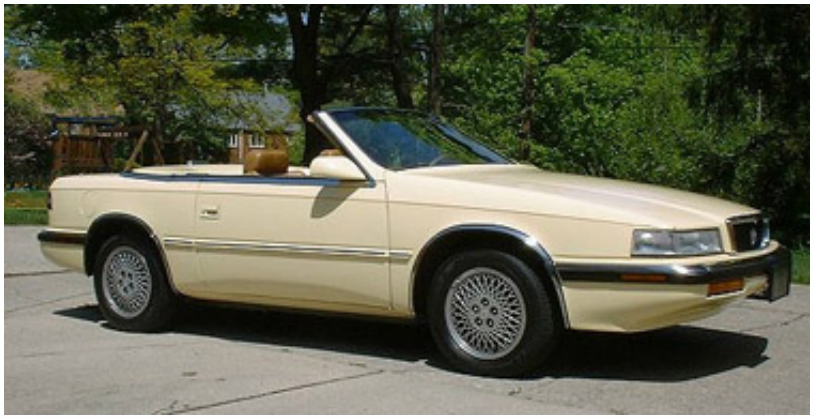
WHAT'S NEW
10/05/02

August, 2001: The '89-'91 Chrysler TC by Maserati was named one of the top five sleeper classics in the $8,000 - $12,000 catagory by Hemming's Special Interest Autos Magazine - click here to read.

THE TC PAGES

Chrysler's TC by Maserati

"This could well be the best-looking italian to show up in this country since my mother came over"
—Lee A. Iacocca



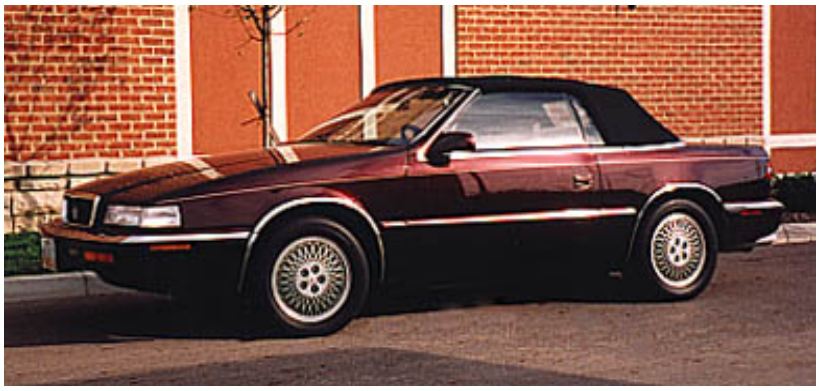
TC GARAGE | TC SPECS | DETAILING | RESALE
PERFORMANCE | TC LINKS | MISC | GUESTBOOK

The TC by Maserati came about as the fortuitous result of two things: Lee Iacocca's desire to produce a Chrysler luxury two seater with European credentials, plus the reunion of Iacocca with Maserati CEO Alejandro De Tomaso (whose joint efforts in the 1970's produced the De Tomaso Pantera for Lincoln-Mercury). Following Chrysler's acquisition of five percent of Maserati stock, plans were announced in early 1985 for the 'Q-coupe', a Chrysler/Maserati venture to be built in Italy and sold in the U.S., with a projected early '87 introduction date.

Since the car wasn't a coupe at all, the name was later changed to 'TC by Maserati'. The 'TC' originally stood for 'Turbo Convertible' in early promotional literature, then changed to 'Touring Convertible' when the V-6 TC was introduced in 1990. Chrysler also reportedly toyed with naming it the 'Lido' (Iacocca's first name), and Iacocca reportedly refered to it as the "Chryslerati'.

The TC was conceived as Chrysler's two seat corporate flagship and Iacocca aimed it squarely at the American market segment of the Cadillac Allante, Buick Reatta and the Mercedes 560 SL, planning to sell the it for about $20,000 less than it's $50,000 rivals.

Beginning with a shortened Dodge Daytona platform and the original sheetmetal designs done at Chrysler's Highland Park studio, Iacocca and De Tomaso set about building their version of a two seat luxury tourer for the American market, using an existing Chrysler engine and drive train, suspension, brakes, steering and heating/air conditioning. In addition, a DOHC 16 valve head was developed by Cosworth, along with a stronger TC-specific Getrag '284' 5-speed. A Teves anti-lock system was added to Chrysler's Kelsey-Hayes 4-wheel disk brake system.



When offered for sale beginning in the 1989 model year, the TC had only one option other than color; the buyer could choose the either the Turbo II with automatic (detuned to 160hp) or the 200 hp twin cam 16 valve 2.2 with a 5-speed. Everything else was standard: Pasubio leather interior, power-everything, anti-lock brakes, 8 speaker Infinity stereo, a 'Haartz fabric' softtop with headliner and a fiberglass hardtop. An Infinity CD player was a dealer installed option.

The TC 'bodies-in-white' were stamped and assembled at the coachworks facility in Sparone, then shipped to Maserati's Innocenti complex in Milan for paint and mechanical assemblies (see Production Photos). Production colors were Exotic Red, Black, White, Light Yellow and Royal Cabernet (Smoke Quartz pearl coat was listed in pre-production sales literature but was not offered in production). Interior colors were in Black, Ginger and Bordeaux, while softtop colors were black 'Haartz' fabric and saddle (vinyl).

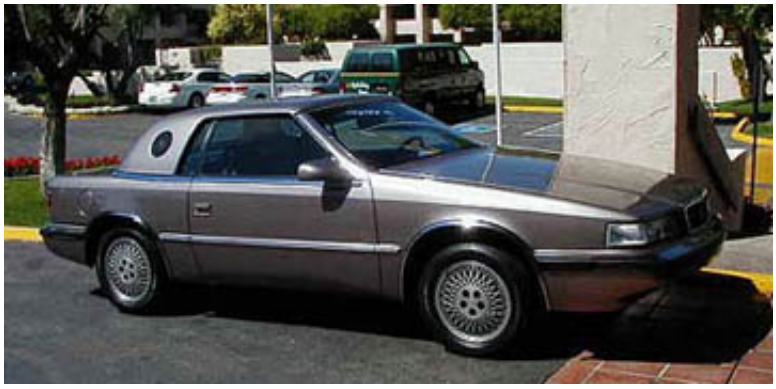
Truly an international car (although 75% of the car's parts/labor cost was Italian), the TC used parts produced in the U.S., Italy, Spain, France, Great Britain, Germany and Mexico. Starting in 1990, the 141 hp Japanese Mitsubishi
DSM 3.0 liter V-6 was added to the mix and was only available with the A604 4-speed automatic transmission.

Loaded with luxury appointments, the TC at 3,000+ pounds was a good bit heavier than it's 93 inch wheelbase would suggest. The Turbo II, detuned to 160 hp, was only offered in '89. Mated with the 3 speed A413 automatic, it yielded leisurely eleven second 0-60 times (go to the PERFORMANCE section for some help with this problem). The '89-'90 200 hp sixteen valve engine with the Getrag 5-speed fared much better, with sub-7 second 0-60 times (R/T 6/88).

The suspension featured 15x6 in. FondMetal alloy wheels with Michelin MXV 205-60x15 tires, Fitchel & Sachs gas-charged struts/shocks, four-wheel anti-lock disc brakes (10" vented front - 10.6" solid rear) and quick ratio (2.1 turns lock to lock) rack & pinion steering. Although fitted with HD-calibrated struts & shocks, the soft springs were aimed more toward a comfortable boulevard ride than any sort of spirited handling.

Sales were accomplished through a select network of some 300 Chrysler dealers, and while the intent was to produce 4,000-5,000 TC's annually, actual sales kept production to just

7,301 total units over 3 years (see build stats). The Turbo II TC was produced only in 1989, and just 501 with the twin cam 16v engines were produced 1989-1990, while the 3.0 V-6 was offered in 1990-1991 and comprised nearly half of all TC production.



While the TC was certainly less than a runaway commercial success, Chrysler had succeeded in producing a luxury two seater with panache equaling the Allante and Mercedes SL, albeit in the rather unique Iacocca fashion.

Although the automotive press focused on the K-car heritage (road tests), Iacocca had done exactly what he intended: build a personal luxury tourer with true Italian lineage and a less-than-the-competition price tag.

August, 2001 - The '89-'91 Chrysler TC by Maserati was named one of the top five sleeper classics for under $10,000 ($8,000 - $12,000) by Hemmings Special Interest Auto Magazine.

While the TC is beginning to appreciate as an automotive investment. you should heed what is written in **The Illustrated Shelby Buyers Guide**, "The only responsible advice that one can give in today's market is that a buyer should purchase a car for the very simple reason that he or she **WANTS TO OWN IT**. That way, while you might be pleasantly surprised later on, you'll never be disappointed. Don't buy one to make a pile of dough, buy it because **YOU'VE GOTTA HAVE IT**." In other words, buy that TC with your heart rather than your head.

The TC is unique as Chrysler's one foray into the world of luxury two seaters and remains an affordable piece of Iacocca-era automotive history that you can drive and enjoy. Although prices are climbing and less than half of the 7,300 TC's are believed to currently survive, a pristine low-mileage example can still be obtained for under $15,000, with the rare '89-'90 16 valve models being the most collectible. Check the current CPI & NADA Collectible Guide values on the **TC Resale** Page.

TC America Inc.is the national club for owners of Chrysler's TC by Maserati.
The club has over 900 members and a goal of bringing TC owners and enthusiasts together. It is the primary source of technical help and information for the TC owner.

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THE TC PAGES

UPDATED 07/07/02

Information in this section contains maintenance procedures and details about TC-specific issues. Clicking on the BLUE LINKS will take you to that section

Most of the engine information in this section is primarily directed at the '89 Turbo2 and the '89-90 16v. I have no experience with or information about the DSM 3.0 V-6 offered in 1990-1991 TC's. Some information is available at the AllPar Pages and Gary Donovan's Mopar site has a 3.0 V6 performance section.

Information regarding general maintenance, lubricants, brakes and suspension apply to all model years.

One of the best investments you can make is a factory service manual (FSM). This is available from Chrysler Publications for about $50.00 and is invaluable reference to you and/or your mechanic (even if you take your TC to the dealer). Order one now before they become NS-1.

Applicable part numbers and vendors mentioned in the text are listed on the Miscellaneous page.

FIRE! FIRE!

DO I HAVE YOUR ATTENTION??? BEFORE YOU DO ANYTHING ELSE on the T2 or 16V model change the two rubber fuel hoses in the engine compartment, between the firewall and the fuel pressure regulator (5/16" supply and 1/4" return). On the turbocharged engines, these hoses are under 45-70 lbs. pressure and dry out, crack and leak with age. Since the leak will occur less than 18 inches from the red-hot turbocharger, you can imagine what happens next.

IT'S IMPORTANT TO USE HIGH-PRESSURE FUEL INJECTION HOSE! Go to the dealer and get OEM F.I.hose and the OEM hose clamps. OEM hose will fit and the clamps won't damage the hose. DON'T try to save money here with store brand hose and tiny worm-gear hose clamps!

DO THIS NOW (!) AND EVERY TIME YOU CHANGE THE FUEL FILTER! YOU SAVE YOURSELF THE POTENTIAL TRAUMA OF HELPLESSLY WATCHING WHILE FLAMES CONSUME YOUR PRIDE AND JOY.

(IN THE PAST YEAR, I'VE LOCATED THREE TC'S THAT HAVE PERISHED DUE TO ENGINE FIRES!)

BEFORE YOU BEGIN.....

Check the SMEC (computer) diagnostic fault codes. The procedure for retrieving and interpreting Diagnostic Fault Codes and the Troubleshooting Guide on Russ Kinze's Mopar site makes identifying and correcting most problems simple.

When ordering engine parts for the Turbo2, it's important to note that the '89 TC's 2.2 TII is based on the pre-'89 block and uses the early-style 'square tooth' timing belt, as well as the pre-'89 three-wire O2 sensor, 'RTV gasket' valve cover, oil pan gasket and '88 TII fuel pressure regulator. It would appear that the TII used in the '89 TC is actually an '88 spec TII.

There were numerous running changes made during the production of the TC, and a small number of the late-'89 Turbo2 TC's used the '89-up 'common block', so these may use the '89 version of the above parts. You can tell which block you have by looking for a small (fuel pump block-off) plate bolted to the front of the engine block, just below and to the right of the A/C compressor. The pre-89 block has it - the common-block doesn't.

Make sure the engine is in tune. This means recent plugs, wires, cap/rotor, hall effect sensor and fuel filter.Stay away from store-brand parts.I use only Mopar OEM ignition and electrical parts (especially the Hall Effect and O2 sensor). OEM replacements may cost a little more but don't have the failure rates of aftermarket parts.The OEM Mopar plug wires and cap/rotor are among the best you can buy at any price. The OEM spark plugs are Champion RN12Y. Don't waste money on multi-tipped plugs and avoid ANY brand of platinum-tipped plugs.

A word of caution: replace spark plugs with the engine COLD. The thermal differences between the aluminum head and the steel spark plug make it pretty easy to strip the threads in the head. When replacing the plugs, use a dab of anti-seize on the threads and torque to 20 lb/ft.

Set the engine timing at 12 degrees BTDC with the coolant temperature sensor disconnected. When setting the timing, the timing mark should hold steady. If not, check that the plate below the Hall Effect Pickup inside the distributor is tight. The small plastic rivets tend to wear, allowing the plate to move, causing variations in ignition timing and contributing to a rough idle. This problem can be fixed with a small amount of epoxy or by carefully re-melting the plastic rivet heads with a soldering iron.

Make sure that the fuel filter and it's high-pressure rubber hose has been changed within the last year. **Changing the fuel filter regularly is VERY important** and cheap insurance, since a clogged unit can restrict fuel flow, causing a lean condition at WOT and damage to (aka melt) a piston. I change it once a year, using the OEM Mopar filter.

The fuel pressure regulator uses vacuum/boost to regulate fuel pressure. It adds one pound for each pound of boost and reduces pressure one pound for each two inches of vacuum.

Fuel pressure should be 53-57 PSI with the engine running and the FPR vacuum line disconnected; with the engine running and the vacuum line attached, pressure should be 44-48 psi.

Occasionally tighten the turbo-to-intercooler and intercooler-to-throttle-body hose clamps to 30 in/lb; they tend to loosen over time, allowing a boost leak.

If you've not already done so, it's a good idea to replace the O^2 sensor, since it's also over 10 years old. This is a critical component, since the SMEC uses this sensor to measure and adjust fuel mixture. Replace it with the OEM Mopar unit, since aftermarket brands tend to have a high failure rate.

Many 'driveability' issues can be traced to cracked/broken vacuum lines or the 4-way vacuum bridge, so insure that there are NO leaks in the vacuum harness. On the 16V and the T2, the fuel pressure regulator is controlled by vacuum/boost, as well as the MAP sensor, wastegate and the fuel purge system. If the harness on your car is original, it's no doubt leaking to some degree. The part number for the vacuum bridge is on the **Miscellaneous** page and you can see the vacuum routing diagram on the **Vacuum** page. Pay special attention to the vacuum routing diagram if replacing vacuum lines, especially the location of check valves and restrictors.

Use an aerosol 'throttle body cleaner', available at auto parts stores, to remove deposits from the throttle body and throttle plate (see Russ Kinze's **Idle Problems** page). Spray some thru the AIS bypass port (located just inside the opening of the throttle body). Once or twice a year, add a can of fuel injector 'cleaner' to the gas tank (I prefer the Chevron brand).

On the Turbo2, determine that the cam timing is correct, especially if the cam drive belt has been replaced (one-tooth-off is a common problem). If the belt is 10+ year old original, now's a good time to have it **replaced**, regardless of mileage.

If replacing the belt, be sure to reset the belt tension with the **ENGINE AT OPERATING TEMPERATURE**, since the belt tends to tighten as the engine WARMS (thanks to Gus Mahon for this tip).

An easy way to check camshaft timing with a timing light:

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1). Remove upper inspection plug on the timing belt cover.
2).With the timing light attached and temperature sensor disconnected, set ignition timing to TDC (0 degrees).
3).With engine still running, direct timing light beam thru the inspection plug hole.
4).The small hole in the cam pulley should appear in the center of the timing belt cover inspection hole.
5). If the cam pulley hole appears toward the left in the cover hole, the cam is retarded.*
6). If the cam pulley hole appears toward the right in the cover hole, the cam is advanced.
7). If the cam pulley hole is not visible, the cam belt is installed incorrectly.

** AN OLD BELT TENDS TO RETARD CAM TIMING SOMEWHAT DUE TO BELT STRETCH.*

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Gary Donovan also has an easy way to check cam timing without removing the belt covers.

Clean the ground strap mounts (battery to left fenderwell, firewall to engine and engine to right motormount) since some of the engine sensors operate on as little as one volt, making the connection to ground very important. Use sandpaper to 'polish' the connections until they're clean and shiny.

Do a multiple 'unplug-replug' of the underhood wiring harness connectors on the left fenderwell as well as the two connectors on the MAP sensor on the right shock tower. This will insure that they're making a proper connection.

OIL and OIL FILTERS

TURBO FAILURES OCCUR BECAUSE OF INSUFFICIENT LUBRICATION!

There can be no arguing the fact that the engine (especially if turbocharged) will last far longer when synthetic oil is used. The principal benefit for the Turbo2 is that synthetics won't "coke" due to heat and clog the turbo oil feed line, thus preventing turbo bearing starvation and failure.

Additional benefits are that the engine is much better lubricated, especially on cold starts and stays cleaner. Synthetics don't form varnish-like deposits or break down from heat like conventional oils. It's also more stable (a concern with cars that are stored for long periods).

A minor plus is that synthetic oil cuts frictional horsepower losses, so the engine runs a little cooler and makes a little bit more power (and with 135 cu.in. every little bit counts).

I use and recommend only MobilOne 10w30, but admittedly have little experience with other brands like Castrol, Redline, Pennzoil and Valvoline. See Russ Kinze's ENGINE OIL CHOICES page for more information.

I change the oil & filter every 3 months/3,000 miles and consider this cheap insurance, even though the car is driven very little. Look at it this way: what little money you save with cheap oil or extended oil-change intervals won't make a dent in the cost of an engine rebuild or turbocharger replacement!

Stay away from the new synthetic 'blends'. They're still expensive and may contain as little as 10% synthetic oil. If you want to save money with a blend, use a 50/50 mix of MobilOne and Mobil conventional (MobilOne literature says this is ok).

A word of caution: If your engine is high mileage/poorly maintained and/or has oil leaks, switching to synthetic will cause those leaks to increase, since synthetic oil will dissolve the sludge and deposits left from conventional oil that are now pluging up the leaks. Either reseal the engine or stay with conventional oil and change it OFTEN!

USE THE BEST OIL FILTER YOU CAN FIND. Wix, AC Delco and Purolator are all sufficient. There is a huge quality difference in filters, so take a look at Russ Kinze's oil filter study for filter data and recommendations.

SOMETHING IMPORTANT THAT'S RARELY MENTIONED: after full throttle acceleration or high speed driving, LET IT IDLE FOR A COUPLE MINUTES! This lets the turbo spin down and cool off and prevents 'coking' of the turbo's oil feed line to the turbo shaft bearings.

STILL DON'T BELIEVE IT? Drive your car at even moderate boost levels at night, pull over in a dark place and lift rhe hood. Look at your turbo glowing red and see how long it takes to stop glowing, then think how long it takes to cool down enough to not bake the oil when you shut off the engine.

ENGINE COOLING

Engine cooling is a critical area on the turbocharged TC's. In order to make room for the intercooler, a narrower (but thicker) Vaelo radiator was used. Since the Vaelo radiator is a special unit, replacement is costly. It's important that you maintain the cooling system, since

overheating can lead to head gasket failure or more serious engine damage.

At least every two years (I do it once a year), use a name-brand cooling system cleaner (Prestone, etc) to flush the system, then replace the coolant with a 50/50 mixture of quality antifreeze containing an 'Alugard inhibitor' and add a small amount (3 ounces) of Redline WaterWetter. This product will improve the cooling properties of the coolant mixture and can lower cylinder head temperatures as much as 20 degrees.

If the radiator and/or heater hoses are original on your TC, they should be replaced. It's simple to accomplish when you're servicing the cooling system. For those wanting to keep their TC original, Mopar-branded OEM radiator and heater hoses are available at the dealer. Also check the condition of the in-line heater control valve, located beneath the battery, as these are plastic and tend to have a high failure rate.

TURBO COOLANT LINES

The turbo coolant line running from the thermostat housing to the turbo has a nasty habit of rupturing at the rubber connection (located on the driver's side of the cylinder head, behind the air cleaner). This generally happens at the absolutely most inconvenient time and will almost certainly leave you stranded. Replacing the entire line is expensive and difficult.

Luckily, the factory crimped-on rubber connector can easily be cut off and replaced with a short piece of 5/8" i.d. rubber heater hose and secured with two small hose clamps. It's easy to do this when you're servicing the cooling system and will save you a towing bill later.

TRANSAXLE

The TII TC uses the 4 clutch 'turbo' A413 automatic with a 3.02 final drive (ratios) . **Have it serviced regularly (annually or every 15K) and use Mopar 7176-3 fluid and a Mopar filter. Change the filter every time you change fluid!** Although Dexron was spec'd for use in pre-'88 A413's, it has different friction characteristics and I've experienced 'chatter' on upshifts when using it in the later A413 units.

Use of Dexron in the V6's electronically-controlled A604 will kill it in a hurry. Don't allow anyone to use anything except 7176 in your A604! Mopar's 7176-3 fluid costs a little more but is cheaper than having your transmission rebuilt. (Mopar spec 7176 Type 3 fluid is also available from Quakerstate and Pennzoil).

Lubricant for the 16V's 5-speed manual is spec'd as 5w-30 engine oil and any high-quality brand should suffice. There have been reports that substituting MobilOne for conventional motor oil causes problems because it's *too slippery* and doesn't allow the syncronizers to spin the gears up to speed quickly enough, resulting in a slight grinding when shifting.

MOTORMOUNTS

The motormounts are a weak link on all the 80's FWD Chryslers, especially the front and right side mounts. It's worth checking the mounts on your TC, since worn or ruptured mounts allow the engine to flop around and put a strain on the axle joints.

The TC's I've looked at use a 'bobble strut' on the right side mount to help control engine torque-shift under acceleration, but there appears to have been a running change during production, so you'll have to order these by chassis number.

AXLES & CV JOINTS

Axle and CV joint problems are pretty rare ....as long as the CV boots aren't ruptured AND/OR the engine is properly centered. If you must replace the axle assemblies, use only OEM Mopar remanufactured units. The aftermarket 'store brand' axles have a long history of inferior parts and short service life.

The engine being uncentered will cause a CV joint to fail in a short time. This can happen if the car has been wrecked or the engine has moved during transaxle removal. The engine-centering procedure is simple and is described in the FSM and on Russ Kinze's Mopar Site in the Engine Centering section.

Occasionally check the CV boots for leaks. Grease on the inside of a front tire is a sure sign that a boot has ruptured and needs replacement. The CV joint may be undamaged if you catch this early enough, and periodic cleaning of the CV boots with a mild detergent and lubrication with a (non-silicone) vinyl protectant will extend their service life. The use of a vinyl protectant provides lubrication and prevents boot 'wind-up' while turning.

BRAKES

I use Raybestos rotors and pads (semi-metallic) front and rear on the TC, feel that they out-perform the OEM parts and are less expensive. I have no experience with similar offerings from other manufacturers.

It's very important to flush the brakes (replace the fluid) at least every 2 years (I do it once a year) with high-quality, fresh DOT 3 or DOT 4 fluid. See the BRAKES section for the bleeding procedure.

SUSPENSION

The OEM Fitchel & Sachs struts/shocks are now mostly NS-1. I've used and recommend KYB struts/shocks. They offer a somewhat firmer ride and much better stability. Fairly inexpensive, they're a good performance/cost compromise.You can read about the KYB's at the ALL-PAR STORE page (look under Daytona).

BODY PARTS

TC sheetmetal is in very short supply and extremely costly, to the point where a minor front-end collision can lead your insurance company to total the car.

The most sought after parts are headlights and parking light lenses, and I get inquiries each week from TC owners looking for them. These have been NS-1 for sometime and the cost of a used replacement (if you can find it) can be breathtaking. Nothing that I've found comes close to interchanging and I have NO source of replacements.

My best advice is to do everything you can to protect your headlights. The **TC Club of America** sells (to members - another good reason to join) plastic headlight and parking light covers that protect them from stones, etc. If your headlights are intact, BUY THESE TO PROTECT THEM! If your headlights are cracked or chipped, these will serve to hold them together until you find replacements.

Check the website of **ChryslerTCparts.com**; they offer body, interior, electrical and driveline parts for the TC.

PORT HOLE WINDOW REPAIR

The problem of clouding of the porthole window glass can be easily repaired in the following manner.

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1). Remove the headliner side panel.
2). Remove the port hole glass from the hardtop by cutting the epoxy that secures the glass in the top.
3). Using an Exacto knife, CAREFULLY separate the inner and outer glass discs.
4). Clean the inner surfaces of both with alcohol and a soft cloth, being careful with the 'trident' decal.
5). Reassemble the two halves and seal the seam with a small bead of clear automotive-grade silicone.
6). When dry, reassemble window into hardtop.

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TOP PULL DOWN MECHANISM

The top pull down mechanism is fragile and easily damaged. The entire motor assembly unit can be ordered from Mopar.

Top pull down motor
Mopar Assembly - 05253193 (motor, gears, switch & relay)

Individual parts can be purchased from a General Motors (Cadillac) dealer.*.

Top pull down motor parts (Cadillac part numbers)
Drive gear - #20160587
Motor - #22101328
Relay - #10026663
Switch - #16629927

** Thanks to Hemi Andersen for the above information.*

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THE TC PAGES

DISCLAIMER

UPDATED 07/07/02

BEFORE MAKING ANY MODIFICATIONS, MAKE SURE THE ENGINE IS IN TUNE! THE FOLLOWING CHANGES WILL NOT CORRECT DRIVABILITY PROBLEMS AND MAY MAKE THEM WORSE.
SEE THE TC GARAGE SECTION FOR DETAILS

Clicking on the BLUE LINKS will take you to that section.

FOR WHAT IT'S WORTH....

The purpose of the following is not to instruct anyone on how to hack up a collectible car; but rather to offer a few simple steps on how to raise the performance of the TC to the level where it should have always been, without making visible changes. Although I'm sure there are those that will object to altering anything on a TC, I feel that the it's performance should come a lot closer to matching it's good looks. Although originality is important to me, I've performed these same performance upgrades on both my show-winning 'numbers-matching' TC and **Shelby Lancer**, and it made both much more responsive and enjoyable to drive without compromising the collectible value. I've never lost show points for a computer change or a non-stock exhaust system (although I take great pains to make any replacement look original). The following changes will transform your TC into a real hi-performance car without changing it's taxi cab reliability. Just think of these changes as a simple correction of a factory oversight.

BEFORE YOU BEGIN

Start by making sure the engine is in tune. Read the TC GARAGE section for information. The following changes WILL NOT correct drivability problems and may even make them worse.

2.2 TurboII (8V) - (160 hp @ 5,200 / 171 ft lb @ 3,600)

The 2.2 Turbo II used in the '89 TC was initially developed by Chrysler in the mid-80's to power Carroll Shelby's Dodge-based limited-edition GLHS, Shelby Lancer and CSX. Beginning in 1987, it was also used by Chrysler in the Dodge Daytona Shelby, the Dodge Lancer Shelby in 1988 and Chrysler's LeBaron GTC in 1989. While the Shelby powerplants were converted Turbo1's, the factory T II's were improved with stronger connecting rods, a heavier 42 lb forged steel crankshaft and cross-drilled head for improved cooling. Starting in '88, they also used the one-piece tuned-length intake and a roller cam that's quieter and more durable than the 'slider' cam used in the pre-'88's.

Fitted with the Garrett T03 turbo, larger 33 lb/hr '895' injectors, a 46mm throttle body on the tuned-runner intake and an air-to-air intercooler, the original Turbo II had an advertised rating of 174 hp / 200 lb/ft of torque and in stock trim would propel a 3,000 pound Daytona or

LeBaron GTC to very respectable 0-60 times and top speeds above 125 mph.

However, when installed in the TC, the T2 engine was 'detuned' to 160 hp, via 'torque management' programming of the SMEC (computer) and a VERY restrictive exhaust system, and developed it's torque very late (3,600 rpm). This was done due to Chrysler's concerns about durability issues stemming from the A413 automatic transmission in a 3,000+ lb TC, but the turbo version of the A413 seems completely adequate for power levels produced by the T2 as long as the torque level doesn't exceed 180 lb/ft. (the only Chrysler-based cars produced with the T II/A413 combination were the '89 TC and the '87 Shelby Lancer, both of which used 'torque-management' to keep peak torque below this level).

It's important to note that most TC T2's are based on the pre-'89 block and use the early-style 'square tooth' timing belt, as well as the pre-'89 three-wire O2 sensor, 'RTV gasket' valve cover and an '88 TII fuel pressure regulator. It would appear that the TII used in the '89 TC is actually an '88 spec TII, although a few of the late 89's were produced with the '89-up common block TII.

The biggest complaint with the T II/A413 combination is turbo lag and lots of it. This is due in large part to the programming of the SMEC combined with spool-up time of the large turbo and the tall gearing of the A413 automatic. You can enhance your TC's lackluster performance with the following changes and, depending on the SMEC used, increase the horsepower level of the Turbo II to around 200 hp without affecting drivability.

2.2 16v Turbo (200 hp @ 5,500 / 220 ft lb @ 3,400)

The Maserati 16V 2.2 uses a TC-specific twin cam cylinder head developed by Cosworth (England). This head differs from both the Lotus-design and Hans Herman 16v heads for the 2.2. The turbo fitted was a small but efficient Japanese 'IHI' model from Warner ISHI. Using the same 2.2 block as the TII, this engine got forged Mahle pistons with a lower 7.3:1 compression, forged Casar connecting rods, a fully counterweighted 52 lb forged crankshaft and was offered only with the TC-specific Getrag '284' 5-speed. Everything listed below also applies to the 16v. In fact , because it's improved breathing, the 16v may realize even bigger gains with the following changes.

To my knowledge, there is no source for a performance 16V-specific SMEC; MP doesn't list an upgrade.The 16V does NOT run on the same SMEC program as the TII, so the MP TII SMEC is not a candidate for a 16V upgrade.

Both the Turbo II and the 16V TC respond eagerly to the following changes and these few minor and relatively inexpensive upgrades make a tremendous difference in performance and drivability.

3.0 V-6 (140 hp @ 5,000 / 170 ft lb @ 2,800)

I have no experience with or information about the DSM 3.0 V-6 offered in 1990-1991 TC's. Some performance information is available at 3.0 PERFORMANCE and Gary Donovan's Mopar site .

IGNITION

I use only Mopar OEM ignition and electrical parts (especially the Hall Effect and O2 sensor) as opposed to store brands. OEM replacements may cost a little more but don't have the failure rates of aftermarket parts.Since the OEM Mopar plug wires, cap/rotor and coil[1] are sufficient for engines producing up to 300 hp, they're fine for our purposes. I've also used and can

recommend the Magnacore wire set for the 2.2, sold by FWD PERFORMANCE. These are available for both the 8v and 16v.

[1] I prefer the '91-up OEM E-coil (PN 523 4210) that mounts to the thermostat housing. This unit is compatible with the SMEC and delivers a faster and more sustained spark. It requires the use of the '91-up coil-to-distributor wire and fabrication of a 2-wire harness to connect to the coil harness on the right fenderwell.

SPARKPLUGS

For stock boost levels, set the ignition timing at 14 degrees BTDC and use OEM Champion RN12Y. For higher boost levels, use Champion RN11Y's or NGK GR45 (Stk# BPR5ES-11) **sparkplugs**. I prefer the NGK's since they seem to endure longer with higher boost levels. Stay away from any sort of platinum-tipped plug, since the platinum coating on the tip can actually dislodge under boost and potentially cause engine damage.

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ENGINE

1.) A good first step is to get a K&N drop-in air filter (about $30.00). These things really work, actually free up a of couple extra horsepower, filter better than the paper variety and are cleanable/reusable forever. They're available from MP or most large automotive chains.

Use sandpaper to remove the casting ridges inside the airbox, especially in the outlet tube-to-turbo area, to aid in smoothing the airflow.

Moving the Blow-Off Valve (Chrysler calls it an 'air shut-off valve') from inside the air cleaner housing will increase intake air flow and offers a performance improvement. This requires a little fabrication and the use of a small filter on the output side of the BOV.

A simple modification to the BOV vacuum circuit will keep the valve from leaking under boost (a common problem). Take a look at the BOV SECTION for details. NOTE: Boost levels above 14 lb will require the replacement of the stock BOV with the stronger metal unit from a Pre-'95 Eagle Talon. Instructions for this modification can be found on Gary Donovan's Mopar Pages.

Because the PCV valve will leak under pressure, it's necessary to place a one-way check valve in the line running from the intake manifold to the PCV valve. Place the check valve so the PCV valve receives only vacuum. This will prevent the PCV valve from leaking during boost, but allow it to function normally otherwise.

2.) The next (and perhaps most important) step is to install a free-flow exhaust. Just changing the exhaust system will give you quicker turbo spool-up, a noticeable overall performance increase and better gas mileage as well. With the stock exhaust, the pipe from the turbo is 2-1/2 inches and exits the catalytic converter at 2-1/4 inches. Before the axle kickover pipe, it necks down again to 1-7/8" and continues into a very restrictive muffler. (In addition, my TC had TWO (!) resonators in the system, one attached to the convertor and one on the cross pipe). The exhaust exits the turbo as a performance system but ends up as something that an Omni could love.

The very best system uses a 2-1/2" I/O hi-flow (Products for Power) catalytic convertor and full 2-1/2" pipe into a low restriction muffler (my favorite is the oval Dynomax 2-1/2"

#17733. It's very low restriction and nearly as quiet as stock. It uses harmonics management instead of restriction to dampen sound). Any competent muffler shop can bend the two (cat-back and axle kickover) pipes and do the installation or JRB Exhaust <www.JRBExhaust> sells a G-body (Daytona) mandrel-bent system in either stainless or aluminumized that should fit the TC after being shortened a little, since the TC is based on a shortened G-body platform.

On my TC, I had 2-1/2" cat-back pipes bent to fit, cut the brackets from the stock exhaust and mig-welded them to the new system, allowing me to use the OEM hangers. The entire system was finished with VHT hi-temp coating before installation , assembled with stainless-steel clamps and finished off with a 2-1/2" I/O twin-outlet plated exhaust tip that is indistinguishable from the original. This system requires a little bit of trial fitting, but there's ample room for the larger pipes and the DynoMax #17733 oval muffler without any problems.

The next best alternative (using the existing catalytic convertor) is to have 2-1/4" cat-back and axle kickover pipes bent that run back to a DynoMax 2-1/4" #17741 (this is a stock (external) dimension replacement unit for the original and has the OEM mounting bracket). Since the OEM catalytic converter is very restrictive, this is a little quieter than the above system, although not as free-flowing. However, it's still much better than stock and has the advantage of being an easier and less expensive installation.

Don't even think about not using a catalytic converter. Although the turbo 2.2 may well pass your state's emission tests without the converter, federal law is very clear re: tampering with emission systems and most states have huge fines for operating a vehicle without it (except off road).The PFP or DynoMax high-flow unit are inexpensive and will detract very little from performance, and Mother Nature will be a little happier.

3.) An extremely significant gain in low-end response (TII only) can be realized by advancing the camshaft timing four (4) degrees. This has a positive effect on cylinder pressure-rise at low rpm and vastly improves off-idle performance while having no noticeable effect on top end power below 5,500 rpm.

This can be easily and inexpensively accomplished when the cam belt is being replaced using either the Relentless Performance adjsutable cam sprocket or an MP offset cam key (**Note**: most '89 TC TII's use tthe pre-'89 style 'square tooth' pulley and timing belt). ***Note that reference to degree of advance is in camshaft degrees.***

4.) The next step is to change the computer (TII only). The SMEC (single module engine controller) is located behind the battery on the left fenderwell. It allows 11 lb of peak boost but has very conservative schedules for boost, fuel curve and ignition timing. Boost doesn't start until 3,400 rpm, resulting in pathetic off-idle performance.

In the order of desirability, you can use **1)** a Mopar Performance SMEC, **2)** the SMEC from an '88 or '89 Daytona Turbo2 or 3) an aftermarket recalibrated SMEC.

A word to the wise: proceed cautiously when choosing an aftermarket SMEC calibration. Remember that the TC engine was 'detuned' because of valid durability issues with the A413 transmission in a 3,000+ lb TC. The turbo version of the A413 seems adequate for power levels produced by the T2 as long as the torque level doesn't exceed 180lb/ft, with 200 lb/ft being the ragged edge (the only Chrysler-based cars produced with the T2/A413 combination were the '89 TC and the '87 Shelby Lancer, both of which used 'torque-management' to keep peak torque below 175 lb/ft).

You're asking for transmission and torque convertor trouble when using high-boost

aftermarket calibrations intended for the much-stronger A555 5-speed used in the T2 Daytonas. In addition, steep boost and ignition timing curves coupled with the TC's tall gearing may cause WOT detonation, which can quickly lead to burned/broken pistons.

To monitor boost and air/fuel levels with an aftermarket calibration, accurate boost /vacuum and air/fuel gauges are also a good idea.. The Autometer #3301 is a reliable 30hg/20psi boost gauge and the #7009 Cyberdyne A/F gauge that measures O2 sensor voltage in 1/10 volt increments works well. Both of these items are 2-1/16 in. diameter and are available from **Jeg's or Summit.**

a) Mopar Performance lists an '89 Turbo2 Stage2 SMEC. **This unit is now NS-1 (discontinued)** but if you're able to find one, list price is $295. This unit is truly a plug-and-play operation; the boost is set at 14 lb, the boost schedule is much better and overboost limit is raised slightly, while timing/fuel curves are unchanged from stock. This SMEC makes a huge difference in any T II 2.2, reducing turbo response time and increasing horsepower to about 200 hp without sacrificing drivability or fuel economy. If using this unit, use one-step-colder **sparkplugs**.

b) A less expensive option is to find an SMEC from a '88 or '89 Daytona Turbo2[2]. The part number to look for is ('88) 5233246 or ('89) 5235069. This unit has 12 lb of boost and the timing/fuel and boost curves are better than the stock TC SMEC, so performance improves a bit. Horsepower /torque increases to 174@4,800 / 200@3,200 (advertised). I currently have this SMEC in my TC and it makes a noticeable difference, especially with the camshaft advanced <see **(3)** above>. The off-idle and low-rpm response is much improved, since the boost now starts to pick up @ 2,300 rpm vs. 3,400 with the stock SMEC.

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[2] It has to be from a 2.2 intercooled 5-speed. You'll have to locate this as a salvage item, because a new OEM unit costs a fortune.

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c) FWD Performance can modify your existing SMEC and is currently offering four calibrations (14/15/16/18lb) for the '88-'89 T2. All these feature increased boost, timing and fuel curves. All are more aggressive than the MP Stage2 unit. The 16 and 18 lb SMEC configurations require using +40% injectors and a 3-bar MAP. You can contact Cindy at FWD Performance for specific information.

5.) An important precautionary modification is to wrap the threads of the 'knock sensor' (located between the 2nd and 3rd fuel injectors) with 3 or 4 turns of a teflon (plumbing) thread tape, and reinstall hand tight. This will help keep the sensor from 'hearing' valve train noise and prevent it from mistakenly retarding engine timing (a very common problem). NOTE: wrap the tape on the sensor in the opposite direction of the threads - sensor threads in clockwise, so wrap in a counter-clockwise direction.

6.) When servicing the cooling system (TC Garage), replace the thermostat with the MP 185 degree (P4286882). This will lower cylinder head temperatures somewhat and help prevent detonation under boost. Drill a 1/16" 'bleed' hole in the outer rim (this is a standard feature in thermostats for most German and Japanese cars) shown in the THERMOSTAT MODIFICATION. By allowing a very small amount of warm coolant to bypass the closed thermostat, this prevents the shock of cold coolant on the hot cylinder head as the engine warms and the thermostat opens. It also allows trapped air to purge from the system after you change the coolant (a real problem with the 2.2's because of the design of the system).When installing,

place the bleed hole in the 12 o'clock position.

MANUAL BOOST CONTROL

If you're interested in 'max-boogie' performance gains, you'll want to visit Gus Mahon's BOOST PAGES. He's the inventor of the 'G-Valve' boost controller and the guru of extracting phenomenal levels of horsepower from the Turbo Chrysler. You can download his plans and diagrams for controlling boost and fuel delivery via control valves and solenoids.

For boost levels above 14 lbs, he details plans for adding extra fuel via pressure switches and extra injectors, or the alternative of larger MP fuel injectors coupled with adjustable and rising-rate/gain fuel pressure regulators.

I've used his 'quick spool' 2-stage boost controller allowing 7 (low) and 14 (high) pounds of boost and combined with the other upgrades on this page makes for very satisfying performance gains.

A word of caution: If you decide to change to manual boost control, an accurate boost /vacuum gauge and an air/fuel gauge are both necessary . The Autometer #3301 is a reliable 30hg/20psi boost gauge and the #7009 Cyberdyne A/F gauge that measures O2 sensor voltage in 1/10 volt increments works well. Both of these items are 2-1/16 in. diameter and are available from **Jeg's or Summit.**

In addition, boost levels above 14 lb will require the replacement of the stock BOV with the stronger unit from an Eagle Talon. Instructions for this modification can be found on Gary Donovan's Mopar Pages.

Mahon's modifications are simple and work with both the TII or the 16V using either an OEM or MP SMEC. However, since these procedures involve some fabrication and assembly, avoid this if you're all thumbs or have trouble following complex instructions.

TRANSAXLE

The TII TC uses the 4 clutch 'turbo' A413 automatic with a 3.02 final drive (ratios) . Mopar Performance lists a 'shift improvement' kit (P/N P4529093)[3] for the A413 that noticeably improves the 1-2 shift performance without being harsh, and raises the WOT shift points to about 5,800 rpm. It is a relatively simple installation that can be accomplished during transmission service.Speaking of which; **have it serviced regularly (annually or every 15K) and use Mopar 7176-3 fluid and a Mopar filter. Change the filter every time you change fluid!** Although Dexron was spec'd for use in pre-'88 A413's, it has different friction characteristics and I've experienced 'chatter' on upshifts when using it in the later A413 units.

If it's necessary to change the torque converter (during a transmission rebuild), avoid using a 'universal' remanufactured unit. Rebuilders sell these without regard to whether it's a 'turbo' or N/A unit. Chances are that you'll end up with an N/A unit with a much lower stall speed, further diminishing off-idle performance. Currently, Gary Donovan at Relentless Performance offers a 'Stage One' reman unit with the correct 3,200-3,500 rpm stall speed.

Use of Dexron in the (V6) electronically-controlled A604 will kill it in a hurry. Mopar's 7176-3 fluid costs a little more but seems worth it. (Mopar spec 7176 Type 3 fluid is also available from Quakerstate and Pennzoil).

[3]*(This part has been on nation backorder for over a year. AShift Kit diagram for this simple modification can be seen at:* http://members.aol.com/MOrgan1528/HP/ShiftKit.html

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The 16v transaxle is a (TC specific) Getrag 284 with a 2.64 final drive ratio (ratios). This transmission was originally developed for the proposed mid-engine Corvette, but obviously never used, so Chrysler paid for tooling changes to convert the bell housing pattern to their 2.2 engines. The 284 is physically larger than even the A568 used with the Dodge Turbo III 16v and is much stronger. The input shaft is almost twice the diameter of the A568 and the surface area of the TC-specific clutch is larger. The larger size of the 284 differential also translates into more strength.

MOTORMOUNTS

The motormounts are a weak link on all the 80's FWD Chryslers, especially the front and right side mounts. It's worth checking the mounts on your TC, since worn or ruptured mounts allow the engine to become misaligned and flop around, putting a strain on the drivetrain.

MP offers heavy-duty front (P4286766) and right side (P4286765) mounts that do a much better job of limiting engine movement and last longer than the OEM units. The MP Catalog lists them as a universal fit for 2.2 and 2.5 FWD Chryslers.

The TC's use a 'bobble strut' on the right side mount to help control engine torque-shift under acceleration (there appears to have been a running change during production, so if replacement isnecessary, you'll have to order by chassis number)

SUSPENSION / BRAKES

While the OEM Fitchel & Sachs gas struts/shocks (see the OEM Suspension PN chart) maintain a reasonable level of ride control, I've used and recommend KYB struts/shocks. They offer a somewhat firmer ride and much better stability. Fairly inexpensive, they're a good performance/cost compromise between Koni's (really expensive) and the stock units. You can read about the KYB's at the ALL-PAR STORE page (look under Daytona).

The TC springs are garden variety 84 lb/in G-body front (Daytona) and 90 lb/in A-body (Dynasty) rear units. Replacing the rear springs with the 135 lb/in OEM rear springs from a '89 Daytona Shelby will reduce understeer by stiffening the rear suspension, making the handling more neutral without affecting the ride a great deal. I avoid the Eibach springs; they have a harsh ride and lower the car an inch or more, affecting the rear suspension geometry.

Constructing 3/8 inch spacers for the left swaybar bushing and bracket (see swaybar) will preload the swaybar, helping to balance the weight on the front wheels and prevent the 'right wheel only spinning' under acceleration - a sure differental killer in both automatics and 5-speeds!

A big improvement in steering response and control is accomplished by replacing the OEM rubber A-frame, stub strut and sway bar bushings with urethane units, available from Suspension Restoration Parts Company.

Brakes are one area where I use aftermarket parts. I've used Raybestos rotors and pads (semi-metallic) front and rear on the TC and feel that they out-perform the OEM parts. There are also brake upgrades available at the ALL-PAR STORE but unless you're planning to autocross your TC (or run from the police), cross-drilled rotors and/or full metallic pads are just expensive overkill.

It's VERY important to flush the brakes (replace the fluid) at least every 2 years (I do it once a year) with fresh DOT 3 or DOT 4 fluid. The procedure for bleeding the rear ABS brakes can be found in the BRAKES section.

OIL

USE A SYNTHETIC! PERIOD! TURBOS FAIL BECAUSE OF INSUFFICIENT LUBRICATION!

I use only MobilOne 10w30, but have little experience with other brands. The cost of MobilOne pales in comparison to the expense of repairing the engine or turbocharger! See Russ Kinze's ENGINE OIL CHOICES page for more oil info.

SOMETHING IMPORTANT THAT'S RARELY MENTIONED: after full throttle acceleration or spirited driving, LET IT IDLE FOR A COUPLE MINUTES! The turbo may be spinning at as much as 160,000 RPM and needs time to spin down and cool off. This prevents 'coking' of the oil in the feed line and the turbo shaft bearings.

STILL DON'T BELIEVE IT? Drive your car for a few WOT maximum boost passes at night, pull over in a dark place and lift the hood. Note that the turbo's glowing red; see how long it takes to stop glowing, let alone cool enough to prevent baking the oil when you shut off the engine. Still think that synthetic oil is too expensive?

OIL FILTERS

Some minor surgery to the alternator stud and plastic shield **WITH THE BATTERY DISCONNECTED !!!** will allow the use of a 'full-size' oil filter in place of the tiny OEM model. This simple modification is very important because it means cleaner oil due to more filter area and also allows another 1/2 quart of oil in the engine, helping the oil temperature stay a little cooler under boost.

Look at the area between the oil filter and the alternator and it'll be apparent what has to be trimmed.You can then use any Mopar V8 or Ford 5.0 filter,

There is a huge quality difference in oil filters, so take a look at Russ Kinze's oil filter study for filter data and his recommendations.

FINISH

These simple and inexpensive changes will wake up your sleepy TC. You may not have a Corvette eater but your TC's performance will now more closely match it's good looks. I've done all this to my '89 TC T II (including the Mahon boost controller) with little visible (or audible) change and now enjoy 200+ horsepower, substantially improved performance/drivability, sub 7-second 0-60 times and better gas mileage. What a deal.