

D - ADJUSTMENTS

1991 Mitsubishi Montero

1991 ENGINE PERFORMANCE On-Vehicle Adjustments

Chrysler Motors: Colt, Colt 200, Colt Vista,
Ram-50, Stealth, Summit
Mitsubishi: Eclipse, Galant, Mirage, Montero,
Pickup, 3000GT

ENGINE MECHANICAL

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

VALVE CLEARANCE

NOTE: All engines except 1.5L use hydraulic valve lifters. Valve adjustment is only required on 1.5L engines. To check hydraulic valve lifter operation, see CHECKING HYDRAULIC VALVE LIFTERS.

MECHANICAL VALVE LIFTERS

CAUTION: DO NOT rotate crankshaft in opposite direction of normal engine rotation.

1.5L

1) Ensure engine is at normal operating temperature. Remove all spark plugs and valve cover. Rotate crankshaft to position cylinder No. 1 on TDC of compression stroke. Adjust intake valves on cylinders No. 1 and No. 2, and exhaust valves on cylinders No. 1 and No. 3. See VALVE CLEARANCE ADJUSTMENT table for specification.

2) Rotate crankshaft 360 degrees to position cylinder No. 4 on TDC of compression stroke. Adjust intake valves on cylinders No. 3 and No. 4, and exhaust valves on cylinders No. 2 and No. 4.

VALVE CLEARANCE ADJUSTMENT TABLE

Application	Cold		Hot	
	In. (mm)		In. (mm)	
Intake003 (.07)006 (.15)	
Exhaust007 (.17)010 (.25)	

CHECKING HYDRAULIC VALVE LIFTERS

Except 1.5L

1) Remove valve cover. Push downward on end of rocker arm above lash adjuster. If lash adjuster is normal, it will feel hard. If lash adjuster moves downward easily when pushed, replace adjuster.

2) If lash adjuster feels soft or spongy, oil with 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.

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

4) 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 adjustments with engine at normal operating temperature, cooling fan and accessories off, transmission in Park or Neutral, and front wheels in straight-ahead position. Set curb idle speed to specification. See IDLE SPEED SPECIFICATIONS table under IDLE SPEED & MIXTURE.

IGNITION TIMING

1) Locate ignition timing adjustment connector. See IGNITION TIMING ADJUSTMENT CONNECTOR LOCATION table. Connect jumper wire between ignition timing adjustment connector and ground. Check ignition basic timing.

2) If ignition basic timing is not within specification, loosen distributor (or crank angle sensor on engines with dual coil assembly) and rotate to adjust timing if necessary. See IGNITION TIMING SPECIFICATIONS table. Disconnect jumper wire from ignition timing adjustment connector.

IGNITION TIMING SPECIFICATIONS TABLE (Degrees BTDC@RPM)

Application	(1) Basic	(1) (2) Actual
1.5L		
Colt, Colt 200 Mirage & Summit	5@650-850	10@650-850
1.6L		
Mirage	5@650-850	8@650-850
1.8L		
Eclipse	5@600-800	10@600-800
2.0L		
Colt Vista & Galant (VIN V)	5@600-800	10@600-800
Eclipse	5@650-850	8@650-850
Galant (VIN R)	5@650-850	8@650-850
(VIN U)	5@650-850	12@650-850
2.4L		
Pickup & Ram-50	5@650-850	8@650-850
3.0L		
Montero, Pickup, Ram-50 Stealth & 3000GT	5@600-800	15@600-800

(1) - Transmission in Park or Neutral.

(2) - Actual timing may fluctuate.

IGNITION TIMING ADJUSTMENT CONNECTOR LOCATION TABLE

Application	(1) (2) Wire Color	Location
Colt, Colt Vista, Colt 200, Mirage & Summit		
1.5L, 1.6L & 2.0L	Yellow/Red	(3)
Eclipse		
1.8L & 2.0L (Except Turbo)	Yellow/Red	(4)
2.0L Turbo	Yellow/Black	(4)
Galant		

2.0L	Yellow/Red	(5)
Montero		
3.0L	White/Yellow	(4)
Pickup & Ram-50		
2.4L	Black/Blue	(6)
3.0L	White/Yellow	(6)
Stealth (SOHC)		
3.0L	White/Yellow	(4)
Stealth & 3000GT (DOHC)		
3.0L (Non-Turbo)	Black/Green	(4)
3.0L (Turbo)	White/Yellow	(4)

- (1) - Remove waterproof female connector (if equipped) for access to wire.
- (2) - Ground connector at wire end for basic timing adjustment.
- (3) - On main wiring harness, near center of firewall.
- (4) - On main wiring harness, near wiper motor on firewall.
- (5) - On main wiring harness, near master cylinder on firewall.
- (6) - Between right shock tower and firewall.
- (7) - Near front of right shock tower.

IDLE SPEED & MIXTURE

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.

CURB (SLOW) IDLE SPEED

NOTE: Curb idle speed is controlled by Idle Speed Control (ISC) 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. 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 ISC system. If ISC system is okay, adjust basic idle speed. See BASIC IDLE SPEED.

BASIC IDLE SPEED

NOTE: ALWAYS check TPS adjustment after adjusting basic idle speed. See THROTTLE POSITION SENSOR (TPS).

BASIC IDLE SPEED TEST APPLICATION TABLE

Application	Test
1.5L	
Colt, Colt 200, Mirage & Summit	TEST NO. 1
1.6L	
Mirage	TEST NO. 2
1.8L	
Eclipse	TEST NO. 1
2.0L (VIN V)	
Colt Vista & Galant	TEST NO. 1
2.0L (VIN R & U)	

Eclipse & Galant	TEST NO. 2
2.4L Pickup & Ram-50	TEST NO. 1
3.0L Montero, Pickup, Ram-50, Stealth & 3000GT	TEST NO. 2

Test No. 1

1) Loosen throttle cable. Turn ignition on for more than 15 seconds. DO NOT start engine. Turn ignition off. This should fully retract ISC motor plunger.

2) On 2.0L Galant (VIN V), connect jumper wire between ignition timing adjustment connector and ground. See IGNITION TIMING ADJUSTMENT CONNECTOR LOCATION table under IGNITION TIMING.

3) On all models, disconnect harness connector(s) from Idle Speed Control (ISC) motor. Ensure ISC plunger is in fully retracted position. Unscrew fixed Speed Adjusting Screw (SAS) until throttle valve is fully closed. See Fig. 1.

CAUTION: When cleaning throttle body, plug air by-pass hole in throttle body to prevent solvent from entering passage.

4) Start engine. Check basic idle speed. See IDLE SPEED SPECIFICATIONS table. If basic idle speed is within specification, go to step 7). If basic idle speed is not within specification, remove air intake hose and clean throttle body. Reconnect air intake hose. Recheck basic idle speed.

5) If basic idle speed is still not within specification after cleaning throttle body, adjust basic idle speed by turning idle speed adjusting screw. See Fig. 1. After adjusting basic idle speed, turn fixed SAS screw clockwise until engine speed begins to increase.

6) Turn fixed SAS screw counterclockwise until engine speed decreases. Turn fixed SAS screw counterclockwise an additional 1/2 turn from point at which engine speed no longer decreases. Turn off engine.

7) Adjust throttle cable. Reconnect harness connector(s) at ISC motor. Start engine. Operate engine for about 5 minutes. Ensure engine idles within curb idle speed specification. See IDLE SPEED SPECIFICATIONS table.

8) Turn ignition off. Disconnect negative battery cable for at least 10 seconds to clear diagnostic trouble code. Reconnect negative battery cable. Operate engine at idle for about 5 minutes to ensure engine idles smoothly.

Test No. 2

1) Locate ignition timing adjustment connector. See IGNITION TIMING ADJUSTMENT CONNECTOR LOCATION table under IGNITION TIMING. Connect jumper wire between ignition timing adjustment connector and ground.

2) Locate diagnostic connector under instrument panel. Connect jumper wire between diagnostic connector terminal No. 10 (White wire) and ground. See Fig. 3. Start engine. Check basic idle speed. See IDLE SPEED SPECIFICATIONS table. If basic idle speed is within specification, go to step 9). If basic idle speed is not within specification, go to step 3).

3) Remove air intake hose. Check throttle body. If throttle body contains deposits, go to next step. If throttle body is clean, disconnect jumper wires connected in steps 1) and 2). On all models except Eclipse, Galant and Mirage, go to step 6). On Eclipse, Galant and Mirage, go to step 5).

CAUTION: When cleaning throttle body, plug air by-pass hole in

throttle body to prevent solvent from entering passage.

4) Clean throttle body with solvent. Replace air intake hose. Recheck basic idle speed. If basic idle speed is within specification after cleaning throttle body, go to step 9). If basic idle speed is still not within specification after cleaning throttle body, disconnect jumper wires connected in steps 1) and 2). On all models except Eclipse, Galant and Mirage, go to step 6). On Eclipse, Galant and Mirage, go to step 5).

5) Adjust idle position switch and go to step 7). See IDLE POSITION SWITCH under THROTTLE POSITION SENSOR (TPS).

6) Adjust fixed Speed Adjusting Screw (SAS) and go to next step. See FIXED SPEED ADJUSTING SCREW under IDLE SPEED & MIXTURE.

7) Reconnect jumper wires as indicated in steps 1) and 2). Check basic idle speed. If basic idle speed is within specification, go to step 9). If basic idle speed is not within specification, adjust by turning idle speed adjusting screw on throttle body. See Fig. 2. Go to next step.

8) If basic idle speed is within specification after turning idle speed adjusting screw, go to step 9). If basic idle speed cannot be adjusted to specification by turning idle speed adjusting screw, check for leaking fast idle air valve. Replace throttle body if fast idle air valve leaks.

9) Turn ignition off. Disconnect jumper wires from ignition timing adjustment connector and diagnostic connector. Operate engine at idle for about 5 minutes. Ensure engine idles smoothly and within curb idle specification. See IDLE SPEED SPECIFICATIONS table.

IDLE SPEED SPECIFICATIONS TABLE

Application	Curb Idle	Basic Idle
1.5L Colt, Colt 200, Mirage & Summit	650-850	700-800
1.6L Mirage	650-850	700-800
1.8L Eclipse	600-800	650-750
2.0L (VIN V) Colt Vista Galant	600-800 650-850	650-750 700-800
2.0L (VIN R & U) Eclipse Galant	650-850 650-850	650-750 700-800
2.4L Pickup & Ram-50	650-850	700-800
3.0L Montero, Pickup, Ram-50, Stealth & 3000GT	600-800	650-750

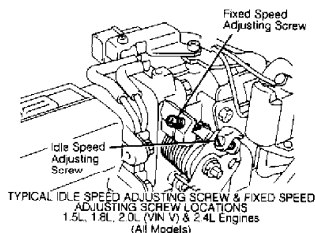
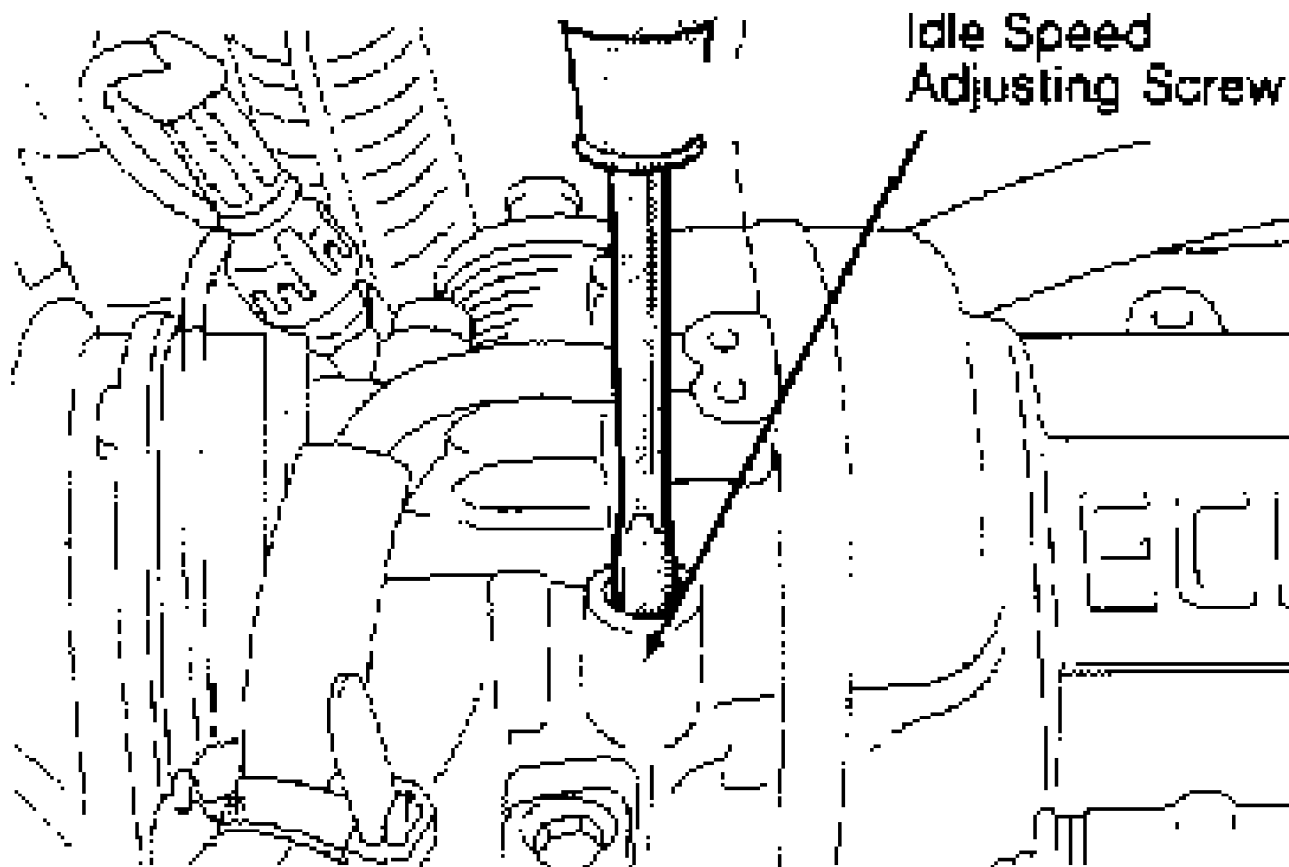


Fig. 1: Idle & Fixed Speed Adj. Screws (1.5L, 1.8L, 2.0L (VIN V) & 2.4L)

Courtesy of Mitsubishi Motor Sales of America.



**TYPICAL IDLE SPEED ADJUSTING SCREW LOCATION
1.6L, 2.0L (VIN R & U) & 3.0L Engines
(All Models)**

Fig. 2: Idle Speed Adj. Screw (1.6L, 2.0L (VIN R & U) & 3.0L)
Courtesy of Mitsubishi Motor Sales of America.

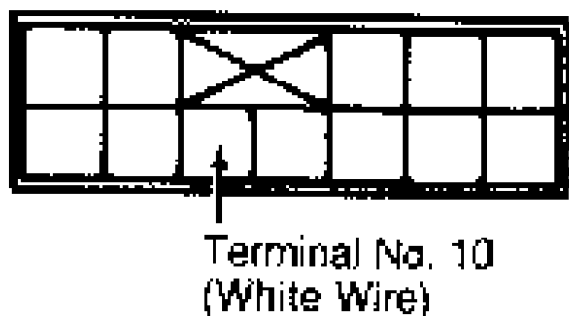


Fig. 3: Identifying Diagnostic Connector Terminal
Courtesy of Mitsubishi Motor Sales of America.

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.

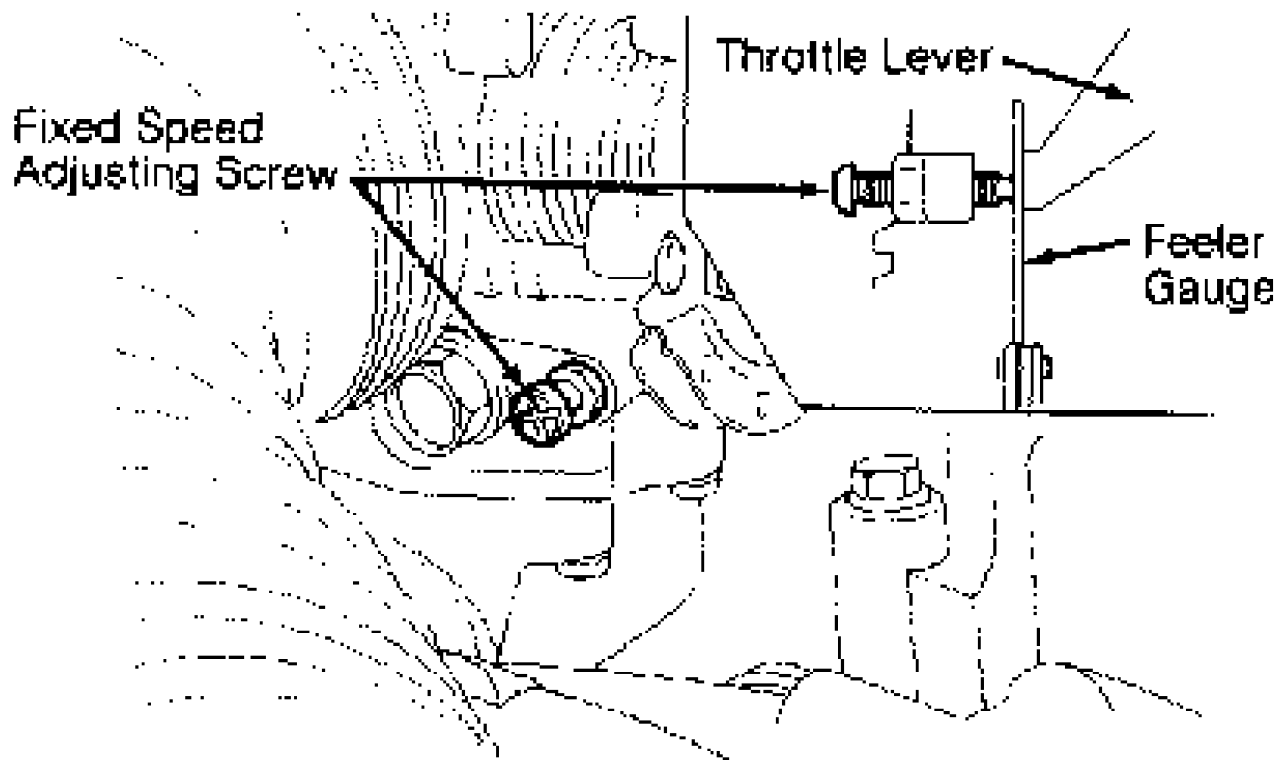
3.0L Montero, Pickup, Ram-50, Stealth & 3000GT

1) Loosen throttle cable. Loosen fixed SAS lock nut. See Fig. 4. 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 under IDLE SPEED & MIXTURE. Adjust throttle position sensor. See THROTTLE POSITION SENSOR (TPS).

All Other Models

To adjust fixed SAS, adjust basic idle speed. See BASIC IDLE SPEED under IDLE SPEED & MIXTURE.



**FIXED SPEED ADJUSTING SCREW LOCATION
& FEELER GAUGE POSITIONING
3.0L Engine
(Montero, Pickup & Ram-50)**

Fig. 4: Fixed Speed Adj. Screw & Feeler Gauge Pos. (3.0L)
Courtesy of Mitsubishi Motor Sales of America.

IDLE MIXTURE

NOTE: Idle mixture is computer controlled on fuel injected engines and is nonadjustable. CO level specifications are not available from manufacturer.

THROTTLE POSITION SENSOR (TPS)

TPS ADJUSTMENT

NOTE: Ensure basic idle speed is set to specification before adjusting TPS. 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.

TPS TEST APPLICATION

Application	Test
1.5L Colt, Colt 200, Mirage & Summit	TEST NO. 1
1.6L Mirage	TEST NO. 2
1.8L Eclipse	TEST NO. 3
2.0L (VIN V) Colt Vista & Galant	TEST NO. 1
2.0L (VIN R & U) Galant	TEST NO. 1
Eclipse	TEST NO. 3
2.4L Pickup & Ram-50	TEST NO. 1
3.0L Montero, Pickup & Ram-50	TEST NO. 4
Stealth & 3000GT	TEST NO. 5

Test No. 1

1) Turn ignition on for more than 15 seconds. DO NOT start engine. Turn ignition off. ISC plunger should be retracted fully.

2) Ensure ISC plunger is in fully retracted position.

Disconnect harness connector(s) from ISC motor. Turn ignition on. DO NOT start engine.

3) Using digital voltmeter, backprobe terminal No. 19 (Green/White wire) and terminal No. 24 (Black or Green/Black wire) at Engine Control Unit (ECU) wiring harness connector. Note TPS output voltage.

4) If output voltage is .48-.52 volt, go to step 6). If output voltage is not .48-.52 volt, loosen TPS mounting screw(s) and rotate TPS clockwise, or counterclockwise, until output voltage is within specification. Tighten TPS mounting screws.

5) Turn ignition off. Reconnect harness connector(s) at ISC motor. Start engine. Ensure engine idles within curb idle speed specification.

6) Turn ignition off. Disconnect negative battery cable for at least 15 seconds to clear diagnostic trouble code. Reconnect negative battery cable. Operate engine at idle for about 5 minutes to ensure engine idles smoothly.

Test No. 2

1) Turn ignition on. DO NOT start engine. Loosen throttle

cable. Using digital voltmeter, backprobe terminal No. 19 (Green/White wire) and terminal No. 24 (Black or Green/Black wire) at Engine Control Unit (ECU) wiring harness connector. Check TPS output voltage.

2) If output voltage is .48-.52 volt, go to step 3). If output voltage is not .48-.52 volt, remove throttle body. Loosen TPS mounting screws and rotate TPS clockwise, or counterclockwise, until output voltage is within specification. Tighten TPS mounting screws.

3) Turn ignition off. Disconnect voltmeter from ECU harness connector. Adjust throttle cable. Disconnect negative battery cable for at least 10 seconds to clear diagnostic code. Reconnect negative battery cable. Operate engine at idle for about 5 minutes to ensure engine idles smoothly.

Test No. 3

1) Turn ignition on for more than 15 seconds. DO NOT start engine. Turn ignition off. This should fully retract ISC plunger.

2) Ensure ISC plunger is fully retracted. Disconnect TPS harness connectors. Connect Test Harness (MD998474) between connectors. Connect digital voltmeter between Red and Blue wires of test harness.

3) Turn ignition on. DO NOT start engine. TPS voltage should be .48-.52 volt. If TPS voltage is .48-.52 volt, go to step 4). If TPS voltage is not .48-.52 volt, loosen TPS mounting screws and rotate TPS clockwise, or counterclockwise, until correct voltage is obtained. Tighten TPS mounting screws.

4) Turn ignition off. Disconnect voltmeter and remove test harness. Reconnect TPS harness connectors. Adjust throttle cable. Start engine and check idle speed.

5) Turn ignition off. Disconnect negative battery cable for at least 10 seconds to clear diagnostic trouble code. Reconnect negative battery cable. Operate engine at idle for about 5 minutes to ensure engine idles smoothly.

Test No. 4

1) Loosen throttle cable. Disconnect electrical connector from TPS. Connect digital ohmmeter between Green/White and Green/Yellow wire terminals of TPS electrical connector (on TPS side of harness).

2) Insert .026" (.66 mm) feeler gauge between fixed Speed Adjusting Screw (SAS) and throttle lever. See Fig. 4. Loosen TPS mounting screws. Rotate TPS fully clockwise. Check for continuity between Green/White wire and Green/Yellow wire terminals of TPS electrical connector.

3) Rotate TPS counterclockwise until ohmmeter registers no continuity. Tighten TPS mounting screws and reconnect TPS electrical connector.

4) Using digital voltmeter, backprobe terminal No. 19 (Green/White wire) and terminal No. 24 (Black or Green/Black wire) at Engine Control Unit (ECU) wiring harness connector. Turn ignition on. DO NOT start engine. Check TPS output voltage.

5) If TPS output voltage is 0.4-1.0 volt, go to step 6). If TPS output voltage is not 0.4-1.0 volt, check TPS and wiring harness for damage or malfunction. Replace TPS or repair wiring harness if necessary and go to next step.

6) Remove feeler gauge. Turn ignition off. Disconnect voltmeter from ECU connector. Adjust throttle cable. Operate engine at idle for about 5 minutes to ensure engine idles smoothly and within specification.

Test No. 5

1) Disconnect electrical connector from TPS. Connect digital ohmmeter between Yellow/Red wire and Black wire terminals of TPS.

2) Insert .026" (.66 mm) feeler gauge between fixed Speed

Adjusting Screw (SAS) and throttle lever. See Fig. 4. Loosen TPS mounting screws. Rotate TPS fully counterclockwise. Check for continuity between Yellow/Red wire and Black wire terminals of TPS.

3) Rotate TPS clockwise until ohmmeter registers no continuity. Tighten TPS mounting screws. Reconnect TPS electrical connector.

4) Use a digital voltmeter to backprobe terminal No. 19 (Brown/Red wire) and terminal No. 24 (Brown wire) at Engine Control Unit (ECU) wiring harness on SOHC vehicles, or terminal No. 64 (Brown/Red wire) and terminal No. 72 (Black wire) on DOHC vehicles. Turn ignition on. DO NOT start engine. Check TPS output voltage.

5) If TPS output voltage is 0.4-1.0 volt, go to step 6). If TPS output voltage is not 0.4-1.0 volt, check TPS and wiring harness for damage or malfunction. Replace TPS or repair wiring harness if necessary and go to step 6).

6) Remove feeler gauge. Turn ignition off. Disconnect voltmeter from ECU connector. Operate engine at idle for about 5 minutes to ensure engine idles smoothly and within specification.

IDLE POSITION SWITCH

NOTE: Idle position switch is preset by manufacturer. Adjustment is usually not necessary. If other procedures in this article require adjustment of idle position switch or if switch setting has been changed, adjust switch as follows.

1.6L Mirage, 2.0L Eclipse & 2.0L Galant (DOHC)

1) Loosen throttle cable. Disconnect electrical connector from idle position switch. See Fig. 5. Loosen lock nut at base of switch. Turn switch counterclockwise until throttle valve is fully closed.

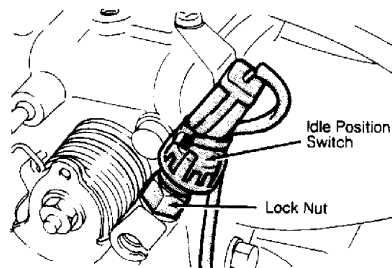
2) Connect ohmmeter between switch terminal and switch body (ground). Turn idle position switch clockwise until ohmmeter registers continuity. At this point, throttle valve should begin to open.

3) Turn switch 15/16 of a turn beyond contact point. Tighten lock nut at base of idle position switch, holding switch to prevent it from turning while tightening.

4) Adjust throttle cable. Adjust basic idle speed. See BASIC IDLE SPEED. Adjust TPS. See TPS ADJUSTMENT.

All Other Models

Idle position switch is incorporated in ISC motor and is automatically adjusted when TPS is adjusted. See TPS ADJUSTMENT.



TYPICAL IDLE POSITION SWITCH LOCATION
1.6L, 2.0L (VIN R & U) & 3.0L Engines
(Colt, Colt 200, Eclipse, Galant, Mirage & Sigma)

NOTE: On engines equipped with idle position switch, switch acts as fixed speed adjusting screw.

Fig. 5: Idle Position Switch Location (1.6L & 2.0L (VIN R & U))
Courtesy of Mitsubishi Motor Sales of America.