

# MOTOR VEHICLE MANUFACTURERS SPECIFICATIONS

METRIC (U.S. Customary)

## 1999

|                                                |                               |         |
|------------------------------------------------|-------------------------------|---------|
| Manufacturer<br>Mazda Motor Corporation        | Vehicle Line<br>Mazda Protégé |         |
| Mailing Address<br>Hiroshima 730-8670<br>Japan | Issued<br>December, 1998      | Revised |

Direct questions concerning these specifications to the manufacturer listed above.

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AAMA

Forms Provided by Motor Vehicle Manufacturers

# MVMA Specifications

1999 MY MAZDA PROTEGE

METRIC (U.S. Customary)

## Vehicle Origin

|                                                |                                 |
|------------------------------------------------|---------------------------------|
| Design & development (company)                 | Mazda Motor Corporation         |
| Where built (country)                          | Hiroshima, Japan                |
| Authorized U.S. sales marketing representative | Mazda North American Operations |

## Vehicle Models

| Model<br>Description & Drive<br>(FWD / RWD / AWD / 4WD) | Make, Vehicle Models<br>Series, Body type | No. of Designated<br>Seating Positions<br>(Front/Rear) | Max. Trunk/Cargo<br>Load-Kilograms | EPA Fuel<br>Economy<br>(City/Hwy) |
|---------------------------------------------------------|-------------------------------------------|--------------------------------------------------------|------------------------------------|-----------------------------------|
| Mazda Protege DX / LX (FWD)                             | 4 door sedan                              | 2 / 3                                                  | -                                  | 29 / 34 (MT)<br>26 / 33 (AT)      |
| Mazda Protege ES (FWD)                                  | 4 door sedan                              | 2 / 3                                                  | -                                  | 26 / 30 (MT)<br>24 / 29 (AT)      |

**METRIC (U.S. Customary)**

SAE J1349 Net bhp (brake horsepower) and Net Torque corrected to 77° F/25° C and 29.91 in. Hg/100 kPa atmospheric pressure.

|        |                                   | A                 | B                                                  | C        | D                                                  |   |
|--------|-----------------------------------|-------------------|----------------------------------------------------|----------|----------------------------------------------------|---|
| ENGINE | Engine Code                       | ZMD               | ←                                                  | FPD      | ←                                                  |   |
|        | Displacement (Liters)             | 1.5979 L          | ←                                                  | 1.8396 L | ←                                                  |   |
|        | Induction system (FI, Carb, etc.) | EFI               | ←                                                  | ←        | ←                                                  |   |
|        | Compression ratio                 | 9.0               | ←                                                  | 9.1      | ←                                                  |   |
|        | SAE Net at RPM                    | Power (HP)        | 105HP @ 5500 (Fed.)<br>103HP @ 5500 (Cal.)         | ←        | 122HP @ 6000 (Fed.)<br>120HP @ 6000 (Cal.)         | ← |
|        |                                   | Torque (lb. -ft.) | 107 lb-ft @ 4000 (Fed.)<br>106 lb-ft @ 4000 (Cal.) | ←        | 120 lb-ft @ 4000 (Fed.)<br>119 lb-ft @ 4000 (Cal.) | ← |
|        | Exhaust (single, dual)            | Single            | ←                                                  | ←        | ←                                                  |   |
| TRANS  | Transmission / Transaxle          | 5MT               | 4AT                                                | 5MT      | 4AT                                                |   |
|        | Effective Final Drive/Axle Ratio  | 3.850             | 3.904                                              | 4.105    | 3.904                                              |   |

[illegible]

# MVMA Specifications

## 1989 MY MAZDA PROTEGE

### Engine Cord / Description

#### ENGINE—GENERAL

| Engine Cord / Description                             |                                                                       | ZMD                                                 | FPD                          |
|-------------------------------------------------------|-----------------------------------------------------------------------|-----------------------------------------------------|------------------------------|
| Type & description                                    |                                                                       | Inline, Front longitudinal DOHC 16 valve 4 cylinder | —                            |
| Manufacturer                                          |                                                                       | MAZDA                                               | —                            |
| Number of cylinders                                   |                                                                       | 4                                                   | —                            |
| Bore                                                  |                                                                       | 78                                                  | 83                           |
| Stroke                                                |                                                                       | 83.6                                                | 85                           |
| Bore spacing (C / L to C / L)                         |                                                                       | 86                                                  | 91                           |
| Cylinder block material & mass kg (lbs.)(machined)    |                                                                       | Cast iron                                           | —                            |
| Cylinder block deck height                            |                                                                       | 206.5                                               | 202                          |
| Cylinder block length                                 |                                                                       | 373.5                                               | 407.5                        |
| Deck clearance (minimum)(above or below block)        |                                                                       | -                                                   | -                            |
| Cylinder head material & mass kg (lbs.)               |                                                                       | Cast aluminum alloy                                 | —                            |
| Cylinder head volume cm3 (inches3)                    |                                                                       | 35.0                                                | 38.7                         |
| Cylinder liner material                               |                                                                       | -                                                   | -                            |
| Head gasket thickness(compressed)                     |                                                                       | 0.43                                                | 0.75                         |
| Minimum combustion chamber total volume cm3 (inches3) |                                                                       | 49.93                                               | 56.8                         |
| Cyl. No. system (front to rear)*                      |                                                                       | 1, 2, 3, 4                                          | —                            |
| Firing order                                          |                                                                       | 1 - 3 - 4 - 2                                       | —                            |
| Intake manifold material & mass kg (lbs.)**           |                                                                       | Cast aluminum alloy & 5.9 kg                        | Cast aluminum alloy & 6.7 kg |
| Exhaust manifold material & mass kg (lbs.)**          |                                                                       | Cast iron & 6.0 kg                                  | Cast iron & 4.9 kg           |
| Knock sensor (number & location)                      |                                                                       | -                                                   | -                            |
| Fuel required unleaded, diesel, etc.                  |                                                                       | Unleaded                                            | —                            |
| Fuel antiknock index (R + M)*2                        |                                                                       | 87                                                  | —                            |
| Engine mounts                                         | Quantity                                                              | 4                                                   | —                            |
|                                                       | Material and type (elastomeric, hydroelastic, hydraulic damper, etc.) | 1, 2, 4 - Elastomeric<br>3 - Hydroelastic           | —                            |
|                                                       | Added isolation (sub-frame, crossmember, etc.)                        | Engine mount member                                 | —                            |
| Total dressed engine mass (wt) dry***                 |                                                                       | -                                                   | -                            |

#### Engine—Pistons

|                                                |                     |   |
|------------------------------------------------|---------------------|---|
| Material & mass, g (weight, oz.) - piston only | Cast aluminum alloy | — |
|------------------------------------------------|---------------------|---|

#### Engine—Camshaft

|                                   |               |                       |
|-----------------------------------|---------------|-----------------------|
| Location                          | Over head     | —                     |
| Material & mass kg (weight, lbs.) | Cast iron     | —                     |
| Drive type                        | Chain / belt  | —                     |
|                                   | Width / pitch | 22.0 / 8.0 25.4 / 8.0 |

\* 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:

# MVMA Specifications

## 1999 MY MAZDA PROTEGE

### Engine CORD / Description

| ZMD | FPD |
|-----|-----|
|-----|-----|

### Engine—Valve System

|                                      |                            |             |
|--------------------------------------|----------------------------|-------------|
| Hydraulic lifters (std., opt., n.a.) | Mechanical lifter          | —           |
| Valves                               | Number intake / exhaust    | 8 / 8       |
|                                      | Head O.D. intake / exhaust | 29.2 / 25.9 |
|                                      |                            | 31.5 / 27.6 |

### Engine—Connecting Rods

|                                      |              |       |
|--------------------------------------|--------------|-------|
| Material & mass kg., (weight, lbs.)* | Carbon steel | —     |
| Length (axes C/L to C/L)             | 132.9        | 129.2 |

### Engine—Crankshaft

|                                             |           |           |
|---------------------------------------------|-----------|-----------|
| Material & mass kg., (weight, lbs.)*        | Cast iron | —         |
| End thrust taken by bearing (no.)           | 2         | 4         |
| Length & number of main bearings            | -         | 484.9 & 5 |
| Seal(material, one, two piece design, etc.) | Front     | Rubber    |
|                                             | Rear      | Rubber    |

### Engine—Lubrication System

|                                                |                       |                       |
|------------------------------------------------|-----------------------|-----------------------|
| Normal oil pressure kPa (psi) at engine rpm    | 284 to 392 at 3000rpm | 400 to 490 at 3000rpm |
| Type oil intake (floating, stationary)         | Stationary            | —                     |
| Oil filter system (full flow, part, other)     | Full flow             | —                     |
| Capacity of c/case, less filter-refill-L (qt.) | 2.9                   | 3.7                   |

### Engine—Diesel Information

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

### Engine—Intake System

|                              |     |
|------------------------------|-----|
| Turbo charger - manufacturer | N/A |
| Super charger - manufacturer | N/A |
| Intercooler                  | N/A |

\* Finished State

**MVMA Specifications**

1999 MY MAZDA PROTEGE

| Engine Cord / Description                    |                                                   | ZMD                                        | FPD   |
|----------------------------------------------|---------------------------------------------------|--------------------------------------------|-------|
| <b>ENGINE—Cooling System</b>                 |                                                   |                                            |       |
| Coolant recovery system (std., opt., n.a.)   |                                                   | Std.                                       | —     |
| Coolant fill location (rad., bottle)         |                                                   | Rad.                                       | —     |
| Radiator cap relief valve pressure kPa (psi) |                                                   | 93 - 122.5 kPa                             | —     |
| Circulation thermostat                       | Type (choke, bypass)                              | Bypass                                     | —     |
|                                              | Starts to open at °C (°F)                         | Sub 85°C, Main 88°C                        | 82.C  |
| Water pump                                   | Type (centrifugal, other)                         | Centrifugal                                | —     |
|                                              | GPM 1000 pump rpm                                 | -                                          | -     |
|                                              | Number of pumps                                   | 1                                          | —     |
|                                              | Drive (V-belt, other)                             | V - ribbed belt                            | —     |
|                                              | Bearing type                                      | Ball & Roller bearing                      | —     |
|                                              | Impeller material                                 | Steel                                      | —     |
| Housing material                             |                                                   | Aluminum                                   | —     |
| By-pass recirculation type (inter., ext.)    |                                                   | External                                   | —     |
| Cooling system capacity                      | With heater—L(qt.)                                | 6.0 L                                      | 7.5 L |
|                                              | With air conditioner—L(qt.)                       | 6.0 L                                      | 7.5 L |
|                                              | Opt. equipment specify—L(qt.)                     | -                                          | -     |
| Water jackets full length of cyl. (yes, no)  |                                                   | Yes                                        | —     |
| Water all around cylinder (yes, no)          |                                                   | No                                         | —     |
| Water jackets open at head face (yes, no)    |                                                   | No                                         | —     |
| Radiator core                                | Std., A/C, HD                                     | Std.                                       | —     |
|                                              | Type (cross-flow, etc.)                           | Down - flow                                | —     |
|                                              | Construction (fin & tube mechanical, braze, etc.) | Corrugated fin                             | —     |
|                                              | Material, mass kg (wgt., lbs.)                    | Aluminum, -                                | —     |
|                                              | Width                                             | 691(AT), 680(MT)                           | —     |
|                                              | Height                                            | 328                                        | —     |
|                                              | Thickness                                         | 16                                         | —     |
|                                              | Fins per inch                                     | 23.1(AT), 14.5(MT)                         | —     |
| Radiator end tank material                   |                                                   | Plastic                                    | —     |
| Fan                                          | Std., elec., opt.                                 | Elec.                                      | —     |
|                                              | Number of blades & type (flex, solid, material)   | 4 blades, Nylon (AT),<br>4 blades, PP (MT) | —     |
|                                              | Number & location (front, rear of radiator)       | 1, rear of radiator (w/o A/C)              | —     |
|                                              | Diameter & projected width                        | 300 mm                                     | —     |
|                                              | Ratio (fan to crankshaft rev.)                    | -                                          | -     |
|                                              | Fan cutout type                                   | -                                          | -     |
|                                              | Drive type (direct, remote)                       | Motor drive                                | —     |
|                                              | RPM at idle (elec.)                               | -                                          | -     |
|                                              | Motor rating (wattage / elec.)                    | 80w (AT), 45w (MT)                         | —     |
|                                              | Motor switch (type & location / elec.)            | Thermo - sensor                            | —     |
|                                              | Switch point (temp., / pressure / elec.)          | Water temp.                                | —     |
|                                              | Fan shroud (material)                             | PP                                         | —     |

# MVMA Specifications

1999 MY MAZDA PROTEGE

## Engine Cord / Description

All models

## Engine—Fuel System

|                              |                                                           |                        |
|------------------------------|-----------------------------------------------------------|------------------------|
| Induction type               |                                                           | Fuel injection         |
| Manufacturer                 |                                                           | Visteon                |
| Carburetor no. of barrels    |                                                           | N/A                    |
| Idle A/F mix.                |                                                           | 14.7                   |
| Fuel injection               | Point of injection (no.)                                  | 4                      |
|                              | Constant, pulse, flow                                     | Pulse                  |
|                              | Control (electronic, mech.)                               | Elec.                  |
|                              | System pressure kPa (psi)                                 | 284                    |
| Idle speed, -rpm             | Manual                                                    | 700 Neutral            |
|                              | Automatic                                                 | 750 P&N RANGE          |
| Intake manifold heat control |                                                           | N/A                    |
| Air cleaner type             |                                                           | Wet                    |
| Fuel filter (type/location)  |                                                           | Paper element          |
| Fuel pump                    | Type (elec. or mech.)                                     | Elec.                  |
|                              | Location (eng., tank)                                     | Tank                   |
|                              | Pressure range kPa (psi)                                  | 637kPa (max)           |
|                              | Flow rate at regulated pressure<br>L (gal)/hr @ kPa (psi) | 80L/hr (min) at 284kPa |
|                              |                                                           |                        |

## Fuel Tank

|                                  |                                           |                              |
|----------------------------------|-------------------------------------------|------------------------------|
| Capacity refill L (gallons)      |                                           | 50L (13.2gal)                |
| Location (describe)              |                                           | Under floor of rear seat     |
| Attachment                       |                                           | Bolt and Nut                 |
| Material & Mass kg (weight lbs.) |                                           | Steel, 14 kg                 |
| Filler pipe                      | Location & material                       | Left rear fender, Steel pipe |
|                                  | Connection to tank                        | Rubber hose                  |
| Fuel line (material)             |                                           | Steel pipe & Plastic pipe    |
| Fuel hose (material)             |                                           | -                            |
| Return line (material)           |                                           | Steel pipe & Plastic pipe    |
| Vapor line (material)            |                                           | Steel pipe & Rubber hose     |
| Extended range tank              | Opt., n.a.                                | -                            |
|                                  | Capacity L (gallons)                      | -                            |
|                                  | Location & material                       | -                            |
|                                  | Attachment                                | -                            |
| Auxiliary tank                   | Opt., n.a.                                | -                            |
|                                  | Capacity L (gallons)                      | -                            |
|                                  | Location & material                       | -                            |
|                                  | Attachment                                | -                            |
|                                  | Selector switch or valve<br>separate fill | -                            |

# MVMA Specifications

1999 MY MAZDA PROTEGE

Engine Code / Description

ZMD

FPD

## Vehicle Emission Control

|                              |                                 |                                   |                                                                 |                    |
|------------------------------|---------------------------------|-----------------------------------|-----------------------------------------------------------------|--------------------|
| Exhaust Emission Control     | Type                            |                                   | 3-way catalyst + Feedback control                               | —                  |
|                              | Air Injection                   | Pump or pulse                     | N/A                                                             | —                  |
|                              |                                 | Driven by                         | —                                                               | —                  |
|                              |                                 | Air distribution                  | —                                                               | —                  |
|                              |                                 | Point of entry                    | —                                                               | —                  |
|                              | Exhaust Gas Recirculation       | Type                              | N/A (Fed. MTX), Elec. (else)                                    | Elec.              |
|                              |                                 | Exhaust source                    | Manifold - exhaust (AT), N/A (MT)                               | Manifold - exhaust |
|                              |                                 | Point of exhaust injection        | Tank - surge (AT), N/A (MT)                                     | Tank - surge       |
|                              | Catalytic Converter             | Type                              | 3 - way                                                         | —                  |
|                              |                                 | Number of                         | 1 (Fed.), 2 (Calif.)                                            | —                  |
|                              |                                 | Location(s)                       | Manifold (Fed.),<br>Manifold & Under engine (Calif.)            | —                  |
|                              |                                 | Volume L (in3)                    | 1.3 L (Fed.), 1.3 L + 1.0 L (Calif.)                            | —                  |
|                              |                                 | Substrate type                    | Ceramic                                                         | —                  |
|                              |                                 | Noble metal type                  | Pt / Rh = 5 / 1                                                 | —                  |
|                              |                                 | Noble metal concentration (g/cm3) | 0.0016 (Fed.)<br>0.0016:Manifold / 0.0013:Under engine (Calif.) | —                  |
| Crankcase Emission Control   | Type                            |                                   | Induction                                                       | Closed type        |
|                              | Energy source                   |                                   | Manifold vacuum                                                 | —                  |
|                              | Discharges to                   |                                   | Intake manifold                                                 | —                  |
|                              | Air inlet                       |                                   | N/A                                                             | Air intake house   |
| Evaporative Emission Control | Vapor vented to (ex. crankcase) | Fuel tank                         | Canister                                                        | —                  |
|                              |                                 | Carburetor                        | N/A                                                             | —                  |
|                              | Vapor storage provision         |                                   | Canister                                                        | —                  |
| Electronic system            | Closed loop (yes/no)            |                                   | Yes                                                             | —                  |
|                              | Open loop (yes/no)              |                                   | No                                                              | —                  |

## Engine—Exhaust System

|                                                      |                                 |                                                  |
|------------------------------------------------------|---------------------------------|--------------------------------------------------|
| Type (single, single with cross-over, dual, other)   | Single                          | —                                                |
| Muffler no. & type / Material & Mass kg (weight lbs) | 1 / Reverse - flow              | —                                                |
| Resonator no. & type                                 | 1 / Expansion                   | 1 / Absorption (Fed.),<br>1 / Expansion (Calif.) |
| Exhaust pipe                                         | Branch o.d., wall thickness     | —                                                |
|                                                      | Main o.d., wall thickness       | 51 x 3.0                                         |
|                                                      | Material & Mass kg (weight lbs) | Casting                                          |
| Intermediate pipe                                    | o.d., & wall thickness          | 48.6 x 2.0                                       |
|                                                      | Material & Mass kg (weight lbs) | Stainless                                        |
| Tail pipe                                            | o.d., & wall thickness          | 45 x 1.0                                         |
|                                                      | Material & Mass kg (weight lbs) | Al. coated stainless                             |



# MVMA Specifications

1999 MY MAZDA PROTEGE

Engine CORD / Description

| ZMD | FPD |
|-----|-----|
|-----|-----|

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

|                                            |          |   |
|--------------------------------------------|----------|---|
| Manual 4-speed (manufacturer/country)      | N/A      | — |
| Manual 5-speed (manufacturer/country)      | Standard | — |
| Manual 6-speed (manufacturer/country)      | N/A      | — |
| Automatic (manufacturer/country)           | N/A      | — |
| Automatic overdrive (manufacturer/country) | Standard | — |

Manual Transmission/Transaxle

|                                     |                   |        |
|-------------------------------------|-------------------|--------|
| Number of forward speeds            | 5                 | —      |
| Gear ratios                         | 1st               | 3.416  |
|                                     | 2nd               | 1.842  |
|                                     | 3rd               | 1.29   |
|                                     | 4th               | 0.872  |
|                                     | 5th               | 0.775  |
|                                     | 6th               | —      |
|                                     | Reverse           | 3.214  |
| Synchronous meshing (specify gears) | All forward gears | —      |
| Shift lever location                | Floor             | —      |
| Trans. case matl. & mass kg (lbs)*  | Aluminum 11kg     | —      |
| Lubricant                           | Capacity L (pt.)  | 2.68   |
|                                     | Type recommended  | 75w-90 |

Clutch (Manual Transmission)

|                                               |                                                  |                 |
|-----------------------------------------------|--------------------------------------------------|-----------------|
| Clutch manufacturer                           | EXEDY                                            | —               |
| Clutch type (dry, wet; single, multiple disc) | dry, single disc                                 | —               |
| Linkage (hydraulic, cable, rod, lever, other) | hydraulic                                        | —               |
| Max. pedal effort N (lbs)                     | Depressed                                        | —               |
|                                               | Released                                         | —               |
| Assist (spring, power/percent, nominal)       | —                                                | —               |
| Type pressure plate springs                   | Diaphragm spring                                 | —               |
| Total spring load (nominal) N (lbs)           | 4315 [N]                                         | 4805 [N]        |
| Clutch facing                                 | Facing mfr. & material coding                    | Nissinbo        |
|                                               | Facing material & construction                   | Semimold        |
|                                               | Rivets per facing                                | 16              |
|                                               | Outside x inside dia. (nominal)                  | 200 x 130       |
|                                               | Total eff. area cm2 (in.2)                       | 181             |
|                                               | Thickness (pressure plate side/fly wheel side)   | 3.8 / 3.5       |
|                                               | Rivet depth (pressure plate side/fly wheel side) | 1.7 / 1.4       |
|                                               | Engagement cushion method                        | Cushion springs |
|                                               | Release bearing type & method lub.               | Ball & grease   |
| Torsional damping method, springs, hysteresis | Coil springs                                     | Rubber springs  |

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

# MVMA Specifications

1999 MY MAZDA PROTEGE

Engine Cord / Description

ZMD

FPD

## Automatic Transmission/Transaxle

Trade Name

Type and special features (describe)

4 speed with lock-up torque converter

Shift mechanics

Gear selector

Location (column, floor, other)

Floor

Ltr./No. designation (e.g. PRND21)

PRND21

Shift interlock (yes, no, describe)

Yes

Gear Ratios

1st

2.818

2nd

1.497

3rd

1.000

4th

0.725

Reverse

2.648

Final drive ratio

3.904

Max. upshift vehicle speed - drive range km/h (mph)

-

Max. upshift Engine speed RPM

-

Max. kickdown speed - drive range km / h (mph)

-

Min. overdrive speed km / h (mph)

-

Torque converter

Type

-

Torus design

-

Number of elements

3 elements, 1 stage, 2 phases

Max. ratio at stall

2.25

Type of cooling (air, liquid)

Liquid

Nominal diameter

236

Capacity factor "K"

255

Pump type

Torchoid gear type

Lubricant

Capacity refill L (pt.)

7.2 L

Type recommended

ATF M-III or equivalent (e.g. Dexron RII)

Oil cooler

Std. external, liquid

Transmission mass kg (lbs) & case material\*\*

-

## All Wheel / 4 Wheel Drive

Description & type

N/A

Transfer case

Manufacturer and model

N/A

Type and location

N/A

Low-range gear ratio

N/A

System disconnect (describe)

N/A

Center differential

Type

N/A

Torque split (% front/rear)

N/A

\* Input speed +  $\sqrt{\text{torque}}$

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

# MVMA Specifications

## 1999 MY MAZDA PROTEGE

| Engine Cord / Description                     |                |           | ZMD                                         | FPD                                         |
|-----------------------------------------------|----------------|-----------|---------------------------------------------|---------------------------------------------|
| <b>Axle Ratio and Tooth Combinations</b>      |                |           |                                             |                                             |
| Effective final drive ratio                   |                |           | 3.904 (AT), 3.850 (MT)                      | 3.904 (AT), 4.105 (MT)                      |
| Transfer ratio and method (chain, gear, etc.) |                |           | -                                           | -                                           |
| Front drive unit                              | Ring gear o.d. |           | 209.89 (AT), 198.31 (MT)                    | 209.89 (AT), 200.83 (MT)                    |
|                                               | No. of teeth   | Pinion    | 82:secondary / 86:primary (AT), 20 (MT)     | 82:secondary / 86:primary (AT), 19 (MT)     |
|                                               |                | Ring gear | 86:ring gear / 21:output gear (AT), 77 (MT) | 86:ring gear / 21:output gear (AT), 78 (MT) |

### Front Drive Unit

|                                        |                         |                          |   |
|----------------------------------------|-------------------------|--------------------------|---|
| Description (integral to trans., etc.) |                         | Integral to transmission | - |
| Limited slip differential (type)       |                         | -                        | - |
| Drive pinion                           | Type                    | -                        | - |
|                                        | Offset                  | -                        | - |
| No. of differential pinions            |                         | 2                        | - |
| Pinion / differential                  | Adjustment (shim, etc.) | -                        | - |
|                                        | Bearing adjustment      | -                        | - |
| Driving wheel bearing (type)           |                         | Shim                     | - |
| Lubricant                              | Capacity L (pt.)        | -                        | - |
|                                        | Type recommended        | -                        | - |

### Axle Shafts - Front Wheel Drive

| Axle Shafts - Front Wheel Drive                    |                              |             |                 |               |
|----------------------------------------------------|------------------------------|-------------|-----------------|---------------|
| Manufacturer and number used                       |                              |             | NTN, 2          |               |
| Type (straight, solid bar, etc.)                   |                              | Left        | Solid bar       | —             |
|                                                    |                              | Right       | Solid bar       | —             |
| Outer diam. x length* x wall thickness             | Manual transaxle             | Left        | φ 21 x 388 mm   | φ 24 x 389 mm |
|                                                    |                              | Right       | φ 23 x 398 mm   | φ 23 x 394 mm |
|                                                    | Automatic transaxle          | Left        | φ 23 x 366.2 mm | —             |
|                                                    |                              | Right       | φ 23 x 399 mm   | φ 23 x 394 mm |
|                                                    | Optional transaxle           | Left        | -               | -             |
|                                                    |                              | Right       | -               | -             |
| Slip yoke                                          | Type                         |             | -               | -             |
|                                                    | Number of teeth              |             | -               | -             |
|                                                    | Spline o.d.                  |             | -               | -             |
| Universal joints                                   | Make and mfg. No.            | Inner       | -               | -             |
|                                                    |                              | Outer       | -               | -             |
|                                                    | Number used.                 |             | -               | -             |
|                                                    | Type, size, plunge           | Inner       | Tripod joint    | —             |
|                                                    |                              | Outer       | Ball joint      | —             |
|                                                    | Attach (u-bolt, clamp, etc.) |             | -               | -             |
|                                                    | Bearing                      | Type        | -               | -             |
|                                                    |                              | Lubrication | -               | -             |
| Drive taken through (torque tube, arms or springs) |                              |             | -               | -             |
| Torque aken through (torque tube, arms or springs) |                              |             | -               | -             |

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

# MVMA Specifications

1999 MY MAZDA PROTEGE

Model or Engine Cord / Description

All models

## 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                               | -                                             |
| 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.) | -                                             |
|                                 | sensors                                             | -                                             |
|                                 |                                                     | -                                             |
|                                 |                                                     | -                                             |
|                                 |                                                     | -                                             |
| Shock absorber (front & rear)   | Type                                                | Cylindrical Double Acting                     |
|                                 | Make                                                | Front: KAYABA,<br>Rear: TOKICO or UNISIA JECS |
|                                 | Piston diameter                                     | -                                             |
|                                 | Rod diameter                                        | 20mm                                          |

## Suspension—Front

|                      |                                                                                 |       |
|----------------------|---------------------------------------------------------------------------------|-------|
| Type and description |                                                                                 | Strut |
| Travel               | Full jounce (define load condition)                                             | 85    |
|                      | Full rebound                                                                    | 90    |
| Spring               | Type (coil, leaf, other & material)                                             | Coil  |
|                      | Insulators (type & material)                                                    | -     |
|                      | Size (Leaf: length & width; Coil: design height & i.d.; Bar: length & diameter) | -     |
|                      | Spring rate [N/mm (lb./in.)]                                                    | -     |
|                      | Rate at wheel [N/mm (lb./in.)]                                                  | -     |
| Stabilizer           | Type (link, linkless, frameless)                                                | Link  |
|                      | Material & O.D. bar/tube, wall thickness                                        | 20mm  |

## Suspension—Rear

|                      |                                                                                 |                        |
|----------------------|---------------------------------------------------------------------------------|------------------------|
| Type and description |                                                                                 | Strut                  |
| Travel               | Full jounce (define load condition)                                             | 90                     |
|                      | Full rebound                                                                    | 110                    |
| Spring               | Type (coil, leaf, other & material)                                             | Coil                   |
|                      | Size (Leaf: length & width; Coil: design height & i.d.; Bar: length & diameter) | -                      |
|                      | Spring rate [N/mm (lb./in.)]                                                    | -                      |
|                      | Rate at wheel [N/mm (lb./in.)]                                                  | -                      |
|                      | Insulators (type & material)                                                    | -                      |
|                      | No. of leaves                                                                   | -                      |
|                      | Shackle (comp. or tens.)                                                        | -                      |
| Stabilizer           | Type (link, linkless, frameless)                                                | Link                   |
|                      | Material & O.D. bar/tube, wall thickness                                        | Tube 15.9 mm, t=2.6 mm |
| Track bar (type)     |                                                                                 | -                      |

# MVMA Specifications

1999 MY MAZDA PROTEGE

| Model or Engine Cord / Description                     |                                            |                                 | ZMD                                  | FPD                   |                       |
|--------------------------------------------------------|--------------------------------------------|---------------------------------|--------------------------------------|-----------------------|-----------------------|
| Brakes—Service                                         |                                            |                                 |                                      |                       |                       |
| Description                                            |                                            |                                 | Four Wheel Hydraulic Actuated System | —                     |                       |
| Manufacturer and brake type (st., opt., n.a.)          | Front (disc or drum)                       |                                 | Disc                                 | —                     |                       |
|                                                        | Rear (disc or drum)                        |                                 | Drum                                 | —                     |                       |
| Valving type (proportion, delay, metering, other)      |                                            |                                 | Proportion                           | —                     |                       |
| Power brake (std., opt., n.a.)                         |                                            |                                 | Standard                             | —                     |                       |
| Booster type (remote, integral, vac., hyd., etc.)      |                                            |                                 | Vacuum                               | —                     |                       |
| Vacuum                                                 | Source (inline, pump, etc.)                |                                 | Inline                               | —                     |                       |
|                                                        | Reservoir (volume in.3)                    |                                 | -                                    | -                     |                       |
|                                                        | Pump-type (elec, gear driven, belt driven) |                                 | -                                    | -                     |                       |
| Traction assist                                        | Operational speed range                    |                                 | N/A                                  | —                     |                       |
|                                                        | Type (Engine or brake intervention)        |                                 | N/A                                  | —                     |                       |
| Anti-lock device                                       | Front / rear (std., opt., n.a.)            |                                 | Opt. / Opt.                          | —                     |                       |
|                                                        | Manufacturer                               |                                 | SUMITOMO ELECTRIC                    | —                     |                       |
|                                                        | Type (electronic, mech.)                   |                                 | Electronic                           | —                     |                       |
|                                                        | Number sensors or circuits                 |                                 | 4                                    | —                     |                       |
|                                                        | Number anti-lock hydraulic circuits        |                                 | 3                                    | —                     |                       |
|                                                        | Integral or add-on system                  |                                 | Add-on                               | —                     |                       |
|                                                        | Yaw control (yes,no)                       |                                 | No                                   | —                     |                       |
| Hydraulic power source (elec., vac. mtr., pwr. strg.)  |                                            |                                 | Electronic                           | —                     |                       |
| Effective area cm2 (in.2)*                             |                                            |                                 | -                                    | -                     |                       |
| Gross Lining area cm2 (in.2)** (F/R)                   |                                            |                                 | 172 / 268.8cm2                       | 182 / 268.8cm2        |                       |
| Swept area cm2 (in.2)*** (F/R)                         |                                            |                                 | 1045 / 440cm2                        | 1140 / 440cm2         |                       |
| Rotor                                                  | Outer working diameter                     | F/R                             | 235 / N/A                            | 258 / N/A             |                       |
|                                                        | Inner working diameter                     | F/R                             | 141 / N/A                            | 168 / N/A             |                       |
|                                                        | Thickness                                  | F/R                             | 22 / N/A                             | 24 / N/A              |                       |
|                                                        | Material & type (vented/solid)             | F/R                             | Cast iron, vented / N/A              | —                     |                       |
| Drum                                                   | Diameter & width                           | F/R                             | N/A / 200 x 35.0mm                   | —                     |                       |
|                                                        | Type and material                          | F/R                             | N/A / Cast iron                      | —                     |                       |
| Wheel cylinder bore                                    |                                            |                                 | 54.0 / 17.4mm                        | 57.1 / 17.4mm         |                       |
| Master cylinder                                        | Bore/stroke                                | F/R                             | 22.2 x 30.0mm                        | 23.8 x 30.0mm         |                       |
| Pedal arc ratio                                        |                                            |                                 | 3.7                                  | —                     |                       |
| Line pressure at 445 N(100 lb.) pedal load (kPa (psi)) |                                            |                                 | -                                    | -                     |                       |
| Lining clearance                                       |                                            | F/R                             | Self Adjusting                       | —                     |                       |
| Brake lining                                           | Front wheel                                | Bonded or riveted (rivets/seg.) |                                      | Bonded                | —                     |
|                                                        |                                            | Rivet size                      |                                      | -                     | -                     |
|                                                        |                                            | Manufacturer                    |                                      | NIHON BRAKE           | —                     |
|                                                        |                                            | Linig code*****                 |                                      | JB NF42 FF            | FA 004 FF             |
|                                                        |                                            | Material                        |                                      | Resin Mold            | —                     |
|                                                        |                                            | ****                            | Primary or out-board                 | 111.2 x 44.0 x 10.0mm | 117.8 x 42.5 x 10.0mm |
|                                                        |                                            | Size                            | Secondary or in-board                | 111.2 x 44.0 x 10.0mm | 117.8 x 42.5 x 10.0mm |
|                                                        |                                            | Shoe thickness (no lining)      |                                      | -                     | -                     |
|                                                        | Rear wheel                                 | Bonded or riveted (rivets/seg.) |                                      | Bonded                | —                     |
|                                                        |                                            | Manufacturer                    |                                      | NISSINBO              | —                     |
|                                                        |                                            | Linig code*****                 |                                      | NBK D8067 FF          | —                     |
|                                                        |                                            | Material                        |                                      | Resin Mold            | —                     |
|                                                        |                                            | ****                            | Primary or out-board                 | 192 x 35 x 4mm        | —                     |
|                                                        |                                            | Size                            | Secondary or in-board                | 192 x 35 x 4mm        | —                     |
|                                                        |                                            | Shoe thickness (no lining)      |                                      | -                     | -                     |

\* Exclusives rivet holes, grooves, chamfers, etc.

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

\*\*\* Total swept area for four brakes. (Drum brake: Widest lining contact width each brake x its contact circumference.)  
(Disc brake: Squar 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 for formulation designation and coefficient of friction classification.

# MVMA Specifications

1999 MY MAZDA PROTEGE

Model or Engine Cord / Description

ZMD

FPD

## Tires And Wheels (Standard)

|        |                                                                   |                           |                        |                                   |
|--------|-------------------------------------------------------------------|---------------------------|------------------------|-----------------------------------|
| Tires  | Size (service description)                                        |                           | P185/65R14 85S         | P185/65R14 85S,<br>P195/55R15 84V |
|        | Type (bias, radial, steel, nylon, etc.)                           |                           | Steel / Radial         | --                                |
|        | Inflation pressure (cold)<br>for recommended max.<br>vehicle load | Front kPa (psi)           | 220kPa (32psi)         | --                                |
|        |                                                                   | Rear kPa (psi)            | 220kPa (32psi)         | --                                |
|        | Rev./mile-at 70 km/h (45 mph)                                     |                           | -                      | -                                 |
| Wheels | Type & material                                                   |                           | Steel /Alloyed         | --                                |
|        | Rim (size & flange type)                                          |                           | 14 x 5 1/2JJ           | 14 x 5 1/2JJ,<br>15 x 6JJ         |
|        | Wheel offset                                                      |                           | 45mm                   | --                                |
|        | Attachment                                                        | Type (bolt or stud & nut) | Nut                    | --                                |
|        |                                                                   | Circle diameter           | 100mm                  | --                                |
|        |                                                                   | Number & size             | 4                      | --                                |
| Spare  | Tire and Wheel                                                    |                           | T125 / 70D14 / 14 x 4T | T115 / 70D15 / 15 x 4T            |
|        | Storage position & location(describe)                             |                           | -- Trunk Room          | --                                |

## Tires And Wheels (Optional)

|                                         |  |  |
|-----------------------------------------|--|--|
| Tire size (service description)         |  |  |
| Type (bias, radial, steel, nylon, etc.) |  |  |
| Wheel (type & material)                 |  |  |
| Rim (size, flange type and offset)      |  |  |
| Tire size (service description)         |  |  |
| Type (bias, radial, steel, nylon, etc.) |  |  |
| Wheel (type & material)                 |  |  |
| Rim (size, flange type and offset)      |  |  |
| Tire size (service description)         |  |  |
| Type (bias, radial, steel, nylon, etc.) |  |  |
| Wheel (type & material)                 |  |  |
| Rim (size, flange type and offset)      |  |  |
| Tire size (service description)         |  |  |
| Type (bias, radial, steel, nylon, etc.) |  |  |
| Wheel (type & material)                 |  |  |
| Rim (size, flange type and offset)      |  |  |
| Spare tire and wheel size               |  |  |

## Brakes—Parking

|                                 |                                             |     |
|---------------------------------|---------------------------------------------|-----|
| Type of control                 | Hand Operated                               |     |
| Location of control             | Between Front Seat                          |     |
| Operates on                     | Rear Service Brake                          |     |
| If separate from service brakes | Type (internal or external)                 | N/A |
|                                 | Drum diameter                               | N/A |
|                                 | Lining size<br>(length x width x thickness) | N/A |

# MVMA Specifications

1999 MY MAZDA PROTEGE

Model or Engine Cord / Description

All models

## Steering

|                                                           |                                           |                        |                      |                   |  |  |
|-----------------------------------------------------------|-------------------------------------------|------------------------|----------------------|-------------------|--|--|
| Manual (std., opt., n.a.)                                 |                                           |                        |                      | N/A               |  |  |
| Power (std., opt., n.a.)                                  |                                           |                        |                      | Standard          |  |  |
| Speed-sensitive(std, opt., n.a.)                          |                                           |                        |                      | N/A               |  |  |
| 4-wheel steering (std., opt., n.a.)                       |                                           |                        |                      | N/A               |  |  |
| Adjustable steering wheel/column (tilt, telescope, other) |                                           |                        |                      | Type              |  |  |
|                                                           |                                           |                        |                      | Manufacturer      |  |  |
|                                                           |                                           |                        |                      | (std, opt., n.a.) |  |  |
| Wheel diameter**                                          |                                           |                        |                      | Tilt              |  |  |
|                                                           |                                           |                        |                      | Manual            |  |  |
|                                                           |                                           |                        |                      | Power             |  |  |
|                                                           |                                           |                        |                      | φ 380             |  |  |
| Turning diameter m(ft.)                                   | Outside front                             | Wall to wall (l. & r.) |                      | -                 |  |  |
|                                                           |                                           | Curb to curb (l. & r.) |                      | 10.6m             |  |  |
|                                                           | Inside rear                               | Wall to wall (l. & r.) |                      | -                 |  |  |
|                                                           |                                           | Curb to curb (l. & r.) |                      | -                 |  |  |
| Scrub Radius*                                             |                                           |                        |                      | -                 |  |  |
| Manual                                                    | Gear                                      | Type                   |                      | -                 |  |  |
|                                                           |                                           | Manufacturer           |                      | -                 |  |  |
|                                                           |                                           | Ratios                 | Gear                 | -                 |  |  |
|                                                           |                                           |                        | Overall              | -                 |  |  |
|                                                           | No. wheel turns (stop to stop)            |                        | -                    |                   |  |  |
| Power                                                     | Type (coaxial, elec., hyd., etc.)         |                        | Hydraulic            |                   |  |  |
|                                                           | Manufacturer                              |                        | NIHON POWER STEERING |                   |  |  |
|                                                           | Gear                                      | Type                   |                      | RACK&PINION       |  |  |
|                                                           |                                           | Ratios                 | Gear                 | ∞                 |  |  |
|                                                           |                                           |                        | Overall              | 15.4              |  |  |
|                                                           | Pump (drive)                              |                        | V-ribbed Belt        |                   |  |  |
|                                                           | No. wheel turns (stop to stop)            |                        | 2.7                  |                   |  |  |
| Linkage                                                   | Type                                      |                        | -                    |                   |  |  |
|                                                           | Location (front or rear of wheels, other) |                        | Rear                 |                   |  |  |
|                                                           | Tie rods (one or two)                     |                        | Two                  |                   |  |  |
| Steering axis                                             | Inclination at camber (deg.)              |                        | -                    |                   |  |  |
|                                                           | Bearings (type)                           | Upper                  |                      | -                 |  |  |
|                                                           |                                           | Lower                  |                      | -                 |  |  |
|                                                           |                                           | Thrust                 |                      | -                 |  |  |
| Steering spindle/knuckle & joint type                     |                                           |                        |                      | -                 |  |  |

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

\*\* See Page 23.

# MVMA Specifications

1999 MY MAZDA PROTEGE

Model or Engine Cord / Description

All models

## Wheel Alignment

|                                |                          |                               |          |
|--------------------------------|--------------------------|-------------------------------|----------|
| Front wheel at curb mass (wt.) | Service checking         | Caster (deg.)                 | 1° 55'   |
|                                |                          | Camber (deg.)                 | - 0° 50' |
|                                |                          | Toe-in outside track-mm (in.) | 2        |
|                                | Service reset*           | Caster (deg.)                 | -        |
|                                |                          | Camber (deg.)                 | -        |
|                                |                          | Toe-in -mm (in.)              | -        |
|                                | Periodic M.V. inspection | Caster (deg.)                 | -        |
|                                |                          | Camber (deg.)                 | -        |
|                                |                          | Toe-in -mm (in.)              | -        |
| Rear wheel at curb mass (wt.)  | Service checking         | Camber (deg.)                 | - 0° 30' |
|                                |                          | Toe-in outside track-mm (in.) | 2        |
|                                | Service reset*           | Camber (deg.)                 | -        |
|                                |                          | Toe-in -mm (in.)              | -        |
|                                | Periodic M.V. inspection | Camber (deg.)                 | -        |
|                                |                          | Toe-in -mm (in.)              | -        |

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

## Electrical - Instruments and Equipment

|                                                    |                                        |                                                 |
|----------------------------------------------------|----------------------------------------|-------------------------------------------------|
| Speed-odometer                                     | Type (analog, digital, std., opt.)     | Analog (Std.)                                   |
|                                                    | Trip odometer (std., opt., n.a.)       | Std.                                            |
|                                                    | Standard, optional, not available      | N/A                                             |
| Head-up display                                    | Type                                   | Secondary, opto-electronic                      |
|                                                    | Speedometer                            | Digital                                         |
|                                                    | Status / warning indicators            | Turn signals, high beam, low fuel, check gauges |
|                                                    | Brightness control                     | Day / night mode, adjustable                    |
|                                                    |                                        | N/A                                             |
| EGR maintenance indicator                          |                                        | N/A                                             |
| Charge indicator                                   | Type                                   | N/A                                             |
|                                                    | Warning device (light, audible)        | Light                                           |
| Temperature indicator                              | Type                                   | Gauge                                           |
|                                                    | Warning device (light, audible)        | N/A                                             |
| Oil pressure indicator                             | Type                                   | N/A                                             |
|                                                    | Warning device (light, audible)        | Light                                           |
| Fuel indicator                                     | Type                                   | Gauge                                           |
|                                                    | Warning device (light, audible)        | Light                                           |
| Wind-shield wiper                                  | Type (standard)                        | 2 speed & Fixed Interval                        |
|                                                    | Type (optional)                        | N/A                                             |
|                                                    | Blade length                           | 525 (Driver side), 475 (Passenger side)         |
|                                                    | Swept area cm2 (in.2)                  | 7449.5 cm2                                      |
| Wind-shield washer                                 | Type (standard)                        | Electric pump, 2-jet x 2                        |
|                                                    | Type (optional)                        | N/A                                             |
|                                                    | Fluid level indicator (light, audible) | Light (opt)                                     |
| Rear window wiper, wiper/washer (std., opt., n.a.) |                                        | N/A                                             |
| Horn                                               | Type                                   | Elec                                            |
|                                                    | Number used                            | 1                                               |
| Other                                              |                                        | -                                               |