

STEERING COLUMN

1995-97 STEERING Mazda Motors Corp. - Steering Columns

DESCRIPTION & OPERATION

Steering columns are designed to be collapsible upon impact. The steering column consists of solid steering shaft with a lower joint assembly. Some models are equipped with tilt steering. Turn signal, headlight, ignition and windshield washer/wiper switches are mounted on column. Switches can be serviced by removing steering wheel and column covers. All models are equipped with air bag restraint system consisting of an driver air bag module, passenger air bag module (except 1995 MPV and 1995 Protege) and clockspring connector assembly located in the steering column.

WARNING: To avoid injury from accidental air bag deployment, read and carefully follow all WARNINGS and SERVICE PRECAUTIONS .

SYSTEM OPERATION CHECK

1. Turn ignition switch to ON or START position. AIR BAG warning light in instrument cluster should illuminate for about 4-8 seconds, and then turn off. This indicates air bag system is functioning properly.
2. If any of the following conditions exists, air bag system is malfunctioning and requires servicing.
 - AIR BAG warning light does not illuminate as specified.
 - AIR BAG warning light remains illuminated for more than 8 seconds.
 - AIR BAG warning light illuminates while driving.
3. If air bag system components are replaced for any reason, air bag system must be checked for proper function after repair. Repeat step 1). If AIR BAG warning light does not illuminate as specified, air bag system is malfunctioning and servicing is required. See AIR BAG RESTRAINT SYSTEM article.

SERVICE PRECAUTIONS

Observe the following precautions when servicing air bag system.

- Disable air bag system before servicing any air bag system or steering column component. See **AIR BAG DISABLING & ACTIVATING** .
- After disabling air bag system, wait at least one minute before servicing. Air bag system voltage is maintained for approximately one minute after system is disabled. Failure to wait one minute before servicing system may cause accidental air bag deployment and possible personal injury.
- Obtain radio code number from customer and deactivate radio anti-theft function (if equipped) before disconnecting battery.
- Because of the critical operation requirements of system, DO NOT service any air bag system component. Repairs are made by replacement only.
- DO NOT use an ohmmeter to check resistance of air bag module, as it may cause air bag deployment.
- When carrying a live (undeployed) air bag module, ensure trim cover is pointed away from your body.

This minimizes chance of injury in the event of accidental air bag deployment.

- When placing a live air bag module on any surface, always face trim cover upward to reduce motion of module if it is accidentally deployed.
- If an open circuit is present, replace entire wiring harness. DO NOT attempt to repair wire(s).
- Air bag system clockspring MUST be aligned in neutral position, since its rotation ability is limited. DO NOT turn steering wheel or column after removal of steering gear.
- A double-lock mechanism is used on clockspring connectors. DO NOT use excessive force when disconnecting connectors, as damage to connector may occur.

AIR BAG DISABLING & ACTIVATING

WARNING: Wait about one minute after disabling air bag system before servicing. Air bag system voltage is maintained for about one minute after system is disabled. Failure to wait one minute before servicing system may cause accidental air bag deployment and possible personal injury.

CAUTION: When battery is disconnected, vehicle computer and memory systems may lose memory data. Driveability problems may exist until computer systems have completed a relearn cycle.

DISABLING SYSTEM (MIATA, MILLENIA, MPV, MX-6, PROTEGE & 626)

1. Obtain radio code from customer and deactivate audio anti-theft function (if equipped). Turn ignition off. Disconnect and shield negative battery cable. Wait at least one minute for back-up power supply to be depleted. Remove lower cover panel(s) below left side of instrument panel.
2. On MPV, remove lower steering column shroud. On all models, disconnect Orange and Blue clockspring connectors for driver air bag module. See **Fig. 1** . On all models except 1995 Protege and 1995 MPV, remove glove box compartment. Disconnect Orange and Blue connectors for passenger air bag module. See **Fig. 2** .

ACTIVATING SYSTEM (MIATA, MILLENIA, MPV, MX-6, PROTEGE & 626)

1. Ensure negative battery cable is still disconnected. On all models except 1995 Protege and 1995 MPV, reconnect Orange and Blue connector for passenger air bag module. Install glove box compartment.
2. On all models, reconnect Orange and Blue clockspring connectors for driver air bag module. Install lower cover panel(s). On MPV, install lower steering column shroud. On all models, reconnect negative battery cable.
3. Turn ignition on. Check AIR BAG warning light to ensure air bag system is operating properly. See **SYSTEM OPERATION CHECK** . Activate audio anti-theft function (if equipped).

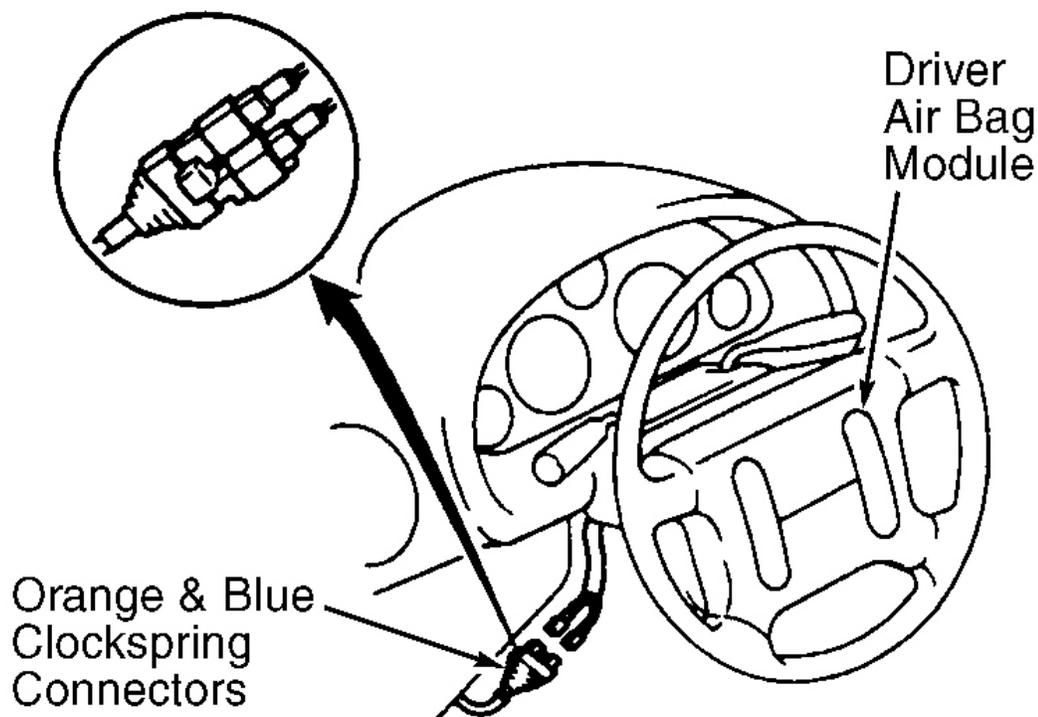
DISABLING SYSTEM (MX-3, RX7 & 929)

1. Obtain radio code from customer and deactivate audio anti-theft function. Turn ignition off. Disconnect and shield negative battery cable. Wait at least one minute for back-up power supply to be depleted.

2. Disconnect diagnostic module connectors located at base of steering column and connect Short Circuit Connectors (49-H066-004) to diagnostic module harness connectors. See **Fig. 3** .

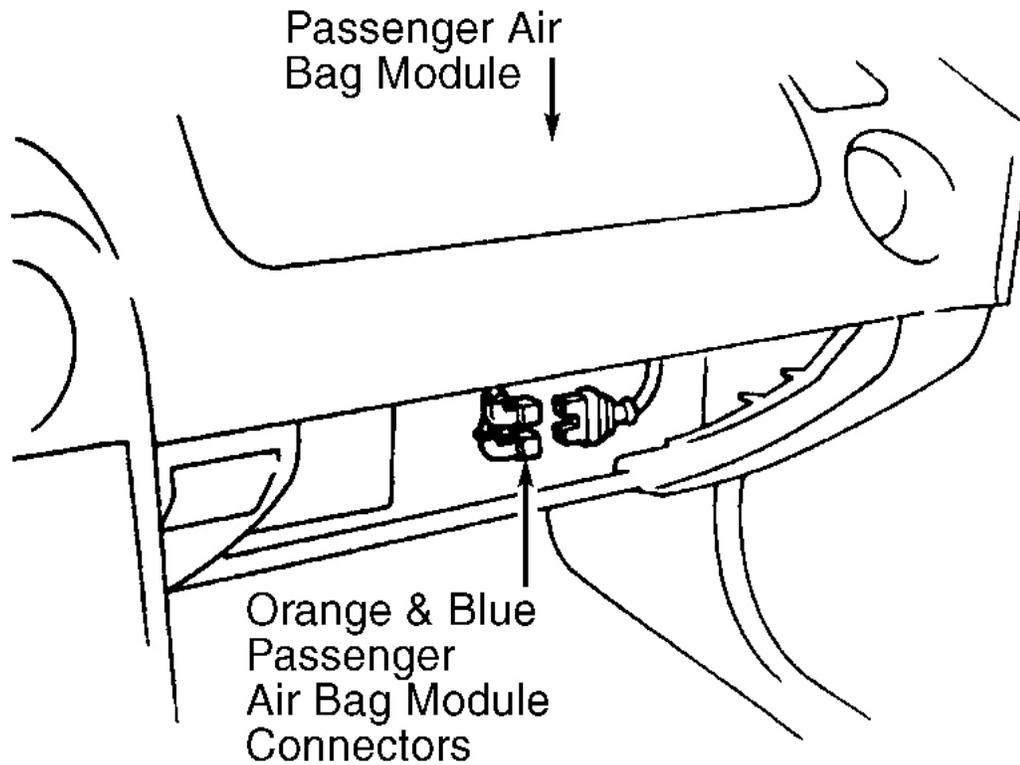
ACTIVATING SYSTEM (MX-3, RX7 & 929)

1. Ensure negative battery cable is still disconnected. Remove short circuit connectors from diagnostic module harness connectors. See **Fig. 3** . Reconnect diagnostic module harness connectors to diagnostic module.
2. Reconnect negative battery cable. Turn ignition on. Check AIR BAG warning light to ensure air bag system is operating properly. See **SYSTEM OPERATION CHECK** . Activate audio anti-theft function (if equipped).



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Fig. 1: Disconnecting Clockspring Connectors (Typical)
Courtesy of MAZDA MOTORS CORP.



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Fig. 2: Disconnecting Passenger Air Bag Module Connectors (Typical)
Courtesy of MAZDA MOTORS CORP.

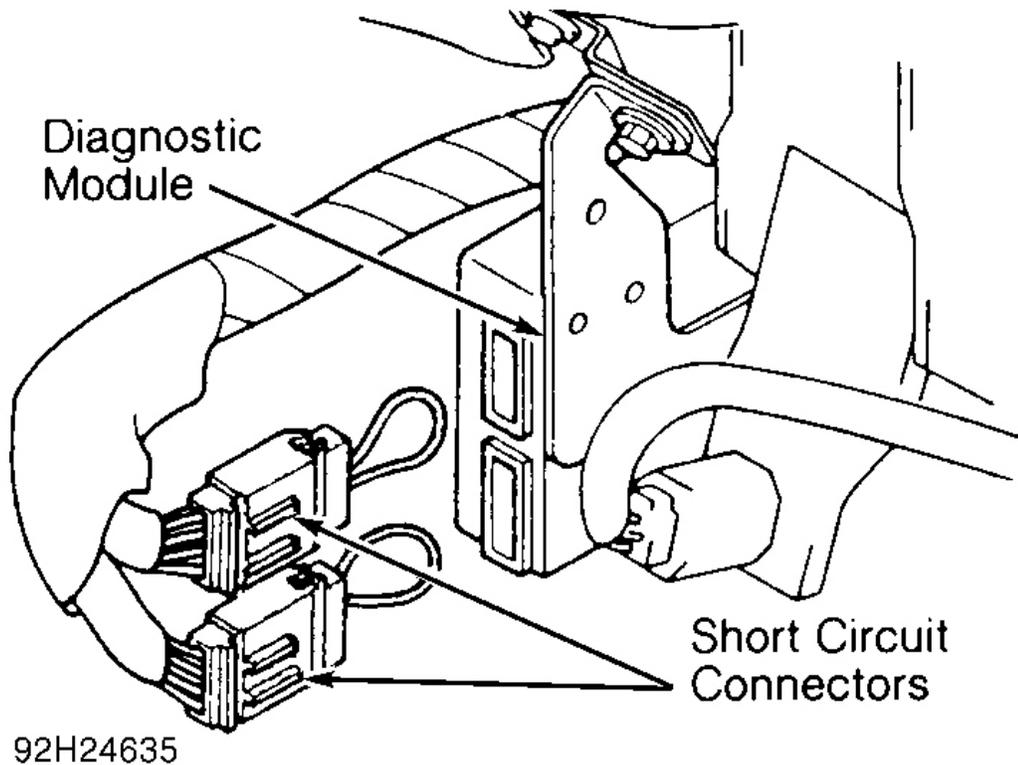
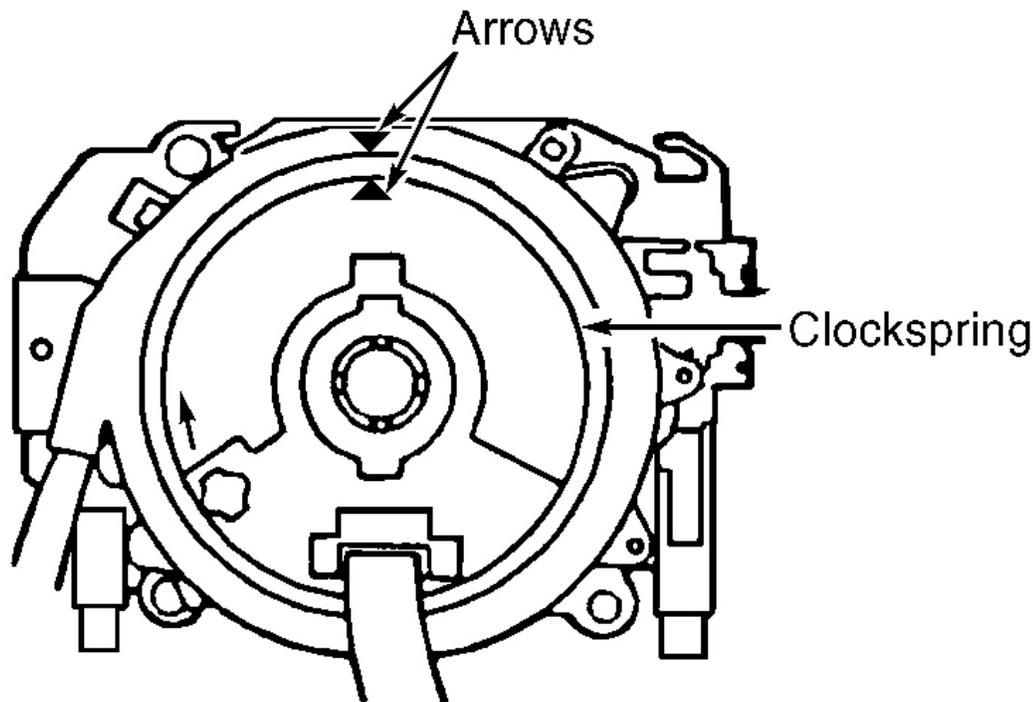


Fig. 3: Connecting Short Circuit Connectors (Typical)
Courtesy of MAZDA MOTORS CORP.

ADJUSTMENTS

CLOCKSPRING CENTERING

Set front wheels in straight-ahead position. Rotate clockspring clockwise until it stops (DO NOT force). Rotate clockspring 2 3/4 turns counterclockwise. Rotate clockspring further, if necessary, to align arrows on clockspring and outer housing. See **Fig. 4**.



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Fig. 4: Centering Clockspring
Courtesy of MAZDA MOTORS CORP.

REMOVAL & INSTALLATION

WARNING: To avoid injury from accidental air bag deployment, read and carefully follow all **WARNINGS** and **SERVICE PRECAUTIONS** .

DRIVER AIR BAG MODULE

Removal

Before proceeding, follow air bag service precautions. See **SERVICE PRECAUTIONS** . Disable air bag system. Refer to **AIR BAG DISABLING & ACTIVATING** . Remove air bag module bolts or nuts from back of steering wheel. Disconnect driver air bag module harness connector(s) and support rope. Remove driver air bag module.

Installation

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To install, reverse removal procedure. Tighten driver air bag module bolts or nuts to specification. See **TORQUE SPECIFICATIONS** table. Activate air bag system. See **AIR BAG DISABLING & ACTIVATING** . Check AIR BAG warning light to ensure system is functioning properly. See **SYSTEM OPERATION CHECK** .

STEERING WHEEL

Removal

Set front wheels in straight-ahead position. Disconnect negative battery cable. Disable air bag system. See **AIR BAG DISABLING & ACTIVATING** . Remove driver air bag module. See **DRIVER AIR BAG MODULE** . Mark steering wheel and shaft for reassembly reference. Remove steering wheel nut. Using appropriate puller, remove steering wheel.

Installation

Ensure front wheels are in straight-ahead position. Install steering wheel, ensuring reference marks are aligned. Tighten steering wheel nut to specification. See **TORQUE SPECIFICATIONS** table. To install remaining components, reverse removal procedure.

COMBINATION SWITCH

Removal

1. Before proceeding, follow air bag service precautions. See **SERVICE PRECAUTIONS** . Disable air bag system. See **AIR BAG DISABLING & ACTIVATING** .
2. Remove driver air bag module. See **DRIVER AIR BAG MODULE** . Remove steering wheel. See **STEERING WHEEL** . Remove upper and lower steering column covers. Disconnect combination switch electrical connectors. Remove combination switch screws.
3. Remove clockspring and combination switch as an assembly. Separate clockspring from combination switch.

Installation

1. To install, reverse removal procedure. Ensure front wheels are in straight-ahead position. Before installing steering wheel, center clockspring. See **CLOCKSPRING CENTERING** under **ADJUSTMENTS**. Tighten steering wheel nut to specification. See **TORQUE SPECIFICATIONS** table.
2. After installation, activate air bag system. See **AIR BAG DISABLING & ACTIVATING** . Check AIR BAG warning light to ensure system is functioning properly. See **SYSTEM OPERATION CHECK** .

IGNITION SWITCH/STEERING LOCK ASSEMBLY

Removal & Installation

1. Remove driver air bag module, steering wheel and combination switch. See the following:
 - **DRIVER AIR BAG MODULE** .

- **STEERING WHEEL** .
- **COMBINATION SWITCH** .

Disconnect ignition switch connectors. Remove key interlock cable from ignition switch/steering lock assembly (if equipped).

2. Using a hammer and chisel, make a groove in ignition switch/steering lock assembly shear screws. Remove 2 shear screws with screwdriver. Remove ignition switch/steering lock assembly. To install, reverse removal procedure. Tighten NEW shear screws until heads break off.

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CAUTION: Excessive pressure or impact to steering shaft assembly during service may cause column to collapse.

Removal & Installation

1. Remove driver air bag module, steering wheel and combination switch. See the following:
 - **DRIVER AIR BAG MODULE** .
 - **STEERING WHEEL** .
 - **COMBINATION SWITCH** .

See **Fig. 5 -11** . Remove ignition switch/steering lock assembly. See **IGNITION SWITCH/STEERING LOCK ASSEMBLY** under REMOVAL & INSTALLATION.

2. Remove lower panel. Remove air duct (if equipped). Remove "U" joint dust cover (if equipped). Remove steering shaft assembly-to-intermediate shaft "U" joint bolt. Mark steering shaft assembly-to-intermediate shaft for installation reference. On MPV, disconnect shift lever mechanism.
3. On all models, remove steering column lower mounting bolts. Separate steering shaft from intermediate shaft. Remove steering column upper bracket bolts. Remove steering column.
4. To install, reverse removal procedure. Tighten bolts and nuts to specification. See **TORQUE SPECIFICATIONS** table.

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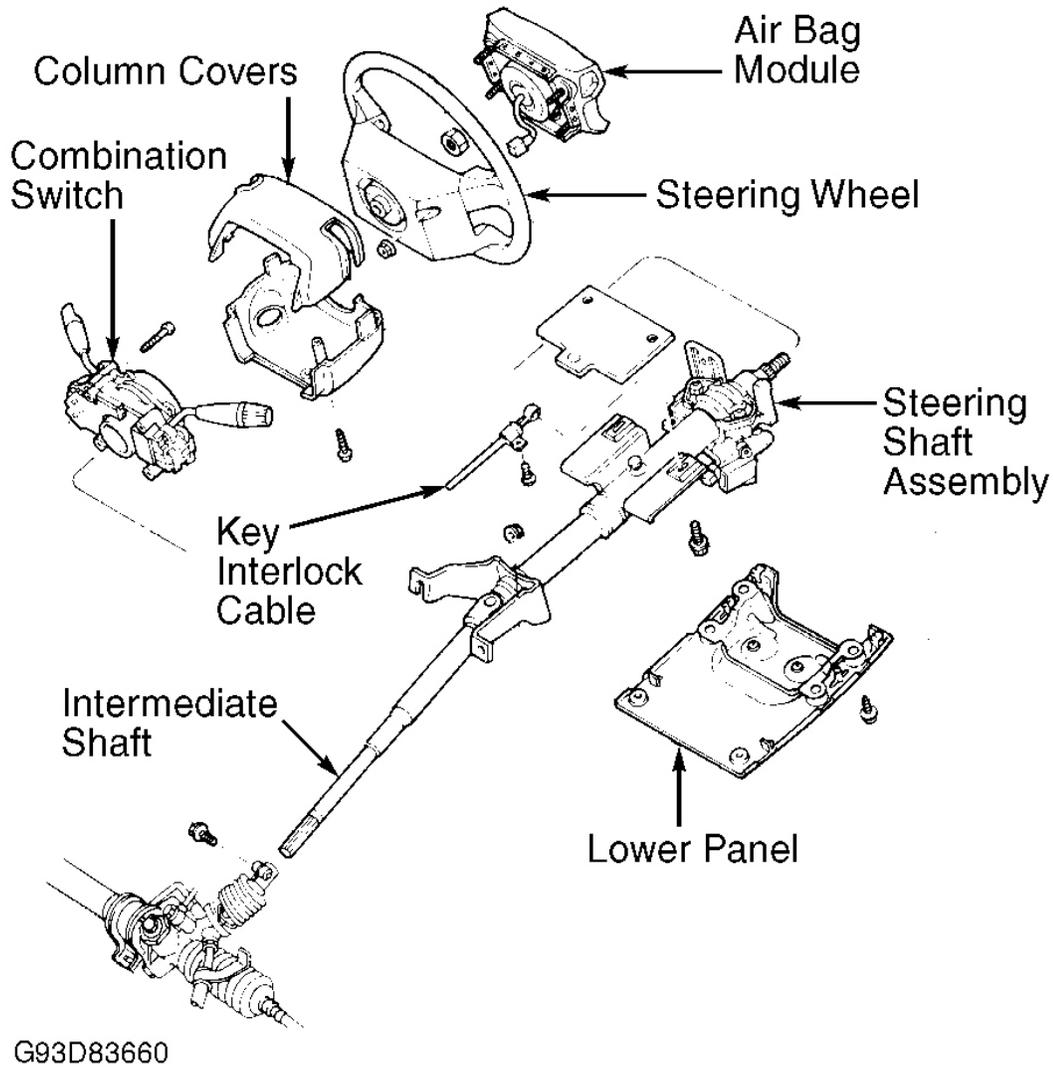
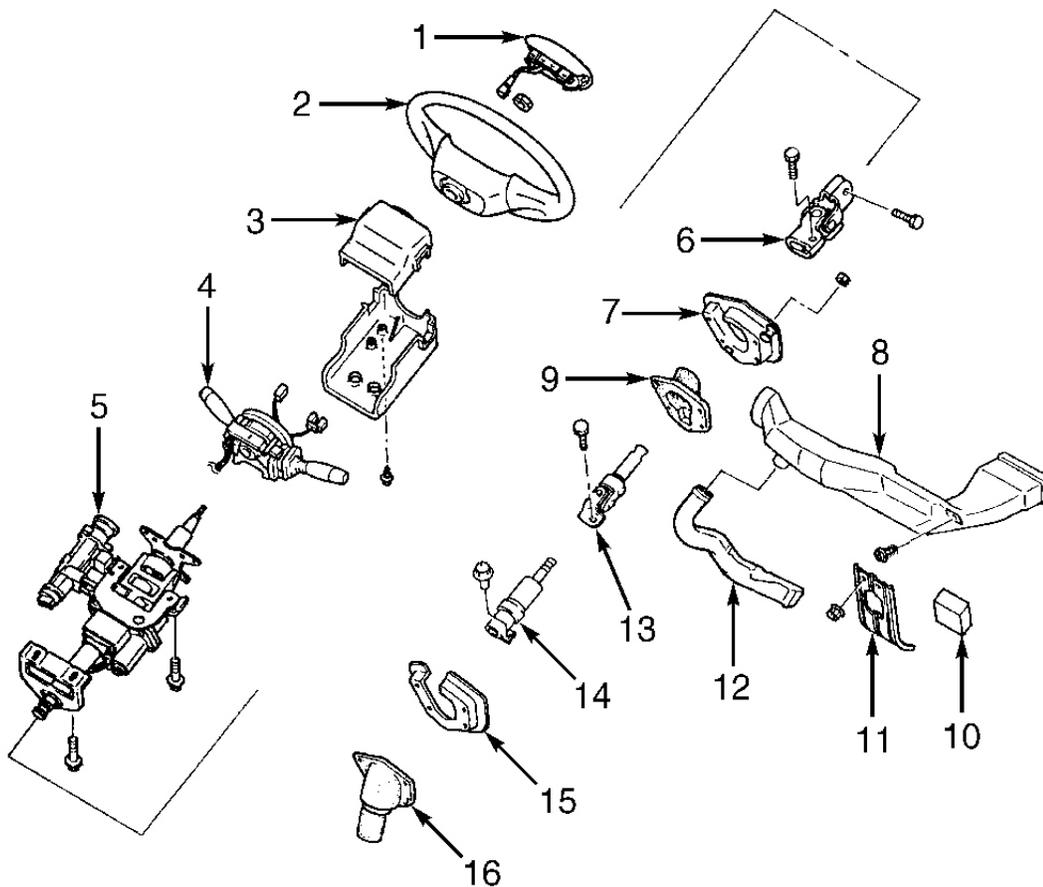


Fig. 5: Exploded View Of Steering Column (Miata)
Courtesy of MAZDA MOTORS CORP.

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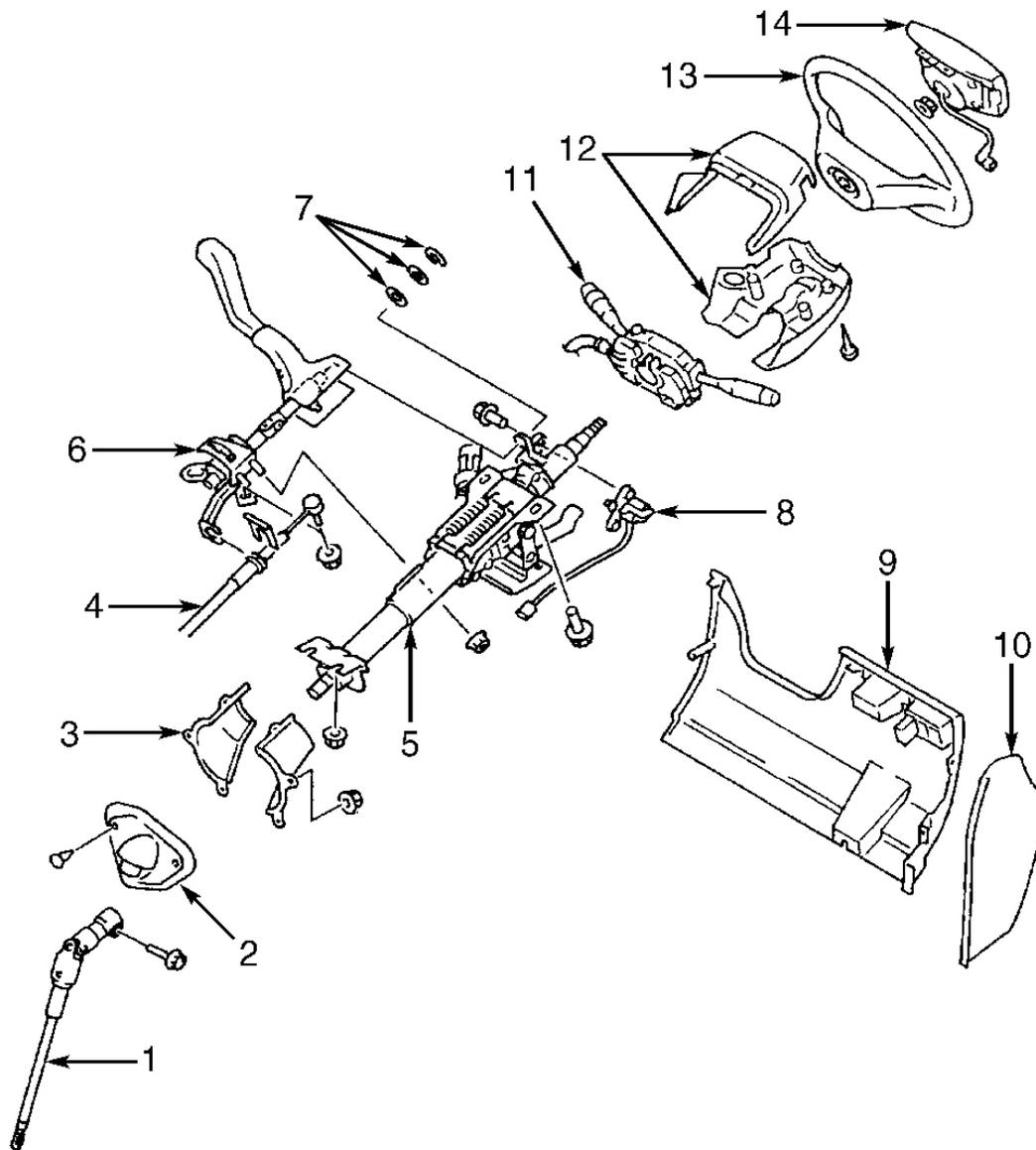
- | | |
|----------------------------|------------------------|
| 1. Air Bag Module | 9. Shaft Seal |
| 2. Steering Wheel | 10. Flasher Unit |
| 3. Steering Column Cover | 11. Bracket |
| 4. Combination Switch | 12. Cover |
| 5. Steering Shaft Assembly | 13. Intermediate Shaft |
| 6. "U" Joint | 14. Collapsible Shaft |
| 7. Cover | 15. Set Plate |
| 8. Air Duct | 16. Dust Cover |

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Fig. 6: Exploded View Of Steering Column (Millenia)
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- | | |
|---|---------------------------|
| 1. Intermediate Shaft | 8. Shift-Lock Actuator |
| 2. Dust Cover | 9. Lower Panel |
| 3. Joint Cover | 10. Kick Panel |
| 4. Selector Cable | 11. Combination Switch |
| 5. Steering Shaft Assembly | 12. Steering Column Cover |
| 6. Selector Shaft Assembly | 13. Steering Wheel |
| 7. Retaining Ring, Wave Washer & Adjustment Washer(s) | 14. Air Bag Module |

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Fig. 7: Exploded View Of Steering Column (MPV)

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Courtesy of MAZDA MOTORS CORP.

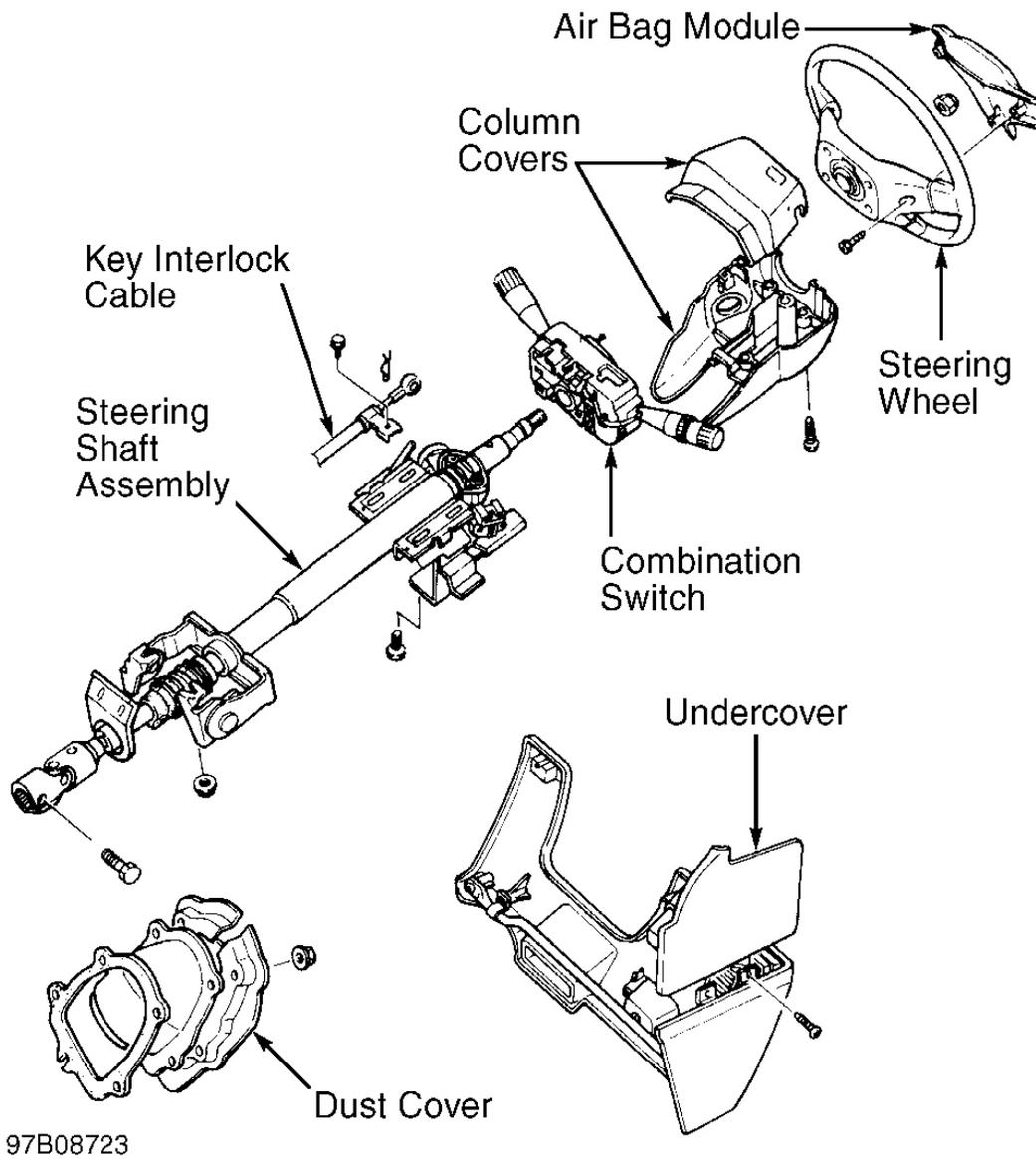


Fig. 8: Exploded View Of Steering Column (MX-3 & Protege)
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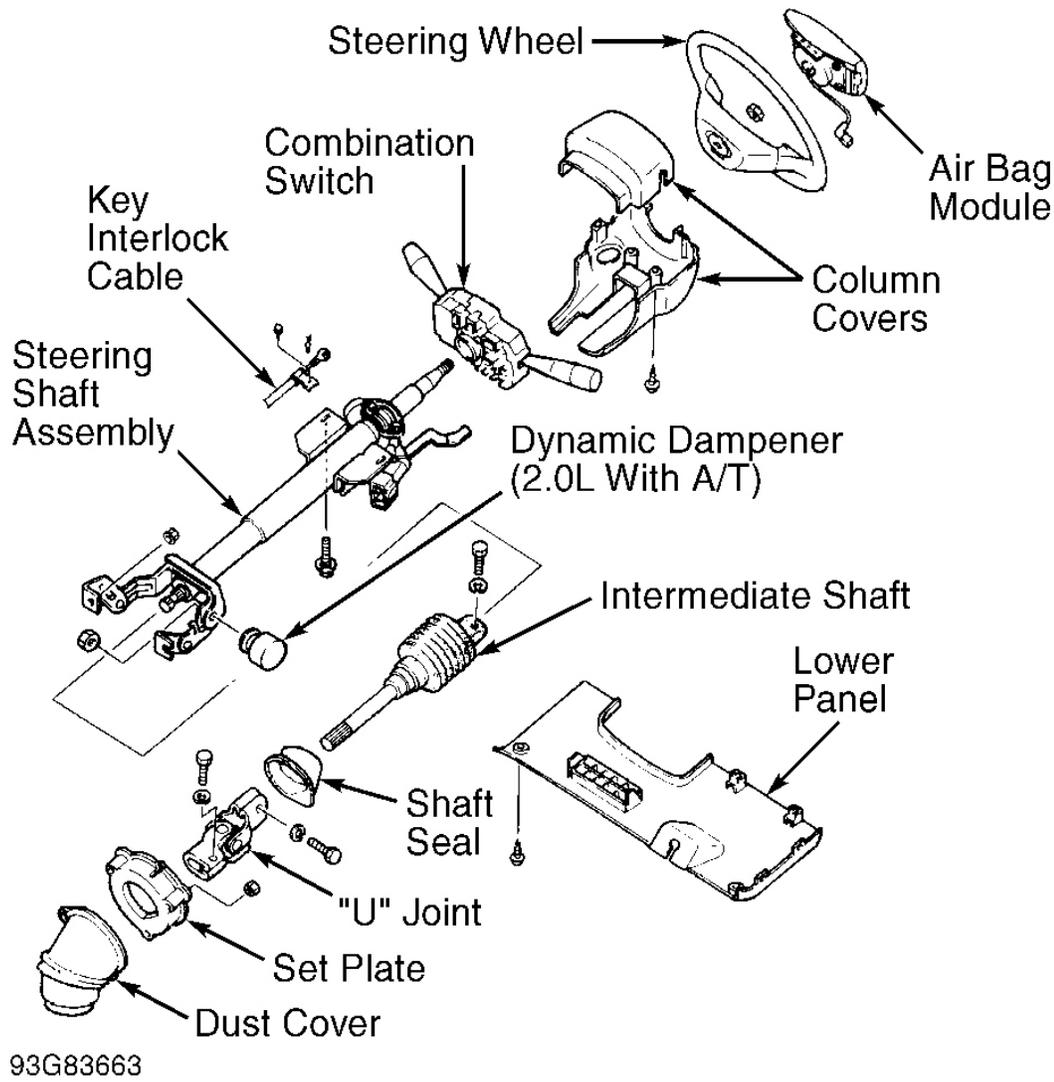
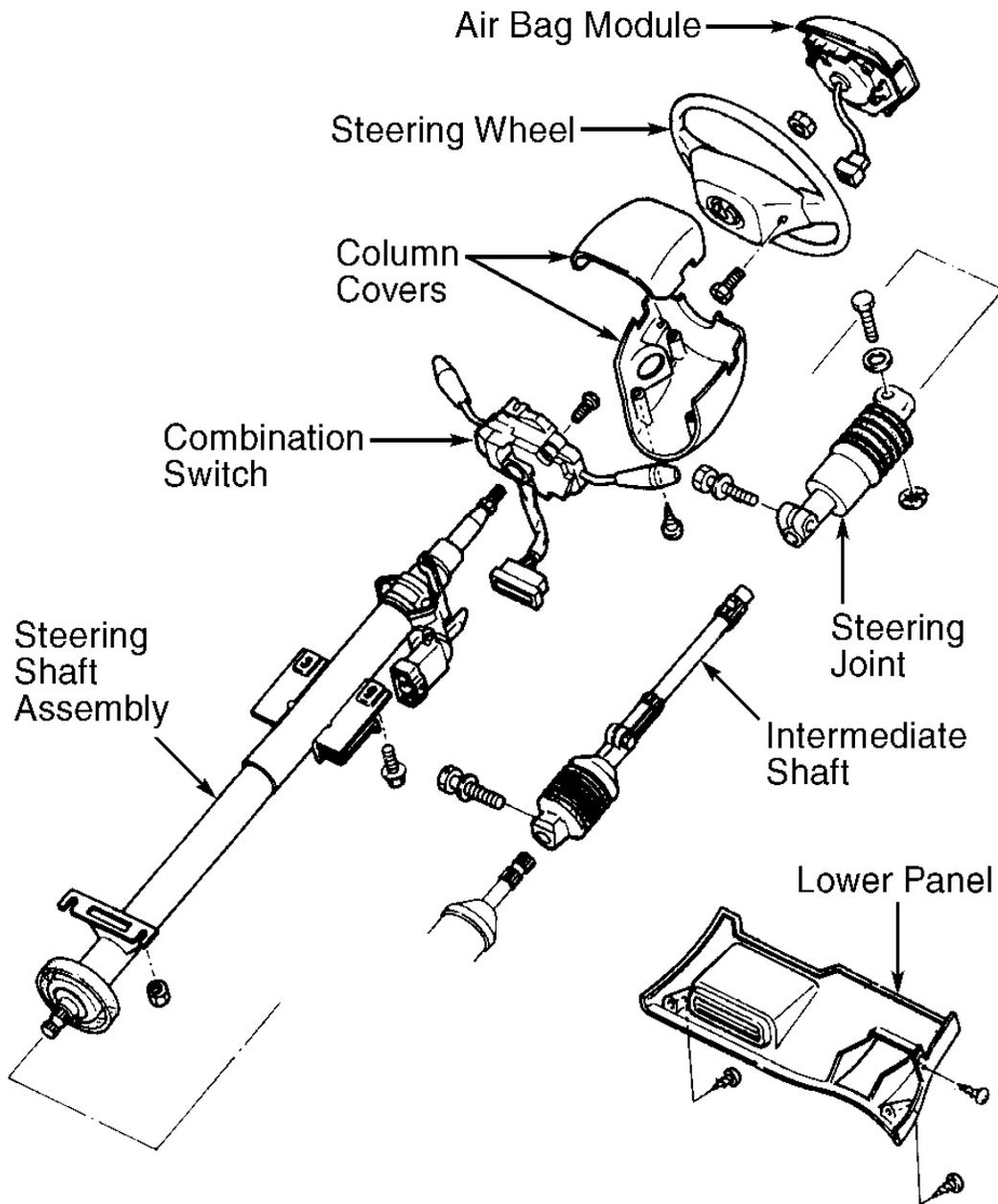


Fig. 9: Exploded View Of Steering Column (MX-6 & 626)
Courtesy of MAZDA MOTORS CORP.

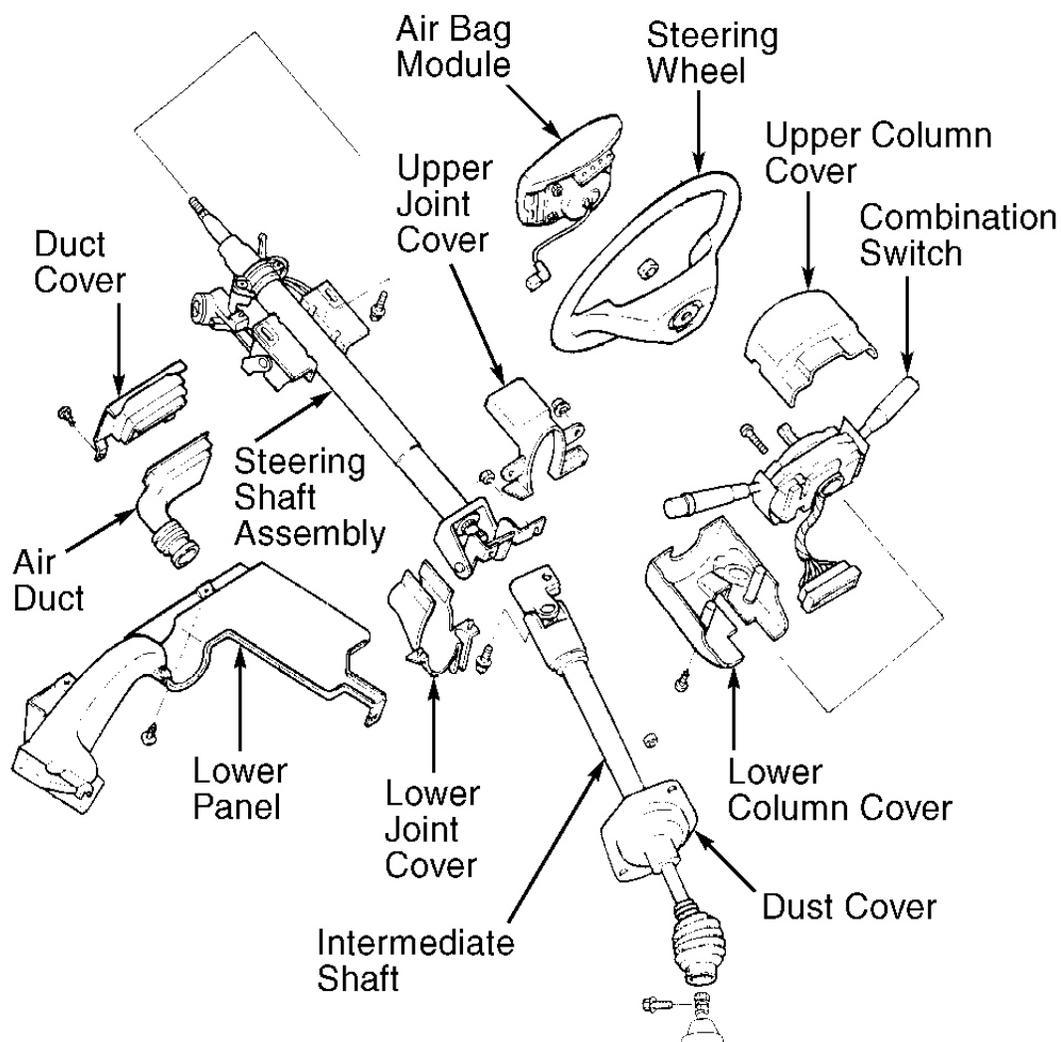
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Fig. 10: Exploded View Of Steering Column (RX7)
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Fig. 11: Exploded View Of Steering Column (929)

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OVERHAUL

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Disassembly

1. Remove driver air bag module, steering wheel and combination switch. See **Fig. 5** -11 . See the following:

- **DRIVER AIR BAG MODULE** .

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- **STEERING WHEEL** .
 - **COMBINATION SWITCH** .
2. Remove ignition switch/steering lock assembly. See **IGNITION SWITCH/STEERING LOCK ASSEMBLY** under REMOVAL & INSTALLATION. Remove steering column. See **STEERING COLUMN** under REMOVAL & INSTALLATION. Turn steering shaft to remove.

Inspection

Inspect all components for damage and wear. Check steering shaft for bends, damage or sheared plastic pins. Check bearings for excessive play. Replace components as necessary. Measure length of steering shaft. See **STEERING SHAFT DIMENSIONS** table. See **Fig. 12** -18 .

Reassembly

To reassemble, reverse disassembly procedure. Grease steering shaft, bushings and bearings. Use NEW shear screws.

STEERING SHAFT DIMENSIONS ⁽¹⁾

Application	Length - In. (mm)
Miata	22.75-22.83 (577.8-579.8)
Millenia	21.95 (557.5)
MPV	24.09-24.21 (612.0-615.0)
MX-3	22.46-22.54 (570.6-572.6)
MX-6 & 626	22.35-22.42 (567.6-569.6)
Protege	21.24-21.31 (539.3-541.3)
RX7	30.69-30.76 (779.5-781.5)
929	24.49-24.57 (622.0-624.0)

(1) For measuring points, see **Fig. 12 -Fig. 18** .

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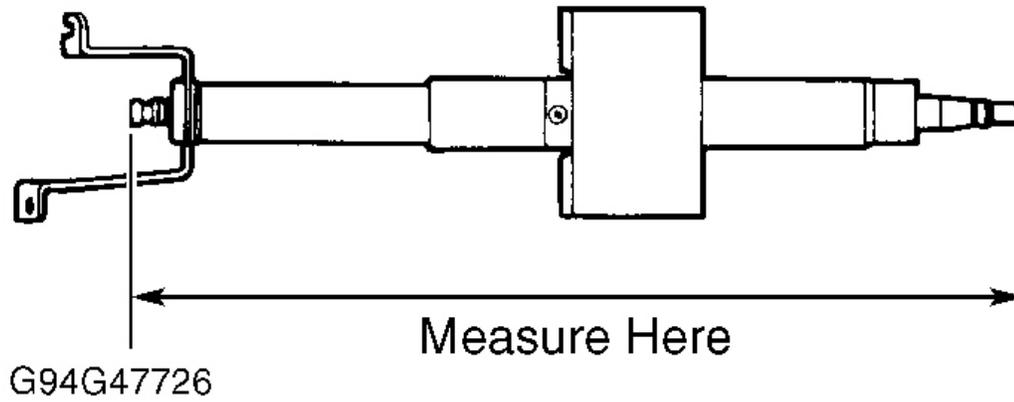


Fig. 12: Measuring Steering Shaft Dimensions (Miata)
Courtesy of MAZDA MOTORS CORP.

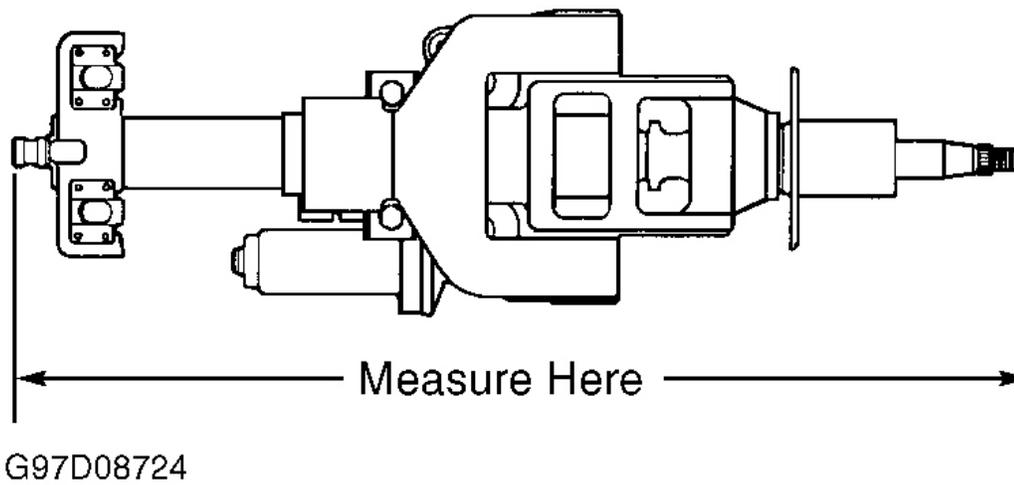
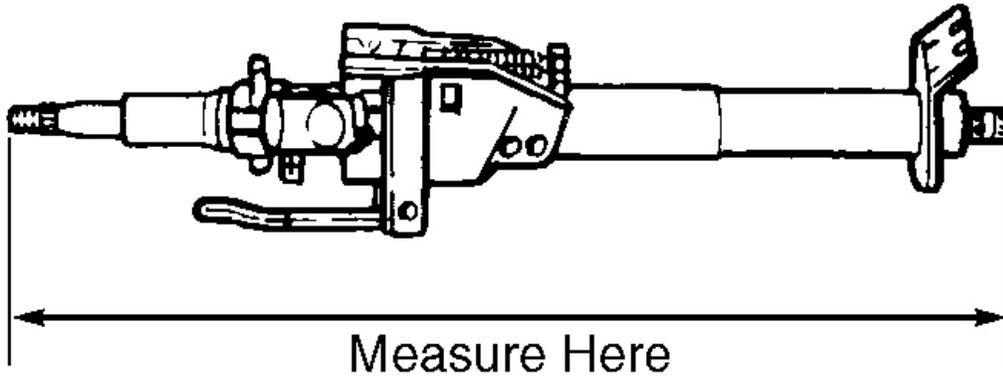


Fig. 13: Measuring Steering Shaft Dimensions (Millenia)
Courtesy of MAZDA MOTORS CORP.

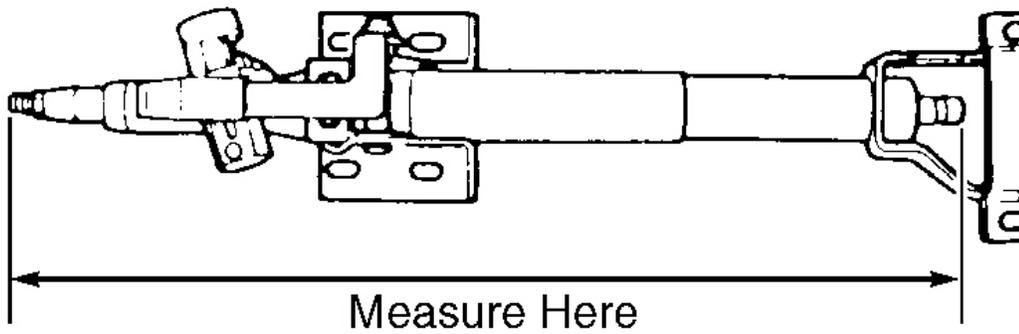
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Fig. 14: Measuring Steering Shaft Dimensions (MPV)
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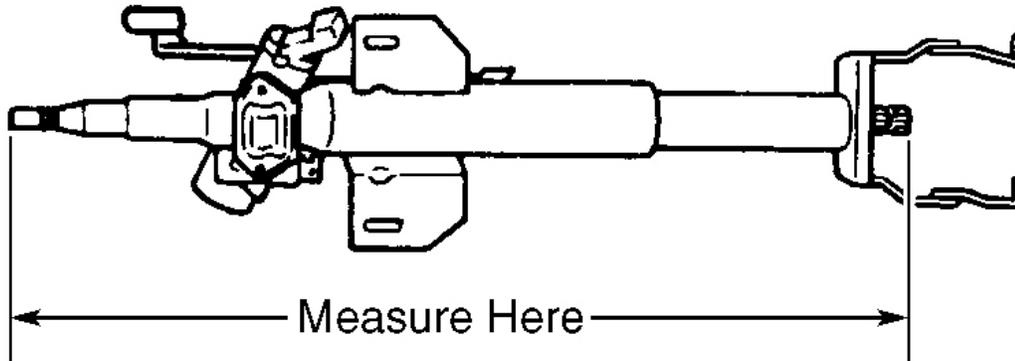


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Fig. 15: Measuring Steering Shaft Dimensions (MX-3, Protege & 323)
Courtesy of MAZDA MOTORS CORP.

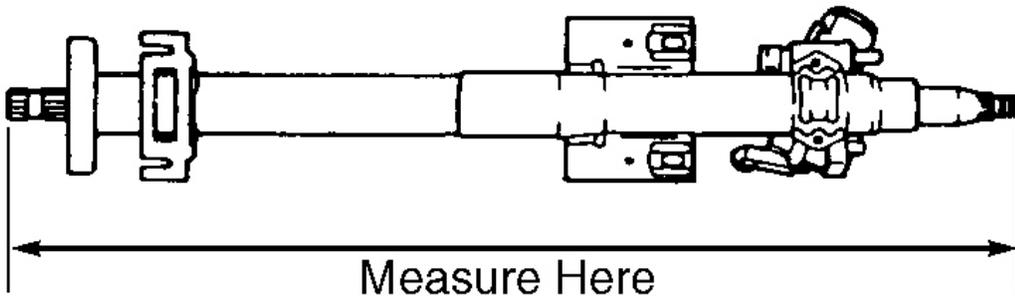
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Fig. 16: Measuring Steering Shaft Dimensions (MX-6, 626)
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Fig. 17: Measuring Steering Shaft Dimensions (RX7)
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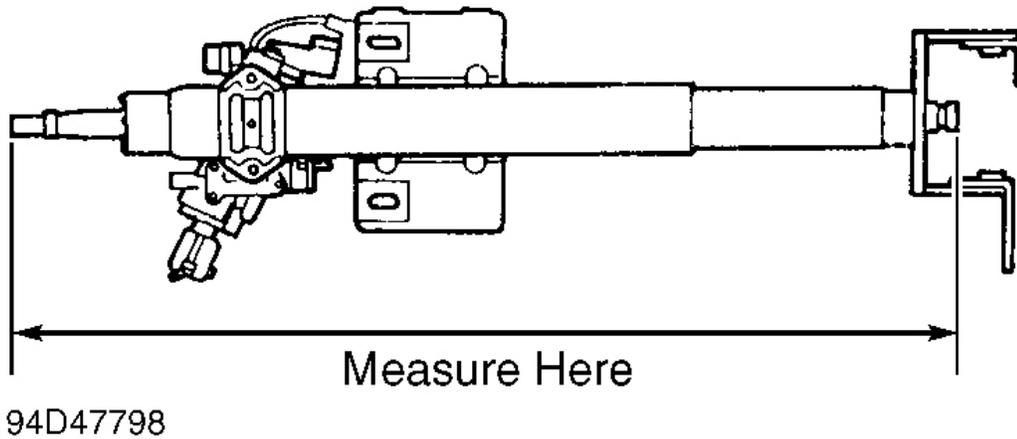


Fig. 18: Measuring Steering Shaft Dimensions (929)
 Courtesy of MAZDA MOTORS CORP.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Steering Column Upper Mounting Bolts	
Miata, Millenia, MPV, MX-6, RX7, 626 & 929	12-16 (16-22)
Steering Column Lower Mounting Bolts	
Miata, RX7 & 929	13-19 (18-26)
Millenia, MX-6 & 626	12-17 (16-23)
Steering Shaft "U" Joint Bolts	13-19 (18-26)
Steering Wheel Lock Nut	29-36 (39-49)
INCH Lbs. (N.m)	
Column Lower Bracket Mounting Bolts	
MX-3	80-124 (9-14)
Protege	53-80 (6-9)
Driver Air Bag Module Bolts/Nuts	
Millenia	80-115 (9-13)
MPV, MX-6, Protege & 626	71-106 (8-12)
Miata	35-53 (4-6)
Key Interlock Cable Bolt	35-53 (4-6)
Steering Column Lower Mounting Nuts	
MPV	62-89 (7-10)
MX-3 & Protege	18-53 (2-6)

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Steering Column Upper Mounting Bolts

MX-3 & Protege

80-124 (9-14)