

YANMAR SERVICE NEWS

Title	FO Injection Pump Rack Limit Values on Engine Starting. (Rev. 4: Engines complying with IMO Tier2 regulation added.)	No. : 02-2-G-09-023-L-Rev.4 Date: Jun. 2011
Eng.Model	ALL	Use Marine Aux. & Industrial
		Engine Nos. _____

In order to ensure satisfactory starting and reduce black smoke emissions, the fuel injection amount on engine starting is set at the values when the engines are shipped from our plant.




This fuel injection limit may be varied due to servicing, etc. and starting performance may drop and black smoke emissions may increase due to secular degeneration of the plunger barrel. At such times, adjust the injection amount to the limit rack values in Table 1, Table 2 below and operate the engine for checking.

Table 1

Model	Limit Rack Value	Model	Limit Rack Value
6NY16L	5.5±1	M220L	19±1
S165L	5.5±1	M220AL	18±1
NHL (1500rpm)	Limit with Scale +5 at 25% load (Refer to Notes ①&②)	12GL	17±1
NHL (1800rpm)		12GAL	20±1
6N165L	Limit with Scale +2 at 25% load (Refer to Notes ①&②)	T240 (A) L	19.5±1
S185DL		T260L-ST, ET, GT	21±1
S185AL	12.5±1	12T26L	21±1
S185L	16±1	T260L-SX, EX	15.5±1
6N18L	14±1	6N260L(excluding GN)	20.5±1
6N18AL	25±0.5	6N260L-GN	23±1
M200L	25±0.5	(8)Z280L	18±1
M200AL	23±1	6/8ZL	18±1
M200HLEN	21±1	12,16ZL	23±1
6/8N21L	18±1	6/8N280L	21±1
6/8N21AL	25±0.5	6/8N330L	38±1
6EY18(A)L	25±0.5	6EY26L	19±1

Notes

- ① Use the indicator scales for the NHL and 6N165L. If 25% load operation is not possible in the NHL, apply the intermediate value between the 0% and 50% load as the scale value at 25% load. When setting the generator with extremely small capacity to the engine's rated capacity, limit the generator capacity at approx. 35% of the engine's rated capacity.
- ② Since the NHL engines in Hokkaido are operated on 'the special light oil, No.3', the injection termination position moves towards the fuel increasing direction. In this particular case, add 2 to the value in the table above for the fuel limit value.
- ③ If the engine is operated at load with the loop piping with the FO return pipe connected to the feed pump inlet, the FO injection pump temperature may exceed the flash point of the fuel oil. In this case, vapor is produced inside the plunger after stopping the engine and the engine may not be re-started with the FO rack position above. If you loosened the rack limit for heated engine starting once, be sure to return the value to the limit position above after completing the trial operation. (Especially for the land use engines.)

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<Engines Complying with IMO Tier2 Regulation>

Table 2.

Model	Limit Rack Value	Model	Limit Rack Value
6NY16LW	Limit at the scale at 25% load + 2	6,8N21LW	28±0.5
		6,8N21ALW	28±0.5
6N165LW	Limit at the scale at 25% load + 2	6EY22LW	25±0.5
		6EY22ALW	25±0.5
6EY18LW	25.5±1	6,8EY26LW	—
6EY18ALW	25.5±1	6,8N330LW	—

(Notes)

- ① The indicator scale is used for 6N165LW. Limit the rack at about 35% of the engine's rated capacity when the generator with an extremely small capacity was set in comparison to the engine's rated capacity.
- ② In the loop piping which connects the FO return pipe to the feed pump inlet, the FO injection pump temperature, upon the load operation, may rise over the flash point of the fuel oil and the vapor may be produced inside the plunger after stopping the engine. Accordingly, it is possible that no re-starting will be made with the rack limit as mentioned above. To avoid this failure, when the rack limit was loosened for hot starting, be sure to re-set the rack limit to the point above after completing the test operation, (Especially for the land use engines.)
- ③ Since the electronic governor is the standard equipment for EY26LW and N330LW, no limit rack of the air piston is described.

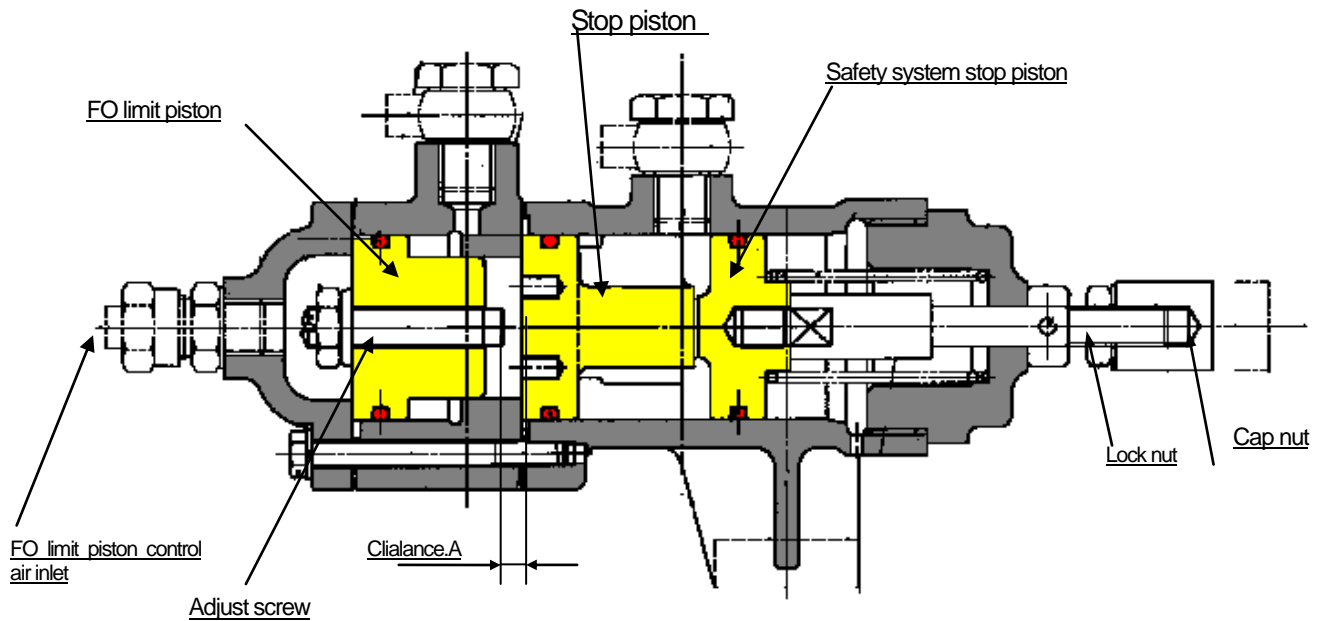


Fig.1 FO Limit & FO Cut Device

1. FO Limit Rack Adjustment Procedures

Fig.1 shows the FO limit and FO Cut Device (FO Limit Piston, Stop Piston & Safety System Stop Piston (Marine Aux. Engine)).

1) The stop piston cuts the supply of fuel oil when stopping the engine automatically or through remote control. Check that the piston is at the proper position for not injecting fuel oil. (The piston is adjusted with the cap nut and lock nut for not injecting fuel at the plant.) When implementing adjustment, take care of the following points:

- ① When the FO non-injection rack scale approaches zero, the plunger guide can interfere with the rack scale and it may be damaged. Accordingly, adjust that no injection is made at the rack scale of 4-6.
- ② When the stop air piston stroke is insufficient, the rack cannot be moved up to the FO non-injecting position and the engine cannot be stopped by the air piston. Adjust the cap nut in this case.

2) FO Injection Limit Adjustment Procedures

- ① Introduce the control air from the FO limit piston control air inlet. Thrust the FO injection pump rack (lay shaft) inside with operating the piston and check that the value complies with the limit rack amount in Table 1.
- ② If the limit rack value is not obtained, adjust Clearance A with the adjust screw, (Fig.1), for obtaining the limit rack value in Table 1.
 - I. Increasing Clearance A causes FO injection on starting to increase and black smoke emissions to increase.
 - II. Note that reducing Clearance A excessively causes FO injection to decrease excessively and the engine not to start.

[Remarks]: Safety System Stop Piston

This stop piston is the device for the marine auxiliary engines to comply with the requirement of each shipping classification association. The piston is used to stop the engine in the cases of LO pressure drop, over speed, etc. for safety purposes. (This safety system piston is not equipped to the industrial diesel engines.)