

DEN-CON TOOL COMPANY
DATA BOOK
&
TECHNICAL / OPERATIONAL / SERVICE MANUAL

ELEVATOR / SPIDER

(14" 500-TON)

DEN-CON TOOL COMPANY

DATA BOOK

DATA BOOK INDEX

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SALES, DESIGN AND MANUFACTURING DATA

Safe Working Load: 500 TON

Assembly Location: DEN-CON TOOL CO
5354 S I-35
OKLAHOMA CITY OK 73129

Design: Body halves, top cover, level beam, &
bell guide, made from alloy steel castings. Other
components are made from various alloy.

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WARRANTY:

The Seller warrants that the products covered by this contract will be free from any defects in material and workmanship for a period of 12 months from the date of installation or 18 months from the date of shipment, whichever period first expires. Customer, in accepting the respect to the equipment, acknowledges that it takes the equipment "as is" and that Den-Con makes no warranties or representations with respect to the equipment, including implied expected life cycle of equipment. If, within that period, the Seller receives from Buyer written notice within 3 days of discovery of any alleged defect in or non-conformance of any product and if in the Seller's sole judgment the product does not conform or is found to be defective in material or workmanship, the Buyer shall, at Seller's request, return the part or product F.O.B. to Seller's designated plant. Seller, at his option and expense, shall repair or replace the defective part or product, or repay to Buyer the full price paid for such part or product by Buyer. Any replacement or purchase price shall be without interest. Seller's sole responsibility and Buyer's exclusive remedy hereunder shall be limited to such repair, replacement or repayment of the purchase price as above provided. In case of a defective product or part thereof, not of Seller's manufacture, Seller's warranty liability shall exist only to the extent that Seller is able to recover from its supplier for the same defects. THERE ARE NO OTHER WARRANTIES, EXPRESS, STATUTORY OR IMPLIED, INCLUDING THOSE OF MERCHANTABILITY AND OF FITNESS FOR PURPOSE; NOR ANY AFFIRMATION OF FACT OR REPRESENTATION, WHICH EXTENDS BEYOND THE DESCRIPTION OF THE FACE HEREOF.

The warranties of Seller do not cover and Seller makes no warranty with respect to:

- a. Failures not reported to Seller within the warranty period specified above.
- b. Failures or damage due to misapplication, abuse, improper installation or abnormal conditions of temperature, dirt, or corrosive matter;
- c. Failures due to operation, either intentional or otherwise, above rated capacities or in an otherwise improper manner;
- d. Products which have been in any way tampered with or altered by anyone other than an authorized representative of Seller;
- e. Products damaged in shipment or otherwise without fault of Seller;
- f. Expenses incurred by Buyer in an attempt to repair or rework any alleged defective products;
- g. Failures due to lack of compliance with industry recommended maintenance procedures;
- h. Products rebuilt, welded, heat-treated or subjected to similar processes performed outside Seller's plants, and
- i. Loss of use, downtime, direct, indirect, incidental or consequential damages.

Sole and complete warranty will apply for original purchaser of equipment, and will effect only for time period of warranty. Any claims made beyond the warranty dates, and/or failure to present required documents will void all warranties. This warranty cannot be transferred. Buyer is solely responsible for providing any required documentation, or documentation requested by Seller.

In the event Buyer declines to return the reportedly defective equipment to Sellers location per the terms of this warranty, or request onsite inspection by Sellers personnel or representatives of Seller, Buyer shall be fully responsible for travel expenses incurred by the Seller in addition to a day rate fee. These charges will be made regardless of the final disposition relative to the reportedly defective equipment.

Purchase and use of Den-Con equipment acknowledges complete acceptance of Den-Con Warranty Policy.

Any written notice of an alleged defect, in, or non-conformance of any product must include inspection reports detailing the alleged defect and the industry inspection criteria used, detailed filed operations data, historical inspection and maintenance records, and drawings and /or sketches of the alleged failure area.

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MATERIAL INDICATOR TABLE

14" 500 TON ELEVATOR / SPIDER BODY

ITEM NO.	DESCRIPTION	PART NO.	NO. REQD PER ASSY	TECHNICAL	SPEC	HEAT TREAT
2	LINK RETAINER	13803	2	WROUGHT	4130 HT	
3	ANCHOR SHACKLE	5417	2	PURCHASE		
4	SAFETY SLING	18122	2	PURCHASE		
5	TOP COVER	17913	2	CAST	8620 MOD	32-36 RC
6	LYNCH PIN	7887	4	PURCHASE		
7	LOWER LINK PIN	11989	4	WROUGHT	4130 HT	
8	UPPER LINK PIN	11878	4	WROUGHT	4130 HT	
9	LINK	11877	4	WROUGHT	4130 HT	
10	LEVELING BEAM	11884	2	CAST	4318 (8620 MOD)	32-36 RC
17	MOUNTING BRACKET	11838	1	WROUGHT	A-36	
39	MANUAL LIFT SOCKET	11842	1	CAST	4318 (8620 MOD)	32-36 RC
40	PIVOT PIN	11870	1	WROUGHT	4130 HT	
41	MANUAL LIFT BRACKET	11840	1	WROUGHT	A-36	
42	HINGE PIN, STATIONARY	13807	1	WROUGHT	4140 HT	30-34 RC
43	HINGE PIN, REMOVABLE	13806	1	WROUGHT	4140 HT	30-34 RC
44	GUIDE KEEPER	12896	4	WROUGHT	4130 HT	
45	REGISTER BUTTON	11882	2	WROUGHT	4140 HT	32-36 RC
47	BODY	13802	2	CAST	4318 (8620 MOD)	32-36 RC

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COMPOSITE CATALOG PRODUCT SHEET

CASING ELEVATOR / SPIDER

350, 500 AND 750 TON TOOLS

The Den-Con Casing Elevator/Spiders are available in 350 ton, 500 ton and 750 ton rated capacities. The 350 ton and 500 ton tools will handle 4½ - 14" pipe sizes. A larger 500 ton tool handles 16" - 24½" casing sizes.

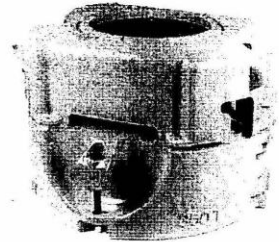
750 ton casing tools are also available in two body sizes. One handles 6⅝" - 14" pipe and the other size is for 16" - 24½" pipe sizes.

All Den-Con Elevator/Spiders are designed for pneumatic operation using the rig air supply. The system may be manually operated if the rig air supply is temporarily lost.

All Elevator/Spider units are manufactured and tested according to the latest industry standards.

4½ to 14 Inch Casing Range											
			350 TON			500 TON			750 TON		
			Elevator/Spider Accessories	P/N	Elevator/Spider Accessories	P/N	Elevator/Spider Accessories	P/N	Elevator/Spider Accessories	P/N	
			Elevator/Spider Body	11776	Elevator/Spider Body	13800	Elevator/Spider Body	16150	Elevator/Spider Body	16150	
			Bell Guide Kit	11798	Bell Guide Kit	11798	Bell Guide Kit	11798	Bell Guide Kit	11798	
			Spider Adapter Plate	19276	Spider Adapter Plate	19276	Spider Adapter Plate	17163	Spider Adapter Plate	17163	
Casing Size (Inches)	Elevator Bottom Guide P/N	Spider Top Guide P/N	Slip Set P/N	Insert Set P/N	Qty Inserts	Slip Set P/N	Insert Set P/N	Qty Inserts	Slip Set P/N	Insert Set P/N	Qty Inserts
4 1/2	11787	18419-1	11865	1456-168-24	40	13842-3	1456-168-32	48	-	-	-
5	11788	18419-2	11864	1459-168-24	40	13842-2	1459-168-32	48	-	-	-
5 1/2	11789	18419-3	11863	1460-40	40	13842-1	1460-48	48	-	-	-
5 3/4	71232	18419-17	11863-17	2741-40	40	13842-4	2741-48	48	-	-	-
6 5/8	11791	18419-4	11861	3156-248-36	60	13841-3	3156-248-48	72	16182-4	3156-248-60	84
7	11791	18419-4	11860	3155-248-36	60	13841-2	3155-248-48	72	16182-8	3155-248-60	84
7 5/8	11792	18419-5	11859	3157-60	60	13841-1	3157-72	72	16182-7	3157-84	84
7 3/4	11792	18419-5	71592-1	2741-60	60	13841-4	2741-72	72	16182-21	2741-84	84
8 5/8	11793	18419-6	11857	2740-328-48	80	13840-3	2740-328-64	96	16182-6	2740-328-80	112
8 3/4	11793	18419-6	71591-3	2742-328-48	80	13840-5	2742-328-64	96	16182-20	2742-328-80	112
9 5/8	11794	18419-7	11856	3157-80	80	13840-1	3157-96	96	16182-3	3157-112	112
9 3/4	71231	18419-15	71591-2	2741-80	80	13840-4	2741-96	96	16182-19	2741-112	112
9 7/8	71231	18419-15	71591-1	2741-80	80	13840-2	2741-96	96	16182-18	2741-112	112
10 3/4	11795	18419-8	11854	2740-408-60	100	13839-3	2740-408-80	120	16182-5	2740-408-100	140
10 7/8	11795	18419-8	71590-1	2742-408-60	100	13839-4	2742-408-80	120	16182-17	2742-408-100	140
11 3/4	11796	18419-9	11853	3161-100	100	13839-2	3161-120	120	16182-2	3161-140	140
11 7/8	11796	18419-9	71590-2	2743-100	100	13839-1	2743-120	120	16182-16	2743-140	140
12 3/4	71300	18419-13	71590-6	2748-408-60	100	70734-6	2748-408-80	120	-	-	-
12 7/8	71300	18419-13	71590-7	2747-408-60	100	70734-7	-	-	-	-	-
13 3/8	11797	18419-10	70732-5	3160-408-60	100	70734-5	3160-408-80	120	16182-10	3160-408-100	140
13 1/2	71228	18419-12	70732-4	2744-408-60	100	70734-4	2744-408-80	120	16182-12	2744-408-100	140
13 5/8	71228	18419-12	70732-3	2745-408-60	100	70734-3	2745-408-80	120	16182-11	2745-408-100	140
13 3/4	71228	18419-12	70732-2	2746-408-60	100	70734-2	2746-408-80	120	16182-13	2746-408-100	140
14	15939	18419-11	70732-1	3159-100	100	70734-1	3159-120	120	16182-9	3159-140	140

16 - 24½ Inch Casing Range									
			500 TON			750 TON			
			Elevator/Spider Accessories	P/N	Elevator/Spider Accessories	P/N	Elevator/Spider Accessories	P/N	
			Elevator/Spider Body	15740	Elevator/Spider Body	16180	Elevator/Spider Body	16180	
			Bell Guide Kit	19000	Bell Guide Kit	19000	Bell Guide Kit	19000	
			Spider Adapter Plate	16552	Spider Adapter Plate	16552	Spider Adapter Plate	16552	
Casing Size (Inches)	Elevator Bottom Guide P/N	Spider Top Guide P/N	Slip Set P/N	Insert Set P/N	Qty Inserts	Slip Set P/N	Insert Set P/N	Qty Inserts	
16	16184	73021	15790-4	3159-180	180	16181	3159-210	210	
16 3/4	16184-1	73021-1	15790-6	3162-180	180	-	-	-	
18 5/8	15794	73029	15790-3	13868-420	420	16179	13868-510	510	
20	15793	73019	15790-2	2745-180	180	16178	2745-210	210	
24	15792	73017	15790-1	3162-180	180	16900	3162-210	210	
24 1/2	15795	73016	15790-5	3159-180	180	16901	3159-210	210	



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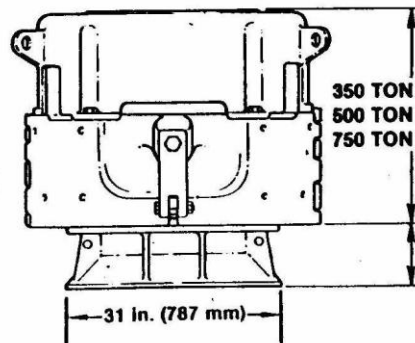
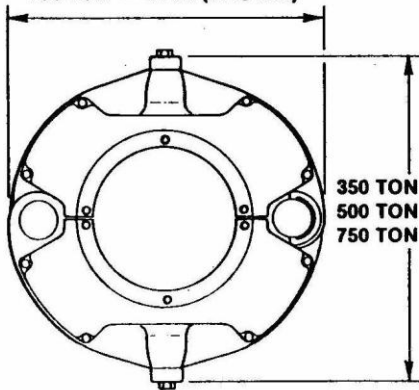
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GENERAL DIMENSIONAL DATA

	350 TON – 14"		500 TON – 14"		750 TON – 14"	
	ENGLISH	METRIC	ENGLISH	METRIC	ENGLISH	METRIC
CASING SIZE RANGE:	4-1/2" THRU 14"	114 THRU 356 MM	4-1/2" THRU 14"	114 THRU 356 MM	6-5/8" THRU 14"	168 THRU 356 MM
MAX SAFE HOOK LOAD:	700,000 LBS	317,518 KG	1,000,000 LBS	455,000 KG	1,500,000 LBS	682,000 KG
APPROXIMATE WEIGHT ELEVATOR / SPIDER (LESS SLIPS & GUIDES):	3,900 LBS	1769 KG	5,000 LBS	2,268 KG	7,500 LBS	3,402 KG
BELL GUIDE KIT:	400 LBS	181 KG	400 LBS	181 KG	410 LBS	186 KG
ADAPTER PLATE:	700 LBS	318 KG	700 LBS	318 KG	1,800 LBS	816 KG
OPERATING PRESSURE:	70 TO 80 PSI, 483 TO 552 KPA					
NORMAL	70 TO 80 PSI, 483 TO 552 KPA					
MAXIMUM	125 PSI, 861 KPA					
APPROXIMATE CYCLE TIME:	1 SECOND					
TO SET SLIPS	1 SECOND					
TO RELEASE SLIPS	2 SECONDS					

350 & 500 TON = 41-1/2 in. (1054 mm)
750-TON = 44 in. (1118 mm)



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INSTALLATION

A. INTRODUCTION

The elevator/spider units are shipped as illustrated in figure 4A. A specified set of slip segments and guide rings are shipped installed.

NOTE:

The slip and guide rings must correspond to casing diameter or damage to slips and casing will result (see table 8A to 8E).

B. INSTALLATION PREPARATION

Clean, dry air, filtered and regulated to 70 to 125 psi is required to operate these units.

C. SPIDER INSTALLATION

NOTE:

*If an adapter plate is used, check to be certain that it is level, so that the spider will be in line with the bore hole. Install the adapter plate with centering lugs faxing up. These stops help to keep the spider centered. If an adapter plate is not used, check with the rotary table manufacturer to be certain that it will support spider unit. When using the 750 ton unit, be certain that the static load-carrying capacity of the rotary table **exceeds** 1,500,000 LBS.*

1. Hoist spider into position over bore hole.
2. Lubricate as indicated on figure 6A.
3. Connect air lines

D. ELEVATOR INSTALLATION

NOTE:

Be certain that links and rig hook are capable of supporting the load capacity on the body of unit (200, 350, 500, or 750 tons).

1. Open elevator link retainers and slid the bottom eyes of links capable of supporting the maximum limit of the elevator, over the lifting lugs.
2. Close and secure link retainers

NOTE:

Be certain that the elevator control handle is on the side that faces the stabbing board, so that the derrick man will have access to it.

3. Lubricate as indicated on figure 6A.
4. Connect air lines

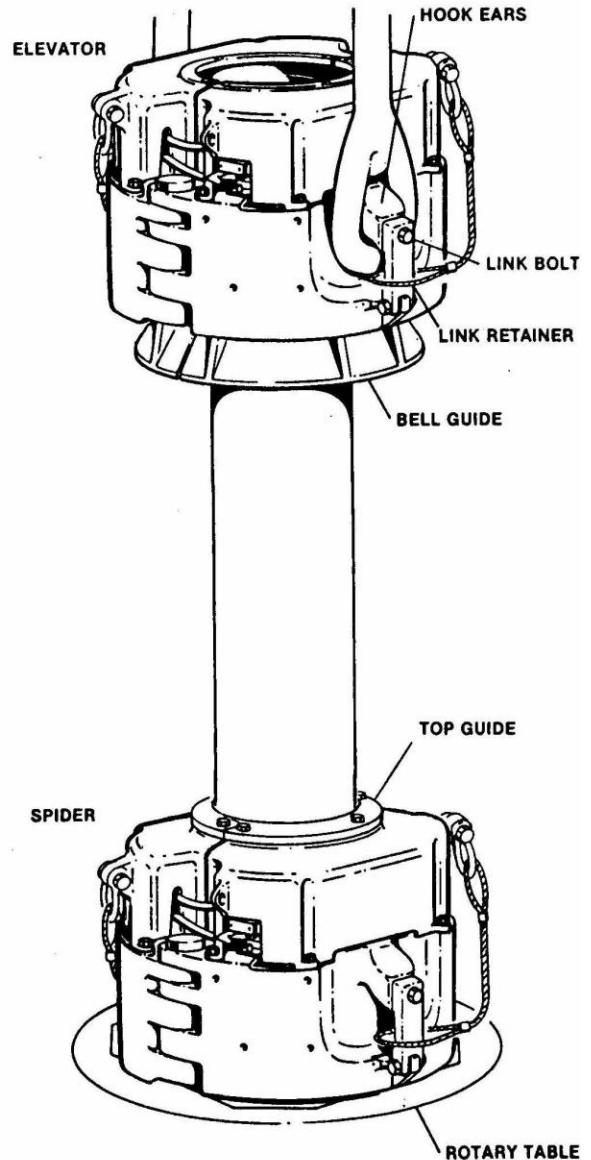


Figure 4A. Elevator and Spider Installed

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INSTALLATION

E. REGULATOR / FILTER AND HOSE INSTALLATION

1. A shutoff valve should be installed on the end of the pipe before installing the regulator / filter. This valve will serve to cut off the air supply in the event that maintenance must be performed on the system.
 - A. Mount the regulator / filter near the air supply line, in the area that allows easy access for service
 - B. Close the shutoff valve. Connect the regulator / filter to the shutoff valve.
- C. Run one 50-foot section of air hose up the derrick, tying it to derrick to prevent damage and keep it clear of the working area. Connect a second 50-foot section to the first and connect its other end to the elevator.
- D. Connect a 25-foot section of air hose to the regulator / filter and the spider.
- E. Open the shutoff valve on the air supply line and adjust the regulator to deliver 70 to 80 psi to the elevator / spider.

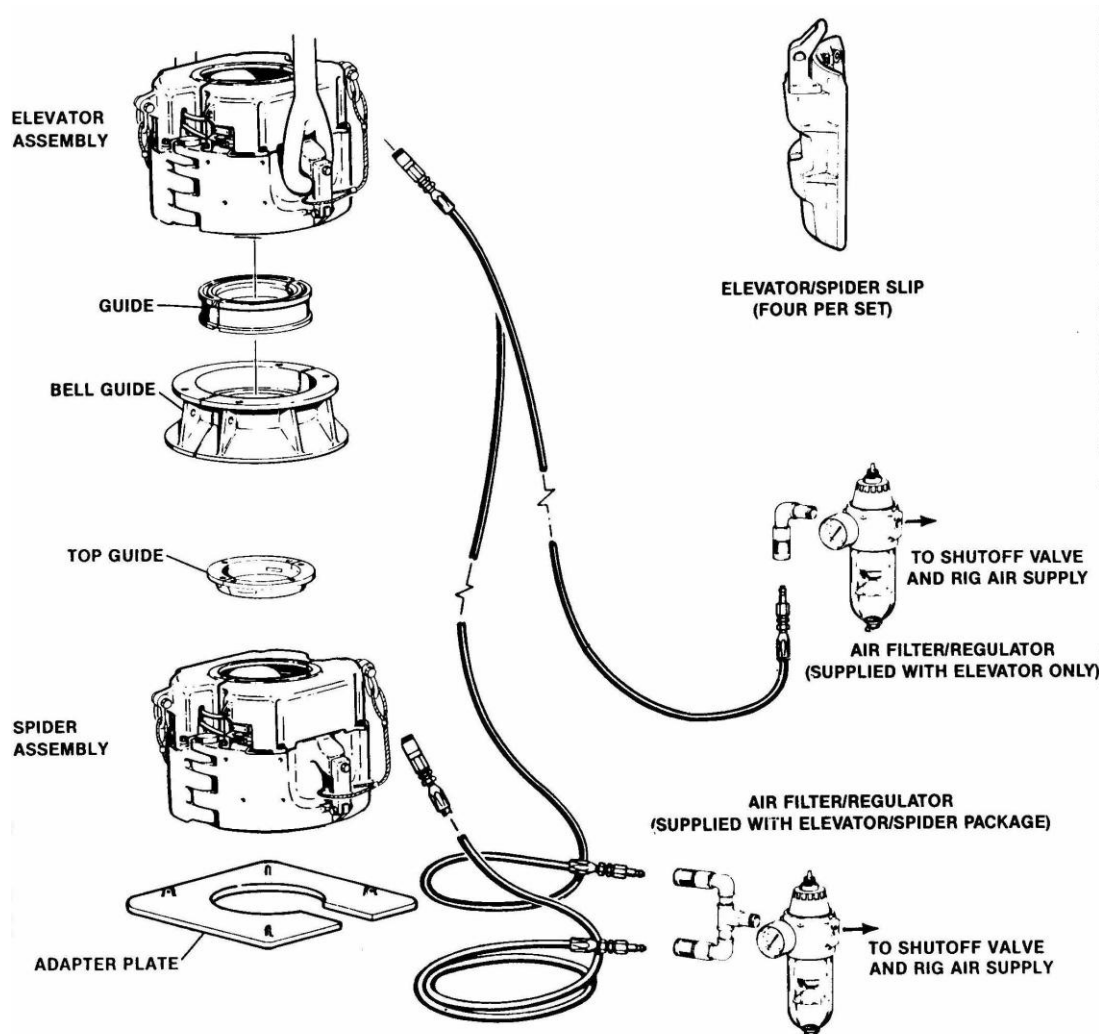


Figure 4B. Elevator/Spider Installation

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INSTALLATION

NOTE:

If tools will not remain permanently with the rig, use two 50-foot air lines. Tie one 50-foot section of hose 45 feet above floor near casing stabber. Attach second section of hose to first hose with the other end to elevator. If tools will remain permanently with

the rig, an air supply line can be run (plumbed) up the derrick. Attach a 50-foot section of hose from the elevator directly to the upper air supply line outlet.

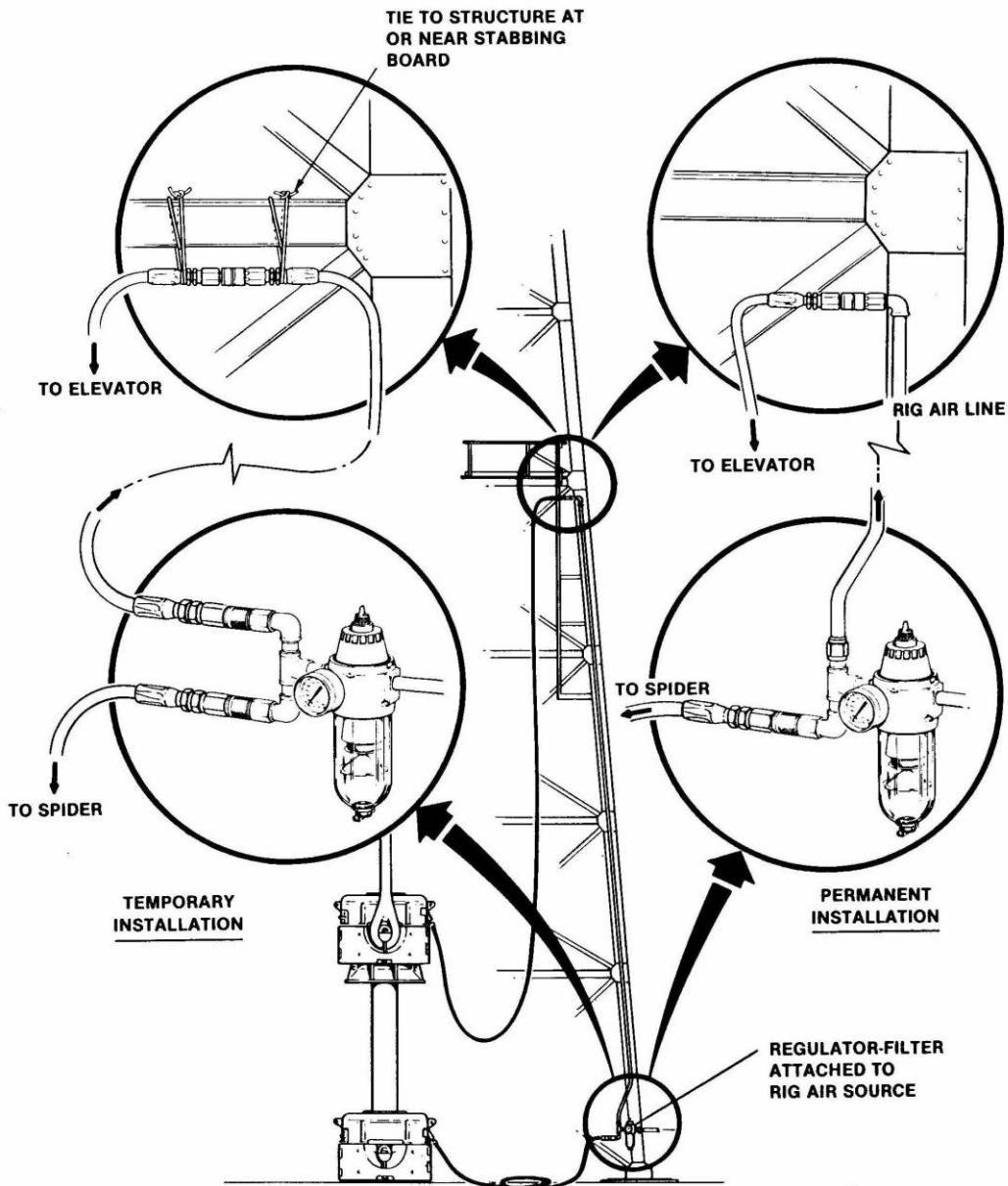


Figure 4C. Regulator/Filter and Hose Installation

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OPERATION

A. OPERATION

The operation of both the elevator and spider is identical. Push the control lever down and the slips will set. Pull the control lever up and the slips will release. If an air pressure failure occurs, the slips can be set by hand.

1. Place a 5-foot pry-bar into the manual lift lever.
2. Push down on bar and move control lever to the "up" position (this moves latch to hold slips up).
3. Set slips by moving control lever down.

B. RUNNING CASING

NOTE:

Slips and guide ring in both the elevator and spider must match the casing size being run (see table 8A to 8E).

1. With the casing string held by the spider, pick up the next joint of casing with a single-joint pickup elevator.
2. Hoist the add-on stand of casing and stab it into the casing string. Make up the joint.
3. Pick up the weight of the casing and then release the elevator. Release spider and lower the casing string.
4. Set the spider slips to grip the casing and then release the elevator slips.

CAUTION:

The spider slips must be set before releasing the elevator slips.

C. CHANGING SLIPS

1. Changing Slips (Figure 5A)

- A. Remove top covers and apply air pressure to raise the slips
- B. With overhead hoist attached to slip lifting eye, pick up enough to take up the weight of the slip.
- C. With slip weight eased, remove lynch pin and slip hanger pin. Hoist slip from body.
- D. Repeat steps B and C for remaining slips.

2. Installing Slips

- A. Clean bowl of all dirt and old grease.
- B. Be sure that replacement slips are clean and the correct size for the casing being run. (Tables 8A to 8E).
- C. Liberally coat the inner body and backs of the slips with a good quality multipurpose, water resistant grease.

NOTE:

Do not use tool joint compound (Dope). It is not a lubricant.

- D. Hoist slip into place and install the slip hanger pin, manipulating the slip with the hoist as necessary to allow the pin to slide all the way in.
- E. Install the lynch pin and loop its ring over the end of the slip hanger pin.

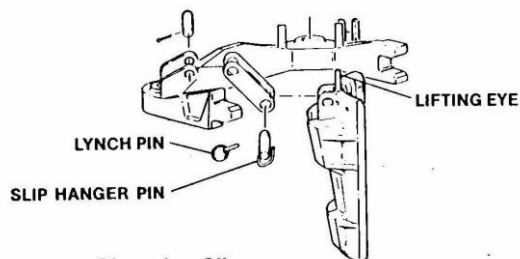


Figure 5A. Changing Slips

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OPERATION

D. CHANGING ELEVATOR BOTTOM GUIDE

1. Using the bail, hoist the removable hinge pin from the body. Swing the body halves apart.
2. Remove bolts and guide keepers. Remove guide halves from both body halves.
3. Thoroughly clean the guide groove.
4. Be certain that replacement guide is the correct size for the casing being run (Tables 8A to 8E).
5. Install guide halves and retain with guide keepers and bolts (Figure 5B).
6. Swing body halves closed and install removable hinge pin.

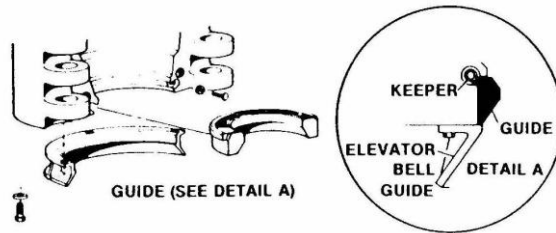


Figure 5B. Elevator Bottom Guide Installation

E. CHANGING SPIDER TOP GUIDE

1. Remove top guide retainer bolts
2. Be certain that replacement guide is the correct size for the casing being run (Tables 8A to 8E).
3. Install guide halves and retain with bolts.

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MAINTENANCE

A. LUBRICATION

Thorough lubrication is important for reliable operation of the elevator / spider. To ensure trouble-free performance, lubricate per figure 6A. The grease used for lubrication should be high-quality multipurpose water-resistant grease (NLGI grade 2). Do not use tool joint compound (Dope). It is not a lubricant.

NOTE:

Lubricate after every 50 joints of casing run, and more frequently if necessary, to prevent slips from sticking in elevator or spider body. Lubricate with the slips set without any casing load on tool.

B. REGULATOR / FILTER MAINTENANCE

1. Open petcock at bottom of the bowl and drain accumulated water. Close petcock when water stops flowing.
2. Remove filter element and clean with kerosene or diesel fuel every 3 months, or more often if required.

NOTE:

Plastic filter bowl can be damaged and fail if strong solvents or oils containing fire-retardant additives are used for cleaning.

3. Use kerosene or warm water to clean the filter bowl.

C. LUBRICATOR MAINTENANCE

1. Close shutoff valve.
2. Remove self-venting fill plug.
3. Fill reservoir to within ¼ inch of top bowl with SAE 10 oil; for temperatures below 20° F (-7° C) use a mixture of equal parts of SAE 10 oil and diesel fuel.
4. Install fill plug
5. Open shutoff valve one turn.

TABLE A. TROUBLE SHOOTING

SYMPTOM	PROBABLE CAUSE	REMEDY
Slips do not operate or operate slowly in both directions	<ul style="list-style-type: none"> ➤ Air pressure is too low ➤ Air line kinked or leaking ➤ Lubricator oil lever low ➤ Control valve faulty * ➤ Defective cylinder seal 	<ul style="list-style-type: none"> ➤ Check air pressure at regulator Adjust as necessary ➤ Straighten or replace ➤ Fill (above C. Lubricator maintenance) ➤ Replace ➤ Replace
Casing slides thru set slips or casing is damaged	<ul style="list-style-type: none"> ➤ Incorrect slip segments or inserts mixed with correct slip segments or inserts ➤ Worn or reshaped inserts 	<ul style="list-style-type: none"> ➤ Install correct slip segments or inserts ➤ Replace with new inserts
Slips sticking in bowls	<ul style="list-style-type: none"> ➤ Inadequate lubrication 	<ul style="list-style-type: none"> ➤ Clean backs of slips and inside of bowl (Figure 6A)

* Air escaping from the control valve does not necessarily mean that the control valve is faulty. If there is a defective cylinder O-ring seal, the air leaking through the cylinders will be released back through the control valve. If control valve leakage is suspected, remove valve from unit and test. If valve is not leaking, inspect cylinder assemblies for defective seals.

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MAINTENANCE

TABLE B. LUBRICATION SCHEDULE

REF. FIG 6A	ITEM	NUMBER OF LUBE POINTS	APPLICATION	LUBE CYCLE
1	Bowl / Slip Surfaces	16 (200, 350 & 500 Ton) 32 (750 Ton)	Multi Purpose Water-Resistant Grease	* See Below
2	Cylinder Assemblies	4	Multi Purpose Water-Resistant Grease	Before each Job
3	Hinge Pins	2	Multi Purpose Water-Resistant Grease	Before each Job
4	Control Valve & Latch	3	Multi Purpose Water-Resistant Grease	Weekly
5	Link Pins	8	SAE 10 Oil	Weekly

* Lubricate after every 50 joints of casing and more frequently if necessary to prevent slips from sticking in the elevator or spider body. To lubricate properly, the slips should be in the set position without any casing load on unit.

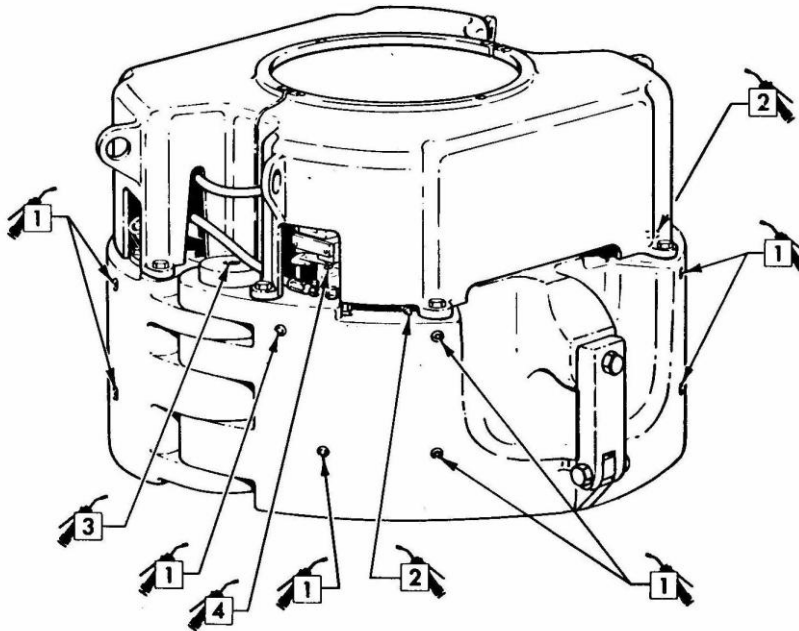


Figure 6A. Lubrication Points

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DISASSEMBLY, INSPECTION, AND ASSEMBLY

DISASSEMBLY AND INSPECTION

NOTE: ALL DISASSEMBLY SHOULD BE PERFORMED IN A DRY, DIRT-FREE AREA.

A. ELEVATOR / SPIDER DISASSEMBLY

1. Raise slips to the up (release) position.
2. Use an overhead lift to remove cover halves, after removing hex head bolts and lock washers.
3. Remove slip segments, as described in paragraph 5C.
4. Remove upper link pins and cotter pins to remove links.
5. Remove air lines to control valve, lubricator, and air cylinders.
6. Remove lubricator and pipe nipple that attaches it to mounting bracket.
7. Remove bolts and lock washers holding lubricator mounting bracket in position.
8. Remove bolts and lock washers holding control valve in position. Disassembly of unit is described in part C.
9. Remove nut, lock washer, and flat washer from each air cylinder rod.
10. Remove bolt leveling beams.
11. Remove hex-head bolts, lock washers, and cylinder retainers. Disassembly of cylinders is described in part B.
12. Remove hinge pin and open elevator / spider body.
13. Remove guides.

INSPECTION OF ELEVATOR / SPIDER

ITEM	LIMITS
Leveling Beam	➤ Check for distortion, bent or worn bracket supports
Links, Link Pins, and Pivot Pins	➤ Check for galling and out-of-round in pivot pins. (Pins should be capable of being rolled on a flat surface without evidence of out-of-round).
Slip Segments	➤ Check for worn inserts, cracked or distorted slip body, and worn link pin mating surface.
Bell Guide	➤ Check that elevator bell guide bolts are tight
Grease Fittings	➤ Check that grease fittings are not plugged and threads are not stripped or damaged
Hinge Pins	➤ Check for bent or otherwise damaged hinge pins. Check that bail on removable pin is securely attached.

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DISASSEMBLY, INSPECTION, AND ASSEMBLY

B. CYLINDER DISASSEMBLY

1. Remove snap ring from cylinder barrel at rod end.
2. Pull and remove gland assembly. Remove wiper ring and seals from gland.
3. Carefully remove piston rod with piston head.
4. Remove snap ring to separate piston head from rod. Remove dowel pin from rod.
5. Remove seals and back-up rings from piston head.
6. Remove snap ring from piston from piston end of cylinder barrel.
7. Remove blank end and seal from groove in blank end.

INSPECTION OF AIR CYLINDER

ITEM	LIMITS
Barrel	➤ Check barrel for scoring, galling, distortion and excessive wear.
Piston and Gland	➤ Check for worn or cracked shoulders and scratched or damaged sealing surfaces that would cause leakage.
Piston Rod	➤ Check rod diameter for distortion, galling, and metal wear.

C. VALVE AND LATCH DISASSEMBLY

1. Remove grease fittings.
2. Remove screw and lock washers that retain spring cover.
3. Remove latch plate springs. Roll pins, valve link, valve handle and latch plate.
4. Remove screws and lock washers that retain holding plate.
5. Remove screws, nuts and lock washers that retain the air control valve.
6. Remove screws and hi-collar lock washers that hold the lock spring retainer and spring.
7. Remove dowel pin and lock down.

INSPECTION OF VALVE AND LATCH ASSEMBLY

ITEM	LIMITS
Latch Plate Springs	➤ Check that springs have equal length and will return to 3 inches after being fully compressed. Check for broken or distorted coils.
Valve Mechanism	➤ Check for smooth lever action and slip operation without binding or malfunction.

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DISASSEMBLY, INSPECTION, AND ASSEMBLY

ASSEMBLY

NOTE: ALL ASSEMBLY SHOULD BE PERFORMED IN A DRY, DIRT-FREE AREA. IT IS RECOMMENDED THAT ALL NEW SEALS BE INSTALLED TO ASSURE RELIABLE OPERATION. LUBRICATE ALL SEALS AT TIME OF ASSEMBLY.

A. VALVE AND LATCH ASSEMBLY

1. Insert dowel pin (12) in lock down (13) and install in valve bracket (14).
2. Insert spring (11) into lock down and cover with lock spring retainer (10). Attach retainer with screws and hi-collar lock washers.
3. Attach air control valve with screws, nuts and lock washers.
4. Attach holding plate with screws and lock washers
5. Attach valve link to valve handle with roll pin.
6. Install latch plate and valve handle with valve link and retain with roll pin through valve handle body.
7. Install latch plate springs and retain with spring cover, screws and hi-collar lock washers.
8. Install grease fittings.

B. AIR CYLINDER ASSEMBLY

1. Install seal in groove in blank end.
2. Install blank end in cylinder barrel and retain with snap ring.
3. Install seals and back-up rings in piston head.
4. Install dowel pin in piston rod. Attach piston head to piston rod with snap ring.
5. Insert piston rod with piston head into cylinder barrel.
6. Install wiper ring and seats in gland. Insert gland into cylinder over piston rod.
7. Install snap ring in cylinder barrel at rod end.

C. ELEVATOR / SPIDER ASSEMBLY

1. With stationary hinge pin in place, open body halves.
2. Install the four air cylinders, with air and grease fittings, into the elevator / spider body. Secure in position with bolts, lock washers and cylinder retainers.
3. Install leveling beams with the valve mounting plate positioned in the stationary hinged side of the body. Locate dowel pin in cylinder rod end with slots in leveling beam.
4. Install valve and latch mechanism and attach with bolts and lock washers. Position lever in down position.
5. Install manual lift assembly with bolts and lock washers.
6. Install lubricator, pipe nipple and bracket with bolts and lock washers.
7. Attach leveling beams to air cylinder rods with nuts, lock washers and flat washers. Be certain that cylinder rod dowels are engaged in slots in leveling beams.
8. Install pneumatic lines as indicated.
9. Install slip support links with upper link pins and cotter pins. Install slips as described in paragraph 5C.
10. Attach cover halves with bolts and lock washers and then install the safety sling.

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14" 500 TON ASSEMBLY PARTS LISTING

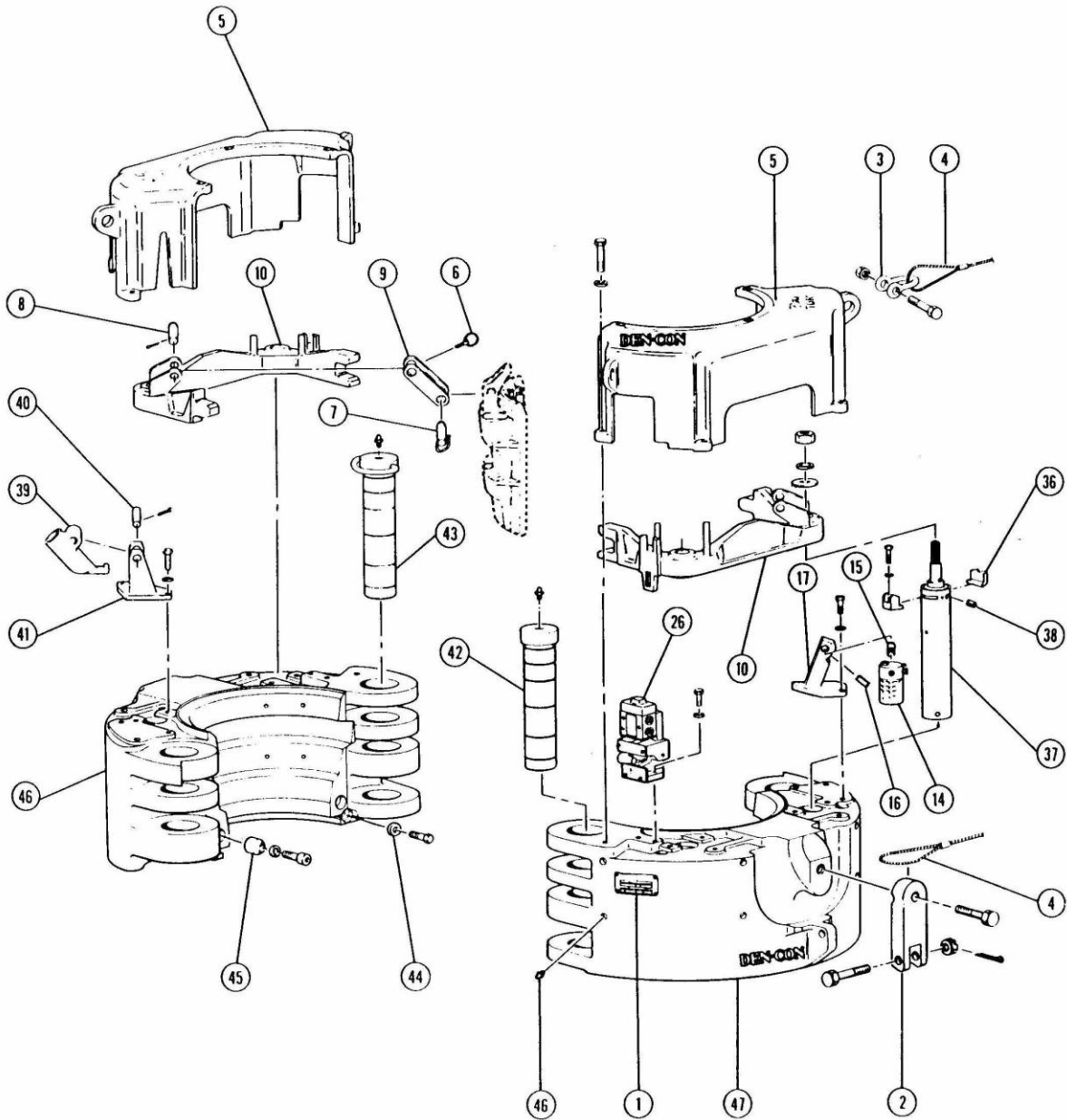
ITEM NO.	DESCRIPTION	PART NO.	NO. REQD PER ASSY
	ELEVATOR/SPIDER 14" 500, TON	13800	REF.
1	NAMEPLATE	13812	1
ATTACHING PARTS			
1A			
2	LINK RETAINER	13803	2
2A	COTTER PIN	51402-16	2
2B	SLOTTED NUT	50516	2
2C	BOLT	15261	2
2D	SCREW	13805	2
3	ANCHOR SCHAKLE	5417	2
4	SAFETY SLING	18122	2
5	TOP COVER	17913	2
5A	SCREW	50010-16-C5	8
5B	LOCKWASHER	50910-C	8
6	LYNCH PIN	7887	8
7	LOWER LINK PIN	11989	4
8	UPPER LINK PIN	11878	4
8A	COTTER PIN	51403-12-S	8
9	LINK	11877	8
10	LEVELING BEAM	11884	2
10A	HEX NUT	55220-H	4
10B	LOCKWASHER	50920-C	4
10C	FLATWASHER	50820-R	4
11	INLET TUBE	12632-2	1
12	CONNECTOR	56501-6-6-S	1
13	ELBOW, 90°	56506-6-6-S	1
14	LUBRICATOR	11836	1
15	PIPE NIPPLE	56703-6-6-S	1
16	COUPLER NIPPLE	56506-6-6-S	1
17	MOUNTING BRACKET	11838	1
17A	SCREW	50008-12-C5	2
17B	LOCKWASHER	50908-C	2
18	UPPER HOSE ASSY	12635-4	1
19	LOWER HOSE ASSY	12638-5	1
21			

ITEM NO.	DESCRIPTION	PART NO.	NO. REQD PER ASSY
22			
23			
24	TEE	56507-6-6-S	1
25			
26	VALVE & LATCH ASSY	16822	1
26A	SCREW	50008-8-C5	2
26B	LOCKWASHER	50908-C	2
27			
28			
29			
30			
31			
32			
33	LOWER HOSE	12633-2	2
34	CONNECTOR	56506-4-6-S	2
36	CYLINDER RETAINER	11849	8
36A	SCREW	50008-12-C5	8
36B	LOCKWASHER	50908-C	8
37	AIR CYLINDER ASSY	11800	4
38	PIPE PLUG	53002-02-C	4
39	MANUAL LIFT SOCKET	11842	1
40	PIVOT PIN	11870	1
40A	COTTER PIN	51402-12	2
41	MANUAL LIFT BRACKET	11840	1
41A	SCREW	50008-8-C5	2
41B	LOCKWASHER	50908-C	2
42	HINGE PIN STATIONARY	13807	1
43	HINGE PIN REMOVABLE	13806	1
44	GUIDE KEEPER	12897	4
44A	SCREW	50008-8-C5	4
45	REGISTER BUTTON	11882	2
45A	SCREW	50112-10-C	2
45B	LOCKWASHER	51112	2
46	GREASE FITTING	53201	16
47	BODY	13802	2

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14" 500 TON ELEVATOR / SPIDER ASSEMBLY

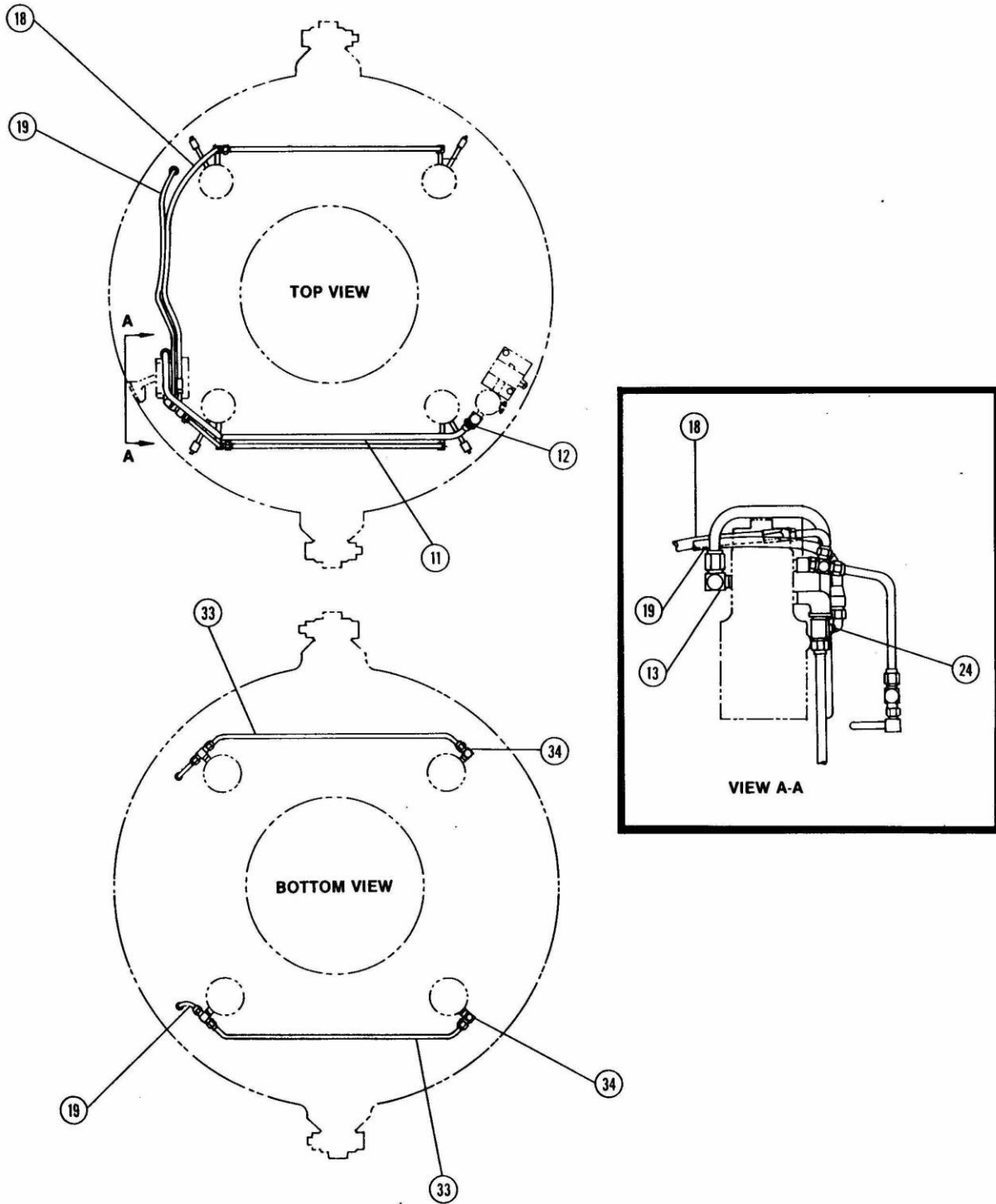


500 Ton Elevator/Spider Assembly (Sheet 1 of 2)

DEN-CON TOOL COMPANY

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14" 500 TON ELEVATOR / SPIDER ASSEMBLY



500 Ton Elevator/Spider Assembly (Sheet 2 of 2)