

SHOP TIPS

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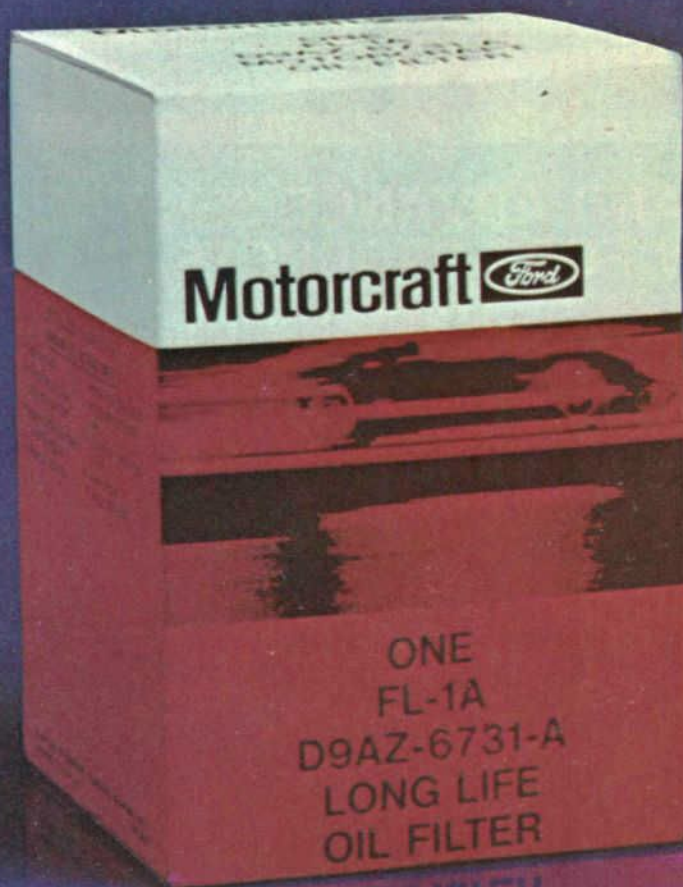
Motorcraft 

TECHNICAL HIGHLIGHTS AND ADVANCE SERVICE NEWS ABOUT THE GREAT NEW FORD PRODUCTS FOR 1979



1979
ANNOUNCEMENT
ISSUE

Motorcraft Announces...



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Motorcraft 

1979 THE DEBUT OF EXCITING FORD-BUILT CARS AND LIGHT TRUCKS

Producing cars and trucks is an evolutionary business. Giant strides are the combination of yearly steps towards refinements in style and engineering. Every change reflects the demands and needs of the time it was introduced. In recent years, demands have accelerated. This is especially true as we face up to the energy situation. Therefore, changes have to evolve at a faster than usual pace. For 1979, the products produced by Ford reflect important strides to meet the new demands for more efficiency and cleaner air while providing owners with room, comfort and stylish good looks. There are some dramatic break-throughs this year and you'll read all about them in this issue. As you turn the pages, you'll see why! But with all that's new, there is much that is familiar. You won't be faced with startling changes in service requirements or special new technology. As in the past — good service common sense is all it takes to render first-aid to any 1979 Ford Product that comes your way. To help you out, this issue of Shop Tips contains the type of information that should help you maintain and service Ford-built vehicles. We suggest you keep this issue for continuous reference throughout the coming model year.

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Be sure to file this and future issues for ready reference. If you have any suggestions for articles that you would like to see included in this publication, please write to: Ford Parts and Service Division, Parklane Tower West, Publications Section, One Parklane Blvd., Dearborn, Michigan 48126.

Also if you wish to change your address, please send us the addressograph mailing label. Send to the above address.

The information in this publication was gathered from materials released by various technical departments of the Ford Motor Company, the Ford Parts and Service Division of the Ford Motor Company, as well as other vehicle and parts manufacturers. The descriptions and specifications contained in this issue were in effect at the time it was approved for printing. Our policy is one of continuous improvement and we reserve the right to change specifications or design without notice and without incurring obligation.

Motorcraft 

ALL NEW MODELS FROM FORD



FORD LTD

Ford Motor Company has designed and manufactured only nine all-new standard-sized cars in its entire history. Only three since World War II. The 1979 Ford LTD is one of those cars!

An all-new car from the frame up, the LTD is built to the space-efficient specifications needed for the 1980's. Ford engineers have applied sophisticated design techniques to retain and actually improve the comfort and handling of this new line of cars.

Newly designed chassis components play a major role. A new "A" arm coil-spring front suspension and four-bar link-coil rear suspension contribute to an excellent ride.

A new steering system configuration, an efficient new rear axle and a new front disc brake design all help enhance LTD's feeling of agility.

All front and rear suspension components are mounted or isolated from the frame with rubber and the frame itself is isolated from the body with rubber body mounts.

Serviceability is another area not overlooked. Besides offering easier accessibility to such components as steering column controls, heating and air conditioning systems and the windshield wiper motor, Ford has developed a new mini-fuse panel with plastic-encased fuses which can be replaced easily by hand. No special removal tools are required.

For 1979, the Ford LTD has crisply styled, functional body lines added to its efficient chassis components. Advanced design techniques help give this all-new Ford the excellent handling and maneuverability of a fine road car while maintaining the traditional LTD roominess and comfort.

Pictures of the new technical features along with a more detailed description appear in the next few pages.

MUSTANG

The 1979 Mustang is a new breed of Mustangs. The emphasis is on engineering. Design and engineering are so closely associated to the new Mustang story that it is difficult to decide whether to look at the car or drive it.



Mustang has a four-inch longer wheelbase than last year, but through a combination of aerodynamic design and the use of high-strength, low-weight materials, Mustang has more room, yet actually weighs less than previous models.

The headline story for 1979 is the optionally available new turbocharged 2.3 litre engine. Engine output has been boosted to nearly 150 horsepower. Full details of this exciting new engine are covered in this issue.

For 1979, the standard Mustang instrument panel includes a tach, trip odometer and gauges for fuel, temperature, oil pressure and alternator.

ALL NEW MODELS FROM LINCOLN-MERCURY



MARQUIS

One of the primary objectives in designing the 1979 Marquis was to maintain Marquis' outstanding ride characteristics while designing it to a new, more maneuverable size and weight.

To achieve this goal, suspension and steering systems were designed along with an all-new sound insulation package.

Details of the new front and rear suspension and the new steering system are covered under the technical features section.

Another major effort went into making the new Marquis easier to service. Typical examples are these: A mini-fuse panel concealed behind the instrument panel using new plastic-covered fuses with two-bladed contacts. They replace the traditional fuses you're familiar with and they require no special tools for removal and replacement. You can do it with your fingers.

Another convenience is see-through reservoirs. They are used for the battery, windshield-washer fluid and coolant recovery system to simplify fluid level checks.

CAPRI

The all-new Capri for 1979 is a totally U.S.-built car but stylewise has continued its European heritage. It represents the "Best of Both Worlds." As in previous years, the standard engine is a 2.3-litre four-cylinder but there are two exciting new engine options. One, a 2.3-litre turbocharged engine and the other a 5.0-litre (302-CID) V-8. Details about the optional turbocharged 2.3-litre engine will be covered separately in this issue.

Also new for 1979 is a four-speed manual overdrive transmission featuring a single-rail shift mechanism. This transmission is standard with the 5.0-litre V-8 but is not available for sale in California. Good handling characteristics are achieved through the use of a modified MacPherson-type strut suspension. A similar design is used on many European vehicles. Full details are covered in the next section of this issue. Manual steering is standard on Capri, but variable-ratio power rack-and-pinion steering is optional.

Serviceability features include these improvements: A modular steering column which provides access to column-mounted controls. Front Disc Brake audible wear indicators. An easy-to-get-at fuse box. Front ball joint wear indicators. See-through reservoirs for battery, windshield washer and coolant recovery system. Single V-belt drive on 5.0L engine that drives all accessories and an easily accessible windshield wiper motor and linkage.



HERE ARE THE OTHER MODELS FOR 1979

FORD

A. FIESTA — This hot-selling car provides outstanding fuel economy! With a 1.6 litre engine fed by a Weber 2V carburetor, it has only 1,760 pounds (base curb weight without options) to move along the streets and highways. Besides that, the Fiesta is a responsive little car, thanks to a good working combination of front-wheel drive, a MacPherson-type strut front suspension and rack and pinion steering. From bumper to bumper it is only 147.1 inches. Width is 61.7 inches.

B. PINTO — A sportier look developed by completely revised front end sheet metal which includes the hood, bumpers, fenders and grille. Rectangular headlights add to the contemporary appearance. Five distinct models are offered . . . the Pinto Pony, the three-door Runabout, the station wagon plus the two-door sedan. You can get the Pinto station wagon with Squire option or the Cruising Package option.

There's a standard 2.3-litre, 4-cylinder engine or the optional 2.8-litre V-6 powerplant. Bumper to bumper length is 168.8 inches except the station wagon which is 178.6 inches.

C. FAIRMONT — Small-car economy with good interior roominess and excellent riding comfort. Options offered for 1979 include . . . tilt steering wheel, speed control, remote-control of the rear deck lid release and performance instrumentation. The standard Fairmont bumper to bumper length is 193.8 inches while the Futura model is two inches longer. Both have an overall width of 71.0 inches.

D. GRANADA — Clean, classic styling give the Granada models their pleasing proportions. Standard models feature a Flight Bench seat with fold-down center armrest, color-keyed cut-pile carpeting and burl woodtone appliques on the instrument panel. The standard engine is the 4.1-litre powerplant (250-CID) six-cylinder engine mated to a four-speed manual overdrive transmission. The 5.0-litre (302-CID) V-8 engine is optional. Overall length is 197.8 inches with a width of 74.0 inches.

E. LTD II — Big car comfort with traditional low-profile styling. An optional 27.5 gallon fuel tank gives "extended travel" with fewer stops for fuel. The two door hardtop has a 114 inch wheelbase, while the four-door models are cradled between a 118 inch wheelbase. Overall length of the two door is 215.5 inches the four door is 219.5 inches. Both have a width of 78.6 inches.

F. THUNDERBIRD — A bold new grille, distinctive new paint finishes and redesigned taillamps. The grille has an open box texture in front of thin vertical bars while the new taillamps are rectangular in shape. A single backup lamp is positioned between the taillamps. The standard engine is the 5.0-litre (302-CID) with the 5.8-litre (351-CID) powerplant optional. Overall length is 217.2 inches (bumper guards are standard) with a width of 78.5 inches.





G

LINCOLN-MERCURY

G. BOBCAT — Fresh, major styling changes complement its reputation as a fun-to-drive car. The bright, vertical-theme grille rakishly slopes back. Three models are available: the versatile three-door hatchback, the base station wagon, and the Villager station wagon. Overall length of the 3-door Runabout is 168.8 inches. Station wagons are 178.6 inches. Width is 69.4 inches (Runabout), wagons are 69.7 inches.



H

H. ZEPHYR — A broad array of functional refinements for 1979 are aimed at satisfying a wide range of buyer preferences. A 3.3-litre engine (200-CID) is available on station wagons with the California Emission System. Overall length of the Z-7 model is 195.8 inches. Other Zephyrs are 193.8 inches. Width is 71.0 inches.



I

I. MONARCH — A number of mechanical refinements plus some significant interior trim revisions help these highly successful models to retain their popularity among a wide range of buyers. A blackout paint treatment on the grille plus two new interior cloth trims and several new exterior paint and vinyl-roof colors add variety for 1979. Overall length is 197.8 inches with an overall width of 74.0 inches.



J

J. COUGAR — Ride engineered with attractive styling helps maintain its popularity. The XR-7 has distinctive styling refinements which include a one-piece grille in a new design with body-color tape and black and bright accents. New velour interior trim is available for the first time on the XR-7 with the Decor Group. Overall length of the two-door and the XR-7 is 215.5 inches while the four-door is 219.5 inches. Width is 78.6 inches for all models.

K. LINCOLN CONTINENTAL — For 1979 there's an expanded range of special model selections . . . all offering traditional full-sized luxury and classic styling. The Collector's Series represents a new expression of Lincoln Continental prestige with styling cues taken from the Mark V Collector's Series. Overall length is 233.0 inches with a width of 79.6 inches for the two-door and 79.9 inches on the four-door models.



K

L. CONTINENTAL MARK V — Graceful, sleek styling gives the Mark V a personality all its own in the luxury passenger-car field. Functionally, both the ignition and door locks have been modified for improved theft resistance. Overall length is 230.3 inches. Width is 79.7 inches. (Not shown).

M. VERSAILLES — A new formal roof treatment that has been resculptured at the rear and extended eight inches helps to create a dramatic new look. A rear-half vinyl roof is now accented by a brushed stainless steel wrap-over moulding and matching brushed finish center-pillar appliques with integrated coach lamps. New sealed-beam halogen headlamps give a whiter, brighter light with less electrical load than the conventional lamps. Overall length is 201.0 inches with a width of 74.5 inches.



M

RANCHERO, LIGHT TRUCKS, BRONCO AND VANS FOR 1979

Ford has always made trucks a large part of their engineering and styling efforts. These new 1979 vehicles



RANCHERO — The utility of a pickup with the comfort and styling of a fine automobile. There are three models to choose from all of which feature a stylish black and argent crosshatch grille with vertically stacked dual rectangular headlamps.

continue to reflect Ford's leadership in those directions. Let's see what's in store for the 1979 model year.



COURIER — The popular compact pickup now has several new standard features and major options. A new 2.0-litre four-cylinder engine replaces the standard 1.8-litre powerplant for 1978. An optional five-speed manual transmission is available.



F-SERIES — The best selling vehicle in America is a truck ... the Ford F-Series light pickup. Four sizes; the F-100, F-150, F-250 and the F-350 are offered and luxury appointments go steadily upward from the Custom to the



Ranger, Ranger XLT and Ranger Lariat. All models have rectangular headlamps while a special paint process applies three coats of finished enamel instead of the traditional two.



CLUB WAGON — New or revised comfort and convenience packages play a major role in expanding the broad appeal of these vehicles. Most notable is the Captains Club Wagon which includes special new features such as a Quad Captains chair that reclines and swivels, a snack/game table and a combination rear seat/bed. This bed measures approximately 62 inches wide by 72 inches in length. A Cruising Van is now available with hinged as well as sliding side doors. ▼

◀ **ECONOLINE, VAN** — With a new front end treatment featuring rectangular headlamps and a new grille, these vans have a fresh-new appearance. Optional equipment for 1979 include a tilt steering wheel which can be added to Vans with the four-speed manual transmission and power operated door locks. A Cruising Van is now available with hinged as well as sliding doors.

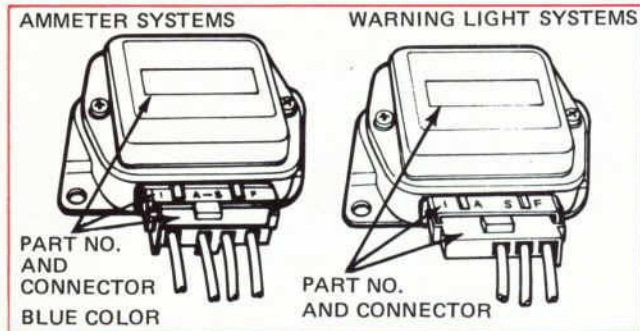
BRONCO — Here's the four-wheel drive vehicle that set a new sales record for Ford Motor Company in 1978. For 1979 this model has rectangular headlamps and a three-coat paint finish process. The two standard front bucket seats feature all-vinyl trim standard. A Quad shock absorber option puts two shocks at each front wheel. They are stagger-mounted on each side of the axle for excellent axle control under rugged off-road use. A maximum capacity (32-gallon) fuel tank is optional while Power Steering is now standard. ▼



TECHNICAL HIGHLIGHTS FOR 1979 MODELS

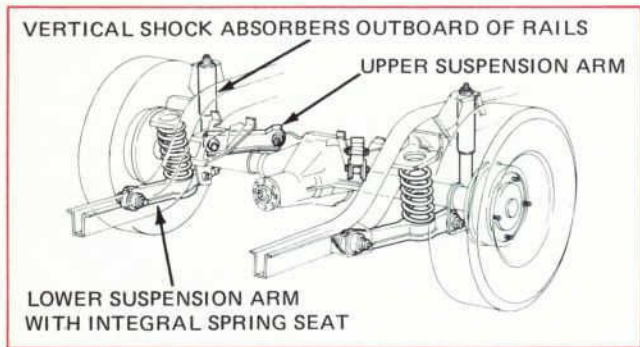
ELECTRONIC VOLTAGE REGULATOR (EVR)

This new type of regulator replaced the electromechanical regulator on the Fairmont and Mustang as well as the Mark V, Lincoln Continental, Cougar, Monarch and Zephyr car lines for 1978. For 1979, all models in the Ford Motor Company lineup will use this new EVR regulator. There are two versions: one for vehicles that have an instrument panel warning lamp and the other for vehicles that have an ammeter. Both versions have a printed circuit board and fewer parts than the earlier electromechanical type and weigh about half as much. There are no contacts to wear out, thus system voltage is more closely controlled.



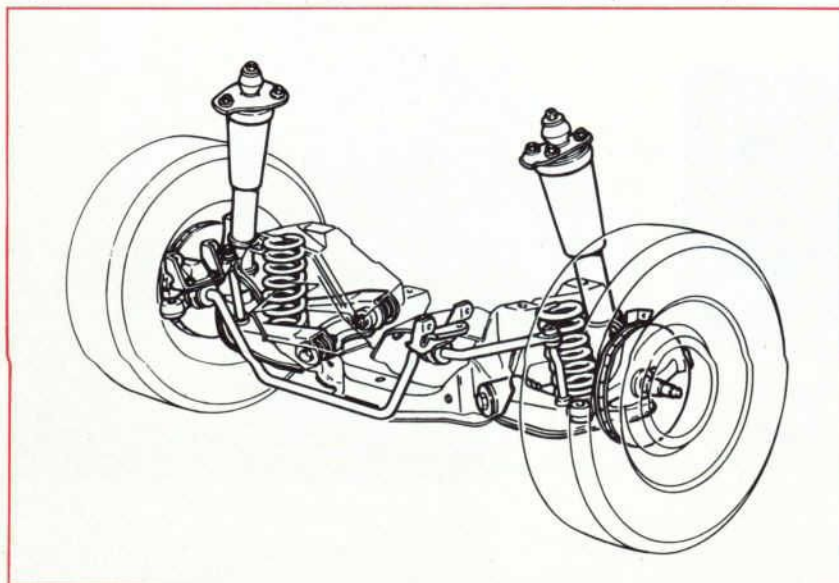
REAR SUSPENSION – MUSTANG/CAPRI

The rear suspension for Mustang and Capri is now the same as Zephyr and Fairmont except for tuning.



FRONT SUSPENSION – MUSTANG/CAPRI

The Capri and Mustang features strut-type front suspension. The design differs from the popular MacPherson strut suspension used on many European cars in that the spring is



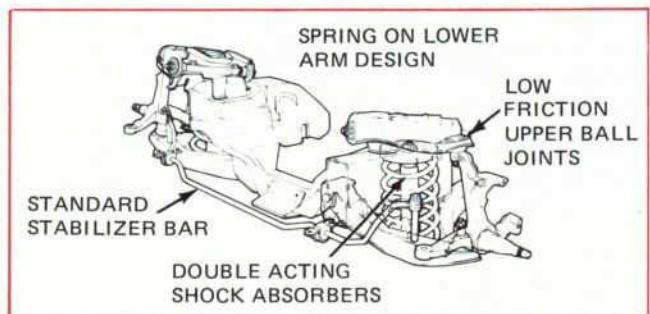
The rear shock absorbers and coil springs are positioned outboard of the rear frame rails for optimum ride control. Mounting the shock absorbers nearly vertically and close to the wheels improves their ability to soak up rough road harshness. A revised piston design in the shock absorbers helps hold down noise transfer from the suspension to the car's passenger compartment.

The shorter upper arms have been positioned at a 68-degree angle for increased lateral stability. The lower suspension arms are attached to the rear axle through large rubber bushings. This allows "give" in a rearward direction upon initial contact with some road obstruction.

When these cars are equipped with the 5.0-litre V-8 engine, a rear stabilizer bar is standard.

FRONT SUSPENSION – MERCURY MARQUIS AND FORD LTD

The all-new front suspension on the 1979 Ford LTD and Mercury Marquis features a long and short-arm coil spring design with a front stabilizer bar. A new, lower "A" arm replaces the previous arm and strut assembly. The upper ball joint utilizes a new low-friction design.



The upper ball joint also incorporates a new "lube-for-life" feature which eliminates the required 36,000-mile lubrication interval of the previous design. Another feature is the addition of visible wear indicators to the lower arm ball joint making it easier to tell when replacement is needed.

located between the lower control arm and the vehicle frame rather than being mounted directly on the strut. This eliminates the need for special tools such as a spring compressor if the unit ever needs replacement.

Internally, the shock strut features a low-pressure, large-bore, anti-friction Polymer-coated piston, a bronze teflon-impregnated rod guide bearing, a multi-lip seal, a low micro-finish hard-chrome-plated piston rod, heavy gauge cylinder tubing and a unique, four-stage, base valve system. The ball joint contains a wear indicator which provides a positive means of determining ball joint wear.

A front stabilizer bar is standard to improve roll control and stability during cornering maneuvers.

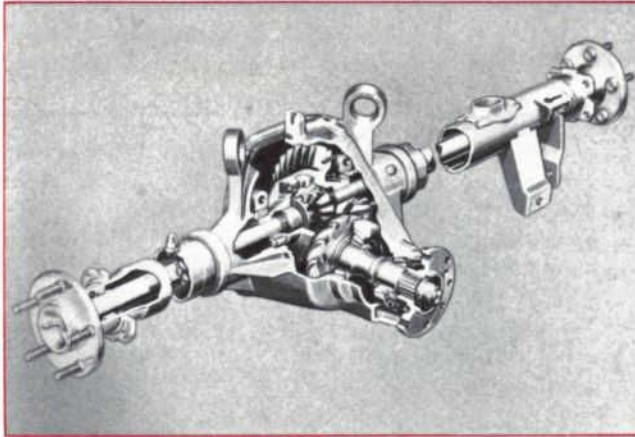
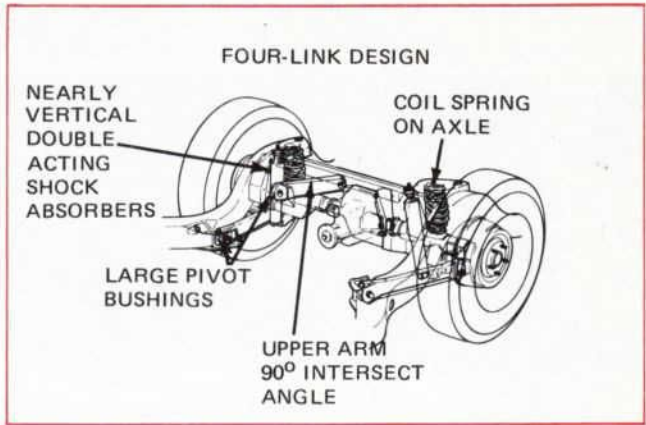
Front end geometry features a near "zero-scrub" radius which means that the turning axis of each front wheel intersects the road surface near the centerline of the tires.

TECHNICAL HIGHLIGHTS FOR 1979 MODELS

REAR SUSPENSION — MERCURY MARQUIS AND FORD LTD

The 1979 Ford LTD and Mercury Marquis feature a new four-link coil spring rear suspension which replaces the previous three-link system. The customer advantages of the new system are improved ride and better handling.

The system's lower arms are mounted forward from under the rear axle. Shorter upper arms are mounted forward from the top of the axle. This configuration provides excellent lateral stability in crosswinds and while cornering. The rear springs are mounted directly above the axle while large rubber bushings at all mounting points help reduce noise transfer into the passenger compartment.

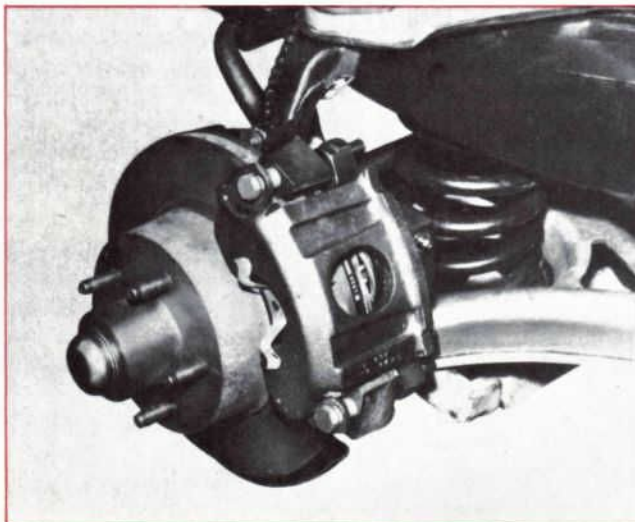
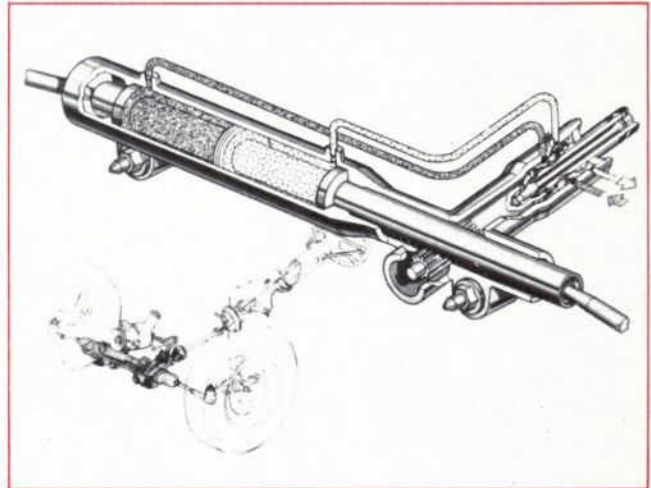


NEW/LIGHT WEIGHT REAR AXLE FOR FORD LTD AND MERCURY MARQUIS

For 1979, engineers were able to achieve substantial weight savings for Ford LTD and Mercury Marquis by designing a lighter-weight rear axle with cast iron center housings and two ring gear sizes depending on the application. Ring gear sizes are 7.5 inches and 8.5 inches. The new axle is designed with a circular piloted companion flange which allows the driveshaft to be indexed in 45-degree increments for more precise balancing.

STEERING SYSTEM — MUSTANG/CAPRI

For Mustang and Capri, a high level of steering response has been achieved through the rack-and-pinion steering system introduced in 1978. In addition to the manual system, an optional power-assist unit is available. The optional power rack-and-pinion steering gear features a variable-ratio rack which causes the steering ratio to decrease as the steering wheel is turned from the on-center position. The high on-center ratio provides good steering feel at highway speeds while the reduced off-center ratio provides fewer steering wheel turns during turning and parking maneuvers. To help minimize weight, both the manual and power steering gear housings are constructed of die-cast aluminum.



PIN SLIDER FRONT DISC BRAKES — FORD LTD AND MERCURY MARQUIS

For 1979, a pin-slider front disc brake system replaces the familiar vee-slider system used on 1978 models. With the previous design, the caliper slid on V-shaped machined metal surfaces. With this pin slider design, the calipers are fitted with flexible rubber bushings with low friction teflon sleeves which slide on two pins projecting out from the spindle/anchor plate. The flexibility of the bushings reduces the sensitivity to minor tolerance variations and improves the brake-pedal feel.

TECHNICAL HIGHLIGHTS FOR 1979 MODELS

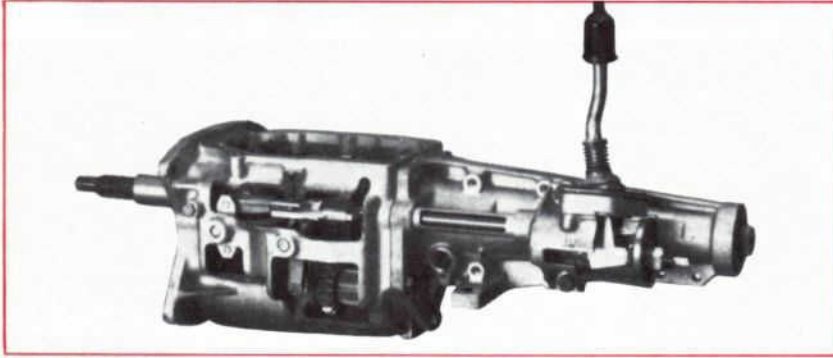
SINGLE-RAIL SHIFT 4-SPEED OVERDRIVE TRANSMISSION

This transmission is a revised version of a design introduced earlier. It is the standard transmission with the V-8, 5.0-litre engine on Mustang and Capri.

It is also standard on Fairmont, Zephyr, Granada and Monarch when equipped with an in-line six cylinder engine or the 5.0-litre, V-8 engine. It is not available on models

with the 2.8-litre, V-6 engine or on models sold in California.

A major change is the use of a single rail shift mechanism which replaces the previous external linkage system. The new shift mechanism is enclosed within a special rear housing, a connecting extension tube and the transmission case. Because it is totally enclosed and protected, the mechanism needs no adjustment or periodic lubrication and provides consistent, easy shifting.



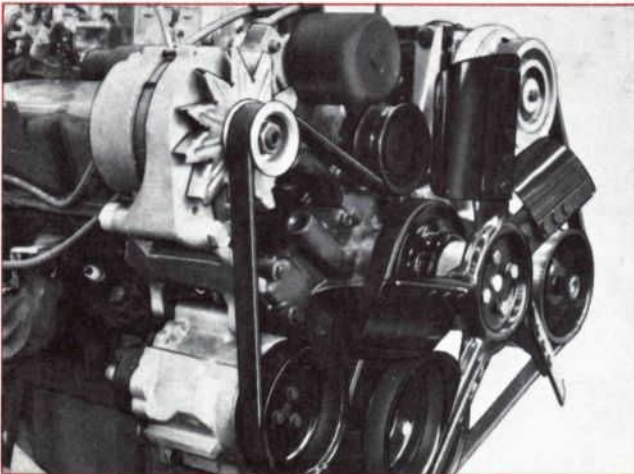
The standard "H" shift pattern remains unchanged except that reverse is attained by pushing down on the shift lever which is an easier and more convenient operation than the previous "lift up" method. The use of aluminum throughout in construction has resulted in a 30-pound reduction over previous four-speed overdrive transmissions.

SINGLE V-RIBBED BELT ACCESSORY DRIVE SYSTEM

One of the new features of the 5.0-litre (302-CID) V-8 engine used on Mustang and Capri is the single-belt accessory drive system. This system features a special V-ribbed belt that drives the fan/water pump, alternator, secondary air pump, optional air conditioning compressor and optional power steering pump. It offers compactness, low weight and a spring-powered tensioning device that eliminates any need for belt adjustment.

Note that the belt doubles back in a "serpentine" configuration and drives the fan/water pump pulley from its back side. This causes the fan and water pump to be driven opposite to engine rotation.

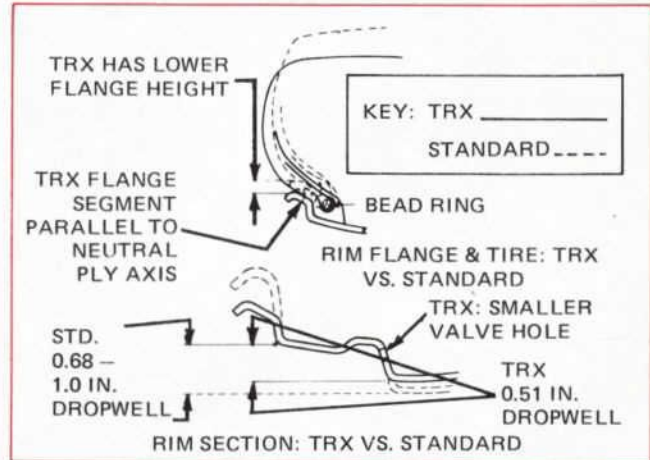
The belt is easy to remove and install. Simply retract the belt tensioner with a pry bar and slip the belt off the pulleys. To install a new belt, reverse the procedure. A similar belt drive is used on the Ford LTD and Marquis 5.8-litre (351-CID) engine to drive the fan/water pump, alternator and power steering pump. Other front end accessories are driven by conventional V-belts.



TRX RIM AND TIRE - MUSTANG/CAPRI

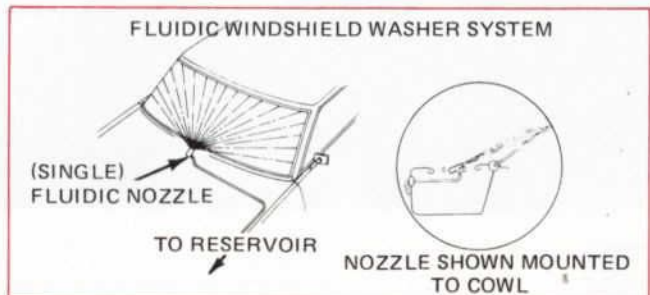
When ordering the optional Michelin 190/65R 390 TRX tires and the 150/TR 390 forged aluminum wheels, a

revised suspension is included with the package. Features include revised shock-absorber valving, revised rear spring rates, a 1.12-inch front stabilizer bar and a rear stabilizer bar. Note that the TRX aluminum wheel rim has a lower flange height, a smaller dropwell dimension than standard rims, plus a smaller valve hole.

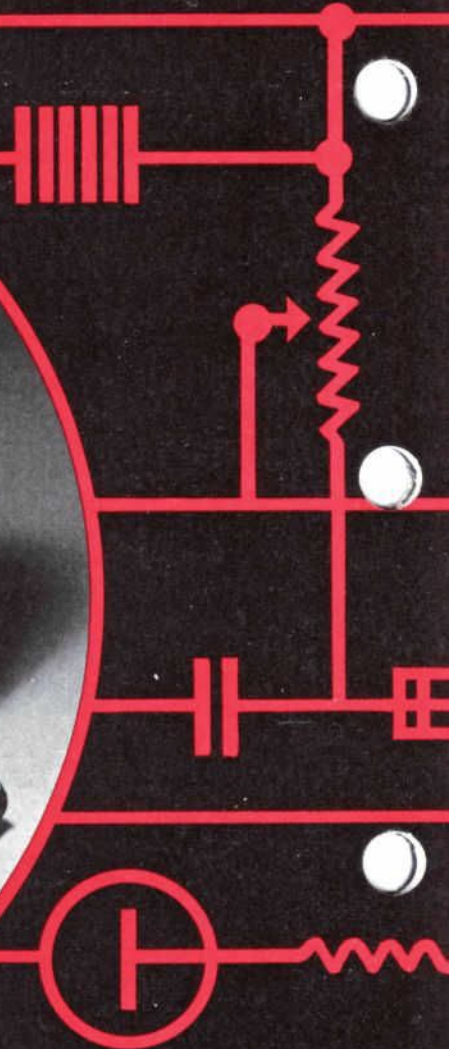


FLUIDIC WINDSHIELD WASHER - MUSTANG/CAPRI

This innovative windshield washer system utilizes a single nozzle to produce a wide pattern of large droplets that spray the entire windshield area. The nozzle is mounted slightly forward and centered in relationship to the windshield. The spray appears as a solid fan-like pattern but is actually a single oscillating jet stream that makes its cleaning action very efficient.



current attractions

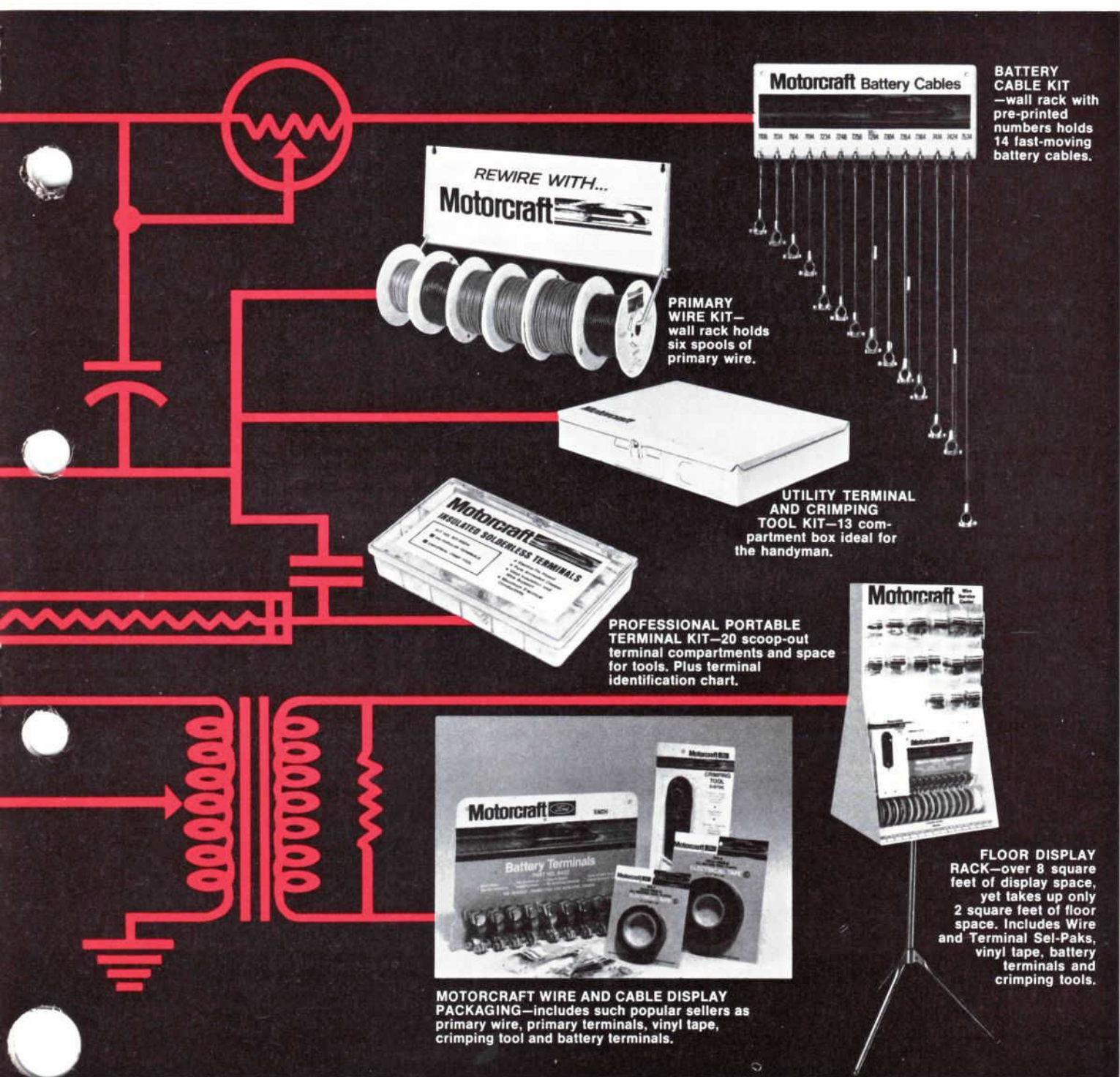


High quality plus a proven track record have made Motorcraft's full line of wire and cable a sales success for years. Professionals as well as do-it-yourselfers buy and buy again. They find exactly what

they're looking for, including all types of automotive wire and cable, terminals, boots, nipples, tools and tape.

Parts are attractively packaged for easy identification and eye appeal. Parts and

parts packages are marked for competitive applications as well. Handsome display stands are available for further sales appeal. Set up your Motorcraft wire and cable products . . . then watch 'em disappear!



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Motorcraft
INSULATED SOLDERLESS TERMINALS

PROFESSIONAL PORTABLE TERMINAL KIT—20 scoop-out terminal compartments and space for tools. Plus terminal identification chart.

Motorcraft

FLOOR DISPLAY RACK—over 8 square feet of display space, yet takes up only 2 square feet of floor space. Includes Wire and Terminal Sel-Paks, vinyl tape, battery terminals and crimping tools.

Motorcraft
Battery Terminals

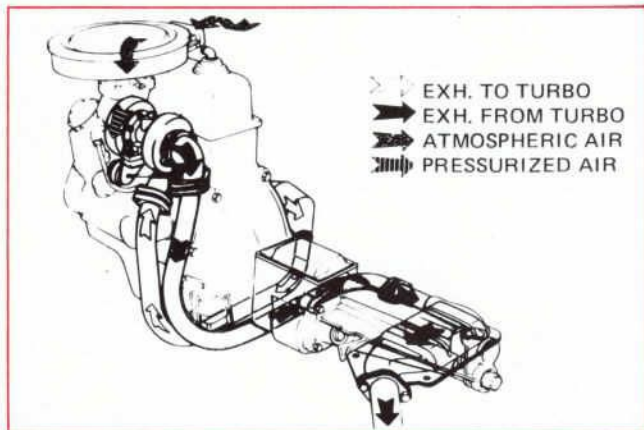
MOTORCRAFT WIRE AND CABLE DISPLAY PACKAGING—includes such popular sellers as primary wire, primary terminals, vinyl tape, crimping tool and battery terminals.

1979 ENGINE LINEUP

Ford Motor Company offers ten fuel-efficient engines in their 1979 passenger-car model lineup. The 1.6-litre, 4-cylinder engine for the 1979 Ford Fiesta and the 5.8-litre engine used on several of the 1979 Ford-built vehicles are essentially the same dependable powerplants that helped

make the 1978 models so successful. Let's examine some of the more significant features of the 1979 engines and see what the engineers have accomplished to provide the motoring public with dependable fuel-squeezing power.

2.3-Litre 2V Engine — This four-cylinder engine is the standard powerplant on the Mustang, Fairmont and Pinto, Capri, Zephyr and Bobcat and is a carryover from its successful usage in the 1978 models.



2.3-Litre 2V Turbocharged Engine — This four-cylinder, in-line engine is a new offering and is available on the all-new Mustang and Capri. More about this responsive powerplant on the facing page.

2.8-Litre 2V Engine — Available in the Mustang and Pinto, Capri and Bobcat, this V-6 engine has improved driveability for 1979. All applications feature a new-design camshaft. On Mustang and Capri, the engine uses a low-restriction exhaust system that helps engine efficiency by permitting improved engine "breathing." When this engine is teamed with an automatic transmission, the transmission shift points (during wide-open throttle operation), are higher to take better advantage of the extra engine performance.

3.3-Litre (200-CID) 6-Cylinder — Optional engine in Fairmont and Zephyr.

4.1-Litre (250-CID) 6-Cylinder — Standard in Granada and Monarch.

5.0-Litre (302-CID) 2V Engine — This V-8 engine is optional on Mustang and Capri, Fairmont and Zephyr, Granada and Monarch; and standard on all Thunderbirds, LTD II, Ford LTD and Marquis models except with High-Altitude equipment or the LTD and Marquis station wagons with California equipment.

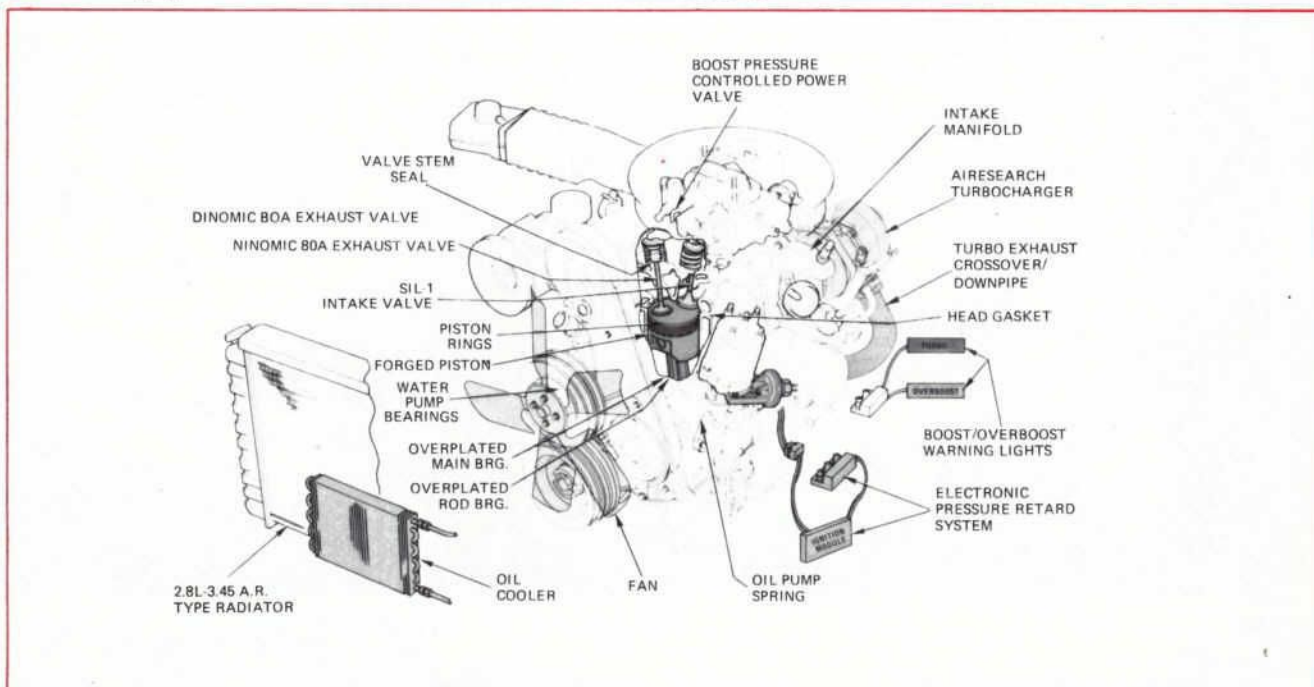
The 5.0-litre (302-CID) features weight-saving actions. On the LTD, Mustang and certain Granadas an aluminum intake manifold is used. An aluminum water pump also is included on the LTD and Mustang. These changes contribute to a significant overall reduction of vehicle weight.

The 5.8-litre engine on the Ford LTD and Marquis models sold in California is equipped with a tamper-proof carburetor that incorporates a tamper-resistant choke and idle-fuel system, a revised fuel-bowl vent system and refinements to the cold enrichment system for improved cold-starting characteristics.

The conventional carburetor used with all other 5.0-litre engine applications has been revised to improve driveability. Changes include fuel-bowl revisions to preclude hard-right-turn fuel starvation, closer low-speed bore-to-bore fuel balance for a smoother idle and an adjustable main fuel system.

5.8-Litre (351-CID) V-8 Engine (W-Version) — This engine is optional on the Ford LTD, Thunderbird, LTD II, Cougar and Marquis car lines and features weight reductions of up to 40 pounds. Changes include an aluminum intake manifold, aluminum water pump and aluminum engine rear cover.

6.6-Litre (400-CID) V-8 Engine — Lincoln Continental and Mark V.



THE 2.3 LITRE TURBOCHARGER POWERPLANT

The ability of a turbocharger to extract extra power from small engines will make turbocharging increasingly important as a means of meeting ever-more-stringent fuel economy standards. The 2.3-litre four-cylinder engine is the first Ford Motor Company engine to benefit from turbocharging.

The principle of turbocharging is simply the utilization of

otherwise wasted exhaust gases to enhance engine combustion. A standard engine must run on the amount of air/fuel mixture that can be pushed into the combustion chambers by normal atmospheric pressure. A turbocharger boosts this pressure, increasing the density of the mixture fed to the engine. Here's how it works:

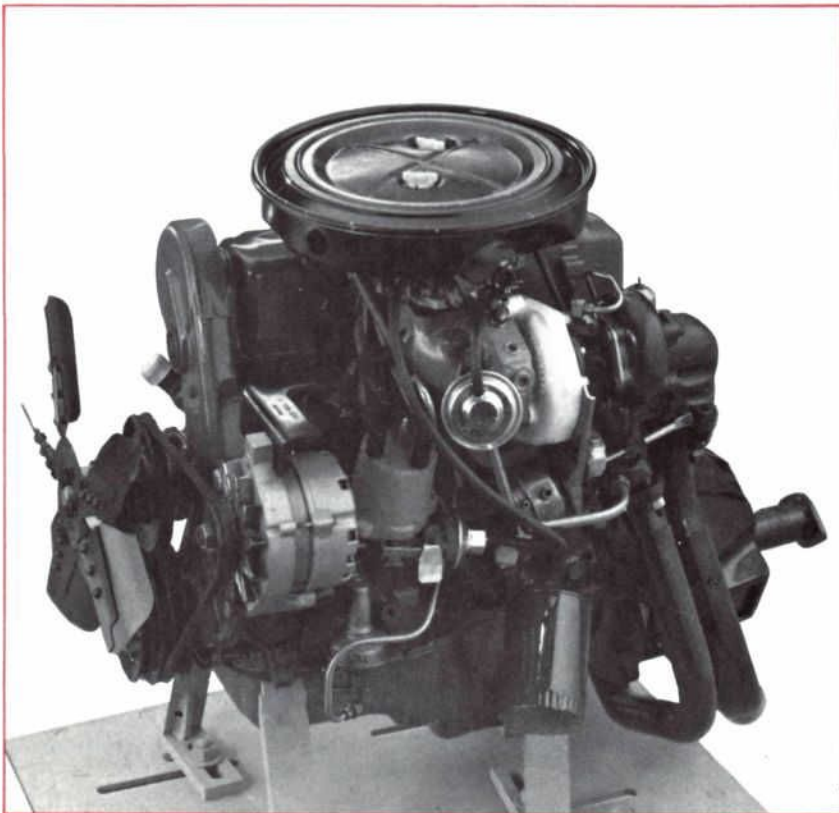
TURBOCHARGER OPERATION

A turbine in the exhaust-gas flow is connected by a shaft to an impeller (compressor) near the carburetor. During normal, steady driving, this turbine does not spin fast enough to significantly boost pressure or affect fuel economy. When the accelerator is depressed, however, the engine speeds up, increasing exhaust-gas output. This accelerates the turbine and, in turn, the impeller, increasing the density of the air/fuel mixture delivered to the engine.

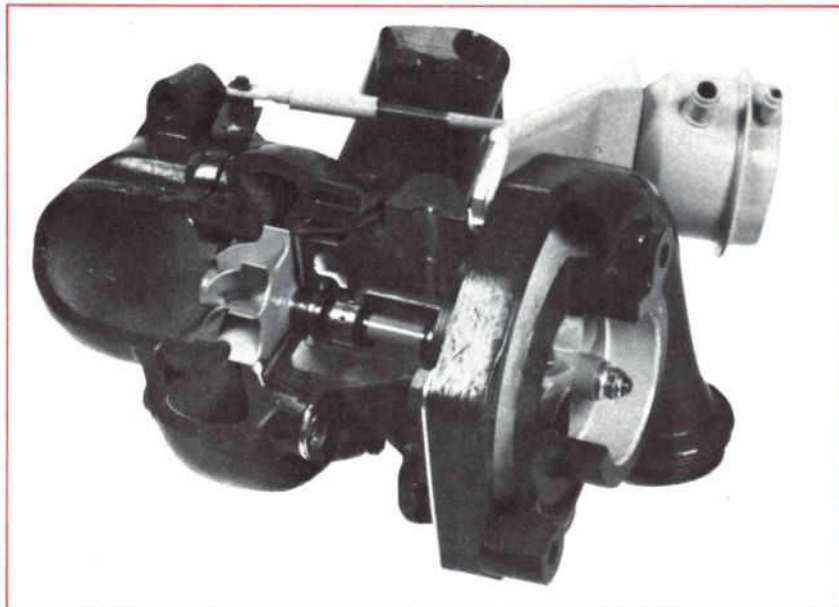
The resulting increase in engine power and exhaust pressure further increases turbine spin and the boost pressure. This cycle is self-perpetuating and could ultimately result in engine damage if it escalated unchecked.

To prevent this, a wastegate, or exhaust valve, bypasses some of the exhaust gases around the turbine at a predetermined point in the cycle, limiting the boost curve. The wastegate starts to open when the turbocharger boost pressure reaches about five psi and routes sufficient exhaust gases around the turbine to limit maximum boost to 5-1/2 psi.

A green light on the instrument panel indicates when the turbocharger is in a safe "boost" condition. A red light and buzzer warn the driver if a malfunction occurs and boost pressure rises above the 5-1/2 psi maximum. Whenever oil temperature exceeds a predetermined level, just the warning light will flash.



The high cylinder temperatures created by boosted combustion can result in detonation — audibly irregular combustion that can cause piston or rod damage — if ignition timing is not retarded. Therefore, two spark retardation points have been designed into the electronic ignition.



At approximately one psi boost pressure, a switch in the intake manifold sends an electrical signal to the ignition module which electronically retards the timing six degrees. At four psi boost, another manifold switch sends a signal and timing is retarded an additional six degrees.

Weight of the turbocharger is about 17 pounds and it features a turbine wheel diameter of 2.56 inches and compressor wheel diameter of 2.84 inches. At idle speed and zero psi boost, turbine speed is 20,000 rpm, while at maximum 5-1/2 psi boost, it is 140,000 rpm.

ELECTRONIC ENGINE CONTROL SYSTEM FOR 1979 — EEC II

This latest electronic engine control system, called EEC II, controls or monitors six engine functions, three more than the EEC I system introduced in 1978. This highly sophisticated system will be included with California Ford and Mercury models only when equipped with the optional 5.8-litre (351-CID) (W) engines. It can be considered a forerunner of the type of system required to meet tougher emission/fuel economy standards in the future while providing optimum driveability.

New functions included with EEC II are control of the carburetor fuel/air mixture, control of the purging of the fuel evaporation emission control system storage canister and control of engine speed at idle. Like the 1978 EEC I system, EEC II also controls the exhaust gas recirculation (EGR) flow, the engine ignition timing, plus control of secondary air to the exhaust emission system.

The entire system consists of an EEC module, several sensors located on the engine and in the various engine

CARBURETOR AIR/FUEL MIXTURE AND SECONDARY AIR CONTROL

Control of the carburetor air/fuel mixture by EEC II is similar to that used on the 1978 California Pinto/Bobcat with the 2.3-litre engine. The electronically controlled carburetor works in conjunction with a three-way catalyst and an oxygen sensor in the exhaust manifold.

The EEC II computer, the oxygen sensor and the carburetor controls form a "closed-loop" circuit. The purpose of the circuit is to maintain the air-to-fuel ratio mixture as close as possible to 14.7 (air) to 1 (fuel) for best efficiency of the three-way catalyst system.

Closed-loop control compensates automatically for tolerances, wear and drift of the fuel-metering system, for changes in fuel composition (which might require a different air-to-fuel ratio), and for variations of atmospheric pressure resulting from altitude or weather changes.

Maintaining the correct air-to-fuel ratio permits the three-way catalyst to work effectively in controlling exhaust emissions of hydrocarbons (HC), carbon monoxide (CO) and oxides of nitrogen (NOx). Too rich a mixture increases HC and CO, while too lean a mixture increases NOx.

During operation, the manifold oxygen sensor constantly monitors the oxygen content of the exhaust gases and indicates if the mixture is too rich or lean by sending a voltage signal to the EEC II computer. The computer analyzes this signal, plus input from other sensors, and signals the stepper motor control on the carburetor to adjust the air/fuel mixture. In actual operation, the closed-loop circuit is constantly making adjustments back and forth between too-rich and too-lean, which results in an average air-to-fuel mixture extremely close to 14.7:1. During starting, warm-up and rapid acceleration, the control system is overridden to permit the richer fuel mixture required under these operating conditions.

Two separate catalyst sections inside a single stainless steel housing are located in the exhaust system between the engine and muffler. Both catalyst sections are of conventional Ford design with a coating of rare metals on a ceramic carrier technically called a substrate.

systems, special controls governed by the module, and various connecting electrical and vacuum lines.

Because EEC II can react to changes precisely and quickly (approximately 30 times a second), it provides close control of climatic conditions and operating modes required of today's vehicles. Through the versatility and miniaturization of electronics, EEC II also is able to replace or simplify many of the electromechanical components that previously performed these control functions. For example, the ignition distributor does not have a mechanical or vacuum advance mechanism since this function now is controlled by EEC II. The heart of the EEC II module is a digital microprocessor with a fixed program and additional integrated circuits custom-designed for this application. The module is, in effect, an onboard computer which receives and analyzes data from the various sensors, and then sends electrical signals to maintain or change any of the functions under its control.

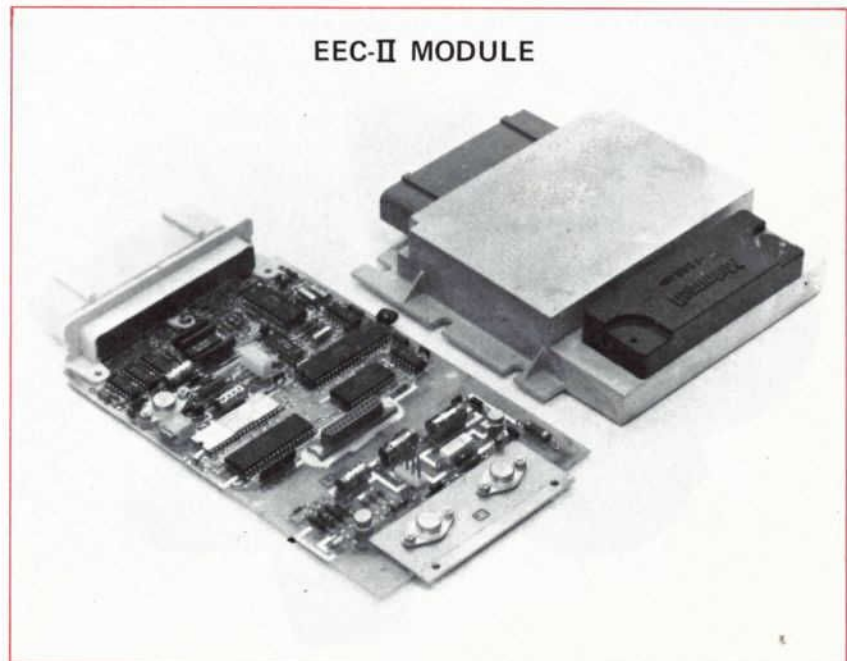
The front section is a combination three-way unit that contains two rare metals, platinum and rhodium, on the substrate. The catalyst formulation decreases HC and CO through oxidation and decreases NOx through a reduction process. The rear section contains platinum and palladium to further decrease the HC and CO through conventional oxidation.

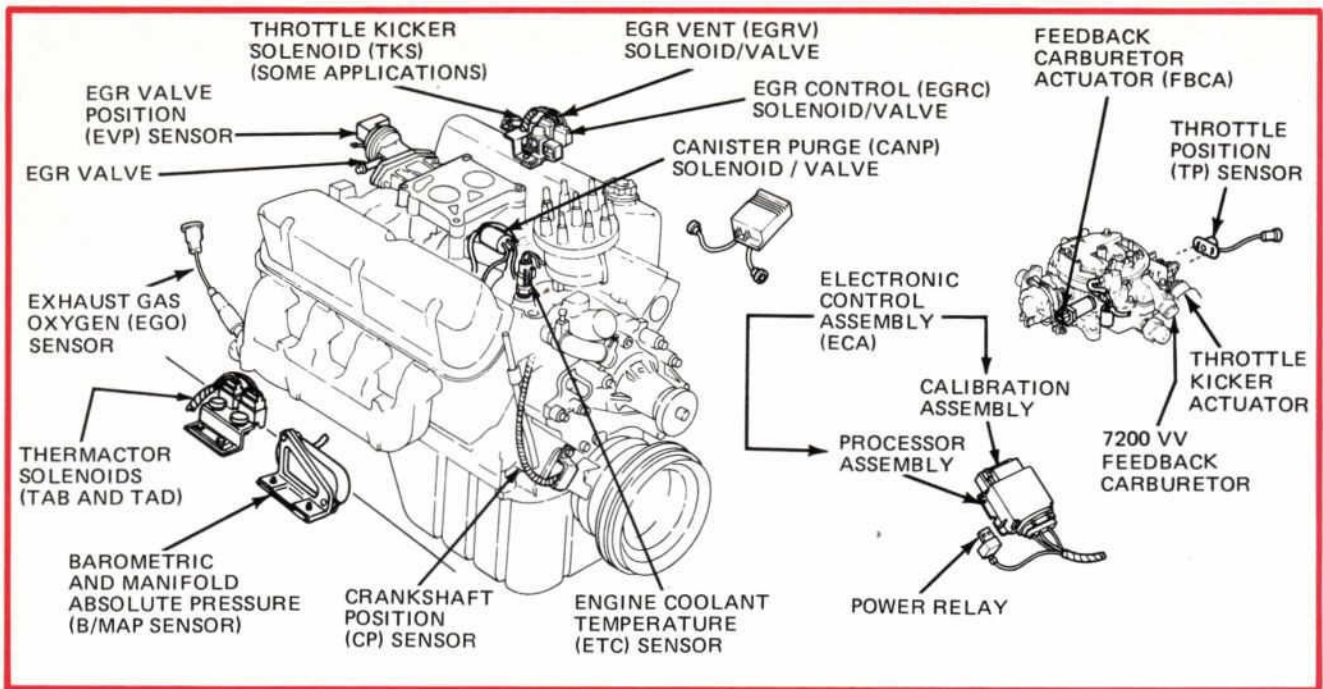
To assist the oxidation process in the rear catalyst, secondary air from an engine-driven Thermactor air pump is injected into the housing between the two sections. The flow of secondary air is controlled by the EEC module with two actuators. One actuator switches the air so it is injected either into the exhaust manifold or ahead of the rear catalyst. The second actuator bypasses the air completely under certain modes to prevent excessive catalyst temperatures.

IGNITION TIMING CONTROL

EEC II provides accurate ignition timing. Control is through an open-loop circuit versus the closed-loop, feedback circuit used with the carburetor. A crankshaft-position sensor sends a small electric pulse every 90 degrees of crankshaft

EEC-II MODULE





rotation. This pulse is processed in the EEC module to give engine rpm.

Another sensor supplies a signal that indicates intake manifold pressure. Using the engine rpm and manifold pressure inputs, the EEC module calculates the correct ignition timing requirement and signals the ignition system solid-state module to generate a spark. The accuracy of the timing reference is fixed by the design and machining of the engine components and service adjustments are not required.

The ignition timing is modulated by sensor inputs that signal starting, throttle position, engine coolant temperature and atmospheric air pressure. For example, at low coolant temperature, the system advances the spark to aid driveability.

During starting and in the event of electronic failure, ignition timing is fixed at a predetermined setting.

EGR FLOW CONTROL AND SECONDARY FUNCTIONS

The EEC II system precisely calculates the desired EGR flow based upon the engine power and speed conditions. The computer then accurately positions the EGR valve with closed-loop control by using the EGR valve sensor as a feedback signal and a dual solenoid actuator to open or close the EGR valve as necessary.

An auxiliary function controlled by EEC II is purging of the vapors in the storage canister used with the fuel evaporative emission control system. These vapors are purged by air that flows through the canister into the air-intake system. Opening or closing of the valve that connects to the purge line is under EEC II control. Under certain conditions, purging of the fuel vapors can enrich the carburetor air-to-fuel ratio. When this occurs, EEC II senses the richer fuel mixture through the exhaust manifold oxygen sensor and compensates by lowering the carburetor air-to-fuel ratio.

Another auxiliary EEC II function is to control the throttle idle position. A sensor indicates that the air conditioning (if so equipped) is on or off. If the air conditioning is on, the module signals a throttle position solenoid to increase the idle-throttle opening which compensates for the increased engine load while maintaining acceptable idle speed.

BASIC TROUBLESHOOTING

Even without special test equipment, there are a number of preliminary checks you can make in the case you have an "intermittent" or "won't start" (EEC) equipped vehicle.

NOTE: Refer to the illustrations for component identification.

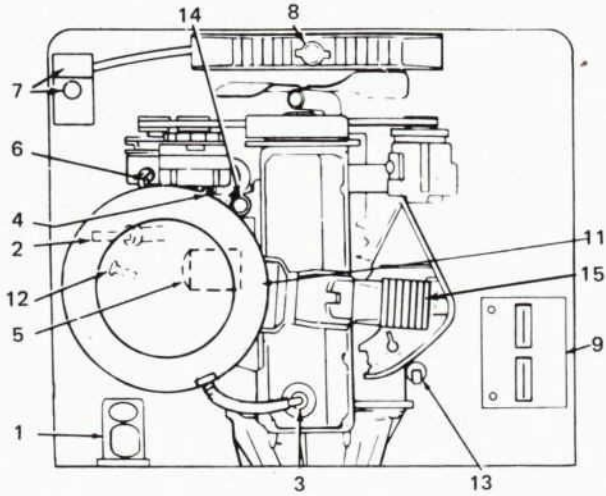
1. Perform the usual checks that you do with a conventional vehicle. Find out if there's gas. Find out whether the gas is contaminated. Check the fuel system out. Next, see if there's a spark.
2. Remove air cleaner assembly and inspect all vacuum and pressure hoses for proper connection to fittings, or any broken, cracked or pinched conditions.
3. Inspect the EEC Sub-system harness for proper connections to the EGR solenoids. Red wire to both, yellow wire to pressure and green wire to vent.
4. Check for any loose or detached connectors or broken or detached wires. Make sure all terminals are completely seated.
5. Check to see if there are partially broken or frayed wires at connectors or any shorting between wires. Also clean up any corrosion you may detect.
6. Inspect the sensors for evidence of physical damage.
7. Repair items as required; replace air cleaner assembly.
8. Check vehicle electrical system. Check for full battery charge and check battery cable connections for tightness.
9. Inside passenger compartment, check to make sure the Power Relay is securely mounted and making a good ground connection.

CAUTION:

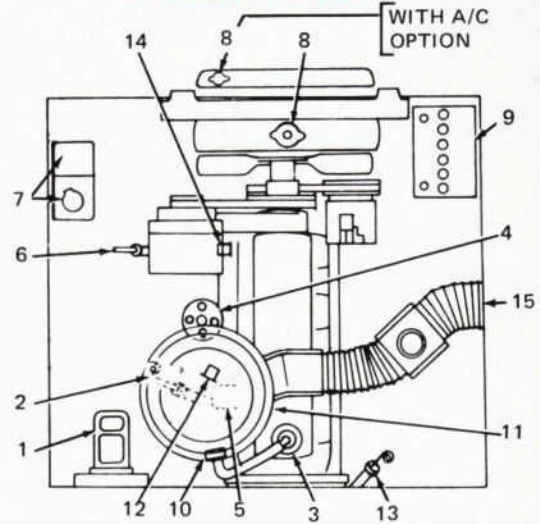
- (a) Don't try and rap on side of distributor to send a test pulse to the Electronic Control Assembly (ECA). There is nothing inside the distributor except the rotor.
- (b) The EEC System contains transistors which CANNOT TOLERATE excessive voltage surges or excessive transient voltage. Never try to jump-start the vehicle with 24-volts.
- (c) Vehicles with EEC are catalyst converter equipped. Be sure to observe all catalyst converter precautions during testing.

ENGINE COMPARTMENT SERVICE

**PINTO/BOBCAT/MUSTANG/
CAPRI
I-4 2.3L (140-CID)**



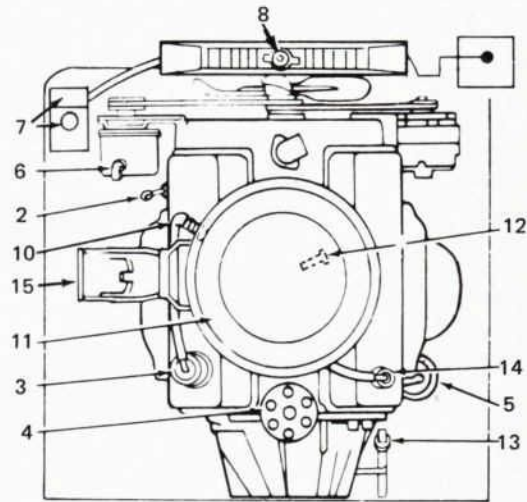
**FAIRMONT/ZEPHYR
I-4 2.3L (140-CID)**



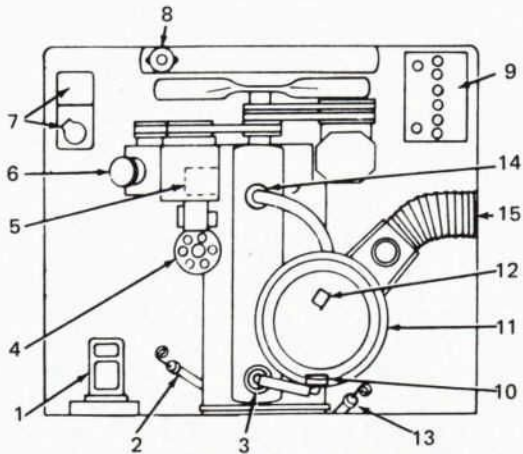
KEY TO NUMBERS

1. BRAKE MASTER CYLINDER
2. ENGINE OIL DIPSTICK
3. ENGINE OIL FILLER CAP & PCV
4. DISTRIBUTOR
5. ENGINE OIL FILTER
6. POWER STEERING RESERVOIR DIPSTICK
7. WINDSHIELD WASHER AND COOLANT EXPANSION RESERVOIR
8. RADIATOR FILLER CAP
9. BATTERY
10. PCV FILTER (IN AIR CLEANER ASSY.)
11. AIR CLEANER ASSEMBLY
12. FUEL FILTER
13. AUTOMATIC TRANSMISSION DIPSTICK
14. PCV VALVE AND GROMMET
15. CARBURETOR INTAKE AIR DUCT

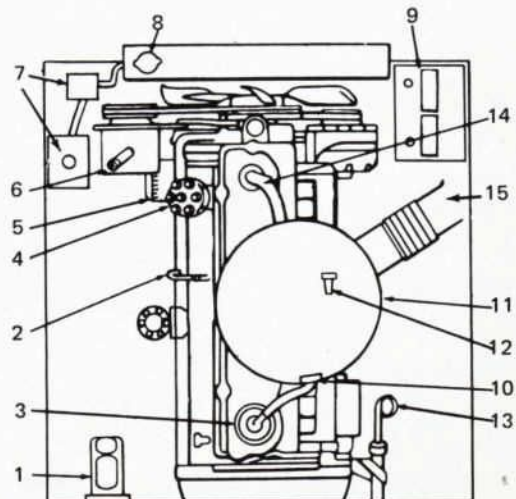
**PINTO/BOBCAT/MUSTANG/CAPRI
V-6 2.8L (171-CID)**



**FAIRMONT/ZEPHYR
I-6 3.3L (200-CID)**

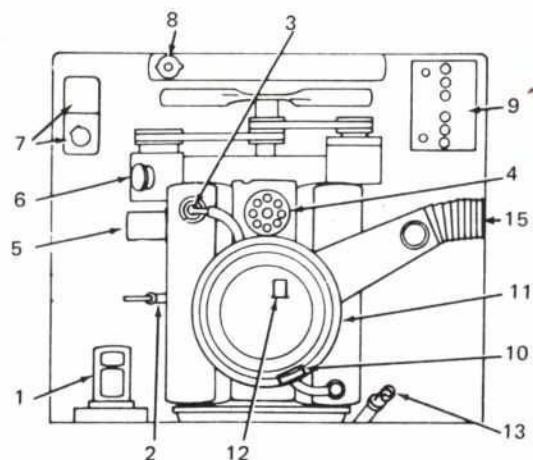


**GRANADA/MONARCH
I-6 4.1L (250-CID)**

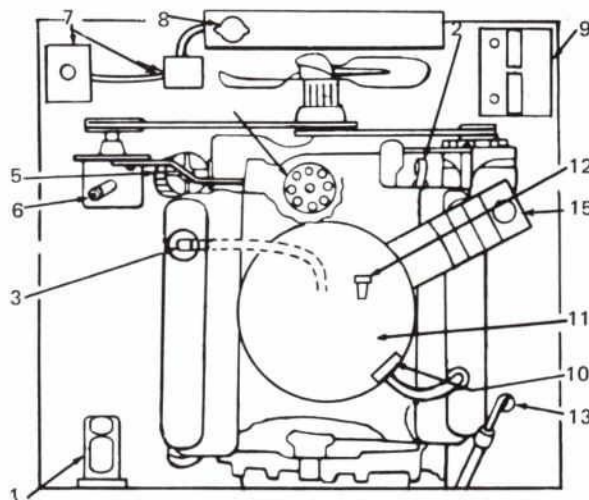


AND MAINTENANCE POINTS

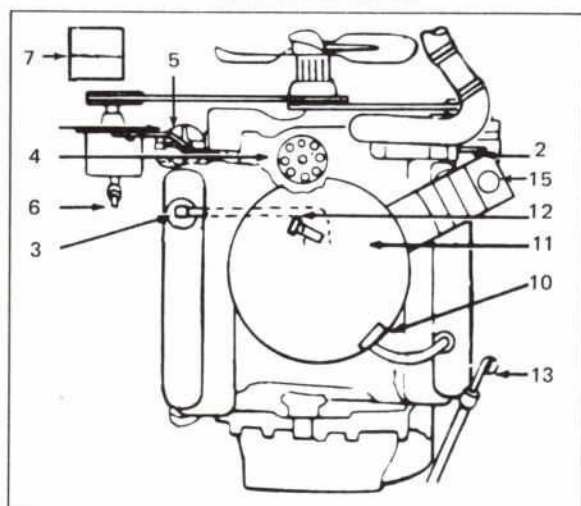
**FAIRMONT/ZEPHYR
V-8 5.0L (302-CID)**



**GRANADA/MONARCH/COUGAR/LTD II
THUNDERBIRD/MERCURY MARQUIS/
FORD LTD/VERSAILLES
V-8 5.0L (302-CID)**



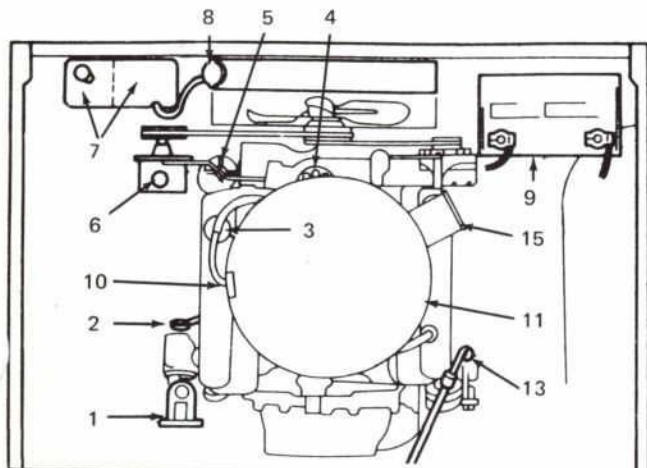
**CAPRI/MUSTANG
V-8 5.0L (302-CID)**



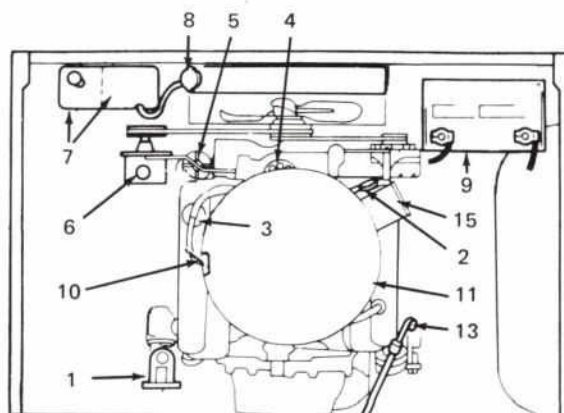
KEY TO NUMBERS

1. BRAKE MASTER CYLINDER
2. ENGINE OIL DIPSTICK
3. ENGINE OIL FILLER CAP & PCV
4. DISTRIBUTOR
5. ENGINE OIL FILTER
6. POWER STEERING RESERVOIR
DIPSTICK
7. WINDSHIELD WASHER AND COOLANT
EXPANSION RESERVOIR
8. RADIATOR FILLER CAP
9. BATTERY
10. PCV FILTER (IN AIR CLEANER ASSY.)
11. AIR CLEANER ASSEMBLY
12. FUEL FILTER
13. AUTOMATIC TRANSMISSION DIPSTICK
14. PCV VALVE AND GROMMET
15. CARBURETOR INTAKE AIR DUCT

**FORD LTD/COUGAR/THUNDERBIRD/LTD II
MERCURY MARQUIS
V-8 5.8L (351-CID)**



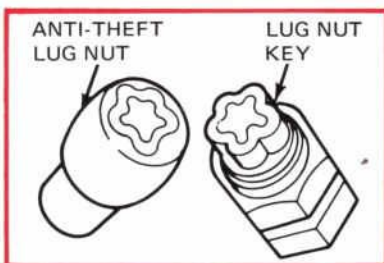
**LINCOLN-CONTINENTAL
CONTINENTAL MARK V
V-8 6.6L (400-CID)**



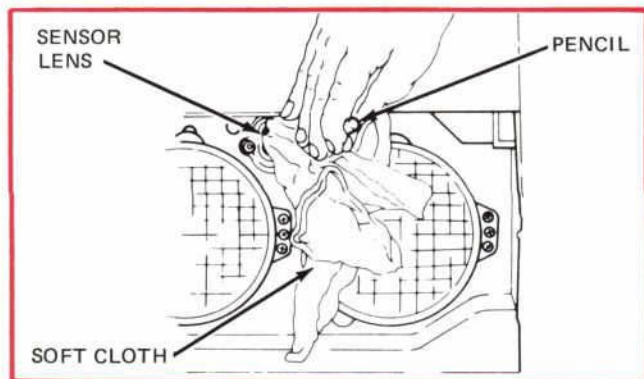
SERVICE TIPS FOR 1979 FORD AND LINCOLN-MERCURY MODELS

ANTI-THEFT WHEEL LUG NUTS

Some 1979 Ford built vehicles may be equipped with aluminum wheels and anti-theft wheel lug nuts. If the owner asks for a "Tire Rotation" or you must remove a wheel in order to perform a service operation, be sure the owner hands you the lug nut key "tool" which is placed in the glove compartment during assembly of the vehicle. Note that the lug nut key has a circular keyway that is matched to the female slot in the anti-theft wheel lug nut. When removing the lug nut, be sure the key is held square to the lug nut and not at an angle or the key and lug nut may become damaged.



CAUTION: POWER TOOLS MAY RESULT IN DAMAGE TO THE KEY AND LUG NUT.



SENSOR LENS CLEANING ▲

The Lincoln Continental and Continental Mark V equipped with an automatic dimmer control system uses a sensor lens which must be cleaned periodically in order for it to operate properly. This small lens is located under the hood and behind the headlights on the drivers' side. You can assist your customers and of course show your technical

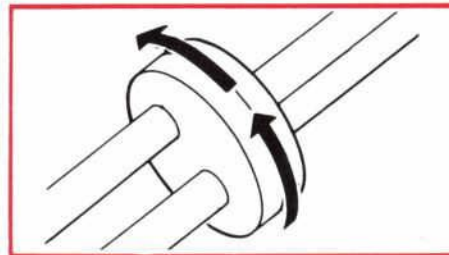
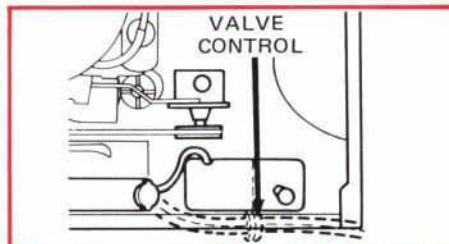
knowledge by cleaning this lens during routine service or when the car is having maintenance performed. To clean the lens, open the hidden headlight door and wipe the lens with a clean soft cloth. Use a pencil inserted into the cloth to reach the light chamber.

HIDDEN HEADLIGHT DOORS WON'T OPEN

Headlight doors on the Continental Mark V models close automatically once the engine is started. When the light switch is pulled out, these hidden doors will raise automatically. They will also raise automatically when the optional Autolamp system turns the headlights on.

However, in the event that the doors Do Not open automatically and the owner requests assistance so that he can drive at night, they can be opened manually. To do this, the manual control valve must be operated. First, lift the hood of the car and rotate the rear half of the control valve 90 degrees COUNTERCLOCKWISE. With the valve in

that position, the headlight doors should open. If necessary, you can also open the headlight doors by disconnecting the hoses from the headlight motors. The hoses are located on each motor behind the front bumper and underneath the car.



SPECIFICATIONS AND CAPACITIES ARE LISTED IN EACH OF THE 1979 FORD AND LINCOLN-MERCURY OWNER GUIDES FOR EACH MODEL. PLEASE REFER TO THE APPROPRIATE GUIDE FOR NECESSARY INFORMATION.

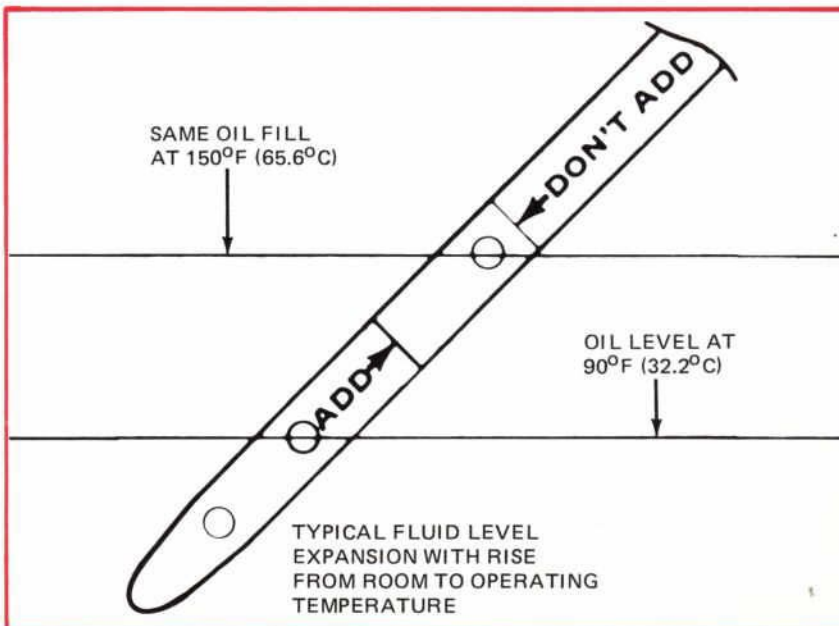
AUTOMATIC TRANSMISSION FLUID LEVEL CHECKING

All Ford-built Models — 1979

At NORMAL OPERATING TEMPERATURES of 150-170 degrees F, when the fluid feels too hot to touch comfortably, the fluid level should be between the ADD and DON'T ADD (full) marks on the dipstick.

At ROOM TEMPERATURE which is considered to be 70° to 95° F., the fluid will feel cool to the touch.

At this temperature range, the fluid level on the dipstick should be between the middle and top holes. If the vehicle has not been operated for some time and outside temperature is BELOW 70°F., the transmission fluid should be raised to room temperature by running the engine for a period of time . . . but the dipstick must still feel cool to touch when checking the level. Add or remove fluid as necessary and recheck. Under filling or overfilling the automatic transmission can cause serious internal malfunctions!



Motorcraft NEWS FOR 1979

Motorcraft-branded parts and Autolite spark plugs are original equipment-level parts designed for competitive makes as well as for Ford Motor Company vehicles.



MOTORCRAFT FILTERS ▲

Motorcraft filter and PCV valve product lines from Ford Parts and Service Division cover a wide range of replacement needs for automobiles, industrial vehicles and farm equipment.

Ford offers seven major types of oil filters that provides coverage for 85 percent of all domestic and foreign cars in the United States. Filtering requirements vary widely for the many automotive, farm, marine and industrial engines in operation, thus creating a demand for a large number of filter types and sizes.



NEW LOW MAINTENANCE MOTORCRAFT BATTERIES

A complete line of low-maintenance batteries has been added to the Motorcraft battery lineup offered by Ford Parts and Service Division. The new Motorcraft low-maintenance batteries supplement the popular maintenance-free line to provide a wide range of performance ratings to meet virtually every need.

MOTORCRAFT V-BELTS AND RUBBER HOSES

Reliable and durable Motorcraft V-belts and rubber hoses are carefully engineered and manufactured to Ford Motor Company specifications to provide long service life and low lifetime operating costs. V-belts and hoses are tailored to a wide variety of automotive, industrial and commercial applications.



MOTORCRAFT ELECTRICAL PARTS CATALOG

One of the automotive industry's broadest lines of electrical parts is featured in the "Complete Catalog of Motorcraft Electrical Parts" from Ford Parts and Service Division. This publication contains information on the following lines of quality Motorcraft electrical parts: air conditioning, alternator and starter assemblies, electronic ignition, electrical switches, emission controls, marine, import vehicles, older models, farm and industrial, windshield washer pumps, wire and cable, and parts for bus, heavy and light trucks. Contact your local Motorcraft supplier for your free copy.



(Continued on next page)



MOTORCRAFT "CAPS AND STATS" ▲

Thermostats, radiator pressure caps, oil filter caps, fuel tank caps and thermostat gaskets comprise just one of 10 product lines from Ford Parts and Service Division. Stats, caps and gaskets are applicable for all Ford-manufactured cars, trucks and engines and a significant number of competitive domestic and foreign makes as well.

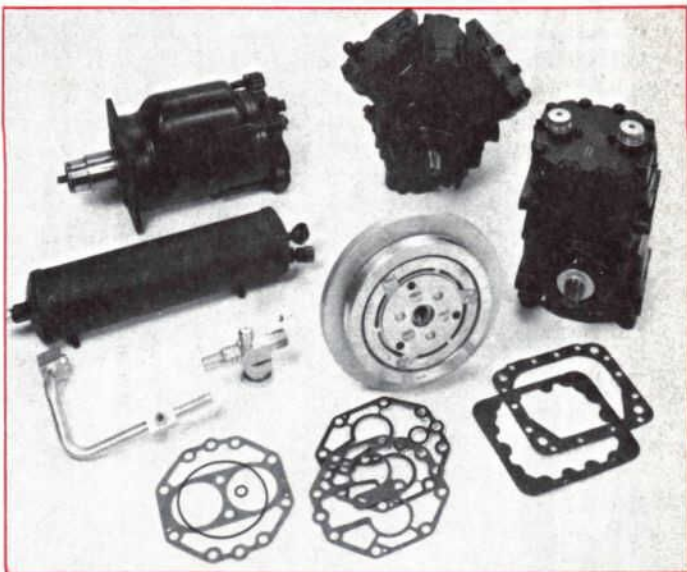
MOTORCRAFT CARBURETOR TUNE-UP KIT

Motorcraft offers a complete line of carburetor tune-up kits for most cars and light trucks on the road today. Other Motorcraft kits are available for trucks, tractors, industrial equipment, small engines, marine engines and snowmobiles. Easy-to-follow instructions are included with each kit. Uniformly sized cartons and easy-to-read part numbers simplify stocking and order filling. Carburetor tune-up kits are available through Ford and Lincoln-Mercury dealers and independent Motorcraft distributors.



MOTORCRAFT AIR CONDITIONER PARTS

Motorcraft-branded air conditioner parts are one of 10 product lines from Ford Parts and Service Division. The line covers virtually 100 percent of Ford air-conditioning systems and an extensive number of non-Ford systems as well, including those marketed by independent suppliers.

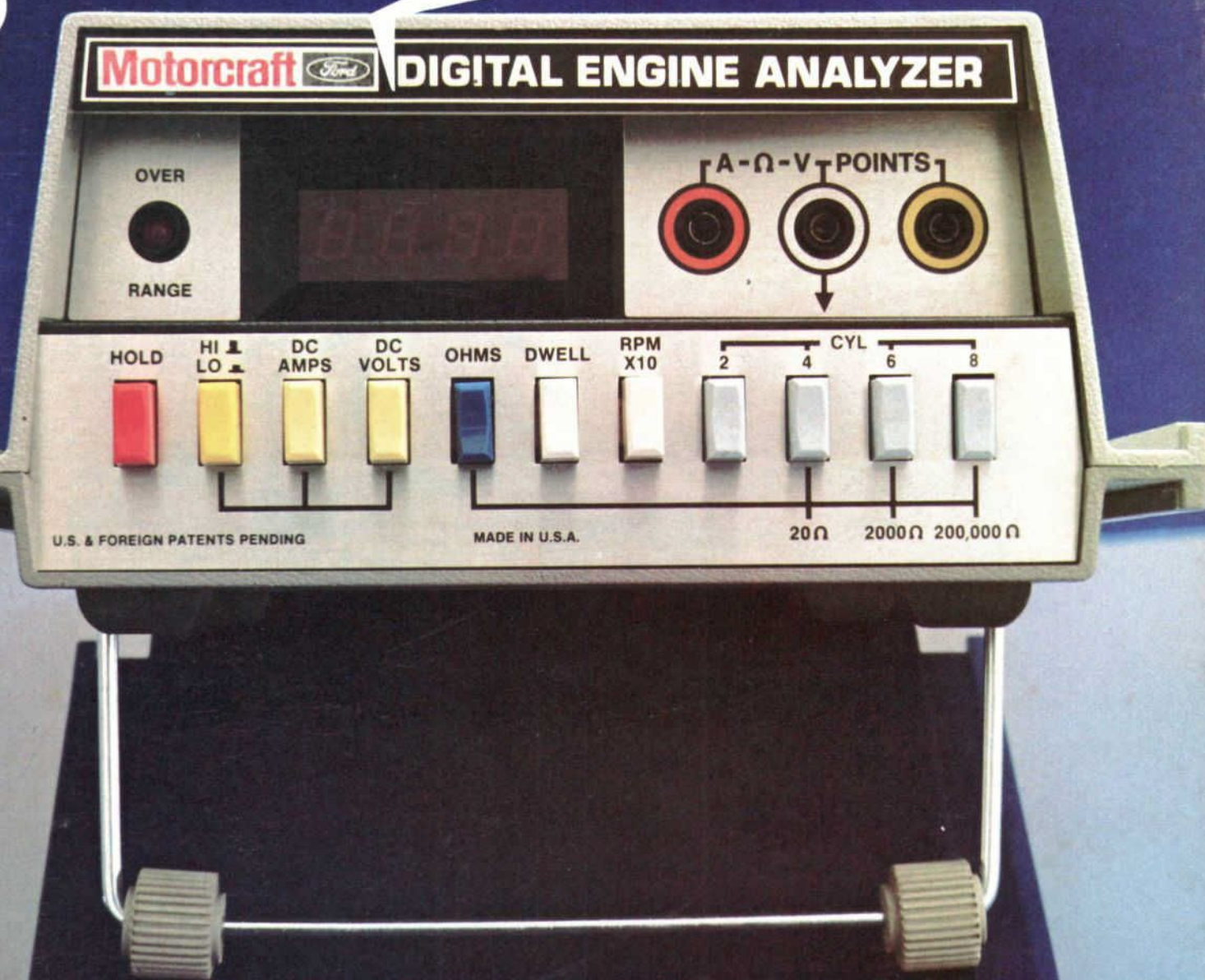


MOTORCRAFT WIRE AND CABLES

The Motorcraft wire and cable line from Ford Parts and Service Division features new Dura-Spark 8-mm spark plug wires for all Ford and Lincoln-Mercury vehicles. The line also includes standard spark-plug wire sets, battery and starter cables, bulk wire, and terminal connectors and crimp tools. It covers most domestic and import vehicles, heavy-duty trucks, off-road equipment and stationary engines.



The Wizard of ohms.



**(as well as AMPS, VOLTS,
RPM and DWELL).**

We call it the Motorcraft Digital Engine Analyzer. Not just new, it's better—a better method of performing all important basic engine diagnostic functions.

Large LED readout displays three or four characters with floating decimal for accuracy never before possible. The heart of this fine instrument is 100% solid state circuitry with integrated circuits, opto electronics and precision integrated resistor networks.

Quick touch color coded push buttons select five basic test functions: RPM, DWELL, VOLTS/POINTS resistance, AMPS and OHMS. High and low ranges are included for AMPS and VOLTS functions. And the unit works on any 2, 4, 6 or 8 cylinder or rotary engine with conventional or breakerless, electronic ignition systems, 12 volt

negative or positive ground. That's versatility!

The Motorcraft analyzer is built to take the rough and tumble life of a shop. Electronic circuitry is protected against incorrect connections and accidental overrange inputs. All protected by a rugged case with built-in carrying handles. Accessories include a plug-in test harness and battery post ammeter shunt plus complete illustrated instructions.

Check out this versatile instrument for yourself. It's now available at all participating Motorcraft suppliers for your purchase of Motorcraft electronic parts. We think it will make your diagnostic work a whole lot easier.

Motorcraft 

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**DIAGNOSTIC TESTER
T79L-50-EEC-II
\$990 (excludes freight)**

**DIGITAL-VOLT-OHM METER
T79L-50-DVOM
\$395 (excludes freight)**

CARS ARE CHANGING FAST

**SO'S CAR LANGUAGE!
ARE YOU UP
ON YOUR
STOICHIOMETRY?***

A "second generation" Electronic Engine Control System (EEC-II) is offered on the 5.8 liter engine for the 1979 standard size Mercury in all 50 states and Ford in California.

A new EEC-II electronic tester and a compatible Digital Volt-Ohm Meter with added features combined with an illustrated flow chart procedure is available for servicing the EEC-II and is required to keep pace with the complex EEC-II system. The new tester contains electronic circuits to monitor specific operation such as EEC computer timing, duty cycle, and sensor voltage. In addition, several banks of light-emitting diodes (LED's) will indicate the On/Off status of specific components.

For additional information and/or order submission for the EEC-II Tester (payment in advance is required) please contact:

Equipment Sales and Marketing Department
Ford Parts and Service Division
3000 Schaefer Road
Dearborn, Michigan 48121
or call (313) 322-7804

**STOICHIOMETRY: A new "buzz" word you'll be hearing more and more of. It means maintaining continuous control of the air/fuel ratio to provide the chemically correct ratio of hydrogen, oxygen and carbon.*