

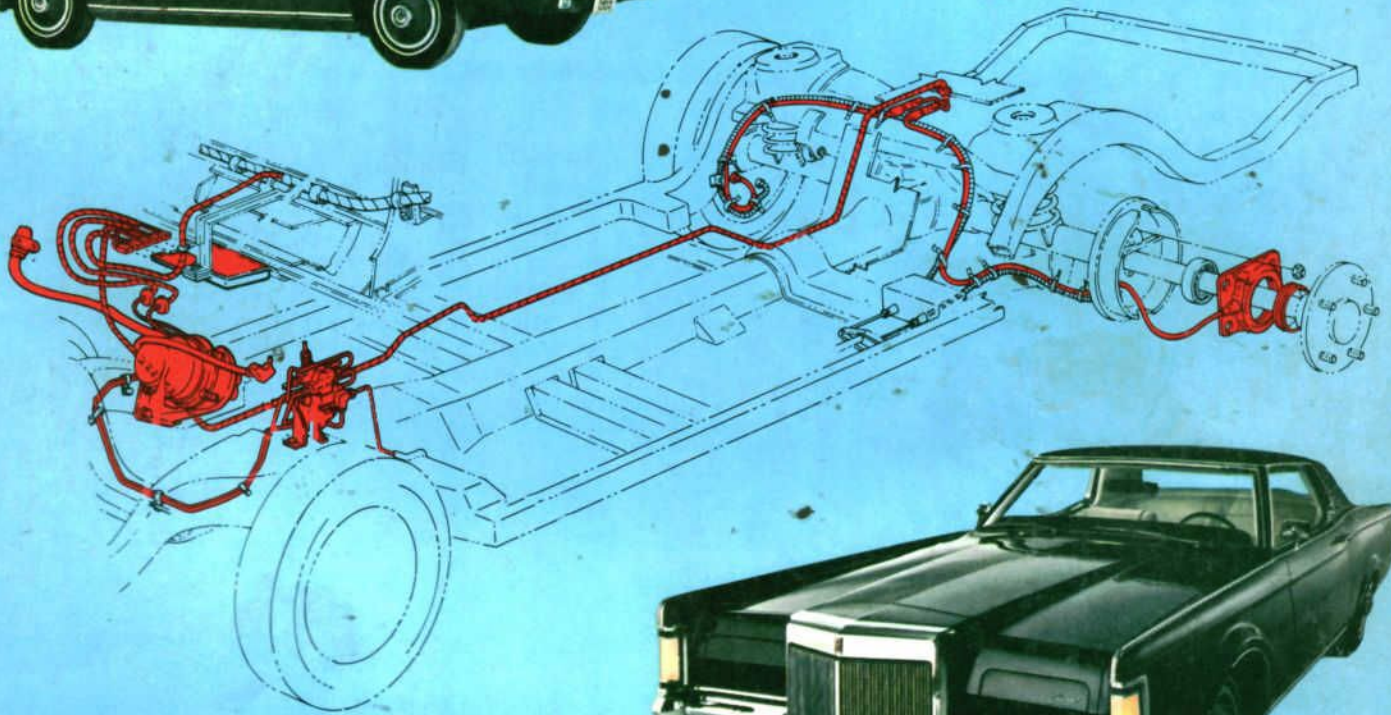
SHOP TIPS

VOL. 7, NO. 8

APRIL, 1969

FROM

Autolite



Technical parts and service information published by the Autolite-Ford Parts Division and distributed by Ford and Lincoln-Mercury dealers to assist servicemen in Service Stations, Independent Garages and Fleets.

ALL ABOUT FORD'S NEW "SURE-TRACK" BRAKE SYSTEM FOR CONTINENTAL MARK III AND THUNDERBIRD PLUS . . . WHY "TYPE F" FLUID MUST BE USED IN FORD AUTOMATIC TRANSMISSIONS

SEE SPECIAL INSERT . . . ON 12 FOR PRICE OF 9 SHOCK ABSORBER OFFER!

IN THIS ISSUE

TROUBLESHOOTING THE NEW

"SURE-TRACK" BRAKE SYSTEM	2-8
Description of Operation	2-4
Trouble Diagnosis	5-6
Diagnosis Guide	7-8

ADVERTISING INSERT

TECHNICAL SERVICE BRIEFS

IMPORTANCE OF USING "TYPE F" FLUID IN FORD AUTOMATIC TRANSMISSIONS	10-13
AUTO TECH	14-15
AUTOLITE FILTER RADIO-RACK	16

Be sure and file this and future bulletins for ready reference. If you have any suggestions for additional information that you would like to see included in this publication, please write to: Autolite-Ford Parts Division of Ford Motor Company, Merchandising Services Dept., P.O. Box 3000, Livonia, Michigan 48151.

The description and specifications contained in this book were in effect at the time the publication was approved for printing. The Ford Motor Company, whose policy is one of continuous improvement, reserves the right to discontinue models at any time, or to change specifications or design without notice and without incurring obligation.



COPYRIGHT © 1969 FORD MOTOR COMPANY
DEARBORN, MICHIGAN

DESCRIPTION

In October, the Continental Mark III and Thunderbird introduced an optional braking system that takes some of the panic out of panic stops. Trade-named "Sure-Track," it's a system of sensors, valves, actuator and a tiny computer working together to help keep the rear end of the vehicle tracking the front by controlling rear-wheel brake locking.

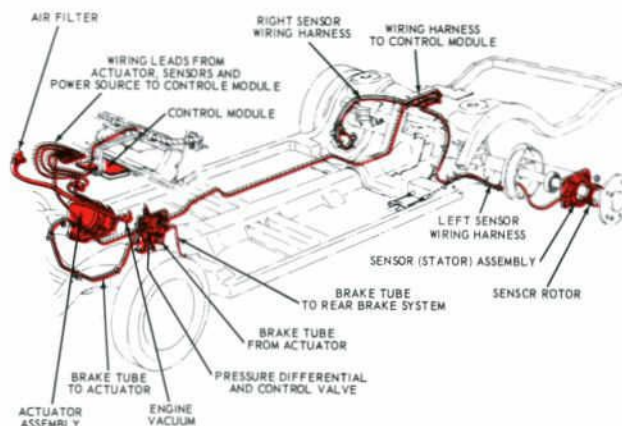
After initial research by Ford Engineering Staff, skid control became a team effort at Ford. The system was developed by Car Systems Research with assistance from the Car Chassis Design and Chassis Systems Engineering offices.

The situation facing the world's first "thinking" brake system is this:

The rate of deceleration of a rotating wheel is measured in terms of "slip" relative to the vehicle speed. If the car is going 50 miles per hour and the wheel with brakes applied is going 40, there is a 20 per cent slip. It is in the 10-to-20 per cent range that maximum braking is accomplished—just short of skidding or "locking up" the wheel.

Ideally, the 10-20 per cent relationship of wheel slip to vehicle velocity should be maintained throughout the range of speed as the vehicle slows down to a stop. This relationship can be difficult to hold! In panic situations, or on extremely slick surfaces, the frictional force available between the tire and the road surface is not sufficient to sustain traction, and the wheels begin to skid.

The role of "Sure-Track" is to maintain the desired slip electronically. It does this by automatically "pumping" the brakes in cycles as rapid as 4 times per second when the rear wheels begin to lock up under heavy braking. By this rapid application and release of the brakes, the locking point is never reached, or is reached and released so fast that the wheels do not stop turning.



SENSORS (1) located at each rear wheel detect the velocity of the rear wheels and transmit it to the control module, a computer the size of a paper back book that's hidden under the car's glove compartment.

THE COMPUTER (2) determines the optimum braking cycle and signals the vacuum-powered brake actuator in the engine compartment.

THE ACTUATOR'S (3) valves regulate the pressure of brake fluid to the rear wheels. The rapid pumping takes place only when the driver's foot applies full pressure to the braking system and the brakes try to lock, as during a panic stop.

'SURE-TRACK' BRAKE SYSTEM

SENSORS

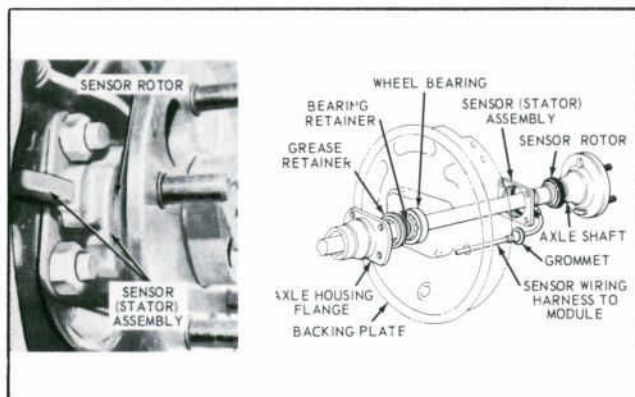


Figure 1—SENSOR COMPONENTS

A mechanically-driven electro-magnetic sensor is located at each rear wheel. Each sensor consists of a rotor and stator assembly. The rotor is a steel ring that is pressed on the rear axle shaft outboard of the wheel bearing and just behind the axle shaft flange. The stator assembly contains a ring-shaped permanent magnet and a coil assembly. This assembly bolts to the brake backing plate. Teeth or segments protrude from the outer circumference of the rotors, and from the inner circumference of the stators. A slight air gap exists between the teeth of the rotor and those of the stator.

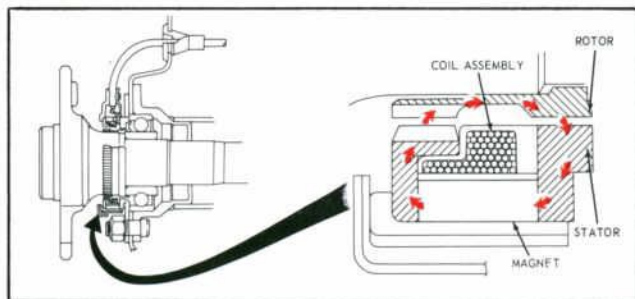


Figure 2—SENSOR MAGNETIC CIRCUIT

When the axle shaft turns, the teeth of the rotor rotate past the teeth of the stator. When the rear wheels rotate, the teeth cut the magnetic lines of force, and an electric current is set up on the coil. AC voltage impulses are generated in proportion to the speed of the rear wheels. Two wires from each of the sensors conduct the sensor impulses to the control module.

CONTROL MODULE

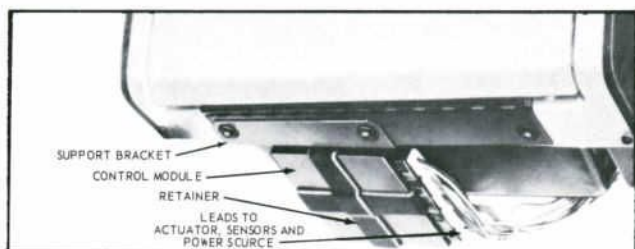


Figure 3—Control Module

The electronic control module is mounted under the glove box in the passenger compartment. The module is the component that controls the action of the "Sure-Track" brake system. The module receives the AC current signals from the sensors and continually monitors rear wheel speed. It operates on the sum of the signals from both rear wheels. When the sum of the signals drops abruptly below a predetermined level, due to rapid deceleration, the module sends an electrical signal to the actuator solenoid to release the rear brakes. Then, when the rear wheel acceleration increases again, the module shuts off the electrical signal and de-energizes the solenoid, allowing the brakes to re-apply. This cycle of release and apply continues until the driver releases the brakes past the "full pressure" point, or until the vehicle slows to less than 4 MPH.

ACTUATOR

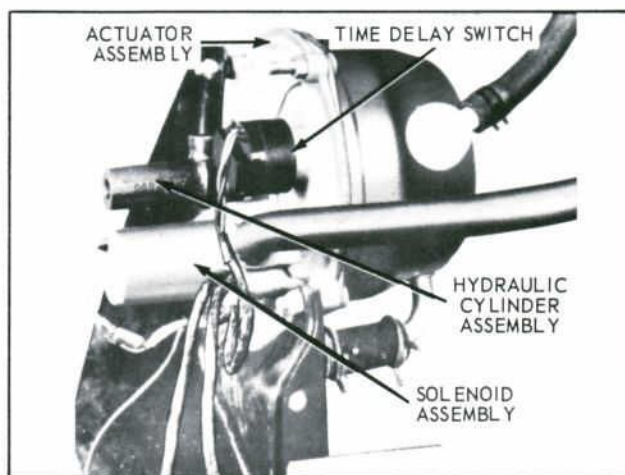


Figure 4—Actuator Assembly

The vacuum-operated actuator is mounted on the inboard side of the right frame side-rail under the toe board. This component operates the "Sure-Track" brake system. The actuator resembles a brake booster and is divided into two chambers by a diaphragm with a spring positioned ahead of the diaphragm.

In addition, the actuator contains a hydraulic cylinder assembly, a solenoid assembly and a time delay switch. These parts function together to regulate pressure to the rear brakes upon command from the control module.

BRAKE SYSTEM WARNING LIGHT

A brake system warning light is located in the right side of the "ALT-TEMP" gauge pod on the instrument panel. It is a combination warning light for the dual braking system, and for the "Sure-Track" braking system. Illumination of the word "BRAKES" indicates that a malfunction has occurred in the "Sure-Track" system, or that the brake system has sustained a loss of hydraulic pressure to either the front or rear brakes. Any indication of malfunction requires that the brake system receive immediate mechanical service.

AS A TEST, the "BRAKES" warning light will light when the ignition key is in the starting position, and will go out when the key is released to the normal "ON" position.

ALL ABOUT THE NEW

CONTROL SYSTEMS

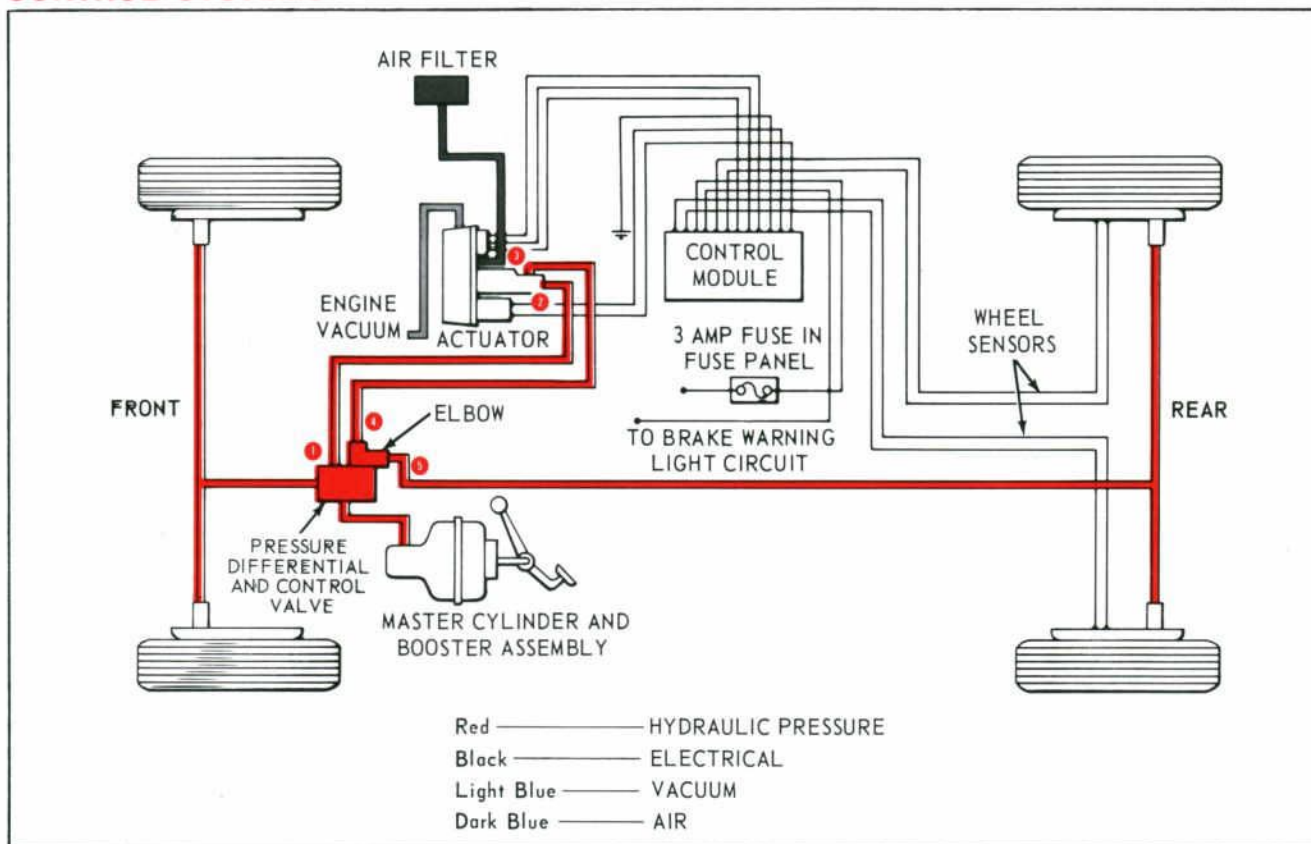


Figure 5—Control Systems Schematic

HYDRAULIC PRESSURE SYSTEM

The "Sure-Track" brake system actuator is connected to the rear brake system between the pressure differential valve and the rear brake hydraulic system. An elbow is mounted on a bracket attached to the pressure control valve body to facilitate this installation. One end of a hydraulic brake tube is connected to the pressure differential valve assembly rear brake system outlet port. (1) This tube is connected to the inlet part of the outer end of the actuator hydraulic cylinder assembly. (2) The return tube is connected at the actuator outlet port, (3) then routed back and connected to the inlet port of the elbow. (4) Another hydraulic tube is routed from the outlet port of the elbow, (5) to the rear braking system.

ELECTRICAL CONTROL SYSTEM

Electrical power is provided to the "Sure-Track" brake system when the ignition switch is turned to any position except "Off" and "Accessory." Circuit protection is provided by a 3-amp fuse located in the fuse panel, which is accessible from the glove compartment.

CAUTION: Do not use a fuse of higher rating than a 3-amp (8AG3) to prevent damage to the control module.

NOTE: The 3-amp fuse is identified by a red cover which is installed over the fuse.

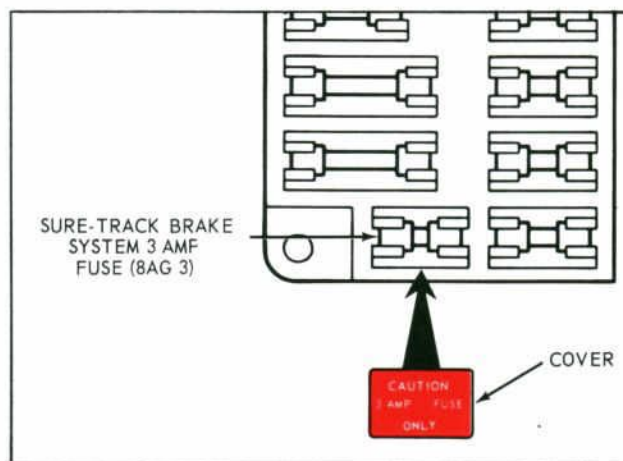


Figure 6—Fuse Panel

VACUUM AND AIR CONTROL SYSTEMS

Vacuum for operation of the actuator is supplied through a vacuum hose connected at the rear of the engine intake manifold. Atmospheric air pressure for the actuator is provided through a hose connected to an air filter mounted on the right hood hinge bracket. The vacuum and air pressure hoses are routed down from the engine compartment to the actuator. A vacuum check valve is installed at the actuator.

"SURE-TRACK" BRAKE SYSTEM

TROUBLE DIAGNOSIS

When a brake system malfunction on vehicles equipped with the "Sure-Track" brake occurs, the "BRAKE" warning light will be illuminated on the instrument panel. Since the failure could be in the brake hydraulic system or in the "Sure-Track" system, it is necessary to find out which system is causing the indication. This can be determined by disconnecting the switch plug from the brake hydraulic system differential switch. If the warning light is extinguished when the plug is disconnected, the failure is in the brake hydraulic system—either front or rear. If the light remains on, the trouble is in the "Sure-Track" brake system, and the following test procedure should be followed to isolate the problem to the wiring harness or to a particular component of the "Sure-Track" system.

FUNCTIONAL TESTING

After it has been determined that the difficulty is in the "Sure-Track" brake system, the engine idle speed, vacuum level and standard brake system must be verified to be within the limits of the service specification prior to proceeding with standard testing and diagnosis.

The following functional check of the "Sure-Track" brake system and hydraulic system may be used to assist in diagnosis, and should be made after repairs, to verify correct system operation.

1. Turn ignition key "ON", listen for solenoid click, and actuator cycle.

NOTE: It may be necessary to run engine prior to performing the check to assure a vacuum supply in actuator.

2. Position the vehicle on a hoist and raise the rear wheels to clear the floor.
3. Start the engine and warm up until normal operating temperature is reached.
4. Place the transmission selector in the "Drive" position and accelerate to approximately 25 to 30 mph. It may be necessary to increase the engine speed slightly to obtain a sufficient cycling of the "Sure-Track" braking system for easy observation of its operation. Apply the brakes quickly and firmly and observe the rear wheels.

If the "Sure-Track" brake system is functioning correctly, it will cycle 5 or 6 times or cycle until the brake pedal is released.

NOTE: Both wheels must be turning during this test, or the system will not operate.

5. Using the data thus gathered, and any other indications shown by examination of the system, proceed to the diagnosis charts on the following pages.

A SPECIAL TOOL...

... will be required to remove the connectors from the control module for testing, as described in the following pages. This tool can be fabricated as shown below, allowing easy removal of the connectors without damage to the locking tab.

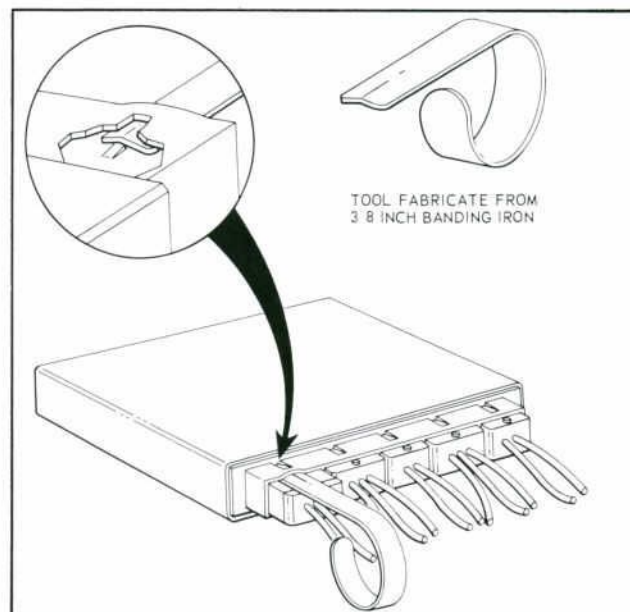


Figure 7—Harness Connector Removal Tool

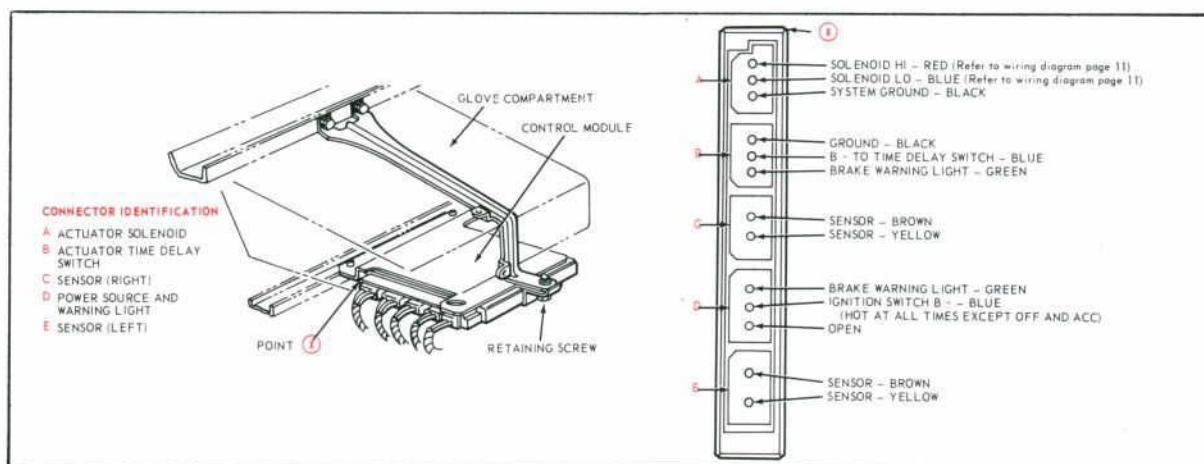


Figure 8—Control Module and Connector Identification

DIAGNOSING THE NEW

TEST PROCEDURES (Referred to in Diagnosis Guide)

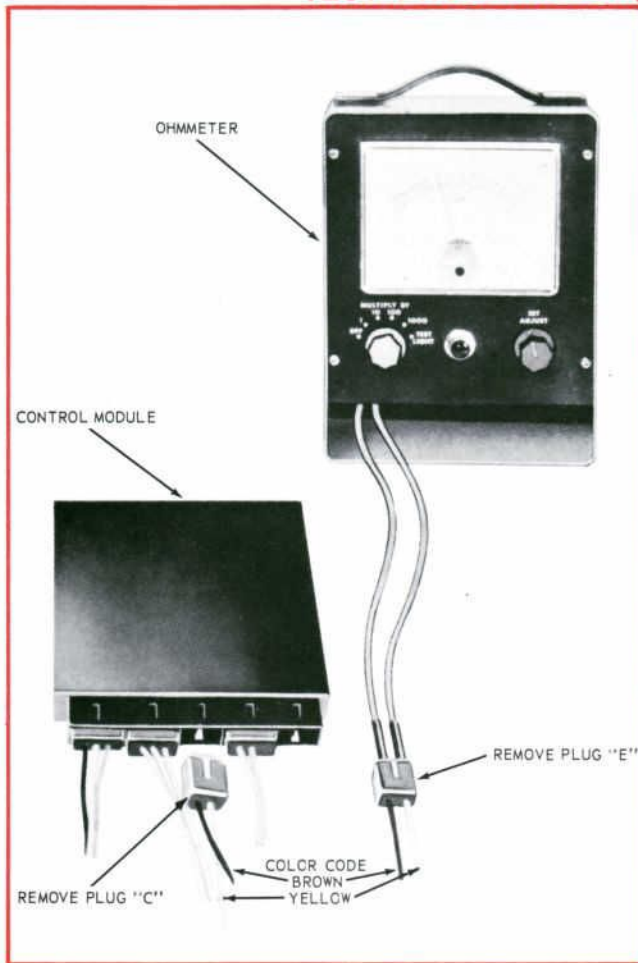


Figure 9—Testing Sensors

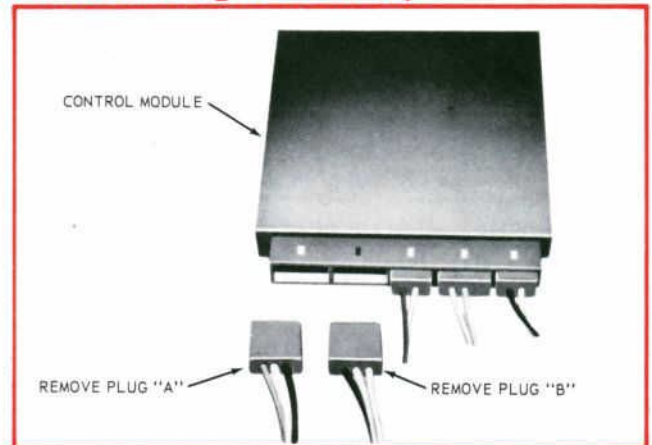


Figure 10—Testing Module

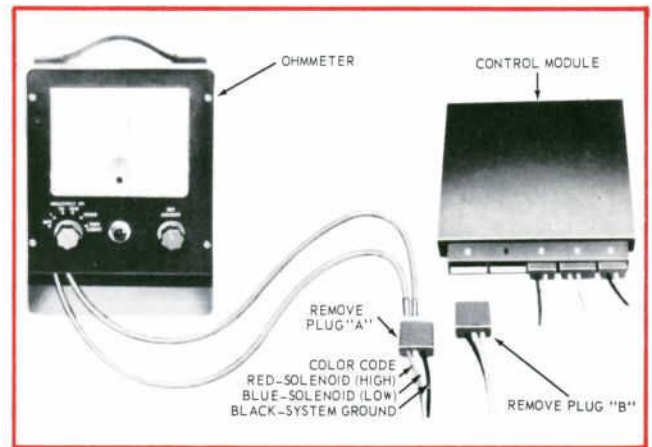


Figure 11—Testing Solenoid Circuit Resistance

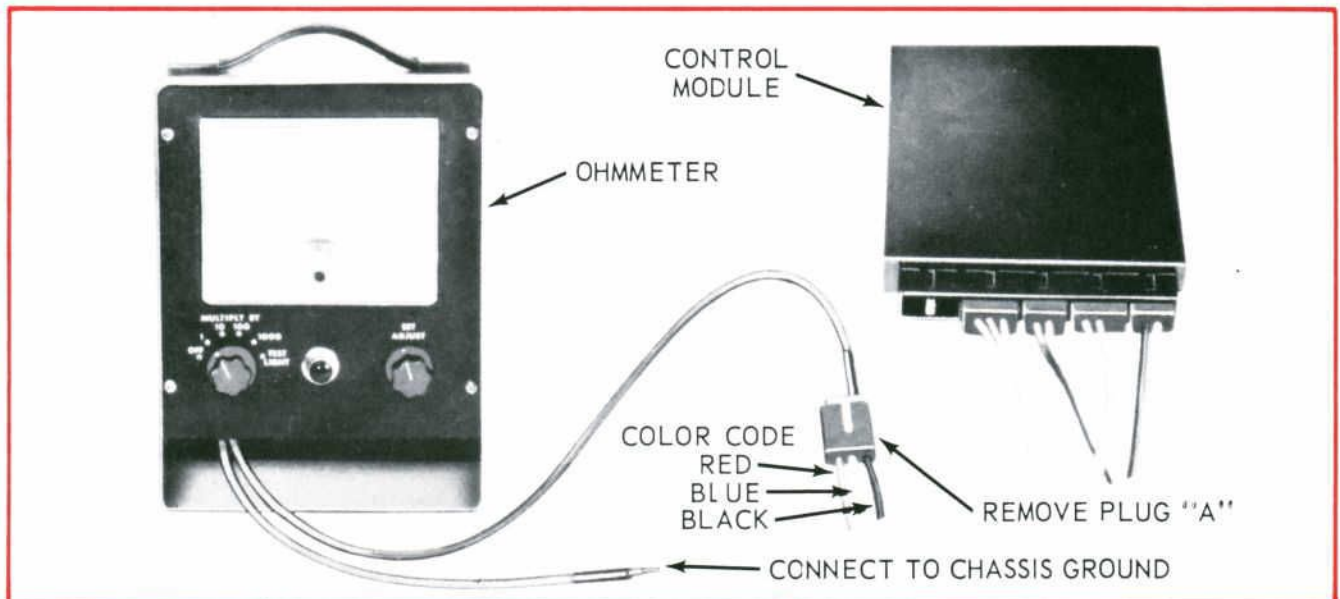


Figure 12—Testing Module and System Ground

"SURE-TRACK" BRAKE SYSTEM

DIAGNOSIS GUIDE

• BRAKE WARNING LIGHT ON

CONDITION	CAUSE	CORRECTION
A. Actuator cycles on start-up, but does not cycle during maximum braking condition.	Module or sensor malfunction.	<p>Remove plugs "C" and "E" from module (Color Code: Yellow-Brown). Refer to Figure 8. Connect an ohmmeter between the two contacts of either sensor lead. Refer to Figure 9. Resistance should be 2000 ± 500 ohms. Repeat check for other sensor lead. If resistance is not within limits, disconnect sensor leads from floor pan wiring harness above the #4 crossmember. Check resistance of sensor lead wires from floor pan harness to sensor assembly at rear wheel. Move wires in all directions during test to check for internal break. If resistance is within specifications, problem is in wiring harness between sensor wiring and module. Repeat check for other sensor lead. If resistance is not 2000 ± 500 ohms, remove rear wheel and inspect sensor cables for physical damage. Replace the sensor if necessary.</p> <p>If wiring harness resistance is within specifications substitute a new module and perform functional check.</p> <p>CAUTION: An .082-.086 inch diameter ohmmeter test prod, short rod or Molex connector pin should be used to complete test head connections. Larger diameter rods will enlarge the plug connectors which will result in loose connections at the module.</p>
B. Actuator cycles on start-up. System functions but will not cycle down to 10 mph.	Faulty sensor assembly and/or sensor wire.	Refer to correction "A" above.
C. Fuse burns out. System does not cycle on start-up or during maximum braking condition.	Actuator wiring, actuator or module faulty.	<p>Remove plugs "A" and "B" from module. Refer to Figures 8 and 10. Replace fuse in fuse panel. Turn ignition key to the "ON" position. If fuse blows again, replace module.</p> <p>If fuse does not blow connect an ohmmeter between the solenoid (high) and solenoid (low) plug contacts. See Figure 11. Resistance should be 6 ± 2 ohms. If resistance is lower than 4 ohms, inspect the solenoid wires for a grounded condition to the floor pan or body. If wiring is satisfactory replace the actuator assembly. If resistance is higher than 8 ohms inspect solenoid wiring for an open condition. If wiring is satisfactory replace the actuator assembly.</p> <p>CAUTION: Calibrate ohmmeter to proper scale to assure accurate reading.</p>
D. Fuse is not blown. Actuator does not cycle on start-up or during a maximum braking condition. (Also see Brake Warning Light "OFF" condition "B".)	<p>Loose or broken connection in module plug leads.</p> <p>Faulty module or loose ground connection.</p> <p>Module component malfunction.</p> <p>Actuator component malfunction.</p>	<p>Replace any broken leads. Crimp sleeves at ends of module leads in plugs "A" and "D." (Color Code: Plug "A" Red-Blue-Black, Plug "D" Green-Blue.)</p> <p>Remove plug "A" (Color Code: Red-Blue-Black) from module. Refer to Figure 8. Connect an ohmmeter between system ground plug sleeve (Black) and suitable chassis ground. (Refer to Figure 12.) If ohmmeter reading is less than one ohm, replace module and recheck system for normal operation. If reading is greater than one ohm, replace or repair the system ground wire.</p> <p>Replace module and perform functional check.</p> <p>Replace actuator and perform functional check.</p>

DIAGNOSING THE NEW "SURE-TRACK" BRAKE SYSTEM

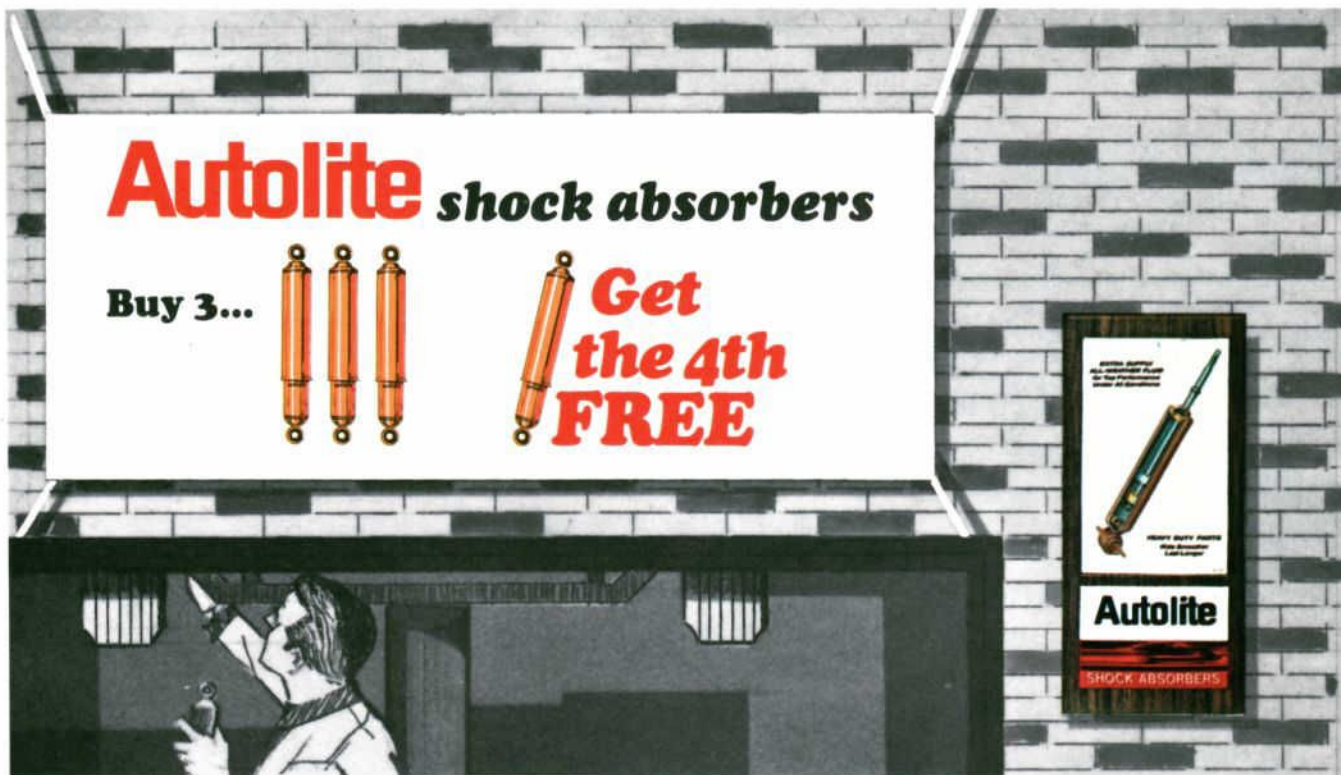
DIAGNOSIS GUIDE (Continued)

• BRAKE WARNING LIGHT ON (Continued)

CONDITION	CAUSE	CORRECTION
E. Intermittent brake warning light. System cycles while driving over rough road.	Broken wire or loose connection in sensor cable(s).	Follow the procedure outlined under correction "A" above.
F. No rear brakes.	Faulty module. Faulty actuator component or hydraulic leak.	Substitute new module. Replace actuator or correct hydraulic leak.

• BRAKE WARNING LIGHT OFF

CONDITION	CAUSE	CORRECTION
A. System operates during normal braking condition. (False cycling.)	Module component failure. Sensor assembly and/or cables and leads defective. Weak sensor magnet, broken teeth or cracked rotor or stator.	Install substitute module and perform functional check. If still not satisfactory, disconnect left sensor lead and test on hoist. Repeat test with right sensor disconnected and left sensor lead connected. Refer to Section 1, Correction "A" for additional sensor tests.
B. Fuse is blown. Actuator does not cycle on start-up or during a maximum braking condition. (Also see Brake Warning Light "ON" condition "D.")	Loose or broken connection in module plug leads. Faulty module or loose ground connection.	Replace broken leads. Crimp sleeves at ends of module leads in plugs "A" and "D." (Color Code: Plug "A" Red-Blue-Black, plug "D" Green-Blue.) Remove plug "A" (Color Code: Red-Blue-Black) from module. Refer to Figure 8. Connect an ohmmeter between system ground plug sleeve (Black) and suitable chassis ground. Refer to Figure 12. If ohmmeter reading is less than one ohm, replace module and recheck system for normal operation. If reading is greater than one ohm, replace or repair system ground wire.
C. No rear brakes.	Module component failure. Actuator component failure.	Replace module and perform functional check. Replace actuator and perform functional check.
D. Actuator cycles slowly during a maximum braking condition.	Faulty module. Faulty actuator. Plugged actuator air filter or pinched actuator air or vacuum hose. Faulty actuator.	Replace module. Replace actuator. Check and clean filter or air or vacuum hoses as required. Replace actuator.



*Here's Your Chance To Participate
In A Sales Making*

SHOCK ABSORBER SPECIAL!

**CASH IN BIG ON OUR SPECTACULAR SPRING
AUTOLITE SHOCK ABSORBER PROGRAM!**

Now is the perfect time to start a shock absorber promotion: Owners are doing more driving . . . they're safety conscious . . . and this hard-hitting "4 for the price of 3" sales offer lets you meet *and beat* all competition!

Every sale nets you *full profit* on all 3 shock absorbers. Your sales and profits will soar when you advertise this free offer to your customers!

Get All The
Details on This Offer
Which Includes a

**FREE
MERCHANDISING
KIT**

At Our
Parts Counter!

Here's How You Can Make This Tremendous "4 For The Price Of 3" Offer And Still Make Your Full Profit Margin!

We'll Help You Stock Up On Auto-Flex Shock Absorbers At A Fraction Of Your Regular Cost!

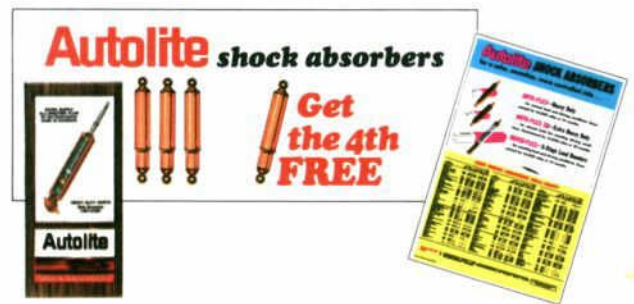
When you select any 12 of the Auto-Flex Heavy Duty Shock Absorbers that best fit your customer needs . . . you'll pay for only 9! . . . at your regular cost . . . the other 3 Auto-Flex Heavy Duty Shock Absorbers are yours ABSOLUTELY FREE!

THAT'S RIGHT: Order any 12 Autolite Auto-Flex Shock Absorbers . . . and pay for only 9 at your regular price! YOU GET 3 FOR FREE!



We'll Help You Bring In The Customers! With This FREE Auto-Flex Merchandising Kit!

A complete merchandising kit with a colorful 7-foot by 3-foot driveway banner . . . three-dimensional self-adhesive shock absorber sign . . . 1969 Autolite Shock Absorber Application Wall Chart . . . and a special order form for free newspaper ad mats.



Make Extra Sales With This "Buy 3—Get The 4th FREE" Promotion Today! Use This Handy Order Form Now at Our Parts Counter!

Use These Money-Making Selling Tips...

BE ALERT—When you have a car on the hoist, look for leaking shock absorber fluid—an uneven tire pattern—signs of excessive bottoming. Do your customers a service and help yourself to extra profits by making them aware of their need for shock absorber replacements and suggesting new Autolite Auto-Flex Heavy Duty Shock Absorbers!

LISTEN—For customer complaints about bouncing and vibration . . . excessive noise . . . hard steering control . . . vehicle not sitting level . . . uneven braking . . . swaying on turns. Could be faulty shocks are to blame, and an opportunity to sell a new set of

Autolite Auto-Flex Heavy Duty Shock Absorbers.

SELL SHOCKS WITH TIRES—In many cases tires and shock absorbers reach the end of their service lives at the same time. So, when you sell a new set of tires, suggest that the shock absorbers also be replaced with Autolite Auto-Flex Heavy Duty Shock Absorbers.

MATCH YOUR CUSTOMER'S NEEDS — Autolite Auto-Flex Heavy Duty Shocks will restore that safe, new-car ride and comfort in all cars for normal driving requirements.

REMEMBER . . .

2 END FLAPS EQUAL 1 PACEMAKER PRIZE POINT!

Save shock absorber end flaps imprinted with a sales number to get your choice of 1800 nationally-known brand awards!



=



AUTOLITE SHOCK ABSORBERS GIVE YOU 80% MARKET COVERAGE WITH ONLY 24 PART NUMBERS!



AUTO-FLEX the performance-proven Heavy Duty shock absorber

Auto-Flex Heavy Duty shocks have up to double the fluid capacity of ordinary shocks. This added fluid soaks up more heat . . . reduces fade under hard use . . . prolongs the life of shock absorber components . . . restores new, safe car ride. *Auto-Flex Heavy Duty Shock Absorbers*—warranted for 24 months or 24,000 miles—whichever comes first.



AUTO-FLEX XD the performance-proven Extra Heavy Duty shock absorber

Specially designed to give your customers the most desirable safety and comfort features of the heavy duty Auto-Flex units, plus other advantages: Extra heavy-duty 1 1/4-inch diameter, 18-gauge pressure tube . . . Extra heavy-duty 3/4-inch diameter piston rod. *Auto-Flex XD Extra Heavy Duty Shock Absorbers*—warranted for 24 months or 30,000 miles, whichever comes first.



SUPER-FLEX the performance-proven 3-stage load booster that adapts to all kinds of loads—all kinds of roads

Industry's *only* automatic 3-stage heavy duty shock absorber—designed for heavy loads at rear wheels. No need to add or let out air to get proper load control. Gives your customers normal shock absorber ride with no "tail-up" look during normal use. Corrosion-resistant spring has full over-load protection for nearly a half ton of extra weight. *Buna-N* rubber spring for heavy impact . . . prevents "bottom out." *Super-Flex Heavy Duty Shock Absorbers*—warranted for 24 months or 24,000 miles, whichever comes first.

Qty. Ord'd	Auto-Flex Part Number, Make Application	(Location)	Year	Qty. Ord'd	Auto-Flex Part Number, Make Application	(Location)	Year	Qty. Ord'd	Auto-Flex Part Number, Make Application	(Location)	Year
	AB-40				AB-16				AB-86		
	Ford	(F)	57-64		Falcon	(F)	60-68		Buick	(F)	54-56
	Mercury	(F)	57-64		Comet	(F)	60-68		Buick	(F)	61-65
	Chevrolet	(F)	55-57		Fairlane	(F)	66-68		Studebaker	(F)	57-66
	Corvair	(F & R)	60-64						Lark	(F)	59-66
	Chevrolet Truck	(F)	55-57		AB-21				Avanti	(F)	62 1/2 -66
	Thunderbird	(F)	58-60		Falcon	(R)	60-68		Packard	(F)	57-58
	Corvette	(F)	63-67		Comet	(R)	60-68				
	Edsel	(F)	58-60		Fairlane	(R)	62-68		AB-88		
	Meteor (Canada)	(F)	64		Mustang	(R)	65-68		Buick	(F)	66
	Monarch	(F)	57-61		Cougar	(R)	67-68		Buick Special	(F)	64-67
					Ford	(R)	59		Tempest	(F)	64-67
	AB-34				Meteor	(R)	62-63		Chevelle	(F)	64-67
	Chevrolet	(F)	58-64		Simca	(R)	60-66		Oldsmobile	(F)	64-67
	Chevrolet Truck	(F)	58-60		Volvo	(R)	57-62				
					Vauxhall	(R)	52-61		AB-50		
	AB-42				Goliath	(R)	59		Plymouth	(F)	65-68
	Chevrolet	(R)	58-64						Valiant	(F)	60-68
	Chevrolet Truck	(R)	58-64		AB-105				Dart	(F)	63-68
					Ford	(F)	65-68		Lancer	(F)	61-62
	AB-3				Chevrolet	(F)	65-68		Oldsmobile	(F)	56
	Ford	(R)	59-64		Mercury	(F)	65-68		Cadillac	(F)	54-55
	Mercury	(R)	61-64		Meteor (Canada)	(F)	66		AB-82		
	Meteor (Canada)	(R)	60-64						Chevrolet	(R)	67
	Edsel	(R)	59-60		AB-104				Pontiac	(R)	63-64
	Monarch	(R)	61		Ford	(R)	65-68		Tempest	(R)	64-67
					Mercury	(R)	65-68		Buick Special	(R)	64-67
	AB-45				Meteor (Canada)	(R)	66		Chevelle	(R)	64-67
	Plymouth	(R)	57-65						Oldsmobile F-85	(R)	64-67
	Dodge	(R)	57-65		AB-36						
	Valiant	(R)	60-67		Pontiac	(F)	58-64		AB-111		
	Lancer	(R)	61-62		Cadillac	(F)	56-60		Chevrolet	(R)	65-66
	Barracuda	(R)	65		Ford (Germany)	(F)	58-62		Pontiac	(R)	65-68
	Chrysler	(R)	55-64						Buick	(R)	65-68
	Dart	(R)	60-68						Oldsmobile	(R)	65-68
	DeSoto	(R)	55-61								
	Dodge Truck	(R)	59-60						AB-63		
	Imperial	(R)	55-65						Chevy II	(F)	62-67
									AB-52		
	AB-39								Buick	(R)	61-65
	Plymouth	(F)	57-61		AB-35				AB-108		
	Dodge	(F)	57-64		Oldsmobile	(F)	59-64		Plymouth	(F)	65-68
	Chrysler	(F)	57-64						Dodge	(F)	65-68
	Dart	(F)	60-61		AB-100				Chrysler	(F)	65-68
	DeSoto	(F)	57-61		Mustang	(F)	64-66				
	Imperial	(F)	57-66						AB-107		
					AB-84				Pontiac	(F)	65-68
	AB-61				Fairlane	(F)	62-65		Oldsmobile	(F)	65-68
	Plymouth	(F)	62-68		Meteor	(F)	62-63				
	Dodge	(F)	62-68								
	Dart	(F)	62								

CUSTOMER NAME _____

ADDRESS _____

CITY _____ STATE _____

CUSTOMER SIGNATURE _____

DEALERSHIP _____

TOTAL SHOCKS ORDERED

For every 12 Autolite Auto-Flex Heavy Duty Shock Absorbers ordered, you will receive 9 shock absorbers at your regular price and 3 shock absorbers absolutely FREE! You will also receive the Special 1969 Autolite Shock Absorber Merchandising Kit FREE!

As Quickly As You Can Say:

"AUTHORIZED REMANUFACTURED FORD PARTS"

*You'll Be Giving Your Customers**

- *New-Part Performance* • *A New-Part Warranty*
- *Savings They'll Appreciate!*

Remanufactured



Engines · Parts

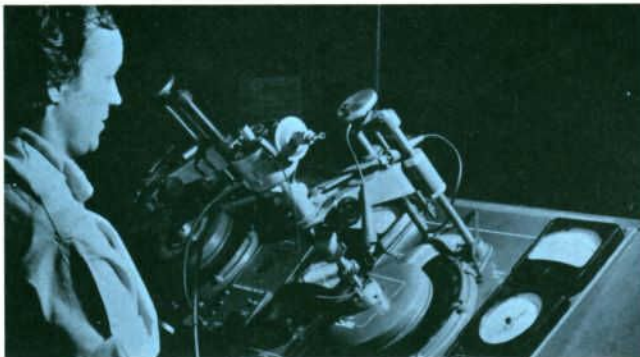
**Owners of Ford-built vehicles only!*



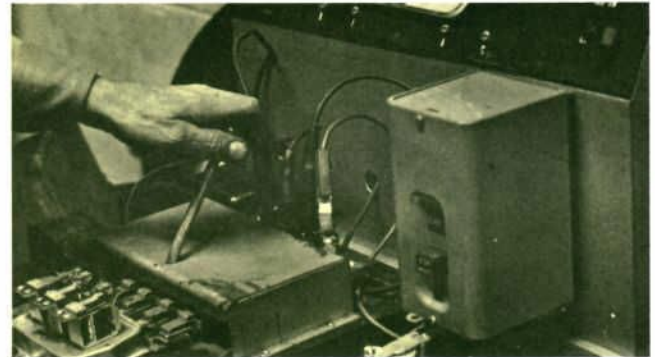
- After complete tear-down and installation of new parts, generators and alternators are 100% performance-tested in compliance with new Ford part specifications.



- After cleaning and installation of new parts, all starters are tested under actual conditions for proper performance to new Ford part specifications.



- Upon completion of remanufacturing, installation of new parts, and reassembly, distributors are electronically tested to new Ford part specifications.



- After many specified parts and all other parts that fail to meet Ford specifications are replaced, each voltage regulator is tested against new Ford part specifications.

Individual tests such as these make sure each Remanufactured Ford Part meets rigid Ford new-part performance standards. That's why you can offer new-part performance and warranty, and install Remanufactured Ford engines and parts with complete confidence.

National Warranty

Every Remanufactured Ford Part is warranted nationally by the Remanufacturer to be free of defects in materials and workmanship for 90 days or 4000 miles from date of installation, whichever occurs first. Complete OHV engine assemblies are warranted for 12 months or 12,000 miles, whichever occurs first. This warranty includes parts replacement plus related labor.
Ford and Lincoln-Mercury dealers will honor this warranty anywhere in the country.

We have a full range of Remanufactured engines and parts always available at our parts counter . . . call us the next time you need a replacement part for a customer's Ford-built vehicle.

TECHNICAL SERVICE BRIEFS

ALTERNATOR REGULATOR MALFUNCTIONS

Repeated alternator regulator malfunctions may result from pinched, cut or burned wires caused by improper routing of the wiring harness. To prevent recurring alternator regulator problems, the wiring harness between the alternator and regulator should be carefully checked during any repair involving the charging system to be sure it's properly routed.

Carefully inspect the following specific locations:

- Check wiring behind alternator for cuts or burns at cylinder head or exhaust manifold on 8 cylinder engines. (Figure 1.)
- Check wiring on all vehicles where alternator wiring crosses front of vehicle to get to the regulator location. Radiator and air conditioning component mounting locations should be inspected for harness pinching or cuts.
- Check for pinched or cut wiring near or under the battery or battery tray, particularly on vehicles where the regulator is mounted on the opposite side of the vehicle from the alternator.
- Check for wire loom contacting exhaust manifold shroud and melting wire insulation.

Another reason for multiple regulator malfunctions on any specific vehicle is the internal alternator field circuit. A grounded field terminal stud, shorted slip-ring or field coil as well as foreign material in the form of hardware or machining chips, can cause permanent regulator damage. When wiring harnesses are found to be okay, the alternator must be tested and examined to be sure that the reason for regulator malfunction has been determined and repaired.

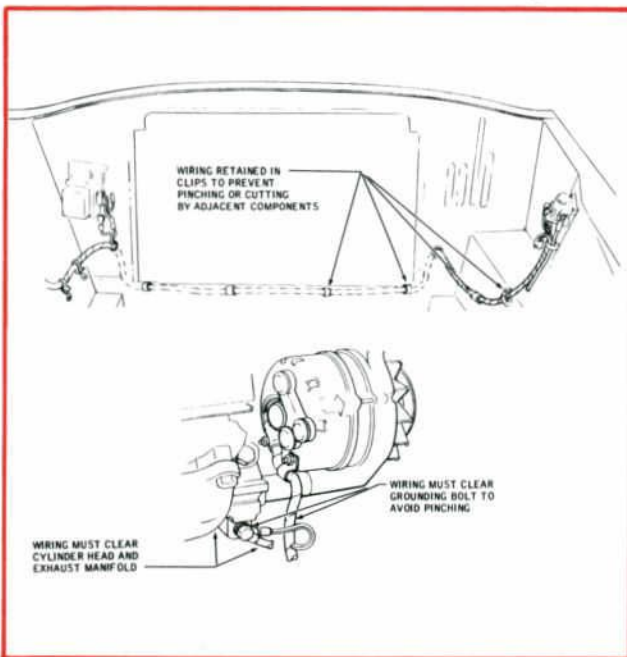


Figure 1—Alternator Regulator Wiring Harness Routing

REVISED AUTOMATIC TRANSMISSION FLUID LEVEL CHECKING PROCEDURE

Current automatic transmission fluid level checking procedures indicate that the fluid should be brought to the "full" mark on the dipstick when the transmission is at normal operating temperatures. Because of the tolerance of temperature variations which might be encountered during filling or subsequent checks, the specified fluid level (to the "full" mark) can result in vehicles having fluid added when in fact the fluid level is adequate for proper transmission function and durability.

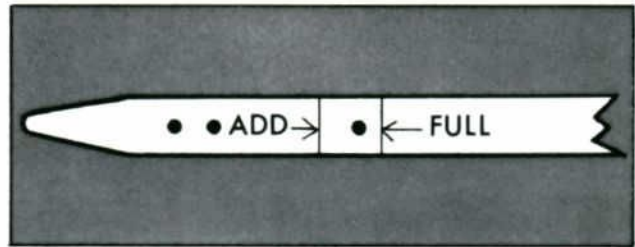


Figure 2—Transmission Fluid Level Dipstick

For these reasons, the *service* fluid level checking procedure is revised, effective immediately, to specify that if the fluid level is *between* the "add" and "full" marks at normal temperature, no fluid need be added.

REVISED CRANKCASE OIL LEVEL INDICATOR AND CHECKING PROCEDURES

1969 Passenger Cars and Trucks

The "full" mark is being eliminated from the engine oil level indicator of 1969 vehicles, as a running change, beginning with the 240 CID engine. Instead of a "full" mark, a "safe" area is indicated on the dipstick as shown in Figure 3.

As long as the oil level remains between the top line and the "add 1" line (the "safe" area of operation) no oil need be added. When the oil level is between these two marks, there is no need for concern as to whether or not there is too much or too little oil in the crankcase.

When the oil level drops to, or below, the "add 1" mark, add 1 quart of oil. This will bring the oil level up to within the safe area again.

The engine should not be operated at high speeds for any extended period of time when the oil level is below the "add 1" mark.

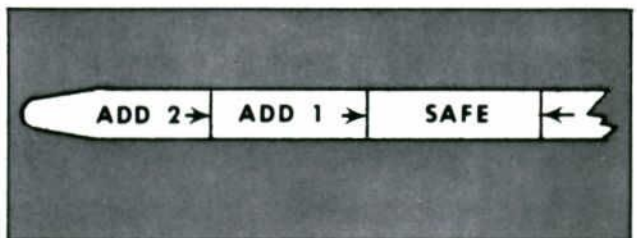


Figure 3—New Engine Oil Dipstick



THE IMPORTANCE OF USING "TYPE F"

"TYPE F" LIFETIME FILL FLUID

Automobile manufacturers generally specify an automatic transmission fluid change interval . . . except Ford. Ford Motor Company vehicles are the exception because they are filled with an exceptional "lifetime" fluid designated . . . Type F. It's lifetime properties stem from a special formula that makes Type F fluid significantly different from the Type A Suffix A, or DEXRON®, fluids specified by other manufacturers, who generally recommend a drain interval.

Although Ford has specified a Type F fluid since 1961, surveys indicate that some service personnel are not fully aware of the importance of using ONLY Type F fluid in Ford automatic transmissions. Use of fluid that does not meet Ford specifications WILL materially affect the service life of the transmission.

This article explains:

1. Why Ford specified fluid is different from other fluids.
2. What the differences are.
3. What happens when non-specified fluids are used in Ford automatic transmissions.

WHY "TYPE F" FLUID IS DIFFERENT

As part of Ford Motor Company effort to build vehicles as free of regular maintenance service as possible, research into formulating a "lifetime fill" automatic transmission fluid began in 1958. The fluid then generally available, Type A Suffix A, was used by all manufacturers (including Ford under Ford Specification M-2C33-B). However, this fluid did not meet the requirements for a "lifetime fill" fluid for two important reasons:

1. To achieve certain frictional characteristics, Type A Suffix A fluids use additives called "friction modifiers." They are considered the least stable compound of the fluid blend. Friction modifiers wear out or deteriorate in use, which is one of the chief reasons for frequent fluid changes.
2. The ability of Type A Suffix A fluids to withstand oxidation at higher temperatures was not sufficient for heavy duty service. A true lifetime fill fluid requires a considerable margin of safety to assure no breakdown under high temperatures at varying environments and operating conditions.

Ford's First "Type F" Fluid (M-2C33-D)

In 1961, Ford released a new automatic transmission fluid under Ford Specification M-2C33-D. The new fluid met the lifetime fill objective in that it contained no friction modifiers to wear out, and was blended with additives that improved its oxidation stability significantly over the M-2C33-B fluid. The new Type FM-2C33-D fluid successfully launched Ford's "never drain" policy for automatic transmissions. However, changing operating conditions indicated further improvements should be made for the following reasons:

- The trend towards more powerful engines (Fig. 1) subjected transmission fluids to increased mechanical shear and heat stresses.

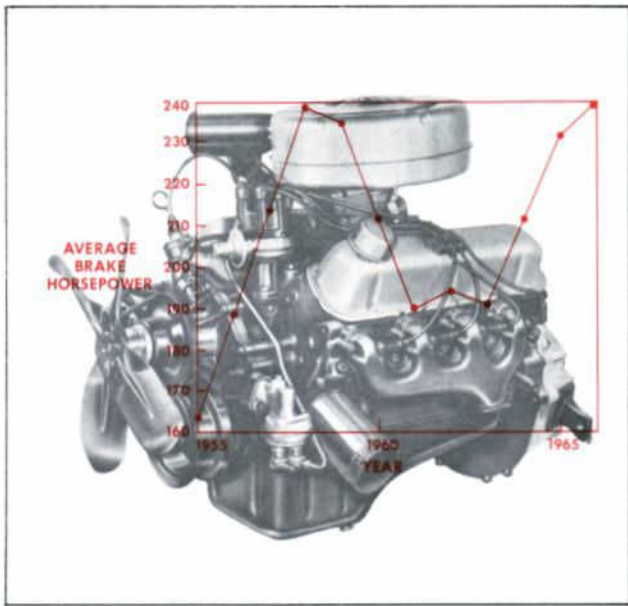


Figure 1—Average Brake Horsepower of Passenger Cars—U.S.A.

- Traffic density also increased. Figure 2 illustrates the total motor vehicle registrations from 1950 through 1965. Increased traffic adds to heat stresses because of low-speed "Stop-and-Go" driving, and long periods of idling.

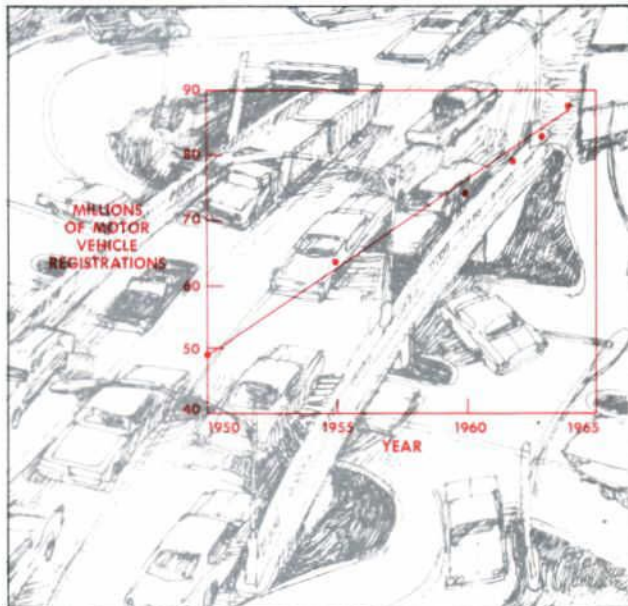


Figure 2—Increase In Traffic Density—U.S.A.

- The growing use of options such as air conditioning, and the fantastic rise in recreational trailers (travel trailer sales alone rose from about 40 thousand in 1961 to over 100 thousand in 1965) imposed additional thermal loads on automatic transmission fluids.

F" FLUID IN FORD AUTOMATIC TRANSMISSIONS

For these reasons, Ford developed an improved Type F fluid under Ford Specification M-2C33-F. It is the only fluid specified for ALL Ford automatic transmissions.

DIFFERENCES BETWEEN FORD (M-2C33-F) "TYPE F" FLUID AND "TYPE A" SUFFIX A OR DEXRON* FLUIDS

The two most important differences between fluids meeting Ford Specification M-2C33-F and other transmission fluids are in the static coefficient of friction and in oxidation stability.

Static Coefficient of Friction

Simply stated, the coefficient of friction is an indication of the force required to stop or prevent motion between two adjacent objects (bands and clutches in the case of automatic transmissions). Figure 3 shows the coefficient of friction curves for three fluids:

1. Type F M-2C33-F fluid.
2. typical Type A Suffix A fluid.
3. mixture of Type A and Type F fluid.

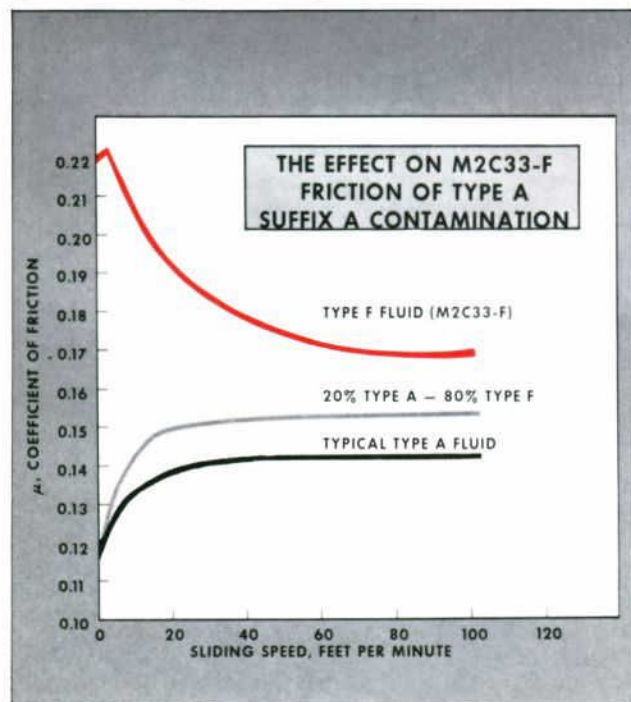


Figure 3—Effects on Coefficient of Friction When Type A Suffix A Fluid Is Mixed With Type F Fluid

From Figure 3 you can see that the "static" coefficient of friction (when there is no relative motion) for Type F fluid is almost double that of Type A Suffix A fluid. When the bands are slipping during application, the "dynamic" coefficient of friction is still higher than the Type A fluid. These markedly different curves directly affect slip time during application of a clutch or band; the higher the coefficient, the lower the slip time.

*Registered Trademark

Oxidation Stability

Oxidation stability is a measure of the fluid's resistance to deterioration in use; specifically its ability to withstand deterioration under high temperature conditions. Oxidation products not only form varnish, sludge and corrosive materials, but create acidic substances that attack automatic transmission seals. The following chart (Fig. 4) shows the temperatures at which various automatic transmission fluids will pass a 300-hour duration test.

300-Hour Duration Test With 100-Milliliter Air Bleed/Minute		
Fluid	Sump Temp.	Conv. Output Temp.
Type A Suffix A	275°F	275°F
M-2C33-D	300°F	300°F
DEXRON*	300°F	325°F
M-2C33-F (Type F)	325°F	325°F

Figure 4—300-Hour Comparison Test

Note that the M-2C33-F specification provides the greatest margin of safety in resisting oxidation at high temperatures. The degree of oxidation that occurs at normal temperatures with M-2C33-F fluid is so small that it is of no consequence. Fluids more prone to oxidation require periodic drain to provide satisfactory service life at normal operating temperatures.

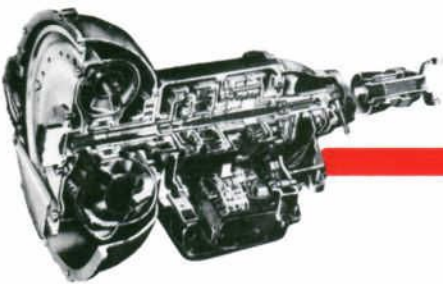
WHAT HAPPENS WHEN FLUIDS THAT DO NOT MEET FORD SPECIFICATIONS ARE USED IN FORD TRANSMISSIONS

Friction Element Failure

The differences in Type F and Type A Suffix A coefficient of friction curves in Figure 3 clearly illustrate one of the reasons only Type F fluid should be used in Ford transmissions. FORD TRANSMISSIONS ARE DESIGNED WITH CLUTCHES AND BANDS TO OPERATE SMOOTHLY WITH THE FRICTIONAL CHARACTERISTICS OF TYPE "F" FLUID. The transmissions can not tolerate the frictional characteristics of Type A Suffix A fluids. Such usage would promote excessive slippage during clutch and band apply.

Slippage, of course, results in higher than normal surface temperatures which, in turn, could lead to separation of resins and fibers from friction materials which could lead to complete failure of the clutch or band friction material.

Topping Off Type F fluid with Type A Suffix A fluid likewise adversely affects transmission operation. Figure 3 shows that just adding 2 qts. of Type A Suffix A fluid to a 10 qt. Type F capacity fill has a drastic effect on the coefficient of friction. This 20% contamination essentially imparts the Type A



THE IMPORTANCE OF USING "TYPE

Suffix A frictional characteristics to Type F fluid. The practical result is the same as if the transmission were totally filled with Type A Suffix A fluid. The new DEXTRON® fluid has a frictional curve similar to Type A Suffix A fluid and could produce similar results.

Varnish and Sludge Formation

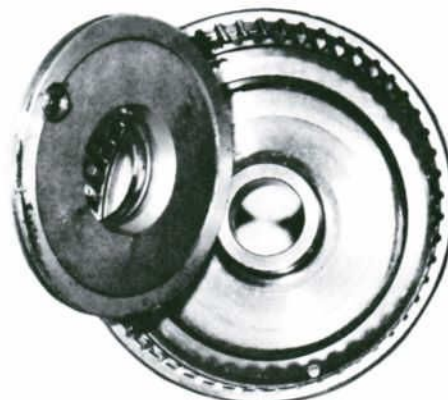
Varnish and sludge formation relates directly to the fluid's ability to withstand deterioration caused by heat. The breakdown of fluid because of heat is generally called oxidation. The formation of sludge and varnish due to oxidation can cause a number of undesirable conditions in an automatic transmission: stuck control valves; oil screen and passage plugging; and clutch glazing, to name a few.

THE CLUTCH PISTON AND CYLINDER IN FIGURES 5 THROUGH 8 ILLUSTRATE THE EFFECT OF TEMPERATURE AND FLUID TYPE ON VARNISH AND SLUDGE FORMATION.



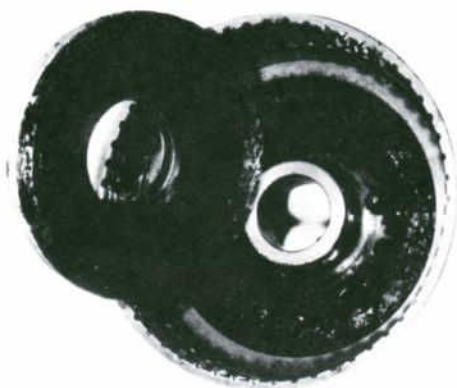
M2C33-B, 200 HOURS, 300°F

Figure 5—This clutch piston and cylinder is from a transmission that used M-2C33-B fluid (substantially Type A Suffix A) that was subjected to a 200-hour 300°F. oxidation test. Obviously, from the standpoint of varnish and sludge formation, this fluid is entirely unacceptable in Ford transmissions.



M2C33-D, 300 HOURS, 300°F

Figure 6—This transmission used M-2C33-D fluid. After a 300-hour test at 300° F, the parts are fairly clean and free of varnish and sludge. Note, however, the effect of raising the test temperature only 25° F., using the same fluid and test time, as shown in Figure 7.



M2C33-D, 300 HOURS, 325°F

Figure 7—This transmission was subjected to the same test as the one in Figure 6, except that the temperature was raised only 25° F. to 325° F. The condition of the parts illustrates that the M-2C33-D fluid has obviously failed the test.



M2C33-F, 300 HOURS, 325°F

Figure 8—This photo dramatically illustrates the advantages of Ford's Type F M-2C33-F fluid over the previous M-2C33-D fluid. Whereas the M-2C33-D fluid in figure 7 left parts coated with varnish and sludge when subjected to a 300-hour test at 325° F., the M-2C33-F fluid in Figure 8 when subjected to the same test conditions left parts clean and serviceable. That's why it's the only fluid Ford specifies for Ford automatic transmissions.

® Registered Trademark

F" FLUID IN FORD AUTOMATIC TRANSMISSIONS

The valve bodies in Figures 9 and 10 illustrate the results of a comparative test, under actual operating conditions, between M-2C33-D (300°F. oxidation level) and M-2C33-F (325°F. oxidation level). Two New York City taxicabs, identical except for fluid type, were operated in actual service for 72,000 miles. The main control and screen from the transmission that used M-2C33-D fluid are heavily varnished and sludged, whereas the same parts from the transmission that used M-2C33-F fluid are fairly clean and still serviceable.



Figure 9—M-2C33-D Fluid



Figure 10—M-2C33-F Fluid

CONCLUSIONS

These tests correlate closely with Ford service engineers' actual field experience; namely, that if other than Ford-specified fluids are used in Ford automatic transmissions, whether for total fill or make up, you can expect a transmission malfunction due to varnish and sludge formation before the transmission has gone 50,000 miles. In other words, all transmission fluid is not the same. There IS a difference.

SERVICE RECOMMENDATIONS

Because of the importance of using the correct fluid in Ford automatic transmissions, the dipstick of 1969 Ford vehicles (Fig. 11) is embossed with "Warranty Requires M-2C33-F (Type F) Oil." There are over 200 brand names that meet Ford Specification M-2C33-F; indicated by having M-2C33-F and "2P" stamped on the container.

Before filling a Ford automatic transmission, look for these two numbers on the container to be assured it is acceptable for use in Ford transmissions.

Do not over-fill transmission as this can lead to foaming because of aeration. Check level with transmission fluid at normal operating temperature. If the fluid level is between the "add" and "full" marks, no fluid need be added.

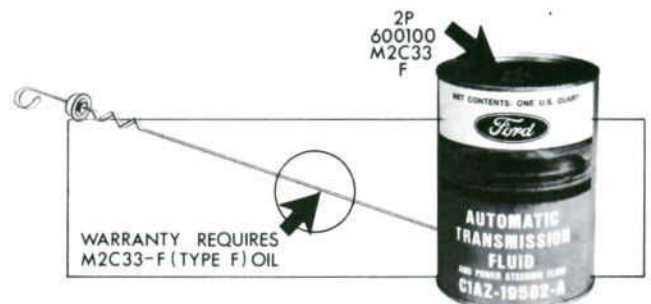
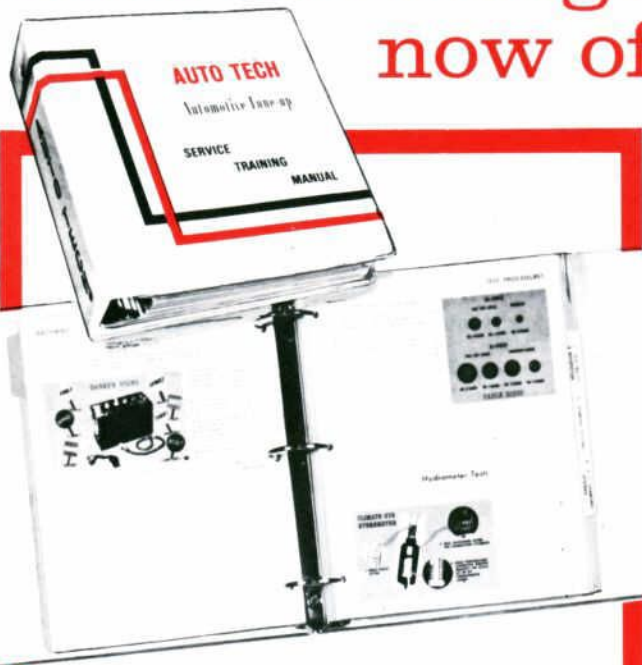


Figure 11—Dipstick and containers marked to show specified fluid.

Take advantage

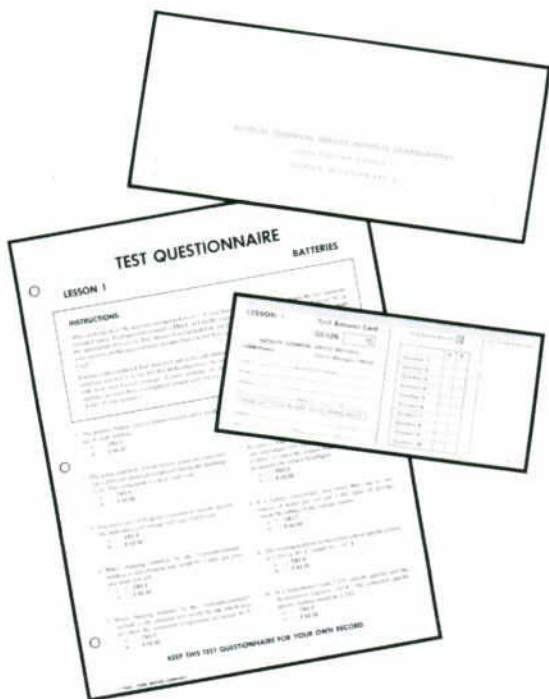
now of ...

AUTO TECH



TRAINING MANUAL/REFERENCE BOOK

This attractive, vinyl-covered looseleaf training manual with over 450 pages is your basic textbook for covering the ten lessons. Of course, after you have sent in your answer cards, you get to keep the manual. We're certain that it will serve you well as a handy reference as you continue to use it on the job.



TEST QUESTIONNAIRE SET

As you complete each lesson, fill in your test answers on the I.B.M. answer card. Then, mail the card to AUTO TECH Headquarters in the self-addressed envelope provided.

AUTOLITE HOME STUDY TECHNICAL SERVICE TRAINING PROGRAM

HERE'S WHAT AUTO TECH COURSE OFFERS ...

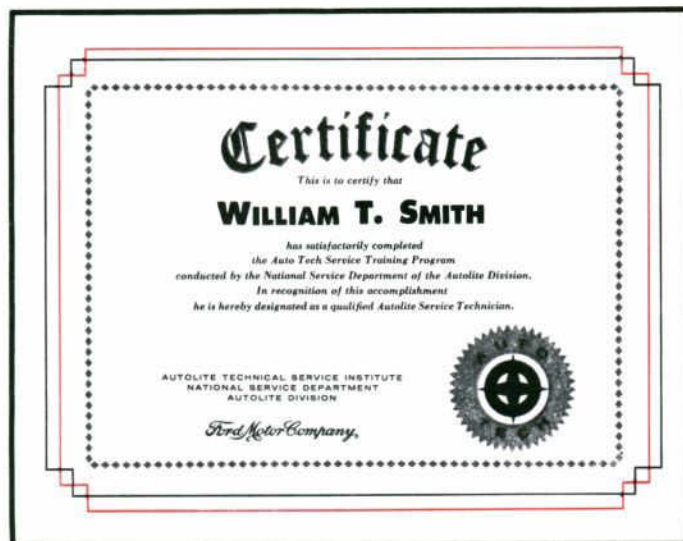
An impressive looseleaf binder with lesson dividers, test questionnaire, test answer card, and Lesson 1 in the first mailing. Succeeding mailings provide complete lessons with their related test questionnaires and I.B.M. test answer cards. The lessons cover ...

(1) Batteries, (2) Electricity and Magnetism, (3) Starting Systems, (4) D.C. Charging Systems, (5) A.C. Charging Systems, (6) Ignition Systems, (7) Carburetion, (8) Emission Control Systems, (9) Tune-Up, (10) Specifications.

Each lesson in the training manual provides complete, concise, and easy-to-understand information including ...

- THEORY—to acquaint you with the principles of operation of the assemblies and systems to be studied.
- TROUBLE-SHOOTING and TESTING PROCEDURES—to guide you in the diagnosis of the probable causes of troubles and the test procedures to follow to determine the accuracy of these diagnoses.
- OVERHAUL—to provide you with typical procedures for disassembly, cleaning, bench testing, assembly, and adjustments.

After your answer cards have been evaluated, and you have passed the course, an impressive graduation certificate, suitable for framing, will be sent to you.



GRADUATION CERTIFICATE

After you have mailed in each of your ten test answer cards for grading, you will receive this Graduation Certificate with the return mailing of your answer card. It is our official recognition of your successful participation in the AUTO TECH Service Training Course. On display, the certificate will let customers know that their vehicle is being serviced by a graduate of the Autolite Technical Service Institute.

HERE'S WHAT AUTO TECH CAN DO FOR YOU!

THROUGH AUTO TECH, YOU LEARN HOW TO SERVICE MOST MAKES OF VEHICLES!

Although AUTO TECH provides detailed coverage of the Autolite-Ford product line as it is used on Ford-built vehicles, the course material presents the information in a manner which is sufficiently typical to enable you to service engine performance problems on most makes of cars and trucks.

HELPS QUALIFY YOU FOR A BETTER JOB...

If you are presently employed in a service station, garage, or dealer service department and are looking for a more challenging job and higher pay, let AUTO TECH help you make it possible.

Briefly, AUTO TECH is a home-study automotive tune-up service training program which can be completed during your own time and at a pace which matches the semi-monthly lesson mailings from AUTO TECH Headquarters. The successful completion of AUTO TECH can present new job opportunities to you by helping you to become a tune-up specialist and qualified service technician.

ALL THIS FOR ONLY \$20.00!

A fraction of the actual value.

AUTOLITE TECHNICAL SERVICE INSTITUTE

REGISTRATION FORM

Please enroll me in the Autolite Technical Service Institute. I am enclosing a check/money order for \$20.00 and I understand that this entitles me to receive all instructions, reference material, questionnaires, answer cards, etc., required to complete the first lesson of this training program—and that the forwarding of each subsequent lesson by Auto Tech is dependent upon receipt of my answer cards reflecting completion of the preceding lesson. I further understand that if I am not completely satisfied with the lessons provided in the Auto Tech service training program, the Autolite Technical Service Institute will refund to me the entire cost of \$20.00 . . . and that I may retain all of the materials received.

ENROLLEE

Name _____ Home Address _____
City _____ State _____ Zip Code _____
Social Security Number _____ Job Description _____
Enrollee's Signature _____

EMPLOYED BY

Company Name _____
Address _____ City _____ State _____ Zip Code _____
Type of Business _____
Employer's Signature (optional) _____

NOTE: All materials will be sent to home address unless otherwise indicated below.

Address _____
City _____ State _____ Zip Code _____

IMPORTANT: Be sure to enclose check with this form in the amount of \$20 payable to Autolite Technical Service Institute. (Michigan Enrollees must add 4% sales tax.)

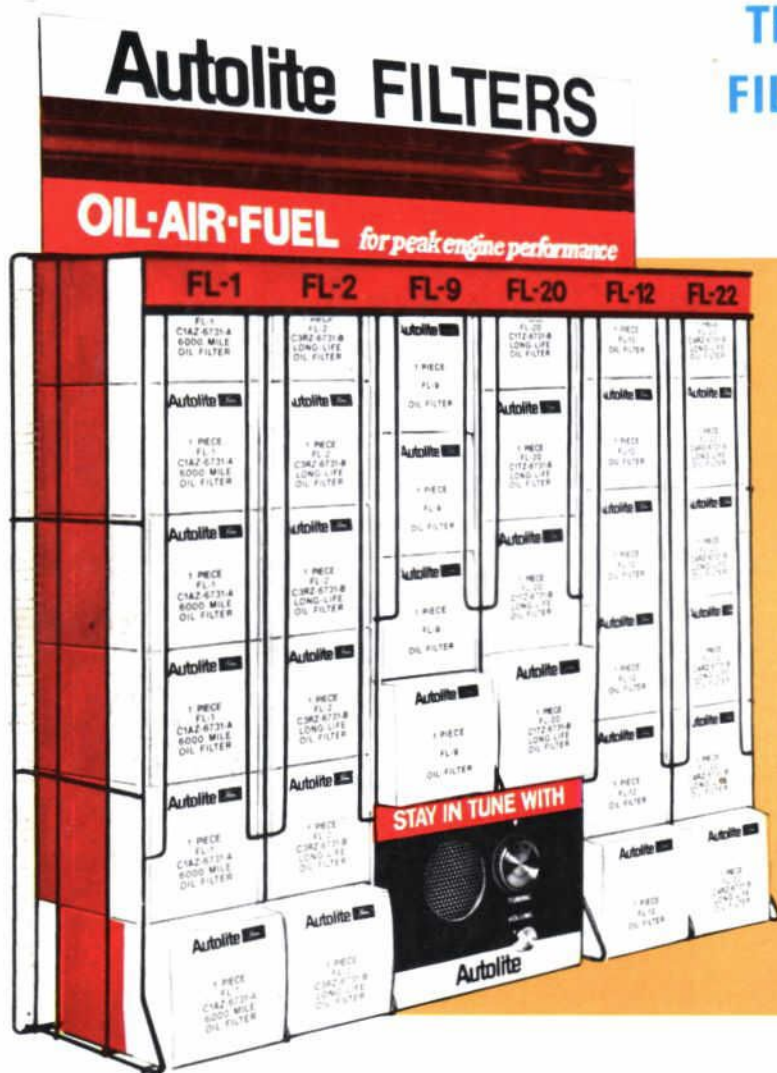
Fill in form and mail with enrollment fee to:

AUTOLITE TECHNICAL SERVICE INSTITUTE HEADQUARTERS

10800 Puritan, Detroit, Michigan 48238

YOUR SOURCE FOR GENUINE FORD AND AUTOLITE ORIGINAL EQUIPMENT PARTS

AND
**THIS EXCLUSIVE NEW AUTOLITE
 FILTER RADIO-RACK DISPLAY UNIT
 FREE!**



Everyone who installs oil filters will find this new dispenser-display unit a real convenience item, a valuable sales aid, and a fine "in shop" news and music center! Here's what you receive:

FREE RACK! Welded heavy-gauge wire dispenser unit!

AND

FREE RADIO! An instant-play, all-transistor model, built right into the rack!

WITH

THE FILTERS! At regular dealer net price! Six fast-moving part numbers in this assortment of 32 Autolite oil filters cover over 70% of popular cars!

ALL-TRANSISTOR,
 SOLID-STATE RADIO **FREE**

ATTRACTIVE, RUGGED
 GRAVITY-FEED RACK **FREE**

HERE'S WHAT YOU GET:

QUANTITY	FILTER	QUANTITY	FILTER
6	FL-1	6	FL-12
6	FL-2	4	FL-20
4	FL-9	6	FL-22

ACT NOW! Offer Ends April 30, 1969