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D - ADJUSTMENTS

1994 ENGINE PERFORMANCE Chrysler Corp./Mitsubishi On-Vehicle Adjustments

INTRODUCTION

NOTE: Introduction information not applicable.

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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

NOTE: Valve clearance is adjustable on 1.5L and 1.8L (VIN C) engines only. All other models use hydraulic lash adjusters.

VALVE ADJUSTMENT

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

- Ensure engine is at normal operating temperature. Remove all spark plugs and valve cover. Rotate crankshaft clockwise to position cylinder No. 1 at TDC of compression stroke. Adjust intake valves on cylinders No. 1 and 2, and exhaust valves on cylinders No. 1 and 3. See <u>VALVE CLEARANCE</u> <u>SPECIFICATIONS</u> table.
- 2. Rotate crankshaft 360 degrees to position cylinder No. 4 at TDC of compression stroke. Adjust intake valves on cylinders No. 3 and 4, and exhaust valves on cylinders No. 2 and 4. Install spark plugs and valve cover.

VALVE CLEARANCE SPECIFICATIONS		
Application	⁽¹⁾ In. (mm)	
1.5L (VIN A) (Hot Engine)		
Intake	.008 (.20)	
Exhaust	.010 (.25)	
1.8L (VIN C) (Hot Engine)		
Intake	.008 (.20)	
Exhaust	.012 (.30)	
(1) Adjust valves with engine hot.		

IGNITION TIMING

NOTE: Perform all adjustments with engine at normal operating temperature, cooling fan and accessories off, transmission in Park or Neutral, and front

home		
7 октября 2010 г. 18:19:38	Page 1	© 2005 Mitchell Repair Information Company, LLC.

wheels in straight-ahead position.

- NOTE: Adjustment of ignition timing cannot be performed on vehicles equipped with Distributorless Ignition Systems (DIS). If ignition timing is not within specification, see CRANKSHAFT POSITION SENSOR in <u>L-</u> <u>SYSTEM/COMPONENT TESTS</u> article.
 - 1. Locate ignition timing adjustment connector. See <u>IGNITION TIMING ADJUSTMENT</u> <u>CONNECTOR LOCATION</u> 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 and rotate to adjust timing if necessary. See **IGNITION TIMING SPECIFICATIONS** table. Remove jumper wire from ignition timing adjustment connector.

IGNITION TIMING SPECIFICATIONS (Degrees BTDC @ RPM)

Application	⁽¹⁾ Basic	⁽²⁾⁽³⁾ Actual
1.5L	3-7 @ 650-850	10 @ 650-850
1.8L	3-7 @ 600-800	5 @ 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. Ignition timing may fluctuate.
- (3) If vehicle altitude is more than 2300 ft. above sea level, actual timing may be advanced (5 degrees).

NOTE: Ignition timing adjustment connector is either round or oval with protective cover. Connector is either Black or Brown and is secured to harness with colored transparent tape.

IGNITION TIMING ADJUSTMENT CONNECTOR LOCATION

Application	⁽¹⁾⁽²⁾ Wire Color	Location
All Models	Black/Blue	(3)

(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.

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

home		
7 октября 2010 г. 18:18:50	Page 2	© 2005 Mitchell Repair Information Company, LLC.

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Curb idle speed is controlled by Idle Air Control (IAC) motor. Adjustment is NOTE: 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 **I SYSTEM/COMPONENT** TESTS article. If IAC 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)**.

NOTE: For Data Link Connector (DLC) location, see G - TESTS W/CODES article.

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

- 1. Insert paper clip or appropriate probe into tachometer connector. See TACHOMETER **CONNECTOR LOCATION** table. Connect a primary voltage detecting type tachometer to paper clip.
- 2. On all models with 16-pin DLC connector, connect a jumper wire between data link terminal No. 1 and vehicle ground. See Fig. 2. On all models with 12-pin DLC connector, connect a jumper wire between data link connector terminal No. 10 and vehicle ground. See Fig. 1 .
- 3. Connect a jumper wire between ignition timing adjustment connector and vehicle ground. See **IGNITION TIMING ADJUSTMENT CONNECTOR LOCATION** table under IGNITION TIMING.
- 4. Start and run engine at idle. Check basic idle speed. See IDLE SPEED SPECIFICATIONS table. If idle speed is not within specification, turn engine speed adjusting screw until correct engine speed is obtained. See Fig. 3. 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 (stop screw contacting throttle lever) has been adjusted. See **FIXED SPEED** ADJUSTING SCREW for procedure.
- 6. After all adjustments are verified correct, possible cause of incorrect idle speed is deterioration of fast idle air control motor. Throttle valve must be replaced to correct symptom. Disconnect jumper wires and recheck idle speed.

TACHOMETER CONNECTOR LOCATION		
Application	Туре	Location
All Models	1-Pin	(1)

(1) Next to EGR solenoid, near center of firewall.

IDLE SPEED SPECIFICATIONS

Application	Curb Idle		b Idle	Basic Idle
home				
7 октября 2010 г. 18:18:50		Page 3	© 2005 Mitchell F	Repair Information Company, LLC.

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1.5L	650-850	650-850
1.8L	600-800	600-800



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Fig. 1: Locating Data Link 12-Pin Connector (Typical) Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

home		
7 октября 2010 г. 18:18:50	Page 4	© 2005 Mitchell Repair Information Company, LLC.

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Fig. 2: Locating Data Link 16-Pin Connector (Typical) Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

home		
7 октября 2010 г. 18:18:50	Page 5	© 2005 Mitchell Repair Information Company, LLC.

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<u>Fig. 3: Adjusting Idle Speed (Typical)</u> Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

FIXED SPEED ADJUSTING SCREW

NOTE: Fixed Speed Adjusting Screw (FSAS) is preset by manufacturer and usually does not require adjustment. Only adjust FSAS if other adjustment procedures require it, or if manufacturer's original setting has been changed.

- 1. Loosen throttle cable. Loosen FSAS lock nut. See <u>Fig. 4</u>. Turn FSAS counterclockwise until throttle valve is fully closed. Turn FSAS clockwise until throttle valve begins to open. Turn FSAS clockwise 1 1/4 turns after throttle valve begins to open.
- Tighten lock nut while holding FSAS in position. Adjust throttle cable. Adjust basic idle speed. See <u>BASIC IDLE SPEED</u> under IDLE SPEED & MIXTURE. Adjust throttle position sensor. See <u>THROTTLE POSITION SENSOR (TPS)</u>.

home		
7 октября 2010 г. 18:18:50	Page 6	© 2005 Mitchell Repair Information Company, LLC.

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Fig. 4: 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 <u>G - TESTS W/CODES</u> article.

THROTTLE POSITION SENSOR (TPS)

TPS ADJUSTMENT

NOTE: Ensure basic idle speed is set to specification before adjusting TPS. See <u>BASIC IDLE SPEED</u> 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 SPECIFICATIONS

Application	⁽¹⁾ Volts
All Models	.3-1.0
(1) At idle.	

home		
7 октября 2010 г. 18:18:50	Page 7	© 2005 Mitchell Repair Information Company, LLC.

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- Disconnect TPS connector. Using external ohmmeter, measure resistance between TPS terminals No. 3 and 4. See <u>Fig. 5</u>. Insert .025" (.65 mm) feeler gauge between fixed speed adjusting screw and throttle lever.
- 2. Loosen TPS mounting screws and rotate TPS fully clockwise. Ensure there is continuity between terminals No. 3 and 4. Rotate TPS counterclockwise until there is no continuity and tighten screws. Install Test Harness (MB991348) between TPS and harness connector.
- Turn ignition on. Using external voltmeter, measure TPS output voltage between terminals No. 2 and
 See <u>TPS SPECIFICATIONS</u> table. If voltage is not within specification, check harness and sensor. See <u>I SYSTEM/COMPONENT TESTS</u> article.



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<u>Fig. 5: Identifying TPS Connector</u> Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

IDLE POSITION SWITCH

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

Idle position switch is incorporated into IAC motor and is automatically adjusted when TPS is adjusted. See **<u>TPS ADJUSTMENT</u>**.

home		
7 октября 2010 г. 18:18:50	Page 8	© 2005 Mitchell Repair Information Company, LLC.

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Fig. 6: Adjusting Idle Position Switch Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

home		
7 октября 2010 г. 18:18:50	Page 9	© 2005 Mitchell Repair Information Company, LLC.