

TECHNICAL DATA

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TECHNICAL DATA

ENGINE

Parameter		Model	480ED-1000010 Magneti Marelli (new)	480ED-1000010EA UAES (new)
Type			Four-cylinders In-Line, four-strokes, water-cooled	Four-cylinders In-Line, four-strokes, water-cooled
Cylinder bore (mm)			79.94	79.94
Stroke (mm)			79.52	79.52
Displacement (L)			1.596	1.596
Compression ratio			10:1	10:1
Max Output/speed (kw/r/min)			65/5500	65/5500
Max. Torque/ engine speed) (Nm/r/min)			135/2500-4000	135/2500-4000
Economic Specific Fuel Consumption (g/kw. H)			285	285
Fuel Supply			Multipoint electric fuel injection engine	Multipoint electric fuel injection engine
Ignition Order			1-3-4-2	1-3-4-2
Lubrication Type			Forced + oil splash	Forced + oil splash
Idling speed (r/min)			880±30	850±50
Exhaust (Idling Speed) CO			≤0.5%	≤0.5%
Weight (kg)			115	115
Outline Dimension (length*width*height) (mm)			615×610×680	615×610×680
Idle ignition angel (crank angel, before TDC)			10° ±5°	10° ±5°
Valve timing (crank angel)	Intake valve open		26° before TDC	26° before TDC
	Intake valve closed		55° after BDC	55° after BDC
	Exhaust valve open		66° before TDC	66° before TDC
	Exhaust valve closed		15° after TDC	15° after TDC

Size of Hydraulic Tappet:

Class	Outside circle diameter (unit: mm)	Hole diameter of the cylinder head tappet (unit: mm)	Fit clearance (unit: mm)
Standard	Φ 22.200~Φ 22.212	Φ 22.25±0.015	0.023~0.065
T25	Φ 22.454~Φ 22.466	Φ 22.50±0.015	0.023~0.065

Cam Height:

Engine model	Admission cam T (unit: mm)	Exhaust cam T (unit: mm)
480	38.602	37.586
480E	37.559	37.559

Standard Size

Number of cam shaft journal	Diameter of cam shaft journal (unit: mm)	Diameter of the cam shaft hole of the cylinder head (unit: mm)
1	44.74—44.76	44.783—44.808
2	44.99—45.01	45.033—45.058
3	45.24—45.26	45.283—45.308
4	45.49—45.51	45.533—45.558
5	45.74—45.76	45.783—45.808

Oversized (0.38)

Number of cam shaft journal	Diameter of cam shaft journal (unit: mm)	Diameter of the cam shaft hole of the cylinder head (unit: mm)
1	45.12—45.14	45.163—45.188
2	45.37—45.39	45.413—45.438
3	45.62—45.64	45.663—45.688
4	45.87—45.89	45.913—45.938
5	46.12—46.14	45.163—45.188

Valve Stem Size And Fit Clearance

Class	Intake valve (unit: mm)			Exhaust valve (unit: mm)		
	Diameter of valve stem	Inner Diameter of valve guide	Clearance	Diameter of valve stem	Inner Diameter of valve guide	Clearance
Standard	$8.043^{+0}_{-0.018}$	$8.063 \sim 8.094$	0.02	$8.017^{+0}_{-0.018}$	$8.063 \sim 8.094$	0.046
Oversized by 0.4	$8.443^{+0}_{-0.018}$	$8.463 \sim 8.494$	~ 0.069	$8.417^{+0}_{-0.018}$	$8.463 \sim 8.494$	~ 0.095

Size of Intake Valve Seat Ring And Cylinder Head Seat Ring Bore

Class	Diameter of intake valve seat ring (unit: mm)	Diameter of the seat ring bore of cylinder head (unit: mm)	Interference (mm)
480 engine	$43.877^{+0.01}_{-0.01}$	$43.763^{+0.025}_0$	0.079~ 0.124
Oversized by 0.5	$44.377^{+0.01}_{-0.01}$	$44.263^{+0.025}_0$	
Oversized by 1.0	$44.877^{+0.01}_{-0.01}$	$44.763^{+0.025}_0$	

Size of Exhaust Valve Seat Ring And Cylinder Head Seat Ring Bore

Class	Diameter of exhaust valve seat ring (mm)	Diameter of cylinder head seat ring bore (mm)	Interference (mm)
480 and others	$38.877^{+0.01}_{-0.01}$	$38.263^{+0.025}_0$	0.079~0.124
Oversized by 0.5	$39.377^{+0.01}_{-0.01}$	$38.763^{+0.025}_0$	
Oversized by 1.0	$39.877^{+0.01}_{-0.01}$	$39.263^{+0.025}_0$	
UAES's new two-valve	$38.377^{+0.01}_{-0.01}$	$38.263^{+0.025}_0$	0.079~0.124
Oversized by 0.5	$38.877^{+0.01}_{-0.01}$	$38.763^{+0.025}_0$	
Oversized by 1.0	$39.377^{+0.01}_{-0.01}$	$39.263^{+0.025}_0$	

Size of Valve Guide And Valve Guide Bore

Class	Valve guide bore (unit: mm)	Diameter of cylinder head guide hole (unit: mm)	Interference (unit: mm)
Standard	$13.555^{0}_{-0.01}$	13.481—13.519	0.026—0.07
Oversized	$14.305^{0}_{-0.01}$	14.231—14.269	
Oversized	$14.505^{0}_{-0.01}$	14.481—14.519	

Size of Cylinder Bore

	480 M cylinder bore (unit: mm)		480 E cylinder bore (unit: mm)	
Ex-factory grouping	1	79.94-79.95	1	79.94-79.95
	2	79.95-79.96	2	79.95-79.96
	3	79.96-79.97	3	79.96-79.97
	4	79.97-79.98	4	79.97-79.98
Ex-factory repair	A	80.23-80.24	A	80.23-80.24
	B	80.24-80.25	B	80.24-80.25
	C	80.25-80.26	C	80.25-80.26
For Maintenance	Standard	79.965-77.975	Standard	79.965-77.975
	Oversized by 0.29	80.245-80.255	Oversized by 0.29	80.245-80.255
	Oversized by 0.5	80.466-80.475	Oversized by 0.5	80.466-80.475

The Diameter of Piston Skirt

	Diameter of 480M piston skirt (unit: mm)		Diameter of 480E piston skirt (unit: mm)	Diameter of UMC's new two-valve piston skirt (unit: mm)
Ex-factory grouping	1	79.91-79.92	79.915-79.925	79.915-79.925
	2	79.92-79.93	79.925-79.935	79.925-79.935
	3	79.93-79.94	79.935-79.94	79.935-79.94
	4	79.94-79.95	79.945-79.955	79.945-79.955
Ex-factory repair	A	80.20-80.21	80.205-80.215	80.205-80.215
	B	80.21-80.22	80.215-80.225	80.215-80.225
	C	80.22-80.23	80.225-80.235	80.225-80.235
Spare parts	Standard	79.93-79.955	79.965-79.975	
	Oversized by 0.29	80.21-80.235	80.245-80.255	
	Oversized by 0.5	80.43-80.455	80.465-80.475	80.435-80.455

The Diameter of Piston Pin Bore

Diameter of 480M piston pin bore (unit: mm)		Diameter of 480E piston pin bore (unit: mm)	
White	20.630-20.633	White	20.630-20.633
Red	20.633-20.636	Red	20.633-20.636
Blue	20.636-20.639	Blue	20.636-20.639

The Diameter of The Piston Pin

Diameter of 480M piston pin bore (unit: mm)		Diameter of 480E piston pin bore (unit: mm)	
White	20.622-20.625	White	20.622-20.625
Red	20.625-20.628	Red	20.625-20.628
Blue	20.628-20.631	Blue	20.628-20.631

The End Clearance of The Piston Ring

First compression ring: 0.30-0.50mm
 Second compression ring: 0.30-0.50mm
 Oil ring: 0.40-1.40mm

The Axial Clearance of Piston Ring In The Piston Groove

	Height of the piston ring (unit: mm)	Size of piston ring groove (unit: mm)	Fit clearance (unit: mm)
First compression ring	1.60 $\begin{smallmatrix} 0 \\ -0.012 \end{smallmatrix}$	1.6 $\begin{smallmatrix} +0.06 \\ +0.04 \end{smallmatrix}$	0.050-0.082
Second compression ring	2.0 $\begin{smallmatrix} 0 \\ -0.012 \end{smallmatrix}$	2.0 $\begin{smallmatrix} +0.06 \\ +0.04 \end{smallmatrix}$	0.050-0.082
Sealing strip of oil ring	0.61 ± 0.025	4.0 $\begin{smallmatrix} +0.03 \\ +0.01 \end{smallmatrix}$	0.01-0.23
Spring of oil ring	2.68 ± 0.05		
Cast iron oil ring	4.0 $\begin{smallmatrix} -0.015 \\ -0.025 \end{smallmatrix}$	4.0 $\begin{smallmatrix} +0.03 \\ +0.01 \end{smallmatrix}$	0.025-0.055

480 UAES's New Two-Valve

	Height of the piston ring (unit: mm)	Size of piston ring groove (unit: mm)
First compression ring	1.2 (-0.03 ~ -0.01)	1.2 (0.03 ~ 0.05)
Second compression ring	1.5 (-0.03 ~ -0.01)	1.5 (0.02 ~ 0.04)
Sealing strip of oil ring	0.46 ± 0.02	3 (0.01 ~ 0.03)
Spring of oil ring	2.75 ± 0.05	
	2.0 ± 0.02	

Size of Piston Ring

480# piston ring	
Paint mark (type)	Size of gauge
No paint (Standard)	79.94
Purple paint (oversized by 0.29)	80.23
Blue paint (oversized by 0.5)	80.44

Size of Connecting Rod Journal And Connecting-rod Bearing Shell

Class	Diameter of connecting rod journal (unit: mm)	Thickness of connecting-rod bearing shell (unit: mm)
Standard	47.89~47.91	1.480~1.487
Downsized by 0.025	47.89~47.91	1.492~1.499
Downsized by 0.25	47.64~47.66	1.605~1.612
Downsized by 0.5	47.39~47.41	1.730~1.737
Downsized by 0.75	47.14~47.16	1.855~1.862
Downsized by 1.0	47.89~46.91	1.980~1.987

Diameter of Main Journal And Size of Main Bearing Shell

Class	Diameter of main journal (unit: mm)	Diameter of the main bearing bore of the cylinder block (unit: mm)	Thickness of the main bearing shell (unit: mm)
Standard	57.98~58.00	62.2935 $\pm$ 0.0065	2.131~2.138
Oversized by 0.4	57.98~58.00	62.6935 $\pm$ 0.0065	2.331~2.338
Downsized by 0.02	57.98~58.00	62.2935 $\pm$ 0.0065	2.141~2.148
Downsized by 0.25	57.73~57.75	62.2935 $\pm$ 0.0065	2.256~2.263
Downsized by 0.50	57.48~57.50	62.2935 $\pm$ 0.0065	2.381~2.388
Downsized by 0.75	57.23~57.25	62.2935 $\pm$ 0.0065	2.506~2.513
Downsized by 0.25 and oversized by 0.4	57.73~57.75	62.6935 $\pm$ 0.0065	2.456~2.463
Downsized by 0.50 and oversized by 0.4	57.48~57.50	62.6935 $\pm$ 0.0065	2.518~2.558
Downsized by 0.75 and oversized by 0.4	57.23~57.25	62.6935 $\pm$ 0.0065	2.706~2.713

Size of Crankshaft Thrust, Thrust Spacer And Cylinder Block Thrust

Class	Size of cylinder block thrust (unit: mm)	Size of crank shaft thrust (unit: mm)	Thickness of thrust spacer (unit: mm)
Standard	24 $\pm$ 0.03	28.825-28.875	2.326 $\pm$ 0.025
Oversized by 0.38	24 $\pm$ 0.03	29.205-29.255	2.516 $\pm$ 0.025

LUBRICATION SYSTEM

Lubricant Spec. (at above -10° C)		SAE10W/30—50 (SG grade)
Fuel Spec.		93 # Regular unleaded gasoline
Oil pressure (Idling Speed)		100Kpa
Oil pressure 2000r/min (water temperature 80°C)		280Kpa
Oil capacity (L)		3.86
Opening pressure of the pressure control valve, oil pump (Kpa)		440±20
Opening pressure of the bypass valve, Oil Filter (Kpa)		78—118
Coolant Mixing Ratio		50% glycol +50% soft water (volume ratio)
Coolant Capacity (complete vehicle) (L)		8
Initial opening temperature of thermostat (°C)		85—89
Full open temperature of thermostat		99—102
Cap Pressure, expansion tank (Kpa)		160
Fan speed (r/min)	Low-speed gear	High-speed motor 2000±200 Low-speed motor 1800±200
	High-speed gear	High-speed motor 2800±200 Low-speed motor 2600±200

COOLING SYSTEM

Cooling System	Parameters
Capacity of Coolant	Overall system capacity (L) 8
	Engine capacity (L) 3.3
	Radiator capacity (L) 2.1
	Capacity of expansion tank (L) 0.4
Fan	Diameter: 280mm
	Number of blades: 6
	Working voltage: 9-15V
	Rotating speed: Gear I: High-speed motor 2000 ± 200 Low-speed motor 1800 ± 200
	Rotating speed: Gear II: High-speed motor 2800 ± 200 Low-speed motor 2600 ± 200
Water pump	Diameter of impeller: $\phi 72\text{mm}$
	Gear ratio: 1.053: 1
	Opening force of pressure cap: 160kPa
Radiator	Front face area 0.202m^2
	Radiation area 8.93m^2
Thermostat	Opening temperature $85^\circ - 89^\circ$
	Full open temperature $99^\circ - 102^\circ$
Thermal switch	Switch-on temperature Gear I 95°C Gear II 102°C
	Switch-off temperature Gear I $\leq 84^\circ\text{C}$ Gear II $\leq 91^\circ\text{C}$
	Working voltage: 12V
CTS	Resistance Ω : 70 Temperature $^\circ\text{C}$: 159 ± 21.3
	90 86.7 ± 11
	110 52.3 ± 6.3
	124 28.2 ± 2.8

ENGINE ELECTRICAL FUEL INJECTION SYSTEM

Marelli Electronic Fuel Injection System-New Camshaft+ New Standard:

Parameters	Normal value	Minimal value	Maximal value
Engine Rotation Speed (rpm)	880 (when air conditioner is turned of)	850	910
Water Temperature (°C)	>80		
Throttle opening angle (°)	Accelerator is released 0	0	0.6
Fuel injection duration (ms)	4.2ms (when air conditioner is turned of)	3.4ms	4.7ms
In-take Pressure (mbar)	390mbar	340mbar	450mbar
Storage battery voltage (V)	14	13	15
Oxygen sensor voltage (mV)	Sinusoidal periodical change	100mV	900mV
Steps of Stepping Motor (step)	70	50	90

UAES M7 Electronic Fuel Injection System:

Parameter name	Value	Unit
Storage battery voltage (V)	14~15	V
Engine Rotation Speed	850±50	rpm
Temperature of cooling fluid, sensor voltage	0.9~1.1	V
Temperature of cooling fluid	85~95	°C
In-take temperature sensor voltage	1.5~2.8	V
In-take temperature	30-60	°C
In-take pressure sensor voltage	1.2-1.4	V
In-take pressure	40-50	KPa
Stepping motor target position	20~100	Step
Fuel injection pulsation width	3~4	ms
Advance angle of ignition	3~9	°
Oxygen sensor voltage	100-900	mv
Throttle opening angle voltage	0.35-0.50	V

CLUTCH

Item			Specification
Clutch	Pedal stroke	mm	150~165
Clutch	Run out limit	mm	0.25
Clutch disc	Rivet head dent depth	Standard mm	1.5
		Service mm	0.5
	Run out limit		0.8
Flywheel	Maximum clearance of flatness of flywheel		0.05
	Service limit		0.15

MANUAL TRANSAXLE

Gearbox		AQ015
Gear ratio	Main	4.133
	1 st	3.455
	2 nd	2.056
	3 rd	1.370
	4 th	1.032
	5 th	0.850
	Reverse	3.167
	Speedometer	2.286
Volume of Lubrication oil		2.0L
Type of oil		GL-4 SAE75
Operation method		Mechanical type
Diameter of driven disk of clutch		210mm
Diameter of flange of driving shaft		100mm
Overall gear ratio at 5 th gear		3.513
Max input torque		132.5 N.m
Max input rotating speed		6300 r/min

HEATER AND AIR CONDITIONER SYSTEMS

Item			Specification
REFRIGERANT SYSTEM			
Refrigerant	Type		R-134
	Regular amount (g)		850±25
BASIC SYSTEM			
A/C compressor	Number of cylinders		7
	Cylinder diameter (mm)		29. 3
	Stroke (mm)	Max	34. 2
		Min	2. 2
	Displacement (cm ³ /r)	Max	161. 3
		Min	10. 4
	Max instantaneous rotation speed allowed(r/min)		8000
	Max continuous rotation speed allowed (r/min)		7000
	Cooling oil volume (cm ³)		115±15
	Rated voltage (V)		12
	Rated power (W)		48
CONTROL SYSTEM			
Magnetic clutch	Clearance (mm)		0.4~0.8
	Mass (kg)		2. 2

BRAKING SYSTEM

Brake master cylinder	$\varnothing 22.2\text{mm}$
Vacuum booster	$\Phi 228.6\text{mm}$
Vacuum booster boost ratio	3.9:1
Primary chamber travel	16 mm
Secondary chamber travel	18 mm
Front wheel disk brake: wheel cylinder diameter	$\Phi 54\text{mm}$
Brake disk outer diameter	$\Phi 256\text{mm}$
Brake disk thickness	13mm
Brake disk service limit	10mm
Brake disk run out limit	0.03mm
Front friction shoe thickness	19.3mm
Front friction shoe service limit	7mm
Rear drum brake: brake drum diameter	$\Phi 200\text{mm}$
Brake drum diameter service limit	$\Phi 201\text{mm}$
Rear drum brake wheel cylinder diameter	$\Phi 17.46\text{mm}$
Rear drum brake shoe plate	$\Phi 200\text{mm} \times 40\text{mm} \times 5\text{mm}$
Brake power distribution ratio	Front wheel 65%, rear wheel 35%
Parking brake	Acting force of parking brake control handle (38mm from end) < 400N with 20% full load on ramp

SUSPENSION

Suspension

Item		Specification
Front wheel alignment	Front wheel camber angle	$-30' \pm 20'$
	Kingpin caster angle	$1^{\circ} 30' \pm 30'$
	Front wheel toe-in	$0' \pm 10'$
Rear wheel alignment	Rear wheel toe-in	$10' \pm 10'$
	Rear wheel camber angle	$-1^{\circ} 30' \pm 20'$

Tire And Wheel

Item	Front Wheel	Rear Wheel	Spare Wheel	Secondary Spare Wheel
No load/half load	200kPa	220kPa	350kPa	420kPa
Full load	210kPa	260kPa	420kPa	420kPa

Tire Model	Wheel Rim Model
185/60 R14×82H	6J×14