

TUNE-UP

Cressida
Land Cruiser
Supra

ENGINE IDENTIFICATION

Engines can be identified by prefix of engine serial number, stamped on right side of engine block. Engine code can also be found on front of valve cover.

Engine Code

Application	Code
Cressida & Supra	5M-E
Land Cruiser	2F

COMPRESSION PRESSURE

Check compression pressure with engine at normal operating temperature, all spark plugs removed, throttle valve wide open and engine at cranking speed.

Compression Pressure Specifications

Application	Pressure psi (kg/cm ²)
Normal (New Engine)	
Cressida & Supra	156 (11.0)
Land Cruiser	149 (10.5)
Minimum	
Cressida & Supra	128 (9.0)
Land Cruiser	114 (8.0)
Maximum Variation	14 (1.0)

VALVE CLEARANCE

NOTE — Check or adjust valve clearance with engine at normal operating temperature.

Cressida & Supra — 1) Set No. 1 cylinder at TDC on compression stroke. Remove valve cover. No. 1 rocker arms should be loose, No. 6 rocker arms should be tight. Adjust No. 1, 2, & 4 intake valves and 1, 3, and 5 exhaust valves. Turn crankshaft 360°. Adjust No. 3, 5, & 6 intake valves and 2, 4, & 6 exhaust valves.

2) Recheck clearance. Feeler gauge should have slight drag when pulled between valve stem and rocker arm. Install valve cover.

Land Cruiser — Remove valve cover. Adjust valves from front to rear. Recheck clearance. Feeler gauge should have slight drag when pulled between valve stem and rocker arm. Install valve cover.

Valve Clearance Specifications[Ⓞ]

Application	Intake In. (mm)	Exhaust In. (mm)
Cressida & Supra	.011 (.28)	.014 (.36)
Land Cruiser	.008 (.21)	.014 (.36)

Ⓞ — Valve clearance set with engine at normal operating temperature.

VALVE ARRANGEMENT

Cressida & Supra
Left Side — All Intake
Right Side — All Exhaust

Land Cruiser — E-I-I-E-E-I-I-E-E-I-I-E

SPARK PLUGS

Application	Gap In. (mm)	Torque Ft. Lbs. (N·m)
All Models	.031 (0.8)	11-15 (15-20)

Spark Plug Type

Application	NGK	Nippondenso
Cressida & Supra	BPR5EA-L or BPR5EY	W14EXR-U
Land Cruiser	BPR4EY	W14EXR-U

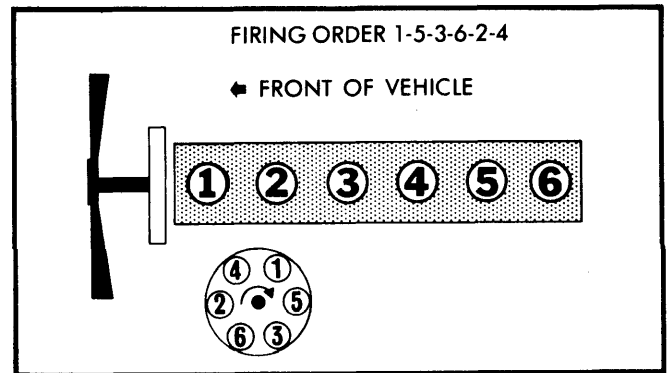


Fig. 1 Firing Order and Distributor Rotation (Cressida & Supra)

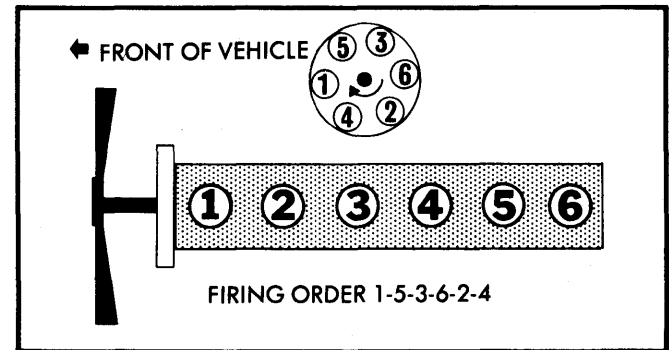


Fig. 2 Firing Order and Distributor Rotation (Land Cruiser)

HIGH TENSION WIRE RESISTANCE

Carefully remove high tension wires from spark plugs and distributor cap. Using an ohmmeter, check high tension wire resistance while gently twisting wires. If resistance is not to specifications, or fluctuates from infinity to any value, replace high tension wire(s).

Resistance (Ohms) Per Wire

Application	Ohms
All Models	16,000-25,000

DISTRIBUTOR

All models with 6-cylinder engines are fitted with Nippondenso Transistorized Electronic Ignition Systems. The only in-service adjustment possible is to set the air gap.

Air Gap	.008-.016" (.2-.4 mm)
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TUNE-UP (Cont.)

IGNITION TIMING

1) Connect tachometer and timing light to engine. The positive (+) lead of tachometer is connected to negative (-) terminal of ignition coil. With engine at normal operating temperature, choke valve fully opened, and transmission in "N" position, be sure all hoses are connected and accessories turned off. Adjust idle speed to correct specification.

CAUTION — Do not allow tachometer connector to touch ground, or damage may occur to the system.

2) On models with dual diaphragm distributors, disconnect and plug hoses at both main and sub-diaphragms. On all models, adjust timing by turning distributor. Reconnect hoses to distributor diaphragms.

NOTE — On Federal low altitude Land Cruiser models, flywheel timing mark should move when vacuum hose between HAC valve and distributor sub-diaphragm is pinched near valve. On high altitude models, timing mark should move when sub-diaphragm hose is reconnected.

Ignition Timing Specifications^① (Degrees BTDC@RPM)

Application	Timing
Cressida & Supra	8@950
Land Cruiser	7@950

① — With distributor sub-diaphragm hose disconnected and plugged.

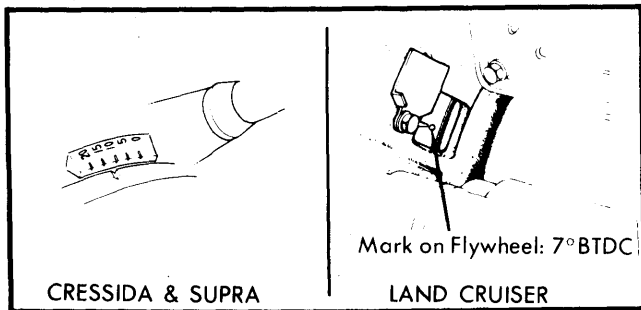


Fig. 3 Ignition Timing Marks

IDLE SPEED & MIXTURE

NOTE — Mixture adjustment is NOT a part of normal tune-up procedure and should not be performed unless carburetor is overhauled, mixture control unit is replaced or vehicle fails emissions testing.

CARBURETED MODELS

NOTE — Attach tachometer positive terminal to coil negative terminal. Do not allow tachometer connector to touch ground, or damage may occur to system.

1) With air cleaner installed, engine at normal operating temperature, choke fully open, all accessories off and vacuum lines connected, be sure timing is set.

2) Set transmission in neutral and check to see that fuel level in carburetor sight glass is midway between marks. Remove idle mixture screw protective cover and idle limiter caps, if installed, and adjust idle speed to 650 RPM.

3) Turn idle mixture adjusting screw to obtain maximum RPM. Now, turn idle speed screw until 690 RPM is obtained. Repeat adjustments again, turning idle mixture screw to maximum

RPM, then turn idle speed screw to idle mixture speed. Repeat until highest RPM is obtained before setting final idle mixture speed.

4) Once idle mixture speed is set after the highest possible RPM is obtained using the above procedure, turn in idle mixture adjusting screw until 650 RPM is obtained. Install replacement mixture screw caps and protective cover, if so equipped.

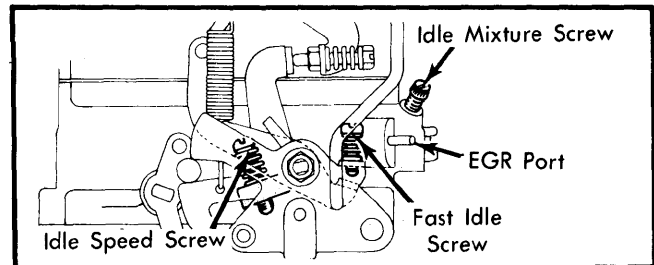


Fig. 4 Carburetor Adjustment Screw Locations

FUEL INJECTED MODELS

NOTE — Attach tachometer positive terminal to coil negative terminal. Do not allow tachometer connector to touch ground, or damage may occur to system.

1) With air cleaner installed, engine at normal operating temperature, all wiring connectors, vacuum lines, pipes and hoses connected and all accessories off, be sure timing is at correct specification.

2) Set transmission in neutral. Start engine and run at idle. Pinch air valve hose checking to see that engine RPM does not drop more than 150 RPM.

3) Remove rubber cap from service connector at left front fender and connect voltmeter positive probe to "VF" and negative probe to "E1". See Fig. 5.

CAUTION — Do not connect the voltmeter probes directly to the service connector.

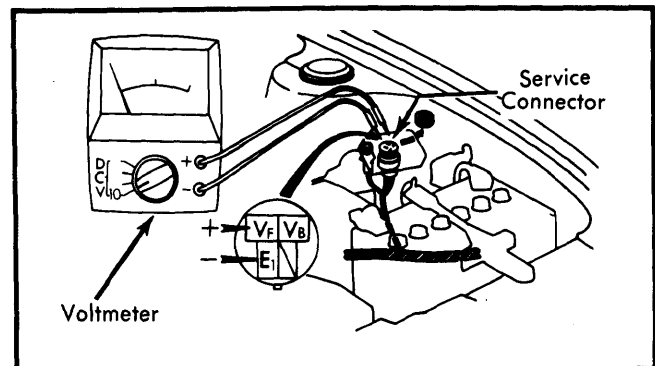


Fig. 5 Idle Speed Service Connections

4) Warm up engine at 2500 RPM for about 2 minutes. Voltmeter needle should fluctuate 8 times or more in 10 seconds. If it does not, check fuel injection system and replace oxygen sensor, if necessary.

5) Set idle speed to 800 RPM with idle speed adjusting screw. Voltmeter reading should now be 3-9 volts. If more than 9 volts, check air intake system for leaks. If less than 3 volts, check fuel injection system.

TUNE-UP (Cont.)

COLD (FAST) IDLE RPM

NOTE — There is no fast idle speed adjustment for Electronic Fuel Injection equipped vehicles.

Land Cruiser — 1) After setting idle speed and mixture, stop engine. Pull choke knob fully out. Disconnect and plug hoses from distributor vacuum advance and from evaporation ports of the VCV and EGR valves.

2) Start engine and adjust idle speed to specification with fast idle adjusting screw. Engine should return to normal idle when choke knob is pushed in fully.

Fast Idle Specifications

Application	RPM
Land Cruiser	⓪1800

⓪ — EGR, EVAP, and distributor diaphragm disconnected.

FUEL PUMP PRESSURE & VOLUME

Pressure	
Cressida & Supra	⓪33-38 psi (2.3-2.7 kg/cm ²)
Land Cruiser	3.4-4.8 psi (.24-.34 kg/cm ²)

Volume	
Land Cruiser	2.5 pints in 30 sec.

⓪ — Measured with vacuum hose at pressure regulator disconnected. With hose connected, 28 psi (2.0 kg/cm²)

EXHAUST EMISSION SYSTEMS

See EXHAUST EMISSION SYSTEMS section.

GENERAL SERVICING

IGNITION

DISTRIBUTOR

All models are equipped with Nippondenso Transistorized Electronic Ignition Systems.

IGNITION COIL

Coil Resistance (Ohms @ 68°F)

Application	Primary	Secondary
All Models5-.6	11,500-15,500

FUEL SYSTEMS

CARBURETORS

Land Cruiser models are equipped with Aisan 2-Bbl. carburetors.

FUEL INJECTION

Cressida and Supra Models are equipped with Bosch AFC fuel injection with oxygen sensor.

ELECTRICAL

BATTERY

Application	Amp. Hr. Rating
All Models	70

Battery Location — In engine compartment.

STARTER

All models are equipped with Nippondenso Starters.

Starter Specifications

Application	Volts	Amps	Test RPM
Cressida & Supra			
Conventional	11.0	50	5000
Reduction	11.5	90	3500
Land Cruiser	11.0	50	5000

ALTERNATOR

Application

Rated
Amp. Output

Cressida & Supra	
With Integral Regulator	65
With External Regulator	60
Land Cruiser	55

ALTERNATOR REGULATOR

All models are equipped with Nippondenso alternators and regulators. Some alternators are equipped with integrated circuit regulators (mounted integrally with alternator). Operating voltage for these regulators is 13.8-14.4 volts. Operating voltage for externally mounted regulators is 14.0-14.9 volts.

Application	CAPACITIES	Quantity
Crankcase (Includes Filter)		
Cressida & Supra		4.9 qts.
Land Cruiser		8.2 qts.
Cooling System		
Cressida		11.6 qts.
Supra		9.5 qts.
Land Cruiser		
Station Wagon		17.4 qts.
All Others		16.9 qts.
Man. Trans. (SAE 80W-90)		
Land Cruiser		7.6 pts.
Supra		5.4 pts.
Auto. Trans. (ATF Type F)		2.5 qts.
Differential (SAE 90)		
Cressida & Supra		3.2 pts.
Land Cruiser		5.2 pts.
Transfer Case (SAE 90)		5.2 pts.
Fuel Tank		
Cressida		
Sedan		17.2 gals.
Station Wagon		16.2 gals.
Land Cruiser		
Station Wagon		23.8 gals.
All Others		22.4 gals.
Supra		16.1 gals.

1981 Toyota 6 Tune-Up

GENERAL SERVICING (Cont.)

BELT ADJUSTMENT

Tension (Lbs.) Using Strand Tension Gauge

Application	New Belt	Used Belt
Cressida & Supra	100-150	60-100
Land Cruiser		
A/C Belt	100-150	60-100
All Others	120-170	80-120

FILTERS

Filter	Service Interval (Miles)
Oil Filter	
Cressida & Supra	Replace every 10,000
Land Cruiser	Replace every 10,000
Air Filter	Replace every 30,000
Fuel Filter	Replace every 60,000