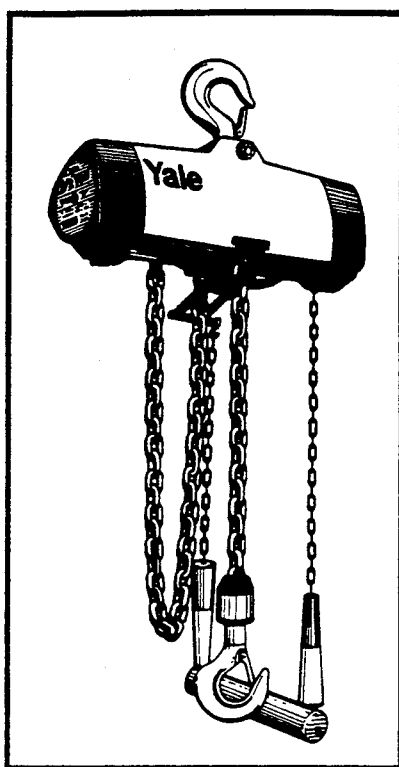


Yale®

OPERATING & MAINTENANCE INSTRUCTIONS WITH PARTS LIST PUBLICATION PART NO. 3325

AIR HOISTS

AIR POWERED CHAIN HOIST



ACL SERIES

1/4 TON — 6 TON

IMPORTANT — CAUTION

This manual contains important information for the correct installation, operation and maintenance of the equipment described herein. All persons involved in such installation, operation, and maintenance should be thoroughly familiar with the contents. To safeguard against the possibility of personal injury or property damage, follow the recommendations and instructions of this manual and keep it for further reference.

WARNING

The equipment shown in this manual is intended for industrial use only and should not be used to lift, support, or otherwise transport people.

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SAFETY

SAFE HOISTING PRACTICES

For your own safety and that of your fellow workers. Material Handling Equipment must be used as recommended by the Manufacturer. Failure to heed the following recommendations could endanger your life. Use good common sense and judgment at all times. Safety is the responsibility of the operator of the equipment. You must be competent and attempt to foresee and avoid all hazardous conditions. To be safe as possible, the hoist must be given proper preventive maintenance and testing as described in the ANSI B30.16 Safety Code for Overhead Hoists and this manual.

BEFORE OPERATING HOIST

1. Do not operate hoist unless you are properly trained, physically fit, and authorized to do so. You must be familiar with all operating controls of the hoist, warnings and instructions on the hoist, the safe hoisting practices listed in this manual. ANSI B30.16 Safety Code for Overhead Hoists, and all pertinent Federal, State, and local regulations before beginning operation.
2. Do not allow unqualified personnel to operate the hoist.
3. On powered hoists, test all controls and limit switches and make sure hoist is well lubricated at beginning of each shift. Make sure needed lubrication, adjustments or repairs are made by appointed personnel before operations are begun.
4. Be familiar with the equipment and its proper care. Do not operate hoist if adjustments or repairs are necessary, if any damage or undue wear is known or suspected, or if any warnings, operating or capacity instructions normally attached to hoist are damaged, obscured or missing. Report same promptly to the proper person and also notify next operator when changing shifts.
5. Do not operate hoist if it is functioning improperly.
6. Do not operate hoist with an out-of-order sign attached until sign has been removed by a properly authorized person.
7. Do not adjust or repair hoist unless qualified for maintenance of hoist.
8. On powered hoists, be sure the power supply is disconnected before maintenance and repair procedure is performed.
9. Do not use the chain as a ground for welding.
10. Do not touch a welding electrode to the chain.

APPLYING THE LOAD

1. Never wrap the hoist chain around the load, or allow it to drag under load.
2. Always use slings or other approved devices to attach load.
3. Be sure the sling is properly seated in the saddle of the hook. Do not allow hook latch to support any part of load.
4. Do not apply a load to tip of hook, or in such a way as to cause bending or prying forces on the hook or hook support block.

5. Be sure chain is not kinked or twisted or that multiple part chains are not twisted about each other.
6. Do not operate hoist if chain is not seated properly in the pocket wheels.
7. Center hoist unit over the load before lifting. Avoid side pull.
8. Never pick up a load beyond the rated capacity appearing on the hoist, except for properly authorized tests.

MOVING THE LOAD

1. Do not engage in any activity which will divert your attention while operating hoist.
2. Respond to signals from designated personnel only, except for stop signals.
3. Never lift a load with the hoist until you and all other personnel are clear of load.
4. Make sure a load clears neighboring stock piles or machinery before moving.
5. On powered hoists, inch the hoist slowly into engagement with a load, but avoid excessive jogging, inching, and quick reversals of load.
6. Do not lift load more than a few inches until it is well balanced in the sling or lifting device.
7. Each time a load approaching rated capacity is handled, check load brake action by raising load just clear of supports and continuing only after you are sure brake is operating properly.
8. Do not transport load over personnel.
9. Never carry personnel on the hook or the load.
10. Avoid swinging of load or load hook when traveling the hoist.
11. On trolley mounted hoists, avoid sharp contact between trolleys, or between trolleys and rail stops.
12. On powered hoists, do not use limit devices as a normal means of stopping the hoist. These are emergency devices only.
13. On powered hoists, do not exceed the maximum duty cycle specified by the manufacturer.

PARKING

1. Do not leave a load suspended in the air for extended or unattended periods.
2. On powered hoists, keep load block above head level when not in use.

SAFETY LAWS FOR PASSENGER ELEVATORS

The safety laws for passenger elevators specify construction details that are not incorporated in Yale Hoists. We recommend that passenger elevator operation equipment be used that meets all state and national safety codes. Duff-Norton will not accept responsibility for applications of Yale Hoists on passenger elevators.

INSPECTION, PREVENTIVE MAINTENANCE AND TESTING

A preventive maintenance program should be initiated for this hoist immediately after it is entered into service. The preventive maintenance program should comply with recommendations in the applicable Yale Hoists Parts and Instructions Manual, and

all pertinent Federal, State, and local regulations. Regular inspections, maintenance, and testing required should be followed for the life of the hoist and written inspection records kept as specified. Sample inspection check lists are included at the back of this manual. Extra inspection check lists can be obtained from you nearest authorized Yale Hoists Distributor.

SECTION II INSTALLATION

GENERAL INFORMATION

The compressed air supply must be dry and clean. A filter and oiler should be used in the supply line.

The hoist is designed to operate at 90 psig. for rated load. The pressure should never exceed 102 psig. The supply hose size must be a minimum of 1/2 inch.

The vane motor and the link chain must be lubricated regularly. See the instructions under "Lubrication."

Make sure that the hoist hangs freely so that it can be turned around the suspension hook.

Before hanging up the hoist, attach the twist rod control or the pendant control if used. To attach these to hoist see the instructions provided with the controls on pages 23 and 27 of this manual. If the accompanying chain control is to be used, it should be attached with the "S" Hooks to the control yoke (7) as shown in figures 1 and 2.

After the hoist has been hung up by the suspension hook, it is advisable to lock the safety pawl on the hook with a screw or pin.

INSTRUCTION FOR INSTALLING CHAIN

To install the chain the hoist should be hung up by the suspension hook and connected to the air supply line. The air pressure should be reduced to approximately 14.5 psig. The hoist is furnished with a steel wire which is fastened around the chain wheel (see 6 in figures 1 and 2.)

1. ACL 1/4 And 1/2 Ton Hoists (Reference Figure 1).
 - a. Remove the locking ring (2) and the pin (3).
 - b. Insert the end link of the chain into the hook holder (1) and lock with the pin (3) then add the locking ring (2).
 - c. Attach the opposite end link of the chain to the accompanying steel wire on the lifting side at A.
 - d. With the aid of the steel wire pull the end link up into the chain guide (4). NOTE: To prevent a twist in the chain the end link put in guide must be turned as shown by D in figure 1. The standing link of the chain must have the chain weld away from the center of the chain wheel (6) as shown by E in figure 1.
 - e. Drive the hoist carefully in the lowering direction, it must not be driven in the lifting direction at this point.

until the end link drops into one of the chain wheel pockets, which will be felt in the pulling wire.

- f. Now drive the hoist slowly in the lifting direction, continuing to pull the steel wire.
 - g. Secure the end link with the screw (5), without twisting the chain.
2. ACL 1 Ton Hoist (Reference Figure 2)
 - a. The chain must be cut in such a manner to provide an odd number of links. This is done to ensure that the chain will not be twisted if installed properly.
 - b. Attach one end link of the chain to the accompanying steel wire on the lowering side at B.
 - c. With the aid of the steel wire pull the end link up into the chain guide, the end link must be turned as shown by D in figure 2. The standing link of the chain must have the chain weld away from the center of the chain wheels (6) as shown by E in figure 2.
 - d. Drive the hoist carefully in the lifting direction, it must not be driven in the lowering direction at this point, until the end link drops into the chain wheel, which will be felt in the pulling wire.
 - e. Now drive the hoist slowly in the lowering direction, continuing to pull the steel wire.
 - f. Attach the same end link to the steel wire which has been passed through the hook casing (9). Pull the chain through the hook casing. NOTE: Do not twist chain. The end link must be turned as shown by D in Figure 2. The standing links of the chain must have the chain weld away from the center wheel as shown by E in figure 2.
 - g. Secure the same end link of chain, without twisting, in the recess C of the chain guide (4) by means of the pin (10). Lock the pins with pins (11).
 - h. Secure the opposite end link of chain with screw (5) without twisting the chain.
 - i. Double check to ensure that the chain has not been twisted.

MAINTENANCE

GENERAL INFORMATION

Take the hoist out of service for a checkup at the slightest sign of a problem. Even if it works satisfactorily, it should be taken apart regularly for a thorough overhaul and cleaning. This overhaul should be carried out at least once a year or more frequently as found by experience, depending on the frequency of use and the surroundings in which the hoists are used. For dismantling and assembly procedures see below.

The strainer at the air connection nipple should be cleaned at regular intervals so that it will not cause throttling and thus reduced lifting capacity.

LUBRICATION

The vane motor is lubricated with oil which is supplied from a lubricator located in the air supply line. The lubricator should be located as close to the hoist as possible. Check that the oil supply is satisfactory.

Gear wheels, ball bearings and needle bearings in the planetary gears are lubricated with a special grease in accordance with the recommendation table. The grease must be changed as part of the overhaul procedure. The amount needed is 5 fluid ounces, half of which is applied in the space between gear rims and housings.

The link chain must be lubricated regularly, in the unloaded condition. Use Keystone No. 2 graphited oil for chain, Shell macoma oil 85 or equal.

Always use lubricants of good quality. See table for examples of lubricants which satisfy the requirements but equivalent grades of other reputable brands can also be used.

BRAKE ADJUSTMENT (REFERENCE FIGURE 3)

The disc brake on the hoist has been correctly adjusted. If readjustment is necessary, proceed in accordance with the following instructions.

1. Connect the hoist to the air supply and drive it very slowly in the lifting direction.
2. Screw in the adjusting screw (12) until the hoist stops or clearly slows down.
3. Back-off the adjusting screw about one eighth of a turn so that the hoist rotates easily again.

NOTE: If the brake cannot be adjusted in accordance with these directions, the brake shoes and brake discs should be cleaned.

ADJUSTMENT OF TRAVEL LIMIT ON CONTROL YOKE (REFERENCE FIGURES 1 AND 2)

The control yoke (7) has two screws (8), with which the travel in the lifting and lowering direction respectively can be limited. These screws are locked with nuts. The hoist is adjusted so that the control yoke (7) is stopped mechanically

against the chain guide (4) before the moving parts of the control valve are stopped mechanically. By this means, over loading of these parts are eliminated. If necessary, the screws can be used for reduction of the lifting and lowering speeds.

INSPECTION OF CHAIN

Check regularly that chain wear does not exceed the limits stated below. Whenever the link chain is changed the chain wheel should also be inspected for wear.

Measurement of chain should be made with a caliper gauge. Check that the inside measurement over seven well stretched links does not exceed $5\frac{3}{16}$ inches (131.6 mm).

FUNCTION TESTING AFTER HOIST REPAIR

After repair of hoist, test with a slight load for proper function. If load sustaining parts have been altered, load test unit with 125% of the rated capacity by lifting and lowering through a short distance. Also test operation of brake, travel limit device and any other parts that were involved in the repair. (If no load sustaining parts were repaired or altered, a normal load lifted may be used for test). A written report of the test should be prepared by the person responsible and kept on file for future reference.



CAUTION Prior to test, all supporting structures, anchorages, and/or suspensions must be approved by the appointed person for the test loads used.

DISMANTLING AND ASSEMBLY PROCEDURES

Before overhauling it is suggested that you acquire the recommended spare parts (see the Repair Parts section), the proper lubrication, sealing and tightening compounds.

For Dismantling and Assembly Procedures use common practice procedures while referring to the Repair Parts section to identify parts and their relative positions. Also, refer to the Installation and Maintenance sections.



CAUTION Metric/Inch

The AC Series Hoists were designed to Metric specifications, therefore, metric wrenches and tools should be used. Metric and inch fasteners are not interchangeable. **DO NOT SUBSTITUTE** one for the other.

Use metric fasteners only, as indicated in the Repair Parts section.

INSTALLING CHAIN, BRAKE AND TRAVEL LIMIT ADJUSTMENT

ACL SINGLE REEVED

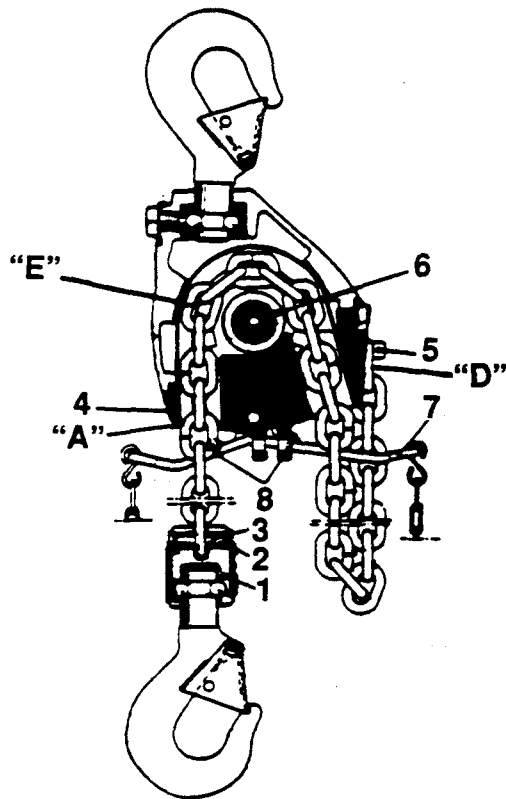


FIGURE 1

ACL DOUBLE REEVED

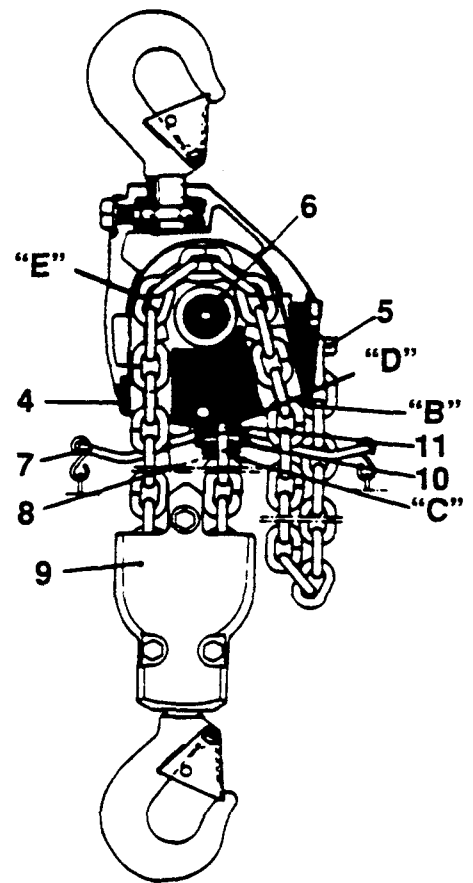


FIGURE 2

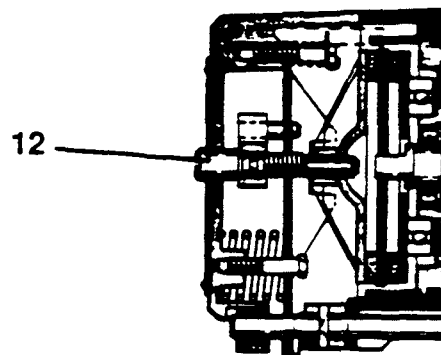


FIGURE 3

LUBRICATION TABLE

Brand Name	Lubrication Oil		Grease	
	Temperature of the Ambient Air, Approximate		For Planetary Gears	For Ball and Needle Bearings
	5°F to 50°F (– 15°C to 10°C)	32°F to 86°F (0°C to 30°C)		
BP	Energol RD 80	Energol RD 80 or RD 150	Energrease GSF	Energrease LS-EP 2
Castrol	Hyspin AWS 10	Magna SPX		Spheerol EP L2
Esso	Arox EP 38	Arox 45 or EF-118		Beacon 2
Gulf	Rock Drill 44	Rock Drill 44 or Merit 47		Gulfcrown Grease EP No. 2 Gulf Universal Grease
MOBIL	Almo Oil 1	Almo Oil 1	PR 103 B	Mobilplex 48
Nynas	LB-41	LB-31		FL 3-42 EP
Shell	Tellus Oil 15	Tonna R Oil 27	Tivela Compound	Alvania Grease EP 2
Texaco	Rock Drill Lubricant EP5W	Rock Drill Lubricant EPL		Multifak EP 2

SECTION IV

REPAIR PARTS

REPAIR PARTS ORDERING INFORMATION

This Parts and Instruction manual is provided as a convenience to assist you in ordering repair parts for your Yale ACL Series Air Hoist. To ensure prompt service, place all parts orders with your local distributor.

To enable your distributor to fill your order promptly, furnish the following information:

Give model, capacity and serial number from hoist nameplate.

Give part number, description and quantity required (see Repair Parts section).

Give shipping destination.

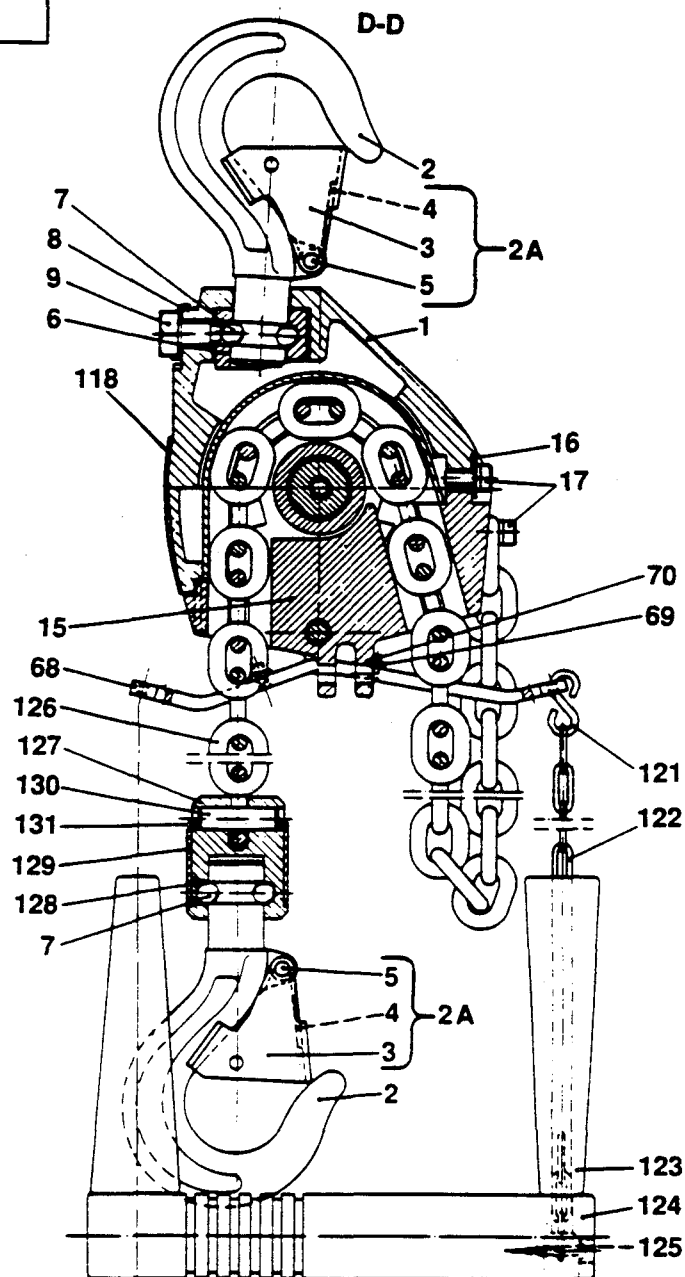
If it becomes necessary to return the complete hoist or certain parts to the factory, a letter requesting such a return is necessary. This letter should contain an explanation for requesting the return. A return authorization will be issued giving you clearance for returning the hoist or parts to the factory. Should you need additional help in ordering, contact your local Yale Hoists distributor.

RECOMMENDED SPARE PARTS

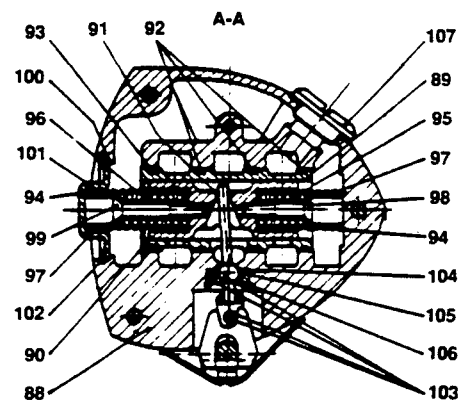
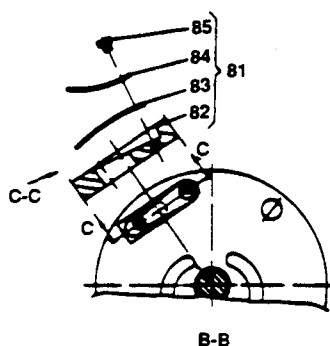
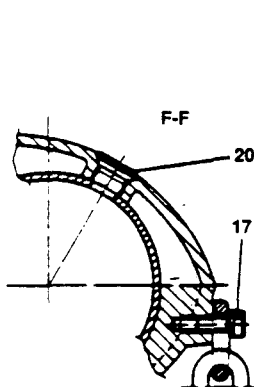
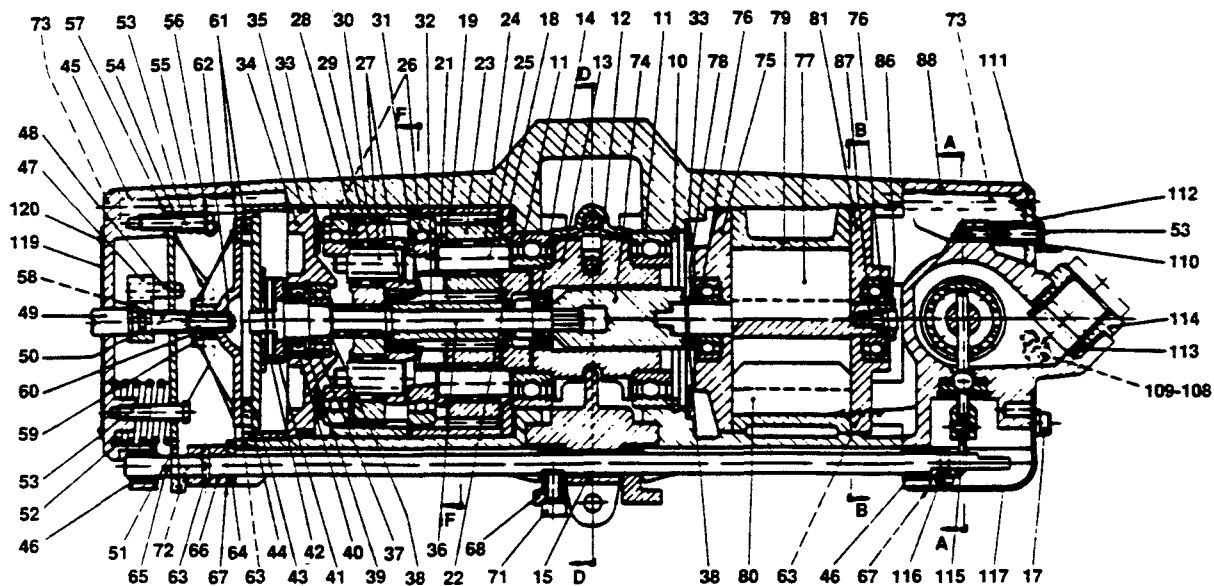
For recommended spare parts list see note (b) on Repair Parts List.

ILLUSTRATED DRAWING ACL 1/4 TON

ITEM NO.	SEALING AND TIGHTENING COMPOUNDS
20	PERMATEX HIGH TACK
85	LOCTITE 290
87	LOCTITE 801
1-88	PERMATEX HIGH TACK
88-111	SCOTCH INDUSTRIAL SEALANT 750 C



ILLUSTRATED DRAWING ACL 1/4 TON



ACL ¼ TON PARTS LIST

ITEM NUMBER	PART NUMBER	QTY. PER UNIT	DESCRIPTION
1 (a)	645022109	1	CASING
2	645023178	2	HOOK, COMP. (INC. ITEM 2A)
2A	645023179	2	PAWL SET (INCL. ITEMS 3, 4 & 5)
3	—	2	PAWL (SEE 2A)
4	—	2	SPRING (SEE 2A)
5	—	2	PIN (SEE 2A)
6 (a)	645022110	1	HOOK HOLDER
7 (b)	645022111	16	BALL/WASHER KIT (5/16 INCH) HARD
8	645022111	1	LOCKWASHER
9	645022112	1	SCREW
10	645021137	1	CIRCLIP (SgH 68)
11	645021144	2	BALL BEARING (6008-2RS)
12	645022113	1	CHAIN GUIDE
13	645022114	1	CHAIN WHEEL
14 (b)	645021141	1	BALL BEARING (608-02RS)
15	645022131	1	CHAIN GUIDE
16	645021177	1	WASHER
17	645021121	4	SCREW (MC6S 6X12)
18 (a)	645022115	1	WASHER
19 (a)	645022116	1	GEAR RIM
20	645022121	1	LOCKSCREW (TORQ. to 14.8-18.5 FT. LB.)
21 (a)	645021117	1	PLANET SHAFT
22	645022118	1	BUSHING
23 (a)	645022119	1	GEAR WHEEL (SET OF 3 EA.)
24 (b)	645021175	3	NEEDLE BEARING (HK 1015)
25	645022120	3	AXLE
26	645021146	2	BALL BEARING (16010)
27 (a)	645022122	1	PLANET SHAFT
28	645022123	1	GEAR WHEEL (SET OF 3 EA.)
29 (b)	645021176	3	NEEDLE BEARING (HK 1212)
30 (a)	645022125	1	GEAR RIM
31	645021180	2	CUP SPRING
32	645022124	1	GEAR WHEEL
33	645022104	2	CUP SPRING
34 (a)	645022127	1	COVER
35 (b)	645021164	1	O-RING (79.5X3)
36 (b)	645022126	1	SHAFT
37 (b)	645021143	1	BALL BEARING (6001-2Z)
38 (b)	645021131	2	CIRCLIP (SgA 12)
39	645021135	1	CIRCLIP (SgH 28)
40 (b)	645021173	1	SEAL RING (BA28-14-7)
41	645023156	1	SUPPORT RING
42	645021108	1	PIN (N-4X32)
43 (b)	645022129	1	BRAKE DISC
44 (a)	645022130	1	SPACER
45 (a)	645022132	1	BRAKE CASING
46	645021148	2	NEEDLE BEARING (HK0810)
47 (a)	645022134	1	CROSS PIECE

(a) These items are not stocked for service and will be furnished on special request only.

(b) Recommended spare parts.

ACL 1/4 TON PARTS LIST

ITEM NUMBER	PART NUMBER	QTY. PER UNIT	DESCRIPTION
48 (a)	645021104	2	PIN (RPA 5X24)
49	645022137	1	ADJUSTING SCREW
50	645021153	1	O-RING (3.3X2.4)
51	645022135	1	YOKE
52	645022133	1	SPRING
53	645021111	3	SPRING (M6S 5X25 Fzb)
54	645021130	1	WASHER (BRFB 5.3X10)
55	645022136	1	SPRING
56	645022178	1	LOCKWASHER
57	645022141	1	SPRING
58	645022138	2	PIN
59 (a)	645022139	1	CROSS PIECE
60	645022140	1	SLEEVE
61	645022142	1	PRESSURE PLATE
62 (b)	645021138	1	CIRCLIP (4)
63	645021105	3	PIN (FRP 3X16)
64 (a)	645022143	1	WASHER
65	645022144	1	SHAFT
66 (a)	645022145	1	KEY
67	645022162	2	WASHER
68	645022146	1	YOKE
69	645021126	2	NUT (M6M4)
70	645021117	2	SCREW (P6SS 4X12)
71	645021120	1	SCREW (MC6S 5X16)(TORQ. to 5.9 to 7.4 FT. LBS.)
72	645021151	4	BALL (3/8 INCH) HARD
73	645021122	6	SCREW (MC6S 6X55)
74	645022147	1	COUPLING
75	645022148	1	END PLATE
76	645021147	2	BALL BEARING (6201-Z)
77	645022149	1	ROTOR ("C" SERIES THREADED SHAFT)
78	645022150	2	CUP SPRING
79	645023107	1	CYLINDER
80 (b)	645023174	7	VANE KIT (7 VANES & RETAINER)
81	645023173	1	END PLATE, COMP. (INCL. 82, 83, 84 & 85)
82	—	1	END PLATE
83	645023176	1	VALVE PLATE
84	645023177	1	SUPPORT
85	645021114	1	SCREW (MCS 3X4 Fzb)
86	645022152	1	WASHER (B SERIES ONLY)
87	645021119	1	SCREW (MC6S 5X10) (B SERIES ONLY)
88 (a)	645022153	1	VALVE HOUSING
88A	645022154	1	VALVE COMP. (NOT SHOWN)(INCL. 89, 90 & 91)
89	—	1	LINER (SEE 88A)
90	—	1	VALVE CONE (SEE 88A)
91	645022155	1	SPRING

(a) These items are not stocked for service and will be furnished on special request only.

(b) Recommended spare parts.

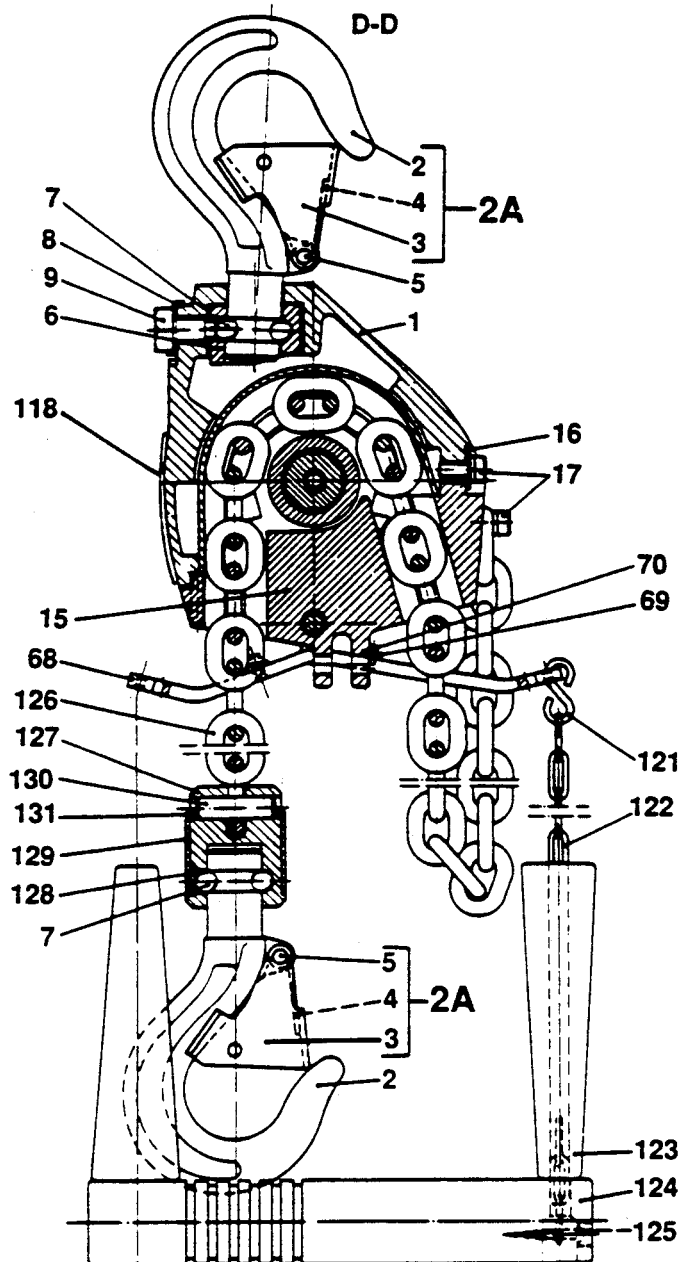
ACL 1/4 TON PARTS LIST

ITEM NUMBER	PART NUMBER	QTY. PER UNIT	DESCRIPTION
92 (b)	645021161	3	O-RING (27.1X1.6)
93 (b)	645021155	1	O-RING (26.2X3)
94 (a)	645022156	2	SPRING
95 (a)	645022157	1	SPACER
96 (a)	645022158	1	SPACER
97 (a)	645022159	2	SLEEVE
98	645021123	1	SCREW (F6S 5X25)
99	645021124	1	SCREW (F6S 5X35)
100	645021163	1	O-RING (37.1X1.6)
101 (a)	645022161	1	COVER
102	645021136	1	CIRCLIP (SgH 40)
103	645022160	1	LEVER, COMPLETE
104	645021160	1	O-RING (15.1X1.6)
105	645021154	1	O-RING (8.3X2.4)
106	645021133	1	CIRCLIP (SgH 18)
107 (a)	645023116	1	PLUG
108	645021166	1	SEAL
109	645021115	1	SCREW (MCS 5X6 Fzb)
110 (a)	645023153	1	SPACER
111	645022165	1	SILENCER
112 (a)	645023154	1	SUPPORT
113	645022101	1	STRAINER
114 (a)	645022102	1	ADAPTER
115 (a)	645022163	1	ANGLE PIECE
116 (b)	645021110	1	SCREW (M6S 4 × 12 Fzb)(TORQ to 3.3 to 4.1 FT. LBS.)
117 (a)	645022166		COVER
118	645814100	1	YALE DECAL
119	4310-2266	1	NAMEPLATE 1/4 TON CAPACITY
120	645021125	4	SCREW (KDS nr 00 X 5 fn)
121	645023102	2	S-HOOK
122	645022179	—	CHAIN (SPECIFY LENGTH IN FEET)
123	647083379	1	HANDLE KIT (INCLUDES ITEMS 124 & 125)
124	645023101	1	HANDLE
125	—	2	SCREW (KST 1 INCH NO. 4)
126 (a)	645022164	—	CHAIN (SPECIFY LENGTH IN FEET)
127	645022167	1	HOOK HOLDER
128	645022168	1	WASHER
129	645022169	1	SLEEVE, BOTTOM BLOCK
130	645021103	1	PIN (CP8h 6X30)
131	645021174	1	LOCKING RING
132	645021181	2	WARNING PLATE
133	644479800	1	WARNING DECAL
134	645024102	1	HOSE NIPPLE, 1/2 INCH (12.5 mm) NOT SHOWN

(a) These items are not stocked for service and will be furnished on special request only.

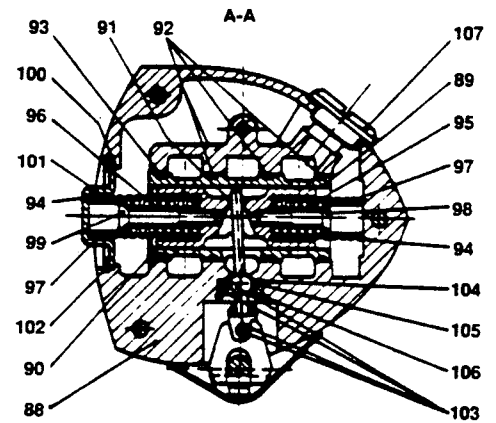
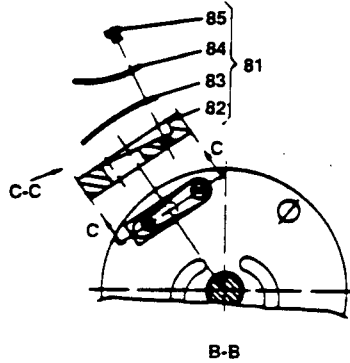
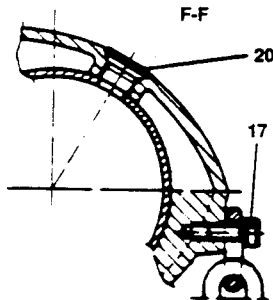
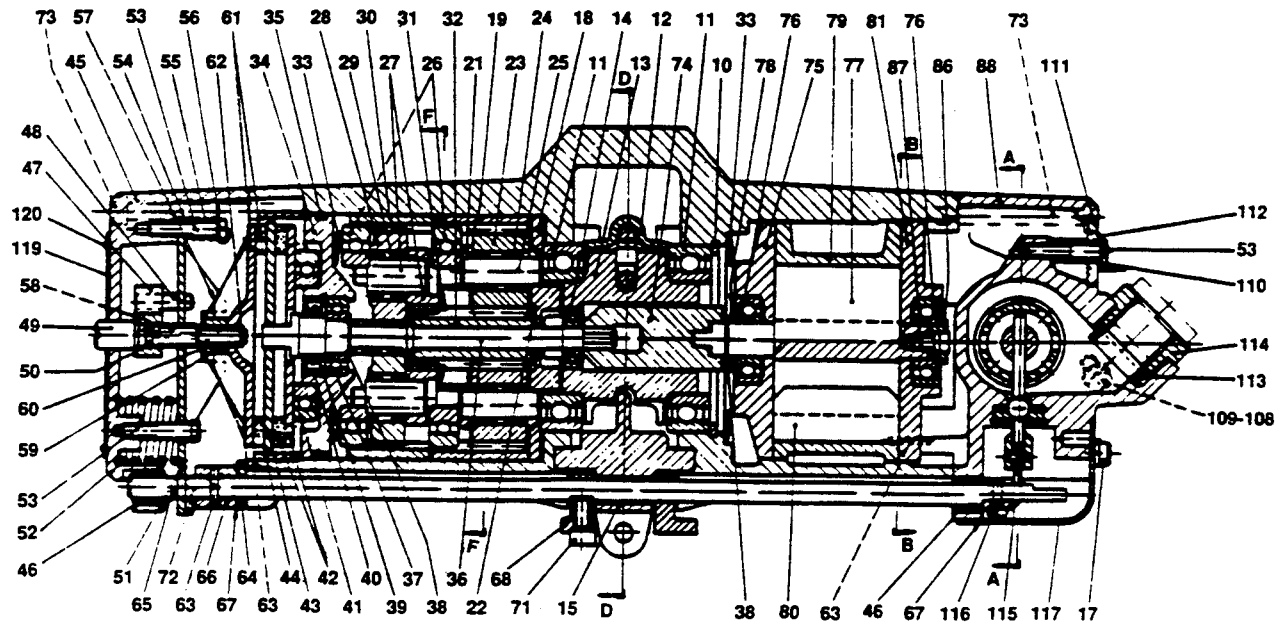
(b) Recommended spare parts.

ILLUSTRATED DRAWING ACL 1/2 TON CAPACITY



ITEM NO.	SEALING AND TIGHTENING COMPOUNDS
20	PERMATEX HIGH TACK
85	LOCTITE 290
87	LOCTITE 801
1-88	PERMATEX HIGH TACK
88-111	SCOTCH INDUSTRIAL SEALANT 750 C

ILLUSTRATED DRAWING ACL 1/2 TON



ACL 1/2 TON PARTS LIST

ITEM NUMBER	PART NUMBER	QTY. PER UNIT	DESCRIPTION
1 (a)	645022109	1	CASING
2	645023178	2	HOOK. COMP. (INC. ITEM 2A)
2A	645023179	2	PAWL SET (INCL. ITEMS 3, 4 & 5)
3	—	2	PAWL (SEE 2A)
4	—	2	SPRING (SEE 2A)
5	—	2	PIN (SEE 2A)
6 (a)	645022110	1	HOOK HOLDER
7 (b)	645022111	1	BALL AND WASHER KIT (5/16 INCH) HARD 16 BALLS
8	645022111	1	LOCKWASHER
9	645022112	1	SCREW
10	645021137	1	CIRCLIP (SgH 68)
11	645021144	2	BALL BEARING (6008-2RS)
12	645022113	1	CHAIN GUIDE
13	645022114	1	CHAIN WHEEL
14 (b)	645021141	1	BALL BEARING (608-02RS)
15	645022131	1	CHAIN GUIDE
16	645021177	1	WASHER
17	645021121	4	SCREW (MC6S 6X12)
18 (a)	645022115	1	WASHER
19 (a)	645022116	1	GEAR RIM
20	645022121	1	LOCKSCREW (TORQ. to 14.8-18.5 FT. LB.)
21 (a)	645021117	1	PLANET SHAFT
22	645022118	1	BUSHING
23 (a)	645022119	1	GEAR WHEEL (SET OF 3 EA.)
24 (b)	645021175	3	NEEDLE BEARING (HK 1015)
25	645022120	3	AXLE
26	645021146	2	BALL BEARING (16010)
27 (a)	645022122	1	PLANET SHAFT
28	645022123	1	GEAR WHEEL (SET OF 3 EA.)
29 (b)	645021176	3	NEEDLE BEARING (HK 1212)
30 (a)	645022125	1	GEAR RIM
31	645021180	2	CUP SPRING
32	645022124	1	GEAR WHEEL
33	645022104	2	CUP SPRING
34 (a)	645022127	1	COVER
35 (b)	645021164	1	O-RING (79.5X3)
36 (b)	645022126	1	SHAFT
37 (b)	645021143	1	BALL BEARING (6001-2Z)
38 (b)	645021131	2	CIRCLIP (SgA 12)
39	645021135	1	CIRCLIP (SgH 28)
40 (b)	645021173	1	SEAL RING (BA28-14-7)
41	645021145	1	BALL BEARING (16007)
42	645022128	1	PRESSURE PLATE
43 (b)	645022129	1	BRAKE DISC
44 (a)	645022130	1	SPACER
45 (a)	645022132	1	BRAKE CASING
46	645021148	2	NEEDLE BEARING (HK0810)

(a) These items are not stocked for service and will be furnished on special request only.

(b) Recommended spare parts.

ACL 1/2 TON PARTS LIST

ITEM NUMBER	PART NUMBER	QTY. PER UNIT	DESCRIPTION
47 (a)	645022134	1	CROSS PIECE
48 (a)	645021104	2	PIN (RPA 5X24)
49	645022137	1	ADJUSTING SCREW
50	645021153	1	O-RING (3.3X2.4)
51	645022135	1	YOKE
52	645022133	1	SPRING
53	645021111	3	SPRING (M6S 5X25 Fzb)
54	645021130	1	WASHER (BRFB 5.3X10)
55	645022136	1	SPRING
56	645022178	1	LOCKWASHER
57	645022141	1	SPRING
58	645022138	2	PIN
59 (a)	645022139	1	CROSS PIECE
60	645022140	1	SLEEVE
61	645022142	1	PRESSURE PLATE
62 (b)	645021138	1	CIRCLIP (4)
63	645021105	3	PIN (FRP 3X16)
64 (a)	645022143	1	WASHER
65	645022144	1	SHAFT
66 (a)	645022145	1	KEY
67	645022162	2	WASHER
68	645022146	1	YOKE
69	645021126	2	NUT (M6M4)
70	645021117	2	SCREW (P6SS 4X12)
71	645021120	1	SCREW (MC6S 5X16)(TORQ. to 5.9 to 7.4 FT. LBS.)
72	645021151	4	BALL (3/8 INCH) HARD
73	645021122	6	SCREW (MC6S 6X55)
74	645022147	1	COUPLING
75	645022148	1	END PLATE
76	645021147	2	BALL BEARING (6201-Z)
77	645022149	1	ROTOR
78	645022150	2	CUP SPRING
79	645022151	1	CYLINDER
80 (b)	645023174	1	VANE KIT (7 VANES & RETAINER)
81	645023172	1	END PLATE. COMP. (INCL. 82. 83. 84 & 85)
82	—	1	END PLATE
83	645023175	1	VALVE PLATE
84	645023177	1	SUPPORT
85	645021114	1	SCREW (MCS 3X4 Fzb)
86	645022152	1	WASHER ("B" SERIES ONLY)
87	645021119	1	SCREW (MC6S 5X10) ("B" SERIES ONLY)
88 (a)	645022153	1	VALVE HOUSING
88A	645022154	1	VALVE COMP. (NOT SHOWN)(INCL. 89. 90 & 91)
89	—	1	LINER (SEE 88A)
90	—	1	VALVE CONE (SEE 88A)
91	645022155	1	SPRING

(a) These items are not stocked for service and will be furnished on special request only.

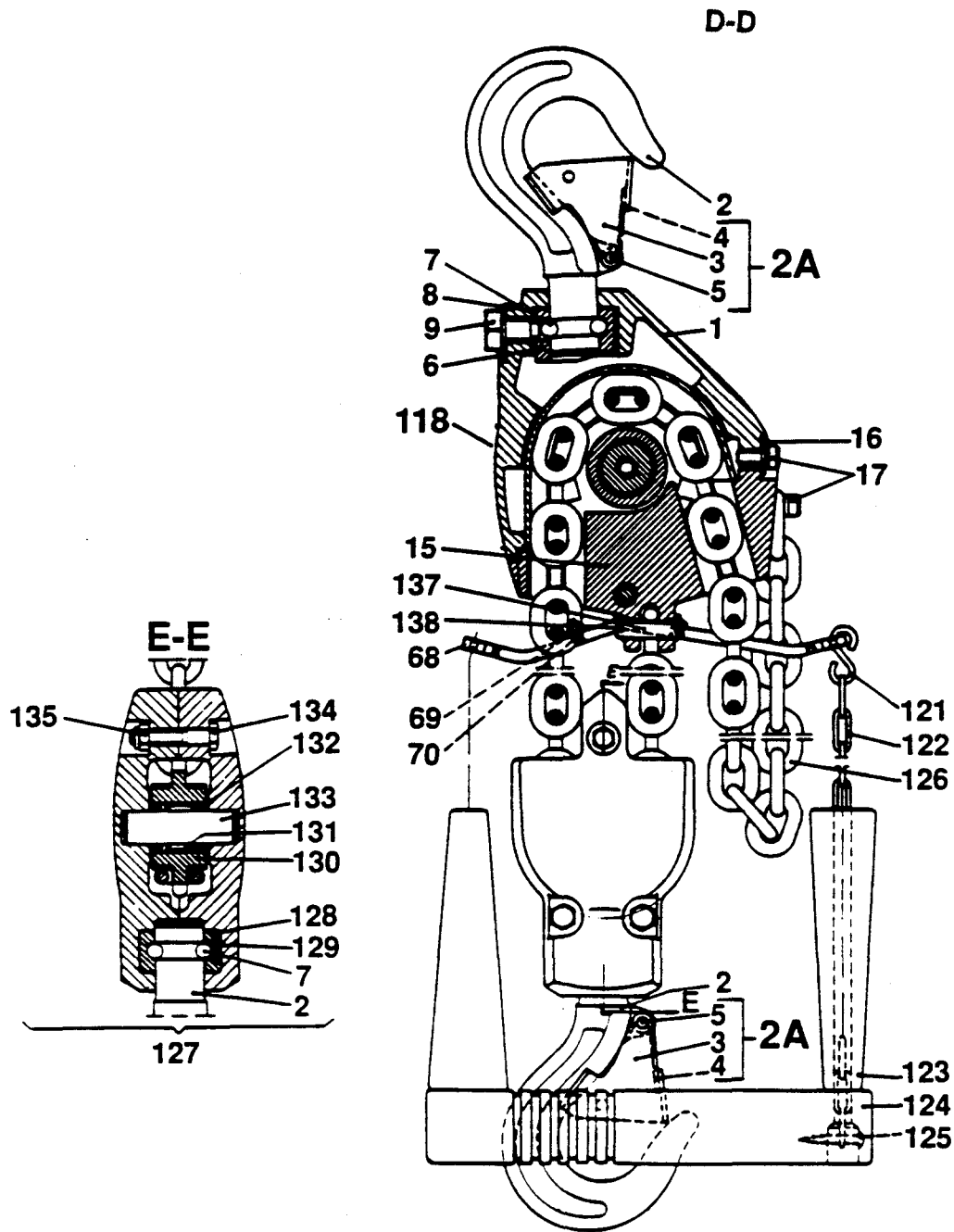
(b) Recommended spare parts.

ACL 1/2 TON PARTS LIST

ITEM NUMBER	PART NUMBER	QTY. PER UNIT	DESCRIPTION
92 (b)	645021161	3	O-RING (27.1X1.6)
93 (b)	645021155	1	O-RING (26.2X3)
94 (a)	645022156	2	SPRING
95 (a)	645022157	1	SPACER
96 (a)	645022158	1	SPACER
97 (a)	645022159	2	SLEEVE
98	645021123	1	SCREW (F6S 5X25)
99	645021124	1	SCREW (F6S 5X35)
100	645021163	1	O-RING (37.1X1.6)
101 (a)	645022161	1	COVER
102	645021136	1	CIRCLIP (SgH 40)
103	645022160	1	LEVER, COMPLETE
104	645021160	1	O-RING (15.1X1.6)
105	645021154	1	O-RING (8.3X2.4)
106	645021133	1	CIRCLIP (SgH 18)
107 (a)	645023116	1	PLUG
108	645021166	1	SEAL
109	645021115	1	SCREW (MCS 5X6 Fzb)
110 (a)	645023153	1	SPACER
111	645022165	1	SILENCER
112 (a)	645023154	1	SUPPORT
113	645022101	1	STRAINER
114 (a)	645022102	1	ADAPTER
115 (a)	645022163	1	ANGLE PIECE
116 (b)	645021110	1	SCREW (M6S 4 x 12 Fzb)(TORQ to 3.3 to 4.1 FT. LBS.)
117 (a)	645022166	1	COVER
118	645814100	1	YALE DECAL
119	4310-2267	1	NAMEPLATE 1/2 TON CAPACITY
120	645021125	4	SCREW (KDS nr 00 X 5 fn)
121	645023102	2	S-HOOK
122	645022179	—	CHAIN (SPECIFY LENGTH IN FEET)
123	647083379	1	HANDLE KIT (INCLUDES ITEMS 124 & 125)
124	—	1	HANDLE
125	—	2	SCREW (KST 1 INCH NO. 4)
126 (a)	645022164	—	CHAIN (SPECIFY LENGTH IN FEET)
127	645022167	1	HOOK HOLDER
128	645022168	1	WASHER
129	645022169	1	SLEEVE, BOTTOM BLOCK
130	645021103	1	PIN (CP8h 6X30)
131	645021174	1	LOCKING RING
132	645021181	2	WARNING PLATE
133	644479800	1	WARNING DECAL
134	645024102	1	HOSE NIPPLE, 1/2 INCH (12.5 mm) NOT SHOWN

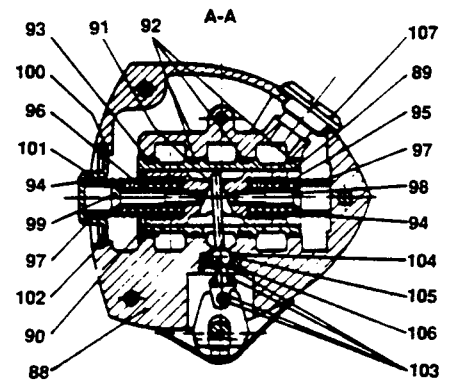
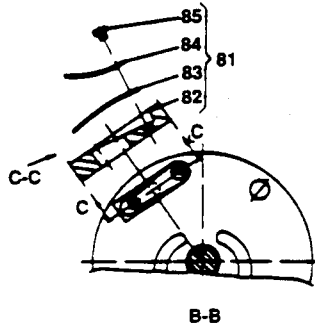
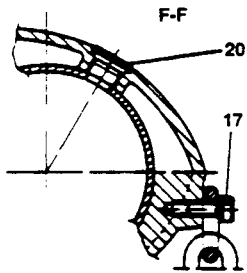
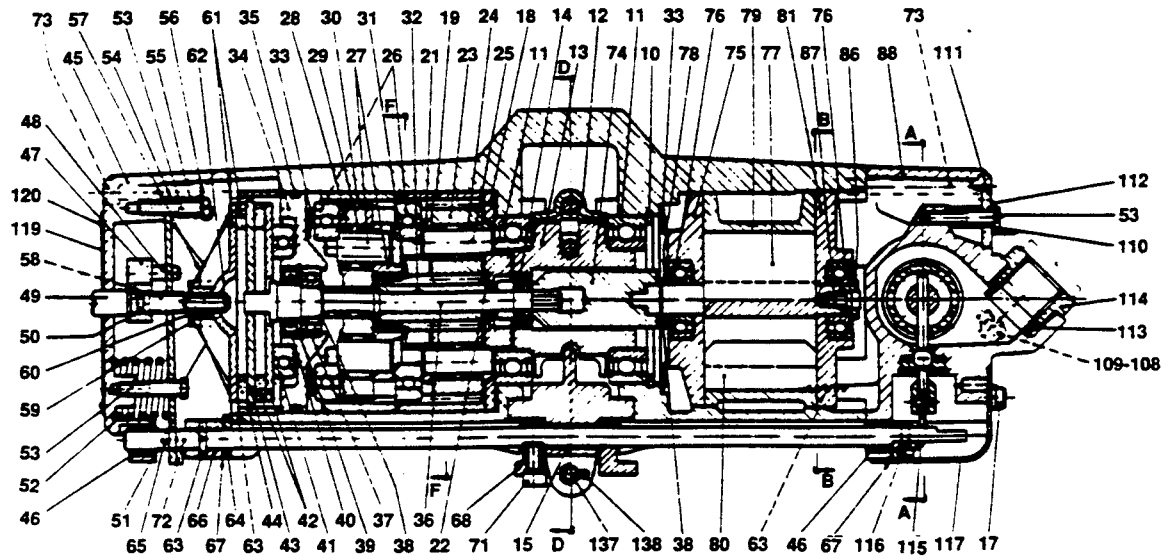
- (a) These items are not stocked for service and will be furnished on special request only.
(b) Recommended spare parts.

ILLUSTRATED DRAWING ACL 1 TON



ITEM NO	SEALING AND TIGHTENING COMPOUNDS
20	PERMATEX HIGH TACK
85	LOCTITE 290
87	LOCTITE 801
1-88	PERMATEX HIGH TACK
88-111	SCOTCH INDUSTRIAL SEALANT 750 C

ILLUSTRATED DRAWING ACL 1 TON



ACL 1 TON PARTS LIST

ITEM NUMBER	PART NUMBER	QTY. PER UNIT	DESCRIPTION
1 (a)	645022109	1	CASING
2	645023178	2	HOOK, COMP. (INC. ITEM 2A)
2A	645023179	2	PAWL SET (INCL. ITEMS 3, 4 & 5)
3	—	2	PAWL (SEE 2A)
4	—	2	SPRING (SEE 2A)
5	—	2	PIN (SEE 2A)
6 (a)	645022170	1	HOOK HOLDER
7 (b)	645022111	1	BALL AND WASHER KIT (⁵ / ₁₆ INCH) HARD 16 BALLS
8	—	1	LOCKWASHER
9	645022112	1	SCREW
10	645021137	1	CIRCLIP (SgH 68)
11	645021144	2	BALL BEARING (6008-2RS)
12	645022113	1	CHAIN GUIDE
13	645022114	1	CHAIN WHEEL
14 (b)	645021141	1	BALL BEARING (608-02RS)
15	645022131	1	CHAIN GUIDE
16	645021177	1	WASHER
17	645021121	4	SCREW (MC6S 6X12)
18 (a)	645022115	1	WASHER
19 (a)	645022116	1	GEAR RIM
20	645022121	1	LOCKSCREW (TORQ. to 14.8-18.5 FT. LB.)
21 (a)	645021117	1	PLANET SHAFT
22	645022118	1	BUSHING
23 (a)	645022119	1	GEAR WHEEL (SET OF 3 EA.)
24 (b)	645021175	3	NEEDLE BEARING (HK 1015)
25	645022120	3	AXLE
26	645021146	2	BALL BEARING (16010)
27 (a)	645022122	1	PLANET SHAFT
28	645022123	1	GEAR WHEEL (SET OF 3 EA.)
29 (b)	645021176	3	NEEDLE BEARING (HK 1212)
30 (a)	645022125	1	GEAR RIM
31	645021180	2	CUP SPRING
32	645022124	1	GEAR WHEEL
33	645022104	2	CUP SPRING
34 (a)	645022127	1	COVER
35 (b)	645021164	1	O-RING (79.5X3)
36 (b)	645022126	1	SHAFT
37 (b)	645021143	1	BALL BEARING (6001-2Z)
38 (b)	645021131	2	CIRCLIP (SgA 12)
39	645021135	1	CIRCLIP (SgH 28)
40 (b)	645021173	1	SEAL RING (BA28-14-7)
41	645023145	1	BALL BEARING (16007)
42	645022128	1	PRESSURE PLATE
43 (b)	645022129	1	BRAKE DISC
44 (a)	645022130	1	SPACER
45 (a)	645022132	1	BRAKE CASING
46	645021148	2	NEEDLE BEARING (HK0810)
47 (a)	645022134	1	CROSS PIECE
48 (a)	645021104	2	PIN (RPA 5X24)
49	645022137	1	ADJUSTING SCREW

(a) These items are not stocked for service and will be furnished on special request only.

(b) Recommended spare parts.

ACLTION PARTS LIST

ITEM NUMBER	PART NUMBER	QTY. PER UNIT	DESCRIPTION
50	645021153	1	O-RING (3.3X2.4)
51	645022135	1	YOKE
52	645022133	1	SPRING
53	645021111	3	SPRING (M6S 5X25 Fzb)
54	645021130	1	WASHER (BRFB 5.3X10)
55	645022136	1	SPRING
56	645022178	1	LOCKWASHER
57	645022141	1	SPRING
58	645022138	2	PIN
59 (a)	645022139	1	CROSS PIECE
60	645022140	1	SLEEVE
61	645022142	1	PRESSURE PLATE
62 (b)	645021138	1	CIRCLIP (4)
63	645021105	3	PIN (FRP 3X16)
64 (a)	645022143	1	WASHER
65	645022144	1	SHAFT
66 (a)	645022145	1	KEY
67	645022162	2	WASHER
68	645022146	1	YOKE
69	645021126	2	NUT (M6M4)
70	645021117	2	SCREW (P6SS 4X12)
71	645021120	1	SCREW (MC6S 5X16)(TORQ. to 5.9 to 7.4 FT. LBS.)
72	645021151	4	BALL (3/8 INCH) HARD
73	645021122	6	SCREW (MC6S 6X55)
74	645022147	1	COUPLING
75	645022148	1	END PLATE
76	645021147	2	BALL BEARING (6201-Z)
77	645022149	1	ROTOR
78	645022150	2	CUP SPRING
79	645022151	1	CYLINDER
80 (b)	645023174	1	VANE KIT (7 VANES AND RETAINER)
81	645023172	1	END PLATE, COMP. (INCL. 82, 83, 84 & 85)
82	—	1	END PLATE
83	645023175	1	VALVE PLATE
84	645023177	1	SUPPORT
85	645021114	1	SCREW (MCS 3X4 Fzb)
86	645022152	1	WASHER ("B" SERIES ONLY)
87	645021119	1	SCREW (MC6S 5X10) ("B" SERIES ONLY)
88 (a)	645022153	1	VALVE HOUSING
88A	645022154	1	VALVE COMP. (NOT SHOWN)(INCL. 89, 90 & 91)
89	—	1	LINER (SEE 88A)
90	—	1	VALVE CONE (SEE 88A)
91	645022155	1	SPRING
92 (b)	645021161	3	O-RING (27.1X1.6)
93 (b)	645021155	1	O-RING (26.2X3)
94 (a)	645022156	2	SPRING

(a) These items are not stocked for service and will be furnished on special request only.

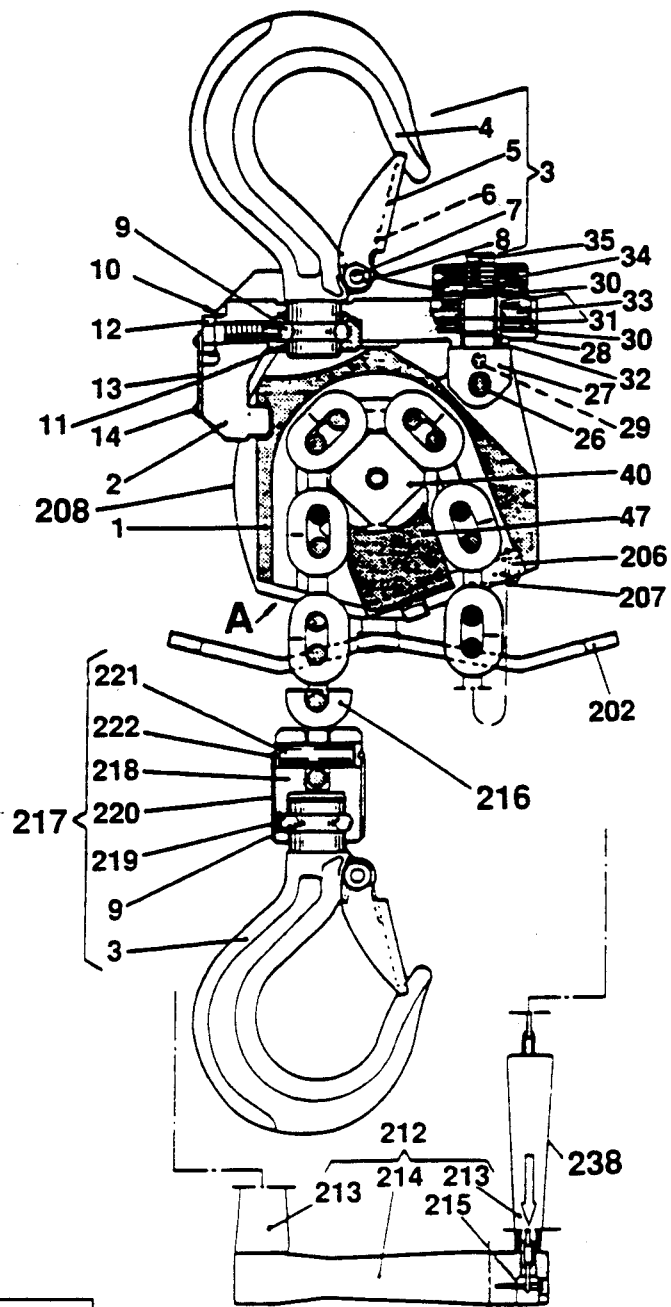
(b) Recommended spare parts.

ACL 1 TON PARTS LIST

ITEM NUMBER	PART NUMBER	QTY. PER UNIT	DESCRIPTION
95 (a)	645022157	1	SPACER
96 (a)	645022158	1	SPACER
97 (a)	645022159	2	SLEEVE
98	645021123	1	SCREW (F6S 5X25)
99	645021124	1	SCREW (F6S 5X35)
100	645021163	1	O-RING (37.1X1.6)
101 (a)	645022161	1	COVER
102	645021136	1	CIRCLIP (SgH 40)
103	645022160	1	LEVER, COMPLETE
104	645021160	1	O-RING (15.1X1.6)
105	645021154	1	O-RING (8.2X2.4)
106	645021133	1	CIRCLIP (SgH 18)
107 (a)	645023116	1	PLUG
108	645021166	1	SEAL
109	645021115	1	SCREW (MCS 5X6 Fzb)
110 (a)	645023153	1	SPACER
111	645022165	1	SILENCER
112 (a)	645023154	1	SUPPORT
113	645022101	1	STRAINER
114 (a)	645022102	1	ADAPTER
115 (a)	645022163	1	ANGLE PIECE
116 (b)	645021110	1	SCREW (M6S 4 x 12 Fzb)(TORQ to 3.3 to 4.1 FT. LBS.)
117 (a)	645022166	1	COVER
118	645814100	1	YALE DECAL
119	4310-2268	1	NAMEPLATE 1 TON CAPACITY
120	645021125	4	SCREW (KDS nr 00 X 5 fn)
121	645023102	2	S-HOOK
122	645022179	—	CHAIN (SPECIFY LENGTH IN FEET)
123	647083379	1	HANDLE KIT (INCLUDES ITEMS 124 & 125)
124	—	1	HANDLE
125	—	2	SCREW (KST 1 INCH NO. 4)
126 (a)	645022164	—	CHAIN (SPECIFY LENGTH IN FEET)
127	645023103	1	HOOK ASSEMBLY COMPLETE (INCL. ITEMS 2, 7 & 128)
128	645023106	1	HOOK HOLDER
129	645022168	1	WASHER
130	645023105	1	CHAIN WHEEL
131	645021179	1	NEEDLE BEARING (HN 1412)
132	645021172	2	SEAL RING (G14X20X3)
133	645023104	1	SHAFT
134	645021112	3	SCREW (M6SX35 Fzb)
135	645021128	3	NUT (M6 Fz)
136	645022173	1	PIN
137	645021109	2	PIN (SP2.5X16)
138	645021181	2	WARNING PLATE
139	644479800	1	WARNING DECAL
140	645024102	1	HOSE NIPPLE, 1/2 INCH (12.5 mm) NOT SHOWN

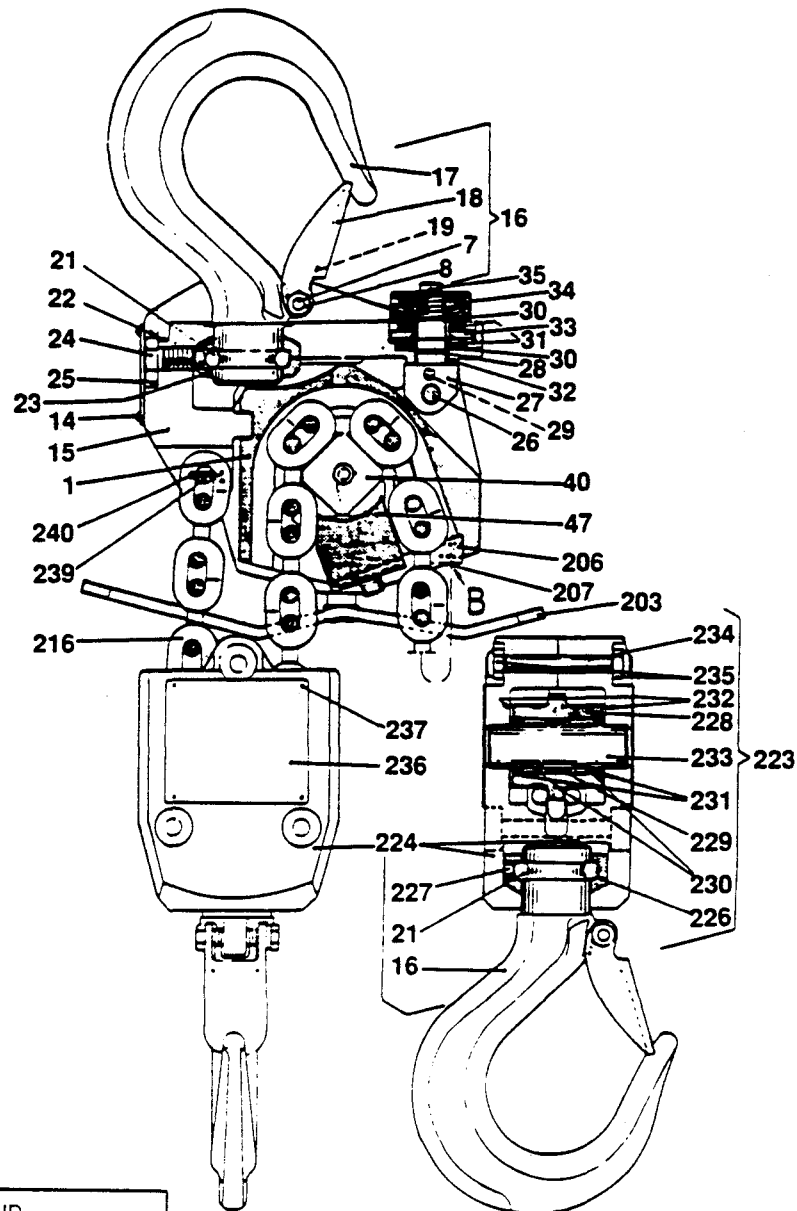
(a) These items are not stocked for service and will be furnished on special request only.

(b) Recommended spare parts.

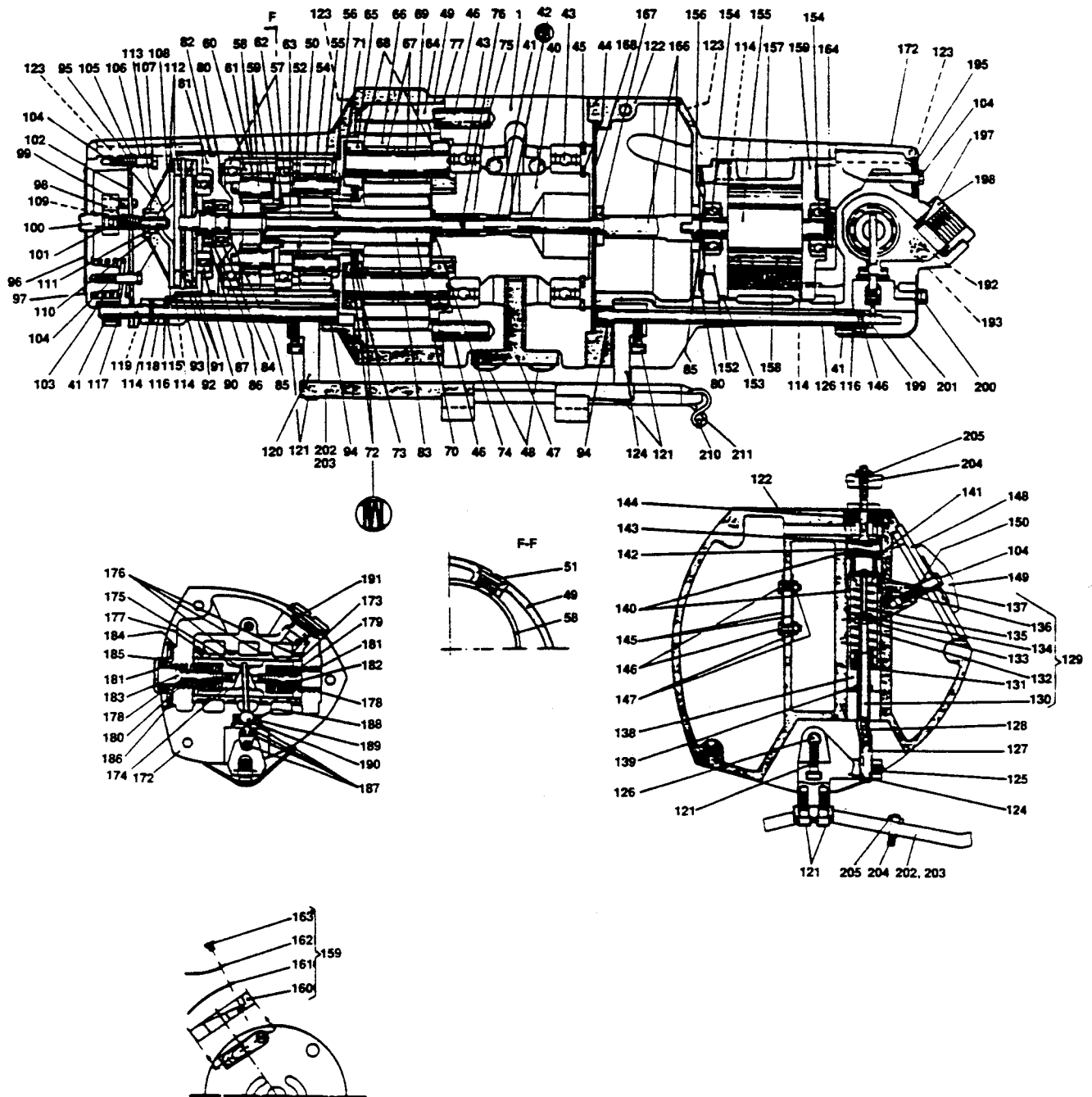


ITEM NO.	SEALING AND TIGHTENING COMPOUNDS
20	PERMATEX HIGH TACK
85	LOCTITE 290
87	LOCTITE 801
1—88	PERMATEX HIGH TACK
88—111	SCOTCH INDUSTRIAL SEALANT 750 C

ILLUSTRATED DRAWING ACL 6 TON



ITEM NO.	SEALING AND TIGHTENING COMPOUNDS
20	PERMATEX HIGH TACK
85	LOCTITE 290
87	LOCTITE 801
1—88	PERMATEX HIGH TACK
88—111	SCOTCH INDUSTRIAL SEALANT 750 C



ACL 3 & 6 TON PARTS LIST

ITEM NUMBER	PART NUMBER	QTY. PER UNIT		DESCRIPTION
		3 TON	6 TON	
1 (a)	647081301	1	1	CASING
2	647081302	1	—	HOOK HOLDER
2A	647081303	1	—	HOOK KIT COMPLETE (INCL. ITEMS 4, 5, 6, 7 & 8)
3	—	—	—	—
4	—	—	—	—
—	647081304	1	—	PAWL SET (INCL. 5, 6, 7 & 8)
5	—	1	—	PAWL
6	—	1	—	SPRING, PAWL
7 (b)	647081305	1	1	SCREW, PAWL
8	647081306	1	1	LOCK NUT
9	647084314	1	—	BALL & WASHER KIT, 10 BALLS & WASHERS (INCLUDES 9 & 10)
10	—	1	—	LOCKWASHER
11	647081307	1	—	BEARING RING
12	647081308	1	—	SCREW
13	647081309	1	—	DATA PLATE (3 TON)
14	647081310	4	4	SCREW, RIVET
15 (a)	647081311	—	1	HOOK HOLDER
16	647081312	—	1	HOOK COMPLETE (INCL. ITEMS 7, 8, 17, 18, 19 & 21)
17	—	—	1	HOOK
—	647081313	—	1	PAWL SET (INCL. ITEMS, 7, 8, 18 & 19)
18	—	—	1	PAWL
19	—	—	1	SPRING PAWL
21	647084315	—	1	BALL & WASHER KIT, 13 BALLS & WASHER (INCL. ITEMS 21 & 22)
22	—	—	1	LOCKWASHER
23	647081314	1	1	BEARING RING
24	647081315	—	1	SCREW
25	647081316	—	1	DATA PLATE (6 TON)
26	647081317	1	1	PIN
27	647081318	1	1	EYE BOLT
28	647081319	1	1	O-RING
29	647081320	1	1	O-RING
30	647081321	2	2	WASHER
31	645023123	5	5	CUP SPRING
32	647081323	1	1	SLEEVE
33	647081324	1	1	WASHER
34	647081325	1	1	NUT
35	647081326	1	1	PIN
40	647081327	1	1	CHAIN WHEEL
41	645021148	3	3	NEEDLE BEARING
42	647081329	1	1	SEAL RING
43	647081330	2	2	BALL BEARING
44	647081331	1	1	CIRCLIP
45	647081332	1	1	CIRCLIP
46	647081333	2	2	PIN
47	647081334	1	1	STRIPPER
48	647081335	2	2	SCREW
49 (a)	647081336	1	1	GEAR CASING

(a) These items are not stocked for service and will be furnished on special request only.

(b) Recommended spare parts.

ACL 3 & 6 TON PARTS LIST

ITEM NUMBER	PART NUMBER	QTY. PER UNIT		DESCRIPTION
		3 TON	6 TON	
50 (a)	645022116	1	1	GEAR RIM
51	645022121	1	1	LOCK SCREW
52 (a)	647081339	1	1	PLANET SHAFT
54 (a)	645022119	1	1	GEAR WHEEL (SET OF 3 EA.)
55	645021175	3	3	NEEDLE BEARING
56	645022120	3	3	AXLE
57	645021146	2	2	BALL BEARING
58 (a)	645022125	1	1	GEAR RIM
59 (a)	645022122	1	1	PLANET SHAFT
60	645022123	1	1	GEAR WHEEL (SET OF 3 EA.)
61	645021176	3	3	NEEDLE BEARING
62	645021180	2	2	CUP SPRING
63	645022124	1	1	GEAR WHEEL
64 (a)	647081350	1	1	GEAR RIM
65 (a)	647081351	1	1	PLANET SHAFT
66 (a)	647081352	1	1	GEAR WHEEL
67	647081353	6	6	NEEDLE BEARING
68	647081354	6	6	END WASHER
69	647081355	3	3	AXLE
70	647081356	1	1	GEAR WHEEL
71	645022118	1	1	BUSHING
72	647081358	2	2	WASHER
73	647081359	3	3	CUP SPRING
74	647081360	1	1	BUSHING
—	647081361	1	1	COUPLING SLEEVE, COMPLETE (INCL. ITEMS 75 & 76)
75	—	1	1	COUPLING SLEEVE
76	—	1	1	PIN
77	647081364	1	1	O-RING
80	645022104	2	2	CUP SPRING
81 (a)	645022127	1	1	COVER
82	645022164	1	1	O-RING
83	647081368	1	1	SHAFT
84	645021143	1	1	BALL BEARING
85	645021131	2	2	CIRCLIP
86	645021135	1	1	CIRCLIP
87	645021173	1	1	SEAL RING
90	645021145	1	1	BALL BEARING
91	645022128	1	1	PRESSURE PLATE, COMPLETE
92	645022129	1	1	BRAKE DISC
93 (a)	645022130	1	1	SPACER
94	647081377	2	2	NEEDLE BEARING
95	645022132	1	1	BRAKE CASING
96	4310-2269	1	—	NAMEPLATE 3 TON CAPACITY
—	4310-2270	—	1	NAMEPLATE 6 TON CAPACITY
97	647081379	4	4	SCREW
98 (a)	645022134	1	1	CROSS PIECE
99 (a)	645021104	2	2	PIN

(a) These items are not stocked for service and will be furnished on special request only.

ACL 3 & 6 TON PARTS LIST

ITEM NUMBER	PART NUMBER	QTY. PER UNIT		DESCRIPTION
		3 TON	6 TON	
100 (a)	645022137	1	1	ADJUSTING SCREW
101	647081383	1	1	O-RING
102	645022135	1	1	YOKE
103	645022133	1	1	SPRING
104	645021111	4	4	SCREW
105	645021130	1	1	WASHER
106	645022136	1	1	SPRING
107	645022178	1	1	LOCKWASHER
108	645022141	1	1	SPRING
109	645022138	2	2	PIN
110	645022139	1	1	CROSS PIECE
111	645022140	1	1	SLEEVE
112 (a)	645022142	1	1	PRESSURE PLATE
113 (a)	645021138	1	1	CIRCLIP
114	645021105	4	4	PIN
115 (a)	645022143	1	1	WASHER
116 (a & b)	645022162	2	2	WASHER
117	647081399	1	1	SHAFT
118	645022145	1	1	KEY
119	645021151	4	4	BALL
120	647083303	1	1	HOLDER
121 (a & b)	645021120	6	6	SCREW
122	647083305	1	1	MOTOR CASING
123	645021122	12	12	SCREWS
124	647083307	1	1	HOLDER
125	647083308	1	1	STOP SCREW
126	647083309	1	1	SHAFT
127	647083310	1	1	SHAFT
128	647083311	1	1	CHAIN LOCK
129	647083312	1	1	VALVE ASM. (INCL. ITEMS 130 thru 137)
130	—	1	1	BAR
131	—	1	1	SLEEVE
132	—	1	1	SPRING
133	—	1	1	WASHER
134	—	1	1	NUT
135	—	1	1	SPRING
136	—	1	1	VALVE PLATE
137	—	1	1	NUT
138	647083313	1	1	SLEEVE
139	647083314	1	1	O-RING
140	647083315	2	2	O-RING
141	647083316	1	1	VALVE SEAT, INNER
142	647083317	1	1	SPRING
143	647083318	1	1	VALVE PLATE
144	647083319	1	1	VALVE SEAT, OUTER
145	647083320	2	2	SILENCER
146 (a & b)	645021110	3	3	SCREW

(a) These items are not stocked for service and will be furnished on special request only.

(b) Recommended spare parts.

ACL 3 & 6 TON PARTS LIST

ITEM NUMBER	PART NUMBER	QTY. PER UNIT		DESCRIPTION
		3 TON	6 TON	
147	645021126	2	2	NUT
148	647083323	1	1	SILENCER
149 (a)	645023154	1	1	SUPPORT
150 (a)	645023153	1	1	SPACER
152	647083326	1	1	END PLATE
153	647083327	1	1	O-RING
154	645021147	2	2	BALL BEARING
155	645022149	1	1	ROTOR
156	645022150	2	2	CUP SPRING
157	645022151	1	1	CYLINDER
158	645023174	1	1	VANE SET (INCLUDES 7 VANES & RETAINER)
159	645023172	1	1	END PLATE COMPLETE (INCL. ITEM 160)
160	—	1	1	END PLATE
161	645023175	1	1	VALVE PLATE
162	645023177	1	1	SUPPORT
163	645021114	1	1	SCREW
164	645021129	1	1	NUT ("C" SERIES)
165	647083339	1	1	SHAFT COMPLETE (INCL. ITEMS 166 & 167)
166	—	1	1	SHAFT
167	—	1	1	PLASTIC WASHER
168	647083342	1	1	COVER
172 (a)	645022153	1	1	VALVE HOUSING
—	645022154	1	1	VALVE COMPLETE (INCL. ITEMS 173 thru 177)
173	—	1	1	LINER
174	—	1	1	VALVE CONE
175 (b)	645022155	1	1	SPRING
176 (b)	647083346	3	3	O-RING
177 (b)	647083347	1	1	O-RING
178 (a)	645022156	2	2	SPRING
179 (a)	645022157	1	1	SPACER
180 (a)	645022158	1	1	SPACER
181 (a)	645022159	1	1	SLEEVE
182	645021123	1	1	SCREW
183	645021124	1	1	SCREW
184 (b)	645021163	1	1	O-RING
185 (a)	645022161	1	1	COVER
186	645021136	1	1	CIRCLIP
187	645022160	1	1	LEVER COMP.
188 (b)	647083358	1	1	O-RING
189 (b)	647083359	1	1	O-RING
190 (b)	645021133	1	1	CIRCLIP
191	645023116	1	1	PLUG
192	647083362	1	1	SEAL
193	645021115	1	1	SCREW
195	647083365	1	1	COVER

- (a) These items are not stocked for service and will be furnished on special request only.
 (b) Recommended spare parts.

ACL 3 & 6 TON PARTS LIST

ITEM NUMBER	PART NUMBER	QTY. PER UNIT		DESCRIPTION
		3 TON	6 TON	
197	645022101	1	1	STRAINER
198 (a)	645022102	1	1	ADAPTER
199 (a)	645022163	1	1	ANGLE PIECE
200	645021121	2	2	SCREW
201 (a)	645022166	1	1	COVER
202	647083372	1	—	YOKE
203	647083373	—	1	YOKE
204	647083374	3	3	STOP SCREW
205	647083375	3	3	NUT
206	647083376	1	1	SCREW
207	647083377	1	1	WASHER
208	645814100	1	1	YALE DECAL
209	644479800	1	1	WARNING DECAL
210	645022179	—	—	CHAIN (SPECIFY LENGTH IN FEET)
211	645023102	2	2	S-HOOK
212	647083379	1	1	HANDLE COMPLETE (INCL. ITEMS 213, 214 & 215)
213	—	2	2	HANDLE
214	—	1	1	HANDLE (CROSS PIECE)
215	—	2	2	SCREW (KST 1 INCH NO. 8)
216	645971381	—	—	CHAIN (SPECIFY LENGTH IN FEET)
217	647083384	1	—	BOTTOM BLOCK, COMPLETE
—	647081303	1	—	HOOK KIT COMPLETE (INCL. ITEMS 3, 9, 218 thru 222)
218	647083386	1	—	HOLDER
219	647083387	1	—	WASHER
220	647083388	1	—	SLEEVE
221	647083389	1	—	PIN
222	647083390	1	—	LOCKING RING
223	647083391	—	1	HOOK ASM. (INCL. ITEMS 16, 21, 224—237)
224	—	—	2	HOOK CASING HALF
225	647081312	—	1	HOOK KIT COMPLETE
226	647081314	—	1	BEARING RING
227	647083395	—	1	WASHER
228	647083396	—	1	CHAIN WHEEL
229	647083397	—	1	SPACER
230	647083398	—	2	NEEDLE BEARING
231	647083399	—	2	SEAL RING
232	647084301	—	2	WASHER
233	647084302	—	1	AXLE
234	647084303	—	3	STUD BOLT
235	647084304	—	6	LOCK NUT
236	—	—	2	PLATE
237	647081379	—	8	SCREW
238	645021181	2	2	WARNING PLATE (HANDLE)
239	647084307	—	1	PIN
240	647084308	—	2	COTTER PIN
241	647084309	1	1	HOSE NIPPLE, 20MM (3/4 INCH) NOT SHOWN)

(a) These items are not stocked for service and will be furnished on special request only.

(b) Recommended spare parts.

SECTION V

PENDANT CONTROL

Assembly Instructions (See Figure on page 24).

The pendant control is delivered complete for direct connection to the air hoist.

1. Remove the casing (A) and the screw (B) from the valve housing (C).
2. Remove the cover (27) from the cylinder holder (20) of the pendant control.
3. Fit the complete cylinder holder (20) together with the cover (28) on the valve housing (C) — use the same screws (D) as were used previously to hold on the casing (A).
4. Connect the hose (E) to the hole in the valve housing where the screw (B) was sited previously.
5. Hang up the air hoist and connect it to the compressed air supply line.
6. Turn the control yoke (F) by hand in the lifting direction so that the adjusting screw (G) stops against the lower chain guide. Then cautiously depress the push button (37) for lifting and check that the piston rod (H) does not travel upwards any further. If necessary, screw the adjusting screw (G) slightly and lock it with the nut (J).
7. Check if possible with the maximum working load, that the lowering speed does not exceed:
85 FPM (26m/min) for ACL 1/4 Ton
69 FPM (21m/min) for ACL 1/2 Ton
36 FPM (11m/min) for ACL 1 Ton
If necessary, adjust the setting of the screw (K).

8. Fit the cover (27).

Adjust the pressure point position of the push buttons. If necessary, the push buttons (37 and 38) can be actuated by the buffers (40) which give a clear pressure-point position. The position of the buffers are adjusted with the setting screws (41).

In adjusting, the push button is kept lightly pressed against the buffer, whereupon the screw is adjusted until the wanted speed is obtained.

Lifting Heights

The connection hose for the pendant control is delivered as standard for a lifting height of 9.8 Ft. (3 meters). For other lifting heights, the following lengths apply for:

- Wire 4190-0138: lifting height minus 2.3 ft. (0.7 m).
- Nylon tube 9030-0059: three lengths, each of the lifting height minus 2 ft. (0.61 m).
- Protection hose 4310-0844: lifting height minus 3 ft. (0.91 m).

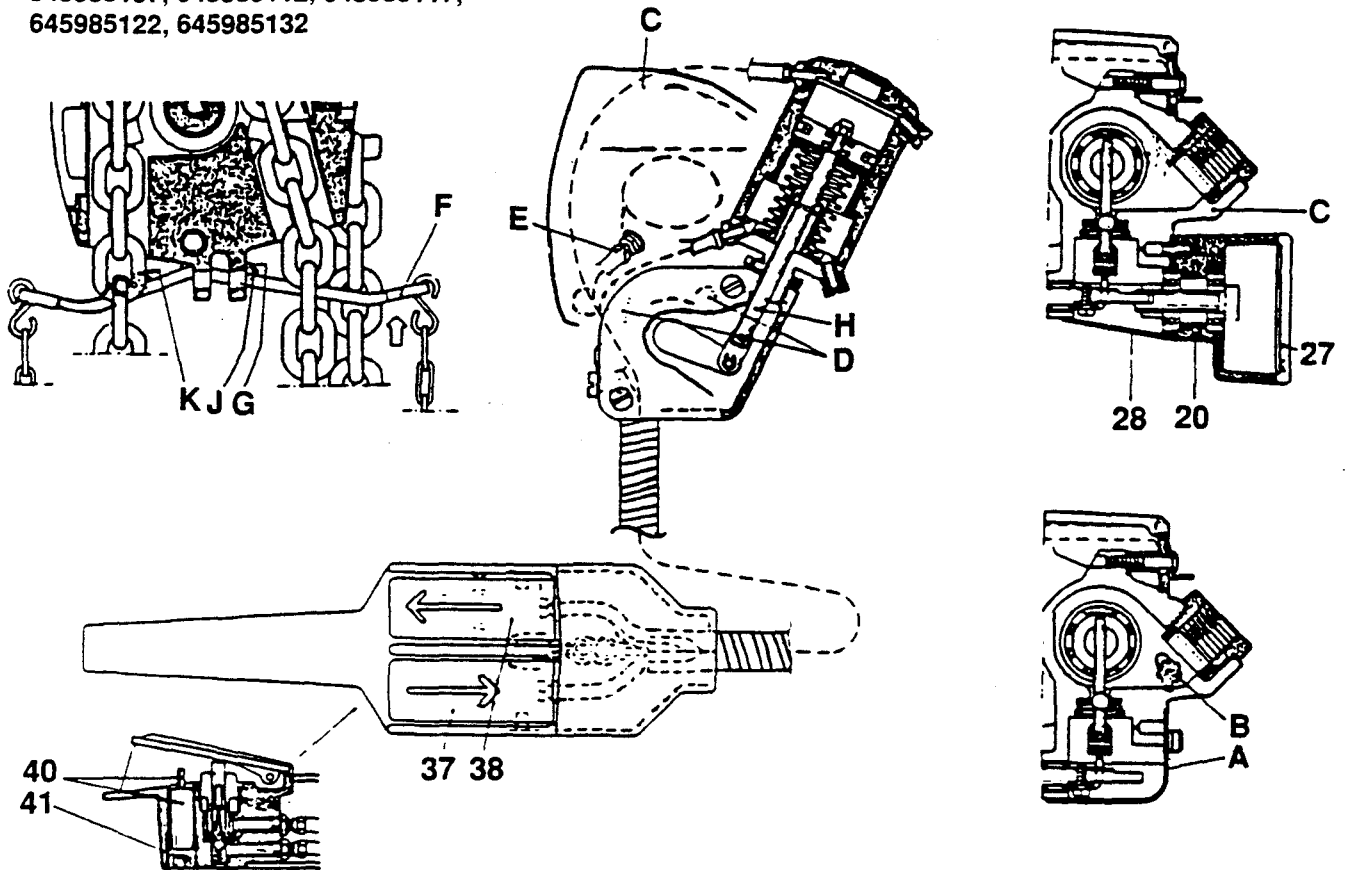
Lubrication

The moving parts of the pendant control are lubricated with grease of EP type.

NOTE: The piston rod (H) and the cylinder bore are lubricated with molybdenum disulphide grease, e.g. Molykote BR 2.

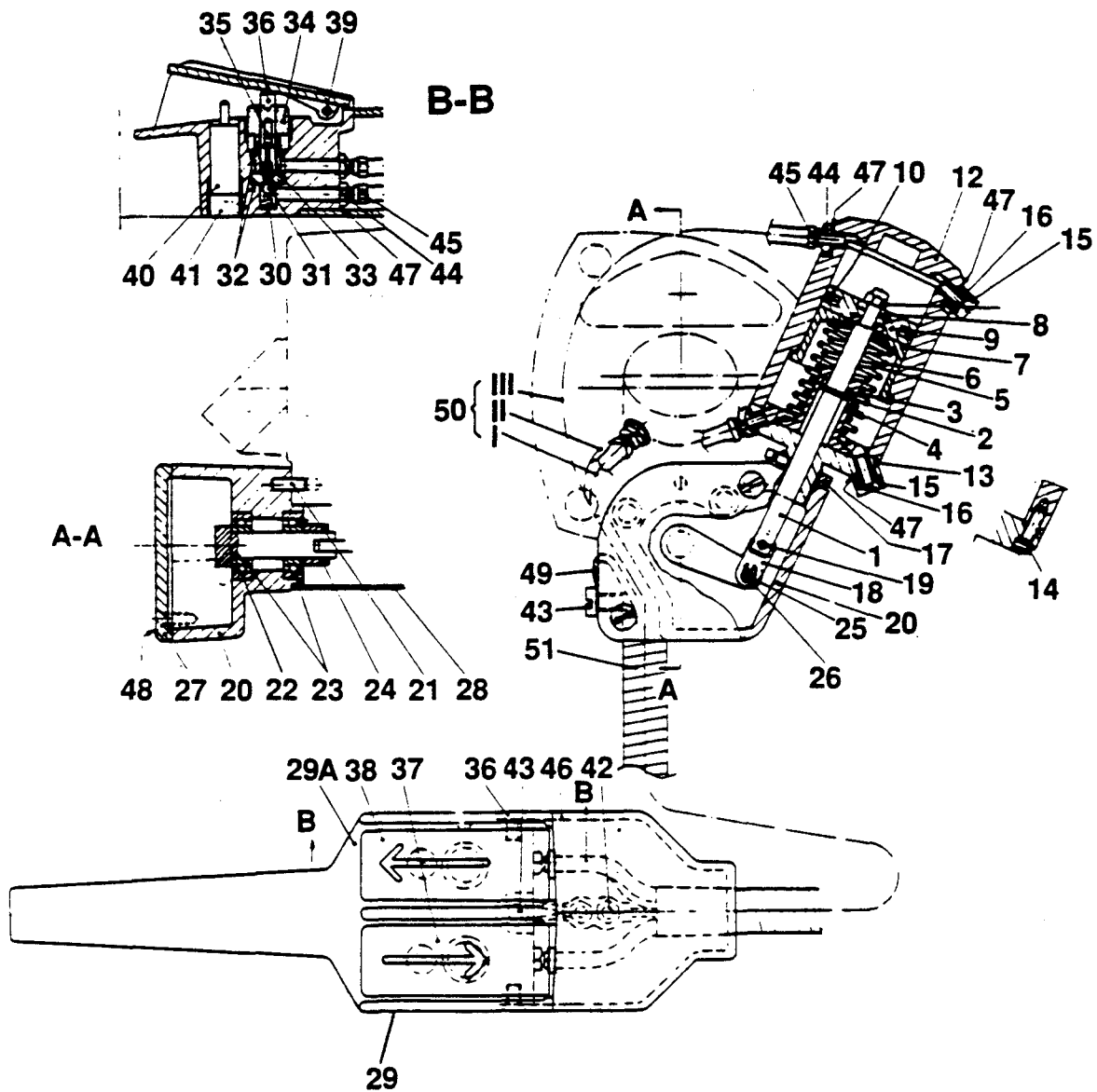
ILLUSTRATED PENDANT CONTROL

FOR FOLLOWING ASSEMBLY NOS.
645985107, 645985112, 645985117,
645985122, 645985132



Pendant Control Part Number Assembly	Pendant Drop	
	Ft.	(m)
645985107	6.58	(2.00)
645985112	12	(3.66)
645985117	17	(5.18)
645985122	22	(6.71)
645985132	32	(9.75)

ILLUSTRATED PENDANT CONTROL



PENDANT CONTROL PARTS LIST

ITEM NUMBER	PART NUMBER	QTY. PER UNIT	DESCRIPTION
1 (a)	645023141	1	PISTON ROD
2	645021178	1	CIRCLIP
3 (a)	645023134	1	RING
4 (a)	645023142	1	SPACER
5	645023143	1	SPRING
6	645023144	1	SPRING
7 (b)	645023145	1	SPACER
8 (a)	645023146	2	WASHER
9 (a)	645023147	1	PISTON COMPLETE (INC. ITEM 10)
10	645021167	1	SEALING RING
11	645021127	1	LOCKNUT (M5Fz)
12 (a)	645023150	1	CYLINDER
13 (a)	645023148	1	CYLINDER COVER
14	645021118	4	SCREW (MC6S 4X10)
15	645023161	2	SCREW
16	645023168	2	SILENCER
17	645021129	1	NUT
18 (a)	645023149	1	LINK
19	645021101	1	PIN (CP2.5h 6X10)
20 (a)	645023139	1	CYLINDER HOLDER
21	645021102	1	PIN (CP4h 6X12)
22	645023140	1	LEVER ARM
23	645021142	2	BALL BEARING (6090-Z)
24	645023111	1	SLEEVE
25	645023152	1	PIN
26 (b)	645021138	1	CIRCLIP (4)
27 (a)	645023138	1	COVER
28 (a)	645023155	1	COVER
29 (a)	645023158	1	VALVE HOUSING, COMPLETE (INCL. ITEM 29 THRU 48)
29A (a)	645023157	1	VALVE HOUSING
30 (b)	645023162	2	SPRING, CONICAL
31 (b)	645021152	2	BALL
32 (b)	645021159	4	O-RING (9.1X1.6)
33	645023163	2	SEAT
34 (a)	645023164	2	LINER
35	645023165	2	VALVE PIN
36	645023166	2	VALVE KNOB
37	345022105	1	PUSH BUTTON (UP)
38	645022106	1	PUSH BUTTON (DOWN)
39	645022108	1	PIN
40 (a)	645022107	2	BUFFER, COMPLETE
41 (a)	645023160	2	ADJUSTING SCREW
42	645021171	1	WIRE LOCK
43	645021113	2	SCREW (MCS 6X12)
44	645021165	6	HOSE NIPPLE
45 (b)	645021139	6	HOSE CLAMP
46 (a)	645023159	1	COVER
47 (b)	645021166	10	SEAL
48	645021116	6	SCREW (MFS 5X8)
49	645022103	—	WIRE (BULK) SPECIFY LENGTH IN FEET
50	645024104	—	NYLON TUBE (BULK) SPECIFY LENGTH IN FEET
51	645023167	—	PROTECTION HOSE (BULK) SPECIFY LENGTH IN FEET
52	645021181	1	WARNING PLATE

(a) These items are not stocked for service and will be furnished on special request only.

(b) Recommended spare parts.

TWIST ROD CONTROL

Assembly Instruction (See Figure 1)

The twist rod control is delivered in two separate main parts — the gear casing part and the control rod part. The control rod can be lengthened with a separate extension set.

Total length of twist rod control from the turning center of the gear casing

Without extension set: 3.9 to 6.6 Ft. (1.2 — 2.0 m)

With extension set: 7.2 to 12.5 Ft. (2.2 — 3.8 m)

1. Back off the screws (A) and remove the cover (B) which, in the standard version, covers the key grip of the control shaft (C).
2. Place the cover (17) on the gear casing (1). Mount the gear casing on the valve housing (D). Fit the pin (10) in the gear casing and the key grip of the gear wheel (3) against the key grip of the control shaft (C).

3. Screw in the screws (A).

4. Assemble the control rods (11 and 14) to the wanted length. Tighten the screw (12) and the nut (13). If wanted, fit the extension set.

5. Mount the complete control rod on the link (7). Tighten the screw (12) and the nut (13).

NOTE: Do not tighten the screw and nut so hard as to prevent the control rod from moving easily in the link.

TWIST ROD CONTROL

645986100

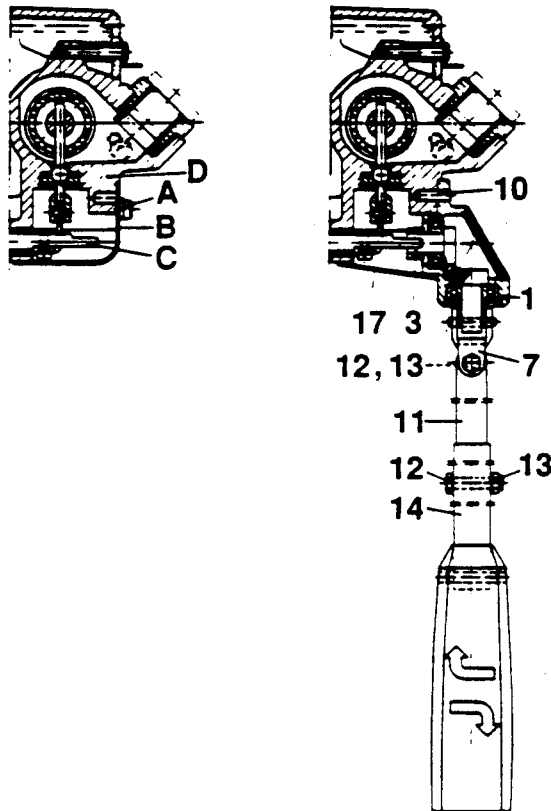


FIGURE 1

ASSEMBLY NO. 645986100 PARTS LIST TWIST ROD CONTROL

ITEM NUMBER	PART NUMBER	QTY. PER UNIT	DESCRIPTION
1 (a)	645023109	1	GEAR CASING. COMP. (INCL. ITEMS 2 THRU 9)
2	645021142	2	BALL BEARING (6090Z)
3 (a)	645023110	1	GEAR WHEEL SET
4	645021134	1	CIRCLIP (SgH 24)
5 (a)	645023111	1	SLEEVE
6 (a)	645023112	1	LINK
7	645021107	1	TENSION PIN (4X28)
8 (a)	645021170	1	WASHER
9	645021102	1	PIN (CP 4X12)
10	645023114	1	EXTENSION SET COMP. (INCL. ITEMS 11 THRU 14)
11 (a)	645023113	1	CONTROL ROD
12	645021111	2	SCREW (M6S 5X25 Fz)
13	645021127	2	NUT (M5Fz)
14	—	1	CONTROL ROD
15	645023115	1	HANDLE
16	645021106	1	PIN (FRP 4X28)
17 (a)	645023155	1	COVER
18	645021181	1	WARNING PLATE (NOT SHOWN)

(a) These items are not stocked for service and will be furnished on special request only.

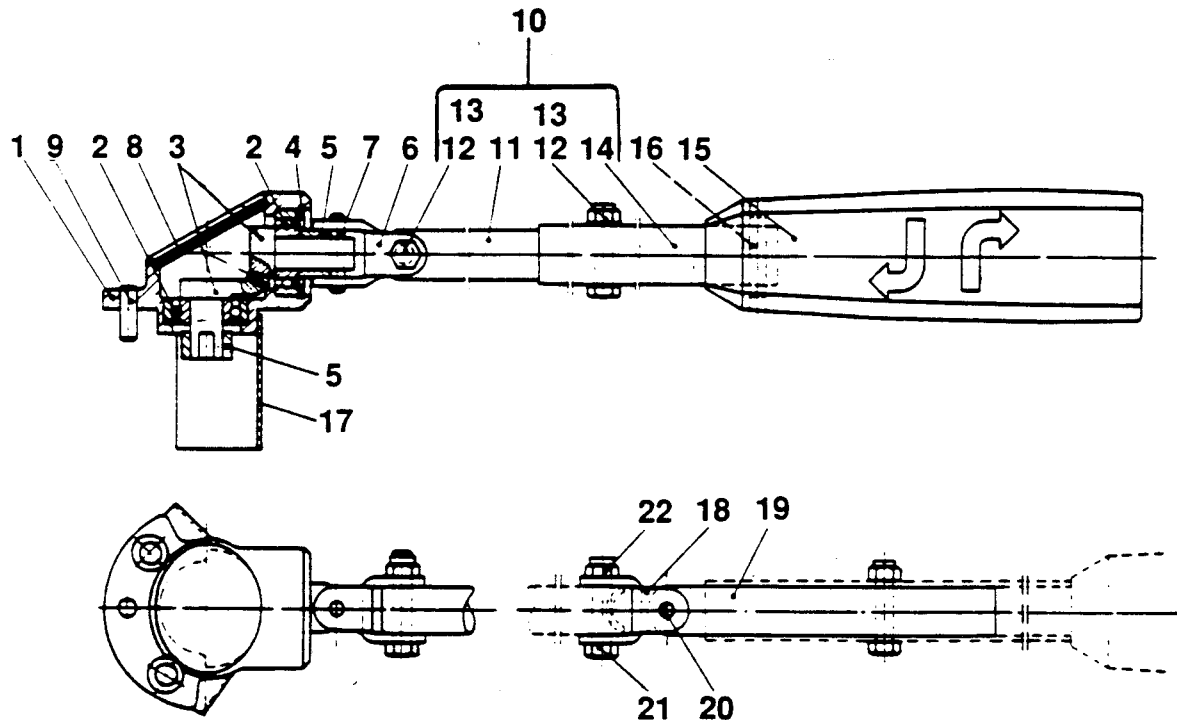


FIGURE 2

SERVICE KITS PARTS LIST

DESCRIPTION	QTY. PER UNIT	DESCRIPTION	PART NUMBER
SERVICE KIT (MOTOR)			645023174
INCLUDES	(2)	CIRCLIP	645021131
	(7)	VANES	AVAILABLE IN KIT ONLY
	(1)	NUT	645021129

DESCRIPTION	QTY. PER UNIT	DESCRIPTION	PART NUMBER
SERVICE KIT (BRAKE)			647084310
INCLUDES	(1)	PRESSURE PLATE	645022128
	(1)	BRAKE DISC	645022129
	(1)	PRESSURE PLATE	645022142
	(1)	CIRCLIP	64502113E
	(2)	WASHER	645022162
	(1)	SCREW	645021120

DESCRIPTION	QTY. PER UNIT	DESCRIPTION	PART NUMBER
SERVICE KIT (VALVE)			647084311
INCLUDES	(2)	WASHERS	645022162
	(1)	SCREW	645021120
	(1)	SPRING	645022155
	(3)	O-RINGS	645021161
	(1)	O-RING	645021155
	(1)	O-RING	645021163
	(1)	O-RING	645021160
	(1)	O-RING	645021154
	(1)	CIRCLIP	645021133
	(1)	SCREW	645021110

DESCRIPTION	QTY. PER UNIT	DESCRIPTION	PART NUMBER
SERVICE KIT (SUSPENSION 1/2-1 TON)			645022111
INCLUDES	(16)	BALLS	AVAILABLE IN KIT ONLY
	(1)	LOCK WASHER	AVAILABLE IN KIT ONLY

DESCRIPTION	QTY. PER UNIT	DESCRIPTION	PART NUMBER
SERVICE KIT (SUSPENSION 3 TON)			647084314
INCLUDES	(10)	BALLS	AVAILABLE IN KIT ONLY
	(1)	LOCK WASHER	AVAILABLE IN KIT ONLY

DESCRIPTION	QTY. PER UNIT	DESCRIPTION	PART NUMBER
SERVICE KIT (SUSPENSION 6 TON)			647084315
INCLUDES	(13)	BALLS	AVAILABLE IN KIT ONLY
	(1)	LOCK WASHER	AVAILABLE IN KIT ONLY

DESCRIPTION	QTY. PER UNIT	DESCRIPTION	PART NUMBER
SERVICE KIT (GEAR 1/2-1 TON)			647084313
INCLUDES	(1)	O-RING	645021164
	(2)	CIRCLIP	645021131
	(1)	CIRCLIP	645021135
	(1)	SEAL RING	645021173
	(1)	TUBE GREASE	—

DESCRIPTION	QTY. PER UNIT	DESCRIPTION	PART NUMBER
SERVICE KIT (GEAR 3-6 TON)			647084312
INCLUDES	(1)	O-RING	645021164
	(2)	CIRCLIP	645021131
	(1)	CIRCLIP	645021135
	(1)	SEAL RING	645021173
	(2)	TUBE GREASE	—

POWERED HOIST INSPECTION CHECK LIST

SEE PREVENTIVE MAINTENANCE SECTION OF INSTRUCTION MANUAL FOR DETAILS.

CHECK ONLY COMPONENTS APPLICABLE FOR SPECIFIC EQUIPMENT AND INSPECTION TYPE.

HOIST MODEL _____

HOIST S/N _____

HOOKS			CABLE			CHAINS		
	YES	NO		YES	NO		YES	NO
HARDWARE LOOSE	☐	☐	BROKEN WIRES AT ENDS	☐	☐	BINDING	☐	☐
CRACKS	☐	☐	BROKEN WIRES EXCESSIVE	☐	☐	CRACKED	☐	☐
EXCESSIVE WEAR	☐	☐	EXCESSIVE WEAR	☐	☐	TWISTED	☐	☐
BENT	☐	☐	KINKED OR DISTORTED	☐	☐	DISTORTED	☐	☐
SPREADING	☐	☐	CORROSION	☐	☐	CORRODED	☐	☐
FREELY ROTATE	☐	☐	HEAT DAMAGED	☐	☐	EXCESSIVE WEAR	☐	☐
LATCH DAMAGED	☐	☐				WORN CHAIN GUIDES	☐	☐
						POCKET WHEELS WORN	☐	☐
BRAKES			WIRING			DRUM & SHEAVES		
	YES	NO		YES	NO		YES	NO
MOTOR BRAKE WORN OR NOT OPERATING	☐	☐	LOOSE CONNECTIONS	☐	☐	WORN EXCESSIVELY	☐	☐
EXCESSIVE LOADBRAKE DRIFT OR BLACKLASH	☐	☐	FRAYED	☐	☐	CRACKED OR SCORED	☐	☐
EXCESSIVE DISC WEAR	☐	☐	DAMAGED	☐	☐			
			PROPER GROUNDING	☐	☐			
LIMIT SWITCHES			LOAD LIMITING DEVICE			COLLECTORS		
	YES	NO		YES	NO		YES	NO
OPERATING PROPERLY	☐	☐	OPERATING PROPERLY	☐	☐	BINDING	☐	☐
						EXCESSIVE WEAR	☐	☐
HOUSING			OPERATION CONTROLS			LUBRICATION		
	YES	NO		YES	NO		YES	NO
DISTORTED	☐	☐	CONTACTOR PITTING	☐	☐	ALL POINTS LUBRICATED AS GIVEN IN LUB CHART	☐	☐
CRACKS	☐	☐	OPERATING PROPERLY	☐	☐	OIL DARK OR LOW	☐	☐
LOOSE HARDWARE	☐	☐	DAMAGED PUSH BUTTON	☐	☐	OIL LEAKS	☐	☐
BEARING NOISE	☐	☐	HOUSING	☐	☐			
SUPPORTING STRUCTURE			AIR SYSTEM			WARNING LABELS		
	YES	NO		YES	NO		YES	NO
CONTINUED ABILITY TO SUPPORT IMPOSED LOADS	☐	☐	LEAKING	☐	☐	MISSING	☐	☐
WORN OR DISTORTED TROLLEY PARTS	☐	☐	LOOSE CONNECTIONS	☐	☐	ILLEGIBLE	☐	☐
			BROKEN CONTROL PENDANT	☐	☐			

NOTE: IF ANY () IS CHECKED DO NOT OPERATE THE HOIST UNTIL REPAIRS HAVE BEEN MADE.

REMARKS AND REPAIRS MADE _____

SIGNATURE _____ DATE _____ CLOCK NUMBER _____

POWERED HOIST INSPECTION CHECK LIST

SEE PREVENTIVE MAINTENANCE SECTION OF INSTRUCTION MANUAL FOR DETAILS.

CHECK ONLY COMPONENTS APPLICABLE FOR SPECIFIC EQUIPMENT AND INSPECTION TYPE.

HOIST MODEL _____

HOIST S/N _____

HOOKS		YES	NO	CABLE		YES	NO	CHAINS		YES	NO
HARDWARE LOOSE	☐	☐	☐	BROKEN WIRES AT ENDS	☐	☐	☐	BINDING	☐	☐	☐
CRACKS	☐	☐	☐	BROKEN WIRES EXCESSIVE	☐	☐	☐	CRACKED	☐	☐	☐
EXCESSIVE WEAR	☐	☐	☐	EXCESSIVE WEAR	☐	☐	☐	TWISTED	☐	☐	☐
BENT	☐	☐	☐	KINKED OR DISTORTED	☐	☐	☐	DISTORTED	☐	☐	☐
SPREADING	☐	☐	☐	CORROSION	☐	☐	☐	CORRODED	☐	☐	☐
FREELY ROTATE	☐	☐	☐	HEAT DAMAGED	☐	☐	☐	EXCESSIVE WEAR	☐	☐	☐
LATCH DAMAGED	☐	☐	☐					WORN CHAIN GUIDES	☐	☐	☐
								POCKET WHEELS WORN	☐	☐	☐
BRAKES		YES	NO	WIRING		YES	NO	DRUM & SHEAVES		YES	NO
MOTOR BRAKE WORN OR NOT OPERATING	☐	☐	☐	LOOSE CONNECTIONS	☐	☐	☐	WORN EXCESSIVELY	☐	☐	☐
EXCESSIVE LOADBRAKE DRIFT OR BLACKLASH	☐	☐	☐	FRAYED	☐	☐	☐	CRACKED OR SCORED	☐	☐	☐
EXCESSIVE DISC WEAR	☐	☐	☐	DAMAGED	☐	☐	☐				
				PROPER GROUNDING	☐	☐	☐				
LIMIT SWITCHES		YES	NO	LOAD LIMITING DEVICE		YES	NO	COLLECTORS		YES	NO
OPERATING PROPERLY	☐	☐	☐	OPERATING PROPERLY	☐	☐	☐	BINDING	☐	☐	☐
								EXCESSIVE WEAR	☐	☐	☐
HOUSING		YES	NO	OPERATION CONTROLS		YES	NO	LUBRICATION		YES	NO
DISTORTED	☐	☐	☐	CONTACTOR PITTING	☐	☐	☐	ALL POINTS LUBRICATED AS GIVEN IN LUB CHART	☐	☐	☐
CRACKS	☐	☐	☐	OPERATING PROPERLY	☐	☐	☐	OIL DARK OR LOW	☐	☐	☐
LOOSE HARDWARE	☐	☐	☐	DAMAGED PUSH BUTTON	☐	☐	☐	OIL LEAKS	☐	☐	☐
BEARING NOISE	☐	☐	☐	HOUSING	☐	☐	☐				
SUPPORTING STRUCTURE		YES	NO	AIR SYSTEM		YES	NO	WARNING LABELS		YES	NO
CONTINUED ABILITY TO SUPPORT IMPOSED LOADS	☐	☐	☐	LEAKING	☐	☐	☐	MISSING	☐	☐	☐
WORN OR DISTORTED TROLLEY PARTS	☐	☐	☐	LOOSE CONNECTIONS	☐	☐	☐	ILLEGIBLE	☐	☐	☐
				BROKEN CONTROL PENDANT	☐	☐	☐				

NOTE: IF ANY () IS CHECKED DO NOT OPERATE THE HOIST UNTIL REPAIRS HAVE BEEN MADE.

REMARKS AND REPAIRS MADE _____

SIGNATURE _____

DATE _____

CLOCK NUMBER _____

Yale®

HOISTS

WARRANTY

Every hoist is thoroughly inspected and tested prior to shipment from the factory. Should any problems develop, return the complete hoist prepaid to your nearest Yale Hoists Authorized Warranty Repair Station.

This warranty does not apply where: (1) deterioration is caused by normal wear, abuse, improper or inadequate power supply, eccentric or side loading, overloading, chemical or abrasive actions, improper maintenance or excessive heat; (2) problems resulted from repairs, modifications or

alterations made by persons other than factory or Yale Hoists personnel; (3) the hoist has been abused or damaged as a result of an accident; (4) repair parts or accessories other than those supplied by Yale Hoists are used on the hoist. Equipment and accessories not of the seller's manufacture are warranted only to the extent that they are warranted by the manufacturer. EXCEPT AS STATED HEREIN, YALE HOISTS MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

Improvements:

Yale Hoists is constantly striving to improve its product. Changes in design and improvements will be made whenever manufacturer believes the efficiency of the product will be improved without incurring any obligation to incorporate such improvements in any products which have been shipped or are in service.

Important Notice:

Use of chain, wire rope or replacement parts other than as supplied as original equipment on Yale hoists may lead to dangerous operation. Accordingly, Yale Hoists cannot be responsible in such cases and our warranty will be voided.

For more information, write Yale Hoists, Forrest City, Arkansas 72335.

Yale® HOISTS
3105 N. Washington
P. O. Box 1000
Forrest City, Arkansas 72335
Customer Service (800) 999-6318
FAX (800) 766-0223