

# YE SERVICE NEWS

Subject	Diesel Engine Modification Parts to Comply with SOx Regulation and Estimated Price △ Revision 1: Correction of errors (Suction valve ⇒ Exhaust valve)		No. : YEN-CP22931-3 Date : 2019/11/01
Engine Model	All model	Use	Marine main & aux. eng.
		Engine No.	-

Further to our Service News on compliance with SOx regulation, (18-2-G-02-013-L), we, herewith, would like to advise you of the engine modification parts and the estimated prices for converting your HFO spec engine to LSMDO or LSMGO specialized engine.  
If you wish to convert your engine to comply with SOx regulation, please contact us at Yanmar Engineering Co.,LTD. or Yanmar Co.,LTD Marine Products Sales and Marketing Division.

(Remarks)

- No modification is required for the engine that is already of MDO or MGO specialized specifications.
- The estimated prices are as of July 2019 and are subject to change in future.
- Concerning former engine models, (T260, T240, S185), no price is specified in the present list. When you wish modification for these models, specify the model name, engine number and your modification plan or job number for consulting us at Yanmar Engineering Co.,LTD or Yanmar Co.,LTD Marine Products Sales and Marketing Division.

(Modification Plan Example)

HFO⇒MDO from Jan. 1, 2020  
MDO⇒LSHFO from Jun.1, 2020

## Modification Parts List to Comply with SOx Regulation (1/8)

○ : Needs be replaced

▲ : To be replaced upon next maintenance opportunity

△ : Re-usable (& to be replaced upon next opportunity)

Engine model	Parts to be Modified	Names of Parts	Parts NO.		Estimated price [JPY/pc.]	Q'ty required [pc./eng.]	To be replaced or not	Remarks
			Existing parts	Replacement parts				
6EY33LW	FO valve	Cooling pipe plug	—	23887-120002	160	6	○	Remove oil cooling pipe
		Packing	—	23414-120000	50	6		
		Closing joint / cap nut	—	43530-001780	460	6		
	FO injection pump	Pinion lubrication plug	—	23887-120002	160	6	○	
			—	23415-120000	50	6		
T/C (A145)	Nozzle ring (w/no coating)	—	132674-19210	Pending	1	△	Existing part (w/coating) re-usable	
8EY33LW	FO valve	Cooling pipe plug	—	23887-120002	160	8	○	Remove oil cooling pipe
		Packing	—	23414-120000	50	8		
		Closing joint /cap nut	—	43530-001780	460	8		
	FO injection pump	Pinion lubrication plug	—	23887-120002	160	8	○	
			—	23415-120000	50	8		
T/C (ST7)	Nozzle ring (w/no coating)	—	132874-19210	Pending	1	△	Existing part (w/coating) re-usable.	

<b>YANMAR ENGINEERING CO.,LTD</b> Market Service Division	Approved	Checked	Prepared
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## Modification Parts List to Comply with SOx Regulation (2/8)

○ : Needs be replaced

▲ : To be replaced upon next maintenance opportunity

△ : Re-usable (&amp; to be replaced upon next opportunity)

Engine model	Parts to be Modified	Names of Parts	Parts NO.		Estimated price [JPY/pc.]	Q'ty required [pc./eng.]	To be replaced or not	Remarks	
			Existing parts	Replacement parts					
6EY26	FO injection pump	FO injection pump	(751695-51208)	(751695-51108)	(371,000)	(6)	(As assembly)		
		P&B assembly	151695-51403	151695-51103	116,000	6			
		O-ring	153604-51401		1,500	6	△		
			153605-51223		800	12			
			153605-51242		1,000	6			
	Pinion lubrication plug	-		26450-080122	50	6	○		
		-		23414-080012	50	6			
	Turbocharger (ST5)	Nozzle ring	-		151696-19250	476,000	1	△	1920kW
			-		151696-19270	476,000	1	△	1620kW
			-		151696-19290	476,000	1	△	1471,1330kW
		Maintenance kit	-		P# being established		1	△	
	Gasket	-		P# being established		2	△		
	T/C (HPR5000) Aux. equipment	Nozzle ring	-		151692-18450	500,000	1	△	1840kW
			-		151692-18430	486,000	1	△	1400-1730kW
	T/C (TPS57) Aux. equipment	Nozzle ring	-		151692-19160	Pending	1	△	1900kW
	T/C (HPR5000) main unit	Nozzle ring	-		151694-18430	486,000	1	△	1920kW
			-		151694-18450	500,000	1	△	1470kW
T/C(A140)	Nozzle ring	-		151693-19300	Pending	1	△	IMO2 aux. equipment	
		-		151696-19010	Pending	1	△	1920kW	
		-		151696-19060	Pending	1	△	1620kW	
8EY26	FO injection pump	FO injection pump	(751695-51208)	(751695-51108)	(371,000)	(8)	(As assembly)		
		P&B assembly	151695-51403	151695-51103	116,000	8			
		O-ring	153604-51401		1,500	8	△		
			153605-51223		800	16			
			153605-51242		1,000	8			
	Pinion lubrication plug	-		26450-080122	50	8	○		
		-		23414-080012	50	8			
	T/C (TPS61)	Nozzle ring	-		151895-19260	Pending	1	△	(IMO1) aux. equipment
	T/C (ST6)	Nozzle ring	-		151896-18690	Pending	1	△	2560kW (4 sets)
			-		151896-19380	784,000	1	△	2360kW (4 sets)
			-		151896-19400	Pending	1	△	2360kW (2 sets)
Maintenance kit		-		P# being established		1	△		
Gasket	-		P# being established		2	△			
T/C (A145)	Nozzle ring	-		151893-19010	Pending	1	△	IMO2 aux. equipment (~2017)	
		-		151893-19110	Pending	1	△	IMO2 aux. equipment (2018~)	
6N330	FO valve	FO valve assembly	(732658-53200)	(732658-53100)	(161,000)	(6)	(As assembly)	★Aux. unit (IMO non-compliant unit only) When changing FO Valve Cooling Spec. to Non-cooling Spec. ★Main unit (IMO non-compliant unit only) When changing FO Valve Cooling Spec. to Non-cooling Spec. When the use of existing FO valve cooling system (with removing cooling pipe) be continued.	
		Nozzle CMP	132658-53250	132658-53000	44,300	6	○A		
		FO valve assembly	(732654-53200)	(732654-53101)	(161,000)	(6)	(As assembly)		
		Nozzle CMP	132654-53250	132654-53110	46,500	6	○A		
		Closing joint/cap nut	-		43530-001780	460	12		○B
			-		23821-080001	220	12		
			Packing		132654-11771		1,000		
	FO injection pump	Pinion lubrication plug	-		23887-120002	160	6	○	
			-		23415-120000	50	6		
			O-ring		24326-000850		470		6
	O-ring		24316-000750		990	6			
Exhaust valve	Exhaust valve (SUH)	132654-11122	132654-11111	74,400	12	△	※When changed from nimonic item, valve head clearance needs be changed: 0.9→0.6		
		132653-11580		2,000	12				

△ : Correction of errors (Suction valve ⇒ Exhaust valve)

Modification Parts List to Comply with SOx Regulation (3/8)

○ : Needs be replaced  
 ▲ : To be replaced upon next maintenance opportunity  
 △ : Re-usable (& to be replaced upon next opportunity)

Engine model	Parts to be Modified	Names of Parts	Parts NO.		Estimated price [JPY/pc.]	Q'ty required [pc./eng.]	To be replaced or not	Remarks		
			Existing parts	Replacement parts						
8N330	FO valve  *Select either A or B	FO valve assembly	(732658-53200)	(732658-53100)	(161,000)	(8)	(As assembly)	★Aux. unit (IMO non-compliant unit only) When changing FO Valve Cooling Spec. to Non-cooling Spec.		
		Nozzle CMP	132658-53250	132658-53000	44,300	8	○A			
		FO valve assembly	(732654-53200)	(732654-53101)	(161,000)	(8)	(As assembly)	★Main unit (IMO non-compliant unit only) When changing FO Valve Cooling Spec. to Non-cooling Spec.		
		Nozzle CMP	132654-53250	132654-53110	46,500	8	○A			
		Closing joint/cap nut	—	43530-001780	460	16	○B	When the use of existing FO valve cooling system (with removing cooling pipe) be continued.		
			—	23821-080001	220	16				
		Packing	132654-11771		1,000	8	○			
	O-ring	24326-000850		470	8					
	O-ring	24316-000750		990	8					
	FO injection pump	Pinion lubrication plug	—	23887-120002	160	8	○			
			—	23415-120000	50	8				
	Exhaust valve △	Exhaust valve (SUH) △	132654-11122	132654-11111	74,400	16	△	※When changed from nimonic item, valve head clearance needs be changed: 0.9→0.6		
			132653-11580		2,000	16				
6N280	FO valve  *Select either A or B	FO valve assembly	(753605-53202)	(753605-53113)	(87,300)	(6)	(As assembly)	When changing from FO valve cooling spec. to non-cooling spec. (with removing cooling pipe)		
		Nozzle CMP	153605-53250	153605-53060	30,500	6	○A			
		Closing joint /cap nut	—	43530-001760	240	12	○B	When continuing existing FO valve cooling spec. (with removing cooling pipe)		
			—	23821-060001	170	12				
		Packing	151605-11790		230	6	○			
		O-ring	24326-000750		410	6				
		O-ring	24316-000710		910	6				
	Nozzle sleeve	Nozzle sleeve replacement kit	—	753605-11490	34,000	6	○	In the case of tapered nozzle spec.: (w/fire protection→w/o fire protection)		
			Nozzle sleeve	153605-11770	153604-11771	30,500	6		(Rpt kit parts)	
			Packing	153605-11760		Pending	6		(Rpt kit parts)	
			Packing	151605-11790		230	6		(Rpt kit parts)	
			O-ring	24326-000750		410	6		(Rpt kit parts)	
			O-ring	24316-000710		910	6		(Rpt kit parts)	
	Nozzle sleeve	Nozzle sleeve replacement kit	—	753604-11210	108,000	6	○	For indirect cooling spec.		
			Nozzle sleeve	153604-11850	153604-11790	Pending	6		(Rpt kit parts)	
			Packing	153604-11870		2,500	6		(Rpt kit parts)	
			Packing	151605-11790		230	6		(Rpt kit parts)	
			O-ring	24326-000750		410	6		(Rpt kit parts)	
			O-ring	24316-000710		910	6		(Rpt kit parts)	
	FO injection pump	FO injection pump	P&B assembly	(753605-51304)	(753605-51108)	(395,000)	(6)	(As assembly)	N280L-N Models having "N" at the end	
			O-ring	153605-51141	153605-51103	167,000	6	△		
				153605-51392	1,000	6				
				153605-51223	800	12				
		153605-51242	1,000	6						
		FO injection pump	FO injection pump	P&B assembly	(753604-51104)	(753604-51204)	(395,000)	(6)	(As assembly)	N280L-V Models having "V" at the end
				O-ring	153604-51102	153604-51202	122,000	6	△	
					153605-51392	1,000	6			
153604-51401					1,500	6				
153605-51223		800	12							
153605-51242	1,000	6								
Pinion lubrication plug	Pinion lubrication plug	—	26450-080122	50	6	○				
		—	23414-080012	50	6					
Exhaust valve △	Exhaust valve (SUH) △	153605-11122	153605-11111	55,800	12	△				
		153605-11580		2,200	12					

△ : Correction of errors (Suction valve ⇒ Exhaust valve)

○ : Needs be replaced  
 ▲ : To be replaced upon next maintenance opportunity  
 △ : Re-usable (& to be replaced upon next opportunity)

Modification Parts List to Comply with SOx Regulation (4/8)

Engine model	Parts to be Modified	Names of Parts	Parts NO.		Estimated price [JPY/pc.]	Qty required [pc./eng.]	To be replaced or not	Remarks
			Existing parts	Replacement parts				
8N280	FO valve  *Select either A or B	FO valve assembly	(753605-53202)	(753605-53113)	(87,300)	(8)	(As assembly)	When changing from FO valve cooling spec. to non-cooling spec.
		Nozzle CMP	153605-53250	153605-53060	30,500	8	○A	
		Closing joint/cap nut	—	43530-001760	240	16	○B	When continuing existing FO valve cooling spec. (with removing cooling pipe)
			—	23821-060001	170	16		
		Packing	—	151605-11790	230	8	○	
		O-ring	—	24326-000750	410	8		
	O-ring	—	24316-000710	910	8			
	Nozzle sleeve	Nozzle sleeve rpt kit	—	753605-11490	34,000	8	○	For tapered nozzle spec.: (W/fire protection→W/O fire protection)
		Nozzle sleeve	153605-11770	153604-11771	30,500	8	(Rpt kit parts)	
		Packing	—	153605-11760	Pending	8	(Rpt kit parts)	
		Packing	—	151605-11790	230	8	(Rpt kit parts)	
		O-ring	—	24326-000750	410	8	(Rpt kit parts)	
		O-ring	—	24316-000710	910	8	(Rpt kit parts)	
	Nozzle sleeve	Nozzle sleeve rpt kit	—	753604-11210	108,000	8	○	For indirect cooling spec.
		Nozzle sleeve	153604-11850	153604-11790	Pending	8	(Rpt kit parts)	
		Packing	—	153604-11870	2,500	8	(Rpt kit parts)	
		Packing	—	151605-11790	230	8	(Rpt kit parts)	
		O-ring	—	24326-000750	410	8	(Rpt kit parts)	
		O-ring	—	24316-000710	910	8	(Rpt kit parts)	
	FO injection pump	FO injection pump	(753605-51304)	(753605-51108)	(395,000)	(8)	(As assembly)	N280L-N Engine models having "N" at the end
		P&B assembly	153605-51141	153605-51103	167,000	8	△	
		O-ring	—	153605-51392	1,000	8		
			—	153605-51223	800	16		
		FO injection pump	(753604-51104)	(753604-51204)	(395,000)	(8)	(As assembly)	N280L-V Engine models having "V" at the end
		P&B assembly	153604-51102	153604-51202	122,000	8	△	
		O-ring	—	153605-51392	1,000	8		
			—	153604-51401	1,500	8		
			—	153605-51223	800	16		
Pinion lubrication plug		—	26450-080122	50	8	○		
Exhaust valve △	Exhaust valve△(SUH)	153605-11122	153605-11111	55,800	16	△	When nimonic suction valve was changed.	
	Stem seal	—	153605-11580	2,200	16			
6N260	FO valve  *Select either A or B	FO valve assembly	(751602-53100)	(751605-53103)	(85,800)	(6)	(As assembly)	When changing from FO valve cooling spec. to non-cooling spec.
		Nozzle CMP	151602-53000	151605-53080	23,800	6	○A	
		Closing joint/cap nut	—	43530-001760	240	12	○B	When continuing existing FO valve cooling spec. (with removing cooling pipe)
			—	23821-060001	170	12		
		Packing	—	151605-11790	230	6	○	
		O-ring	—	24326-000750	410	6		
	O-ring	—	24316-000710	910	6			
	Nozzle sleeve	Nozzle sleeve rpt kit	—	753605-11490	34,000	6	○	For tapered nozzle spec.:Change (w/fire protection→w/o fire protection)
		Nozzle sleeve	153605-11770	153604-11771	30,500	6	(Rpt kit parts)	
		Packing	—	153605-11760	Pending	6	(Rpt kit parts)	
		Packing	—	151605-11790	230	6	(Rpt kit parts)	
		O-ring	—	24326-000750	410	6	(Rpt kit parts)	
		O-ring	—	24316-000710	910	6	(Rpt kit parts)	
	Nozzle sleeve	Nozzle sleeve rpt kit	—	753604-11210	108,000	6	○	For indirect cooling spec.
		Nozzle sleeve	153604-11850	153604-11790	Pending	6	(Rpt kit parts)	
		Packing	—	153604-11870	2,500	6	(Rpt kit parts)	
		Packing	—	151605-11790	230	6	(Rpt kit parts)	
		O-ring	—	24326-000750	410	6	(Rpt kit parts)	
		O-ring	—	24316-000710	910	6	(Rpt kit parts)	
	FO injection pump	FO injection pump	(751604-51104)	(751604-51204)	Pending	(6)	(As assembly)	6N260L-V Engine models having "V" at the end
		P&B assembly	151604-51102	151604-51202	120,000	6	△	
		O-ring	—	153604-51401	1,500	6		
			—	153605-51223	800	12		
		Pinion lubrication plug	—	26450-080122	50	6	○	
		FO injection pump	(751605-51304)	(751605-51107)	(390,000)	(6)	(As assembly)	For 6N260L-GN only *6N260L-N, excepting for -GN model, needs no replacement, (because of common use of Bunker A/C oils)
		P&B assembly	151605-51141	151605-51102	126,000	6	△	
		O-ring	—	153605-51392	1,000	6		
			—	153604-51401	1,500	6		
			—	153605-51223	800	12		
	Pinion lubrication plug	—	26450-080122	50	6	○		
	Exhaust valve △	Exhaust valve△(SUH)	151605-11121	151605-11111	52,900	12	△	
		Stem seal	—	151607-11580	1,800	12		

△ : Correction of errors (Suction valve ⇒ Exhaust valve)

## Modification Parts List to Comply with SOx Regulation (5/8)

○ : Needs be replaced

▲ : To be replaced upon next maintenance opportunity

△ : Re-usable (&amp; to be replaced upon next opportunity)

Engine model	Parts to be Modified	Names of Parts	Parts NO.		Estimated price [JPY/pc.]	Q'ty required [pc./eng.]	To be replaced or not	Remarks
			Existing parts	Replacement parts				
6EY22(A)L	Nozzle sleeve	Nozzle sleeve rpt kit	—	750633-11450	41,000	6	○	
		Nozzle sleeve	150633-11670	150633-11650	33,600	6	(Rpt kit parts)	
		O-ring	24326-000400		250	12	(Rpt kit parts)	
		Packing	150633-11870		1,420	6	(Rpt kit parts)	
		Packing	137600-53091		360	6	(Rpt kit parts)	
	FO injection pump	FO injection pump	(750633-51301)	(750633-51102)	(226,000)	(6)	(As assembly)	
		P&B assembly	150633-51600	150633-51101	95,800	6	△	
		O-ring	153604-51401		1,500	6		
		O-ring	146685-51830		1,200	12		
		O-ring	146685-51810		1,300	6		
		Pinion lubrication plug	—	23887-120002	160	12	○	
	Pinion lubrication packing	—	23415-120000	50	12			
	T/C (A135)	Nozzle ring	—	150634-19030	Pending	1	△	ALW(1370,1300kW)
	T/C (TPS52)	Nozzle ring	—	150634-19360	Pending	1	△	ALW(1180,1100kW)
			—	150634-19320	Pending	1	△	ALW(1020-880kW)
T/C (A130)	Nozzle ring	—	150634-19070	Pending	1	△	LW(1080-880kW)	
T/C (TPS48)	Nozzle ring	—	150634-19260	Pending	1	△	LW(1080-880kW)	
		—	150634-19690	Pending	1	△	ALW(1370kW)[~2019/2]	
		—	150634-19710	Pending	1	△	ALW(~1300kW)[~2019/2]	
T/C (MET22)	Nozzle ring	—	150634-19650	Pending	1	△	ALW(1100-1370kW) [2019/3~]	
6EY18(A)L	FO injection pump	FO injection pump	(746623-51102)	(746623-51202)	(200,000)	(6)	(As assembly)	
		P&B assembly	146623-51102	146623-51202	56,600	6	△	
		O-ring	146673-51812		1,000	6		
		O-ring	146673-51821		930	12		
		O-ring	146673-51831		970	6		
		Pinion lubrication plug	—	23887-120002	160	12	○	
	Pinion lubrication packing	—	23415-120000	50	12			
	T/C (TPS44) IMO2 : LW	Nozzle ring	—	146621-19220	Pending	1	△	440-500kW
			—	146621-19230	Pending	1	△	550-615kW
	T/C (MET18) IMO2 : ALW	Nozzle ring	—	146621-19330	480,000	1	△	660-800kW
			—	146621-19340	480,000	1	△	455-615kW
	T/C (MET18) IMO1 : 1000min-1	Nozzle ring	—	146623-19330	480,000	1	△	680-800kW
			—	146623-19340	480,000	1	△	615-660kW
	T/C (MET18) IMO1 : 900min-1	Nozzle ring	—	146623-19350	Pending	1	△	455-550kW
			—	146623-19330	480,000	1	△	680-800kW
T/C (MET18) IMO1 : 720/750min-1	Nozzle ring	—	146623-19340	480,000	1	△	615-660kW	
		—	146623-19350	480,000	1	△	455-550kW	
		—	146625-19330	480,000	1	△	615kW	
	Nozzle ring	—	146625-19340	480,000	1	△	450-500kW	
		—	146625-19350	480,000	1	△	400kW	
6EY18(A)L Low Sulfur Bunker C (3-15cSt)	FO injection pump	FO injection pump	(746623-51102)	(746623-51103)	(215,000)	(6)	(As assembly)	
		P&B assembly	146623-51102	146623-51103	54,700	6	▲	
		O-ring	146673-51812		1,000	6		
		O-ring	146673-51821		930	12		
		O-ring	146673-51831		970	6		

Modification Parts List to Comply with SOx Regulation (6/8)

○ : Needs be replaced  
 ▲ : To be replaced upon next maintenance opportunity  
 △ : Re-usable (& to be replaced upon next opportunity)

Engine model	Parts to be Modified	Names of Parts	Parts NO.		Estimated price [JPY/pc.]	Qty required [pc./eng.]	To be replaced or not	Remarks
			Existing parts	Replacement parts				
6N21(A)L	FO valve	FO valve assembly	(747673-53221)	(747673-53212)	(102,000)	(6)	(As assembly)	For engine models having "V" at the end
		Nozzle CMP	147673-53700	147673-53580	11,100	6	△	
		O-ring	151673-51381		1,100	6	△	
		O-ring	146673-53900		630	6	△	
		FO valve assembly	(747673-53131)	(747673-53411)	(102,000)	(6)	(As assembly)	
		Nozzle CMP	147673-53260	147673-53600	11,100	6	△	
	O-ring	151673-51381		1,100	6	△		
	O-ring	146673-53900		630	6	△		
	Nozzle sleeve	Nozzle sleeve rpt kit	—	747673-11450	69,900	6	○	For engine models having "W" at the end
		Nozzle sleeve	147672-11870	147673-11880	Pending	6	(Rpt kit parts)	
		O-ring	24326-000400		250	12	(Rpt kit parts)	
		Packing	147643-11870		680	6	(Rpt kit parts)	
		Packing	137600-53091		360	6	(Rpt kit parts)	
		Nozzle sleeve rpt kit	—	747673-11460	69,900	6	○	For engine models having "4" and "N" at the end, (NOx Regulation compliant)
		Nozzle sleeve	147673-11870	147673-11890	Pending	6	(Rpt kit parts)	
		O-ring	24326-000400		250	12	(Rpt kit parts)	
		Packing	147643-11870		680	6	(Rpt kit parts)	
		Packing	137600-53091		360	6	(Rpt kit parts)	
		Nozzle sleeve rpt kit	—	747673-11470	15,200	6	○	For engine models having "N" at the end (no NOx compliant)
		Nozzle sleeve	147673-11850	147673-11860	11,200	6	(Rpt kit parts)	
	O-ring	24326-000400		250	12	(Rpt kit parts)		
	Packing	146673-11870		470	6	(Rpt kit parts)		
	Packing	137600-53091		360	6	(Rpt kit parts)		
	FO injection pump	FO injection pump	(747673-51106)	(747673-51207)	(183,000)	(6)	(As assembly)	
		P&B assembly	147673-51102	147673-51202	62,800	6		
		O-ring	146673-51812		1,000	6	△	
		O-ring	146673-51821		930	12		
		O-ring	146673-51831		970	6		
Pinion lubrication plug		—	23887-120002	160	12	○		
Pinion lubrication packing	—	23415-120000	50	12				
Exhaust valve △	Exhaust valve △	147673-11740	147673-11110	23,800	12	△	For IMO2 or over 3500sec.	
	Stem seal	141616-11751		1,600	12	△	IMO1	
	Stem seal	146670-11640		860	12	△	IMO2	
6N21(A)L Low Sulfur Bunker C (3-15cSt)	FO injection pump	FO injection pump	(747673-51106)	(747673-51107)	(241,000)	(6)	(As assembly)	
		P&B assembly	147673-51102	147673-51103	57,800	6		
		O-ring	146673-51812		1,000	6	▲	
		O-ring	146673-51821		930	12		
		O-ring	146673-51831		970	6		
8N21(A)L	FO valve	FO valve assembly	(747673-53231)	(747673-53201)	(102,000)	(8)	(As assembly)	For engine models having "V" at the end
		Nozzle CMP	147673-53720	147673-53540	11,100	8	△	
		O-ring	151673-51381		1,100	8	△	
		O-ring	146673-53900		630	8	△	
		FO valve assembly	(747673-53131)	(747673-53411)	(102,000)	(8)	(As assembly)	
		Nozzle CMP	147673-53260	147673-53600	11,100	8	△	
	O-ring	151673-51381		1,100	8	△		
	O-ring	146673-53900		630	8	△		
	Nozzle sleeve	Nozzle sleeve rpt kit	—	747673-11450	69,900	8	○	For engine models having "W" at the end
		Nozzle sleeve	147672-11870	147673-11880	Pending	8	(Rpt kit parts)	
		O-ring	24326-000400		250	16	(Rpt kit parts)	
		Packing	147643-11870		680	8	(Rpt kit parts)	
		Packing	137600-53091		360	8	(Rpt kit parts)	
		Nozzle sleeve rpt kit	—	747673-11460	69,900	8	○	For engine models having "V" and "N"(Indirect Cooling Spec.) at the end
		Nozzle sleeve	147673-11870	147673-11890	Pending	8	(Rpt kit parts)	
		O-ring	24326-000400		250	16	(Rpt kit parts)	
		Packing	147643-11870		680	8	(Rpt kit parts)	
		Packing	137600-53091		360	8	(Rpt kit parts)	
		Nozzle sleeve rpt kit	—	747673-11470	15,200	8	○	For engine models having "N" at the end, (Indirect Cooling Spec.)
		Nozzle sleeve	147673-11850	147673-11860	11,200	8	(Rpt kit parts)	
	O-ring	24326-000400		250	16	(Rpt kit parts)		
	Packing	146673-11870		470	8	(Rpt kit parts)		
	Packing	137600-53091		360	8	(Rpt kit parts)		
	FO injection pump	FO injection pump	(747673-51106)	(747673-51207)	(183,000)	(8)	(As assembly)	
		P&B assembly	147673-51102	147673-51202	62,800	8		
		O-ring	146673-51812		1,000	8	△	
		O-ring	146673-51821		930	16		
		O-ring	146673-51831		970	8		
Pinion lubrication plug		—	23887-120002	160	16	○		
Pinion lubrication packing	—	23415-120000	50	16				
Exhaust valve △	Exhaust valve △	147673-11740	147673-11110	23,800	16	△	For IMO2 or over 3500 sec.	
	Stem seal	141616-11751		1,600	16	△	IMO1	
	Stem seal	146670-11640		860	16	△	IMO2	
8N21(A)L Low Sulfur Bunker C (3-15cSt)	FO injection pump	FO injection pump	(747673-51106)	(747673-51107)	(241,000)	(8)	(As assembly)	
		P&B assembly	147673-51102	147673-51103	57,800	8		
		O-ring	146673-51812		1,000	8	▲	
		O-ring	146673-51821		930	16		
		O-ring	146673-51831		970	8		

△: Correction of errors (Suction valve ⇒ Exhaust valve)

Modification Parts List to Comply with SOx Regulation (7/8)

○ : Needs be replaced  
 ▲ : To be replaced upon next maintenance opportunity  
 △ : Re-usable (& to be replaced upon next opportunity)

Engine model	Parts to be Modified	Names of Parts	Parts NO.		Estimated price [JPY/pc.]	Q'ty required [pc./eng.]	To be replaced or not	Remarks
			Existing parts	Replacement parts				
6N18	FO valve	FO valve assembly	(746673-53521)	(746673-53511)	(102,000)	(6)	(As assembly)	(A)L-V
		Nozzle CMP	146673-53540	146673-53520	11,100	6	△	
		O-ring	151673-51381		1,100	6	△	
		O-ring	146673-53900		630	6	△	
		FO valve assembly	(746673-53141)	(746673-53111)	(102,000)	(6)	(As assembly)	L-DN,UN,SN AL-HN,DN,UN
		Nozzle CMP	146673-53300	146673-53040	9,700	6	△	
		O-ring	151673-51381		1,100	6	△	
		O-ring	146673-53900		630	6	△	
		FO valve assembly	(746673-53151)	(746673-53121)	(102,000)	(6)	(As assembly)	L-EN AL-SN,EN
		Nozzle CMP	146673-53320	146673-53060	9,700	6	△	
		O-ring	151673-51381		1,100	6	△	
		O-ring	146673-53900		630	6	△	
	Nozzle sleeve	Nozzle sleeve rpt kit	—	746674-11480	69,900	6	○	※No modification is required for -N model, indirect cooling spec. engines
		Nozzle sleeve	146673-11611	146673-11890	Pending	6	(Rpt kit parts)	
		O-ring	24326-000400		250	12	(Rpt kit parts)	
		Packing	147643-11870		680	6	(Rpt kit parts)	
		Packing	137600-53091		360	6	(Rpt kit parts)	
	FO injection pump	FO injection pump	(746673-51107)	(746673-51206)	(183,000)	(6)	(As assembly)	△
		P&B assembly	146673-51102	146673-51202	62,800	6		
		O-ring	146673-51812		1,000	6		
O-ring		146673-51821		930	12			
O-ring		146673-51831		970	6			
Pinion lubrication plug		—	23887-120002	160	12	○		
Pinion lubrication packing	—	23415-120000	50	12				
Exhaust valve <sup>△</sup>	Exhaust valve <sup>△</sup>	146673-11120	146673-11110	22,400	12	△	Different for over 3500 sec. engines only	
	Stem seal	141616-11751		1,600	12	△		
6N18 Low Sulfur Bunker C (3-15cSt)	FO injection pump	FO injection pump	(746673-51107)	(746673-51108)	(242,000)	(6)	(As assembly)	▲
		P&B assembly	146673-51102	146673-51103	53,100	6		
		O-ring	146673-51812		1,000	6		
		O-ring	146673-51821		930	12		
		O-ring	146673-51831		970	6		
M220	Nozzle sleeve	Nozzle sleeve rpt kit	—	747643-11450	15,600	6	○	Tapered nozzle, sleeve cooling spec. should be changed to:⇒Non-cooling sleeve spec.
		Nozzle sleeve	147643-11851	147643-11820	14,400	6	(Rpt kit parts)	
		O-ring	152633-11750		450	12	(Rpt kit parts)	
		Packing	147643-11870		680	6	(Rpt kit parts)	
		Packing	137600-53091		360	6	(Rpt kit parts)	
		Cooling oil bypass parts	—	747643-59500	43000	6	○	
	Bypass plug	—	147643-59950	44500	6	○	Oil cooling spec. should be changed: ⇒ Cooling oil bypass parts	
		Packing	—	23414-170000	50	6		○
		Seal washer	—	153672-59920	360	12		○
	FO injection pump	FO injection pump	(747644-51354)	(747644-51304)	(119,000)	(6)	(As assembly)	Parts different for 3500,7000 sec. engines only.
		P&B assembly	147644-51602	147644-51103	49,900	6		
		O-ring	141616-51221		450	6	△	
O-ring		141616-51890		440	6			
O-ring		134674-51381		460	6			
Exhaust valve <sup>△</sup>	Exhaust valve <sup>△</sup>	147644-11121	147644-11140	36,400	12	△	Nimonic for 7000 sec. spec.	
	Stem seal	147644-11581		980	12	△		
M220 Low Sulfur Bunker C (3-15cSt)	Injection pump	FO injection pump	(747644-51354)	(747644-51355)	Pending	(6)	(As assembly)	▲
		P&B assembly	147644-51602	147644-51603	Pending	6		
		O-ring	141616-51221		450	6		
		O-ring	141616-51890		440	6		
		O-ring	134674-51381		460	6		

△ : Correction of errors (Suction valve ⇒ Exhaust valve)

Modification Parts List to Comply with SOx Regulation (8/8)

○ : Needs be replaced  
 ▲ : To be replaced upon next maintenance opportunity  
 △ : Re-usable (& to be replaced upon next opportunity)

Engine model	Parts to be Modified	Names of Parts	Parts NO.		Estimated price [JPY/pc.]	Q'ty required [pc./eng.]	To be replaced or not	Remarks
			Existing parts	Replacement parts				
M200	FO valve	FO valve assembly	(741616-53300)	(741616-53100)	(89,200)	(6)	(As assembly)	Oil cooling separate gallery. →Non-cooling
		Nozzle CMP	141616-53000	138658-53060	10,300	6	△	Oil cooling separate gallery. →Non-cooling
		FO valve assembly	(741616-53210)	(741616-53110)	(81,200)	(6)	(As assembly)	
		Nozzle CMP	141616-53030	138658-53030	9,000	6	△	
		FO valve assembly	(741616-53220)	(741616-53120)	(81,100)	(6)	(As assembly)	Oil cooling separate gallery. →Non-cooling
		Nozzle CMP	141616-53060	139684-53010	9,200	6	△	
		O-ring	141616-53900		430	6	△	No change for oil cooling bypass, tapered nozzle & indirect cooling spec.
	Nozzle sleeve	Cooling oil bypass parts	—	747643-59500	43,000	6	○	Oil cooling separate gallery spec. ⇒Cooling oil bypass spec.
		Bypass plug	—	147643-59950	44,500	6	○	
		Packing	—	23414-170000	50	6	○	
		Seal washer	—	153672-59920	360	12	○	
		Nozzle sleeve rpt kit	—	747643-11450	15,600	6	○	Modification required only for tapered nozzle, sleeve cooling spec. (147643-11851) & engines with head no. 141644-11020, 147643-11851(See Parts List, E/#2101 ~2645)
		Nozzle sleeve	147643-11851	147643-11820	14,400	6	(Rpt kit parts)	
		Packing	147643-11870		680	6	(Rpt kit parts)	
		O-ring	152633-11750		450	12	(Rpt kit parts)	
		Packing	137600-53091		360	6	(Rpt kit parts)	
		Nozzle sleeve rpt kit	—	741644-11420	46000	6	○	Indirect cooling nozzle spec., head no. 141644-11030
		Nozzle sleeve	141644-11620	141644-11720	Pending	6	(Rpt kit parts)	
		Packing	147643-11870		680	6	(Rpt kit parts)	
	O-ring	152633-11750		450	12	(Rpt kit parts)		
	Plug	Plug	—	23887-200002	250	12	○	For oil cooling separate gallery spec.; pump outlet, main pipe inlet & thermometer
		Packing	—	153672-59970	480	12	○	
		Plug	—	23893-030002	690	12	○	
		Packing	—	153672-59960	480	12	○	
	FO injection pump	FO injection pump	(741646-51353)	(741646-51304)	(127,000)	(6)	(As assembly)	It is not possible to assemble MGO/MDO barrel in HFO pump unit.
		P&B assembly	141646-51601	141646-51104	49,900	6		
		O-ring	—	134674-51381	460	6	△	
		Backup ring	—	24372-000390	280	6		
		Damper ring	—	141616-51890	440	6		
		O-ring	—	141616-51221	450	6		
Pinion lubrication plug		—	26450-060102	50	6	△		
Pinion lubrication packing	—	23414-060000	50	6				
M200 Low Sulfur Bunker C (3-15cSt)	FO injection pump	FO injection pump	(741646-51353)	(741646-51354)	Pending	(6)	(As assembly)	
		P&B assembly	141646-51601	141646-51602	Pending	6		
		O-ring	134674-51381		460	6	▲	
		Backup ring	24372-000390		280	6		
		Damper ring	141616-51890		440	6		
O-ring	141616-51221		450	6				
6N165L	Nozzle sleeve	Nozzle sleeve rpt kit	—	733644-11410	32200	6	○	
		Nozzle sleeve	133644-11610	133644-11620	29,100	6	(Rpt kit parts)	Replacement is required only for nozzle sleeve spec.[133644-11610]
		Packing, round	152633-11750		450	12	(Rpt kit parts)	
		Packing	137600-53091		360	6	(Rpt kit parts)	
		Packing, round	147643-11870		680	6	(Rpt kit parts)	
		O-ring	24311-000400		80	6	(Rpt kit parts)	
		O-ring	152623-53360		470	6	(Rpt kit parts)	
		Packing A, coupling	152623-59421		530	6	(Rpt kit parts)	
		Packing B, coupling	152623-59450		720	6	(Rpt kit parts)	
		Seal washer	153672-59980		480	6	(Rpt kit parts)	
	O-ring	24316-000160		230	6	(Rpt kit parts)		
	O-ring	24613-000200		Pending	6	(Rpt kit parts)		
	FO injection pump	FO injection pump	(733644-51101)	(733670-51112)	(179,000)	(6)	(As assembly)	
		Pump unit	133644-51010	133670-51014	Pending	6	△	No pinion lubrication hole
		P&B assembly	133644-51100	133670-51301	25,100	6	▲	
		Tappet assembly	133644-51200	133670-51202	19,700	6	▲	
		Pinion	133670-51510		3,700	6	—	
O-ring	137679-51892		480	6	—			
6N165 Low Sulfur Bunker C (3-15cSt)	FO injection pump	FO injection pump	(733644-51101)	(733644-51102)	Pending	(6)	—	
		P&B assembly	133644-51100	133644-51101	Pending	6	▲	
		O-ring	137679-51892		480	6		