TUNE-UP

4000

ENGINE IDENTIFICATION

Engine number is stamped on left side of engine block near distributor.

Application	Code
Federal	YG
Calif.	YK

COMPRESSION PRESSURE

Check compression with engine warm, all spark plugs removed, and throttle wide open. Maximum variation permitted between cylinders is 28 psi (2.0 kg/cm²).

NOTE – *On models with electronic ignition, connect coil high tension wire to ground before cranking engine for compression test.*

Application	Standard Pressure psi (kg/cm²)	Minimum Pressure psi (kg/cm²)
All Models	128-185 (9-13)	100 (7)

VALVE CLEARANCE

1) Adjust valves with engine at normal operating temperature. Clearance adjustments are to be checked and made according to firing order sequence (1-3-4-2). Rotate crankshaft until cam lobes for No. 1 cylinder valves point upward, then measure valve clearances of No. 1 cylinder.

NOTE – *When adjusting valves, rotate engine CLOCKWISE only, otherwise timing belt may slip.*

2) If adjustment is necessary, use special tools 10-208 (disc removal tool) and VW546 (tappet depressing tool) to remove and install adjusting discs. Rotate camshaft until cam lobes no longer rest on adjusting discs of cylinder to be adjusted. Turn tappet until notches are at 90° to camshaft. Insert tool VW546 and depress tappet. Using tool 10-208, grasp tappet disc and rotate it out from under camshaft.

3) Thickness is stamped on bottom side of disc. Using clearance measurement, determine thickness of adjusting disc necessary to bring valve clearances within specifications. Discs are available in .0019" (.05 mm) increments from .1181" (3.0 mm) to .1673" (4.25 mm). Reverse removal procedure to install proper disc. Repeat procedure as required for remaining valves.

Valve Clearance

Application	Specification
Intake	①.008-.012" (.2-.3 mm)
Exhaust	①.016-.020" (.4-.5 mm)

① – Adjust with engine warm.

VALVE ARRANGEMENT

E-I-E-I-I-E-I-E (front to rear).

SPARK PLUGS

Application	Gap In. (mm)	Torque Ft. Lbs. (mkg)
All Models	.028 (.7)	22 (3)

Spark Plug Type

Application	Bosch	Champion
Federal	W7D	N8Y
Calif.	WR7DS	N8GY

HIGH TENSION WIRE RESISTANCE

Carefully remove ends of wire from spark plug and distributor. Using an ohmmeter, check resistance of wire while gently twisting wire. If resistance is not to specification, or fluctuates from infinity to any value, replace wire.

Resistance (Ohms) Per Wire

Application	Resistance
Ignition Wire	4800-7400
Coil Wire	1600-2400

DISTRIBUTOR

California models are equipped with electronic ignition systems that use a Hall generator and an idle stabilizer unit. Federal models are equipped with conventional breaker point ignition systems.

Point Gap	.016" (.4 mm)
Cam Angle	44-50°
Condenser Capacity	.22 mfd.

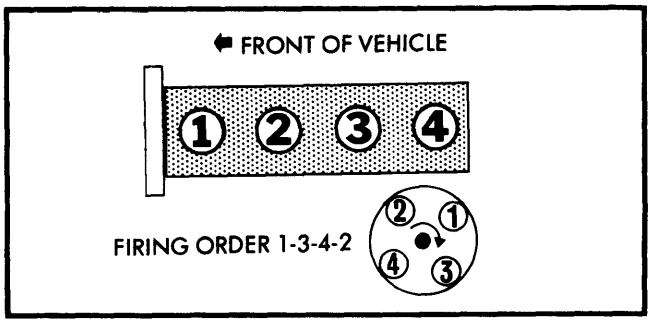

Fig. 1 Firing Order and Distributor Rotation

IGNITION TIMING

CAUTION – *Do not connect any test instruments to terminal 15 (+) of ignition coil on vehicles with electronic ignition. Use fuse 10 for connection.*

1) Warm engine to normal operating temperature. On Federal models, turn headlight high beams on. On California models,

TUNE-UP (Cont.)

stop engine and disconnect oxygen sensor, then disconnect both plugs from idle stabilizer unit and connect them together.

2) On all models, pull PCV hose from valve cover, adjust idle speed, then check ignition timing. Adjust by turning distributor. All vacuum hoses must remain connected.

NOTE – *Electric cooling fan must not run while adjustments are made.*

Ignition Timing Specifications

Application	RPM	Timing
Federal	850-1000	①3° ATDC
Calif.	920-960	①3° ATDC

① – With vacuum hoses connected.

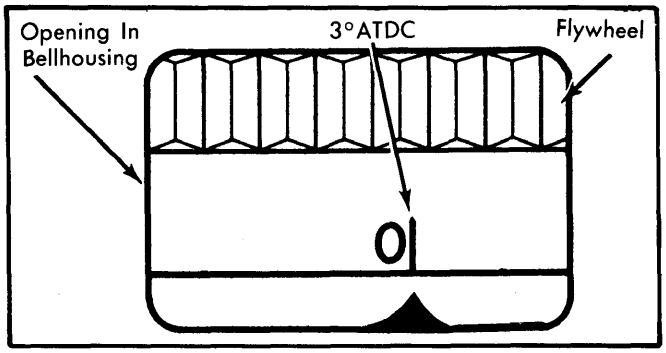

Fig. 2 Ignition Timing Mark Location

IDLE SPEED & MIXTURE

1) With engine at normal operating temperature, check and adjust ignition timing and valve clearances. Engine fan must come on at least once before adjustment, but must not be on during adjustment.

2) Pull PCV hose from valve cover and plug it. On Federal models, turn headlights on high beam. On California models, disconnect Green oxygen sensor wire, then disconnect both plugs from idle stabilizer and connect plugs together. Connect a dwell meter (set to 4-Cyl. scale) to frequency valve connector near battery. Meter should read 40-50°.

3) Remove cap from exhaust manifold test port and connect CO meter. Adjust idle speed with adjusting screw on side of throttle valve housing. Remove mixture plug from mixture control unit and adjust CO level using Allen wrench tool (P377).

CAUTION – *Do not press down on tool while adjusting CO, and do not accelerate engine with tool in place. Remove tool after each adjustment and accelerate engine briefly before checking CO reading. Always adjust CO level from lean to rich.*

4) On California models, reconnect oxygen sensor wire. Dwell meter reading should begin to vary and CO level should be within 0.4-1.2%. On all models, stop engine and remove test equipment. Reconnect all wiring and hoses.

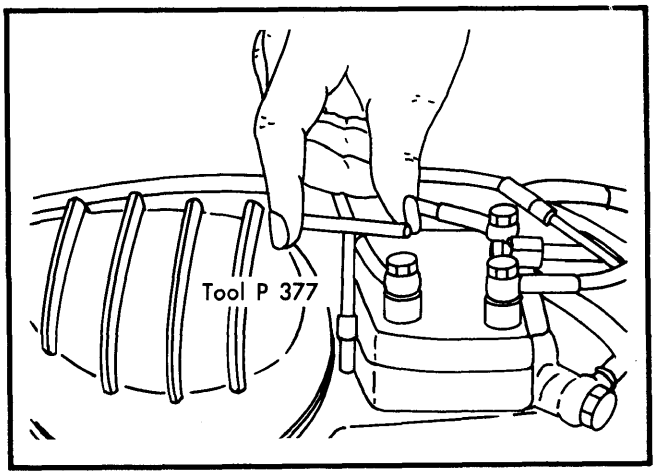

Fig. 3 Adjusting Idle Speed and Mixture

Idle Speed & CO Level

Application	Idle RPM	CO%
Federal	850-1000	0.5-0.9
Calif.	920-960	0.6-1.0

FUEL PUMP PRESSURE & VOLUME

Pressure	64-74 psi (4.5-5.2 kg/cm²)
Volume	1qt. in 40 sec.

EXHAUST EMISSION SYSTEMS

See EXHAUST EMISSION SYSTEMS section.

GENERAL SERVICING

IGNITION

DISTRIBUTOR

California models are equipped with Bosch breakerless electronic ignition with idle stabilizer unit. Federal models are equipped with Bosch single point distributors.

Other Data & Specifications – *See Tune-Up article and appropriate article in DISTRIBUTORS & IGNITION SYSTEMS section.*

IGNITION COIL

Resistance Specifications

Application	Primary	Secondary
Federal	1.7-2.1	7000-12,000
Calif.	.52-.76	2400-3500

GENERAL SERVICING (Cont.)

FUEL SYSTEMS

FUEL INJECTION

All models are equipped with Bosch Continuous Injection System (CIS). California models use an oxygen sensor system.

Other Data & Specifications – *See Tune-Up and Bosch CIS Fuel Injection in FUEL SYSTEMS Section.*

ELECTRICAL

BATTERY

Application	Amp. Hr. Capacity
Without A/C	45
With A/C	54

Battery Location – Right side of engine compartment.

STARTER

All models are equipped with Bosch Starters.

Other Data & Specifications – *See Tune-Up article and appropriate article in DISTRIBUTORS & IGNITION SYSTEMS section.*

ALTERNATOR

Application	Rated Amp. Output
Without A/C	55
With A/C	65

ALTERNATOR REGULATOR

Motorola and Bosch – Non-adjustable, integral with alternator.

Operating Voltage ..... 12.5-14.5 Volts

BELT ADJUSTMENT

When depressed with firm thumb pressure, deflection should be 3/8-9/16" (10-15 mm) for all belts.

FILTERS

Filter	Service Interval (Miles)
Oil Filter	Replace every 15,000
Air Filter	Replace every 30,000
Fuel Filter	Replace every 15,000

CAPACITIES

Application	Quantity
Crankcase (Includes Filter)	3.7 qts.
Cooling System	7.4 qts.
Man. Transaxle (SAE 80W-90)	1.8 qts.
Fuel Tank	15.9 gals.