



**MODINE**

# ShopTalk

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## TECHTOPICS

# Tips for gasket tape users

*On occasion, you may have a job where you'll need to bolt-up a heavy-duty radiator core and replace the gasket. When you do, you may want to have a copy of this article for reference. To bring you up to date on gasket tape, Modine is pleased to welcome back Larry LePrevost, a*



**Larry LePrevost**

*frequent contributor to these pages. Larry, national sales manager for the Johnson Manufacturing Company, is well-known as a speaker at industry seminars nationwide. Questions on any of the subject matter that follows can be directed to Larry at the Johnson Manufacturing Company in Princeton, Iowa, (319) 289-5123. The observations of guest contributors in ShopTalk do not necessarily reflect Modine's own viewpoint.*

The other day I heard someone comment about life before Post-it™ notes. It is still hard to believe those semi-sticky little note pads, which I use every day, have been around for more than ten years. But that's nothing; I can even remember life before TV. I'll bet most rad shop people have difficulty remembering what bolting-up a heavy-duty radiator was like before gasket tape. Johnson Manufacturing was one

of the first to introduce this convenient, labor-saving product over 30 years ago. Since then, literally millions of feet, probably enough to wrap around the whole planet several times, have been used for radiator work. Let's see . . . how many radiators would that be?

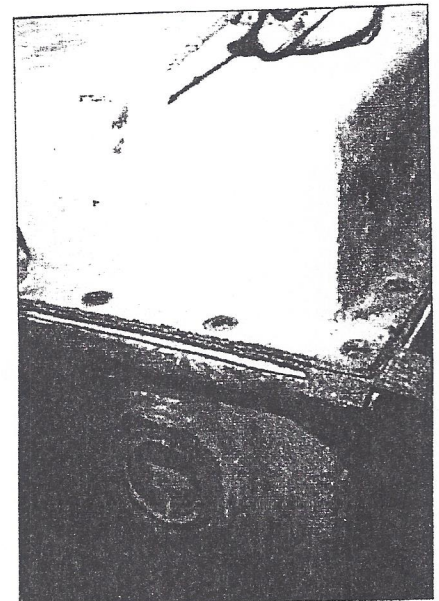
Just as with most other products, proper use has much to do with how well they perform. Most of the time, gasket tape does a great job, but once in a while, we hear stories about re-work or down-time because something went wrong. Cumulatively, we've spent a lot of time trying to track down causes for these occasional failures. We think that some problems relate to the design of the units themselves. Some are built tough; others are a little on the light side. It all depends on what job they're intended to do. Some have tight bolt patterns; most rely on back-up bars for support. Almost every job is different from the last, making it virtually impossible for shops to predict which OEM (precut) gaskets to keep in stock. That's why gasket tape has been so popular.

Thanks to experts like Harvey DeMarley of Milan Radiator and Muffler, in Milan, Illinois, we have made good progress in understanding what works most of the time, and why. We also know which traps to avoid. Then, just when we think we're getting it down pat. . . we get kicked in the seat of the pants again.

There are several alternatives to gasket tape. You can always install OEM gaskets, however, that alone does not guarantee success. As Harvey will tell you, he recently installed factory gaskets on a Michigan

675 wheel loader, and the next week he had to do it all over again. Also, there are oil-treated gasket materials available in rolls about 36" wide. They require cutting out a one-piece gasket, including all the holes, which takes quite a bit of time. It also leaves you a lot of extra material to be used for thermostat housings, etc. Several good shop people we know of use materials like this, but generally speaking, they require more compression than regular gasket tape. While we expect gasket tape to continue providing trouble-free service for the vast majority of bolt-on applications, nonetheless, we are

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*Properly used, gasket tape is a great time saver for reassembly of heavy-duty bolted cores.*



## Gasket tips

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presently looking at several alternatives to cover the exceptions. We will report on our success in a future issue of *ShopTalk*.

### The Basics of Gasket Tape

Strictly as the basis for kicking off this discussion, and without meaning to insult anyone's intelligence, allow me to explain what conditions are likely to bring about success when using gasket tape for bolt-on radiators. (1) the surfaces must be clean and dry, (2) the surfaces must be flat and smooth, (3) if other materials are used in-conjunction with this process, they must be compatible with the gasket tape, (4) bolts should be introduced in a manner so as not to tear or damage the tape, (5) they should be torqued properly, and retorqued if necessary. It takes a lot of experience and common sense to know how to recognize and deal with all the exceptions you are likely to encounter. But hey, that's part of being a professional.

The surfaces must be clean and dry. Try to imagine you are putting head gaskets on your cherry '56 T-Bird. I mean *really* clean and dry! I have talked with shop owners who warm the header with a torch before applying the tape. Though this should not be necessary, they swear by it. Just don't make it too hot to touch. I have seen other shop people grind off headers which have been soldered. This should be avoided because of creating airborne lead. Also, you don't want any sanding marks. It is okay to scrape off small lumps of solder using a wood chisel or other sharp instrument. Melt them off if they are big ones.

The surfaces must also be flat, not warped or stretched out of shape. How many of you have ever put a straight edge (like a level) along the bolt holes on the header. Now bend down and take a really close look at how much daylight you can see under the edge, between holes. I've seen as much as .020" to .030" difference between the high spots where the holes have been pulled out of shape due to "over torquing" and the low spots in between the holes. This difference is almost half the thickness of the gasket tape, which makes it virtually impossible to

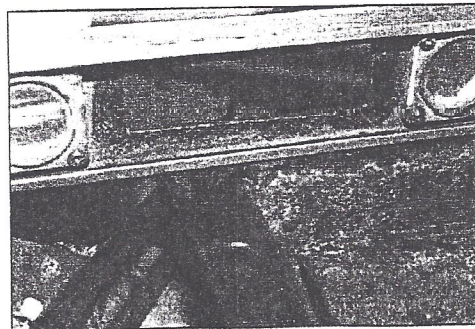
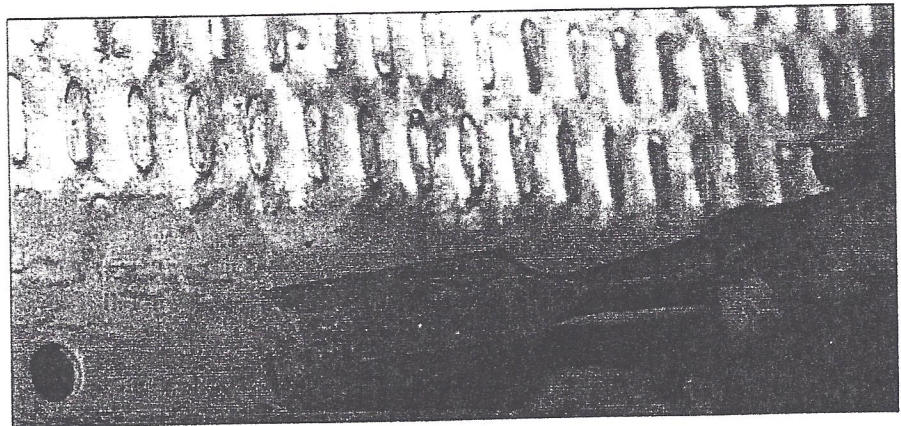
compress the tape uniformly when torquing down the bolts. Once a light gage metal is stretched out of shape, it is hard to return it to original. You can't pound the bolt holes flat, as this tends to warp the header because the excess material has to go somewhere. If you grind off the high spots, you could substantially reduce the thickness and strength of the header or tank. Someone suggested using a seamer to run a small bead down the centerline of the bolt holes to help problems like this. Thinking about this, it might (a) take-up the extra material, (b) stiffen the header (c) create a stress riser effect to be seated into the gasket tape. While this idea may have merit, we just haven't had time to try it yet.

Other solutions include the use of RTV silicone to fill in the low spots on the header or tank using a putty knife. While the RTV is curing, apply the gasket tape to the mating part and clear out the bolt holes. This gives you a little bit of insurance that you wouldn't have otherwise.

All materials must be compatible. Some shops have resorted to the use of

gasket adhesives, aviation cement or super goo to help seal the gasket tape. Certain products we've tested contain one or more solvents, all of which attack gasket tape. In our opinion, the worst thing you can do is to apply a thick coating of this stuff on top of the gasket tape and then immediately set the tank in place and bolt it together. Doing so traps solvents right next to the gasket tape, with no chance for them to evaporate through the thin edges of the compressed gasket tape. This will surely result in rapid degradation of the gasket tape. If you feel you must use a product like this, apply the gasket tape to the header (or tank) and spread a thin layer of glue on the mating surface. Then, allow plenty of time for the solvents to evaporate out of the glue (maybe several hours) before placing the tank on the header and bolting them together. Doing it this way should slow down the rate of disintegration. Better yet, we recommend using RTV blue silicone, if you feel a separate adhesive is necessary.

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▲ Remove small solder lumps along the header and tank with a sharp wood chisel.

◀ Use a straight edge like this level to check the peaks and valleys along the bolt holes on the header and the tank.

## Gasket tips

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### Stopping Chemical Attack

Those of you who do fleet work should be aware of the different types of coolants, chemical flushes and additives that your customers use in their cooling systems. One antifreeze substitute we tested for example, is not compatible with gasket tape. Do not be overly alarmed by this statement, but be aware. When gasket tape is placed between the header and tank, and then compressed to approximately half its thickness, it presents a very thin profile for attack by any chemical or additive in the cooling system. Yet it can occur and does. If you suspect that chemical attack is involved in any premature failures of the gasket tape, here's a suggestion which may help. After installing the gasket tape on the header, apply a thin bead (1/4") of RTV blue silicone directly along the inside edge of the gasket tape, all the way around the header. Smooth it out with your finger, forming a continuous seal between the header and the gasket tape about 1/4-inch on each side. Allow 20 minutes to tack up. Then, assemble the tank and bolt into place. The result should provide a continuous seal around the inside edge of the gasket tape, reducing its exposure to prolonged chemical attack.

Overlapping the ends of the gasket tape works better and is faster than trying to miter or puzzle-cut the corners. If you want to put a little RTV right next to the double thickness, it won't hurt anything, but generally this is not necessary.

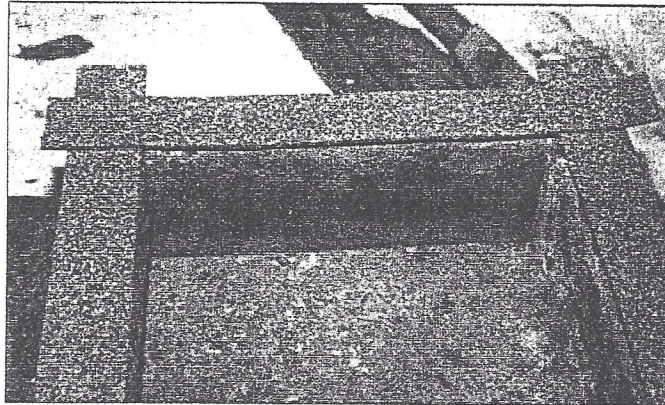
Many shops just punch bolts through the gasket material. Other shops at least poke the holes with an awl and then run the bolts in with a pneumatic tool. Suggestion: try removing the gasket tape from each bolt hole using an Xacto™ art knife with a No. 11 blade. This really doesn't take as long as you might think, and it eliminates the chance that the bolts may actually start a tear that runs to the next hole(s) as soon as you start torquing down the bolts.

Use double-thick (1/8") gasket tape when it is called for. Usually, the determining factor is based on what was used in the unit before you tore it down. The problem of gasket tape

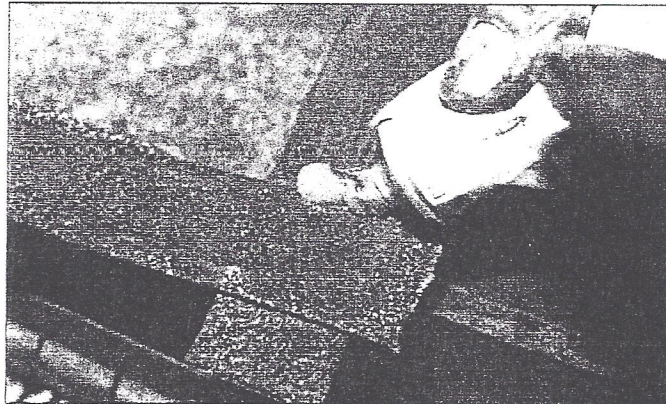
being torn by the bolts is exaggerated when using the thicker material, making it all the more important to clear out the holes with an art knife.

### Easy on the Torque

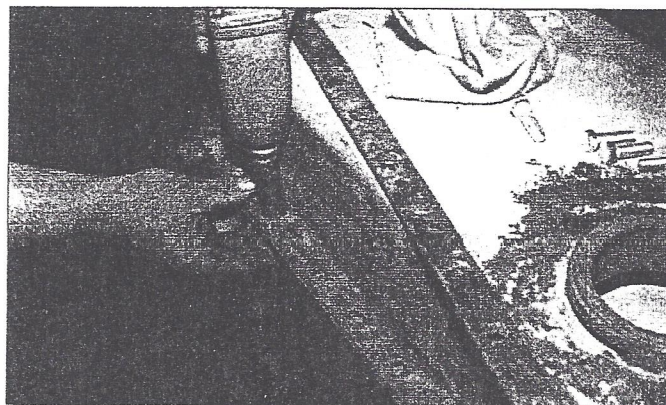
Torquing! I have always believed



*Overlap the corners and cut off the excess gasket tape before testing.*



*Using a little RTV blue silicone at the corners where the gasket tape overlaps is okay.*



*Cutting the bolt holes in the gasket tape is the best approach. Extra care is required when using a pneumatic tool. Start the holes with an awl or similar tool.*

there must be some magic number of foot pounds that works well for every situation, but now I wonder. I have talked to a lot of radiator service people around the country, but I never heard the same answer twice. So, I took our torque wrench to a few bolts, and here's

what I learned. At somewhat less than 20 lbs. of torque, the head of a 3/8" bolt pulls a standard 1-1/4" OD x .090" steel washer way out of shape. At the same time, it over compressed the gasket material under the bolt head. With this in mind, I'd definitely keep the torque under 15 lbs. Then, I'd go down to my nearest auto parts store and get several different lengths of box end wrenches and match them with my personnel. For example, I'd give the 10" wrench to our weight lifter, the 12" to the young buck and I'd keep the 14" wrench for myself.

Guarantee your work, especially if it means you have to do a job over every now and then. Remember, as the only true radiator professional in your area (and that's how I hope you all think of yourselves), who else could have figured out a tough job like this . . . in only one or two tries.