

DAIHATSU
TYPE CB
ENGINE

[CB-23, CB-61 & CB-80]

3

SECTION 3
ENGINE TUNE-UP

ENGINE TUNE-UP PROCEDURE	3- 2
ENGINE TUNE-UP [CB-23 and CB-61]	3- 6
ENGINE TUNE-UP [CB-80]	3-19

WM-03001

ENGINE TUNE-UP

ENGINE TUNE-UP PROCEDURE

NOTE:

The operation enclosed by heavy lines is described in the main text.

Checking cooling water level and engine oil level

Specified value:
Cooling water capacity:
(including reserve tank capacity of 0.6 liter)

Item \ Engine type	CB-23	CB-61	CB-80
Manual transmission	3.5	3.9	4.0
Automatic transmission	3.9	—	—

Specified value:
Engine oil capacity:

Item \ Engine type	CB-23	CB-61	CB-80
When only oil is changed	2.7	2.7	2.7
When oil and oil filter are changed	3.0	3.0	3.1

Specified value:
Radiator cap opening pressure:
0.75 - 1.05 kg/cm² (1.7 - 2.3 psi)

Checking battery electrolyte level and specific gravity

Specified value:
Battery electrolyte specific gravity:
(at electrolyte temperature of 20°C)
1.27 to 1.29 (34B-17L)

[NOTE]
The vehicles mounted with a maintenance-free battery should be checked by a battery checker.

Checking and cleaning air cleaner

Checking and adjusting spark plugs

..... Spark Plug Specifications

Engine type	CB-23				CB-61				CB-80		
	DENSO		NGK		BOSCH		CHAMPION		DENSO		
ECE & EEC	W16EXR-U	BPR5EAL	BPR5EY	WR8DC	RN-11YC	W16EXR-U	BPR5EY	WR8DC	RN-9YC	W20ETR-L	W22ETR-L
Except for ECE & EEC	W16EX-U	BPR5EAL	BPR5EY	WR8DC (X,Y)	N-11YC	W16EX-U	BPR5EY	WR8DC (X,Y)	N-9YC	W20ET-L	W22ET-L
Spark plug gap mm (inch)	0.7 - 0.8 (0.028 - 0.031)		0.8 - 0.9 (0.031 - 0.036)		0.7 - 0.8 (0.028 - 0.031)		0.7 - 0.8 (0.028 - 0.031)		0.9 - 1.0 (0.035 - 0.040)		

WM-03002

ENGINE TUNE-UP

Checking resistive cords

.... Specified value:

Item	Engine type		
	CB-23	CB-61	CB-80
Cord No.1	6.8 - 10.0	6.8 - 10.0	3.2 - 4.8
Cord No.2	8.1 - 12.1	8.1 - 12.1	4.6 - 7.0
Cord No.3	8.1 - 12.1	8.1 - 12.1	7.0 - 10.3
Center cord	6.1 - 9.2	6.1 - 9.2	5.1 - 7.7

kΩ

Checking and adjusting V-belt for deflection

.... Specified deflection:
Cooling water capacity:
(including reserve tank capacity of 0.6 liter)

Item	Engine type		
	CB-23	CB-61	CB-80
V-belt deflection	5-7/10 (0.20-0.28/22.1)	5-7/10 (0.20-0.28/22.1)	7.5-8.5/8 (0.30-0.33/17.6)

mm/kg (inch/lb)

Checking cylinder head and manifolds for tightening condition

.... Specified value:
Cylinder head tightening torque & Manifold tightening torque

Item	Engine type		
	CB-23	CB-61	CB-80
Cylinder head tightening torque	5.5 - 6.5 (40 - 47)	5.5 - 6.5 (40 - 47)	6.0 - 7.0 (43 - 51)
Exhaust manifold tightening torque	1.0 - 1.6 (7 - 12)	1.0 - 1.6 (7 - 12)	4.0 - 5.0 (29 - 36)
Intake manifold tightening torque	1.0 - 1.6 (7 - 12)	1.0 - 1.6 (7 - 12)	1.7 - 2.5 (29 - 36)

kg-m (ft-lb)

Warming-up engine
(Cooling water temperature: 75 to 80°C)

Checking valve clearances

.... Specified clearance:
(Clearance between cam and rocker arm)

Item	Engine type		
	CB-23	CB-61	CB-80
IN (When hot)	0.20 (0.0079)	0.25 (0.0098)	0.27 (0.0101)
EX (When hot)	0.20 (0.0079)	0.25 (0.0098)	0.32 (0.0126)

mm (inch)

[NOTE]

"HOT" denotes a period during which the engine block temperature is above 80°C (176°F) after the vehicle has been warmed up completely.

WM-03003

ENGINE TUNE-UP

Checking compression pressure

Item	Engine type	kg/cm ² (ps ²)		
		CB-23	CB-61	CB-80
Specified value (350 rpm)		12.5 (177.8)	12.0 (170.7)	10.5 (300 rpm) (149.3 - 300 rpm)
Minimum requirement (350 rpm)				8.5 (300 rpm) (121 - 300 rpm)
Difference between cylinders				

Checking and adjusting distributor
(Except CB-80)

Specified value:

Item	Engine type	CB-23	CB-61
		Heel gap mm (inch)	0.4 - 0.5 (0.016 - 0.020)
Dwell angle (°)		58 - 66	58 - 66

Checking and adjusting ignition timing

Specified value:

Item	Engine type	CB-23	CB-61	CB-80
		Ignition timing	BTDC 5°±2%/d/ding	BTDC 10°±2%/d/ding

Checking idle speed

Specified value:

[NOTE]

Make sure that no additional electrical load such as headlamps is applied to the engine.

Item	Engine type	rpm		
		CB-23	CB-61	CB-80
Manual transmission		800 ± 50 (1000 ± 50)	800 ± 50 (1000 ± 50)	950 ± 50
Automatic transmission		850 ± 50 (1000 ± 50)	—	—

() Swedish and Norwegian specifications.

WM-03C

ENGINE TUNE-UP

Measuring CO concentration

Specified value:

Item \ Engine type	CB-23	CB-61	CB-80
CO concentration	1 ± 0.5%	1 ± 0.5%	1 ± 0.5%

NOTE: For Swiss specifications, be sure to cut off the EGR operation.

Not conformed to specifications

4. Adjusting idling speed

Checking and adjusting fast idle speed
(Except CB-80)

Specified speed:

Item \ Engine type	CB-23	CB-61
Engine speed (rpm)	2000 ± 200	2600 ± 200

NOTE: Pull the choke button out as far as it will go and depress the accelerator pedal once or twice.

Checking and adjusting dashpot

Specified speed:

Item \ Engine type	CB-23	CB-61	CB-80
General specifications	1600 ± 50	1600 ± 50	1600 ± 100
Swiss & Australian specifications	1300 ± 50	1300 ± 50	1600 ± 100
Australian & West German specifications	1300 ± 50	1300 ± 50	1600 ± 100

rpm

Checking choke opener for operation
(Except CB-80)

WM-03005

ENGINE TUNE-UP

ENGINE TUNE-UP [CB-23 and CB-61]

Connecting Method of Instruments and Handling Instructions

1. Engine tachometer
 - (1) In the case of a tachometer in which the pick-up is made from the primary circuit and there is no 3-cylinder range, carry out the measurement using the 6-cylinder range. And multiply the reading by 2. This product is the actual rotational speed of the 3-cylinder engine.
 - (2) In the case of a tachometer in which the pulses flowing through the resistive cord of the cylinder No.1 are sensed, the reading can be read directly regardless of the number of cylinders.
2. The power supply for the tachometer, timing light and other instruments should be connected to the battery terminal.
3. Never disconnect the battery terminals while the engine is running.
(Failure to observe this caution will cause abnormal pulses to apply to the transistors, even leading to damage of the transistors and other electronic meters, etc.)
4. Care must be exercised to ensure that no water gets to each electric part during the cleaning.
5. Make sure that the CO meter is adjusted and calibrated accurately before it is put into use.
 - (1) Warming-up
 - (2) Zero-point adjustment
 - (3) Span adjustment

WM-03006

Checking engine oil level

After the engine has warmed up, stop the engine. A few minutes later, check the engine oil level using a level gauge.

Ensure that the oil level is between the full level and the low level.

Engine Oil Capacity

Item \ Engine type	CB-23	CB-61
Full level	2.7	2.7
Low level	1.7	1.7

NOTE:

When the engine oil level is below the specified level, replenish the specified oil to the full level.

(When the engine oil level is below the specified level, check to see if oil leakage exists.)

2. Checking cooling water level

Check the cooling water level at the reserve tank. Ensure that the cooling water level is between the full level and the low level.

NOTE:

When the cooling water level is below the specified level, replenish the reserve tank with water to the full level.

If the cooling water level is below the low level, remove the radiator cap and check the radiator cooling water for correct level.

If the cooling water level is always below the specified level, check the radiator cap and water leakage, using a radiator cap tester.

CAUTION:

Never open the radiator cap when the engine is running or when the cooling water is still hot.

Cooling water capacity

CB-23	Manual transmission-equipped vehicle.	3.5 ℓ (Including 0.6 ℓ for reserve tank)
	Automatic transmission-equipped vehicle.	3.9 ℓ (Including 0.6 ℓ for reserve tank)
CB-61	3.9 ℓ (Including 0.6 ℓ for reserve tank)	

WM-03009

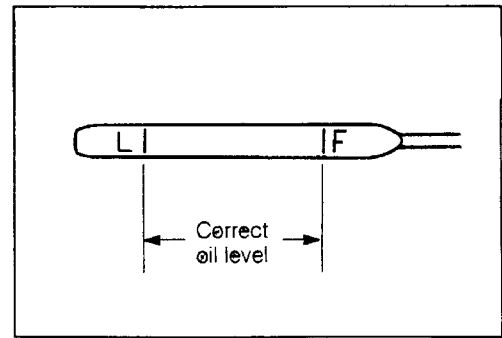


Fig. 3-1

WM-03007

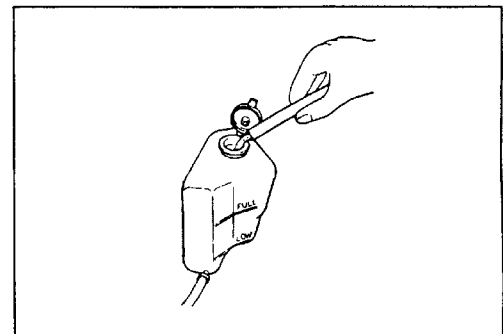


Fig. 3-2

WM-03008

ENGINE TUNE-UP

3. Checking air cleaner element

- (1) Visually inspect to see if the air cleaner element is restricted, abnormally dirty or damaged.

NOTE:

Replace the air cleaner element, as required.

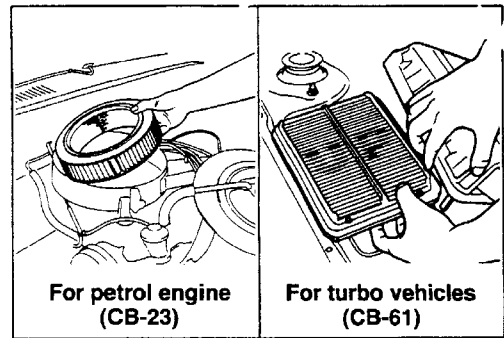


Fig. 3-3

WM-03010

- (2) Clean the element with compressed air. Blow compressed air from the inside or up side of the air cleaner element.

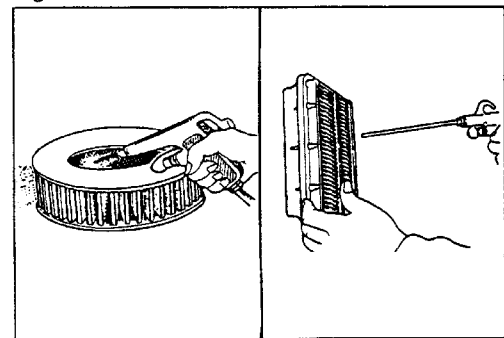


Fig. 3-4

WM-03011

4. Checking spark plugs

- (1) Visually inspect the spark plugs for damage or cracks.

NOTE:

Replace the spark plug, as required.

- (2) Clean the spark plugs.
 (3) Check and adjust the spark plug gaps.

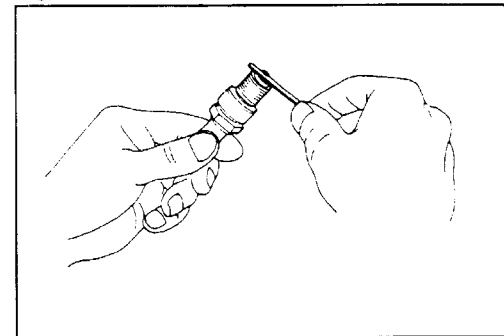


Fig. 3-5

WM-03012

Specified Spark Plug Gap

Engine type	CB-23					CB-61			
	DENSO	NGK		BOSCH	CHAMPION	DENSO	NGK	BOSCH	CHAMPION
ECE & EEC specifications	W16EXR-U	BPR5EA-L	BPR5EY	WR8DC	RN-11YC	W16EXR-U W20EXR-U	BPR5EY BPR6EY	WR8DC WR7DC	RN-9YC RN-11YC
Except ECE & EEC specifications	W16EX-U	BP5EA-L	BP5EY	W8DC (X,Y)	N-11YC	W16EX-U W20EX-U	BP5EY BP6EY	W8DC (X,Y) W7DC (X,Y)	N-9YC N-11YC
Spark plug gap mm (inch)	0.7 - 0.8 (0.028 - 0.031)		0.8 - 0.9 (0.031 - 0.036)	0.7 - 0.8 (0.028 - 0.031)		0.7 - 0.8 (0.028 - 0.031)	0.8 - 0.9 (0.032 - 0.036)	0.7 - 0.8 (0.028 - 0.031)	

WM-03013

5. Checking V-belt

(1) Visually inspect to see if the V-belt exhibits damage, cracks or wear.

NOTE:

Replace the V-belt, as required.

(2) Measure the amount of belt deflection.

Specified Deflection of V-Belt:

5 - 7 mm (0.20 - 0.28 inch)

[With a force of 8 kg (17.64 lb) Applied]

6. Checking valve clearances

Warm up the engine.

Cooling water temperature: 75 - 85°C (167 - 185 °F)

Check and adjust the valve clearances.

Specified Valve Clearance:

CB-23: 0.20 ± 0.05 mm (0.0079 ± 0.002 inch)

CB-61: 0.25 ± 0.05 mm (0.0098 ± 0.002 inch)

Both for Intake and Exhaust Valves

NOTE:

Carry out the check and adjustment of valve clearances, with the piston of the No.1 cylinder set to the end of the compression stroke or to the tops of the intake and exhaust strokes, respectively. See the table at the right for the adjustable valves for the respective positions of the No.1 piston.

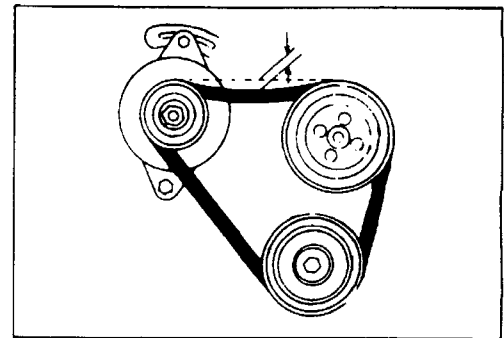


Fig. 3-6

WM-03014

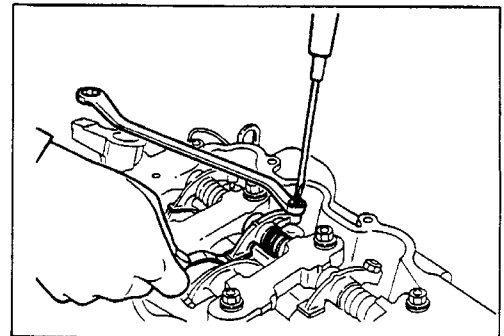


Fig. 3-7

WM-03015

Crank angle	Cylinder		
	1	2	3
When No.1 piston is set to end of compression stroke	IN	○	○
	EX	○	○
When No.1 piston is set to tops of intake and exhaust strokes, respectively	IN	○	○
	EX	○	○

WM-03016

7. Checking compression pressure

kg/cm² (psi) at 350 rpm

CB-23	10.5 - 12.5 (149.4 - 170.7)
CB-61	10.5 - 12.5 (149.4 - 170.7)

NOTE:

The compression pressure check should be performed with all spark plugs removed. Also, be sure to keep both the throttle valve and choke valve fully opened during the check.

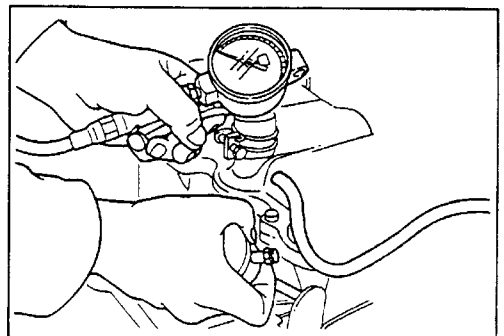


Fig. 3-8

WM-03017

The measurement of compression pressure should be performed for a short period of time. Moreover, care must be exercised to ensure that the measurement time for each cylinder becomes equal.

If the specified pressure is not met, check to see if the cylinder-to-piston clearance conforms to the specification. Also check the piston rings for wear.

WM-03018

ENGINE TUNE-UP

8. Checking contact points

- (1) Check to see if the contact points exhibit the trace of burning.

- (2) Check and adjust the gap of the contact points.

Specified Heel Gap:

0.4 - 0.5 mm (0.016 - 0.020 inch)

[Referential Information]

Specified Contact Point Gap:

0.4 - 0.5 mm (0.016 - 0.020 inch)

Specified Dwell Angle: 58° - 66°

9. Checking ignition timing

- (1) Disconnect the vacuum hose from the vacuum advancer. Plug the disconnected vacuum hose.

Using a timing light, check the ignition timing while idling the engine.

Specified Ignition Timing:

Manual transmission

BTDC 5° ± 2°/800 ± 50 rpm

Automatic transmission

BTDC 5° ± 2°/850 ± 50 rpm

Daylight system-equipped vehicle

BTDC 5° ± 2°/1,000 ± 50 rpm

NOTE:

Upon completion of the ignition timing check, be certain to install the clutch housing cover on the inspection window.

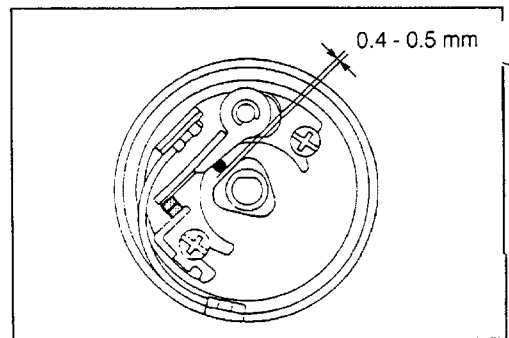


Fig. 3-9

WM-03019

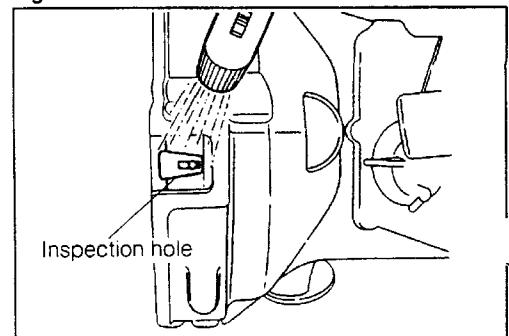


Fig. 3-10

WM-03020

10. Adjustment

- (1) The ignition timing can be adjusted by slackening the retaining bolt of the distributor flange and then by turning the distributor body.

NOTE:

When the distributor body is turned counterclockwise, the ignition timing is advanced. Conversely, when the distributor body is turned clockwise, the ignition timing is retarded.

- (2) After the adjustment has been completed, reconnect the auxiliary vacuum hose to the vacuum advancer. Ensure that the engine revolution speed rises about 50 to 100 rpm. Also ensure that the engine is emitting a normal sound.

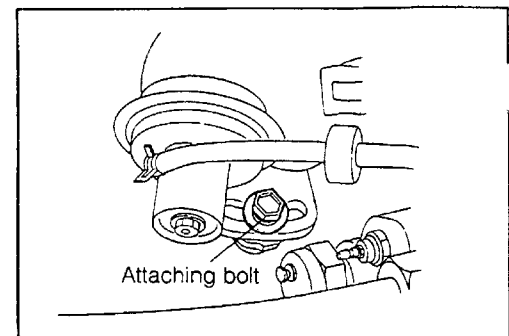


Fig. 3-11

WM-03021

WM-03022