Chapter 2

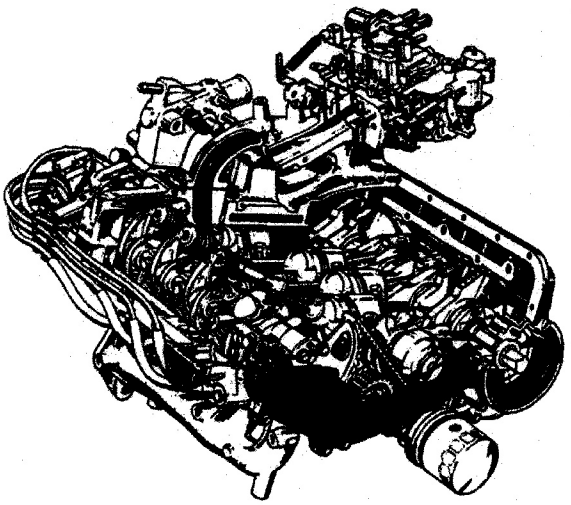
General Maintenance & Tune Up

16. Engine Specifications
17. Testing Equipment
18. Battery & Coolant
19. Oil & Filter Including Supercharger
20. Air & Fuel Filter
21. Spark Plugs
22. V- Belts
23. Valve Adjustment
24. Vacuum Hose
25. Distributor Point Settings
26. Timing
27. Idle Setting
28. CO-HC Levels and Adjustment
29. Engine Vacuum & Troubleshooting
30. Main Relay Location Guide

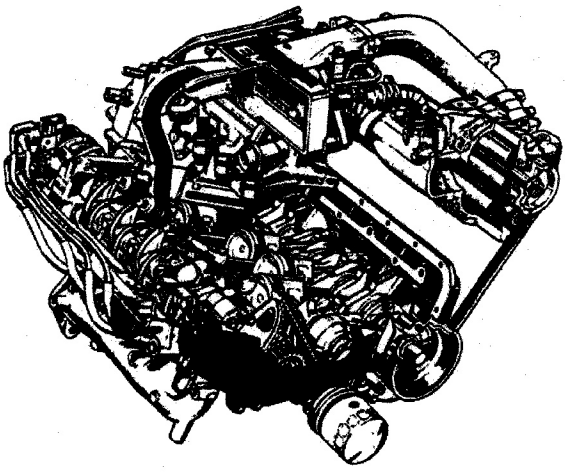
Engine Basic Specifications

Specifications		
Series	EN07C (NA)	EN07Y (SC)
Cylinder	4	←
CAM	SOHC	←
Engine (cc)	658	←
Bore/Stroke (㎜)	56.0×66.8	←
Compression	9.8	8.3
HP Rating (PS/rpm)	40/6,500	55/6,200
Torque (kg-m/rpm)	5.5/3,500	7.1/3,800
Fuel	Carburated	EFI
Ignition	STD	Crank Sensor ECU Controled
Firing Order	#1-3-4-2	←
Forced Induction	—	Super Charged

EN07C



EN07Y

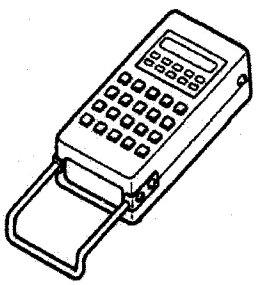


www.yokohamamotors.com [English]

Engine Inspection & Testing Tools

ST	4985454000	Oil Filter Wrench	Oil Filter Replacement
	-----	Battery Tester	
	GU-51C	Compression Gage	Engine Compression
	-----	Timing Light	Engine Timing
	498307900	Subaru Select Monitor	Engine Test
	498348300	Cartridge	For Select Monitor
	-----	Thickness Gage	Valve Adjustment
	NA	NA	NA

ST= Service Tool



Subaru
Select Monitor

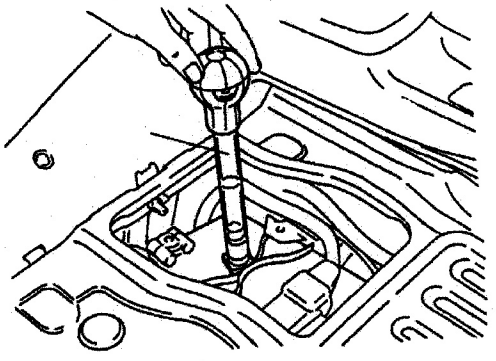
Contector Cord
(Select Monitor Use)

Cartridge
(Model Specific)

Maintenence Check

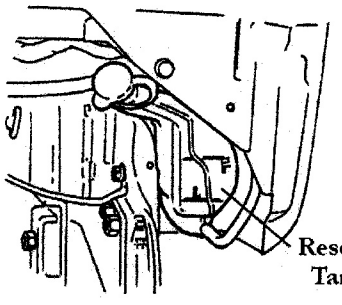
Battery

Battery Maintenance Check
1. Remove Battery Cover
2. Disconnect Battery Terminals
3. Remover Batter
4. Inspect Side of Battery for High-Low Level
5. Fill to Proper Level
6. Use Battery Tester To Check Volt 11.5~14V
7. Use Battery Fluid Tester
8. Clean Battery Terminals
9. Install Battery
10. Start Vehicle

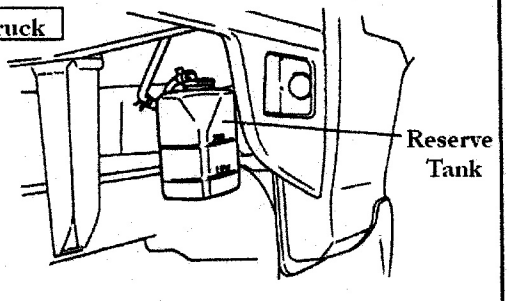


Coolant

VAN



Truck



Coolant Inspection
1. Check Reserve Tank for Proper Level
Note: If Tank is Dirty Remove and Flush
2. Fill Tank to Proper Level
Note: If Coolant Replacement is Scheduled
Drain Entire System & Replace with
New Coolant. Never Re-Use Coolant.

Coolant-Water Ratio

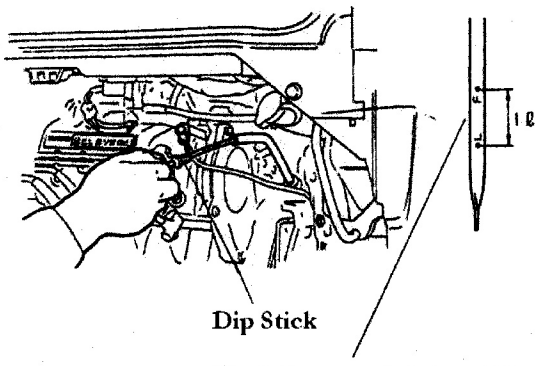
	2WD	4WD
Coolant	30%	50%
Temperature Range	−8℃ (−15℃)	−28℃ (−35℃)

Coolant Inspection

Check	Monthy
Replace	40,000K or 2 Years

Oil Level and Oil Change Including Filter

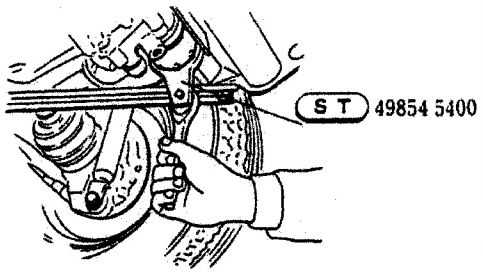
1. Open Engine Cover
2. Pull Out Engine Oil Dip Stick (Handle Yellow)
3. Wipe Off Oil and Repeat
4. Check Oil Level and Must be between L&F
   Note: If Oil is Below "L" or Dirty Proceed to Change Oil.
   Note: If Oil is Clean and a Bit Low Add Fresh Oil to Proper Level



Engine Oil

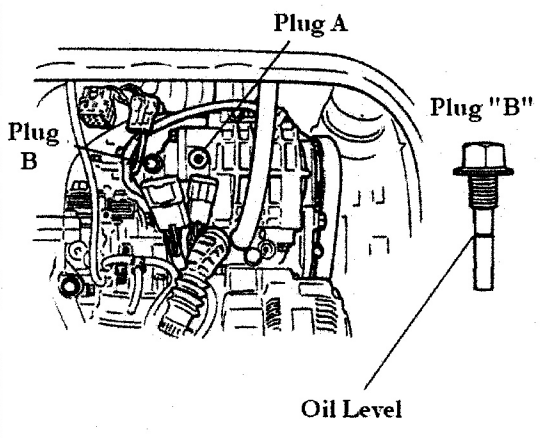
Use Straigh 30W For Multi-Season
Note: For Cold Weather Areas Use 7.5~30W
Note: Do NOT Use Heavy Weight 50W+

Oil Capacity
Oil Only: 2.8 Liters (MT) 2.9 Liters (ECTV)
Oil & Filter: 3.0 L (MT) 3.1 L (ECTV)



Oil Filter Part
Subaru Part Number
#15208-KA0120 #15208-KA010
Cross Number
Mitsubishi #MD134953
Mazda #B6Y1-14-302

Super Charger Oil Inspection



1. Remove Plug "B" First to Ceck Oil Level.
   Note: If Oil Level is In Range it is Not Necessary to Remove Plug "A"

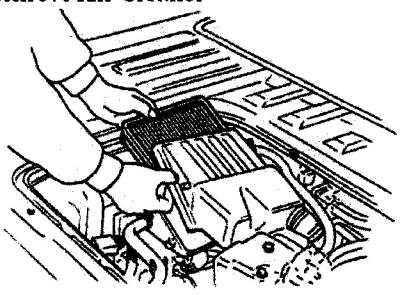
Oil	Shell MSC Gear Oil

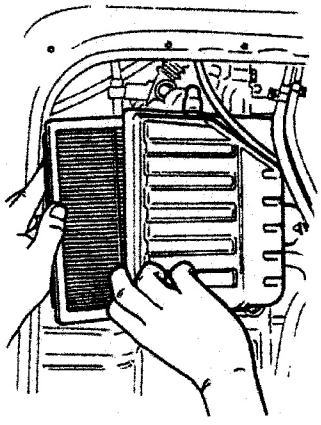
Plug A Torque	2.5±0.2kg-m
Plug B Torque	1.2±0.2kg-m

Maintenance Check

Air Filter

1. Remove Engine Cover
2. Un-Clip Plastic Air Cleaner Cover
3. Remove Air Cleaner





4. Vacuum or Wipe Out Air Cleaner Case
5. Use an Air Pressure Cleaner to Clean Filter

Note: Filter Should be Changed Every 20,000 Kilometers or Every 6 Months.

Fuel Filter

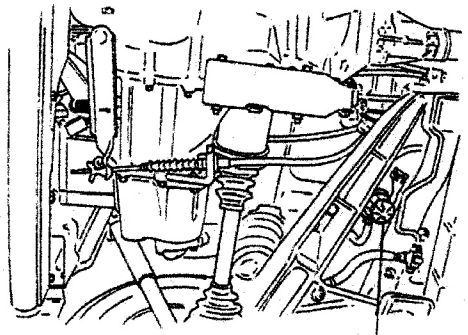
Note: Fuel Filters Should be Changed Once a Year or 20,000 Kilometers

Caution: EFI vehicles Fuel System is Under High Pressure.

EFI Engines: Disable Fuel Pump, Start Engine and Run Until Out of Fuel. Disconnect (-) Battery Connection. Remove and Replace Filter. Engage Fuel Pump and Re-Connect (-) Battery Conection. Start Engine and Observe For any Leaks.

Carbureted Engines: Remove & Replace Filter
Caution: Never Smoke Around Fuel, No Open Flames Within 50 Meters

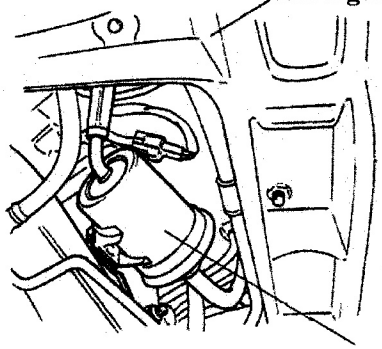
Carbureted Vehicle



EFI Vehicle

Fuel Filter

Trailing Arm

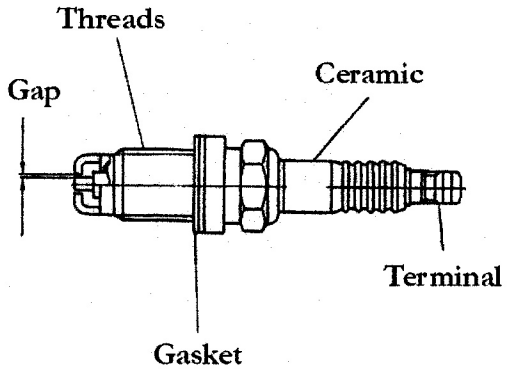


Fuel Filter

Spark Plugs

Spark Plugs are Recommended to be Changed Every 10,000 Kilometers.

Spark Pugs Can be Your Best Indication of the Inside of Your Engine.



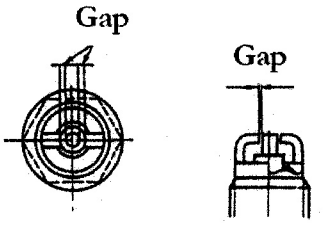
Appearence Indicators

Normal: Gayish Color-Replace at Recommended Time Period

Oil Deposits: Oily or wet Appearence
Remove Engine and Overhaul

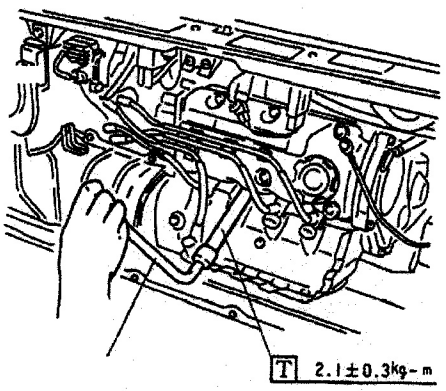
Burnt: Visualy Burnt or Insulator Cracked
Incorrect Heat Range

Gap Measurment Using a Feeler Gage



Note: Make Sure Engine Is Cool When Removing Spark Plugs

1. Open Engine Cover
2. Remove (One Wire at a Time) Plug Wire
3. Remove Old Plug (Discard)
4. Set Gap to New Plug and Install
5. Repeat Step for all 4 Cylinders



NGK	Nippon Denso	Gap (mm)
ZFR 6 G	K20DTR-S11	1.0~1.1
ZFR 5 G	K16DTR-S11	1.0~1.1

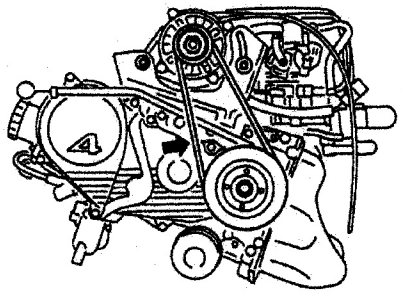
Note: Due to Engine Constant High Revelutions It is Recommended to Change Spark Plugs Every 10,000 Kilometers

V-Belts

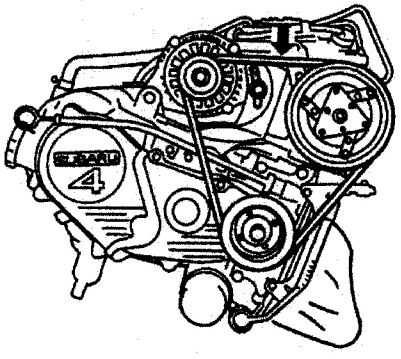
All V-Belts Should be Periodically Inspected for Cracks and Wear.

Note: All V-Belts Must be Changed at 100,000 Kilometers

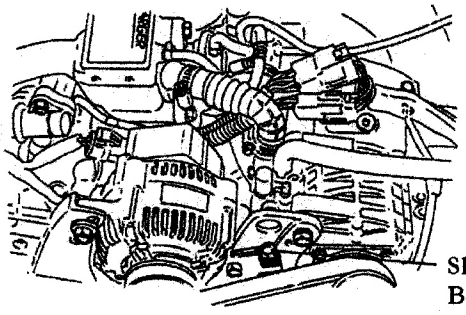
Carbureted Engine (No Accesories)

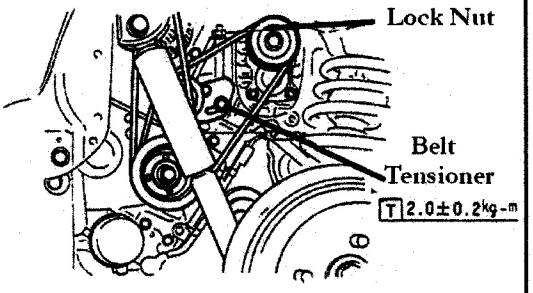


Carbureted Engine: AC Option

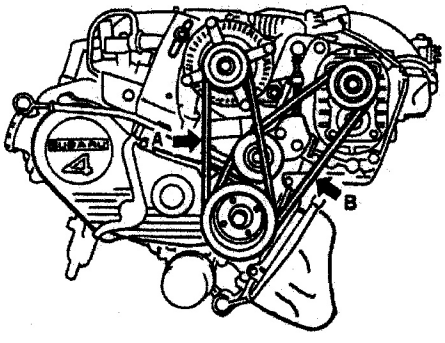


EFI Equiped Engines





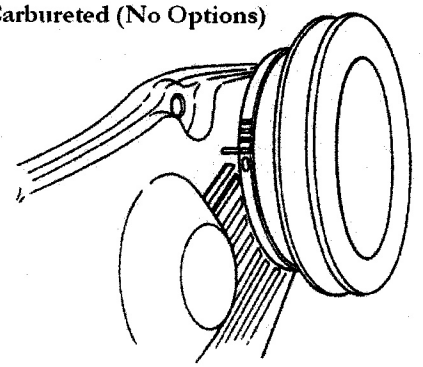
EFI Supercharged Engine



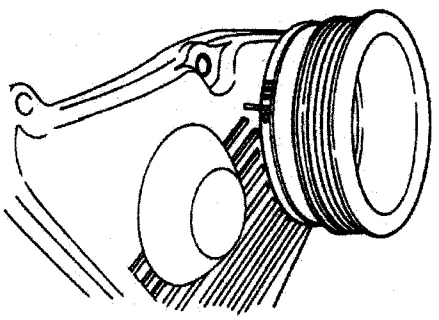
Valve Adjustment

Set the Crankshaft Timing Mark to Zero Degrees on the Compression Stroke as Indicated on the Picture Diagrams Below.

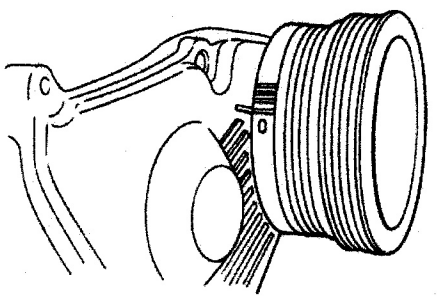
Carbureted (No Options)



Carbureted AC Equippted



EFI Supercharged

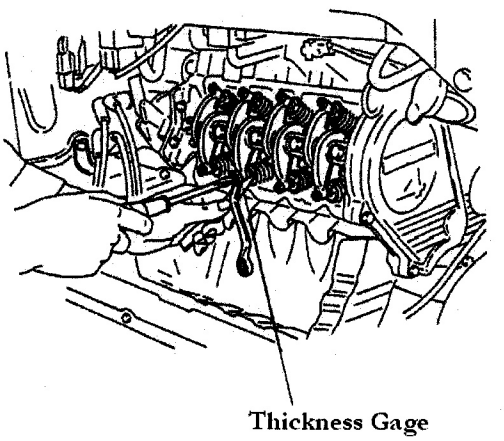


Note: Set Valve Adjustment With Engine Cold (Ambient Temperature)

1. Make Sure Engine is at TDC Compression Stroke.
2. Remove Valve Cover
3. Loosen Adjustment Nuts
4. Using a Screwdriver Loosen Intake and Exhaust Adjustment Screws

Set Cold	
Intake	0.15±0.02mm
Exhaust	0.20±0.02mm

Nut Torque	0.9±0.1kg-m



Thickness Gage

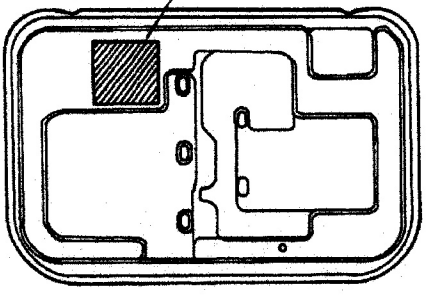
5. Set #1 Intake and Exhaust, #2 Intake, #3 Exhaust.
6. Turn the Engine One Rotation.
7. Set Remaining Valves to Specifications
8. Torque Retainer Nuts
9. Using a New Gasket Attach Valve Cover
10. Drain Oil and remove Oil Filter
11. Add New Oil and Filter
12. Run Engine at Various Idle Speeds 10 Min.
13. Test Drive

Non-AC Vehicle Vacuum Hose and Point Settings

Vacuum Hose Inspecton

Note: Vacuum Hoses Over The Years Become Dry and Cracked. This Leads to System Balance Trouble. It is an Important Step To Follow The Provided Diagrams Per Vehicle. Look for the Sticker Near The Engine Compartment

Vacuum Hose Diagram (Per Vehicle)



Note: Points Should be Changed Every 24,000 Kilometers or 2 Years

Point Dwell

Limit	Mitsubishi	49°~55°
	DENSO	49°~55°

Point Gap (mm)

Limit	Mitsubishi	0.45~0.55mm
	DENSO	0.4~0.5mm

Note: When Changing Points Make Sure To Grease The Cam With Fresh Lithium White Grease.

Point Spring Lift Pressure

Limit (Range)	Mitsubishi	450~600g
	DENSO	400~550g

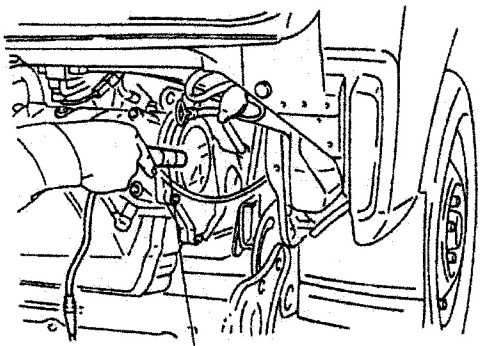
Condensor

Limit (Range)	Mitsubishi	0.243~0.297μF
	DENSO	0.225~0.275μF

Note: Condensors Should Be Changed Every 48,000 Kilometers or 4Years

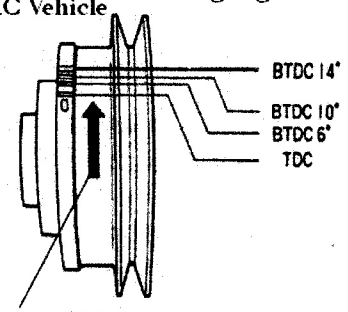
Timing Carbureted Vehicle

Caution: Beware of Moving Fan
1. Loosen Distributor Hold Down Bolt
2. Warm Engine
3. Remove and Plug Vacuum Hose
4. Using Timing Light Check Timing
5. Adjust as Necessary
6. Tighten Hold Down Bolt
7. Attach Vacuum Hose



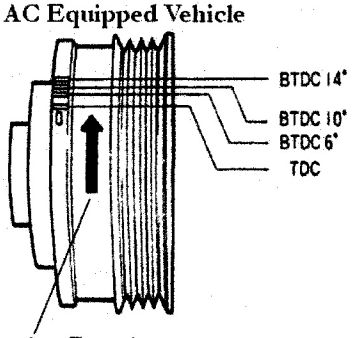
Timing Light

Non-AC Vehicle



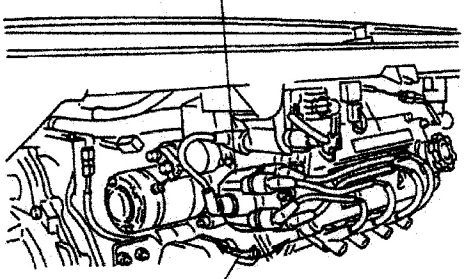
Engine Rotation

AC Equipped Vehicle



Engine Rotation

Distributor



Distributor Rotation L~R

Timing	(BTDC/rpm)
NA Carb	6° /800

Note: If Timing is Erratic Check Points and Distributor Cap. Also Check For Bad spark Plug Wires

Spark Plug Wires: Must be Changed Every 60,000 Kilometers

Point Adjustment: Every 12,000 Kilometers

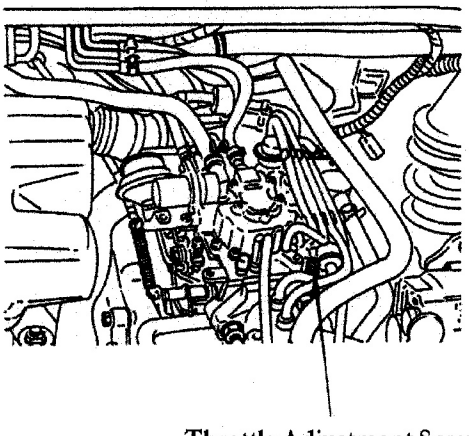
Cap Replacement: Every 24,000 Kilometers

Non-AC vehicle Idling and CO-HC Levels

Idling Setting

1. Warm Engine to Operating Temperature
2. Confirm Timing is Set Correct
   (See Timing Settings in Previous Steps)
3. Set Idle By Adjusting Idle Screw

Idle RPM	800±50rpm



Throttle Adjustment Screw

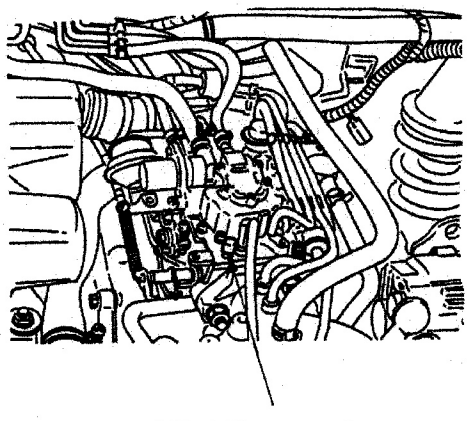
Caution: Alway Beware of The Fan With The Engine Running

CO-HC Levels

Note: Setting The Adjustment Screw Can Take Up To 5 Min to Take Effect

CO-HC Level Chart

CO(%)	1.5±0.5
HC(ppm)	1000 or Below



Idle Adjustment Screw

1. Warm Engine To Operating Temperature
2. Put CO-HO Tail Pipe Sniffer and Check Reading
3. If Adjustment is Required Wait up to 5 Min For a Reading to Take Effect.

Note: If All Timing Specifications Are Correct and CO-HC Can Not be Adjusted by The Idle Adjustment Screw The Carburetor Must be Replaced or Rebuilt.

Note: See The Following Page For More Setting Information

Carbureted

CO-HC (Continued)

Part	RPM	CO Level
Idle Adjustment Screw	Turn Right	Lower
	Turn Left	Higher

Note: Idle Adjustment Screw Has a CO Adjustment Level of 1.5(+-) 0.5%

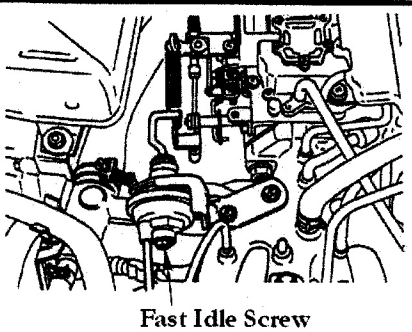
AC Equiped Carbured Vehicle

Fast Idle

AC Equiped Fast Idle Circuit is Set to 1050 (+-) 50 RPM

Note: Make Sure AC Switch is [ON]

Fast Idle Adjustment Screw	Turn	Engine RPM
	Turn Right	Idle Up
	Turn Left	Idle Down

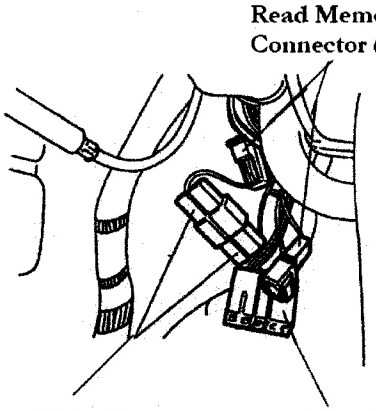


Fast Idle Screw

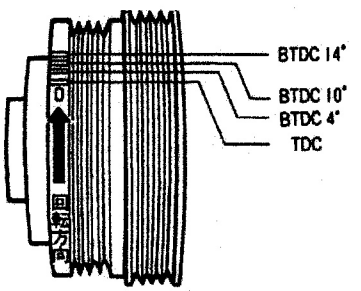
EFI Supercharged

Timing

Note: EFI Engine Timing is Set by Computer Hand Held Computer is Necessary



Note: The Timing Light Method Can be Used by By-Passing the Computer. If Setting the Timing Directly The Computer May Re-set Itself.



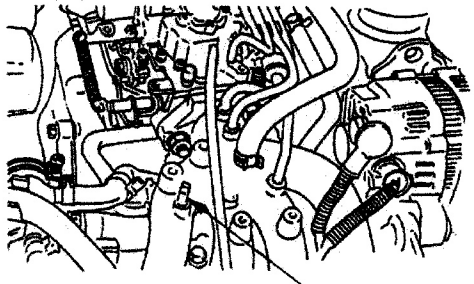
Set To: BTDC 10° /800rpm

Note: Most Timing Errors On Computer Controlled vehicles Are Vacuum Issues. Check for Leaks in Vacuum Lines. The Computer Will Re-Adjust Itself If a Vacuum Line is Found Broken and Repaired.

Idle Vacuum

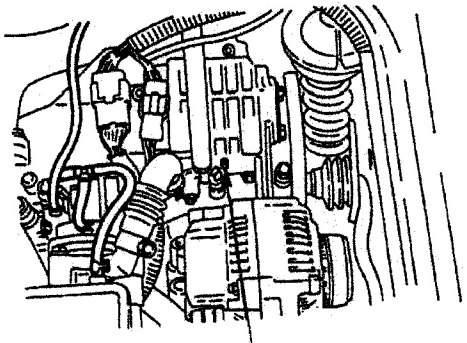
1. Warm Engine to Operting Temperature
2. AC Equiped Vehicles, Attach Vacuum Gage to AC Idle Nipple. 4WD Vehicles Attach Gage to Actuator Nipple.
3. Take Measurements and Compare to Chart Listed Below.

NA Vehicle



AC Fast Idle Nipple

SC Vehicle



4WD Atuator Nipple

Vacuum Specifications

Vacuum (mmHg)	NA Vehicle		430~530
	EFI SC	MT	350~470
		ECVT	330~450

Note: Vacuum measurements Below The Readings Above Signify a Leak in The System

Troobleshooting

Vacuum Level	Cause
Too Low	1. Intake Gasket Leak 2. Ignition Timing 3. Valve Guide Worn 4. Valve Seat Worn 5. Bypass Valve Gasket 6. Supercharger Gasket (SC) 7. Carburetor Base Gasket 8. Carburetor 9. Vacuum Hose Leak
Too High	Timing Setting or Valve Adj
Fluctuation	Timing Miss or Bad Carb

Main Relay Locations