

# IDENTIFICATION CODES

**GROUP  
10**

<b>SECTION TITLE</b>	<b>PAGE NO.</b>	
Identification Codes	10-00-1	
Lubrication Charts and Lubricant Specifications	10-03-1	
Maintenance	10-02-1	
Hoisting, Jacking and Towing	10-04-1	
Metric Information		

# SECTION 10-00 Identification Codes

SUBJECT	PAGE	SUBJECT	PAGE
<b>GENERAL INFORMATION</b>		<b>VEHICLE DATA (Cont'd.)</b>	
Chassis-Cab Certification Label .....	10-00-1	Body Codes .....	10-00-8
Vehicle Data .....	10-00-3	District Sales Office Codes .....	10-00-6
Vehicle Identification Number (VIN) .....	10-00-2	Exterior Paint Color Codes .....	10-00-5
Vehicle Rating Decal .....	10-00-1	Transmission Codes .....	10-00-9
<b>VEHICLE APPLICATION</b> .....	10-00-1	Type/Gross Vehicle Weight Codes .....	10-00-7
<b>VEHICLE DATA</b>		Wheelbase Codes .....	10-00-7
Axle Codes (Front) .....	10-00-9	<b>VEHICLE IDENTIFICATION NUMBER</b> .....	10-00-3
Axle Codes (Rear) .....	10-00-10		

## VEHICLE APPLICATION

All Cargo Vehicles.

## GENERAL INFORMATION

### Chassis-Cab Certification Label

The Chassis-Cab Certification Label is attached to the face of the driver's side door pillar. The label contains the name of the manufacturer, the month and year of manufacture and the certification statement.

#### CHASSIS CAB CERTIFICATION LABEL

THIS CHASSIS-CAB CONFORMS TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NOS. 101, 102, 103, 104, 106, 107, 111, 113, 115, 116, 124, 205, 206, 207, 208, 209, 210 AND 302. THIS VEHICLE WILL CONFORM TO STANDARD NOS. 108, 120 AND 105 OR 121 (AS APPLICABLE) IF IT IS COMPLETED IN ACCORDANCE WITH THE INSTRUCTIONS CONTAINED IN THE INCOMPLETE VEHICLE DOCUMENT FURNISHED PURSUANT TO 49 CFR PART 568. CONFORMITY TO THE OTHER SAFETY STANDARDS APPLICABLE TO THIS VEHICLE WHEN COMPLETED IS NOT SUBSTANTIALLY AFFECTED BY THE DESIGN OF THE CHASSIS-CAB. CHASSIS-CAB MANUFACTURED BY FORD BRASIL S.A. IN BRAZIL.

DATE:

VE5HT-19A349-BA

CY2926-1A

### Vehicle Rating Decal

The Vehicle Rating Decal contains pertinent information about vehicle type/GVW wheelbase dimension, body, transmission and axle identification. The Rating Decal is attached to the door pillar on the driver's side.

#### VEHICLE RATING DECAL

### FORD BRASIL S.A.

AVENIDA HENRY FORD 1787-SAO PAULO-CAPITAL  
C.G.C.33.160.839/0031-61-INDUSTRIA BRASILEIRA  
INCOMPLETE VEHICLE MANUFACTURED BY  
FORD BRASIL S.A. IN BRAZIL. DATE: 11/89

GVWR: 29,500	LBS. 13,381	kg
FAWR: 11,000	LBS. 4,990	kg
RAWR: 18,500	LBS. 8,391	kg

VEHICLE IDENTIFICATION NO.

2K 9A EXTERIOR PAINT COLORS		48 DISTRICT		
WB	TYPE-GVW	BODY	TRANS	AXLE
189	H70	118	CW	3HG 1989

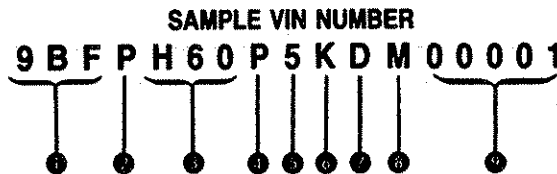
VE5MB-18173-BA

CY2927-1E

**GENERAL INFORMATION (Continued)****Vehicle Identification Number (VIN)**

By looking at the seventeen digit VIN number a variety of information about the vehicle can be determined. The first three digits identify the manufacturer and the vehicle make and type. The fourth digit determines the type of brake system (air or hydraulic) and the Gross Vehicle Weight Rating (GVWR) Class for Trucks and MPV's (completed vehicles). For incomplete vehicles and buses, the fourth digit determines the brake system. Digits five, six and seven identify the model or line, series, chassis and cab type. The eighth digit points out the particular engine and type found in the vehicle. Digit

nine is the VIN check digit. The tenth digit identifies the model year of a Ford—completed vehicle or the model year of the incomplete vehicle, if sold by Ford as an incomplete vehicle. The eleventh digit determines the assembly plant. Digits twelve through seventeen make up the sequential serial and warranty number. Digit twelve uses the letter "M" until the production or sequence of 99,999 units (digits thirteen through seventeen) is reached. Letter "M" then becomes "N" for the next production sequence of vehicles.



- ① Positions 1, 2 and 3 — Manufacturer, Make and Type (World Manufacturer Identifier)
- ② Position 4 — Brake System GVWR Class for Trucks and MPV's (complete vehicles); Brake System (only) for Incomplete Vehicles and Buses.
- ③ Positions 5, 6 and 7 — Model or Line, Series, Chassis, Cab Type
- ④ Position 8 — Engine Type
- ⑤ Position 9 — Check Digit
- ⑥ Position 10 — Model Year (Ford — completed vehicles)
- ⑦ Position 11 — Assembly Plant
- ⑧ Position 12 — Constant "M" until sequence number of 99,999 is reached, then changes to a constant "N" and so on.
- ⑨ Positions 13 through 17 — Sequence number — begins at 00001

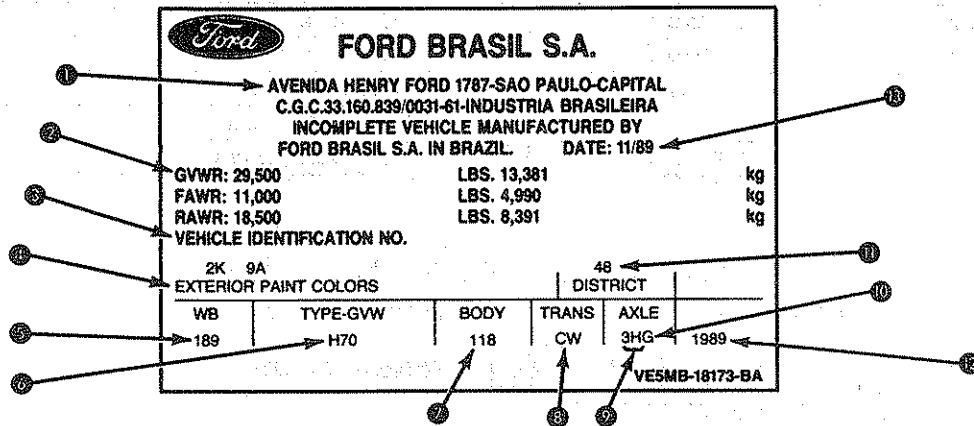
CY2929-2D

**GENERAL INFORMATION (Continued)**

**Vehicle Data**

The Vehicle Data appears on the Vehicle Rating Decal on the two lines following the identification number. The code set (two numbers or a number and letter) above COLOR identify the exterior paint color (two sets of codes designate a two-tone). The first three digits under W.B. designate the wheelbase in inches. The letter and three digits under TYPE/GVW designate the truck model within

a series and the gross vehicle weight rating. The letters and/or numeral under BODY designate the interior trim, seat and body type. The transmission installed in the vehicle is identified under TRANS by a code of letter(s) and/or number(s). A letter and a number or two numbers under AXLE identify the rear axle ratio (when required, a letter is also stamped after the rear axle code to identify the front axle).



- 1 Name and Location of Manufacturer
- 2 Gross Vehicle Weight Rating in Pounds (LB) and Kilograms (KG)
- 3 Vehicle Identification Number
  - (a) World Manufacturer Identifier
  - (b) Brake System and Gross Vehicle Weight Rating (GVWR) Class for Trucks (complete vehicles); Brake System (only) for Incomplete Vehicles
  - (c) Model or Line, Series, Chassis and Cab Type
  - (d) Engine Type
  - (e) Check Digit
  - (f) Model Year (Ford — completed vehicles)
  - (g) Assembly Plant Code
  - (h) Sequential Serial Number
- 4 Exterior Paint Codes (Two sets of figures designates a two-tone)
- 5 Wheelbase in Inches
- 6 Model Code and GVW
- 7 Interior Trim, Seat and Body/Cab Type
- 8 Transmission Code
- 9 Rear Axle Code
- 10 Front Axle Code
- 11 District/Special Order Codes
- 12 Vehicle Model Year
- 13 Date of Manufacture by Month/Year

CY2930-2E

**VEHICLE IDENTIFICATION NUMBER**

Refer to the following charts for further explanation of the 17-digit Vehicle Identification Number.

**WORLD MANUFACTURER IDENTIFIER (VIN POSITIONS 1, 2 AND 3)**

9BF PH60P5KDM00001

VIN Code	Manufacturer	Make	Type
9BF	Ford Brasil, S.A.	Ford	Incomplete Vehicle (Truck)

CY2931-2D

VEHICLE IDENTIFICATION NUMBER (Continued)

**BRAKE SYSTEM AND GVWR CLASS FOR TRUCKS AND MPV'S —  
BRAKE SYSTEM (ONLY) FOR BUSES AND  
INCOMPLETE VEHICLES  
(VIN POSITION 4)**

9 B F **P** H 6 0 P 5 K D M 0 0 0 0 1

Brake System	GVWR Class	GVWR Range	VIN Code
Hydraulic	Class 6	19,501-26,000 pounds	N
Hydraulic	Class 7	26,001-33,000 pounds	P
Hydraulic	Class 8	33,001-55,000 pounds	R
Air	Class 6	19,501-26,000 pounds	W
Air	Class 7	26,001-33,000 pounds	X
Air	Class 8	33,001-55,000 pounds	Y

CY2932-2D

**MODEL OR LINE, SERIES, CHASSIS, CAB TYPE  
(VIN POSITIONS 5, 6 AND 7)**

9 B F P **H60** P 5 K D M 0 0 0 0 1

VIN Code	Description
H60	CF6000
H70	CF7000
H81	CF8000
H85	CFT-8000

CY2933-2D

**ENGINE TYPE, DISPLACEMENT, CYLINDERS,  
FUEL TYPE, AND MANUFACTURER  
(VIN POSITION 8)**

9 B F P H 6 0 **P** 5 K D M 0 0 0 0 1

Type	VIN Code	Displacement		Cylinders	Fuel Metering	Manufacturer	Net Brake Horsepower
		Liter	CID				
Diesel	P	6.6	401	I-6	Turbo Diesel	Ford Brasil S.A.	165-170
Diesel	A	7.8	474	I-6	Turbo Diesel	Ford Brasil S.A.	185-240

CY2934-2E

**CHECK DIGIT FOR ALL VEHICLES  
(VIN POSITION 9)**

9 B F P H 6 0 P **5** K D M 0 0 0 0 1

CY2935-1D

VEHICLE IDENTIFICATION NUMBER (Continued)

VEHICLE DATA

VEHICLE MODEL YEAR  
(FORD-COMPLETED VEHICLES)  
(VIN POSITION 10)

9 B F P H 6 0 P 5 **K** D M 0 0 0 0 1

VIN Code	Year
K .....	1989
L .....	1990
M .....	1991
N .....	1992

CY2936-1D

ASSEMBLY  
PLANT  
(VIN POSITION 11)

9 B F P H 6 0 P 5 K **D** M 0 0 0 0 1

VIN Code	Assembly Plant
D .....	Ipiranga (Brasil)

CY2937-1D

PRODUCTION SEQUENCE NUMBER  
(VIN POSITIONS 12 THROUGH 17)


9 B F P H 6 0 P 5 K D **M 0 0 0 0 1**

SEQUENCE NUMBER
M00001 — M99999 and so on.

CY2938-1D

Refer to the following charts for further explanation of the Vehicle Rating Decal.

Exterior Paint Color Codes



**FORD BRASIL S.A.**  
 AVENIDA HENRY FORD 1787-SAO PAULO-CAPITAL  
 C.G.C.33.160.839/0031-61-INDUSTRIA BRASILEIRA  
 INCOMPLETE VEHICLE MANUFACTURED BY  
 FORD BRASIL S.A. IN BRAZIL. DATE: 11/89

GVWR: 29,500 LBS. 13,381 kg  
 FAWR: 11,000 LBS. 4,990 kg  
 RAWR: 18,500 LBS. 8,391 kg

VEHICLE IDENTIFICATION NO.

2K 9A		48			
EXTERIOR PAINT COLORS					DISTRICT
WB	TYPE-GVW	BODY	TRANS	AXLE	
189	H70	118	CW	3HG	1989


VE5MB-18173-BA

Code	Color
1C	Raven Black
1D	Smoke Metallic
1E	Silver Metallic
2K	Candyapple Red
3T	Bahama Blue
8Q	Light Desert Tan
9Y	Walnut Metallic
94	Diamond White

CY2939-1E

VEHICLE DATA (Continued)

District Sales Office Codes

		<b>FORD BRASIL S.A.</b>	
AVENIDA HENRY FORD 1787-SAO PAULO-CAPITAL C.G.C.33.160.839/0031-61-INDUSTRIA BRASILEIRA INCOMPLETE VEHICLE MANUFACTURED BY FORD BRASIL S.A. IN BRAZIL. DATE: 11/89			
GVWR: 29,500	LBS. 13,381	kg	
FAWR: 11,000	LBS. 4,990	kg	
RAWR: 18,500	LBS. 8,391	kg	
VEHICLE IDENTIFICATION NO.			
2K 9A		48	
EXTERIOR PAINT COLORS		DISTRICT	
WB	TYPE-GVW	BODY	TRANS
189	H70	118	CW
			AXLE
			3HG
			1989
VE5MB-18173-BA			

**DSO — FSO — PTO (DOMESTIC, FOREIGN AND SPECIAL ORDER)**

The D.S.O. space will show a two-digit code number of the district which ordered the unit (see chart below). This code will appear on all units — domestic or export. If unit is built on a D.S.O., E.S.O., P.T.O. (special orders), the complete order number is under the D.S.O. space after the district code.

Code	District
11	Boston
12	Buffalo
13	New York
14	Pittsburgh
16	Philadelphia
17	Washington
21	Atlanta
22	Charlotte
23	Memphis
24	Jacksonville
26	New Orleans
28	Louisville
41	Chicago
42	Cleveland
43	Milwaukee
46	Indianapolis
47	Cincinnati
48	Detroit

Code	District
52	Dallas
53	Kansas City
54	Omaha
55	St. Louis
57	Houston
58	Twin Cities
71	Los Angeles
72	San Jose
74	Seattle
75	Phoenix
76	Denver
83	Government
84	Home Office Reserve
85	American Red Cross
86	Recreation Vehicles
87	Body Company
89	Transportation Services
90's	Export
00	Special

Ford of Canada
<b>Ford Regions</b>
B1 Central
B2 Eastern
B3 Atlantic
B4 Midwestern
B6 Western
B7 Pacific
B8 Great Lakes
I1 Export

VEHICLE DATA (Continued)

Wheelbase Codes

**Ford** **FORD BRASIL S.A.**  
 AVENIDA HENRY FORD 1787-SAO PAULO-CAPITAL  
 C.G.C.33.160.839/0031-61-INDUSTRIA BRASILEIRA  
 INCOMPLETE VEHICLE MANUFACTURED BY  
 FORD BRASIL S.A. IN BRAZIL. DATE: 11/89

GVWR: 29,500 LBS. 13,361 kg  
 FAWR: 11,000 LBS. 4,990 kg  
 RAWR: 18,500 LBS. 8,391 kg

VEHICLE IDENTIFICATION No.

2K 9A		48			
EXTERIOR PAINT COLORS					DISTRICT
WB	TYPE-GVW	BODY	TRANS	AXLE	
189	H70	118	CW	3HG	1989

VE5MB-18173-BA

Wheelbase	(Inches)
CF6000-7000	153
	171
	189
	207
CF-8000	225
	117
	171
	189
CFT-8000	207
	225
	189

CY2941-1F

Type/Gross Vehicle Weight Codes

**Ford** **FORD BRASIL S.A.**  
 AVENIDA HENRY FORD 1787-SAO PAULO-CAPITAL  
 C.G.C.33.160.839/0031-61-INDUSTRIA BRASILEIRA  
 INCOMPLETE VEHICLE MANUFACTURED BY  
 FORD BRASIL S.A. IN BRAZIL. DATE: 11/89

GVWR: 29,500 LBS. 13,361 kg  
 FAWR: 11,000 LBS. 4,990 kg  
 RAWR: 18,500 LBS. 8,391 kg

VEHICLE IDENTIFICATION No.

2K 9A		48			
EXTERIOR PAINT COLORS					DISTRICT
WB	TYPE-GVW	BODY	TRANS	AXLE	
189	H70	118	CW	3HG	1989

VE5MB-18173-BA

H70


Series	Code	GVWR Lbs.		Vehicle Shipping Weight Lbs.
		Standard	Maximum	
CF6000	H60	26,500	26,500	9,800
CF7000	H70	29,500	29,500	10,300
CF8000	H81	33,000	36,000	—
CFT-8000	H85	51,000	51,000	—

CY2942-1E



VEHICLE DATA (Continued)

Body Codes

 <b>FORD BRASIL S.A.</b> AVENIDA HENRY FORD 1787-SAO PAULO-CAPITAL C.G.C.33.160.839/0031-61-INDUSTRIA BRASILEIRA INCOMPLETE VEHICLE MANUFACTURED BY FORD BRASIL S.A. IN BRAZIL. DATE: 11/89					
GVWR: 29,500	LBS. 13,381	kg			
FAWR: 11,000	LBS. 4,990	kg			
RAWR: 18,500	LBS. 8,391	kg			
VEHICLE IDENTIFICATION No.					
2K 9A		EXTERIOR PAINT COLORS		DISTRICT	
WB	TYPE-GVW	BODY	TRANS	AXLE	DISTRICT
189	H70	118	CW	3HG	1989
VE5MB-18173-BA					

1 1 8

SEAT TRIM AND STYLE

CF6000/CF7000/CF8000/CFT8000	Code
Cloth and Vinyl Bucket (Opt)	1
All Vinyl Bucket (Base)	2

CAB/BODY STYLE

CF6000/CF7000/CF8000/CFT8000	Code
Chassis Cab	8

TRIM COLOR

Color	Code
Black With Red Laser Stripe (Std)	1
Black Vinyl (Opt)	2

CY2943-2E

VEHICLE DATA (Continued)

Transmission Codes

TRANSMISSION CODES

**Ford FORD BRASIL S.A.**  
 AVENIDA HENRY FORD 1787-SAO PAULO-CAPITAL  
 C.G.C.33.160.839/0031-61-INDUSTRIA BRASILEIRA  
 INCOMPLETE VEHICLE MANUFACTURED BY  
 FORD BRASIL S.A. IN BRAZIL. DATE: 11/89

GVWR: 29,500 LBS. 13,381 kg  
 FAWR: 11,000 LBS. 4,990 kg  
 RAWR: 18,500 LBS. 8,391 kg

VEHICLE IDENTIFICATION No.

2K 9A  
 EXTERIOR PAINT COLORS

WB	TYPE-GVW	BODY	TRANS	AXLE	DISTRICT
189	H70	118	CW	3HG	1989

VE5MB-18173-BA

TRANSMISSION CODES

CODE	DESCRIPTION
AA	Allison AT545 4-speed Automatic
BR	Allison MT643 4-speed Automatic
BS	Allison MT653 5-speed Automatic
CV	FS5005B 5-speed Manual (2)
CY	FS5005A 5-speed Manual (1)
CW	FS4005A 5-speed Manual (1)
CX	FS4005B 5-speed Manual (2)
CR	FS6105A 5-speed Manual (1)
CS	FS6105B 5-speed Manual (2)
CT	FS5106 6-speed Manual
CU	FS6106 6-speed Manual
BN	RT-6610 10-speed Manual
BP	RT-6613 13-speed Manual

(1) Wide Ratio. (2) Soft Fourth. (3) Available for California Vehicles Only.  
 CY2944-1E

Axle Codes (Front)

**Ford FORD BRASIL S.A.**  
 AVENIDA HENRY FORD 1787-SAO PAULO-CAPITAL  
 C.G.C.33.160.839/0031-61-INDUSTRIA BRASILEIRA  
 INCOMPLETE VEHICLE MANUFACTURED BY  
 FORD BRASIL S.A. IN BRAZIL. DATE: 11/89

GVWR: 29,500 LBS. 13,381 kg  
 FAWR: 11,000 LBS. 4,990 kg  
 RAWR: 18,500 LBS. 8,391 kg

VEHICLE IDENTIFICATION NO.

2K 9A  
 EXTERIOR PAINT COLORS

WB	TYPE-GVW	BODY	TRANS	AXLE	DISTRICT
189	H70	118	CW	3HG	1989

VE5MB-18173-BA

REAR AXLE CODES

3HG

FRONT AXLE CODES AND DESCRIPTION

CF 6000	
Code	Description
N	9,000 Lb. Steel
P	12,000 Lb. Steel

CF 7000	
Code	Description
G	12,000 Lb. Steel <sup>①</sup>


CF-CFT 8000	
Code	Description
G	12,000 Lb. Steel
R	13,000 Lb. Steel

Note: <sup>①</sup>With greasable drag link and tie rod.

CY2945-1E

VEHICLE DATA (Continued)

Axle Codes (Rear)

 <b>FORD BRASIL S.A.</b> AVENIDA HENRY FORD 1787-SAO PAULO-CAPITAL C.G.C.33.160.839/0031-61-INDUSTRIA BRASILEIRA INCOMPLETE VEHICLE MANUFACTURED BY FORD BRASIL S.A. IN BRAZIL. DATE: 11/89					
GVWR: 29,500	LBS. 13,381	kg			
FAWR: 11,000	LBS. 4,990	kg			
RAWR: 18,500	LBS. 8,391	kg			
VEHICLE IDENTIFICATION No.					
2K 9A		48		DISTRICT	
EXTERIOR PAINT COLORS					
WB	TYPE-GVW	BODY	TRANS	AXLE	1989
189	H70	118	CW	3HG	
VE5MB-18173-BA					

**3H G**

FRONT AXLE CODE

REAR AXLE CODES AND DESCRIPTION

CF6000		
Code	Description	Ratio
54	Rockwell RS-17-140 17,500 Lb. Single Speed	4.88
W8	Rockwell RS-17-220 17,500 Lb. Two Speed	4.88/6.80

CF7000		
Code	Description	Ratio
2H	Rockwell RS-21-145 21,000 Lb. Single-Speed	4.88
3H	Rockwell RS-21-230 21,000 Lb. Two-Speed	4.88/6.80
3S	Rockwell RS-21-230	5.86/8.17

CF8000		
Code	Description	Ratio
2G	Rockwell RS-21-145 21,000 Lb. Single Speed	4.56
3G	Rockwell RS-21-230 21,000 Lb. Two Speed	4.56/6.36
V8	Rockwell RS-23-160 23,000 Lb. Single Speed	4.56
X3	Rockwell RS-23-240 23,000 Lb. Two Speed	4.56/6.36

CFT8000		
Code	Description	Ratio
61	Rockwell RT-40-145 40,000 Lb. Single Speed Tandem Axle	4.56

CY2946-2E

# SECTION 10-02 Maintenance

SUBJECT	PAGE	SUBJECT	PAGE
<b>MAINTENANCE</b>		<b>VEHICLE APPLICATION</b>	<b>10-02-1</b>
Maintenance Scheduled .....	10-02-1		
Non-Scheduled Maintenance .....	10-02-6		

## VEHICLE APPLICATION

Cargo Truck Models.

## MAINTENANCE

It should be noted that any modification of the emission control systems could create liability under Federal law (U.S.) if made prior to the first sale and registration and, under the laws of some states, if made thereafter. Further, federal law prohibits vehicle manufacturers or dealers and other persons engaged in the business of repairing, servicing, selling, leasing, or trading

motor vehicles as well as fleet operations from knowingly removing or rendering an emission control system inoperative after sale and delivery to an ultimate purchaser. In Canada, modifications of the emission control system could create liability under applicable Federal or Provincial laws.

### Maintenance Scheduled

Refer to the appropriate Sections of the Engine Shop Manual and the Engine/Emission Diagnosis\* manual for the Maintenance Procedures, which are related to the item listed on the maintenance schedule. Use these procedures to perform the required emission systems maintenance items listed on the maintenance charts.

Maintenance service adjustments must conform to specifications contained in the Engine/Emissions Diagnosis\* manual, to those listed in the Truck Performance Specifications Book, or shown on the Vehicle Emission Control Information Decal which is located on or near the engine, or the emission systems may become inoperative.

As a safety precaution, before starting the engine to perform maintenance, make sure the transmission selector is in PARK (automatic transmission) or NEUTRAL (manual transmission), the parking brake set and the wheels blocked.

In general, maintenance, replacement, or service of the emission control devices or systems in your

new Ford vehicle or Ford engine may be performed at your expense by any automotive repair establishment or individual using automotive parts equivalent to those with which your vehicle or engine was originally equipped. If other than Ford or Motorcraft service parts or Ford authorized, remanufactured parts are used for maintenance replacements or for the service of components affecting emission control, the owner should assure himself that such parts are warranted by their manufacturer to be equivalent to genuine Ford Motor Company parts in performance and durability. Ford, however, assumes no liability whatsoever, under the emission control system or any other warranty with respect to parts other than Ford service parts or Ford authorized, remanufactured parts. The emission control system's warranty covers the emission control devices and systems. Please consult your warranty facts booklet for warranty information.

\*Can be purchased as a separate item.

**MAINTENANCE (Continued)**

**MAINTENANCE SCHEDULE — VEHICLES WITH FORD DIESEL ENGINES**

MAINTENANCE OPERATIONS	NORMAL SERVICE INTERVALS											
	Miles or kilometers in thousands, unless otherwise specified.											
	NOTE: Scheduled maintenance beyond 48,000 miles (77 000 kilometers) should be continued as before 48,000 miles (77 000 kilometers) except as noted.											
MILES (Thousands)	6	12	18	24	30	36	42	48	54	60		
KILOMETERS (Thousands)	10	19	29	39	48	58	68	77	87	96		
ENGINE SERVICE HOURS (Emission Control Systems)	150	300	450	600	750	900	1050	1200	1350	1500		
Perform at Distance or Hours, whichever occurs first.												
<b>Engine System</b>												
Check engine oil	DAILY											
Check coolant level	DAILY											
Check fuel/water separator	DAILY											
Change fuel/water separator element ⑤	X				X					X		
Check air filter restriction indicator ⑫	DAILY											
Change engine oil and oil filters ①② every 3 months or	X	X	X	X	X	X	X	X	X	X	X	
Inspect drive belts and hoses	X	X	X	X	X	X	X	X	X	X	X	
Change coolant/filter conditioner ③		X		X		X		X		X		
Change fuel filters				X				X				
Check low idle — adjust if required				X				X				
Change crankcase vent filter				X				X				
Check valve lash — adjust if required ⑭ ⑮				X								
Check coolant strength/condition — replace if necessary	ANNUALLY											
Replace coolant ④								X				
Replace fuel injection nozzles ⑯	Every 4500 hours or 150,000 miles (241 350 kilometers)											
Lubricate fuel shutoff solenoid linkage ball and socket	ANNUALLY											

**MAINTENANCE SCHEDULE — VEHICLES WITH FORD DIESEL ENGINES (CONT'D.)**

MAINTENANCE OPERATIONS	NORMAL SERVICE INTERVALS											
	Miles or kilometers in thousands, unless otherwise specified.											
	NOTE: Scheduled maintenance beyond 60,000 miles (96 000 kilometers) should be continued as before 60,000 miles (96 000 kilometers) except as noted.											
MILES (Thousands)	6	12	18	24	30	36	42	48	54	60		
KILOMETERS (Thousands)	10	19	29	39	48	58	68	77	87	96		
<b>Chassis and Body Mounted Noise Shields — Side Shields, Rear Shields, Undershields, Hood Blanket ⑩</b>												
Inspect for damage to absorber — replace when necessary ⑦⑧			X			X				X		
<b>Exhaust System</b>												
Inspect entire exhaust system (inlet pipes, mufflers, outlet pipes, clamps, and fasteners for holes, leakage, breakage, corrosive damage, and separation from other components ⑦⑧)		X			X			X				
<b>Frame and Mounting System</b>												
Torque all crossmember bolts and cab mount bracket bolts								X				
Inspect rubber cab mounts and shocks								X				
<b>Suspension System</b>												
Torque wheel mounting nuts	SEE NOTE ⑩											
Lube front and rear spring shackles and pins ⑪	First 1,000 miles (1 600 km) ⑬	X				X				X		

**MAINTENANCE (Continued)**

**MAINTENANCE SCHEDULE — VEHICLES WITH FORD DIESEL ENGINES (CONT'D.)**

MAINTENANCE OPERATIONS	NORMAL SERVICE INTERVALS									
	Miles or kilometers in thousands, unless otherwise specified. NOTE: Scheduled maintenance beyond 60,000 miles (96 000 kilometers) should be continued as before 60,000 miles (96 000 kilometers) except as noted.									
MILES (Thousands) KILOMETERS (Thousands)	6 10	12 19	18 29	24 39	30 48	36 58	42 68	48 77	54 87	60 96
<b>Suspension System (Continued)</b>										
Torque front and rear spring U-bolts	First 1,000 miles (1 600 km) ⑬		X			X			X	
Torque front and rear spring bracket to frame bolts	First 1,000 miles (1 600 km) ⑬								X	
Torque rear spring eye bolts	X⑥								X	
Torque shock absorber bracket to frame bolts	Each 100,000 miles (160 000 kilometers)									
Torque tandem axle walking beam adapter end nut, saddle cap nuts, and torque arm attaching bolts and nuts	⑥								X	
Repack and adjust front wheel bearings⑯								X		
<b>Driveline and Rear Axle System</b>										
Drain and refill rear axle	First 500 and 1,000 miles ⑥ (800/1 600 km)							X		
Check rear axle lube level, clean breather and magnetic fill plug			X			X			X	
Lube U-joints and slip yoke ⑱			X			X			X	
<b>Brake System</b>										
Drain air brake system reservoir to 0 psi/kPa — manual valve (deplete all condensates)	DAILY									
Torque air compressor mounting bolts	X⑥							X		
Check operation of air reservoir safety valve			X			X			X	
Lube air brake foot control valve, valve pedal hinge and roller, brake camshaft slack adjusters ⑲	Every 12 months or				X					X
Clean or replace air filter in brake chamber — air-over-hydraulic spring brake ⑫⑭	Every 12 months or							X		
Inspect all air brake lines and linings, compressor to air tank tubing ⑮								X		
Inspect disc brake chamber and air/hydraulic actuator air chamber diaphragm (if equipped) ⑲	Every 12 months or					X				
Disassemble, clean and check air reservoir safety valve	Each 100,000 miles (160 000 kilometers)									
Inspect all hydraulic brake lines			X⑥					X		
Check brake master cylinder fluid level	X	X	X	X	X	X	X	X	X	
Inspect drum brake linings through inspection holes	X		X			X			X	
Inspect/adjust drum brakes (hydraulic) ⑳	See "Hydraulic Drum Brake Adjustment"									
Inspect drum brake wheel cylinder/expander cylinder boots						X				
Inspect and torque backing plate bolts	X⑥		X					X		
Inspect and torque disc brake torque plate bolts	X⑥		X					X		
Disassemble, clean and check quick-release valve ⑱								X		
Disassemble, clean and check lanyard drain valve ⑫⑯								X		
Lube brake slack adjuster (manual and automatic) ⑪⑫	Every 6 months or			X				X		
Lube brake camshaft (S-cam air brakes)	Every 12 months or			X				X		
Adjust drum brakes (S-cam air brakes) ⑫ ㉑	Every 3 months or 25,000 miles (40 000 kilometers)									
Single check valve (SC-2) — disassemble, clean and inspect for wear and deterioration								X		
Double check valve (DC-4) — disassemble, clean and inspect for wear and deterioration	Each 100,000 miles (160 000 kilometers)									

**MAINTENANCE (Continued)**

**MAINTENANCE SCHEDULE — VEHICLES WITH FORD DIESEL ENGINES (CONT'D.)**

MAINTENANCE OPERATIONS	NORMAL SERVICE INTERVALS										
	Miles or kilometers in thousands, unless otherwise specified. NOTE: Scheduled maintenance beyond 60,000 miles (96 000 kilometers) should be continued as before 60,000 miles (96 000 kilometers) except as noted.										
MILES (Thousands) KILOMETERS (Thousands)	6 10	12 19	18 29	24 39	30 48	36 58	42 68	48 77	54 87	60 96	
<b>Transmission System</b>											
Check manual transmission fluid level and clean breather ⑪	Every 6 months or		X			X			X		
Change lubricant in manual transmission ⑫	X ⑫							X			
Torque transmission front mounting bolts, rear retainer bolts/nuts and shift linkage fasteners	X ⑭							X			
Drain and refill automatic transmission fluid and replace external filter	⑮										
<b>Clutch System</b>											
Check clutch master cylinder fluid level	Every 12 months or		X			X			X		
Lube clutch release cross shaft, both sides ⑯					X					X	
<b>Fuel System</b>											
Inspect accelerator linkage		X		X		X		X		X	
Torque fuel tank support mounting bolts								X			
Drain accumulated water or sediment from fuel tanks ⑫ ⑰	X ⑰			X		X		X		X	
Replace water/fuel separator element	X ⑱				X				X		
<b>Steering System</b>											
Check power steering pump fluid level and check system for leaks	X ⑲	X	X	X	X	X	X	X	X	X	
Inspect steering linkage						X					
Lube steering shaft(s), u-joints and splines when equipped with grease fittings			X			X			X		
Check manual steering gear lubricant level	⑲					X					
Lube steering linkage when equipped with grease fittings			X			X			X		
Torque power steering mounting bolts and mounting bracket bolts if so equipped	⑲					X					
Change power steering fluid and filter	⑳	Each 100,000 miles (160 000 kilometers)									
Lube front axle spindle pins			X			X			X		
Torque steering shaft u-joint fasteners	⑲					X					
Torque front axle spindle lock pin nuts	⑲					X					
Torque check power steering remote reservoir mounting bolts ㉑	⑲					X					

CY3924-2B

**MAINTENANCE (Continued)****NOTES:****SEVERE SERVICE:**

If operation includes frequent short trips of 10 miles (16 kilometers) or less when temperature remains below 10°F (-12°C) for 60 days or more; sustained high speed/high load driving during hot weather (90°F, 32°C); driving in severe dust conditions; extended idling; or use of high sulfur fuel (see note ②), the following maintenance intervals apply:

- Engine oil and oil filter — Change every 3 months, 75 hours, or 3,000 miles (4 800 kilometers) whichever occurs first.
  - Air filter — If operating in severe dust conditions, replace more often than regular intervals, as determined by local procedures. Make sure that air filter restriction indicator is in good working order.
- ① Change engine oil and oil filter at 3 months or 6000 miles (10 000 kilometers) whichever occurs first. Refer to "Servicing Your Vehicle" section for recommended API quality and SAE Viscosity grades.
  - ② Normal oil change interval when fuel sulfur content is below 0.5%. When sulfur content is between 0.5% and 1%, decrease oil change interval to one half the normal interval. When sulfur content is above 1%, decrease oil change interval to one fourth the normal interval. Use of fuel with sulfur content above 1.3% is not recommended. Change oil and filter on rebuilt engine at first 600 miles (1 000 kilometers) or 15 hours of operation.
  - ③ Service Coolant Filter/Conditioner System with E7HZ-8A424-B (2 DCA units) or Fleetguard WF2070 filter (2 DCA units) or add 8 ounces of Motorcraft FW-15 Cooling System Additive.
  - ④ Replace coolant at two years if before interval shown.  
If, at any time, coolant is contaminated with oil or residual solids, clean the system and replace the coolant and conditioner additive.  
When all coolant is replaced, install Fleetguard filter WF2072, Ford E7HZ-8A424-A, or Motorcraft FW-17 (6 DCA units), or install Fleetguard filter WF2070 or Ford filter E7HZ-8A424-B (2 DCA units) supplemented with one pint of Motorcraft FW-15 (4 DCA units) Cooling System Additive.  
If topping off or partially filling the cooling system, add Motorcraft FW-15 Cooling System Additive at a strength of 4 ounces per gallon of coolant being added.
  - ⑤ Required at first 6,000 miles (10 000 kilometers) or 150 hours and each 24,000 miles (39 000 kilometers) or 600 hours thereafter.
  - ⑥ Required at this interval for initial service only. Thereafter, perform only at major intervals as indicated in the schedule.
  - ⑦ Adjust, repair or replace as required with same or equivalent part.
  - ⑧ Also a noise emissions control service.
  - ⑨ If so equipped.
  - ⑩ Required at first 500 and 1,000 miles (800 and 1 600 kilometers) and at 500 and 1,000 miles (800 and 1 600 kilometers) after each wheel removal.
  - ⑪ Perform at specified miles/kilometers or 6 months, whichever occurs first.
  - ⑫ Check slack adjusters stroke (at 90-100 psi in reservoirs) to verify proper operation of automatic adjustment functions.
  - ⑬ Required at first 1,000 miles (1 600 kilometers) for initial service.
  - ⑭ Perform at specified miles/kilometers or 12 months, whichever occurs first.
  - ⑮ Replace wheel seal whenever a hub assembly is removed.
  - ⑯ Perform at specified miles/kilometers or 18 months, whichever occurs first.
  - ⑰ Perform at 8,000 miles (13 000 kilometers) for severe service.
  - ⑱ Relubrication cycles vary depending on the service requirements and operating conditions of the vehicle. The following is a recommended relube cycle for various types of service. For city and on/off highway service relube every 6,000 miles (10 000 kilometers). For on-highway service relube every 12,000 miles (19 000 kilometers).
  - ⑲ Hydraulic drum brakes adjust automatically during forward and reverse applications.
  - ⑳ Replace element when indicator shows red.
  - ㉑ See the Diesel Engine Manufacturer's Service Policy or Operator's Manual for service requirements, intervals, performance specifications and adjustments for diesel engine.
  - ㉒ Required at this interval for initial service only. Thereafter, perform at 54,000 mile (87 000 kilometer) intervals.
  - ㉓ Initial adjustment at 1000 miles (1 600 kilometers), check adjustment and/or operation of automatic slacks per specified interval or more frequently depending on your particular vehicle usage.
  - ㉔ See Allison Automatic Transmission Driver's Handbook for transmission oil and filter change intervals.
  - ㉕ Should be performed by a qualified service technician in accordance with instructions in the Ford Truck Shop Manual.
  - ㉖ Once a year for severe service, 250,000 miles (402 250 kilometers) for line haul operation.

CY4152-2B



**MAINTENANCE (Continued)****Non-Scheduled Maintenance****NON-SCHEDULED MAINTENANCE**

The following maintenance operations are not required at definite mileage or time intervals, but should be performed on an "as required" basis. Refer to the appropriate section in this manual for procedures.

Maintenance Operation	Frequency — Observation
Clean body/door drain holes.	At least twice annually.
Clean windshield wiper blades.	As required.
Replace windshield wiper blades.	If wiping the blades with a clean cloth and mild detergent and washing the windshield with a cleaner does not restore a clean wipe.
Lubricate body lock cylinders, door and hood hinges.	Difficult to operate or noisy.
Check headlamp alignment.	Light beams in wrong position when vehicle operating loaded.
Check windshield washer fluid level. Add fluid if required.	If washers do not spray fluid when operated.
Adjust brakes.	Insufficient power shown in loaded practice stop.
Check operation of brakes, clutch, and steering.	Vehicle handling qualities not up to par.
Check steering stop adjustment.	When front wheel alignment is checked and if front wheels rub on undercarriage or body sheet metal when turning.
Inspect the vehicle for missing, damaged, or mislocated chassis and body mounted noise shields.	Excessive noise emanates from under the cab or engine compartment.
Inspect diesel engine mounted noise hardware for damage or oil/fuel saturation i.e.; block panels, oil pan covers, treated valve covers.	Excessive engine noise emanates from under cab or engine compartment.
Inspect the fan, fan shroud, and fan clutch.	Engine overheats, fan runs at high speed constantly, or excessive fan noise, or fan wobble due to worn bearings.
Inspect the entire exhaust system (including inlet pipe, muffler, outlet pipe and all exhaust clamps and fasteners) for holes, leakage, breakage, looseness, and corrosive damage.	Excessive noise or the smell of fumes is experienced.
Inspect engine air induction system (including air ducts, air cleaner, air cleaner element) for loose fitting, damaged, or missing components.	Excessive noise emanates from the engine compartment.
Check hydraulic brake master cylinder fluid level and brake pedal adjustment.	Excessive pedal effort.
Inspect tires and check air pressure.	Poor steering, wandering or excessive tire wear.
Balance wheels and tires.	Vibration or abnormal tire wear indicates imbalance.
Check and adjust clutch pedal travel.	Insufficient free travel or hard shifting.
Check front end alignment.	Poor steering, wandering or excessive tire wear.
Check transmission and engine mountings.	Hard shifting or excessive vibration.
Check and adjust transmission controls.	High effort to shift or noisy transmission.
Clean radiator cap seal. Clean and inspect cap surface on the radiator.	When cap does not hold pressure.
Check battery terminals for corrosion.	Whenever electrical power supply has diminished.
Check battery electrolyte level.	At least every 24,000 miles in temperatures up to 90°F (32°C) — More often in temperatures above 90°F (32°C) — Add water as required.
Check engine coolant level.	Daily, before start of operation. Add coolant to surge tank located at back side of cab.

CY2992-2D

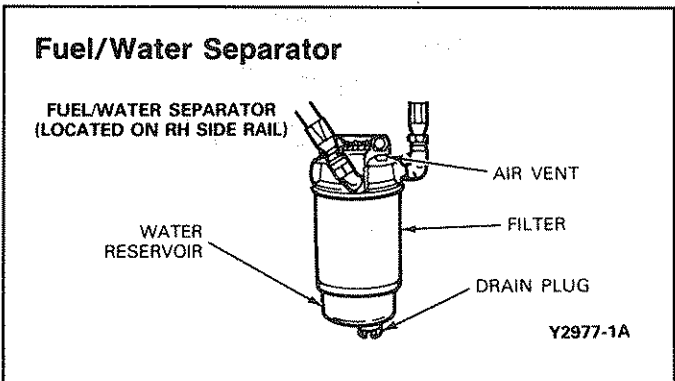
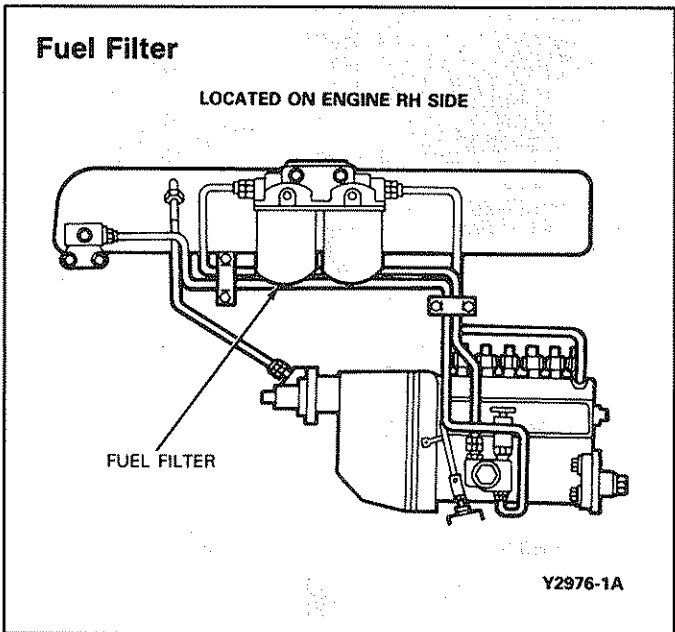
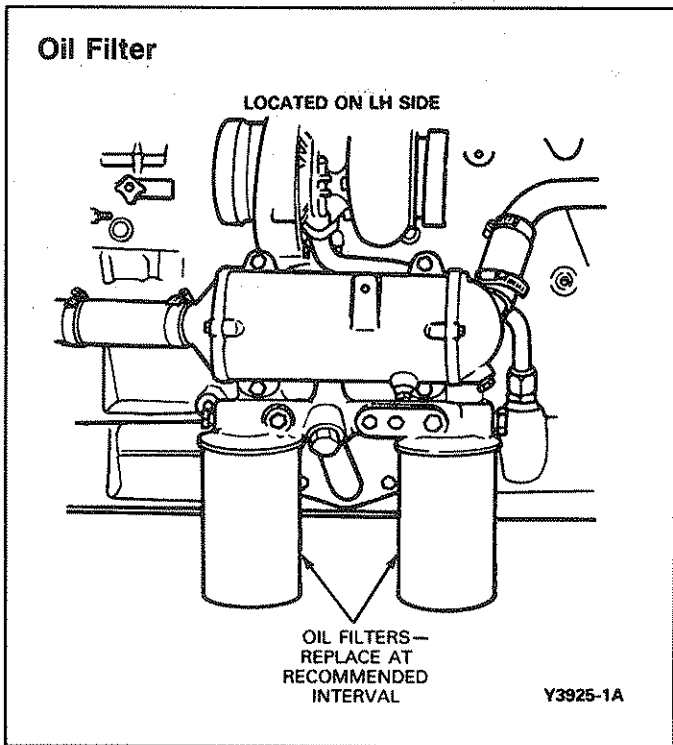
# SECTION 10-03 Lubrication Charts and Lubricant Specifications

SUBJECT	PAGE	SUBJECT	PAGE
<b>LUBRICATION CHARTS</b>		<b>LUBRICATION CHARTS (Cont'd.)</b>	
Air Filter .....	10-03-2	Engine Oil Level Check .....	10-03-3
Automatic Transmission Fluid Level Check .....	10-03-2	Fuel Filter .....	10-03-1
Chassis Lubrication Points — Typical Cargo .....	10-03-3	Fuel/Water Separator .....	10-03-1
Clutch Fluid Reservoir .....	10-03-2	Oil Filter .....	10-03-1
Coolant Supply Tank .....	10-03-2	Power Steering Fluid Level Check .....	10-03-2
		<b>SPECIFICATIONS</b> .....	10-03-4
		<b>VEHICLE APPLICATION</b> .....	10-03-1

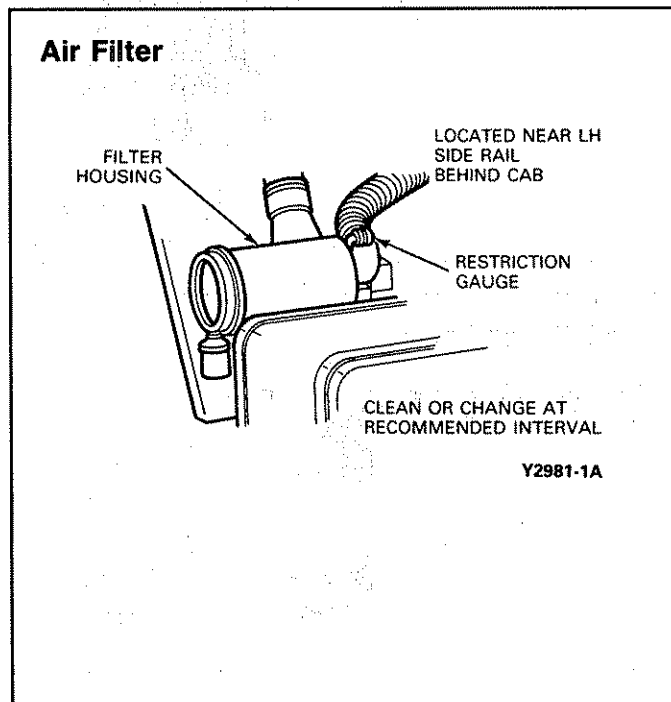
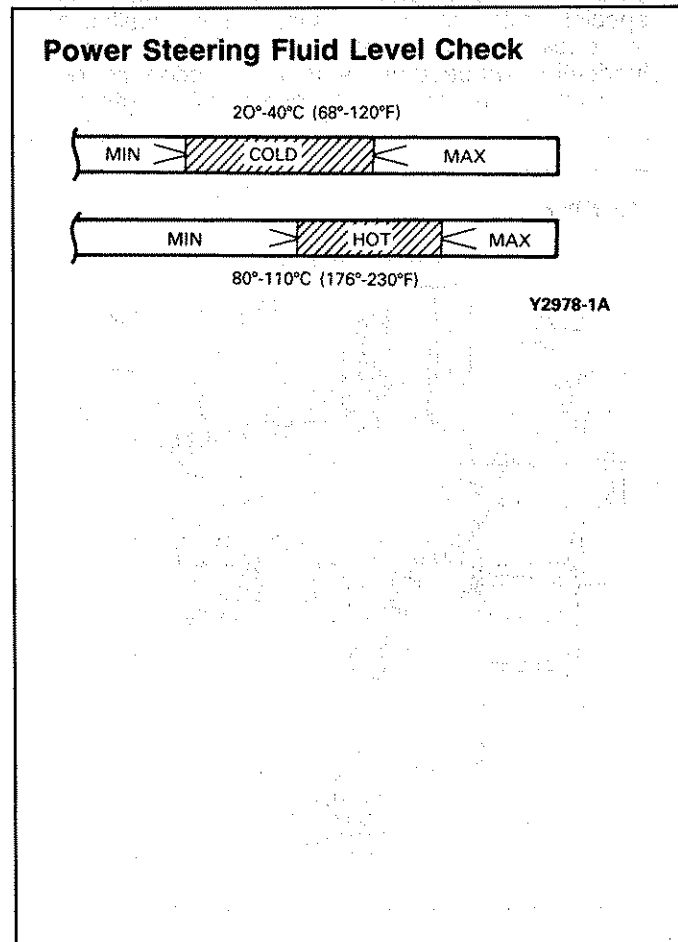
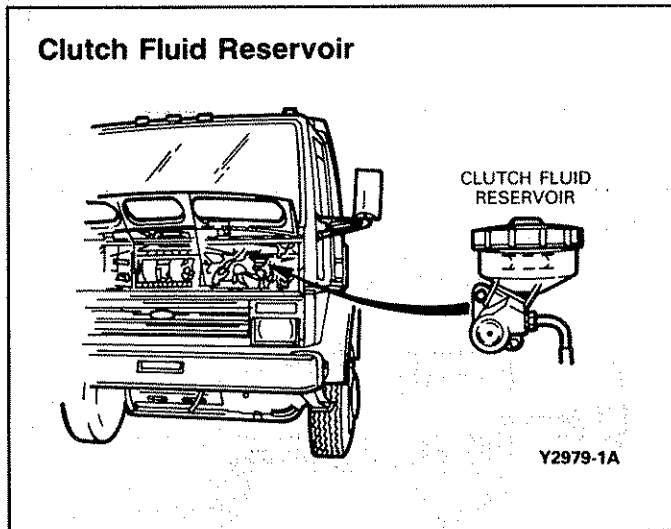
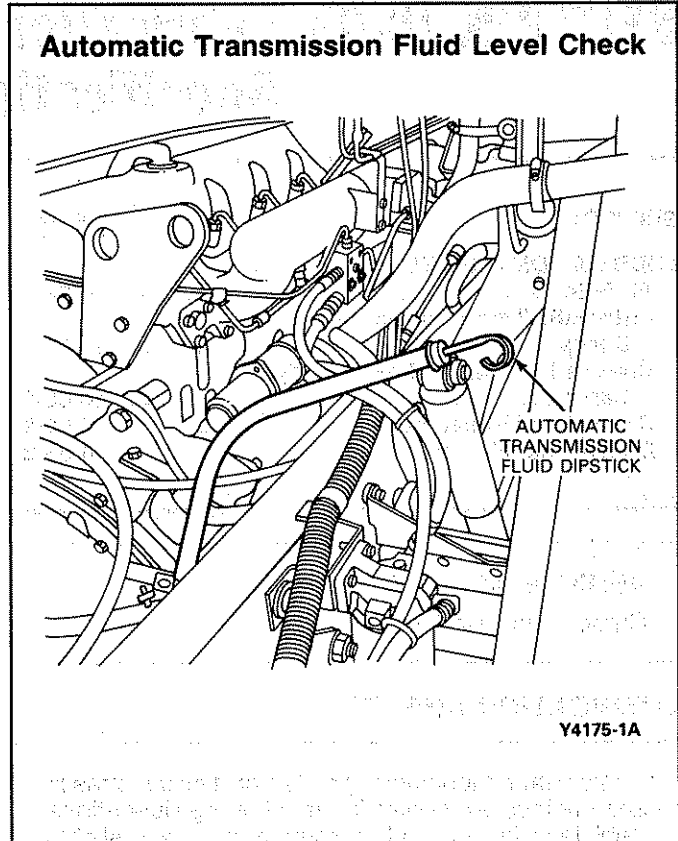
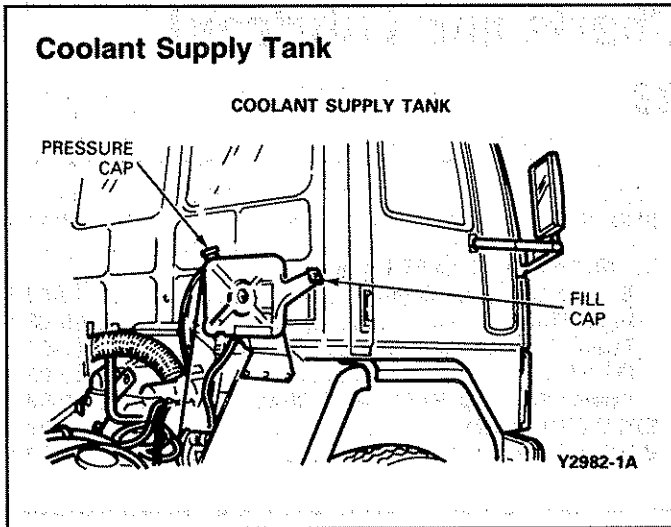
**VEHICLE APPLICATION**  
Cargo Truck Models.

## LUBRICATION CHARTS

Important lubrication points for typical chassis and engines are shown in the following illustrations. Vehicles with optional equipment may have slightly different or additional lubrication points. When special equipment or accessories are installed on the truck, consult the manufacturer's literature for lubrication procedures. A table of recommended lubricants is included at the end of this Section.

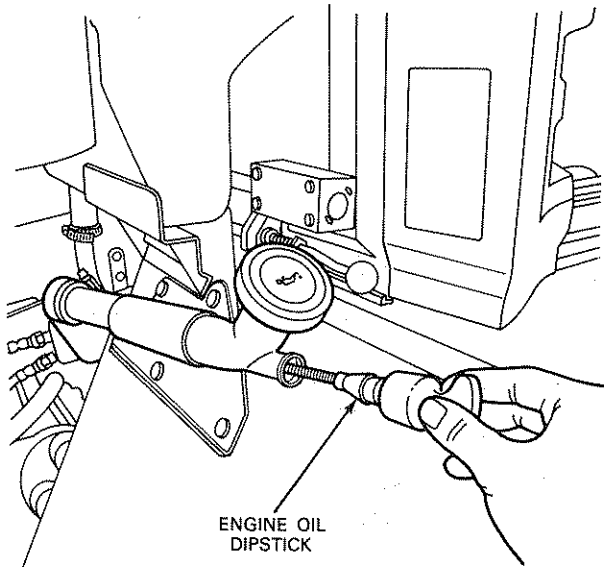


LUBRICATION CHARTS (Continued)



LUBRICATION CHARTS (Continued)

Engine Oil Level Check

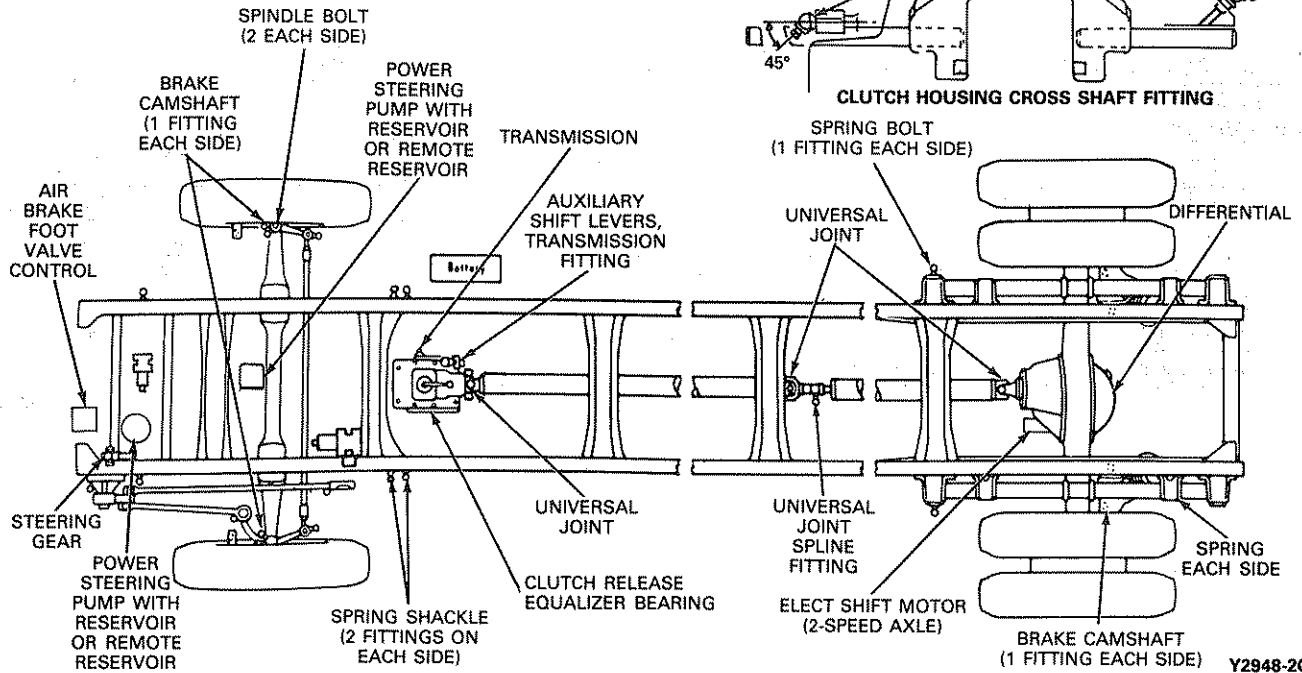


Y4355-1A

**WARNING: THE AMERICAN PETROLEUM INSTITUTE (API) HAS ANNOUNCED THAT CONTINUOUS CONTACT WITH USED MOTOR OIL HAS CAUSED SKIN CANCER IN LABORATORY MICE. THE EFFECTS OF USED MOTOR OIL ON HUMANS HAS NOT BEEN ESTABLISHED. IT IS RECOMMENDED, HOWEVER, THAT AS A PRECAUTIONARY MEASURE, HUMANS PROTECT THEIR SKIN BY WASHING WITH SOAP AND WATER AFTER COMING IN CONTACT WITH USED MOTOR OIL.**

Chassis Lubrication Points — Typical Cargo

CHASSIS LUBRICATION POINTS — TYPICAL CARGO



## SPECIFICATIONS

## LUBRICANT SPECIFICATIONS — CARGO TRUCK MODELS

Item	Ford Part Name	Ford Part Number	Ford Specification
Body and Access Panel, Hinges and Latches, Door Checks	Multi-Purpose Grease	D7AZ-19584-AA	ESR-M1C159-A
Lock Cylinders	Lock Lubricant	D8AZ-19587-AA	ESB-M2C20-A
Front Axle Spindle Pins, Steering Linkage, Front and Rear Spring Shackles, Steering Column U-Joints, Clutch Linkage Fittings, Universal Joints, Air Brake Foot Control Valve, Linkage, Treadle Hinge and Roller	Long Life Lubricant	C1AZ-19590-BA	ESA-M1C75-B
Power Steering	Motorcraft MERCON® Multi-Purpose Automatic Transmission Fluid	XT-2-QDX	MERCON® ESP-M2C166-H
Brake Master Cylinder	Heavy Duty Brake Fluid	C6AZ-19542-AA or -BA	ESA-M6C25-A
Hydraulic Clutch Master Cylinder	Heavy Duty Brake Fluid	C6AZ-19542-AA or -BA	ESA-M6C25-A
Spring Leaves, Transmission Linkage Pivots, Accelerator Ball Sockets, Brake and Clutch Pedal Pivots and Clevises	Engine Oil SAE-10W	—	ESE-M2C153-E
Front and Rear Wheel Bearings	Long Life Lubricant	C1AZ-19590-BA	ESA-M1C75-B
Allison Automatic Transmission	Motorcraft MERCON® Multi-Purpose Automatic Transmission Fluid	XT-2-QDX	MERCON® ESP-M2C166-H
Speedometer and Tachometer Cables	Speedometer Cable Grease	D2AZ-19581-A	ESF-M1C160-A
45° and 90° Speedometer and Tachometer Adapters with Lube Fittings	Multi-Purpose Grease	D7AZ-19584-AA	ESR-M1C159-A
Engine Oil Filter (Spin On)	Motorcraft Oil Filter	E7HZ-6731-A	—
Radiator Coolant	Ford Heavy Duty Diesel Engine Cooling System Fluid	E6HZ-19549-A	ESE-M97B18-C
Accelerator Linkage & Starting Motor	SAE-10W Oil	—	ESE-M2C153-E
Rear Axle	Rear Axle Lubricant	C6AZ-19580-E	ESW-M2C105-A
Manual Shift, Main Transmissions	Engine Oil SAE-50 — Above 0°F (-18°C) Motorcraft Single Weight SAE 30 Motor Oil Below 0°F (-18°C)	— XO-30-QSD	ESE-M2C153-E ESE-M2C153-E
Transmission Linkage, U-Joints, Crank Arm and Side Bushing	Long Life Lubricant	C1AZ-19590-B	ESA-M1C75-B
Two-Speed Axle Shift Unit	Engine Oil SAE-10W — Above 0°F (-18°C) 3 Parts SAE-10W Oil to 1 Part Kerosene — Below 0°F (-18°C)	— — —	ESE-M2C153-E —
Driveshaft Slip Spline and Clutch Release Bearing Hub	Long Life Lubricant	C1AZ-19590-BA	ESA-M1C75-B
Driveshaft, Universal Joints (if equipped with fitting), Slip Spline and Spring Stud Shackles	Long Life Lubricant	C1AZ-19590-BA	ESA-M1C75-B
Engine Oil — Diesel Engines Refer to Respective Engine Operator's Manual or the Vehicle Owner's Guide for Ford Diesel Engines	10W30 Premium 20W40 Premium	XO-10W30-QP XO-20W40-QP	ESE-M2C153-E and API Categories SG or SG/CE
	15W-40 Super Duty 30 Weight Super Duty	XO-15W40-QSD XO-30-QSD	ESE-M2C153-E and API Categories SG or SG/CE
Transmission Shift Lever Pivot and Crank Arm in Front Linkage	Steering Linkage Lubricant	D4AZ-19590-A	ESA-M1C92-Type II
Door Weatherstrip	Silicone Lubricant	C0AZ-19553-AA	ESR-M13P4-A
Fuel Shutoff Solenoid Ball and Socket (Ford Diesel Engines)		C1AZ-19590-BA	ESA-M1C75-B

CY2949-2F

# SECTION 10-04 Hoisting, Jacking and Towing

SUBJECT	PAGE	SUBJECT	PAGE
<b>EMERGENCY TOWING</b>		<b>HOISTING AND JACKING</b> .....	10-04-3
Emergency Towing with Another Vehicle .....	10-04-2	<b>VEHICLE APPLICATION</b> .....	10-04-1
General Towing Procedure .....	10-04-1		

## VEHICLE APPLICATION

All Cargo Vehicles.

## EMERGENCY TOWING

### General Towing Procedure

#### Preparatory Steps

To tow a vehicle, a towing sling equipped with J-hooks and T-hooks and a 4X4 wood crossbeam are required.

**CAUTION:** It is recommended that only an unloaded vehicle be towed when either the front or rear wheels are off the ground.

If towing with a minimal load is unavoidable, care must be taken to properly restrain load from shifting.

**CAUTION:** Improper towing of the vehicle provides insufficient lubrication to transmission parts. Always follow the outlined towing procedures.

Always unload the vehicle before towing. The recommended method of towing is with the drive wheels off the ground.

Before towing, release the parking brake. Place the transmission gear in NEUTRAL. The transmission and rear axle must be in proper working order before towing.

**CAUTION:** Loss of air pressure at the spring brake chamber will result in automatic

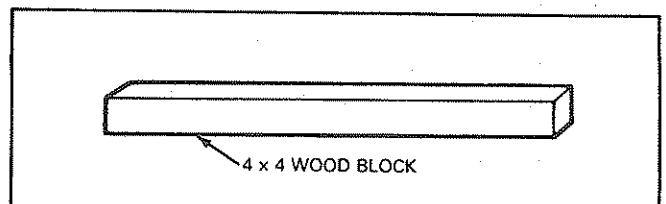
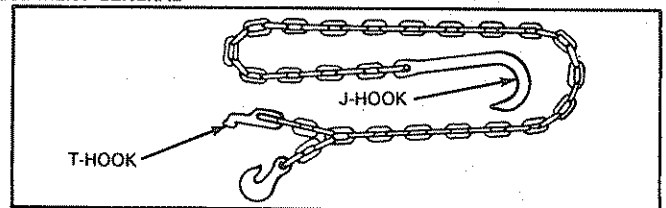
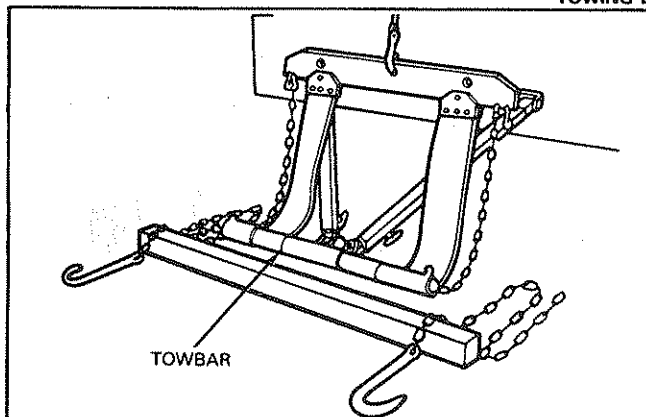
application of the brakes. Before towing the vehicle, the parking/emergency brake spring must be manually released. Refer to the appropriate Section in Group 12 in this manual for specific manual release procedures for the brake chamber being serviced.

**CAUTION:** If the vehicle is equipped with a driver controlled main differential lock, it will be necessary to remove the axle shafts before the vehicle is towed. Refer to special towing procedures for vehicles with main differential lock in this Section for procedure.

To move a vehicle with an inoperative rear axle, it is necessary to raise the rear wheels. If the transmission is inoperative, the driveshaft must be removed or the rear wheels raised.

To tow a vehicle on its front wheels, the steering wheel must be clamped in the straight ahead position with a steering wheel clamping device designed for towing service use, such as provided by towing manufacturers.

TOWING EQUIPMENT-GENERAL



MATERIAL - 4 x 4 WOOD BLOCK  
 2 x 4 LUMBER ACTUALLY MEASURES 1-1/2" x 3-1/2"  
 4 x 4 LUMBER ACTUALLY MEASURES 3-1/2" x 3-1/2"

**EMERGENCY TOWING (Continued)****Vehicles with a Manual Transmission**

To tow a vehicle with an inoperative rear axle, it is necessary to raise the rear wheels. To tow a vehicle from the front, it is necessary to remove the driveshaft or rear axle shafts, whichever is more convenient. Failure to do this can result in extensive transmission damage.

NOTE: When the axle shafts are removed, the ends of the axle housing must be sealed to prevent the loss of axle lubricant.

**Special Towing Instructions for Vehicles with Main Differential Lock**

**CAUTION:** If vehicles with the driver controlled main differential lock must be towed with the wheels on the ground, it is necessary to remove the axle shafts before the vehicle is towed. Follow these procedures:

**Axle Shafts Removal**

1. Shift the main differential to the unlocked (disengaged) position. The differential lock light in the cab of the vehicle will go out.

NOTE: If air pressure is lost, the shift collar will go to the unlocked (disengaged) position when air pressure is lost.

2. Remove the axle shafts as described in the appropriate Section in Group 15.

NOTE: The left axle shaft (as seen from the rear of the axle) has two sets of splines: One set to engage with the differential side gear and one set to engage with the shift collar for the differential lock. It may be necessary to rotate the shaft slightly to align the side gear spline teeth with the clutch collar teeth, in order to remove the axle shaft.

3. Assemble a cover over the openings of both wheel ends to prevent loss of lubricant and keep dirt from the wheel bearing cavities.

**Axle Shafts Installation**

1. Remove the covers from the wheel ends.
2. Install an axle shaft gasket on each axle shaft.
3. Shift the differential lock to the unlocked (disengaged) position. Install the left axle shaft into the axle as follows:
  - A. Push the axle shaft and gasket into the housing until the shaft stops against the differential lock collar.
  - B. Push down and in on the axle shaft flange and rotate the shaft until the splines of the shaft and the shift collar are engaged.
  - C. Push the axle shaft further into the housing until the shaft stops against the differential side gear.
  - D. Push down on the axle shaft flange and rotate the shaft until the splines of the shaft and the side gear are engaged.
  - E. Push the axle shaft until the flange and gasket are flush against the wheel hub. Install shaft retaining bolts and tighten to specifications.
4. Install the right-hand axle shaft and gasket into the wheel end and fasten both shafts to the hubs. Install shaft retaining bolts and tighten to specifications.

**Towing Slings/Chains/Hooks**

Tow chain attachments must be made directly to the main structural members of the vehicle. On vehicles equipped with towing hooks, towing chains must be fastened directly to the tow hooks on the vehicle. On vehicles not equipped with tow hooks, the chains must be routed along the bottom edge of the bumper with a protection bar to protect the bumper, and attached to the vehicle chassis. Under no circumstances is the vehicle to be lifted or towed by attaching chains directly to the bumper.

**Towing Speeds**

When towing with the rear wheels on the ground and the axle shafts connected, do not exceed a maximum speed of 48 km/h (30 mph) and a maximum distance of 2 km (1 mile).

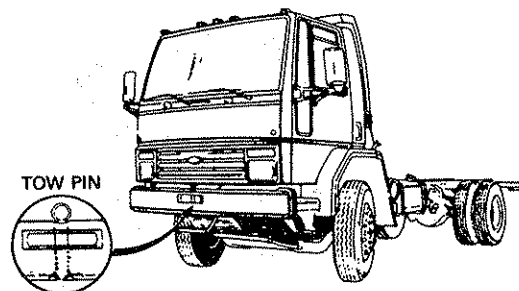
When towing with the rear wheels off the ground or the axle shafts removed, do not exceed a maximum speed of 88 km/h (55 mph). There is no maximum distance.

NOTE: After towing any vehicle equipped with a tandem axle, allow it to sit on a level surface until lubricant equalizes in both axles. Loss of lubricant may have occurred during towing. Check the lubricant level of both axles and refill if low.

**Emergency Towing with Another Vehicle**

If you must tow the vehicle and a tow truck is not available, your vehicle is equipped with a tow pin. The tow pin is stowed behind the passenger seat in the cab.

Install the tow pin in the middle of the front bumper and lock in place by inserting a pin, rigid bar, or a tube through the hole in the bottom of the pin. Do not use a chain, flexible cable or cord to secure the tow pin.



Y3921-1A

**CAUTION:** The tow pin is only for emergency use and should not be used for extended vehicle towing.

**EMERGENCY TOWING (Continued)**

**CAUTION:** Improper towing of the vehicle provides insufficient lubrication to transmission parts. Always follow the outlined towing procedures.

Before towing, release the parking brake and place the transmission in neutral. The transmission and rear axle must be in proper working order before towing. If air or hydraulic pressure is lost, release the spring brakes manually.

**Vehicles with an Automatic Transmission**

To tow a vehicle with automatic transmission less than one mile (2 km), place the selector lever at N (NEUTRAL). Be sure that the brakes are released. Don't tow at speeds faster than 30 mph (50 km/h) with the rear wheels on the ground. If the vehicle must be towed more than one mile (2 km), or if the automatic transmission is inoperative, raise the rear wheels off the ground or remove the rear axle shafts and seal the ends of the housing to prevent the loss of axle lubricant before towing the vehicle with the rear wheels on the ground.

**NOTE:** Due to the transmission's hydraulic system, the engine cannot be started by pushing or towing.

**HOISTING AND JACKING**

Hoist adapters for heavy duty hoists should be positioned according to the hoist manufacturer's recommendations. Be sure the hoist has an adequate lifting capacity for the vehicle being lifted.



# METRICS

<u>SUBJECT</u>	<u>PAGE</u>	<u>SUBJECT</u>	<u>PAGE</u>
Decimal/Metric Equivalents Chart .....	4	Strength Identification Bolts .....	2
English/Metric Conversion Chart .....	5	Hex Nuts .....	3
Introduction .....	1	Studs .....	3
Nomenclature for Bolts .....	2	Tapping Screws .....	3
		Thread Forming Screws .....	3
		U-Nuts .....	3
		Torque Conversion Chart .....	6

## INTRODUCTION

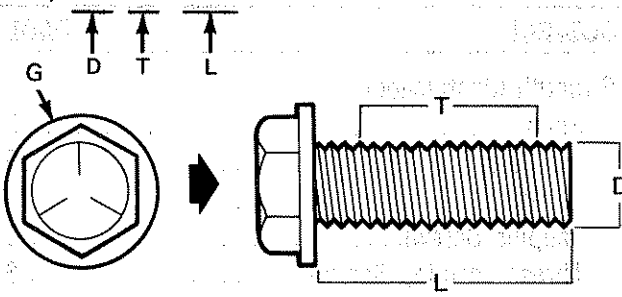
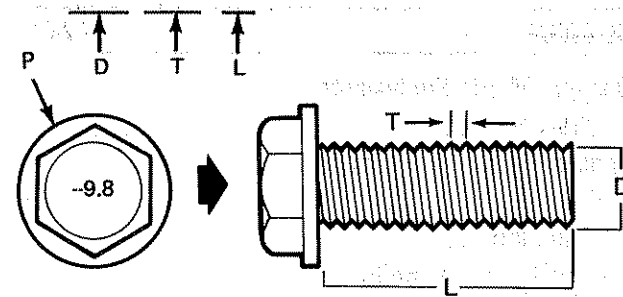
Most threaded fasteners are covered by specifications that define required mechanical properties, such as tensile strength, yield strength, proof load and hardness. These specifications are carefully considered in initial selection of fasteners for a given application. To assure continued satisfactory vehicle performance, replacement fasteners used should be of the correct strength, as well as the correct nominal diameter, thread pitch, length, and finish.

Most original equipment fasteners (English system or metric) are identified with markings or numbers indicating the strength of the fastener. These markings are described in the pages that follow. Attention to these markings is important in assuring that the proper replacement fasteners are used.

Further, some metric fasteners, especially nuts, are colored blue. This metric blue identification is in most cases a temporary aid for production start-up, and color will generally revert to normal black or bright after start-up.

English system and metric system fasteners are available through your Ford Parts and Service operation.

# NOMENCLATURE FOR BOLTS

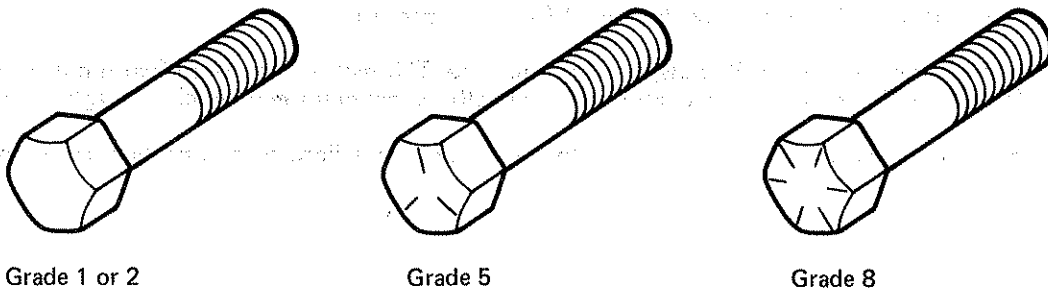
(ENGLISH) INCH SYSTEM		METRIC SYSTEM	
<b>Bolt, 1/2-13x1.25</b> 		<b>Bolt M12-1.75x25</b> 	
D- Nominal Diameter (inches)	L- Length, (inches)**	D- Nominal Diameter (millimeters)	P- Property Class* (bolt strength)
G- Grade Marking (bolt strength)	T- Thread Pitch (thread/inch)	L- Length (millimeters)**	T- Thread Pitch (thread width crest to crest mm)

\*The property class is an Arabic numeral distinguishable from the slash SAE English grade system.

\*\*The length of all bolts is measured from the underside of the head to the end.

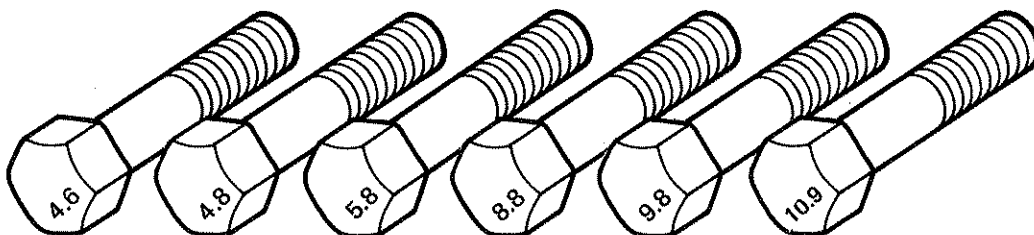
## BOLT STRENGTH IDENTIFICATION

### (ENGLISH) INCH SYSTEM







(English) Inch bolts - Identification marks correspond to bolt strength - increasing number of slashes represent increasing strength.

### METRIC SYSTEM



Metric bolts – Identification class numbers correspond to bolt strength - increasing numbers represent increasing strength. Common metric fastener bolt strength properties are 9.8 and 10.9 with the class identification embossed on the bolt head.

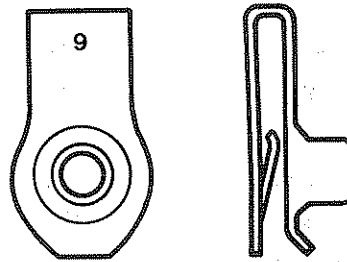
# HEX NUT STRENGTH IDENTIFICATION

(ENGLISH) INCH SYSTEM		METRIC SYSTEM	
Grade	Identification	Class	Identification
Hex Nut Grade 5	 3 Dots	Hex Nut Property Class 9	 Arabic 9
Hex Nut Grade 8	 6 Dots	Hex Nut Property Class 10	 Arabic 10
Increasing dots represent increasing strength.		May also have blue finish or paint daub on hex flat. Increasing numbers represent increasing strength.	

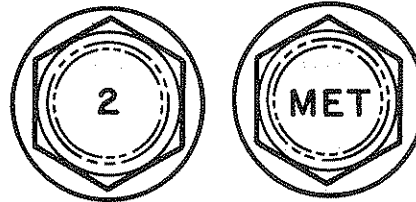
## OTHER TYPES OF PARTS

Metric identification schemes vary by type of part, most often a variation of that used of bolts and nuts. Note that many types of English and metric fasteners carry no special identification if they are otherwise unique.

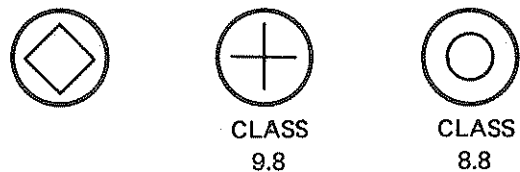
–Stamped “U” Nuts



–Tapping, thread forming and certain other case hardened screws



–Studs, Large studs may carry the property class number. Smaller studs use a geometric code on the end.



# DECIMAL AND METRIC EQUIVALENTS

Fractions	Decimal In.	Metric mm.	Fractions	Decimal In.	Metric mm.
1/64	.015625	.397	33/64	.515625	13.097
1/32	.03125	.794	17/32	.53125	13.494
3/64	.046875	1.191	35/64	.546875	13.891
1/16	.0625	1.588	9/16	.5625	14.288
5/64	.078125	1.984	37/64	.578125	14.684
3/32	.09375	2.381	19/32	.59375	15.081
7/64	.109375	2.778	39/64	.609375	15.478
1/8	.125	3.175	5/8	.625	15.875
9/64	.140625	3.572	41/64	.640625	16.272
5/32	.15625	3.969	21/32	.65625	16.669
11/64	.171875	4.366	43/64	.671875	17.066
3/16	.1875	4.763	11/16	.6875	17.463
13/64	.203125	5.159	45/64	.703125	17.859
7/32	.21875	5.556	23/32	.71875	18.256
15/64	.234375	5.953	47/64	.734375	18.653
1/4	.250	6.35	3/4	.750	19.05
17/64	.265625	6.747	49/64	.765625	19.447
9/32	.28125	7.144	25/32	.78125	19.844
19/64	.296875	7.54	51/64	.796875	20.241
5/16	.3125	7.938	13/16	.8125	20.638
21/64	.328125	8.334	53/64	.828125	21.034
11/32	.34375	8.731	27/32	.84375	21.431
23/64	.359375	9.128	55/64	.859375	21.828
3/8	.375	9.525	7/8	.875	22.225
25/64	.390625	9.922	57/64	.890625	22.622
13/32	.40625	10.319	29/32	.90625	23.019
27/64	.421875	10.716	59/64	.921875	23.416
7/16	.4375	11.113	15/16	.9375	23.813
29/64	.453125	11.509	61/64	.953125	24.209
15/32	.46875	11.906	31/32	.96875	24.606
31/64	.484375	12.303	63/64	.984375	25.003
1/2	.500	12.7	1	1.00	25.4

# ENGLISH METRIC CONVERSION

	multiply	by	for equiv. no. of:
ACCELERATION	Foot/sec <sup>2</sup> Inch/sec <sup>2</sup>	0.304 8 0.025 4	meter/sec <sup>2</sup> (m/s <sup>2</sup> ) meter/sec <sup>2</sup>
TORQUE	Pound-inch Pound-foot	0.112 98 1.355 8	newton-meters (N·m) newton-meters
POWER	horsepower	0.746	kilowatts (kw)
PRESSURE or STRESS	inches of water pounds/sq. in.	0.249 1 6.895	kilopascals (kPa) kilopascals (kPa)
ENERGY or WORK	BTU foot-pound kilowatt-hour	1 055. 1.355 8 3 600 000. or 3.6 x 10 <sup>6</sup>	joules (J) joules (J) joules (J=one W's)
LIGHT	foot candle	10.76	lumens/meter <sup>2</sup> (lm/m <sup>2</sup> )
FUEL PERFORMANCE	miles/gal gal/mile	0.425 1 2.352 7	kilometers/liter (km/l) liters/kilometer (l/km)
VELOCITY	miles/hour	1.609 3	kilometer/hr. (km/h)
LENGTH	inch foot yard mile	25.4 0.304 8 0.914 4 1.609	millimeters (mm) meters (m) meters kilometers (km)
AREA	inch <sup>2</sup> foot <sup>2</sup> yard <sup>2</sup>	645.2 6.45 0.092 9 0.836 1	millimeters <sup>2</sup> (mm <sup>2</sup> ) centimeters <sup>2</sup> (cm <sup>2</sup> ) meters <sup>2</sup> (m <sup>2</sup> ) meters <sup>2</sup>
VOLUME	inch <sup>3</sup> quart quart gallon yard <sup>3</sup>	16 387. 16.387 0.016 4 0.946 4 3.785 4 0.764 6	mm <sup>3</sup> cm <sup>3</sup> liters(1) liters liters meters <sup>3</sup> (m <sup>3</sup> )
MASS	pound ton ton	0.453 6 907.18 0.907	kilograms (kg) kilograms (kg) tonne (t)
FORCE	kilogram ounce pound	9.807 0.278 0 4.448	newtons (N) newtons newtons
TEMPERATURE	degree fahrenheit	(1°F 32) 1.8	degree Celsius

# TORQUE CONVERSION

NEWTON METERS (N-m)	POUND-FEET (LB.-FT.)
1	0.7376
2	1.5
3	2.2
4	3.0
5	3.7
6	4.4
7	5.2
8	5.9
9	6.6
10	7.4
15	11.1
20	14.8
25	18.4
30	22.1
35	25.8
40	29.5
50	36.9
60	44.3
70	51.6
80	59.0
90	66.4
100	73.8
110	81.1
120	88.5
130	95.9
140	103.3
150	110.6
160	118.0
170	125.4
180	132.8
190	140.1
200	147.5
225	166.0
250	184.4

POUND-FEET (LB.-FT.)	NEWTON METERS (N-m)
1	1.356
2	2.7
3	4.0
4	5.4
5	6.8
6	8.1
7	9.5
8	10.8
9	12.2
10	13.6
15	20.3
20	27.1
25	33.9
30	40.7
35	47.5
40	54.2
45	61.0
50	67.8
55	74.6
60	81.4
65	88.1
70	94.9
75	101.7
80	108.5
90	122.0
100	135.6
110	149.1
120	162.7
130	176.3
140	189.8
150	203.4
160	216.9
170	230.5
180	244.0