



65.99897-8059

MAINTENANCE MANUAL

Diesel Engine

DV15

DV15T

DV15TI

DV15TIS
















FOREWORD

This maintenance manual is designed to serve as a reference for DAEWOO Heavy Industries & Machinery Ltd's (here after DAEWOO's) customers and distributors who wish to gain basic product knowledge on DAEWOO's DV series diesel engines (**DV15, DV15T, DV15TI** and **DV15TIS**)

These economical and high-performance diesel engines (8 cylinders, 4 strokes, V-type, direct injection type) have been so designed and manufactured to be used for overland transport and industrial purpose. That meets all the requirements such as low noise, fuel economy, high engine speed, and durability. (especially, DV15TIS model is an environment friendly one fulfilling the EURO-II emission regulation)

To maintain the engine in optimum condition and retain maximum performance for a long time, **CORRECT OPERATION** and **PROPER MAINTENANCE** are essential.

In this manual, the following symbols are used to indicate the type of service operations to be performed.

	Removal		Adjustment
	Installation		Cleaning
	Disassembly		Pay close attention-Important
	Reassembly		Tighten to specified torque
	Align the marks		Use special tools of manufacturer's
	Directional Indication		Lubricate with oil
	Inspection		Lubricate with grease
	Measurement		

During engine maintenance, please observe following instructions to prevent environmental damage;

- Take old oil to an old oil disposal point only.
- Ensure without fail that oil and diesel fuel will not get into the sea or rivers and canals or the ground.
- Treat undiluted anti-corrosion agents, antifreeze agents, filter element and cartridges as special waste.
- The regulations of the relevant local authorities are to be observed for the disposal of spent coolants and special waste.

If you have any question or recommendation in connection with this manual, please do not hesitate to contact our head office, dealers or authorized service shops.

For the last, the content of this maintenance instruction may be changed without notice for some quality improvement and please feel free to contact to our agents near by your location for any services. Thank you.

DAEWOO Heavy Industries & Machinery LTD.

Dec. 2001

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WORLDWIDE NETWORK

1. GENERAL INFORMATION

1.1. General Repair Instructions

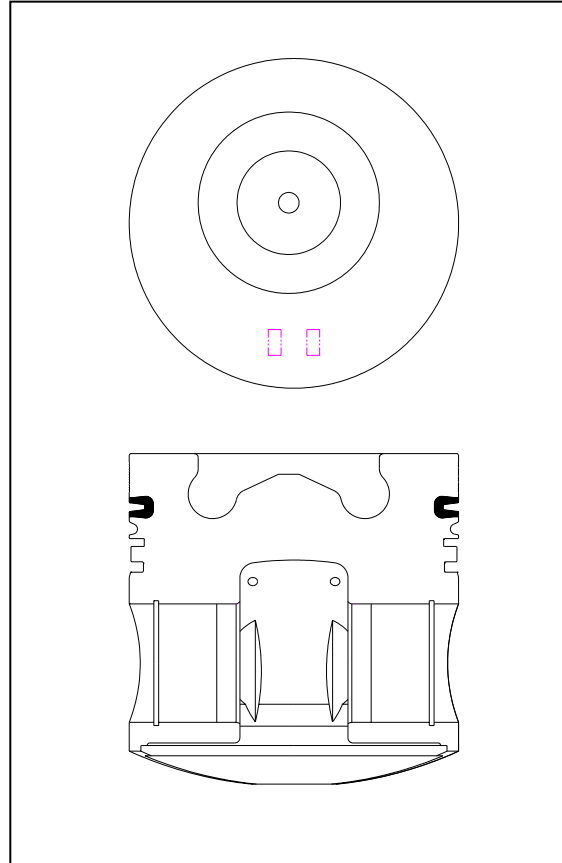
1. Before performing service operation, disconnect the grounding cable from the battery for reducing the chance of cable damage and burning due to short-circuiting.
2. Use covers for preventing the components from damage or pollution.
3. Engine oil and anti-freeze solution must be handled with reasonable care as they cause paint damage.
4. The use of proper tools and special tools where specified is important to efficient and reliable service operation.
5. Use genuine DAEWOO parts necessarily.
6. Used cotter pins, gaskets, O-rings, oil seals, lock washer and self-lock nuts should be discarded and new ones should be prepared for installation as normal function of the parts can not be maintained if these parts are reused.
7. To facilitate proper and smooth reassemble operation, keep disassembled parts neatly in groups. Keeping fixing bolts and nut separate is very important as they vary in hardness and design depending on position of installation.
8. Clean the parts before inspection or reassembly. Also clean oil ports, etc. using compressed air to make certain they are free from restrictions.
9. Lubricate rotating and sliding faces of parts with oil or grease before installation.
10. When necessary, use a sealer on gaskets to prevent leakage.
11. Carefully observe all specifications for bolts and nuts torques.
12. When service operation is completed, make a final check to be sure service has been done property.

1.2. Engine characteristics

1.2.1. OMEGA combustion bowl

The OMEGA combustion bowl is a unit designed to perform high efficiency, low emission combustion. As the rim around the combustion bowl port of the upper of the piston has been machined in a smaller size than the interior of the combustion bowl, strong swirl is produced in the combustion bowl and strong squish flow makes the fuel be mixed more sufficiently with air.

Due to the application of **OMEGA** combustion system and optimal utilization of intake and exhaust port configuration within the cylinder head, the **DV15TIS** diesel engines discharge very low level of hazardous exhaust gases such as smoke, nitrogen oxide, hydrocarbon, or carbon monoxide and thus ensure high performance and low fuel consumption.



1.3. Engine Specifications

1.3.1. Specification

Engine		DV15	DV15T	DV15TI	DV15TIS
Model Items					
Engine type		Water-cooled,4 cycle Vee type Naturally aspirated	Water-cooled,4 cycle Vee type Turbo charged	Water-cooled,4 cycle Vee type Turbo charged & intercooled	
Combustion chamber type		Direct injection type			
Cylinder liner type		Wet type			
Timing gear system		Gear driven type			
No. of piston ring		2 compression ring, 1 oil ring			
No. of cylinder-bore X stroke (mm)		8 – 128 × 142			
Total piston displacement (cc)		14,618			
Compression ratio		16.9 : 1	16.5 : 1	16.5 : 1	17.4 : 1
Engine dimension (length x width x height) (mm)		1,150x1,060x1,043.5	1,377x1,352x1,206.5	1,377x1,352x1,206.5	1,373x1,352x1,206.5
Engine weight (kg)		880	990	1,020	1,020
Fuel injection order		1-5-7-2-6-3-4-8			
Fuel injection timing (B.T.D.C static)		10°	Vehicle : 7° Industrial : 9°	11°	5.5°
Injection pump type		Bosch in-line P type			
Governor type		RQ or RQV type			
Injection nozzle type		Multi-hole(4 x φ0.34)	Multi-hole(5 x φ0.31)	Multi-hole(4 x φ0.39)	Multi-hole(5 x φ0.32)
Fuel injection pressure (kg/cm ²)		200+8	200+8	200+8	250+8
Compression pressure (kg/cm ²)		28 (at 200 rpm)			
Intake and exhaust valve clearance (at cold) (mm)		0.25/ 0.35			
Intake valve	Open at	12° (B.T.D.C)		15° (B.T.D.C)	
	Close at	48° (A.B.D.C)		35° (A.B.D.C)	
Exhaust valve	Open at	61° (B.B.D.C)		71.5° (B.B.D.C)	
	Close at	11° (A.T.D.C)		15.5° (A.T.D.C)	
Lubrication method		Pressurized circulation			
Oil pump type		Gear type			
Oil filter type		Full-flow, paper element type(double)			
Lubricating oil capacity (max./min.) (lit)		Bus : 24/ 20 , Truck : 21/ 19			
Oil cooler type		Water cooled			
Water pump		Belt driven centrifugal type			
Cooling Method		Pressurized circulation			
Cooling water capacity (engine only) (lit)		19			
Thermostat type		Wax pallet type (79 ~ 94 °C)			
Air compressor type & capacity (cc/rev)		Gear driven type : 300			
Power steering pump (lit/bar)		Bus : 16 / 100 , Truck : 18 / 125			
Alternator voltage – capacity (V - A)		Bus : 24-150 , Truck : 24 – 45 , 60 or 80			
Starting Motor voltage – output (V - kW)		Bus : 24 – 6.6 , Truck 24 – 7.0			
Air heater capacity (V - A)		22 – 95 (1.06 kW)			
Battery capacity (V - AH)		200			

1.3.2. Engine power

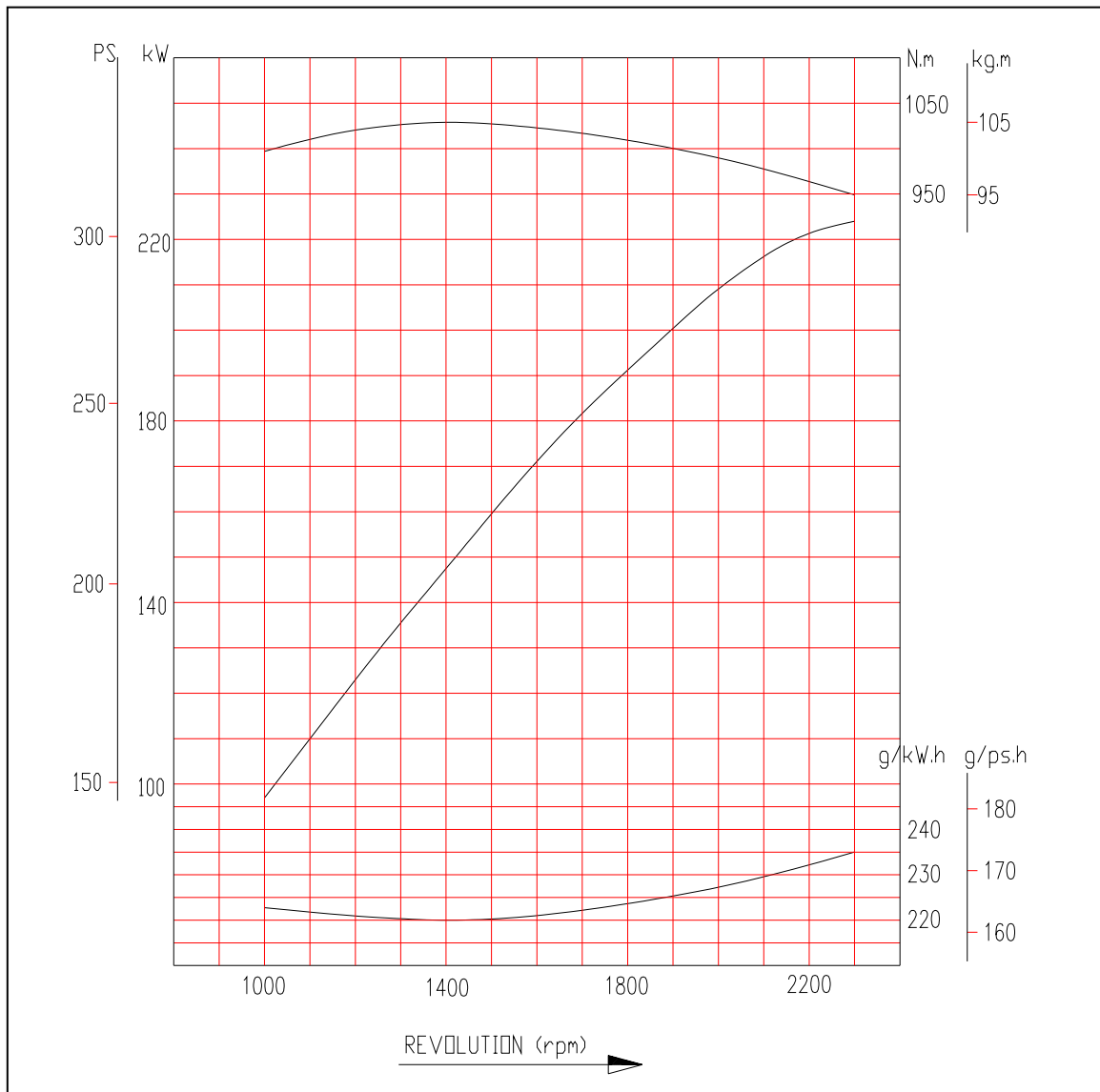
Production tolerance : $\pm 5\%$

Engine Model		Performance					Remark
Model	Suffix	Injection timing (BTDC °)	Power (PS / rpm)	Torque (kg.m / rpm)	Low idle (rpm)	High idle (rpm)	
DV15	ECLBA	10	305 / 2,300	105 / 1,400	550+50	2530 ~2600	EURO-I
DV15T	ECVXA ECVXC	7	340 / 2,300	132 / 1,300	575 \pm 25	2530 ~2600	
	ECVBA ECVBB ECVBC ECVCF	7	365 / 2,300	138 / 1,300	575 \pm 25	2530 ~2600	
	ECVCA ECVCB ECVCC ECVCD ECVCE ECVCH ECVCI ECVCJ	7	370 / 2,300	145 / 1,300	575 \pm 25	2530 ~2600	
DV15TI	ECVEA ECVEB ECVEC ECVED	9	300 / 2,000	125 / 1,300	850 \pm 25	2250 \pm 50	TIER-I
	ECJCA ECJCB ECJCC	11	420 / 2,100	170 / 1,200	575 \pm 25	2310 ~ 2360	EURO-I
	DV15TIS	EDJBA EDJXA EDJXC	5.5	390 / 2,100	160 / 1,200	575 \pm 25	2320 ~ 2370
EDJCA EDJCB EDJCC EDJCF EDJCG		5.5	420 / 2,100	170 / 1,200	575 \pm 25	2320 ~ 2370	

* Note : All data are based on operation without cooling fan at ISO 1585(SAE J1349).

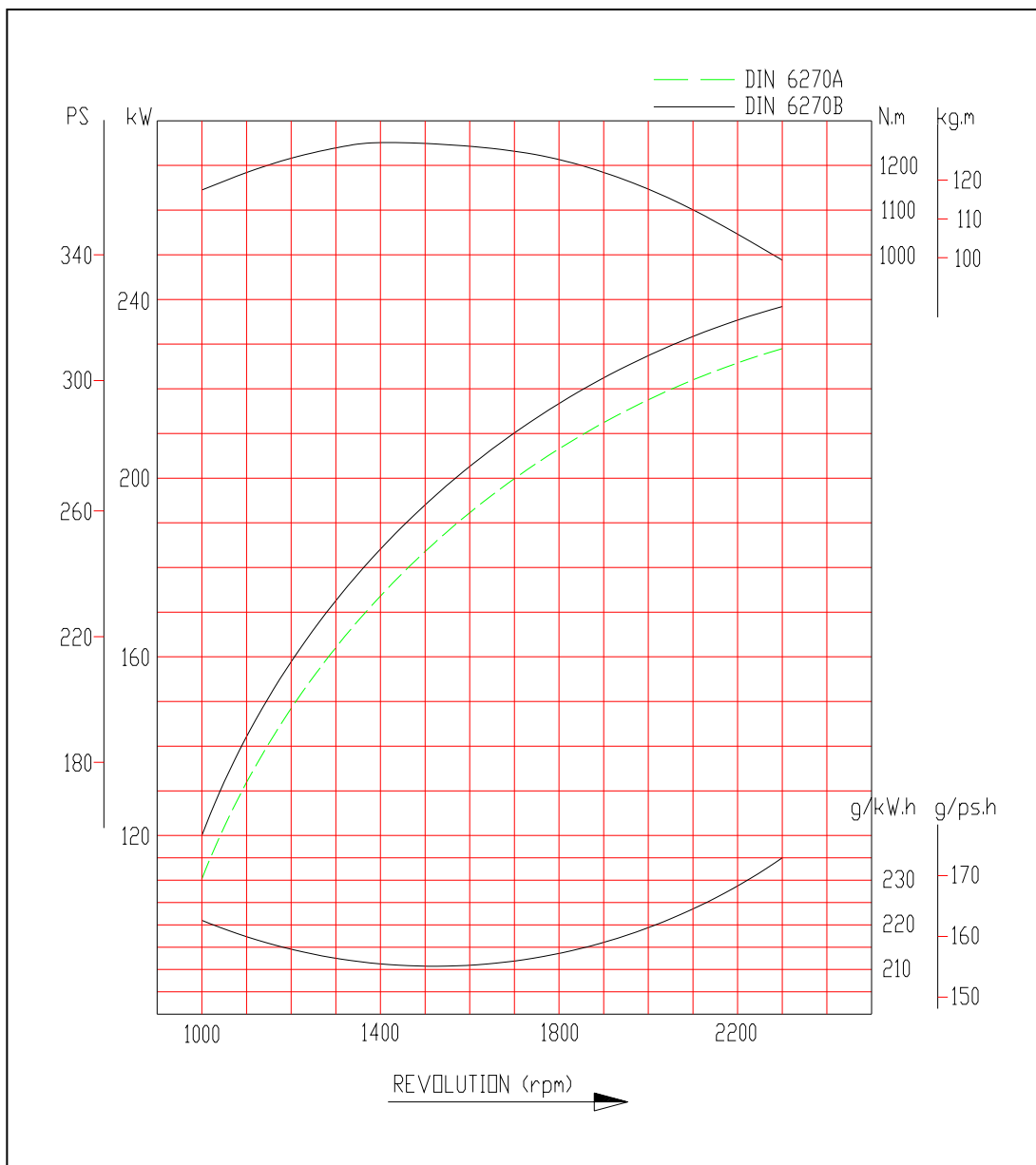
1.3.3. Performance curve

1) DV15



Performance		ISO 1585 (SAE J1349)
Output	(max.)	224 kW (305PS) / 2,300 rpm
Torque	(max)	1,029 N.m (105 kg.m) / 1,400 rpm
Fuel consumption	(min.)	220 g/kW.h (162 g / PS.h)

2) DV15T



Performance	DIN 6270B	DIN 6270A
Output (max.)	238 kW (324PS) / 2,300 rpm	229 kW (311PS) / 2,300 rpm
Torque (max)	1,255 N.m (128 kg.m) / 1,400 rpm	
Fuel consumption (min.)	211 g/kW.h (155 g / PS.h)	