PONTIAC PERFORMANCE HANDBOOK

BY THE EDITORS OF HOT ROD MAGAZINE

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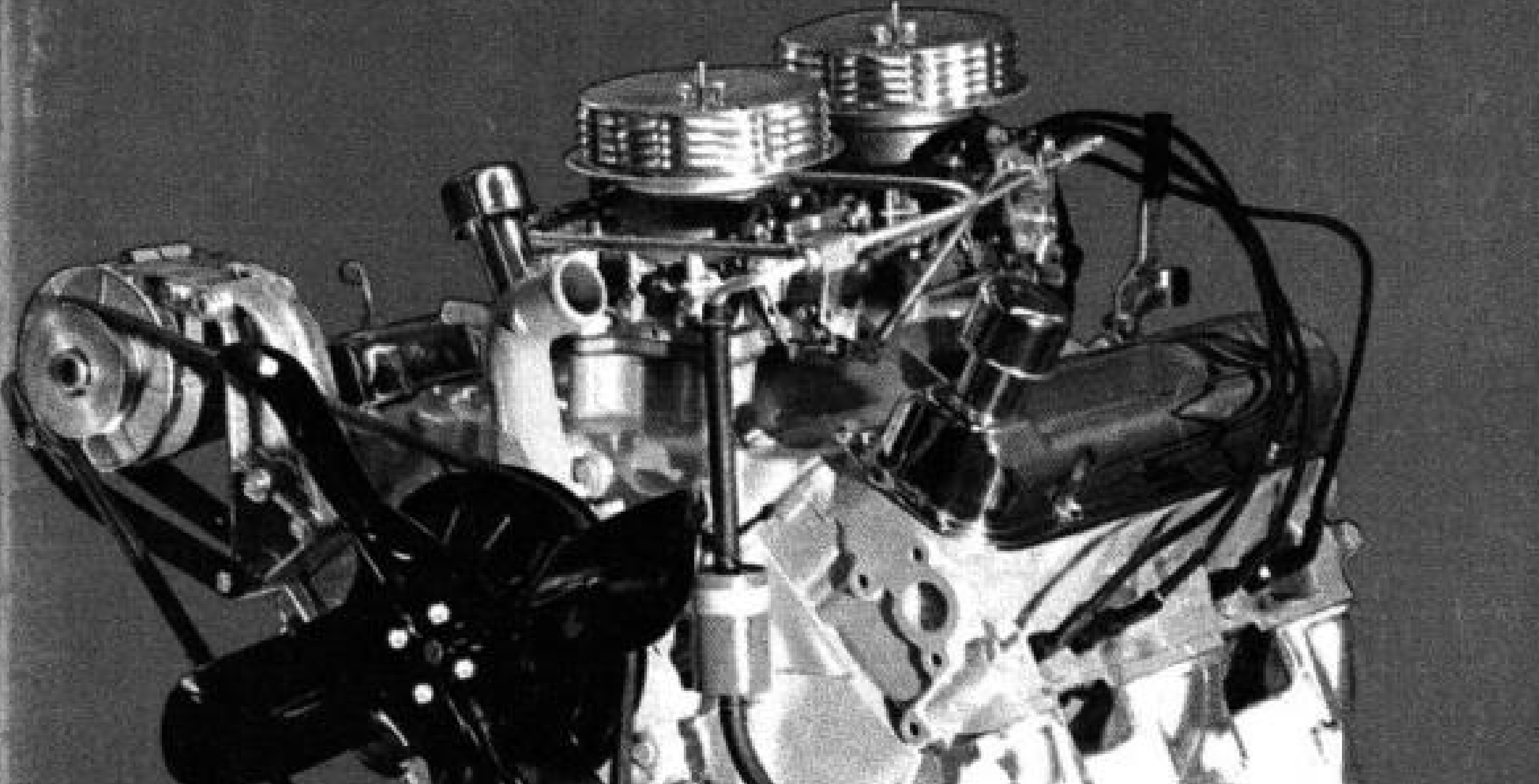

ENGINE, CHASSIS
SECRETS FOR ALL PONTIACS—
FROM TEMPEST TO 421

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HOW THE EXPERTS MAKE THEM GO!

TEMPEST SUSPENSION

Virtues and Vices of Complete Independence

By OCee Ritch

LAST year, writing for a Petersen Publication, HOT RODDING THE COMPACTS, I introduced a section on making the Tempest handle with this quote from a road tester's report:

"By its very nature, and inherent in the features which cause us to admire the car, the Tempest is tricky. It is at the same time a joy to drive under go-to-the-market conditions but a thrilling handful under pressure. A sudden application of either all out-power or panic brakes will break the rear end loose and the driver can find himself staring at the road behind. Up to a point it is extremely 'sticky' on the road, but a sharp, reverse camber curve is apt to lead into its deceptive and sudden, breakaway oversteer. Like most independent rear suspension cars, it takes some getting used to by the average driver who is accustomed to understeering automobiles."

This summation states the case pretty well. And, although we were able to make a notable improvement in the Tempest through the addition of a couple of proprietary items offered at that time, none of our test group was completely satisfied that any ultimate had been achieved. Working with the 1962 model we were unable to lay hands on the optional heavy duty suspension components listed by Pontiac, so a question always remained unanswered in our minds: "Is the Tempest really such a hog on ice, or are we expecting too much?"

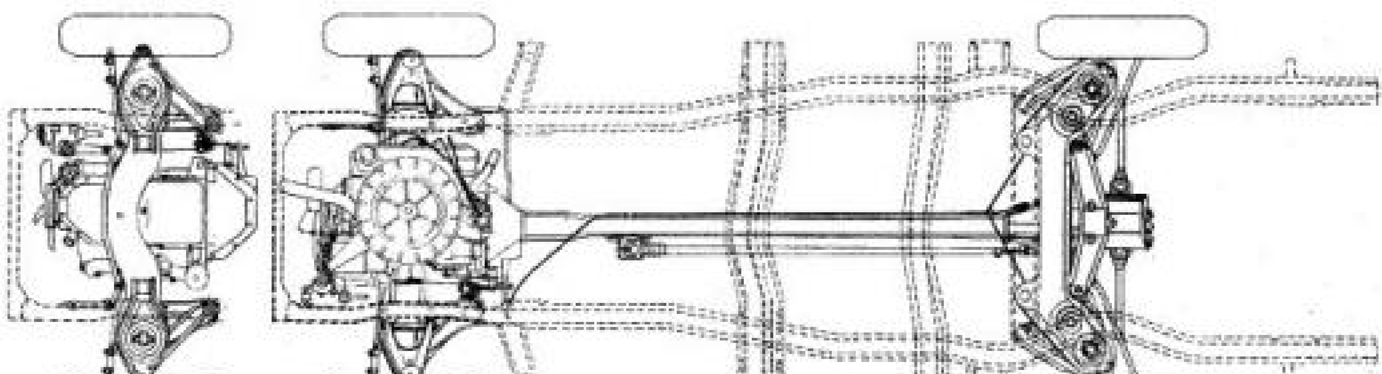
Our impression that it was, as introduced, a relatively unstable car in certain common highway situations, was confirmed with the presentation of the 1963 models. Quite a bit of attention has been paid by Pontiac engineering to correcting the qualities of which many drivers complained. In addition the aluminum V8 is gone and a new conventional V8 is offered as the option to the four-cylinder engine, which changes the picture in another direction. The altered weight distribution and amount of power available gives us what amounts to a new car. Our original analysis needed revision in the light of 1963 developments, it seemed, so we embarked on another round of experiments.

As mentioned in the chapter on Pontiac chassis, there is a paucity of information on chassis tuning for the street and highway. Although almost every shade tree mechanic can make an engine perform in a way to startle its designers, a thousand specialists can re-work an automatic transmission to handle several hundred horsepower and a great number of experts can change a stock car into a racing machine of almost incredible performance, nobody seems to find it profitable or fascinating to offer street and highway chassis tuning. Yet the owner who once experiences the difference between a production car ride and the feeling of a well set up, roadworthy vehicle is an instant convert to better handling. And the alterations required to effect the changes are not necessarily difficult or expensive.

Two or three factors contribute to this situation most heavily. First, it is only the present generation of car buyers which has been exposed to so-called sports cars to any extent. The great importation of European vehicles, traditionally smaller, more stiffly suspended, began only a few short years ago, so the overwhelming mass of buyers are those people who know only domestic automobiles and who equate a swaying, soft, springy, boudoir bounce with comfort.

"Give me a big car for a cross country trip," is the attitude of the average purchaser. "You can't beat 'em for comfort."

This is sheer nonsense unless you intend to proceed at 25 mph in a straight line over smoothly paved roads. The soft suspension and lack of stability of the typical big car results in a continuous effort on the part of the human body to maintain equilibrium, an upright position. The consequent use of leg and back muscles in bracing against sway and fighting against bounce is extremely tiring, particularly to those who do not drive long distances frequently and bring some of the little-used muscles into play. The more taut ride of the small car, admitting that small amplitude bumps are more noticeable, is actually more comfortable in the long run because the body simply does not react against



Tempest Four and V8 are identical in chassis details, with exception of engine package. Independent suspension is used.

Evil handling of stock Tempest is most pronounced in reverse camber curve or when car must be decelerated during cornering.

them. In short, you can drive farther in a day and arrive more refreshed in something like a Volkswagen than you can in a limousine.

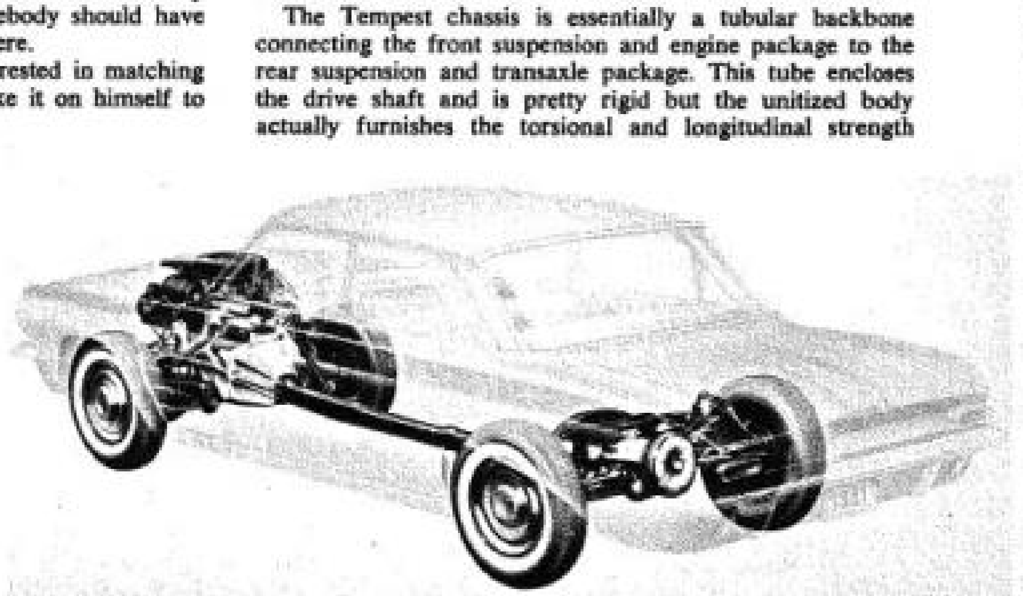
Automobile engineers know this and any conscientious designer wants to give the ultimate consumer the best possible product. But, especially in the case of the automobile, he must take into consideration the buyer's attitude. In this case an attitude formed by generations of father-to-son misconception and derived opinion.

Taste and preference, then, must necessarily be considered if the product is to be accepted. And this is what Pontiac engineers faced when they set out to create a fine little compact in the Tempest. Their adoption of independent swing axles and a rear-mounted transmission was a real step forward in American automobile construction. But having to make a concession to mass no-taste pretty well scuttled the ideal. Even in a compact, the sales force feels a need to be able to say "It rides just like a big car." Having taught ourselves to believe that anything "big" is therefore automatically "good," this makes some sense but somebody should have blown the whistle along the line somewhere.

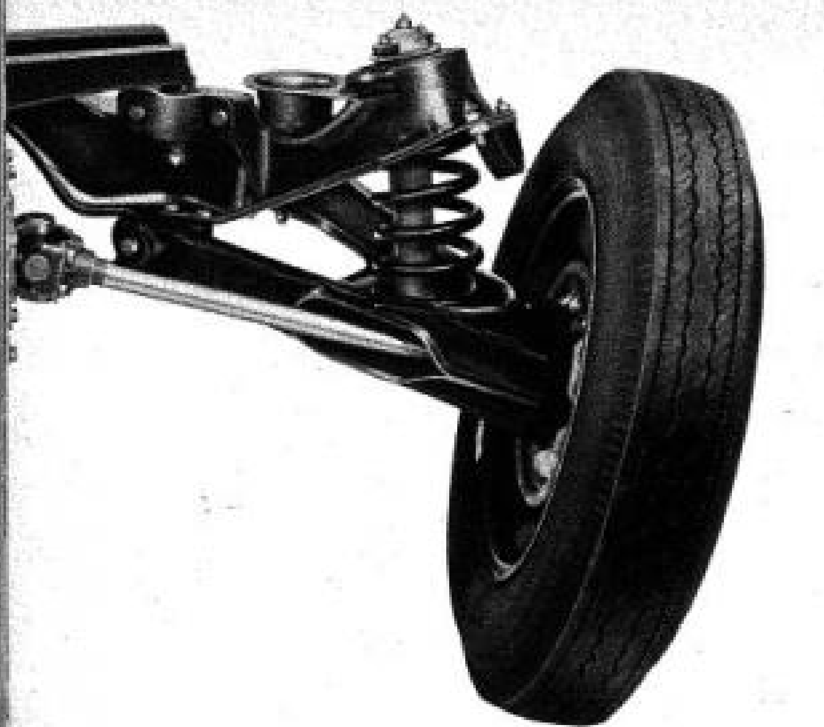
They didn't, so the owner who is interested in matching handling to the power potential must take it on himself to find the solution.

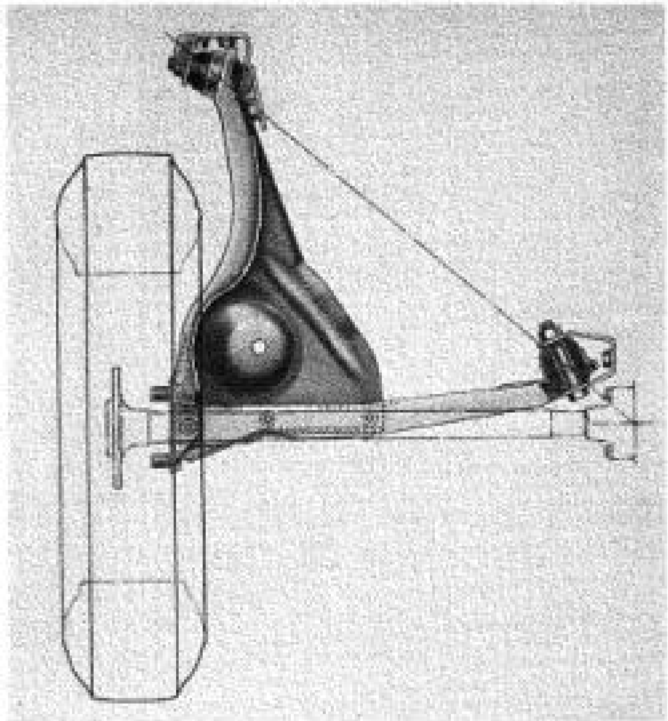
Let's look at the car. Although it has been out for three years and received comprehensive dissection by every automotive magazine when introduced, the Tempest's unique features do not seem to be appreciated by the casual visitor to a Pontiac dealership. Most buyers don't know from swing axles and when they ask about the little "whine" discernible at idle or on racing the engine in neutral and are told that it is caused by the flexible drive shaft, they nod wisely and never inquire further, although their present car surely does not make any similar sound. "Transaxle" is not in their vocabulary and if the salesman goes into details they are apt to lose interest unless he snaps their attention back with a quick reference to "deal." But to you and me, this arrangement is important. It is the guts of the four wheel independent suspension system and the reason another of our road testers wrote: ". . . to be really fair we should point out that very few buyers are going to crowd the Tempest hard—but those who do are going to have some busy moments."

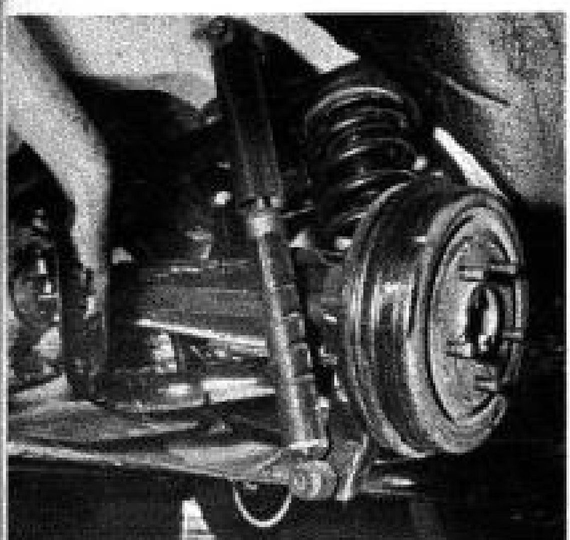
The Tempest chassis is essentially a tubular backbone connecting the front suspension and engine package to the rear suspension and transaxle package. This tube encloses the drive shaft and is pretty rigid but the unitized body actually furnishes the torsional and longitudinal strength



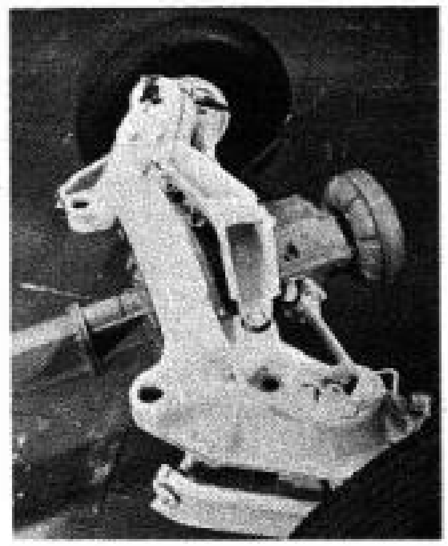
Backbone of chassis is drive shaft enclosure which connects front and rear independent assemblies. Unitized body adds stiffness required to sustain swing axle system. Rear-mounted transmission helps weight distribution.







Tempest suspension details have been changed since introduction of car: Above left; 1961 rear suspension included A frame arrangement, shock absorber mounted inside coil spring. Above right; 1963 design is trailing arm in character (top of picture is toward front of car). Left: 1963 shock is behind axle. Right: 1961 rear unit has now been lightened.



ordinarily derived from the conventional girder frame. Together, they make a light, stiff base for almost any type of spring set up which might be specified. Volkswagen, Porsche and others use essentially the same design but, where they follow the small-car-rigid-suspension theory, the Tempest adapts the large-car-soft-suspension idea. This is the first departure. Weight distribution is another.

The front suspension unit is a sizeable cross member which serves as an engine mount and an attaching point for an upper "A" frame control arm and a cantilever type lower control arm on either side. Between the arms are coil springs enclosing shock absorbers. A compression strut on each side takes thrust from the front and is adjustable for altering caster angle. A stabilizer bar connects the two lower control arms. Ball joint type steering knuckles allow both steering and vertical motion. The whole unit attaches to the body with only three bolts on each side.

The rear suspension in 1961 and 1962 models is attached to the body and backbone in four places with a central mount at the transaxle which provides for rear wheel toe-out settings by means of shims. The axle shafts are equipped with universal joints at the inner ends, where they are attached to the differential, and the lower "A" frames pivot in line with the U-joints, necessitated by an arc of wheel travel equal to the length of the axle shaft. The "A" frames are attached to the brake backing plates and between the "A" frame and a rigid upper mount a coil spring and shock absorber is interposed.

In the 1963 model, this has been altered considerably. The wide end of the "A" has been opened out, in effect, until the outside leg of the "A" is now a trailing arm, attached to the body forward of the wheel. The pivot of the leg which lies almost parallel to the axle is now mounted quite close to the U-joint. The cross member is much simpler and lighter and toe adjustments are now carried out at the trailing arm attaching point, making it much easier to correct toe-in on one wheel without affecting the other. Shocks are now mounted outside the coil springs at an increased angle.

Under this arrangement, each wheel is free to assume a rather individual attitude during road maneuvers, cornering, bumps, braking or acceleration. Also, such construction results in less unsprung weight, greatly improving the relationship of sprung-to-unsprung weight and making control of the unsuspended mass (wheels, tires, suspension pieces, etc.)

Series of photographs shot at Riverside International Raceway during Tempest handling experiments demonstrates basic problem and approach to cure. Oversteering caused by loss of traction on rear wheels can be lessened by stiffening anti-roll bar, increasing spring rate, snubbing spring action with heavier shock absorbers. EMPI camber compensator installed on rear axle is assist notable in bottom right photo. Improvement from Armstrong shocks can be noted in bottom left illustration.

much easier than is possible with the more conventional live rear axle where the axle halves, differential, housings and drive shaft form a heavy unit which, once started oscillating, is difficult to snub. This type of suspension has been used formerly on only the most economical or the most expensive automobiles, for two different reasons, obviously. When the transaxle is combined in one package with the engine, in either front- or rear-mounted arrangement, it is less costly to produce and lighter in weight. Smaller suspension pieces can be used, further reducing production prices. Properly engineered, four-wheel independent suspension gives the most in stability and roadability in a high performance car; hence it is used when cost is no object.

However, the mere use of swing axles and independent front suspension does not guarantee good handling. In fact, some of the small cars so equipped are downright homicidal.

In the disposition of the transmission to the rear in unit with the differential, the aim is to effect a more balanced weight distribution compatible with the chassis. This is the case in the Lancia-Ferrari, Maserati and other grand prix racing cars and the Lancia sports cars. And, while Pontiac advertising stresses these advantages, the Tempest is not a perfect example of a goal attained. True, it would have a lot more forward weight bias if the transmission was not mounted at the rear, but it still remains at 54 percent fore and 46 aft.

This could even be tolerated if we didn't have the public to contend with. But here is where the snafu occurs. To maintain the soft qualities of conventional springing requires a lot of wheel travel. A lot of wheel travel creates large changes in wheel attitude. Camber, the angle of the centerline of the wheel relative to a vertical line, has an important bearing on stability and even small changes have a great effect. If the engineer is designing for performance only, tire wear, production cost and so-called passenger comfort can be subordinated to sheer handling but the passenger car calls for compromises. The extent of these compromises, we have already belabored enough.

In the front, the control arm design is intended, first of all, to minimize tread variation which causes tire scrubbing and hard steering. Camber change must be accepted. Lancia, in striving for perfection, uses a sliding-pillar type of suspension which permits wheels to rise and fall only in a vertical plane, thus keeping tread and camber constant, no matter how soft the springing or the extent of wheel travel. But this is a costly design and the only recourse in the more widely used arrangement is to limit travel reasonably.

At the rear, the longer the radius of the arc described by the wheel, the less the camber change. We are limited by the length of the axles here, so a classic solution has been the use of outboard U-joints, as well as inboard, and tying the wheels together with a dead axle or deDion tube. Again, quite expensive, and the recourse: Again limit wheel travel.

Camber in the front wheels is determined by the angle at which the steering knuckle and its ball joints are mounted in the control arms. This is fixed by the factory within limits which can be changed by the addition and removal of shims between the front cross member and the upper control arm mounting shaft. Stock settings are at 0° 8′ positive (outward tilt of the wheel at top). Rear wheel camber cannot be adjusted by such easy methods inasmuch as the centerline of the axle must always remain at a 90 degree angle to the wheel centerline. Apparent camber, the attitude of the wheel relative to the car and the pavement while at rest, can be changed by altering the springs or modifying the relationship of the transaxle mounting to the upper spring and shock mounts.

As the Pontiac sits at the curb, it exhibits the positive camber attitude common to swing axle cars. A small amount of positive tilt is desirable from the standpoint of even tire wear, since loading or bumps induce negative camber and thus distribute tread-road contact. However, with the low roll center of the front suspension and a forward center of gravity, this positivity can get out of hand. Complicating the situation is the fact that most automobiles are used with almost no load distribution which would help weight bias. The Tempest is set up so that rear seat passengers and luggage will achieve fore-and-aft balance but, unless a couple of sacks of cement are judiciously inserted into the trunk, this seldom prevails.

So, what does this mean in terms of driving pleasure and what can be done about it?

The words "breakaway oversteer," in the road test report are the clue to the condition which is most disturbing. Secondary characteristics found annoying are the car's tendency to pitch or oscillate around the center of gravity when loaded and excessive nosedive on braking. These flaws were discovered while driving the car to gain impressions for a road test report and did not encompass any rugged maneuvers or track tests, just average operation on the city streets and up and down the canyon roads which are so much a part of Hollywood and environs. In order to study carefully the

Tire size is handicap to Tempest when seeking maximum performance. Optimum cross section is not available for 15 inch wheels, but owners adapted Corvair 13 inch wheels by cutting Pontiac bolt circle out, welding into smaller rims, as shown.

automobile's character, we eventually took one to Riverside International Raceway and honked it around Turn Eight, a sneaky kind of bend which is on a slight downhill and throws a little reverse camber at you, exactly the type of curve found in many hilly sections and the worst kind for Tempests according to the original analysis.

The photos we obtained at the time were so revealing of the suspension's action under stress that they are extremely valuable reference. Shot by Pat Brollier, they capture the critical moment in a turn when everything seems to come loose, or clearly show the correction attitudes necessary to keep the car on the track. Most important, they reveal that the Tempest's rear wheels are in a grossly positive camber attitude when, for most effective action, negative camber is needed.

Theoretically, the wheel on the loaded side should lift up and, following the arc described with the axle as the radius, tilt inward at the top and thus set up the negative camber.

Never hoppen.

Our experiences with this 1962 model are worth recounting.

Initially, just to give the car a little more of a toss than we had been able to on the street, we drove it into Turn Eight at approximately 35 mph. If you saw this curve coming on the highway, you'd estimate it at about 30 mph, so we were flabbergasted to find ourselves all over the road, crossed up and fighting for control. Backing off the throttle, which, in the case of the VW or Porsche, is a prescription for regaining some composure, made things worse. If the brakes had been applied it is a moral certainty that the car would have spun like a top.

Looping out isn't an everyday experience for a road tester; we spin 'em once in a while, but to do it under such Sunday conditions was enervating, to say the least.

The first thought was that tire pressure must have been grossly awry, but changing the relationship from front to back and going to various extremes did not seem to produce any really measurable improvement. Changes, yes. There was an optimum poundage on this particular car right at stock, 26 psi front and rear, after the U.S. Royals had been on the road for a while, equivalent to 22 psi cold.

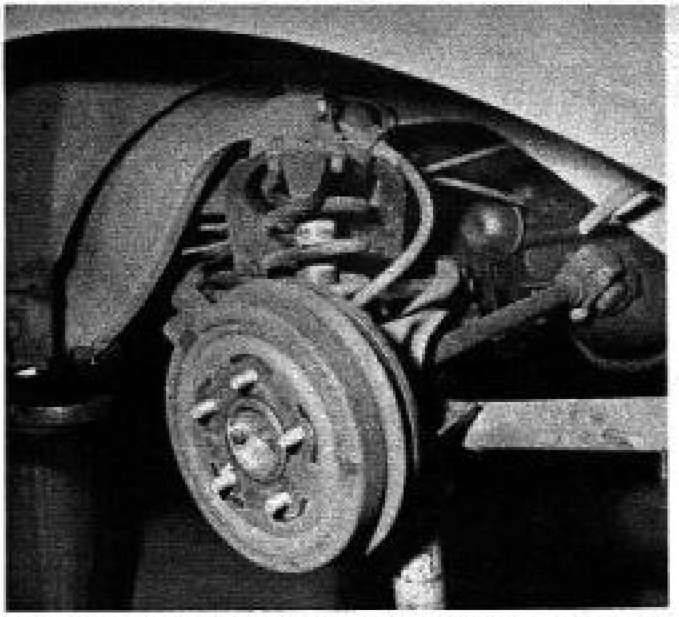
With 6.00 x 15 tires, the car seems quite deficient in the amount of rubber which can be laid on the road. The station wagon and air conditioner equipped cars mount 6.50 x 15's, which would be an improvement. But, knowing that most owners have the smaller cross section rubber, we carried on with the tools we had. (Incidental intelligence: At 60 mph, with 3.31 gears and 6.50 tires, engine speed is 80 rpm less than with 6.00's; think of the economy!)

Having gone the route with tire pressures and reduced the tread considerably by repeated trips through Turn Eight with highly obscene wheel attitudes (see photos) cameraman Pat Brollier coined the best description of the car by saying that it seemed to "hump up in the middle and pull its wheels off the ground." This got more than a laugh from our test crew; it suggested the first obvious move the owner could make, replacing the shock absorbers with more restrictive types in order to control the soft springs. Under the conditions imposed by the turn, the normal forward weight transfer was accented by both the readiness of the front springs to compress and the rear ones to extend, which, in turn, increased the rate of transfer. The stabilizer bar is not nearly strong enough nor purposeful enough to counteract the "tucking under" of the inside front wheel and the laying over of the outside wheel, so the tire action, whatever it might be, is hardly a factor. Anything which would help keep a modicum of tread on the pavement seemed like a good bet.

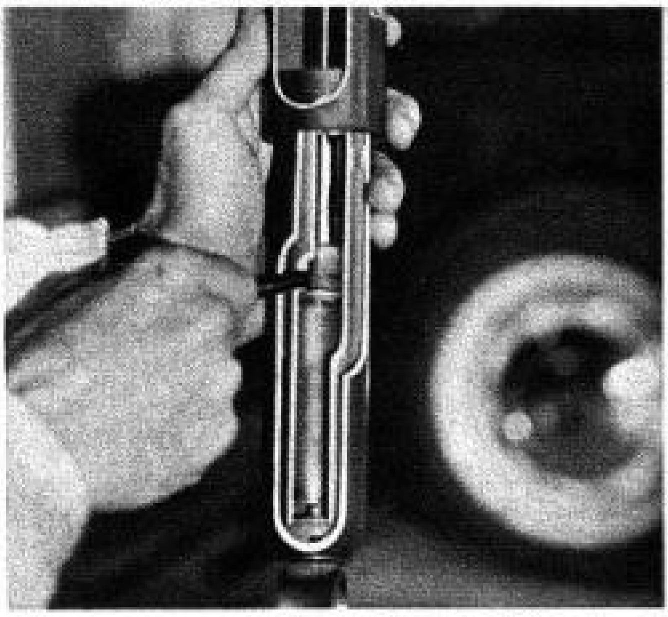
The stock shocks are one inch in diameter and valved so as to be almost unobtrusive in the system, it appears. Entirely compatible with the American idea of riding comfort, they are light in weight and economically made as, no doubt, they must be in order to keep costs down. Design-wise, they are typical of cost-reduction methods as well, since the use of stampings persists throughout. It is easy to see how the original effectiveness, whatever it is, could disappear under abuse when heat expands the cylinder and the fluid which is more or less sloshed up and down, begins to thin and froth. This isn't a treatise on shocks, but the remarks are included to offset the disbelievers' grunts of, "Don't tell me that just changing brands of shocks is going to do all that much."

No, not brands, so much, just quality. Any replacement part designed to improve over the original equipment is bound to cost more. The buyer stands for the extra tab because he is actively seeking a little more. So, we ripped out the stock shocks and put in a set of Armstrong tubular AT-7's. The part numbers, for those who care, are 1557 front and 1822 rear. We could have used any of several other similar quality units but these were chosen because Armstrong has recently made quite a survey of the compact car requirements and report that they have the handle. Arm-

Further experiments resulted in confirmation that stiffer shocks alone can do much toward correcting unpleasant aspects of Tempest road feel. Another approach is optional heavy spring and shock package — ordered with new car at low cost.



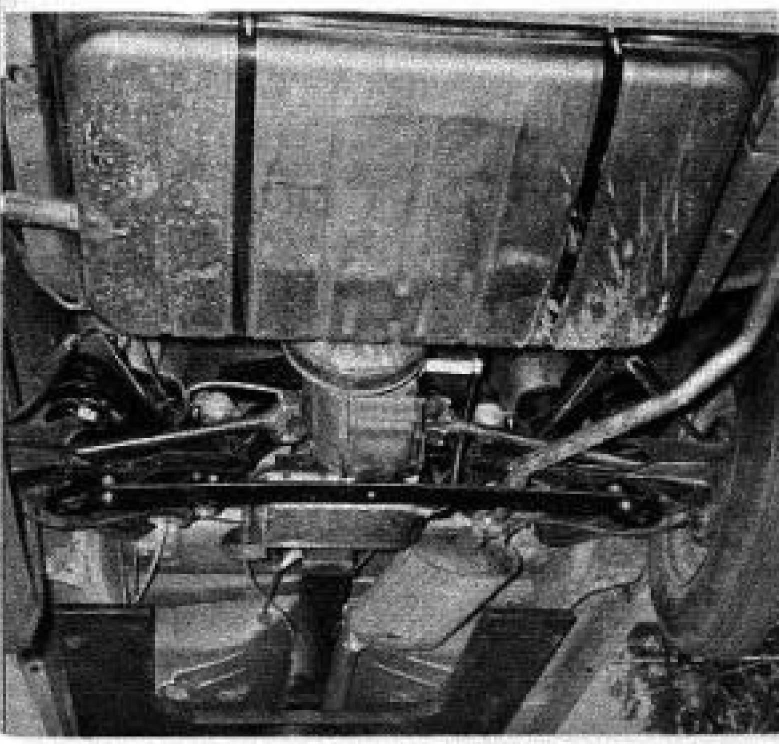
Shock installation is quick and simple shop chore unless the replacement units are too large to pass through slot in A frame.

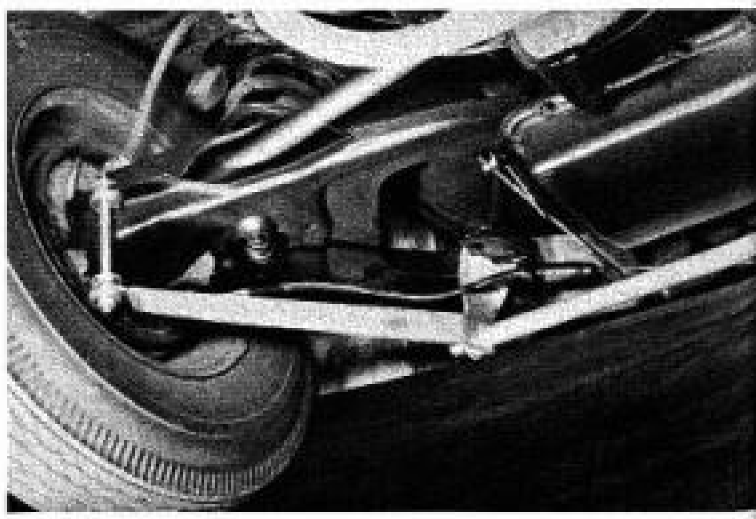


Construction of Armstrong heavy duty shock absorber is such that fluid is cooled as it is circulated and retains viscosity.

1961-1962 shock mounts sometimes require alteration to use heavier units. Opening may be enlarged by file or torch.

Author, left, and Joe Vittone of EMPI make changes on Tempest rear suspension during tests at Riverside International Raceway.





Above: Huffman Swaymaster is proprietary item designed to improve handling of Tempest, can be installed by owner. Left: Installed EMPI Camber Compensator. Bolts to A frame outer ends, pivots at center bracket on differential case.

1963 Tempest shows improvement resulting from factory altered suspension, but same traits are present as in previous models.

Optional heavy duty springs from 1962 are used as standard on 1963 V8. Stiffer units are necessary to reduce body lean.

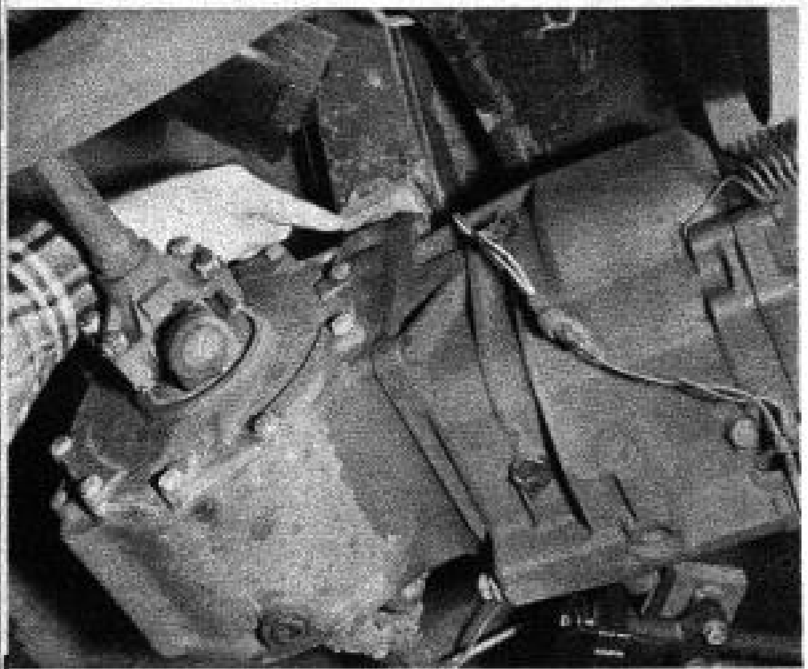
De-cambered Pontiac exhibits best road performance. Rear shows negative camber easily induced (wheels slant in at top).

strong, according to distributor Bill Corey, is the largest manufacturer of this type of equipment in the world and equips more makes of cars with its product as original equipment than anybody. Lest we begin equating size with worth, though, the product, in this case, is used by nearly all the sports racing and racing automobiles on the international scene: Cooper, Lotus, Jaguar, Lola, Elva, etc., and it works well over a long period because the piston, for instance, instead of being a stamped cup, is cast iron and has a piston ring. The walls are heavy and oil is circulated outside the cylinder on each stroke to cool it and prevent aeration. So, when you put it on the car it is designed for, the correct amount of action is there.

With the new shocks, the Tempest was something else. It levelled off tremendously and, although we were still sliding off the road, it was a matter of no side bite because of incorrect tire pressure. However, we had only a short time to run additional tests on EMPI's Camber Compensator, so we were unable to play with pressures. Briefly, there was no air supply available and for data purposes it was necessary to test the effect of the camber compensator with the same tire pressure we had at the beginning, so we cut short the shock experiments.

Then, when we began preparation of this book, it was determined to wring out the shock absorber idea as far as the Tempest and Pontiac were concerned, since this is an inexpensive and seemingly extremely valid way to go.

In line with this plan, we liberated a Tempest belonging to a Petersen Publishing Co. employee, Harry Foster. This is a 1962 Le Mans with some 20,000 miles on the odometer. Typical, if there ever was one, and non-stock in only one department, dual exhausts, which, although of no influence on handling, could be a source of rattles since we found that we could lean the car over far enough to cause the "A" frames of the rear suspension to strike the tailpipes! This is beaucoup lean; twenty-odd thousand miles had not improved



the qualities we discovered at Riverside some months before.

During this series of tests, the first discovery was that tire pressures do make a difference with Firestone tires. In succeeding passes at our chosen curve, pressures were varied, pound at a time, up and down, seeking the best combination and we finally turned with 31 front, 28 rear; hot, of course. So, the instant conclusion is that each owner should make a few checks for himself.

Our second discovery was a verification of what we suspected at Riverside: The Tempest can be whipped into fair shape just with proper shock absorbers. Back at Bill Corey's Sports Car Center in Pasadena we installed another set of Armstrongs and discovered you can run into problems. On some cars, the slot in the "A" frame is just sufficient to clear the standard shocks. Armstrongs, and other replacement units, are slightly larger in diameter. This means that a little judicious filing is occasionaly necessary; otherwise, a half hour is plenty of time to make the swap.

It is time well spent. With this assist, the car begins to feel a lot more sticky when tire pressures are reduced. The shocks enable the tires to assume their function to a much greater extent and pressures can be brought down to a point where it is obvious they are working. Down to 26 front, 24 rear, in fact.

A lot of combinations were tried, naturally, and a few experiments with shocks in the Armstrong line revealed that the original selection was right. There is a heavy duty AT9, number 2689, which would be fine, we suspect, for extremely rough conditions, and an adjustable AT9 (2689-A) which offers 24 settings, This looks like a good move for the man who tows a boat trailer, or some such, and wants to dial a less restrictive setting. As far as handling with the stock springs, there is no appreciable difference.

The shocks effect a substantial improvement, certainly worth the outlay, but to say that they transform the Tempest into a racer would be to overstate the case. The ride and handling will be highly acceptable, but the oversteering and sudden breakaway, while reduced, can still be instituted. This, we concluded, is so much a function of tire profile that a new set of skins is the only next happy solution.

Our work with the Camber Compensator at Riverside indicated that it is a helper, too. But to realize its maximum effects, it seems, the rear end should be brought down and tires with firm sidewalls employed.

The EMPI Camber Compensator, for those who are not aware of the piece, is a single leaf transverse spring, pivoted in the center on a bracket attached to the differential housing. It connects to the "A" frame outer ends via a link and as the car sits at curb imposes no load or tension on the suspension. Under conditions where both wheels bounce or rebound, the Camber Compensator comes into play as a snubber and it acts to transmit the motion of one control arm to the other. A reference to the photos will make this arrangement clear.

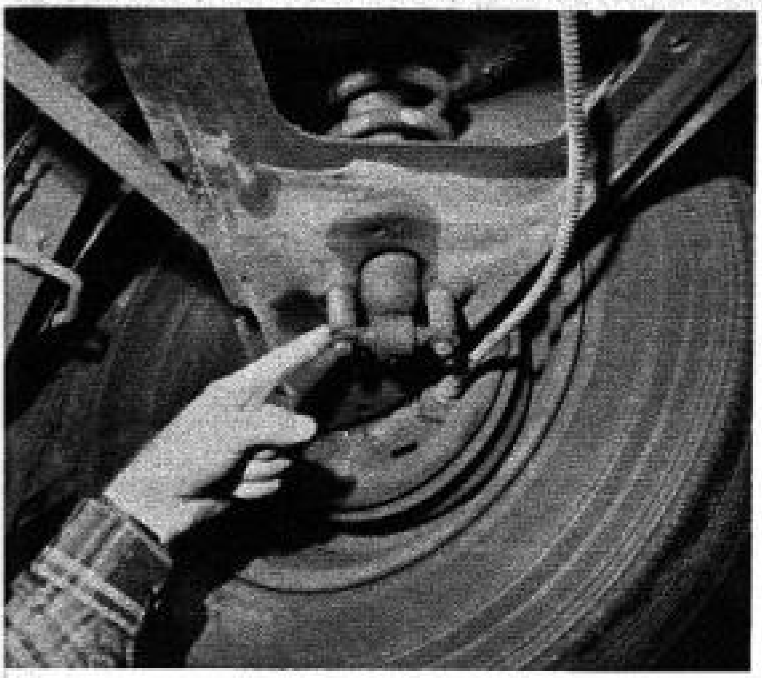
Another device, the Huffman Swaymaster, is quite similar to the stabilizer bar fitted to the front of the Tempest and to the rear of the 1963 Pontiac. Its effectiveness in keeping the rear axles in a lateral plane, as it is intended, again depends much on the suspension's action under a given set of conditions. This, to re-state, is influenced by weight, weight transfer and the ability of the tires to "work."

Improvements to the 1963 model are supposed to have taken care of many complaints; so, in the middle of wringing out Harry Foster's car, we called on our nearby Pontiac agency, Gianera Pontiac, in Montrose Calif., and checked out a number of types and models. Working with Al Caudabec, a high performance enthusiast who also happens to be a salesman, we were able to evaluate the new Tempest and compare it, side-by-side, with the 1962 and altered jobs.

First, the new rear suspension seems to work handily. Our stock (before shocks) 1962 could not keep up with the 1963 through the selected curves even with an extra dose of brave pills. The optional suspension (option number 634) makes the new model even sleeker, with the 6.50 X 15 tires. This consists of heavy duty springs and shocks and costs a mere $6.24 when specified before delivery of a new car.

These pieces cataloged last year under "Special Parts" were not readily available, just listed; but this year they are lumped in a good, easily obtainable package. Heavier springs for the 1961-62 model are parts numbers 540480 and 540481, front and rear.. Shocks for the 1963 (in case you have one not so equipped) are, for the front: 5559076. In the rear, the shocks and springs come as a package, number 3166072, or shocks alone, 3171472.

Apparently the heavy duty springs from last year became the stock springs for the new 326-cubic-inch V8 powered Tempest and an optional set is offered, together with the "Superlift" shocks, for this 260-hp version. Separately, they are part number 9771851 for the front, 548257 for the rear



De-cambering is accomplished by lowering centersection and inner A frame mounts with aluminum blocks and longer bolts. It is also necessary to lower the shock absorber mounts an equal amount. Locations of spacers are pointed out in photos.

and color coded yellow and dark green front, yellow and aluminum, rear.

Although it is natural to expect the V8 to be even more of a handling problem than the four, it fails to bear this out. In spite of the additional 150 pounds up front tacked on by the cast iron V8 it doesn't seem any quicker to swap ends. It is improved over 1962 but the same remedies apply; heavy shocks, more tire and what is evidently the sole, final solution, de-cambering of the rear end.

This is a fairly simple job in many swing axle cars, the Porsche and VW being notable examples where a re-setting of the torsion bars accomplishes the deed, but it is more complex where no provision has been made for this change, as in the Corvair and Tempest. As mentioned, it is a matter of applying the torch to the coils to induce the wheels to begin their upward arc of travel and assume the negative position, but in a suspension as sensitive as this, weakening of the coils is the last thing to be attempted. Although "letting it sag" is accepted in some circles when applied to front coils, it is far too crude. Chopping a turn and a half off the coils has been done to set the rear end down for drag strip operation, but the resulting bottoming on rough roads is highly unwelcome, even if the gain in traction is impressive.

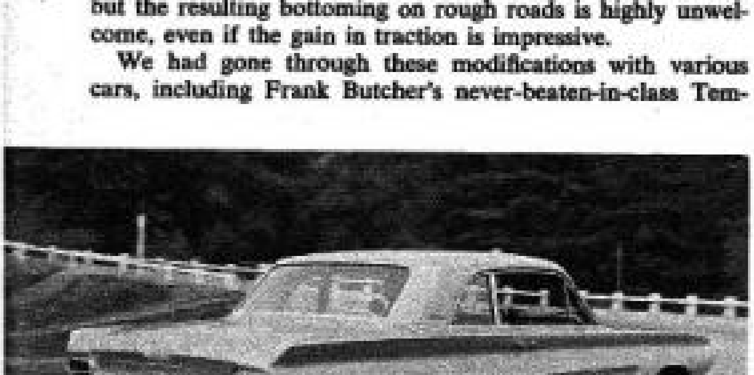
We had gone through these modifications with various cars, including Frank Butcher's never-beaten-in-class Tempest drag machine, but did not feel like advocating them for the street, when we turned up a young man, Dave Thalimer of Glendale, Calif., who had taken the bull by the horns, or the Tempest by the rear crossmember, and performed a major operation: Lowering the inboard portion of the rear end package. This was accomplished by inserting ¾-inch spacing blocks, cut, in this case, from a piece of scrap aluminum, under the transaxle and inner "A" frame mountings.

Since the "A" frame is suspended by the shock (and this is something to remember if you change shocks: The rear spring must be under compression before the shock bolts can be removed), Thalimer also blocked up the mount in similar fashion.

The net effect is good and is accented by a switch in tires. Thalimer chose Michelin X, a type with extremely rigid sidewalls, in 6.40 X 15 size. Under almost any attitude, the car has excellent traction and is far less sensitive to the type of curve which proves to be the stock Tempest's nemesis. However, Dave reports that the real stinker, the situation where it is necessary to back off in the turn, is still fraught with imminent peril. The weight transfer thus induced is just too much for the suspension to handle. The 1963 model, with its 1½-inch wider tread and trailing arm set up, is far less sensitive. Decambering, stiffer shocks, heavy-duty springs, particularly in front, make it a pleasant little machine.

A word on brakes: Most owners report short lining life under hard usage. The better-cooled 1963 drums help, but the car definitely needs a commercial grade lining or the metallic type, such as GM's Moraine or a proprietary brand like Velvetouch. Although an HD brake setup is listed in parts catalogs, it is extremely difficult to obtain.

The amount of improvement in road performance which can be made for a small outlay, however, should give the Tempest owner encouragement, and, once set up, it is a highly desirable and enjoyable machine. ■



De-cambered car handled best of all Tempests tested, seems to be optimum arrangement. Right: New finned brake drums, standard on 1963 V8s offer much-needed improved braking.