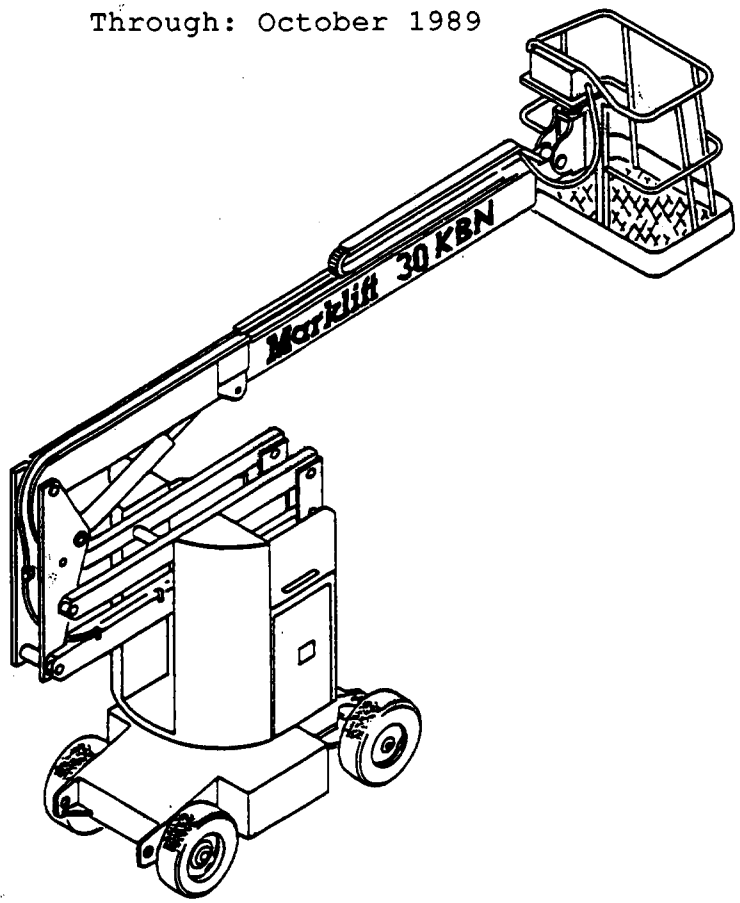
The Marklifts.®

A Product of Mark Industries

SELF-PROPELLED KNUCKLEBOOM OPERATION MAINTENANCE AND PARTS MANUAL

Through: October 1989



Model: 30KBN

FIRST EDITION: May 1988

FINAL EDITION: May 1990

Mark Industries

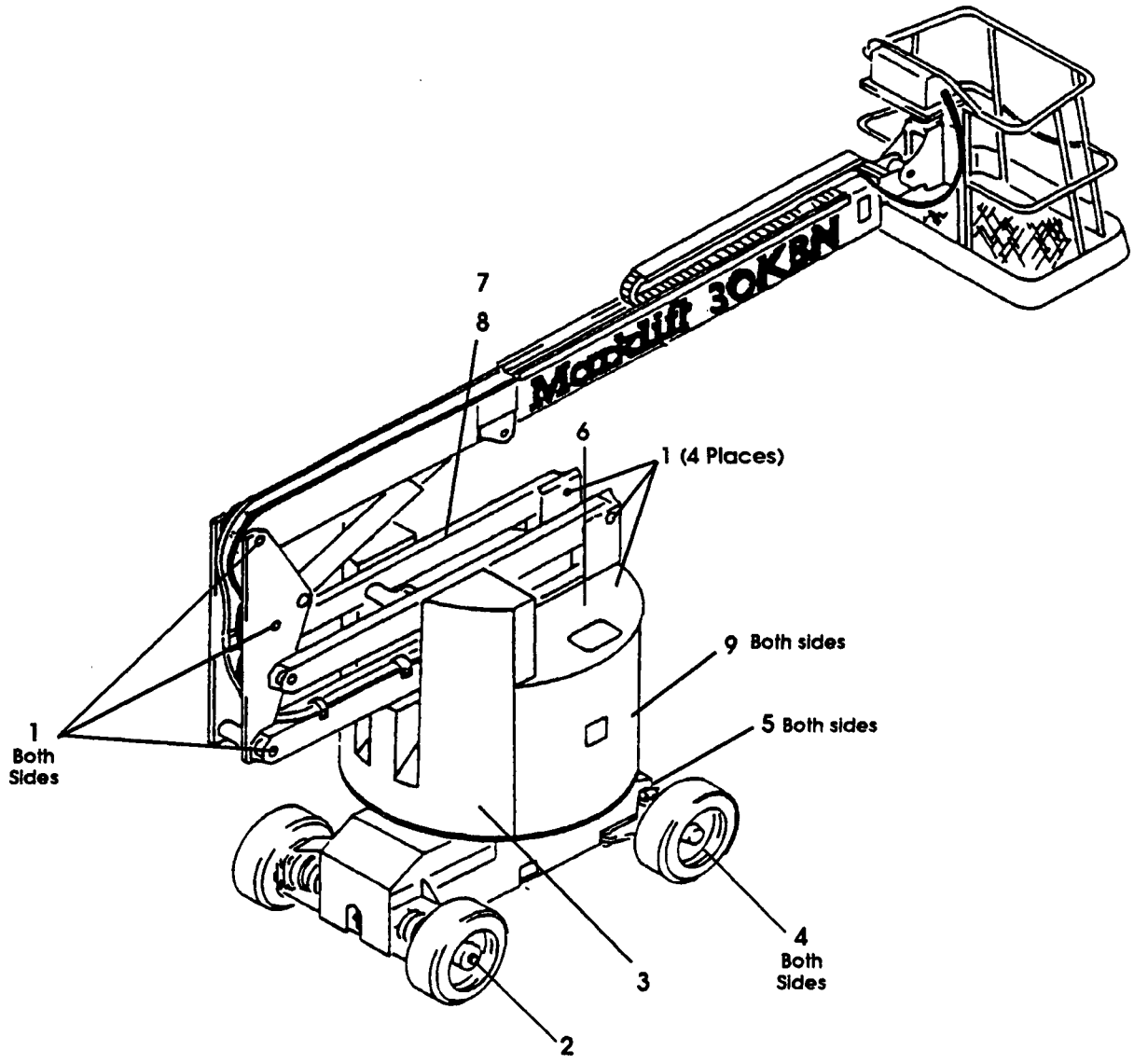
106 12th Street S.E.
Waverly, Iowa 50677-9466
TEL. (319) 352-3920, FAX (319) 352-5727

17301

Drive the **MARKLIFT** approximately 15 feet with the controller handle in maximum (full on) position. Release the controller when the wheel passes next to a marker (visual indicator) on the ground. An acceptable slowing and braking distance should be within 3 feet when measured from the marker to the center of the same wheel after the unit has completely stopped. Adjust the brake control valve on the parking brakes to achieve this distance.

Warning: Do Not drive on uneven, sloping, or soft terrain that sets the unit in an out-of-level condition.

DECAL P/N	DECAL DESCRIPTION 30KBN	ASSEMBLY	QTY
67399	Decal Set	All Standard Decals	1
182703	Platform Leveling Switch	Final Assembly	1
140374	Upper Control	Upper control panel	1
140595	Tie Down Diagram	Final Assembly	2
181901	Marklift 30KBN	Final Assembly	2
20462	Forward Arrow Aft	Final Assembly	1
20896	Brake	Final Assembly	1
182101	Danger & Aerial Operation Instructions	Final Assembly	1
22385	Caution Attach Your Safety Belt	Final Assembly	2
181103	Danger Obey the Following	Final Assembly	4
181102	Danger, Do Not Operate Unless...	Final Assembly	2
2022	Load Capacity 500 lbs.	Final Assembly	1
140496	Hand Pump	Final Assembly	1
140495	Emergency	Final Assembly	1
31259	Marklift	Final Assembly	1
131061	Blue Stripe	Final Assembly	1
130596	'A Product of Mark Industries'	Final Assembly	1
20420	Tire Pressure 75 PSI	Final Assembly	2
20410	Logo Mark Industries	Final Assembly	1
2017	Hydraulic System Fluid	Final Assembly	1
20461	Forward Arrow	Final Assembly	1
22386	"D" Ring Attach Safety Belt	Final Assembly	2
20419	Danger Keep Clear	Final Assembly	2
22449	No Smoking for Electrical Booms	Final Assembly	2
2003	Battery Water Level	Final Assembly	2
130820	'Operation & Safety Handbook'	Final Assembly	1
183301	Warning Lead and Paint for CTW	Final Assembly	2
183302	Warning This Counterweight...	Final Assembly	2
20661	Plate, ANSI A92	Final Assembly	1
20660	Nameplate, Identification	Final Assembly	1
182716	Ground Control	Ground Control panel	1

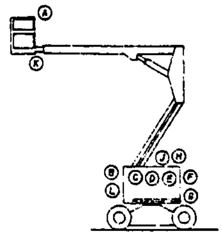

Mastlift 30K&N
7
8
6
1 (4 Places)
9 Both sides
5 Both sides
1
Both
Sides
4
Both
Sides
3
2

![Mark Industries]

TITLE	ELECTRICAL SCHEMATIC
MODEL	30KBN
NOTES	140501 REV C

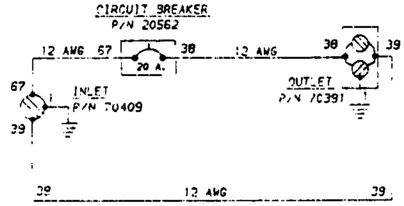
SCHEMATIC PAGE 2

WIRING SCHEDULE.													
NO.	AWG	A	B	C	D	E	F	G	H	J	K	L
[illegible]	[illegible]							●				
[illegible]	1					●						
[illegible]	12	●		●	●		●	●	●	●		●
[illegible]	12	●					●	SPARE				
[illegible]	12						●			●		
[illegible]	12	●					●					
[illegible]	12	●					●					
[illegible]	12	●					●	SPARE				
[illegible]	18	●					●	SPARE				
[illegible]	18	●					●	SPARE				
[illegible]	18	●					●	SPARE				
10	18	●					●					
11	12	●									●	
[illegible]	18	●		●			●					
[illegible]	18	●		●			●					
[illegible]	18	●			●		●					
[illegible]	18	●			●		●					
[illegible]	18	●		●			●					
17	18	●		●			●					
[illegible]	18	●			●		●					
[illegible]	18	●			●		●					
[illegible]	18	●			●		●					
[illegible]	18	●			●		●					
[illegible]	18	●			●		●					
[illegible]	18	●			●		●					
[illegible]	18	●					●					
[illegible]	18	●					●					
[illegible]	18	●					●					
[illegible]	18	●					●					
[illegible]	18	●		●			●					
[illegible]	18	●					●					
[illegible]	18	●					●					
[illegible]	18	●		●			●					
[illegible]	18	●	●				●					
[illegible]	18	●			●		●					
[illegible]	18	●			●		●					
[illegible]	18	●					●	SPARE				
[illegible]	18	●					●	SPARE				
[illegible]	18	●					●	SPARE				
[illegible]	12	●					●					
[illegible]	12	●					●					
[illegible]	12	●					●	SPARE				

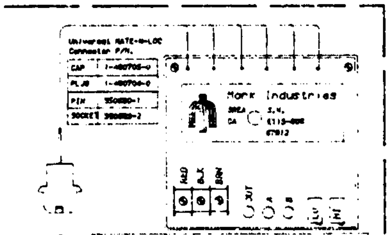


IDENT.	DESCRIPTION	LOCATION
A	UPPER CONTROL BOX.	PLATFORM
B	LIMIT SWITCH # 1.	TURRET
C	DRIVE/STEER VALVE P.	CARRIAGE
D	BOOM FUNCTIONS VALV.	TURRET
E	PUMP/MOTOR.	TURRET
F	GROUND CONTROL PANEL.	TURRET
G	BATTERIES.	TURRET
H	BATTERY CHARGER.	TURRET
J	SLOPE SENSOR.	TURRET
K	FOOT SWITCH.	PLATFORM
L	POWER RELAY.	TURRET
M	BATTERY INDICATOR. OPTION	PLATFORM
N	HORN. OPTION	TURRET
P	BEACON. OPTION	TURRET

WIRING SCHEDULE.													
NO.	AWG	A	B	C	D	E	F	G	H	J	K	L
[illegible]	18						●			●		
[illegible]	18				●		●					
[illegible]	18											
[illegible]	18		●				●					
[illegible]	18						●					
[illegible]	18											
[illegible]	18						●					
[illegible]	12	●									●	
[illegible]	18		●		●		●					
[illegible]	18											
[illegible]	18		●	●			●					
[illegible]	18	●										
[illegible]	12	●										
[illegible]	12						●	●				
[illegible]	18											
[illegible]	12						●					
[illegible]	12						●					
[illegible]	18											
[illegible]	18						●					
[illegible]	18						●					●
[illegible]	18						●					
[illegible]	12								●	●		
[illegible]	1							●				●
[illegible]	[illegible]					●						●



115VDC WIRING.



ROTATE WIRING	DRIVE WIRING	TERM.	COLOR	FUNCTION
1	1	1	BLACK	GROUND
30	31	2	ORG	COM
39	39	3	RED	+ SUPPLY
63	17	4	ORG/RED	A
62	16	5	ORG/BLK	B
[illegible]	28	6	YEL/RED	OUT

DETAIL FOR P/N 70488 ROTATION AND DRIVE CONTROLLERS

LEGEND FOR LIMIT SWITCHES.

NOTES:

1. ALL DIODES ARE P/N 70473 UNLESS OTHERWISE SPECIFIED.
2. WIRING AND SWITCHES SHOWN IN STOWED POSITION.
3. ALL 115 A.C. WIRES ARE 12 AWG. STRANDED.
4. IDENTIFY EACH WIRE BY NUMBER FLAG AT BOTH ENDS WRAPPING COMPLETELY AROUND.
5. ALL WIRES ARE 18 AWG. STRANDED, UNLESS OTHERWISE SPECIFIED.
6. RELABEL WIRE #5 IN ARM CABLE TO WIRE #4 USE THIS WIRE IN PARALLEL WITH #4.

1. Finding the Mark Industries Part Number.

   A. Using the Table of Contents, find the Section and Figure Number. Locate the correct page by referencing these numbers.

   B. Match the required part to the figure illustration. Note the Item Number.

   C. Find the Item Number on the part listing that follows the figure.

   D. Use the Mark Industries Part Number listed next to the Item Number when ordering.

2. Ordering: Listed below are the methods of ordering parts. The **preferred** method of ordering parts is by **FAX**.

   A. By **FAX**: **(714) 879-8884**

   B. By Phone: (714) 879-MARK

   C. By Mail: MARK INDUSTRIES
   ATTENTION: PARTS DEPARTMENT
   P.O. BOX 2255
   BREA, CA. 92622

Mark Industries

TITLE	DECAL SET
MODEL	30KBN
NOTES	UNTIL OCT. 1989

SECT.	2
FIG.	2
PAGE	4

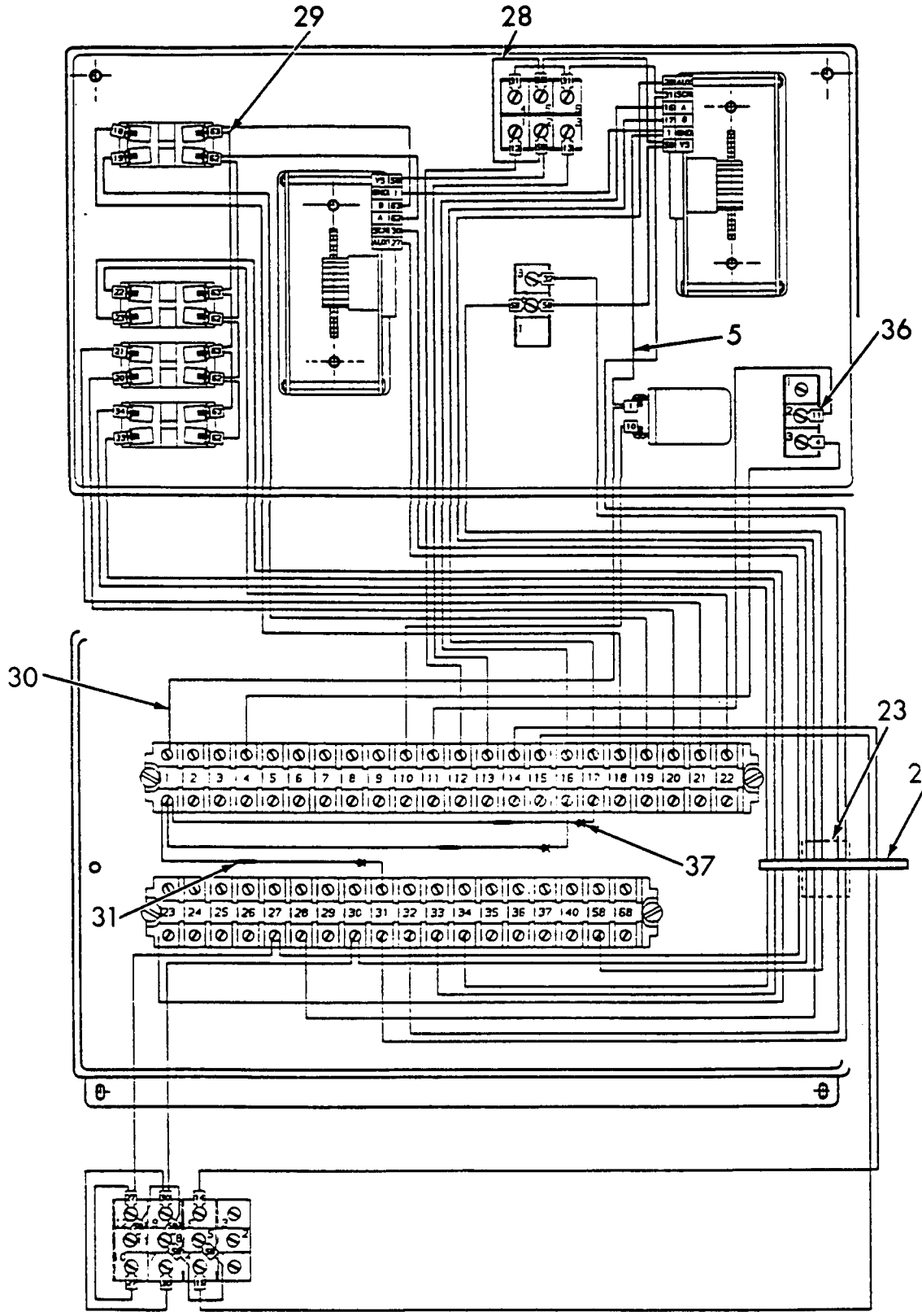
ITEM	PART NUMBER 1234	DESCRIPTION	UNITS PER ASSY
26	.2003	DECAL, BATTERY WATER LEVEL...	2
27	.130820	DECAL, OPERATION & SAFETY HANDBOOK...	1
28	.20661	PLATE, ANSI A92	1
29	.20660	NAMEPLATE, IDENTIFICATION	1
30	.183301	DECAL, WARNING LEAD AND PAINT...	2
31	.183302	DECAL, WARNING THIS COUNTERWEIGHT...	2

DASH (-) INDICATES THE 'ITEM' IS NOT ILLUSTRATED

Mark Industries

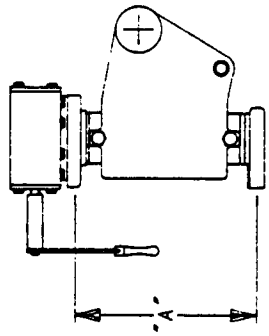
TITLE	AERIAL CONTROL BOX ASSEMBLY
MODEL	30KBN
NOTES	UNTIL MARCH 1988

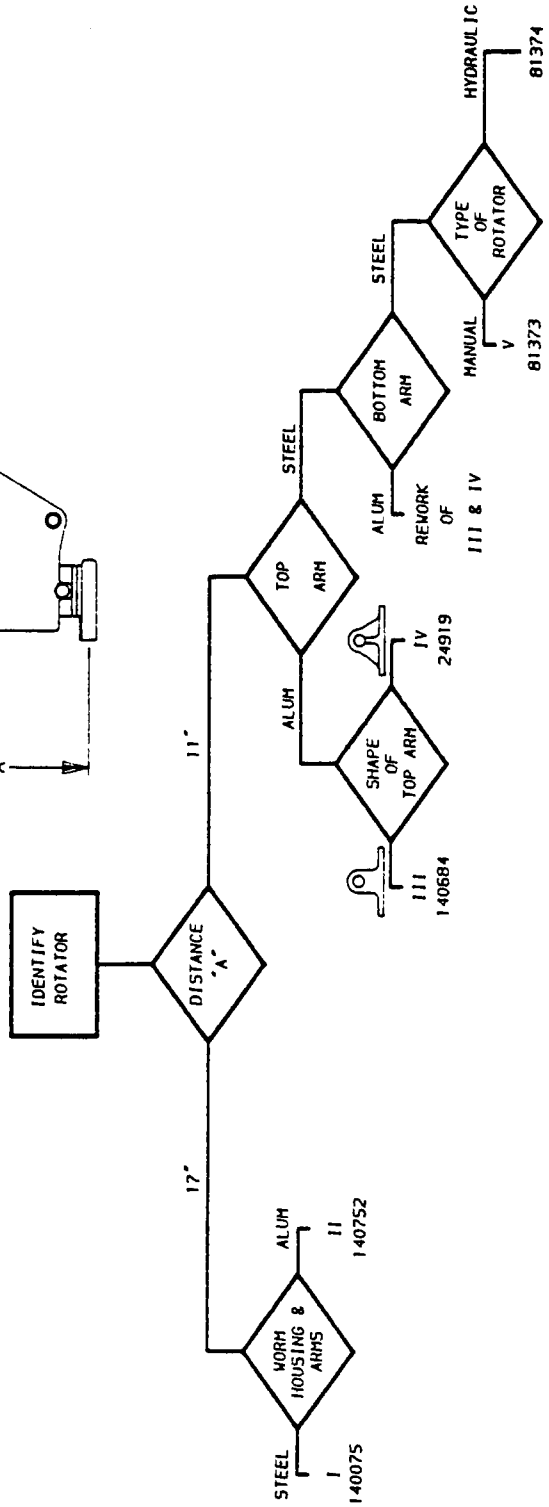
SECTION	2
FIGURE	5
PAGE	3



AERIAL CONTROL BOX
WIRING DIAGRAM

ROTATOR IDENTIFICATION FLOW CHART

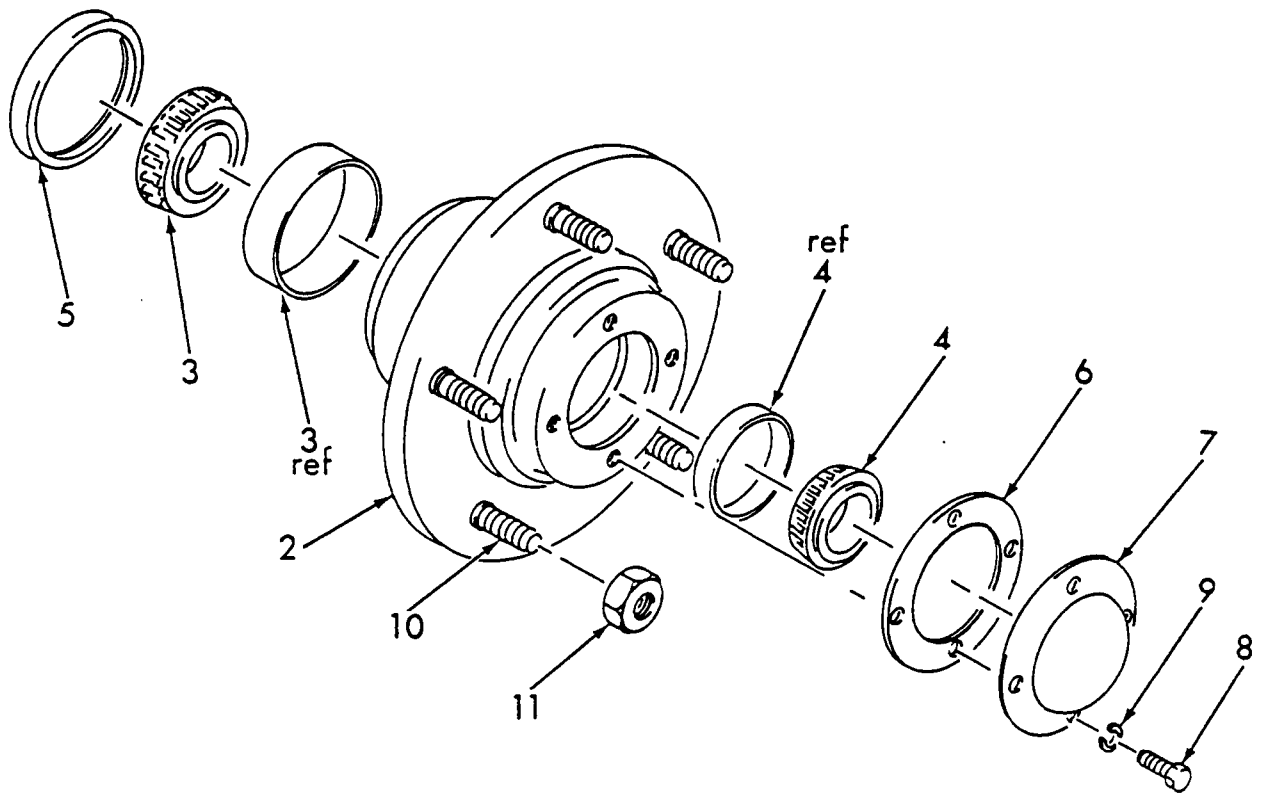




Mark Industries

TITLE	HUB ASSEMBLY
MODEL	30KBN
NOTES	

SECTION	3
FIGURE	3
PAGE	1

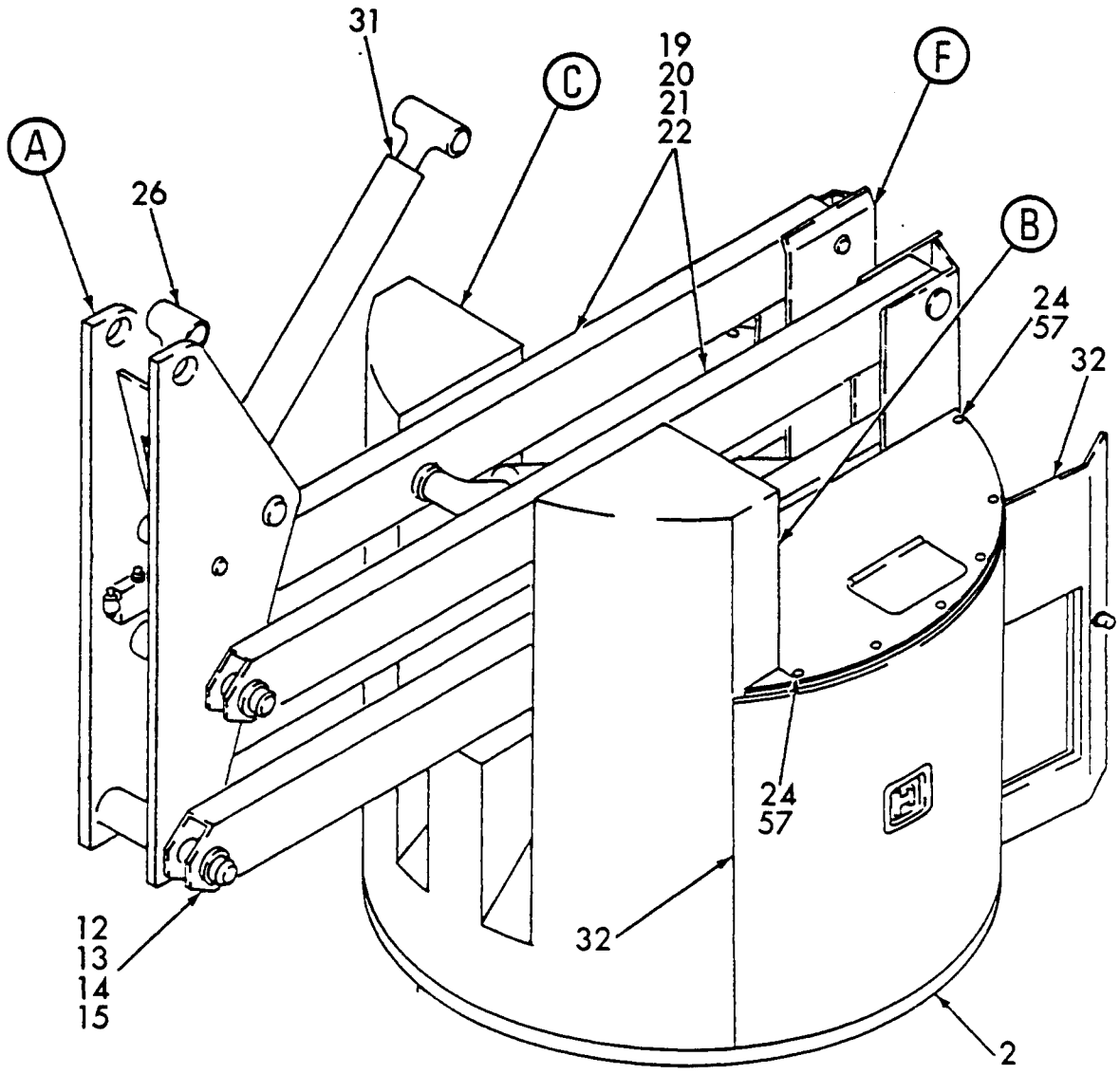


ITEM	PART NUMBER 1234	DESCRIPTION	UNITS PER ASSY
-1	140089	ASSEMBLY, HUB (See Sect. 3, Fig. 1 for NHA)	REF
2	.67141	HUB	1
3	.67140	CONE, INNER BEARING	1
4	.67139	CONE, OUTER BEARING	1
5	.67137	SEAL, GREASE	1
6	.67136	GASKET	1
7	.67135	CAP, GREASE	1
8	.67143	BOLT, HEX HEAD	4
9	.67144	WASHER, LOCK	4
10	.65943	BOLT, WHEEL	5
11	.67138	NUT, WHEEL	5

Mark Industries

TITLE	TURRET ASSEMBLY
MODEL	30KBN
NOTES	BEFORE OCT. 1989

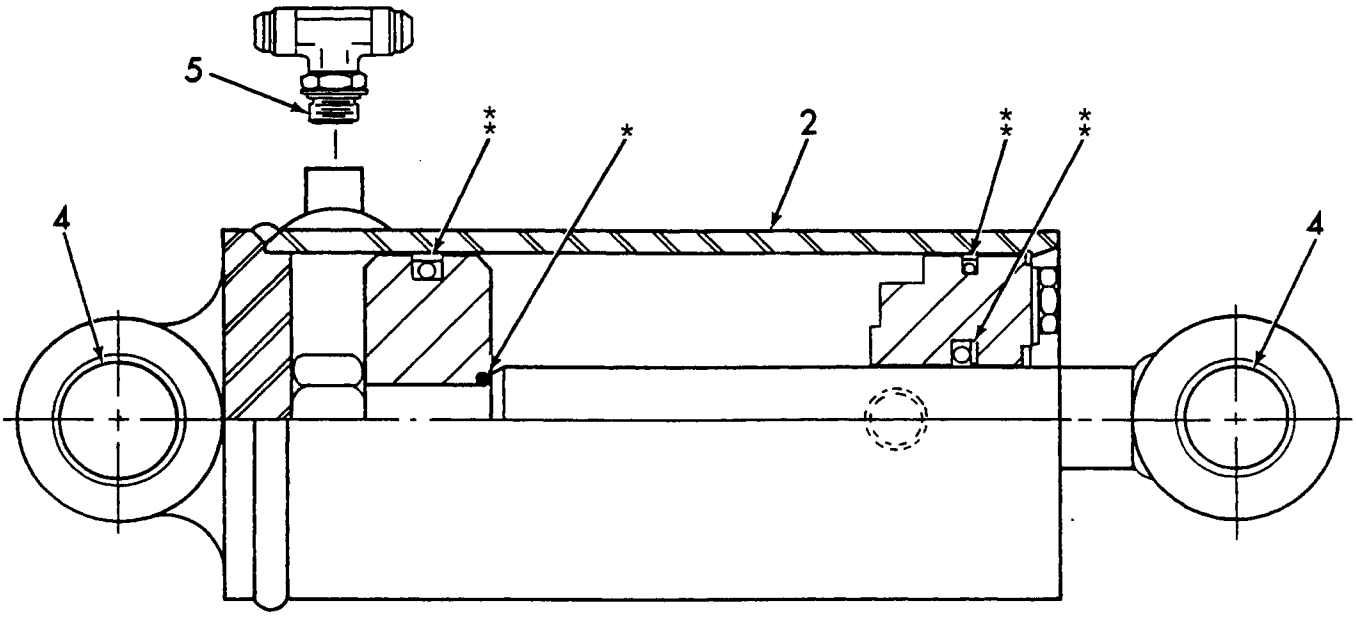
SECTION	4
FIGURE	1
PAGE	1



Mark Industries

TITLE	MASTER CYLINDER SUB-ASSEMBLY
MODEL	30KBN
NOTES	

SECTION	4
FIGURE	2
PAGE	1



NOTE 1: DUE TO ONGOING VENDOR/MFG. REVISIONS, WHEN POSSIBLE, PROVIDE ALL NUMBERS FROM THE CYLINDER I.D. TAG.

NOTE 2: THE SEAL KIT INCLUDES ITEMS SHOWN WITH AN ASTERISK (*).

ITEM	PART NUMBER 1234	DESCRIPTION	UNITS PER ASSY
-1	140062	SUB-ASSEMBLY, CYLINDER MASTER (See Sect. 4, Fig. 1 for NHA)	REF
2	.140094	CYLINDER, MASTER (SE)	1
3	..67130	KIT, SEAL	1
4	..67191	BUSHING	1
5	.80036-03	TEE, STRAIGHT THREAD	2
		NOTE 3: INTERNAL SERVICE REPLACEMENT PARTS AVAILABLE ON A SPECIAL ORDER BASIS.	

Mark Industries

TITLE	BOOM FUNCTION VALVE ASSEMBLY
MODEL	30KBN
NOTES	UNTIL LATE 1988

SECT.	4
FIG.	7
PAGE	4

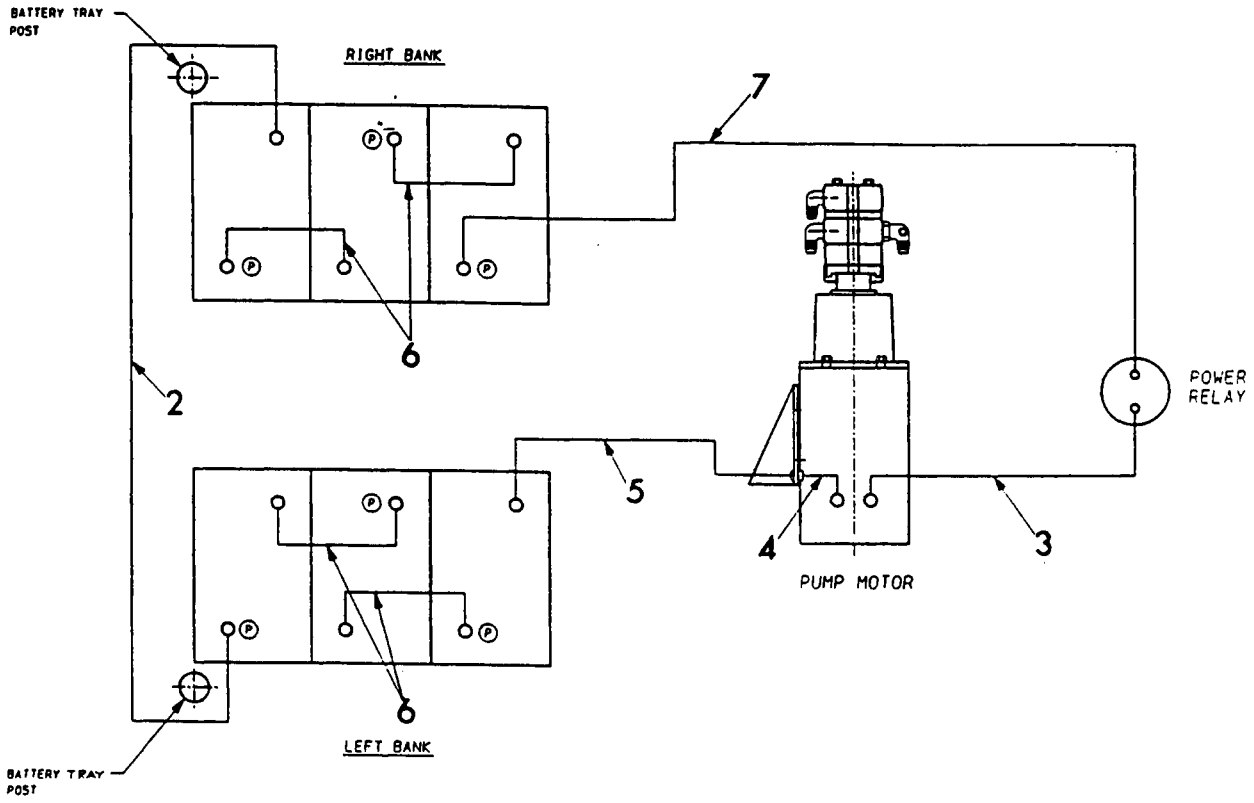
ITEM	PART NUMBER 1234	DESCRIPTION	UNITS PER ASSY
23	.80001-04	CONNECTOR, MALE	2
24	.20357	VALVE, NEEDLE	2

DASH (-) INDICATES THE 'ITEM' IS NOT ILLUSTRATED

Mark Industries

TITLE	BATTERY CABLE KIT
MODEL	30KBN
NOTES	

SECTION	4
FIGURE	11
PAGE	1

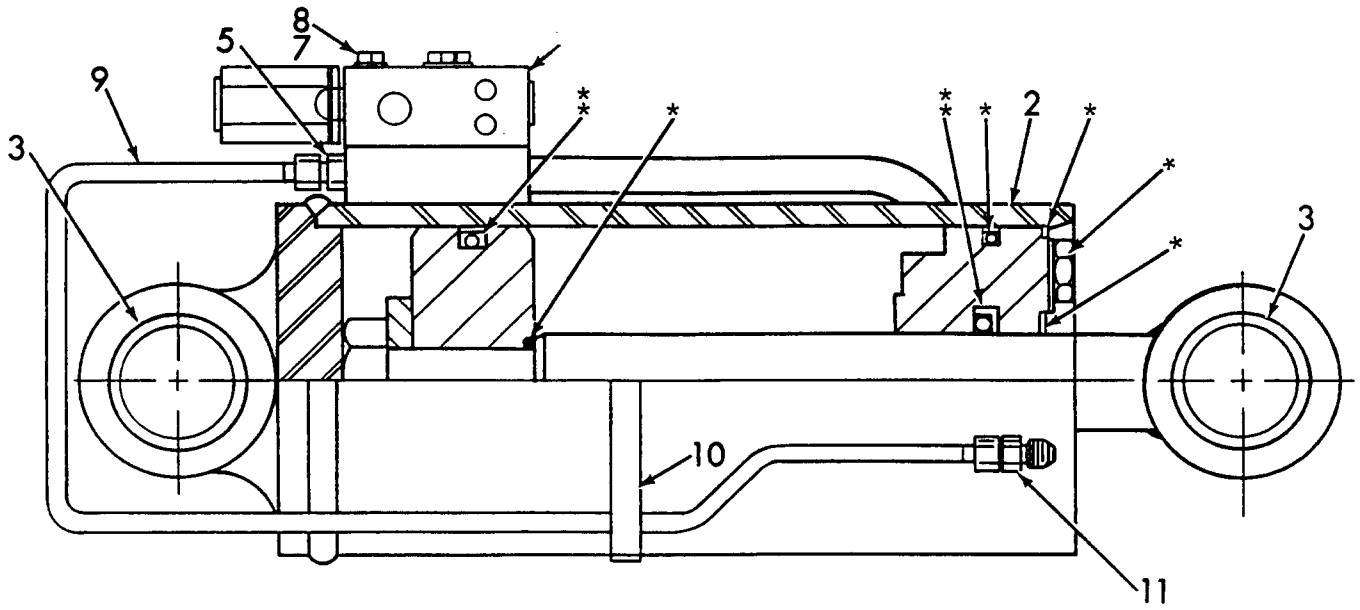


ITEM	PART NUMBER 1234	DESCRIPTION	UNITS PER ASSY
-1	.140603	KIT, BATTERY CABLE (See Sect. 4, Fig. 1 for NHA)	REF
2	..13226-0840	CABLE, BATTERY	1
3	..13226-1200	CABLE, BATTERY	1
4	..13226-0310	CABLE, BATTERY	1
5	..13226-0170	CABLE, BATTERY	1
6	..13226-0730	CABLE, BATTERY	1
7	..13226-0110	CABLE, BATTERY	4

Mark Industries

TITLE	SLAVE CYLINDER SUB-ASSEMBLY
MODEL	30KBN
NOTES	UNTIL EARLY 1989

SECTION	5
FIGURE	3
PAGE	1



NOTE 1: DUE TO ONGOING VENDOR/MFG. REVISIONS, WHEN POSSIBLE, PROVIDE ALL NUMBERS FROM THE CYLINDER I.D. TAG.

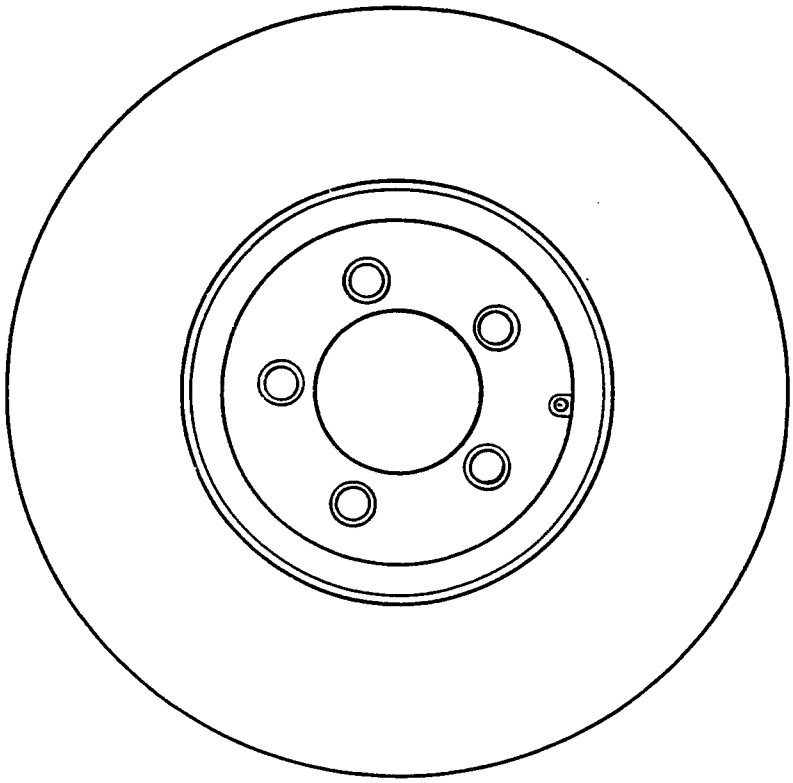
NOTE 2: THE SEAL KIT INCLUDES ITEMS SHOWN WITH AN ASTERISK (*).

ITEM	PART NUMBER 1234	DESCRIPTION	UNITS PER ASSY
-1	140058	SUB-ASSEMBLY, SLAVE CYLINDER (See Sect. 5, Fig. 2 for NHA)	REF
2	.140057	CYLINDER, SLAVE (SE)	1
3	..67191	BUSHING	4
-4	..67130	KIT, SEAL (SE)	1
5	.80004-03	CONNECTOR, STRAIGHT THREAD	2
6	.81205	VALVE, HOLDING	1
7	.60319	SCREW, CAP	3
8	.63301	WASHER, LOCK	3
9	.140058-6	ASSEMBLY, TUBE	2
10	.65111	STRAP	1
11	.80042-03	CONNECTOR, UNION	2
		NOTE 3: INTERNAL SERVICE REPLACEMENT PARTS AVAILABLE ON A SPECIAL ORDER BASIS.	

Mark Industries

TITLE	MONOFILLED TIRE
MODEL	30KBN
NOTES	

SECTION	6
FIGURE	6
PAGE	1



ITEM	PART NUMBER 1234	DESCRIPTION	UNITS PER ASSY
-1	140626	ASSEMBLY, STEER/DRIVE MONOFILLED TIRE	4

2. MAINTENANCE- INSPECTION PROCEDURES

1. **Water batteries at least once a week.**

   a. Add only approved water to the cells. Distilled water is recommended, high mineral content water must not be used. Maximum allowable impurities in percent-iron (.003), chloride (.004), fixed residue (.075).

   b. Remove vent caps and water batteries preferable after charging to prevent over flow of acid due to expansion.

   c. Fill all cells to the proper level. **Do not overfill cells.** Fill to level indicator or 1/2 inch over the top of the separators if there is no level indicator. Do not use a hose to water batteries.

   d. Spot check cells between weekly waterings to assure electrolyte is above separators. Excess water usage indicates the presence of any one or all of the following conditions which should be checked.

      1. Overcharging
      2. High temperature operation
      3. Nearing end of service life

   e. **Do not allow the electrolyte level to drop** below the top of the separators since this will lead to shortened battery life.

2. **Clean batteries after weekly watering or when washing cars.**

   a. Wash the tops of the batteries making sure the vent caps are in place. Do not allow water or other foreign matter to enter the cells.

   b. Use a solution of bicarbonate of soda and water to wash batteries if there is an accumulation of acid.

3. **Inspection** to insure good conditions which will give better battery service.

   a. When watering batteries inspect battery and other terminal connections for:

      1. **Corrosion** -- If any exists, clean connection and apply a non-metallic grease or protective spray to retard further corrosion.

      2. **Loose Connections** -- Be sure all connections are tight and that good contact is made between terminals.

Introduction

Service Manual for Series MG, MF, MB, ME

This service manual has one purpose: to guide you in maintaining, troubleshooting, and servicing the MG, MF, MB & ME Torqmotor (low-speed, high-torque hydraulic motor).

Material in this manual is organized so you can work on the Torqmotor and get results without wasting time or being confused. To get these results, you should read this entire manual before you begin any work on the Torqmotor.

This manual also contains troubleshooting information and checklist. If you must service the Torqmotor, the checklist will help you to determine where the problem may be.

The three-column format of the Disassembly and Inspection, and Assembly sections will make it easier for you to conduct major work on the Torqmotor. Column 1 gives a brief key for each procedure. Column 2 explains in detail the procedure you should follow. Column 3 illustrates this procedure with photographs. Read all material carefully and pay special attention to the notes, cautions, and warnings.

A foldout page with the same Torqmotor exploded assembly view on both sides is provided in this manual. The component part names and item numbers assigned on this exploded assembly view correspond with names and item numbers (in parentheses) used in the disassembly and assembly procedures set forth in this manual. When this exploded assembly view page is folded out, you can easily identify components and locate their relative position on the exploded assembly view as you follow the disassembly and assembly procedures.

Service part list charts are also provided in this manual with the part names and exploded view item numbers cross referenced to Ross Gear service part numbers.

Service parts are available through the Original Equipment Manufacturer or Ross approved MG, MF, MB & ME Distributors.

As you gain experience in servicing the Torqmotor, you may find that some information in this manual could be clearer or more complete. If so, let us know about it. Do not try to second guess the manual. If you are stuck, contact us. Servicing the Torqmotor should be a safe and productive procedure, in order for the unit to deliver the reliable, long-life operation engineered into it.

check coupling shaft for rust or corrosion

14. Check exposed portion of coupling shaft (12) to be sure you have removed all signs of rust and corrosion which might prevent its withdrawal through the seal and bearing. Crocus cloth or fine emery paper may be used. SEE FIGURE 19. Remove any key (12A), nut (12B), washer (12C), bolt (12D), lock washer (12E), or retaining ring (12F).

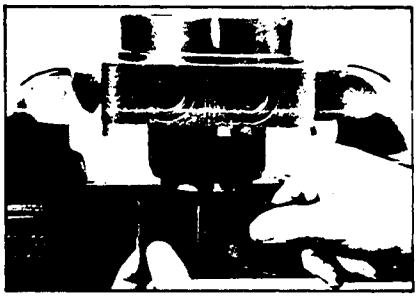


Figure 19

remove & inspect coupling shaft

15. Remove coupling shaft (12), by pushing on the output end of shaft. SEE FIGURE 20. Inspect coupling shaft bearing and seal surfaces for spalling, nicks, grooves, severe wear or corrosion and discoloration. Inspect for damaged or worn internal and external splines or keyway. SEE FIGURE 21. Replace coupling shaft if any of these conditions exist.

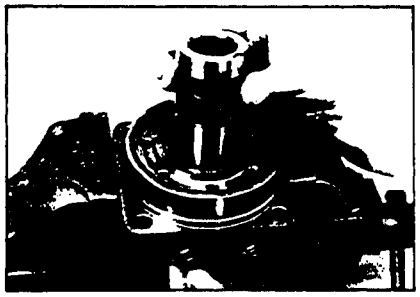


Figure 20

NOTE

NOTE: Minor shaft wear in seal area is permissible. If wear exceeds .020 inches (0.51 mm) diametrically, replace coupling shaft.

NOTE

NOTE: A slight "polish" is permissible in the shaft bearing areas. Anything more would require coupling shaft replacement.

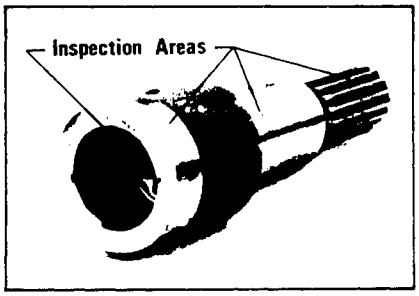


Figure 21

remove seal ring from housing

16. Remove and discard seal ring (4) from housing (18).

remove & inspect thrust washer & thrust bearing

17. Remove thrust bearing (15) and thrust washer (14) if the unit is a Series MG or MF. Inspect for wear, brinelling, corrosion and a full complement of retained rollers. SEE FIGURE 22.

NOTE

NOTE: Large Frame Series MB & ME Torqmotors have a thrust bearing (15) sandwiched between two thrust washers (14) that cannot be removed from housing (18) unless bearing (13) is removed for replacement.

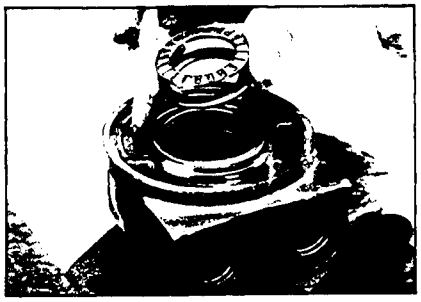


Figure 22

assemble seal & commutator

19. Assemble a **new** seal ring (3) flat side up, into commutator (5) and assemble commutator over the end of drive link (10) onto manifold (7) with seal ring side up. SEE FIGURE 59, 60.

Figure 59

Figure 60

assemble shuttle valve parts into end cover

20. If shuttle valve components items #21, #22, #23, #24 were removed from the end cover (2) turn a plug (21) with a **new** o-ring (22), loosely into one end of the valve cavity in the end cover. Insert a spring (23) the valve (24) and the second spring (23) into the other end of the valve cavity. Turn the second plug (21) with a **new** o-ring (22) loosely into the end cover valve cavity. 3/16 inch Allen wrench required. SEE FIGURE 61.

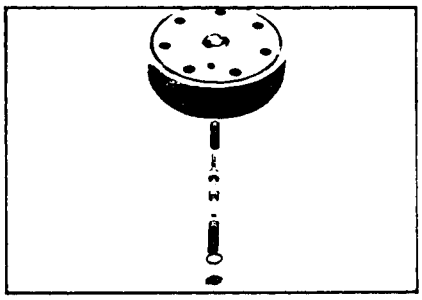


Figure 61

assemble relief valve parts in end cover

21. If relief valve components items #21, #22, #24 were removed from the end cover (2) assemble a **new** o-ring (22) on the two plugs (21). Assemble a two piece relief valve (24) in each of the plugs, with the large end of the conical spring into the plug first and the small nut of the other valve piece in the small end of the conical spring. Turn each of the plug and relief valve assemblies into the end cover loosely to be torqued later. 3/8 inch Allen or 1 inch Hex socket required. SEE FIGURE 62.

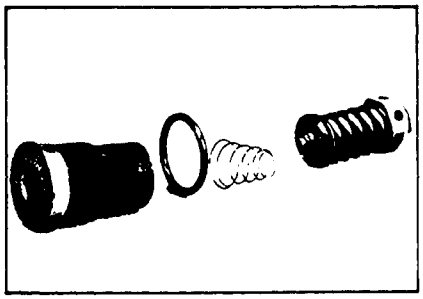


Figure 62

Troubleshooting Guide

NOTE: Before troubleshooting any system problem, check service literature published by the equipment and/or component manufacturers. Follow their instructions, if given, for checking any component other than the MAB or MAE Torqmotor™ unit.

Preparation

Make your troubleshooting easier by preparing as follows:

- work in a clean, well-lighted place;
- have proper tools and materials nearby;
- have an adequate supply of clean petroleum-based solvent.

WARNING: SINCE THEY ARE FLAMMABLE, BE EXTREMELY CAREFUL WHEN USING ANY SOLVENT. EVEN A SMALL EXPLOSION OR FIRE COULD CAUSE INJURY OR DEATH.

WARNING: WEAR EYE PROTECTION AND BE SURE TO COMPLY WITH OSHA OR OTHER MAXIMUM AIR PRESSURE REQUIREMENTS.

Preliminary Checks

Hydraulic systems are often trouble-free. The problem an operator complains of could be caused by something other than the hydraulic components.

Thus, once you have determined that a problem exists, start with the easy-to-check items, such as:

- parts damaged from impact that were not properly repaired, or that should have been replaced; and
- improper replacement parts used in previous servicing
- mechanical linkage problems such as binding, broken, or loose parts or slipping belts.

Hydraulic Components

If you think the problem is caused by a hydraulic component, start by checking the easy-to-reach items.

Check all hoses and lines for cracks, hardening, or other signs of wear. Reroute any useable hoses that are kinked, severely bent, or that rest against hot engine parts. Look for leaks, especially at couplings and fittings. Replace any hoses or lines that don't meet system flow and pressure ratings.

Next, go to the reservoir and filter or filters. Check fluid level and look for air bubbles. Check the filter(s). A filter with a maximum 50 micron filtration is recommended for the MAB and MAE system.

Visually check other components to see if they are loosely mounted, show signs of leaks, or other damage or wear.

Excessive heat in a hydraulic system can create problems that can easily be overlooked. Every system has its limitation for the maximum amount of temperature. After the temperature is attained and passed, the following can occur:

- oil seal leaks
- loss of efficiency such as speed and torque
- pump loss of efficiency
- pump failure
- hoses become hard and brittle
- hose failure

A normal temperature range means an efficient hydraulic system. Consult the manuals published by equipment and/or component manufacturers for maximum allowable temperatures and hydraulic tests that may be necessary to run on the performance of the hydraulic components. The MAB and MAE are not recommended for hydraulic systems with maximum temperatures above 200°F (93.3°C).

Disclaimer

This Service Manual has been prepared by TRW Ross Gear Division for reference and use by mechanics who have been trained to repair and service hydraulic motors and systems on commercial and non-commercial equipment applications. TRW Ross Gear Division has exercised reasonable care and diligence to present accurate, clear and complete information and instructions regarding the techniques and tools required for maintaining, repairing and servicing the complete line of TRW Ross Gear MAB & MAE Torqmotor Units. However, despite the care and effort taken in preparing this general Service Manual, TRW **makes no warranties** that (a) the Service Manual or any explanations, illustrations, information, techniques or tools described herein are either accurate, complete or correct as applied to a specific Torqmotor unit, or (b) any repairs or service of a particular Torqmotor unit will result in a properly functioning Torqmotor unit.

If inspection or testing reveals evidence of abnormal wear or damage to the Torqmotor unit or if you encounter circumstances not covered in the Manual, STOP – CONSULT THE EQUIPMENT MANUFACTURER'S SERVICE MANUAL AND WARRANTY. DO NOT TRY TO REPAIR OR SERVICE A TORQMOTOR UNIT WHICH HAS BEEN DAMAGED OR INCLUDES ANY PART THAT SHOWS EXCESSIVE WEAR UNLESS THE DAMAGED AND WORN PARTS ARE REPLACED WITH ORIGINAL TRW REPLACEMENT AND SERVICE PARTS AND THE UNIT IS RESTORED TO TRW'S SPECIFICATIONS FOR THE TORQMOTOR UNIT.

It is the responsibility of the mechanic performing the maintenance, repairs or service on a particular Torqmotor unit to (a) inspect the unit for abnormal wear and damage, (b) choose a repair procedure which will not endanger his/her safety, the safety of others, the equipment, or the safe operation of the Torqmotor, and (c) fully inspect and test the Torqmotor unit and the hydraulic system to insure that the repair or service of the Torqmotor unit has been properly performed and that the Torqmotor and hydraulic system will function properly.

remove & inspect drive link washer

5. Remove drive link washer (3) from the commutator (6) or from the end cover if it was removed with the end cover. Replace washer if it shows signs of wear, spalling, nicks or is bent or has other deformation that could interfere with commutator or drive link rotation. SEE FIGURE 6.

Figure 6

remove & inspect sleeve

6. Remove sleeve (5) and inspect if for deformation from the original cylindrical shape to a "barrel" or "hour glass" shape. Inspect the ends for severe nicks or burrs. Replace sleeve if any of these conditions exist. SEE FIGURE 7.

Figure 7

NOTE

NOTE: Minor burrs can be removed.

remove & inspect commutator ring

7. Remove commutator ring (7). SEE FIGURE 8. Inspect commutator ring for cracks, or burrs.

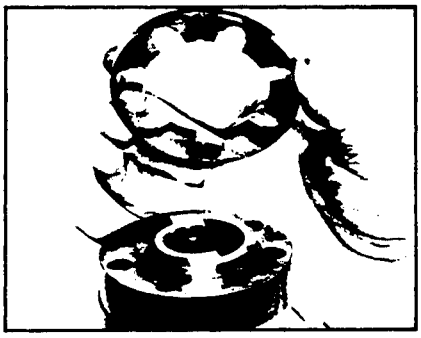


Figure 8

remove & inspect commutator

8. Remove commutator (6) and inspect its ground surfaces for scoring, spalling, brinelling (denting) or wear. SEE FIGURE 9. Inspect the drive link pin slot and cover pin hole for wear. Inspect for cracks. If any of these conditions exist replace the commutator and commutator ring as a matched set.

Figure 9

NOTE

NOTE: It may be necessary to use one or two bolts (1) as probes to align the bolt holes of the components for bolt installation.

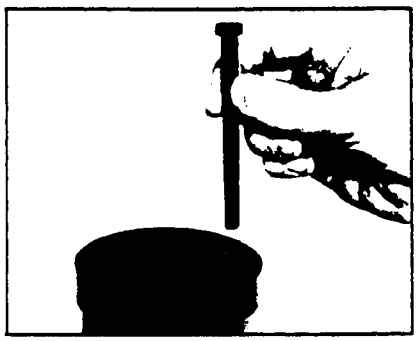


Figure 46

install and torque bolts

19. Install 7 bolts (1) into the assembly bolt holes finger tight, then torque the bolts to 22-26 foot pounds, (30-35 N.m), in the sequence shown, using a 1/2 inch, thin wall socket and appropriate torque wrench. SEE FIGURES 46, 47, 48.

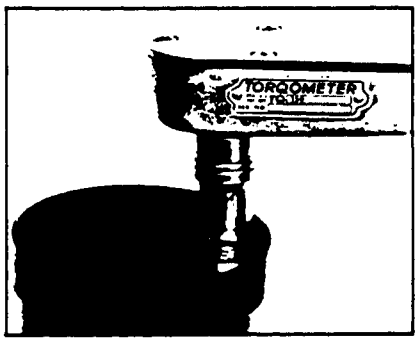


Figure 47

The assembly of the MAG Tormotor™ is now complete, except for woodruff key (13) and/or two port manifold O-Rings (18.1) if applicable at Torqmotor installation. See Page 21 for final checks.

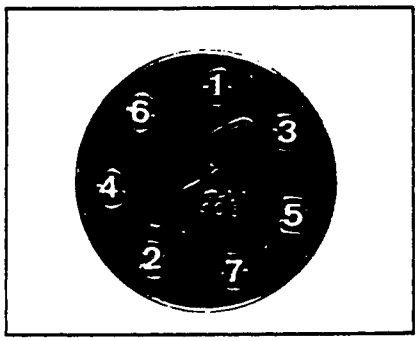


Figure 48

TORQUE-HUB®

Final Drives

ASSEMBLY-DISASSEMBLY MANUAL

FOR THE

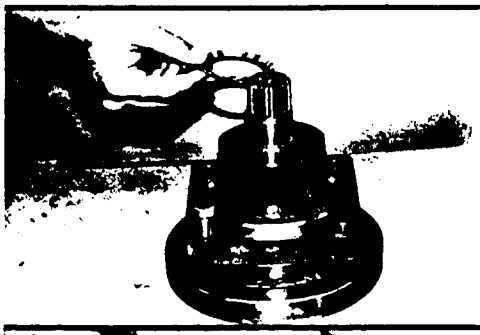
S07A

UNIT

Fairfield Manufacturing Company Inc.

19. At this point the main disassembly is complete.

Hub-shaft Sub-assembly

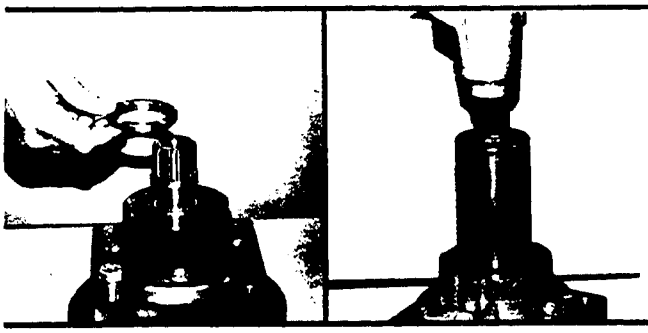


10. Place **lockwasher(1F)** onto **output shaft/carrier(1T)**.

11. Spray **locknut(1E)** and **output shaft/carrier(1T)** with Locquic Primer T. Allow two minutes drying time.

12. Apply Loctite 271 to the second screwthread from the bottom of **locknut(1E)**. The bottom of the locknut has a chamfered or gradually sloped edge.

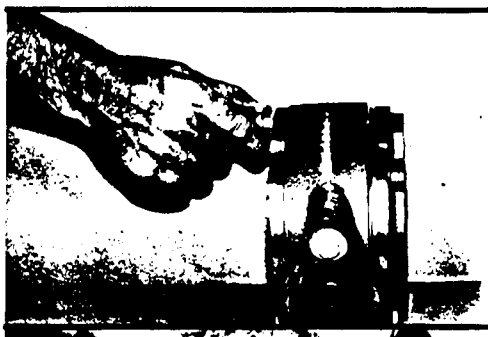
NOTE: Loctite 271 is an anaerobic adhesive. Once it has been removed from contact with air, it sets. Therefore once the locknut has been placed on the output shaft it must be tightened and torqued immediately or the adhesive will make it difficult to turn.



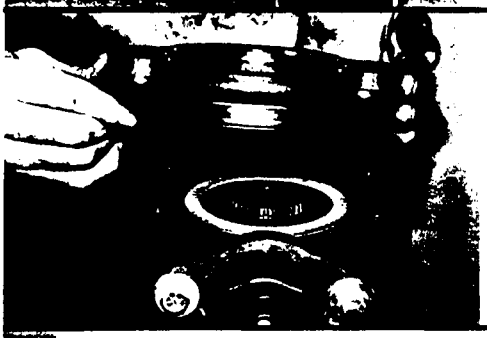
13. Using a locknut wrench (tool no. T-152999), tighten **locknut(1E)** onto **output shaft/carrier(1T)**.

BRAKE ASSEMBLY

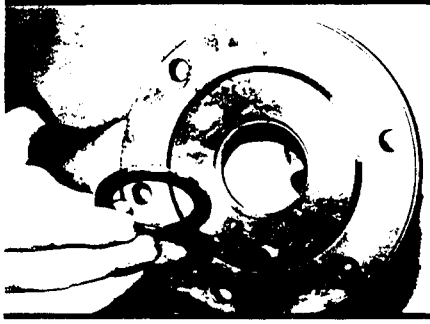
Some applications of the S07A torque-hub unit require a brake to be installed. The following steps tell how to install an assembled brake.



1. Remove the 5 bolts from the cover of **brake(6)** if this has not already been done.



2. Remove the cover from **brake(6)**.



3. Remove the thrust washer from the counterbore in the center of the brake's cover.

PARTS LIST

ITEM	QUANTITY	DESCRIPTION
1	1	hub-shaft sub-assembly
1B	1	seal
1C	2	bearing cup
1D	2	bearing cone
1E	1	locknut
1F	1	lockwasher
1G	1	hub
1K	3	magnetic pipe plug
1R	1	output shaft sub-assembly
1S	1	thrust washer
1T	1	output shaft/carrier
1V	3	planet shaft
1W	3	planet gear
1X	57	needle roller
1Y	3	spring pin
1Z	12	thrust washer

ADDITIONAL PARTS FOR UNITS WITHOUT A BRAKE

2	1	ring gear
4	4	pipe plug
5	2	"O" ring
6	1	cover
9	1	input gear
11	1	thrust washer
12	6	bolt
14	6	lock washer
24	1	ID plate
25	4	drive screw
26	2	dowel pin

ADDITIONAL PARTS FOR UNITS WITH A BRAKE

2	1	ring gear
5	1	"O" ring
6	1	brake
9	1	input gear
21	5	bolt
22	5	lock washer
24	1	ID plate
25	4	drive screw
26	2	dowel pin
27	1	gasket
29	1	thrust spacer