SHOP TIPS FROM FORD

NEW... SERVICE TRAINING AIDS
from FORD to improve your customer services

PLUS...

Safety Flare Special Offer

See Pages 15 and 16

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.

VOL. 5, NO. 6 FEBRUARY, 1967

SERVICE TRAINING

SERVICE TRAINING AIDS AND PUBLICATIONS FROM FORD

IN THIS ISSUE

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, Ford Products Merchandising 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.

AUTOLITE

FoMoCo GENUINE PARTS

ROTUNDA

VOL. 67 PSM 73 LITHO IN U.S.A.

FORD . . . the better idea people . . . have another one: A new Mechanic Training Plan to provide better customer services. Using modern, up-to-date service training aids in Ford Service Training Centers, Ford and Lincoln-Mercury mechanics become well qualified automotive technicians with the skills and knowledge to properly service today's vehicles that have more modern and sophisticated equipment.

You can share in this know-how your customers expect you to have, and insure their satisfaction. Although at this time the Service Training Centers are open only to Ford and Lincoln-Mercury Dealership personnel, the complete line of modern, up-to-date service training aids and publications used in these centers is available to independent service personnel.

As a garage, service station or fleet operator, body shop specialist, or other service outlet, you will want to have these informative service aids to help you gain a more thorough knowledge of the Ford products you service. Included are: Shop Manuals, Specification Books, Instructor Notes, Training Handbooks, Slide Films, Film Digest Books and the latest in training techniques—"Color" 8" x 10" Overhead Projector Transparencies and Programmed Training Books.

Written in clear, concise, easy-to-follow language, these materials contain step-by-step explanations and diagrams of all major assemblies and components in Ford Motor Company cars and trucks. Each publication is conveniently organized and clearly referenced in full detail for quick referral.

SEE YOUR FORD OR LINCOLN-MERCURY DEALER TODAY AND PICK UP THE ORDER FORMS TO OBTAIN THESE HELPFUL PUBLICATIONS. HE WILL BE PLEASED TO HELP YOU.

FORD SERVICE PUBLICATIONS

SHOP MANUALS

Contain servicing information and specifications on cars and trucks of the year and models to which they apply. Each manual is illustrated with pictures and charts, and divided into groups of related systems and components. For quick reference, the manuals utilize three separate indexes:

- The Group Index appears on the title page of each manual
- A Part Index is located at the beginning of each Group
- A Section Index is located at the beginning of each Part

SHOP MANUAL SUPPLEMENTS

Generally contain repair and adjustment information only on components that were changed or were new to that particular model year. For complete information, the Shop Manual of the preceding model year(s) is also required.

FORD CAR AND TRUCK SHOP MANUALS

FORM NO.	YEAR	DESCRIPTION	PRICE
7098	1949-1951	Ford Car Shop Manual	$3.00
7098	1952	Ford Car Shop Manual	3.00
7098	1953#	Ford Car Shop Manual Supplement	1.75
7098	1954	Ford Car Shop Manual (Need 1952 Manual for full coverage)	1.75
7098	1955	Ford Car Shop Manual	3.75
7098	*1958-1962	Ford Car Shop Manual	5.00
7098	1963	Ford Car Shop Manual Supplement	3.00
7098	1964	Ford Car Shop Manual	5.00
7098	1965	Ford Car Shop Manual	5.00
7098	1966	Ford Car Shop Manual	4.75
7098	1967	Ford Car Shop Manual (Incl. Maintenance and Lubrication Man.)	4.75
7760	*1960-1962	Falcon Shop Manual	3.75
7760	1963#†	Falcon Shop Manual Supplement	2.75
7760	1964	Falcon Shop Manual	4.75
7760	1965	Falcon-Fairlane-Mustang Shop Manual	5.00
7760	1966	Falcon-Fairlane-Mustang Shop Manual	4.75
7760	1967	Falcon-Fairlane-Mustang Shop Manual (Incl. Maintenance and Lubrication Man.)	4.50
7760	*1959-1962	Thunderbird Shop Manual	4.25
7750	1963#	Thunderbird Shop Manual Supplement	2.25
7750	1964	Thunderbird Shop Manual	4.75
7750	1965	Thunderbird Shop Manual	4.50
7750	1966	Thunderbird Shop Manual	4.75
7750	1967	Thunderbird Shop Manual (Incl. Maintenance and Lubrication Man.)	5.00
7780	1962	Fairlane Shop Manual	4.00
7780	1963#	Fairlane Shop Manual Supplement	2.25
7920C	1967	CAR Maintenance and Lubrication Manual	1.75
7920T	1967	Truck Maintenance and Lubrication Manual	2.00
7099	1955	Truck Shop Manual	3.75
7099	1957	Truck Shop Manual	4.25

FORM NO.	YEAR	DESCRIPTION	PRICE
7099	*1958-1960	Truck Shop Manual	5.00
7099A	1961	Truck Shop Manual (Series 100 thru 800)	5.00
7099A	1962-1963#	Truck Shop Manual Supplement (Series 100 thru 800)	2.50
7099A	1964	Truck Shop Manual (Series 100 thru 350)	5.50
7099	1965	Truck Shop Manual—3 Volumes	7.00
7099	1966	Truck Shop Manual—4 Volumes	7.50
7099	1967	Truck Shop Manual—3 Volumes (Incl. Maintenance and Lubrication Man.)	8.25
7099B	1961	Truck Shop Manual (Series 850 thru 1100)	5.00
7099B	1962-1963#	Truck Shop Manual Supplement (Series 850 thru 1100)	2.50
7099B	1964#	Truck Shop Manual Supplement (Series 850 thru 1100)	3.50
7099C	1964	Truck Shop Manual (Series 500-800)	6.00
7766	1961	Econoline Truck Shop Manual	4.00
7766	1962-1963#	Econoline Truck Shop Manual Supplement	2.00
7766	1964#	Econoline Truck Shop Manual Supplement	2.50
7766	*1965-1966	Econoline and Falcon Bus Shop Manual	4.00
7766	1967	Econoline, Falcon Bus and Bronco Shop Man. (Incl. Maintenance and Lubrication Man.)	5.25
7766P	1966	Bronco Preliminary Shop Manual	2.25
7802	1963	Truck Shop Manual (3500-7000 Diesel)	5.00
7785	1961	Truck Shop Manual (850-1100 Diesel)	4.75
7785	1963	Truck Shop Manual (850-1100 Diesel)	4.75
D-2700	1967	Dagenham Diesel Manual	4.75
CUMMINS ENGINE MANUAL			
983559		All Series—Operation and Maintenance	2.00
983570		V. Series—Overhaul	2.00
983584		N-NH Series—Overhaul	2.00
983569B		C and J Series—Overhaul	2.00

LINCOLN-MERCURY SHOP MANUALS

FORM NO.	YEAR	DESCRIPTION	PRICE
6077	1954	Mercury Repair and Adjustment Manual	$3.25
6077	1956	Mercury Maintenance Manual	4.25
6077	*1957-1961	Mercury Maintenance Manual	4.50
7098	1962-1963#	Mercury Monterey Maintenance Manual Supplement	3.00
7098	*1964-1965	Mercury Maintenance Manual	5.25
7098	1966	Mercury Maintenance Manual	4.75
7098	1967	Mercury Maintenance Manual (Incl. Maintenance and Lubrication Man.)	4.75
10249	*1960-1961	Comet Maintenance Manual	4.00
7760	1962-1963#†	Comet Maintenance Manual Supplement	2.75
7760	1964	Comet Maintenance Manual	4.75
7760	1965	Comet Maintenance Manual	5.00
7760	1966	Comet Maintenance Manual	4.75
7760	1967	Comet Maintenance Manual (Incl. Maintenance and Lubrication Man.)	4.50
7149	1962	Meteor Maintenance Manual	4.00
7780	1963#	Meteor Maintenance Manual Supplement	2.25
6076	1954	Lincoln Repair and Adjustment Manual	3.25
6076	1956	Lincoln Maintenance Manual	4.25
6076	1957#	Lincoln and Continental Mark II Service Information Manual Supplement	2.00

FORM NO.	YEAR	DESCRIPTION	PRICE
6076	1958	Lincoln and Continental Mark III Maintenance Manual	4.50
6076	1959	Lincoln and Continental Mark IV Maintenance Manual	4.50
6076	1960	Lincoln and Continental Mark V Maintenance Manual	4.50
6076	1961	Lincoln and Continental Maintenance Manual	4.50
6076	*1962-1963#	Lincoln and Continental Maintenance Manual Supplement	3.00
6076	1964	Lincoln and Continental Maintenance Manual	6.50
6076	1965	Lincoln and Continental Maintenance Manual	6.50
6076	1966	Lincoln and Continental Maintenance Manual	6.75
6076	1967	Lincoln and Continental Maintenance Manual (Incl. Maintenance and Lubrication Man.)	6.50
5703	1958	Edsel Service Manual	4.00
5703	1959	Edsel Maintenance Manual	4.00
5703	1960	Edsel Maintenance Manual	4.00
5705	1958	Edsel Automatic Transmission	2.75

†Does not include information on V-8 Engine—Use 1964 Manual.

*Order the individual year desired.

#Previous year model manual must be ordered with this supplement to obtain complete coverage.

FORD SERVICE PUBLICATIONS

OWNER'S OR OPERATOR'S MANUALS

Contain complete information on operation of the vehicle, driver care of the vehicle, and valuable hints on proper servicing and care of the vehicle to which they apply.

FORM NO.	YEAR	DESCRIPTION	PRICE
3692	*1954-1967	Ford Car Owner's Manual	$ .75 each
7779	*1962-1967	Fairlane Owner's Manual	.75 each
7759	*1960-1967	Falcon Owner's Manual	.75 each
7833	*1965-1967	Mustang Owner's Manual	.75 each
7513	*1955-1967	Thunderbird Owner's Manual	.75 each
7767	*1961-1967	Econoline Owner's Manual	.75 each
7901	*1966-1967	Bronco Owner's Manual	.75 each

FORM NO.	YEAR	DESCRIPTION	PRICE
7822		Hi-Performance Owner's Manual	.75 each
3651	*1956-1967	Truck Operator's Manual (Series 100-350)	1.00 each
7808	*1963-1967	Truck Operator's Manual (Series 500-1000)	1.00 each
7764	*1961-1967	Truck Operator's Manual (Series 850-1100)	.80 each
7809	*1963-1967	Diesel Operator's Manual (Series 3500-7000)	1.50 each
7786	*1963-1967	Diesel Operator's Manual (Series 850-1100)	1.75 each

*Order the individual year desired.

SPECIFICATION BOOKLETS

These handy pocket size books list repair and adjustment specifications necessary to service Ford Motor Company cars and trucks for the indicated model year. The service specifications are considered the most frequently used by technicians engaged in the maintenance and testing of Ford automotive products.

MISCELLANEOUS SERVICE PUBLICATIONS

FORM NO.	YEAR	DESCRIPTION	PRICE
7256	1955	Fordomatic	$1.50
7256	1956-1957	Fordomatic	1.50
7557	1958	Air Conditioning	.65
7746	1958	Transmatic (Ford)	.65
24		Model T	.50
1940		Model A	.50

FORM NO.	YEAR	DESCRIPTION	PRICE
7745	1957	Retractable Hardtop Conv.	.50
7749	1958	Air Suspension (Ford)	.50
7748	1957	Supercharger Manual	2.00
4613	1958	Lincoln and Mercury Turbo Drive Transmission Service Manual	1.75
7202	1959-1967	Ford Service Specifications (Specify model year and car or truck)	.75

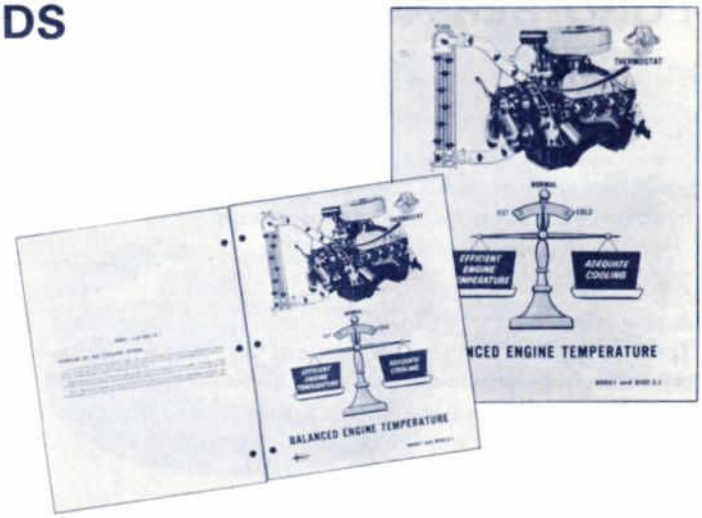
SERVICE TRAINING AIDS

FLIP CHARTS

These training aids are designed to be hung on an easel or chart stand. The charts are 24" x 36" and bound at the top by Chicago screw posts, so the pages may be readily flipped or turned as the illustrated material is presented.

INSTRUCTOR'S NOTES

Exact 8½" x 11" reductions of the flip charts are bound together with supplementary information on facing pages of the illustrated material. These Instructor Notes assist in the preparation and presentation of each training course.



	COURSE TITLE	COURSE NO.	INST. NOTES	FLIP CHARTS	TRAIN. BOOK	SLIDEFILM & RECORD	FILM DIGEST	TRANS-PARENCIES	PROG'M. TRAIN.
MISCELLANEOUS									
	Shop Practice	1750.0			$ 2.00				
	Ford Vacuum Diagrams	1760.0			$ 2.00				
	Safety Checks	1770.0			$ 2.00				
PERFORMANCE ADJUSTMENTS									
	Vibration And Noise Analysis	1860.1				$ 5.00	$ .65		
	Tire Noise Analysis	1860.2			$ 2.00	$ 5.00	(Ready Reference $2.00)		
BRAKES									
PRINCIPLES OF OPERATION	Hydraulic And Vacuum-Hydraulic	2000.1	$ 8.54	$10.02		$ 5.00		$12.35	
	Air-Hydraulic And Full-Air	2000.2	$ 4.67	$10.44					
DIAGNOSIS ADJUSTMENT AND LIGHT REPAIR	Hydraulic and Vacuum-Hydraulic	2001.1	$ 5.57	$ 9.90					
	Air-Hydraulic And Full-Air	2001.2	$ 1.92	$ 5.04					
OVERHAUL AND MAJOR REPAIR	Hydraulic And Hydraulic Brake Components	2002.1	$10.70	$ 4.92	$ 2.00				
SUSPENSION, STEERING, WHEELS AND TIRES									
PRINCIPLES OF OPERATION	Car Suspension And Conventional Steering	3000.1	$ 2.67	$ 5.29		$ 5.00	$ .65		
	Truck Front Suspension And Conventional Steering	3000.2	$ 2.42	$ 7.29					
	Car Power Steering	3000.3	$ 4.67	$ 9.90					
	Truck Rear Suspension	3000.4	$ 1.37	$ 4.04					
	Car And Truck Front Wheel Alignment And Balance	3000.5	$ 2.57	$ 5.14					
	Truck Power Steering	3000.6	$ 7.43	$21.12					
DIAGNOSIS ADJUSTMENT AND LIGHT REPAIR	Car Suspension And Conventional Steering	3001.1	$ 2.91	$ 6.08					
	Truck Front Suspension And Conventional Steering	3001.2	$ 3.17	$ 5.49					
	Car Power Steering	3001.3	$ 5.11	$ 7.15		$ 5.00	$ .65		
	Car And Truck Front Wheel Alignment And Balance	3001.5	$ 2.70	$ 9.97					
OVERHAUL AND MAJOR REPAIR	Car Suspension And Conventional Steering	3002.1	$ 7.60	$18.54	$ 2.00				
	Truck Power Steering	3003.2	$10.48	$13.51					
	Car Power Steering	3003.1	$ 2.33	$ 6.89					
	Truck Rear Suspension	3004.1			$ 2.00				
	Truck Front Suspension And Conventional Steering	3005.1	$ 2.82	$ 5.19					

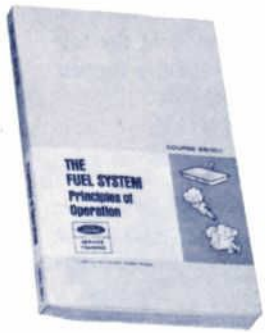
FORD SERVICE TRAINING AIDS

TRANSPARENCIES

All new overhead projector 8" x 10" color transparencies are now available in heavy duty frames. Corresponding full color notes, lesson plans and a notebook-type folder—suitable for bookshelf storage are included in the package.

PROGRAMMED TRAINING BOOKS

A new effective concept in training materials. Programmed Training is information made clear and committed to memory through an easy-to-use plan of self-instruction. Step-by-step, students acquire knowledge at a pace set by themselves. A fact learned in this way is a fact always remembered.



	COURSE TITLE	COURSE NO.	INST. NOTES	FLIP CHARTS	TRAIN. BOOK	SLIDEFILM & RECORD	FILM DIGEST	TRANS-PARENCIES	PROG'M TRAIN.
REAR AXLE & DRIVE SHAFT									
PRINCIPLES OF OPERATION	Car And Truck Rear Axle	4000.1	$ 6.33	$ 8.12	$ 2.00	$ 5.00		$ 7.60	
	Heavy Duty Single Speed Truck Axles	4000.2	$ 2.00	$ 2.91					
	Drive Line Alignment	4000.5	$ 2.12	$ 4.69					
	4-Wheel Drive Principles	4000.8	$ 3.62	$ 5.20	$ 2.00	$ 5.00			
	Rear Axle Inspection And Failure Analysis	4001.1	$ 3.87	$ 9.49					
OVERHAUL AND MAJOR REPAIR	Car And Light Truck Ford Axles	4002.1	$ 9.12	$ 8.89					
	Light Truck Spicer Rear Axles	4002.2	$ 2.09	$ 6.33					
	Lincoln Rear Axle	4002.3	$ 3.56	$10.88					
	H.D. Truck Single Speed, Single Reduction	4003.1			$ 2.00				
	Tandem Axles And Power Dividers	4005.1	$ 5.82	$11.64					
	4-Wheel Drive	4007.1	$ 3.47	$ 7.14					
	Axle Shift Systems	4008.1	$ 3.13	$ 6.60					
THERMACTOR									
	Thermactor Systems	5000.1	$ 6.67	$ 8.77	$ 2.00				
ENGINES									
PRINCIPLES OF OPERATION	Gasoline Engines	6000.1	$ 3.26	$ 6.97	$ 2.00	$ 5.00		$ 9.75	
	Diesel Engines	6000.2	$ 2.57	$ 5.89	$ 2.00	$ 5.00	$ .65		
DIAGNOSIS ADJUSTMENT AND LIGHT REPAIR	Gasoline Engines	6001.1	$ 3.77	$ 7.19					
	Diesel Engines	6001.2	$ 2.68	$ 7.96					
DESCRIPTION AND OVERHAUL	170 and 200 Six Cylinder Engines	6002.1	$ 2.02	$ 6.46					
	240 and 300 Six Cylinder Engines	6003.1	$ 4.27	$ 7.99					
	289 V-8 Engines	6004.1	$ 1.89	$ 9.62	$ 2.00				
	MD And HD V-8 Truck Engines	6005.1	$ 3.72	$ 8.39					
	352" And 390" V-8 Engines	6006.1	$ 2.36	$ 8.76					
	SD V-8 Engines	6007.1	$ 3.37	$ 8.24					
	430 Engines	6010.1	$ 9.46	$18.47					

FORD SERVICE TRAINING AIDS

TRAINING HANDBOOKS

These informative handbooks are individually bound 8½" x 11" manuals covering a single subject or component. They provide basic fundamentals to complete service information on varied subjects.

SLIDEFILMS

The slidefilm is usually a 20-minute continuous sound film strip in black and white or color. The sound for the film is recorded on a 33⅓ rpm record. A FILM DIGEST or READY REFERENCE is a "recap" of the accompanying slidefilm. It contains all the highlights of the film, and serves as a refresher of information featured in the film.

	COURSE TITLE	COURSE NO.	INST. NOTES	FLIP CHARTS	TRAIN. BOOK	SLIDEFILM & RECORD	FILM DIGEST	TRANS-PARENCIES	PROG'M. TRAIN.

CLUTCH AND MANUAL SHIFT TRANSMISSIONS

PRINCIPLES OF OPERATION	Clutches	7000.1	$ 3.26	$ 7.00				$ 8.55	
	Truck 4- And 5-Speed Manual Shift Transmissions	7000.2	$ 3.87	$ 9.49					
	Car 4-Speed Manual-Shift Transmission	7000.3	$ 2.37	$ 5.24					
	3-Speed Manual-Shift Transmissions And Overdrive	7000.4	$ 3.37	$ 7.24					
DIAGNOSIS ADJUSTMENT AND LIGHT REPAIR	Clutches And Linkage	7001.1	$ 4.50	$ 8.84					
	Car And Truck 3-Speed Overdrive And 4-Speed Transmissions	7001.3	$ 3.27	$ 6.99					
OVERHAUL AND MAJOR REPAIR	New Process 4-Speed Transmissions	7005.1	$ 1.62	$ 3.84					
	Bronco Transfer Case	7007.3	$ 5.37	$13.03					
	Fuller 5-Speed Twin Countershaft	7008.2			$ 2.00				
	Fuller 8 and 10 Speed Road Ranger	7008.5			$ 2.00				

AUTOMATIC TRANSMISSIONS

PRINCIPLES OF OPERATION	Automatic Transmissions	7500.0			$ 2.00				
	C4 Cruise-O-Matic Transmission	7500.1	$12.99	$ 7.15 ($1.08—Coloring Book) ($2.08—Wall Chart)					
	Cruise-O-Matic Transmission	7500.3	$16.87	$10.02					
	Transmatic Transmission	7500.4	$ 2.17	$ 5.14					
	C6 Transmission	7500.5	$ 9.82	$12.19	$ 2.00	$ 5.00			
DIAGNOSIS ADJUSTMENT AND LIGHT REPAIR	Cruise-O-Matic Transmission	7501.1	$32.74	$22.46					
	Transmatic Transmission	7501.2	$ 6.01	$12.71					
	C4 Cruise-O-Matic Transmission	7501.3	$ 3.52	$ 6.98		$ 5.00	(Diagnosis wheel available $.70)		
	C6 Transmission	7501.4	$ 5.39	$ 7.03	$ 2.00	$ 5.00			
OVERHAUL AND MAJOR REPAIR	Cruise-O-Matic Transmission	7503.1	$ 3.44	$ 5.69					
	Transmatic Transmission	7504.1	$ 3.81	$ 7.58	$ 2.00				
	C4 Cruise-O-Matic Transmission	7505.1	$ 3.68	$ 7.16					
	C6 Transmission	7506.1	$ 1.61	$ 3.16					

FORD SERVICE TRAINING AIDS

WIRING DIAGRAMS

This handy reference manual is devoted exclusively to electrical equipment and wiring diagrams. It is divided into indexed sections, containing complete schematic diagrams and cutaway illustrations, to help in the servicing of all Ford Motor Company cars and trucks.

	COURSE TITLE	COURSE NO.	INST. NOTES	FLIP CHARTS	TRAIN. BOOK	SLIDEFILM & RECORD	FILM DIGEST	TRANS-PARENCIES	PROG'M. TRAIN.
COOLING SYSTEM									
PRINCIPLES OF OPERATION	Cooling System Principles	8000.1						$12.55	
	Car And Light Truck	8001.1			$ 2.00	$ 5.00			
FUEL SYSTEM									
PRINCIPLES OF OPERATION	Carburetors And Fuel Pumps	9500.1				$ 5.00	$ .65		$ 1.67
	Ford Diesel Fuel System	9500.2	$ 2.42	$ 5.04					
	Lucas CAV Fuel System	9500.4	$ 1.31	$12.60					
DIAGNOSIS ADJUSTMENT AND LIGHT REPAIR	Carburetors and Fuel Pumps	9501.1	$ 3.75	$14.62					
	Ford Diesel Fuel System	9501.3	$ 4.62	$ 9.69					
	Single Barrel Carburetors	9502.1	$ 3.77	$ 7.74					
OVERHAUL AND MAJOR REPAIR	Ford 2- And 4-Barrel Carburetors	9503.1	$ 2.71	$ 5.51		$ 5.00			
	Holley 2- And 4-Barrel Carburetors	9504.1	$ 4.22	$ 8.39					
	Carter 4-Barrel Carburetor	9507.1	$ 2.17	$ 9.79					
CHARGING AND STARTING SYSTEMS									
PRINCIPLES OF OPERATION	Batteries	10000.1	$ 2.15	$ 5.62				$ 6.15	
	AC Generators and Regulators	10000.2	$ 1.85	$10.34	$ 2.00	$ 5.00		$ 9.35	
DIAGNOSIS ADJUSTMENT AND LIGHT REPAIR	D.C. Charging Systems	10001.1	$ 3.17	$ 6.29					
	Alternator Charging System	10001.2	$ 2.35	$ 6.47	$ 2.00				
	Starting System	10001.3	$ 2.37	$ 5.04	$ 2.00				
IGNITION SYSTEM									
PRINCIPLES OF OPERATION	Conventional Ignition Systems	12000.1			$ 2.00	$ 5.00			$ 1.67
	Transistorized Ignition System	12000.2	$ 2.03	$ 8.88					
	Governor	12000.3	$ 2.57	$ 5.34					
DIAGNOSIS ADJUSTMENT AND LIGHT REPAIR	Ignition Systems	12001.1	$ 2.78	$12.22					
OVERHAUL AND MAJOR REPAIR	Load-O-Matic Distributor	12002.1	$ 1.42	$ 4.54					
	Dual Advance And Centrifugal Distributor	12002.2	$ 1.42	$ 4.54					

FORD SERVICE TRAINING AIDS

...ALSO AVAILABLE...

DIAGNOSTIC WHEEL—to assist in the diagnosis of components such as transmissions and rear axles and help eliminate guess work and unnecessary repairs . . . COLORING BOOKS—containing schematics or gear train build-ups to be colored in by the student to more firmly fix power flow and/or circuit operation in their minds . . . VACUUM DIAGRAMS—illustrated with schematic or pictorial diagrams of the vacuum hose routings for simplified servicing and trouble diagnosing.

	COURSE TITLE	COURSE NO.	INST. NOTES	FLIP CHARTS	TRAIN. BOOK	SLIDEFILM & RECORD	FILM DIGEST	TRANS-PARENCIES	PROG'M. TRAIN.
ELECTRICAL . . . LIGHTS, HORNS, WIRING, AND CONTROLS									
PRINCIPLES OF OPERATION	Basic Electricity	13000.1	$ 2.62	$ 8.19	$ 2.00	$ 5.00		$14.20	$ 1.67
DIAGNOSIS ADJUSTMENT AND LIGHT REPAIR	Body And Chassis Electrical Circuits	13001.1			$ 2.00				$ 1.67
	Electrical Circuits	13001.1	1963, Wiring Diagram Book, Price $3.60 1964, Wiring Diagram Book with supplement, Price $5.68 1965, Wiring Diagram Book, Price $7.95 1966, Wiring Diagram Book, Price $8.10 1967, Wiring Diagram Book, Price $8.75						
DIAGNOSIS ADJUSTMENT AND LIGHT REPAIR	Heaters Wiring And Controls	17001.1	$31.95	$50.09					
	Radio, Antenna, Speaker and Wiring	17001.2	$ 7.75	$18.04					
	Ford Instruments And Accessories	17001.3	$28.80	$48.10					
	Lincoln-Mercury Comet Instruments And Accessories	17001.4	$37.56	$63.87					
AIR CONDITIONING									
PRINCIPLES OF OPERATION	Air Conditioning	19000.1	$ 7.02	$13.09	$ 2.00	$ 5.00		$ 5.10	
	Lincoln A/C	19000.2	$34.55	$29.04					
DIAGNOSIS ADJUSTMENT AND LIGHT REPAIR	Air Conditioner	19001.1	$ 6.60	$31.15					
INSTALLATION	Air Conditioner Installation	19002.1	$ 8.65	$44.49			$ .65		
BODY									
DIAGNOSIS ADJUSTMENT AND LIGHT REPAIR	General Body	20001.1			$ 2.00	$ 5.00	(Ready Reference $.65)		
	Water And Dust Leaks	20001.2			$ 2.00	$ 5.00			
	Glass Replacement	20002.4	$ 3.87	$ 8.31					
	Sheet Metal Repair	20003.1	$ 2.79	$ 7.89					
	Paint	20004.1 (Major Paint Repair Wall Chart $2.08) (Minor Paint Repair Wall Chart $2.08)				$ 5.00	$ .65		
	Ford And Mercury Body	20101.1	$12.26	$33.71					
	Mustang Body	20110.1	$ 6.67	$26.98					
	Cougar Body	20110.2	$ 8.16	$40.33					
	Falcon, Comet, Fairlane Body	20201.1	$ 5.30	$ 8.60					
	Thunderbird Body	20301.1	$ 1.96	$35.78					
	Bronco Body	20501.1	$ 6.18	$ 5.50					
	Truck Cab F-11 Series	20701.2	$ 8.23	$18.67					
	Convertible Tops	20801.1	$ 7.30	$ 7.76					
	Lincoln Convertible Top	20801.2	$21.46	$20.80					

TEMPERATURE SWITCH DIAGNOSIS

Ford and Fairlane

A properly operating temperature switch is necessary to correctly indicate cooling system temperatures. To determine if the temperature switch is operating correctly, the systematic diagnostic procedure outlined below should be followed.

Temperature (Cold and Hot) Indicator Lights Testing:

Do not apply 12 volts directly to temperature switch terminals at any time during the test procedure. This voltage will damage the temperature switch unit.

1. Blue Light—COLD. Perform this test only if engine is cool (below 125°F). Turn ignition switch to ON position. The blue light marked "COLD" should glow. If the blue light does not glow:

(a) the engine temperature is above 125°F.

(b) the electrical circuit is not completed or

(c) the switch unit is not properly grounded to engine.

Connect a jumper wire from the temperature switch hex portion to the engine. If the blue light now glows, tighten the switch as necessary to establish a good ground connection from the switch to the engine. If the blue light still does not glow, proceed with further testing.

Remove the two-terminal connector from the temperature switch and connect a jumper wire from the connector white-green stripe wire to the engine (Fig. 1). If the blue light now glows, verify that the switch is defective.

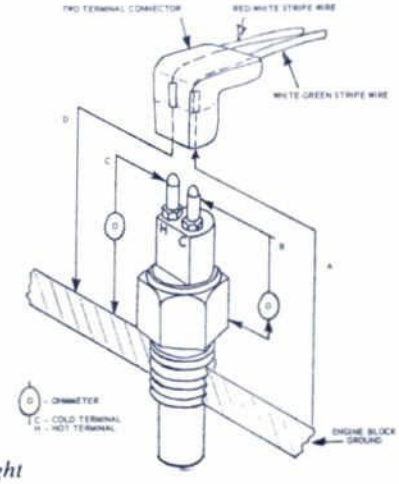


Figure 1—Temperature Switch and Cold and Hot Light Bulbs Testing Diagram

Connect an ohmmeter from the switch COLD terminal to the hex portion B of Fig. 1. If the resistance is not zero ohms, remove and replace the temperature switch. Be sure to use electrically conductive thread sealer Ford Part No. C3AZ-19554-B, or equivalent. Reconnect the two-terminal connector and check that the blue light glows. If the blue light does not glow, the wiring or light bulb is defective (open circuit).

When replacing the light bulb, be sure that the ignition switch is in the OFF position.

2. Red Light—HOT. Perform this test only if engine temperature is less than 245°F. If the red light stays on with the ignition switch turned to the ON position a defective temperature sending unit switch is indicated. Remove the two-terminal connector from the temperature switch and connect an ohmmeter from the temperature switch HOT terminal to the engine. There should be an open circuit (infinite ohms). If the meter reads zero ohms replace the switch. Now if the light is off when the ignition switch is in the ON position turn the switch to the START position and the prove-out circuit should light the bulb. If the bulb does not glow the bulb or the prove-out circuit is defective. Remove the bulb and check the bulb for continuity. If the ohmmeter indicates open circuit (infinite ohms) replace the bulb and again turn the ignition switch to START position

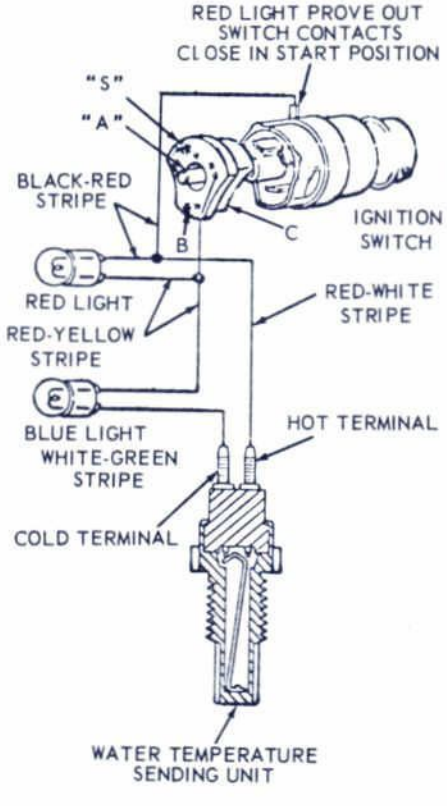


Figure 2—Temperature Indicating System—Ford

to light the bulb with the prove-out circuit. If the bulb still does not light, check the wire continuity from the temperature sending switch to the light bulb to the ignition switch and repair any breaks in the circuit. This should complete the prove-out circuit and the bulb will light when the ignition switch is again turned to the START position.

SERVICE BRIEFS

Temperature Switch Diagnosis (continued)

Temperature Indicating Lights System—Operation:

The temperature indicating system provides the driver with warning indication of engine coolant operating temperature by means of indicator lights. This system consists of a temperature switch unit mounted in the intake manifold (8 cylinder) or engine head (6 cylinder), lead wires and two temperature indicator lights mounted on the instrument panel. The lights in the instrument panel are identified by letters "HOT" on red color and "COLD" on blue color. (Fig. 2.)

When the engine is cold and the ignition switch is ON (IGN) position, the "COLD" blue light glows and remains on until the engine begins to approach operating temperature. When the temperature of the engine coolant reaches approximately 125°F, the blue light will go out, indicating that the engine has reached 125° or more.

Should the temperature of the engine coolant reach approximately 245°F, the "HOT" red warning light will glow, indicating that the engine is overheated. NOTE: The "HOT" red light will not indicate low coolant level.

These indicating lights are controlled by the temperature switch. The temperature switch has a temperature-sensitive bimetallic arm which completes the circuit through switch body to engine ground.

With the ignition switch in START position, the "HOT" red light should glow even though the engine is cold, thus proving that the light bulb is operable. A set of contacts in the ignition switch (normally open) completes the proving circuits to ground in START position.

1967 IGNITION COIL SERVICE PRECAUTION

(All 1967 8-Cylinder Cars)

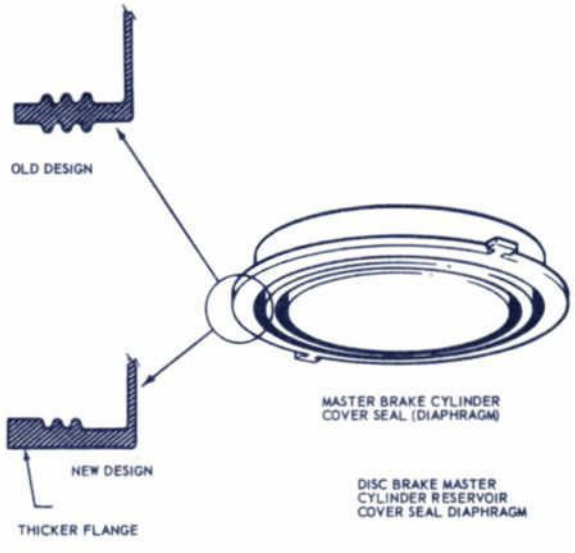
Push-on type terminal connectors are used to attach both primary leads to the ignition coil on all 1967 eight cylinder passenger cars. Previously, the distributor lead wire could be distinguished by the fact that its terminal connector was an eyelet, attached with a retaining nut. On all 1967 eight cylinder passenger cars, the distributor lead wire is black and the significantly finer wire of the two primary leads to the ignition coil.

When replacing the ignition coil, be careful to distinguish the two primary coil leads and to avoid a reverse connection. Although a car will run with a reverse connection, reversed ignition system polarity limits the available secondary voltage and overloads the coil and spark plugs, thus causing premature failure.

To connect a Dwell-Tach meter to the engine, use a jumper wire with an eyelet connector applied under the distributor push-on type terminal connector. This must be removed following service.

DISC BRAKE MASTER CYLINDER RESERVOIR COVER SEAL DIAPHRAGM

(All Vehicles with Disc Brakes)



Brake fluid leakage at the reservoir cover of the master cylinder can be caused by the reservoir cover seal (diaphragm) not seating and sealing effectively. A new design seal (Ford Part Number C5SZ-2167-A), identified by the sealing ribs on the cover side only of the outer sealing surface, and by the increased thickness of the outer sealing flange, corrects this condition.

Be sure the sealing ribs of the diaphragm are located to the cover side only before placing cover and seal to reservoir.

NEW SPARK PLUG WIRES

(All 1967 Trucks)

All 1967 truck engines are equipped with radio-resistance fiberglass strip and fold back design spark plug wires, in place of the steel core conductor used in previous years.

The correct procedure in removing these wires is to grasp the spark plug *boot* by hand (no tools may be used) and rotate in a clockwise or counterclockwise direction to free the boot from the spark plug insulator. The boot and plug wire can then be removed by pulling on the boot. At no time should radio-resistance spark plug wires be removed by pulling the wire itself. This method of removal may result in damage to the wire termination which would eventually cause spark plug missfire.

In addition, radio-resistance spark plug wires or boots must not be probed for engine timing purposes, as this may cause high voltage leaks.

BATTERY SERVICE

Battery service is an important year-round activity, as indicated by statistics which show battery and associated electrical problems lead the list of yearly reasons for emergency road service calls. Wintertime, however, with sub-freezing temperatures and extended use of heater, defroster, wipers, lights and other accessories tax to the limit the capacity of the battery to deliver current. Owners of vehicles who have put off proper preventative maintenance, such as a tune-up, are likely to need battery service . . . especially when the temperature drops, and "hard start" conditions increase.

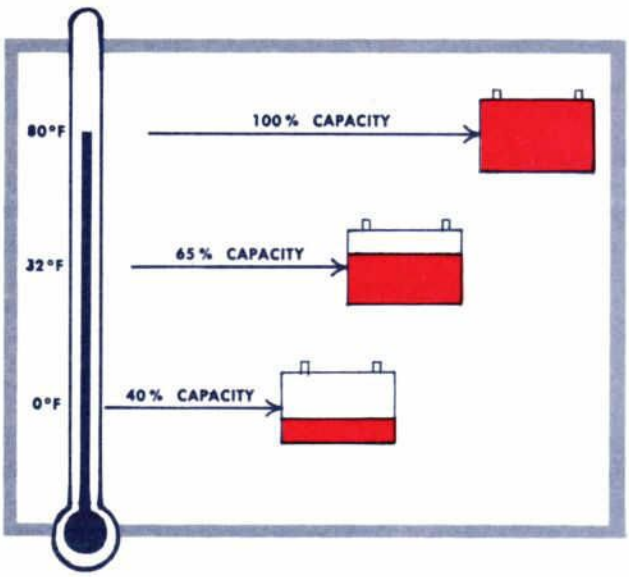


Figure 1–How Temperature Affects Battery Capacity

Figure 1 shows the capacity of a battery to deliver current decreases quickly as the temperature drops. A fully charged battery at 0° Fahrenheit performs at only 40% of the capacity of a fully charged battery at 80° Fahrenheit. It's easy to see that a partially charged battery that "got by" during warm weather is almost certain to cause trouble when the temperature drops.

DIAGNOSIS AND TESTING

While poor maintenance originally causes most "hard start" problems, it is equally true that faulty diagnosis or repair are likely to result in repeat "hard starts" and comebacks. To avoid comebacks, follow a systematic diagnosis procedure. Start by getting all the information possible from the owner.

- What is the exact nature of the (battery) complaint?
- How long has the battery been in service (miles-months)?
- Is this the first trouble? Has the battery been using excessive water? Are cranking speeds slow? Do ammeter or indicator lights show little or no charge? Is there extreme headlight dimming?
- Have any previous repairs or adjustments been performed?
- What are driving conditions?

VISUAL INSPECTION

The next step is a visual inspection. The top should be clean and dry. If wet, dirty or acid soaked, there will be a constant discharge. Note the electrolyte level. If it remains below the top of the plates for any length of time and water is not added, permanent damage can result and the battery never fully recharged. Check the battery case for damage or cracks. If seriously damaged, it should be replaced. Check the battery cables. Loose, worn or corroded cables are often overlooked as a cause of battery discharge. Lastly, but very important, observe the type of battery cover. The smooth, one-piece cover design battery (Figure 2) must not be probed with an open circuit voltage tester, to check individual cells. If the sealing compound is pierced, surface dirt, acid or contamination may cause battery self-discharge. Instead, the following test procedure is recommended.

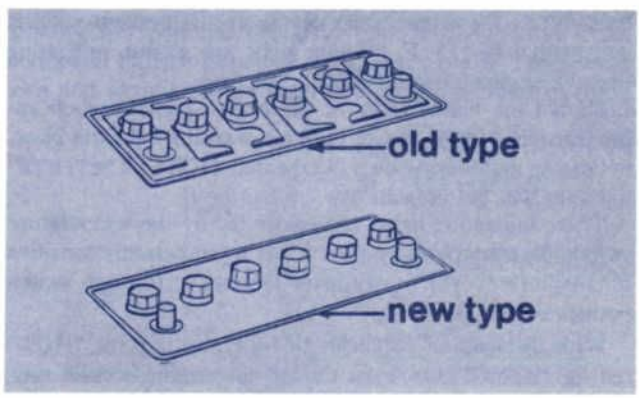


Figure 2–Battery Comparison

CAPACITY TEST

The next and most important step is the battery capacity test. This test measures the battery's ability to furnish current and maintain minimum necessary voltage. If the battery passes this test, it is in satisfactory condition. However, it may require some additional charging to bring it up to peak performance. The test MUST be performed with the BATTERY SOLUTION between 60° F and 100° F, since temperature affects capacity. If the battery solution is not between these temperatures, let it stand until warm before making the capacity test. A high rate discharge tester, such as a Battery-Starter tester with a carbon pile resistor and a voltmeter is used to make the first part of the test.

TEST CONNECTIONS

1. Connect the appropriate leads to the battery posts. See Figure 3. Be sure the voltmeter clips are connected DIRECTLY to the battery posts, and not to the heavy tester clips.
2. Adjust the carbon pile resistor until the ammeter reads 3 times the ampere-hour rating of the battery. (A 45 ampere-hour battery should be tested at 135 ampere load.)

AND TESTING

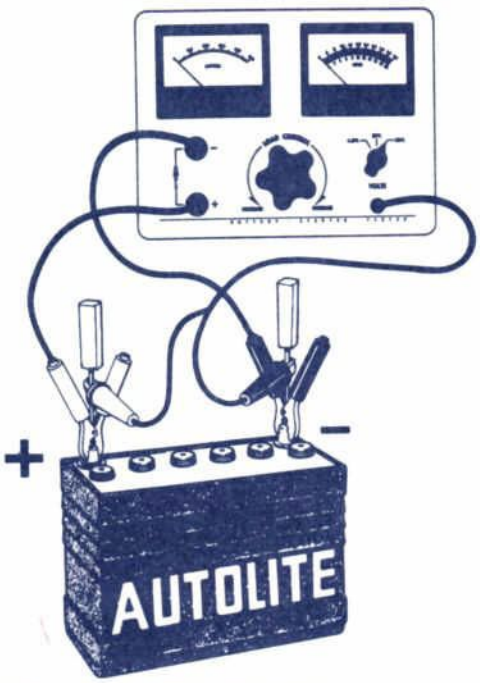


Figure 3–Capacity Test Connections

3. With the ammeter reading the required load, hold for 15 seconds and note the voltmeter reading. CAUTION: Do not leave the high discharge load on the battery longer than 15 seconds.
4. If the voltmeter reading is 9.6 volts or more on a 12-volt battery (4.8 volts on a 6-volt battery), the battery has sufficient output capacity and should readily accept a charge. Check the specific gravity. If it is 1.230 or below, charge the battery fully. It is fully charged when all the cells are gassing freely and the specific gravity ceases to rise for three successive readings taken at hourly intervals.
5. If the voltmeter reads less than 9.6 volts on a 12-volt battery (4.8 volts on a 6-volt battery), check the specific gravity of each cell. NOTE: If water is added to take a specific gravity reading, the battery must be charged until all cells are gassing freely, before taking the reading. Otherwise, the readings will not be reliable.

CAUTION: A specific gravity test should never be used by itself to determine if a battery is serviceable. The capacity test must be made first. The specific gravity test only indicates the strength of the acid in the electrolyte, or degree of charge on the battery. Only the capacity test actually checks the ability of the battery to deliver current, by putting a load on it. Only a capacity test can detect internal short circuits, excessive sulfation, and other types of internal, mechanical, or chemical damage that affect a battery's ability to deliver current. Old or deteriorated batteries may pass the specific gravity test, but no doubt will soon lose their charge; again causing further electrical problems.

SPECIFIC GRAVITY

The electrolyte in each battery cell consists of water and acid. The acid is used up as the battery becomes discharged. By weighing the amount of acid in the water, the degree of charge on each cell can be determined. When fully charged, electrolyte at 80° F weighs 1.280 times the weight of water. A hydrometer is used to determine the electrolyte's weight, or specific gravity. Figure 4 shows specific gravities for various percents of discharge.

SPECIFIC GRAVITY	STATE OF CHARGE
1.260-1.280	100% CHARGED
1.230-1.250	75% CHARGED
1.200-1.220	50% CHARGED
1.170-1.190	25% CHARGED
1.140-1.160	VERY WEAK
1.110-1.130	DISCHARGED

Figure 4–Specific Gravities For Percents of Discharge

A temperature corrected hydrometer should always be used, since the volume of electrolyte expands when heated and contracts when cooled. The standard temperature is 80° F. For every 10° F ABOVE 80° F, four gravity points (.004) must be added to compensate for expansion. For every 10° F BELOW 80° F, four gravity points (.004) must be subtracted to compensate for contraction. Most hydrometers include this feature.

SPECIFIC GRAVITY TEST

1. If the difference between any two cells is *more* than 50 points (.050), the battery should be replaced.
2. If the difference between cells is *less* than 50 points (.050), the battery should be charged. Charge the battery for maximum charging time according to the charging schedule on page 14.
3. After the battery is charged, the capacity test should be repeated. If the voltage reading is still less than 9.6 volts for a 12-volt battery (4.8 volts for a 6-volt battery), *replace the battery*. If the voltage is 9.6 volts or more for a 12-volt battery (4.8 volts for a 6-volt battery), the battery is satisfactory.
4. If the battery is discharged only, check the electrical system as follows:
   a) Perform a battery drain test to determine if any shorts exist in the wiring harness. Disconnect the negative ground cable. Connect a voltmeter from the negative battery post to the disconnected negative ground cable. With all circuits off, the meter should read zero. Any external drain will cause the voltmeter to read full battery voltage.
   b) Check for loose fan belt and loose electrical connections.
   c) Check charging system output.

BATTERY SERVICE AND TESTING

BATTERY CHARGING

SLOW CHARGING is the only method which will fully charge a battery. As a rule of thumb, slow charging should be at a rate of 1 ampere for each positive plate per cell for a sufficient time to fully charge the battery. It may sometimes require more than 24 hours to fully charge a battery, since badly sulfated batteries require more charging time than normal batteries.

HIGH-RATE CHARGERS cannot fully charge a battery in an hour or so. However, they do charge a battery sufficiently to allow continued service commensurate with the battery's condition and state of charge. To obtain a full charge, follow high-rate charging with slow-rate charging. Always follow the manufacturer's operating instructions to avoid damage to the battery.

BATTERY CHARGING PRECAUTIONS

1. Explosive hydrogen gas escapes out the vent caps during charging. Never smoke or allow a spark near the battery.

2. Avoid overcharging. Excessive charging will cause high internal temperatures which will expand and buckle plates. Never allow the internal temperature to exceed 125° F.

3. Allow the battery to warm up to 60° F before adding water, as the level will rise as the water warms. Always use as pure a water as possible.

4. The sulphuric acid in the electrolyte can cause serious burns if spilled on the skin or spattered in the eyes. It should be washed away with large quantities of water. If spilled on clothing, neutralize with ammonia or baking soda.

BATTERY REPLACEMENT

All batteries eventually deteriorate because of their chemical nature. While proper maintenance will insure the longest possible battery life, there comes a time when tests indicate the battery should be replaced. Since most customers can tell very little about a battery, it is most important that the servicing dealer guide the customer in selecting a battery of at least the same capacity as the original. If the dealer fails to recommend a battery with a rating equal to that of the orginal equipment battery, the customer is likely to encounter further electrical problems.

Capacity is expressed in ampere-hour discharge for a specific period of time. A rate commonly used is the 20-hour rate. A battery at 80° F which is rated at 100 ampere-hour at the 20-hour rate should deliver 5 amperes continuously for 20 hours.

INSTALLATION AND PERIODIC SERVICE

The following points should be observed when installing a battery.

- Be sure the carrier is clean, and the battery rests level. Tighten the hold-down nuts evenly until snug.
- Be sure the cables are in good condition and the terminal clamps are clean. Grease the battery posts and cables lightly to retard corrosion.
- Be sure correct polarity is observed with respect to the generating system.

The following points should be observed when servicing a battery.

- Keep the top clean to avoid self-discharge. If necessary, wash with a solution of baking soda or ammonia and rinse with water.
- If necessary to add water, do not overfill. Be sure water is as pure as possible.
- When using a booster battery to start a vehicle, be sure correct polarity is observed.

ALLOWABLE BATTERY HIGH RATE CHARGE TIME SCHEDULE

		BATTERY CAPACITY—AMP HOURS					
Specific Gravity Reading	Charge Rate Amperes	40	45	55	65	70	80
		HIGH RATE CHARGING TIME					
1.125* to 1.150	35	1 Hr.	1 Hr. 5 Min.	1 Hr. 20 Min.	1 Hr. 35 Min.	1 Hr. 40 Min.	1 Hr. 55 Min.
1.150 to 1.175	35	45 Min.	50 Min.	1 Hr. 5 Min.	1 Hr. 15 Min.	1 Hr. 20 Min.	1 Hr. 35 Min.
1.175 to 1.200	35	35 Min.	40 Min.	50 Min.	1 Hr.	1 Hr.	1 Hr. 10 Min.
1.200 to 1.225	35	25 Min.	30 Min.	35 Min.	40 Min.	45 Min.	50 Min.
Above 1.225	5	NOTE: Charge at low rate only (5 amps) until specific gravity reaches—1.260 at 80° F (Standard Battery), 1.250 at 80° F (Sta-Ful Battery)					

*If the specific gravity is below 1.125, use the indicated high-rate charge, then use a low rate of charge (5 amperes) until the specific gravity reaches: 1.260 at 80° F (Standard Battery), 1.250 at 80° F (Sta-Ful Battery)

Ford Division offers these 15-minute safety flares at a special price!

Please send me_______ packages of Safety Flares @ 75¢ per package. Enclosed is a check or money order in the amount of $________. (Limit is three packages)

NAME __________________________

ADDRESS ________________________

CITY ___________________________

STATE ______________ ZIP ________

(Please Print)

Please send me_______ packages of Safety Flares @ 75¢ per package. Enclosed is a check or money order in the amount of $________. (Limit is three packages)

NAME __________________________

ADDRESS ________________________

CITY ___________________________

STATE ______________ ZIP ________

(Please Print)

Please send me_______ packages of Safety Flares @ 75¢ per package. Enclosed is a check or money order in the amount of $________. (Limit is three packages)

NAME __________________________

ADDRESS ________________________

CITY ___________________________

STATE ______________ ZIP ________

(Please Print)

Please send me_______ packages of Safety Flares @ 75¢ per package. Enclosed is a check or money order in the amount of $________. (Limit is three packages)

NAME __________________________

ADDRESS ________________________

CITY ___________________________

STATE ______________ ZIP ________

(Please Print)

Please send me_______ packages of Safety Flares @ 75¢ per package. Enclosed is a check or money order in the amount of $________. (Limit is three packages)

NAME __________________________

ADDRESS ________________________

CITY ___________________________

STATE ______________ ZIP ________

(Please Print)

Please send me_______ packages of Safety Flares @ 75¢ per package. Enclosed is a check or money order in the amount of $________. (Limit is three packages)

NAME __________________________

ADDRESS ________________________

CITY ___________________________

STATE ______________ ZIP ________

(Please Print)

125 lives could have been saved in 1965 alone through the use of safety flares, according to the National Safety Council. And nearly 2,000 injuries could have been averted, *if only the drivers of those cars had carried safety flares! AND USED THEM!*

In the interest of added driving safety, Ford is making fifteen-minute emergency flares available to you at a low cost. Their hope is that *every* driver will carry them whenever a roadside emergency occurs.

At the special offer price of only 75¢ for a package of two fifteen-minute flares, you can't afford to be without them.

Use one of the coupons at the left to send for *your* emergency flares. If all coupons are gone, just send 75¢ for each package of two to the following address:

Ford Division,
Ford Motor Company
Dept. ST
P.O. Box 1000
Plymouth, Michigan 48170

Make checks payable to:

Ford Division, Ford Motor Company

(Sorry, Limit is three packages)

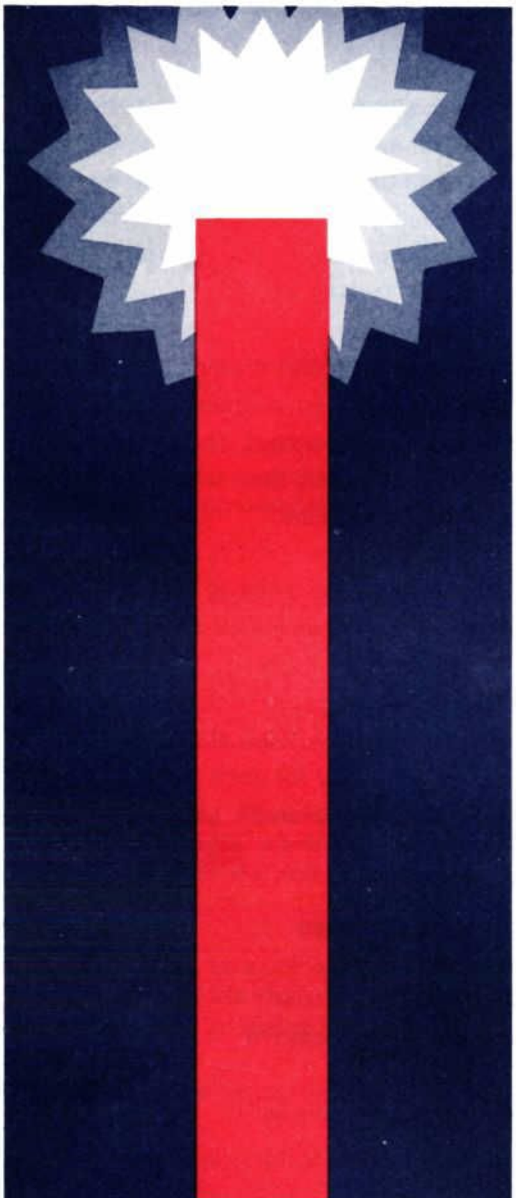
Don't put it off!

Send for your emergency safety flares without delay.

(OFFER ENDS APRIL 30, 1967)

From Ford... for SAFETY'S SAKE

two 15-minute emergency safety flares for only 75¢



MAIL ONE OF THESE COUPONS TODAY!

Offer ends April 30, 1967
Full details on other side

Fill in other side of this coupon and mail with check or money order to:

Ford Division
Ford Motor Company
Dept. ST
P.O. Box 1000
Plymouth, Michigan 48170

Fill in other side of this coupon and mail with check or money order to:

Ford Division
Ford Motor Company
Dept. ST
P.O. Box 1000
Plymouth, Michigan 48170

Fill in other side of this coupon and mail with check or money order to:

Ford Division
Ford Motor Company
Dept. ST
P.O. Box 1000
Plymouth, Michigan 48170

Fill in other side of this coupon and mail with check or money order to:

Ford Division
Ford Motor Company
Dept. ST
P.O. Box 1000
Plymouth, Michigan 48170

Fill in other side of this coupon and mail with check or money order to:

Ford Division
Ford Motor Company
Dept. ST
P.O. Box 1000
Plymouth, Michigan 48170

Fill in other side of this coupon and mail with check or money order to:

Ford Division
Ford Motor Company
Dept. ST
P.O. Box 1000
Plymouth, Michigan 48170