

# YANMAR SERVICE NEWS

Subject	<b>Maintenance of Engine Starting Motor (Ingersoll Rand ST900, 150T)</b>	No. 10-2-G-06-004-L-rev.1 Aug. 2018
Engine Model	6EY26(L), 8EY26(L), 6EY18(A) L	Use
		Engine Nos.

## 1.Introduction

This starting motor works by 0.7~1.0MPa compressed air for starting the engine. It is important to conduct daily checks and periodic maintenance for maintaining good starting performance of the engine. We recommend to check and maintain the motor on a periodic basis as follows:

## 2.Inspection and Maintenance

### 2-1.Daily Inspection

No.	Inspection Items	Interval
1	Check that the electrical wiring is not loose.	Monthly
2	Check that no air leaks from the air pipe and joints.	Monthly
3	Disassemble and clean the Y-shape strainer.	Every 3 months

### 2-2.Disassembly Inspection and Maintenance

No.	Interval of Disassembly Inspection & Maintenance	Inspection Items
1	Within 15,000 hrs. or 3 years (Called Inspection A)	Disassemble, check and clean; replace grease of moving parts; replace O-ring, drive gear bearing and special oil.
2	Within 30,000 hrs. or 6 years (Called Inspection B)	Disassemble, check and clean; replace grease of moving parts; replace O-rig, drive gear bearing, planet gear and special oil.

### 2-3.Disassembly Maintenance



Since this starting motor has a high-speed rotational part, the motor must be maintained by the qualified engineer who received the training in principle. We recommend that the motor be disassembled and maintained by your Yanmar Distributor or Yanmar Engineering Co., Ltd. It takes about 2 weeks for ordinary (non-emergency) maintenance.

### 2-4.Request for Maintenance to our Company

For requesting the maintenance of the motor to us, enter the necessary items in Air Motor Maintenance Request Form and send it to your Yanmar Distributor or Yanmar Engineering Co., Ltd.

### Attached Materials

- ST150 & ST900 Maintenance Schedule and Replacement Parts, (2/12~3/12)
- ST150 Operation Manual (Excerpt) (4/12~6/12)
- ST900 Operation Manual (Excerpt) (7/12~11/12)
- Air Motor Maintenance Request Form (12/12)

<b>YANMAR CO.,LTD.</b> Customer Service Division Large Power Products Management Division Power Solution Business	Approved	Checked	Drawing
			J. Nagayama



## 150TMP MODEL MAINTENANCE SCHEDULE

<b>A</b>	<b>15,000hr running or within 3-years</b> As under " Service Training Manual" disassemble and clean each parts for inspection renew <b>"A"</b> Maintenance parts. To be carried out test and inspection after assembly each parts.
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<b>B</b>	<b>30,000hr running or within 6-years</b> As under " Service Training Manual" disassemble and clean each parts for inspection renew <b>"A&amp;B"</b> Maintenance parts. To be carried out test and inspection after assembly each parts.
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### Minimum Renewal Parts For Each Maintenance A&B

No	Drawing #	Name of Parts	Parts#	Q'ntly	Mainte'	Remarks
<b>O-Rings</b>						
1	5	Exhaust Cover Gasket	ST500-283	1	A,B	
2	11	Motor 0-ring Seal(2)	SS800-152	1	A,B	2 pcs/set
3	20	Motor 0-ring Seal (2)	Y325-29	1	A,B	2 pcs/set
4	13	Rear Gear Case 0-ring	Y325-46	1	A,B	
5	15	Offset Gearcase Gasket	150BMP-284	1	A,B	
6	28	Gear Case Cover	150BMP-604	1	A,B	
7	29	Gear Case Cover	150BMP-607	1	A,B	
8	39	Piston 0-ring	150BMP-337	1	A,B	
9	48	Offset Gear Case	ST500-137	1	A,B	
<b>Seals</b>						
10	30	Drive shaft	150BMP-271	1	A,B	
<b>Bearings</b>						
11	15	Front Gear Frame Bearing	ST500-23	1	A,B,	
12	16	Rear Gear Frame Bearing	ST500-105	1	A,B,	
13	22	Offset Gear Bearing	10BM-399	1	A,B,	
14	25	Rear Drive Shaft Bearing	T02-33	1	A,B,	
15	42	Drive Housing Bearing	ML50K-318	1	A,B,	
<b>Planet Gear Parts</b>						
1	14	Planet Gear (3)	150TMF-10B	1	B	3 pcs/set
2	14	Planet Gear Bearing (6)	150TMF-24	1	B	
3	14	Bearing Spacer (6)	42364	1	B	6pcs/set
4	14	Planet Gear Shaft (3)	ST500-191	1	B	3pcs/set
<b>Others</b>						
5	36	Drive	101BMP-299-1	1	B	
6	40	Piston Return Spring	101BMP-700-1	1	B	Not straight
<b>Oil</b>						
		Planet Gear& Motor Oil	80w90		A,B	55.ml
		Gear Grease	I-11		A,B	8 .fl.oz
		Pinion Grease	I-11		A,B	
		Inspect turbine motor	*		B	

\* Please refer to the Installation and Maintenance Manual

\*\* Time to compete "A" Two Hours Labor, "B" Three Hours Labor



## ST900 MODEL MAINTENANCE SCHEDULE

<b>A</b>	<b>15,000hr running or within 3-years</b> As under " Service Training Manual" disassemble and clean each parts for inspection renew "A" Maintenance parts. To be carried out test and inspection after assembly each parts.
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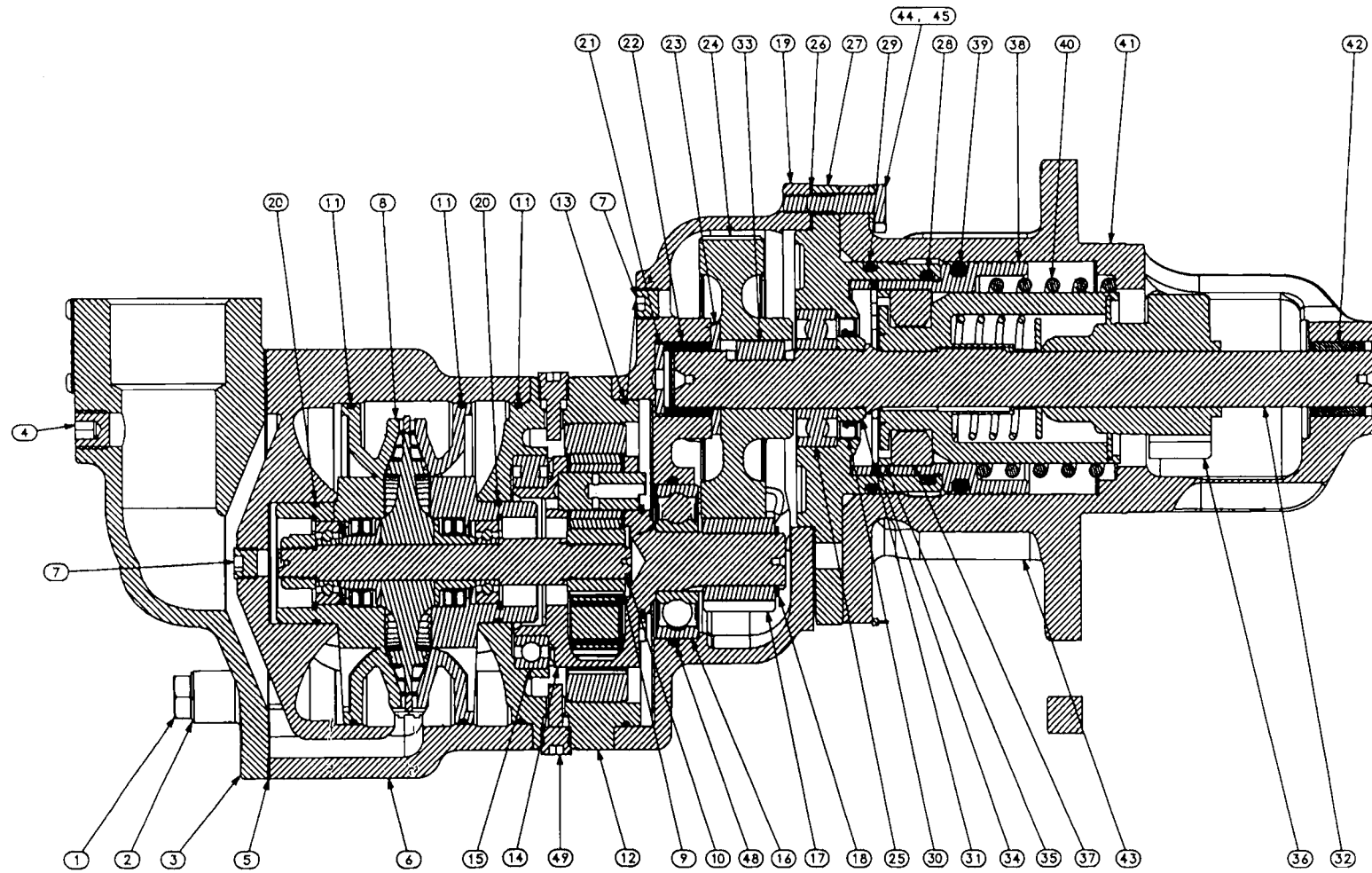
<b>B</b>	<b>30,000hr running or within 6-years</b> As under " Service Training Manual" disassemble and clean each parts for inspection renew "A&B" Maintenance parts. To be carried out test and inspection after assembly each parts.
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### Minimum Renewal Parts For Each Maintenance A&B

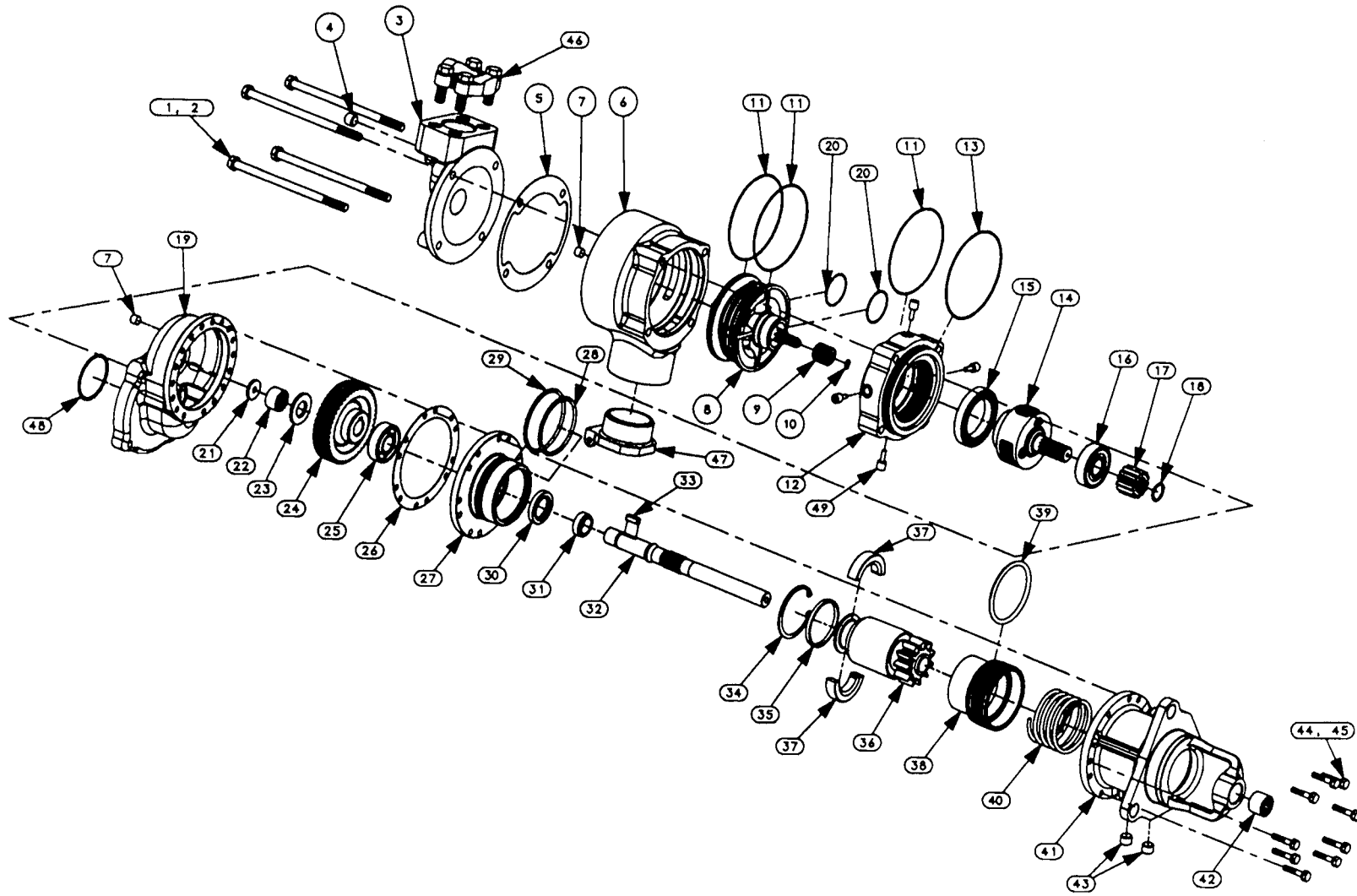
No	Drawing #	Name of Parts	Parts#	Q'ntly	Mainte'	Remarks
<b>O-Rings</b>						
1	2	Exhaust Cover O-Ring	SS800-67	1	A,B	
2	12A	Motor O-ring Seal(2)	ST700-67	1	A,B	2 pcs/set
3	12B	Motor O-ring Seal (2)	Y327-032	1	A,B	2 pcs/set
4	14	Rear Gear Case O-ring	Y327-163	1	A,B	
5	15	Front Gear Case O-ring	Y327-162	1	A,B	
6	37	Drive Gear Screw O-ring	SS800-176	1	A,B	
7	41	Drive Housing O-ring	SS800-244	1	A,B	
8	47	Outer Bulkhead O-ring	SS800-152	1	A,B	
9	48	Inner Bulkhead O-ring	SS800-151	1	A,B	
10	55	Piston O-ring	SS800-337	1	A,B	
<b>Seals</b>						
11	16	Planet Gear Frame Shaft Seal	ST700-272	1	A,B	
12	43	Drive Housing Seal	SS800-273	1	A,B	
<b>Bearings</b>						
13	17C	Front Gear Frame Bearing	SS800-22	1	A,B,	
14	23	Rear Gear Frame Bearing	T06-24	1	A,B,	
15	30	Front Drive Gear Bearing	SS800-278	1	A,B,	
16	31	Rear Drive Gear Bearing	SS800-359	1	A,B,	
17	42	Front Drive Shaft Bearing	SS800-363	1	A,B,	
18	58	Rear Drive Shaft Bearing	SS800-K399	1	A,B,	Including Retainer
<b>Other</b>						
19	23	Gear Shalf Retaining Washer (2)	ST700-100	1	A,B	2 pcs/set
<b>Planet Gear Parts</b>						
1	19	Planet Gear (3)	ST900-10	1	B	3 pcs/set
2	20	Planet Gear Bearing (6)	ST900-24	1	B	
3	21	Bearing Spacer (6)	ST700-364	1	B	6pcs/set
4	22	Planet Gear Shaft (3)	ST900-191	1	B	3pcs/set
<b>Others</b>						
5	52	Clutch Jaw Kit (set)	SS800R-K587	1	B	Wear down of heat treat
6	59	Piston Return Spring	SS800-700	1	B	Not straight
<b>Oil</b>						
		Planet Gear& Motor Oil	ATF*		A,B	175ml.
		Gear Grease	I-30		A,B	8oz.
		Pinion Grease	I-30		A,B	
		Inspect turbine motor	**		B	

\* Automatic Transmission Fluid

\*\* Please refer to the Installation and Maintenance Manual  
Time to complete "A" Two Hours Labor, "B" Three Hours Labor



(Dwg. TP1911)



(Dwg. TP1912)

## PART NUMBER FOR ORDERING



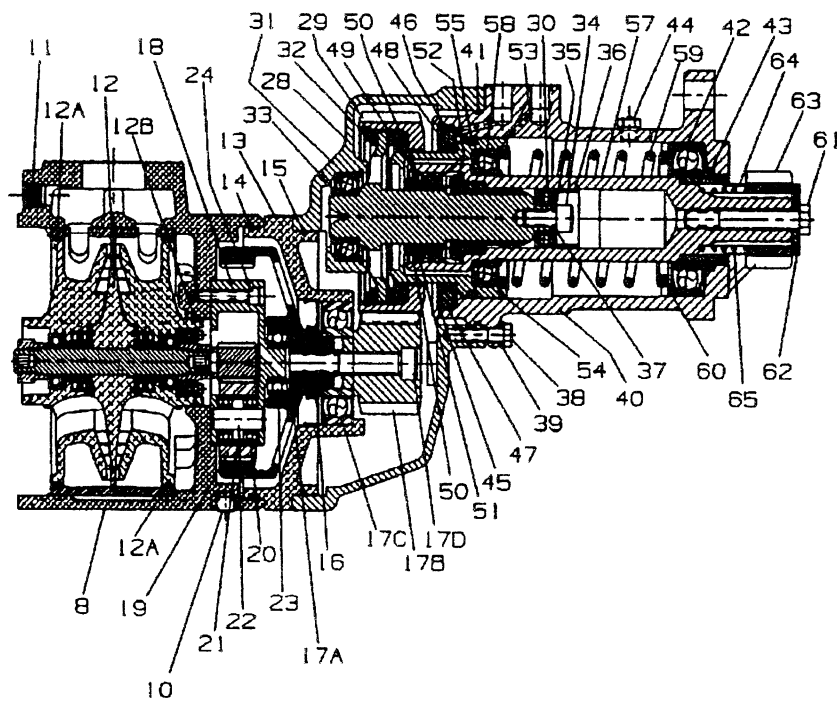
## PART NUMBER FOR ORDERING



1	Cap Screw .....	107-25	26	Gasket .....	150BMP-284
2	Washer, Lock .....	D02-504	27	Cover, Gear Case .....	150BMP-378X
3	Inlet Cover .....	ST500-202	28	O-ring .....	150BMP-604
4	Plug .....	ROH-377	29	O-ring .....	150BMP-607
5	Gasket .....	ST500-283	30	Seal .....	150BMP-271
6	Motor Housing .....	ST500-40	31	Collar .....	10BM-30
7	Pipe Plug - 1/8 NPT .....	R2-227	32	Shaft .....	150BMP-8-2
8	Motor Assembly, RH .....	ST599R-A53 (for 150TLP..., RH rot.)	33	Key .....	10BM-610
	Motor Assembly, LH .....	ST599L-A53 (for 150TLP..., LH rot.)	34	Ring, Retaining .....	10BMP-606
	Motor Assembly, RH .....	ST544R-A53 (for 150TMP..., RH rot.)	35	Ring .....	10BMP-602
	Motor Assembly, LH .....	ST544L-A53 (for 150TMP..., LH rot.)	36	Bendix Drive - RH Index .....	101BMP-299-1 (for ...E88R54-.. Models)
9	Gear, Pinion .....	ST500-319		Bendix Drive - RH Index .....	101BMP-299-3 (for ...E88R53-.. Models)
10	Ring, Retaining .....	ST500-18	37	Shift Ring .....	101BMP-705-1
11	O-ring .....	SS800-152	38	Piston - O-ring Type .....	150BMP-703
12	Gear Case Assembly .....	ST500-A37	39	Piston O-ring .....	150BMP-337
13	O-ring .....	Y325-46	40	Spring, Return .....	101BMP-700-1
14	Gear Frame Assembly .....	ST500-A108B	41	Drive Housing .....	150BMP-300-88
15	Bearing, Ball .....	ST500-23	42	Bearing, Needle Roller .....	ML50K-318
16	Bearing, Ball .....	ST500-105	43	Pipe Plug .....	HSPPS-2
17	Pinion .....	150BME-17	44	Screw, Hex Cap .....	10BM-744
18	Ring, Retaining .....	ST500-69	45	Washer, Lock .....	10BM-67
19	Gear Case .....	10BM-X37	46	Flange Kit - 1-1/4" Pipe .....	ST500-K166
20	O-ring .....	Y325-29		.....	(Optional Equipment)
21	Washer .....	10BM-25	47	Deflector Assembly .....	ST500-A735
22	Bearing, Needle .....	10BM-399		.....	(Optional Equipment)
23	Washer .....	10BM-15	48	O-ring .....	ST500-137
24	Drive Gear .....	150BME-9	49	Plug, Magnetic Drain .....	150T-29
25	Bearing .....	T02-33	*	Muffler .....	ST500-674
			.	.....	(Optional Equipment)

(\*) - Not Shown

**ST900 TURBINE STARTER (Pre-Engaged)**



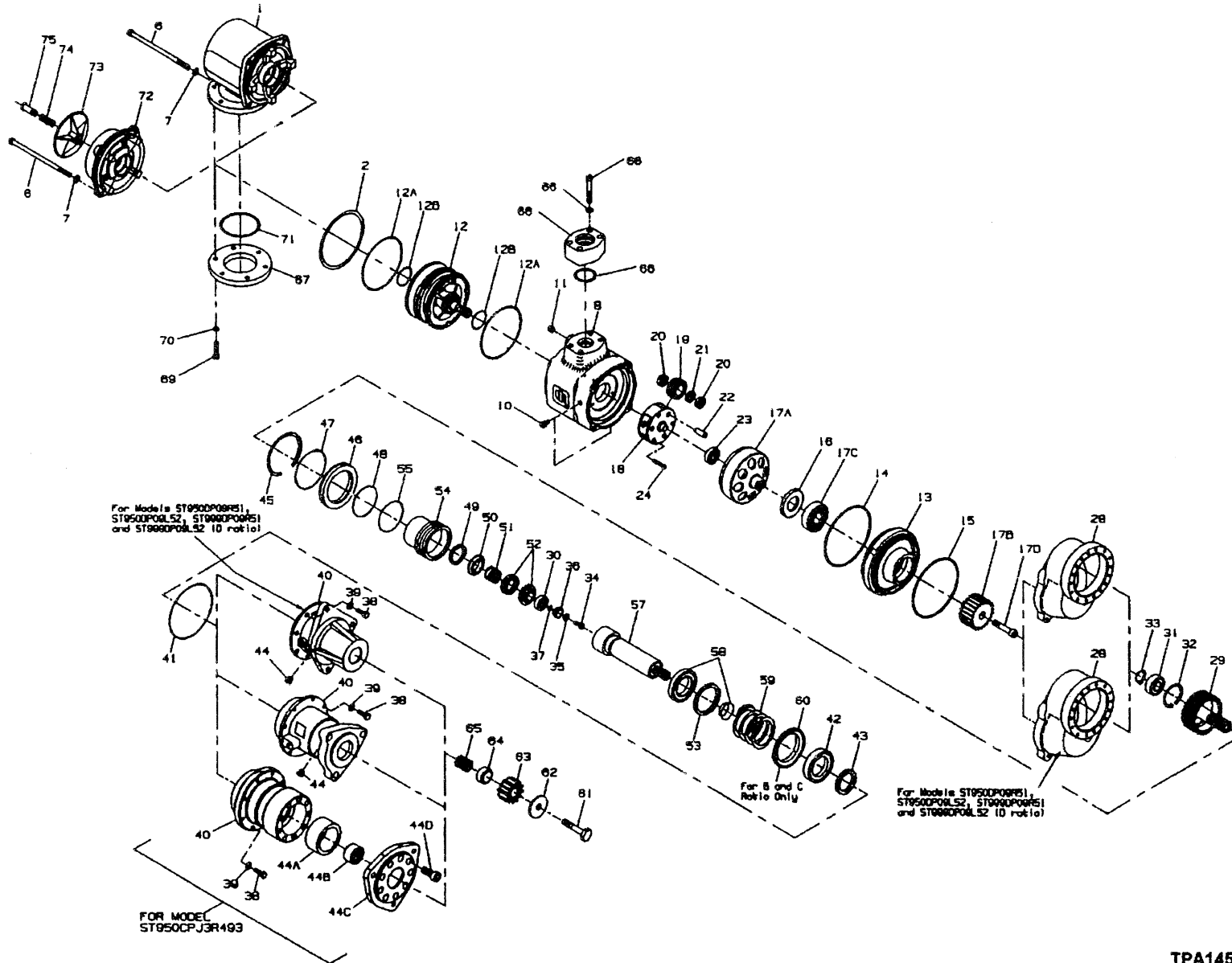
ST950CP03L26

MAINTENANCE SECTION

12

SERISST900 TURBINE STARTERS

# ST900 TURBINE STARTER (Pre-Engaged)



13

MAINTENANCE SECTION



## PRE-ENGAGED DRIVE

	PART NO. FOR ORDERING		PART NO. FOR ORDERING
1	Exhaust Kit..... Directional Housing Exhaust Cover.....	ST700K-350 ST700-350	21 Idler Gear Bearing Spacer (3)..... 22 Idler Gear Shaft (3).....
2	Exhaust Cover Seal.....	SS800-67	23 Gear Frame Bearing.....
*	Plug.....	ROH-377	24 Cap Screw (3).....
6	Starter Assembly Cap Screw (4).....	ST700-2574	28 Gear Case
7	Cap Screw Washer (4).....	SS800-26	
	Motor Housing Assembly.....	ST900-A40	for Models
8	Motor Housing.....	ST900-40	ST950CP03L26 .....
10	Housing Plug (2).....	CE110-29	29 Drive Gear
11	Housing Plug Inlet Boss.....	ROH-377	
*	Nameplate.....	ST900-301	for Models
*	Nameplate Screw (4).....	R4K-302	ST950CP03L26 .....
12	Motor Assembly.....		SS825C-9
	for Models		
	ST950CP03L26 .....	ST750R-A53A	
12A	Cylinder O-ring Seal (2).....	ST700-67	30 Front Drive Gear Bearing.....
12B	Housing O-ring Seal (2).....	Y327-32	◆31 Rear Drive Gear Bearing.....
	Intermediate Gear Case Assembly.....	ST900-A37	32 Drive Gear Bearing Retainer.....
13	Intermediate Gear Case.....	ST900-37	33 Drive Gear Shaft Bearing Retainer.....
14	Rear Gear Case O-ring.....	Y327-163	34 Drive Gear Screw.....
15	Front Gear Case O-ring.....	Y327-162	35 Drive Gear Lock Washer.....
16	Seal.....	ST700-272	36 Drive Gear Cup.....
17A	Ring Gear.....	04324596	37 Drive Gear Screw O-ring.....
17B	Intermediate Pinion		38 Drive Housing Cap Screw (8).....
	for Models		39 Drive Housing Cap Screw Lock Washer (8).....
	ST950CP03L26 .....	SS825C-17	40 Drive Housing Kit
17C	Bearing.....	SS800-22	for Model
17D	Screw.....	SS800-732	ST950CP03L26 .....
	Idler Gear Frame Assembly.....	ST900-A108	SS825-K300
18	Idler Gear Frame.....	ST900-108	◆41 Drive Housing O-ring
19	Idler Gear (3).....	ST900-10	for B & C ratio.....
20	Idler Gear Bearing (6).....	ST900-24	SS800-244
			42 Front Drive Shaft Bearing.....
			43 Drive Housing Seal.....
			44 Drive Housing Vent Plug.....

\* Not illustrated.  
◆ Indicates Tune-up Kit part.

**PRE-ENGAGED DRIVE (continued)**

PART NO. FOR ORDERING

PART NO. FOR ORDERING

44D	Cap Screw (for Model ST950GCDPJ3R493)	SS800-179	◆55	Piston O-ring	
◆45	Bulkhead Retainer for Models ST950CP03L26 .....	SS800-181		for Models ST950CP03L26	SS800-337
46	Bulkhead Kit  for Models ST950CP03L26 .....	SS800-K150	57	Drive Shaft Kit  for Models ST950CP03L26 .....	SS800L-K8
◆47	Outer Bulkhead O-ring  for Models ST950CP03L26 .....	SS800-152	58	Rear Drive Shaft Bearing (includes bearing retainer)  for Models ST950CP03L26 .....	SS800-K399
◆48	Inner Bulkhead O-ring  for Models ST950CP03L26 .....	SS800-151	59	Piston Return Spring  for Models ST950CP03L26 .....	ST700-700
49	Clutch Spring Cup Retainer.....	SS800-366	◆60	Seat (for all "B" and "C" ratio Models only).	SS800-191
50	Clutch Spring Cup.....	SS800-367	61	Drive Pinion Retaining Screw  for Models ST950CP03L26 .....	SS800L-394
51	Clutch Spring.....	SS800-583			
52	Clutch Jaw Kit  for Models ST950CP03L26 .....	SS800L-K587	62	Drive Pinion Washer  for Models ST950CP03L26 .....	SS800-725
53	Large Drive Shaft Bearing Retainer  for Models ST950CP03L26 .....	SS800-107			
54	Piston Kit  for Models ST950CP03L26 .....	SS800K-703			

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\* Not illustrated.

◆ Indicates Tune-up Kit part.

**PRE-ENGAGED DRIVE (continued)**

PART NO. FOR ORDERING

PART NO. FOR ORDERING

63	Drive Pinion for ST950CP03L26.....	SS825L-13-26	68	Weld Sleeve.....	ST700-352
			69	Cap Screws (6).....	ST700-703
			70	Lockwashers (6).....	845-58
			71	Exhaust Adapter Seal.....	Y327-46
			*	Flange Mounting Hardware Kit (includes O-ring, Mounting Bolts and Lockwashers).....	ST750-K167
			*	Tune-up Kit (for Pre-engaged drive models) (includes illustrated parts 31,41,45,47,48,55 and 60).....	ST700P-TK7
64	Pinion Spring Sleeve for Models ST950CP03L26 .....	SS800-335	72	Housing Exhaust Cover.....	ST700-562
			73	Splash Deflector.....	ST700-735
			74	Deflector Return Spring.....	D10-275
65	Pinion Spring for Models ST950CP03L26 .....	SS800L-419	75	Deflector Return Screw.....	ST700-737
			*	Gear Kit (includes parts 14,15,16,17A,17C,19,20,21,22,23).....	ST900-GK1
			*	Seal Kit (includes parts 2,12A,12B,14,15,16,37,41,43,47,48,55,71).....	ST900-SK1
66	Inlet Flange Kit (includes Inlet Flange, O-ring, Mounting Bolts and Lock Washers) Exhaust Flange Kit (includes illustrated parts 67, 68, 69, 70, and 71).....	ST700-K166 ST700-K351			
67	Exhaust Flange.....	ST700-351			

\* Not illustrated.

◆ Indicates Tune-up Kit part.



Ingersoll-Rand  
Engine & Vessel Information for Air Starter

Prepared by  
Date :  
Revision :

1	Issue Title	Investigation Overhaul	
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2	Starter Model		
3	Serial No. & QTY'		
4	Engine Manufacturer		
5	Reference No.		
6	Engine Model		
7	Application (Device)		
8	Issue was found	at	
9		on	
10	Vessel	Name	
11		Ship Yard & Shell No.	
12		Owner Name	
13		Commissioning Date	
14	Date of Accident (Investigation only)		
15	Operation Log	Total Running Hours of Engine	
16		Total Starting Times	
17		Last Operation Date	
18		Operating Air Pressure	
19		Maximum Clanking Duration	
20	Starting Method	Manual	
21		Remote	
22	Accessories for Starter	Relay Valve	
23		Strainer	
24		Solenid Valve	
25		Air Regulator	
26		Relief Vakve	
27		Muffler	
28		Pressure Gauge	
29		Air Plumbing	
30	Summary of Incident Log (Investigation only)	Dis-Engagement	
31		Pinion Extrusion Failure	
32		Unintentional Run	
33		Others	
34	Maintenance	Done or Not	
35		By	
36		Period	
37		Strainer Cleaning	
38		Drainage of Air Tank	
39	Special Affairs	If any.	