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IDLING ENGINE SPEED, INJECTION TIMING AND DIESEL BLACK SMOKE DENSITY INSPECTION

CD20, 20T

Inspection and adjustment

START



Visual inspection

- Blockage in air filter
- Air leak in hose and duct
- Harness connector stability??
- Gasket damage
- Throttle linkage operation

A

Start and warm up engine

B

Open the engine cover and race the engine for 2~3 minutes, then set to idling status.

C

Attaching the diesel tachometer

- To eliminate the affect of the injection signal on the other tubes, remove the injection tube clamp and attach the tachometer sensor.

Inspection

- Check that the engine is warm, each electric burden switch is OFF and there is no burden on power steering pump.
- Inspect that the idling engine speed is at the specified value.

Idling engine speed (rpm)

CD20	M/T: 700
	A/T: 800
CD20T	M/T: 700
	A/T: 800

When air conditioner is "ON"

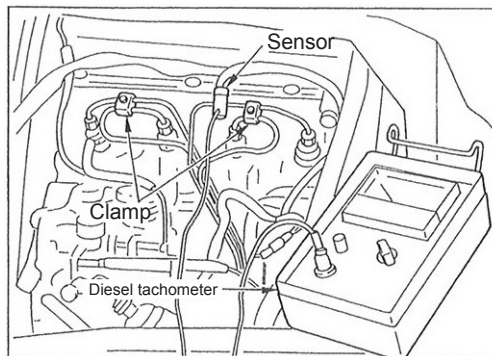
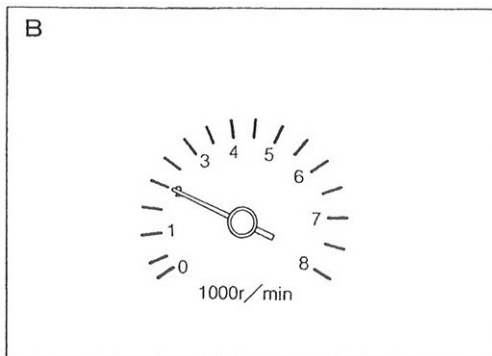
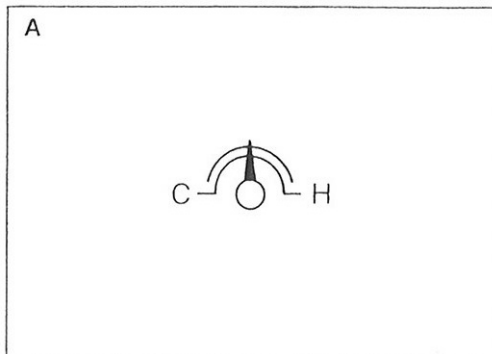
CD20, CD20T	M/T: 800
	A/T: 800 (N range)

↓ OK

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↓ NG

Go to 2 in next page



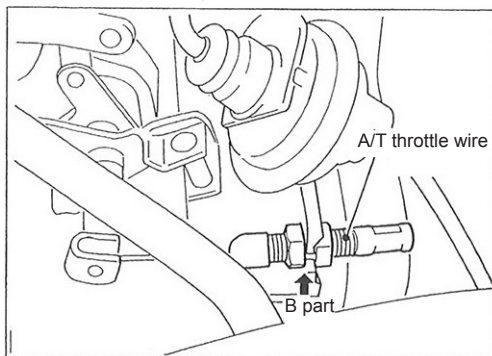
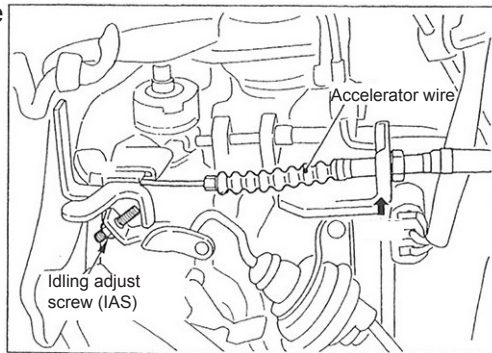
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Idling rotating speed adjustment

- Check that the water temperature gauge needle is positioned roughly in the centre.
- Loosen the adjustment nuts (A and B) of the accelerator wire and A/T throttle wire to set the wire to free state.
- Use the idling adjust screw to adjust the idling rotating speed.
- Make sure that the accelerator wire is not too tight or too loose, then adjust using a nut and tighten it.
- Use the same method for adjusting the A/T throttle wire.
- Depress the accelerator pedal two to three times to check that the accelerator pedal moves smoothly and does not get caught.

Tightening torque:
7.8~9.8N·m {0.8~1.0kg·m}

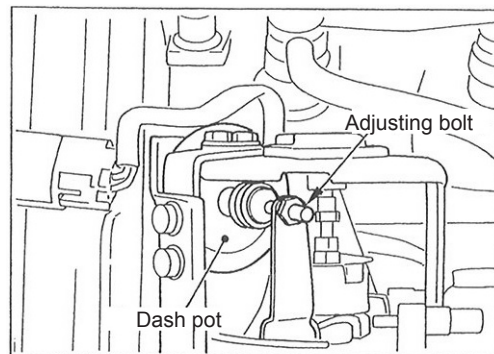


E

Dash pot touch revolutions adjustment
(Only for M/T vehicles)

- If the dash pot touch speed is not at the specified value, use the dash pot adjust bolt to adjust.

Specified value: 1300rpm

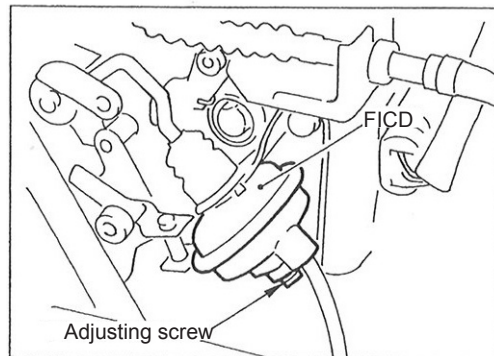


F

FICD Inspection

- If the speed when FICD is operated is not at the specified value, use the FICD adjust bolt to adjust.

Specified value: 750~850rpm

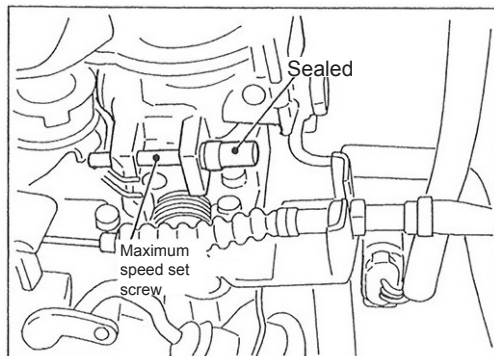


G

No-load maximum revolution speed inspection

- Fully depress the accelerator pedal from idling state and check that the accelerator control lever is touched to the maximum speed set screw, then inspect the engine rotating speed at the time.

No-load maximum revolution speed: 5200~5500rpm
Caution: Maximum set screw is sealed (Non adjustable)



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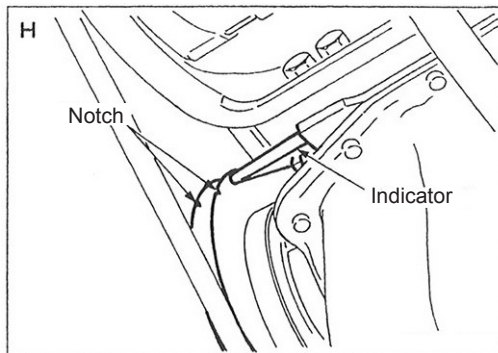
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H

No.1 cylinder compression top dead centre

- Turn the crank pulley and match the crank pulley notch (white mark, one point side) and the indicator.
- Remove the oil filler cap located on upper part of the locker cover and check that the intake/release valve of No.4 cylinder is in lift start state.

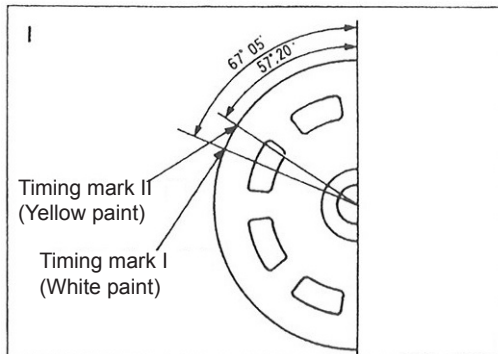
Caution: Simplified inspection using the matching mark cannot be performed.



I

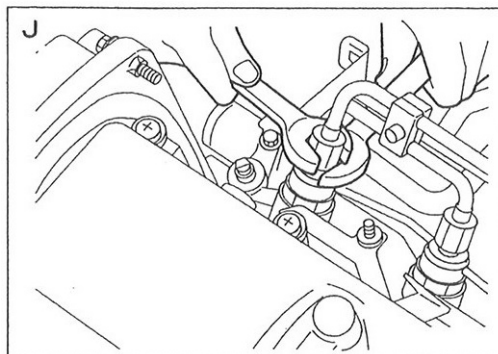
- There are two setting types of notches for the crank pulley.

Notch	Mark matching state	Mark position	Identification colour
For injection timing position	9°45' ATDC (No.1 cyl)	θ=57°20' (Both FR & RR sides)	Yellow
For compression top dead centre	TDC (No.1 cyl)	θ=67°05' (RR side only)	White



J

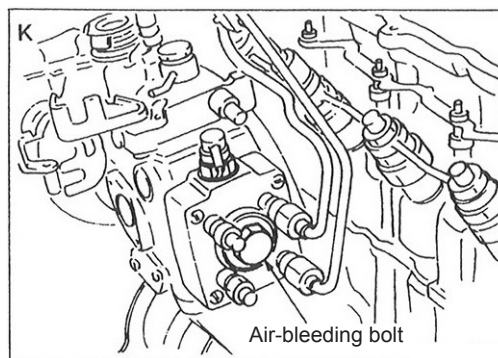
- Desorb the injection tube using the double spanner.
- Caution: When desorbing, do not bend the tube.



K

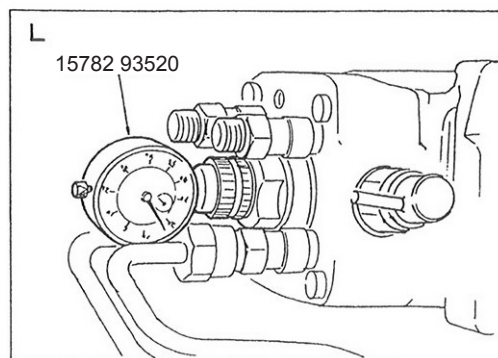
- Remove the air-bleeding bolt located in the rear part of the injection pump.
- When attaching, replace the copper washer to a new one and tighten it.

Air-bleeding bolt tightening torque:
13.7~19.6N-m {1.4~2.0kg-m}



L

- Insert the dial gauge (special tool) into an air-bleeding bolt position, and set it so that the lift amount is approximately 1.7mm.
- Turn the crankshaft once clockwise to check that the dial gauge moves smoothly.



Go to 5 in the next page

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M

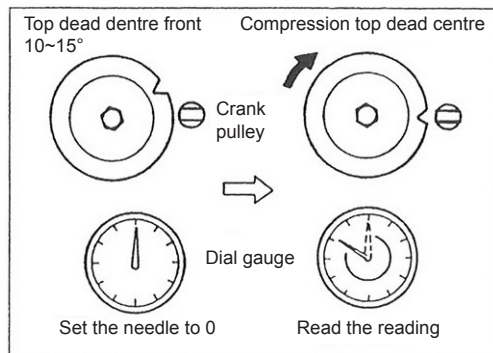
- After turning the crankshaft anti-clockwise to about 100°, turn it clockwise and set the indicating needle of the dial gauge to "0" at the position where the needle rests. (No.1 cylinder compression top dead centre front CD20: approx. 22°, CD20T: approx. 20°)
- Turn the crankshaft clockwise, match No.1 cylinder ATDC 9°45' and read the dial gauge indicator reading.

Caution: Always turn clockwise for injection timing inspection. If turned too much, set back more than 100° and turn clockwise again.

Plunger lift specified value:

CD20: 0.85~0.91 (mm)

CD20T: 0.73~0.79 (mm)



N

- If the reading is not at the specified value, loosen the injection pump attachment nuts (3 nuts in bracket side) and a bolt (one bolt in support side), then stir the pump slightly to set the lift amount as specified.

Caution: If the pump is turned clockwise seen from the transmission side, the lift amount increases and if turned anticlockwise, the lift amount decreases.

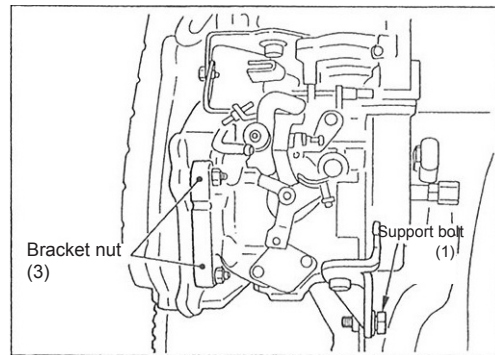
- After adjusting, tighten the attachment bolt and the nut.

Injection pump tightening torque:

: Bracket side
12.7~17.6N-m {1.3~1.8kg-m}

: Support side
45.1~59.8N-m {6.3~8.0kg-m}

- After tightening using a specified torque, inspect the injection timing again as the injection pump may move while tightening.



Go to 6 in next page

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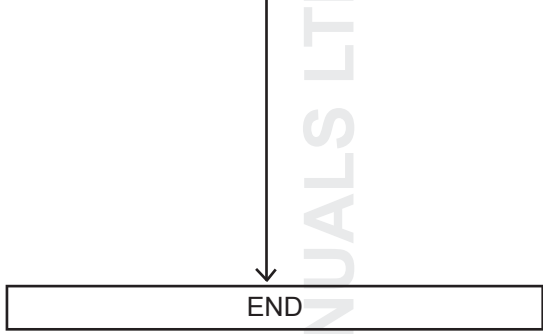
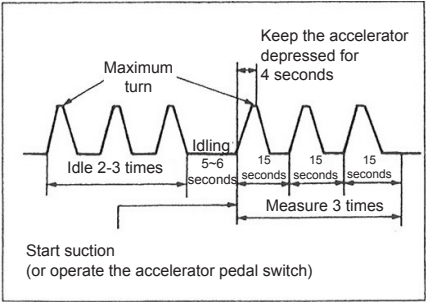
Diesel black smoke density inspection

- Follow the measurement mode in the diagram on the right to measure three times.
- Check that the average of the three values is equivalent to the specified value.

Diesel black smoke density specified value: Less than 50%

NG →

- If the result of the measurement is not at the specified value, inspect the injection timing, misting condition, compression pressure, air-intake blockage and the sealing of full load adjusting screw.



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