A40

OWNERS MANUAL

Manual No. 407900000

Rev. 9/2/2003

Serial No. _____

Mailing Address:
P.O. Box 580697
Tulsa, OK 74158-0697
Physical Address:
4707 N. Mingo Rd.
Tulsa, OK 74117-5904

Phone (918) 836-0463
Fax (918) 834-5979
http://www.autocrane.com

Auto Crane Warranty Registration

Fax Transmission

To: Warranty Department Fax: (918) 834-5979

From: Date:

Re: Product Registration Pages:

End User Information: (Required for Warranty Activation)

Name: Phone:

Address:

City: State: Zip:

Contact: E-mail Address:

Distributor Information: (Required for Warranty Activation)

Name:

Address:

City: State: Zip:

Contact: E-mail Address:

Product Information: (Required for Warranty Activation)

Model No.: Serial No.:

Date Product Delivered: Date Processed:*

VIN #

* For Auto Crane use only

ONE REGISTRATION FORM PER UNIT (CRANE OR BODY)

Registration form must be mailed or faxed within 15 days of customer installation.

Mail to:
Warranty Department
Auto Crane Company
P.O. Box 581510
Tulsa, OK 74158-0697

A40 ARTICULATING CRANE
OWNER'S MANUAL – REVISION RECORD

Revision Date	Section(s) Or Page(s)	Description of Change
09/02/03	Last page	New 2-year warranty policy to replace 1-year warranty policy

WARNINGS

WARNING! Federal law (49 cfr part 571) requires that the Final Stage Manufacturer of a vehicle certify that the vehicle complies with all applicable federal regulations. Any modifications performed on the vehicle prior to the final state are also considered intermediate stage manufacturing and must be certified as to compliance. The installer of this crane and body is considered on of the manufacturers of the vehicle. As such a manufacturer, the installer is responsible for compliance with all applicable federal and state regulations, and is required to certify that the vehicle is in compliance.

WARNING! It is the further responsibility of the installer to comply with the OSHA Truck Crane Stability Requirements as specified by 29 CFR part 1910.180 (C) (1).

WARNING! NEVER OPERATE THE CRANE NEAR ELECTRICAL POWER LINES!
Death or serious injury will result from boom, line, or load contacting electric lines. Do not use crane within 10 feet (3.05m) of electric power lines carrying up to 50,000 volts. One foot additional clearance is required for every additional 30,000 volts or less. **SEE DANGER DECAL (P/N 040529)** in this Owner's Manual.

WARNING! NEVER.....

- **EXCEED** load chart capacities (centerline of rotation to hoist hook).
- Un-reel last 5 wraps of cable from drum!
- Wrap cable around load!
- Attempt to lift or drag a load from the side! The boom can fail far below its rated capacity.
- Weld, modify, or use unauthorized components on any Auto Crane unit! This will void any warranty or liability. Also failure of the crane may result.
- Place a chain link on the tip of the hook and try to lift a load!
- Use a sling bar or anything larger than the hook throat that could prevent the hook latch from closing, thus negating the safety feature!
- Hold on any pendant Select Switch that will cause unsafe operating conditions!

WARNING! In using a hook with latch, **ALWAYS** make sure that the hook throat is closed before lifting a load! Proper attention and common sense applied to the use of the hoist hook and various slings will prevent possible damage to material being hoisted and may prevent injury to personnel.

WARNING! Failure to correctly plumb and wire crane can cause inadvertent operation and damage to crane and/or personnel!

WARNING! Auto Crane Company remote controlled cranes are not designed or intended to be used for any applications involving the lifting or moving of personnel.

WARNING! ALWAYS operate the crane in compliance with the load capacity chart. **DO NOT USE** the overload shutdown device to determine maximum rated loads, if the crane is equipped with this type of device.

READ THIS PAGE

A40 OWNER'S MANUAL
TABLE OF CONTENTS

NOTES

A40 INTRODUCTION

Auto Crane products are designed to provide many years of safe, trouble-free, dependable service when properly used and maintained.

To assist you in obtaining the best service from your crane and to avoid untimely crane and/or vehicle failure, this manual provides the following operating and service instructions. It is **specifically recommended** that all operating and service personnel consider this manual as mandatory material for reading and study before operating or servicing Auto crane products. It is **highly recommended** that crane owners, equipment managers and supervisors also read this manual.

Auto Crane has incorporated several safety features in the A-40 series cranes for your protection. The choice of materials and the design of the electrical system minimizes weight and lengthens durability. Holding valves prevent the load from dropping if a hose should fail. A **10 mircon filter** in the return line of the hydraulic system removes dirt and grit that may cause erratic operation. The reservoir has a **15 mircon air filter** in the filler cap. The pump has a **100 mesh strainer** in the suction line.

For your convenience the overall dimensions of the A40 crane are on the General Dimension Drawing, Section 3.

Remember, the crane adds weight to the vehicle. Adding weight may change the driving and riding characteristics of the vehicle unless the appropriate overload spring(s are installed on the truck. The payload of the vehicle is reduced by the weight of the crane. The operator should exercise care when loading the vehicle. Distributing the payload on the vehicle evenly will greatly improve the driving and riding characteristics of the vehicle. **A minimum G.V.W. of 17,500 lbs. and a minimum RBM of 600,000 is recommended for mounting the A40 series cranes.**

Auto Crane Company issues a limited warranty certificate with each unit sold. See last page for warranty policy.

It has always been Auto Crane Company policy to handle all warranty claims we receive as promptly as possible. If a warranty claim involves discrepant material or workmanship, Auto Crane will take immediate corrective action. It is understandable that Auto Crane company cannot assume responsibility of liability when it is obvious that our products have been abused, mis-used, overloaded or otherwise damaged by inexperienced persons trying to operate the equipment without reading the manual.

Auto Crane will not assume responsibility or liability for any modifications or changes made to a unit, or installation of component parts done without authorization.

DISTRIBUTOR ASSISTANCE:

Should you require any assistance not given in this manual, we recommend that you consult your nearest Auto Crane Distributor. Our distributors sell authorized parts and have service departments that can solve almost any needed repair.

Auto Crane maintains distributor network and a knowledgeable Customer Service Department. In most cases, an equipment problem is solved via phone conversation with your distributor. When the distributor can not handle the problem, our customer service department can assist and can bring a regional sales manager or a factory serviceman into the solution

Auto Crane Company's extensive Research and Development Program allow our customers to use the best equipment on the market. Our Engineering Staff and our knowledgeable sales people, are always available to our customers in solving crane and winch-type application problems. When in doubt, call the Auto Crane factory.

This manual does not cover all maintenance, operating, or repair instructions pertinent to all possible situations. If you require additional information, please contact the **Auto Crane Co.** at the following telephone number: **(918) 836-0463**.

The information contained in the manual is in effect at the time of this printing. Auto Crane Company reserves the right to update this material without notice or obligation.

NOTE: THIS MANUAL SHOULD REMAIN WITH THE CRANE AT ALL TIMES.

A40 GENERAL DESCRIPTION

The Auto Crane A40 knuckle boom is an all hydraulic crane with a 40,000 ft-lb rating. It is suitable for both hook and attachment service.

The A40 comes in (4) basic configurations:

1. (1) Hydraulic Extension with a horizontal reach of 17 ft. -10 in.
2. (1) Hydraulic Extension & (1) Manual Extension with a horizontal reach of 23 ft. -7 in.
3. (2) Hydraulic Extension with a horizontal reach of 23 ft. -7 in.
4. (2) Hydraulic Extension & (1) Manual Extension with a horizontal reach of 29 ft. -4 in.

The main components of the crane are:

1. Outriggers
2. Crane Base Assembly
3. Rotation System
4. Control Valve
5. Pedestal Assembly
6. Inner Boom
7. Lift Cylinder
8. Outer Boom
9. Outer Boom Cylinder
10. Telescoping Boom Section(s) and Extension Cylinder
11. Manual Boom
12. Reservoir

OUTRIGGERS

The outriggers are extended manually in the horizontal direction and are raised and lowered hydraulically. Optional hydraulic in & out is available. Outriggers are operated by selecting the option at the main control valve, manually moving the Outrigger Slide and raising or lowering the foot with the manual control valve on each Outrigger Cylinder. Outrigger cylinders have integral dual pilot operated check valves which will close if a hose break occurs, preventing any uncontrolled movement of outrigger cylinder and to prevent an outrigger cylinder from drifting down once they have been stowed. Outrigger span is 12 ft. when extended. Once the outrigger slides are extended or retracted to their maximum or minimum span they are locked by a spring loaded hand operated catch. The Outriggers should always be extended to their maximum out position before operating crane.

CRANE BASE ASSEMBLY

The crane base is an all welded structure which consists of mounting brackets to mount crane to truck frame, outrigger cross tube, base plate to mount rotation bearing, mounting plate for hydraulic control valve and handles.

ROTATION SYSTEM

Rotation system consists of a integral ball rotation bearing and worm drive powered by a hydraulic rotation motor. The rotation motor is mounted directly to the worm shaft. Crane has approximately 390 degrees of rotation. The zero centerline of rotation of the crane is at the longitudinal centerline of truck frame facing forward if mounted behind cab. All components of the rotation system are serviceable without removal of base assembly from truck frame. Crane rotation output 5400 ft-lbs of torque.

CONTROL VALVE

(5) section manual control valves standard with remote actuators on the opposite side of crane base. Optional (7) section valve, (2) auxiliary functions is available. The first section is to select or deselect to Outriggers. If the outriggers a on the other crane functions are off and vise-a-verse. The remaining (4) sections are to control the crane functions. Control valve has adjustable inlet relief valve set at 3500 psi. Each section has one or two port relief's to limit the capacity per function. This prevents Overloading the any crane function. Please refer to the Hydraulic Schematic in this manual for specific settings.

A40 GENERAL DESCRIPTION

PEDESTAL ASSEMBLY

The pedestal assembly is an all welded structure consisting of a base plate used to mount two vertical columns which the inner boom is hinged to and the outer boom swings along side._

BOOM

Inner boom assembly is an all welded structure consisting of an inner boom pivot which is hinged to the pedestal, outer boom pivot and a common pivot for the inner and outer boom cylinders.

INNER LIFT CYLINDER

The inner boom is actuated by a single double acting lift cylinder with a single counter-balance cartridge mounted in a block directly to the cylinder. Both ends of the cylinder have 2 in. replaceable self-lubricating bushing

OUTER BOOM & OUTER BOOM CYLINDER

Outer boom assembly is an all welded structure which is hinged to one end of the inner boom assembly and is actuated by an Outer Boom Cylinder. Outer boom houses the extension section(s) which are moved by a one or two extension cylinders. The outer boom which is offset to clear the pedestal includes a knuckle assembly which is hinged to the inner boom assembly. .

TELESCOPING BOOM SECTION(S) & EXTENSION CYLINDER

One or two hydraulic telescoping boom sections are inserted one inside another and then into outer boom assembly. Telescoping boom sections are actuated by one or two extension cylinders with 64 in of stroke each.

MANUAL BOOM (OPTIONAL)

The manual boom is a one piece boom section which is installed into the last hydraulic telescoping boom extension. It is pinned into place for both storage and extension.

RESERVOIR

Reservoir capacity is 12 gallons with 100 mesh suction strainer mounted in reservoir, sight level indicators with temperature, a baffle to reduce oil splash and a in-tank 10 micro filter that is a filler and breather combined.

A40 GENERAL SPECIFICATIONS

Dimensions

Width: 21.5 in

Height: 68 in from top of chassis rails

Length: 96 in Outriggers stored
144 in Outriggers extended

Weight: 1750 lbs Std Crane
1860 lbs (1) Manual Ext
2040 lbs (2) Hydraulic Ext
2120 lbs (2) Hyd Ext,
(1) Man Ext

Mounting Space: 24 in min

Center of Gravity

Horizontal: Centerline of chassis
Vertical: 18.50 above chassis frame rail

Capacity

40,000 ft-lbs maximum

LIFTING CAPACITIES			
Distance	**Weight**	**Extension**	**Position**
8 ft 0 in	5,000 lbs	1st	Retracted
12 ft 6 in	3,200 lbs	1st	Retracted
17 ft 10 in	2,200 lbs	1st	Extended
23 ft 7 in	1,640 lbs	2nd	Extended
29 ft 4 in	1,000 lbs	3rd	Extended

The A40 Knuckleboom Crane is rated at the hook on a Specific Section **not** distance divided into Ft-Lb Rating. Once a section is moved out even 1 inch, the capacity falls to the rating fully extended. The exception is a fully retracted single section can lift to 5,000 lbs at 8 ft.
See Load Chart

Rotation Bearing

Lubricant: Moly 29
elf Keystone Lubricants
1-800-344-2241

Chassis Requirements

17,500 lbs GVWR minimum
600,000 RBM minimum

Hydraulic System

Pressure: 3500 psi maximum operating
Individual spool section have separate port relief settings. See Hydraulic Schematic

Flow: 8 gpm

Filtration: Suction line strainer 100 mesh
Hydraulic Filter 10 micron in-tank

Hydraulic Reservoir: 12 gals

Oil type: 10w Hydraulic Oil
Mobile DTE 13, Sun 2015,
Dextron II

Rotation Motor: 9.8 cid
Inner Boom Cylinder: 5.00 Bore x 14.70 Stroke
Outer Boom Cylinder: 5.00 Bore x 27.75 Stroke
Extension Cylinder: 2.00 Bore x 64.00 Stroke
Outrigger Cylinder: 2.00 Bore x 22.00 Stroke

Electrical System Requirements

Alternator: 60 amp minimum
Battery: Standard Truck Okay
Standard A40 has no electrical requirements

A40 GENERAL DIMENSION

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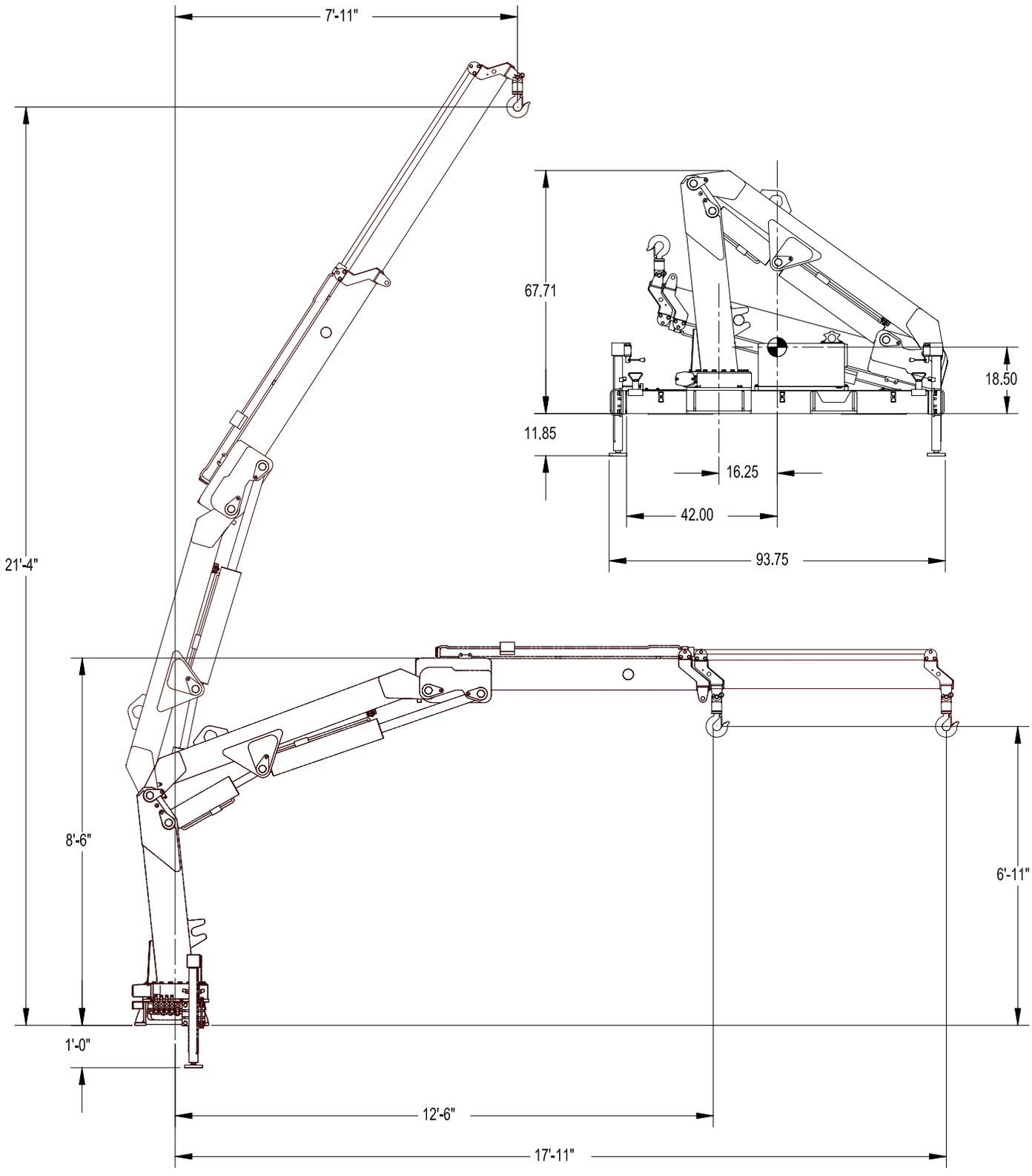
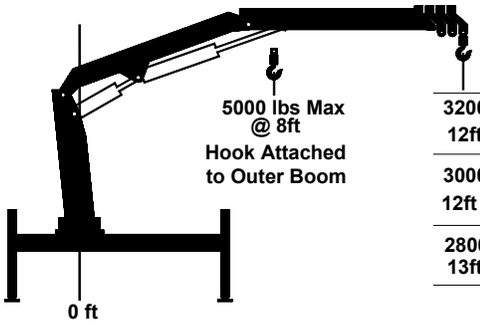


NOTES

A40 LOAD CHART
P/N: 407022000

Model A40 Load Chart



3200 lbs 12ft 6in	2200 lbs 17ft 10in	- -	- -	Single Extension Hook on First Extension
3000 lbs 12ft 11in	2000 lbs 18ft 3in	1640 lbs 23ft 7in	- -	Dual Extension Hook on Second Extension
2800 lbs 13ft 4in	1750 lbs 18ft 8in	1400 lbs 24ft 0in	1000 lbs 29ft 4in	Triple Extension Hook on Third Extension

Note: Deduct the Weigth of Load Handling Attachment

407022000

The A40 Knuckleboom Crane is rated at the hook on a Specific Section not distance divided into Ft-Lb Rating. Once a section is moved out even 1 inch, the capacity falls to the rating fully extended. The exception is a fully retracted single section can lift to 5,000 lbs at 8 ft.

--- IMPORTANT ---
SAFETY TIPS AND PRECAUTIONS

1. No unqualified or unauthorized person shall be allowed to operate the crane.
2. WARNING: Never weld, modify, or use unauthorized components / parts on any Auto Crane unit. This will void any warranty or liability. Also, failure of the crane may result.
3. Make certain the vehicle meets minimum chassis requirements. (These requirements do not guarantee unit stability.)
4. Make certain the crane is installed per factory specifications. Contact your local distributor or the Auto Crane factory if any questions arise.
5. Visual inspections and tests should be conducted at the beginning of each shift each day to ensure that the crane and all its operating systems are in good condition and working order before it is used.
6. Inspect hydraulic hoses frequently for signs of deterioration, and replace them as required.
7. If a hydraulic break occurs, leave the area of the break and do not attempt to stop the break by hand as the hydraulic oil may be hot and under high pressure which can cause serious injury. Shut the system down as soon as possible.
8. Check the hook at least every thirty days for distortions or cracks and replace it as required.
9. Oil gears as required.
10. Stop all operations when cleaning, adjusting or lubricating the machine.
11. Keep dirt and grit out of moving parts by keeping a crane clean. Make sure machine is free of excess oil, grease, mud and rubbish, thus reducing accidents and fire hazards.
12. When a new cable is installed, operate first with a light load to let the cable adjust itself.
13. Locate the vehicle at the work site for the best stability possible.
14. Keep the vehicle in a level position while loading or unloading.
15. Observe operating area for obstructions and/or power lines that might be a hazard.
16. WARNING: NEVER OPERATE THE CRANE NEAR ELECTRICAL POWER LINES. Auto Crane Company recommends that the crane never be any closer to a power line (including telephone lines) than 10 feet at any point.
17. Allow the vehicle engine to warm up before operating crane.
18. Know the weight of your rigging and load to avoid overloading the crane.
19. Deduct the weight of the load handling equipment from the load rating to determine how much weight can be lifted.
20. All load ratings are based on crane capacity, NOT the vehicle stability.

    Remember in lifting a heavy load, the weight can create enough tipping moment to overturn the vehicle.
21. Always comply with load chart capacities, (centerline of rotation to hook).
22. Secure all loads before lifting.
23. Always set the emergency brake before beginning operation.
24. Keep objects and personnel clear of crane path during operation.
25. Operate control levers slowly and smoothly in order to meter oil flow for safe operation.
26. Always use outriggers from vehicle to the ground during crane operation. Ensure that they are firmly positioned on solid footings. Stand clear of outriggers while they are being extended.
27. If any outrigger, when extended, rests on a curb or other object that prevents it from extending to its maximum distance, shorten bearing or fulcrum point and reduce the maximum load accordingly.
28. When an outrigger will not reach the ground due to holes or grades, it shall be blocked up to provide level and firm support for the truck.
29. When working in soft earth, use wide pads under outrigger feet to prevent sinking.

WARNING!

Auto Crane Company cranes are not designed or intended for use in lifting or moving persons. Any such use shall be considered to be improper and the seller shall not be responsible for any claims arising there from. This sale is made with the express understanding that there is no warranty that the goods shall be fit for the purpose of lifting or moving persons or other improper use and there is no implied warranty or responsibility for such purposes.

--- IMPORTANT ---
SAFETY TIPS AND PRECAUTIONS

30. Always store outriggers before transportation.
31. Always store the crane in its stowed position for transportation.
32. Remember the overall height of the entire unit for garage door clearance or when moving under objects with low overhead clearance.
33. Disengage power takeoff (PTO) before moving the vehicle.
34. Always walk around the vehicle before moving.
35. Never drive with a load suspended from crane.
36. Do not take your eyes off a moving load. Look in the direction you are moving.
37. Never swing a load over people.
38. Do not stop the load sharply in midair so that it swings like a pendulum. Meter the control levers to avoid this situation.
39. Crane boom length should be kept as short as possible for maximum lifting capacity and greater safety. Longer booms require additional care in accelerating and decelerating the swing motion, and thus slow down the working cycle and reduce productivity.
40. Keep the load directly and vertically under the boom point at all times. Crane booms are designed primarily to handle vertical loads, not side lifts.

    WARNING: Never attempt to lift, drag, tow or pull a load from the side. The boom can fail far below its rated capacity.

41. Do not push down on anything with boom extensions, lift or outer boom function.
42. Do not lift personnel with any wire rope attachment or hook. There is no implied warranty or responsibility for such purposes.
43. WARNING: In using a safety hook, ALWAYS close the hook throat before lifting a load. Proper attention and common sense applied to the use of the hook and various slings will prevent possible damage to material being hoisted and may prevent injury to personnel.
44. WARNING: Never place a chain link on the tip of the hook and try to lift a load with the hoist.
45. WARNING: Never use a sling bar or anything larger than the hook throat which could prevent the safety latch from closing, thus negating the safety feature.
46. If the crane is equipped with an optional winch:
    - do NOT allow personnel to ride on loadline, hook, load, or any other device attached to winch line.
    - do NOT extend boom without reeling off line at the same time when using winch.
    - do pull load-block up against the boom tip.
47. Do not wrap the wire rope around sharp objects when using winch.
48. WARNING: Never unreel last 5 wraps of cable from drum.

A40 ARTICULATING CRANE MOUNTING and INSTALLATION

1. Vehicle should meet minimum 17,500 lb. GVW rating and/or a frame resistance to bending of 600,000 in-lbs. minimum, dual rear wheels and tires, engine tachometer and throttle control, and front and rear springs to match axle ratings.

2. Make sure frame is clear of all obstructions in the area where the crane is to be mounted.

3. Distance required between back of cab and front of flatbed or body is 24 in.

4. A40 weight: **1,750 lbs with (1) hydraulic extension**
   1,860 lbs with (1) hydraulic extension & (1) manual boom
   2,040 lbs with (2) hydraulic extension
   2,100 lbs with (2) hydraulic extension & (1) manual boom

5. In preparation for crane mounting, ensure mounting surfaces are flat by having wear plates between the crane base and the top of truck frame rails. Wear plates are as follows: (Fig. 1)

   - (1) ¼" thick x 3" wide x 25" long flat bar on the driver side.
   - (1) ¼" thick x 3" wide x 11" long flat bar on the passenger side.

   These wear plates should have clearance holes as applicable to clear rivet heads on the truck frame rails.

6. Use lifting eye, ref fig. 2, to lift the crane and position it on the truck frame

7. Once the crane is positioned on the wear plates on the truck, weld (4) stop tabs on wear plates in front and behind of crane mount to prevent the wear plates from moving. Stop tab should be a minimum of ½" thick x 2 ¾" wide x 2" long.

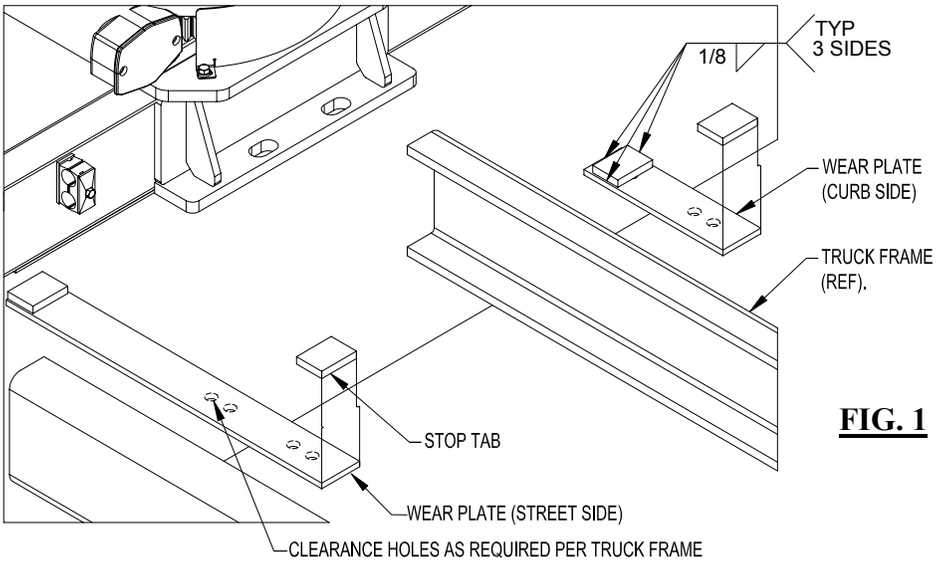


FIG. 1

NOTE: Never weld on truck frame.

A40 ARTICULATING CRANE MOUNTING and INSTALLATION

8. Install the mounting hardware, as shown in diagram according to selected Ford chassis.

9. Torque the first set of mounting bolts and nuts to 225 ft-lbs. Torque the second set of mounting bolts and nuts to 100 ft-lbs. Recheck the torques after initial installation testing is performed, after the first 10 hours of operation and once a year thereafter.

10. The Suction & Pressure hoses and fittings are not furnished with this crane. These items are normally determined at installation.
    A. Suction hose from pump to reservoir: Hose size, 1 inch (-16) SAE 100 R4
    B. Pressure hose from pump to control valve inlet: Hose size, ¾ inch (-08) with minimum working pressure of 4000 psi.

    Install PTO by following PTO's manufacturers installation instructions. It is recommended that PTO mounting bolts be safely wired to prevent bolts from becoming loose. Always check to make sure that there is no transmission oil leaking around the PTO mounting.

> **NOTE: After installation of the pump/PTO and the reservoir is complete, connect the pressure and return lines together. Circulate the hydraulic oil for thirty minutes to trap any contaminates in the system before hooking the pressure and return lines to the crane. Be sure to check filters after purging the system.**

11. Crane operation requires 8 gpm at 3800 psi.

12. To insure proper crane operation and crane performance, the vehicle shall be equipped with an engine speed control and tachometer.

13. Always store the crane in the figure-4 position as shown in fig. 2, when not in operation.

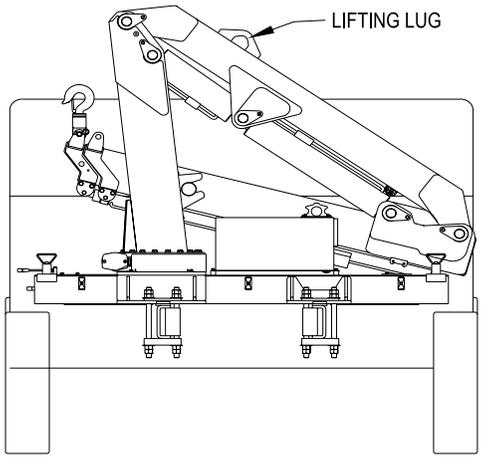
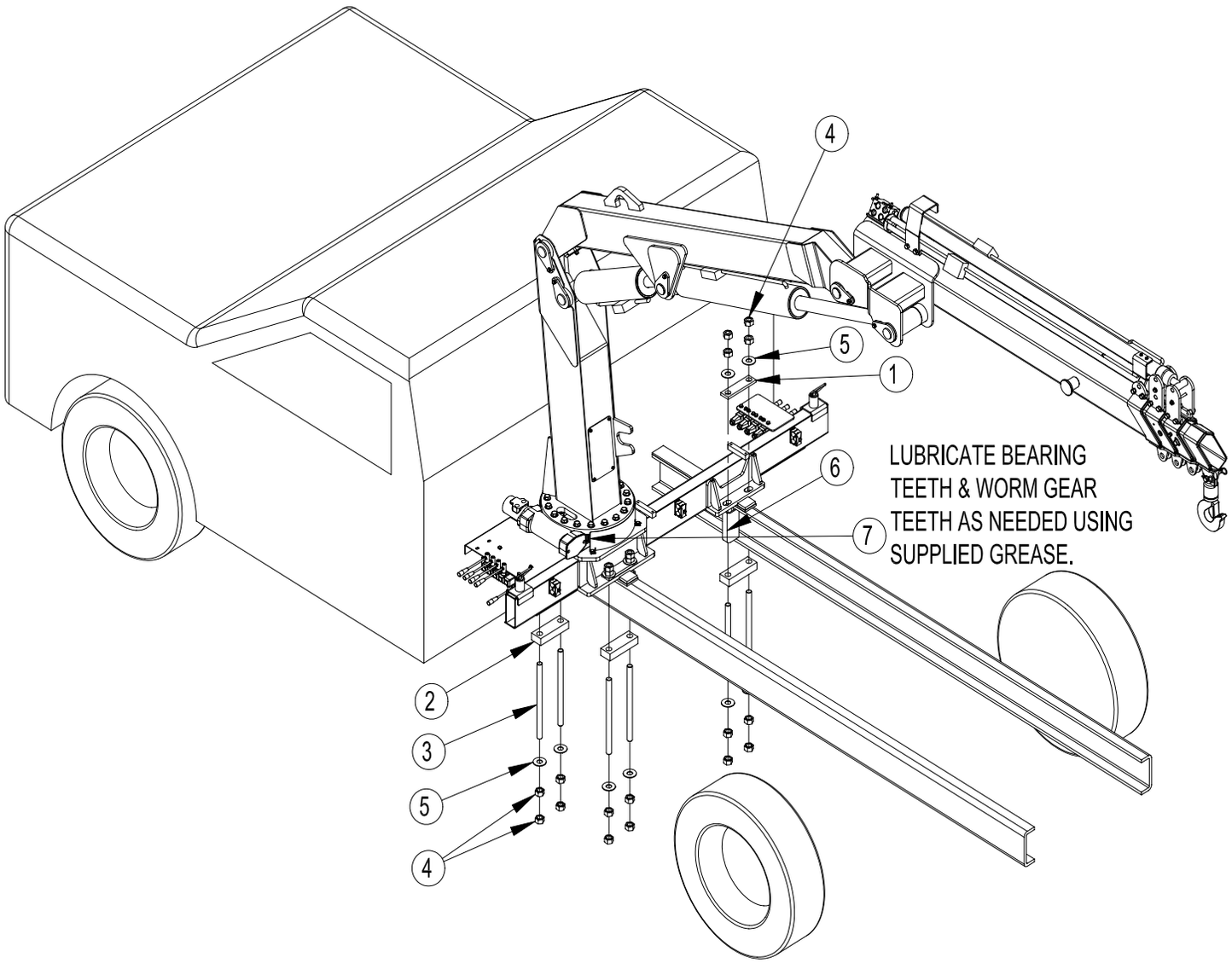


FIG. 2

14. Lubricate bearing teeth and worm gear teeth as needed using supplied grease.

A40 CRANE INSTALLATION (STANDARD INSTALLATION)

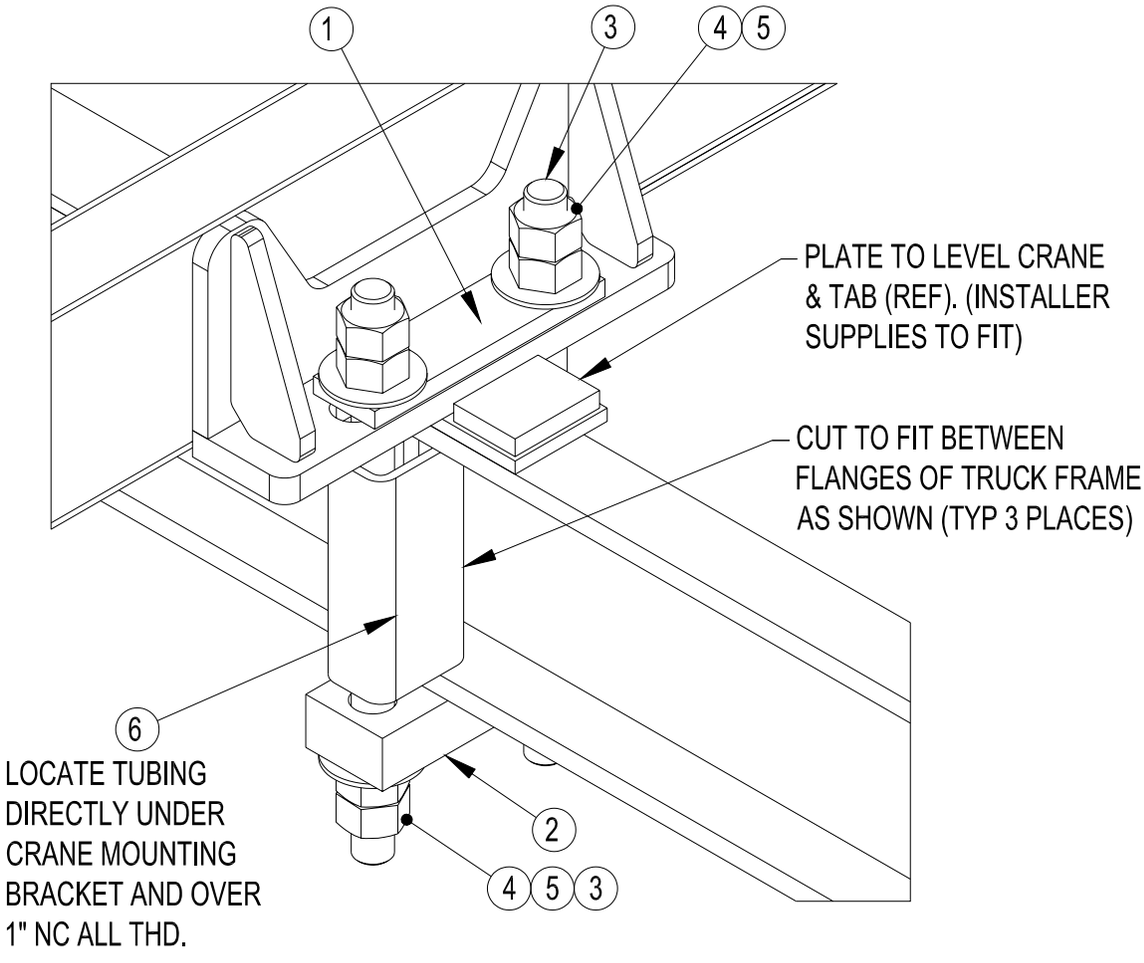


OPTIONAL CRANE INSTALLATION

HYDRAULIC RESERVOIR REMOVED FOR CLARITY

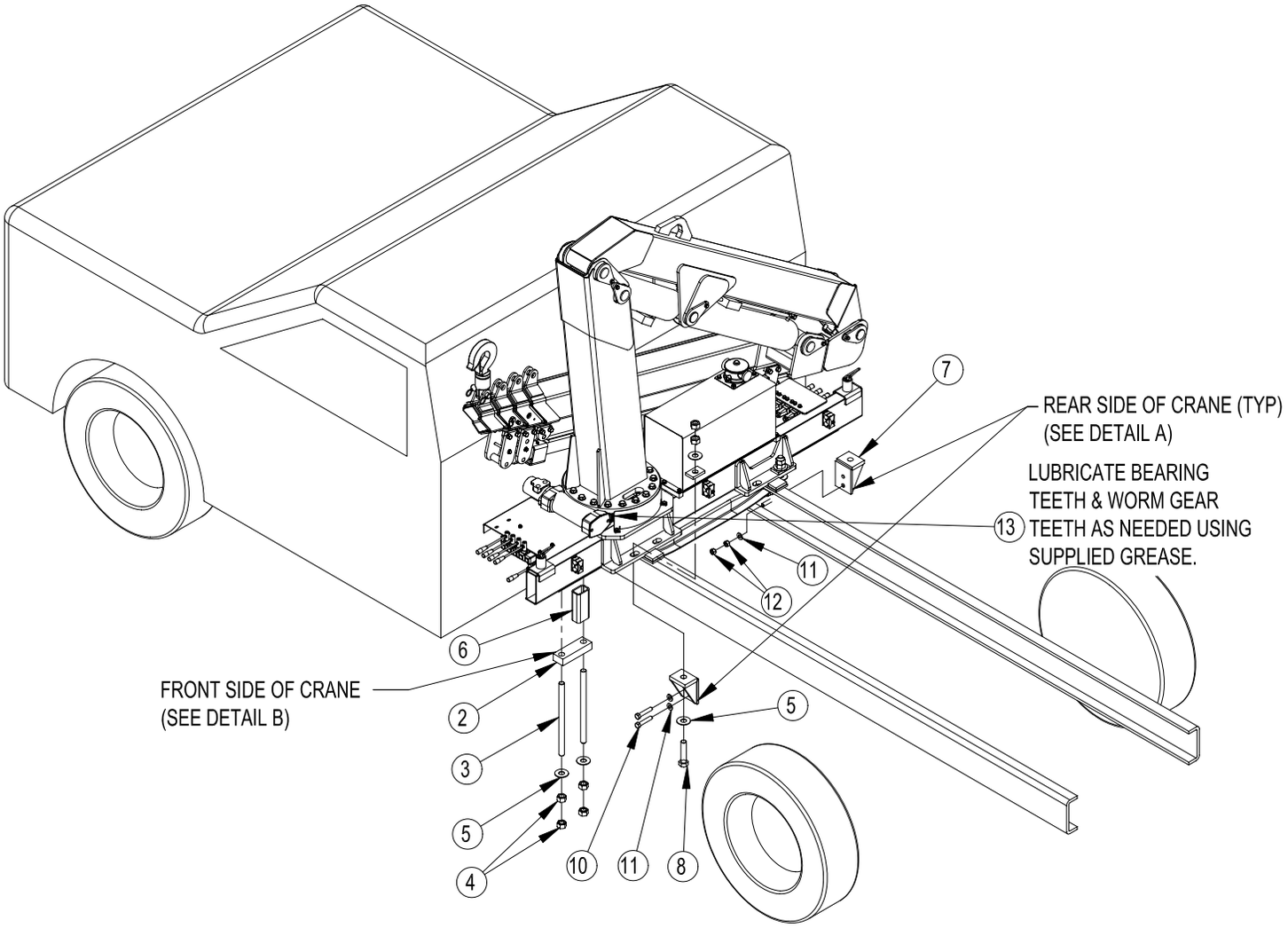
A40 CRANE INSTALLATION (STANDARD INSTALLATION)

VIEW OF REAR MOUNTING POINT ON THE PASSENGER SIDE.



ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	3	368087	PAD MTG
2	3	368088	PAD BTM MTG
3	6	367182	ALL THD 1" UNC X 20 LG
4	24	367183	NUT 1" UNC
5	12	407311000	WASHER FL 1 I.D. x 2.50 O.D. HARDENED
6	3	407174000	TBG RT STL 3 X 2 X .250W X 10
7	1	407106101	GREASE - MOLY 29

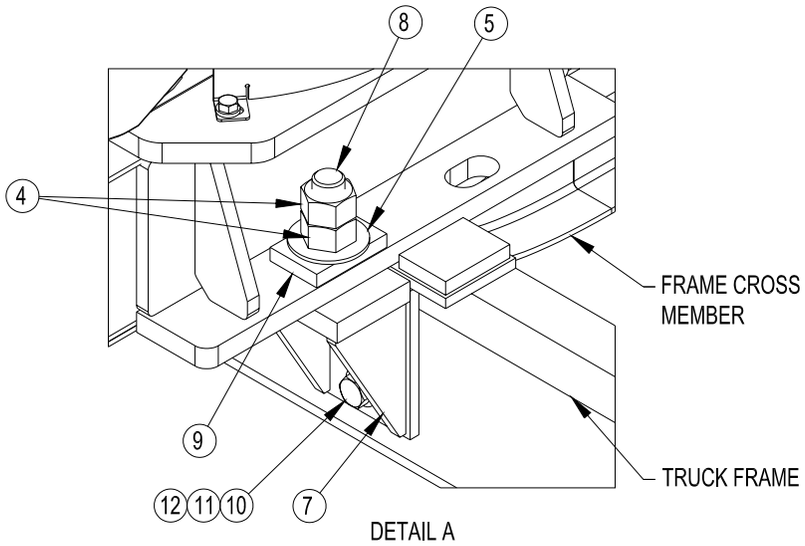
A40 CRANE INSTALLATION – (OPTIONAL)
(ONLY FOR USE WHEN THERE IS AN OBSTRUCTION)
(REF. – FRAME CROSS MEMBER)



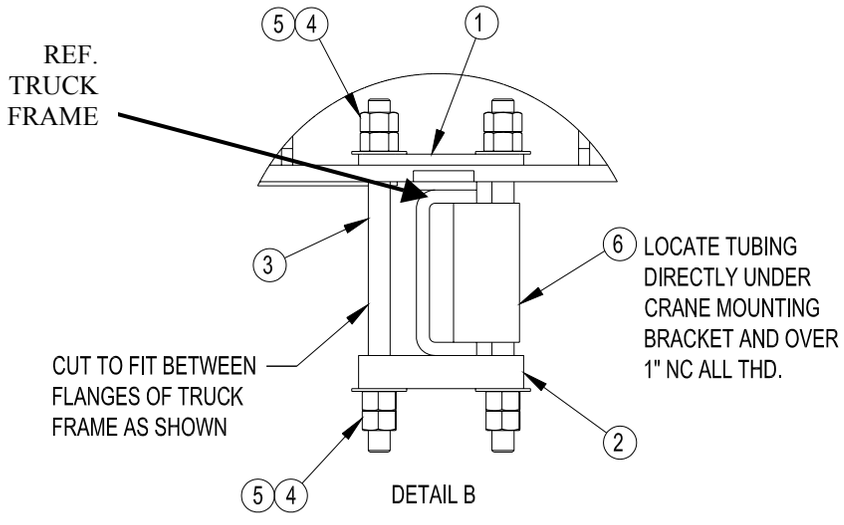
OPTIONAL CRANE INSTALLATION

(ONLY FOR USE ON THE FORD F-550 TRUCK CHASSIS)
EXAMPLE: FRAME CROSS MEMBER

A40 CRANE INSTALLATION – (OPTIONAL)
(ONLY FOR USE WHEN THERE IS AN OBSTRUCTION)
(REF. – FRAME CROSS MEMBER)



DETAIL A



DETAIL B

ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	368087	PAD MTG
2	1	368088	PAD BTM MTG
3	2	367182	ALL THD 1" UNC X 20 LG
4	12	367183	NUT 1" UNC
5	8	407311000	WASHER FL 1 I.D. x 2.50 O.D. HARDENED
6	1	407174000	TBG RT STL 3 X 2 X .250W X 10
7	2	407307000	FRAME MTG BRKT WDMT
8	2	407173000	SCW HX HD 1" NC X 4.50 LG GR8
9	2	407171000	DOUBLER
10	4	490170000	SCW HX 5/8 NC X 3 1/4 GR 8
11	8	407314000	WASHER FL 5/8 X 1 5/16 OD HARDENED
12	8	407315000	NUT HX 5/8 NC CP GR8
13	1	407106101	GREASE - MOLY 29

--- IMPORTANT ---
OPERATION OF UNIT

1. Make sure this manual has been thoroughly read by all crane operating personnel and supervisors. The crane should be operated by qualified personnel only.

2. A daily routine inspection of the crane should be mandatory before each operating day. Any defects should be corrected immediately and before operating the crane.

3. At a job site the vehicle should be positioned so that the crane can adequately reach the load within the rated capacity - centerline of rotation to hoist hook. The job site should be checked for any hazards which might create an unsafe situation for the operator; such as any overhead electrical lines, soft or unlevel ground, etc. When cross grade parking is necessary, restrict the load to compensate for the increased risk of tipping the vehicle.

4. Keep the vehicle as level as possible during operation.

5. **Engage emergency brake & Chock rear wheels,** place gear selector in neutral, press clutch, activate PTO, release clutch and after hydraulic fluid is warm, set throttle control to proper engine speed.

6. Always fully extend outriggers from the truck and hydraulic power down to the ground. Be sure the pads are firm and adequately positioned. When rotating, **keep load as low to the ground as possible.**

7. When unstowing the knuckleboom crane, first retract outer boom cylinder, then extend the inner boom until crane is raised high enough so that in rotation the boom sections will clear any obstructions, i.e. cab, rack, body, etc.

8. Always observe safe and practical operating practices to avoid possible accidents. **NEVER** use two cranes to support a load too large for either crane. Refer to safety tips and precautions.

9. After completing lifting operations, return the boom to stowed figure-4 position for travel. When stowing, begin by retracting the extension cylinder. Retract outer boom cylinder next. Rotate crane into position by aligning up the arrows on the rotation bearing and tower base plate. Retract inner boom cylinder into the figure-4 position. Always stand on the opposite side of the inner boom when stowing and unstowing.

10. Return outriggers to stowed position. Make sure the outrigger slides are pinned in place and outrigger cylinders are fully retracted before traveling.

11. Check work area for any tools or equipment not stored. Store all wheel chocks.

12. Release throttle control, depress clutch and disengage PTO.

13. Report any unusual occurrence during crane operation that may indicate required maintenance or repair.

QUALIFICATIONS FOR AND CONDUCT OF OPERATORS AND OPERATING PRACTICES

OPERATORS

1 Crane operation shall be limited to personnel with the following minimum qualifications:

A. designated persons

B. trainees under the direct supervision of a designated person

C. maintenance and test personnel (when it is necessary in the performance of their duties)

D. inspectors (crane).

2 No one other than the personnel specified above shall enter the operating area of a crane with the exception of persons such as oilers, supervisors, and those specified persons authorized by supervisors whose duties require them to do so and then only in the performance of their duties and with the knowledge of the operator or other persons.

QUALIFICATIONS FOR OPERATORS

3 Operators shall be required by the employer to pass a practical operating examination. Qualifications shall be limited to the specific type of equipment for which examined.

4 Operators and operator trainees shall meet the following physical qualifications:

A. Vision of at least 20/30 Snellen in one eye and 20/50 in the other, with or without corrective lenses.

B. Ability to distinguish colors, regardless of position, if colors differentiation is required for operation.

C. Adequate hearing with or without hearing aid for the specific operation.

5 Evidence of physical defects or emotional instability which render a hazard to operator or others, which in the opinion of the examiner could interfere with the operator's performance may be sufficient cause for disqualification. In such cases, specialized clinical or medical judgment and tests may be required.

6 Evidence that the operator is subject to seizures or loss of physical control shall be sufficient reason for disqualification. Specialized medical tests may be required to determine these conditions.

7 Operators and operator trainees should have normal depth perception, coordination, and no tendencies to dizziness or similar undesirable characteristics.

8 In addition to the above listed requirements, the operator shall:

A. Demonstrate the ability to comprehend and interpret all labels, operator's manuals, safety codes and other information pertinent to correct crane operations.

B. Possess knowledge of emergency procedures and implementation of same.

C. Demonstrate to the employer the ability to operate the specific type of equipment.

D. Be familiar with the applicable safety regulations.

E. Understand responsibility for maintenance requirements of crane.

F. Be thoroughly familiar with the crane and its control functions.

G. Understand the operating procedures as outlined by the manufacturer.

CONDUCT OF OPERATORS

9 The operator shall not engage in any practice which will divert his attention while actually operating the crane.

10 Each operator shall be responsible for those operations under the operator's direct control. Whenever there is any doubt as to safety, the operator shall consult with the supervisor before handling the loads.

11 The operator should not leave a suspended load unattended unless specific precautions have been instituted and are in place.

12 If there is a warning sign on the switch or engine starting controls, the operator shall not close the switch or start the engine until the warning sign has been removed by the appointed person.

13 Before closing the switch or starting the engine, the operator shall see that all controls are in the "OFF" or neutral position and all personnel are in the clear.

14 If power fails during operation, the operator shall:

A. move power controls to the "OFF" or neutral position.

B. land the suspended load and boom, if practical.

15 The operator shall be familiar with the equipment and its proper care. If adjustments or repairs are necessary, the operator shall report the same promptly to the appointed person, and shall also notify the next operator.

QUALIFICATIONS FOR AND CONDUCT OF OPERATORS AND OPERATING PRACTICES

16 All controls shall be tested by the operator at the start of each shift. If any controls do not operate properly, they shall be adjusted or repaired before operations are begun.

17 Stabilizers shall be visible to the operator while extending or setting unless operator is assisted by a signal person.

OPERATING PRACTICES HANDLING THE LOAD

18 Size of load

A. No crane shall be loaded beyond the rated load except for test purposes.

B. The load to be lifted is to be within the rated load of the crane and its existing configuration.

C. When loads which are not accurately known are to be lifted, the person responsible for the job shall ascertain that the weight of the load does not exceed the crane rated load at the radius at which the load is to be lifted.

19 Attaching the load

A. The load shall be attached to the hook by means of slings or other devices of sufficient capacity.

B. Hoist rope shall not be wrapped around the load.

20 Moving the load

A. The operator shall determine that:

B. The crane is level and, where necessary, the vehicle/carrier is blocked properly.

C. The load is well secured and balanced in the sling or lifting device before it is lifted more than a few inches.

D. Means are provided to hold the vehicle stationary while operating the crane.

E. Before starting to lift, the hook shall brought over the load in such a manner as to minimize swinging.

F. During lifting care shall be taken that:

1. there is no sudden acceleration or deceleration of the moving load.
2. load, boom or other parts of the crane do not contact any obstruction.

G. Cranes shall not be used for dragging loads sideways

H. This standard recognizes that articulating boom cranes are designed and intended for handling materials. They do not meet personnel lift or elevator requirements. Therefore, no lifting, lowering, swinging or traveling shall be done while a person is on the hook or load. Hook attached suspended work platforms (baskets) shall not be used with cranes covered by this standard. Work platforms attached to the boom must be approved by crane manufacturer.

I. The operator should avoid carrying loads over people.

J. When the crane is so equipped, the stabilizers shall be fully extended and set. Blocking under stabilizers shall meet the requirements as follows:

1. strong enough to prevent crushing.
2. of such thickness, width and length as to completely support the stabilizer pad.

K. Firm footing under all tires, or individual stabilizer pads should be level. Where such a footing is not otherwise supplied, it should be provided by timbers, cribbing, or other structural members to distribute the load so as to not exceed allowable bearing capacity or the underlying material.

L. In transit, the boom shall be carried in stowed position.

M. When rotating the crane, sudden starts and stops shall be avoided. rotational speed shall be such that the load does not swing out beyond the radius at which it can be controlled.

N. The crane shall not be transported with a load on the hook unless recommended by the manufacturer.

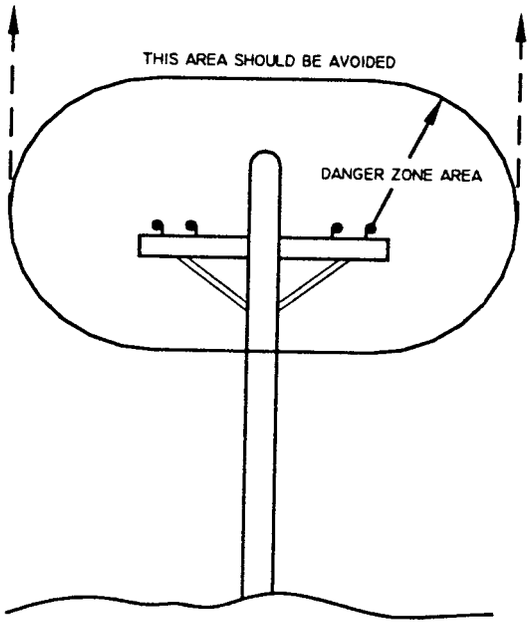
O. No person should be permitted to stand or pass under a suspended load.

21 Stowing procedure. Follow the manufacturer's procedure and sequence when stowing and un-stowing the crane.

QUALIFICATIONS FOR AND CONDUCT OF OPERATORS AND OPERATING PRACTICES

MISCELLANEOUS

OPERATING NEAR ELECTRICAL POWER LINES



22 Cranes shall be operated so that no part of the crane or load enters into the danger zone shown above.

EXCEPTIONS

A. The danger zone may be entered after confirmation by an appointed person that the electrical distribution and transmission lines have been de-energized and visibly grounded at the point of work; or

B. The danger zone may be entered if insulating barriers (not a part of nor an attachment to the crane) have been erected to prevent physical contact with the lines.

23 For lines rated 50 kV or below, minimum clearance between the lines and any part of the crane or load (including handling appendages) shall be 10 ft. (3m). For higher voltages, see Table 1.

24 Caution shall be excercised when working near overhead lines, because they can move horizontally or vertically due to wind, moving the danger zone to new positions.

25 In transit with no load and boom lowered the clearance shall be specified in Table 1.

26 A qualified signalperson shall be assigned to observe the clearance and give warning before approaching the above limits.

A. Any overhead wire shall be considered to be an energized line unless and until the person owning such line or the electrical utility authorities verify that it is not an energized line.

B. Exceptions to this procedure, if approved by the administrative or regulatory authority if the alternate procedure provides equivalent protection and set forth in writing.

C. Durable signs shall be installed at the operator's station and on the outside of the crane, warning that electrocution or serious bodily injury may occur unless a minimum clearance of 10 ft. (3.0m) between the crane or the load being handled and energized power lines. Greater clearances are required because of higher voltage as stated above. These signs shall be revised but not removed when local jurisdiction requires greater clearances.

TABLE 1

normal voltage, kV (phase to phase)	minimum required clearance ft	(m)
when operating near high voltage power lines		
over to 50	10	(3.05)
over 50 to 200	15	(4.6)
over 200 to 350	20	(6.1)
over 350 to 500	25	(7.62)
over 500 to 750	35	(10.67)
over 750 to 1000	45	(13.72)
while in transit with no load and boom lowered		
over to 0.75	4	(1.22)
over 0.75 to 50	6	(1.83)
over 50 to 345	10	(3.83)
over 345 to 750	16	(4.87)
over 750 to 1000	20	(6.1)

INSPECTION, TESTING AND MAINTENANCE GENERAL

INSPECTION CLASSIFICATION

1 Initial inspection. Prior to initial use, all new, altered, modified or extensively repaired cranes shall be inspected by a designated person to insure compliance with provisions of this standard.

2 Regular inspection. Inspection procedure for cranes in regular service is divided into two general classifications based upon the intervals at which inspection should be performed. The intervals in turn are dependent upon the nature of the components of the crane and the degree of their exposure to wear, deterioration, or malfunction. The two general classifications are herein designated as "frequent" and "periodic" with respective intervals between inspections as defined below.

A. frequent inspection - daily to monthly intervals
B. periodic inspection - one to twelve intervals, or as specifically recommended by the manufacturer

FREQUENT INSPECTION

3 Inspection shall be performed by designated personnel.

A. control mechanisms for maladjustment interfering with proper operation - daily, when used
B. control mechanisms for excessive wear of components and contamination by lubricants or other foreign matter
C. safety devices for malfunction
D. all hydraulic hoses, particularly those which flex in normal operation of crane functions, should be visually inspected once every working day, when used
E. hooks and latches for deformation, chemical damage, cracks, and wear. Refer to ANSI/ASME B30.10
F. rope reeving for compliance with crane manufacturer's specifications, if optional winch is used
G. electrical apparatus for malfunctioning, signs of excessive deterioration, dirt and moisture accumulation
H. hydraulic system for proper oil level and leaks daily
I. tires for recommended inflation pressure, cuts and loose wheel nuts
J. connecting pins and locking device for wear and damage

PERIODIC INSPECTION

4 Deformed, cracked or corroded members in the crane structure and carrier.
5 Loose bolts, particularly mounting and rotation bolts.
6 Cracked or worn sheaves and drums.
7 Worn, cracked, or distorted parts such as pins, bearings, shafts, gears, rollers and devices.
8 Excessive wear on brake and clutch system parts and lining.
9 Crane hooks inspected for cracks.

10 Travel steering, braking, and locking devices, for malfunction.

11 Excessively worn or damaged tires.

12 Hydraulic and pneumatic hose, fittings, and tubing inspection.

A. evidence of leakage at the surface of the flexible hose or its junction with metal and coupling
B. blistering, or abnormal deformation to the outer covering of the hydraulic or pneumatic hose
C. leakage at threaded or clamped joints that cannot be eliminated by normal tightening or recommended procedures
D. evidence or excessive abrasion or scrubbing on the outer surface of a hose, rigid tube, or fitting. Means shall be taken to eliminate the interference of elements in contact or otherwise protect the components

13 Hydraulic and pneumatic pumps and motors inspection.

A. loose bolts or fasteners
B. leaks at joints between sections
C. shaft seal leaks
D. unusual noises or vibrations
E. loss of operating speed
F. excessive heating of the fluid
G. loss of pressure

14 Hydraulic and pneumatic valves inspection.

A. cracks in valve housing
B. improper return of spool to neutral position
C. leaks at spools or joints
D. sticking spools
E. failure of relief valves to attain or maintain correct pressure setting
F. relief valve pressure shall be checked as specified by the manufacturers

INSPECTION, TESTING AND MAINTENANCE GENERAL

15 Hydraulic and pneumatic cylinders inspection.

A. drifting caused by fluid leaking across piston
B. rod seals leaking
C. leaks at welding joints
D. scored, nicked, or dented cylinder rods
E. damaged case (barrel)
F. loose or deformed rod eyes or connecting joint-sHydraulic filters. Evidence of rubber particles on the filter elements may indicate hose, "O" ring, or other rubber component deterioration. Metal chips or pieces on the filter may denote failure in pumps, motors, or cylinders. Further checking will be necessary to determine origin of the problem before corrective action can be taken.

16 Labels are to be in place and legible.

CRANES NOT IN REGULAR USE

17 A crane which has been idle for a period of over one month or more, but not less than six months, shall be given an inspection conforming with the initial-regular- frequent inspections.

18 A crane which has been idle for a period of over six months shall be given a complete inspection conforming with the initial-regular-frequent inspection requirements.

INSPECTION RECORDS

19 Dated records for periodic inspection should be made on critical items such as brakes, crane hooks, rope, hydraulic and pneumatic cylinders, and hydraulic and pneumatic relief pressure valves. Records should be kept available to an appointed person.

OPERATIONAL TESTS

20 Prior to initial use, all new, altered, modified, or extensively repaired cranes shall be tested for compliance with the operational requirements of this section, including functions such as the following:

A. load lifting and lowering mechanisms
B. boom lifting and lowering mechanisms
C. boom extension and retraction mechanisms
D. swing mechanisms
E. safety devices
F. operating controls comply with appropriate function labels

Operational crane test results shall be made available to an appointed person.

INSPECTION, TESTING AND MAINTENANCE GENERAL

RATED TEST LOAD

Prior to initial use, altered, modified, or extensively repaired cranes shall be load tested by or under the direction of an appointed person.

21 Test loads shall not exceed 110% of the manufacturer's load ratings.

22 Written reports shall be maintained showing test procedures and confirming the adequacy of repairs.

MAINTENANCE

PREVENTIVE MAINTENANCE

23 Before adjustment and repairs are started on a crane, the following precautions shall be taken as applicable:

A. crane placed where it will cause the least interference with other equipment or operations
B. all controls at the "off" position
C. starting means rendered inoperative
D. boom lowered to the ground if possible or otherwise secured against dropping
E. relieve hydraulic oil pressure from all hydraulic circuits before loosening or removing hydraulic components

24 Warning or "OUT OF ORDER" signs shall be placed on the crane controls.

25 After adjustments and repairs have been made, the crane shall not be returned to service until all guards have been reinstalled, trapped air removed from hydraulic system (if required), safety devices reactivated, and maintenance equipment removed.

ROTATION BEARING & WORM DRIVE LUBRICATION

ROTATION BEARING RACE

Lubricate bearing race at the grease zerk located inside the tower through acess panel on front face.

Listed in the chart below are several lubricants which are acceptable for both rust inhibiting and extreme pressure characteristics:

- Lubricate the inner race daily if crane is used continuousily each day or weekly with normal use.
- Lubricate the inner race every 30 days if the crane is used intermittently.
- Rotate the bearing through two or more rotations during lubrication process.

WORM DRIVE LUBRICATION

Lubricate worm drive bearings at the two grease zerk located at lower outside of worm housing. This should be done at same time bearing race is lubricated

Listed in the chart below are several lubricants which are acceptable for both rust inhibiting and extreme pressure characteristics:

- Lubricate the worm drive daily if crane is used on a daily basis or weekly with normal use.
- Lubricate the worm drive every 30 days if the crane is used intermittently.

MOBILE	TEXACO	SUNOCO	PURE	SOHIO
Mobil Plex EP 2	MARFAC MP 2	Prestige 742 EP	Poco HT EP 2	Sohitran EP1

RING GEAR

Recommends **Keystone Moly 29** for the ring gear. It is a Molybdenum Disulfide based lubricant that is very tacky and can with stand high pressure and temperature. It is recommended that the teeth be lubricated with a small amount of grease every 8 hours if the crane is used daily, or weekly with normal use. The grease is purged from the teeth by the very nature of being exposed to the elements. Therefore close attention to gear lubricant will provide a longer tooth life.

NOTE: Regular periodic lubrication is the most effective way to increase the life and service ability of the rotation bearing. Most bearings are used outdoors and under conditions likely to produce intenal condensation.

OIL SELECTION

ALL WEATHER OILS

MOBIL DTE 13
MOBIL DTE 15
TEXACO URSA SUPER 3 SEA 10W
GULF XHD 10W/30
TEXACO RONDO HDAZ-32
ESSO UNIVIS J 26

WARM WEATHER OILS

MOBILE DELVAC 1210
TEXACO URSATEX 10W/30
ESSO NUTO H 32
MOBIL DELVAC SPECIAL 10W/30 UNIVERSAL TRACTOR FLUID

COLD WEATHER OILS

MOBIL DTE 11
CONOCO DN 600
ESSO UNIVIS J 13

CAUTION:

Do not add kerosene or other "thinners" to hydraulic oil. These fluids will cause swelling and rapid deterioration of o-rings and other seals in the hydraulic system.

The reservoir of the crane contains approximately 19-25 gals. (72-95 liters) of hydraulic oil, depending on the model. Oil level should be maintained at the full mark shown on the sight gauge with all cylinders in the retracted or stowed position.

If there is any question regarding the condition of the hydraulic oil, drain some of the oil from the bottom of the reservoir into a glass container and inspect for the following indications of deterioration:

1. Dark color or cloudy appearance
2. A rancid or burned odor
3. Foreign particles or other contaminants
4. A loss of viscosity
5. A separation of water or other fluids from the oil

If the sample checked exhibits any of the above characteristics, an oil change is recommended as outlined previously.

HYDRAULIC OIL

Hydraulic oil is the "LIFEBLOOD" of the crane. Proper selection and care is important to provide the most efficient operation and the longest life from each of the hydraulic components in the crane. Hydraulic oil not only transmits the energy required operate the machine from the pump to the various cylinders and motors, but also provides for lubrication and cooling of the components. it is often said that oil does not wear out and can be left in a crane indefinitely, providing the filters are changed regularly. Good filtration does prolong the life of hydraulic oil, but its lubrication characteristics are diminished as it becomes diluted by condensation, acids and other non-filterables which form during normal use of the crane.

It is recommended that the hydraulic reservoir be drained and refilled with new oil after each 500 hours of operation. In climates that have a wide variation of operating temperature, it is recommended that oil of the appropriate weight be used for cold and warm weather operation.

In the event that the hydraulic system becomes contaminated with metallic particles due to a motor, pump or other component failure, the following should be done immediately to prevent failure to the crane:

1. Drain the oil reservoir completely.
2. Fill the reservoir 1/2 full with clean hydraulic oil to flush the contaminated oil from the cylinders and hydraulic lines of the system.

NOTE: Operate each function to the full open and closed position several times.

3. Operate the system at a slow RPM to prevent cavitation of the pump.
4. Drain the reservoir completely again.
5. Change the return and suction filters
6. Refill the reservoir to the full line on the sight glass.
7. Allow the new oil to circulate through the system for several minutes before operating the unit.
8. Change the return line filter again after approximately 25 hours of operation.

LUBRICATION & MAINTENANCE SCHEDULE
A40 CRANE

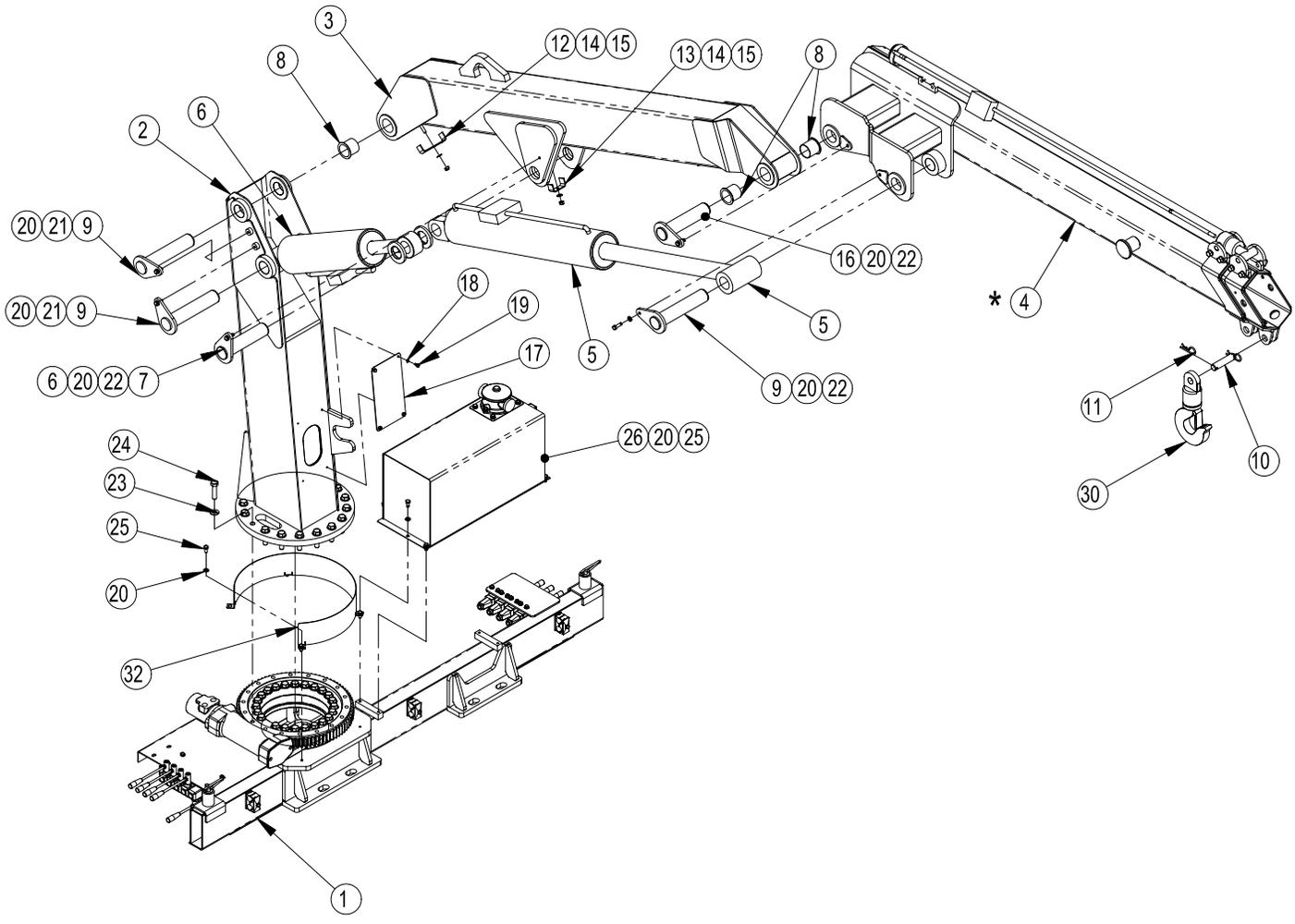
SERVICE PERFORMED	DAY	WEEKLY	3 MOS	YEAR	NOTES
LOAD HOOK	X				INSPECT HOOK & LATCH FOR DEFORMATION, CRACKS, & CORROSION
HYD HOSES	X				VISUAL INSPECTION, REPLACE IF DAMAGED
HYD FLUID	X				CHECK FLUID LEVEL, FILL AS REQUIRED
MOUNTING BOLTS		X			CHECK TORQUE TO 225 FT-LBS (DRY) AS REQUIRED
ROTATION RING GEAR	X	X			WITH CONTINOUS 8 HR USE, APPLY DAILY OTHERWISE WEEKLY WITH MOLY 29 from elf KEYSTONE Lubricants 800 344-2241
ALL OTHER BOLTS		X			CHECK & TIGHTEN AS REQUIRED
ALL CYLINDERS		X			CHECK AROUND CYLINDER RODS FOR EXCESS FLUID LEAKAGE
ALL CYLINDER PINS		X			CHECK FOR DAMAGE AND LOOSE MOUNTING HARDWARE
BOOM PADS		X			REPLACE WHEN 1/16TH THICK
RETURN LINE FILTER			X		REPLACE ELEMENT
ROTATION BEARING			X		GREASE WITH MOBILPLEX EP-2 OR EQUIVA-LENT @ ZERKS
WORM DRIVE BEARINGS			X		GREASE WITH MOBILPLEX EP-2 OR EQUIVA-LENT @ ZERKS
ROTATION BEARING BOLTS			X		RE-TORQUE TO 150 FT-LBS (DRY) AS REQUIRED
HYDRAULIC FLUID				X	DRAIN, FLUSH, AND REFILL WITH DTE 13, OR EQUIVALENT
FOR ADDITIONAL INFORMATION SEE:	1) OWNER'S MANUAL 2) OSHA SECTION 1910.180 3) ANSI B30.5-1989				

CAUTION: Routine maintenance insures trouble-free operation and protects your investment. All warranties are void if maintenance is neglected.

NOTES:

1. Use only authorized parts. Any damage or malfunction caused by the use of unauthorized parts is not covered by Warranty or Product Liability.
2. Once a bolt has been torqued to its rated capacity and then removed; the bolt should be replaced with a new one.
3. Auto Crane Company recommends that this crane be serviced per “Crane Inspection Log” P/N 999978. These logs should be filled in at the intervals noted and kept as a permanent record.

A40 CRANE ASSEMBLY - STD
P/N: 407000000



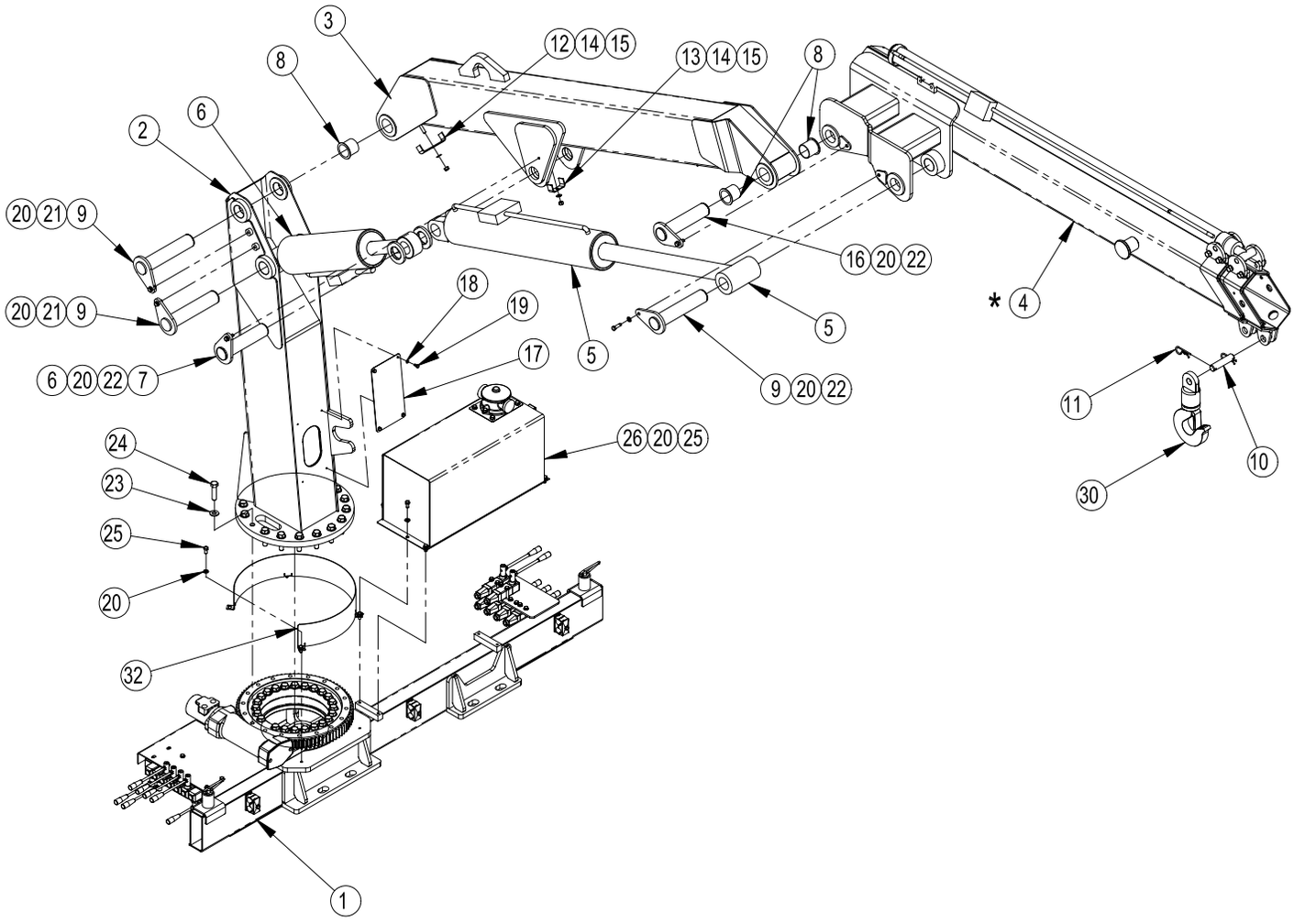
A40 CRANE ASSEMBLY - STD
P/N: 407000000

ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	407100000	BASE ASSY
2	1	407151001	TOWER WELDMENT
3	1	407205001	INNER BOOM WDMT
* 4	1	407295000	OUTER BOOM ASSY 1 HYD EXT
5	1	407516000	CYL OUTER BOOM 5 X 27.75 X 2.50 ROD
6	1	407051000	CYL INNER BOOM 5 X 14.75 X 2 ROD
7	1	407207000	PIN WDMT 2 OD x 8.38
8	4	366394	BEARING, PIVOT
9	3	407242000	PIN WDMT 2 OD x 9.75
10	1	466232	PIN BLOCK 1 OD
11	2	360124000	PIN HITCH
12	1	407216000	HOSE RETAINER 4.75 WIDE
13	1	407217000	HOSE RETAINER 2.50 WIDE
14	2	021200	WASHER FL 3/8
15	2	017301	NUT HX LOCK 3//8 NCCP
16	1	407207001	PIN WDMT 2 OD x 8.75
17	1	407161000	COVER PL A40 TOWER
18	4	020200	WASHER SPLIT LOCK 1/4
19	4	005406	SCW HX 1/4-28 X 1/2
20	13	021100	WASHER SPLK 3/8
21	2	008701	SCW HX 3/8 UNC X 7/8 GR5
22	3	008702000	SCW HX 3/8-16 X 1 1/4 GR5
23	18	021801	WASHER FL 5/8 X 1 5/16 OD
24	18	366393	HEX HEAD 5/8-11 X 2.5 GR8
25	8	008400	SCW HEX HD 3/8-16 UNC X 3/4 GR 5
26	1	407065000	HYD TANK ASSY 12 GAL
27	1	407061000	A40 HYD DIAGRAM
28	1	407020000	DECAL LAYOUT A40
29	1	407030000	SHIP KIT A40
30	1	200197	HOOK SWIVEL 3 METRIC TON
31	2	407218000	SPACER 2.031 ID X .375
32	1	407135000	COVER ROTATION GEAR

*** OPTIONAL BOOMS**

CRANE ASSY	BOOM	DESCRIPTION
407000001	407296000	OUTER BOOM ASSY 1 HYD EXT 1 MANUAL
407000002	407280000	OUTER BOOM ASSY 2 HYD EXT
407000003	407297000	OUTER BOOM ASSY 2 HYD EXT 1 MANUAL

A40 CRANE ASSEMBLY - STD
W/7 FUNCTION CONTROL VALVE - P/N: 407002000



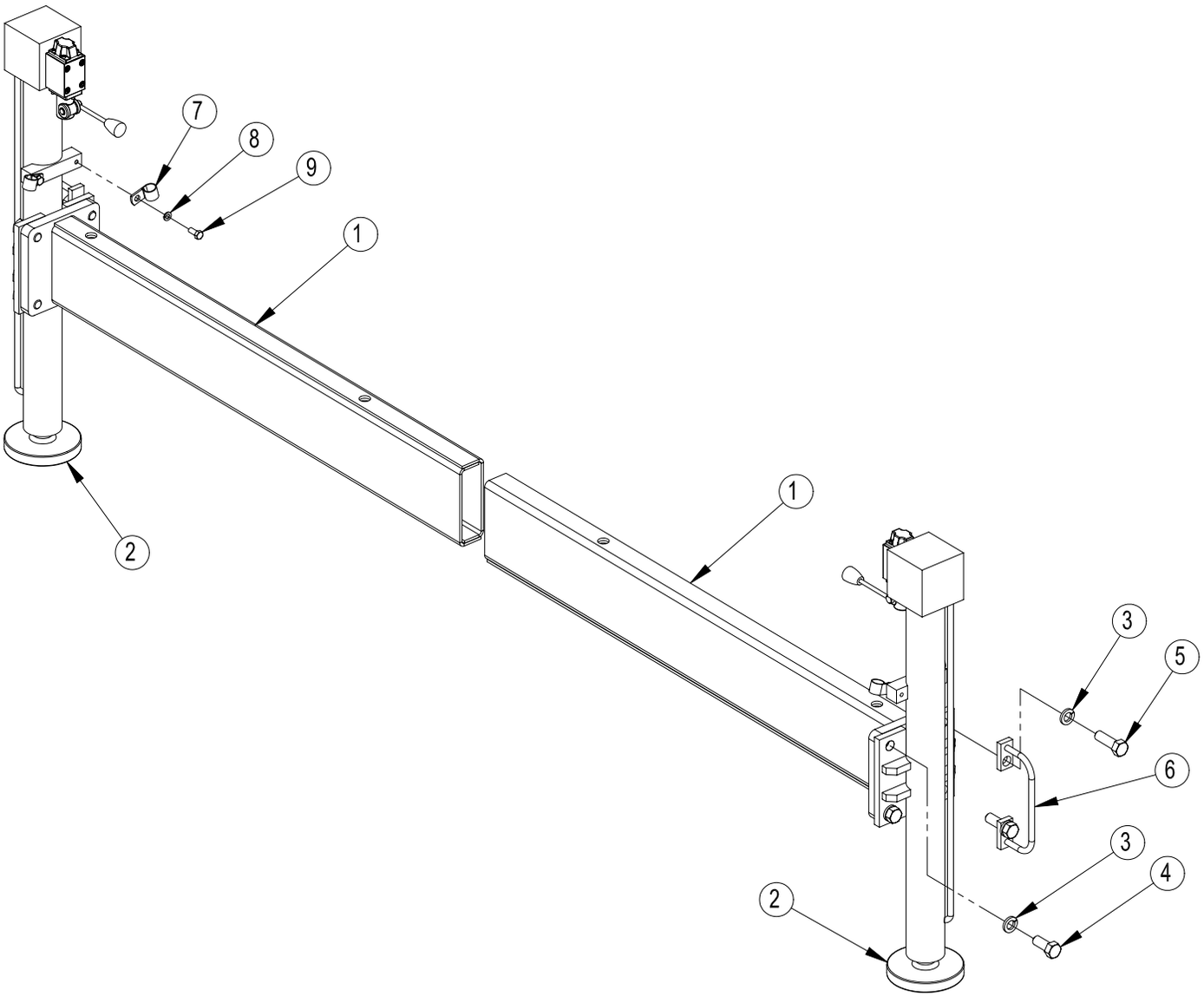
A40 CRANE ASSEMBLY - STD
W/7 FUNCTION CONTROL VALVE - P/N: 407002000

ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	407300000	BASE ASSY
2	1	407151001	TOWER WELDMENT
3	1	407205001	INNER BOOM WDMT
* 4	1	407295000	OUTER BOOM ASSY 1 HYD EXT
5	1	407516000	CYL OUTER BOOM 5 X 27.75 X 2.50 ROD
6	1	407051000	CYL INNER BOOM 5 X 14.75 X 2 ROD
7	1	407207000	PIN WDMT 2 OD x 8.38
8	4	366394	BEARING, PIVOT
9	3	407242000	PIN WDMT 2 OD x 9.75
10	1	466232	PIN BLOCK 1 OD
11	2	360124000	PIN HITCH
12	1	407216000	HOSE RETAINER 4.75 WIDE
13	1	407217000	HOSE RETAINER 2.50 WIDE
14	2	021200	WASHER FL 3/8
15	2	017301	NUT HX LOCK 3//8 NCCP
16	1	407207001	PIN WDMT 2 OD x 8.75
17	1	407161000	COVER PL A40 TOWER
18	4	020200	WASHER SPLIT LOCK 1/4
19	4	005406	SCW HX 1/4-28 X 1/2
20	13	021100	WASHER SPLK 3/8
21	2	008701	SCW HX 3/8 UNC X 7/8 GR5
22	3	008702000	SCW HX 3/8-16 X 1 1/4 GR5
23	18	021801	WASHER FL 5/8 X 1 5/16 OD
24	18	366393	HEX HEAD 5/8-11 X 2.5 GR8
25	8	008400	SCW HEX HD 3/8-16 UNC X 3/4 GR 5
26	1	407065000	HYD TANK ASSY 12 GAL
27	1	407061001	A40 HYD DIAGRAM 7 FUNCT 1 HYD EXT
28	1	407025000	DECAL LAYOUT A40 7 FUNCTION
29	1	407030000	SHIP KIT A40
30	1	200197	HOOK SWIVEL 3 METRIC TON
31	2	407218000	SPACER 2.031 ID X .375
32	1	407135000	COVER ROTATION GEAR

*** OPTIONAL BOOMS**

CRANE ASSY	BOOM	DESCRIPTION
407002001	407296000	OUTER BOOM ASSY 1 HYD EXT 1 MANUAL
407002002	407280000	OUTER BOOM ASSY 2 HYD EXT
407002003	407297000	OUTER BOOM ASSY 2 HYD EXT 1 MANUAL

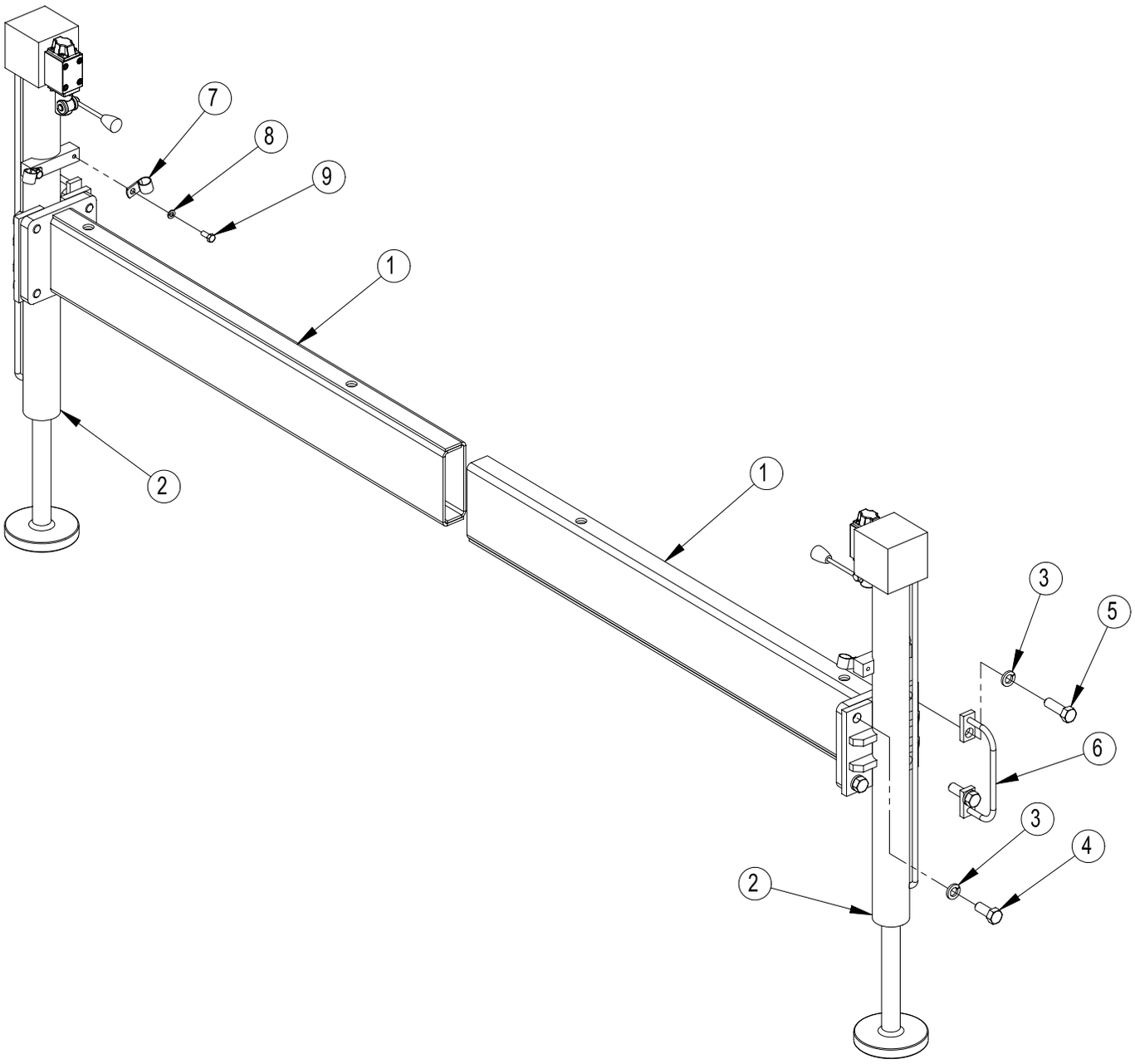
A40 OUTRIGGER ASSEMBLY
P/N: 407302000



A40 OUTRIGGER ASSEMBLY
P/N: 407302000

ITEM	QTY	PART NO	DESCRIPTION
1	2	407115000	SLIDE WELDMENT CS/SS
2	2	407050000	CYLINDER OUTRIGGER
3	8	023800	WASHER SP LK 5/8
4	4	490172	SCW HX 5/8 NC X 1 1/2 LG
5	4	490306	HX HD 5/8-11 X 2.00 GR8
6	2	407138000	HANDLE WDMT OUTRIGGER
7	4	480024	MOUNT PENDANT CABLE RETAINER
8	4	020600	WASHER SP LK 5/16 NC
9	4	007807	SCW HEX 5/16-18 3/4LG GR5
10	1	407303000	HOSE & FITTING KIT OUTRIGGERS

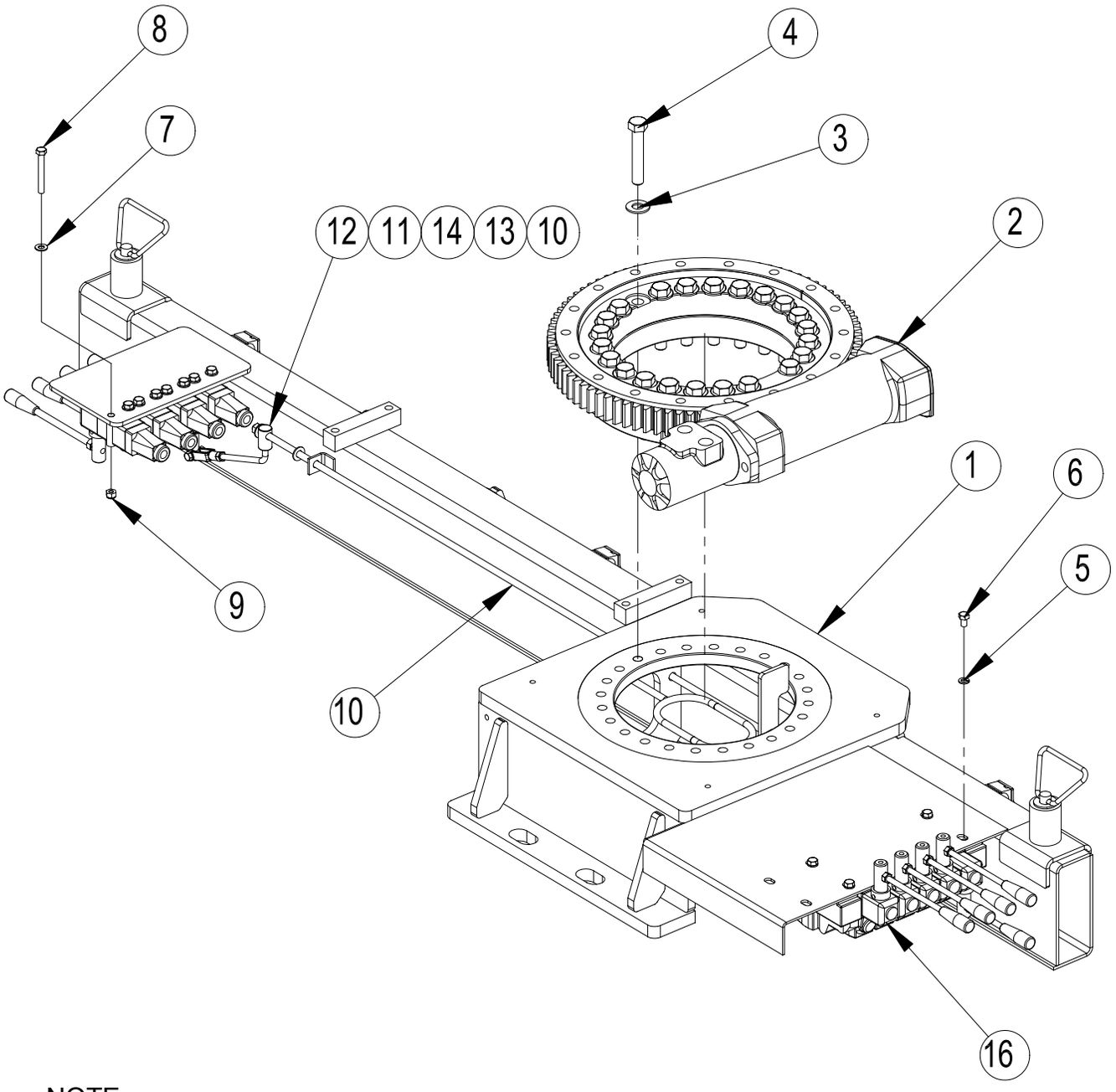
A40 OUTRIGGER ASSEMBLY W/8" LONGER CYLINDER - P/N: 407302800



A40 OUTRIGGER ASSEMBLY W/8" LONGER CYLINDER - P/N: 407302800

ITEM	QTY	PART NO	DESCRIPTION
1	2	407115000	SLIDE WELDMENT CS/SS
2	2	407050800	CYL OUTRIGGER W/8" LONGER ROD
3	8	023800	WASHER SP LK 5/8
4	4	490172	SCW HX 5/8 NC X 1 1/2 LG
5	4	490306	HX HD 5/8-11 X 2.00 GR8
6	2	407138000	HANDLE WDMT OUTRIGGER
7	4	480024	MOUNT PENDANT CABLE RETAINER
8	4	020600	WASHER SP LK 5/16 NC
9	4	007807	SCW HEX 5/16-18 3/4LG GR5
10	1	407303000	HOSE & FITTING KIT OUTRIGGERS

A40 BASE ASSEMBLY
P/N: 407100000



NOTE:

1. BOLTS SHOULD BE TORQUED TO THE MAXIMUM VALUE RECOMMENDED. TIGHTENING AND TORQUING THE BOLTS SHOULD BE IN INCREMENTAL STEPS AND START WITH THOSE AT THE 12, 6, AND 9 O'CLOCK POSITIONS.

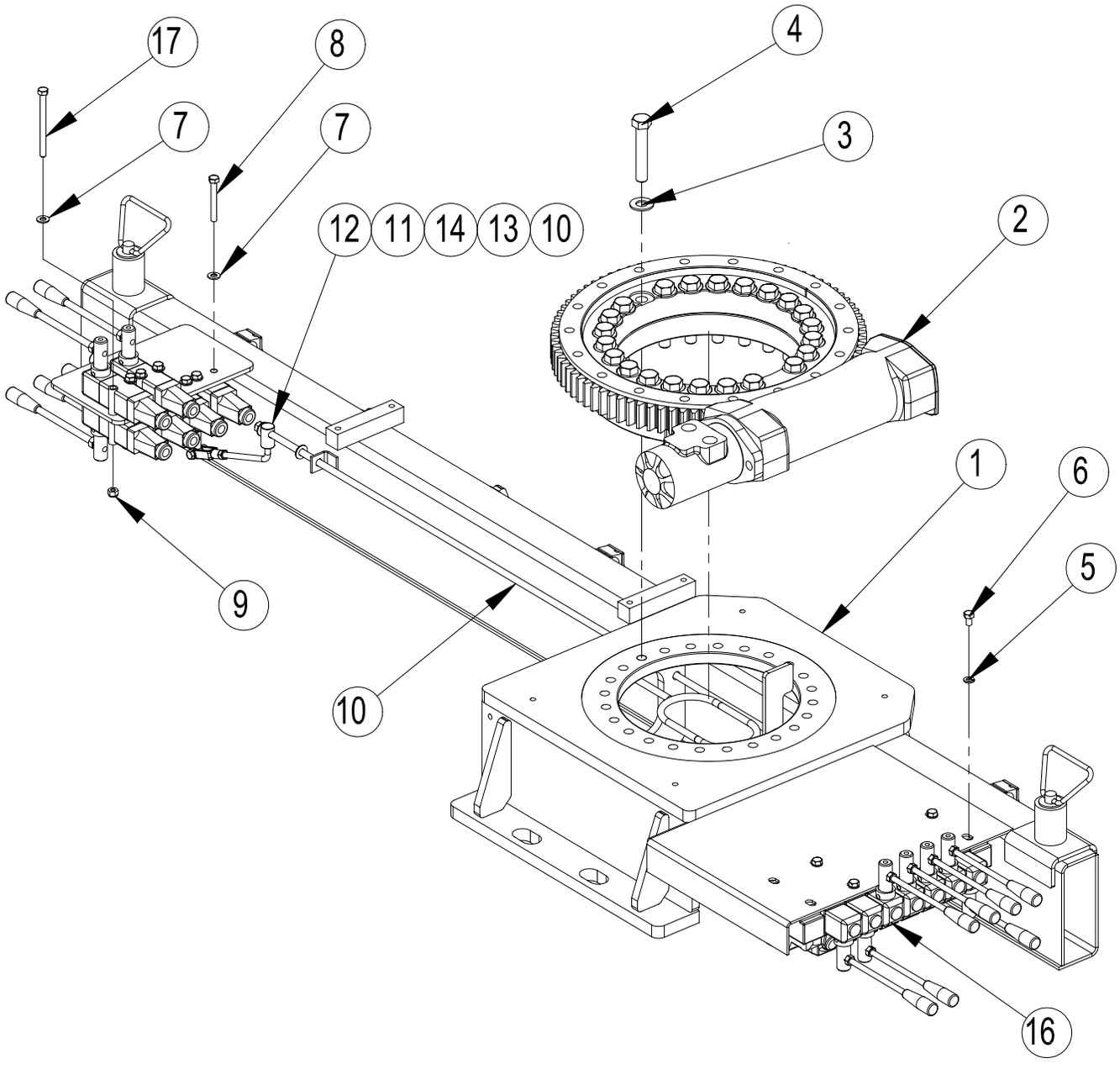
2. LUBRICATE ALL EXPOSED GEAR TEETH WITH EXTERNAL GEAR LUB.

3. LUBRICATION OF THE RACEWAY SHOULD TAKE PLACE EVERY (8) HOURS IN SECERE DUTY APPLICATIONS OR IN DUSTY OR WET ENVIROMENTS.

A40 BASE ASSEMBLY
P/N: 407100000

ITEM	QTY	PART NO	DESCRIPTION
1	1	407101001	BASE WDMT
2	1	407106001	BEARING ROTATION W/HYD MOTOR
3	23	021801	WASHER FL 5/8 X 1 5/16 OD
4	23	407118000	SCW HX HD 5/8-11 X 3 1/2 GR8
5	4	020600	WASHER SP LK 5/16 NC
6	4	007401	SCW 5/16-18 X 1/2 LG
7	8	020901	WASHER FL 5/16
8	8	811029	SCW HX 5/16 NC X 2 1/2
9	8	016801	NUT HEX-LOCK 5/16 NC
10	1	407133000	STOP PUSH ROD WDMT
11	1	407130000	STOP TAB
12	1	407140000	STOP LINKAGE ASSY
13	1	021200	WASHER FL 3/8
14	2	017301	NUT HX LOCK 3//8 NCCP
15	1	330372	NUT HEX 3/8-16 UNC
16	1	407078000	CONTROL VALVE SUB-ASSY 5 SECT

A40 BASE ASSEMBLY
W/7 FUNCTION CONTROL VALVE - P/N: 407300000



NOTE:

1. BOLTS SHOULD BE TORQUED TO THE MAXIMUM VALUE RECOMMENDED. TIGHTENING AND TORQUING THE BOLTS SHOULD BE IN INCREMENTAL STEPS AND START WITH THOSE AT THE 12, 6, AND 9 O'CLOCK POSITIONS.

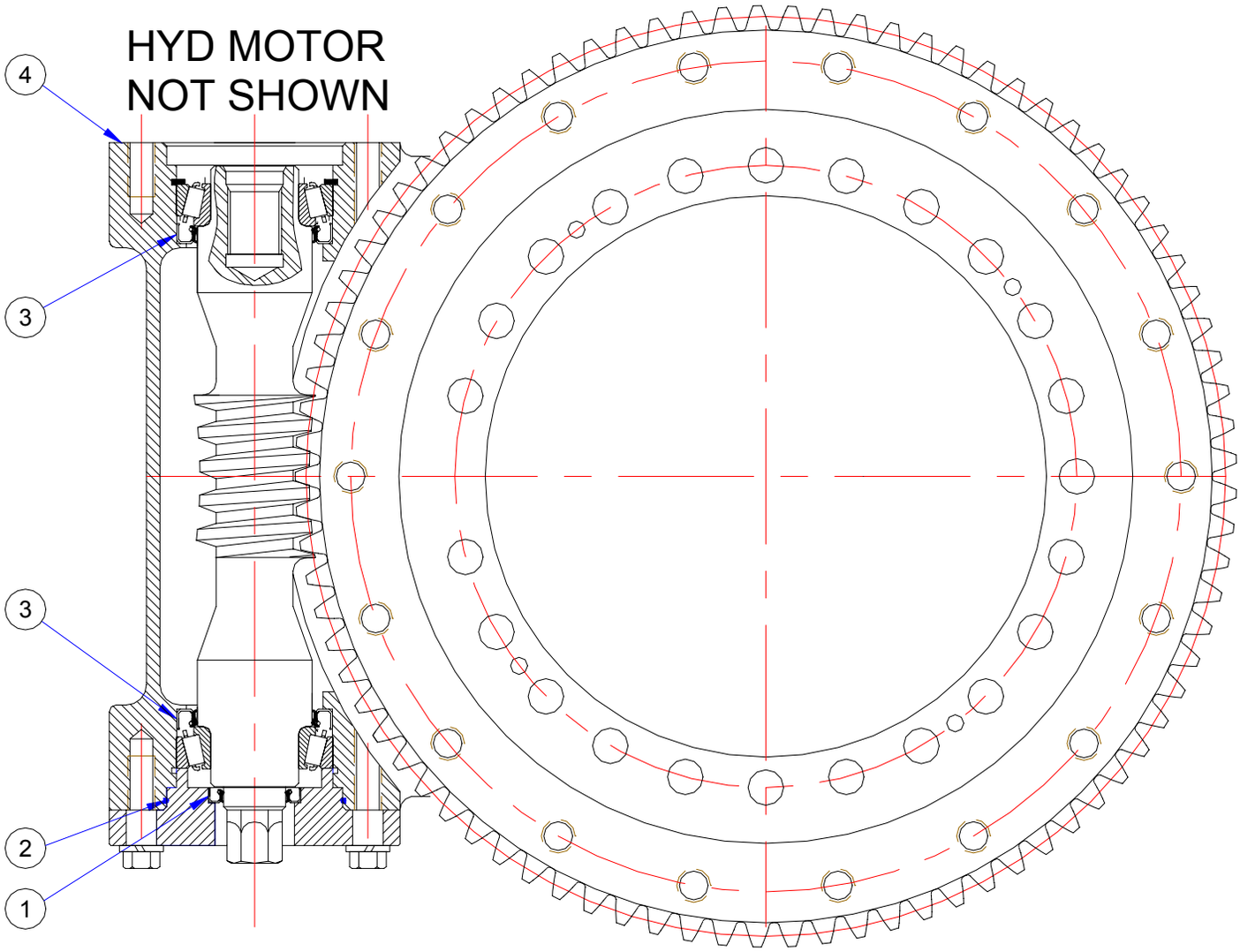
2. LUBRICATE ALL EXPOSED GEAR TEETH WITH EXTERNAL GEAR LUB.

3. LUBRICATION OF THE RACEWAY SHOULD TAKE PLACE EVERY (8) HOURS IN SECERE DUTY APPLICATIONS OR IN DUSTY OR WET ENVIROMENTS.

A40 BASE ASSEMBLY
W/7 FUNCTION CONTROL VALVE - P/N: 407300000

ITEM	QTY	PART NO	DESCRIPTION
1	1	407101001	BASE WDMT
2	1	407106001	BEARING ROTATION W/HYD MOTOR
3	23	021801	WASHER FL 5/8 X 1 5/16 OD
4	23	407118000	SCW HX HD 5/8-11 X 3 1/2 GR8
5	4	020600	WASHER SP LK 5/16 NC
6	4	007401	SCW 5/16-18 X 1/2 LG
7	8	020901	WASHER FL 5/16
8	4	811029	SCW HX 5/16 NC X 2 1/2
9	8	016801	NUT HEX-LOCK 5/16 NC
10	1	407133000	STOP PUSH ROD WDMT
11	1	407130000	STOP TAB
12	1	407140000	STOP LINKAGE ASSY
13	1	021200	WASHER FL 3/8
14	2	017301	NUT HX LOCK 3//8 NCCP
15	1	330372	NUT HEX 3/8-16 UNC
16	1	407079000	CONTROL VALVE SUB-ASSY 7 SECT
17	4	811056	SCW HX 5/16 NC X 4 LG

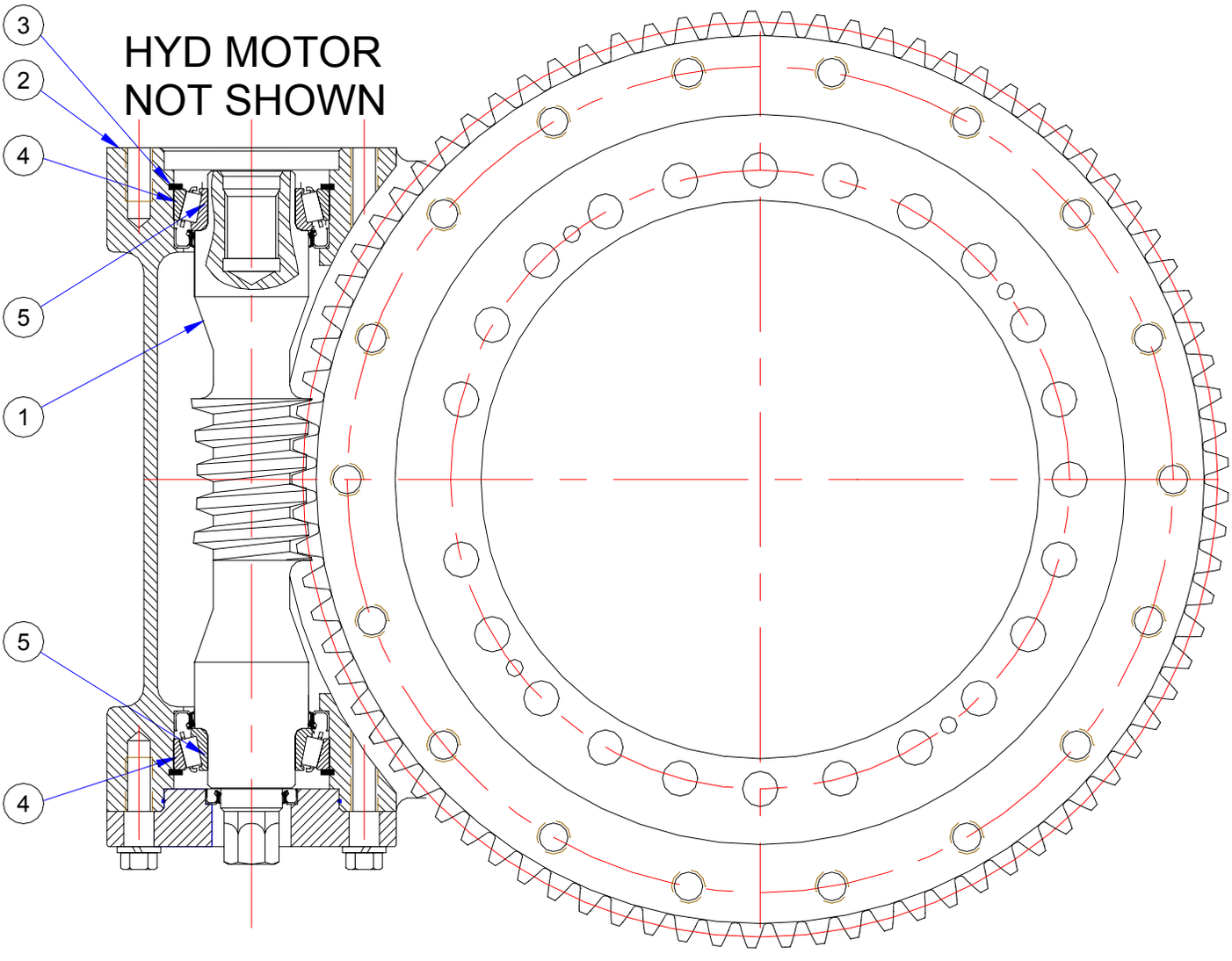
SEAL KIT
P/N: 407106002



SEAL KIT FOR 407106001

ITEM	QTY	PART NO.	DESCRIPTION
1	1	REF	SEAL NAT'L #471818
2	1	REF	O'RING RLH#OR-151N73038
3	2	REF	SEAL RLH21252875-375BYP2
4	1	REF	GASKET MOTOR 2A MAG

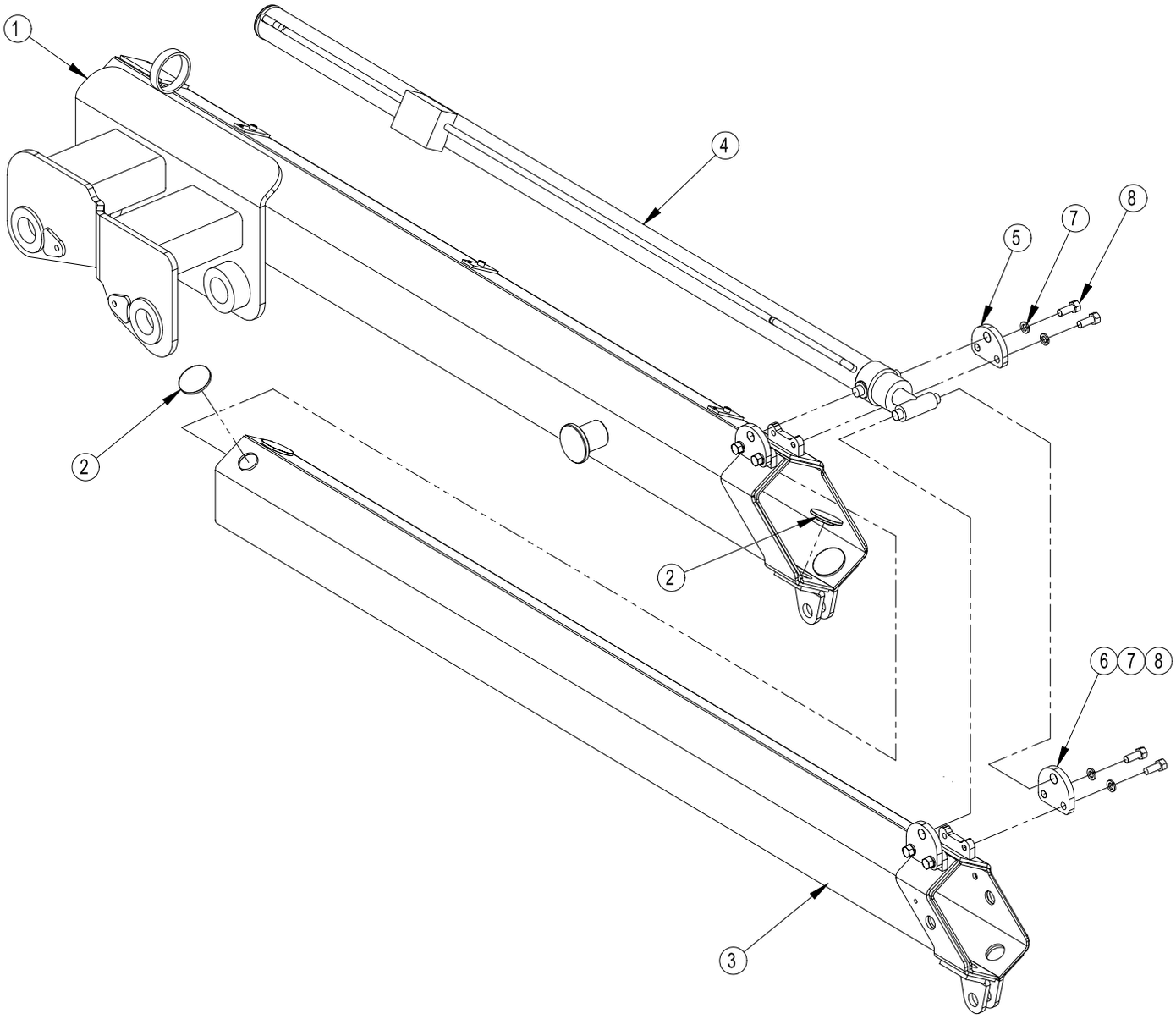
WORM REPLACEMENT KIT
P/N: 407106003



WORM REPLACEMENT KIT FOR 407106001

ITEM	QTY	PART NO.	DESCRIPTION
1	1	REF	WORM 6B-RH-SI
2	1	REF	GASKET MTR 2A MAG
3	1	REF	RING SNAP SPIRLX #RRN-287
4	2	REF	BEARING CONE #LM501349
5	2	REF	BEARING CUP LM #501310

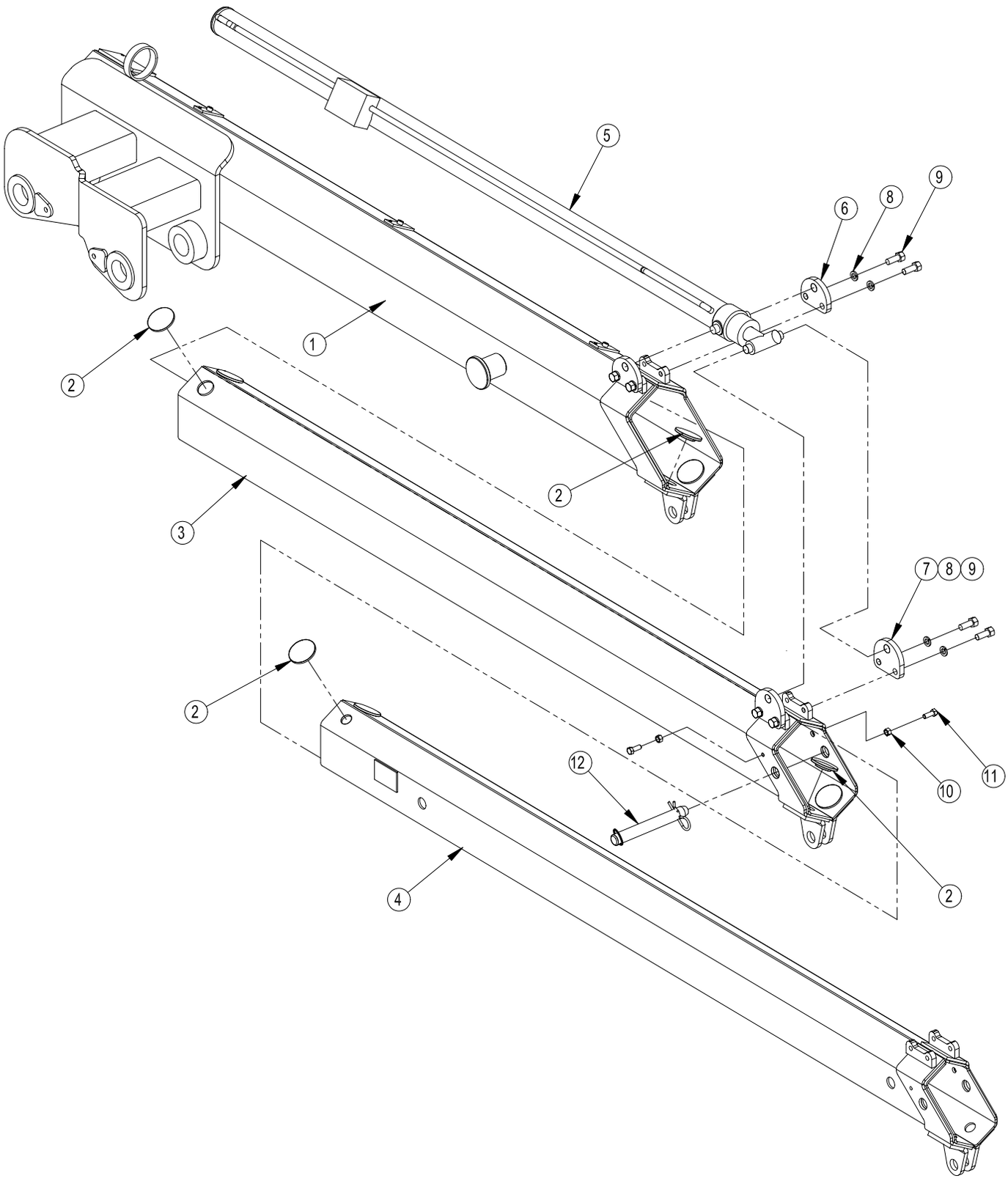
A40 OUTER BOOM ASSEMBLY
1 HYD. EXTENSION – P/N: 407295000



A40 OUTER BOOM ASSEMBLY
1 HYD. EXTENSION – P/N: 407295000

ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	407281000	OUTER BOOM WDMT
2	4	407202000	PAD BOOM 2.50 O.D.
3	1	407285000	1ST SECT BOOM WDMT
4	1	407064000	CYL 1st EXTENSION
5	2	407221000	CYL KEEPER
6	2	407222000	CYL KEEPER 1ST SECT
7	8	021500	WASHER SP LK 1/2
8	8	011510	SCW HX 1/2 NC X 1 1/4

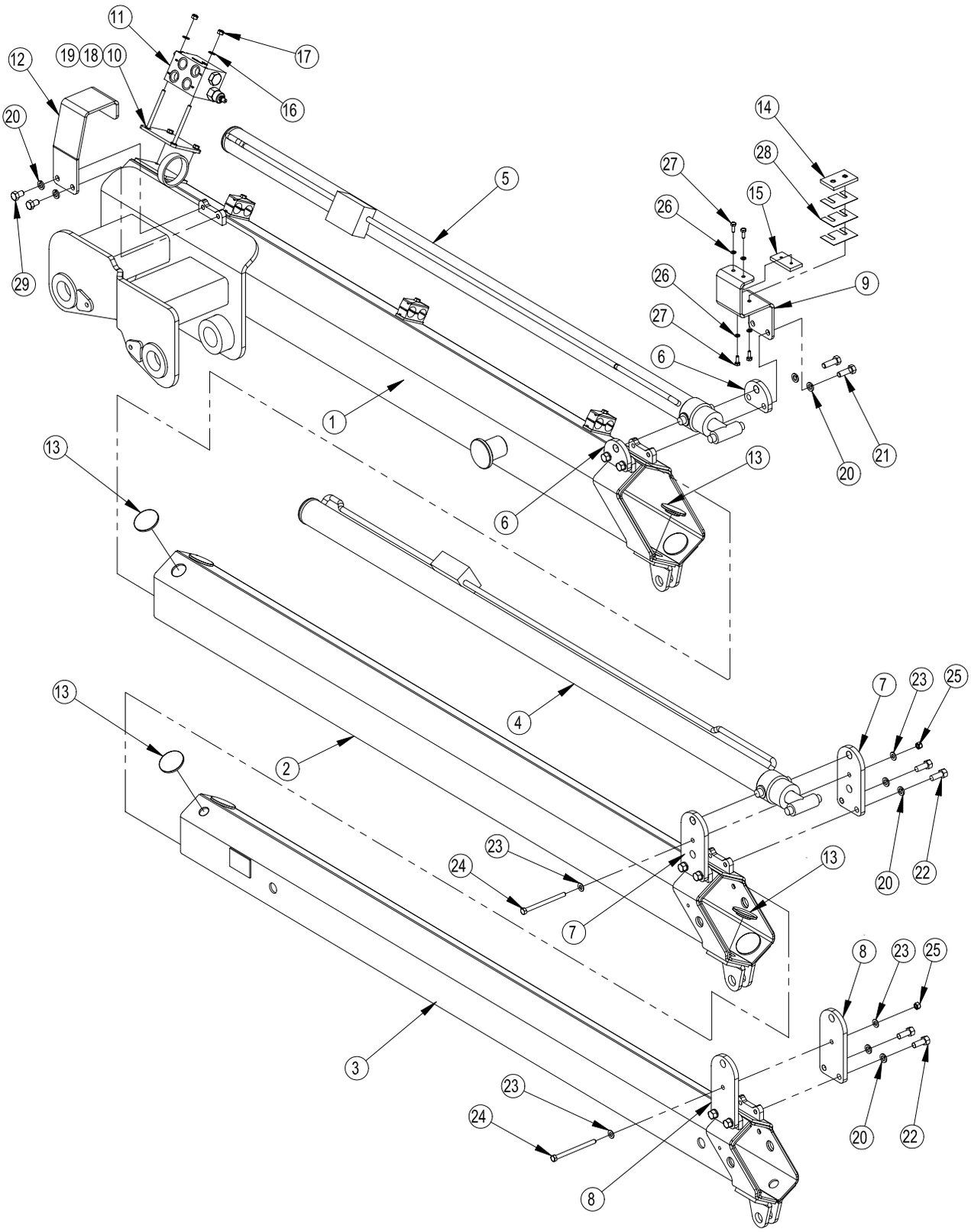
A40 OUTER BOOM ASSEMBLY
1 HYD. EXTENSIONS 1 MANUAL – P/N: 407296000



A40 OUTER BOOM ASSEMBLY
1 HYD. EXTENSIONS 1 MANUAL – P/N: 407296000

ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	407281000	OUTER BOOM WDMT
2	8	407202000	PAD BOOM 2.50 O.D.
3	1	407285000	1ST SECT BOOM WDMT
4	1	407286000	2ND SECT BOOM WDNT
5	1	407064000	CYL 1st EXTENSION
6	2	407221000	CYL KEEPER
7	2	407222000	CYL KEEPER 1ST SECT
8	8	021500	WASHER SP LK 1/2
9	8	011510	SCW HX 1/2 NC X 1 1/4
10	2	017102	NUT HEX 3/8 UNF
11	2	008701	SCW HX 3/8 UNC X 7/8 GR5
12	1	373213	PIN ASSY W/LANYARD

A40 OUTER BOOM ASSEMBLY
2 HYD. EXTENSION – P/N: 407280000

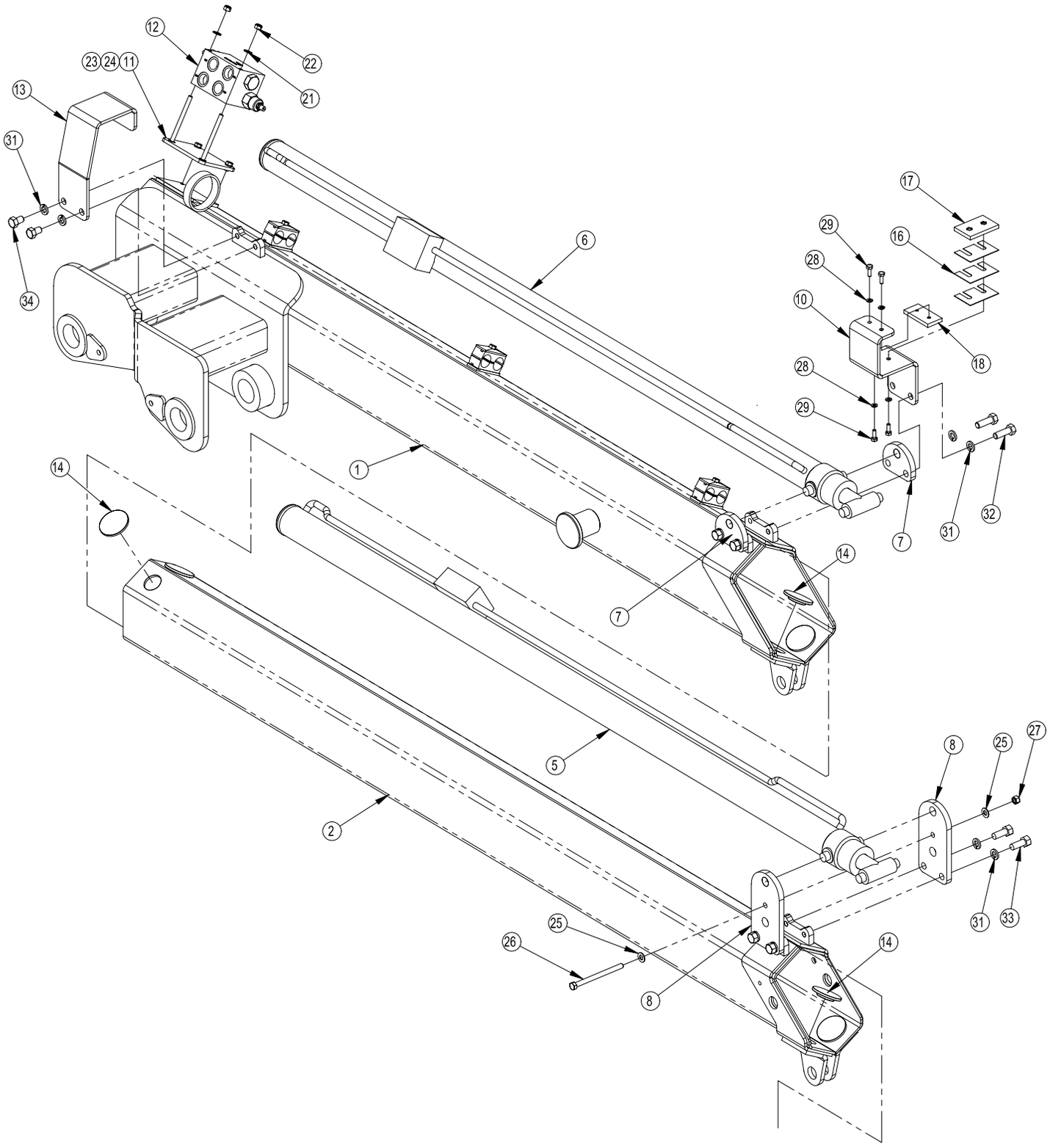


A40 OUTER BOOM ASSEMBLY
2 HYD. EXTENSION – P/N: 407280000

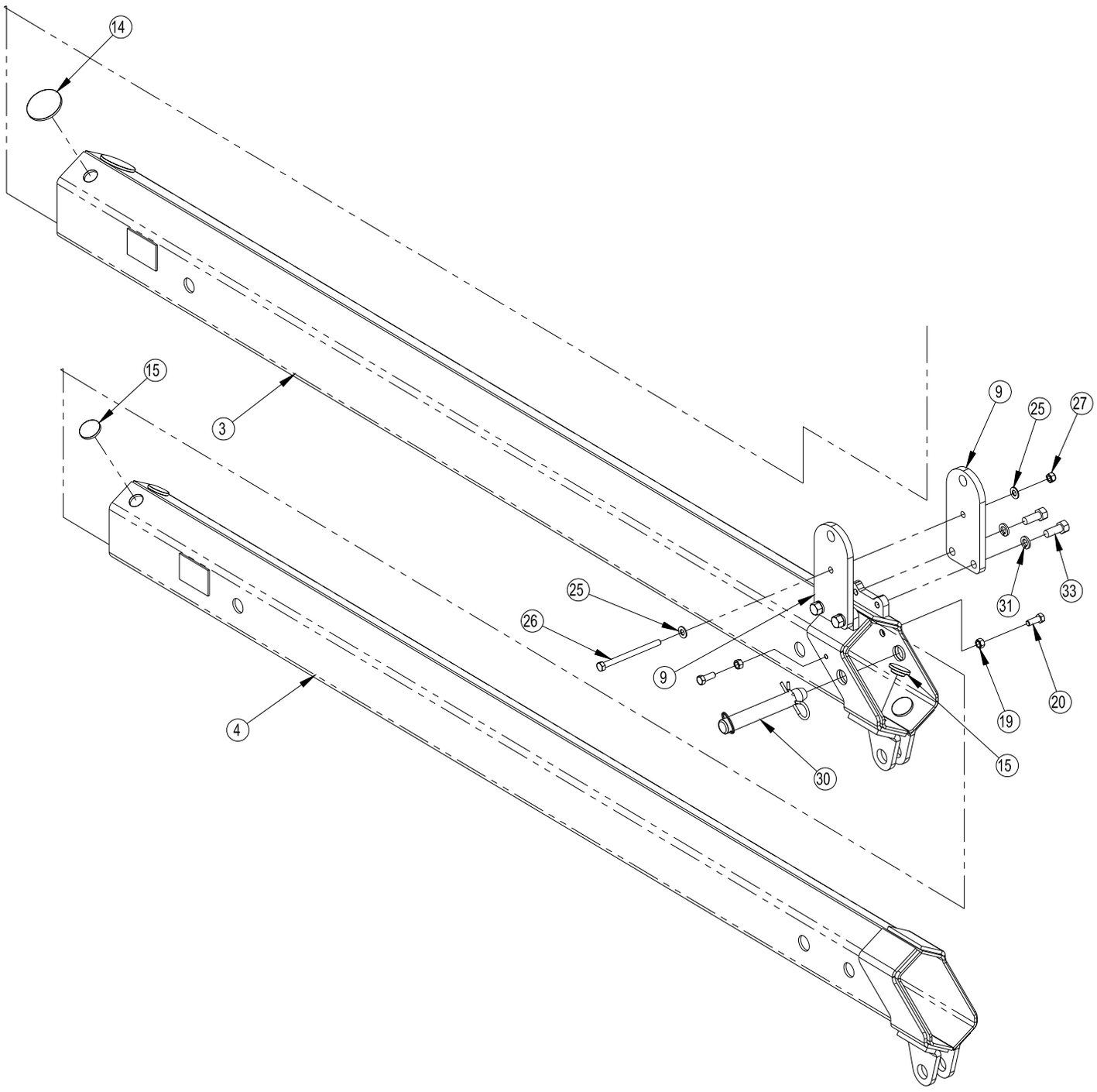
ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	407281000	OUTER BOOM WDMT
2	1	407285000	1ST SECT BOOM WDMT
3	1	407286000	2ND SECT BOOM WDNT
4	1	407063000	CYL 2nd EXTENSION
5	1	407064000	CYL 1st EXTENSION
6	2	407221000	CYL KEEPER
7	2	407223000	CYL KEEPER 1ST SECT 2 CYL'S
8	2	407224000	CYL KEEPER 2ND SECT
9	1	407229000	WEAR PAD MTG BRKT
10	1	407284000	MTG PLATE WDMT DUAL SEQUENCING
11	1	369701	DUAL SEQUENCING VALVE BLOCK
12	1	407294000	EXTENSION CYL REST
13	8	407202000	PAD BOOM 2.50 O.D.
14	1	480036	PAD BOOM SIDE
15	1	407316000	WEAR PAD .31 X 1.50 X 3.00
16	2	020901	WASHER FL 5/16
17	2	016801	NUT HEX-LOCK 5/16 NC
18	2	020600	WASHER SP LK 5/16 NC
19	2	007401	SCW 5/16-18 X 1/2 LG
20	14	021500	WASHER SP LK 1/2
21	2	010201	SCW HX 1/2 NC x 1 1/2
22	10	011510	SCW HX 1/2 NC X 1 1/4
23	4	021200	WASHER FL 3/8
24	2	811052	SCW HX 3/8 NC X 5
25	2	017301	NUT HX NYLON LOCK 3/8 NCCP
26	4	020200	WASHER SPLIT LOCK 1/4
27	4	005501	SCW HX 1/4 NF X 3/4
28	3	480037	SHIM SMALL
29	2	010000	SCW HX 1/2 X 3/4 NC

NOTES

A40 OUTER BOOM ASSEMBLY
2 HYD. EXTENSIONS 1 MANUAL – P/N: 407297000



A40 OUTER BOOM ASSEMBLY
2 HYD. EXTENSIONS 1 MANUAL – P/N: 407297000

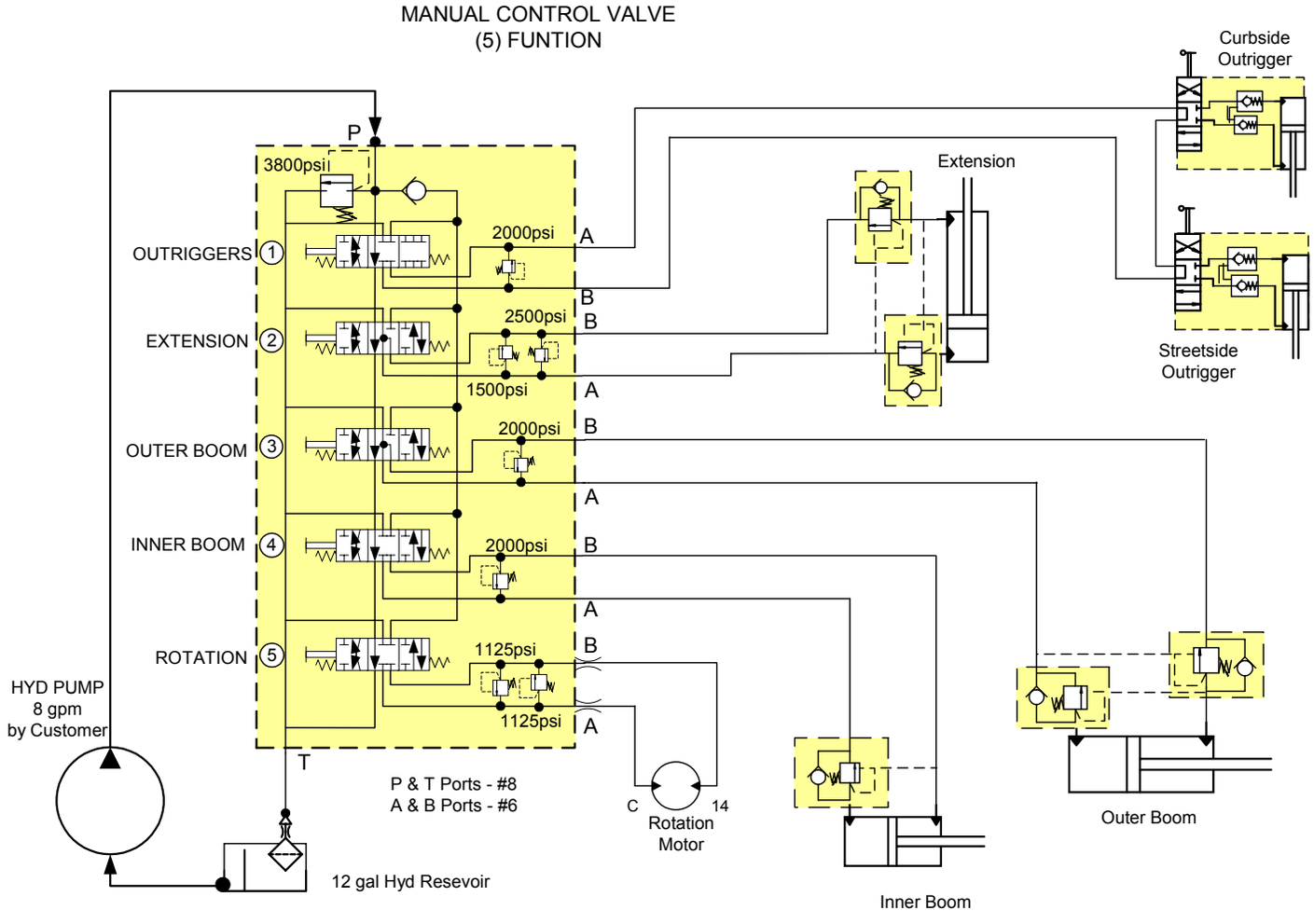


A40 OUTER BOOM ASSEMBLY
2 HYD. EXTENSIONS 1 MANUAL – P/N: 407297000

ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	407281000	OUTER BOOM WDMT
2	1	407285000	1ST SECT BOOM WDMT
3	1	407286000	2ND SECT BOOM WDNT
4	1	407271000	3RD SECT BOOM WDMT
5	1	407063000	CYL 2nd EXTENSION
6	1	407064000	CYL 1st EXTENSION
7	2	407221000	CYL KEEPER
8	2	407223000	CYL KEEPER 1ST SECT 2 CYL'S
9	2	407224000	CYL KEEPER 2ND SECT
10	1	407229000	WEAR PAD MTG BRKT
11	1	407284000	MTG PLATE WDMT DUAL SEQUENCING
12	1	369701	DUAL SEQUENCING VALVE BLOCK
13	1	407294000	EXTENSION CYL REST
14	8	407202000	PAD BOOM 2.50 O.D.
15	4	407277000	PAD BOOM 1.5 O.D.
16	3	480037	SHIM SMALL
17	1	480036	PAD BOOM SIDE
18	1	407316000	WEAR PAD .31 X 1.50 X 3.00
19	2	017102	NUT HEX 3/8 UNF
20	2	008701	SCW HX 3/8 UNC X 7/8 GR5
21	2	020901	WASHER FL 5/16
22	2	016801	NUT HEX-LOCK 5/16 NC
23	2	020600	WASHER SP LK 5/16 NC
24	2	007401	SCW 5/16-18 X 1/2 LG
25	4	021200	WASHER FL 3/8
26	2	811052	SCW HX 3/8 NC X 5
27	2	017301	NUT HX NYLON LOCK 3/8 NCCP
28	4	020200	WASHER SPLIT LOCK 1/4
29	4	005501	SCW HX 1/4 NF X 3/4
30	1	372168	PIN ASSY W/LANYARD
31	14	021500	WASHER SP LK 1/2
32	2	010201	SCW HX 1/2 NC x 1 1/2
33	10	011510	SCW HX 1/2 NC X 1 1/4
34	2	010000	SCW HX 1/2 X 3/4 NC

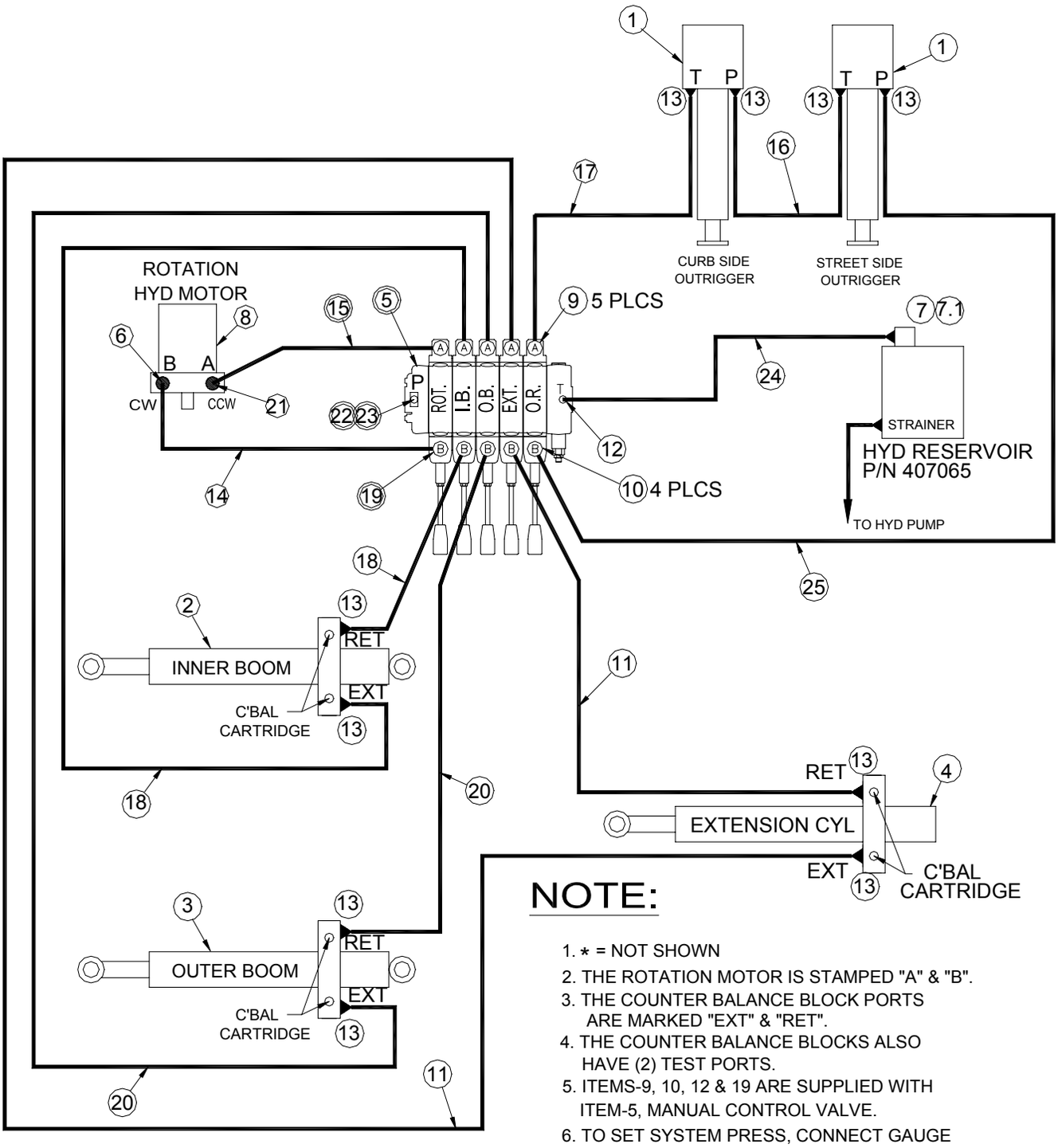
NOTES

A40 HYDRAULIC SCHEMATIC - P/N: 407061000
5 FUNCTION CONTROL VALVE 1 HYD EXTENSION



A40 HYD SYSTEM INFO	
HYD PUMP =	8 GPM
HYD RESERVOIR =	12 GAL CAPACITY
SYSTEM PRESS =	3800 PSI MAX
EXTENSION =	EXT 2000 PSI, RET 2500 PSI
OUTER BOOM =	EXT 3500 PSI, RET 2000 PSI
INNER BOOM =	EXT 3500 PSI, RET 2000 PSI
ROTATION =	EXT 1125 PSI, RET 1125 PSI

A40 HYDRAULIC SCHEMATIC - P/N: 407061000
5 FUNCTION CONTROL VALVE 1 HYD EXTENSION



NOTE:

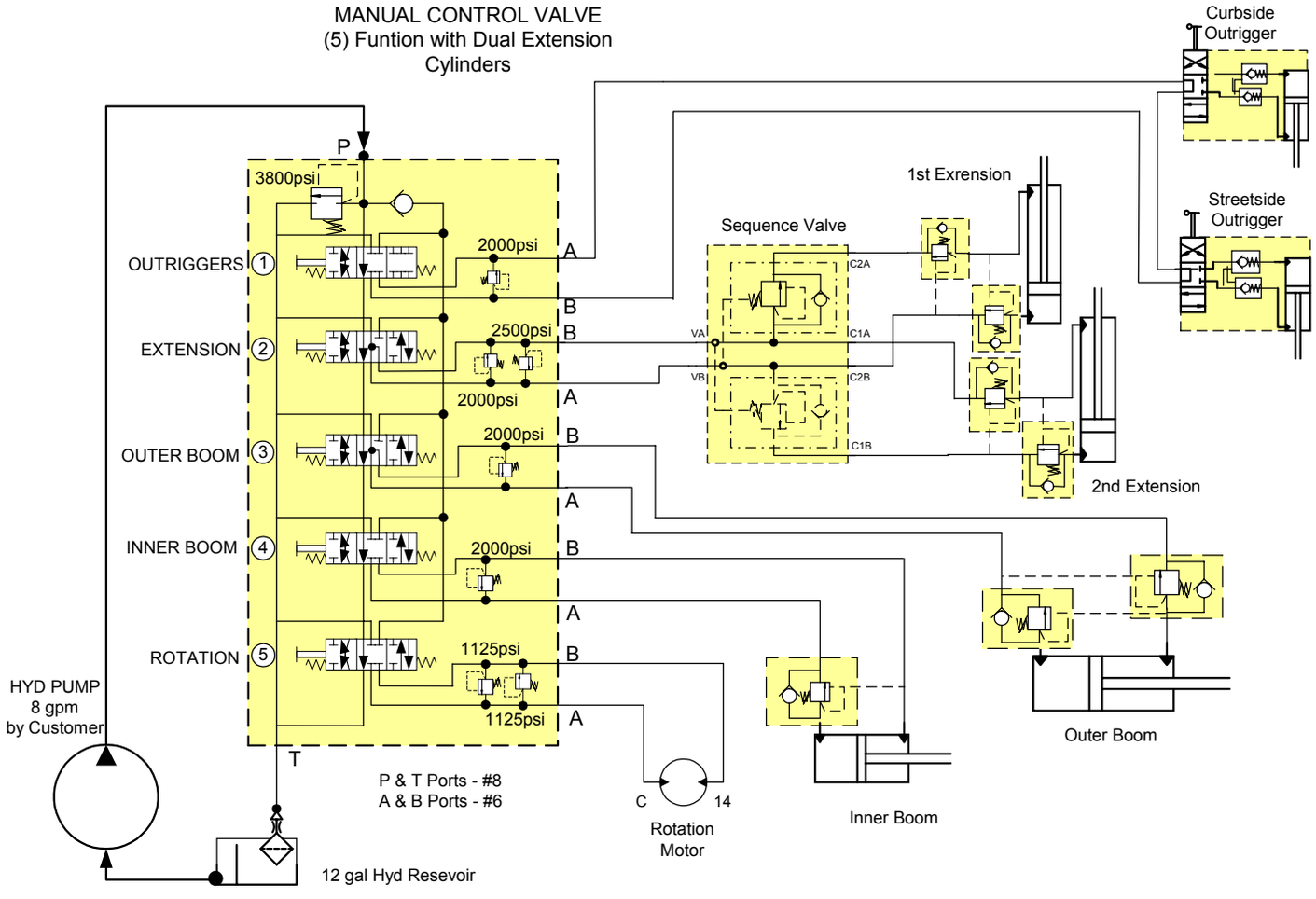
1. * = NOT SHOWN
2. THE ROTATION MOTOR IS STAMPED "A" & "B".
3. THE COUNTER BALANCE BLOCK PORTS ARE MARKED "EXT" & "RET".
4. THE COUNTER BALANCE BLOCKS ALSO HAVE (2) TEST PORTS.
5. ITEMS-9, 10, 12 & 19 ARE SUPPLIED WITH ITEM-5, MANUAL CONTROL VALVE.
6. TO SET SYSTEM PRESS, CONNECT GAUGE TO ITEM-22 (TEE) LOCATED @ VALVE PORT (IN).

A40 HYDRAULIC SCHEMATIC - P/N: 407061000
5 FUNCTION CONTROL VALVE 1 HYD EXTENSION

	ITEM	QTY	PART NO	DESCRIPTION
	1	2	407050000	OUTRIGGER CYL W/MANUAL VALVE
	2	1	407051000	INNER BOOM CYLINDER
	3	1	407052000	OUTER BOOM CYLINDER
	4	1	407064000	EXTENSION CYLINDER
	5	1	407055000	MANUAL CONTROL VALVE (5) FUNCTION
	6	1	372044000	FITTING 90 DEG -10SAE/-8JIC
	7	1	367210000	FITTING STR -16 SAE/-12 JIC
	7	1	367283000	FITTING 90 DEG -12 JIC
	8	1	407109000	HYDRAULIC MOTOR 10.0 CU IN
	9	4	241175000	FITTING 90 DEG -6 SAE/-6 JIC
	10	5	330645000	FITTING 90 DEG -6 SAE/-6 JIC LONG
	11	2	812209195	HOSE ASSY -6 X 195 LG STR
	12	1	362020000	FITTING 90 DEG -8 SAE/-8 JIC
	13	10	200876000	FITTING STR -6 SAE/-6 JIC
	14	1	812303024	HOSE ASSY -8 X 24 STR
	15	1	812203024	HOSE ASSY -6 X 24 STR
	16	1	812203175	HOSE ASSY -6 X 165 STR
	17	1	812203050	HOSE ASSY -6 X 50 STR
	18	2	812203110	HOSE ASSY -6 X 110 STR
	19	1	407062000	FITTING 90 DEG -6 SAE/-8 JIC
	20	2	812203126	HOSE ASSY -6 X 126 STR
	21	1	490198000	FITTING 90 DEG -10 SAE/-6 JIC
	22	1	360445000	CAP -8 JIC
	23	1	369219000	FITTING TEE -8 SAE/-8 JIC RUN
	24	1	812514060	HOSE ASSY -12/-8 X 60 STR
	25	1	812303136	HOSE ASSY -6 X 136 STR
*	26	REF	407050001	SEAL KIT OUTRIGGER CYL W/MANUAL VALVE
*	27	REF	407051001	SEAL KIT INNER BOOM CYLINDER
*	28	REF	407052001	SEAL KIT OUTER BOOM CYLINDER
*	29	REF	407063001	SEAL KIT EXTENSION CYLINDER

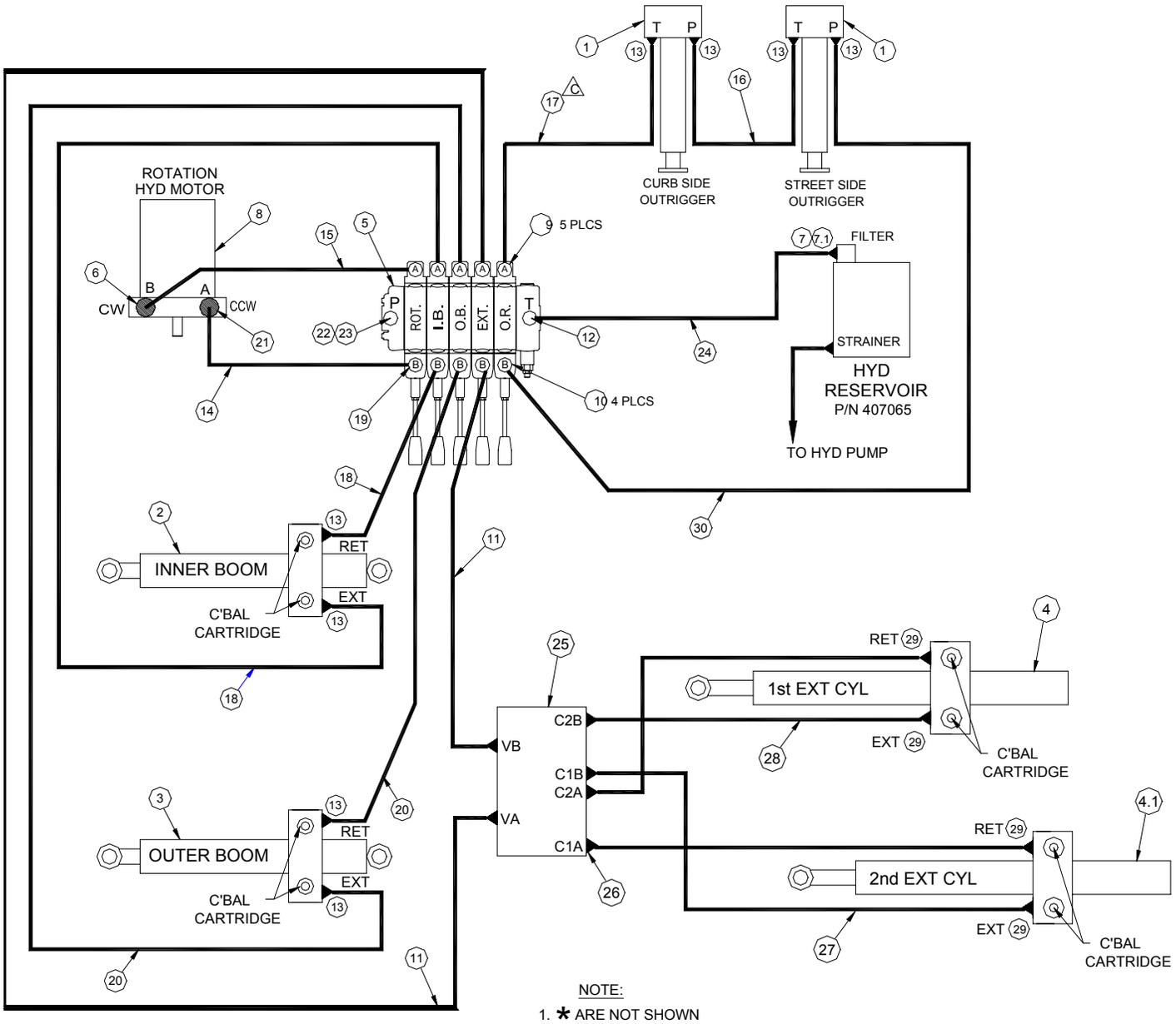
NOTES

A40 HYDRAULIC SCHEMATIC - P/N: 407061002
5 FUNCTION CONTROL VALVE 2 HYD EXTENSION



A40 HYD SYSTEM INFO	
HYD PUMP =	8 GPM
HYD RESERVOIR =	12 GAL CAPACITY
SYSTEM PRESS =	3800 PSI MAX.
EXTENSION =	EXT 2000 PSI, RET 2500 PSI
OUTER BOOM =	EXT 3500 PSI, RET 2000 PSI
INNER BOOM =	EXT 3500 PSI, RET 2000 PSI
ROTATION =	EXT 1125 PSI, RET 1125 PSI

A40 HYDRAULIC SCHEMATIC - P/N: 407061002
5 FUNCTION CONTROL VALVE 2 HYD EXTENSION



NOTE:

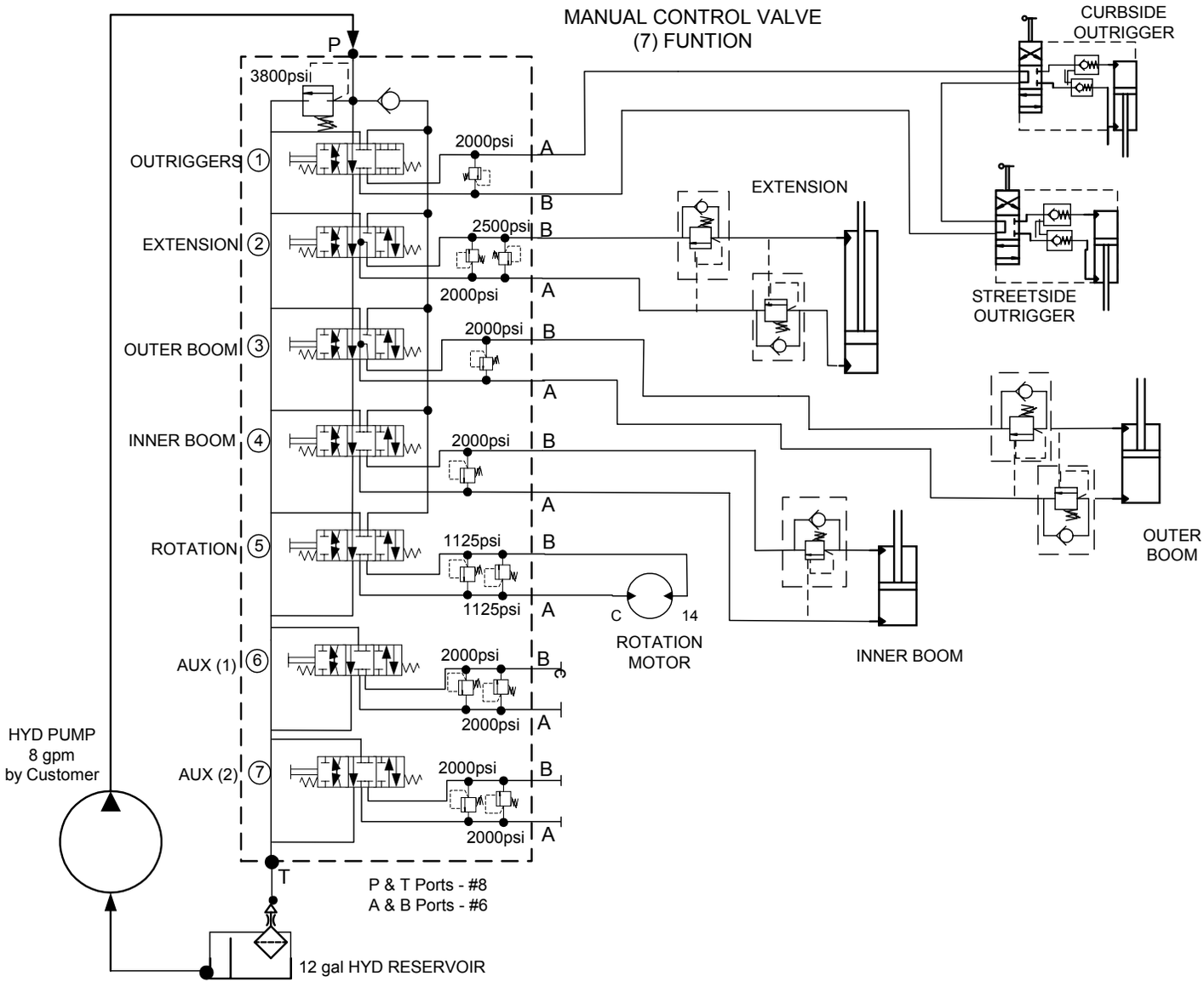
1. ✱ ARE NOT SHOWN
2. THE ROTATION MOTOR IS STAMPED "A" & "B".
3. THE COUNTER BALANCE BLOCK PORTS ARE MARKED "EXT" & "RET".
4. THE COUNTERBALANCE BLOCKS ALSO HAVE (2) TEST PORTS.
5. + ITEMS ARE SUPPLIED WITH ITEM-5, MANUAL CONTROL VALVE.
6. TO SET SYSTEM PRESSURE, CONNECT GAUGE TO ITEM-22 (TEE) LOCATED @ VALVE "P" PORT

A40 HYDRAULIC SCHEMATIC - P/N: 407061002
5 FUNCTION CONTROL VALVE 2 HYD EXTENSION

	ITEM	QTY	PART NO	DESCRIPTION
	1	2	407050000	OUTRIGGER CYL W/MANUAL VALVE
	2	1	407051000	INNER BOOM CYLINDER
	3	1	407052000	OUTER BOOM CYLINDER
	4	1	407064000	EXTENSION CYLINDER
	4.1	1	407063000	EXTENSION CYLINDER 2nd EXT
	5	1	407055000	MANUAL CONTROL VALVE (5) FUNCTION
	6	1	372044000	FITTING 90 DEG -10SAE/-8JIC
	7	1	367210000	FITTING STR -16 SAE/-12 JIC
	7	1	367283000	FITTING 90 DEG -12 JIC
	8	1	407109000	HYDRAULIC MOTOR 10.0 CU IN
	9	4	241175000	FITTING 90 DEG -6 SAE/-6 JIC
	10	5	330645000	FITTING 90 DEG -6 SAE/-6 JIC LONG
	11	2	812209195	HOSE ASSY -6 X 195 LG STR
	12	1	362020000	FITTING 90 DEG -8 SAE/-8 JIC
	13	10	200876000	FITTING STR -6 SAE/-6 JIC
	14	1	812303024	HOSE ASSY -8 X 24 STR
	15	1	812203024	HOSE ASSY -6 X 24 STR
	16	1	812203175	HOSE ASSY -6 X 165 STR
	17	1	812203050	HOSE ASSY -6 X 50 STR
	18	2	812203110	HOSE ASSY -6 X 110 STR
	19	1	407062000	FITTING 90 DEG -6 SAE/-8 JIC
	20	2	812203126	HOSE ASSY -6 X 126 STR
	21	1	490198000	FITTING 90 DEG -10 SAE/-6 JIC
	22	1	360445000	CAP -8 JIC
	23	1	369219000	FITTING TEE -8 SAE/-8 JIC RUN
	24	1	812514060	HOSE ASSY -12/-8 X 60 STR
	25	1	369701000	VALVE DUAL SEQUENCE
	26	6	202755000	FITTING STR 10 SAE/-6 JIC
	27	2	812209112	HOSE ASSY -6/-6 90 DEG X 112
	28	2	812206025	HOSE ASSY -6/-6 90 DEG LG X 25
	29	4	241175000	FITTING 90 DEG -6 SAE/-6 JIC SHORT
	30	1	812203136	HOSE ASSY -6/-6 LG X 136
*	31	REF	407050001	SEAL KIT OUTRIGGER CYL W/MANUAL VALVE
*	32	REF	407051001	SEAL KIT INNER BOOM CYLINDER
*	33	REF	407052001	SEAL KIT OUTER BOOM CYLINDER
*	34	REF	407063001	SEAL KIT EXTENSION CYLINDER

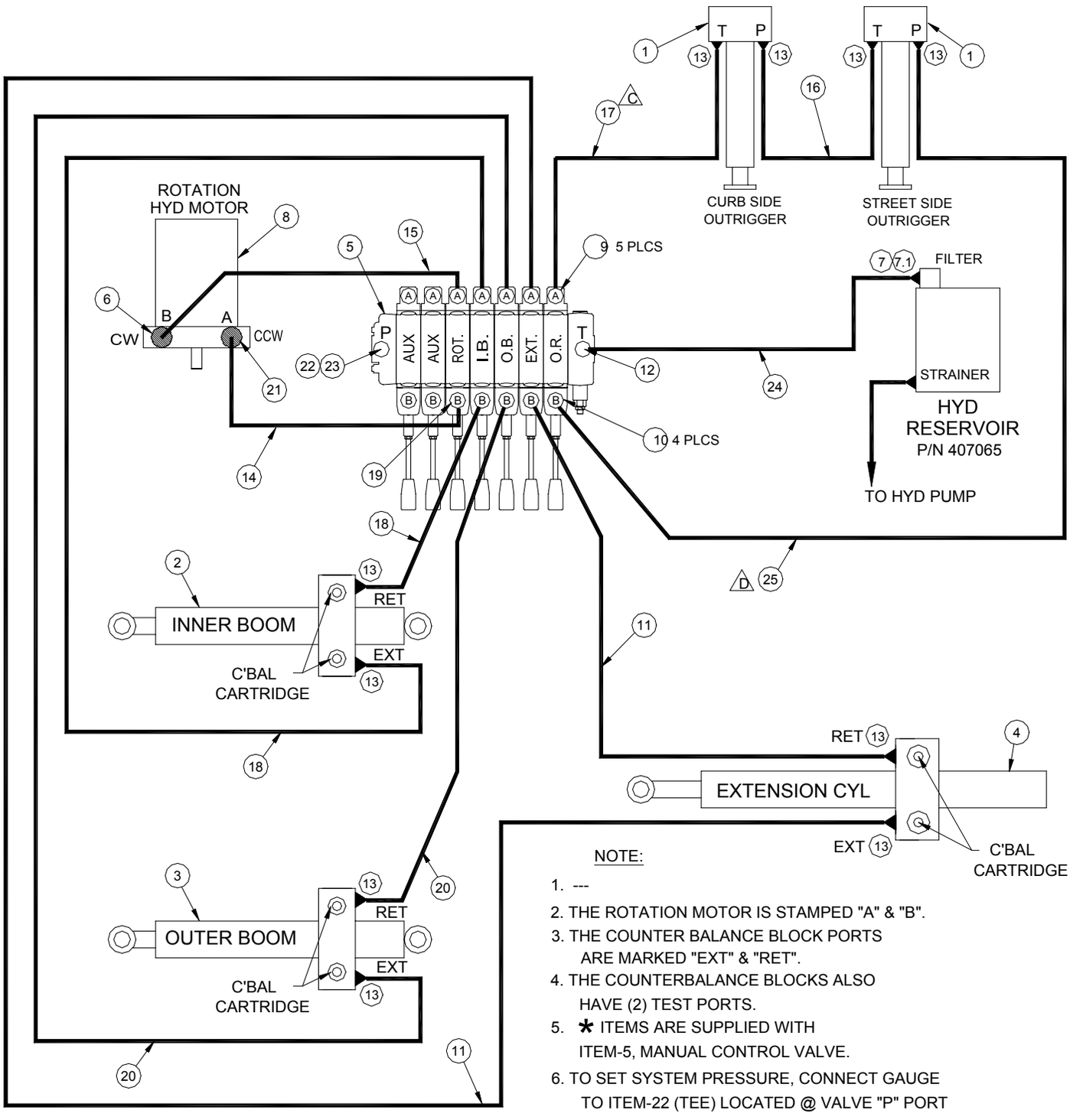
NOTES

A40 HYDRAULIC SCHEMATIC - P/N: 407061001
7 FUNCTION CONTROL VALVE 1 HYD EXTENSION



A40 HYD SYSTEM INFO	
HYD PUMP =	8 GPM
HYD RESERVOIR =	12 GAL CAPACITY
SYSTEM PRESS =	3800 PSI MAX
EXTENSION =	EXT 2000 PSI, RET 2500 PSI
OUTER BOOM =	EXT 3500 PSI, RET 2000 PSI
INNER BOOM =	EXT 3500 PSI, RET 2000 PSI
ROTATION =	EXT 1125 PSI, RET 1125 PSI

A40 HYDRAULIC SCHEMATIC - P/N: 407061001
7 FUNCTION CONTROL VALVE 1 HYD EXTENSION



NOTE:

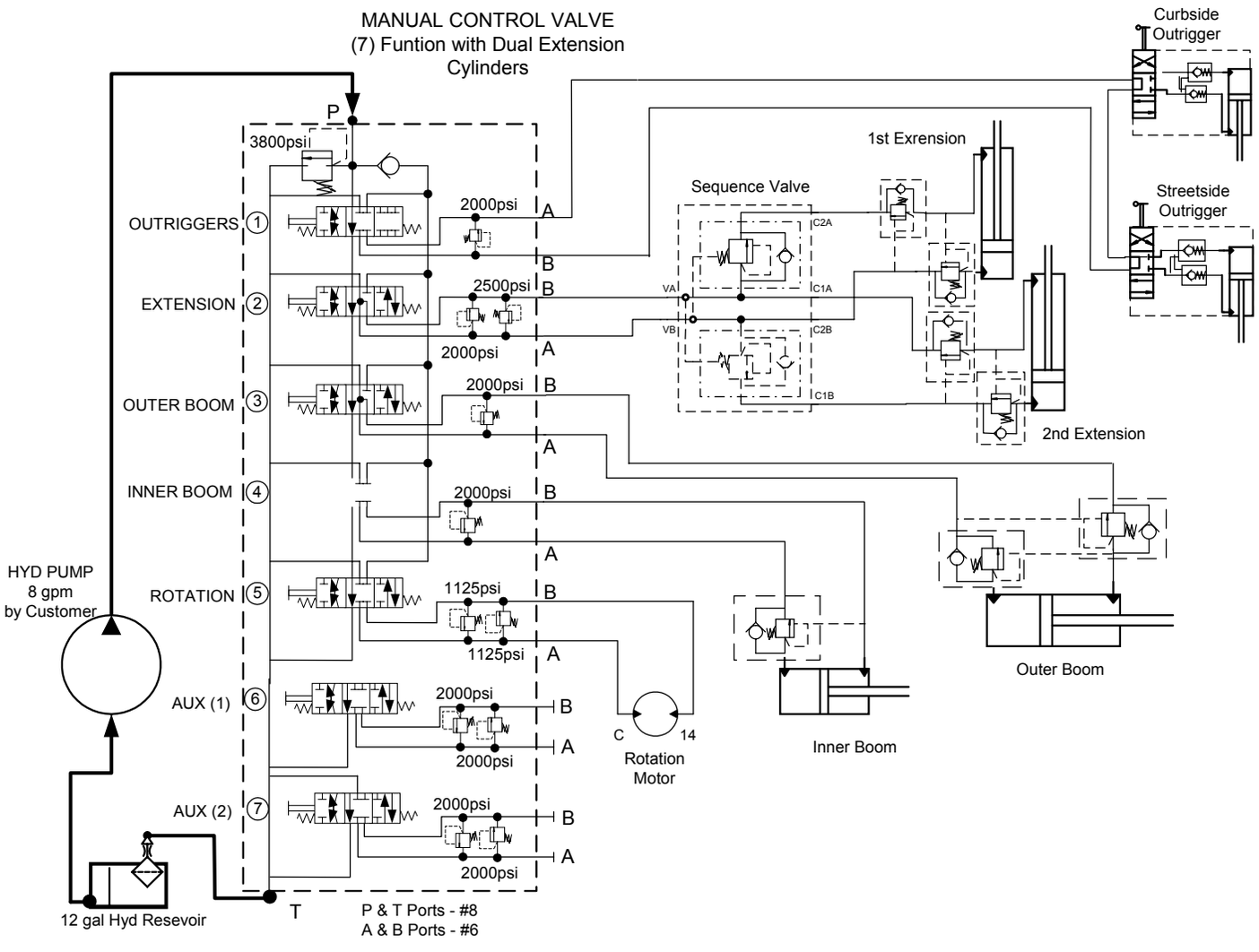
1. ---
2. THE ROTATION MOTOR IS STAMPED "A" & "B".
3. THE COUNTER BALANCE BLOCK PORTS ARE MARKED "EXT" & "RET".
4. THE COUNTERBALANCE BLOCKS ALSO HAVE (2) TEST PORTS.
5. * ITEMS ARE SUPPLIED WITH ITEM-5, MANUAL CONTROL VALVE.
6. TO SET SYSTEM PRESSURE, CONNECT GAUGE TO ITEM-22 (TEE) LOCATED @ VALVE "P" PORT

A40 HYDRAULIC SCHEMATIC - P/N: 407061001
7 FUNCTION CONTROL VALVE 1 HYD EXTENSION

	ITEM	QTY	PART NO	DESCRIPTION
	1	2	407050000	OUTRIGGER CYL W/MANUAL VALVE
	2	1	407051000	INNER BOOM CYLINDER
	3	1	407052000	OUTER BOOM CYLINDER
	4	1	407064000	EXTENSION CYLINDER
	5	1	407056000	MANUAL CONTROL VALVE (5) FUNCTION
	6	1	372044000	FITTING 90 DEG -10SAE/-8JIC
	7	1	367210000	FITTING STR -16 SAE/-12 JIC
	7	1	367283000	FITTING 90 DEG -12 JIC
	8	1	407109000	HYDRAULIC MOTOR 10.0 CU IN
	9	4	241175000	FITTING 90 DEG -6 SAE/-6 JIC
	10	5	330645000	FITTING 90 DEG -6 SAE/-6 JIC LONG
	11	2	812209195	HOSE ASSY -6 X 195 LG STR
	12	1	362020000	FITTING 90 DEG -8 SAE/-8 JIC
	13	10	200876000	FITTING STR -6 SAE/-6 JIC
	14	1	812303024	HOSE ASSY -8 X 24 STR
	15	1	812203024	HOSE ASSY -6 X 24 STR
	16	1	812203175	HOSE ASSY -6 X 165 STR
	17	1	812203050	HOSE ASSY -6 X 50 STR
	18	2	812203110	HOSE ASSY -6 X 110 STR
	19	1	407062000	FITTING 90 DEG -6 SAE/-8 JIC
	20	2	812203126	HOSE ASSY -6 X 126 STR
	21	1	490198000	FITTING 90 DEG -10 SAE/-6 JIC
	22	1	360445000	CAP -8 JIC
	23	1	369219000	FITTING TEE -8 SAE/-8 JIC RUN
	24	1	812514060	HOSE ASSY -12/-8 X 60 STR
	25	1	812303136	HOSE ASSY -6 X 136 STR
*	26	REF	407050001	SEAL KIT OUTRIGGER CYL W/MANUAL VALVE
*	27	REF	407051001	SEAL KIT INNER BOOM CYLINDER
*	28	REF	407052001	SEAL KIT OUTER BOOM CYLINDER
*	29	REF	407063001	SEAL KIT EXTENSION CYLINDER

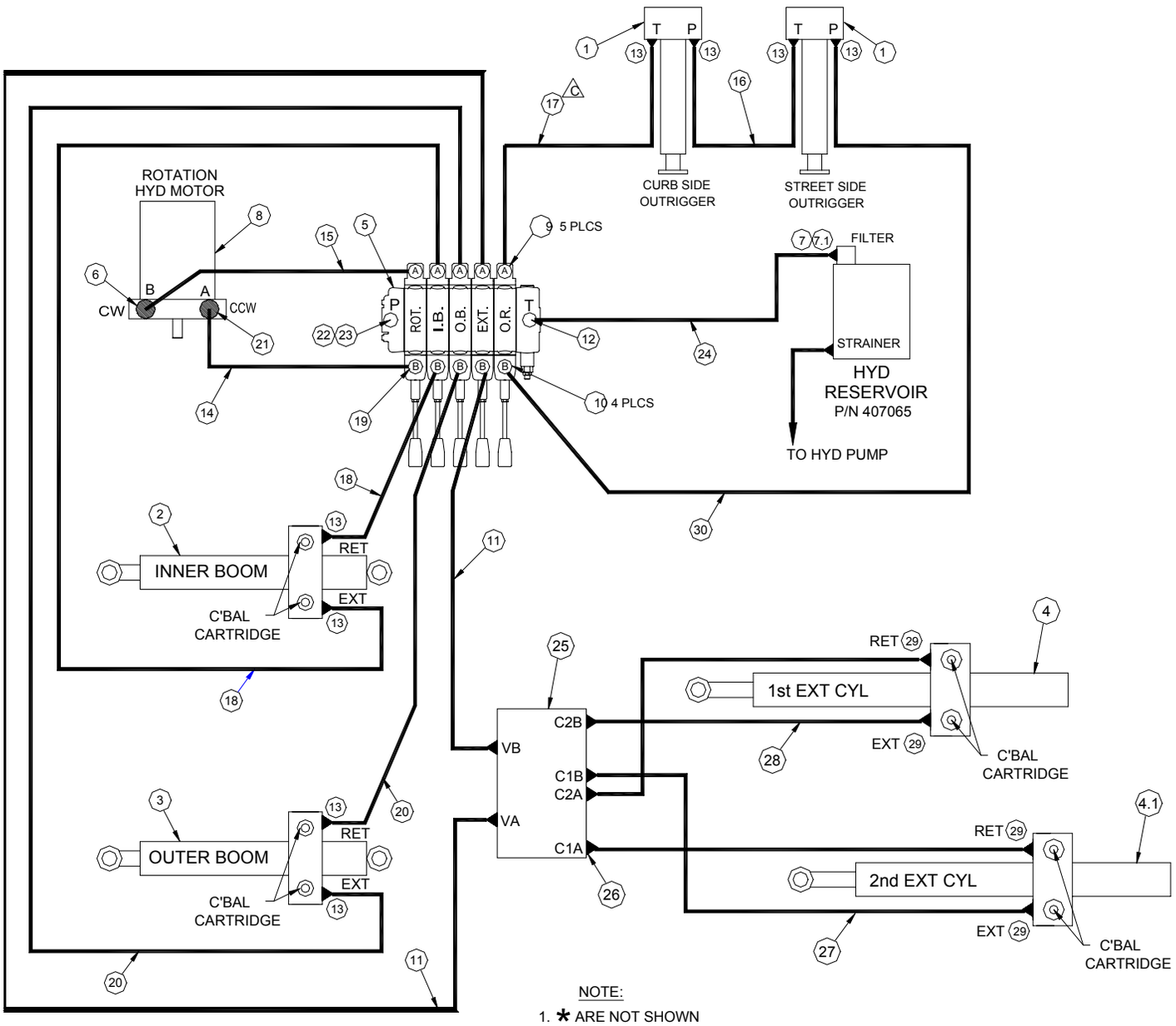
NOTES

A40 HYDRAULIC SCHEMATIC - P/N: 407061003
7 FUNCTION CONTROL VALVE 2 HYD EXTENSION



A40 HYD SYSTEM INFO	
HYD PUMP =	8 GPM
HYD RESERVOIR =	12 GAL CAPACITY
SYSTEM PRESS =	3800 PSI MAX
EXTENSION =	EXT 2000 PSI, RET 2500 PSI
OUTER BOOM =	EXT 3500 PSI, RET 2000 PSI
INNER BOOM =	EXT 3500 PSI, RET 2000 PSI
ROTATION =	EXT 1125 PSI, RET 1125 PSI

A40 HYDRAULIC SCHEMATIC - P/N: 407061003
7 FUNCTION CONTROL VALVE 2 HYD EXTENSION



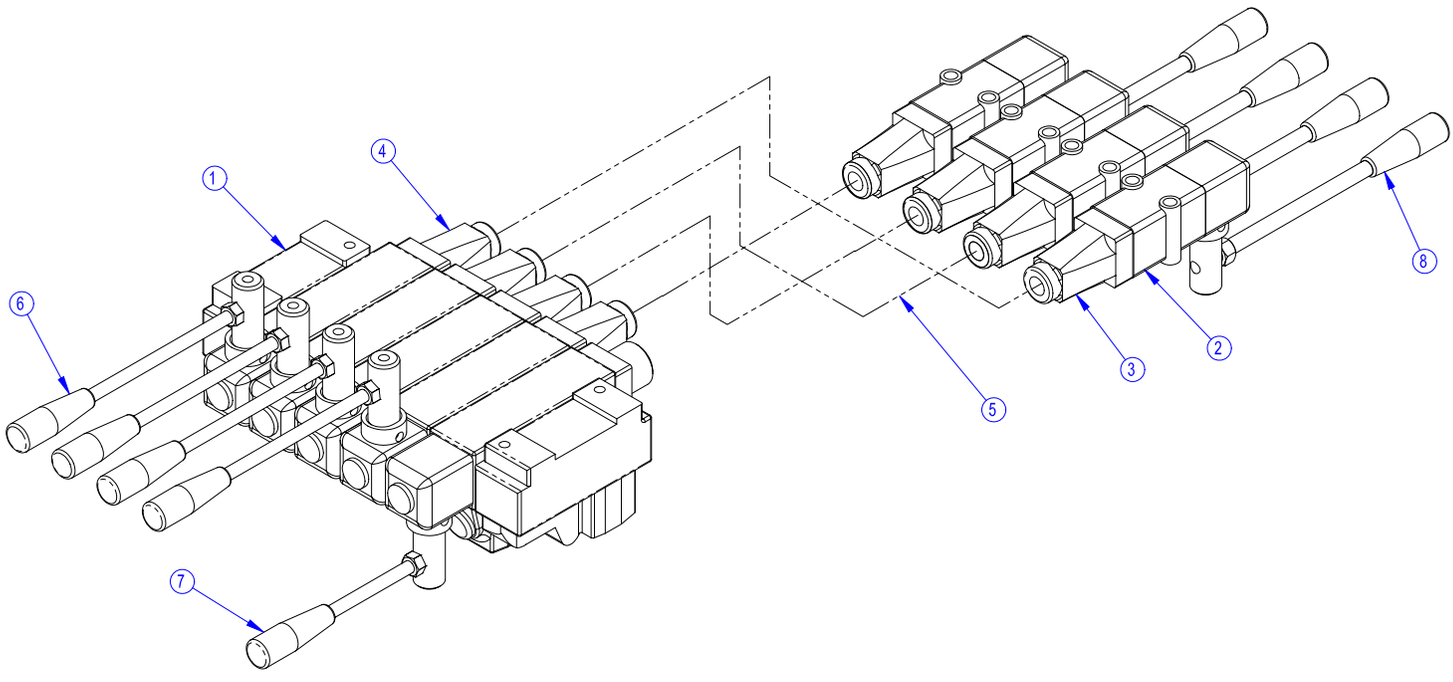
NOTE:

1. ✱ ARE NOT SHOWN
2. THE ROTATION MOTOR IS STAMPED "A" & "B".
3. THE COUNTER BALANCE BLOCK PORTS ARE MARKED "EXT" & "RET".
4. THE COUNTERBALANCE BLOCKS ALSO HAVE (2) TEST PORTS.
5. + ITEMS ARE SUPPLIED WITH ITEM-5, MANUAL CONTROL VALVE.
6. TO SET SYSTEM PRESSURE, CONNECT GAUGE TO ITEM-22 (TEE) LOCATED @ VALVE "P" PORT

A40 HYDRAULIC SCHEMATIC - P/N: 407061003
7 FUNCTION CONTROL VALVE 2 HYD EXTENSION

	ITEM	QTY	PART NO	DESCRIPTION
	1	2	407050000	OUTRIGGER CYL W/MANUAL VALVE
	2	1	407051000	INNER BOOM CYLINDER
	3	1	407052000	OUTER BOOM CYLINDER
	4	1	407064000	EXTENSION CYLINDER
	4.1	1	407063000	EXTENSION CYLINDER 2nd EXT
	5	1	407056000	MANUAL CONTROL VALVE (7) FUNCTION
	6	1	372044000	FITTING 90 DEG -10SAE/-8JIC
	7	1	367210000	FITTING STR -16 SAE/-12 JIC
	7	1	367283000	FITTING 90 DEG -12 JIC
	8	1	407109000	HYDRAULIC MOTOR 10.0 CU IN
	9	4	241175000	FITTING 90 DEG -6 SAE/-6 JIC
	10	5	330645000	FITTING 90 DEG -6 SAE/-6 JIC LONG
	11	2	812209195	HOSE ASSY -6 X 195 LG STR
	12	1	362020000	FITTING 90 DEG -8 SAE/-8 JIC
	13	10	200876000	FITTING STR -6 SAE/-6 JIC
	14	1	812303024	HOSE ASSY -8 X 24 STR
	15	1	812203024	HOSE ASSY -6 X 24 STR
	16	1	812203175	HOSE ASSY -6 X 165 STR
	17	1	812203050	HOSE ASSY -6 X 50 STR
	18	2	812203110	HOSE ASSY -6 X 110 STR
	19	1	407062000	FITTING 90 DEG -6 SAE/-8 JIC
	20	2	812203126	HOSE ASSY -6 X 126 STR
	21	1	490198000	FITTING 90 DEG -10 SAE/-6 JIC
	22	1	360445000	CAP -8 JIC
	23	1	369219000	FITTING TEE -8 SAE/-8 JIC RUN
	24	1	812514060	HOSE ASSY -12/-8 X 60 STR
	25	1	369701000	VALVE DUAL SEQUENCE
	26	6	202755000	FITTING STR 10 SAE/-6 JIC
	27	2	812209112	HOSE ASSY -6/-6 90 DEG X 112
	28	2	812206025	HOSE ASSY -6/-6 90 DEG LG X 25
	29	4	241175000	FITTING 90 DEG -6 SAE/-6 JIC SHORT
	30	1	812203136	HOSE ASSY -6/-6 LG X 136
*	31	REF	407050001	SEAL KIT OUTRIGGER CYL W/MANUAL VALVE
*	32	REF	407051001	SEAL KIT INNER BOOM CYLINDER
*	33	REF	407052001	SEAL KIT OUTER BOOM CYLINDER
*	34	REF	407063001	SEAL KIT EXTENSION CYLINDER

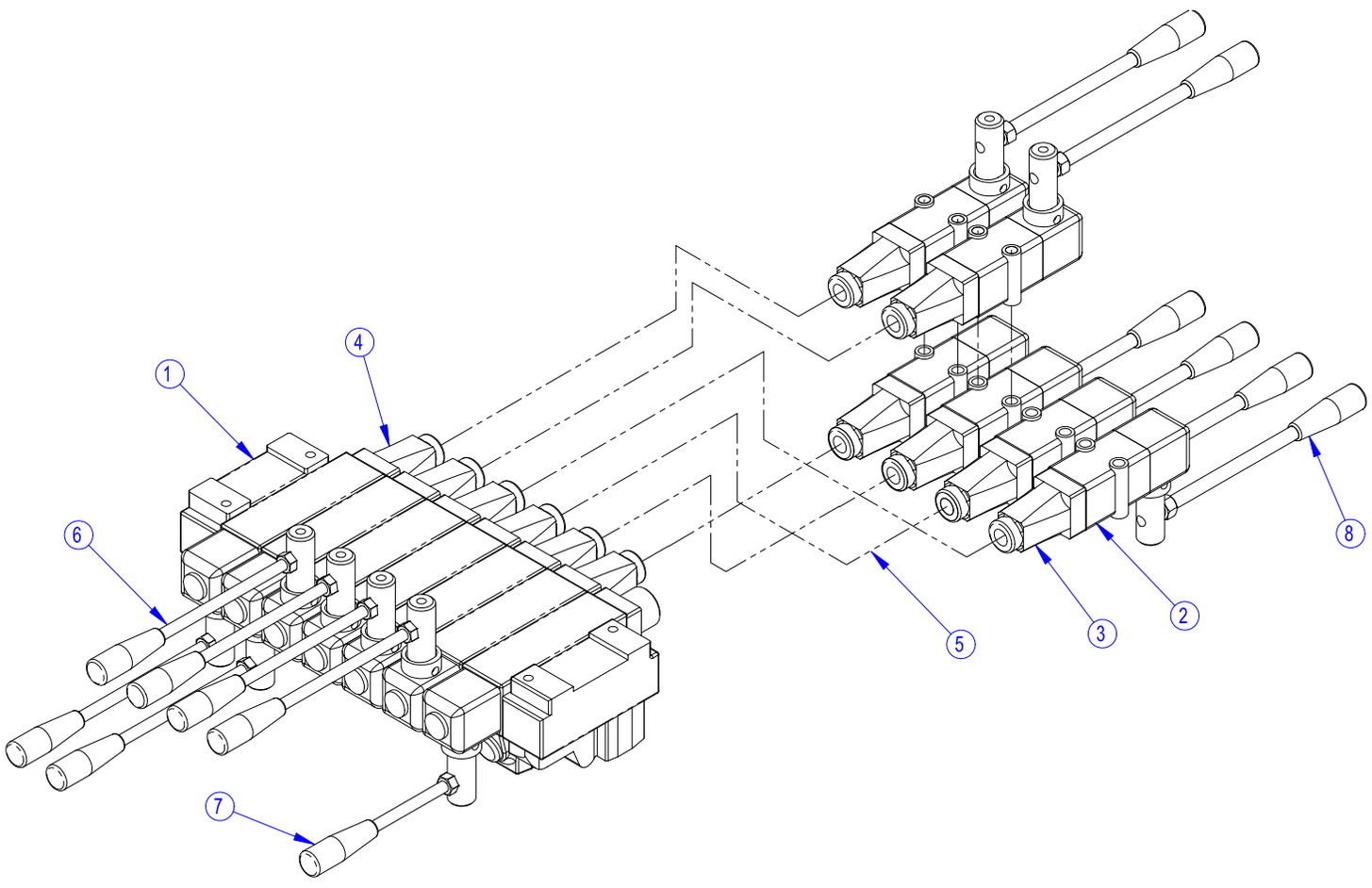
CONTROL VALVE ASSY - 5 FUNCTION
P/N: 407078000



VALVE SUPPLIED WITH FITTINGS (NOT SHOWN)

ITEM NO	QTY	PART NO	DESCRIPTION
1	1	407055000	VALVE CONTROL MANUAL 5 SECTION
2	4	407057000	LEVER BOX REMOTE CABLE OPERATOR
3	4	407060000	CONNECTOR KIT REMOTE OPERATOR
4	4	407059000	CONNECTOR KIT DIRECTIONAL VALVE
5	4	407058000	CABLE REMOTE 59" LG
6	4	407080000	LEVER M8 X 200mm
7	1	407081000	LEVER M8 X 150mm
8	4	407082000	LEVER M10 X 200mm

CONTROL VALVE ASSY - 7 FUNCTION
P/N: 407079000

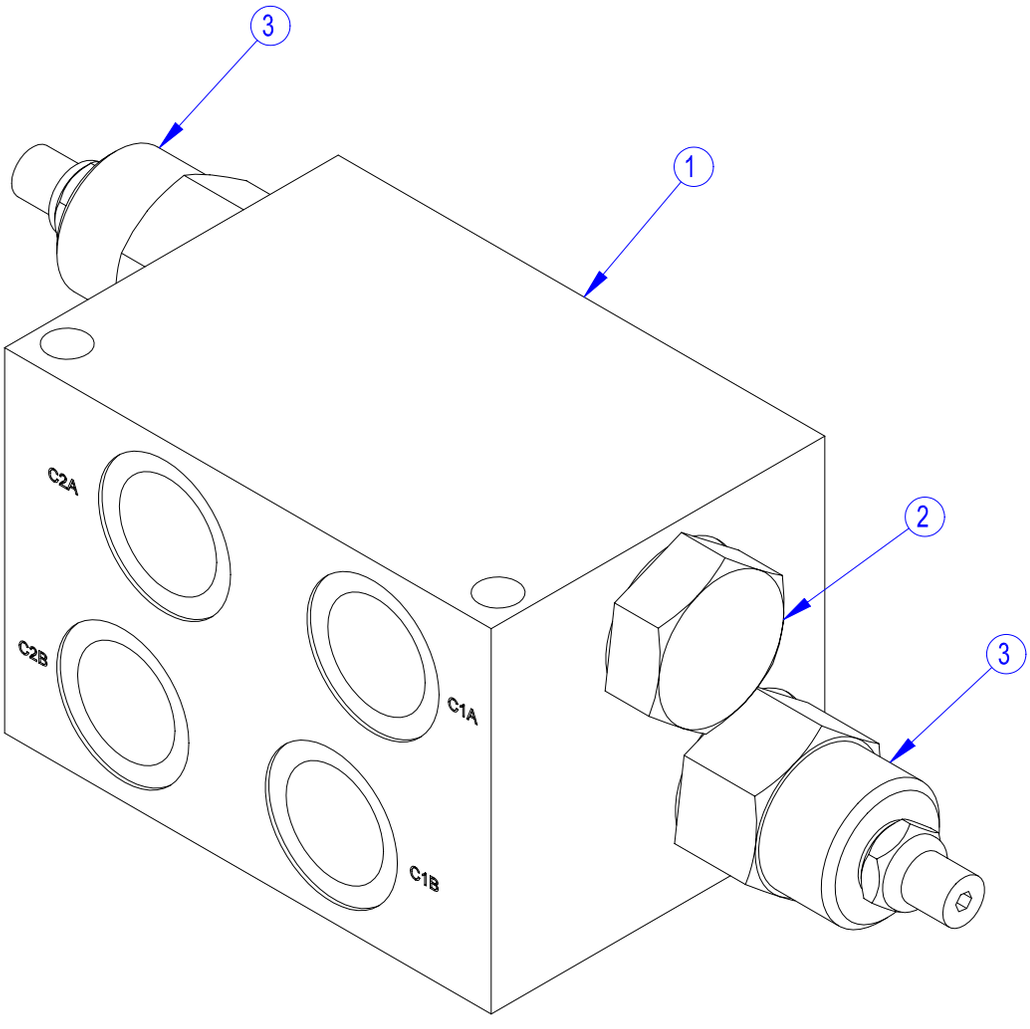


VALVE SUPPLIED WITH FITTINGS (NOT SHOWN)

ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	407056000	VALVE CONTROL MANUAL 7 SECTION
2	6	407057000	LEVER BOX REMOTE CABLE OPERATOR
3	6	407060000	CONNECTOR KIT REMOTE OPERATOR
4	6	407059000	CONNECTOR KIT DIRECTIONAL VALVE
5	6	407058000	CABLE REMOTE 59" LG
6	6	407080000	LEVER M8 X 200mm
7	1	407081000	LEVER M8 X 150mm
8	6	407082000	LEVER M10 X 200mm

NOTES

DUAL SEQUENCING VALVE
P/N: 369701000



ITEM	QTY	PART NO	DESCRIPTION
1	1	369701	DUAL SEQUENCING VALVE BLOCK
2	2	369701002	CHECK VALVE
3	2	369701001	SEQUENCING CARTRIDGE

DUAL SEQUENCING VALVE ADJUSTMENT P/N: 369701000

The (2) Extension Cylinders should be phased so that the first boom section goes out first followed by the second boom section and vise a verse on retraction. If the cylinders do not sequence properly, the following procedure may be used to correct the sequencing.

1. Loosen both cartridge jam nuts (CCW) and back off (CCW) one turn the cartridge pressure adjustment screws. See Figure 01?

2. Collapse both Extension Cylinders.

3. Start extending the Extension Cylinders and slowing turn-in (CW) the Extend Cartridge Pressure Adjustment Screw until the 2nd Extension Cylinder stops moving. See Figure 01?

4. Collapse both Extension Cylinders and extend fully. If Extension Cylinders do not correctly sequence, repeat step 3.

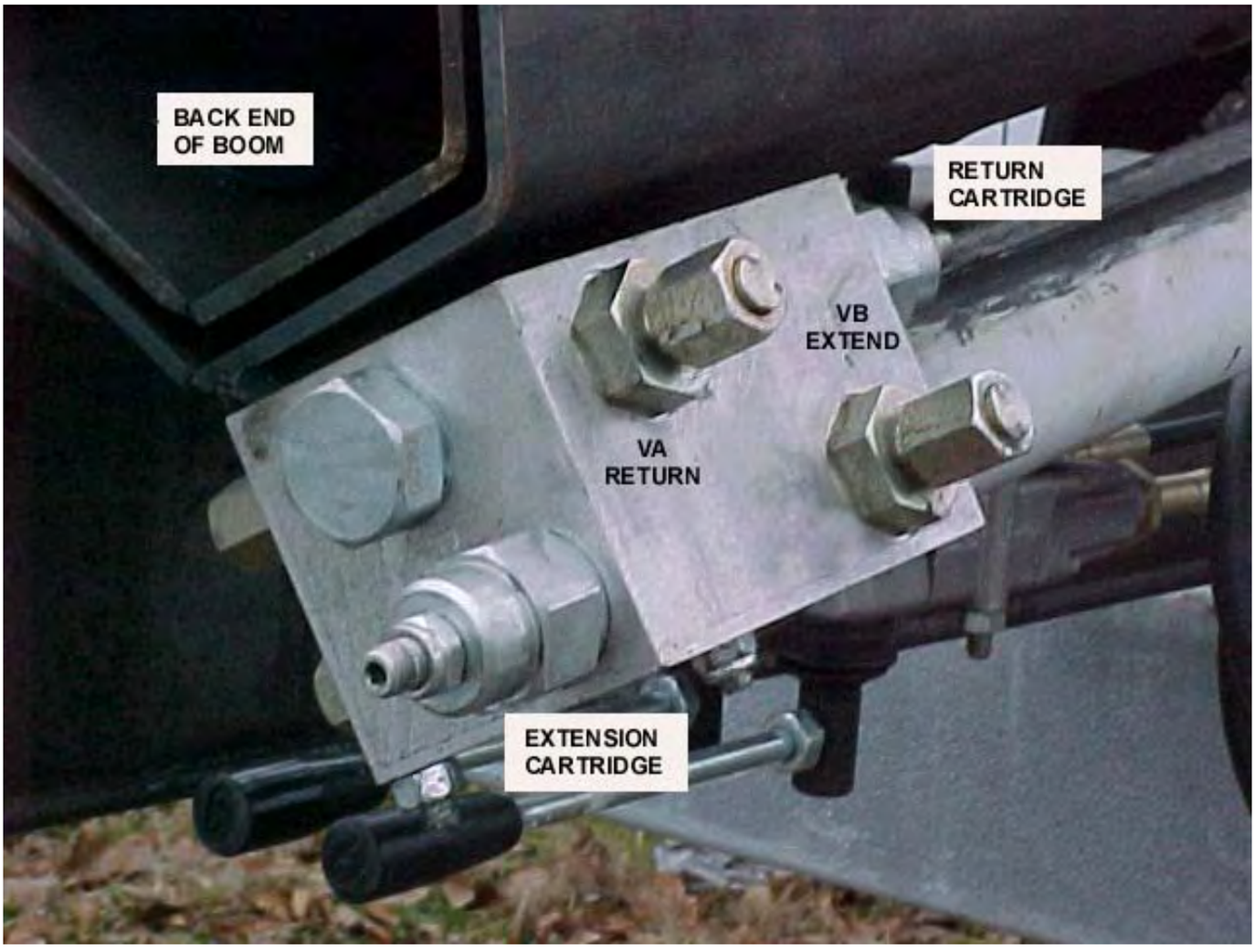
5. With both Extension Cylinders fully extended, start retracting the Extension Cylinders and slowing turn-in (CW) the Retract Cartridge Pressure Adjustment Screw until the 1st Extension Cylinder stops moving. See Figure 01?

6. Extend both Extension Cylinders and retract fully. If Extension Cylinders do not correctly sequence, repeat step 5.

7. Turn-in each Pressure Adjustment Screw 1/8 turn and operate Extension Cylinders fully each direction to be sure they sequence correctly.

8. Tighten both cartridge jams nuts (CW).

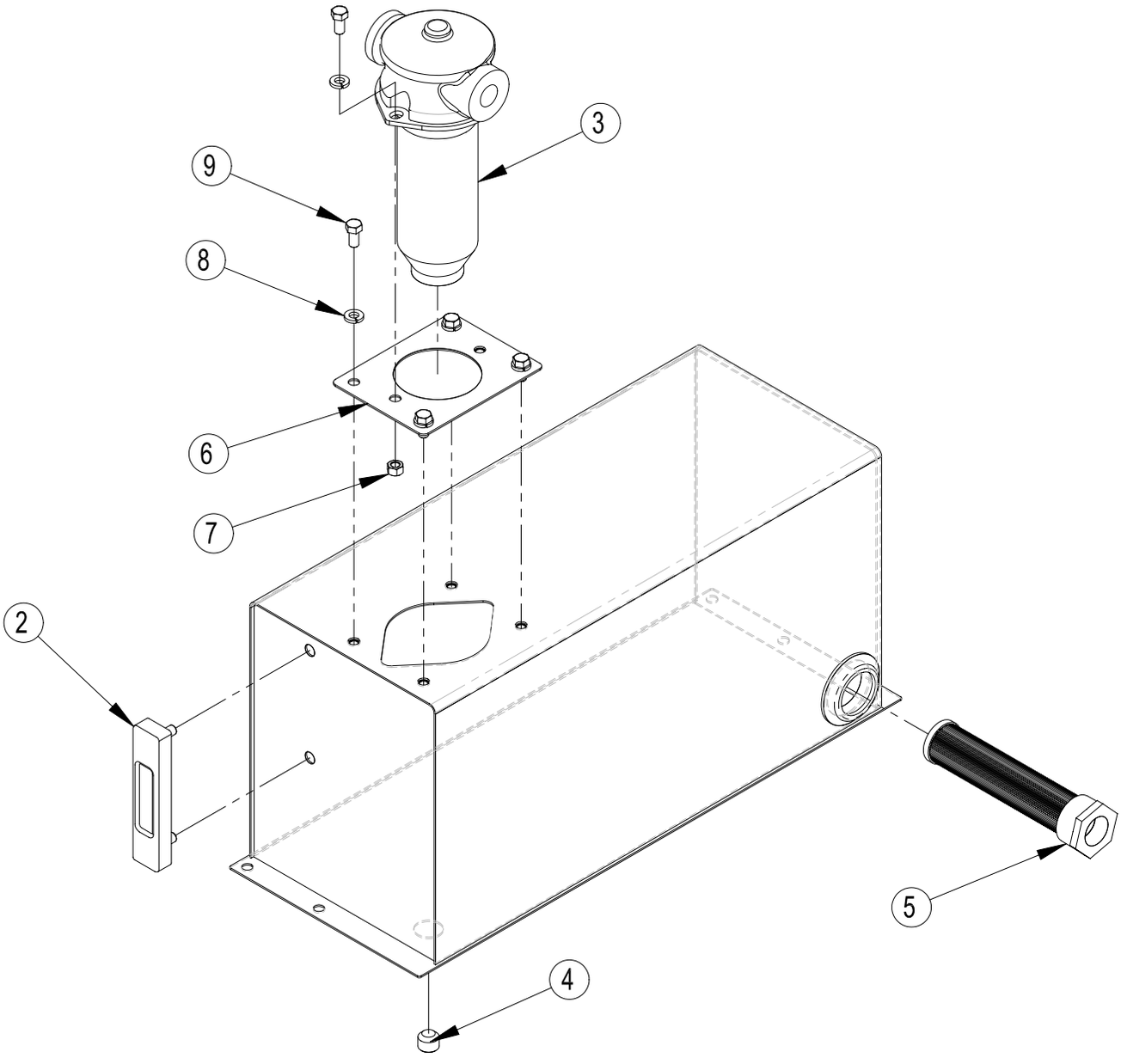
DUAL SEQUENCING VALVE ADJUSTMENT
P/N: 369701000



VIEW SHOWS BOOM SECTIONS IN THE STOWED POSITION.

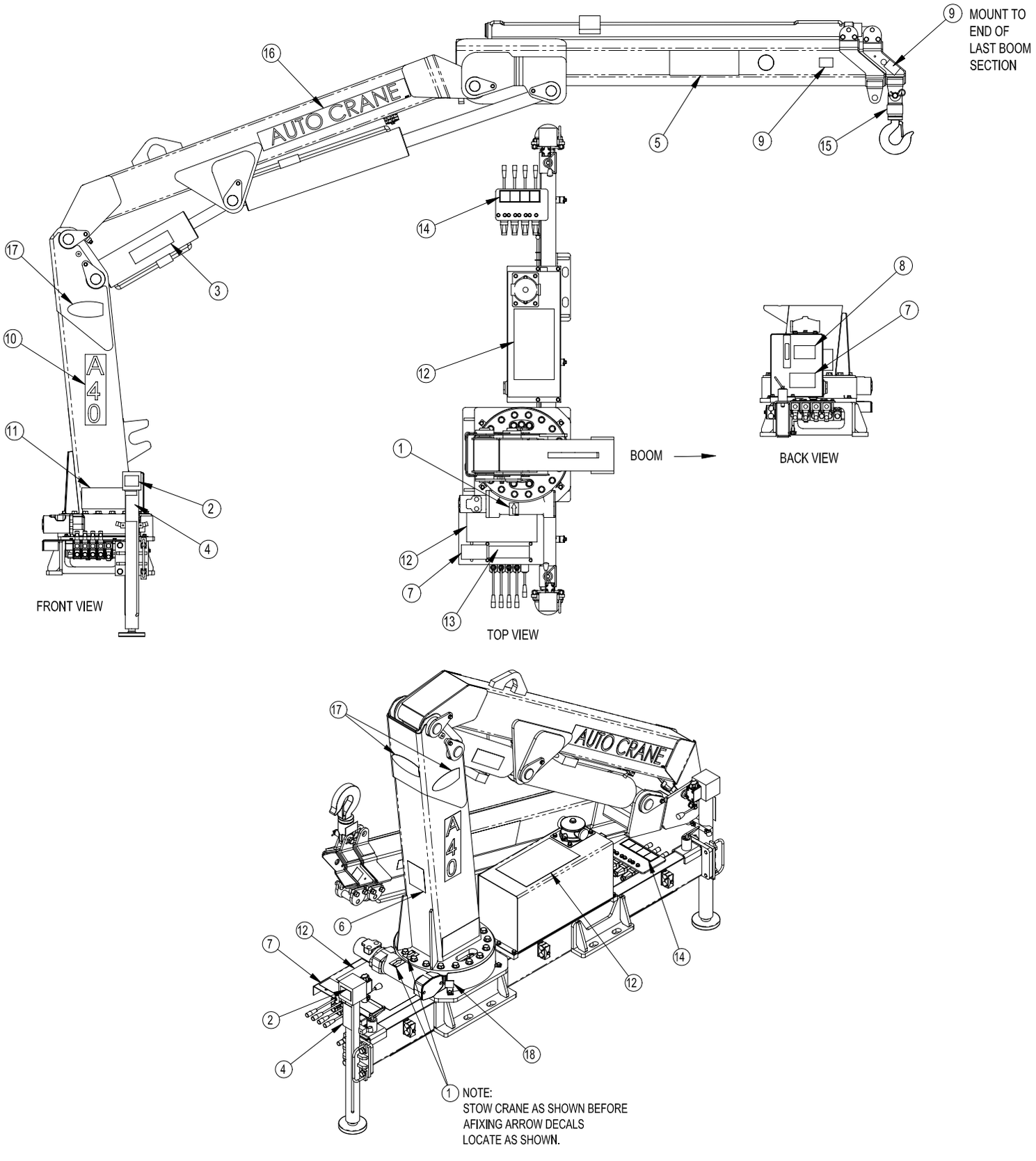
NOTES

A40 HYDRAULIC TANK ASSEMBLY
P/N: 407065000



ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	407070000	HYD TANK WDMT 12 GAL
2	1	407067000	FLUID LEVEL W/TEMP INDICATOR
3	1	407066000	IN-TANK FILTER W/FILLER BREATHER
4	1	750477000	PLUG PIPE -8 NPTF
5	1	360282000	STRAINER SUCTION
6	1	407076000	PLATE FILTER MOUNT
7	2	017300000	NUT HX 3/8 NC
8	6	021100000	WASHER SPLK 3/8
9	6	008400000	SCW HEX HD 3/8-16 UNC X 3/4 GR 5

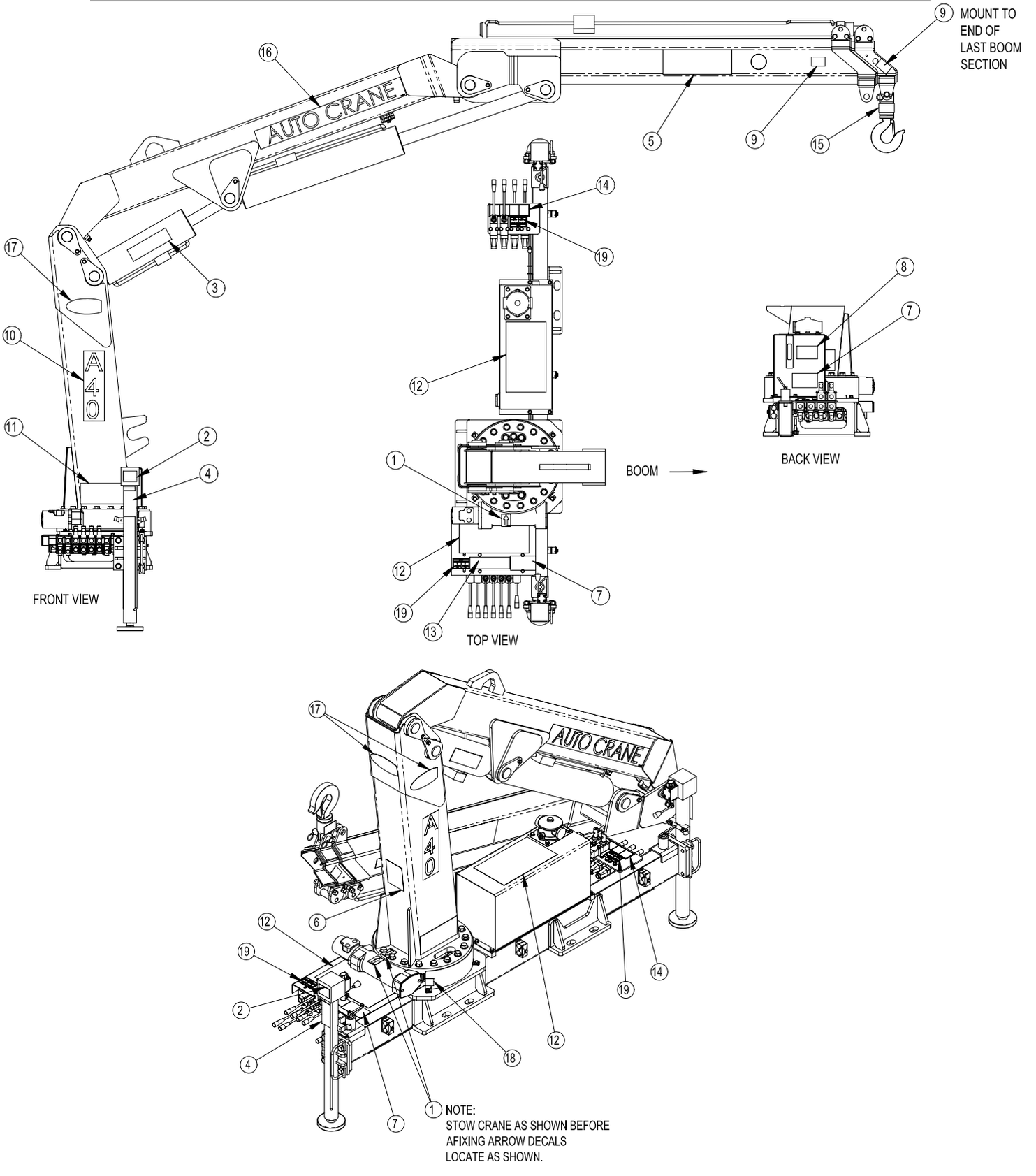
A40 DECAL ASSEMBLY – 5 FUNCTION
P/N: 407020000



A40 DECAL ASSEMBLY – 5 FUNCTION
P/N: 407020000

ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	2	367242	DECAL ARROW BLACK 2 INCH
2	2	759017	DECAL DANGER MOVING OUTRIGGER
3	2	040519	DECAL DANGER SCISSOR POINT
4	2	040581	DECAL DANGER SERIOUS CRUSHING INJURY
5	2	367241	DECAL DANGER "ELECTROCUTION HAZARD"
6	1	367250	DECAL DANGER "STOWING & UNFOLDING"
7	2	725961	DECAL DANGER "OUTRIGGERS"
8	1	367244	DECAL DANGER "HYDRAULIC FLUID LEVEL"
9	4	367251	DECAL DANGER "STAY CLEAR OF BOOM"
10	2	407021000	DECAL A40 LOGO
11	2	407022000	DECAL LOAD CHART A40
12	2	407023000	DECAL DANGER ONE PIECE
13	1	407024000	DECAL CONTROL VALVE
14	1	407026000	DECAL CONTROL VALVE REMOTE OPER
15	1	040630	DECAL DANGER "STAY CLEAR OF LOAD"
16	2	366389	DECAL AUTO CRANE
17	3	360034	DECAL AUTO CRANE LOGO
18	1	367243	DECAL "GREASE"

A40 DECAL ASSEMBLY – 7 FUNCTION
P/N: 407025000



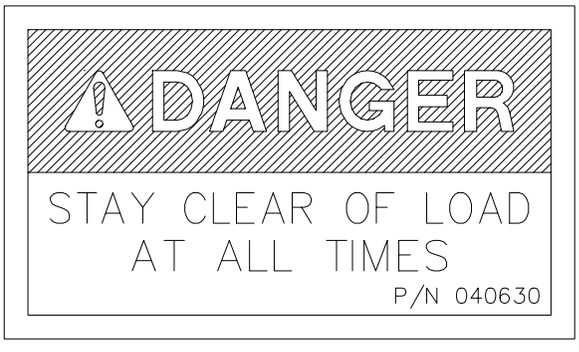
A40 DECAL ASSEMBLY – 7 FUNCTION
P/N: 407025000

ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	2	367242	DECAL ARROW BLACK 2 INCH
2	2	759017	DECAL DANGER MOVING OUTRIGGER
3	2	040519	DECAL DANGER SCISSOR POINT
4	2	040581	DECAL DANGER SERIOUS CRUSHING INJURY
5	2	367241	DECAL DANGER "ELECTROCUTION HAZARD"
6	1	367250	DECAL DANGER "STOWING & UNFOLDING"
7	2	725961	DECAL DANGER "OUTRIGGERS"
8	1	367244	DECAL DANGER "HYDRAULIC FLUID LEVEL"
9	4	367251	DECAL DANGER "STAY CLEAR OF BOOM"
10	2	407021000	DECAL A40 LOGO
11	2	407022000	DECAL LOAD CHART A40
12	2	407023000	DECAL DANGER ONE PIECE
13	1	407024000	DECAL CONTROL VALVE
14	1	407026000	DECAL CONTROL VALVE REMOTE OPER
15	1	040630	DECAL DANGER "STAY CLEAR OF LOAD"
16	2	366389	DECAL AUTO CRANE
17	3	360034	DECAL AUTO CRANE LOGO
18	1	367243	DECAL "GREASE"
19	2	407027000	DECAL AUX FUNCTION

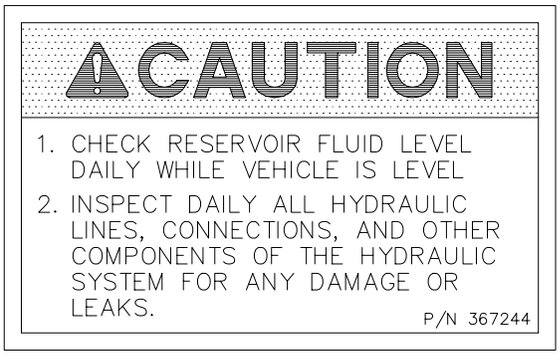
SAFETY DECAL SECTION
A40 SERIES

PART NO.: 040581000
DECAL: STAND CLEAR
FUNCTION: To inform the operator of danger associaced with outriggers.
QUANTITY: 2
PLACEMENT: On outrigger cylinder

PART NO.: 040630000
DECAL: STAY CLEAR OF LOAD
FUNCTION: To inform the operator of hazard of proximity of contact with the crane load during operation.
QUANTITY: 1
PLACEMENT: On lifting hook

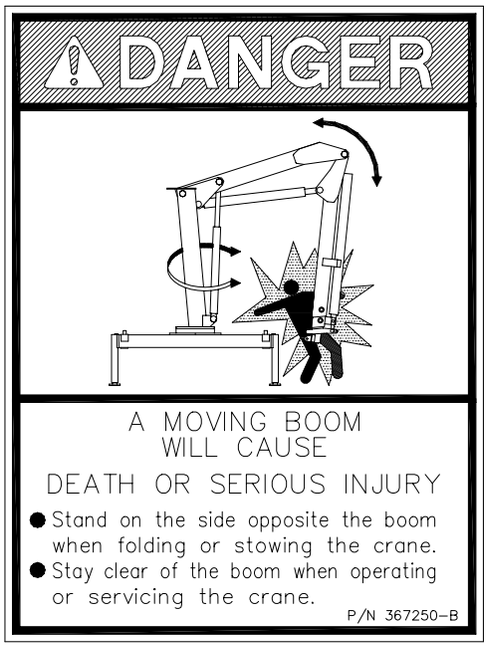


PART NO.: 367244000
DECAL: HYDRAULIC FLUID
FUNCTION: To inform the operator to check fluid level and check for leaks/damage.
QUANTITY: 1
PLACEMENT: Hydraulic reservoir

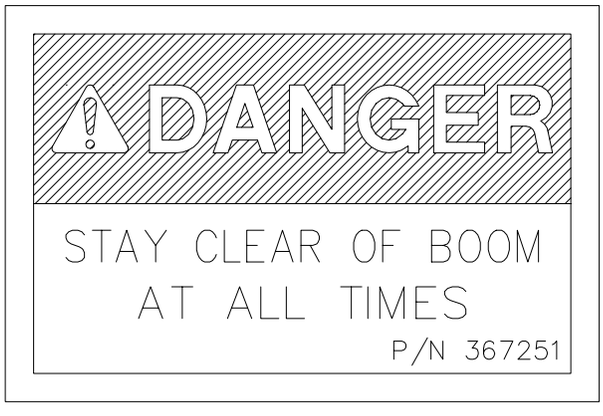


SAFETY DECAL SECTION
A40 SERIES

PART NO.: 367250000
DECAL: STOWING & UNFOLDING
FUNCTION: To inform the operator of the danger a moving boom will cause.
QUANTITY: 1
PLACEMENT: Back of pedestal

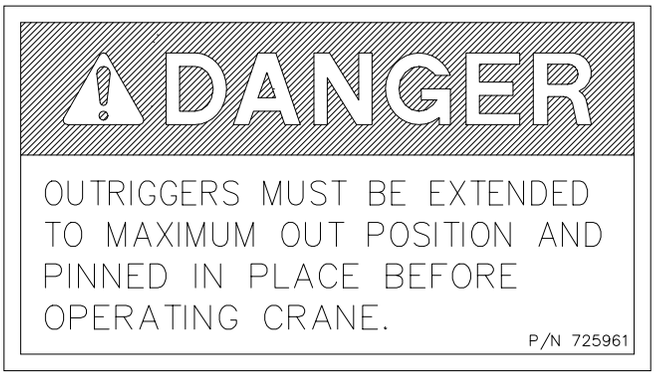


PART NO.: 367251000
DECAL: STAY CLEAR OF BOOM
FUNCTION: To inform the operator of hazard of proximity or contact with the crane boom operation.
QUANTITY: 4
PLACEMENT: End of booms

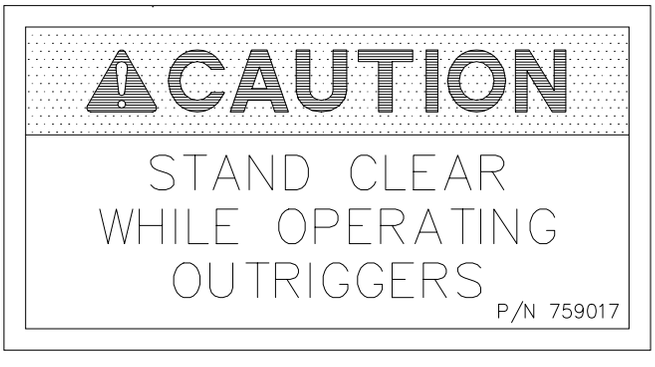


SAFETY DECAL SECTION
A40 SERIES

PART NO.: 725961000
DECAL: OUTRIGGERS
FUNCTION: To inform the operator that the outriggers must be extended and pinned in place before operating the crane.
QUANTITY: 2
PLACEMENT: Both sides of crane base

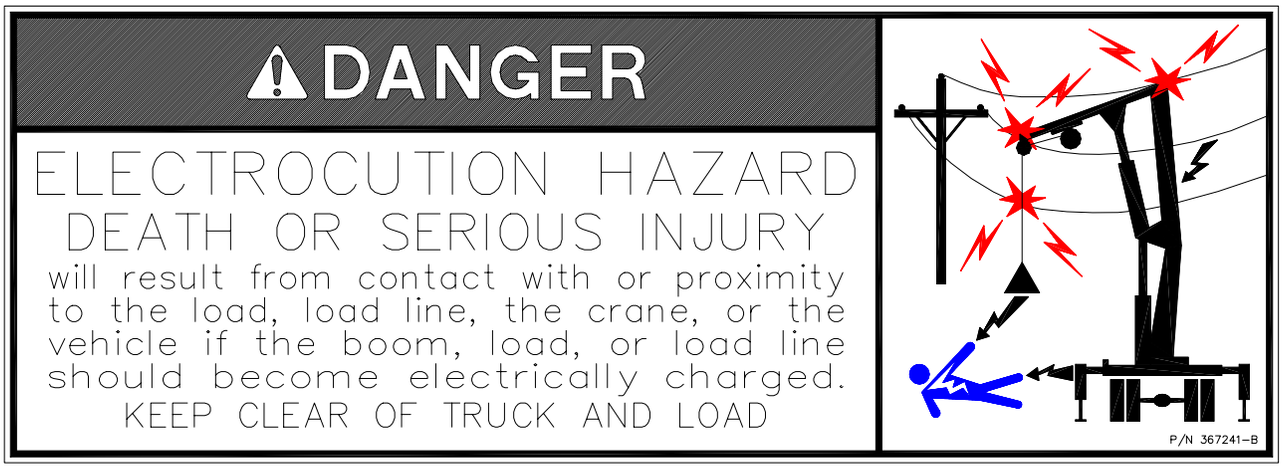


PART NO.: 759017000
DECAL: MOVING OUTRIGGER
FUNCTION: To inform the operator of the hazard involved while operating outriggers.
QUANTITY: 2
PLACEMENT: On outrigger cylinder

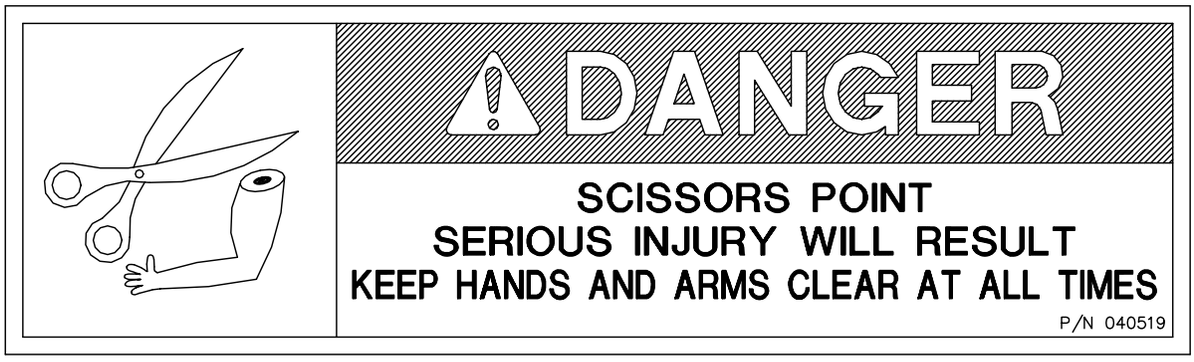


SAFETY DECAL SECTION
A40 SERIES

PART NO.: 367241000
DECAL: ELECTROCUTION HAZARD
QUANTITY: 2
FUNCTION: To inform the operator of the hazard involved with contacting electrical power lines with crane boom.
PLACEMENT: Both sides of boom

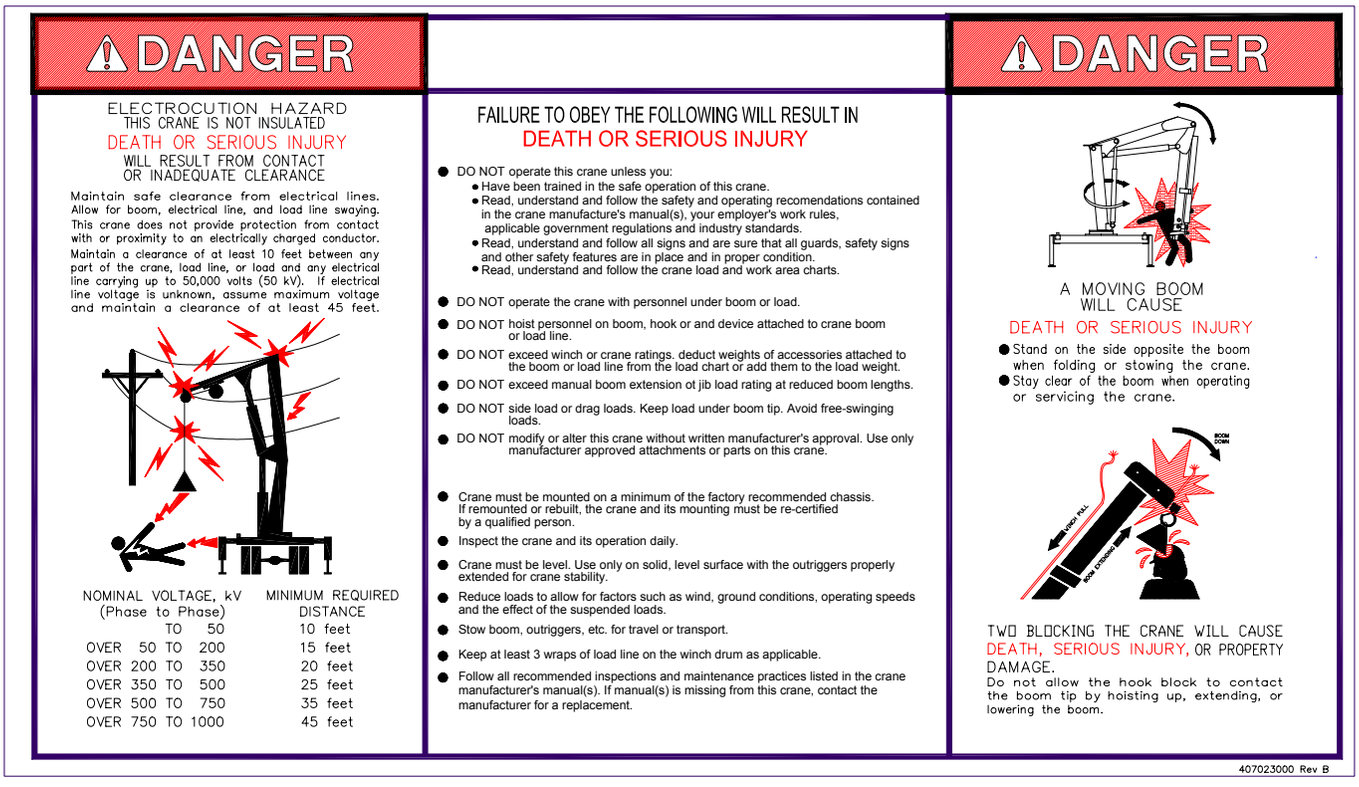


PART NO.: 040519000
DECAL: SCISSORS POINT
QUANTITY: 2
FUNCTION: To inform the operator of possible danger at scissors point on crane.
PLACEMENT: Both sides of the lift cylinder



SAFETY DECAL SECTION
A40 SERIES

PART NO.: 407023000
DECAL: DANGER ONE PIECE
QUANTITY: 1
FUNCTION: To inform the operator of the dangers and hazards involved in the operation of crane.
PLACEMENT: On crane base

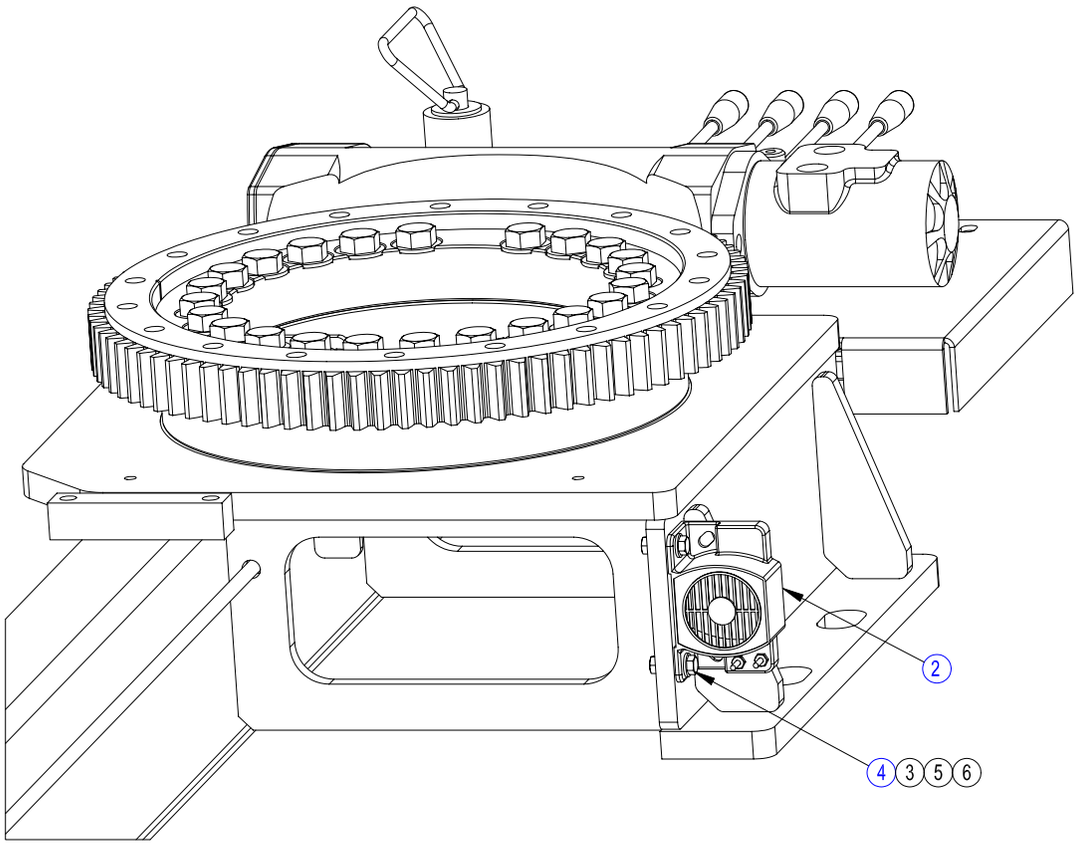


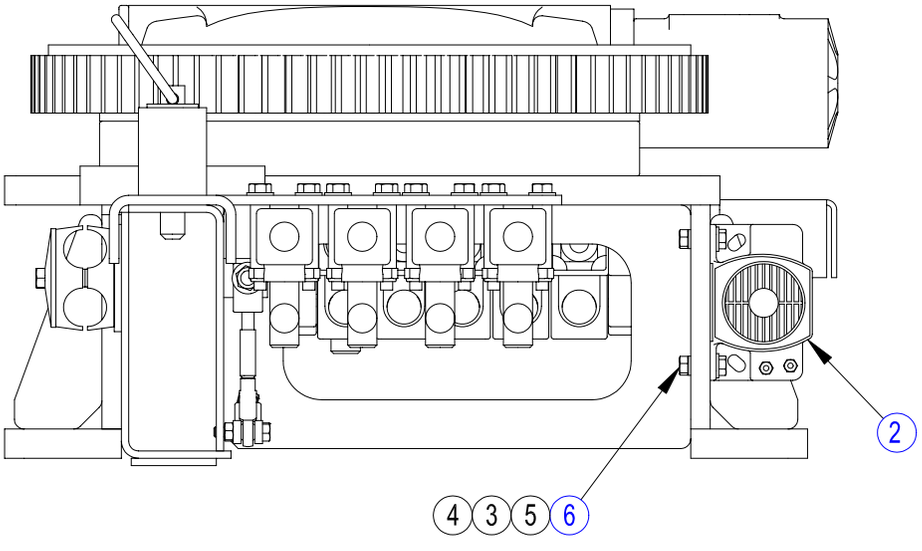
A40 TROUBLESHOOTING

CAUTION: Never check for hydraulic leaks by feeling around hoses, fittings, or any other components. High pressure oil can be injected through the skin causing severe injury, or death.

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
Crane won't move	Load too heavy	Check load chart.
	PTO not engaged	Engage PTO.
	Low fluid level	Check and fill as required.
	Suction line blocked	Remove hose and clear blockage.
	Pressure line blocked	Remove hose and clear blockage.
	Bad pump	Check flow and pressure to crane. Note: A bad pump will have some flow but the flow will drop off as pressure increases.
	Main relief valve setting too low or not working properly	Check and adjust.
Poor crane performance	Pump speed	Check PTO ratio, pump size, and engine speed for proper oil flow. Check oil flow with flow meter installed in pressure line.
	Low fluid level	Check and fill.
	Main relief valve setting	Check and adjust.
	Worn pump, motor, or cylinder	Replace bad part.
	Blocked filters	Check suction and return filters.
	Hydraulic oil temperature too cold	Circulate oil to warm.
	Pressure or suction lines blocked	Check lines, clean and repair.
	Load too heavy	Check load chart.
Noise	Pump area	Circulate oil to warm, check suction line, fill reservoir.
	Cylinders	Check for damage to cylinders.
	Rotation	Check rotation bearing, lubricate bearing.
Cylinder drift	Overload	Remove overload
	Holding valve relief set too low	Replace as required.
	Damaged cylinder	Repair.
	Dirt in holding or check valve	Cycle under no load to reset, clean and/or replace.
	Air in hydraulic system or entrapped in cylinder	Cycle cylinder to remove air.
Rotation Worm Drive Gear to Hot	Not enough lubricant	Lubricate as required
Rotation Worm Drive Gear to Noisy	Not enough lubricant	Lubricate as required

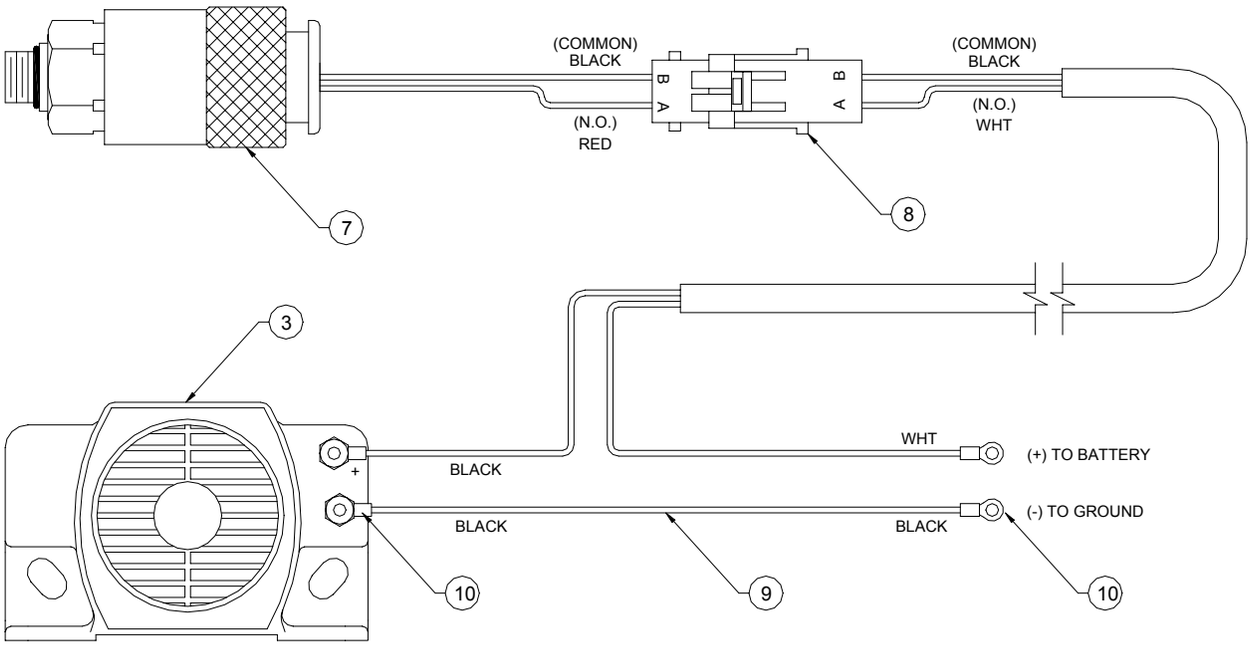
OVERLOAD WARNING HORN KIT OPTION
P/N: 407012000





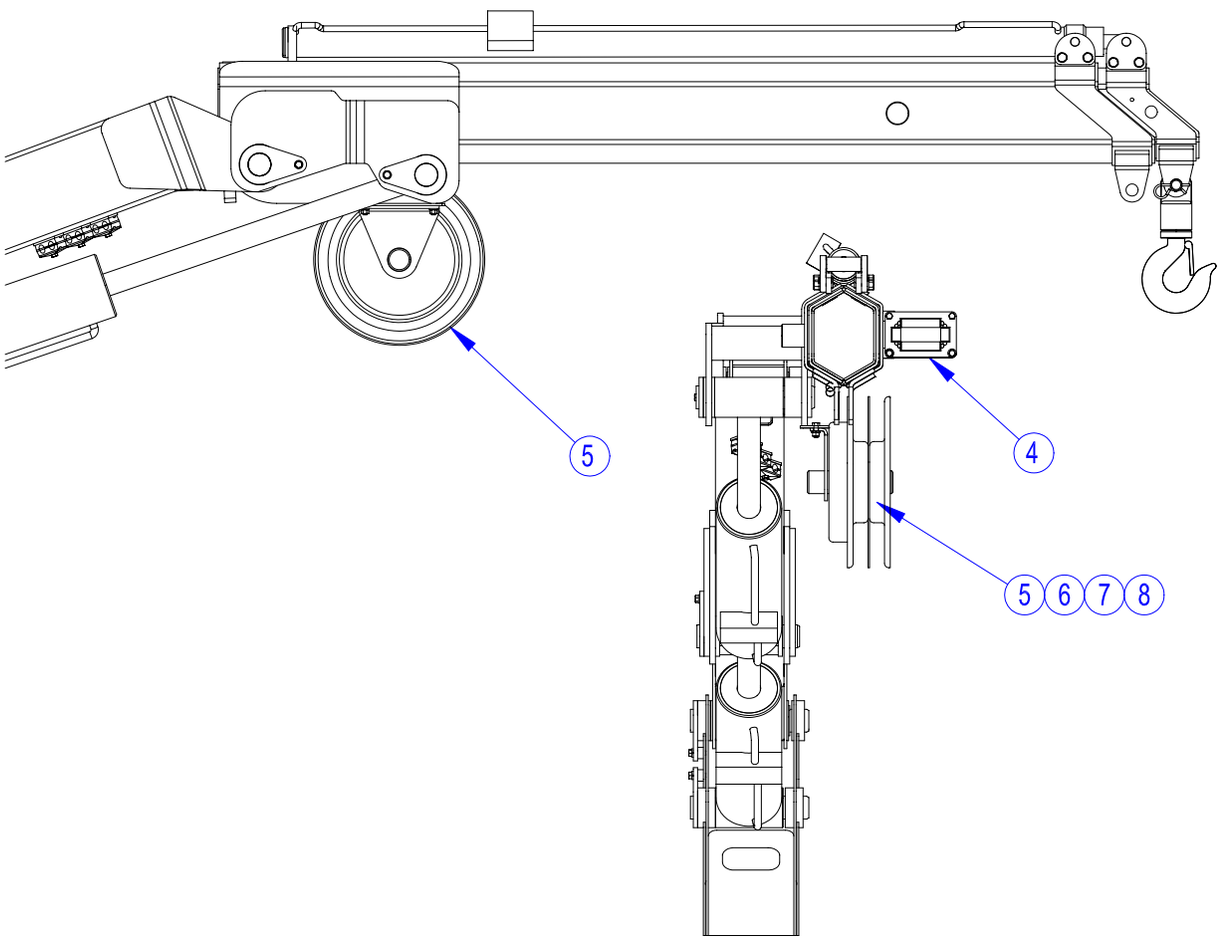
CURB SIDE VIEW

OVERLOAD WARNING HORN KIT OPTION
P/N: 407012000



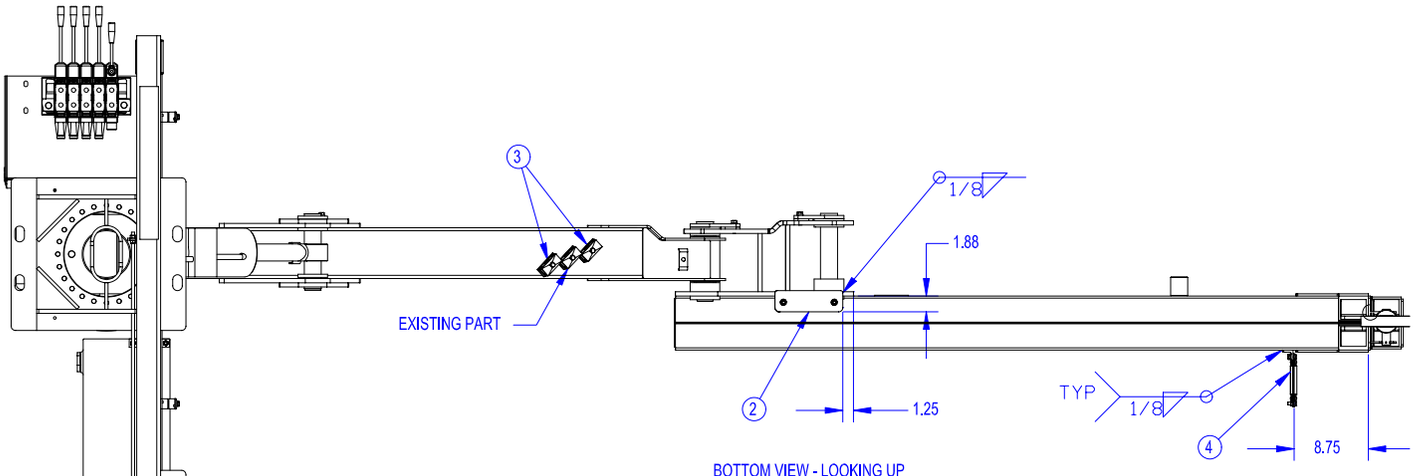
ITEM NO.	QTY.	PART NO.	DESCRIPTION
2	1	750733	BACKUP SAFETY ALARM
3	2	020400	WASHER FL SAE 1/4
4	2	005604	SCW HX 1/4 NC X 1
5	2	020200	WASHER SPLIT LOCK 1/4
6	2	015900	NUT 1/4 NC
7	1	407298000	LOAD SENSOR SWITCH ADJUSTABLE
8	1	407299000	WIRE ASSY LOAD SENSOR
9	1	800657000	WIRE 1C BLACK
10	2	000300000	TERMINAL RING RB 14-10

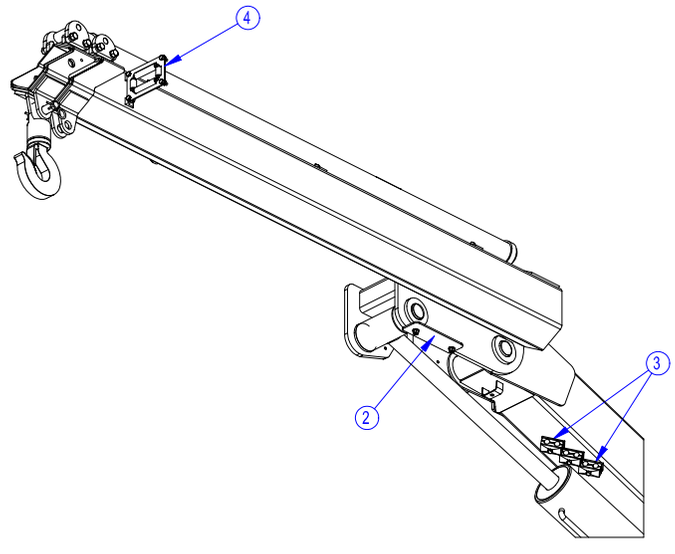
HOSE REEL KIT
P/N: 407011000

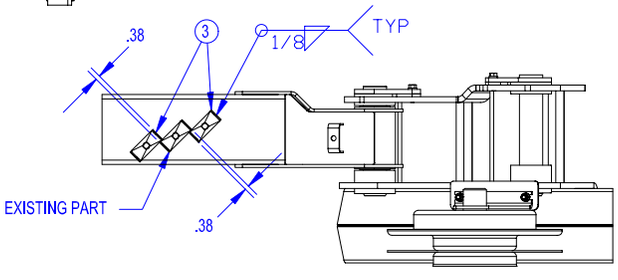


HOSES NOT SHOWN

HOSE REEL KIT
P/N: 407011000







ITEM NO.	QTY.	PART NO.	DESCRIPTION
2	1	407305000	HOSE REEL MTG BRKT
3	2	350048000	HOSE CLAMP ASSY
4	1	368202	HOSE REEL GUIDE ASSY
5	1	368992	HOSE REEL
6	2	008701	SCW HX 3/8 UNC X 7/8 GR5
7	2	021100	WASHER SPLK 3/8
8	2	330372	NUT HEX 3/8-16 UNC
9	2	812035231	HOSE ASSY -5 JIC(F)/-6 JIC(F) X 231 LG
10	4	812036185	HOSE ASSY -5 JIC(F) 90 ELL/-6 JIC(F) X 185

NOTES

P.O. Box 580697 * Tulsa, OK 74158-0697
4707 N. Mingo Rd. * Phone (918) 836-0463

LIMITED WARRANTY
2 YEAR PARTS AND LABOR

Auto Crane will warranty to the consumer for a period of (2) years parts and labor from the date of purchase. Each new Auto Crane unit they sell will be free under normal use and service from defects in material and workmanship. Date of purchase will be honored as the date indicated on the Bill of Sale, which must accompany the Warranty Registration and be on file with Auto Crane. Absent a valid Warranty Registration and appropriate documentation, the original date of manufacture, as indicated by the serial number on the product, will be used to determine the effective date of the 2 year warranty.

The obligation of Auto Crane under this warranty is limited to the replacement or repair of parts that appear to the manufacturer after review and/or inspection to be defective and paid flat rate labor for replacing defective parts. This warranty does not obligate Auto Crane to bear the travel time charges in connection with the replacement or repair of defective parts. Responsibility for customer's claims arising from misapplication, abuse, misuse or alteration of equipment or parts lies with the distributor or user and no warranty obligation is assumed in these circumstances by Auto Crane.

Auto Crane will in no event be liable for any consequential damages or contingent liabilities arising out of the failure of any Auto Crane Product or parts to operate properly.

Auto Crane makes no warranty in respect to component accessories, it being subject to the warranties of their respective manufacturers.

If field service, at the request of the distributor, is rendered and fault is found not to be with Auto Crane's product, the distributor shall pay the time and expense of the field representative.

Claims for service labor or other expenses that have incurred by the buyer without approval or authorization or Auto Crane will not be accepted.

When applying for warranty, claims may be handled by contacting your nearest authorized Auto Crane Distributor. All claims are to be filed in writing on an Auto Crane Warranty Claim Form.

AUTO CRANE COMPANY IS UNDER NO OLIGATION TO EXTEND THIS WARRANTY TO ANY CUSTOMER FOR WHICH AN AUTO CRANE DELIVERY REPORT FORM HAS NOT BEEN COMPLETED AND ON FILE WITH AUTO CRANE COMPANY