1975-79 TUNE-UP PROCEDURES
International Harvester V8 Tune-Up

ENGINE IDENTIFICATION

VEHICLE IDENTIFICATION NUMBER

Vehicle Identification Number (VIN) appears on left frame rail front and on a plate attached to right door hinge pillar. Engine is identified by 5th character of VIN code.

ENGINE IDENTIFICATION CODE

Engine identification number is located at the upper front corner of the right bank. Engine configuration and displacement is indicated by first 4 characters of engine code.

ENGINE CODE

Application	Codes
304"	V-304
345"	V-345
392"	V-392

TUNE-UP NOTES

NOTE: When performing tune-up on vehicles equipped with a catalytic converter, do not allow or create a condition of engine misfire in one or more cylinders for an extended period of time. Damage to converter from overheating may occur due to loading with unburned fuel.

NOTE: Due to production changes, always refer to Emission Control Tune-Up Decal in engine compartment before attempting tune-up. In the even of a conflict between specifications given in this manual and decal specifications, use the decal specifications.

ENGINE COMPRESSION

ENGINE COMPRESSION SPECIFICATIONS

Application	Specification
Compression Ratio	
304"	8.19:1
345"	
1975-77 Models	8.05:1
1978-79 Models	8.28:1
392"	8.02:1
Compression Pressure	[1]
Recommended Fuel	[2] Unleaded (87 AKI Minimum)

[1] - Lowest cylinder pressure must be at least 75% of highest cylinder pressure.
[2] - Use Liquid Petroleum Gas (LPG) on LPG equipped vehicles.

VALVE CLEARANCE

Hydraulic Lifters - Zero lash.

VALVE ARRANGEMENT

Information not available from manufacturer.

SPARK PLUGS

SPARK PLUG TYPE

Application	Champion No.
1977-78 Models	
304"	RJ-10Y
345" & 392"	[1] RJ-6
304" & 345" LPG	RJ-6
1979 Models	RJ-10Y

[1] - RJ-10Y spark plug may be used for Light Duty service.

SPARK PLUG INSTALLATION

Application	Gap	Torque
All Models		
Carbureted	.035"	28-30 Ft. Lbs.
LPG	.015"	28-30 Ft. Lbs.

HIGH TENSION WIRE RESISTANCE

Carefully remove distributor cap and spark plug wires at plugs. Using an ohmmeter, check resitance while gently twisting wire. If resistance is not to specification, or if it fluctuates from infinity to any value, replace cable.

WIRE RESISTANCE (OHMS)

Application	Ohms (Maximum)
Up to 36"	30,000
Over 36"	45,000

DISTRIBUTOR

All 1975-77 models use Holley Breakerless Ignition system. The 1978-79 models are equipped with Prestolite Electronic Breakerless Ignition system. Service distributor every 12,000 miles by applying light oil to felt wick under rotor.

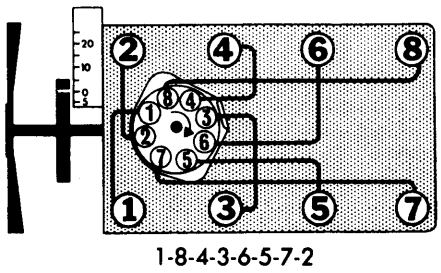

Fig. 1: Firing Order & Timing Mark Identification

IGNITION TIMING

1) Connect timing light. Disconnect and plug vacuum advance hose. Start engine and run until it reaches normal operating temperature. Observe engine idle speed and compare to specifications.

IGNITION TIMING SPECIFICATIONS (DEGREES BTDC)

Application	Federal	Calif.
1975-76 Models		
304"	TDC	TDC
345"		
Gasoline	TDC	5
LPG	10	10
392"	TDC	TDC
1977 Models		
304"	TDC	5
345"		
Gasoline	TDC	[1] 5
LPG	10	10
392"	TDC	TDC
1978 Models		
304"		
Gasoline	TDC	5
LPG	8	8
345"		
Gasoline	TDC	5
LPG	10	10
1979 Models	TDC	TDC

[1] - Set to TDC on California Models with Holley 2300G carburetor.

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International Harvester V8 Tune-Up (Cont.)

2) Adjust idle speed if necessary. Check ignition timing. To adjust, loosen distributor clamp and turn distributor until timing is correct. Tighten clamp and recheck timing. Stop engine and reconnect vacuum hoses and remove timing light.

HOT (SLOW) IDLE RPM

1975-78 Models - On gasoline engines, adjust idle speed with engine at normal operating temperature, transmission in Neutral, A/C off and vapor canister hose disconnected and plugged (if equipped). On LPG engines, idle speed must be adjusted in conjunction with idle mixture. See IDLE MIXTURE in this article.

1979 Models - 1) Apply parking brake. With air cleaner in place, transmission shift lever in Neutral, A/C off and engine at normal operating temperature, connect tachometer.

2) With engine running and solenoid energized and extended (345" engine does not have solenoid), turn curb idle adjusting screw in or out against solenoid plunger to obtain specified RPM. Adjust dashpot (if equipped).

3) Disconnect solenoid electrical wire and idle speed should drop as plunger retracts. Set low idle speed to specifications by adjusting low idle speed adjusting screw. Reconnect solenoid wire.

NOTE: Low idle speed can also be adjusted by setting curb idle speed first. Then, with low idle speed screw contacting throttle lever, backing off screw 1/2 turn.

HOT (SLOW) IDLE RPM SPECIFICATIONS

Application	Federal	Calif.
1975 Models		
345" (Calif.)	625-675	625-675
All Others	650-700	650-700
1976-78 Models		
304"		
Gasoline	650-700	600-650
LPG	[1]	[1]
345"		
Gasoline	650-700	625-675
LPG	450-500	450-500
392"	650-670	625-675
1979 Models	675-725	675-725

[1] - See Emission Control Tune-Up Decal in engine compartment.

IDLE MIXTURE

1975-78 Models - 1) On gasoline engines, disconnect air injection hose at manifold check valve and plug check valve. Disconnect vapor canister hose at canister and plug hose. Warm engine to normal operating temperature.

2) With engine at specified curb idle RPM, gently seat idle mixture screws. Insert Exhaust Gas Analyzer (SE-2507) probe into tailpipe. Adjust idle mixture screws to obtain specified CO value.

3) On LPG engines, warm engine to normal operating temperature. Ensure that transmission is in Neutral and A/C system is off. Insert Exhaust Gas Analyzer (SE-2507) probe into tailpipe.

4) Slowly close idle mixture adjusting screw until seated. Adjust part throttle air/fuel mixture drag link to obtain a .25 percent CO reading at 100 RPM below specified idle speed. *See Fig. 2.*

5) Adjust mixture screw to obtain specified idle CO value, then adjust idle speed screw to obtain specified idle RPM. Tighten lock nut on air/fuel mixture drag link and recheck CO value.

1979 Models - 1) Set parking brake. With air cleaner installed, transmission shift lever in Neutral and A/C off, disconnect and plug vacuum purge hose at charcoal canister. If canister is equipped with vacuum controlled bowl vent switch, be sure vacuum supply is still connected to switch.

2) Do not idle engine continuously for more than 3 minutes at a time. After each 3 minutes of idling, run engine at 2000 RPM for 1 minute and resume procedure. In winter months, make idle mixture check as soon as possible after engine will run without choke.

NOTE: Use steps 3) through 5) if using exhaust gas analyzer to check idle mixture. If not using analyzer, use steps 6) through 8) to check idle mixture. On 345" engines, a tailpipe extension MUST be connected to tailpipe due to diffuser which prevents insertion of probe into tailpipe.

3) Connect tachometer to engine. Disconnect air injection hoses at check valve and plug valves. Run engine at normal operating temperature and adjust curb idle speed to specifications.

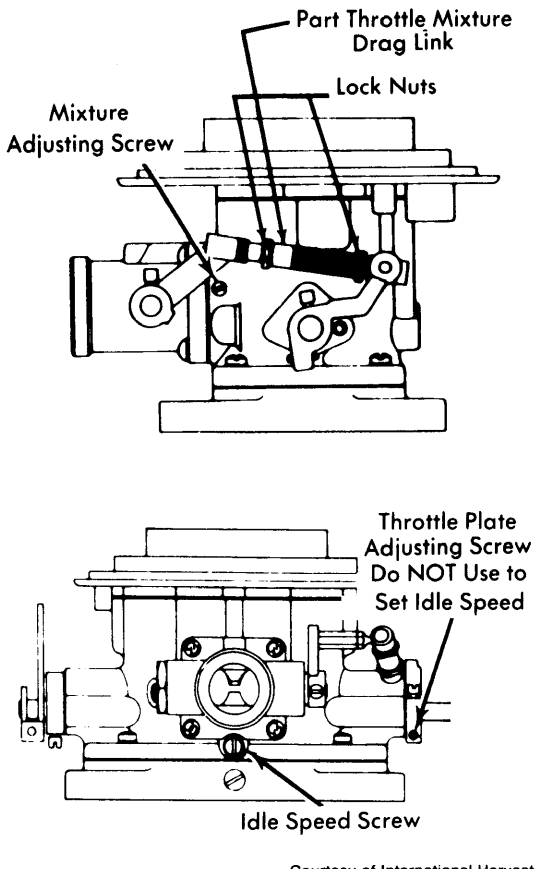
4) Insert Exhaust Gas Analyzer (SE-2507) probe into tailpipe. Observe CO value and adjust to specifications. Readjust idle speed and mixture screws to provide specified CO value.

5) If specifications cannot be achieved, remove limiter caps by filing (do not pry off). Gently seat idle mixture screws. Adjust mixture screws equal number of turns to provide specified CO value. Then install new limiter caps with tab at midposition. Disconnect test equipment and reconnect air injection check valve hoses.

6) Connect tachometer. Note position of idle mixture screws. File off (do not pry off) limiter caps. Set idle screws to position noted prior to cap removal.

7) Run engine at normal operating temperature. Adjust to curb idle speed. Gently seat idle mixture screws. Carefully adjust screws counterclockwise (equally) to provide maximum idle speed. Do not turn screws past point where highest RPM is first obtained (lean best idle).

8) Carefully adjust curb idle speed screw to 60 RPM over specifications. Turn mixture screws clockwise (equally) to obtain 60 RPM speed drop. Adjust curb idle speed screws to specifications. Install new plastic limiter caps with tabs in midposition.



Courtesy of International Harvester Co.

Fig. 2: LPG Idle Mixture & Idle Speed Adjustments

1975-79 TUNE-UP PROCEDURES
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IDLE MIXTURE (CO%) SPECIFICATIONS

Application	Federal	Calif.
1975 Models		
304" & 392"	2.0	2.0
345"	1.5	1.5
1976-77 Models		
304"	2.0	0.5-1.5
345"		
2210C Carb.	1.5	0.5-1.5
2300G Carb.	1.5	1.0-3.0
LPG	0.8-1.5	0.8-1.5
392"	2.0	0.5-1.5
1978 Models		
304"		
Gasoline	2.0	0.5-1.5
LPG	0.8-1.5	0.8-1.5
345"		
Gasoline	1.5	0.5-1.5
LPG	0.8-1.5	0.8-1.5
1979 Models	0.1-0.8	0.1-0.8

COLD (FAST) IDLE RPM

NOTE: Cold (fast) idle RPM adjustment procedure does not apply to LPG equipped engines.

1) Warm engine to normal operating temperature. Shut off engine. Remove air cleaner and disconnect and plug hose at EGR valve. Connect tachometer and check timing. Set curb idle speed.
2) With engine stopped, open throttle and move choke plate to fully closed position. Holding choke closed, close throttle. Fast idle screw should be on highest step of fast idle cam on 304" engines and on 2nd step on 345" engines.
3) Without touching accelerator, start engine. Allow engine speed to stabilize and observe tachometer for fast idle RPM. If necessary, adjust fast idle speed screw to achieve specification. If accelerator linkage moved during the process, repeat steps **2)** and **3)**.

COLD (FAST) IDLE RPM SPECIFICATIONS

Application	RPM
1975-76 Models	
2-Bbl. Carburetor	
345" (Calif.)	2000
All Others	2200
4-Bbl. Carburetor	1550-1600
1977 Models	
304"	2200
345"	[1] 2200
392"	2000
1978 Models	2200
1979 Models	
304"	2200
345"	1600

[1] - Set to 2000 RPM on Holley 2300G carburetor equipped California models.

AUTOMATIC CHOKE ADJUSTMENT

NOTE: Automatic choke adjustment procedure does not apply to LPG equipped engines.

1975-77 Models - Loosen choke cover retaining screws. Rotates cover to specified setting and tighten cover retaining screws.
1978 Models - Pry cover from choke housing to expose index marks. Loosen lock nut on thermostatic coil shaft. Using a screwdriver, rotate coil shaft until its mark aligns with specified index mark on choke housing. Tighten lock nut and replace cover.

AUTOMATIC CHOKE SETTING

Application	Setting
1975-77 Models	
Federal	
2-Bbl. Carb.	1NL
4-Bbl. Carb.	1NR
California	Preset
1978 Models	
Federal	1NL
California	Preset

THROTTLE MODULATOR ADJUSTMENT

NOTE: Throttle modulator adjustment procedure does not apply to LPG equipped engines.

1976-79 Models - With tachometer connected to engine, manually apply vacuum to throttle modulator unit and check that speed increases to specifications. If not, loosen lock nut and adjust position of throttle modulator to obtain specified RPM.

THROTTLE MODULATOR EXTENDED RPM

Application	RPM
1976-77 Models	
304"	1300-1400
345"	
2210C Carb.	1300-1400
2300G Carb.	[1] 1300-1400
392" (Calif.)	1350-1450
1978 Models	1300-1400
1979 Models	1850

[1] - Set California models to 1400-1500 RPM.

GOVERNOR ADJUSTMENT

1975-78 Models - 1) Ensure engine is properly tuned and at normal operating temperature. Connect tachometer and race engine to determine maximum no-load RPM. If adjustment is necessary, turn engine off. Remove governor clamp and gasket assembly.
2) Turn engine over until adjusting screw hole appears in opening. Remove plug and insert Adjustment Handle (SE-2072-2) into opening so that it engages adjusting tang. Turn handle clockwise to decrease speed, counterclockwise to increase speed. A $^1/_4$ turn will change speed by approximately 100 RPM.

GOVERNOR ADJUSTMENT SPECIFICATIONS

Application	RPM
1975-77 Models	
304" & 345"	4000
392"	3800
1978 Models	
345"	3800

DASHPOT ADJUSTMENT

1979 Models - To adjust dashpot, first set curb idle speed to specification. Depress dashpot plunger completely into dashpot and measure clearance between plunger and throttle lever pad, using a gauge from SE-2425 Gauge Set. If not within clearance, loosen jam nut and rotate dashpot to achieve clearance of .090". Retighten dashpot jam nut.

FUEL PUMP

Make all tests at specified RPM. For pressure test, pinch off fuel return line, if equipped. Connect pressure gauge to fuel line at carburetor, then hold gauge at level of pump outlet. For volume test, use short hose from pump outlet into receptacle.

1975-79 TUNE-UP PROCEDURES
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FUEL PUMP SPECIFICATIONS

Application	Specification
Pressure (At 500 RPM)	4.5-5.75 psi
Volume (At 500 RPM)	1 qt. in 1 min.

IGNITION SYSTEM

DISTRIBUTOR

All 1975-77 models use Holley Brekerless Ignition system. The 1978-79 models are equipped with Prestolite Electronic Breakerless Ignition system.

Other Data & Specifications - See Holley or Prestolite Distributors in DISTRIBUTORS & IGNITION SYSTEMS section.

IGNITION COIL

IGNITION COIL SPECIFICATIONS

Application	Specification
Primary Resistance (at 70° F)	1.25-1.40 Ohms
Secondary Resistance (at 70° F)	9,400-11,700 Ohms
Minimum Coil Output (at 2500 RPM)	20,000 Volts

FUEL SYSTEM

CARBURETORS

Application	Model
1975 Models	
304" & 345"	Holley 2210C 2-Bbl.
392"	Carter Thermo Quad 4-Bbl.
1976-77 Models	
304"	Holley 2210C, 2245C or 2300G 2-Bbl.
345"	
Carbureted	Holley 2210C or 2300G 2-Bbl.
LPG	Holley 2251E or 2527 2-Bbl.
392"	Holley 4150 4-Bbl.
1978 Models	
304"	
Federal	Holley 2210C 2-Bbl.
California	Holley 2245C 2-Bbl.
LPG	Holley 2527 2-Bbl.
345"	
Carbureted	Holley 2210C 2-Bbl.
LPG	Holley 2251E 2-Bbl.
1979 Models	
304"	Holley 2245C 2-Bbl.
345"	Carter Thermo-Quad 4-Bbl.

Other Data & Specifications - See Carter and Holley Carburetors in FUEL SYSTEMS section.