

Henry Pratt MDT Actuators



Operation and Maintenance Manual

SAFETY MESSAGES

All safety messages in the instructions are flagged with an exclamation symbol and the word “Warning”. These messages indicate procedures that must be followed exactly to avoid equipment damage, physical injury, or death. Safety labels on the product indicate hazards that can cause equipment damage, physical injury, or death.



WARNING

Personnel involved in the installation or maintenance of valves should be constantly alert to potential emission of pipeline material and take appropriate safety precautions. Always wear suitable protection when dealing with hazardous pipeline materials.

PARTS

Order parts from your local Henry Pratt sales representative or directly from Henry Pratt Company. When ordering parts, please include the serial number located on the valve tag.



WARNING

Read all applicable directions and instructions prior to any maintenance, troubleshooting or installation



Henry Pratt MDT Actuators

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Henry Pratt MDT Actuators

FUNCTIONAL DESCRIPTION

The Pratt MDT gear actuators are designed to smoothly operate quarter turn valves such as butterfly or ball valves in sizes 3” – 48”. The MDT actuator converts turns of a hand wheel, chainwheel, or nut into ¼ Turn valve rotation per the following chart:

MDT Size	# of Turns for 1/4 Rotation
MDT 2S	32 Turns
MDT 3S	30 Turns
MDT 4S	40 Turns
MDT 5	44 Turns
MDT 5S	136 Turns
MDT 6S	215 Turns

The travel of the valve is limited by physical mechanical stops in the actuator housing. The Pratt MDT2 style is a scotch yoke type operator and the MDT3 and larger styles are a compound lever/link traveling nut style operator designed to provide 90 degree output rotation.

MAINTENANCE

MDT MANUAL ACTUATORS (FOR STANDARD ABOVE GROUND SERVICE):



WARNING

CAUTION: Valve must be locked out in a “no flow and “no pressure or no drawn vacuum” condition prior to performing any maintenance tasks.

1. Verify that actuator is still bolted securely to the valve trunnion or bonnet. If movement is detected, remove actuator cover and tighten mounting bolts.
2. If operation is difficult or gear box is noisy, remove actuator cover to inspect gearing and lubricant. Clean actuator and replace grease if it has separated or worn away.
3. Check pointer on top of actuator to see if it properly indicates valve position

Recommended lubricant (for use on moving parts): L-W 2000 NLGI #2

MAINTENANCE (Cont.)

MDT MANUAL ACTUATORS (FOR BURIED OR SUBMERGED SERVICE):

No scheduled maintenance is required on buried or submerged service MDT manual actuators.

Recommended lubricant (for use on moving parts): If grease replacement is required, pack gear box with L-W 2000 NLGI #2.

MDT ACTUATORS WITH DURACYL CYLINDERS:



WARNING

CAUTION: Valve must be locked out in a “no flow and “no pressure or no drawn vacuum” condition prior to performing any maintenance tasks.

1. Cycle cylinder and check for erratic movement. If cylinder does not respond, or movement is jerky, then clean and lubricate cylinder per the instruction manual for Pratt non-metallic MDT cylinders. Note: Air cylinders will inherently operate in a jerky manner if the cylinder speed is set too slow.
2. If the cylinder passes the supply media without moving, open flow controls (if present) to increase flow rate. Cycle cylinder several times to exercise seals. If leakage continues replace cup seals.
3. Pressurize cylinder and check for leakage at either end of cylinder tube. If leakage is detected, tighten tie rod bolts.
4. Check mounting face of cylinder for leakage. If leakage is detected, replace packing gland assembly.

Recommended lubricant (for use on moving parts): Dow Corning #33 silicone grease.



Henry Pratt MDT Actuators

HOW TO CONTACT PRATT

HOW TO ORDER PARTS:

To order parts, contact our Parts Department:

Write: - Henry Pratt Company
401 South Highland Avenue
Aurora, IL 60506-5563

Attn: Parts Manager

Call - (630) 844-4000

Fax - (630) 844-4191

Please include valve serial number and description of part requested.

HOW TO OBTAIN SERVICE:

To obtain further information or secure field service, contact our Field Service Department:

Write: - Henry Pratt Company
401 South Highland Avenue
Aurora, IL 60506-5563

Attn: Field Service Manager

Call - (630) 844-4163

Fax - (630) 844-4160

Please include the following with your inquiry for service:

Henry Pratt Order Number:

Henry Pratt Item Number:

Valve Serial Number:

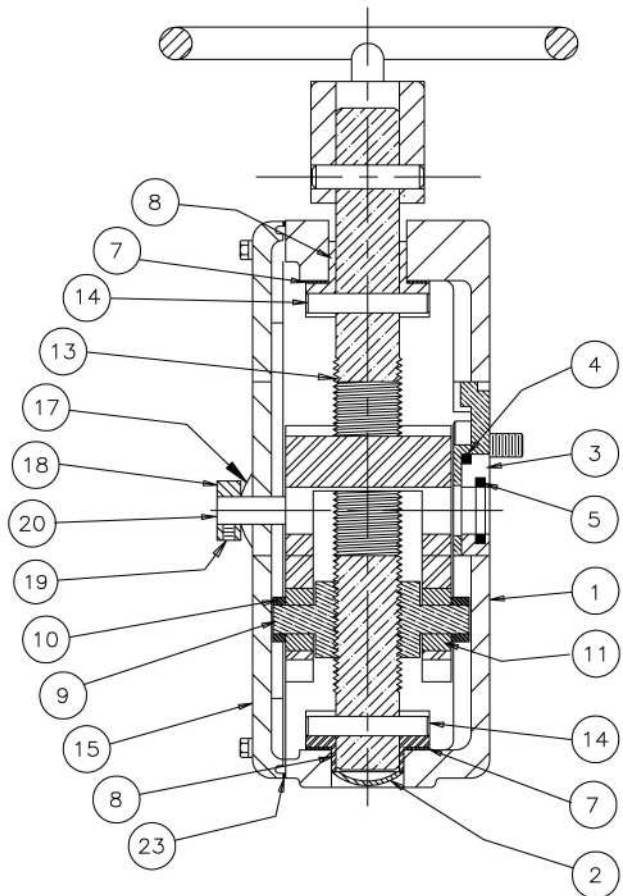
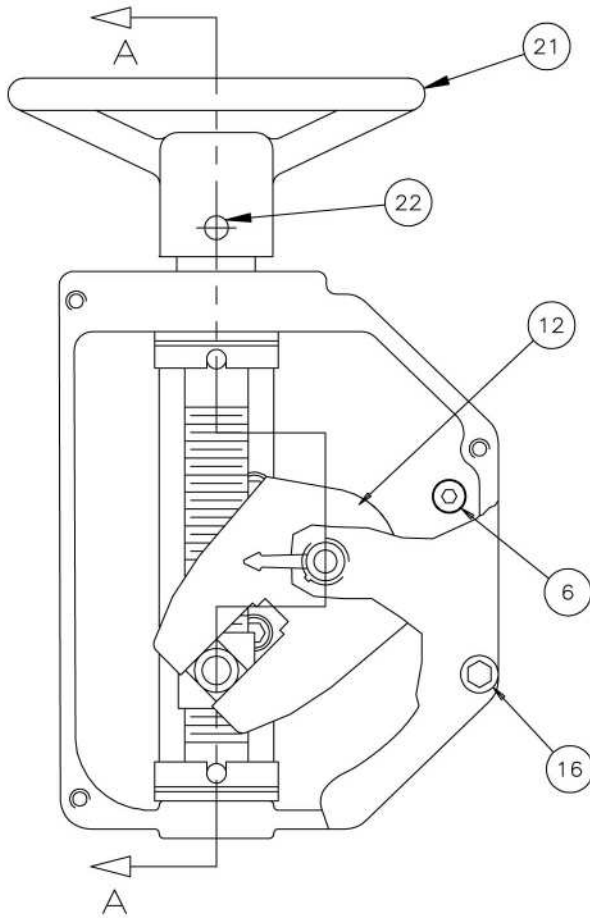
Type of Service Requested

Henry Pratt MDT Actuators

MDT 2S with Handwheel Parts and Material Drawing

ITEM	DESCRIPTION	MATERIAL
1	HOUSING	CAST IRON ASTM A-126 CLASS B
2	EXPANSION PLUG	STAINLESS STEEL TYPE 304
3	INSERT	NORYL GRADE GFN3-780
4	O-RING	RUBBER BUNA-N
5	O-RING	RUBBER BUNA-N
6	CAPSCREW	ALLOY STEEL
7	SHIM	HARDENED STEEL
8	BEARING	SINTERED IRON
9	SLIDER NUT	DUCTILE IRON ASTM A-536 GRADE 80-55-06
10	SLIDER TUBE	CARBON STEEL
11	SLIDER BLOCK	SINTERED IRON ASTM B-439 GRADE 3

ITEM	DESCRIPTION	MATERIAL
12	LEVER	DUCTILE IRON ASTM A-536 GRADE 65-45-12
13	SHAFT	CARBON STEEL AISI 12L14 COLD DRAWN
14	GROOVE PIN	ALLOY STEEL
15	COVER	CAST IRON ASTM A-126 CLASS B
16	CAP SCREW	STAINLESS STEEL TYPE 304
17	GROMMET	NEOPRENE
18	INDICATOR ARROW	DIE CAST (CHROME PLATED)
19	SET SCREW	ALLOY STEEL
20	STUD FASTENER	CARBON STEEL
21	HANDWHEEL	ALUMINUM
22	SPRING PIN	STAINLESS STEEL TYPE 420
23	GASKET	BLENDED FIBER, CURED, NITRILE BINDER

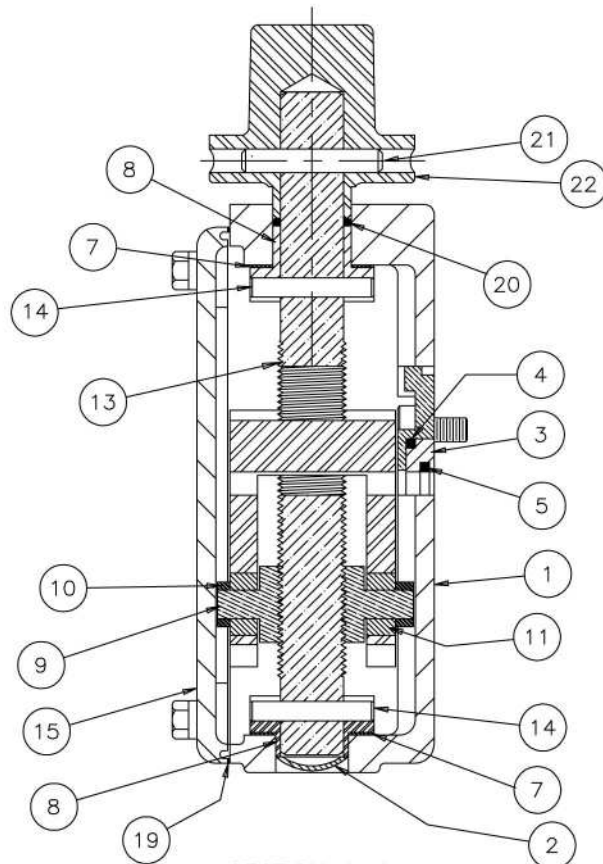
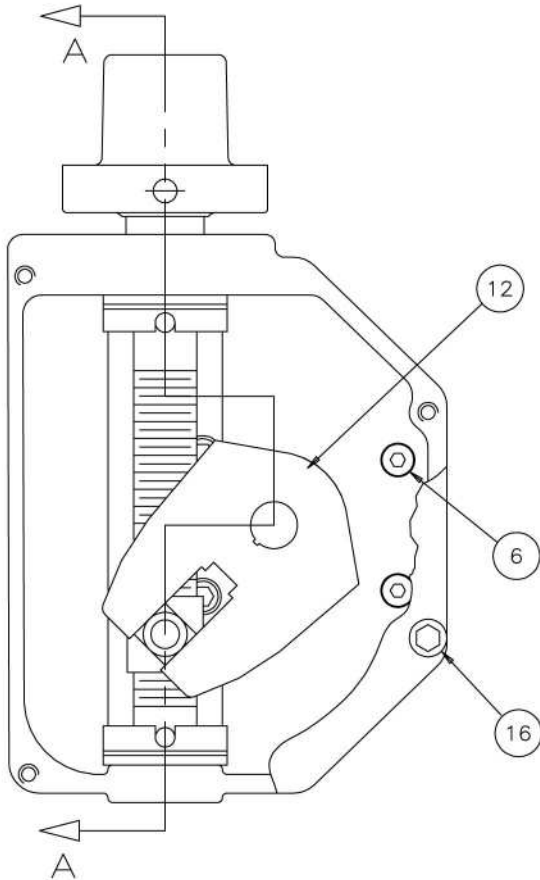


Henry Pratt MDT Actuators

MDT 2S with Buried Service Nut Parts and Material Drawing

ITEM	DESCRIPTION	MATERIAL
1	HOUSING	CAST IRON ASTM A-126 CLASS B
2	EXPANSION PLUG	STAINLESS STEEL TYPE 304
3	INSERT	NORYL GRADE GFN3-780
4	O-RING	RUBBER BUNA-N
5	O-RING	RUBBER BUNA-N
6	CAPSCREW	ALLOY STEEL
7	SHIM	HARDENED STEEL
8	BEARING	SINTERED IRON
9	SLIDER NUT	DUCTILE IRON ASTM A-536 GRADE 80-55-06
10	SLIDER TUBE	CARBON STEEL
11	SLIDER BLOCK	SINTERED IRON ASTM B-439 GRADE 3

ITEM	DESCRIPTION	MATERIAL
12	LEVER	DUCTILE IRON ASTM A-536 GRADE 65-45-12
13	SHAFT	CARBON STEEL AISI 12L14 COLD DRAWN
14	GROOVE PIN	ALLOY STEEL
15	COVER	CAST IRON ASTM A-126 CLASS B
16	CAP SCREW	STAINLESS STEEL TYPE 304
19	GASKET	BLENDED FIBER, CURED NITRILE BINDER
20	O-RING	RUBBER BUNA-N
21	SPRING PIN	STAINLESS STEEL TYPE 420
22	NUT	CAST IRON ASTM A-126 CLASS B

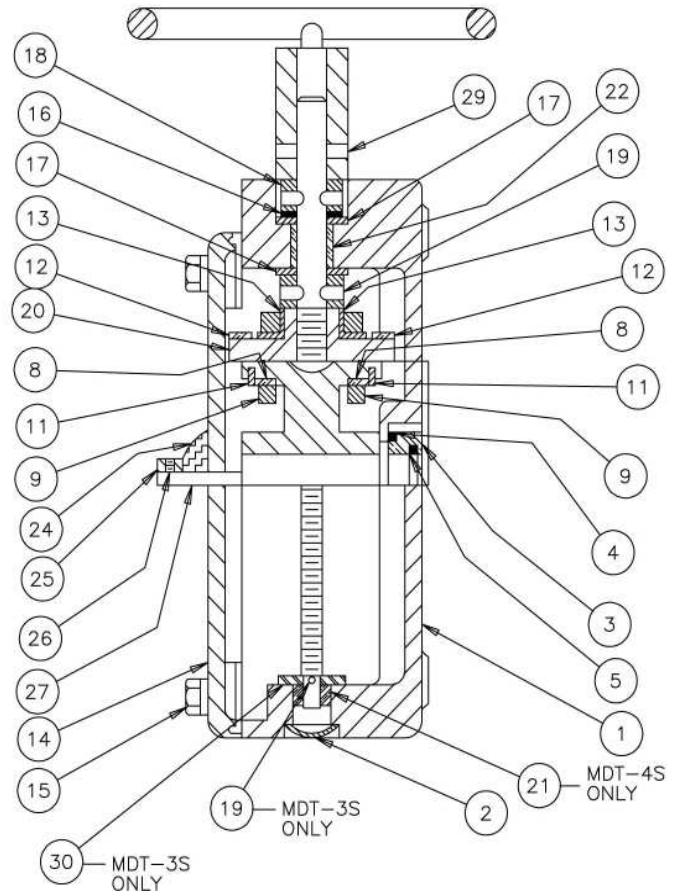
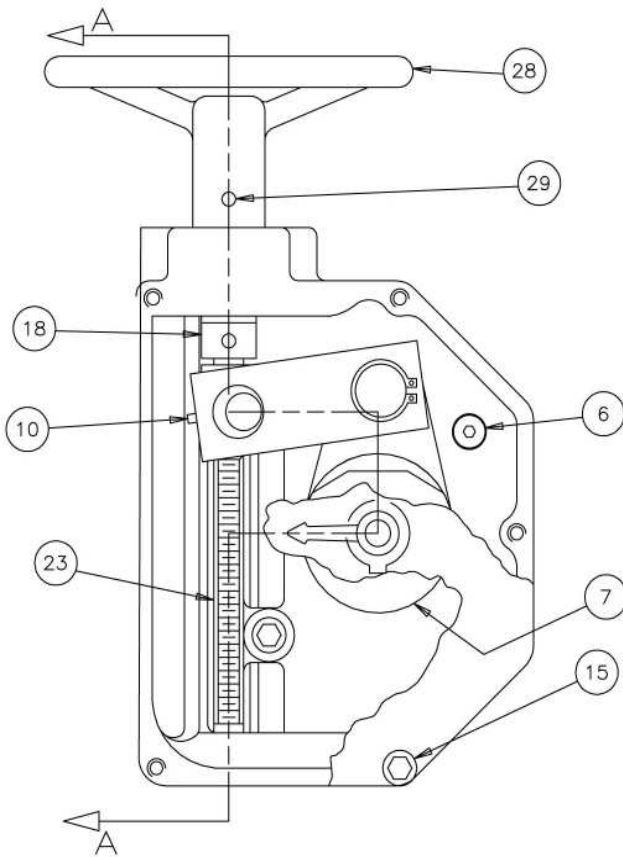


Henry Pratt MDT Actuators

MDT 3S & 4S with Handwheel Parts and Material Drawing

ITEM	DESCRIPTION	DESCRIPTION
1	HOUSING	CAST IRON ASTM A126 CLASS B
2	EXP. PLUG	STAINLESS STEEL TYPE 304
3	INSERT	NORYL GRADE GFN3-780
4	O-RING	BUNA-N
5	O-RING	BUNA-N
6	CAPSCREW	ALLOY STEEL (ZINC PLATED)
7	LEVER	DUCTILE IRON ASTM A536 GRADE (65-45-12)
8	BEARING	SINTERED BRONZE
9	LINK	CARBON STEEL
10	SET SCREW	ALLOY STEEL
11	RET. RING	CARBON STEEL
12	SLIDER TUBE	CARBON STEEL
13	ECCENTRIC BRG	SINTERED IRON
14	COVER	CAST IRON ASTM A126 CLASS B
15	CAPSCREW	STAINLESS STEEL TYPE 304

ITEM	DESCRIPTION	DESCRIPTION
16	SHIM	CARBON STEEL
17	THRUST WASHER	SINTERED BRONZE MDT4S/ IRON MDT3S
18	THRUST COLLAR	CARBON STEEL
19	DRIVE PIN	ALLOY STEEL
20	SLIDER NUT	DUCTILE IRON ASTM A-536 GRADE 65-45-12
21	BEARING	NYLON (MDT-4S ONLY)
22	BEARING	SINTERED BRONZE
23	SHAFT	CARBON STEEL
24	GROMMET	NEOPRENE
25	INDCTR. ARROW	DIE CAST CHROME PLATED
26	SET SCREW	ALLOY STEEL
27	STUD FASTENER	CARBON STEEL
28	HANDWHEEL	CAST ALUMINUM
29	SPRING PIN	STAINLESS STEEL
30	FLANGE BRG.	SINTERED IRON

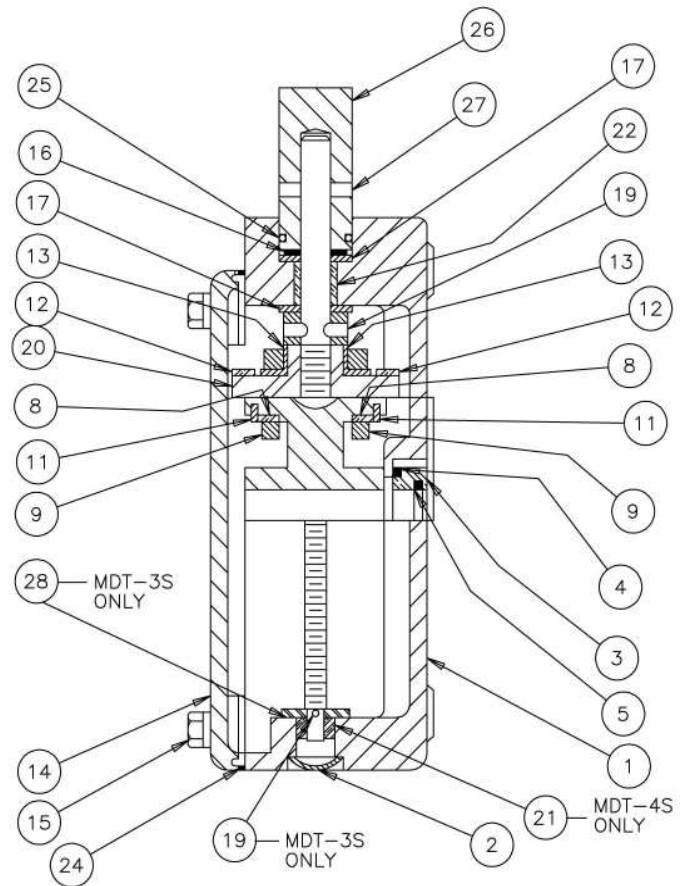
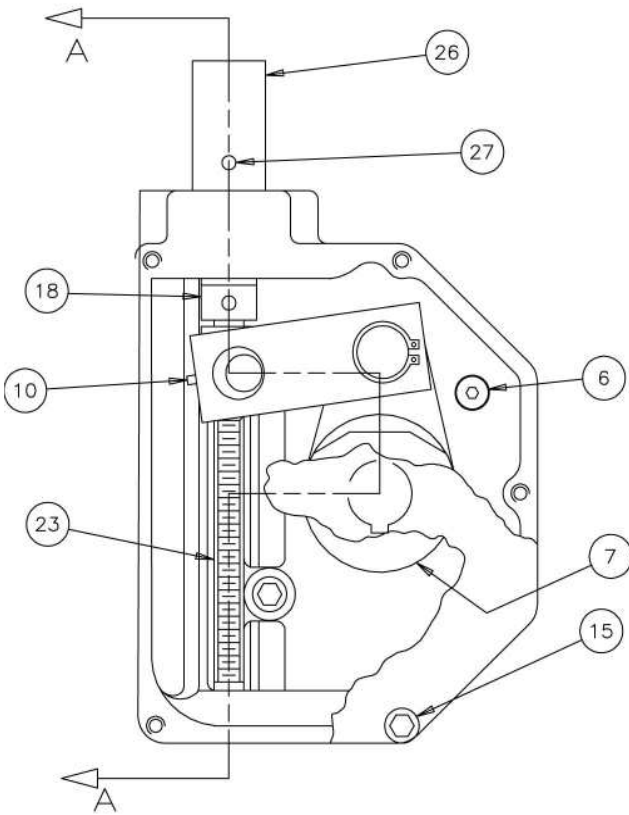


Henry Pratt MDT Actuators

MDT 3S & 4S with Buried Service Nut Parts and Material Drawing

ITEM	DESCRIPTION	DESCRIPTION
1	HOUSING	CAST IRON ASTM A126 CLASS B
2	EXP. PLUG	STAINLESS STEEL TYPE 304
3	INSERT	NORYL GRADE GFN3-780
4	O-RING	BUNA-N
5	O-RING	BUNA-N
6	CAPSCREW	ALLOY STEEL (ZINC PLATED)
7	LEVER	DUCTILE IRON ASTM A536 GRADE (65-45-12)
8	BEARING	SINTERED BRONZE
9	LINK	CARBON STEEL
10	SET SCREW	ALLOY STEEL
11	RET. RING	CARBON STEEL
12	SLIDER TUBE	CARBON STEEL
13	ECCENTRIC BRG	SINTERED IRON
14	COVER	CAST IRON ASTM A126 CLASS B
15	CAPSCREW	STAINLESS STEEL TYPE 304

ITEM	DESCRIPTION	DESCRIPTION
16	SHIM	CARBON STEEL
17	THRUST WASHER	SINTERED BRONZE MDT4S/ IRON MDT3S
18	THRUST COLLAR	CARBON STEEL
19	DRIVE PIN	ALLOY STEEL
20	SLIDER NUT	DUCTILE IRON ASTM A-536 GRADE 65-45-12
21	BEARING	NYLON (MDT-4S ONLY)
22	BEARING	SINTERED BRONZE
23	SHAFT	CARBON STEEL
24	GASKET	BLENDED FIBER NITRILE BINDER
25	O-RING	BUNA-N
26	NUT	CAST IRON ASTM A48 CLASS 40 (MDT4S)
26	NUT	CAST IRON ASTM A-126 CLASS B (MDT3S)
27	PIN	STAINLESS STEEL TYPE 304
28	FLANGE BRG.	SINTERED IRON

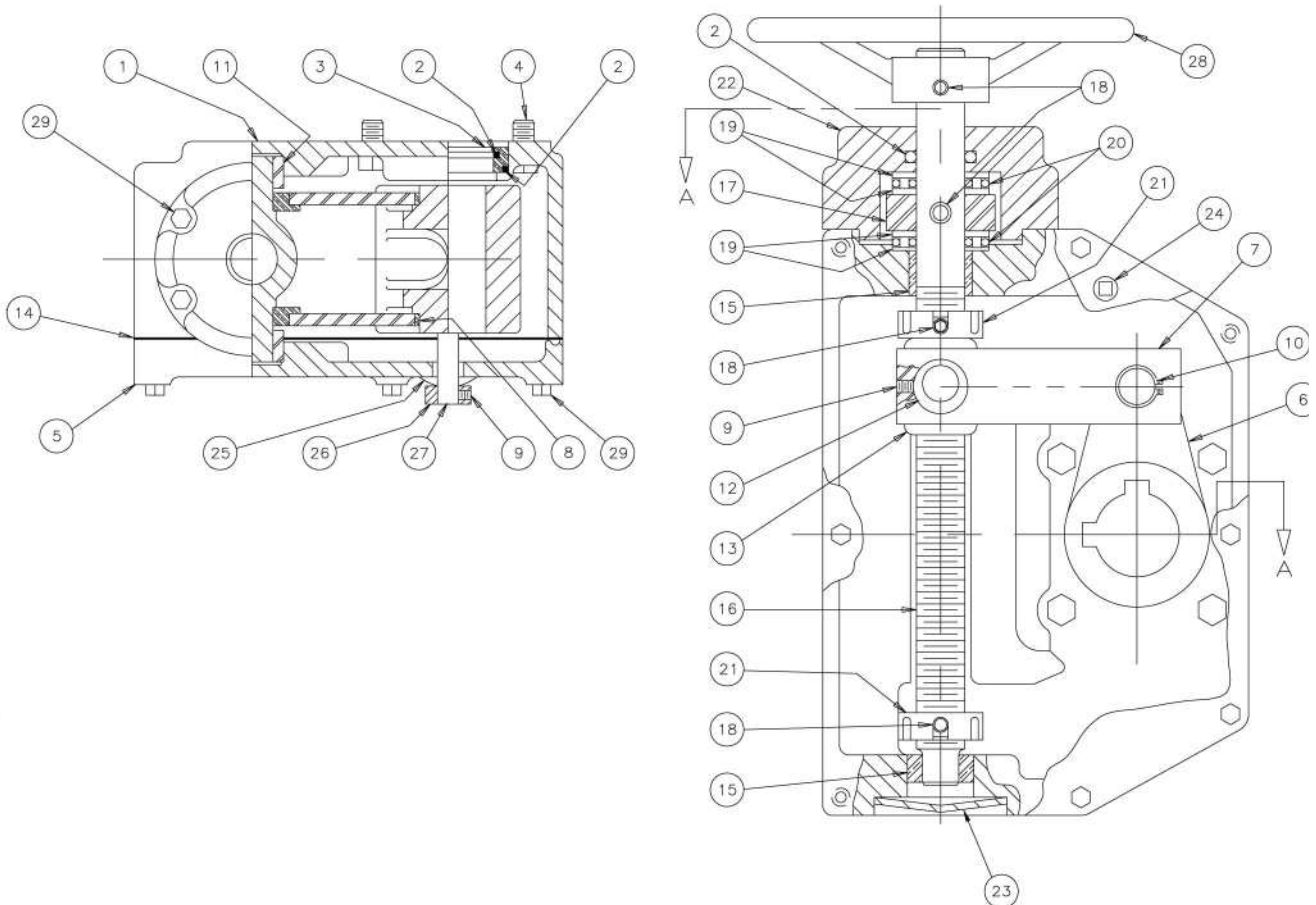


Henry Pratt MDT Actuators

MDT 5 with Handwheel Parts and Material Drawing

ITEM	DESCRIPTION	DESCRIPTION
1	HOUSING	CAST IRON ASTM A-48 CLASS 40
2	O-RING	RUBBER BUNA-N
3	INSERT	NORYL GRADE GFN3-780
4	CAPSCREW	ALLOY STEEL
5	COVER	CAST IRON ASTM A-48 CLASS 40
6	LEVER	DUCTILE IRON ASTM A-536 GRADE 80-60-03
7	LINK	CARBON STEEL
8	LINK BEARING	"DU" BEARING MATERIAL
9	SET SCREW	ALLOY STEEL
10	RETAINING RING	CARBON SPRING STEEL
11	SLIDE BLOCK	ALUMINUM BRONZE
12	ECCENTRIC BEARING	SINTERED METAL
13	SLIDER NUT	DUCTILE IRON ASTM A-536 GRADE 80-60-03
14	GASKET	NEOPRENE RUBBER

ITEM	DESCRIPTION	DESCRIPTION
15	BEARING	SINTERED BRONZE
16	SHAFT	CARBON STEEL AISI 12L14
17	THRUST COLLAR	CARBON STEEL
18	SPRING PIN	STAINLESS STEEL TYPE 420
19	THRUST RACE	HARDENED STEEL
20	ROLLER BEARING	HARDENED STEEL
21	COLLAR	DUCTILE IRON ASTM A-536 GRADE 80-60-03
22	ADAPTER	CAST IRON ASTM A-48 CLASS 40
23	EXPENSION PLUG	STAINLESS STEEL TYPE 304
24	PIPE PLUG	MALLEABLE IRON (GALVANIZED)
25	GROMMET	NEOPRENE
26	INDICATOR ARROW	DIE CAST (CHROME PLATED)
27	STUD FASTENER	CARBON STEEL
28	HANDWHEEL	ALUMINUM
29	CAPSCREW	CARBON STEEL

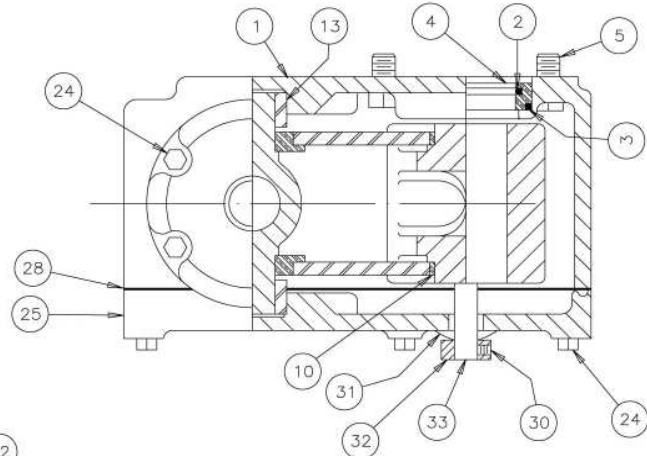
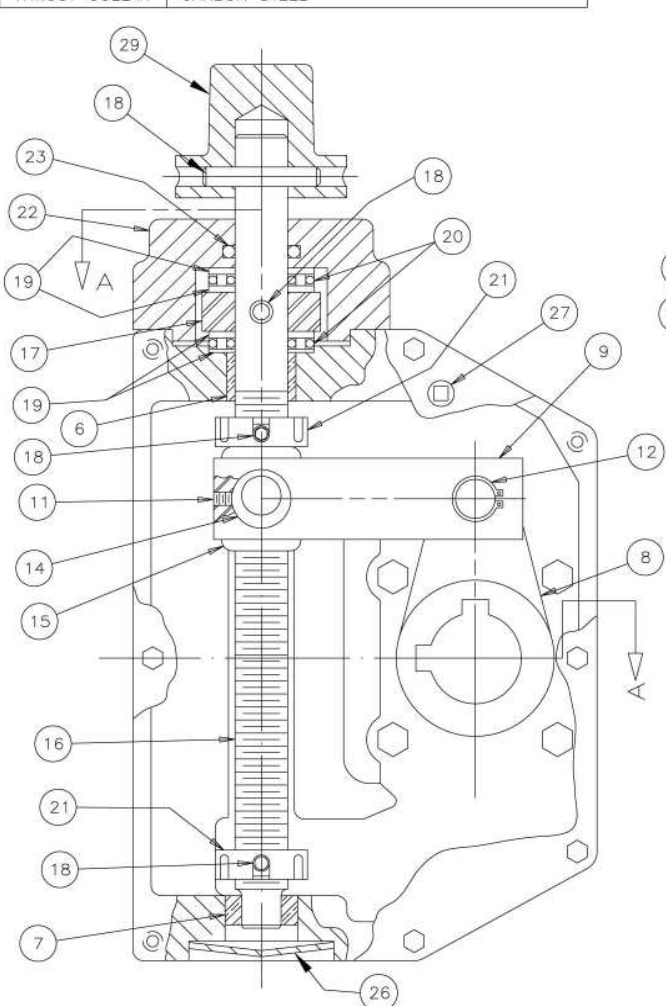


Henry Pratt MDT Actuators

MDT 5 with Buried Service Nut Parts and Material Drawing

ITEM	DESCRIPTION	DESCRIPTION
1	HOUSING	CAST IRON ASTM A-48 CLASS 40
2	O-RING	RUBBER BUNA-N
3	O-RING	RUBBER BUNA-N
4	INSERT	NORYL GRADE GFN3-780
5	CAPSCREW	ALLOY STEEL
6	BEARING	SINTERED BRONZE
7	BEARING	SINTERED BRONZE
8	LEVER	DUCTILE IRON ASTM A-536 GRADE 80-60-03
9	LINK	CARBON STEEL
10	LINK BEARING	"DU" BEARING MATERIAL
11	SET SCREW	ALLOY STEEL
12	RETAINING RING	CARBON SPRING STEEL
13	SLIDE BLOCK	ALUMINUM BRONZE
14	ECCENTRIC BEARING	SINTERED METAL
15	SLIDER NUT	DUCTILE IRON ASTM A-536 GRADE 80-60-03
16	SHAFT	CARBON STEEL AISI 12L14
17	THRUST COLLAR	CARBON STEEL

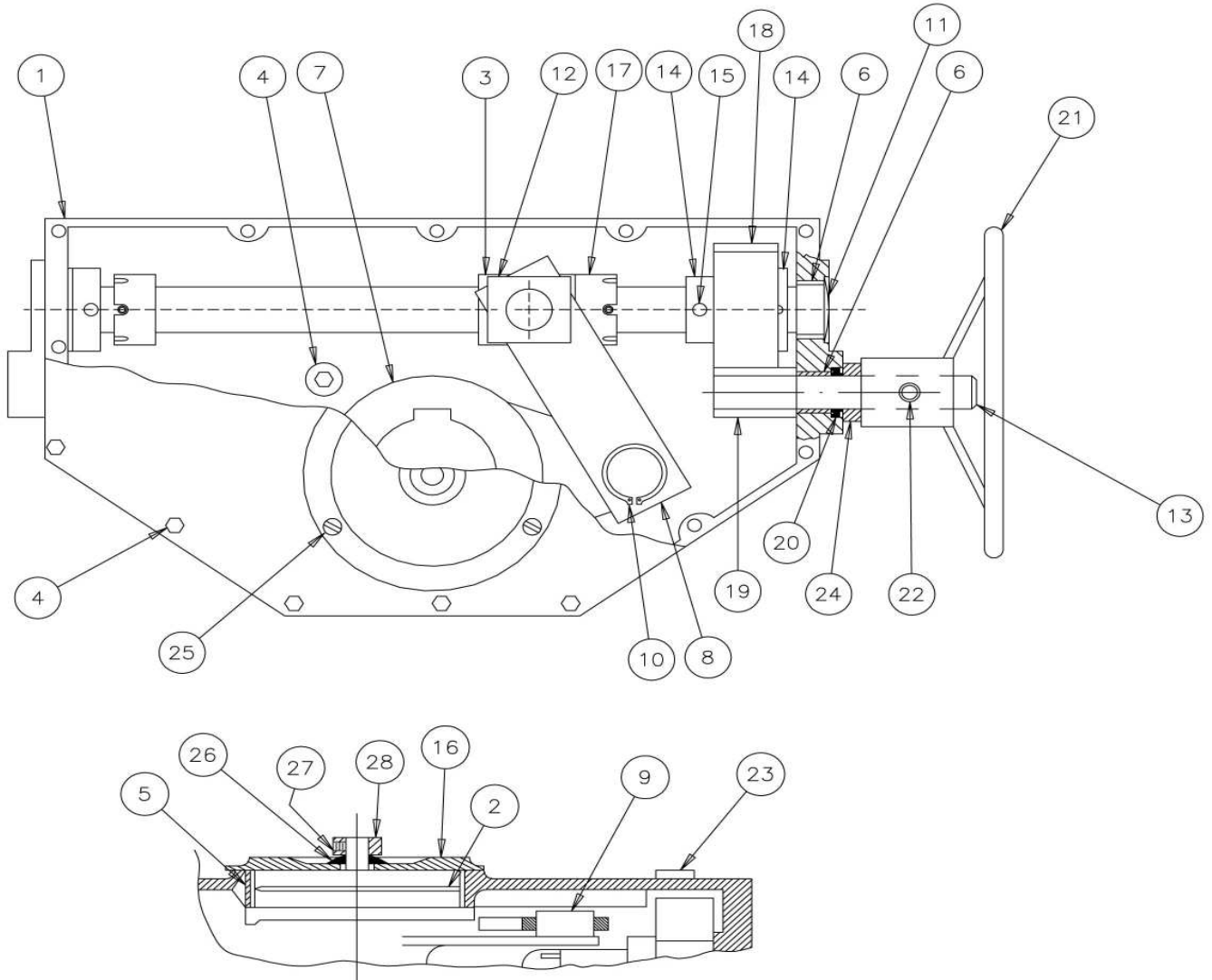
ITEM	DESCRIPTION	DESCRIPTION
18	SPRING PIN	STAINLESS STEEL TYPE 420
19	THRUST RACE	HARDENED STEEL
20	ROLLER BEARING	HARDENED STEEL
21	COLLAR	DUCTILE IRON ASTM A-536 GRADE 80-60-03
22	ADAPTER	CAST IRON ASTM A-48 CLASS 40
23	O-RING	RUBBER BUNA-N
24	CAPSCREW	CARBON STEEL
25	COVER	CAST IRON ASTM A-48 CLASS 40
26	EXPANSION PLUG	STAINLESS STEEL TYPE 304
27	PIPE PLUG	MALLEABLE IRON (GALVINIZED)
28	GASKET	NEOPRENE RUBBER
29	NUT	CAST IRON ASTM A-48 CLASS 40
30	SET SCREW	ALLOY STEEL
31	GROMMET	NEOPRENE
32	INDICATOR ARROW	DIE CAST CHROME PLATE
33	STUD FASTENER	CARBON STEEL



Henry Pratt MDT Actuators

MDT 5S with Handwheel Parts and Material Drawing

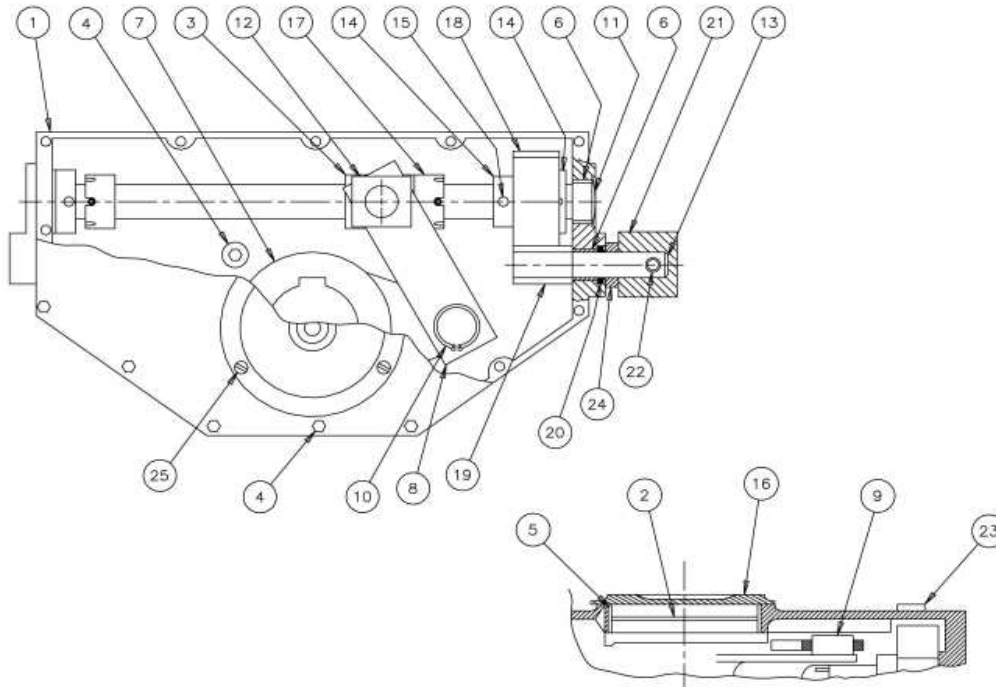
ITEM	DESCRIPTION	MATERIAL	ITEM	DESCRIPTION	MATERIAL
1	HOUSING	DUCTILE IRON ASTM A-536 (65-45-12)	16	INDICATOR	CAST IRON ASTM A-126 CLASS B
2	O-RING	BUNA-N	17	COLLAR	DUCTILE IRON ASTM A-536 (65-45-12)
3	SLIDER BLOCK	ALUM. BRONZE ASTM B148 ALLOY C95400	18	DRIVE GEAR	ALLOY STEEL
4	CAPSCREW	STEEL SAE GR. 2	19	DRIVE PINION	CARBON STEEL
5	BEARING	SINTERED BRONZE	20	WIPER	BUNA-N
6	BEARING	SINTERED BRONZE	21	HANDWHEEL	CAST IRON
7	LEVER	DUCTILE IRON ASTM A-536 (80-60-06)	22	SPRING PIN	CORROSION RESISTANT STEEL
8	LINK	LOW CARBON C.R.S. C-1018	23	PIPE PLUG	MALLEABLE IRON GALVANIZED
9	LINK BEARING	"DU" BEARING MATERIAL	24	CLAMP COLLAR	CARBON STEEL
10	RETAINING RING	CARBON SPRING STEEL SAE 1065-1090	25	SCREW	STEEL SAE GR. 2
11	EXPANSION PLUG	STAINLESS STEEL TYPE 304	26	BEVELED WASHER	BUNA-S
12	SLIDER	ALUM. BRONZE ASTM A-150 ALLOY CA630	27	SET SCREW	STEEL SAE GRADE 5
13	SHAFT	CARBON STEEL AISI B12L14 COLD DRAWN	28	INDICATOR ARROW	DIE CAST CHROME PLATED
14	THRUST COLLAR	CARBON STEEL STRESS PROOF			
15	SPRING PIN	CARBON STEEL			

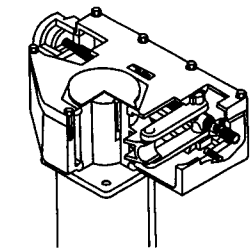
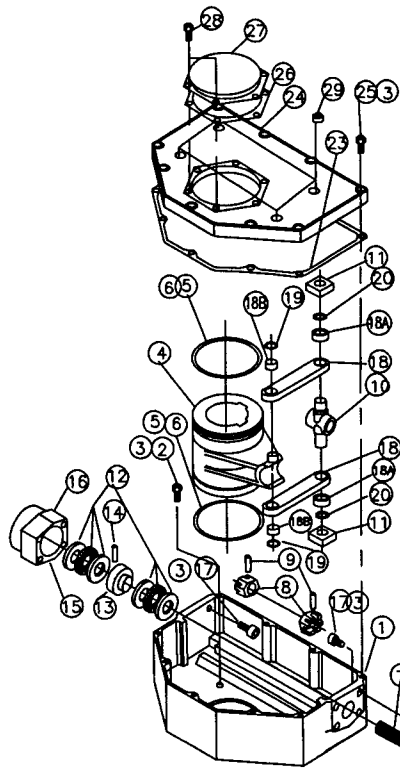


Henry Pratt MDT Actuators

MDT 5S with Buried Service Nut Parts and Material Drawing

ITEM	DESCRIPTION	MATERIAL
1	HOUSING	DUCTILE IRON ASTM A-536 GRADE 65-45-12
2	O-RING	RUBBER BUNA-N
3	SLIDER BLOCK	ALUMINUM BRONZE ASTM B-148 ALLOY C95400
4	CAPSCREW	CARBON STEEL
5	BEARING	SINTERED BRONZE
6	BEARING	SINTERED BRONZE
7	LEVER	DUCTILE IRON ASTM A-536 GRADE 80-60-06
8	LINK	CARBON STEEL AISI 1018
9	LINK BEARING	BRONZE
10	RETAINING RING	CARBON SPRING STEEL
11	EXPANSION PLUG	STAINLESS STEEL TYPE 304
12	SLIDER	ALUMINUM BRONZE ASTM A-150 ALLOY C63000
13	SHAFT	CARBON STEEL AISI B12L14 COLD DRAWN
14	THRUST COLLAR	CARBON STEEL (STRESS PROOF)
15	SPRING PIN	CARBON STEEL
16	INDICATOR	CAST IRON ASTM A-126 CLASS B
17	COLLAR	DUCTILE IRON ASTM A-536 GRADE 65-45-12
18	DRIVE GEAR	ALLOY STEEL
19	DRIVE PINION	CARBON STEEL
20	WIPER	RUBBER BUNA-N
21	NUT	CAST IRON ASTM A-48 CLASS 40
22	SPRING PIN	STAINLESS STEEL TYPE 420
23	PIPE PLUG	MALLEABLE IRON (GALVANIZED)
24	CLAMP COLLAR	CARBON STEEL
25	SCREW	CARBON STEEL

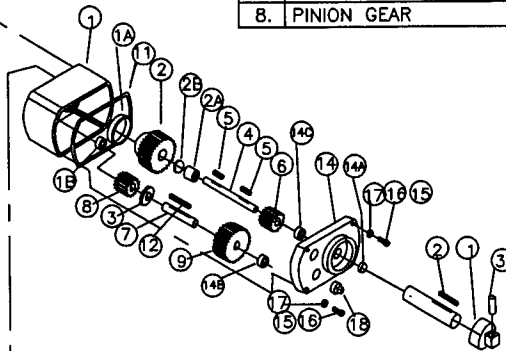




OPERATOR ASSEMBLY SPUR GEAR ASSEMBLY

SPUR GEAR ATTACHMENT

1	SPUR GEAR HOUSING	9.	SPUR GEAR
1A.	BEARING	10.	GREASE
1B.	BEARING	11.	COVER GASKET
2	SPLINED SPUR GEAR	12.	SQUARE KEY
2A.	BEARING	14.	SPUR GEAR COVER
2B.	BACKING PLATE	14A	OIL SEAL
3.	FLAT WASHER	14B	BEARING
4.	SPUR GEAR SHAFT	14C	BEARING
5.	SQUARE KEY	15.	LOCTITE-GR. CV
6.	PINION GEAR	16.	HEX HEAD CAP SCREW
7.	IDLER SHAFT	17.	LOCK WASHER
8.	PINION GEAR	18.	PIPE PLUG



2" SQUARE NUT ASSEMBLY

WHEN ORDERING PARTS PLEASE SPECIFY

1.	PRATT SHOP ORDER AND ITEM NUMBER
2.	OPERATOR SIZE
3.	ASSEMBLY DESCRIPTION
4.	ITEM NUMBER AND DESCRIPTION

2" SQUARE AWWA NUT

1.	2" SQUARE AWWA NUT
2.	SQUARE KEY
3.	HEADLESS SET SCREW

BASIC OPERATOR-BURIED SERVICE

1	HOUSING	16.	THRUST BEARING COVER
2	HEX HEAD CAP SCREW	17.	SOCKET HEAD CAP SCREW
3.	LOCTITE-GR. CV	18.	LINK
4.	LEVER	18A	BEARING
5.	O-RING	18B	BEARING
6.	GREASE	19.	RETAINER RING
7.	SCREW SHAFT	20.	RETAINER RING
8.	TRAVELING STOP	21.	GASKET
9.	DOWEL PIN	23.	GASKET
10.	SLIDER NUT	24.	HOUSING COVER
11.	THRUST BEARING	25.	HEX HEAD CAP SCREW
12.	THRUST COLLAR	26.	COVER GASKET
13.	THRUST COLLAR	27.	COVER
14.	DOWEL PIN	28.	HEX HEAD CAP SCREW
15.	SHIM	29.	PIPE PLUG

Date: 10/14/02
Scale: NONE

Parts and Construction Drawing
MDT-6S
BURIED SERVICE OPERATOR

Drawing No.
E-493-MDT-6S

PRATT