

WORKSHOP MANUAL

MITSUBISHI MEIKI ENGINE

TYPE GM SERIES

'02-01



MITSUBISHI HEAVY INDUSTRIES, LTD

Introduction

This workshop manual provides the necessary information for checking, adjusting, disassembling, repairing reassembling and operating the Mitsubishi Meiki Engine "GM" series by the service staff. To implement rapid and correct maintenance, we recommend that you read this manual thoroughly before starting the above procedures.

The contents of this manual may not conform to your engine as a result of the change of the specifications for the purpose of improvements as this manual has been issued in accordance with the specifications as of July 1998.

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**Group
I**

General description of engine

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- (1) Compact size with low centre of gravity through the adoption of the inclined cylinder (OHV engine). Miniature but powerful OHV engine through the ideal combustion chamber, utilizing the results of our long time research and development. As the inclined cylinder is adopted to solve inconveniences from the heightened OHV engine, you can install the engine easily on the operation equipment and also obtain less vibration, better operability and stability with its low centre of gravity.
- (2) Easy to operate and perform maintenance.
Mental and physical fatigue is minimized by:
 - ▷ Reducing of power to pull the recoil through the adoption of decompression mechanism (Half compared with the conventional.)
 - ▷ Centralizing of all operations (All operation from start through running to stop of the engine can be done on one side.)
 - ▷ Low noise and vibration design which reduces the fatigue (Noise: 2dBA reduction from the conventional.)
 - ▷ Low fuel consumption (230 gr/PS-hr 30% reduction from the conventional.)
 - ▷ Considerable extension of lubrication interval (4 to 5 times compared with the conventional.)
 - ▷ Corrosion free carburetor
 - ▷ Simplified fuel and lubricant supply.
 - ▷ Simplified maintenance.
- (3) Economical and High Performance engine. The engine can achieve the following basic function at high level:
 - ▷ Easy to start
 - ▷ Acceleration.
 - ▷ Output characteristics (The adoption of big volume cylinder compare with that of our competitors provides more room for a wide range of operations.)
 - ▷ Torque characteristics in low/medium range of speed (Such tenacity of engine that the torque reaches maximum at around 2800 rpm.)
 - ▷ Cooling characteristics (This provides more room for the installation environment, i.e., for covering.)
 - ▷ Economy (Fuel and lubrication consumption, durable functional parts.)

Features of GM82, GM132, and GM182 Engines

- (1) Introduction of pent-roof combustion chamber
 - ▷ About 10% output increase compared to conventional OHV engine.
 - ▷ Combustion efficiency is further improved and the engine clears the CARB emission control for the Year 2000 by the EPA of the United States.
- (2) Realization of low noise which is at the top level of the industry
 - ▷ Introduction of large muffler and air cleaner. Also, vibration noise from metal plate parts is reduced.
 - ▷ Low-noise characteristics due to introduction of silent chain (low-speed type.).
- (3) Large bearing is used for the output axis.
The largest bearing in the class is used which is suitable for machine the larger load in the direction of the thrust against the output axis.

- 2 Specifications

Type	Air-cooled 4 stroke cycle overhead valve gasoline engine with cylinder inclined by 30 degrees																		
Model	GM90	GM130	GM180	GM220	GM290	GM300	GM91	GM131	GM181	GM221	GM231	GM291	GM301	GM391	GM401	GM82	GM132	GM182	
No. of cylinders- Bore × Stroke (mm)	1 – 52×42	1 – 62×42	1 – 68×50	1 – 72×53	1 – 80×59		1 – 52×42	1 – 62×42	1 – 68×50	1 – 72×53		1 – 80×59		1 – 89×63		1 – 52×38	1 – 62×42	1 – 68×50	
Displacement (cm ³)	89	126	181	215	296		89	126	181	215		296		391		80	126	181	
Continuous rated output	(kW/rpm)	1.6/3600	2.1/3600	3.3/3600	3.7/3600	4.4/3600	5.5/3600	1.6/3600	2.1/3600	3.3/3600	3.7/3600		4.4/3600	5.5/3600	5.9/3600	6.6/3600	1.3/3600	2.1/3600	3.3/3600
	(PS/rpm)	2.2/3600	2.8/3600	4.5/3600	5.0/3600	6.0/3600	7.5/3600	2.2/3600	2.8/3600	4.5/3600	5.0/3600		6.0/3600	7.5/3600	8.0/3600	9.0/3600	1.8/3600	2.8/3600	4.5/3600
Max. output	(kW/rpm)	2.0/4000	2.9/4000	4.4/4000	5.1/4000	5.9/4000	7.4/4000	2.0/4000	2.9/4000	4.4/4000	5.1/4000		5.9/4000	7.4/4000	8.1/4000	9.6/4000	1.8/4000	2.9/4000	4.4/4000
	(PS/rpm)	2.7/4000	4.0/4000	6.0/4000	7.0/4000	8.0/4000	10.0/4000	2.7/4000	4.0/4000	6.0/4000	7.0/4000		8.0/4000	10.0/4000	11.0/4000	13.0/4000	2.4/4000	4.0/4000	6.0/4000
Max. torque	(N-m/rpm)	5.20/2800	7.65/2800	11.6/2800	13.7/2800	17.7/2800	19.3/2800	5.20/2800	7.65/2800	11.6/2800	13.7/2800		17.7/2800	19.3/2800	23.5/2800	26.5/2800	4.31/3000	7.65/2800	11.57/2800
	(kgf-m/rpm)	0.53/2800	0.78/2800	1.18/2800	1.40/2800	1.80/2800	1.97/2800	0.53/2800	0.78/2800	1.18/2800	1.40/2800		1.80/2800	1.97/2800	2.4/2800	2.7/2800	0.44/3000	0.78/2800	1.18/2800
Engine rotation	Counterclockwise facing to output shaft																		
Fuel	Lead-free automobile gasoline																		
Fuel tank capacity (ℓ)	2.2	3.0	4.0	6.0	3.0	4.0	4.5	6.0	7.0	1.6	2.5	4.0							
Lubricating Oil	Engine Oil SD class or higher, SAE standard #30 (In winter, #20)																		
Lubricating Oil Volume (ℓ)	0.6	0.7	1.2	0.6	0.7	0.9	1.4	1.2	0.4	0.6	0.6								
Carburetor	Float (butterfly valve transverse suction type)																		
Starting system	Recoil starter or Self-starting motor																		
Spark plug	NGK, BP5ES												CHANPION RC12YC		NGK, BP6HS				
Ignition system	Breaker-less ignition type, flywheel magnet (MTI)																		
Governor	Conical pendulum system																		
Lubrication	Splash lubrication				Splash lubrication paralleled with oil pump		Splash lubrication				Splash lubrication paralleled with oil pump				Splash lubrication				
Reduction system	L type=1/2 Cam reduction system												1/2 external reduction system		L type=1/2 Chain reduction system				
Air cleaner element	Oil wet polyurethane or oil bath system		Oil wet polyurethane foam	Oil wet polyurethane or oil bath system		Oil wet polyurethane or oil bath system		Oil wet polyurethane foam	Oil wet polyurethane or oil bath system										
Lighting capacity (V – W)	6 – 15 (Option)																		
Charging capacity (V – A)	12 – 2 or 12 – 4 (Option)																		
Dry weight (kg)	14.5	15.0	17.5	18.0	25.0	26.0	15.5	18.5	21.5	26.0	27.0	35.0	9.5	P: 12.7, L: 13.7	P: 14.95, L: 15.8				
Dimensions (Length×Width×Height) (mm)	304×337×326	304×337×336	326×362×363	336×362×363	370×426×426		308×345×336		326×363×368		339×375×418	370×431×431		462.5×463×466		275×304×284	297×340×320	304×357×350	

Note:

- 1) Indicated revolution is at the crankshaft.
- 2) The above specifications are subject to change without prior notice by the manufacturer for the purpose of improvement.
- 3) Indicated dimensions and weights are based on LN type specifications.