two inches from the turbo mounting flange centered on the exhaust manifold, then move forward or rearward on the manifold 5/8 inch and center punch for drilling. Drill 5/16 inch diameter hole straight down through one wall. Tap threads using 1/8 inch tapered pipe tap. Tap depth is important. The bottom of the thermocouple 1/8 pipe fitting should be flush with the inside of the exhaust flow path.



Exhaust Manifold viewed from above



Probe Installation Cut-away view

3. Use a small mechanics magnet that will pass through the tapped hole to the bottom wall of the manifold to retrieve drill and tap shavings. Clean shavings from magnet and search for more shavings until the magnet comes back clean.
4. Install thermocouple 1/8 pipe fitting in hole and tighten with a 1/2 inch or 13 mm open end wrench. Using a 3/8 inch or 10 mm open end wrench insure the thermocouple is securely attached to the pipe fitting.
5. Remove the terminal locknuts from the red and yellow wires of the thermocouple and attach the matching color to the end of the long thermocouple wire that has the red wire longer than the yellow wire. Slide the shrink-wrap tubing over the exposed terminals so they cannot short out against other metal under hood components.
6. Route the lead wire toward the firewall taking precaution to keep it away from hot and moving parts. Route the wire next to the main wiring harness that runs along the top of the firewall over the top of the brake booster, and then through the firewall piercing a large rubber grommet in the firewall beside the brake booster canister. NOTE: Do NOT cut or splice the thermocouple lead wire as it is special wire that provides correct reading to the gauge. Simply coil any excess wire out of the way. If the thermocouple wire is too short, call factory for longer leads.
7. From under the dash, retrieve the long wire and route it through an opening in front of and about 6 inches above the fuse block such that the wire comes out on top of the dash near the left windshield pillar.
8. Remove the horseshoe like wire jumper that was shipped between the two terminal posts on the back of the pyrometer gauge.
9. Route the lead wire through the hole at the lower back of the gauge cup to the inside of the cup. The lead wire is attached to the back of the gauge with spade connectors. Attach the yellow wire to the (+) spade side of the gauge and the red wire to the other terminal of the gauge.
10. Route the two wires for the gauge lamp through the hole in the gauge cup along the same path used for the long thermocouple wire toward the vehicle fuse block. Attach one of the two wires for the instrument bulb to a good metal ground and attach the other wire to the fuse protected side of the dash illum 5A fuse in the fuse block. (Use a test lamp or volt/ohm meter to determine the protected side, it should show no voltage when the fuse is removed.) Using this fuse as a power source dims the gauge lamp when the instrument panel is dimmed. NOTE: Paint is sometimes used on the instrument bulbs to match lighting color to stock gauge lamp color. If gauge lights are too bright, you may need to add more paint to the bulb. If lamp is too dim you may need to remove some paint.
11. Cover all exposed wires above the dash with the split convoluted harness cover provided, sliding one end of the harness cover into the gauge cup and the other end out of sight toward the fuse block.
12. Reassemble the gauge into the cup per instructions supplied with the cup. Adjust cup so that it is easily visible while driving.
13. Turn on parking lights to verify the gauge bulb works and dims when the dash lights are dimmed.
14. Note the temperature reading on the pyrometer before starting engine. It should read close to the out door temperature. Start engine and let idle a minute or two, reading should go to 250-300. Drive unloaded vehicle at 55 mph on the level and temperature should read about 400-450 above the outdoor temperature. At 70 mph on the level an unloaded temperature should be 500-600 above the outdoor temperature. The temperature should not exceed 1300 degrees over 30 seconds under any conditions. NOTE: If the thermocouple was installed after the turbo in the exhaust pipe, all temperatures will indicate lower and the maximum safe temperature is 900 degrees.