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CHASSIS MODIFICATION

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"THE FLAGMEN SAY, CAR 9'S STEREO IS TOO LOUD"



by Brock Yates

(Reprinted and edited from January, 1970
Car and Driver Magazine)

They laughed when we sat down to race a Boss 302 Mustang — complete with vinyl interior and stereo radio. But when we drove out of Watkins Glen with a second place trophy sitting in the back seat, all the laughter was ours.

It was so good on the road, it had to be good on the track. Rushing along through the pre-dawn darkness with its great Firestones hissing against the pavement and its engine chortling ominously, this white and black coupe exuded competence and authority. A proper car, hurrying over humped, tree thick ridges on its way to a weekend at Watkins Glen — a weekend in which it would be rolled onto a race track and be expected to behave like an outright competition machine.

So far it had been perfect. It had covered the 300 miles of level, nondescript Lake Erie shore country between Detroit and the Niagara Frontier with ease, and now, as it plunged into the hills that surround Watkins Glen, it seemed to gain strength. But, as an orange morning sun began to burn away a light frost, doubts started to gnaw at me. Surely the Boss 302 was an extraordinary road car, but would our experiment work? By merely unbolting the exhaust pipes and changing the spark plugs, could the car be made competitive in amateur road racing? If it was possible then it might open an entirely new avenue for the enthusiast to obtain a low-cost, dual-purpose sports car for daily transport and for occasional forays into racing. If, on the other hand, the Boss 302 — with its full insulation, heater, defroster, A.M.-F.M. stereo radio and other baubles making it over

400 lbs. heavier than the legal minimum — turned out to be a mule among the thoroughbreds, we would be making nothing more than another foray into the land of four-wheeled fantasy — in public.

We rolled down Franklin Street in Watkins Glen. A few competition cars, chained down on trailers, were parked along the curbs, but otherwise there was little evidence that a race was being held. Sensible people have long since given up trying to attract crowds to Regional Sports Car Club of America events; and they are now run for the sole pleasure of the competitors. This particular Glen race, organized by the membership of the Finger Lakes Region of the SCCA, has a reputation for being a well-run, rollicking close-out — a final chance for the amateurs to thrash around before locking their cars away against the cold, dark northeastern winter. It seemed like a good place to test our theory. After all, our 302 was specifically intended for this brand of racing — as a casual competitor's machine and not as a chopped-down fire-belching monster.

A small collection of cars and people clustered around the technical inspection building. We parked the Mustang behind a tiny formula car and waited for skeptical heads to turn.

Krueger arrived and I felt better. A long-time racing friend and maybe the best mechanic I'd ever met, we'd started banging around in Formula Juniors together and went through the frustrating first year of the Trans-Am Series. Known and respected among the area's hard-core racers,

Chuck Krueger lent the Boss 302 a certain local credibility, and it was good to know the car would be well-tended and well-driven on its first outing.

The car, its doors now pasted with numbers and its headlights taped over, passed inspection easily except for the request that we remove the radio antenna (2 min.) and install an oil catch tank to collect any lubricant that might belch out of the breathers at speed. Krueger and I jumped into the 302 and drove down the long hill overlooking slate-gray Seneca Lake and into the village. The local Ford dealer had a windshield washer reservoir that would work perfectly as a catch tank, and as we thundered back up the hill, the Boss 302 was beginning to feel harsher and tougher. It was turning into a race car. It took twenty minutes to unbolt the mufflers and install the stubby racing pipes and racing spark plugs.

Tire pressures were upped a few pounds and the kids buffed away the last particle of dust as Krueger climbed in for practice. The engine thundered happily, free of the stricture of muffler baffles and kinked pipes. The track record for the best Trans-Am type sedans on the course stood at about 1:26, and I felt that if we could come within six seconds of that time on this long, horsepower-gobbling track, we might be competitive.

Krueger cruised for two laps then turned a 1:36. A few more times around and the clock said 1:34. "It's so stable, I have trouble breaking the rear end loose in the slow corners," he said when he came in. He had been holding the revs to a conservative 6500, except for the flat-out trip through the dangerous kink at Wedgewood Road where the engine speed rose to 7000 rpm and the speed approached 130 mph.

We adjusted the tire pressures slightly and lined up for the first race — an event in which the A-sedans (in amateur competition, Trans-Am type cars are so designated) were to compete with a clutch of faster A- and B-production Class cars. The Boss 302 was second fastest among the A-Sedans. Our closest competition would come from a well-driven old Shelby Mustang, now painted green and carrying number thirteen.

The big unmuffled V-8s of the A- and B-production cars and the sedans rattled over the vacant grandstands as our race started. Krueger moved up a couple of places and held second among the sedans and then failed to appear on the fourth lap. I ran down the pits to a nearby communications

station and was informed by a worker in white coveralls and headphones that Krueger was off the course with a flat tire. I jumped into a car and thumped across the empty infield thinking about the consequences. Trying to carry our concept to the limit, we had brought no spare tires, no tow bar or trailer to trundle home a damaged car.

Krueger was standing by the edge of the track with his wounded automobile. As he had tried to overtake a trio of slower cars, one had popped a water hose, the second driver had spiked his brakes and the third had thumped him in the tail and spun at the fastest section on the course. He bounced through a ditch and into the side of the Boss 302 and bunted Krueger sideways. Chuck kept the Mustang from spinning, then guided the car onto the inside apron. The left door and rear fender had been bashed in and the left rear tire slashed in the collision. Had it been a Trans-Am event, he would have driven it into the pits for a tire change, but in a short, unimportant race like this he wisely parked it.

A tow truck came out in the gathering darkness and pulled the Boss 302 into the garage area. Nothing but the tire and the sheet metal had suffered and we had been lucky. We would race again the next day. Our only consolation lay in the fact that Krueger had cut another two seconds off his lap time which put us within our hoped-for limit.

Somehow, in the stark autumn light of the next day, the scarred side of the Mustang didn't look as bad. It was as if the car had its first battle scar; its nose was bloodied. We raced again, late in the afternoon. At the start it began to drizzle but suddenly stopped. If the pavement had gotten damp, our intermediate rain tires — chosen as a compromise between highway and track applications — might have given us an advantage. Nevertheless, Krueger worked from his spot on the back of the grid (because of his non-finish the day before) into second place in the sedan class after a rousing battle with the green Mustang that lasted until the final lap.

When he finished, the oil pressure was as high and the engine temperatures as low as when I'd picked up the car in Detroit. It had behaved perfectly in over 100 miles of racing and practice, and as we hitched up the street mufflers and changed back to street plugs, we felt we had proven at least part of our point. The car was driven home in a cold, pelting rain. The driver's window had been shattered in the crash, but the cockpit was as hospitable as any I'd ever been in. Such is the warmth of satisfaction.

A WORD ABOUT THIS BOOK

Now, maybe you have a yen to be like Brock Yates, or even Parnelli, and want to actually participate in some competition events. If that's the case you already know that some changes are in order. A production street machine is not a race car, and vice versa. However, because of its racing heritage your Boss Mustang or Cougar Eliminator is a lot closer than most cars, and considerably easier to modify.

And that's what this book is all about. How to modify your chassis from a few simple bolt-on additions (like the car described in the preceding article) to a full-race setup, and how to order the special parts from Ford. (For engine modifications and parts availability refer to the separate Boss 302 engine modification manual.)

The modifications described have all been developed by Ford engineers and leading independents from experience gained in years of racing. Some are basic techniques and parts well known to everyone in racing. Others are specially developed for Mustangs and Cougars. The important point is they all work — and have been proven in competition.

PICK YOUR STAGE

To make it easy to determine the type of modifications you may want or need, the chassis changes have been grouped in three stages. Stage I is suggested for owners interested in rallying, gymkhanas and limited racing who also want to use their vehicle for everyday use. Stage II is an intermediate step which provides a significant improvement in handling and braking at reasonable cost. Stage III is for serious Trans-Am or similar type racing and utilizes all of the special chassis kits available.

The following chart lists the various recommended changes for the three types of modifications. Pick your stage, order the parts and you're on the way to racing.

STAGE I MODIFICATIONS

Brakes	Heavy-Duty Front Pads, Rear Metallic-Type Linings. Optional remove rear adjusters. Adjustable brake proportioner may be necessary.
Steering	Production 16:1 Manual Gear.
Suspension	Production Front Springs, Optional Remove One Coil. Production Rear Springs, Optional One Inch Blocks. Single Adjustable Koni Shocks, Front and Rear.
Wheels	Production 15" x 7".

Tires	F60 x 15, G60 x 15 or H60 x 15. Max. O.D. 25.60" Max. Section 10.30" Max. Tread Width 8.20"
Body Structure	Dash to Spring Tower Brace, Export Type. Roll Bar.
Rear Axle	3.91 Ratio w/Traction-Lok or Detroit Automotive Locker.

STAGE II MODIFICATIONS

Brakes	Heavy-Duty Front Pads. Rear Disc Brake Kit with Heavy-Duty Pads. Adjustable Brake Proportioner.
Steering	Production 16:1 Manual Gear.
Suspension	Drop Front Upper Arm 1.0". Modified Front Springs. Higher Rate Rear Springs. Optional Rear Track Bar. Single or Double Adjustable Front and Rear Koni Shocks.
Wheels	15" x 7" Steel or Mag with 1/4" Outboard Offset, Optional 15" x 8" Mag with 0.81" Outboard Offset.

Tires	Front — O.D. 25.7" — Section 10.9" — Tread Width 9.1" Rear — O.D. 26.8" — Section 12.1" — Tread 10.0"
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Body Structure	Dash-to-Spring-Tower Brace, Export-Type. Optional Spring Tower Cross Brace. Roll Bar or Optional Roll Cage. Rework Fenders to Clear Tires. Fender Flaring Required with 8" Wide Wheels.
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Rear Axle	Detroit Automotive Locker with 3.91, 4.11 or 4.30 Ratio.
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STAGE III MODIFICATIONS

Brakes	Heavy-Duty Front Disc Brake Kit. Rear Disc Brake Kit. Stronger Front Spindles. Master Cylinder. Adjustable Brake Proportioner.
Steering	Production 16:1 Manual Gear.
Suspension—Front	Heavy-Duty Suspension and Steering Kit. Upper Control Arm Assembly. Export Upper Shock Bracket. Power Steering Idler Arm. Strut Insulators and Lower Ball Joint. Koni Double Adjustable Shocks.

Suspension—Rear	Heavy-Duty Suspension Kit with Track Bar. Stabilizer Bar Kit. Stabilizer Bar Installation Kit.
Rear Axle	Detroit Automotive Locker with Optional Ratios. Second Vent Fitting. Optional Lube Cooler.
Transmission	Rework Breather, Optional Oil Cooler.
Wheels	15" x 8" Mag with 0.81" Outboard Offset, Front - 1.30" Outboard Offset, Rear.
Tires	Trans-Am Type Racing Tires. Goodyear— Front - 500/11.30/25 Dia. Rear - 600/12.30/26.8 Dia. Firestone— Front - 500/11.50/25 Dia. Rear - 580/12.00/27 Dia.
Body Structure	Dash-to-Spring-Tower Brace, Export-Type. Spring Tower Cross Brace. Reinforce Front End Structure. Roll Cage. Racing Bucket Seat. Steel Panel Between Trunk Area and Passenger Compartment. Fender Rework and Flaring.
Engine Installation	Rework Clutch Cordon Shift. Rework Rocker Cover Vents. Relocate Battery. Optional Revised Water Pump and Alternator Drive.
Cooling	Radiator Ducting. Relocate Oil Cooler.
Fuel System	Safety Fuel Tank.

WARRANTY PROVISIONS

Your stock Boss 302 or Cougar Eliminator is protected under the terms of the Ford and Lincoln-Mercury passenger car warranty. If you intend to modify it for competition use, neither Ford Motor Co. nor any of its operating divisions can continue to offer you the same protection afforded a vehicle used for normal, everyday transportation only. For this reason, your regular new car warranty does not apply to any vehicle used in a Competitive Event.

Competitive Events are defined in the warranty as formal or informal time trials, competition with any other vehicle, or any abnormal application of stress to the vehicle or components thereof in a competitive situation.

Federal law also prohibits the removal or adverse modification of any emission control system, or device installed pursuant to governmental requirement prior to the retail sale and delivery of a vehicle so equipped.

In addition, certain states prohibit highway operation of a car or truck unless it has properly installed and operating emission control systems and other equipment. Check the law of your home state.

The special high performance parts and kits listed in later sections of this booklet carry no warranty provisions. Check carefully so that you fully understand what is covered and what isn't. These parts are intended for competition use only and as such carry NO WARRANTY either expressed or implied, of MERCHANTABILITY or FITNESS or otherwise. Installation of these parts in a vehicle will void the vehicle warranty.

BEFORE STARTING — READ THIS

This book describes the changes and lists the parts recommended for the three modification stages. It is intended primarily for the serious amateur or professional and covers the procedures only pertinent to performance modifications. Step-by-step disassembly and assembly procedures are not covered. Therefore, before starting, it is highly recommended that you obtain a copy of the 1970 Ford and Lincoln-Mercury Shop Manual. This manual can be ordered for \$7.95 from Ford Service Publications, P.O. Box 7750, Detroit, Michigan 48207. The shop manual, when used with this book, will contain sufficient information to properly modify your Mustang or Cougar chassis.

At the end of each modification stage, the part required, along with the part numbers, are listed. In addition, suppliers of non-Ford parts and services are listed at the end of this booklet.

Before starting preparations for SCCA A-Sedan or Trans-Am racing, obtain the 1970 SCCA General Competition Rules and FIA Recognition Papers for the 1970 Boss 302 Mustang. Both of these publications are needed to accurately prepare a car that conforms to the rules and regulations. They are available from the SCCA for \$1.00 and \$5.00 respectively. Write to SCCA, P.O. Box 791, Westport, Connecticut 06880.

For the same information concerning NASCAR Grand American racing contact NASCAR, P.O. Box, Bin K, Daytona Beach, Florida 32015.

For USAC rules and regulations contact United States Auto Club, 4910 W. 16th St., Speedway, Indiana 46224.

STAGE I MODIFICATIONS

If you're planning to do a few weekend rallies or take in a gymkhana or two, this is the modification stage best suited for your needs. It is aimed at improving the basic good handling and braking built into your car, without reducing its usability for everyday transportation.

BRAKES

Brake modifications for this stage are quite simple. In the front discs install the listed heavy-duty pads. In the rear, install metallic-type lining such as "Velvetouch." The installation of these pads and linings provides a considerable increase in fade resistance, but they are still quite streetable.

If you find that rear wheel lockup occurs under extreme braking, install and adjust the listed brake proportioning valve. Make any proportioner adjustment with a normal load. The front wheels should have a tendency to lockup first.

If desired the rear brake self-adjusters can be removed. Kits are available from parts stores to do this.

SUSPENSION

Your Boss Mustang or Cougar Eliminator suspension is more than satisfactory for most types of amateur events.

If desired, the car can be lowered one inch in the front and rear to aid cornering. It must be remembered, however, that lowering also decreases both jounce clearance and ground clearance a proportionate amount.

To lower the front, remove the front spring and cut one coil from the bottom. Reshape or grind the spring pig-tail to fit the spring seat. In the rear, install one inch lowering blocks available at most parts stores.

Install single adjustable Koni shocks, front and rear. These will permit adjusting the suspension control for both competition events and street operation. These shocks are available from your Ford dealer. Starting adjustment can be 1-1/2 turns from soft, front and soft, rear.

After completing the suspension modifications, take your vehicle to a reliable front end alignment shop and have the front end alignment adjusted to the specs listed.

Front Suspension Specifications

Caster 0°
Camber 1/2° - 1° negative
Toe-in 3/16 inch

Once you have the proper camber adjustment for your usage, tack weld the camber adjusting eccentrics to the frame. This prevents their loosening under hard usage and changing camber setting.

Several sizes of front and rear stabilizer bars are available for chassis tuning as listed in the Stage II and III parts list.

WHEELS AND TIRES

Your stock production 15" x 7" (0" offset) wheels can be used for everything except serious racing. Lighter weight aluminum or mag wheels can be substituted, if desired.

Your car is already equipped with high performance F60 x 15 Polyglas belted tires. However, larger 60 aspect ratio tires, radial ply tires or other types of high performance tires may be used, if desired. Do not mix radial tires with other types. The maximum size tire that can be used without reworking the fender flanges is:

Outside Diameter	25.60"
Section Width	10.30"
Tread Width	8.20"

Even with these size tires, the front wheels require 1/4 inch thick spacers, or wheels with 1/4 inch outboard offset.

After installation and some initial running - be sure to check for tire contact with the suspension members or the fender flanges.

BODY STRUCTURE

The heavy-duty export-type spring-tower-to-dash brace, as shown in Figure 1, is highly recommended if you plan to do any rallying. This brace adds extra strength and rigidity to the front end structure and suspension.



FIGURE 1. Export-Type Spring-Tower-to-Dash Brace.

To install this brace, drill four new holes in the firewall after removing the two standard production braces. The installation of a roll bar is recommended. Several companies supply bolt-in units, (see listing of manufacturers at end of this book).

REAR AXLE

Usually a 3.91 or higher rear axle ratio with a Traction-Lok differential is required for any competition event.

The Detroit Automotive Locker is one of the best production locking-type differentials and will work well with the higher numerical ratios. This differential is available as a production or dealer-installed option.

To keep rear axle lube from the left rear brake and tires during competition, it is best to route the vent into a small can located securely inside the trunk. Run the vent hose through a grommet into the trunk.

STAGE I PARTS

Quantity Required	Description	Part Number
1 Set	Brake Linings, Metallic, Rear Drum	Velvet Touch 2091-152
1 Set	Brake Pads, Heavy-Duty, Front Disc	DOZX 2001-A
1	Proportioner, Brake (If needed)	C5ZZ 2B091-B
1	Brace-Dash to Spring Tower, Export	C5ZZ 16A052-E
1	Roll Bar (Purchase locally)	-
1	Traction-Lok Differential (Requires lubricant C6AZ 19580-C)	C9OZ 4026-C
1	Detroit Automotive Locker (Alternate)	C3AZ 4880-B
1	Rear Axle Gear Sets	
	3.91	C8OZ 4209-A
	4.11	B7AZ 4209-K
	4.30	C8OZ 4209-B
	4.57	C3OZ 4209-C
	4.86	C4AZ 4209-AB
2	Koni Shock Absorbers, Single Adjustable, Front	S1MS 18124-A
2	Koni Shock Absorbers, Single Adjustable, Rear	S1MS 18125-A

STAGE II MODIFICATIONS

If you plan to do serious rallying or road racing, this is the modification stage for you. Included are modifications to the brakes, suspension, wheels, tires, body structure and rear axle.

A vehicle modified to the Stage II level is intended only for off-the-road use and cannot legally be used for everyday transportation on the street.

BRAKES

The brake system recommended includes manual discs on all four wheels. In the front, production discs are used with the listed heavy-duty pads. In the rear, replace the drum brakes with the listed rear disc brake kit. The parts for this kit are shown in Figure 2. Included are the rear axle shaft assemblies which include the shaft, rotor, caliper bracket and bearing; plus heavy-duty caliper pads and spacers. The following items are not included and must be ordered separately: brake caliper assemblies, brake hoses, gaskets and caliper attaching bolts. All these parts are listed in the Stage II parts list. Complete installation instructions are included with the rear disc brake kit. The rear disc brakes installed are shown in Figure 3.

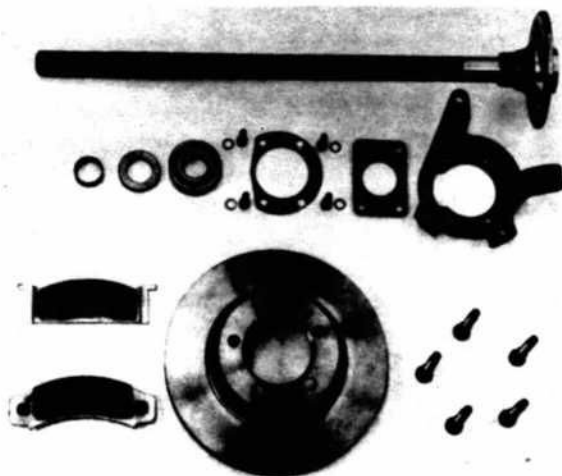


FIGURE 2. Rear Disc Brake Kit.

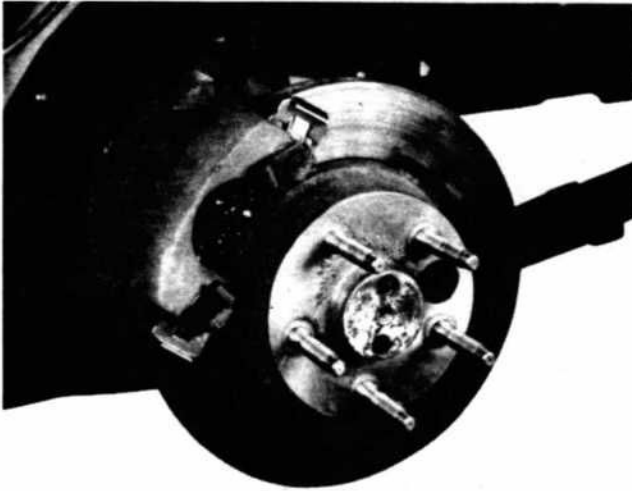


FIGURE 3. Rear Disc Brake Installed.

You will also need the listed manual master brake cylinder, replacing the power master cylinder. Modify this master cylinder by removing the outlet port check valves. These valves must be removed to prevent the brake pads from dragging. Complete instructions for installing the master cylinder are supplied with the rear disc brake kit. Also, the manual brake pedal must be substituted for the power pedal.

The listed brake proportioner also will be required. Adjust the proportioning valve to obtain slight front wheel lockup under very hard braking. Adjust the screw outward to obtain more front wheel braking; inward to obtain more rear wheel braking. The proportioning valve recommended



FIGURE 4. Brake Proportioning Valve.

is shown in Figure 4, installed in the rear seat area where it is quickly available for adjustment. Be sure the ports are upward.

Use a dry spray lube (moly or graphite) on the special long wheel studs to prevent thread galling and subsequent stud breakage.

SUSPENSION

This revised suspension will give your Mustang or Cougar extremely good handling at a reasonable cost. It is an excellent compromise between the stock suspension and the full race setup described in Stage III.

To modify the front suspension requires a complete tear-down, plus welding and drilling operations. If you do not have the equipment required, it is suggested that this operation be performed by a competent chassis shop, or a frame and alignment shop that specializes in high performance work.

Start the front suspension modifications by first removing the upper and lower control arms, springs, shocks and the crossmember under the engine.

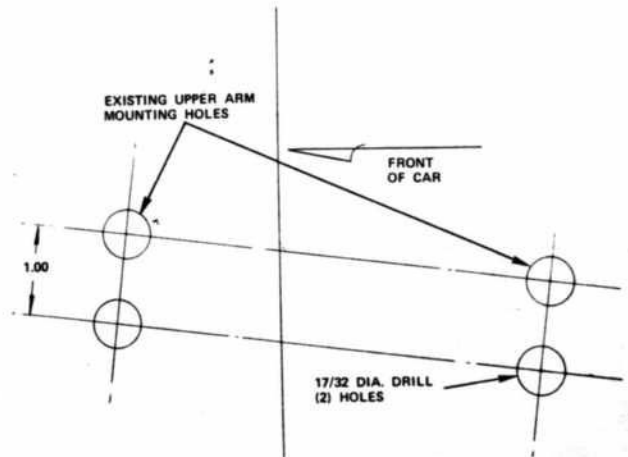


FIGURE 5. Upper Control Arm Inner Pivot Hole Relocation.

Relocate the upper control arm inner mounting holes one inch lower and on a line parallel with the original holes. This is shown in Figure 5. Drill the holes 17/32 inch diameter.

in Figures 6 and 7. The washers should be positioned 9.87 inches from the car centerline. The car centerline can be determined by measuring from the frame rails.

You can now temporarily bolt in the crossmember, and using the washers welded on the lower arm mount, mark the position on the gussets for the one-half inch bolt holes. Also, measure the length required for the spacer shown in Figure 7. The spacer should have a 1.00 O.D. and .50 I.D. Drill the 1/2 inch holes marked in the gussets and weld the spacers to the gussets.

This rework of the crossmember and lower pivot firmly anchors the inner end of the control arm, preventing any change in camber adjustment during hard usage.

You can now install the lower arm and crossmember using a 1/2-13 bolt 4-3/4 inches long through the pivot as shown in Figure 7.

Use the listed front springs. These are higher spring rate production parts. They should be reworked by removing 1.3 coils off the lower end and reshaping or grinding the pig-tail to fit the spring seat. After rework, these springs provide a rate of 620 lbs./in. and give the proper height for the front of the vehicle. You may require different spring rates for certain courses or usage. Stage III lists springs you can use.

After assembly, the front suspension camber can be adjusted to the specification listed by shimming the upper control arm inner pivot mounting bolts.

The front stabilizer bar has a diameter of .95 inch. Several alternate sizes (.85, .72 and .69 inch) also are listed in the parts list.

Install the listed 200 lb./in. rate 5-1/2 leaf rear springs. Lower and higher rate springs also are available as listed in the Stage III parts list.

The installation of the rear track bar is optional at this stage. The track bar is included with the rear suspension kit for Stage III modifications. To install the bar for Stage II order the parts separately as listed in the kit service parts at the end of this book.

You also will have to install the listed special rear stabilizer bar and stabilizer bar installation kit. This is necessary to clear the rear disc brakes. Stabilizer bars are available in 5/8 inch and 11/16 inch diameters for chassis tuning. Complete instructions are included with the stabilizer bar installation kit.

The single adjustable Koni shock absorbers can be used front and rear. If desired, you can also use the listed double adjustable Koni's. You can set the initial adjustment as follows, then final tune on the course.

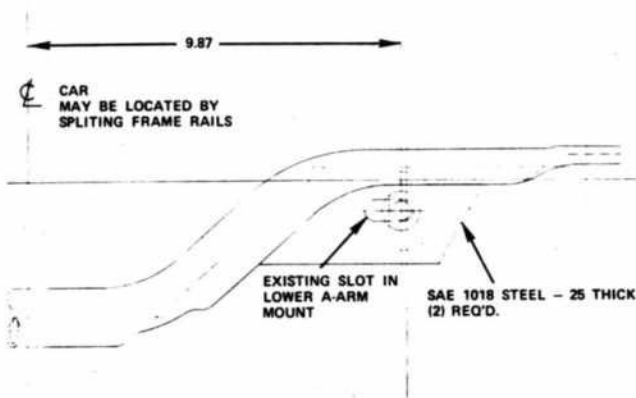


FIGURE 6. Reworked Number Two Crossmember.

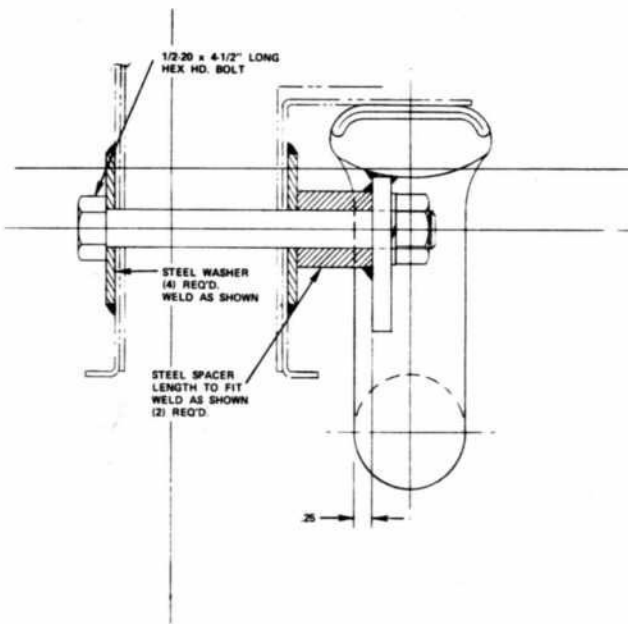


FIGURE 7. Lower Inner Arm Pivot Rework.

The crossmember is reworked by adding gussets at both ends as shown in Figure 6. The gussets should be SAE 1018 steel, .250 inch thick, and welded .250 inch from the forward edge of the crossmember as shown in Figure 7. Do not drill the bolt holes at this time.

Weld 2.00 O.D. x .50 I.D. x .125 inch thick SAE 1018 steel washers to the lower arm inner mounting bracket as shown

Single-type – Front – 2 turns from soft
 Rear – 1 turn from soft

Double-type – Front – jounce 1/3 from soft (4 clicks)
 – rebound 1/2 from soft (12 sweeps)
 Rear – jounce 1/3 from soft (4 clicks)
 – rebound 1/2 from soft (12 sweeps)

	Front	Rear
Diameter	25.7"	26.8"
Section Width	10.9"	12.1"
Tread Width	9.1"	10.0"

15" x 8" mag wheels with 0.81" outboard offset also can be used. Flaring of the fenders as described under Stage III will be required with these wheels.

REAR AXLE

To obtain maximum traction you should have a Detroit Automotive Locker differential and run a gear ratio of 3.91, 4.11 or 4.30. Gear selection is dependent on course layout.

Periodically inspect and zyglo wheels used for racing.

WHEELS AND TIRES

Use 15" x 7" steel, aluminum or mag wheels with 1/4 inch outboard offset. The production wheels also can be used with 1/4 inch spacers. The following size tires, when mounted on the 15" x 7" 1/4" offset wheels, will fit under the fenders with a small amount of fender reworking.

BODY STRUCTURE

Install a bolt-in roll-bar kit for any serious racing or rallying. A full roll cage is highly recommended for maximum protection. A roll cage installation is described in Stage III.

The export type dash-to-spring-tower brace described in Stage I should be installed. If you are going to do serious rallying you can also install the fabricated spring tower cross brace described in Stage III under Body Structure.

STAGE II PARTS

Quantity Required	Description	Part Number
Brakes		
1 Set	Brake Pads, Heavy-Duty, Front Disc, (Also used and included with rear disc brake kit)	DOZX 2001-A
1	Rear Disc Brake Kit	DOZX 2B514-A
1	Brake Caliper Assembly, Right Front (Use on rear)	C8OZ 2B120-A
1	Brake Caliper Assembly, Left Front (Use on rear)	C8OZ 2B121-A
1	Bracket, Caliper, Right Front (Use on rear)	C8OZ 2B292-A
1	Bracket, Caliper, Left Front (Use on rear)	C8OZ 2B293-A
1	Brake Hose, Right Front (Use on rear)	C8ZZ 2078-A
1	Brake Hose, Left Front (Use on rear)	C8ZZ 2078-B
4	Clip, Brake Pad Retainer	C8AZ 2066-A
4	Pin, Brake Pad Retainer	C8AZ 2069-A
4	Gasket, Brake Hose to Caliper	8M-2149
4	Clip, Stabilizer	C8AZ 2B164-A
2	Stabilizer, Brake Caliper	C8OZ 2B295-A
4	Insulator, Brake Caliper	C8AZ 2B299-A
4	Bolt, Bracket	381985-S
4	Bolt, Bracket	382563-S
4	Bolt, Caliper	C8AZ 2B296-A
2	Bolt, Caliper, Upper	382713-S
2	Bolt, Caliper, Lower	382201-S
2	Washer (For 382713-S Bolt)	34810-S7
2	Washer (For 382201-S Bolt)	34808-S
1	Brake Proportioner	C5ZZ 2B091-B
1	Master Cylinder	C9TZ 2140-F
1	Brake Pedal, Manual	C9ZZ 2455-B

Quantity Required	Description	Part Number
Suspension		
2	Front Springs (Rework)	C9OZ 5310-L
1	Front Stabilizer Bar .95" dia. (Standard)	C7ZZ 5482-D
1	Front Stabilizer Bar .85" dia. (alternate)	C7ZZ 5482-C
1	Front Stabilizer Bar .72" dia. (alternate)	C7ZZ 5482-B
1	Front Stabilizer Bar .69" dia. (alternate)	C7ZZ 5482-A
2	Insulators—Front bar (95")	C9ZZ 5493-A
2	Insulators—Front bar (85")	C6OZ 5493-E
2	Insulators—Front bar (72")	C7OZ 5493-C
2	Insulators—Front bar (69")	C4DZ 5493-B
2	Koni Shock Absorbers, Single Adjustable, Front	S1MS 18124-A
2	Koni Shock Absorbers, Double Adjustable, Front (alternate)	8210-J-1050
2	Rear Springs — 200 lb/in rate	DOZX 5556-B
	— 220 lb/in rate (alternate)	DOZX 5556-D
	— 180 lb/in rate (alternate)	DOZX 5556-C
1	Rear Stabilizer Bar Installation Kit	DOZX 5B496-A
1	Rear Stabilizer Bar — 5/8"	DOZX 5A772-B
1	Rear Stabilizer Bar — 11/16" (alternate)	DOZX 5A772-A
2	Bar Insulators, 5/8" and 11/16"	C7OZ 5493-C
2	Koni Shock Absorbers, Single Adjustable, Rear	S1MS 18125-A
2	Koni Shock Absorbers, Double Adjustable, Rear (alternate)	8210J-1003 SP1
Rear Axle		
1	Rear Axle Differential — Detroit Locker	C3AZ 4880-B
1	Ring and Pinion Gear Set — 3.91 Ratio	C8OZ 4209-A
	— 4.11 Ratio	B7AZ 4209-K
	— 4.30 Ratio	C8OZ 4209-B
Wheels and Tires		
4	15" x 7" (1/4" offset) Wheels	—
—	Racing Tires	—
Body Structure		
1	Brace, Dash-to-Spring-Tower, Export	C5ZZ 16A052-E
1	Roll Bar (Purchase locally)	—

Note: See page 27 for a listing of the kit service parts.

STAGE II SPECIFICATIONS

Front Suspension

Caster 2°
Camber -1°
Toe-In 1/8 inch
Ride Height 8.00 inches from ground to center of lower A-arm inboard pivot

Rear Suspension

Ride Height 2.6" (Distance between top of axle housing and bottom of frame rail)

STAGE III MODIFICATIONS

This stage is for modifying your car for all out racing. The installation of the kits and production parts described will provide the basis for a very competitive Trans-Am or Sedan racing vehicle.

All components and modifications listed are designed to be used as a complete package to provide the maximum performance level. The modified front and rear suspensions and steering provide a stable and well handling package with a modified engine and the recommended four wheel disc brakes. Structural improvements provide extra reliability for a total performance vehicle.

Detailed assembly instructions are not included in this book for the various kits. Instruction sheets are supplied with the kits for this purpose.

A vehicle modified to the Stage III level is intended only for off-the-road use and cannot legally be used for everyday transportation on the street.

BRAKES

The full race brake setup described herein will give your vehicle an exceptional brake system for the hardest usage.



FIGURE 8. Front Disc Brake Kit.

For the front, you will need the listed front disc brake kit. This kit includes the rotor, caliper, caliper mounting bracket and attaching parts for both front wheels. These brakes incorporate 1969 Lincoln four piston calipers with special heavy-duty pads. The kit parts for one side are shown in Figure 8, while they are shown installed in Figure 9.

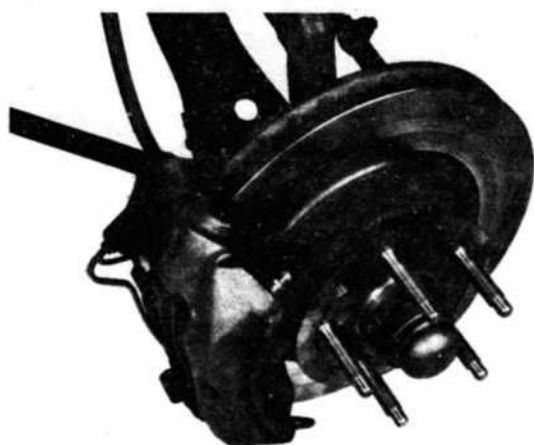


FIGURE 9. Front Disc Brake Installed.

Before installing the calipers be sure to remove the dust boots as they are not required for racing.

You also will need the related production parts in the listing to complete the front disc installation. These are the front spindles, brake hoses and caliper tube assemblies. The spindles are from a 1970 Mustang drum brake setup and are used to provide a stronger anchoring point for the calipers. Be sure to magnaflux and modify the spindles as described under suspension changes.

After installing the front disc brakes, safety wire all bolts. Set the wheel bearing adjustment as described in the Shop Manual. Recheck the adjustment after the front brakes are hot from use.

For the rear brakes, you will need the listed rear brake kit. This is the same kit as used for Stage II. It includes the rear



FIGURE 10. Rear Disc Brake Kit.

rotor, rear caliper bracket and special long race-type wheel studs all assembled on a magnafluxed, shot peened and specially ground axle shaft to make an assembly for ease of installation. This assembly is shown in Figure 10. The kit also includes a set of heavy-duty brake pads and spacers. To complete the installation you will need a set of brake calipers, hoses and caliper attaching bolts as listed in the parts list. The production calipers removed from the front wheels can be used if they are in good condition. Figure 3 shows the rear disc brakes installed on the vehicle.

The listed master cylinder, brake proportioner and brake pedal complete the four wheel disc brake installation. The master cylinder and brake pedal are manual-type, replacing the power booster production units. Modify and install the master cylinder and brake pedal mount as described in the kit instruction. Information on hooking up the brake tubing also is included in the kit instructions. Use the existing master cylinder tube fittings and transfer them to the new tubing being installed. These are special fittings and difficult to obtain.

The brake proportioner should be installed in the rear brake line with the ports upward. An ideal location is in the rear seat area as shown in Figure 4, where the valve is easily accessible for adjustment. Adjusting the large screw on the proportioner outward reduces rear wheel lockup; inward reduces front wheel lockup. Final adjustment should be made on the track with the tires to be used. Adjust the valve to provide front wheel lockup slightly ahead of rear wheel lockup.

Be sure to check the brake tube routing and relocate any tube that comes near a header or exhaust pipe.

Fill the brake system with extra H.D. Ford brake fluid and pressure bleed the complete system.

For longer races, you will probably need some cooling air to the brake rotors and calipers. At the front, air can be ducted from the existing holes in the valance panel or holes can be cut in the spoiler. Cover the holes with coarse screen to keep stones and other debris out of the brakes. Duct the air with flexible hose or fabricated metal to the rotors with a small portion of it being directed to the calipers. At the rear, scoops can be placed under the rocker panels or under the rear axle to catch air, which is then ducted to the rotors and calipers by flexible hose.

SUSPENSION

To modify your car's suspension similar to a Trans-Am setup, there are three kits available — a front suspension and steering kit, a rear spring and track bar kit, and a rear stabilizer bar installation kit. A special rear-stabilizer bar also is required. All kits include complete installation instructions.

The installation of these kits requires special Ford tools, welding equipment and other specialized equipment. If you

do not have the tools and equipment to do the work yourself, it is recommended that you farm this work out to a competent shop with the proper equipment.

After modifying the suspension, it should be tuned on the track. Basically, tuning the suspension involves balancing the front and rear springs and stabilizer bars to obtain a neutral handling vehicle. If the front end pushes or plows:

- Reduce front spring rate
- Reduce front bar size
- Increase rear spring rate
- Increase rear bar size

If the vehicle oversteers and causes the rear end to break loose:

- Increase front spring rate
- Increase front bar size
- Reduce rear spring rate
- Reduce rear bar size

Spring rates should be selected so that the car does not bounce, pitch or bottom out on the course. With the car on its wheels and loaded, the stabilizer bars should be connected without preload.

FRONT SUSPENSION

The front suspension kit shown in Figure 11 includes springs, No. 2 crossmember, steering crosslink, crossmember spacers, lower arm washers, camber adjusting shims, and lower arm attaching bolts, nuts and washers. You will also need the other listed parts — upper control arm assemblies, Koni double adjustable shock absorbers, export-type shock absorber brackets, MOOG front strut insulator kits, MOOG lower arm ball joints and a power steering type idler arm. All of the above parts are required to obtain full benefits of the front suspension modifications.

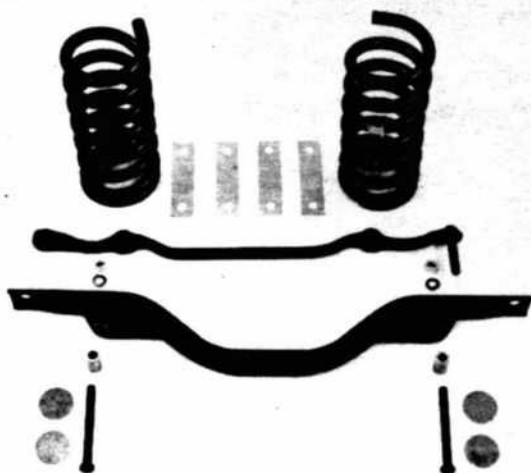


FIGURE 11. Front Suspension and Steering Kit.

The front suspension kit provides a great improvement in control and handling by reducing the positive camber change during jounce. It also features improved toe change geometry.

The improved camber change is obtained by relocating the upper arm inner mounting holes 1.2 inches lower. The kit instructions explain how to make a template to do this. The existing camber adjustment on the lower arm is removed. The special crossmember is utilized to anchor the inner end of the lower control arm and prevents any change in camber during hard usage. Initial camber setting is obtained by shimming the upper arm inner mounting with the shims provided.

The special washers in the kit are welded to the lower arm pivot mount and then drilled to accept the 1/2 inch bolt. The holes in the crossmember are used for guides to determine the hole locations. The spacers are machined to length and welded to the crossmember before assembly. A close-up of the lower arm pivot with the kit parts installed is shown in Figure 12.

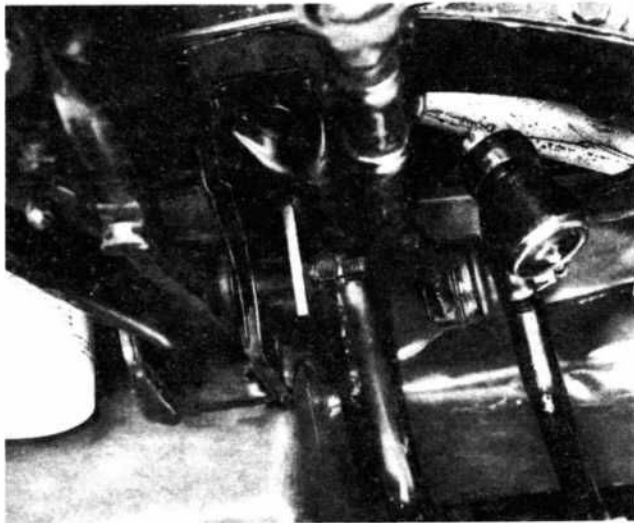


FIGURE 12. Front Suspension Kit Parts Installed on Lower Arm Pivot.

You can start with the front springs that come with the kit. Higher and lower spring rates and alternate size stabilizer bars also are available as shown in the listing. Before installing the springs check the clearance between the upper control arm and spring seat in maximum jounce position. If necessary, grind the outer edge of the spring seat to provide sufficient clearance.

You will need the listed upper control arm assembly to provide additional jounce travel. This is a heavy-duty unit from the Boss 429 Mustang. The export-type upper shock bracket is a heavy-duty unit that adds extra reliability.

The Koni double adjustable shocks are special short versions that do not restrict suspension travel. The assembled spring, shock and control arms are shown in Figure 13.

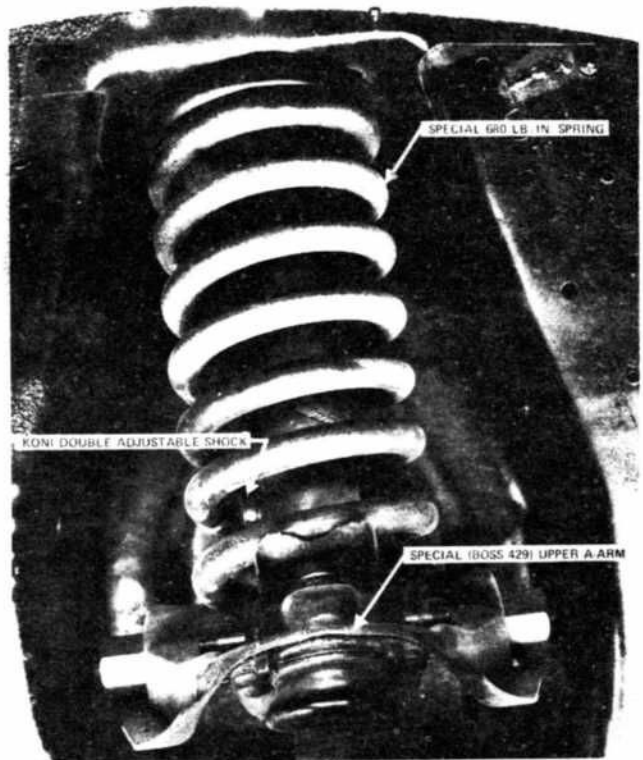


FIGURE 13. Special Front Spring and Koni Shock Absorber.

The specified power steering idler arm assembly mates with the longer pivot stud on the steering crosslink in the kit.

The MOOG front strut insulators reduce compliance of the front strut, while the MOOG lower ball joint kit provides more positive retention of the spindle lower end.

Before assembling the front suspension, you should do additional work on the front spindles to improve their strength and durability. First have the spindles magnafluxed. After passing magnaflux, all small laps, seams and scratches can be removed by filing, grinding and polishing. Magnaflux again before using.

Optionally, you can smooth and shot-peen the spindles for maximum strength. Smooth the spindle surface by filing and/or grinding. It is not necessary to polish the spindles — just obtain a smooth defect-free surface. Finally, shot-peen all over except the bearing journals, threads and tapered holes.

STEERING

The stock 16:1 ratio manual steering gear in your vehicle is recommended. All other stock components also are OK except for the special crosslink in the front suspension kit and the listed power steering idler arm. Nearly ideal steering

geometry is provided with this setup. The special crosslink has been magnafluxed. All other steering components should be magnafluxed before assembly.

To prevent any possible steering wheel lockup on the track, it is advisable to remove the steering wheel lock pin as described on page 13-02-13 in the Shop Manual. At this time also braze the two portions of the steering shaft together at their junction.

REAR SUSPENSION

For the rear suspension you will need the listed two kits, the special rear stabilizer bar and the double adjustable Koni shock absorbers.

The rear spring and track bar kit is shown in Figure 14. The special rear springs have 5-1/2 leaves and are designed to provide additional rear axle control with a reasonable ride. Further axle control is provided by the aluminum front eye bushings and steel sleeve, replacing the stock rubber bushing. Alternate spring rates are available as shown in the parts listing.

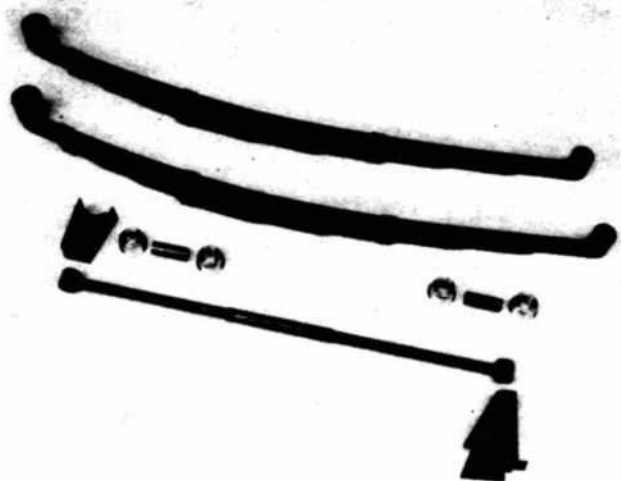


FIGURE 14. Rear Spring and Track Bar Kit.

The track bar in the kit is shown installed in Figure 15. The left bracket is welded to the frame, and the car is set on its wheels and loaded with fuel and driver. The right side bracket is then welded to the axle so the bar is level. Complete instructions and installation dimensions are included with the kit.

The rear stabilizer bar and bar installation kit are shown in Figure 16. Two diameters of bars are available – 5/8 inch and 1 1/16 inch. In addition, the bars have three holes in the end for fine tuning.

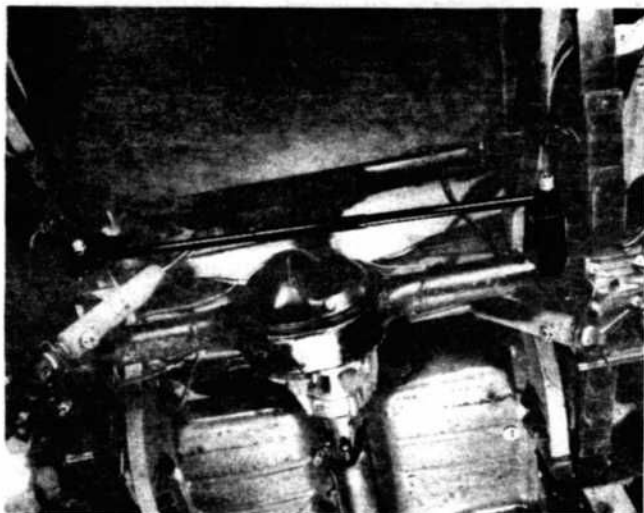


FIGURE 15. Track Bar Installed.

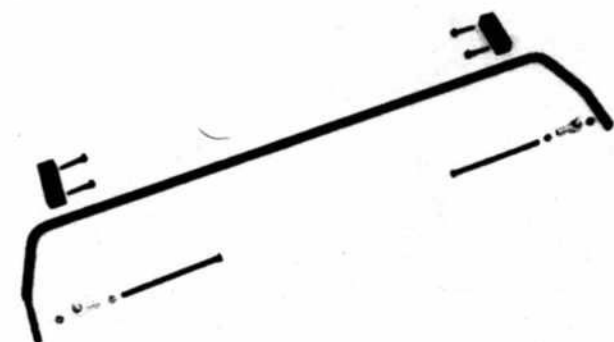


FIGURE 16. Rear Stabilizer Bar and Bar Installation Kit.

The installation kit includes two spacer blocks, attaching links and hardware. Figure 17 shows the spacer block installation. Also note the track bar bracket welded to the frame and special routing of the fuel line.



FIGURE 17. Stabilizer Bar Spacer Block Installation.

Figure 18 shows the links attached to the bar end and axle lower plate. These plates are production units switched from left to right and right to left. The link insulators are production units removed from the original installation.

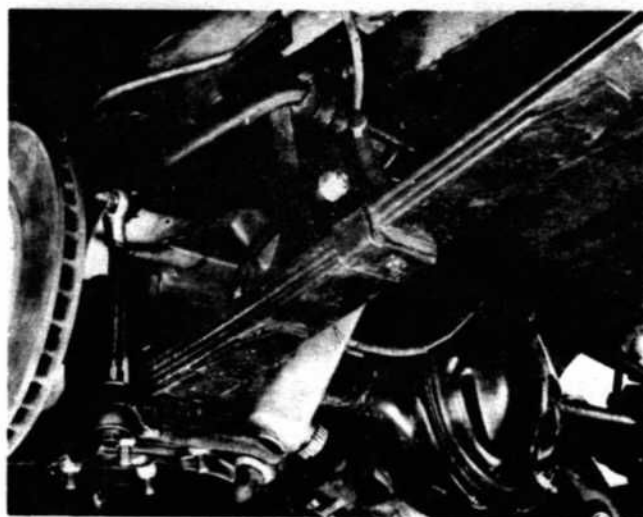


FIGURE 18. Stabilizer Bar Link Attachment.

REAR AXLE

Your production heavy-duty-type rear axle is very satisfactory with minor modifications for racing use. The optional Detroit Automotive Locker should be installed if your vehicle was ordered without one. All Ford ring and pinion gear sets will fit the Detroit Locker unit. For Trans-Am-type road racing, start with a 4.30 ratio. Other ratios are shown in the Parts List.

The production axle shafts are replaced by the axle shafts in the rear disc brake kit. These axle shafts have been magnafluxed, ground to reduce flange run out and shot-peened to increase their strength. The brake rotors are also special. They are Mustang front units that have been x-rayed, magnafluxed, ground to control run out and thickness, and machined to fit the axle shaft.

The axle shaft assemblies require unique service procedures. The caliper bracket is behind the bearing, making the normal bearing puller plates not usable. After removing the retainer ring, the best way to remove the bearing is to weld two rectangular steel bars to the bearing outer race and then press the bearing off in an arbor press. After sliding off the caliper bracket, all other service operations are the same as described in the Shop Manual.

While the axle is apart, you should install a second vent fitting on the right side axle shaft housing. This provides additional axle breathing to prevent lube leaks and blown oil seals. Connect 1/4 inch ID oil-resistant hose to both axle vents and route them into the trunk through grommets.

Terminate the hoses into cans fastened high in the trunk. It is also advisable to add a filler hole at the rear of the axle housing center section to allow easier lube filling. Use the production front hole to determine the full lube level.

Also weld the axle shaft bearing retaining rings to the shaft at three places. This is a safety precaution to prevent the axle shaft from pulling out of the bearing under extreme cornering conditions.

After assembly, fill with a racing gear lube such as DA Speedsport, Castrol or Shell SL 7923.

Under extreme racing conditions it may be necessary to fit an external rear axle oil cooler and pump to provide sufficient cooling. A JabsCo "Water Puppy" 12 volt pump (#6360) has been used successfully. The lube should be routed through the cooler and then to the pump since it is not designed for use with a fluid temperature over 180° F. Use 5/8" ID industrial reinforced hose and run it to a Harrison, Hayden, or equivalent aluminum oil cooler. The maximum recommended lube temperature is 275° F.

TRANSMISSION

The standard Boss 302 close-ratio transmission is satisfactory for racing use. It is advisable to plug the vent hole in the top cover and add a breather cap assembly (from another type of transmission or axle) to the top of the extension housing. A competition shift linkage is recommended.

For extreme conditions an oil cooler and pump of the same type recommended for the rear axle also can be installed.

WHEELS AND TIRES

For road racing you will need 15" x 8" magnesium wheels with 0.81 inch outboard offset for the front and 1.30 inch outboard offset for the rear; and a 4-1/2 inch bolt circle. Suppliers of suitable wheels are listed at the back of this book. Wheels used for racing should be visually inspected for cracks every weekend. Once a month zyglol inspect magnesium or aluminum wheels for cracks. The special long wheel studs with the kits allow wheels of this size to clear the fender inner panels. The studs also will work with the long race type nuts sold by American Racing and others. These studs are dry-lubed when shipped to prevent thread galling and subsequent stud breakage. Periodically clean the threads with a die and spray with dry moly or graphite.

Fender modifications and fender flares are required to clear the large tires used with the 15" x 8" wheels. These modifications are described under the Body Structure heading.

Tires recommended are racing specials of the type usually supplied by Goodyear and Firestone. The sizes listed below are an excellent starting point. Initial pressure settings are 28 psi cold, front, and 24/28 psi cold, rear.

Goodyear	Front	Rear
Size	5.00/11.30	6.00/12.30
Diameter	25"	26.8"
Tread Width	9.0	10.4
Section Width	10.8	12.5

Firestone	Front	Rear
Size	5.00/11.50	5.80/12.00
Diameter	25"	27"
Tread Width	9.4" arc	10.2"
Section Width	11.28"	12.6"

Consult tire company representatives for the latest sizes, compounds and pressure recommendations. Selecting the proper tires for a specific track and conditions borders on an art, and tire reps can really help in this respect.

BODY STRUCTURE

There's no percentage in carrying around a lot of non-essential weight on a race track. So, before making any body modifications first remove all seats, floor mats, insulation, sound deadeners, radio, heater and other non-structural components.

The instrument cluster can be removed and replaced with a flat plate of aluminum or fiberglass to mount the desired instruments. Instruments usually used are a tach, oil pressure, oil temperature, water temperature, rear axle temperature, transmission temperature, and fuel pressure. A typical installation is shown in Figure 19.

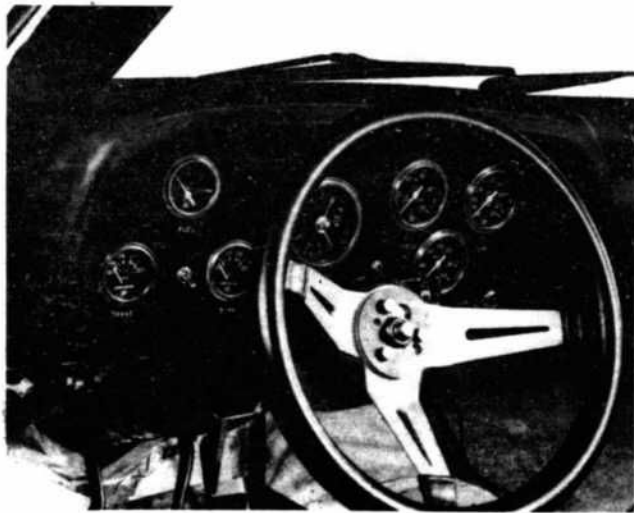


FIGURE 19. Typical Instrument Panel Installation.

After stripping the car interior, fit a racing-type bucket seat along with a three-inch wide seat belt and two-inch wide shoulder harness. Seats are available from several companies, some of which are listed in the back of this book. Follow the seat manufacturer's recommendations for attachment. The seat must be firmly anchored. A good seat installation is shown in Figure 20.

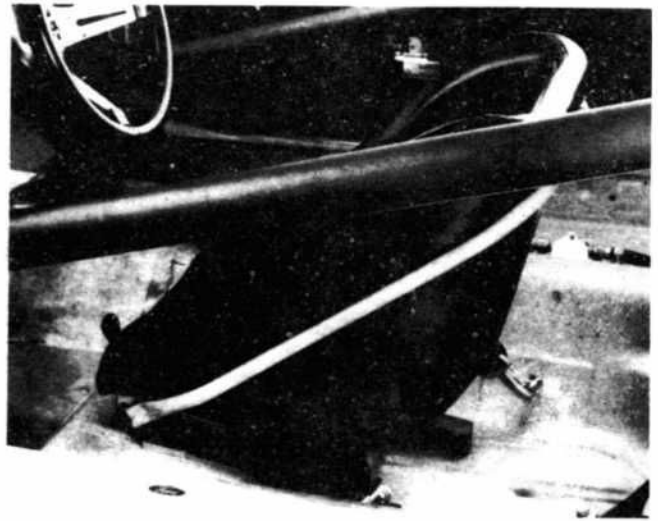


FIGURE 20. Typical Racing Seat Installation.

A rigid body structure is very important to contribute to a safer and better handling vehicle.

A roll cage is a must for serious racing. Recommended roll cage installation instructions are shown in Figure 21. It is not necessary to extend the rear braces all the way back to the rear of the car as long as the rear structure of the vehicle has not been disturbed nor cut away. Do not cut into the inner wheelhouse structure as this will weaken the rear body. Provide a horizontal tube behind the driver's head area to help prevent whiplash injuries and to firmly anchor the shoulder harness at the proper angle. The instrument panel upper trim panel can be sectional in the center and moved inwards from both ends to provide clearance for the roll cage. Be sure that you employ a qualified experienced welder to install the roll cage. Only the best will do here.



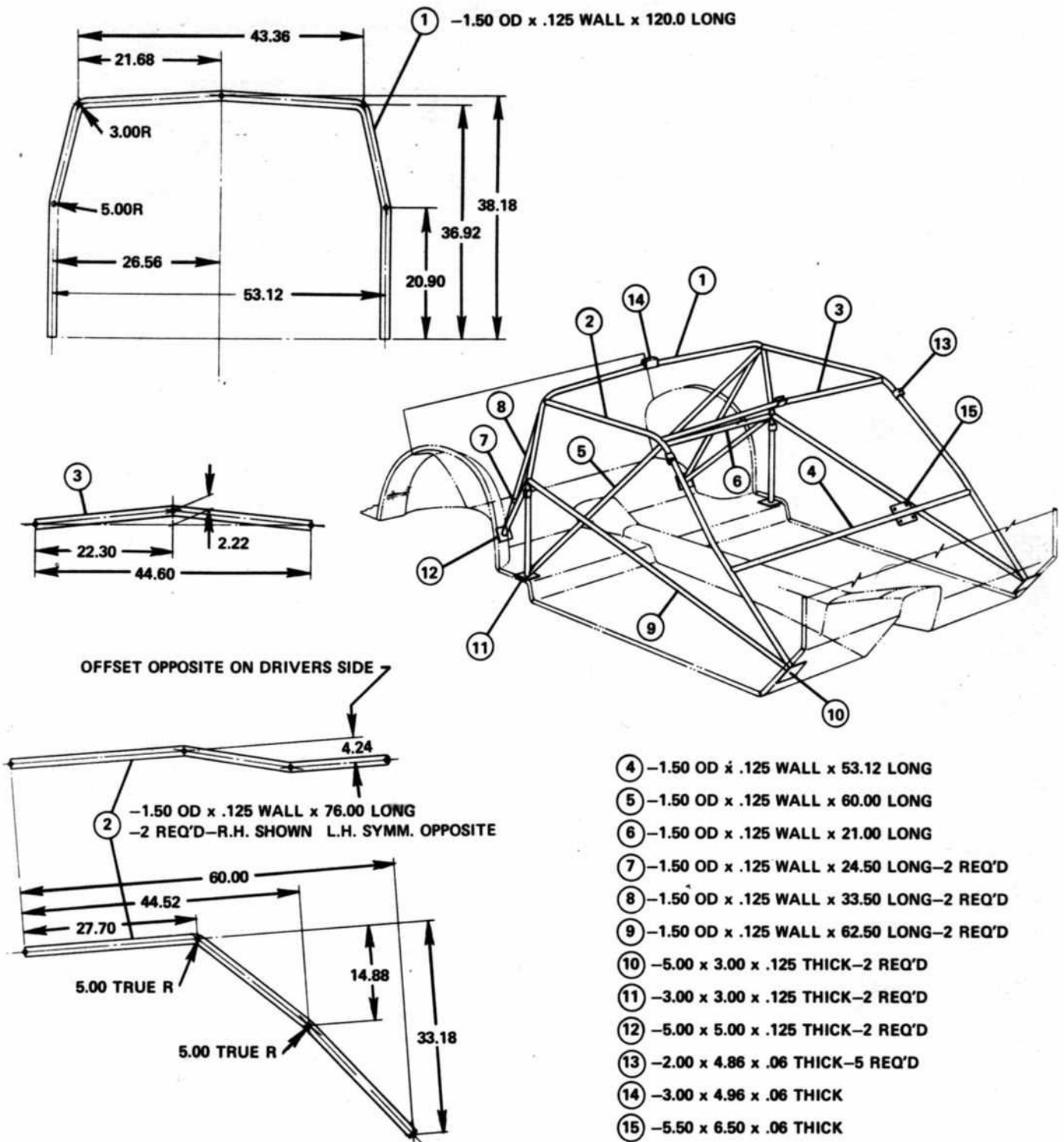


FIGURE 21. Roll Cage Fabrication

Figures 22 and 23 show a roll cage made to the recommendations. Note the protective sponge rubber padding on the bars around the driver.

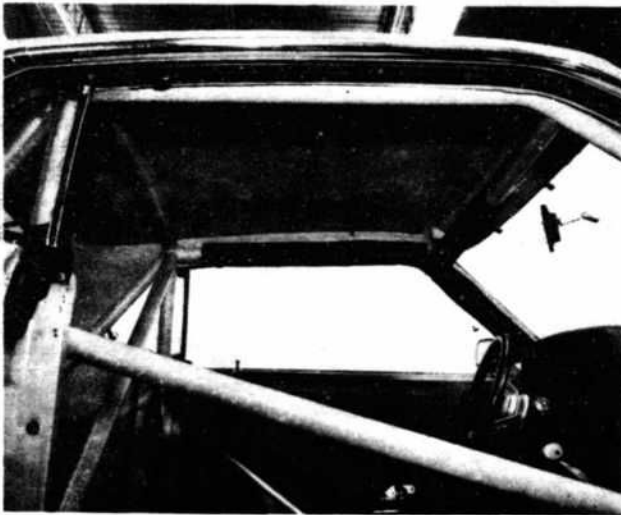


FIGURE 22. Roll Cage Installation.

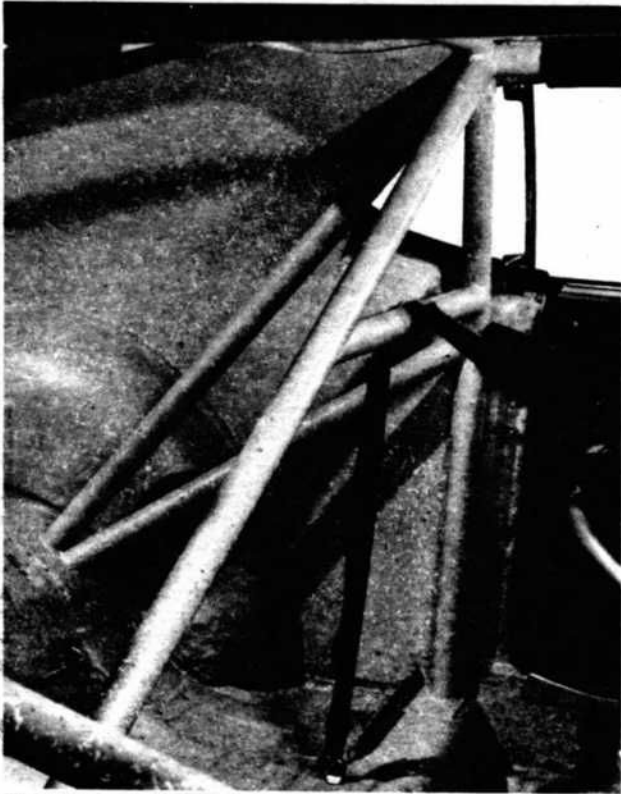


FIGURE 23. Roll Cage Installation.

In the front, add the listed export-type dash-to-spring tower brace and the fabricated spring tower cross brace. These are shown in Figure 24. Fabrication and installation instructions for the cross brace are shown in Figure 25.

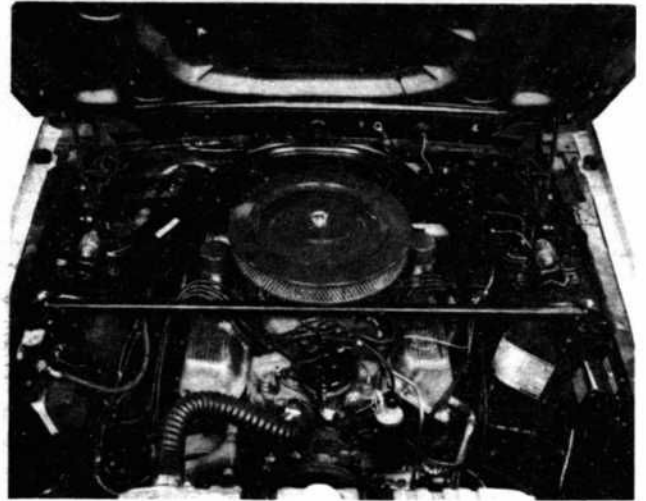


FIGURE 24. Spring Tower Cross Brace and Export-Type Spring-Tower-to-Dash Brace Installation.

The front structure is further rigidized and strengthened by skip welding or brazing in the following areas, and as shown in Figure 26.

- 1) The spring tower reinforcements to the spring towers.
- 2) The diagonal lower front strut support members at the front rails and the side rails.
- 3) The front stabilizer bar brackets to the diagonal frame member.
- 4) The rear of the inner fender to the toe board. These add support to the roll cage front base plates. (Not shown in Figure 26.)

As shown in Figure 27, add a reinforcing plate to fill in the bottom of the spring tower to the inner frame rail flange. Position the reinforcement upward at a 45° from the frame rail to the inside of the spring tower.

Reinforce the pedal support bracket by adding a plate at either side of the rear portion that has the lowest height. Also, tie the pedal support bracket at the rear to the fabricated plate in the front horizontal roll cage member. This will help to anchor the steering column and will also reduce movement of the brake master cylinder and the resulting soft pedal "feel."

In the rear, install a .06 inch thick steel plate between the trunk area and the passenger compartment as shown in Figure 28. This is required by most rules and adds stiffness to the rear body section. The panel should be welded to the existing rear seat structure. Also, add filler panels at both sides between the outer quarter panel and the rear seat structure to completely seal the fuel tank area from the passenger compartment.

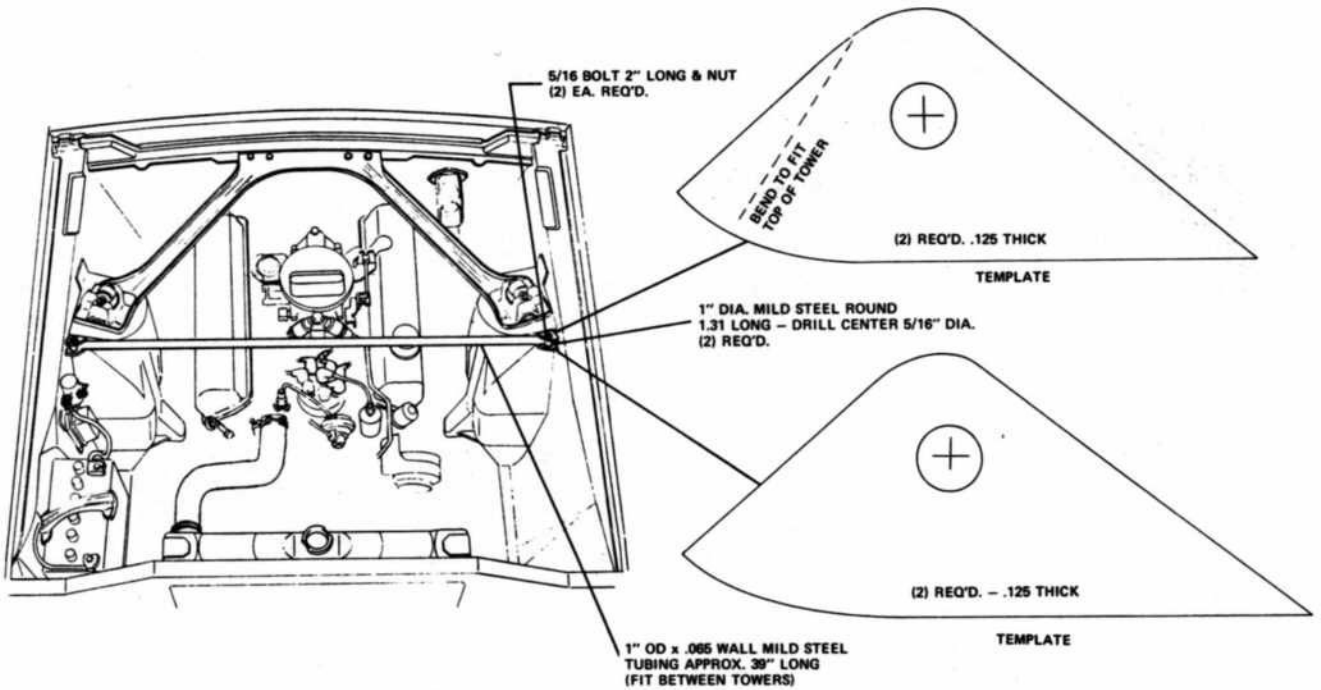


FIGURE 25. Spring Tower Cross Brace Fabrication Instructions.

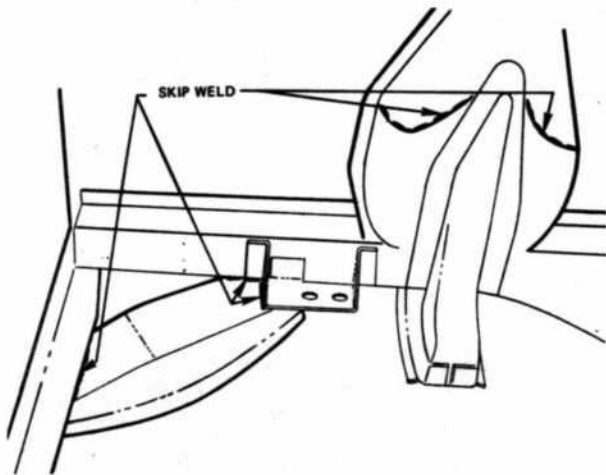


FIGURE 26. Front Structure Welding Reinforcement.

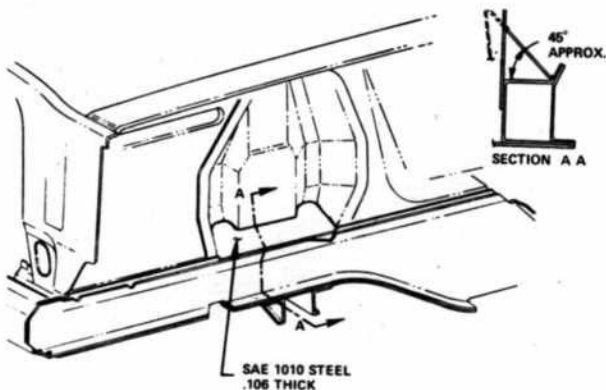


FIGURE 27. Spring Tower Reinforcing Plate.



FIGURE 28. Welded-In Plate Between Trunk and Rear Seat Area.

Bump the spare tire projection in the rear corner of the right rear fender well inward to the general contour of the fender well. Bend inward the lower edges of the inner rear fender wheelhouse to prevent these edges from catching a tire.

The listed flare kit provides the necessary parts and instructions to flare the front and rear fenders to permit the use of racing tires and wheels. Included are metal flares for the

rear as shown in Figure 29 and contour templates for the front and rear. Correctly flared front fenders are shown in Figure 30 and the rear in Figure 31.



FIGURE 29. Rear Fender Flare.



FIGURE 30. Flared Rear Fender.



FIGURE 31. Flared Front Fender.

Remove the center hood latch mechanism and install the listed hood pins to the radiator support and drill holes through the hood. The pins are shown in Figure 33.

COOLING

Add .04 thick aluminum sheet filler panels between the grille and radiator to obtain maximum cooling efficiency. These panels will duct all available air through the radiator.

Included are a horizontal panel at the bottom, panels at both sides and a top removable panel. The bottom and side panels are shown in Figure 32. The top panel is shown in Figure 33. A rubber flap fastened with rivets or sheet metal screws is used to seal the area between the radiator upper support and the radiator itself.

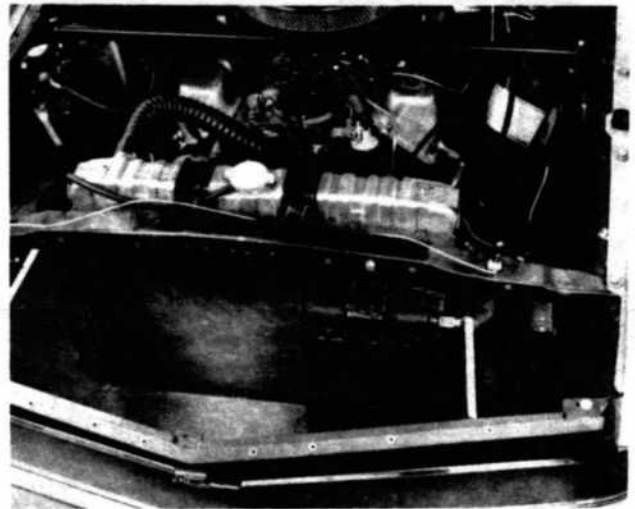


FIGURE 32. Radiator Ducting Panels.

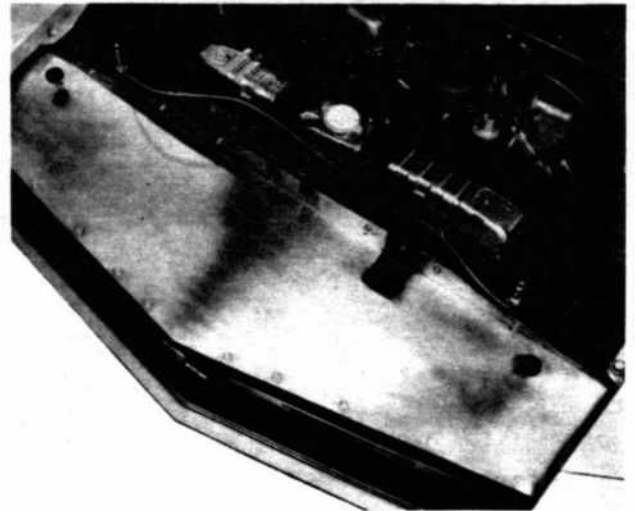


FIGURE 33. Top Radiator Ducting Panel.

The oil cooler installation shown is typical. It also can be turned 90° or mounted next to the radiator. In either of the latter cases be sure sufficient air is ducted through the cooler.

ENGINE INSTALLATION

You should install a racing-type clutch as recommended in the Boss 302 Engine Modification book. Due to the higher loading of these clutches, the clutch cordon shaft (or equalizer) should be inspected and reinforced. To reinforce the shaft weld a piece of bar or box section steel along the shaft. Make sure the reinforcement does not interfere with the headers.

Install a safety clutch housing or safety shield of an approved type.

Rocker cover venting is important to prevent oil loss and at the same time allow the engine to breathe properly. An efficient valve cover breather is shown in Figure 1 and Figure 34. The aluminum upright breather tubes are four inches high and have three angled baffles inside. Under the tube opening in the cover a 2-1/2 x 3 inch horizontal baffle is placed which also has a deflector inside it. The original holes in the rocker covers have been filled. This arrangement also will work with steel valve covers which are easier to weld.

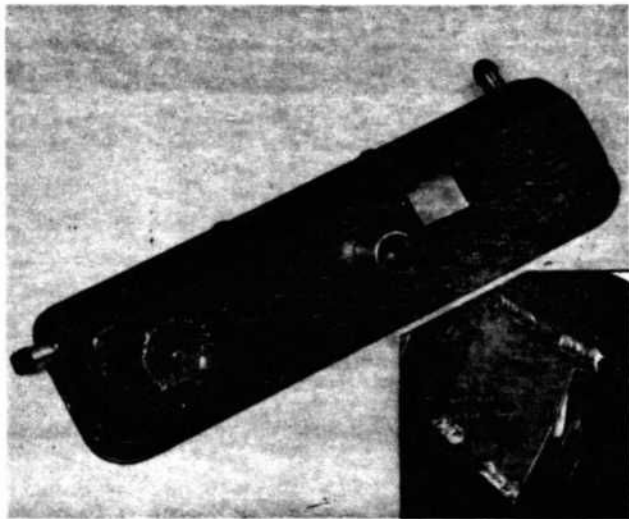


FIGURE 34. Valve Cover Breather Rework.

The battery shown in Figure 24 is an Autolite LU-9 which is mounted on a reworked bracket high enough to clear the headers. This battery has sufficient capacity to start and run a race car. The location shown helps to improve the weight distribution and allows for a fresh air inlet through the original battery location.

A revision to the water pump drive belt is desirable to prevent the loss of the water pump drive during racing. The simplest arrangement is to use a short belt 33-1/2" long x 3/8" wide, (Autolite JB341) to connect the water pump pulley directly to the crank pulley. There is no racing belt available in this length. The alternator is then driven directly by the crank pulley using a 37-5/8" long by 3/8" wide belt (Autolite Racing Belt JA380R). A better setup is to use a double belt drive to the water pump and a single drive to the alternator. To get the proper pulleys to do this requires extensive parts changing to '69 parts, but provides an extremely reliable belt drive system. The changes required are:

'69 water pump

'69 water pump housing

'69 harmonic balancer (must be rebalanced to match the original 1970 balancer)

'69 alternator mounting brackets

'69 crank and water pump pulleys

This setup will allow the use of Autolite Racing Belts on both pulley grooves. The parts required are listed in the Parts List. This change also requires relocating the radiator inlet to the right side.

FUEL SYSTEM

Most sanctioning organizations require a foam filled type safety fuel tank. These can be purchased from several suppliers, some of which are listed at the back of this book. A slight amount of reworking of the tank flange and the floor area may be required to complete the installation. A typical installation is shown in Figure 35.

You may desire to revise the filler arrangement on these tanks to improve pit refueling.

The fuel line to the carburetor should be at least 3/8 inch ID.

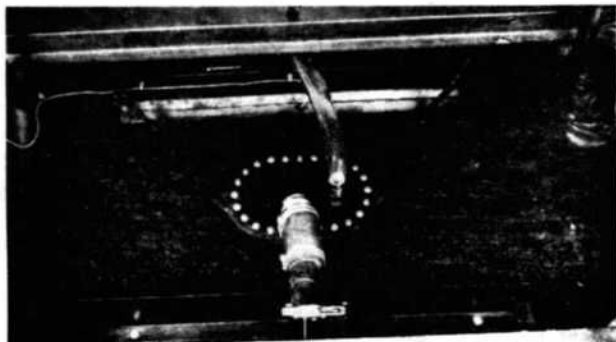


FIGURE 35. Typical Safety Fuel Tank Installation.

STAGE III PARTS

Quantity Required	Description	Part Number
Brakes		
1	Front Disc Brake Kit	DOZX 2B513-A
1	Front Spindle, Right	DOOZ 3105-D
1	Front Spindle, Left	DOOZ 3106-D
1	Front Brake Hose, Right	C7VY 2078-C
1	Front Brake Hose, Left	C7VY 2078-D
1	3/16 10 x 15" Steel Tubing (To make tube to connect hose assembly to caliper)	-
4	Tube Nut, 3/16 Inverted Flare (To make tube to connect hose assembly to caliper)	382967-S100
2	Connector, Tubing to Caliper	357444-S
2	Gasket, Connector to Caliper	8M-2149
1	Pedal, Manual Brake	C9ZZ 2455-B
1	Master Cylinder	C9TZ 2140-F
1	Brake Proportioner	C5ZZ 2B091-B
2	Front Wheel Bearing, Cone and Roller Assembly, Inner	DOAZ 1201-A
2	Front Wheel Bearing, Cone and Roller Assembly, Outer	DOAZ 1216-A
2	Retainer, Grease, Front Wheel Bearing	C8AZ 1190-A
1	Tee, 3/16 Inverted Flare (master cylinder hookup)	
2	Union, 3/16 Inverted Flare (master cylinder hookup)	
5	Nut, 3/16 Inverted Flare (master cylinder hookup)	
1 pr.	Brake Calipers, Rear (front used on rear)	see Stage II listing
1	Brake Hose, Right Front (used on rear)	C8ZZ 2078-A
1	Brake Hose, Left Front (used on rear)	C8ZZ 2078-B
2	Bolt, Caliper Mounting, Upper	382713-S
2	Bolt, Caliper Mounting, Lower	382201-S
2	Lock Washer - For 382713-S	34810-S7
2	Lock Washer - For 382201-S	34808-S
Front Suspension		
1	Front Suspension and Steering Kit	DOZX 3K064-A
2	Front Spring, 680 lb/in.rate	DOZX 5310-A
2	Front Spring, 640 lb/in.rate (alternate)	DOZX 5310-C
2	Front Spring, 720 lb/in.rate (alternate)	DOZX 5310-B
2	Arm Assy, Front Upper Control	C9ZZ 3082-A
2	Bracket Assy, Front Shock, Upper, Export	C7ZZ 18183-A
1	Steering Idler Arm Assy (power steering)	C7ZZ 3350-A
2	Kit, Lower Arm Ball Joint	MOOG K-8024
2	Kit, Front Strut, Insulator	MOOG 8124
2	Koni Shock Absorber, Front, Double Adjustable	Koni 8210-J-1050
1	Front Stabilizer Bar, .95" Dia. (Standard)	C7ZZ 5482-D
1	Front Stabilizer Bar, .85" Dia. (alternate)	C7ZZ 5482-C
1	Front Stabilizer Bar, .72" Dia. (alternate)	C7ZZ 5482-B
1	Front Stabilizer Bar, .69" Dia. (alternate)	C7ZZ 5482-A
2	Insulator - Front Bar .95" Dia.	C9ZZ 5493-A
2	Insulator - Front Bar .85" Dia.	C6OZ 5493-E
2	Insulator - Front Bar .72" Dia.	C7OZ 5493-C
2	Insulator - Front Bar .69" Dia.	C4DZ 5493-B
AR	Shim - Front Spring (to raise vehicle .50 inch)	DOZX 5355-B

Quantity Required	Description	Part Number
Rear Suspension		
1	Rear Spring and Track Bar Kit	DOZX 5A816-A
1	Rear Stabilizer Bar Installation Kit	DOZX 5B496-A
1	Bar, Rear Stabilizer, 5/8" Dia.	DOZX 5A772-B
1	Bar, Rear Stabilizer, 11/16" Dia. (alternate)	DOZX 5A772-A
2/bar	Insulator – Stabilizer Bar	C7OZ 5493-C
2	Koni Shock Absorber, Rear, Double Adjustable	Koni 8210-J-1003
2	Rear Spring Assy, 180 lb/in. Rate (alternate)	DOZX 5556-C
2	Rear Spring Assy, 220 lb/in. Rate (alternate)	DOZX 5556-D
1	Stud – Track Bar, Rear	C6AZ 4269-A
1	Bolt – 9/16-12 x 2.75 Long (track bar)	382878-S100
3	Nut – 9/16-12, Hex Lock (track bar)	375022-S100
Rear Axle		
1	Detroit Locker Differential	C3AZ 4880-B
1	Ring and Pinion Gear Set – 3.91 Ratio	C8OZ 4209-A
	– 4.11 Ratio	B7AZ 4209-K
	– 4.30 Ratio	C8OZ 4209-B
	– 4.44 Ratio	C3AZ 4209-H
	– 4.57 Ratio	C3UZ 4209-C
	– 4.71 Ratio	C4AZ 4209-AA
	– 4.86 Ratio	C4AZ 4209-AB
1	Oil Cooler	Harrison 3157804
Wheels and Tires		
AR	Wheels – 15" x 8" Magnesium Racing, Front Outboard Offset .81" – Rear Outboard Offset 1.30" 5 Bolt Holes on 4-1/2" Diameter Bolt Circle; American Racing TA-70 or Minilite Racing Wheel	
AR	Nuts – Long Type – American Racing Equipment	1/2-20 RH Thread
AR	Tires – Firestone – Front: 5.00/11.50-15 – Rear: 5.80/12.00-15 Goodyear – Front: 5.00/11.30-15 – Rear: 6.00/12.30-15	
Body Structure		
1	Brace-Dash-to-Spring Tower	C5ZZ 16A052-E
2	Hood Pins	C9OZ 16700-C
1	Spring Tower Cross Brace (Fabricate)	–
1	Roll Cage (Fabricate)	–
1	Racing Seat (B & B or equivalent)	–
1	Fender Flare Kit	DOZX 16D212-A

Quantity Required	Description	Part Number
Engine Installation		
1	Water Pump (Aluminum)	C5AZ 8051-K
1	Water Pump Housing (Aluminum)	C4AZ 6019-B
1	Gasket, Housing	C2OZ 6020-A
1	Harmonic Balancer	C9ZZ 6316-B
1	Bracket, Alternator Mounting, Upper	C8OZ 10145-A
1	Bracket, Alternator Mounting, Lower	C5AZ 10156-A
1	Spacer	C5AZ 10A370-B
1	Pulley, Crankshaft	C7AZ 6A312-A
1	Pulley, Water Pump	C8OZ 8509-B
1	Pulley, Alternator (larger diameter)	C5AZ 10344-H
1	Belt, Alternator	Autolite JA-410-R
1	Belt, Water Pump	Autolite JA-321-R
1	Bolt, 3/8-16 x 1-1/4 Long (upper bracket)	20428-S7
1	Flat Washer, 3/8 (upper bracket)	352981-S
1	Cap Assy, Fuel Tank Filler	DOZX 9030-A
1	Pipe Assy, Fuel Tank Filler	DOZX 9034-A

Note: See page 27 for a listing of the kit service parts.

STAGE III SPECIFICATIONS

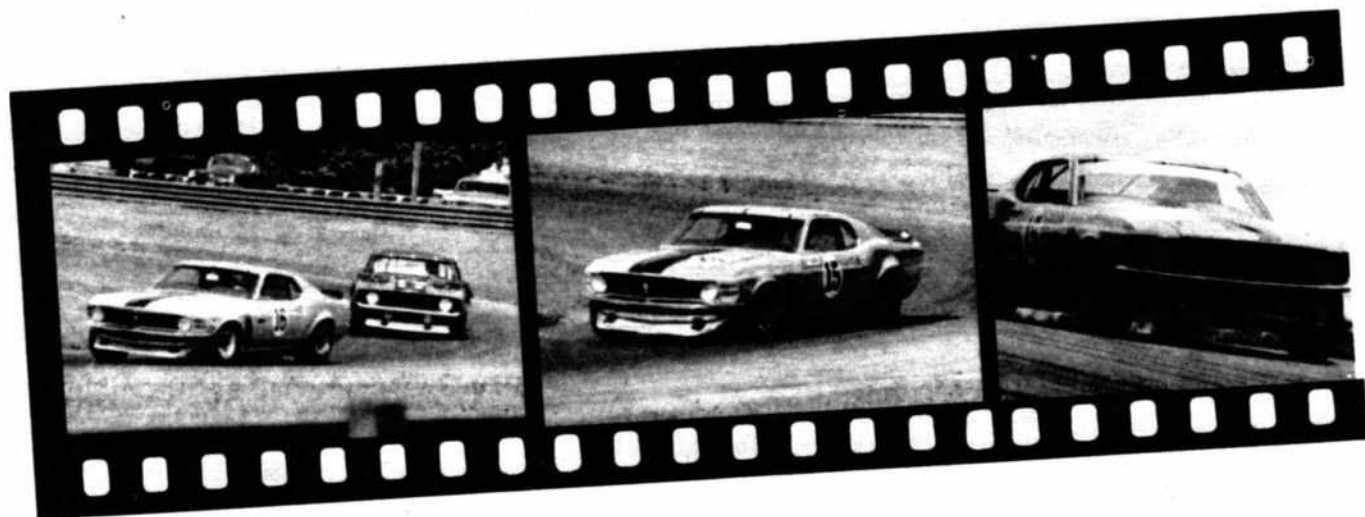
Front Spring Rate	680 lb/in
Rear Spring Rate	200 lb/in
Front Stabilizer Bar Dia.	.95 inch
Rear Stabilizer Bar Dia.	.62 inch
Front Ride Height	1.0 inch
(measured as the height of the inner lower control arm pivot bolt center line, (@ front), minus the height of the bottom of the outer lower control ball joint housing)	
Rear Ride Height	3.6 inch
(distance between top of axle housing and rear frame rails)	
Caster	2-1/2° pos.
Camber	2° neg. to 3° neg.
Toe-In	1/8"
Front Tread	62.5 inch
Rear Tread	63.6 inch



KIT SERVICE PARTS

Quantity Used	Description	Part Number
Front Disc Brake Kit		DOZX 2B513A
10	Studs – Wheel	DOZX 1107-A
2	Hub and Rotor Assembly (Includes studs)	DOZX 1102-A
1	Bracket, Caliper, Right	DOZX 2B134-B
1	Bracket, Caliper, Left	DOZX 2B135-B
1	Caliper Assembly, Left	DOZX 2B119-A
1	Caliper Assembly, Right	DOZX 2B118-A
1	Brake Pads (Set)	DOZX 2001-B
4	Bolt, 9/16-12 x 1.38 Long (caliper to bracket)	352344-S100
4	Washer, Lock (9/16 caliper to bracket)	34810-S7
6	Bolt, 3/8-16 x 1.375 Long (bracket to spindle)	43002-S2
2	Bolt, 3/8-16 x 2.625 Long (bracket to spindle @ steering arm)	43011-S
8	Washer, Lock 3/8 (bracket to spindle)	34807-S8
8	Nut, 3/8-16 (bracket to spindle)	377605-S8
	Instruction Sheet	
Rear Disc Brake Kit		DOZX 2B514-A
1	Rear Axle Shaft Assembly, Left (Includes rotor, caliper bracket, bearing)	DOZX 4A359-A
1	Rear Axle Shaft Assembly, Right (Includes rotor, caliper bracket, bearing)	DOZX 4A358-A
1	Brake Pads (Set)	DOZX 2001-A
2	Spacer (Replaces backing plate)	DOZX 4374-A
1	Axle Shaft, Left	DOZX 4238-A
1	Axle Shaft, Right	DOZX 4235-A
2	Rotor	DOZX 1126-A
1	Bracket, Caliper, Left	DOZX 2B512-A
1	Bracket, Caliper, Right	DOZX 2B511-A
8	Screw, Socket Hd., 3/8-16 x 1.00 Long (bracket to axle housing)	302218-S36
8	Washer, 3/8 Lock (bracket to axle housing)	356403-S8
	Instruction Sheet	
Front Suspension and Steering Kit		DOZX 3K064-A
1	Steering Crosslink Assembly	DOZX 3304-A
1	No. 2 Crossmember Assembly	DOZX 5025-A
4	Shim, Camber Adjusting	DOZX 3043-A
2	Spacer, No. 2 Crossmember Assembly	DOZX-5A090-A
4	Washer, Lower Arm Reinforcing	DOZX 3B329-A
2	Front Spring	
2	Bolt – 1/2-13 x 4.75 Long (Attaches arm and crossmember to chassis)	381667-S7
2	Washer – 1/2 Lock (For 381667-S7 bolt)	34809-S8
2	Nut – 1/2-13 Hex (For 381667-S7 bolt)	380952-S2
	Instruction Sheet	

Quantity Used	Description	Part Number
Rear Suspension Kit		DOZX 5A816-A
2	Rear Spring Assemblies 200 lb./in. rate	DOZX 5556-B
4	Bushings Assembly, Rear Spring Eye	DOZX 5781-B
2	Spacer, Rear Spring Bushing	DOZX 5997-A
1	Track Bar Assembly	DOZX 5A639-A
1	Bracket, Track Bar, Frame	DOZX 5546-A
1	Bracket, Track Bar, Axle	DOZX 5557-A
Instruction Sheet		
Rear Stabilizer Bar Installation Kit		DOZX 5B496-A
2 ea.	Block, Spacer	DOZX 5B495-A
2	Link Assemblies	DOZX 4A343-A
4	Bolt - 5/16-18 x 2.00	56126-S
2	Ball Joint Assemblies	Superior SPF-65
Instruction Sheet		
Fender Flare Kit		DOZX 16D212-A
1 pr.	Panel, Quarter, Partial	X-4033, X-4034
Template, Wheel Opening centerline, front		X-4032
Template, Wheel Opening centerline, rear		X-4031
Instruction Sheet		



SPECIAL COMPONENT SUPPLIERS

Roll-bar-Bolt-In

RBF-5
Autopower Corp.
3163 Adams Ave.
San Diego, Calif. 92116

B & B Motors, Ltd.
Bumt Hills, N.Y. 12027

Paeco
213 S. 21st St.
Birmingham, Ala. 35233

Clutch Safety Shield

#1520
Lakewood Industries
4800 Q. Briar Rd.
Cleveland, Ohio 44135

Paeco
213 S. 21st St.
Birmingham, Ala. 35233

Bell Auto Parts
3663 East Gage Ave.
Bell, Calif. 90201

Fuel Cells

Firestone
Gene White Company
1586 Howell Mill Rd., NW
Atlanta, Georgia 30318

The Goodyear Tire &
Rubber Co.
Engineered Products Group
6500 Mt. Elliott Avenue
Detroit, Mich. 48211

Donn W. Allen
5730 Bankfield Ave.
Culver City, Calif. 90230

Aero Tec Laboratories
20 Belden Place
Norwood, N.J. 07648

Lube Pumps

Jabsco Pump Company
1485 Dale Way
Costa Mesa, Calif. 92626

Seat - Racing

B & B Motors, Ltd.
Bumt Hills, N.Y. 12027

Auto World
701 N. Keyser Ave.
Scranton, Penn. 18508

Crusader Cars
819 N. Wilson Way
Stockton, Calif.

Berry Plastics
2460 Lemon Ave.
Long Beach, Calif.

Seat Belt and Harness

CB-500 & CH603 (black)
American Safety Equip. Corp.
1500 N. Peach
Fresno, Calif. 93727

Paeco
213 S. 21st St.
Birmingham, Ala. 35233

Shock Absorber (Koni)

Kensington Products Corp.
150 Green St.
Hackensack, N.J. 07601

Wheels

American Racing Equip.
355 Valley Drive
Brisbane, Calif. 94005

"Minilite"
Hank Thorpe
P. O. Box 201
Edison, N.J. 08817

Transmission and Differential Oil Coolers

Harrison
Holman and Moody
Box 27065
Municipal Airport Station
Charlotte, N.C. 28208

"Velvetouch" Brake Shoes

Relined Locally.
(Look under Brake Shoe
Bonding & Exchange in the
Yellow Pages.)

HOW TO ORDER PARTS

TO THE CUSTOMER

All Ford parts listed can be ordered from your nearest Ford or Lincoln-Mercury Dealer.

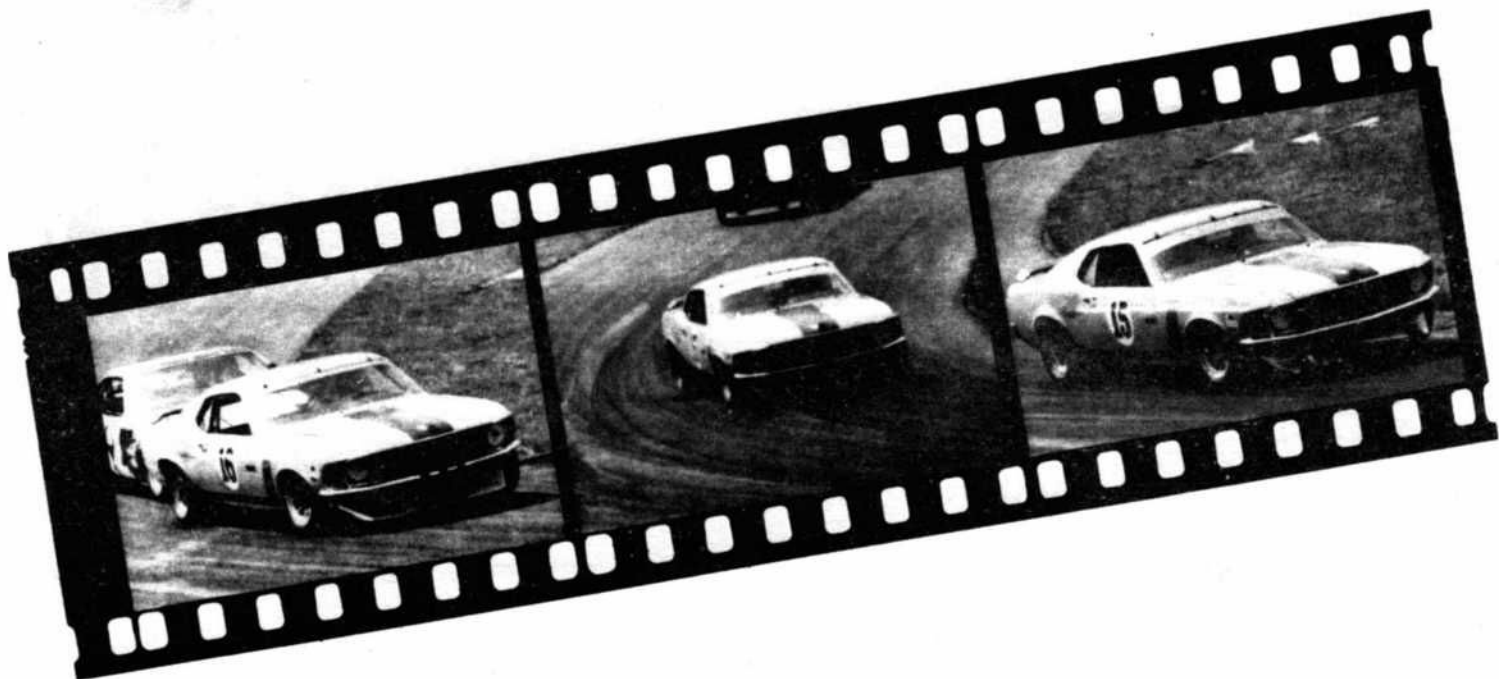
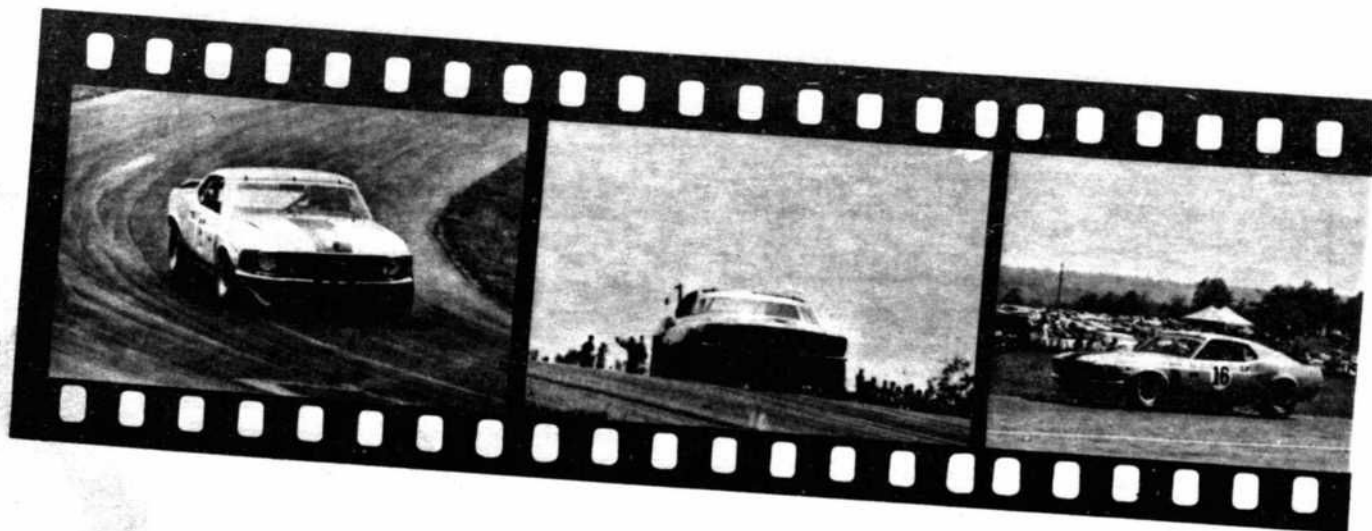
TO THE DEALER

All of the part numbers in this book have regular Depot classifications and should be ordered in the usual manner for each class.

SPECIAL INFORMATION REQUESTS

All requests for special information or assistance should be referred to Mr. Fred T. Martin, Jr. at the Hi-Per Depot address ... or at phone number: Area Code 704, 392-9314.

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Ford Motor Company
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P. O. Box 27074
Charlotte, North Carolina 28208



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