

1995 Mazda MX-3 Workshop Manual

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WARNING

Servicing a vehicle can be dangerous. If you have not received service-related training, the risks of injury and property damage increase. The recommended servicing procedures for the vehicle in this workshop manual were developed with Mazda-trained technicians in mind. This manual may be useful to non-Mazda trained technicians, but a technician with our service-related training and experience will be at less risk when performing servicing operations. However, all users of this manual are expected to know general safety procedures.

This manual contains "Warnings" and "Cautions" applicable to risks not normally encountered in a general technician's experience. They should be followed to reduce the risk of injury and the risk that improper service or repair may damage the vehicle or render it unsafe. It is also important to understand that the "Warnings" and "Cautions" are not exhaustive. It is impossible to warn of all the hazardous consequences that might result from failure to follow the procedures.

The procedures recommended and described in this manual are effective methods of performing service and repair. Some require tools specifically designed for a specific purpose. Nonrecommended procedures and tools should include consideration for safety of the technician and continued safe operation of the vehicle.

Parts should be replaced with genuine Mazda replacement parts, not parts of lesser quality. Use of a nonrecommended replacement part should include consideration for safety of the technician and continued safe operation of the vehicle.

1995 Mazda MX-3 Workshop Manual

FOREWORD

For proper repair and maintenance, a thorough familiarization with this manual is important, and it should always be kept in a handy place for quick and easy reference.

All the contents of this manual, including drawings and specifications, are the latest available at the time of printing. As modifications affecting repair or maintenance occur, relevant information supplementary to this volume will be made available at Mazda dealers. This manual should be kept up-to-date.

Mazda Motor Corporation reserves the right to alter the specifications and contents of this manual without obligation or advance notice.

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WARRANTY

The manufacturer's warranty on Mazda vehicles and engines can be voided if improper service or repairs are performed by persons other than those at an Authorized Mazda Dealer.

**Mazda Motor Corporation
HIROSHIMA, JAPAN**

APPLICATION:

This manual is applicable to vehicles beginning with the Vehicle Identification Numbers (VIN) shown on the following page.

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* Refer to the 1995 MX-3 Body Electrical Troubleshooting Manual (Form No. 1474-10-94H, Part No. 9999-95-086F-95) for servicing of the body electrical components.

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VEHICLE IDENTIFICATION NUMBERS (VIN)

JM1 EC433 * S0 40001 —
JM1 EC434 * S0 40001 —

PRE-DELIVERY INSPECTION AND SCHEDULED MAINTENANCE

| | |
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PRE-DELIVERY INSPECTION

PRE-DELIVERY INSPECTION TABLE

The following items may be done at any time prior to delivery to your customer.

EXTERIOR

INSPECT and **ADJUST**, if necessary, the following items to specification:

- Glass, exterior bright metal, and paint for damage
 - Wheel lug nuts and locks (if equipped)
89–117 N·m {9–12 kgf·m, 66–86 ft·lbf}
 - All weatherstrips for damage or detachment
 - Operation of hood release and lock
 - Operation of rear hatch, and fuel lid opener
 - With trunk open, check for spare jack, tire, tools, and fasteners securing these items in place.
 - Door operation and alignment
 - Headlight aim
- INSTALL** the following parts:
- Wheel caps or rings (if equipped)

UNDER HOOD-ENGINE OFF

INSPECT and **ADJUST**, if necessary, the following items to specification:

- Fuel, coolant and hydraulic lines, fittings, connections, and components for leaks
- Engine oil level
- Power steering fluid level
- Brake and clutch master cylinder fluid level
- Windshield washer reservoir fluid level
- Radiator coolant level
- Tightness of battery terminals
- Manual transaxle oil level

INTERIOR

INSTALL the following parts:

- Rubber stopper for rearview mirror
- CHECK** operation of the following items:
- Seat controls (slide and recline) and headrests
 - Folding rear seat
 - Door locks
 - Seat belts and warning system
 - Ignition switch and steering lock
 - Transaxle range switch (ATX only)
 - Starter interlock switch (clutch pedal, MTX only)
 - All lights, including warning and indicator lights
 - Sound warning system
 - Horn, wipers, and washers (front and rear, if equipped)
 - Audio system (if equipped)
 - Cigarette lighter and clock

- Sliding sunroof (if equipped)
- Power door lock (if equipped)
- Power outside mirrors (if equipped)
- Power windows (if equipped)
- Heater, defroster, and air conditioner at various mode selections (if equipped)

CHECK the following items:

- Presence of spare fuses
- Upholstery and interior finish

CHECK and **ADJUST**, if necessary, the following items:

- Pedal height and free play of brake and clutch pedal

| | Pedal height mm {in} | Free play mm {in} |
|--------------|--------------------------------------|-------------------|
| Clutch pedal | 199–204 {7.83–8.03} {With carpet} | 5–16 {0.19–0.63} |
| Brake pedal | 193–196 {7.60–7.72} | 4–7 {0.16–0.28} |

- Parking brake
5–7 notches/98 N {10 kgf, 22 lbf}

UNDER HOOD-ENGINE RUNNING AT OPERATING TEMPERATURE

CHECK the following items:

- Automatic transaxle fluid level

ON HOIST

CHECK the following items:

- Underside fuel, coolant and hydraulic lines, fittings, connections, and components for leaks
- Tires for cuts or bruises
- Steering linkage, suspension, exhaust system, and all underside hardware for looseness or damage

ROAD TEST

CHECK the following items:

- Brake operation
- Clutch operation
- Steering control
- Operation of gauges
- Squeaks, rattles or unusual noises
- Emergency locking retractors
- Cruise control system (if equipped)

AFTER ROAD TEST

CHECK for owner information materials.

The following items must be done just before delivery to your customer.

- Load test battery and charge if necessary
- Adjust tire pressure to specification
(Refer to door label)
- Clean outside of vehicle

Volts
Load test result

- Install fuses for accessories
- Remove seat and cabin carpet protective covers
- Vacuum and clean interior of vehicle
- Inspect installation of optional parts

SCHEDULED MAINTENANCE**SCHEDULED MAINTENANCE TABLE (EXCEPT CANADA)****Schedule 1 (Normal driving conditions)**

The vehicle is mainly operated where none of the "unique driving conditions" apply.

Schedule 2 (Unique driving conditions)

- Repeated short-distance driving.
- Driving in dusty conditions.
- Driving with extended use of brakes.
- Driving in areas where road salt or other corrosive materials are used.
- Driving on rough or muddy roads.
- Extended periods of idling or low-speed operation.
- Driving for long prolonged periods in cold temperatures or extremely humid climates.

A

SCHEDULED MAINTENANCE

Schedule 1 (Normal driving conditions)

| Maintenance Interval Maintenance Item | Number of months or miles (kilometers), whichever comes first | | | | | | | | |
|--|---|-----|----|------|----|------|----|------|----|
| | Months | 6 | 12 | 18 | 24 | 30 | 36 | 42 | 48 |
| | × 1,000 Kilometers Miles | 12 | 24 | 36 | 48 | 60 | 72 | 84 | 96 |
| | | 7.5 | 15 | 22.5 | 30 | 37.5 | 45 | 52.5 | 60 |

Engine

| | | | | | | | | | |
|---------------------------------|---|---|---|---|---|---|---|---|-----|
| Engine oil | R | R | R | R | R | R | R | R | R |
| Oil filter | R | R | R | R | R | R | R | R | R |
| Tension of all drive belts | | | | I | | | | | I |
| Engine timing belt | Replace every 60,000 miles (96,000 km) | | | | | | | | |
| Engine timing belt (California) | Inspect at 60,000 miles (96,000 km) and again at 90,000 miles (144,000 km) *2 | | | | | | | | |
| | Replace every 105,000 miles (168,000 km) | | | | | | | | |
| Hose and tube for emission | | | | | | | | | I*2 |

Air cleaner

| | | | | | | | | | |
|---------------------|--|--|--|---|--|--|--|--|---|
| Air cleaner element | | | | R | | | | | R |
|---------------------|--|--|--|---|--|--|--|--|---|

Ignition system

| | | | | | | | | | |
|-------------|--|--|--|---|--|--|--|--|---|
| Spark plugs | | | | R | | | | | R |
|-------------|--|--|--|---|--|--|--|--|---|

Fuel system

| | | | | | | | | | |
|-------------------------|--|--|--|-----|--|--|--|--|-----|
| Idle speed | | | | I*2 | | | | | I*1 |
| Fuel filter | | | | | | | | | R*1 |
| Fuel lines and hoses | | | | I*2 | | | | | I*1 |
| Fuel hoses (California) | Inspect every 105,000 miles (168,000 km) | | | | | | | | |

Cooling system

| | | | | | | | | | |
|----------------|--|--|--|---|--|--|--|--|---|
| Cooling system | | | | I | | | | | I |
| Engine coolant | | | | R | | | | | R |

Chassis and body

| | | | | | | | | | |
|-------------------------------------|---|---|---|---|---|---|---|---|---|
| Brake lines, hoses, and connections | | | | I | | | | | I |
| Drum brakes | | | | I | | | | | I |
| Disc brakes | | | | I | | | | | I |
| Steering operation and linkages | | | | I | | | | | I |
| Front suspension ball joints | | | | I | | | | | I |
| Drive shaft dust boots | | | | I | | | | | I |
| Bolts and nuts on chassis and body | | | | I | | | | | I |
| Exhaust system heat shields | | | | I | | | | | I |
| All locks and hinges | L | L | L | L | L | L | L | L | L |

Air conditioner system (if equipped)

| | | | | | | | | | |
|--------------------------|--|---|--|---|--|---|--|---|--|
| Refrigerant amount | | I | | I | | I | | I | |
| A/C compressor operation | | I | | I | | I | | I | |

Chart symbols:

I : Inspect and repair, clean, or replace if necessary.

R: Replace

L: Lubricate

Remarks:

After 48 months or 60,000 miles (96,000 km), continue to follow the described maintenance at the recommended intervals.

*1 This maintenance is required for all states except California. However, we recommend that it also be performed on California vehicles.

*2 This maintenance is recommended by Mazda. However, it is not necessary for emission warranty coverage or manufacturer recall liability.

SCHEDULED MAINTENANCE

A

Schedule 2 (Unique driving conditions)

| Maintenance Interval | Number of months or miles (kilometers), whichever comes first | | | | | | | | | | | | |
|----------------------|---|------------|----|----|----|----|----|----|----|----|----|----|----|
| | Months | 4 | 8 | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 | 44 | 48 |
| | × 1,000 | Kilometers | 8 | 16 | 24 | 32 | 40 | 48 | 56 | 64 | 72 | 80 | 88 |
| Miles | | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 |

Engine

| | | | | | | | | | | | | | |
|---------------------------------|--|---|---|---|---|---|---|---|---|---|---|---|-----|
| Engine oil | R | R | R | R | R | R | R | R | R | R | R | R | R |
| Engine oil (Puerto Rico) | Replace every 3,000 miles (4,800 km) or 3 months | | | | | | | | | | | | |
| Oil filter | R | R | R | R | R | R | R | R | R | R | R | R | R |
| Tension of all drive belts | | | | | | I | | | | | | | I |
| Engine timing belt | Replace every 60,000 miles (96,000 km) | | | | | | | | | | | | |
| Engine timing belt (California) | Inspect at 60,000 miles (96,000 km) and again at 90,000 miles (144,000 km)*2 | | | | | | | | | | | | |
| | Replace every 105,000 miles (168,000 km) | | | | | | | | | | | | |
| Hose and tube for emission | | | | | | | | | | | | | I*2 |

Air cleaner

| | | | | | | | | | | | | | |
|---------------------|--|--|-----|--|--|--|---|--|--|-----|--|--|---|
| Air cleaner element | | | I*2 | | | | R | | | I*2 | | | R |
|---------------------|--|--|-----|--|--|--|---|--|--|-----|--|--|---|

Ignition system

| | | | | | | | | | | | | | |
|-------------|--|--|--|--|--|--|---|--|--|--|--|--|---|
| Spark plugs | | | | | | | R | | | | | | R |
|-------------|--|--|--|--|--|--|---|--|--|--|--|--|---|

Fuel system

| | | | | | | | | | | | | | |
|-------------------------|--|--|--|--|--|--|-----|--|--|--|--|--|-----|
| Idle speed | | | | | | | I*2 | | | | | | I*1 |
| Fuel filter | | | | | | | | | | | | | R*1 |
| Fuel lines and hoses | | | | | | | I*2 | | | | | | I*1 |
| Fuel hoses (California) | Inspect every 105,000 miles (168,000 km) | | | | | | | | | | | | |

Cooling system

| | | | | | | | | | | | | | |
|----------------|--|--|--|--|--|--|---|--|--|--|--|--|---|
| Cooling system | | | | | | | I | | | | | | I |
| Engine coolant | | | | | | | R | | | | | | R |

Chassis and body

| | | | | | | | | | | | | | |
|-------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Brake lines, hoses, and connections | | | | | | | I | | | | | | I |
| Drum brakes | | | | | | | I | | | | | | I |
| Disc brakes | | | I | | | | I | | | I | | | I |
| Steering operation and linkages | | | | | | | I | | | | | | I |
| Front suspension ball joints | | | | | | | I | | | | | | I |
| Drive shaft dust boots | | | | | | | I | | | | | | I |
| Bolts and nuts on chassis and body | | | I | | | | I | | | I | | | I |
| Exhaust system heat shields | | | | | | | I | | | | | | I |
| All locks and hinges | L | L | L | L | L | L | L | L | L | L | L | L | L |

Air conditioner system (if equipped)

| | | | | | | | | | | | | | |
|--------------------------|--|--|---|--|--|--|---|--|--|---|--|--|---|
| Refrigerant amount | | | I | | | | I | | | I | | | I |
| A/C compressor operation | | | I | | | | I | | | I | | | I |

Chart symbols:

- I : Inspect and repair, clean, or replace if necessary.
(Inspect, and if necessary replace—Air cleaner element only)
- R: Replace
- L: Lubricate

Remarks:

- After 48 months or 60,000 miles (96,000 km), continue to follow the described maintenance at the recommended intervals.
- *1 This maintenance is required for all states except California. However, we recommend that it also be performed on California vehicles.
- *2 This maintenance is recommended by Mazda. However, it is not necessary for emission warranty coverage or manufacturer recall liability.

SCHEDULED MAINTENANCE TABLE (CANADA)

| Maintenance Interval Maintenance Item | Number of months or miles (kilometers), whichever comes first | | | | | | | | | | | | |
|--|---|----|----|----|----|----|----|----|----|----|----|----|----|
| | Months | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 |
| | × 1,000 Kilometers | 8 | 16 | 24 | 32 | 40 | 48 | 56 | 64 | 72 | 80 | 88 | 96 |
| Miles | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | |

Engine

| | | | | | | | | | | | | | |
|----------------------------|---|---|---|---|---|---|---|---|---|---|---|---|-----|
| Engine oil | R | R | R | R | R | R | R | R | R | R | R | R | R |
| Oil filter | R | R | R | R | R | R | R | R | R | R | R | R | R |
| Tension of all drive belts | I | I | I | I | I | I | I | I | I | I | I | I | I |
| Engine timing belt | | | | | | | | | | | | | R*1 |

Air cleaner

| | | | | | | | | | | | | | |
|---------------------|--|--|---|--|--|--|---|--|--|---|--|--|---|
| Air cleaner element | | | I | | | | R | | | I | | | R |
|---------------------|--|--|---|--|--|--|---|--|--|---|--|--|---|

Ignition system

| | | | | | | | | | | | | | |
|-------------|--|--|--|--|--|--|---|--|--|--|--|--|---|
| Spark plugs | | | | | | | R | | | | | | R |
|-------------|--|--|--|--|--|--|---|--|--|--|--|--|---|

Cooling system

| | | | | | | | | | | | | | |
|-----------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Engine coolant level and strength | I | I | I | I | I | I | I | I | I | I | I | I | I |
| Cooling system for leaks | | | I | | | | I | | | I | | | I |
| Engine coolant | | | | | | | R | | | | | | R |

Fuel system

| | | | | | | | | | | | | | |
|--------------------------|--|--|---|--|--|--|-----|--|--|---|--|--|-----|
| Idle speed | | | I | | | | I | | | I | | | I |
| Fuel lines and hoses | | | | | | | I*2 | | | | | | I |
| Fuel filter | | | | | | | R | | | | | | R |
| PCV valve | | | | | | | | | | | | | I*2 |
| Emission hoses and tubes | | | | | | | | | | | | | I |

Chassis and body

| | | | | | | | | | | | | | |
|--|---|---|----|---|---|---|-----|---|---|----|---|---|-----|
| Automatic transaxle fluid level | I | I | I | I | I | I | I | I | I | I | I | I | I |
| Transaxle oil (MTX and ATX) | | | | | | | R | | | | | | R |
| Drive shaft dust boots | | | | | | | I | | | | | | I |
| Brake lines and hoses | | | | | | | I | | | | | | I |
| Brake and clutch fluid level | I | I | I | I | I | I | I | I | I | I | I | I | I |
| Brake fluid | | | | | | | R*3 | | | | | | R*3 |
| Disc brakes (front and rear) | | | I | | | | I | | | I | | | I |
| Rear drum brakes | | | | | | | I | | | | | | I |
| Tire inflation pressure and tire wear | I | I | I | I | I | I | I | I | I | I | I | I | I |
| Tires | | | Rt | | | | Rt | | | Rt | | | Rt |
| Power steering fluid level | I | I | I | I | I | I | I | I | I | I | I | I | I |
| Steering operation and linkage (includes four wheel alignment) | | | | | | | I | | | | | | I |
| Front and rear suspension components | | | | | | | I | | | | | | I |
| All chassis and body nuts and bolts | | | I | | | | I | | | I | | | I |
| Exhaust system heat shields | | | | | | | I | | | | | | I |
| All locks and hinges | L | L | L | L | L | L | L | L | L | L | L | L | L |
| Washer fluid level | I | I | I | I | I | I | I | I | I | I | I | I | I |
| Function of all lights | I | I | I | I | I | I | I | I | I | I | I | I | I |

Air conditioner system (if equipped)

| | | | | | | | | | | | | | |
|--------------------------|--|---|--|---|--|---|--|---|--|---|--|---|--|
| Refrigerant amount | | I | | I | | I | | I | | I | | I | |
| A/C compressor operation | | I | | I | | I | | I | | I | | I | |

Chart symbols:

- I** : Inspect and repair, clean, or replace if necessary.
(Inspect, and if necessary replace.....Air cleaner element only)
- R**: Replace
- L** : Lubricate
- Rt** : Rotation (tires)

Remarks:

After 60 months or 60,000 miles {96,000 km}, continue to follow the described maintenance at the recommended intervals.

- *1 Replacement of the timing belt is required every 60,000 miles {96,000 km}. Failure to replace this belt may result in damage to the engine.
- *2 This maintenance is recommended by Mazda. However, it is not necessary for emission warranty coverage or manufacturer recall liability.
- *3 This maintenance is recommended by Mazda.

Before beginning any service procedure, refer to the 1995 MX-3 Body Electrical Troubleshooting Manual; see section S for air bag system service warnings.

ENGINE (K8)

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INTAKE MANIFOLD TIGHTENING TORQUE
19-25 N·m {1.9-2.6 kgf·m, 14-18 ft·lbf}

COMPRESSION INSPECTION, PAGE B2-10
STANDARD: 1334 kPa (13.6 kgf/cm², 193 psi)-300 rpm
MINIMUM: 981 kPa (10.0 kgf/cm², 142 psi)-300 rpm

DEFLECTION AT 98 N (10 kgf, 22 lbf)

| | mm {in} | | |
|-----------------|---------------------|---------------------|------------|
| | NEW | USED | LIMIT |
| DRIVE BELT | | | |
| GENERATOR | 6.0-7.0 {0.24-0.27} | 7.0-8.0 {0.28-0.31} | 9.0 {0.35} |
| GENERATOR + A/C | 5.5-6.5 {0.22-0.25} | 6.5-7.5 {0.26-0.29} | 8.0 {0.32} |
| P/S | 6.0-7.0 {0.24-0.27} | 7.0-8.0 {0.28-0.31} | 9.0 {0.35} |

EXHAUST MANIFOLD TIGHTENING TORQUE
19-25 N·m (1.9-2.6 kgf·m, 14-18 ft·lbf)

| | kPa {kgf/cm ² , psi}-rpm |
|----------|-------------------------------------|
| STANDARD | 1,334 {13.6, 193}-300 |
| MINIMUM | 981 {10.0, 142}-300 |

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Engine stand mounting page B2- 52
Disassembly page B2- 56
Inspection / Repair page B2- 73
Assembly page B2- 86
Engine stand dismounting ... page B2-116
Installation page B2-117

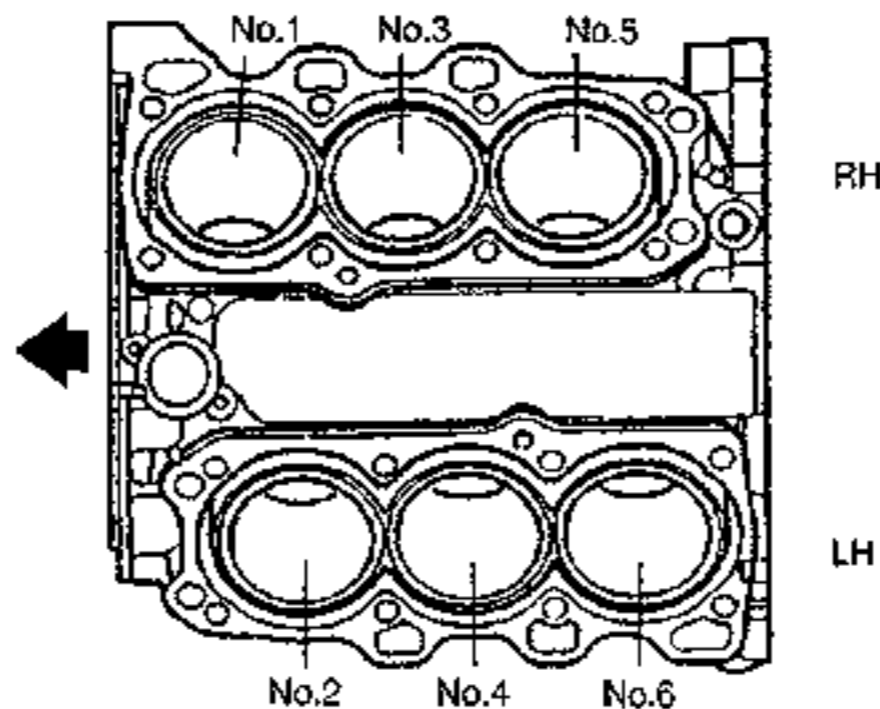
OUTLINE

SPECIFICATIONS

| Item | | Engine | K8 DOHC | |
|---------------------------------|----|-------------------------------------|----------------------------------|-----|
| Type | | | Gasoline, 4-cycle | |
| Cylinder arrangement and number | | | 60°-V configuration, 6 cylinders | |
| Combustion chamber | | | Pentroof | |
| Valve system | | | DOHC, belt-driven, 24 valves | |
| Displacement | | ml {cc, cu in} | 1,844 {1,844, 112.4} | |
| Bore stroke | | mm {in} | 75 × 69.6 {2.95 × 2.74} | |
| Compression ratio | | | 9.2 | |
| Compression pressure | | kPa {kgf/cm ² , psi}-rpm | 1,334 {13.6, 193}-300 | |
| Valve timing | IN | Open | BTDC | 6° |
| | | Close | ABDC | 37° |
| | EX | Open | BBDC | 49° |
| | | Close | ATDC | 6° |
| Valve clearance | IN | mm {in} | 0 {0} : Maintenance-free | |
| | EX | mm {in} | 0 {0} : Maintenance-free | |
| Firing order | | | 1-2-3-4-5-6 | |

B2

Cylinder Arrangement



TROUBLESHOOTING GUIDE

| Problem | Possible Cause | Action | Page |
|--------------------|---|---------------------|-------|
| Difficult starting | Malfunction of engine-related components | | |
| | Burned valve | Replace | B2-74 |
| | Worn piston, piston ring, or cylinder | Replace or repair | B2-82 |
| | Damaged cylinder head gasket | Replace | B2-23 |
| | Malfunction of fuel system | Refer to section F2 | |
| | Malfunction of electrical system | Refer to section G | |
| Poor idling | Malfunction of engine-related components | | |
| | Malfunction of HLA | Replace | B2-37 |
| | Poor valve-to-valve seat contact | Repair or replace | B2-76 |
| | Damaged cylinder head gasket | Replace | |
| | Malfunction of fuel system | Refer to section F2 | |

*Tappet noise may occur if the engine has not been started for an extended period of time. The noise should stop after the engine reaches normal operating temperature. (HLA troubleshooting: Refer to page B2-8.)

| Problem | Possible Cause | Action | Page |
|---------------------------|---|---|--|
| Insufficient power | Insufficient compression Malfunction of HLA Compression leakage from valve seat Stuck valve Weak or broken valve spring Damaged cylinder head gasket Cracked or distorted cylinder head Stuck, damaged, or worn piston ring Cracked or worn piston | Replace Repair Replace Replace Replace Replace Replace Replace | B2-37 B2-76 B2-74 B2-77 B2-23 B2-73 B2-82 B2-82 |
| | Malfunction of fuel system | Refer to section F2 | |
| | Others Dragging brake Wrong size tires | Refer to section P Refer to section Q | |
| Abnormal combustion | Malfunction of engine-related components Malfunction of HLA Stuck or burned valve Weak or broken valve spring Carbon accumulation in combustion chamber | Replace Replace Replace Eliminate carbon | B2-37 B2-74 B2-77 |
| | Malfunction of fuel system | Refer to section F2 | |
| Excessive oil consumption | Oil working up Worn piston ring groove or stuck piston ring Worn piston or cylinder | Replace Replace or repair | B2-82 B2-81,82 |
| | Oil working down Worn valve seal Worn valve stem or guide | Replace Replace | B2-65 B2-75 |
| | Oil leakage | Refer to section D2 | |
| Engine noise | Crankshaft- or bearing-related parts Excessive main bearing oil clearance Main bearing heat-damaged Excessive crankshaft end play Excessive connecting rod bearing oil clearance Connecting rod bearing heat-damaged | Replace or repair Replace Replace or repair Replace or repair Replace | B2-91 B2-84 B2-93 B2-94 B2-84 |
| | Piston-related parts Worn cylinder Worn piston or piston pin Damaged piston ring Bent connecting rod | Replace or repair Replace Replace Replace | B2-81 B2-82,83 B2-82 B2-83 |
| | Valve train-related parts Malfunction of HLA* Broken valve spring Excessive valve guide clearance Malfunction of timing belt auto tensioner Malfunction of friction gear | Replace Replace Replace Replace Replace | B2-80 B2-77 B2-75 B2-85 B2-76 |
| | Malfunction of cooling system | Refer to section E2 | |
| | Malfunction of fuel system | Refer to section F2 | |
| | Others Malfunction of water pump bearing Improper drive belt tension Malfunction of generator bearing Exhaust gas leakage | Replace Adjust Replace Repair | — B2-5 — — |

* Tappet noise may occur if the engine has not been started for an extended period of time. The noise should stop after the engine reaches normal operating temperature. (HLA troubleshooting: Refer to page B2-8.)

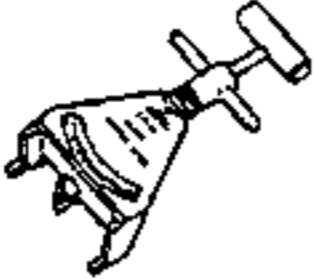
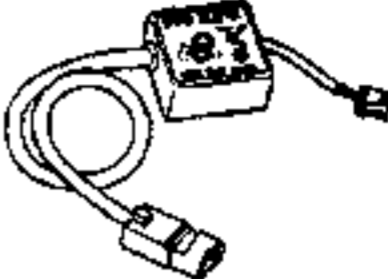
Warning

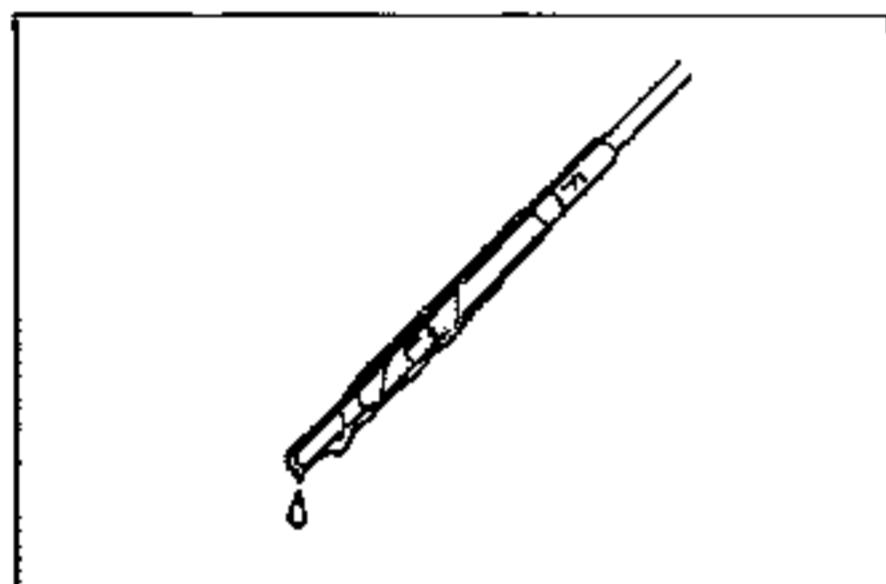
- Continuous exposure with USED engine oil has caused skin cancer in laboratory mice. Protect your skin by washing with soap and water immediately after this work.

ENGINE TUNE-UP

PREPARATION

SST

| | | | |
|--|---|---|---|
| <p>49 9200 020A</p> <p>V-ribbed belt tension gauge</p>  | <p>For inspection of drive belt tension</p> | <p>49 B019 9A0</p> <p>System selector</p>  | <p>For inspection of ignition timing and idle speed</p> |
|--|---|---|---|



ENGINE OIL

Inspection

1. Be sure the vehicle is on level ground.
2. Warm up the engine to normal operating temperature and stop it.
3. Wait for five minutes.
4. Remove the dipstick and check the oil level and condition.
5. Add or replace oil if necessary.

Note

- The distance between the L and F marks on the dipstick represents 1.0 L {1.1 US qt, 0.9 Imp qt}.

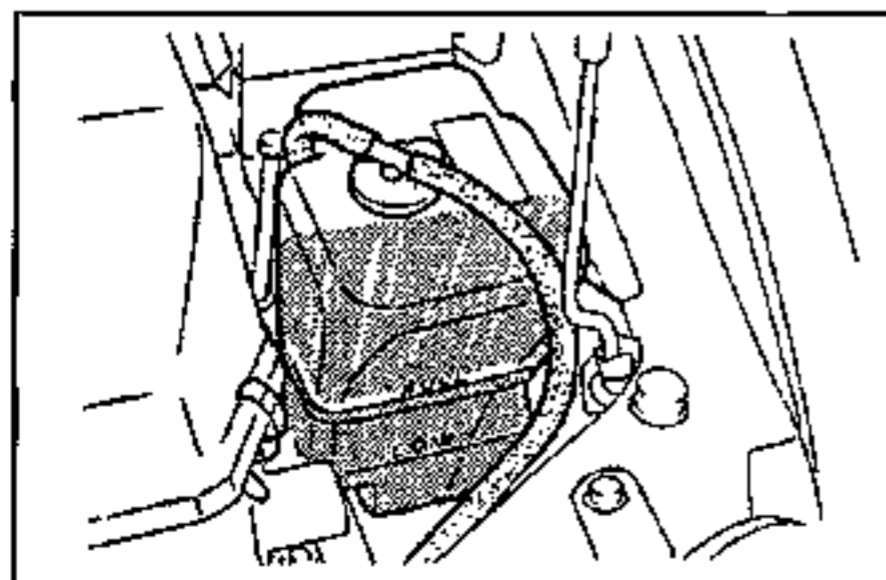
ENGINE COOLANT

Inspection

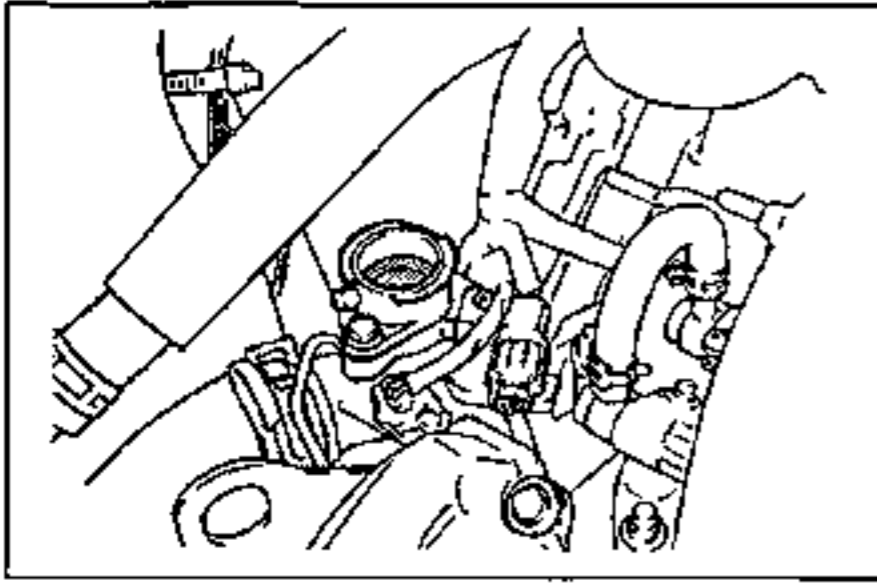
Coolant level (engine cold)

Warning

- Removing the radiator cap or the coolant filler cap while the engine is running, or when the engine and radiator are hot is dangerous. Scalding coolant and steam can shoot out and cause serious injury. It can also damage the engine and cooling system. Turn off the engine and wait until it is cool. Even then, be very careful when removing the cap. Wrap a thick cloth around it and slowly turn it counter-clockwise to the first stop. Step back while the pressure escapes. When you're sure all the pressure is gone, press down on the cap – still using a cloth – turn it, and remove it.

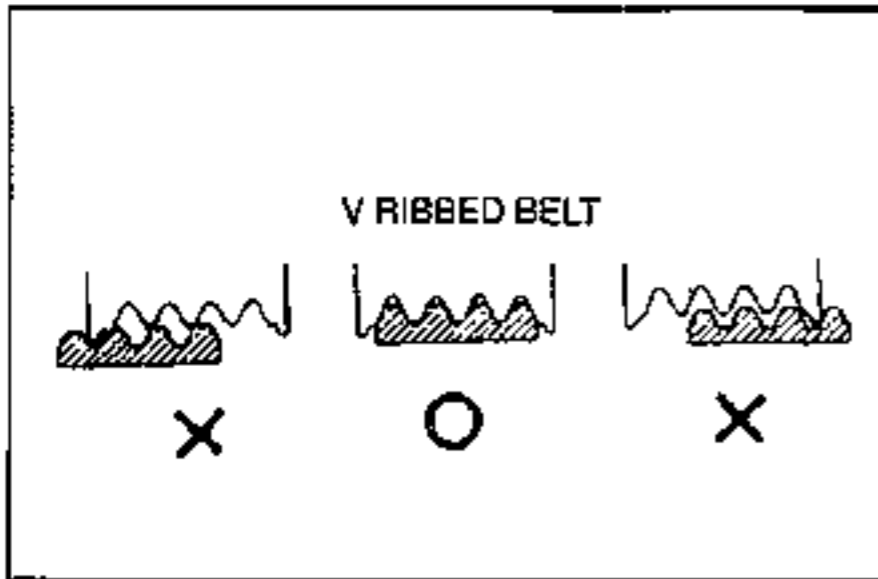


1. Verify that the coolant level is near the filler neck.
2. Verify that the coolant level in the coolant reservoir is between the FULL and LOW marks.
3. Add coolant if necessary.



Coolant quality

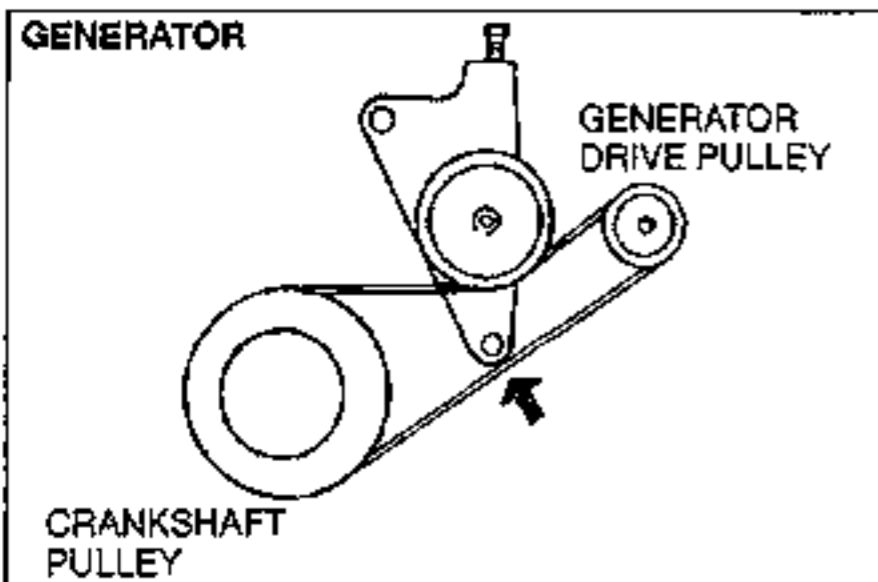
1. Verify that there is no buildup of rust or scale around the radiator cap, filler cap, or filler neck.
2. Verify that the coolant is free of oil.
3. Replace the coolant if necessary.



DRIVE BELT

Inspection

1. Check the drive belts for wear, cracks, and fraying. Replace if necessary.
2. Verify that the drive belts are correctly mounted on the pulleys.

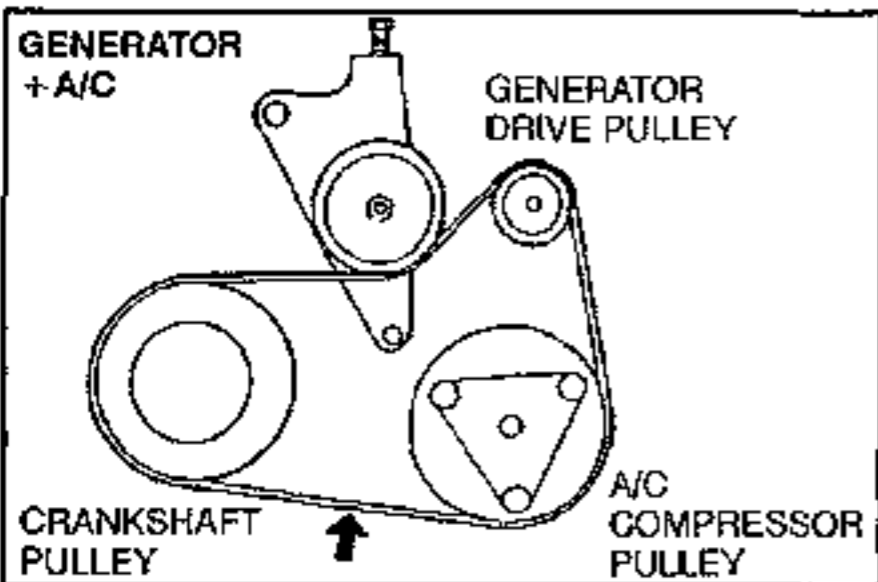


3. Check the drive belt deflection when the engine is cold, or at least 30 minutes after the engine has stopped. Apply moderate pressure 98 N {10kgf, 22 lbf} midway between the specified pulleys.

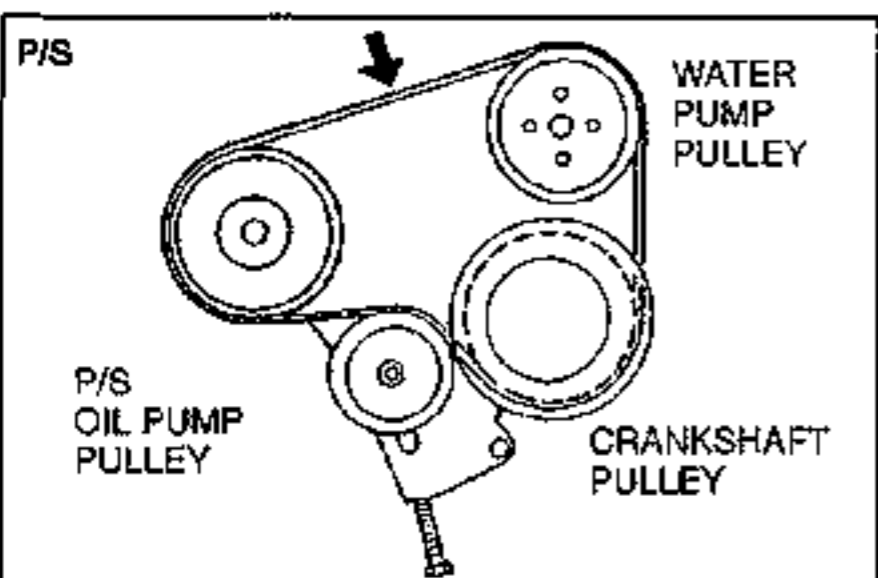
Deflection

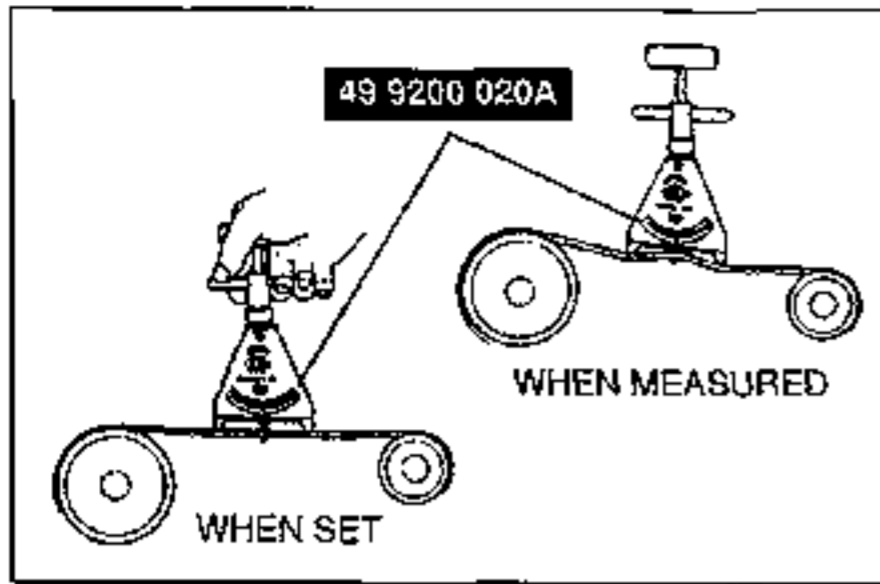
| Drive belt | mm {in} | | |
|-----------------|------------------------|------------------------|---------------|
| | New * | Used | Limit |
| Generator | 6.0-7.0 {0.24-0.27} | 7.0-8.0 {0.28-0.31} | 9.0 {0.35} |
| Generator + A/C | 5.5-6.5 {0.22-0.25} | 6.5-7.5 {0.26-0.29} | 8.0 {0.32} |
| P/S | 6.0-7.0 {0.24-0.27} | 7.0-8.0 {0.28-0.31} | 9.0 {0.35} |

* A belt that has been on a running engine for less than five minutes.



4. If the deflection is not within the specification, adjust it. (Refer to page B2-7.)



**Drive belt tension check**

Belt tension can be checked in place of belt deflection.

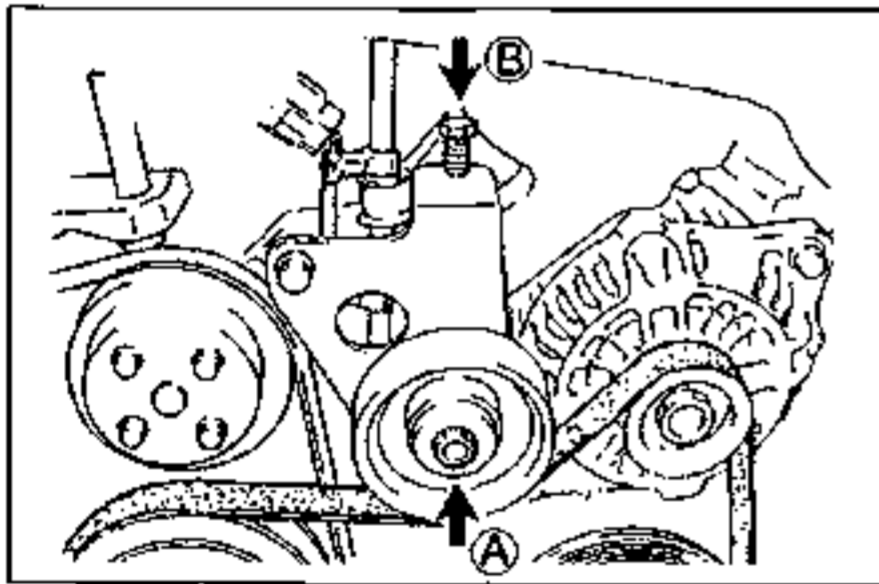
1. Check the drive belt tension when the engine is cold, or at least 30 minutes after the engine has stopped. Using the SST, check the belt tension between any two pulleys.

Tension

| Drive belt | N {kgf, lbf} | | |
|--------------------|--------------------------------|--------------------------------|----------------|
| | New * | Used | Limit |
| Generator | 690-880 {70-90, 160-190} | 500-680 {50-70, 110-150} | 440 {45,99} |
| Generator + A/C | 690-880 {70-90,160-190} | 500-680 {50-70,110-150} | 440 {45,99} |
| P/S | 540-680 {55-70,130-150} | 400-530 {40-55, 90-120} | 340 {35,77} |

* A belt that has been on a running engine for less than five minutes.

2. If the tension is not within the specification, adjust it. (Refer to below.)

**Adjustment****Generator + A/C, Generator**

1. Loosen idler pulley locknut (A).
2. Adjust the belt deflection by turning adjusting bolt (B).

Deflection**(Generator + A/C)**

New : 5.5-6.5mm {0.22-0.25 in}

Used: 6.5-7.5mm {0.26-0.29 in}

(Generator)

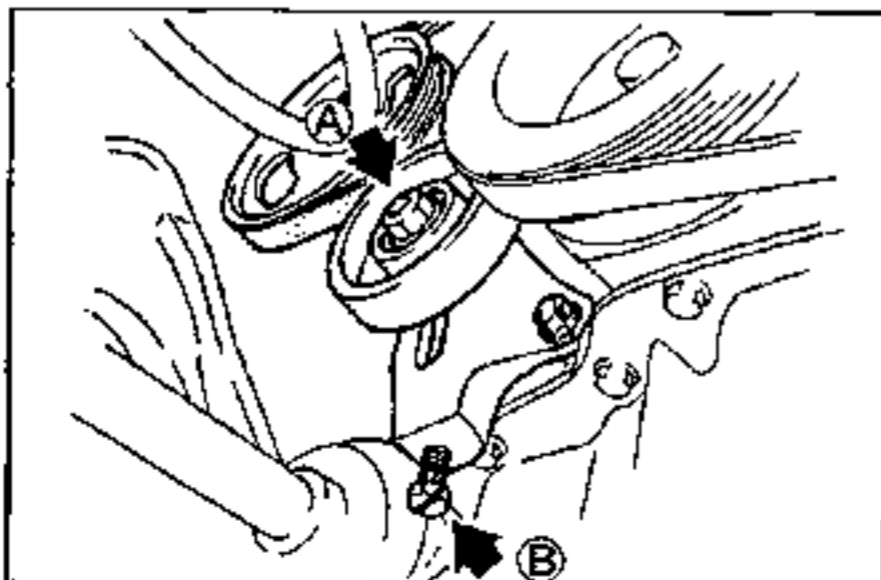
New: 6.0-7.0 mm {0.24-0.27 in}

Used: 7.0-8.0 mm {0.28-0.31 in}

3. Tighten pulley locknut (A).

Tightening torque:

32-46 N·m {3.2-4.7 kgf·m, 24-33 ft·lbf}

**P/S**

1. Loosen idler pulley locknut (A).
2. Adjust the belt deflection by turning adjusting bolt (B).

Deflection

New : 6.0-7.0mm {0.24-0.27 in}

Used: 7.0-8.0mm {0.28-0.31 in}

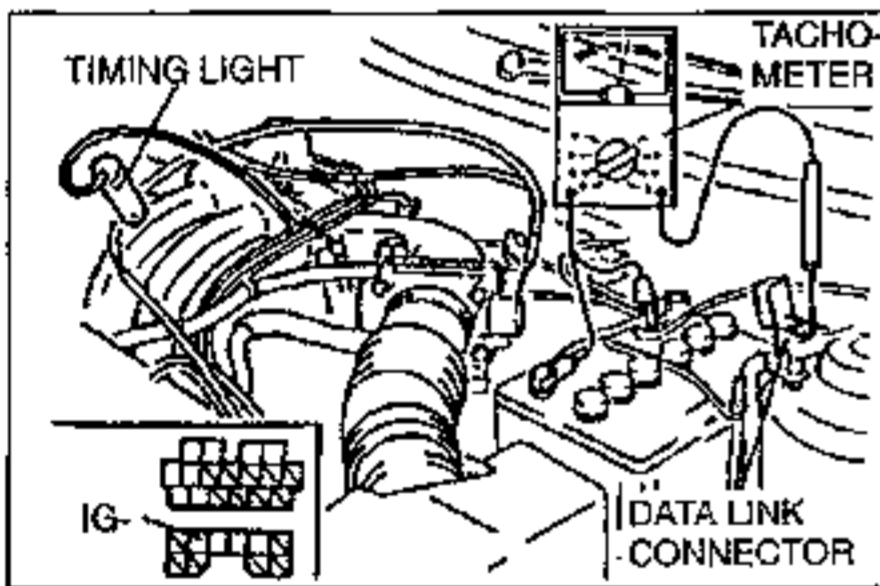
3. Tighten pulley locknut (A).

Tightening torque:

32-46 N·m {3.2-4.7 kgf·m, 24-33 ft·lbf}

HLA TROUBLESHOOTING GUIDE

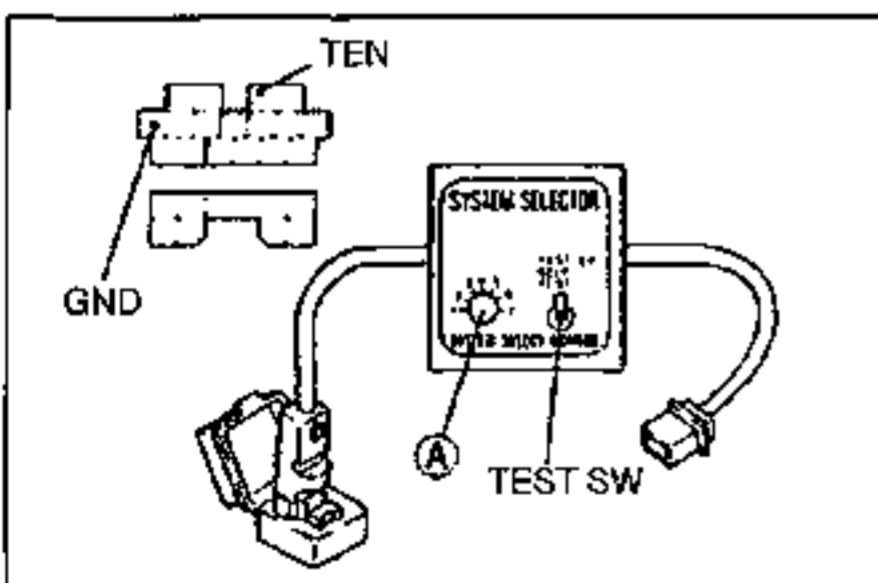
| Problem | Possible Cause | Action | |
|--|---|--|---------------------------|
| 1. Noise when engine is first started after oil is changed. 2. Noise when engine is started after setting approx. one day. | Insufficient oil in HLA Oil leakage from HLA | Run engine at 2,000–3,000 rpm. If noise stops after 2 seconds–10 minutes,* HLA is normal. If not, replace HLA. * Time required for engine oil to circulate within engine includes tolerance for engine oil condition and ambient temperature. | |
| 3. Noise when engine is started after cranking for 3 seconds or more. 4. Noise when engine is started after new HLA is installed. | | | |
| 5. Noise continues more than 10 minutes. | | | Insufficient oil pressure |
| | | | Faulty HLA |
| 6. Noise during idle after high speed running. | Incorrect oil amount | Check oil level. Drain or add oil as necessary. | |
| | Deteriorated oil | Check oil quality. If deteriorated, replace with specified type and amount of oil. | |



IGNITION TIMING, IDLE SPEED

Preparation

1. Warm up the engine to normal operating temperature.
2. Turn all electric loads off.
 - Headlight switch
 - Blower switch
 - Rear window defroster switch
3. Connect the **SST** to the data link connector.
4. Connect a timing light.
5. Connect a tachometer to the data link connector terminal **IG-**.



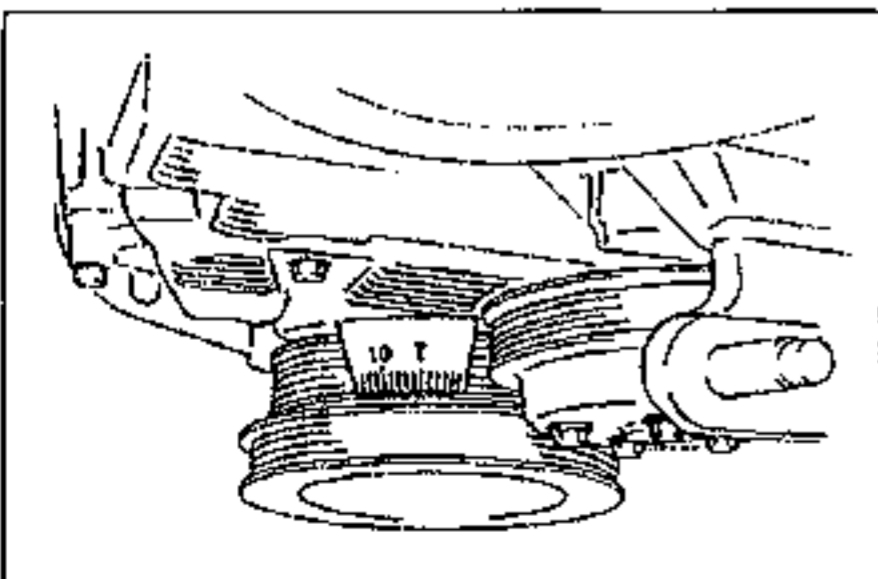
Ignition timing

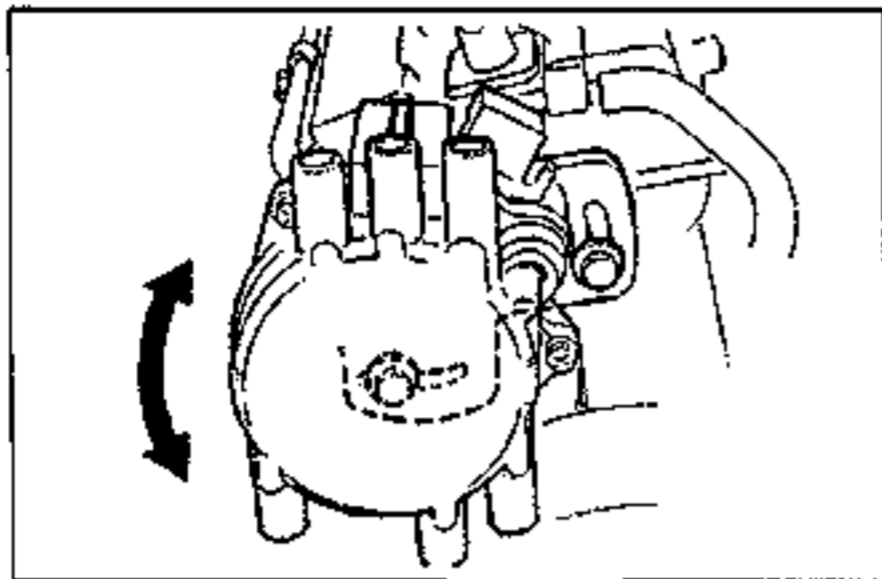
1. Perform "Preparation." (Refer to above.)
2. Make sure the idle speed is within the specification. If not, adjust the idle speed.

Idle speed (MTX in Neutral, ATX in P range)
:650–710 rpm

3. Set switch **A** to position 1.
4. Set **TEST SW** to **SELF-TEST**.
5. If the **SST** is not used, jump across the **TEN** and **GND** terminals of the data link connector.
6. Make sure the timing mark (yellow) on the crankshaft pulley and the mark on the timing belt cover are aligned.

Ignition timing: 9–11° BTDC



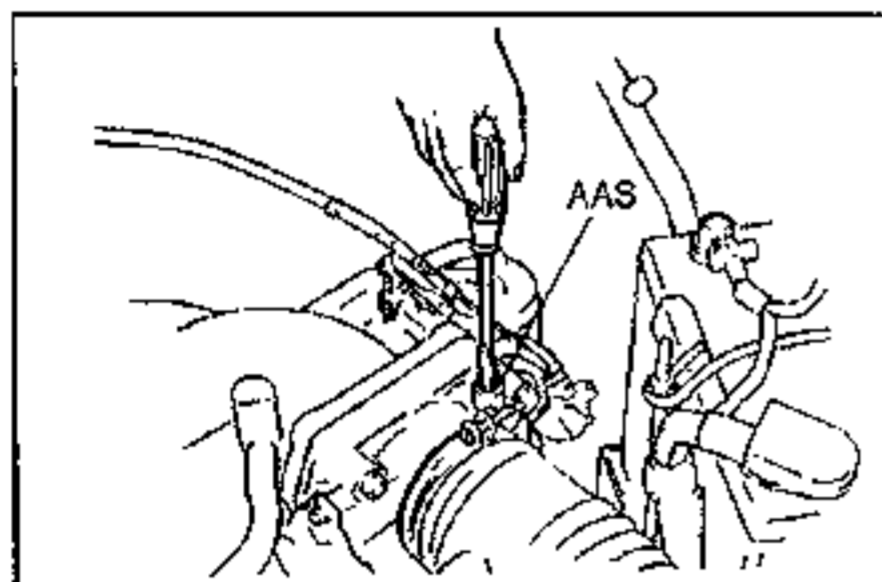


7. If the marks are not aligned, loosen the distributor mounting bolts and turn the distributor to make the adjustment.
8. Tighten the distributor bolts to the specified torque.

Tightening torque:

19–25 N·m (1.9–2.6 kgf·m, 14–18 ft·lbf)

9. Disconnect the jumper wire or the SST.

**Idle Speed**

1. Apply parking brake.
2. Perform "Preparation." (Refer to page B2–8.)
3. With the coolant fan off, verify that the idle speed is within the specification.

Idle speed (Neutral or P range) : 640–700 rpm

4. If not, adjust the idle speed by turning the air adjusting screw (AAS).
5. Disconnect the jumper wire or the SST.