

# Bedford 381 60

## 6 cyl 6.11 Litres 381 Cu In.

vmanref 1054

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### General

Year	1966 to 70
Bore	104 mm ( 4.125 ")
Stroke	120 mm ( 4.75 ")
Capacity	6.11 L ( 381 Cu in)
Firing order	1 5 3 6 2 4
Compression Ratio	17 to 1
Compression Pressure	3,517 kpa ( 510 psi )
Maximum variation between cylinders	10 - 15 %

### Lubrication

Maximum Oil Pressure	275 - 300 kpa ( 40 - 45 psi )
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### Injection Pump Setting

Injector Pump Setting	26 Degrees BTDC
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### Injector Nozzle Opening Pressure

Nozzle opening pressure	17,500 kpa ( 2538 psi )
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### Cylinder Head

Cylinder Head Height Minimum	85.293 mm ( 3.385 ")
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### Tappets

Tappets - Cold	
Inlet	0.33 mm ( 0.013 ")
Exhaust	0.33 mm ( 0.013 ")

### Block

Piston Protrusion from Block	0.61 - 0.87 mm ( 0.024 - 0.034 ")
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### Connecting Rod

Rod Journal Diameter	63.462 - 63.487 mm ( 2.4985-2.4995")
Rod Tunnel Diameter	67.208 - 67.221 mm ( 2.6460-2.6465")

### Crankshaft

Main Journal Diameter	88.862 - 88.887 mm ( 3.4985- 3.4995 ")
Main Tunnel Diameter	93.116 - 93.142 mm ( 3.6660- 3.6670 ")

### Torques

Cylinder Head	142 nm ( 105 ft lb)
Con Rod	118 nm ( 87 ft lb )
Main Bearings	138 nm ( 102 ft lb)
Flywheel	131 nm ( 97 ft lb)

# JEEP KJ 2.8 L

## 2776 cc 4 Cylinder

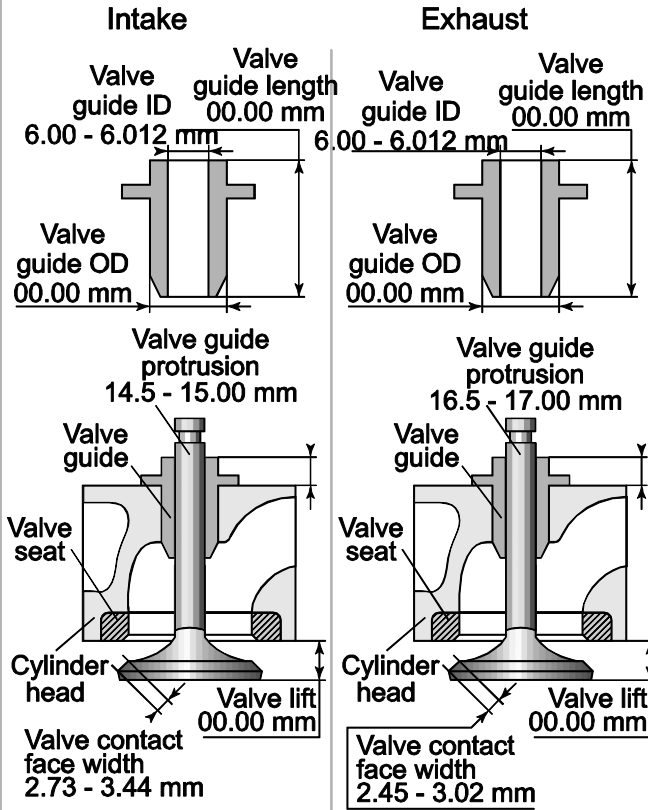
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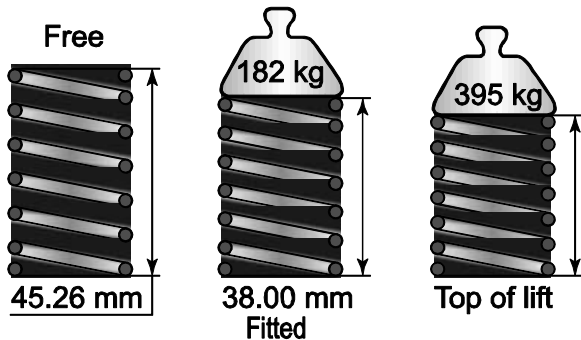
Fit the flywheel.

### Jeep 2.8 L

Valve drawing for all makes



Valve spring length

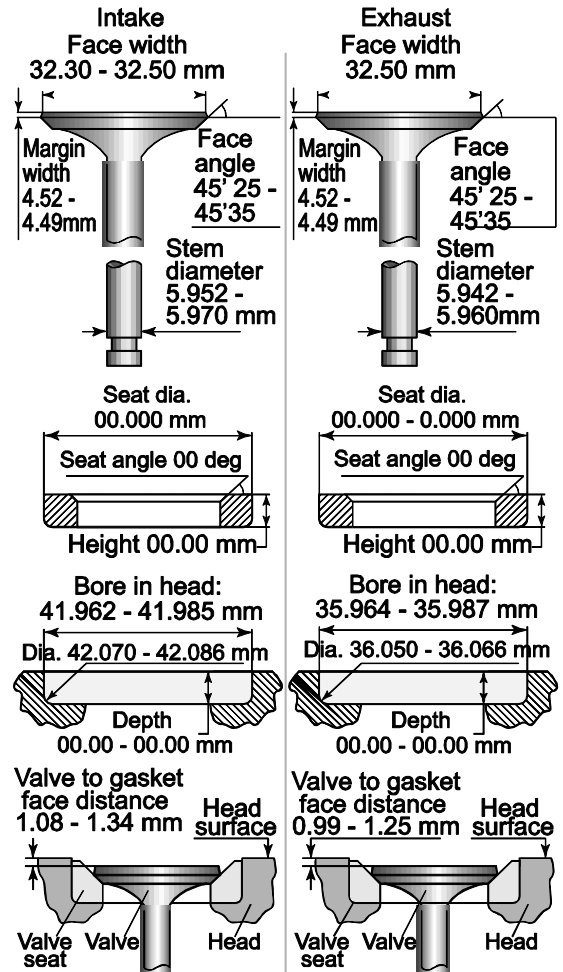


Number of coils 8

Intake valve opens 15.6 Deg. BTDC  
 Intake valve closes 64.4 Deg. ABDC  
 Exhaust valve opens 66 Deg. BBDC  
 Exhaust valve closes 32 Deg. ATDC

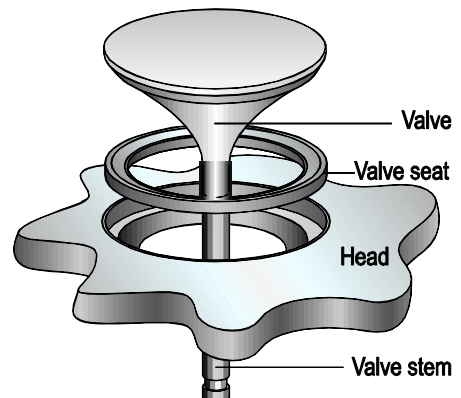
### Jeep 2.8 L

Valve drawing for all makes



Stem to valve guide cl. Inlet: 0.030 - 0.060 mm

Stem to valve guide cl. Exhaust: 0.040 - 0.070 mm



Valve clearance Intake: 0.00 mm  
 Exhaust: 0.00 mm

# DDEC 15 L

## 781 Cu. in. DOHC


Vmanref 7058

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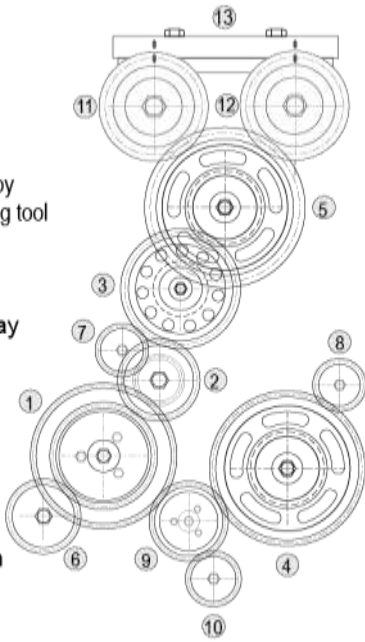
Rocker shaft bolts	<b>80.3 mm (3.161 in.)</b>
Bearing cap to rod bolt cap bolt	<b>82.3 mm (3.240 mm)</b>
Flywheel with crankshaft	<b>88 mm (3.465 in.)</b>
Damper bolts	<b>29.3 mm (1.153 in.)</b>
Idler gear No.1	<b>84.0 mm (3.307 in.)</b>
Idler gear No.2	<b>55.5 mm (2.185 in.)</b>
Idler gear No.3	<b>60.5 mm (2.381 in.)</b>
Idler gear No.4	<b>84.0 mm (3.307 in.)</b>
Idler gear No.5	<b>45.5 mm (1.791 in.)</b>
Turbocharger mount bolts	<b>40 mm (1.574 in.)</b>
Exhaust bolts :	
(3 pieces manifold bolts)	
Bolt	<b>80.5 mm (3.169 in)</b>
Spacer	<b>9.0 mm (0.354 in)</b>
Exhaust bolts:	
(5 pieces manifold bolts):	
Center bolts	<b>80.5 mm (3.169 in)</b>
Spacer	<b>9.0 mm (0.354 in)</b>
Outer bolts	<b>60.5 mm (2.381 in)</b>
Spacer	<b>5.0 mm (0.196 in)</b>
Axial power turbine bolts:	
Upper location bolts	<b>35 mm (1.37 in.)</b>
Lower location bolts	<b>120 mm (4.72 in.)</b>
Air Compressor mount bolt	<b>35 mm (1.37 in)</b>

### Detroit DDEC 15

#### Timing Gear



Flywheel window



**Note:**  
TDC can be confirmed by installing camshaft timing tool

Idler 1, 4 Axial play  
0.100 - 0.33 mm

Idler 2, 3, 5 Axial play  
0.100 - 0.18 mm

- 1- Idler gear  
84.0 mm (3.307 in.)
- 2- Idler gear 100 Nm  
55.5 mm (2.185 in.)
- 3- Idler gear 65 Nm  
60.5 mm (2.381 in.)
- 4- Idler gear 100 Nm  
Part no. to block  
84.0 mm (3.307 in.)
- 5- Idler gear 65 Nm  
45.5 mm (1.791 in.)
- 6- Air compressor gear
- 7- Fuel pump gear 250 Nm,  
see drawing for alignment
- 8- Axial power turbine gear
- 9- Crankshaft gear 100 Nm
- 10- Oil pump gear
- 11- Camshaft gear exhaust
- 12- Camshaft gear intake
- 13- Camshaft timing tool (W470589034000)  
to be installed by bolts for timing setting

**Backlash of idler:**

Crank gear - Idler 1	0.039 - 0.197 mm
Idler 1 - Idler 2	0.042 - 0.166 mm
Idler 2 - Idler 3	0.042 - 0.166 mm
Idler 3 - Idler 5 (hold 3 and measure 5)	0.079 - 0.305 mm
Idler 3 - Idler 5 (hold 5 and measure 3)	0.043 - 0.165 mm
Idler 5 - Cam gear	0.051 - 0.257 mm
Crank gear - Oil pump gear	0.032 - 0.388 mm
Crank gear - Idler 4	0.039 - 0.197 mm
Idler 4 - Turbocompound gear	0.037 - 0.143 mm
Idler 2 - Fuel pump gear	0.041 - 0.167 mm

**Note:**  
The timing is correct if:

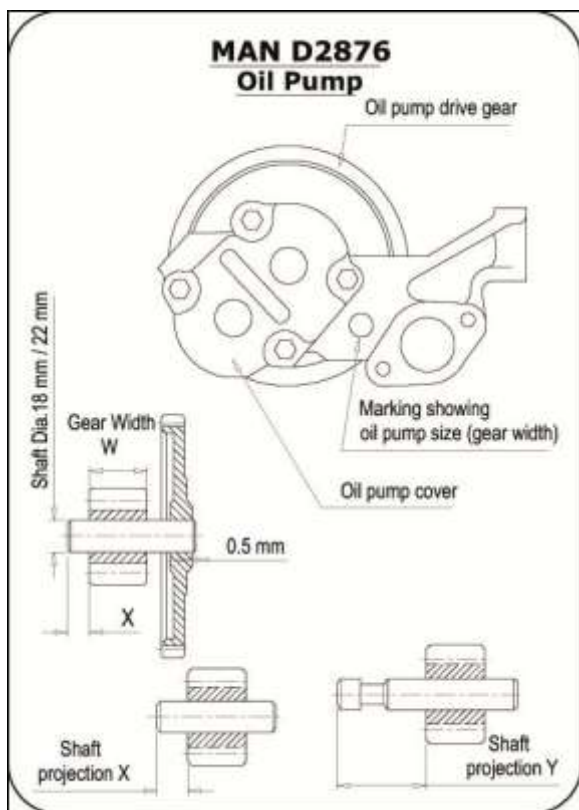
1. The valves are rocking on cyl. 6.
2. The plastic tip of the TDC peg is in the flywheel pickup cutout.
3. The flywheel window shows the dot between the two teeth of the flywheel.
4. The two dots on the inside of the camshafts are at 12 o'clock

# MAN D 2876

## 12.8 Litre 6 Cylinder

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Gear width	<b>27.927 – 27.960 mm</b>
Gear end play	<b>0.040 – 0.160 mm</b>
Shaft projection, X	<b>14.5 mm</b>
Shaft projection, Y	<b>40.800 – 41.000 mm</b>
Oil pump with housing depth = 34 mm, Tandem pump and normal type pump:	
Housing depth	<b>34.000 – 34.039 mm</b>
Gear width	<b>33.911 – 33.950 mm</b>
Gear end play	<b>0.050 – 0.128 mm</b>
Shaft projection, X	<b>14.5 mm</b>
Shaft projection, Y	<b>40.800 – 41.000 mm</b>

Oil pump with housing depth of 38 mm Tandem pump and normal type pump:	
Housing depth	<b>38.000 – 38.039 mm</b>
Gear width	<b>37.911 – 37.950 mm</b>
Gear end play	<b>0.050 – 0.128 mm</b>
Shaft projection, X	<b>14.5 mm</b>
Shaft projection, Y	<b>39.800 – 40.000 mm</b>

Oil pump with housing depth = 43 mm Tandem pump and normal type pump:	
Housing depth	<b>43.000 – 43.039 mm</b>
Gear width	<b>42.911 – 42.950 mm</b>
Gear end play	<b>0.050 – 0.128 mm</b>
Shaft projection, X	<b>11.5 mm</b>

Shaft projection, Y **41.800 – 42.000 mm**

### 18 mm Shaft:

Shaft Diameter	<b>17.930 – 17.940 mm</b>
Bore in housing cover	<b>18.000 – 18.018 mm</b>
Clearance	<b>0.060 – 0.088 mm</b>
Bore in drive gear	<b>17.900 – 17.915 mm</b>

### 22 mm Shaft (new model):

Shaft Diameter	<b>21.930 – 21.940 mm</b>
Bore in housing cover	<b>22.000 – 22.021 mm</b>
Clearance	<b>0.060 – 0.091 mm</b>
Bore in drive gear	<b>21.900 – 21.915 mm</b>

### Oil pump Capacity:

(Oil SAE 10, at temp. 50 Deg. C & pressure 4 Bar)

Oil Pump with gear width = 23 mm Rpm 600	<b>18 lit. / min</b>
Rpm 2440	<b>91 lit. / min</b>
Oil Pump with gear width = 28 mm Rpm 600	<b>25 lit. / min</b>
Rpm 2440	<b>113.5 lit. / min</b>
Oil Pump with gear width = 34 mm Rpm 600	<b>29.5 lit. / min</b>
Rpm 2440	<b>138 lit. / min</b>
Oil Pump with gear width = 38 mm Rpm 600	<b>33 lit. / min</b>
Rpm 2440	<b>155 lit. / min</b>
Oil Pump with gear width = 43 mm Rpm 600	<b>37 lit. / min</b>
Rpm 2440	<b>175 lit. / min</b>

### Cylinder head

Head gasket thickness:	
Before installation	<b>1.55 - 1.75 mm</b>
Installed and tightened	<b>1.163 - 1.297 mm</b>
Cylinder head height:	
Standard	<b>113.9 – 114.0 mm</b>
Minimum	<b>112.9 mm</b>
Surface roughness of sealing surface	<b>0.008 – 0.016 mm</b>

### Valves

Valve seat angle:	
Intake	<b>30 degree</b>
exhaust	<b>45 degree</b>

Theoretical valve seat:  
Intake valve: