



**ASSEMBLY, DISASSEMBLY  
MANUAL FOR  
D3EICS-162**

**Pump BM# 3252/720**

**Imo Assembly # SC6143**

**Imo Outline # SDD18311**



**WARNING**

This Special Instruction Manual and General Instructions Manual, CA-1, should be read thoroughly prior to pump installation, operation or maintenance.


**MANUAL NO. - SRM00093**


**Rev. 0**

**January 2010**



## READ THIS ENTIRE PAGE BEFORE PROCEEDING

FOR SAFETY OF PERSONNEL AND TO PREVENT DAMAGE TO EQUIPMENT, THE FOLLOWING NOMENCLATURE HAS BEEN USED IN THIS MANUAL:

	<b>DANGER</b>	
Failure to observe the precautions noted in this box can result in severe bodily injury or loss of life.		

	<b>WARNING</b>	
Failure to observe the precautions noted in this box can cause injury to personnel by accidental contact with the equipment or liquids. Protection should be provided by the user to prevent accidental contact.		

	<b>CAUTION</b>		<b>ATTENTION</b>
Failure to observe the precautions noted in this box can cause damage or failure of equipment.			

Non compliance of safety instructions identified by the following symbol could affect safety for persons:	Safety instructions where electrical safety is involved are identified by:	Safety instructions which shall be considered for reasons of safe operation of pump and/or protection of pump itself are marked by the sign:
		<b>ATTENTION</b>

<b>ATTENTION</b>
<i><b>If operation of this pump is critical to your business, we strongly recommend you keep a spare pump or major repair kit in stock at all times. As a minimum, a minor repair kit (o-rings, gaskets, shaft seal and bearings) should be kept in stock so pump refurbishment after internal inspection can be accomplished.</b></i>

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## Pump Description

This instruction manual covers the D3EICS-162 pump.

The D3EICS-162 pump is a positive displacement, rotary screw pump consisting of a precision machined housing that encloses a driven screw (power rotor) and two intermeshing following screws (idler rotors). These screws, when rotating, form a succession of closures or cavities. As they rotate, the fluid is moved axially from the inlet port to the outlet port in a continuous, uniform flow with minimum fluid pulsation and pump noise. Fluid flowing through pump provides lubrication for moving parts. Normal rotation of pump is clockwise as viewed from the shaft end. It is assumed by Imo that fluid this pump will be used on is not hazardous in any way, nor is fluid considered flammable. Environmental or health risk associated with fluid spillage or contact is not considered as part of Imo Pump's hazard analysis. Imo Pump must approve use in any other service.

## GENERAL INSTRUCTIONS

Instructions given herein cover generally operation and maintenance of subject equipment. Should any questions arise which may not be answered specifically by these instructions, they should be referred to Imo Pump for further detailed information and technical assistance.

This manual cannot possibly cover every situation connected with operation, adjustment, inspection, test, overhaul and maintenance of equipment furnished. Every effort is made to prepare text of manual so that engineering and design data is transformed into most easily understood wording. Imo Pump, in furnishing this equipment and this manual, must presume that operating and maintenance personnel assigned thereto have sufficient technical knowledge and experience to apply sound safety and operational practices which may not be otherwise covered herein.

In applications where Imo Pump furnished equipment is to be integrated with a process or other machinery, these instructions should be thoroughly reviewed to determine proper integration of equipment into overall plant operational procedures. On critical or dangerous equipment, provide suitable safety and emergency systems to protect personnel and property from injury due to pump malfunction. If pump handles flammable, toxic, corrosive or explosive fluids, provide for safety in event of pump leakage or malfunction.



### WARNING

If installation, operation and maintenance instructions are not correctly and strictly followed and observed, injury to personnel or serious damage to pump could result. Imo Pump cannot accept responsibility for unsatisfactory performance or damage resulting from failure to comply with instructions.

## ORDERING INSTRUCTIONS

To order replacement pump, contact an Imo sales office or representative with pump model number and serial number. This information can be found on pump nameplate and in this manual. Major and minor kits are also available.

## LIQUID LIMITATIONS

Never operate on water. Pump is designed for liquids having general characteristics of lubricating oil or distillate fuel oils.

## OPERATING PARAMETERS

CAUTION	ATTENTION
<p>Operating conditions, such as speed, fluid viscosity, temperature inlet pressure, discharge pressure, filtration, duty cycle, drive type, mounting, etc., are interrelated. Due to these variable conditions, the specific application limits may be different from that of the operational limitations. This equipment must not be operated without verifying system's operating requirements are within pump's capabilities.</p>	

**Pump Weight = 38 lb (17.2 Kg)**

**Pump Airborne Sound Pressure Levels are expected to be 70 dBA or less.**

**Under no circumstances are operating and structural limits below to be exceeded without specific approval from Imo Pump.**

<b>MAXIMUM SPEED:</b> .....	4000 RPM
<b>VISCOSITY</b> .....	33 to 3000 SSU
<b>TEMPERATURE:</b> .....	0° to 250° F (-18° to 107° C).
<b>INLET PRESSURE:</b> .....	75 PSIG (5.2 Bar) Max.
<b>DIFFERENTIAL PRESSURE:</b> .....	150 PSIG (10.3 Bar) Max.
<b>DISCHARGE PRESSURE:</b> .....	150 PSI (10.3 Bar) Max.
<b>DRIVE:</b> .....	Direct Drive only.
<b>FILTRATION:</b> .....	See General Installation Manual, SRM00046
<b>MOUNTING:</b> .....	Integral Mounted.
<b>SHAFT ROTATION:</b> .....	Clockwise

**Table 1. Pump Parts List.**

IDP	QTY	DESCRIPTION	IDP	QTY	DESCRIPTION
1	1	Case	26 x	1	Inboard Cover O-Ring
2 xx	1	Inlet Cover	27	4	Inboard Cover Bolts
3	4	Inlet Bolts	75 xx	1	Housing
4	1	Inboard Cover	76 x	1	Housing O-Ring
7 xx	1	Power Rotor	96	1	Pipe Plug
8 xx	2	Idlers	97	1	Dowel Pin
13	1	Key			

X = Minor Repair Kit Item (Also in Major Kit)

XX = Major Repair Kit Items

## INSPECTION

Interval for inspection and replacement of worn parts varies with properties of pumped liquid and can only be determined by experience. All internal parts of 3E pumps are lubricated by pumped fluid. Pumping liquid which contains abrasive materials or liquid that are corrosive, will significantly reduce service life and call for shorter service intervals. A worn pump will be noticeable by excessive vibration, noise, reduction of flow output and/or reduction in system pressure.

## PUMP MAINTENANCE



### WARNING

Failure to observe precautions while installing, inspecting, and maintaining pump can cause injury to personnel from accidental handling, e.g.: Liquids that may harm skin or clothing, fire hazard risks from flammable liquids, or injury from high pressure fluid jets.



### DANGER

Failure to observe precautions noted in this box can result in severe bodily injury or loss of life.

**Note:** Part number identifiers (IDP's) contained in Table 1 and shown within parenthesis such as (01) refer to circled numbers shown on Assembly Drawing.

**NOTE:** If upon disassembly, significant wear on power, idler rotors and rotor housing is found, Imo Pump recommends replacement of entire pump.

## TOOLS REQUIRED

Procedures described in this manual require common mechanics hand tools, arbor press, torque wrench and a suitable lifting device such as a sling.

## PUMP DISASSEMBLY, See ASSEMBLY DRAWING

**NOTE:** The 3E Series pumps incorporate highly finished precision parts that must be handled carefully to avoid damage to critical machined surfaces. Parts removed should be tagged for identification and their exact positions in pump carefully noted so that new parts, or removed parts can be properly replaced.



### CAUTION

### ATTENTION

Fluid leakage from disassembly of pump may make floor slippery and cause personal injury

The following steps are required before starting any maintenance action:

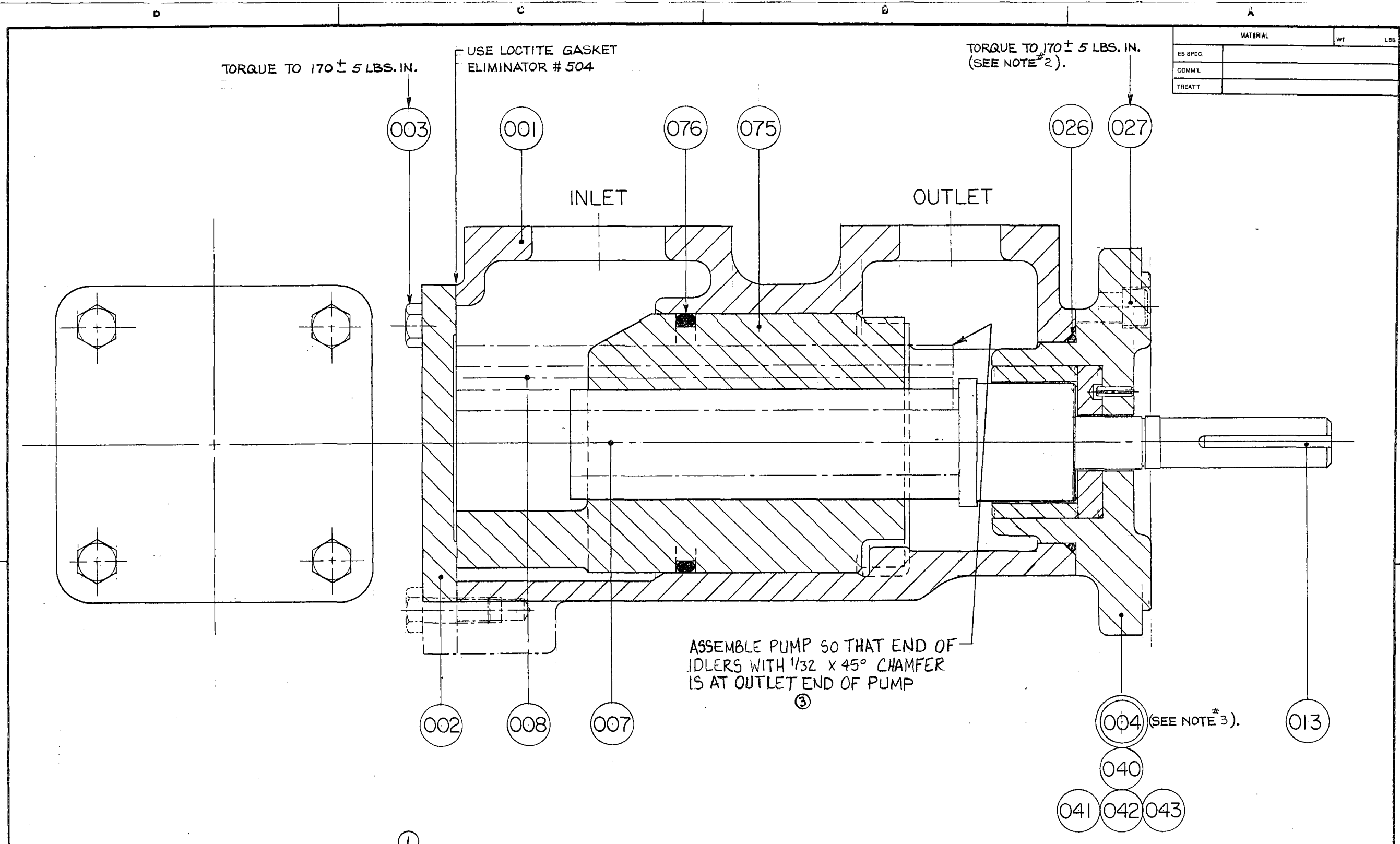
- A. De-energize and lock out power to driver and tag power control box "**WARNING - Out of Service**".
- B. Close all inlet and outlet valves and tag valves "**WARNING - Out of Service**".

- C. Remove pipe fittings/flanges at pump inlet and outlet openings.
- D. Remove bolts holding pump to its mounting.
- E. Remove key (13) from power rotor (7) shaft and locate pump on a suitable workbench
- F. Drain pumping liquid from pump.
  - 1. Remove bolts (027) and cover (004) from case (001). Remove O-ring (026) from either case (001) or cover (004).
  - 2. Remove power rotor (007) and idlers (008) as a set from housing (075). Take care not to drop idlers (008) as rotor set is removed from housing (075).
  - 3. Remove bolts (003) and cover (002) from case (001). Clean Loctite Gasket Eliminator from cover (002) and flange of case (001).
  - 4. Remove housing (075) from inlet end of case (001) and O-ring (076) from housing (075)

### **Pump Reassembly, See Assembly Drawing**

**NOTE: Prior to pump assembly, all parts should be cleaned and inspected for nicks, burrs or gouges. When ready for assembly, wipe all parts, including bolts, O-rings and seal faces with clean, Lubricating oil or pumped product, if applicable.**

- 1. Install O-ring (076) on groove in housing (075) and housing (075) in inlet end of case (001) ensuring that anti-rotation groove in housing (075) is aligned with anti-rotation boss in case (001).
- 2. Wipe all traces of oil from mating face of cover (002) and flange of case (001). Apply a thin coat of Loctite gasket eliminator #504 to cover (002) and flange of case (001). Install cover (002) to case (001) using bolts (003). Torque bolts to  $170 \pm 5$  lb-in.
- 3. Mesh two idlers (008) to power rotor (007) and install rotor set in housing (075) making sure idler rotors and balance piston are properly engaged.
- 4. Install O-ring (26) on inboard cover (4).
- 5. Install inboard cover (4) with bolts (027). Torque bolts to  $170 \pm 5$  lb-in.
- 6. Installing key (13) into power rotor (7) keyway and coupling on shaft (7).



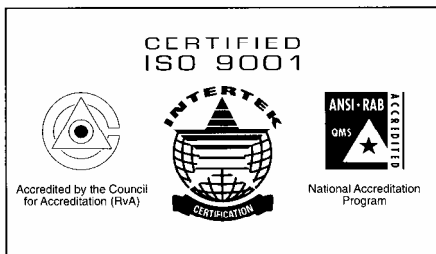
MATERIAL	WT	LBS
ES SPEC.		
COMM'L		
TREATT		

**NOTES:**

1. INSTALL NAMEPLATES PER ES 3.36.3.
2. APPLY LOCTITE 510 GASKET ELIMINATOR UNDER HEAD OF CAPSCREW (PT. NO. 027).
3. PT. NO. 040, 041, 042, & 043 ARE NOT SERVICED SEPARATELY, FURNISHED AS PART OF SUB-ASS'Y (PT. NO. 004).

94-P0648	B1	3	ADDED NOTE	12-9-94	JEM		
92-D0567	ALL	2	REV. NOTES, DEL. PUMP TYPES	9/21/82	WV		
88P-175	-	1	PUMP BUSHING CHANGED FROM LOCTITE BUSHING TO SHRINK FIT PISTON	3/11/86	MS		A
CHG. NO.	ZONE	CHG.	ALTERATIONS	DATE	BY	CHKD	WHY

IMO PUMP DIVISION P.O. BOX 5020 MONROE, N.C. 28111		IMO INDUSTRIES INC.	
UNLESS STATED OTHERWISE 1. FRACTIONAL = 1/32" 2. TWO PLACE DECIMAL XX = .010 3. THREE PLACE DECIMAL XXX = .005 4. MACHINED SURFACES 250 μ FINISH 5. BREAK SHARP CORNERS .015 ± .005 6. ALL THREADS TO ES 5.1.18/5.1.18		FEDERAL CODE IDENT. NO. 59180	TITLE ASSEMBLY GENERIC D3EIC3-143/162
DRAWN AMJ	DATE 9/14/82	SCALE 12" = 1'-0"	FIRST ORDER 180171
CHECKED NRS	DATE 9/29/82	APPR. NRS	DATE 9/29/82
METHODS APPR.		SYMBOL SC6143	



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