

MANUFACTURERS MOTOR VEHICLE SPECIFICATIONS

METRIC (U.S. Customary)

1990

Manufacturer FORD MOTOR COMPANY	Vehicle Line FORD THUNDERBIRD	
Mailing Address P.O. BOX 2053 DEARBORN, MICHIGAN 48121	Issued NOVEMBER 30, 1988	Revised OCTOBER 31, 1989

Direct questions concerning these specifications to the manufacturer listed above.

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Motor Vehicle Manufacturers Association
of the United States, Inc.

Forms Provided by Technical Affairs Division

MVMA Specifications

METRIC (U.S. Customary)

Vehicle Line THUNDERBIRD

Model Year 1990 Issued 11/88 Revised (e) 5/15/89

Vehicle Origin

Design & development (company)	Ford Motor Company
Where built (country)	U.S.A.
Authorized U.S. sales marketing representative	Ford Division, Ford Motor Company

Vehicle Models

Model Description & Drive (FWD/RWD/4WD/4WD)*	Introduction Date	Make, Vehicle Models, Series, Body Type (Mfr's Model Code)	No. of Designated Seating Positions (Front/Rear)	Max. Trunk/Cargo Load—Kilograms (Pounds)
REAR WHEEL DRIVE (RWD)				
(e) STANDARD	10/5/89			
2-Door		63D/HVS	2/3	68.0 (150)
(e) LX	10/5/89			
2-Door		63D/HVB	2/3	68.0 (150)
(e) SUPER COUPE	10/5/89			
2-Door		63D/HVC	2/3	68.0 (150)
(e) 35TH ANNIVERSARY EDITION	10/5/89			
2-Door		63D/HVS	2/3	68.0 (150)

* FWD-Front Wheel Drive RWD-Rear Wheel Drive AWD-All Wheel Drive 4WD-Four Wheel Drive

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Power Teams

SAE J1349 Net bhp (brake horsepower) and Net Torque corrected to 77°F/25°C and 29.61 in. Hg/100 kPa atmospheric pressure.

			A	B	C	D
ENGINE	Engine Code		994	99R	99R	
	Displacement Liters (in³)		3.8 (232)	3.8 (232)	3.8 (232)	
	Induction system (FI, Carb, etc.)		Sequential Electronic Fuel Injection	Sequential Electronic Fuel Injection	Sequential Electronic Fuel Injection	
	Compression Ratio		9.0	8.2	8.2	
	SAE Net at RPM	Power kW (bhp)	104(140) @ 3800	157(210) @ 4000	157(210) @ 4000	
		Torque N · m (lb. ft.)	292(215) @ 2400	427(315) @ 2600	427(315) @ 2600	
	Exhaust single, dual		Single	Dual	Dual	
TRANS	Transmission/ Transaxle		4-Spd. Automatic Overdrive (AOD)	5-Spd. Manual Overdrive (M5R2)	4-Spd. Automatic Overdrive (AOD)	
	Axle Ratio (std. first)		3.27 \$	2.73 %	3.27 %	

\$ — Traction-Lok Available
% — 8.8 Inch Rear Locker Axle Standard

[illegible]

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Engine Description
Engine Code

3.8L

3.8L SC

ENGINE — GENERAL

Type & description (inline, V, angle, flat, location, front, mid, rear, transverse, longitudinal, sohc, dohc, ohv, hemi, wedge, pre-chamber, etc.)	90°V, Front, Longitudinal Overhead Valve Engine with Modified Wedge Combustion Chamber	
Manufacturer	Ford Motor Company	
No. of cylinders	Six	
Bore	98.8 (3.8)	
Stroke	86.0 (3.4)	
Bore spacing (C/L to C/L)	106.5	
Cylinder block material & mass kg (lbs.) (machined)	Cast Iron 54.5 (120.0)	
Cylinder block deck height	234.5 (9.2)	
Cylinder block length	411.0 (16.2)	
Deck clearance (minimum) (above or below block)	0.255 (0.010) Above	
Cylinder head material & mass kg (lbs.)	SAE 331, Alum. 7.2 (15.9)	SAE 331, Alum. 8.0 (17.5)
Cylinder head volume (cm³)	61.2	
Cylinder liner material	N/A	
Head gasket thickness (compressed)	1.04-1.19 (0.041-0.047)	1.07 (0.042)
Minimum combustion chamber total volume (cm³)	73.2	
Cyl. no. system (front to rear)*	L. Bank	4, 5, 6
	R. Bank	1, 2, 3
Firing order	1, 4, 2, 5, 3, 6	
Intake manifold material & mass [kg (lbs.)]**	Alum. 11.3 (24.8)	Alum. 11.06 (24.0)
Exhaust manifold material & mass [kg (lbs.)]**	Cast Iron 7.1 (15.6)	
Fuel required unleaded, diesel, etc.	Unleaded	
Fuel antiknock index (R + M) ÷ 2	87 Minimum Octane	92 Minimum Octane
Engine mounts	Quantity	Three
	Material and type (elastomeric, hydroelastic, hydraulic damper, etc.)	Hydroelastic
	Added isolation (sub-frame, crossmember, etc.)	Crossmember at Transmission
Total dressed engine mass (wt) dry***	200.9 (443.0)	229.9 (506.9)

Engine — Pistons

Material & mass, g (weight, oz.)-piston only	Zolloy 16, Alum. Alloy, 521 (18.4)	Zolloy 16, Alum. Alloy, 524 (18.5)
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Engine — Camshaft

Location	In Block	
Material & mass kg (weight, lbs.)	SAE 1050 Steel Bar Stock 3.82 (8.4)	
Drive type	Chain/belt	Chain (Silent)
	Width/pitch	14.91-13.64 (0.587-0.537)/9.525 (0.375)

*Rear of engine — drive takeoff. View from drive takeoff end to determine left & right side of engine.

**Finished state.

***Dressed engine mass (weight) includes the following: Front End Dress, All Engine Mounted Components and Flex Plate; Excludes Starter and Alternator.

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Engine — Valve System

Hydraulic lifters (std., opt., NA)		Hydraulic Roller	
Valves	Number intake/exhaust	6/6	
	Head O.D. intake/exhaust	45/37	44/36

Engine — Connecting Rods

Material & mass [kg., (weight, lbs.)]*	Forged Steel (SAE-1151-M) .665-.667 (1.46-1.47)
Length (axes ϕ to ϕ) mm	150.17-150.24

Engine — Crankshaft

Material & mass [kg., (weight, lbs.)]*	Nodular Cast Iron Alloy 14.06 (31)	Austempered Ductile Iron
End thrust taken by bearing (no.)	#3	
Length & number of main bearings	4	
Seal (material, one, two piece design, etc.)	Front	One Piece, Fluorocarbon
	Rear	Fluorocarbon, Dual Lip

Engine — Lubrication System

Normal oil pressure [kPa (psi) at engine rpm]	276-414 (40-60) @ 2000 RPM
Type oil intake (floating, stationary)	Stationary Shrouded Screen in Sump
Oil filter system (full flow, part, other)	Full Flow
Capacity of c/case, less filter-refill-L (qt.)	3.8 (4.0) Plus 0.5 (0.5) for Filter

Engine — Diesel Information (NOT OFFERED)

Diesel engine manufacturer	
Glow plug, current drain at 0°F	
Injector nozzle	Type
	Opening pressure [kPa (psi)]
Pre-chamber design	
Fuel injection pump	Manufacturer
	Type
Fuel injection pump drive (belt, chain, gear)	
Supplementary vacuum source (type)	
Fuel heater (yes/no)	
Water separator, description (std., opt.)	
Turbo manufacturer	
Oil cooler-type (oil to engine coolant; oil to ambient air)	
Oil filter	

Engine — Intake System (NOT OFFERED)

Turbo charger - manufacturer	
Super charger - manufacturer	
Intercooler	

Eaton (a)

Air to Air — Engine Mounted

*Finished State

(a) 2 Rotors, 3 Lobes each w/60° Helical Twist:

Dimensions — 152.4 (6.0) x 284.5 (11.2)

Weight — 3.64 (8.0)

Maximum Boost Pressure — 12 PSI

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Engine — Cooling System

Coolant recovery system (std., opt., n.a.)		Standard	
Coolant fill location (rad., bottle)		Radiator Coolant Fill; Bottle Coolant Add	
Radiator cap relief valve pressure [kPa (psi)]		110.3 (16.0)	
Circulation thermostat	Type (choke, bypass)	Reverse Poppet	
	Starts to open at °C(°F)	91 (197)	
Water Pump	Type (centrifugal, other)	Centrifugal	
	GPM 1000 pump rpm	10	
	Number of pumps	One	
	Drive (V-belt, other)	Six Rib Poly-V	Eight Rib Poly-V
	Bearing type	Double Row, Sealed, Ball and Roller	
	Impeller material	Steel	
	Housing material	Aluminum	
By-pass recirculation [type (inter., ext.)]		External	
Cooling system capacity	With heater-L(qt.)	10.2 (10.8) Plus 1.5 Quart in Overflow Bottle	
	With air conditioner-L(qt.)	10.2 (10.8) Plus 1.5 Quart in Overflow Bottle, A/C Std.	
	Opt. equipment [specify-L(qt.)]	N/A	
Water jackets full length of cyl. (yes, no)		No	
Water all around cylinder (yes, no)		Yes	
Water jackets open at head face (yes, no)		No	
Radiator core	Std., A/C, HD	A/C, Standard	
	Type (cross-flow, etc.)	Crossflow	Downflow
	Construction (fin & tube mechanical, braze, etc.)	Tube and Slit Fin, Vacuum Brazed Alum., 1 Row	Tube and Slit Fin, Copper & Brass, 2 Row
	Material, mass [kg (wgt. lbs.)]	Aluminum, 3.31 (7.29)	Copper/Brass
	Width	571.9 (22.5)	508.0 (20.0)
	Height	469.8 (18.5)	384.0 (15.1)
	Thickness	25.9 (1.0)	37.1 (1.5)
	Fins per inch	10	15
Radiator end tank material		Plastic	Brass
Fan	Std., elec., opt.	Standard	Electric, Two
	Number of blades & type (flex, solid, material)	7 Blade Solid, Steel	8 Blade, Plastic
	Diameter & projected width	406 (16.0); 68.5 (2.7)	
	Ratio (fan to crankshaft rev.)	1.35:1	
	Fan cutout type	Clutch	
	Drive type (direct, remote)	Direct	
	RPM at idle (elec.)	N/A	
	Motor rating (wattage) (elec.)	N/A	400
	Motor switch (type & location) (elec.)	N/A	EEC Control
	Switch point (temp., pressure) (elec.)	N/A	221°F
	Fan shroud (material)	Plastic	

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Engine — Fuel System (See supplemental page for details of Fuel Injection, Supercharger, Turbocharger, etc. if used)

Induction type: carburetor, fuel injection system, etc.		Electronic Fuel Injection System	
Manufacturer			
Carburetor no. of barrels		N/A	
Idle A/F mix.		14.8:1 Closed Loop	
Fuel injection	Point of injection (no.)	Port Injection (Six)	
	Constant, pulse, flow	Pulse	
	Control (electronic, mech.)	Electronic	
	System pressure [kPa (psi)]	270 (39.5)	
Idle spd.-rpm (spec. neutral or drive and propane if used)	Manual	N/A	700
	Automatic	N/A	600
Intake manifold heat control (exhaust or water thermostatic or fixed)		N/A	
Air cleaner type		Dry, Remote Paper Element	
Fuel filter (type/location)			
Fuel pump	Type (elec. or mech.)	Electric	
	Location (eng., tank)	In-Tank	
	Pressure range [kPa (psi)]	30-45	30-60
	Flow rate at regulated pressure (L (gal)/hr @ kPa (psi))	60 L/hr	110 L/hr

Fuel Tank

Capacity [refill L (gallons)]		72.0 (19.0)	
Location (describe)		Underside Rear Center — In Front of Rear Suspension	
Attachment		Steel Support Tray w/Two Straps Bolt at Front & Rear	
Material & Mass [kg (weight lbs.)]		HDPE	
Filter pipe	Location & material	Right Hand Quarter Panel — Steel (Terne)	
	Connection to tank	Rubber Hose	
Fuel line (material)		Nylon	
Fuel hose (material)		N/A	
Return line (material)		Nylon	
Vapor line (material)		Nylon	
Extended range tank	Opt., n.a.	N/A	
	Capacity [L (gallons)]		
	Location & material		
	Attachment		
Auxiliary tank	Opt., n.a.	N/A	
	Capacity [L (gallons)]		
	Location & material		
	Attachment		
	Selector switch or valve		
	Separate fill		

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Vehicle Emission Control

Exhaust Emission Control	Type (air injection, engine modifications, other)		Vehicle and Engine Modifications Plus Exhaust Gas Recirculation and Air Injection (a)	
	Air Injection	Pump or pulse	N/A	
		Driven by	N/A	
		Air distribution (head, manifold, etc.)	N/A	
		Point of entry	N/A	
	Exhaust Gas Recirculation	Type (controlled flow, open orifice, other)	Electronic (PFE)	
		Exhaust source	R.H. Exhaust Manifold	
		Point of exhaust injection (spacer, carburetor, manifold, other)	Intake Manifold	S/C Air Inlet Adaptor
	Catalytic Converter	Type	TWC Toeboard (2)	
		Number of	Two	
		Location(s)	Toeboard (L.O.)	
		Volume [L (in ³)]	Toeboard 2 x 2 x 38	
		Substrate type	Coated Ceramic Monolith	
		Noble metal type	TWC — Palladium/Rhodium	TWC — Platinum/Palladium/Rhodium
Noble metal Concentration (g/cm ³)		TWC — 11.77/2.35 ÷ 10,000 & TWC — 5.89/11.77 ÷ 10,000	TWC — 8.24/1.65 ÷ 10,000 & TWC — 5.89/11.77 ÷ 10,000	
Crankcase Emission Control	Type (ventilates to atmosphere, induction system, other)		Closed Induction System	
	Energy source (manifold vacuum, carburetor, other)		Manifold Vacuum	
	Discharges (to intake manifold, other)		Intake Manifold	
	Air inlet (breather cap, other)		Air Cleaner	
Evaporative Emission Control	Vapor vented to (crankcase, canister, other)	Fuel tank	Externally Vented to Carbon Canister	
		Carburetor	N/A	
	Vapor storage provision		Carbon Canister	
Electronic system	Closed loop (yes/no)		Yes	
	Open loop (yes/no)		Yes	No

Engine — Exhaust System

Type (single, single with cross-over, dual, other)		Single w/Dual Catalyst System	Dual w/Dual Catalyst System Mufflers
Muffler no. & type (reverse flow, straight thru, separate resonator) Material & Mass [kg (weight lbs.)]		One, Reverse Flow (b)	Two, Reverse Flow (b)
Resonator no. & type		—	
Exhaust pipe	Branch o.d., wall thickness	—	57.0 x 1.37 (2.25 x .054)
	Main o.d., wall thickness	—	63.0 x 1.37 (2.50 x .054)
	Material & Mass [kg (weight lbs.)]	—	Aluminized Stainless Steel (b)
Intermediate pipe	o.d. & wall thickness	50.8 x 1.37 (2.00 x .054)	
	Material & Mass [kg (weight lbs.)]	Aluminized Stainless Steel (b)	
Tail pipe	o.d. & wall thickness	50.8 x 1.37 (2.00 x .054)	
	Material & Mass [kg (weight lbs.)]	Aluminized Stainless Steel (b)	

(a) Components May Vary According to Engine Calibration

(b) Purchased in Assembly (PIA) Muffler and Pipe Assembly 11.0 (24.5)

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Transmissions/Transaxle (Std., Opt., N.A.)

Manual 3-speed (manufacturer/country)	N/A	
Manual 4-speed (manufacturer/country)	N/A	
Manual 5-speed (manufacturer/country)	N/A	Standard (Mazda/Japan)
Automatic (manufacturer/country)	N/A	
Automatic overdrive (manufacturer/country)	Standard (Ford/USA)	Optional (Ford/USA)

Manual Transmission/Transaxle (NOT OFFERED)

2.73 AXLE RATIO ONLY

Number of forward speeds		Five — M5R2
Gear ratios	1st	3.75
	2nd	2.32
	3rd	1.43
	4th	1.00
	5th	0.75
	Reverse	3.28
Synchronous meshing (specify gears)		All Fwd. & Rev. Gears
Shift lever location		Floor
Trans. case mat'l. & mass kg (lbs)*		Aluminum 51.3 (113.0)
Lubricant	Capacity [L (pt.)]	3.0 (6.3)
	Type recommended	Dexron II

Clutch (Manual Transmission) (NOT OFFERED)

Clutch manufacturer		LUK
Clutch type (dry, wet; single, multiple disc)		Dry Plate, Single Disc
Linkage (hydraulic, cable, rod, lever, other)		Hydraulic
Max. pedal effort (nom. spring load, new) N (lbs)	Depressed	151 (34)
	Released	9 (22)
Assist (spring, power/percent, nominal)		No
Type pressure plate springs		Belleville
Total spring load (nominal, new) N (lbs)		8500 (1910)
Clutch facing	Facing mfr. & material coding	Valeo F-202
	Facing material & construction	Woven Non-Asbestos
	Rivets per facing	16
	Outside x inside dia. (nominal)	280 x 198 (11 x 7.8)
	Total eff. area [cm ² (in. ²)]	615 (95.3)
	Thickness (pressure plate side/fly wheel side)	3.30 (0.13)/3.30 (0.13)
	Rivet depth (pressure plate side/fly wheel side)	1.2 (0.047)/1.2 (0.047)
	Engagement cushion method	Segmented
	Release bearing type & method lub.	(a)
Torsional damping method, springs, hysteresis		(b)

*Includes shift linkage, lubricant, and clutch housing. If other specify.

- (a) Self-Centering, Angular Contact, Constant Running, Pre-Packed
(b) Multi-Stage, Springs & Friction Material

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⑦ Automatic Transmission/Transaxle

Trade name		Automatic Overdrive (AOD)
Type and special features (describe)		Torque Converter, Planetary Gear Set
Gear Selector	Location (column, floor, other)	Floor
	Ltr./No. designation (e.g. PRND21)	P R N D 1
	Shift interlock (yes, no, describe)	No
Gear ratios	1st	2.40:1
	2nd	1.47:1
	3rd	1.00:1
	4th	0.67:1
	Reverse	2.00:1
(e) Max. upshift speed - drive range [km/h (mph)]		108 (66.8) 109 (67.5)
(e) Max. kickdown speed - drive range [km/h (mph)]		91 (56.6) 92 (57.1)
(e) Min. overdrive speed [km/h (mph)]		57 (35.2) 61 (37.8)
Torque converter	Number of elements	Three
	Max. ratio at stall	2.53 2.30
	Type of cooling (air, liquid)	Liquid
	Nominal diameter	305 (12)
	Capacity factor "K"	165 140
Lubricant	Capacity [refill L (pt.)]	11.6 (24.6)
	Type Recommended	ESP-M2C138-CJ (Mercon® for Service)
Oil cooler (std., opt., NA, internal, external, air, liquid)		Standard, External, Oil to Engine Coolant
Transmission mass kg (lbs) & case material**		Aluminum 87.1 (192.0) 87.4 (192.7)

⑦ All Wheel/4 Wheel Drive (NOT OFFERED)

Description & type (part-time, full-time, 2/4 shift while moving, mechanical, elect., chain/gear, etc.)		
Transfer case	Manufacturer and model	
	Type and Location	
Low-range gear ratio		
System disconnect (describe)		
Center differential	Type (bevel, planetary, w or w/o viscous bias, torsen, etc.)	
	Torque split (% front/rear)	

*Input speed ÷ √ torque

**Dry weight including torque converter. If other, specify.

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① Axle Ratio and Tooth Combinations (See 'Power Teams' for axle ratio usage)

Axle ratio (or overall top gear ratio)	3.27	2.73 (M/T)	3.27
Ring gear o.d.	11	15	11
No. of teeth	Pinion	36	41
	Ring gear	198.1 (7.8)	223.5 (8.8)

② Rear Axle Unit (7.8) (8.8)

Description		Semi-Floating Type with Cast Center and Overhung Pinion	
Limited slip differential (type)		Friction Plate	
Drive pinion	Type	Hypoid	
	Offset	25.4 (1.0)	38.1 (1.5)
No. of different pinions		Two	
Pinion/differential	Adjustment (shim, etc.)	Shim	
	Bearing adjustment	Collapsible Spacer	
Driving wheel bearing (type)		Straight Roller	
Lubricant	Capacity [L (pt.)]	1.47 (3.1) (a)	1.58 (3.35) (a)
	Type recommended	ESP-M2C154-A	

③ Propeller Shaft — Rear Wheel Drive

Manufacturer Type (straight tube, tube-in-tube, internal-external damper, etc.)			Ford, Collapsible Tube with Internal Tuned Damper	Ford Collapsible Tube with Cardboard Liner
Outer diam. x length* x wall thickness	Manual 3-speed transmission		N/A	
	Manual 4-speed transmission		N/A	
	Manual 5-speed transmission (M5R2)		N/A	88.90 x 1361 x 1.65 (3.5 x 53.6 x .065)
	Overdrive (AOD)		88.90 x 1468 x 1.65 (3.5 x 57.8 x .065)	88.90 x 1468 x 1.65 (3.5 x 57.8 x .065)
	Automatic transmission		N/A	
Inter-mediate bearing	Type (plain, anti-friction)		N/A	
	Lubrication (fitting, prepack)		N/A	
Slip yoke	Type		Plain	
	Number of teeth		28	
	Spline o.d.		30.99 (1.22)	
Universal joints	Make and mfg. no.	Front	Ford 1310	Ford 1330
		Rear	Ford 1310	Ford 1330
	Number used		Two	
	Type (ball and trunnion, cross)		Cross	
	Rear attach (u-bolt, clamp, etc.)		Circular Flange	
	Bearing	Type (plain, anti-friction)	Needle Roller	
		Lubrication (fitting, prepack)	Prepack	
Drive taken through (torque tube, arms or springs)			Rear Subframe	
Torque taken through (torque tube, arms or springs)			Rear Subframe	

*Centerline to centerline of universal joints, or to centerline of rear attachment. (a) Limited Slip; Substitute 4 Oz. M2C118-A Friction Modifier

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⑦ Axle Ratio and Tooth Combinations (See 'Power Teams' for axle ratio usage) REFER TO PAGE 10

Effective final drive ratio (or overall top gear ratio)		
Transfer ratio and method (chain, gear, etc.)		
Front drive unit	Ring gear o.d.	
	No. of teeth	Pinion
	Ring gear	

⑦ Front Drive Unit (NOT OFFERED)

Description (integral to trans., etc.)		
Limited slip differential (type)		
Drive pinion	Type	
	Offset	
No. of different pinions		
Pinion/differential	Adjustment (shim, etc.)	
	Bearing adjustment	
Driving wheel bearing (type)		
Lubricant	Capacity [L (pt.)]	
	Type recommended	

⑦ Axle Shafts — Rear Wheel Drive

Manufacturer and number used			GKN, Two-One Each RH & LH	
Type (straight, solid bar, tubular, etc.)		Left	Solid Bar	
		Right	Solid Bar	
Outer diam. x length* x wall thickness	Manual transmission 5-Speed	Left	N/A 30.43 x 470.2 (1.20 x 18.51)	
		Right	N/A 30.43 x 470.2 (1.20 x 18.51)	
	Automatic transmission (AOD)	Left	25.55 x 481.3 (1.01 x 18.95) 30.43 x 470.2 (1.20 x 18.51)	
		Right	25.55 x 481.3 (1.01 x 18.95) 30.43 x 470.2 (1.20 x 18.51)	
	Optional transmission	Left	N/A	
		Right	N/A	
Slip yoke	Type		N/A	
	Number of teeth		N/A	
	Spline o.d.		N/A	
Universal joints	Make and mfg. no.		Inner	GKN
			Outer	GKN
	Number used		Four-Two Inboard Plunging & Two Outboard Fixed	
	Type, size, plunge.		Inner	Tripod, C2650 36 (1.42) C4000 44 (1.73)
			Outer	Rzeppa, C2650 36 (1.42) C4000 44 (1.73)
	Attach (u-bolt, clamp, etc.)		I/B to Axle Spline & Snap Ring; O/B to Hub-Spline & Nut	
	Bearing	Type (plain, anti-friction)	N/A	
		Lubrication (fitting, prepack)	N/A	
Drive taken through (torque tube, arms or springs)			N/A	
Torque taken through (torque tube, arms or springs)			N/A	

*Centerline to centerline of universal joints, or to centerline of attachment.

MVMA Specifications

Vehicle Line THUNDERBIRD

Model Year 1990

Issued 11/88

Revised (●)

METRIC (U.S. Customary)

Body Type And/Or
Engine Displacement

ALL MODELS EXCEPT SUPER COUPE

Suspension — General Including Electronic Controls

Car leveling	Standard/optional/not avail.	N/A
	Manual/automatic control	
	Type (air/hydraulic)	
	Primary/assist spring	
	Rear only/4 wheel leveling	
	Single/dual rate spring	
	Single/dual ride heights	
	Provision for jacking	Notched Rocker Panel Positions, Front and Rear
Shock absorber damping controls	Standard/option/not avail.	N/A
	Manual/automatic control	
	Number of damping rates	
	Type of actuation (manual/electric motor/air, etc.)	
	5 e n s o r s	Lateral acceleration
		Deceleration
		Acceleration
Shock absorber (front & rear)	Type	(a) See Page 11B
	Make	Motorcraft
	Piston diameter	30.2 (1.2) Front and Rear
	Rod diameter	16.0 (0.63) Front; 12.5 (0.49) Rear

Suspension — Front

Type and description		Short/Long Arm Design with Double Isolated Tension Strut
Travel*	Full jounce	100.3 (3.95)
	Full rebound	104.7 (4.12)
Spring	Type (coil, leaf, other) & material	Coil SAE-5160-H Steel (Variable Rate)
	Insulators (type & material)	Top-Steel Bonded in Rubber; Bottom Steel Bonded to Rubber
	Size (coil design height & i.d.)	Check Hgt.: 294.3 (11.6) ID: 94 (3.7) Bar Dia.: 15.38 (0.606) — 14.62 (0.576) Bar Length: 4120 (162.2)
	Spring rate [N/mm (lb./in.)]	39.1 (223) — 49.4 (282)
	Rate at wheel [N/mm (lb./in.)]	18.1 (103.4)
Stabilizer	Type (link, linkless, frameless)	Link, Teflon Lined Rubber Sub Frame Insulator
	Material & bar diameter	SAE-1090 27.0 (1.1)

Suspension — Rear

Type and description		H-Arm, IRS
Travel*	Full jounce	113.6 (4.47)
	Full rebound	119.4 (4.70)
Spring	Type (coil, leaf, other) & material	Coil, SAE-5160-H (Variable Rate)
	Size (length x width, coil design height & i.d.)	Check Height: 233.3 (9.2) ID 108 (4.3), Bar Dia.: 16.81 (0.662) — 15.28 (0.602); Length: 2935 (115.6)
	Spring rate [N/mm (lb./in.)]	63.2 (361) — 87.7 (501)
	Rate at wheel [N/mm (lb./in.)]	19.2 (109.6)
	Insulators (type & material)	Rubber Top and Bottom
	If leaf	No. of leaves
		Shackle (comp. or tens.)
Stabilizer	Type (link, linkless, frameless)	Link
	Material & bar diameter	SAE-4130 25.0 (0.98)
Track bar (type)		None

*Define load condition:

MVMA Specifications

Vehicle Line THUNDERBIRD

Model Year 1990

Issued 11/88

Revised (●) _____

METRIC (U.S. Customary)

Body Type And/Or
Engine Displacement

SUPER COUPE

Suspension — General Including Electronic Controls

Car leveling	Standard/optional/not avail.	N/A
	Manual/automatic control	
	Type (air/hydraulic)	
	Primary/assist spring	
	Rear only/4 wheel leveling	
	Single/dual rate spring	
	Single/dual ride heights	
Shock absorber damping controls	Provision for jacking	Notched Rocker Panel Positions, Front and Rear
	Standard/option/not avail.	Standard
	Manual/automatic control	Both
	Number of damping rates	Two
	Type of actuation (manual/ electric motor/air, etc.)	Electric Actuator
	s e n s o r s	Lateral acceleration
		Turn Angle
Shock absorber (front & rear)		Deceleration
		Brake Fluid Pressure
		Acceleration
		Degree of Pedal Depression
		Transmission Speed
Shock absorber (front & rear)	Type	(b) See Page 11B
	Make	Motorcraft
	Piston diameter	32.0 (1.26) Front; 30.0 (1.2) Rear
	Rod diameter	16.0 (0.63) Front; 12.5 (0.49) Rear

Suspension — Front

Type and description		Short/Long Arm Design with Double Isolated Tension Strut
Travel*	Full jounce	104.4 (4.11)
	Full rebound	100.6 (3.96)
Spring	Type (coil, leaf, other) & material	Coil, SAE-5160-H Steel (Variable Rate)
	Insulators (type & material)	Top-Steel Bonded in Rubber; Bottom Steel Bonded to Rubber
	Size (coil design height & i.d.)	Check Height: 291.3 (11.5) ID: 94 (3.7) Bar Diameter: 16.75 (0.659) — 15.10 (0.595) Bar Length: 3650 (143.7)
	Spring rate [N/mm (lb./in.)]	61.1 (349) — 70.6 (403)
	Rate at wheel [N/mm (lb./in.)]	26.1 (149)
Stabilizer	Type (link, linkless, frameless)	Link, Teflon Lined Rubber Sub Frame Insulator
	Material & bar diameter	SAE-1090 29.0 (1.2)

Suspension — Rear

Type and description		H-Arm, IRS
Travel*	Full jounce	120.9 (4.76)
	Full rebound	112.1 (4.41)
Spring	Type (coil, leaf, other) & material	Coil, SAE-5160-H (Variable Rate)
	Size (length x width, coil design height & i.d.)	Bar Length: 2765 (108.9) Check Height: 231.3 (9.1) ID: 108 (4.3) Bar Diameter: 17.98 (0.708) — 16.40 (0.646)
	Spring rate [N/mm (lb./in.)]	89.1 (509) — 111.6 (637)
	Rate at wheel [N/mm (lb./in.)]	25.1 (143)
	Insulators (type & material)	Rubber Top and Bottom
	If leaf	No. of leaves
		Shackle (comp. or tens.)
Stabilizer	Type (link, linkless, frameless)	Link
	Material & bar diameter	SAE-4130 26.5 (1.04)
Track bar (type)		None

*Define load condition:

MVMA Specifications

METRIC (U.S. Customary)

SUPPLEMENTAL PAGE

Vehicle Line THUNDERBIRD

Model Year 1990 Issued 11/88 Revised (●) _____

Suspension (Cont'd):

- (a) Direct, double acting nitrogen gas pressurized hydraulic front and rear shocks.
- (b) Direct, double acting nitrogen gas pressurized hydraulic front and rear shocks.

Automatic Ride Control (Computer Controlled Adjustable Damping Shock Absorbers) —

A mode select switch on the instrument panel will allow the driver to select between "automatic" and "firm" (firm damping rate). During automatic operation, the system control module monitors signals from speed, brake pressure and steering sensors and an acceleration signal from the EEC IV engine control module. The shock absorber damping will normally be soft, automatically switching to firm when the control module anticipates excessive vehicle roll, pitch, dive or speed. During firm operation, the shock absorber damping will always be firm.

The module changes damping rate by energizing 2 relays which control 4 feedback actuators, one on top of each shock absorber. The actuators rotate a valve inside the shock absorbers to change the damping rate, and provide a signal to the module indicating whether the shocks are in the firm or soft mode. This allows the module to detect malfunctions and notify the customer by flashing a warning light. The feedback signals also allow the module to flash an error code during diagnostics to isolate the location of the malfunction for the service technician.

MVMA Specifications

METRIC (U.S. Customary)

Vehicle Line **THUNDERBIRD**

Model Year **1990**

Issued **11/88**

Revised (●)

Body Type And/Or
Engine Displacement

ALL MODELS EXCEPT SUPER COUPE

Brakes — Service

Description			Four Wheel Hydraulic Actuated System
Manufacturer and brake type (std., opt., n.a.)	Front (disc or drum)		Disc, Vented, Standard; Kelsey Hayes
	Rear (disc or drum)		Drum, Standard, Allied Bendix, Kelsey Hayes
Valving type (proportion, delay, metering, other)			Proportioning (Rear)
Power brake (std., opt., n.a.)			Standard
Booster type (remote, integral, vac., hyd., etc.)			Single Diaphragm, Integral, Vacuum
Vacuum	Source (inline, pump, etc.)		Engine
	Reservoir (volume in. ³)		N/A
	Pump-type (elec., gear driven, belt driven)		N/A
Traction control	Operational speed range		N/A
	Type engine intervention (electronic, mech.)		N/A
Anti-lock device	Front/rear (std., opt., n.a.)		Four Wheel Anti-Lock Brake System, Optional
	Manufacturer		Alfred Teve
	Type (electronic, mech.)		Electronic
	Number sensors or circuits		4 Sensors
	Number anti-lock hydraulic circuits		3 Circuits
	Integral or add-on system		Integral
	Yaw control (yes, no)		Yes
	Hydraulic power source (elect., vac. mtr., pwr. strg.)		Electric Motor Pump
Effective area [cm ² (in. ²)]*			Front 204.0 (31.6) Rear 446.1 (69.1)
Gross lining area [cm ² (in. ²)]** (F/R)			Front 240.4 (37.2) Rear 468.8 (72.7)
Swept area [cm ² (in. ²)]*** (F/R)			Front 1258.0 (195.0) Rear 706.8 (109.6)
Rotor	Outerworking diameter	F/R	275.5 (10.8)
	Inner working diameter	F/R	178.3 (7.0)
	Thickness	F/R	26.0 (1.0)
	Material & type (vented/solid)	F/R	Cast Iron/Steel Vented
Drum	Diameter & width	F/R	250.0 (9.8), 46.8 (1.8)
	Type and material	F/R	Cast Iron/Steel Finned
Wheel cylinder bore			Front 66.0 (2.6) Rear 25.4 (1.0)
Master cylinder	Bore/stroke	F/R	23.8 (0.94)/39.0 (1.54)
Pedal arc ratio			2.8:1
Line pressure at 445 N(100 lb.) pedal load [kPa (psi)]			10480 (1520) @ 20" Hg Vacuum
Lining clearance			F/R Front 0.20 (0.008) Rear 0.29 (0.011)
Brake lining	Front wheel	Bonded or riveted (rivets/seg.)	Riveted (6/Lining)
		Rivet size	4.7 x 7.5 (0.18 x 0.295)
		Manufacturer	Allied Bendix FMD
		Lining code*****	BX-HC-EE
		Material	Semi-Metallic
		**** Primary or out-board	144.0 x 44.6 x 9.7 (5.7 x 1.8 x 0.38)
		Size Secondary or in-board	144.0 x 44.6 x 9.7 (5.7 x 1.8 x 0.38)
		Shoe thickness (no lining)	6.0 (0.24)
	Rear wheel	Bonded or riveted (rivets/seg.)	Riveted (10 PRI, 10 SEC)
		Manufacturer	Allied Bendix FMD
		Lining Code*****	BX-UA-FF
		Material	Organic
		**** Primary or out-board	247 x 45 x 6.35 (9.72 x 1.77 x 0.25)
		Size Secondary or in-board	247 x 45 x 6.35 (9.72 x 1.77 x 0.25)
		Shoe thickness (no lining)	1.89 (0.074)

*Excludes rivet holes, grooves, chamfers, etc. **Includes rivet holes, grooves, chamfers, etc.

***Total swept area for four brakes. (Drum brake: Widest lining contact width for each brake x its contact circumference.) (Disc brake: Square of Outer Working Dia. minus Square of inner Working Dia. multiplied by Pi/2 for each brake.)

****Size for drum brakes includes length x width x thickness. *****Manufacturer I.D., catalog or formulation designation and coefficient of friction classification.

MVMA Specifications

Vehicle Line **THUNDERBIRD**

Model Year **1990**

Issued **11/88**

Revised (e) **7/31/89**

METRIC (U.S. Customary)

Body Type And/Or
Engine Displacement

SUPER COUPE

Brakes — Service

Description			Four Wheel Hydraulic Anti-Lock Brake System
Manufacturer and brake type (std., opt., n.a.)	Front (disc or drum)		Disc, Standard; Kelsey Hayes, Allied Bendix
	Rear (disc or drum)		Disc, Standard; Kelsey Hayes, Varga
Valving type (proportion, delay, metering, other)			Proportioning (Rear)
Power brake (std., opt., n.a.)			Standard
Booster type (remote, integral, vac., hyd., etc.)			Hydraulic
Vacuum	Source (inline, pump, etc.)		N/A
	Reservoir (volume in. ³)		N/A
	Pump-type (elec., gear driven, belt driven)		N/A
Traction control	Operational speed range		N/A
	Type engine intervention (electronic, mech.)		N/A
Anti-lock device	Front/rear (std., opt., n.a.)		Four Wheel Anti-Lock Brake System, Standard
	Manufacturer		Alfred Teve
	Type (electronic, mech.)		Electronic
	Number sensors or circuits		Four Sensors
	Number anti-lock hydraulic circuits		Three Circuits
	Integral or add-on system		Integral
	Yaw control (yes, no)		Yes
Hydraulic power source (elect., vac. mtr., pwr. strg.)			Electric Motor Pump
Effective area [cm ² (in. ²)]*			Front 204.0 (31.6) Rear 114.4 (17.7)
Gross lining area [cm ² (in. ²)]** (F/R)			Front 240.0 (37.2) Rear 130.0 (20.2)
Swept area [cm ² (in. ²)]*** (F/R)			Front 1258.0 (195.0) Rear 1047.6 (162.4)
(e) Rotor	Outerworking diameter	F/R	Front 275.5 (10.8) Rear 254.0 (10.0)
	Inner working diameter	F/R	Front 178.3 (7.0) Rear 162.0 (6.4)
	Thickness	F/R	Front 26.0 (1.02) Rear 24.0 (0.94)
	Material & type (vented/solid)	F/R	Front/Rear: Cast Iron, Steel Vented
Drum	Diameter & width	F/R	N/A
	Type and material	F/R	N/A
Wheel cylinder bore			Front 66.0 (2.60) Rear 45.4 (1.79)
Master cylinder	Bore/stroke	F/R	23.8 (0.94)/31.0 (1.22)
Pedal arc ratio			3.5:1
Line pressure at 445 N(100 lb.) pedal load [kPa (psi)]			17900 (2600)
Lining clearance			F/R Front 0.20 (0.008) Rear 0.22 (0.008)
Brake lining	Front wheel	Bonded or riveted (rivets/seg.)	Riveted (6/Lining)
		Rivet size	4.7 x 7.5 (0.18 x 0.295)
		Manufacturer	Abex
		Lining code*****	Abex 6022EE
		Material	Semi-Metallic
		**** Primary or out-board	Outer 144.0 x 44.6 x 9.7 (5.7 x 1.8 x 0.38)
		Size Secondary or in-board	Inner 144.0 x 44.6 x 9.7 (5.7 x 1.8 x 0.38)
		Shoe thickness (no lining)	6.0 (0.24)
	Rear wheel	Bonded or riveted (rivets/seg.)	Riveted (5 Rivets/Lining)
		Manufacturer	Nuturn
		Lining Code*****	NT-4-GG
		Material	Organic
		**** Primary or out-board	99.4 x 38.5 x 12.0 (3.91 x 1.5 x 0.47)
		Size Secondary or in-board	99.4 x 38.5 x 12.0 (3.91 x 1.5 x 0.47)
		Shoe thickness (no lining)	5.0 (0.197)

*Excludes rivet holes, grooves, chamfers, etc. **Includes rivet holes, grooves, chamfers, etc.

***Total swept area for four brakes. (Drum brake: Widest lining contact width for each brake x its contact circumference.)

(Disc brake: Square of Outer Working Dia. minus Square of inner Working Dia. multiplied by Pi/2 for each brake.)

****Size for drum brakes includes length x width x thickness. *****Manufacturer I.D., catalog or formulation designation and coefficient of friction classification.

MVMA Specifications

METRIC (U.S. Customary)

Vehicle Line THUNDERBIRD

Model Year 1990

Issued 11/88

Revised (e) 5/15/89

Body Type And/Or
Engine Displacement

ALL MODELS (EXCL. SUPER COUPE) SUPER COUPE

Tires And Wheels (Standard)

(e) Tires	Size (load range, ply)		P205/70R15	P225/60R16
	Type (bias, radial, steel, nylon, etc.)		Steel Belted Radial	
	Inflation pressure (cold) for recommended max. vehicle load	Front [kPa (psi)]	207 (30)	
		Rear [kPa (psi)]	207 (30)	
	Rev./mile — at 70 km/h (45 mph)		792	784
Wheels	Type & material		Stamped Steel Disc	Cast Aluminum — Pinwheel
	Rim (size & flange type)		15 x 6.0	16 x 7.0
	Wheel offset		39.0 (1.54)	
	Attachment	Type (bolt or stud)	Stud	
		Circle diameter	107.9 (4.25)	
		Number & size	Five — M12 x 1.5	
Spare	Tire and wheel		T125/90R15 BSW 413.7 kPa 60 PSI with 15 x 4 (Steel) High Pressure Mini-Spare and Forged Alum. Mini-Spare	
	Storage position & location (describe)		Left Hand Quarter Panel	

Tires And Wheels (Optional)

(e) Tire size (load range, ply)	GT+4 P225/60R16 (Available on Super Coupe Only)
Type (bias, radial, steel, nylon, etc.)	Steel Belted Radial
Wheel (type & material)	
Rim (size, flange type and offset)	
Tire size (load range, ply)	P215/70R15 (Not Available on Super Coupe)
Type (bias, radial, steel, nylon, etc.)	Steel Belted Radial
Wheel (type & material)	Cast Aluminum
Rim (size, flange type and offset)	15 x 6.5, 39.0 (1.54) Offset
Tire size (load range, ply)	
Type (bias, radial, steel, nylon, etc.)	
Wheel (type & material)	
Rim (size, flange type and offset)	
Tire size (load range, ply)	
Type (bias, radial, steel, nylon, etc.)	
Wheel (type & material)	
Rim (size, flange type and offset)	
Spare tire and wheel size (if configuration is different than road tire or wheel, describe optional spare tire and/or wheel location & storage position)	Conventional Spare Tire and Wheel 15x6.0 Steel Stamped Mini-Spare w/Aluminum Wheel on Super Coupe Only

Brakes — Parking

Type of control	Foot Operated	Hand Operated
Location of control	LH Side Under Inst. Panel	Tunnel
Operates on	Rear Service Brakes	
If separate from service brakes	Type (internal or external)	—
	Drum diameter	—
	Lining size (length x width x thickness)	—

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Revised (e) **7/31/89**

METRIC (U.S. Customary)

Body Type And/Or
Engine Displacement

ALL MODELS

Steering

Manual (std., opt., n.a.)			N/A			
Power (std., opt., n.a.)			Standard			
Adjustable steering wheel/column (tilt, telescope, other)	Type		Steering Wheel Tilt — Five Positions			
	Manufacturer		Ford			
	(Std., opt., n.a.)		Optional			
Wheel diameter** (W9) SAE J1100	Manual		N/A			
	Power		368 (14.5)			
(e) Turning diameter m (ft.)	Outside front	Wall to wall (l. & r.)				
		Curb to curb (l. & r.)		10.85 (35.6)		
	Inside rear	Wall to wall (l. & r.)				
		Curb to curb (l. & r.)				
Scrub Radius*			2.85 (0.11)			
Manual	Gear	Type		N/A		
		Manufacturer		—		
		Ratios	Gear	—		
			Overall	—		
	No. wheel turns (stop to stop)		—			
Power	Type (coaxial, elec., hyd., etc.)		Integral Rack and Pinion			
	Manufacturer		# (See Below)			
	Gear	Type		Rack and Pinion, Constant Ratio		
		Ratios	Gear	56.1°/mm/rev.		
			Overall	14.1:1 On Center, 11.0:1 At Stops		
			Pump (drive)		Multi-Rib Belt Off Crankshaft Pulley	
	No. wheel turns (stop to stop)		2.76			
Linkage	Type		Rack and Pinion (Rod and Ball Joint Directly Attached to Gear)			
	Location (front or rear of wheels, other)		Front of Wheels			
	Tie rods (one or two)		Two (Integral with Gear)			
Steering axis	Inclination at camber (deg.)		15.7°			
	Bearings (type)	Upper	Prelubricated Ball Joint Spring Loaded			
		Lower	Prelubricated Ball Joint			
		Thrust	Teflon Coated Fabric Wash in Lower Ball Joint			
Steering spindle/knuckle & joint type			Internal with Wheel Spindle Ball Socket Joints			
Wheel spindle/hub	Diameter	Inner bearing	37.98 (1.50)			
		Outer bearing	22.10 (0.87)			
	Thread (size)		13/16-20 UNEF 2A R.H. Thread			
	Bearing (type)		Tapered Roller			

*The horizontal distance in the front elevation between wheel centerline and kingpin (ball joint) axis at ground.

**See Page 22.

Gear & Pump (Speed Sensitive Variable Assist (EVO) w/LX & Super Coupe) Ford; Fluid ESP-M2C138-CJ

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Vehicle Line **THUNDERBIRD**

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Revised (e) **10/31/89**

Body Type And/Or
Engine Displacement

ALL MODELS EXCEPT SUPER COUPE

Wheel Alignment

(e)	Front wheel at curb mass (wt.)	Service checking	Caster (deg.)	$5.5^{\circ} \pm 0.75^{\circ}$ (a)
			Camber (deg.)	$-0.5^{\circ} \pm 0.75^{\circ}$ (a)
			Toe-in [outside track-mm (in.)]	$3.0 \pm .30$ (0.12 ± 0.01) (b)(c)
	(e)	Service reset*	Caster	$5.5^{\circ} \pm 0.75^{\circ}$ (a)
			Camber	$-0.5^{\circ} \pm 0.75^{\circ}$ (a)
			Toe-in	$3.0 \pm .30$ (0.12 ± 0.01) (b)(c)
(e)	Rear wheel at curb mass (wt.)	Periodic M.V. inspection	Caster	$5.5^{\circ} \pm 0.75^{\circ}$ (a)
			Camber	$-0.5^{\circ} \pm 0.75^{\circ}$ (a)
			Toe-in	$3.0 \pm .30$ (0.12 ± 0.01) (b)(c)
	(e)	Service checking	Camber (deg.)	$-0.5^{\circ} \pm 0.5^{\circ}$ (a)
			Toe-in [outside track-mm (in.)]	$3.0 \pm .30$ (0.12 ± 0.01)
		Service reset*	Camber	$-0.5^{\circ} \pm 0.5^{\circ}$ (a)
(e)	Rear wheel at curb mass (wt.)		Toe-in	$3.0 \pm .30$ (0.12 ± 0.01)
		Periodic M.V. inspection	Camber	$-0.5^{\circ} \pm 0.5^{\circ}$ (a)
			Toe-in	$3.0 \pm .30$ (0.12 ± 0.01)

*Indicates pre-set, adjustable, trend set or other.

Electrical — Instruments and Equipment

Speedometer	Type (analog, digital, std., opt.)	Electronic Analog on Base; Electronic Digital on LX
	Trip odometer (std., opt., n.a.)	Analog Speedo on Base; Electronic Digital on LX
EGR maintenance indicator		N/A
Charge indicator	Type	Electronic Analog on LX
	Warning device (light, audible)	Warning Lamp on Base
Temperature indicator	Type	90° Pointer Type Gauge on Base; Elect. Analog on LX
	Warning device (light, audible)	N/A
Oil pressure indicator	Type	Electronic Analog on LX
	Warning device (light, audible)	Warning Lamp on Base
Fuel indicator	Type	90° Pointer Type Gauge on Base; Elect. Analog on LX
	Warning device (light, audible)	N/A
Windshield wiper	Type (standard)	Interval Wipe (Column-Mounted Control), Standard
	Type (optional)	N/A
	Blade length	L.H. 609.6 (24.0); R.H. 509.0 (20.0)
	Swept area [cm ² (in. ²)]	8135.3 (1260.9)
Windshield washer	Type (standard)	Electric Pump (Impeller Type) Dual Fluidic Spray
	Type (optional)	None
	Fluid level indicator (light, audible)	Warning Light, Optional
Rear window wiper, wiper/washer (std., opt., n.a.)		N/A
Horn	Type	Air Electric
	Number used	Two — 1 Lo-Pitch, 1 Hi-Pitch

Other SEE PAGE 15B

(a) Max. side-to-side difference between wheels (left minus right) to be within $\pm 0.75^{\circ}$ with caster and camber set to specification

(b) Steering wheel must be within $\pm 5^{\circ}$ of straight-ahead position after toe setting

(c) Individual rear toe 0.8 ± 1.5 (0.03 ± 0.06)

MVMA Specifications

METRIC (U.S. Customary)

Vehicle Line THUNDERBIRD

Model Year 1990

Issued 11/88

Revised (e) 10/31/89

Body Type And/Or
Engine Displacement

SUPER COUPE

Wheel Alignment

(e)	Front wheel at curb mass (wt.)	Service checking	Caster (deg.)	5.5° ± 0.75° (a)
			Camber (deg.)	- 0.5° ± 0.75° (a)
			Toe-in [outside track-mm (in.)]	3.0 ± .30 (0.12 ± 0.01) (b)(c)
	Service reset*		Caster	5.5° ± 0.75° (a)
			Camber	- 0.5° ± 0.75° (a)
			Toe-in	3.0 ± .30 (0.12 ± 0.01) (b)(c)
	Periodic M.V. inspection		Caster	5.5° ± 0.75° (a)
			Camber	- 0.5° ± 0.75° (a)
			Toe-in	3.0 ± .30 (0.12 ± 0.01) (b)(c)
(e)	Rear wheel at curb mass (wt.)	Service checking	Camber (deg.)	- 0.5° ± 0.5° (a)
			Toe-in [outside track-mm (in.)]	3.0 ± .30 (0.12 ± 0.01)
	Service reset*		Camber	- 0.5° ± 0.5° (a)
			Toe-in	3.0 ± .30 (0.12 ± 0.01)
	Periodic M.V. inspection		Camber	- 0.5° ± 0.5° (a)
			Toe-in	3.0 ± .30 (0.12 ± 0.01)

*Indicates pre-set, adjustable, trend set or other.

Electrical — Instruments and Equipment

Speedometer	Type (analog, digital, std., opt.)	Electric Speedometer, Standard
	Trip odometer (std., opt., n.a.)	Standard
EGR maintenance indicator		N/A
Charge indicator	Type	N/A
	Warning device (light, audible)	Light
Temperature indicator	Type	90° Pointer Type, Standard (MAG Gauge)
	Warning device (light, audible)	N/A
Oil pressure indicator	Type	90° Pointer Type, Standard (MAG Gauge)
	Warning device (light, audible)	N/A
Fuel indicator	Type	90° Pointer Type, Standard (MAG Gauge)
	Warning device (light, audible)	N/A
Windshield wiper	Type (standard)	Interval Wipe (Column-Mounted Control), Standard
	Type (optional)	N/A
	Blade length	L.H. 609.6 (24.0); R.H. 509.0 (20.0)
	Swept area [cm ² (in. ²)]	8135.3 (1260.9)
Windshield washer	Type (standard)	Electric Pump (Impeller Type) Dual Fluidic Spray
	Type (optional)	None
	Fluid level indicator (light, audible)	Warning Light, Optional
Rear window wiper, wiper/washer (std., opt., n.a.)		N/A
Horn	Type	Air Electric
	Number used	Two — 1 Lo-Pitch, 1 Hi-Pitch

Other SEE PAGE 15B

(a) Max. side-to-side difference between wheels (left minus right) to be within ± 0.75° with caster and camber set to specification

(b) Steering wheel must be within ± 5° of straight ahead position after toe setting

(c) Individual rear toe 0.8 ± 1.5 (0.03 ± 0.06)

MVMA Specifications

METRIC (U.S. Customary)

SUPPLEMENTAL PAGE

Vehicle Line THUNDERBIRD

Model Year 1990 Issued 11/88 Revised (●) _____

Electrical — Instruments and Equipment: (Cont'd)

- Brake System Warning Light
- Emergency Flashers
- Directional Turn Signal Lights
- Hi-Beam Indicator Light
- Fasten Seat Belts Warning Light
- Automatic Lamp System
- Illuminated Entry System
- Vehicle Maintenance Monitor (Low Fluids: Fuel, Oil, Windshield Washer and Coolant) and Oil Change Indicator Base and LX Models
- Check Gauge Light (Low Fluids: Fuel, Oil and Coolant) and Oil Change Indicator — Super Coupe Model
- Firm Ride Light w/3.8L SC Engine
- Anti-Lock Brake Warning Light w/3.8L SC Engine
- EEC Malfunction Warning Light
- Door Ajar Warning Lamp
- Up-Shift Indicator Light w/3.8L, SC Engine
- Anti-Theft Alarm Warning Light

MVMA Specifications

METRIC (U.S. Customary)

Vehicle Line THUNDERBIRD

Model Year 1990

Issued 11/88

Revised (e) 6/5/89

Engine Description
Engine Code

3.8L

3.8L SC

Electrical — Supply System

(e) Battery	Manufacturer	Motorcraft	
	Model, std., (opt.)	Standard	
	Voltage	12 Volt	
	Amps at 0°F cold crank	480	540 (Manual) 650 (Auto)
	Minutes-reserve capacity	82	100 (Manual) 130 (Auto)
	Amp/hrs. - 20 hr. rate	48 (a)	58 (Manual) 72 (Auto)
	Location	Left Front Engine Compartment	
Alternator	Manufacturer	Ford (EED Rawsonville)	Mitsubishi
	Rating (idle/max. rpm)	10300 E8SF-BA (65 Amp.)	E9SF-DA (110 Amp.)
	Ratio (alt. crank/rev.)	3.38:1	
	Output at idle (rpm, park)	N/A	
	Optional (type & rating)	N/A	
Regulator	Type	10316	Electronic-Integral w/ Alternator

Electrical — Starting System

Motor	Manufacturer	Ford	
	Current drain 0 °F	245-270 Amps.	
	Power rating [kw (hp)]		
Motor drive	Engagement type	11001	Positive (E4DF-BA) Positive (E9SF-AA)
	Pinion engages from (front, rear)	Front	

Electrical — Ignition System

Type	Electronic (std., opt., n.a.)		Standard
	Other (specify)		N/A
Coil	Manufacturer	Motorcraft	
	Model	12029	E73F-AB E9SF-AA
	Current	Engine stopped — A	
		Engine idling — A	6.5 5.5 to 6.0
Spark plug	Manufacturer	Motorcraft	
	Model	AWSF-44C AWSF-34P	
	Thread (mm)	14	
	Tightening torque [N·m (lb, ft)]	7-15 (5-11)	
	Gap	1.32-1.42 (.052-.056)	
	Number per cylinder	One	
Distributor	Manufacturer	Motorcraft	N/A
	Model	Universal	N/A

Electrical — Suppression

Locations & type	Capacitor in Alternator, Resistor Spark Plugs, Resistance Ignition Wire, Ground Cable — Engine to Dash. Hood Bond, Cowl to Engine Strap, Ignition Coil Capacitor, Cowl Bracket to Body Strap.
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(a) 58 Amp Standard On LX Model

MVMA Specifications

METRIC (U.S. Customary)

Vehicle Line THUNDERBIRD

Model Year 1990

Issued 11/88

Revised (e)

Body Type

ALL MODELS

Body

Structure		Unitized Body Construction with Bolt-On Front and Rear Subframes and Energy-Absorbing Front and Rear Structures with Anchors for Engine, Suspension, Steering and Driveline Components
Bumper system front-rear	(Five (5) Mile Per Hour Bumper Frt/RR — Ford Requirements)	Full RMP Urethane Rim Front and Rear Bumper Covers (Wheel Opening to Wheel Opening) with Stamped Steel Front and Rolled Martinsitic Steel Rear Reinforcing Beams. Egg Crate EVA Energy Absorbers.
Anti-corrosion treatment		Selected Critical Body Parts are Protected by the Use of Galvanized Steel or Through Application of Zinc-Rich Primer. During Body Assembly, Vinyl Sealers and Aluminized Wax are Used, Each for Selected Body Parts.

Body — Miscellaneous Information

Type of finish (lacquer, enamel, other)	Acrylic Enamel for Non-Metallic Colors (a)	
Hood	Material & mass	Steel
	Hinge location (front, rear)	Rear
	Type (counterbalance, prop)	Counterbalance — Gas Spring
	Release control (internal, external)	Primary-Internal Remote Cable; Secondary-External
Trunk lid	Material & mass	Steel
	Type (counterbalance, other)	Counterbalance
	Internal release control (elec., mech., n.a.)	Electric, Optional
Hatch-back lid	Material & mass	N/A
	Type (counterbalance, other)	N/A
	Internal release control (elec., mech., n.a.)	N/A
Tailgate	Material & mass	N/A
	Type (drop, lift, door)	N/A
	Internal release control (elec., mech., n.a.)	N/A
Vent window control (crank, friction, pivot, power)	Front	N/A
	Rear	N/A
Window regulator type (cable, tape, flex, drive, etc.)	Front	Cross Arm
	Rear	N/A
Seat cushion type (e.g., 60/40, bucket, bench, wire, foam etc.)	Front (b)	Deep Polyurethane Foam on Flat Wire Grid Susp. by Coil Sprgs.
	Rear	Integral Frame & Polyurethane Foam Pad
	3rd seat	N/A
Seat back type (e.g., 60/40, bucket, bench, wire, foam etc.)	Front (b)	Full Polyurethane Foam Pad & Steel Stamped Frame
	Rear	Integral Steel Frame & Polyurethane Foam Pad
	3rd seat	N/A

(a) Acrylic Base Coat/Acrylic Clear Coat for Metallic Colors

(b) Standard Bucket; Articulated Sport Seat on Super Coupe

MVMA Specifications

METRIC (U.S. Customary)

Vehicle Line THUNDERBIRD

Model Year 1990

Issued 11/88

Revised (e)

Body Type

ALL MODELS

Restraint System

Seating Position			Left	Center	Right
Active	Type & description (lap & shoulder belt, lap belt, etc.) Standard/optional	First seat	N/A	N/A	N/A
		Second seat	3-Point Continuous Loop Lap & Shoulder Belt, Standard	Lap Belt	3-Point Continuous Loop Lap & Shoulder Belt, Standard
		Third seat	N/A	N/A	N/A
Passive	Type & description (air bag, motorized-2-point belt, fixed belt, knee bolster, manual-lap belt) Standard/optional	First seat	Motorized — 2-Point Belt, Knee Bolster, Manual Lap Belt, Standard	N/A	Motorized — 2-Point Belt, Knee Bolster, Manual Lap Belt, Standard
		Second seat	N/A	N/A	N/A
		Third seat	N/A	N/A	N/A

Glass	SAE Ref. No.	
Windshield glass exposed surface area [cm ² (in. ²)]	S1	11878 (1841)
Side glass exposed surface area [cm ² (in. ²)]-total 2-sides	S2	7600 (1178) Side Door — 3936 (610) Qtr. — 3664 (568)
Backlight glass exposed surface area [cm ² (in. ²)]	S3	10521 (1631)
Total glass exposed surface area [cm ² (in. ²)]	S4	29999 (4650)
Windshield glass (type)		Laminated — Safety
Side glass (type)		Tempered
Backlight glass (type)		Tempered

Headlamps

Description-sealed beam, halogen, replaceable bulb, etc.	Replaceable Bulb, Halogen
Shape	Low Profile Aerodynamic
Lo-beam type (2A1, 2B1, 2C1, etc.)	9008
Quantity	Two
Hi-beam type (1A1, 2A1, 1C1, 2C1, etc.)	9005
Quantity	Two (Combined with Low Beam Assy.)

Frame

Type and description (separate frame, unitized frame, partially-unitized frame)	Unitized Construction with Bolt-On Front and Rear Subframes
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MVMA Specifications

METRIC (U.S. Customary)

Vehicle Line THUNDERBIRD

Model Year 1990

Issued 11/88

Revised (●)

Body Type

ALL MODELS

Convenience Equipment (standard, optional, n.a.)

Air conditioning (manual, auto. temp control)		Standard, Manual; Optional, Automatic Temperature Control
Clock (digital, analog)		Digital (Part of Radio Assy.)
Compass/thermometer		N/A
Console (floor, overhead)		Standard, Floor
Defroster, elec. backlight		Optional, (Mandatory in New York State)
Electronic	Diagnostic monitor (integrated, individual)	Optional, Integrated
	Instrument cluster (list instruments)	Std.: LCD Speedo., Trip Odometer, Fuel, Temp., Oil and Volts Gauges
	Keyless entry	Optional
	Tripminder (avg. spd., fuel)	Standard w/Electronic Cluster
	Voice alert (list items)	N/A
	Other	Standard, Interval Windshield Wipers
Fuel door lock (remote, key, electric)		Optional, Electric
Lamps	Auto head on/off delay, dimming	Optional
	Cornering	Optional
	Courtesy (map, reading)	Optional
	Door lock, ignition	Optional, Illuminated Door Locks
	Engine compartment	Optional
	Fog	Standard, Available on Super Coupe Only
	Glove compartment	Standard
	Trunk	Standard
	Illuminated entry system (list lamps, activation)	(a)
Mirrors	Other	
	Day/night (auto. man.)	Std., Day/Night Manual; Opt. Automatic Day/Night (b)
	L.H. (remote, power, heated)	Standard, Manual Remote; Optional, Power Remote Control
	R.H. (convex, remote, power, heated)	Optional, Power Remote Control, Convex
Visor vanity (RH/LH, illuminated)		Optional, L.H. and R.H. Illuminated
Navigation system (describe)		N/A
Parking brake-auto release (warning light)		Manual Release Standard (c)

(a) Included and Only Available with Keyless Entry. Raising Either Front Door Outside Handle Turns on All Interior Courtesy Lamps (not Map/Reading) and Front Door Lock Cylinder L.E.D.'s, Optional.

(b) Includes Interior Lamp on Moonroof Equipped Cars only.

(c) Super Coupe Model Equipped with Tunnel Mounted Hand Brake.

MVMA Specifications

METRIC (U.S. Customary)

Vehicle Line THUNDERBIRD

Model Year 1990

Issued 11/88

Revised (e) _____

Body Type

ALL MODELS

Convenience Equipment (standard, optional, n.a.)

Power equipment	Deck lid (release, pull down)		Electric Release Included w/Optional Power Door Locks
	Door locks (manual, automatic, describe system)		Optional, Electric
	Seats	2 - 4 - 6 way, etc.	Optional, 6-Way Power Tracks
		Reclining (R.H., L.H.)	N/A
		Memory (R.H., L.H., preset, recline)	N/A
		Lumbar, hip, thigh, support	N/A
		Heated (R.H., L.H., other)	N/A
	Side windows		Standard
	Vent windows		N/A
Rear windows		N/A	
Radio systems	Antenna (location, whip, w/shield, power)		RF Fender Whip Standard; Power Optional
	Standard	AM, FM, stereo, tape compact disc, graphic equalizer, theft deterrent, radio prep package, headphone jacks, etc.	Electronic AM/FM Stereo Search
	Optional		Electronic AM/FM Stereo Search w/Cassette, Electronic Premium Cassette Radio (EPC) and Premium Sound, Electronic Premium Sound (EPC) with JBL Sound System and Compact Disc Player
	Speaker (number, location)		Two Door Speakers & Two Quarter Panel Speakers with Upgrade for Premium Sound and JBL Option
Roof: open air or fixed (flip-up, sliding, "T")			Optional, Power Sliding
Speed control device			Optional
Speed warning device (light, buzzer, etc.)			Digital Speedo Audible Tone for Speed Set Warning
Tachometer (rpm)			Standard, 7000 RPM
Telephone system (describe)			N/A
Theft deterrent system			Optional, See Below (a)

(a) Anti-Theft System is Triggered when Vehicle Is Entered Without the Key or Keyless Entry Code if the System was Previously Armed or Activated. The Car Won't Start, Lights Flash and Horn Sounds.

MVMA Specifications

METRIC (U.S. Customary)

Vehicle Dimensions See Key Sheets for definitions

All dimensions to ground are for comparative purposes only. Dimensions are to be shown for all base body models of each vehicle line. SAE Ref. no. refers to the definition published in SAE Recommended Practice J1100 "Motor Vehicle Dimensions," unless otherwise specified.

Vehicle Line THUNDERBIRD

Model Year 1990 Issued 11/88 Revised (●) _____

Body Type

SAE
Ref.
No.

2-DOOR SEDAN

Width

Tread (front)	W101	1565 (61.6)
Tread (rear)	W102	1530 (60.2)
Vehicle width	W103	1847 (72.7)
Body width at SgRP (front)	W117	1824 (71.8)
Vehicle width (front doors open)	W120	
Vehicle width (rear doors open)	W121	—
Tumble-home (deg.)	W122	25.7°
Outside mirror width	W410	

Length

Wheelbase	L101	2870 (113.0)
Vehicle length	L103	5047 (198.7)
Overhang (front)	L104	1068 (42.0)
Overhang (rear)	L105	1109 (43.7)
Upper structure length	L123	2893 (113.9)
Rear wheel C/L "X" coordinate	L127	4462 (96.9)

Height*

Passenger distribution (front/rear)	PD1,2,3	2/2
Trunk/cargo load		0
Vehicle height	H101	1338 (52.7)
Cowl point to ground	H114	909 (35.8)
Deck point to ground	H138	971 (38.2)
Rocker panel-front to ground	H112	
Rocker panel-rear to ground	H111	
Windshield slope angle	H122	63.9°
Backlight slope angle	H121	66.6°

Ground Clearance*

ALL MODELS EXCEPT SUPER COUPE

SUPER COUPE

Front bumper to ground	H102	360.7 (14.2)	368.3 (14.5)
Rear bumper to ground	H104	335.3 (13.2)	340.1 (13.4)
Bumper to ground (front at curb mass (wt.))	H103	386.1 (15.2)	
Bumper to ground (rear at curb mass (wt.))	H105	396.2 (15.6)	
Angle of approach (degrees)	H106	20.2°	20.9°
Angle of departure (degrees)	H107	18.9°	19.8°
Ramp breakover angle (degrees)	H147	11.9°	12.7°
Axle differential to ground (front/rear)	H153	173.3 (6.8)	185.6 (7.3)
Min. running ground clearance	H158	136.4 (5.4)	145.4 (5.7)
Location of min. run. grd. clear.		Converter Grass Shield	

*All vehicle height and ground clearances are measured at the Manufacturer's Design Load Weight.

Manufacturers Design Load Weight is defined with indicated passenger distribution and trunk/cargo load, unless otherwise specified. All linear dimensions are in millimeters (inches) unless otherwise noted.

MVMA Specifications

METRIC (U.S. Customary)

Vehicle Dimensions See Key Sheets for definitions

Vehicle Line THUNDERBIRD

Model Year 1990 Issued 11/88 Revised (e) _____

Body Type

2-DOOR SEDAN

⑦ Front Compartment

SAE
Ref.
No.

SgRP front, "X" coordinate	L31	3050 (41.4)
Effective head room	H61	967 (38.1)
Max. eff. leg room (accelerator)	L34	1081 (42.5)
SgRP to heel point	H30	224 (8.8)
SgRP to heel point	L53	888 (34.9)
Back angle	L40	25.0°
Hip angle	L42	97.0°
Knee angle	L44	129.3°
Foot angle	L46	87.0°
Design H-point front travel	L17	218.2 (8.6)
Normal driving & riding seat track trvl.	L23	195 (7.7)
Shoulder room	W3	1502 (59.1)
Hip room	W5	1464 (57.6)
Upper body opening to ground	H50	1200 (47.2)
Steering wheel maximum diameter*	W9	379 (14.9)
Steering wheel angle	H18	20.0°
Accel. heel pt. to steer. whl. cntr	L11	527 (20.8)
Accel. heel pt. to steer. whl. cntr	H17	609 (24.0)
Undepressed floor covering thickness	H67	38 (1.5)

⑦ Rear Compartment

SgRP point couple distance	L50	795 (31.3)
Effective head room	H63	953 (37.5)
Min. effective leg room	L51	909 (35.8)
SgRP (second to heel)	H31	274 (10.8)
Knee clearance	L48	35 (1.4)
Shoulder room	W4	1500 (59.1)
Hip room	W6	1438 (56.6)
Upper body opening to ground	H51	N/A
Back angle	L41	26.0°
Hip angle	L43	85.5°
Knee angle	L45	91.4°
Foot angle	L47	122.8°
Depressed floor covering thickness	H73	20 (0.8)

Luggage Compartment

Usable luggage capacity [L (cu. ft.)]	V1	416.3 (14.7)
Liftover height	H195	622 (24.5)

Interior Volumes (EPA Classification)

Vehicle class		Mid-Size
Interior volume index (cu. ft.)**		116.1
Trunk/cargo index (cu. ft.)		14.7

* See page 14.

** Includes passenger and trunk/cargo index — see General section for definition.

MVMA Specifications

METRIC (U.S. Customary)

Vehicle Dimensions See Key Sheets for definitions

Vehicle Line THUNDERBIRD

Model Year 1990 Issued 11/88 Revised (e)

Body Type

SAE
Ref.
No.

Station Wagon—Third Seat

(NOT APPLICABLE)

Seat facing direction	SD1	
SgRP couple distance	L85	
Shoulder room	W85	
Hip room	W86	
Effective leg room	L86	
Effective head room	H86	
SgRP to heel point	H87	
Knee clearance	L87	
Back angle	L88	
Hip angle	L89	
Knee angle	L90	
Foot angle	L91	

Station Wagon—Cargo Space

(NOT APPLICABLE)

Cargo length (open front)	L200	
Cargo length (open second)	L201	
Cargo length (closed front)	L202	
Cargo length (closed second)	L203	
Cargo length at belt (front)	L204	
Cargo length at belt (second)	L205	
Cargo width (wheelhouse)	W201	
Rear opening width at floor	W203	
Opening width at belt	W204	
Min. rear opening width above belt	W205	
Cargo height	H201	
Rear opening height	H202	
Tailgate to ground height	H250	
Front seatback to load floor height	H197	
Cargo volume index [m ³ (ft. ³)]	V2	
Hidden cargo volume index [m ³ (ft. ³)]	V4	
Cargo volume index-rear of 2-seat	V10	

Hatchback—Cargo Space

(NOT APPLICABLE)

Cargo length at front seatback height	L208	
Cargo length at floor (front)	L209	
Cargo length at second seatback height	L210	
Cargo length at floor (second)	L211	
Front seatback to load floor height	H197	
Second seatback to load floor height	H198	
Cargo volume index [m ³ (ft. ³)]	V3	
Hidden cargo volume index [m ³ (ft. ³)]	V4	
Cargo volume index-rear of 2-seat	V11	

MVMA Specifications

METRIC (U.S. Customary)

Vehicle Line THUNDERBIRD
 Model Year 1990 Issued 11/88 Revised (●) _____

Body Type

ALL MODELS

Vehicle Fiducial Marks

Fiducial Mark Number*		Define Coordinate Location
1 & 2 Front		The rear vertical edge of the master control notch on the underside of the front door rocker panels located the "X" coordinate relative to body grid.
		X = 2434 Y = 818.5 Z = 428.7
3 & 4 Rear 5 & 6		The intersection of the horizontal-vertical surfaces on the rocker panel door rabbet locates the "Y" and "Z" coordinates relative to body grid at particular fore-aft inch lines. The fore-aft location can be determined by the reference dimension from Fiducial Mark 1 and 2.
		X = 3300 Y = 833.3 Z = 423.5
Fiducial Mark Number		
Front	W21*	—
	L54*	—
	H81*	—
	H161*	—
	H163*	—
Rear	W22*	—
	L55*	—
	H82*	—
	H162*	—
	H164*	—

*Reference—SAE Recommended Practice, J182, Motor Vehicle Fiducial Marks.

METRIC (U.S. Customary)

Model Year 1990 Issued 11/88 Revised (e) 9/1/89

*Reference — SAE J1100 Motor vehicle dimensions, curb weight definition.

****ETWC — Equivalent Test Weight Class — basis for U.S. Environmental Protection Agency emission certifications.
Refer to ETWC code legend below for test weight class.**

A	=	1000	I	=	2000	Q	=	3000	Y	=	4000
B	=	1125	J	=	2125	R	=	3125	Z	=	4250
C	=	1250	K	=	2250	S	=	3250	AA	=	4500
D	=	1375	L	=	2375	T	=	3375	BB	=	4750
E	=	1500	M	=	2500	U	=	3500	CC	=	5000
F	=	1625	N	=	2625	V	=	3625	DD	=	5250
G	=	1750	O	=	2750	W	=	3750	EE	=	5500
H	=	1875	P	=	2875	X	=	3875	FF	=	5750

Shipping Mass (weight) = Curb Weight Less:

66 (146)

MVMA Specifications

METRIC (U.S. Customary)

Vehicle Line **THUNDERBIRD**

Model Year **1990**

Issued **11/88**

Revised (e)

Optional Equipment Differential Mass (weight)*

Code	
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*Also see Engine - General Section for dressed engine mass (weight).

METRIC (U.S. Customary)

Model Year 1990

Issued 11/88

Revised (a)

*Also see Engine - General Section for dressed engine mass (weight).

METRIC (U.S. Customary)

Model Year 1990 Issued 11/88 Revised (●) _____

*Also see Engine - General Section for dressed engine mass (weight).