

2012 ENGINE**Mechanical - 2.4L - Outlander****GENERAL INFORMATION**

The 4B12 (2.4 L) engine is an in-line four-cylinder engine. The cylinder numbers are assigned as 1-2-3-4 from the front of the engine (timing belt side). The firing order is 1-3-4-2.

GENERAL SPECIFICATIONS**ENGINE DIAGNOSIS****SYMPTOM CHART**

SYMPTOMS	PROBABLE CAUSE	REMEDY
Compression is too low	Blown cylinder head gasket	Replace the gasket.
	Worn or damaged piston rings	Replace the rings.
	Worn piston or cylinder	Repair or replace the piston and/or the cylinder block.
	Worn or damaged valve seat	Repair or replace the valve and/or the seat ring
Drop in engine oil pressure	Engine oil level is too low	Check the engine oil level.
	Malfunction of engine oil pressure switch	Replace the engine oil pressure switch.
	Clogged oil filter	Install a new filter.
	Worn oil pump gears or cover	Replace the gears and/or the cover.
	Thin or diluted engine oil	Change the engine oil to the correct viscosity.
	Stuck (opened) oil relief valve	Repair the relief valve.

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	Excessive bearing clearance	Replace the bearings.
Engine oil pressure too high	Stuck (closed) oil relief valve	Repair the relief valve.
Noisy valves	Incorrect valve clearance	Adjust valve clearance
	Thin or diluted engine oil (low engine oil pressure)	Change the engine oil.
	Worn or damaged valve stem or valve guide	Replace the valve and/or the guide.
Connecting rod noise/main bearing noise	Insufficient oil supply	Check the engine oil level.
	Thin or diluted engine oil	Change the engine oil.
	Excessive bearing clearance	Replace the bearings.

SERVICE SPECIFICATIONS**SERVICE SPECIFICATIONS**

Item		Standard value	Limit
Drive belt tension	Vibration frequency Hz (Reference)	102 - 129	-
	Tension N (lb) (Reference)	248 - 400 (56 - 90)	-
Basic ignition timing at idle		5° BTDC ± 3°	-
Actual ignition timing at curb idle Approximately		10° BTDC	-
CO contents %		0.5 or less	-
HC contents ppm		100 or less	-
Curb idle speed r/min		650 ± 100	-
Compression pressure (200 r/min) kPa (psi)		1, 440 (209)	Minimum 1, 000 (145)
Compression pressure difference of all cylinder kPa (psi)		-	98 (14)
Intake manifold vacuum at curb idle kPa (in Hg)		-	Minimum 60 (18)

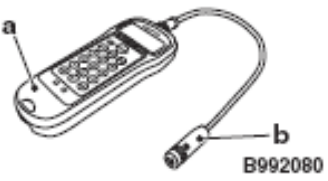
SEALANTS AND ADHESIVE**SEALANTS AND ADHESIVE**

Item	Specified sealant and adhesive	Remark
Rocker cover assembly (matching area of the cylinder head and the timing chain case)	ThreeBond 1227D, ThreeBond 1217G (Mitsubishi Genuine Part No. 1000A923), LOCTITE 5900 or equivalent	Semi-drying sealant
Engine oil pan	ThreeBond 1227D, ThreeBond 1217G (Mitsubishi Genuine Part No. 1000A923), ThreeBond 1207F (Mitsubishi Genuine Part No. 1000A992), LOCTITE 5970, LOCTITE 5900 or equivalent	
Drive plate bolt	ThreeBond 1324 or equivalent	Anaerobic adhesive
Cylinder head gasket (matching area of the cylinder head, cylinder head gasket and the cylinder block)	ThreeBond 1217G (Mitsubishi Genuine Part No. 1000A923), LOCTITE 5900 or equivalent	Semi-drying sealant

Timing chain case assembly

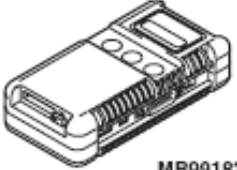
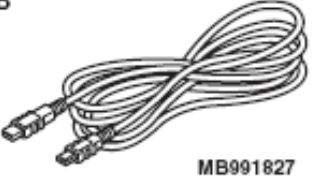
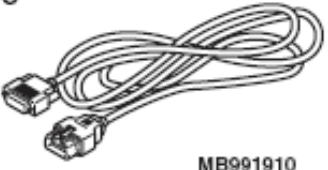
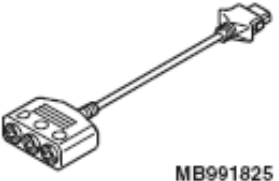
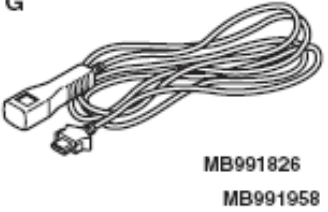
SPECIAL TOOLS

SPECIAL TOOLS

Tool	Tool number and name	Supersession	Application
	MB992080 Belt tension meter set		
	a. MB9912081 Belt tension meter b. MB992082 Microphone assembly	Tool not available	Drive belt tension (frequency) measurement
	MB991958 Scan tool (M.U.T.-III sub assembly) a. MB991824 Vehicle communication interface (V.C.I.) b. MB991827 M.U.T.-III USB cable c. MB991910 M.U.T.-III main harness A (Vehicles with CAN communication system) d. MB991911 M.U.T.-III main harness B (Vehicles without	MB991824-KIT NOTE: MB991826 M.U.T.-III Trigger Harness is not necessary when pushing V.C.I. ENTER key.	CAUTION: For vehicles with CAN communication, use M.U.T.-III main harness A to send simulated vehicle speed. If you connect M.U.T.-III main harness B instead, the CAN communication does not function correctly. • Standard ignition timing check

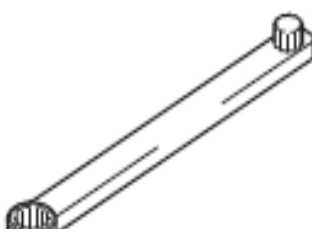
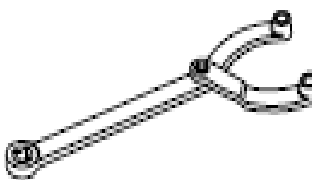
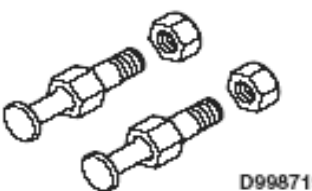
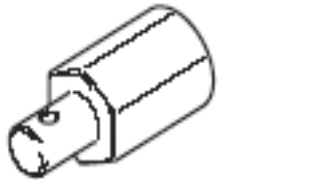
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A  B  C  D  E  F  G 	CAN communication system) e. MB991914 M.U.T.-III main harness C (for Chrysler models only) f. MB991825 M.U.T.-III adapter harness g. MB991826 M.U.T.-III trigger harness		Idle speed check
	MB992278 Belt tension release wrench	-	Auto-tensioner tension release

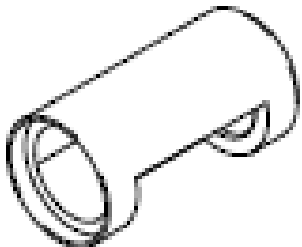
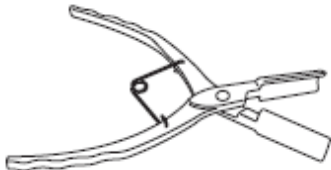
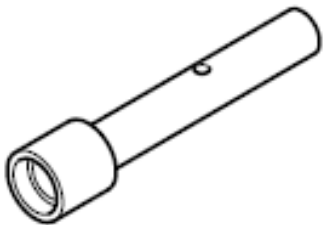
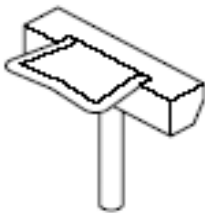
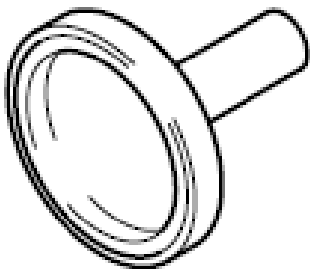
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 B990767	MB990767 Front hub and flange yoke holder	MB990767-01	Holding the crankshaft pulley
 D998719	MD998719 Pin	MIT308239	
 B992103	MB992103 Chain tension release bar	-	Camshaft and camshaft sprocket assembly (exhaust side) removal
 MD998772	MD998772 Valve spring compressor	General service tool	Valve spring compression
 B992090	MB992090 Retainer holder attachment	-	

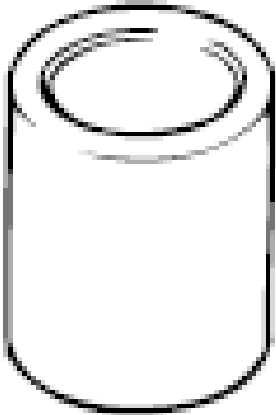
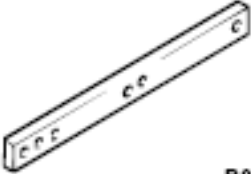
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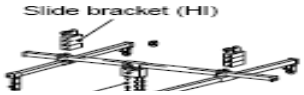
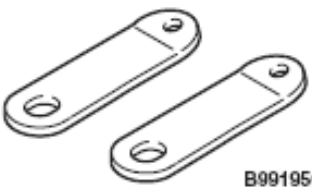
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	MB992089 Retainer holder C	-	
	MB992085 Valve stem seal pliers	-	Valve stem seal removal
	MD998737 Valve stem seal installer	MD998737-01	Valve stem seal press-fitting
 D998727	MD998727 Oil pan FIPG cutter	MD998727-01	Oil pan removal
 MB991883	MB991883 Flywheel stopper	General service tool	Supporting the drive plate
	MD998718 Crankshaft rear oil seal installer	MD998718-01	Press-fitting the crankshaft rear oil seal

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	MB991448 Bush remover and installer base	MB991448-01	Press-fitting the crankshaft front oil seal
 MB991614	MB991614 Angle gauge	-	Balancer shaft and oil pump module bolt installation
 B991454	MB991454 Engine hanger balancer	MZ203827-01	
 B991527	MB991527 Hanger	Tool not available	
 MB991895	MB991895 Engine hanger	Tool not available	
	MB991928 Engine hanger a. MB991929		When the engine hanger is used: Supporting the engine assembly during removal and

	Joint (50) x 2 b. MB991930 Joint (90) x 2 c. MB991931 Joint (140) x 2 d. MB991932 Foot (standard) x 4 e. MB991933 Foot (short) x 2 f. MB991934 Chain and hook assembly	Tool not available	installation of the transaxle assembly NOTE: Special tool MB991454 is a part of engine hanger attachment set MB991453.
	MB991956 Engine hanger plate	-	

ON-VEHICLE SERVICE

DRIVE BELT TENSION CHECK

1. Remove the radiator condenser tank mounting bolt, and move the radiator condenser tank to a place where it does not interfere with the drive belt tension check (Refer to **RADIATOR** .

CAUTION: Check the drive belt tension after turning the crankshaft clockwise one turn or more.

2. Make sure that the indicator mark on the auto-tensioner is within the area marked with A in the illustration.
3. If the mark is out of the area A, replace the drive belt (Refer to **<< B >> DRIVE BELT REMOVAL** .

NOTE: The drive belt tension adjustment is not necessary as the auto-tensioner is adopted.

4. Install the radiator condenser tank to the original position (Refer to **RADIATOR** .

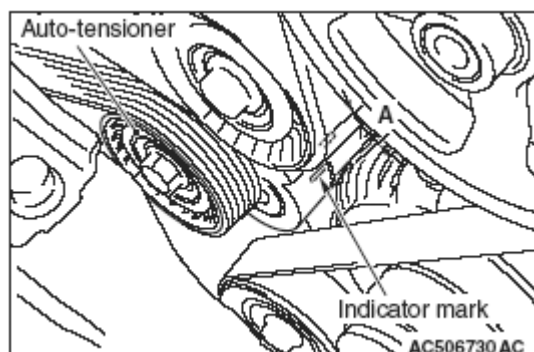


Fig. 1: Identifying Auto-Tensioner And Indicator Mark
Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

AUTO-TENSIONER CHECK

OPERATION CHECK

Required Special Tool:

MB992278: Belt tension release wrench

1. Stop the engine from the idle state.
2. Remove the radiator condenser tank mounting bolt, and move the radiator condenser tank to a place where it does not interfere with the auto-tensioner check (Refer to **RADIATOR** .
3. Check that the drive belt are not protruding from the pulley width of drive belt auto-tensioner.
4. Remove the drive belt (Refer to **<< B >> DRIVE BELT REMOVAL** .

WARNING: Always work from above when releasing the tension of the auto-tensioner. When you try to gain access from underneath the vehicle, you will experience difficulty, thus causing the tool to be dropped off.

CAUTION: To work at the optimum angle, you must choose a most suitable box-type wrench is applied to the special tool.

WARNING: Be sure to set the box-type wrench and the special tool MB992278 to the hexagonal parts securely to prevent the tool from falling off because the tension of the auto-tensioner is high.

5. Install special tool MB992278 and a box-type wrench at the optimum angle.
6. Check that no binding is present by turning the auto-tensioner in the left and right directions.

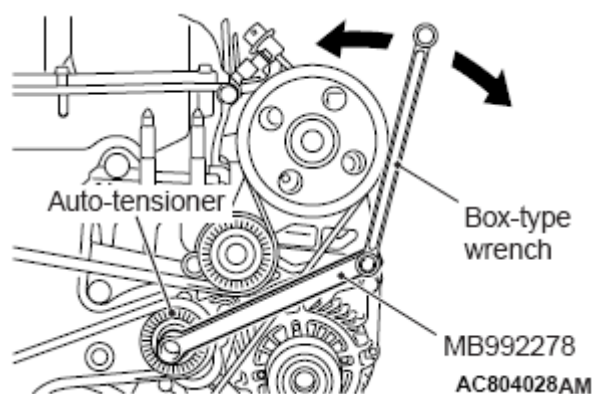


Fig. 2: Turning Auto-Tensioner Left And Right Using Special Tool MB992278 And Box-Type Wrench

Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

7. If there are any problems in the procedure 3 or 6, replace the auto-tensioner (Refer to **TIMING CHAIN** .
8. Install the drive belt (Refer to << **B** >> **DRIVE BELT REMOVAL** .
9. Install the radiator condenser tank to the original position (Refer to **RADIATOR** .

FUNCTION CHECK

The auto-tensioner can be checked whether it is in good condition by checking its tension.

< When the vibration frequency is measured: Recommendation >

Required Special Tools:

- MB992080: Belt Tension Meter Set
 - MB992081: Belt Tension Meter
 - MB992082: Microphone Assembly

1. Check the tension of the drive belt (Refer to **DRIVE BELT TENSION CHECK** .
2. Check the tension of the drive belt in the following procedures.
 1. Connect special tool MB992082 to special tool MB992081 of special tool MB992080.
 2. Press the "POWER" button to turn on the power supply.
 3. Press number key "1". Check to ensure that "No. 01" appears on the upper left of the display and that the following numeric values are displayed for individual items (M, W, and S):

M 000.9 g/m

W 010.0 mm/R

S 0100 mm

Belt tension meter set (MB992080)

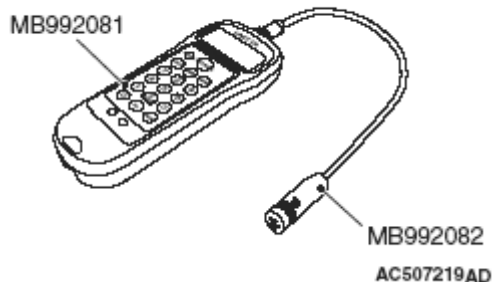


Fig. 3: Identifying Belt Tension Meter Set (MB992080)
 Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

If numeric values have not been entered (new tool), set them according to the belt specifications as shown in the illustration below. Once you set them, you do not have to set them again. The settings remain undeleted even after battery replacement.

NOTE: This operation is to temporarily set the preset data such as the belt specifications, because if the measurement is taken without input of the belt specifications, conversion to tension value (N) cannot be made, resulting in judgement of error.

< Setting procedure >

- a. Press down the "MASS" button till the belt mass select display appears.
- b. Press the "UP" or "DOWN" button to select "01 1.5GT 0.9" and press the "MEASURE" button to decide it.

Check to ensure that "M 000.9 g/m" is displayed.

- c. Press the "WIDTH" button to change to the belt width input display.
 - d. Press number keys 0, 1, 0, and 0 sequentially, and press the "SELECT" button to apply them. Check to ensure that "W 010.0 mm/R" appears on the display.
 - e. Press the "SPAN" button to change to the span length input display.
 - f. Press number keys 0, 1, 0, and 0 sequentially, and press the "SELECT" button to apply them. Check to ensure that "S 0100 mm" appears on the display.
4. Press "Hz" button twice to change the display to the frequency display (Hz.)

CAUTION:

- When measuring, make sure that the engine is cold.
- Measure after turning the crankshaft clockwise one turn or more.
- Do not allow any contaminants such as water or oil to get onto the microphone.
- If strong gusts of wind blow against the microphone or if

there are any loud sources of noise nearby, the values measured by the microphone may not correspond to actual values.

- If the microphone is touching the belt while the measurement is being made, the values measured by the microphone may not correspond to actual values.
- Do not take the measurement while the vehicle's engine is running.

5. Hold special tool MB992080 to the middle of the belt between the pulleys (at the place indicated by arrow) where it does not contact the belt [approximately 10 - 15 mm (0.4 - 0.59 inch) away from the rear surface of the belt] so that it is perpendicular to the belt (within an angle of ± 15 degree angle.)
6. Press the "MEASURE" button.
7. Gently tap the middle of the belt between the pulleys (the place indicated by the arrow) with your finger as shown in the illustration, and check that the vibration frequency of the belt is within the standard value.

Standard value: 102 - 129 Hz

NOTE: To take the measurement repeatedly, tap the belt again.

8. Press and hold the "POWER" button to turn off the power supply.
3. If not within the standard value, replace the auto-tensioner (Refer to **TIMING CHAIN** .

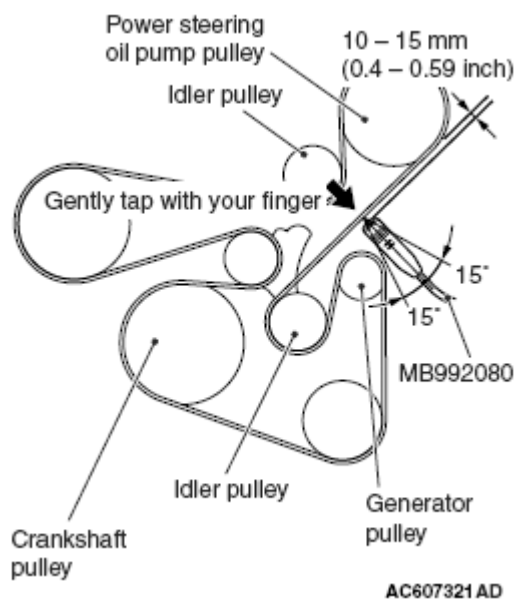


Fig. 4: Checking Tension Of Drive Belt Using Special Tool MB992080
Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

< When using a tension gauge >

1. Check the tension of the drive belt (Refer to DRIVE BELT TENSION CHECK .

CAUTION:

- When measuring, make sure that the engine is cold.
- Measure after turning the crankshaft clockwise one turn or more.

2. Use a belt tension gauge in the middle of the belt between the pulleys shown in the illustration (at the place indicated by the arrow) to check that the belt tension is within the standard value.

Standard value: 262 - 409 N (59 - 97 lb)

3. If not within the standard value, replace the auto-tensioner (Refer to TIMING CHAIN .

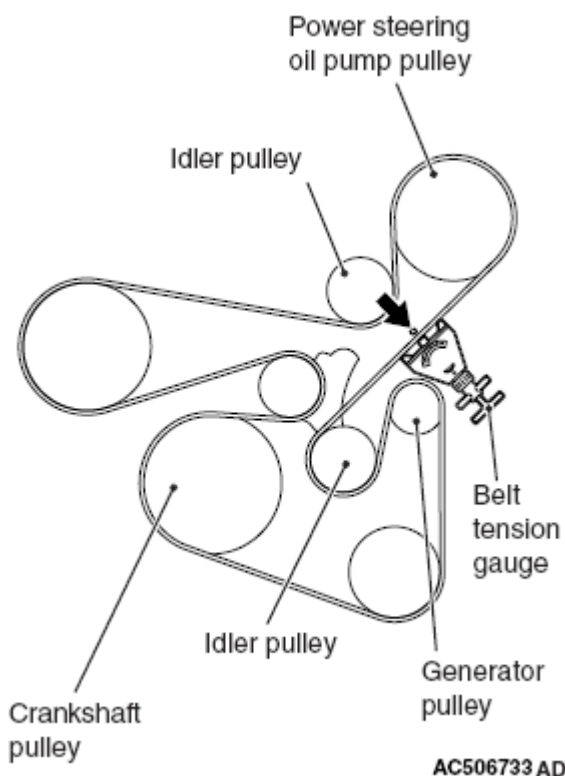


Fig. 5: Checking Tension Of Drive Belt Using Belt Tension Gauge
Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

VALVE CLEARANCE CHECK AND ADJUSTMENT

Refer to INTAKE AND EXHAUST VALVE CLEARANCE (INSPECT AND ADJUST)

IGNITION TIMING CHECK

Required Special Tool:

MB991958: Scan Tool (M.U.T.-III Sub Assembly)

- MB991824: V.C.I.
- MB991827: M.U.T.-III USB Cable
- MB991910: M.U.T.-III Main Harness A

1. Before inspection, set the vehicle in the following condition:

- Engine coolant temperature: 80 - 95°C (176 - 203°F)
- Lights and all accessories: OFF
- Transaxle: P range

NOTE: On vehicles for Canada, the headlight, taillight, etc. remain lit even when the lighting switch is in "OFF" position but this is no problem for checks.

CAUTION: To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

2. Connect scan tool MB991958 to the data link connector.

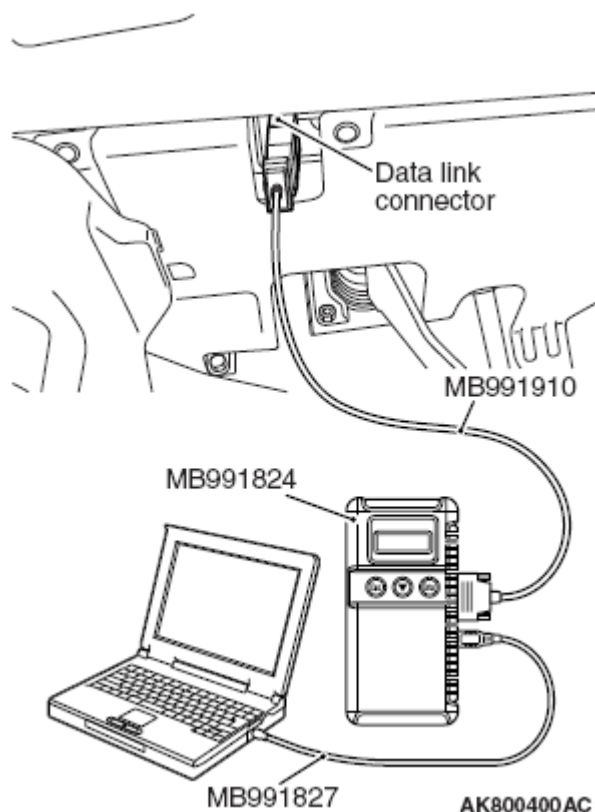


Fig. 6: Connecting Scan Tool To Data Link Connector
 Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

3. Set the timing light to the power supply line (terminal No. 3) of the ignition coil No. 1.
4. Start the engine and run it at idle.
5. Check that the idle speed is approximately 650 r/min.
6. Select scan tool MB991958 actuator test "item number 11".
7. Check that basic ignition timing is within the standard value.

Standard value: 5° BTDC ± 3°

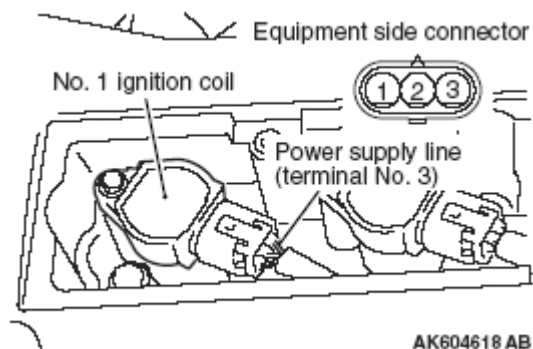


Fig. 7: Identifying Power Supply Line Connector Terminals

Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

8. If the basic ignition timing is not within the standard value, refer to SYMPTOM CHART .

CAUTION: If the actuator test is not canceled, the forced drive will continue for 27 minutes. Driving in this state could lead to engine failure.

9. Cancel the setting mode of the scan tool MB991958.
10. Check that the actual ignition timing is at the standard value.

Standard value: Approximately 10° BTDC

NOTE: The ignition timing fluctuates about $\pm 7^\circ$, even under normal operating condition.

NOTE: It is automatically further advanced by about 5° from 10° Before Top Dead Center at higher altitudes.

NOTE: Wait till approximately 1 minute passes after the engine started, and check the ignition timing when the engine stabilized.

11. Remove the timing light.

CAUTION: To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

12. Disconnect scan tool MB991958 from the data link connector.

CURB IDLE SPEED CHECK

Required Special Tool:

MB991958: Scan Tool (M.U.T.-III Sub Assembly)

- MB991824: V.C.I.
- MB991827: M.U.T.-III USB Cable
- MB991910: M.U.T.-III Main Harness A

1. Before inspection, set the vehicle in the following condition:
- Engine coolant temperature: 80 - 95°C (176 - 203°F)
 - Lights and all accessories: OFF
 - Transaxle: P range

NOTE: On vehicles for Canada, the headlight, taillight, etc. remain lit even when the lighting switch is in "OFF" position but this is no problem for checks.

CAUTION: To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

2. Connect scan tool MB991958 to the data link connector.

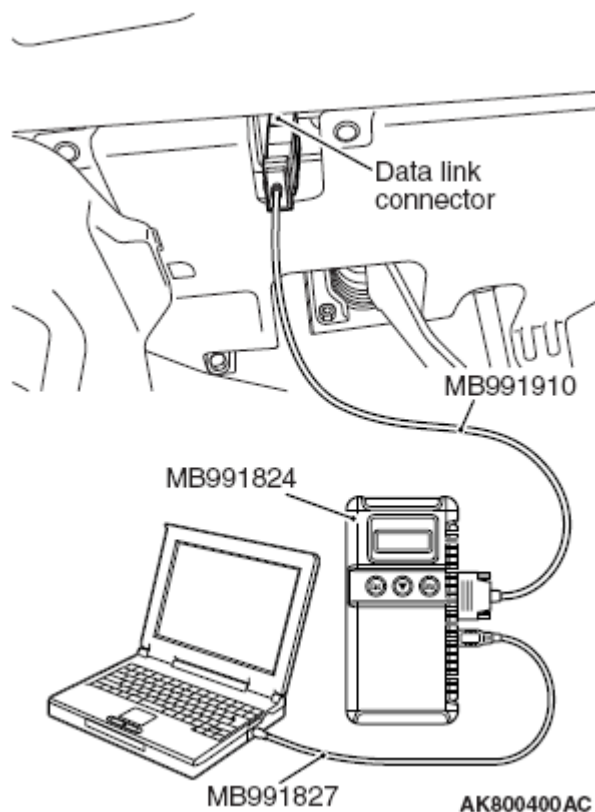


Fig. 8: Connecting Scan Tool To Data Link Connector
Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

3. Set the timing light to the power supply line (terminal No. 3) of the ignition coil No. 1.
4. Start the engine.
5. Run the engine at idle for 2 minutes.
6. Check the actual ignition timing is at the standard value.

Standard value: Approximately 10° BTDC

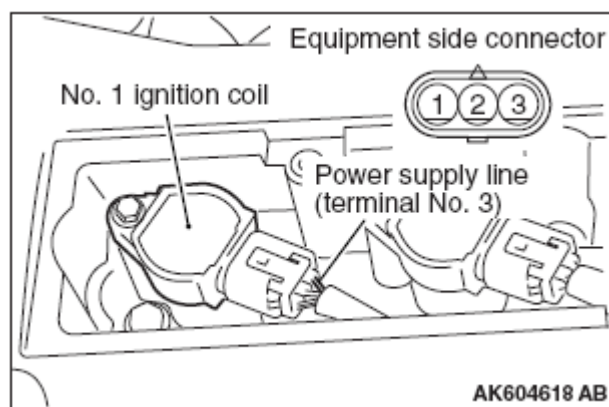


Fig. 9: Identifying Power Supply Line Connector Terminals
 Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

NOTE: The ignition timing fluctuates about $\pm 7^\circ$, even under normal operating condition.

NOTE: It is automatically further advanced by about 5° from 10° Before Top Dead Center at higher altitudes.

7. Check the idle speed. Select item number 2 and take a reading of the idle speed.

Curb idle speed: 650 ± 100 r/min

NOTE: The idle speed is controlled automatically by the idle air control system.

8. If the idle speed is outside the standard value, refer to SYMPTOM CHART.
9. Remove the timing light.

CAUTION: To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

10. Disconnect scan tool MB991958 from the data link connector.

IDLE MIXTURE CHECK

Required Special Tool:

MB991958: Scan Tool (M.U.T.-III Sub Assembly)

- MB991824: V.C.I.
- MB991827: M.U.T.-III USB Cable
- MB991910: M.U.T.-III Main Harness A

1. Before inspection, set the vehicle in the following condition:

- Engine coolant temperature: 80 - 95°C (176 - 203°F)
- Lights and all accessories: OFF
- Transaxle: P range

NOTE: On vehicles for Canada, the headlight, taillight, etc. remain lit even when the lighting switch is in "OFF" position but this is no problem for checks.

CAUTION: To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

2. Connect scan tool MB991958 to the data link connector.

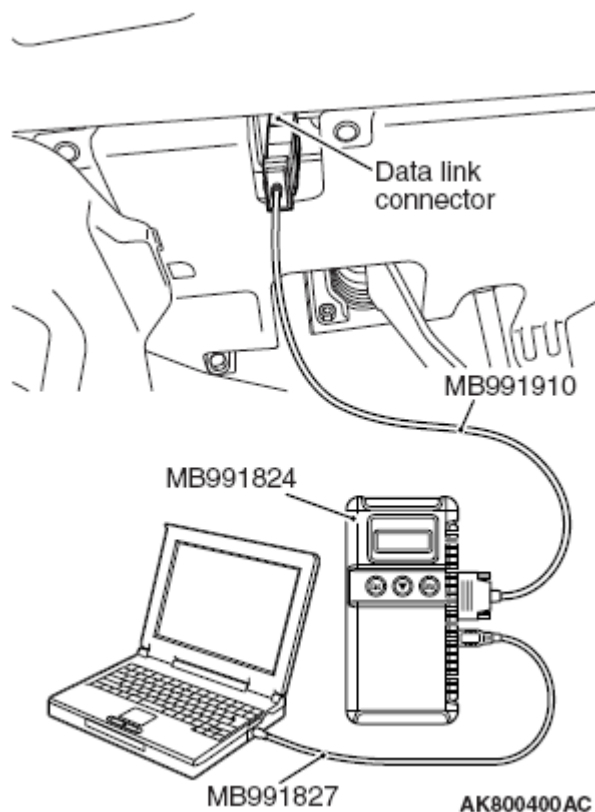


Fig. 10: Connecting Scan Tool To Data Link Connector
Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

3. Set the timing light to the power supply line (terminal No. 3) of the ignition coil No. 1.
4. Start the engine and let it run at idle.
5. Check that the actual ignition timing is at the standard value.

Standard value: Approximately 10° BTDC

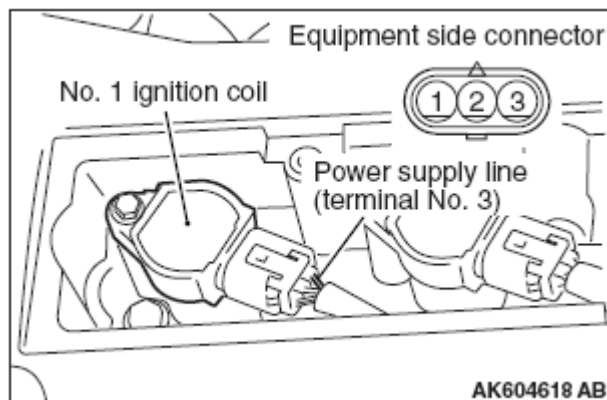


Fig. 11: Identifying Power Supply Line Connector Terminals
Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

- NOTE:** The ignition timing fluctuates about $\pm 7^\circ$, even under normal operating condition.
- NOTE:** It is automatically further advanced by about 5° from 10° Before Top Dead Center at higher altitudes.
- NOTE:** Wait till approximately 1 minute passes after the engine started, and check the ignition timing when the engine stabilized.

6. Run the engine and increase the engine speed to 2,000 - 3,000 r/min for 2 minutes.
7. Set the CO, HC tester.
8. Check the CO contents and the HC contents at idle.

Standard value:

CO contents: 0.5% or less

HC contents: 100 ppm or less

9. If there is a deviation from the standard value, inspect the MFI system (Refer to **SYMPTOM CHART**)
10. Remove the CO, HC tester and timing light.

CAUTION: To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

11. Disconnect scan tool MB991958 from the data link connector.

COMPRESSION PRESSURE CHECK

Required Special Tool:

MB991958: Scan Tool (M.U.T.-III Sub Assembly)

- MB991824: V.C.I.
- MB991827: M.U.T.-III USB Cable
- MB991910: M.U.T.-III Main Harness A

1. Before inspection, check that the engine oil, starter and battery are normal. Also, set the vehicle in the following condition:
 - Engine coolant temperature: 80 - 95°C (176 - 203°F)
 - Lights and all accessories: OFF
 - Transaxle: P range

NOTE: On vehicles for Canada, the headlight, taillight, etc. remain lit even when the lighting switch is in "OFF" position but this is no problem for checks.

2. Remove all of the ignition coils and spark plugs.
3. Disconnect the all of the injector connectors.

WARNING: Keep your distance from the spark plug hole when cranking. Oil, fuel, etc., may spray out from the spark plug hole and may cause serious injury.

4. Cover the spark plug hole with a shop towel etc., after the engine has been cranked, check that no foreign material is adhering to the shop towel.

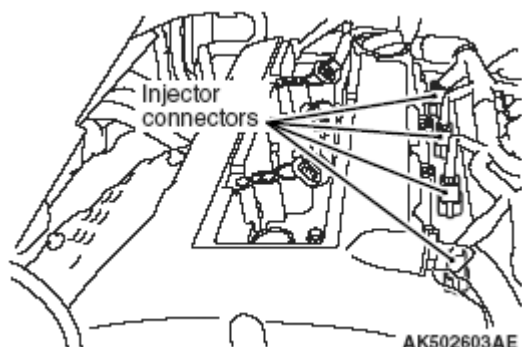


Fig. 12: Identifying Injector Connectors

Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

5. Set compression gauge to one of the spark plug holes.

6. Crank the engine with the throttle valve fully open and measure the compression pressure.

Standard value (at engine speed of 200 r/min): 1, 440 kPa (209 psi)

Limit (at engine speed of 200 r/min): Minimum 1, 000 kPa (145 psi)

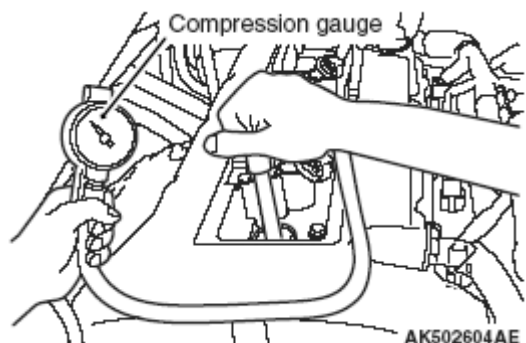


Fig. 13: Measuring Compression Pressure

Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

7. Measure the compression pressure for all the cylinders, and check that the pressure differences of the cylinders are below the limit.

Limit: Maximum 98 kPa (14 psi)

8. If there is a cylinder with compression or a compression difference that is outside the limit, pour a small amount of engine oil through the spark plug hole, and repeat the operations in steps from 5 to 7.
 1. If the compression increases after oil is added, the cause of the malfunction is a worn or damaged piston ring and/or cylinder inner surface.
 2. If the compression does not rise after oil is added, the cause is a burnt or defective valve seat, or pressure is leaking from the gasket.
9. Connect the all of the injector connector.
10. Install the spark plugs and ignition coils.
11. Use the scan tool MB991958 to erase the diagnosis codes.

NOTE: This will erase the diagnosis code resulting from the injector connectors being disconnected.

12. Select "Mode \$0A" from "Special Function" of Scan tool MB991958. Check whether the permanent-DTC (PDTC) is stored or not. If stored, clear the PDTC. (Refer to **DIAGNOSTIC FUNCTION**)

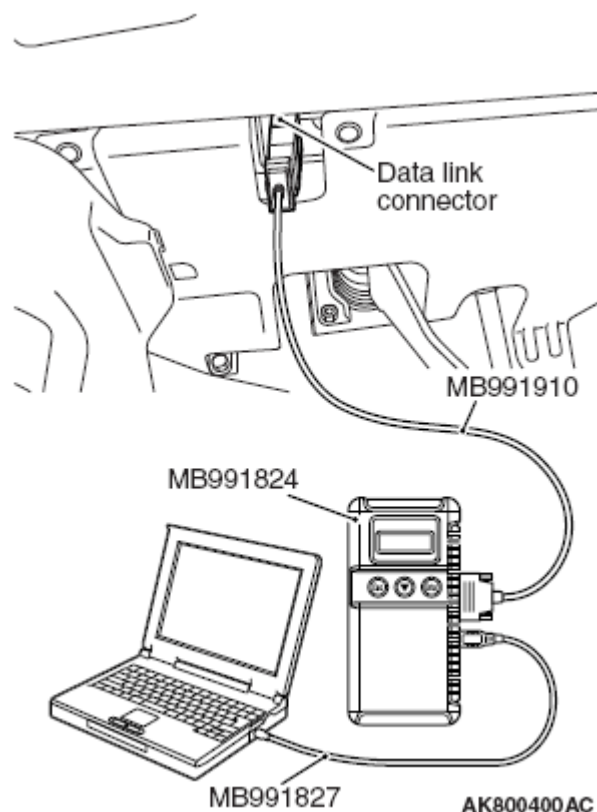


Fig. 14: Connecting Scan Tool To Data Link Connector
Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

MANIFOLD VACUUM CHECK

Required Special Tool:

MB991958: Scan Tool (M.U.T.-III Sub Assembly)

- MB991824: V.C.I.
- MB991827: M.U.T.-III USB Cable
- MB991910: M.U.T.-III Main Harness A

1. Before inspection, set the vehicle in the following condition:

- Engine coolant temperature: 80 - 95°C (176 - 203°F)
- Lights and all accessories: OFF
- Transaxle: P range

NOTE:

On vehicles for Canada, the headlight, taillight, etc. remain lit even when the lighting switch is in "OFF" position but this is no problem for checks.

CAUTION: To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

2. Connect scan tool MB991958 to the data link connector.

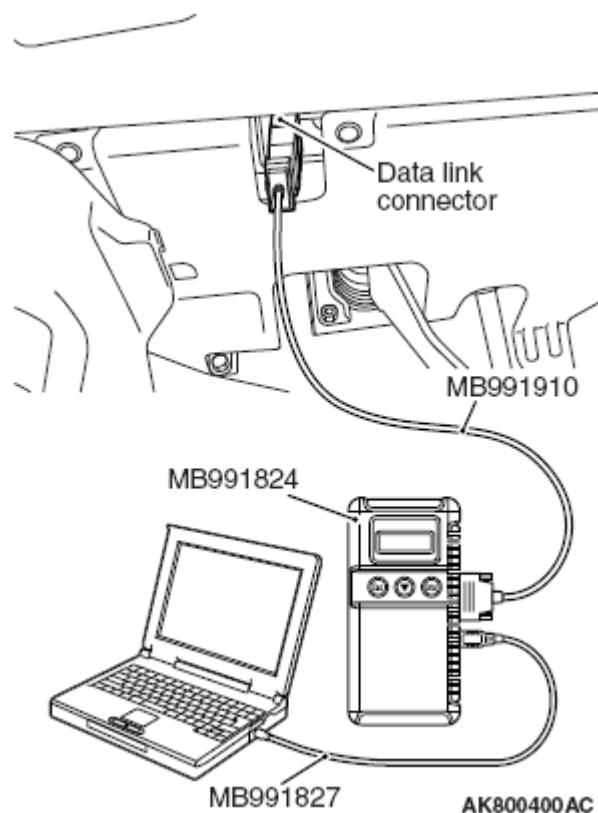


Fig. 15: Connecting Scan Tool To Data Link Connector
Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

3. Disconnect the ventilation hose from the positive crankcase ventilation (PCV) valve, and then connect a vacuum gauge to the ventilation hose. Plug the PCV valve.
4. Start the engine and check that idle speed is approximately 650 r/min.
5. Check the intake manifold vacuum.

Limit: Minimum 60 kPa (18 in Hg)

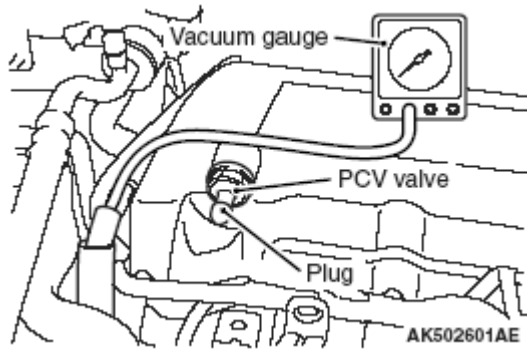


Fig. 16: Checking Intake Manifold Vacuum

Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

6. Turn off the ignition switch.
7. Remove the vacuum gauge and then connect the ventilation hose to the PCV valve.

CAUTION: To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

8. Disconnect scan tool MB991958 from the data link connector.

CRANKSHAFT PULLEY

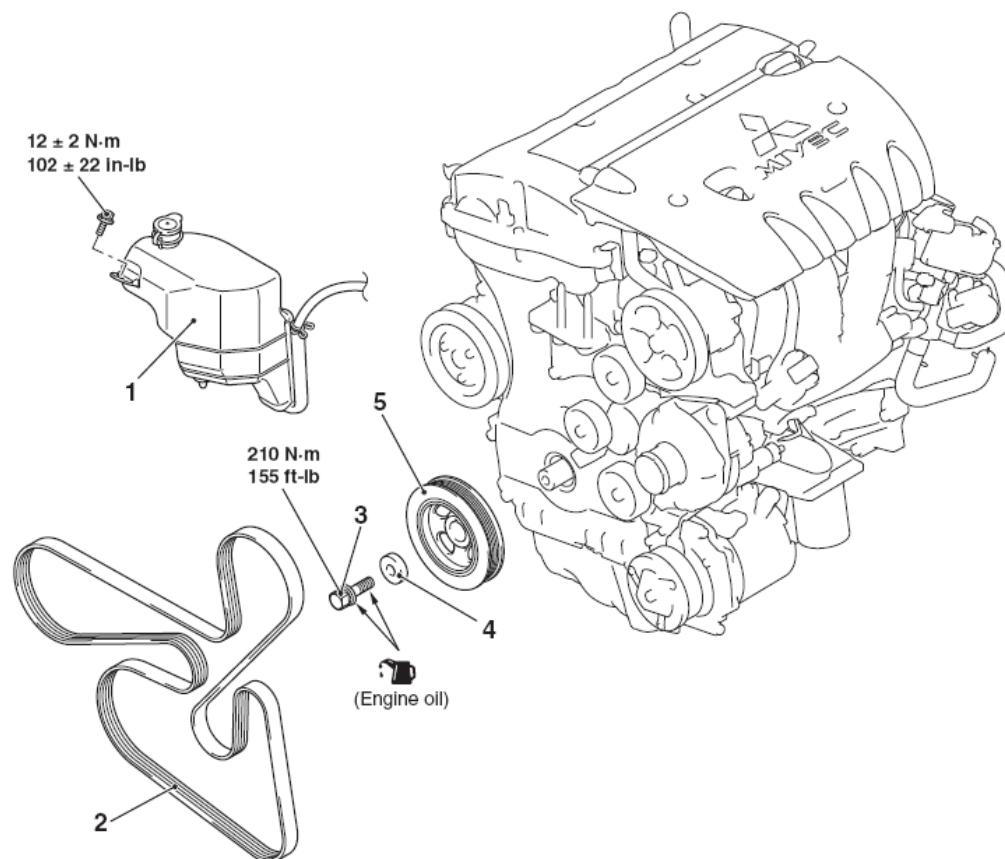
REMOVAL AND INSTALLATION

Pre-removal operation

- Engine Room Under Cover Front B and Engine Room Side Cover (RH) Removal

Post-installation operation

- Drive Belt Tension Check
- Engine Room Under Cover Front B and Engine Room Side Cover (RH) Installation



AC611683AC

Removal steps

- | | | | | | |
|-------|-------------------------------------|----------------------------------|-------|-----------------------------|----------------------|
| <<A>> | 1. Radiator condenser tank assembly | <<C>> | >>A<< | 4. Crankshaft pulley washer | |
| <> | >>B<< | 2. Drive belt | <<C>> | >>A<< | 5. Crankshaft pulley |
| <<C>> | >>A<< | 3. Crankshaft pulley center bolt | | | |

Fig. 17: Removing/Installing Crankshaft Pulley With Torque Specifications

Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

Required Special Tools:

- MB990767: Front Hub and Flange Yoke Holder
- MD998719: Pin

REMOVAL SERVICE POINTS**<< A >> RADIATOR CONDENSER TANK ASSEMBLY REMOVAL**

Remove the radiator condenser tank assembly mounting bolt, and move the radiator condenser tank assembly to a place where it does not interfere with the drive belt removal and installation.

<< B >> DRIVE BELT REMOVAL

Since the serpentine drive system with the drive belt auto-tensioner is used, the following operations will be required.

CAUTION: To reuse the drive belt, draw an arrow indicating the rotating direction on the back of the belt using chalk to install the same direction.

WARNING: Always work from above when releasing the tension of the auto-tensioner. When you try to gain access from underneath the vehicle, you will experience difficulty, thus causing the tool to be dropped off.

CAUTION: To work at the optimum angle, you must choose a most suitable box-type wrench is applied to the special tool.

WARNING: Be sure to set the box-type wrench and the special tool MB992278 to the hexagonal parts securely to prevent the tool from falling off because the tension of the auto-tensioner is high.

1. Install special tool MB992278 and a box-type wrench at the optimum angle.
2. Rotate the pulley bolt of the auto-tensioner counterclockwise.
3. Insert the L-shaped hexagon wrench into the auto-tensioner hole to fix the auto-tensioner.
4. Remove the drive belt.

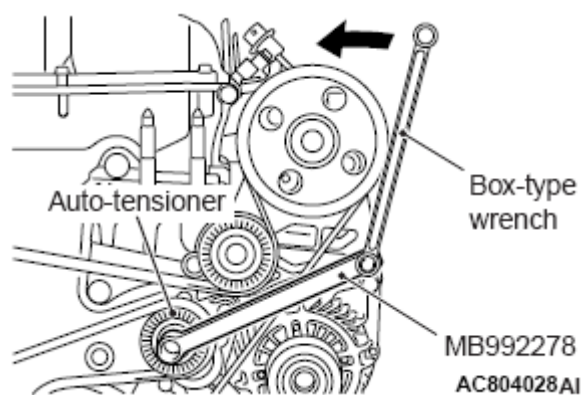


Fig. 18: Rotating Pulley Bolt Of Auto-Tensioner Counterclockwise
Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

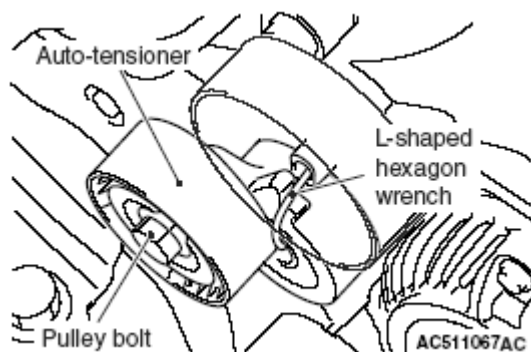


Fig. 19: Identifying Pulley Bolt And Auto-Tensioner
 Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

<< C >> CRANKSHAFT PULLEY CENTER BOLT/CRANKSHAFT PULLEY WASHER/CRANKSHAFT PULLEY REMOVAL

1. Hold the crankshaft pulley with special tools MB990767 and MD998719.
2. Loosen the crankshaft pulley center bolt and remove the crankshaft pulley center bolt, crankshaft pulley washer and crankshaft pulley.

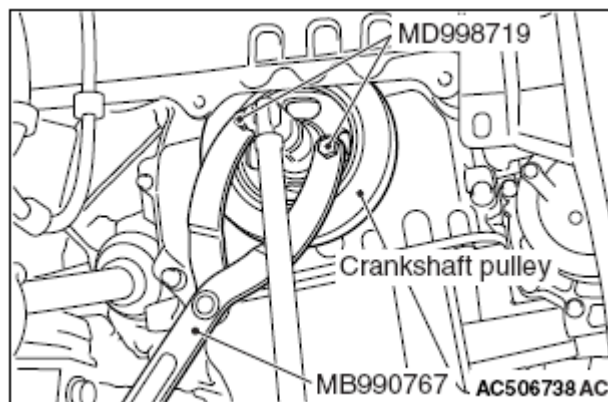


Fig. 20: Holding Crankshaft Pulley With Special Tools MB990767 And MD998719
 Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

INSTALLATION SERVICE POINTS

>> A << CRANKSHAFT PULLEY/CRANKSHAFT PULLEY WASHER/CRANKSHAFT PULLEY CENTER BOLT INSTALLATION

1. Wipe off the dirt on the crankshaft and the crankshaft pulley as shown in the illustration using a rag.
2. Wipe off the dirt on the crankshaft sprocket, the crankshaft and the crankshaft pulley as shown in the illustration using a rag, and then degrease them.

NOTE: **Degrease them to prevent drop in the friction coefficient of the pressed area, which is caused by oil adhesion.**

3. Install the crankshaft pulley.
4. Wipe off the dirt on the crankshaft pulley washer and the crankshaft pulley center bolt as shown in the illustration using a rag.
5. Apply an adequate and minimum amount of engine oil to the threads of the crankshaft pulley center bolt and the lower area of the flange.

- ▣ : Wipe clean with a rag.
- * : Wipe clean with a rag and degrease.
- : Apply a small amount of engine oil.

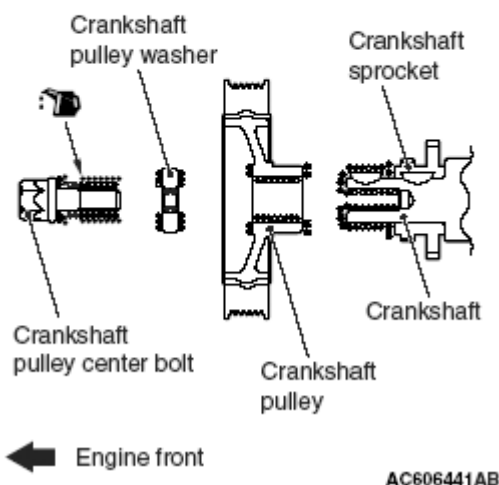


Fig. 21: Wiping Off Dirt/Degreasing Components And Applying Engine Oil To Bolt Threads
Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

6. Hold the crankshaft pulley with special tools MB990767 and MD998719 in the same manner as removal.
7. Tighten the crankshaft pulley center bolt to the specified torque.

Tightening torque: 210 N.m (155 ft-lb)

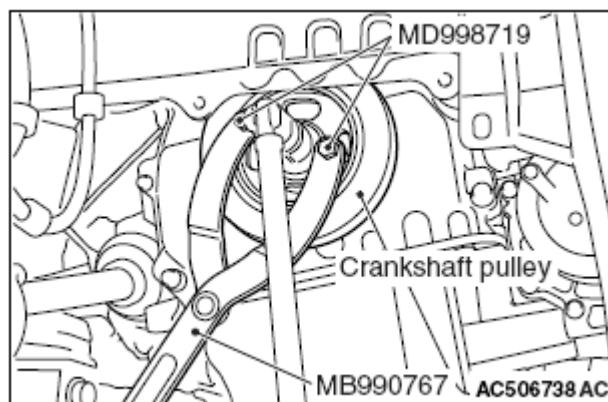


Fig. 22: Holding Crankshaft Pulley With Special Tools MB990767 And MD998719
 Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

>> B << DRIVE BELT INSTALLATION

CAUTION:

- To reuse the drive belt, install it by aligning the arrow mark on the backside of belt marked at the removal with the rotating direction.
- Check that the notches of the notched pulley and the notches of the drive belt are fit correctly.
- Check that the drive belt is installed in the center of the flat surface of the flat pulley.

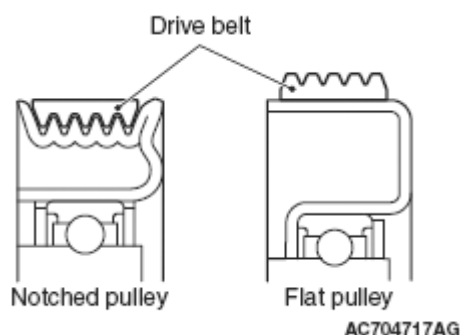


Fig. 23: Checking Drive Belt Installation
 Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

1. Install the drive belt to each pulley as shown in the illustration.

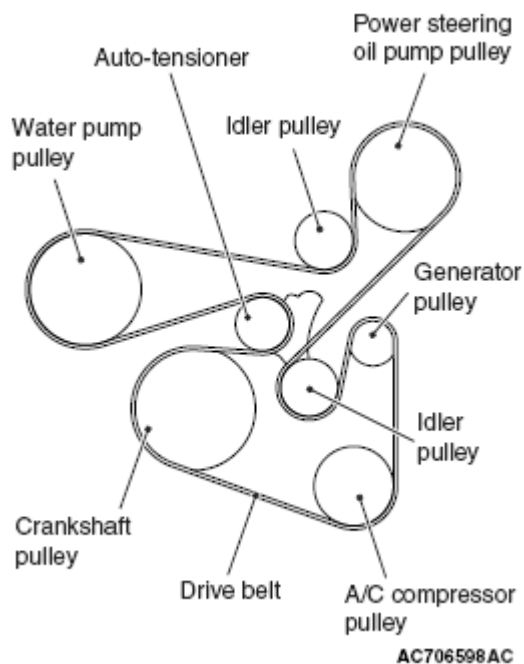


Fig. 24: Drive Belt Routing Diagram

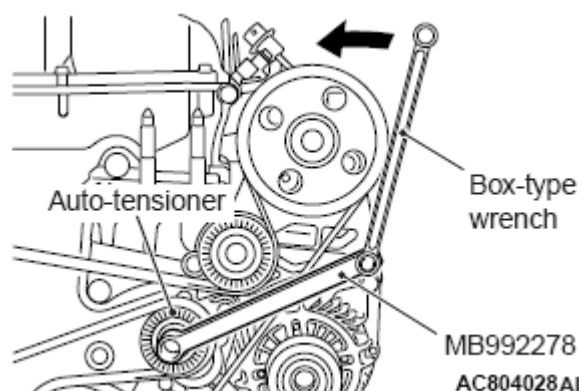
Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

WARNING: Always work from above when releasing the tension of the auto-tensioner. When you try to gain access from underneath the vehicle, you will experience difficulty, thus causing the tool to be dropped off.

CAUTION: To work at the optimum angle, you must choose a most suitable box-type wrench is applied to the special tool.

WARNING: Be sure to set the box-type wrench and the special tool MB992278 to the hexagonal parts securely to prevent the tool from falling off because the tension of the auto-tensioner is high.

2. Install special tool MB992278 and a box-type wrench at the optimum angle.
3. Rotate the auto-tensioner counterclockwise and remove the L-shaped hexagon wrench fixing the auto-tensioner.
4. Apply tension to the drive belt while slowly turning the auto-tensioner clockwise.

**Fig. 25: Rotating Pulley Bolt Of Auto-Tensioner Counterclockwise**

Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

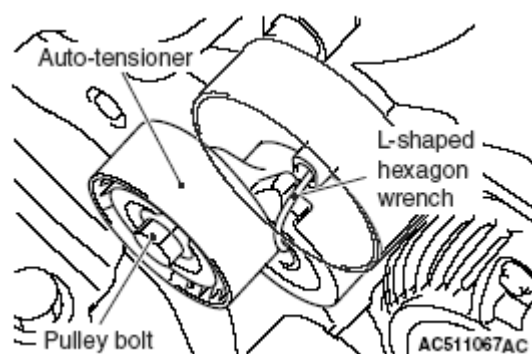


Fig. 26: Identifying Pulley Bolt And Auto-Tensioner

Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

CAMSHAFT

REMOVAL AND INSTALLATION