

D - ADJUSTMENTS

1998 Mitsubishi Montero

1998 ENGINE PERFORMANCE
Mitsubishi - On-Vehicle Adjustments

Diamante, Eclipse, Galant, Mirage, Montero, Montero Sport,
3000GT

ENGINE MECHANICAL

Before performing any on-vehicle adjustments to fuel or ignition system, ensure engine mechanical condition is okay (i.e., engine compression).

VALVE CLEARANCE

VALVE ADJUSTMENT

NOTE: All models use hydraulic valve lifters. Adjustment is not required.

CHECKING HYDRAULIC VALVE LIFTERS

1) Warm engine to normal operating temperature. Remove valve cover. Position cylinder No. 1 at TDC on compression stroke. On 4-cylinder engines, check intake rockers on cylinders No. 1 and 2. Check exhaust rockers on cylinders No. 1 and 3. On V6 engines, check intake rockers on cylinders No. 1, 5 and 6. Check exhaust rockers on cylinders No. 1, 2 and 3.

2) Push downward on end of rocker arm, above lash adjuster. Rotate crankshaft 360 degrees. On 4-cylinder engines, check intake rockers on cylinders No. 3 and 4. Check exhaust rockers on cylinders No. 2 and 4. On V6 engines, check intake rockers on cylinders No. 2, 3 and 4. Check exhaust rockers on cylinders No. 4, 5 and 6. If lash adjuster is normal, it will feel solid.

3) If lash adjuster moves downward easily when pushed, replace adjuster. If lash adjuster feels soft or spongy, air has probably entered lash adjuster. If this occurs, check engine oil level. If engine oil level is okay, check oil screen and oil screen gasket for damage.

4) After repairing cause of air ingestion, warm engine to operating temperature. Drive vehicle at low speed for approximately 5 minutes. Turn engine off for a few minutes.

5) Restart engine and drive at low speed for approximately 5 minutes. Repeat this step several times for about one hour. This helps remove air from engine oil.

IGNITION TIMING

NOTE: Perform all checks with engine at normal operating temperature, cooling fan and accessories off, transmission in Park or Neutral, and front wheels in straight-ahead position. Ignition timing check procedure for Eclipse 2.0L non-turbo not available from manufacturer at time of publication.

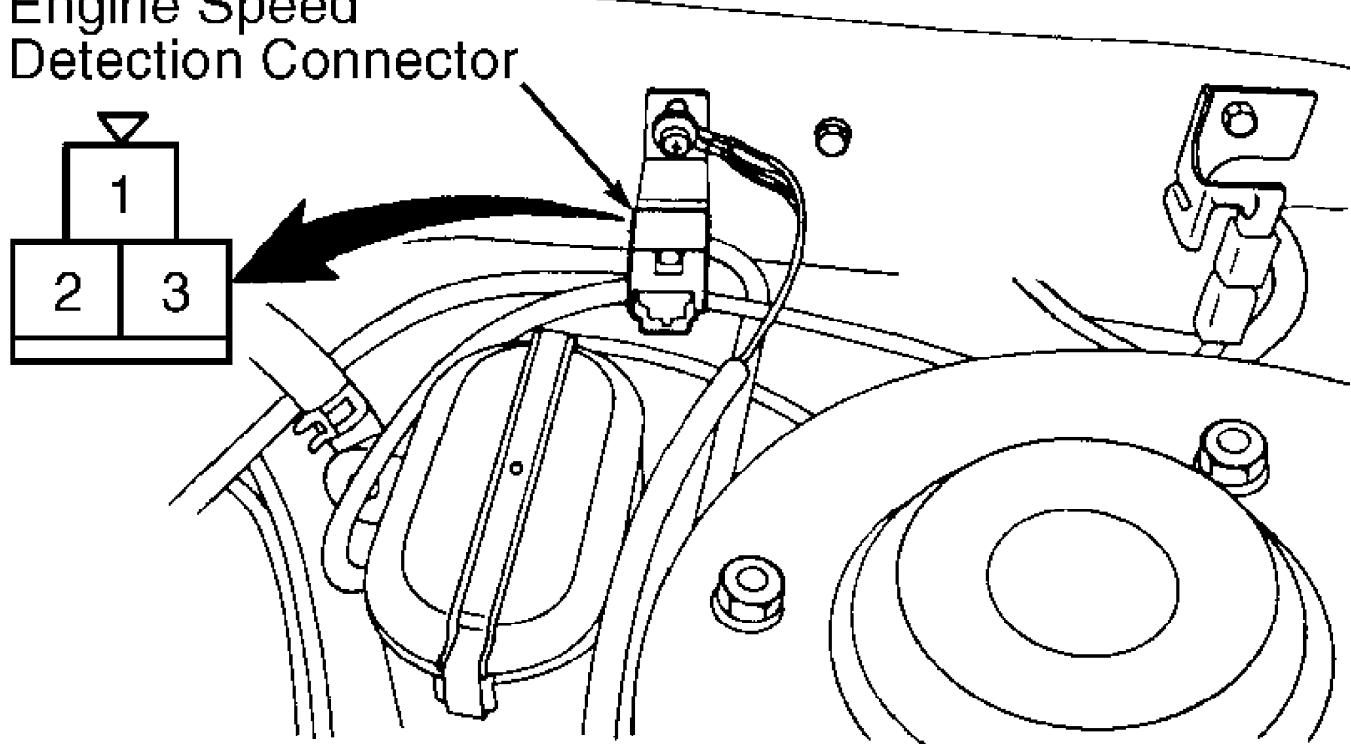
Diamante

1) Ignition timing is controlled by Powertrain Control Module (PCM) and is not adjustable. Manufacturer provides procedure for checking timing. DO NOT attempt to adjust ignition timing by rotating

distributor.

2) Start engine and warm engine until engine temperature coolant is 176-203°F (80-95°C). Turn engine off. Insert a paper clip in engine speed detection connector terminal No. 3. See Fig. 1. Connect a primary voltage detection-type tachometer to paper clip.

Engine Speed Detection Connector



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Fig. 1: Locating Engine Speed Detection Connector (Diamante)
Courtesy of Mitsubishi Motor Sales of America

3) Install a timing light. Start engine and allow it to idle. Ensure engine curb idle speed is about 700 RPM. Curb idle speed is automatically controlled by Idle Air Control (IAC) system. If curb idle speed is not as specified, see DTC P0505 in G - TESTS W/CODES article.

CAUTION: MFI system actuator test must be cancelled or test will continue to run for 27 minutes. Driving vehicle under this condition may damage engine.

4) Turn engine off. Connect scan tool to Data Link Connector (DLC). DLC is located below left side of dash, near steering column. See Fig. 2. Start engine and allow it to idle. Using scan tool, select MFI SYSTEM ACTUATOR TEST, then select item 17 (BASIC IGNITION TIMING). Press "Y" and read basic ignition timing value. See IGNITION TIMING SPECIFICATIONS table. If basic ignition timing is within specification, go to next step. If basic ignition timing is not within specification, cancel MFI system actuator test. See DTC P0335 in G - TESTS W/CODES article.

5) Read actual ignition timing value. If actual ignition timing is not within specification, cancel MFI system actuator test. See DTC P0335 in G - TESTS W/CODES article.

IGNITION TIMING

IGNITION TIMING SPECIFICATIONS (Degrees BTDC @ RPM) TABLE

Application	(1) Basic	(2)	(3)	(4) Actual
1.5L	2-8 @ 650-750	.....	10 @ 600-800	
1.8L	2-8 @ 600-800	.....	5 @ 600-800	
2.0L				
Non-Turbo	(5) .....	.....	.....	(5)
Turbo	2-8 @ 650-850	.....	8 @ 650-850	
2.4L	2-8 @ 650-850	.....	10 @ 650-850	
3.0L	2-8 @ 600-800	.....	15 @ 600-800	
3.5L	2-8 @ 600-800	.....	15 @ 600-800	

- (1) - With ignition timing adjustment connector grounded or vacuum hose (farthest from distributor) disconnected.
- (2) - With ignition timing adjustment connector ungrounded or vacuum hose (farthest from distributor) connected.
- (3) - If vehicle altitude is more than 2300 feet above sea level, actual timing may be advanced (5 degrees).
- (4) - Actual ignition timing is approximate and may fluctuate plus or minus 7 degrees.
- (5) - Ignition timing is NOT adjustable.

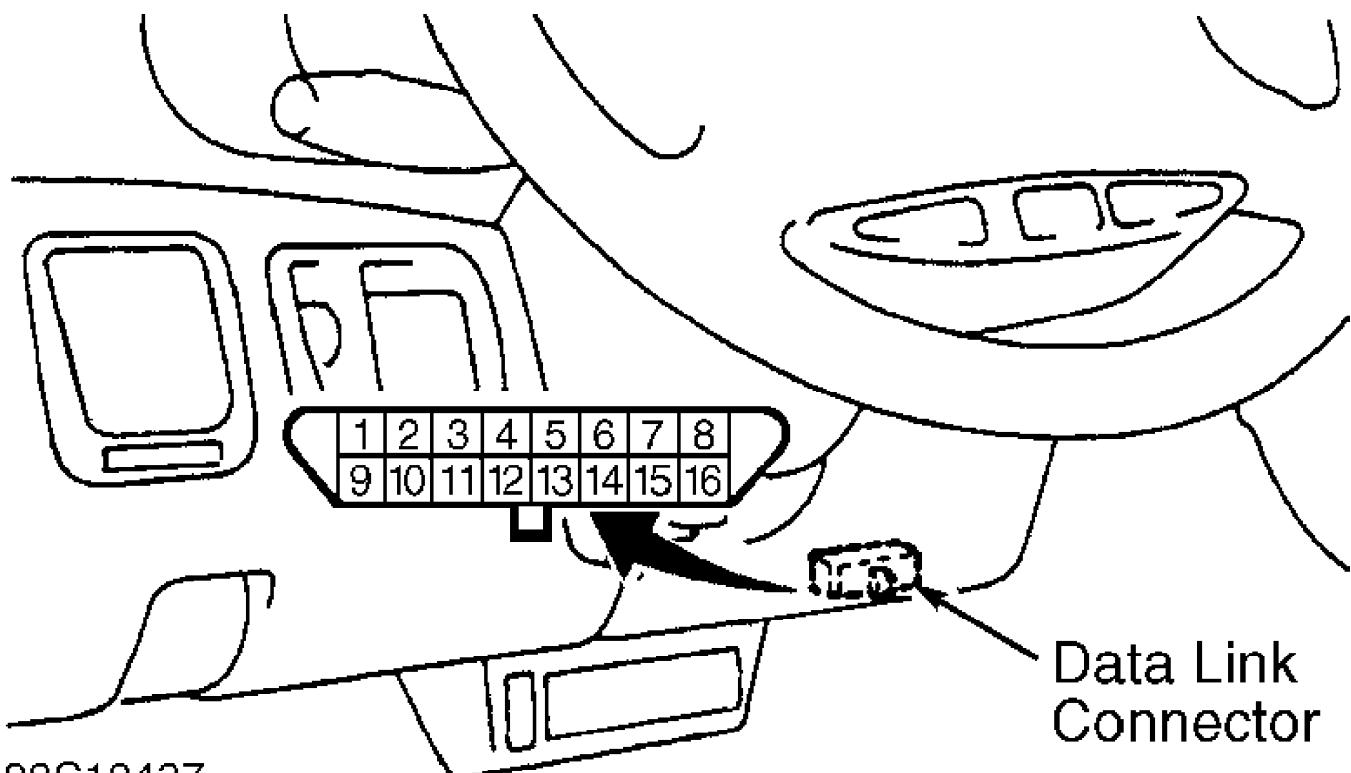
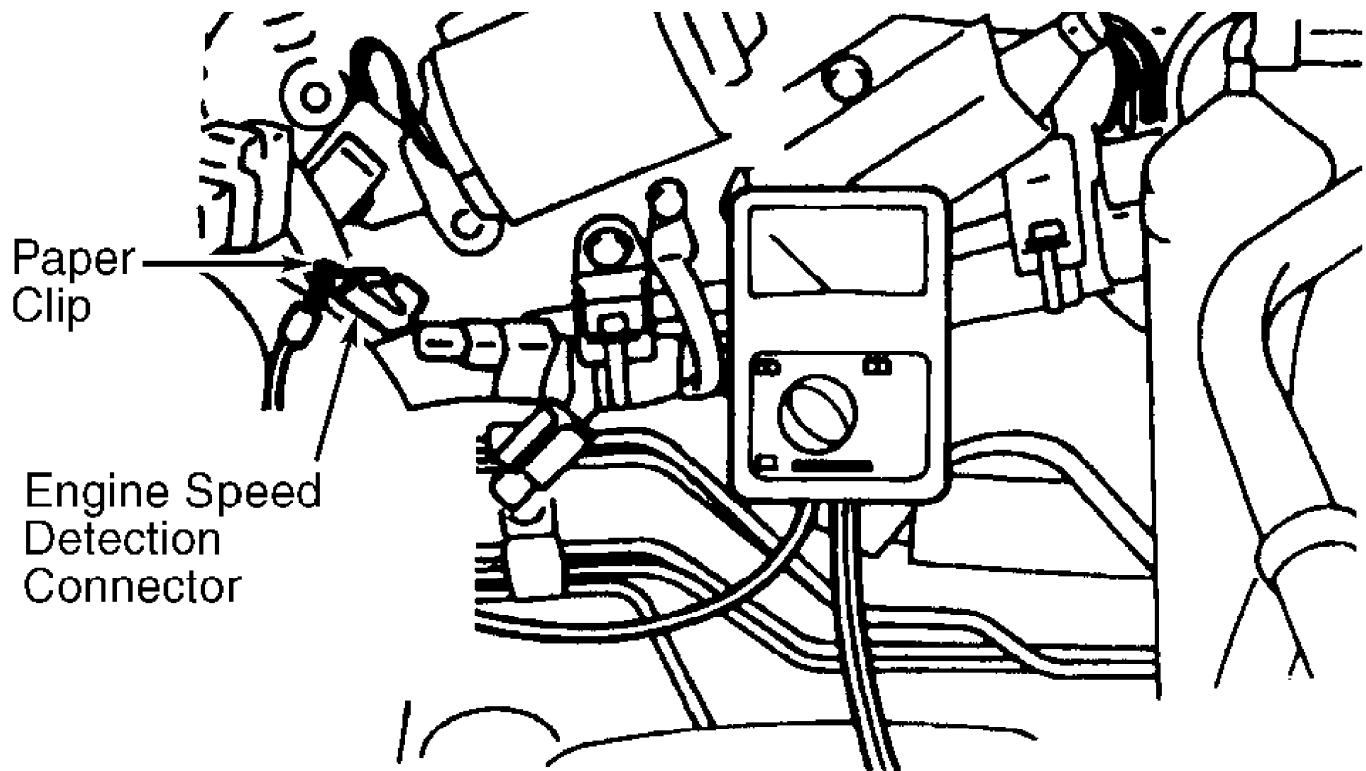


Fig. 2: Locating Data Link Connector (Typical)
Courtesy of Mitsubishi Motor Sales of America

3000GT (DOHC)

- 1) Ignition timing is controlled by Powertrain Control Module (PCM) and is not adjustable. Manufacturer provides procedure for checking timing.
- 2) Start engine and warm engine until engine temperature

coolant is 176-203°F (80-95°C). Turn engine off. Insert a paper clip in engine speed detection connector. See Fig. 3. Connect a tachometer to paper clip.



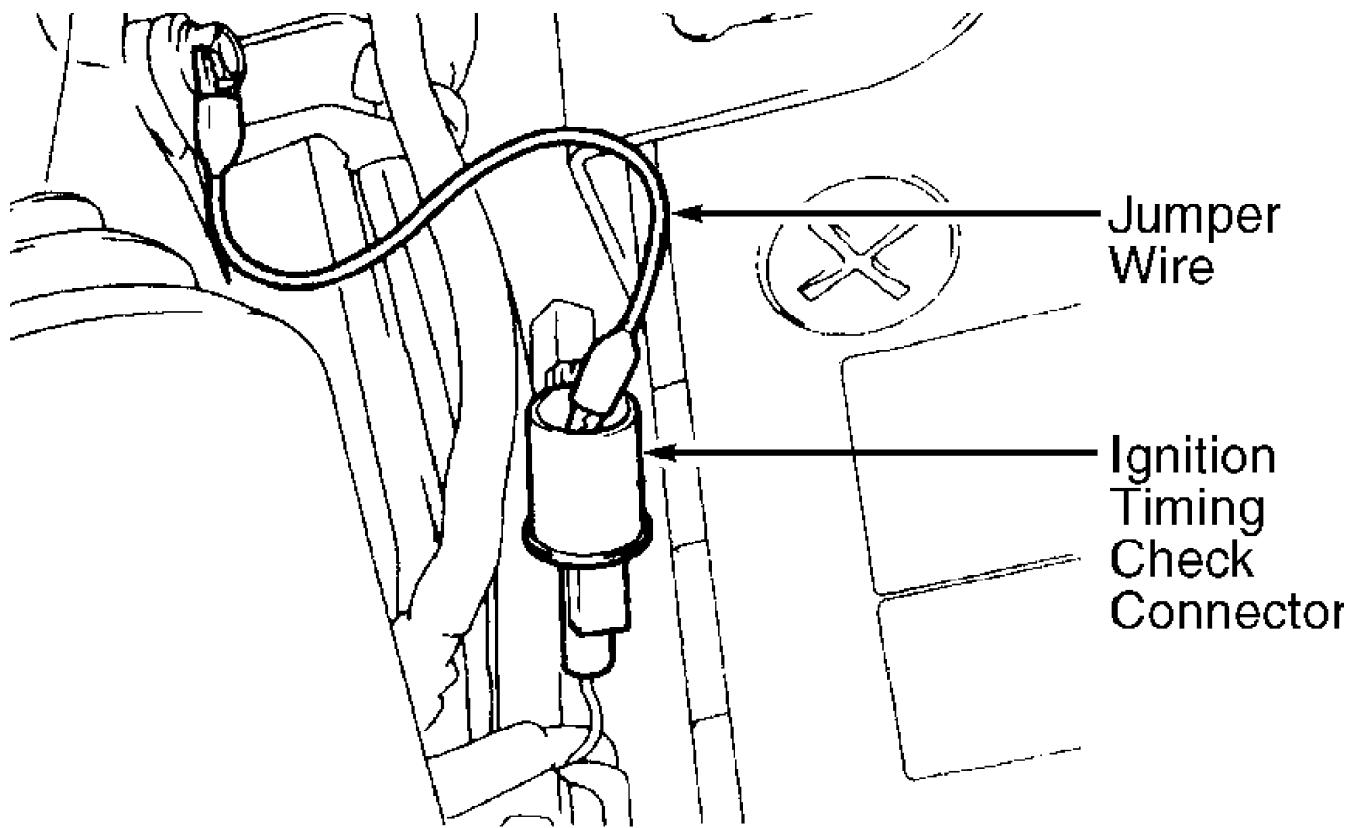
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Fig. 3: Locating Engine Speed Detection Connector (3000GT - DOHC)
Courtesy of Mitsubishi Motor Sales of America

3) Install a timing light. Start engine and allow it to idle. Using tachometer, read curb idle (RPM). Multiply RPM reading by 3 to obtain actual curb idle speed. Ensure curb idle speed is 600-700 RPM. Turn engine off. Curb idle speed is automatically controlled by Idle Air Control (IAC) system. If curb idle speed is not as specified, see DTC P0505 in G - TESTS W/CODES article.

4) Disconnect waterproof female connector from Brown ignition timing check connector. See Fig. 4. Using a jumper wire, ground ignition timing check terminal to read basic ignition timing. Using timing light, read basic ignition timing value. See IGNITION TIMING SPECIFICATIONS table. If basic ignition timing is within specification, go to next step. If basic ignition timing is not within specification, see DTC P0335 in G - TESTS W/CODES article.

5) Remove jumper wire to read actual ignition timing. Using timing light, read actual ignition timing value. If actual ignition timing is not within specification, see DTC P0335 in G - TESTS W/CODES article.



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Fig. 4: Locating Ignition Timing Check Connector
Courtesy of Mitsubishi Motor Sales of America

3000GT (SOHC)

1) Ignition timing is controlled by Powertrain Control Module (PCM) and is not adjustable. Manufacturer provides procedure for checking timing.

2) Start engine and warm engine until engine temperature coolant is 176-203°F (80-95°C). Turn engine off. Insert a paper clip in noise filter connector. See Fig. 5. Connect a tachometer to paper clip.

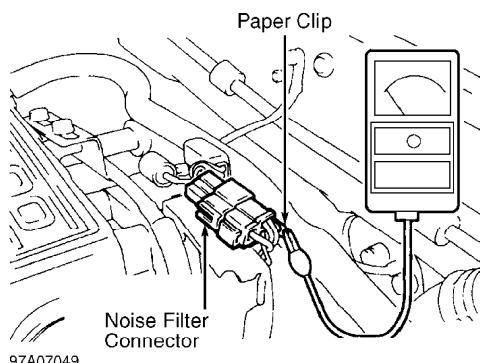


Fig. 5: Locating Noise Filter Connector
Courtesy of Mitsubishi Motor Sales of America

3) Install a timing light. Start engine and allow it to idle. Using tachometer, read curb idle speed (RPM). Ensure curb idle speed

is 600-700 RPM. Turn engine off. Curb idle speed is automatically controlled by Idle Air Control (IAC) system. If curb idle speed is not as specified, see DTC P0505 in G - TESTS W/CODES article.

4) Disconnect waterproof female connector from Brown ignition timing check connector. See Fig. 4. Using a jumper wire, ground ignition timing check terminal to read basic ignition timing. Using timing light, read basic ignition timing value. See IGNITION TIMING SPECIFICATIONS table. If basic ignition timing is within specification, go to next step. If basic ignition timing is not within specification, see DTC P0335 in G - TESTS W/CODES article.

5) Remove jumper wire to read actual ignition timing. Using timing light, read actual ignition timing value. If actual ignition timing is not within specification, see DTC P0335 in G - TESTS W/CODES article.

All Other Models

1) Ignition timing is controlled by Powertrain Control Module (PCM) and is not adjustable. Manufacturer provides procedure for checking timing. On models with distributor, DO NOT attempt to adjust ignition timing by rotating distributor.

2) Connect scan tool to Data Link Connector (DLC). DLC is located below dash, near steering column. See Fig. 2. Install a timing light. Start engine and allow it to idle.

3) Using scan tool, read curb idle speed (RPM). Ensure curb idle speed is about 750 RPM. Turn engine off. Curb idle speed is automatically controlled by Idle Air Control (IAC) system. If curb idle speed is not as specified, see DTC P0505 in G - TESTS W/CODES article.

CAUTION: MFI system actuator test must be cancelled or test will continue to run for 27 minutes. Driving vehicle under this condition may damage engine.

4) Using scan tool, select MFI SYSTEM ACTUATOR TEST, then select item 17 (BASIC IGNITION TIMING). Read basic ignition timing value. See IGNITION TIMING SPECIFICATIONS table. If basic ignition timing is within specification, go to next step. If basic ignition timing is not within specification, cancel MFI system actuator test. See DTCS P0100 (except Mirage 1.5L), P0105, P0115 and P0335 in G - TESTS W/CODES article.

5) Read actual ignition timing value. If actual ignition timing is not within specification, cancel MFI system actuator test. See DTCS P0100 (except Mirage 1.5L), P0105, P0115 and P0335 in G - TESTS W/CODES article.

IDLE SPEED & MIXTURE

*** PLEASE READ THIS FIRST ***

NOTE: Perform adjustments with engine at normal operating temperature, cooling fan and accessories off, transmission in Park or Neutral, and front wheels in straight-ahead position.

BASIC IDLE SPEED

NOTE: Basic idle speed adjustment information on Eclipse 2.0L non-turbo engine is not available from manufacturer at time of publication.

3000GT

1) Ensure vehicle is at normal operating temperature with all

lights, cooling fan and accessories off. Shift transmission into Neutral or Park position.

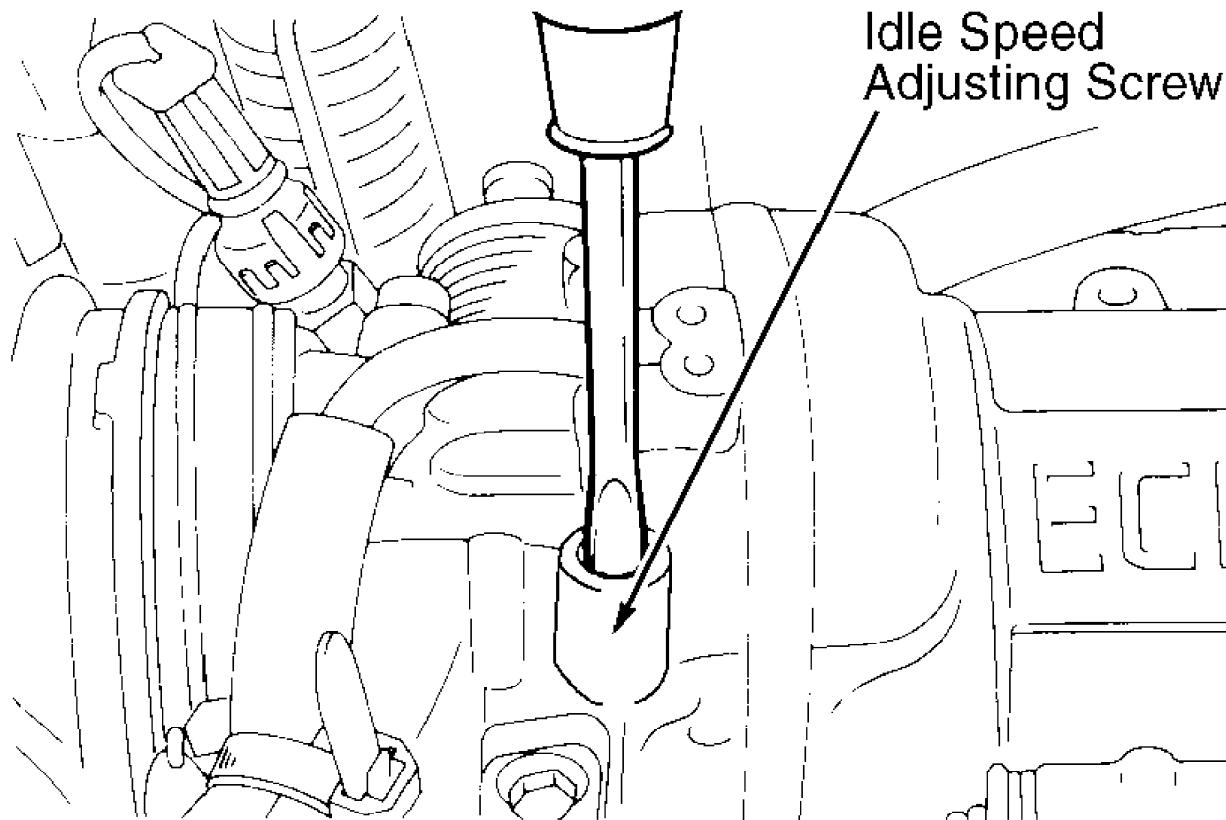
2) If not using scan tool, go to next step. Connect scan tool to Data Link Connector (DLC). DLC is located below dash, near steering column. See Fig. 2. Go to step 5).

3) On DOHC models, insert a paper clip in engine speed detection connector. See Fig. 3. On SOHC models, insert paper clip in noise filter connector. See Fig. 5. On all models, connect a tachometer to paper clip.

4) Connect a jumper wire between ground and Data Link Connector (DLC) terminal No. 1. See Fig. 2. Disconnect waterproof female connector from Brown ignition timing check connector. See Fig. 4. Using a jumper wire, ground ignition timing check terminal.

5) Start engine and allow it to idle. Check basic idle speed. See IDLE SPEED SPECIFICATIONS table. On DOHC models, multiply tachometer reading by 3 to obtain actual basic idle speed. If idle speed is not within specification, turn engine speed adjusting screw until correct engine speed is obtained. See Fig. 6. Access to speed adjusting screw is obtained by removing rubber plug on throttle body.

6) If idle speed cannot be lowered by turning engine speed adjusting screw, determine if Throttle Position (TP) sensor has been moved. Adjust TP sensor if necessary. See TP SENSOR ADJUSTMENT under THROTTLE POSITION (TP) SENSOR. If TP sensor is okay, replace throttle body.



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Fig. 6: Adjusting Idle Speed (Typical)
Courtesy of Mitsubishi Motor Sales of America

IDLE SPEED SPECIFICATIONS TABLE

Application	Curb Idle	Basic Idle
1.5L & 1.8L	600-800	650-750
2.0L		
Non-Turbo	700-900	(1)
Turbo	650-850	700-800
2.4L	650-850	700-800
3.0L & 3.5L	600-800	650-750

(1) - Information is not available from manufacturer at time of publication.

NOTE: Basic idle speed should only be adjusted after verifying spark plugs, fuel injectors, idle air control motor and engine compression are okay.

All Other Models

1) Ensure vehicle is at normal operating temperature with all lights, cooling fan and accessories off. Shift transmission into Neutral or Park position.

2) Basic idle speed can only be adjusted using a scan tool to ground Data Link Connector (DLC). Connect scan tool to DLC. DLC is located below dash, near steering column. See Fig. 2.

3) Start engine and allow it to idle. Using scan tool, select MFI SYSTEM ACTUATOR TEST, then select item 30. Check basic idle speed. See IDLE SPEED SPECIFICATIONS table.

CAUTION: MFI system actuator test must be cancelled or test will continue to run for 27 minutes. Driving vehicle under this condition may damage engine.

4) Cancel MFI system actuator test. If idle speed is not within specification, turn engine speed adjusting screw until correct engine speed is obtained. See Fig. 6. Access to speed adjusting screw is obtained by removing rubber plug on throttle body.

5) If idle speed cannot be lowered by turning engine speed adjusting screw, determine if fixed Speed Adjusting Screw (SAS). Fixed SAS is stop screw contacting throttle lever. See FIXED SPEED ADJUSTING SCREW for procedure.

6) After all adjustments are verified to be correct, possible cause of incorrect idle speed is deterioration of Idle Air Control (IAC) circuit. See DTC P0505 in G - TESTS W/CODES article.

CURB (SLOW) IDLE SPEED

NOTE: Curb idle speed is controlled by Idle Air Control (IAC) motor. Adjustment is usually not necessary. For curb idle speed specifications, see IDLE SPEED SPECIFICATIONS table under BASIC IDLE SPEED.

1) Check ignition timing and adjust if necessary. See IGNITION TIMING. Run engine at 2000-3000 RPM for more than 5 seconds. Allow engine to idle for 2 minutes. Check curb idle speed.

2) If curb idle speed is not within specification, check IAC system. See DTC P0505 in G - TESTS W/CODES article. If IAC system is okay, adjust basic idle speed. See BASIC IDLE SPEED.

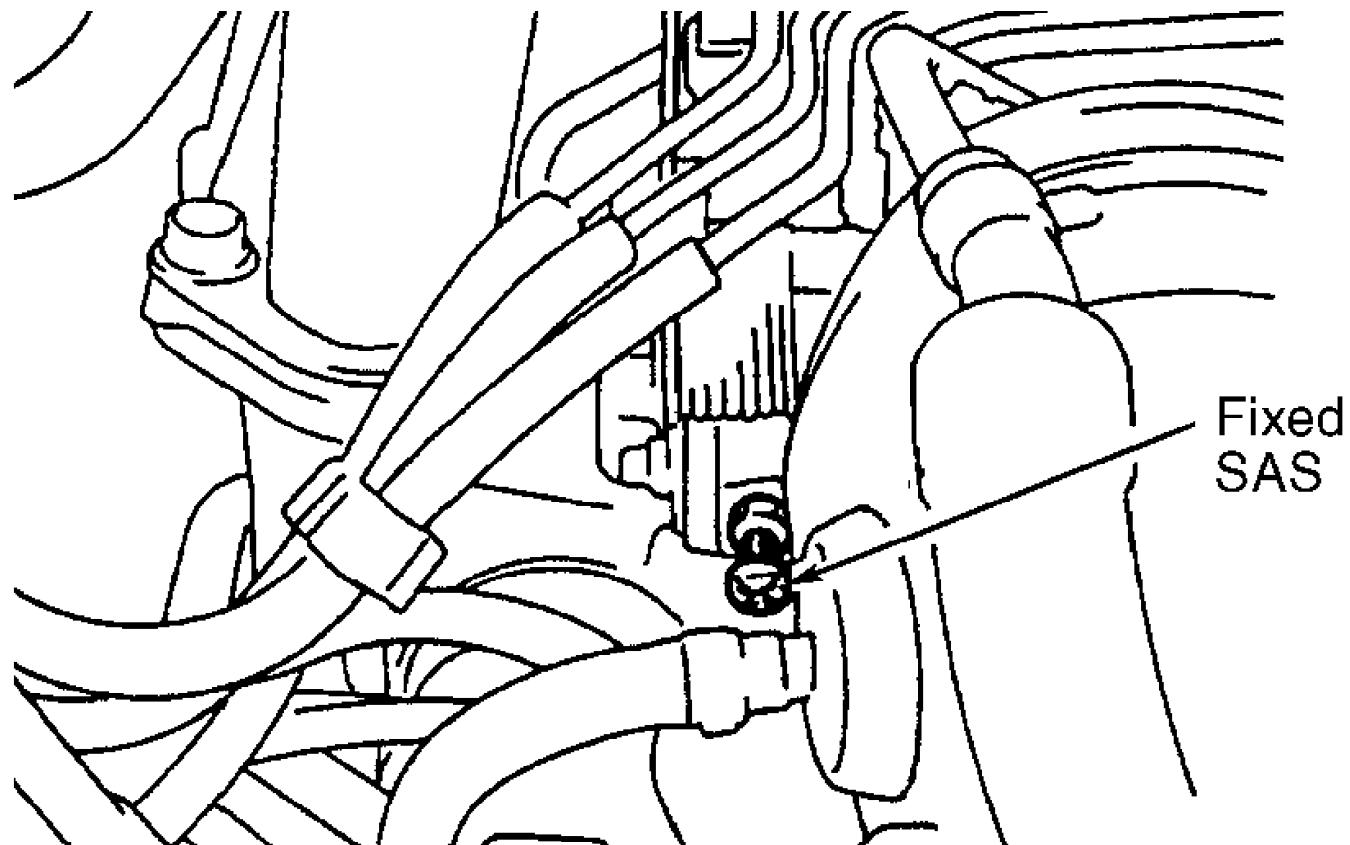
FIXED SPEED ADJUSTING SCREW

NOTE: Fixed Speed Adjusting Screw (SAS) is preset by manufacturer and usually does not require adjustment. Only adjust fixed SAS if other adjustment procedures require it, or if

manufacturer's original setting has been changed.

1) Loosen throttle cable. Loosen fixed SAS lock nut. See Fig. 7. Turn fixed SAS counterclockwise until throttle valve is fully closed. Turn fixed SAS clockwise until throttle valve begins to open. Turn fixed SAS clockwise 1 1/4 turns after throttle valve begins to open.

2) Tighten lock nut while holding fixed SAS in position. Adjust throttle cable. Adjust basic idle speed. See BASIC IDLE SPEED. Adjust Throttle Position (TP) sensor. See TP SENSOR ADJUSTMENT under THROTTLE POSITION (TP) SENSOR.



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Fig. 7: Adjusting Fixed Speed Adjusting Screw (Typical)
Courtesy of Mitsubishi Motor Sales of America

IDLE MIXTURE

NOTE: Idle mixture is computer controlled on fuel injected engines and is nonadjustable. CO level should not exceed .5%. HC level should not exceed 100 ppm. If mixture levels exceed limits, see G - TESTS W/CODES article.

THROTTLE POSITION (TP) SENSOR

TP SENSOR ADJUSTMENT

NOTE: Ensure basic idle speed is set to specification before adjusting TP sensor. See BASIC IDLE SPEED under IDLE SPEED &

MIXTURE. Perform all adjustments with engine at normal operating temperature, front wheels in straight-ahead position, cooling fan and all accessories off, and transmission in Park or Neutral.

Eclipse 2.0L Non-Turbo

1) TP sensor is not adjustable. Disconnect TP sensor connector. Using external ohmmeter, measure resistance between TP sensor terminals No. 1 and 3. See Fig. 8. If resistance is not 3500-6500 ohms, replace TP sensor.

2) While slowly rotating throttle valve from idle to full open, measure resistance between TP sensor terminals No. 2 and 3. If resistance does not change smoothly in proportion to throttle opening, replace TP sensor.

Montero

1) Disconnect TP sensor connector. Using jumper wires, connect an external ohmmeter between TP sensor terminals No. 1 and 2. See Fig. 9. Insert .025" (.65 mm) feeler gauge between fixed speed adjusting screw and throttle lever.

2) Loosen TP sensor mounting screws and rotate TP sensor fully clockwise. Ensure there is continuity between terminals No. 1 and 2. Rotate TP sensor counterclockwise until there is no continuity, and tighten screws. Install Test Harness (MB991348) between TP sensor and harness connector.

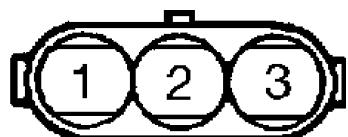
3) Turn ignition on. Using external voltmeter, measure TP sensor output voltage between terminals No. 1 and 3. If voltage is not .4-1.0 volt, check harness and sensor. See DTC P0120 in G - TESTS W/CODES article.

All Other Models

1) Disconnect TP sensor connector. Using jumper wires, connect an external ohmmeter between TP sensor terminals No. 1 and 2 on Diamante or No. 3 and 4 on all other models. See Fig. 9. On Diamante and Mirage 1.8L with cruise control, insert .055" (1.40mm) feeler gauge between fixed speed adjusting screw and throttle lever. On Galant, insert .025" (.65 mm) feeler gauge between fixed speed adjusting screw and throttle lever. On all other models, insert .018" (.45 mm) feeler gauge between fixed speed adjusting screw and throttle lever.

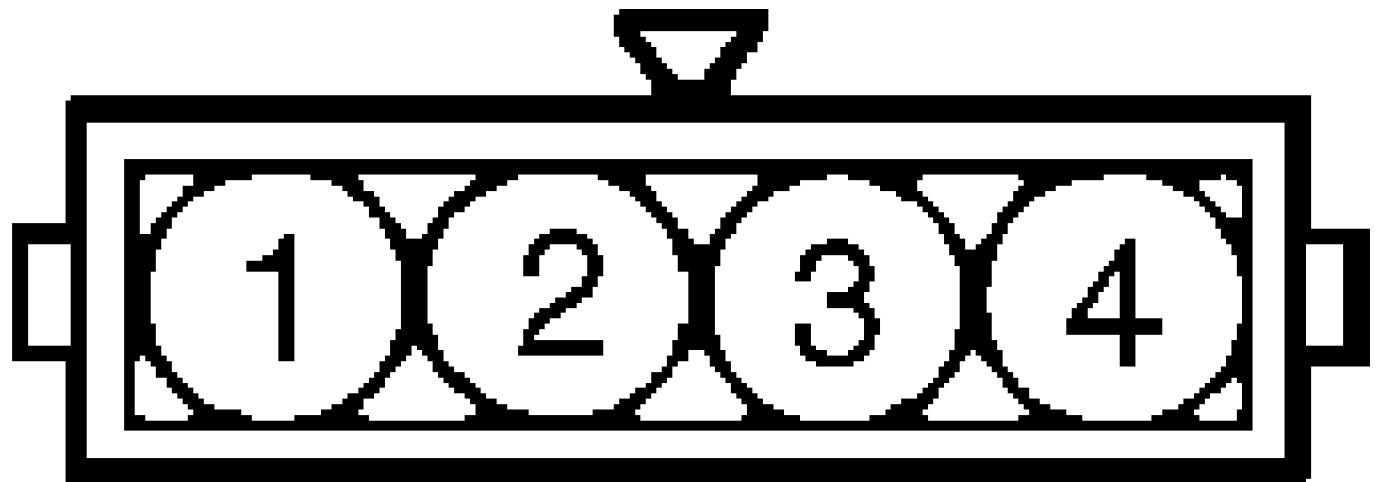
2) Loosen TP sensor mounting screws and rotate TP sensor fully counterclockwise. Ensure there is continuity between terminals No. 1 and 2 on Diamante, or No. 3 and 4 on all other models. Rotate TP sensor clockwise until there is no continuity and tighten screws. Install Test Harness (MB991348) between TP sensor and harness connector.

3) Turn ignition on. Using external voltmeter, measure TP sensor output voltage between terminals No. 1 and 3 on Diamante, or No. 2 and 4 on all other models. If voltage is not .4-1.0 volt, check harness and sensor. See DTC P0120 in G - TESTS W/CODES article.



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Fig. 8: TP Sensor Connector Terminals (Eclipse 2.0L Non-Turbo)
Courtesy of Mitsubishi Motor Sales of America



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Fig. 9: TP Sensor Connector Terminals (All Other Models)
Courtesy of Mitsubishi Motor Sales of America