



725 CRANE ARCHIVE

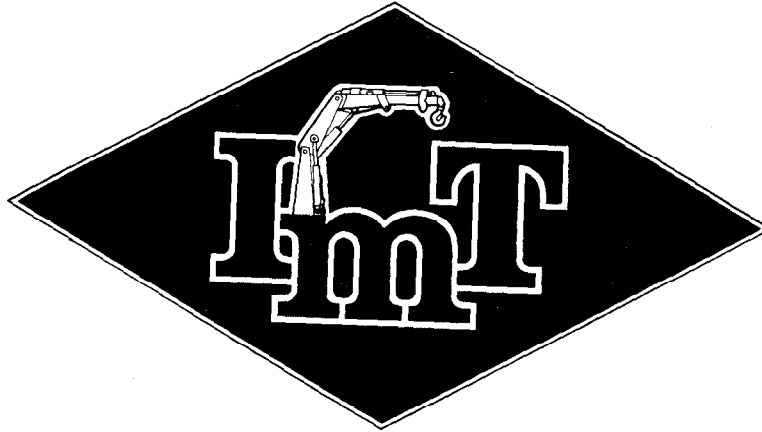
PART 1 OF 3

PN 99900447

(1-11-80)



725 CRANE



IOWA MOLD TOOLING CO., INC.

500 HWY 18 WEST, GARNER, IA 50438

515-923-3711



Introduction - Read Carefully!

This volume deals with information applicable to your particular crane. For operating, maintenance and repair instructions, refer to Volume 1, Operation, Maintenance and Repair. Volume 1 contains the following information.

- SECTION 1. OPERATION
- SECTION 2. MAINTENANCE
- SECTION 3. REPAIR
- SECTION 4. INSPECTION & TEST REPORT
- SECTION 5. INSTALLATION - CHASSIS PREPARATION
- SECTION 6. APPENDIX

We recommend that Volume 2, Parts and Specifications be kept in a safe place in the office.

This manual is provided to assist you with ordering parts for your IMT truck-mounted articulating crane. It also contains additional instructions regarding your particular installation.

Three means are used throughout this manual to gain the attention of personnel. They are NOTES, CAUTIONS and WARNINGS and are defined as follows:

NOTE

A NOTE is used to either convey additional information or to provide further emphasis for a previous point.

CAUTION

A CAUTION is used when there is the strong possibility of damage to the equipment or premature equipment failure.

WARNING

A WARNING is used when there is the potential for personal injury or death.

It is the user's responsibility to maintain and operate this unit in a manner that will result in the safest working conditions possible.

In addition, it is also the user's responsibility to be aware of existing Federal, State and Local codes and regulations governing the safe use and maintenance of this unit. Listed below is a publication that the user should thoroughly read and understand.

ANSI/ASME B30.5-1982
MOBILE AND LOCOMOTIVE CRANES
The American Society of Mechanical Engineers
United Engineering Center
345 East 47th Street
New York, NY 10017

Warranty of this unit will be void on any part of the unit subjected to misuse due to overloading, abuse, lack of maintenance and unauthorized modifications. No warranty - verbal, written or implied - other than the official, published IMT new machinery and equipment warranty will be valid with this unit.

Treat this equipment with respect and service it regularly. These two things can add up to a safer working environment.



Section 1. SPECIFICATIONS

GENERAL

	Standard Crane	Optional 4th Self-storing Ext.	Optional 4th Pin-On Ext.
Crane Rating	74,000 ft-lb. (10.23 ton-meters)	74,000 ft-lb. (10.23 ton-meters)	74,000 ft-lb. (10.23 ton-meters)
Reach (from centerline of rotation)	25'-2" (7.67 m)	29'-4" (8.94 m)	35'-2" (10.72 m)
Hydraulic Extension	45"/51" (114.3/129.5 cm)	45"/51" (114.3/129.5 cm)	45"/51" (114.3/129.5 cm)
Manual Extension	45" (114.3 cm)	45"/51" (114.3/129.5 cm)	45"/120" (114.3/304.8 cm)
*Lifting Height	34'-9" (10.6 m)	38'-8" (11.8 m)	44'-0" (13.4 m)
Crane Weight	4,380 lbs. (1,987 kg.)	4,400 lbs. (1,996 kg.)	4,530 lbs. (2,055 kg.)
Outrigger Span	11'-11" (3.63 m)	11'-11" (3.63 m)	11'-11" (3.63 m)
*Storage Height	11'-1" (3.38 m)	11'-1" (3.38 m)	11'-1" (3.38 m)
**Mounting Space Required	29" (73.7 cm)	29" (73.7 cm)	29" (73.7 cm)
Optimum Pump Capacity	9 U.S. GPM (34.1 liters/min.)	9 U.S. GPM (34.1 liters/min.)	9 U.S. GPM (34.1 liters/min.)
Oil Reservoir Capacity	17 U.S. Gal. (64.4 liters)	17 U.S. Gal. (64.4 liters)	17 U.S. Gal. (64.4 liters)
Design Factors - Pins and Hydraulics	4/1	4/1	4/1

*Based on 39" (99.1 cm) truck frame height.

**Add approximately 4" (10.2 cm) between base and cab to allow for rotation clearance between mast and cab.

LIFTING CAPACITY (from centerline of rotation)

9'-2" (2.79 m)	(3,629 kg.)	8,000 lbs.
13'-5" (4.09 m)	(2,495 kg.)	5,500 lbs.
17'-2" (5.23 m)	(1,950 kg.)	4,300 lbs.
21'-5" (6.53 m)	(1,565 kg.)	3,450 lbs.
25'-2" (7.67 m)	(1,338 kg.)	2,950 lbs.
*29'-4" (8.94 m)	(726 kg.)	1,600 lbs.
**35'-2" (10.72 m)	(363 kg.)	800 lbs.

*Optional 4th-stage self-storing extension only.

**Optional 4th-stage pin-on extension only.

PERFORMANCE CHARACTERISTICS

Rotation - 370° (6.46 Rad.)	30 Seconds
Inner Boom Elevation - -53° to +67° (-0.93 Rad. to +1.17 Rad.)	24 Seconds
Outer Boom Articulation - 137° (2.39 Rad.)	18 Seconds
Telescoping Extension - 45" & 51" (114.3 cm & 129.5 cm)	17 & 24 Seconds
Power-down Outrigger Extension - 21" (53.3 cm)	6 Seconds

CYLINDERS

	Bore	Stroke
Inner	4" (10.2 cm)	32" (81.3 cm)
Outer	5" (12.7 cm)	36-1/16" (91.6 cm)
Telescoping Extension - 1st stage	4" (10.2 cm)	45" (114.3 cm)
Telescoping Extension - 2nd stage	3" (7.6 cm)	51" (129.5 cm)
Outrigger	2-1/2" (6.4 cm)	21" (53.3 cm)



ROTATION

Turntable bearing powered with a high-torque hydraulic motor through a ring-and-pinion type spur gear train (total gear reduction is 51.8 to 1).

CYLINDER HOLDING VALVES

The holding sides of all cylinders are equipped with integral-mounted holding and/or counter-balance valves to prevent sudden cylinder collapse in case of hose or other hydraulic failure. The outrigger cylinders have positive, pilot-operated holding valves that open only upon command.

The inner, outer and extension cylinders have pilot-operated counter-balance valves. The counter-balance valve serves several functions. First, it is a holding valve. Secondly, it is so constructed that it will control the lowering function and allow that motion to be feathered while under load. Finally, if a hose breaks, the only oil loss will be that in the hose.

MINIMUM CHASSIS SPECIFICATIONS

Body Style	Conventional Cab
Wheelbase	(480.1 cm) 189"
Cab to Axle	(304.8 cm) 120"
Frame Section Modulus	(314.7 cc) 19.2 in. ³
R B M	(10,373 kg-m) 900,000 in.-lbs.
Front Axle Rating	(4,082 kg.) 9,000 lbs.
Rear Axle Rating	(7,938 kg.) 17,500 lbs.
Transmission	5-speed

In addition to these specifications, heavy-duty electrical and cooling systems and dual rear wheels are required. It is recommended that the vehicle be equipped with an electric engine tachometer, auxiliary brake lock, power steering.

POWER SOURCE

Integral-mounted hydraulic pump and PTO application. Other standard power sources may be utilized - minimum power required is 17 horsepower.

HYDRAULIC SYSTEM

Open-centered, full-pressure system that requires 9 GPM (34.1 liters/minute) optimum oil flow at 2750 PSI (193.4 kg/sq. cm.). Six-spool, stack-type control valve with dual operational control handles located at both sides for convenient operation. System includes hydraulic oil reservoir, suction-line filter, return-line filter, pump and control valve.

NOTE

To maintain 100% stability for the above chassis, the finished unit should weigh approximately:

Front Axle	7,100 lbs. (3,221 kg.)
Rear Axle	10,200 lbs. (4,627 kg.)

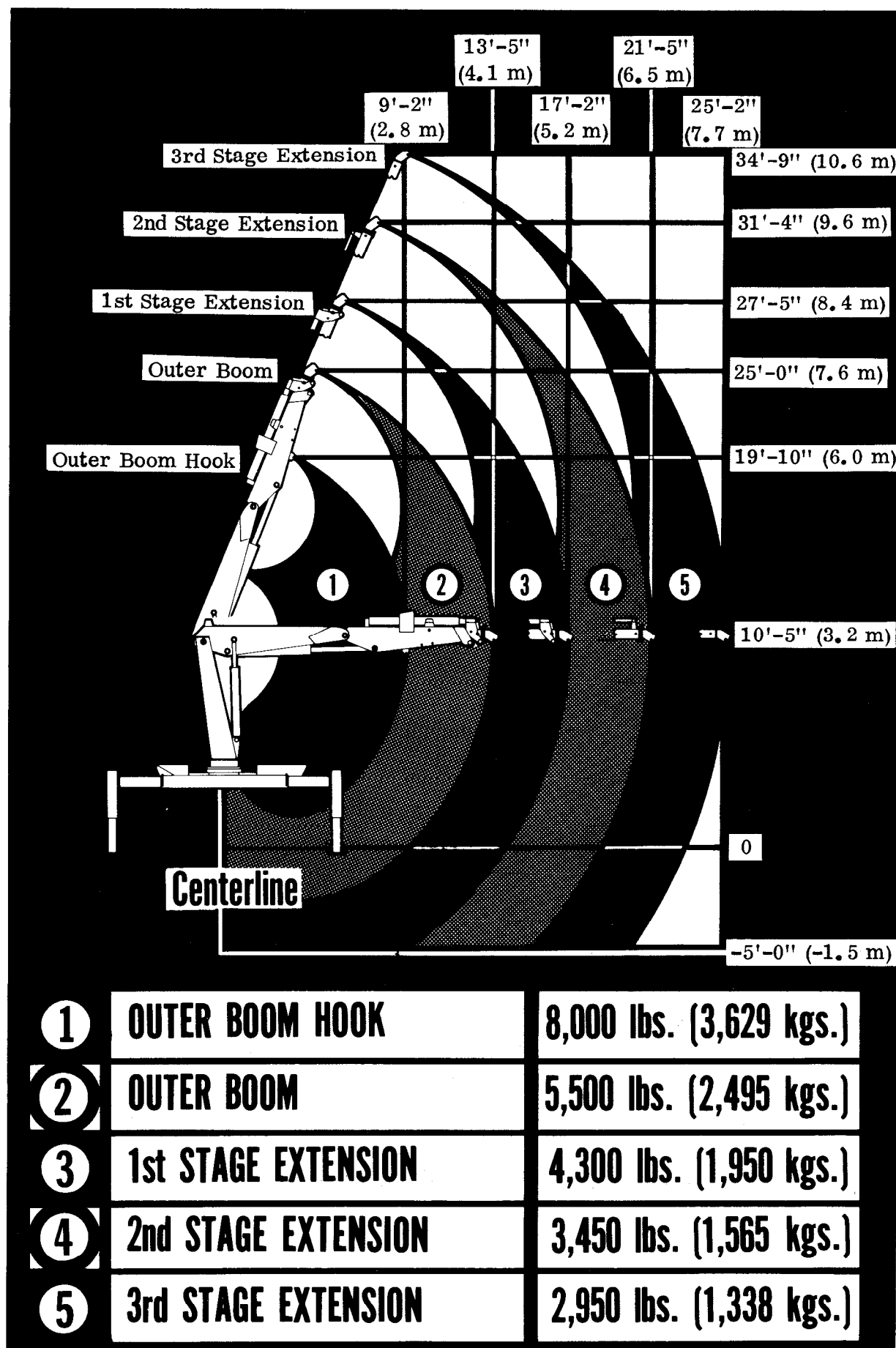


Figure A—1. Capacity Chart

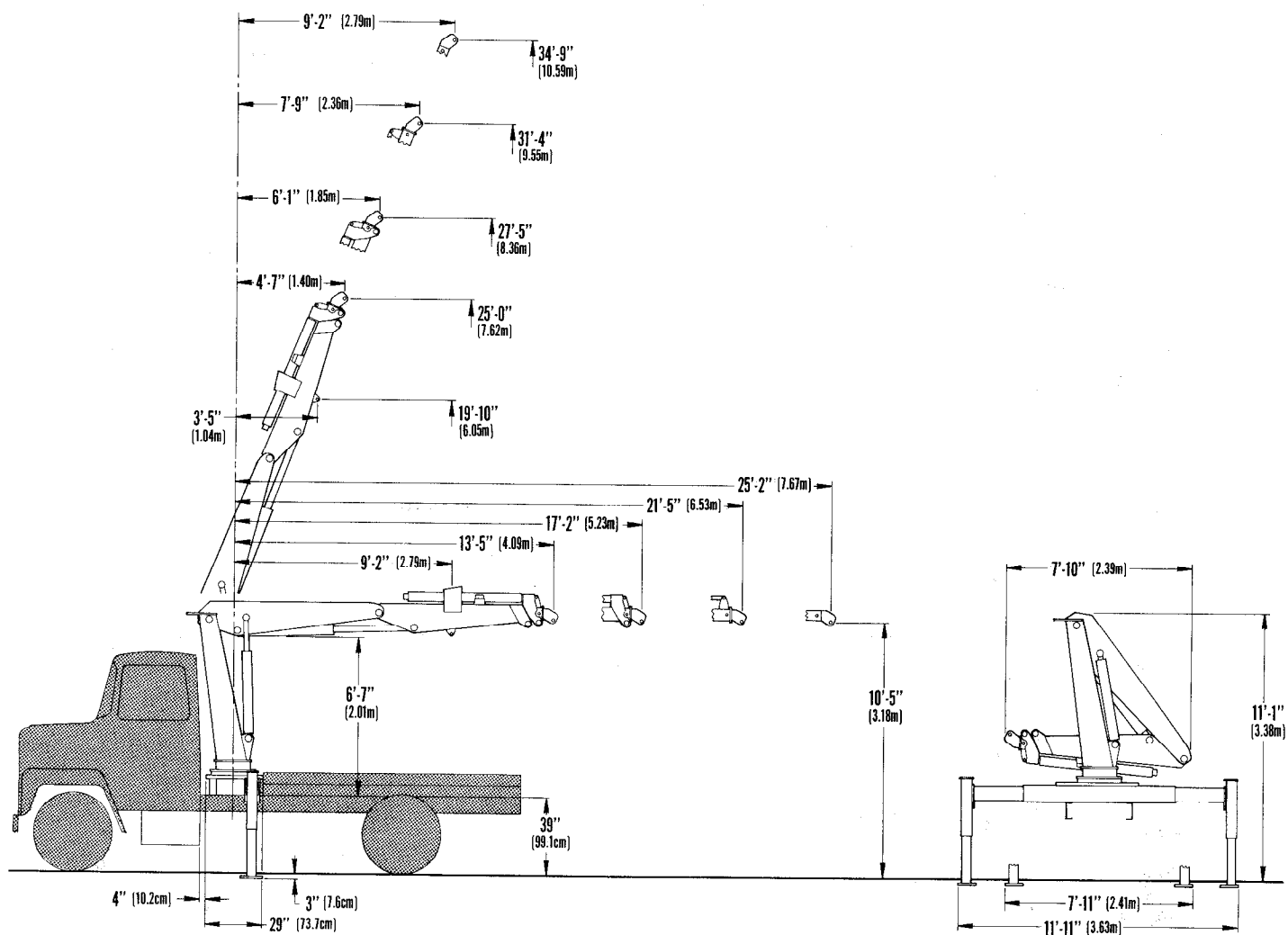


Figure A—2. Geometric Configuration



Section 2. CRANE DESCRIPTION

2—1. GENERAL

This section describes the major assemblies that are available with this crane. Figure B-1 illustrates the location of the assemblies.

2—2. BASE AND OUTRIGGERS

The base provides the means for mounting the crane on a truck chassis. It incorporates the 370° (6.46 Rad.) rotation mechanism. The outriggers are housed in the base and may be either manual pull out or power out. Crane stability is provided by the power-down outrigger cylinders.

2—3. MAST

The mast provides the necessary elevation for crane operation as well as a hinge point for the inner boom.

2—4. INNER BOOM

The inner boom will swing through a full 120° (2.09 rad.) from -53° (-0.92 rad.) to +67° (1.17 rad.). It is raised and lowered through the use of twin, double-acting hydraulic cylinders.

2—5. OUTER BOOM

The outer boom will swing through a full 137° (2.39 rad.). It provides the mounting point for the optional winch and an additional location for attachment of the crane hook. It is raised and lowered through the use of a single, double-acting hydraulic cylinder.

2—6. EXTENSION BOOM

The extension boom will increase the operating range of the crane from 13'-5" (4.1 m) to 25'-2" (7.7 m). This is accomplished by a telescoping, 2-stage, double-acting hydraulic cylinder and a single manual extension.

2—7. CONTROLS

The crane may be operated from either side of the base or from an optional remote control unit with 35 ft. (10.7 m) of control cable.

2—8. HYDRAULIC KITS

The crane hydraulics consist of double-braided pressure hoses, return hoses, filters, control valve bank and all necessary hydraulic fittings.

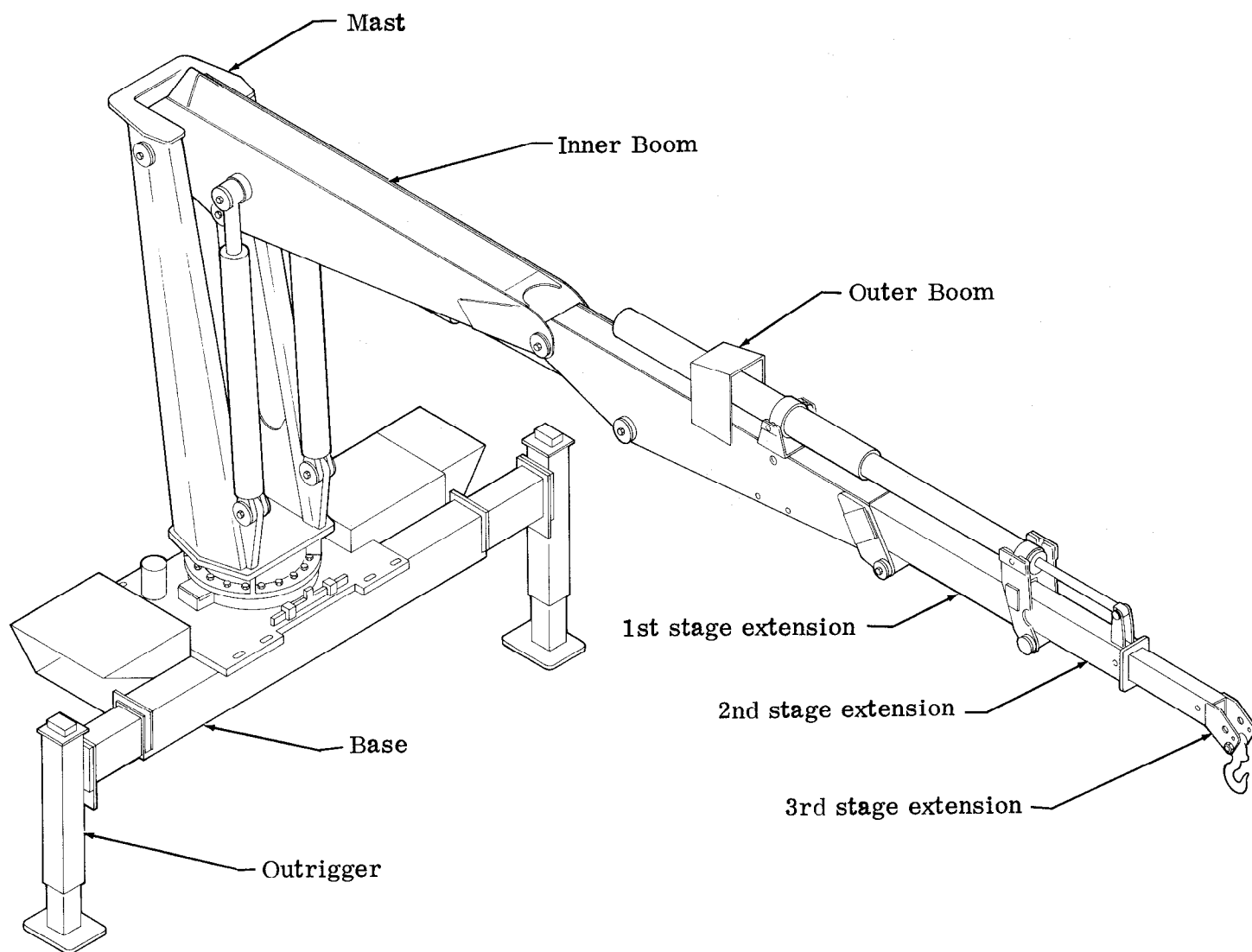


Figure B—1. 725 Crane Group



Section 3. INSTALLATION

3—1. GENERAL

This section contains specific instructions for the installation of your crane. Prior to installing the crane and hydraulic components, make sure the chassis is ready to receive the crane (refer to Section 5, Installation - Chassis Preparation in Volume 1).

3—2. CRANE INSTALLATION

To install the crane on the chassis:

1. Use a lifting device capable of lifting the weight of the crane - approximately 4,500 lbs. (2,041 kg.) depending upon the optional equipment added to the standard crane. Attach the lifting device to the lift bracket welded to the top of the inner boom. Lift the crane, move the chassis into position under the crane and lower the crane into

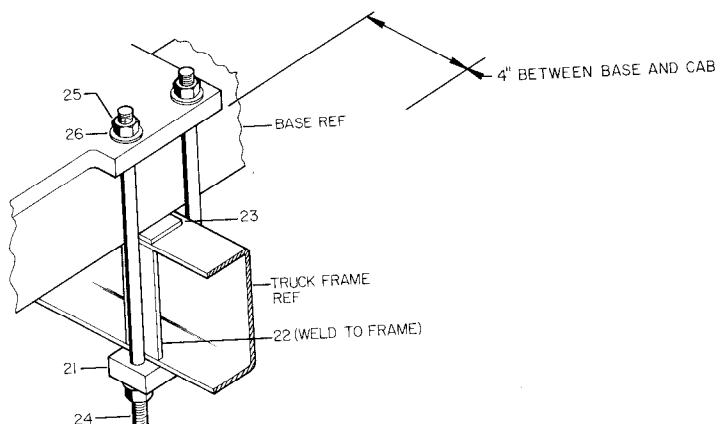
the desired position. Allow sufficient room between the crane and cab for mast rotation - at least 4" (10.2 cm). Check for front to rear alignment.

2. Install the tie rods, clamp plates, washers and lock nuts to secure the crane base to the chassis (Figure C-1). Power wrench the nuts tight.

CAUTION

Do not attempt to apply the same torque to the tie rod and self-locking nuts as shown in the Torque Data Chart in the APPENDIX in Volume 1. Do not exceed 200 ft. lbs. (28 kg-m). Exceeding this torque value could damage either the chassis or crane base.

Power wrenching is not recommended until the lead thread of the nut insert is engaged by hand turning.



Item No.	Description	Qty
21.	PLATE, clamp	4
22.	BAR, frame reinforcing	4
23.	SPACER, frame flange	2
24.	STUD, tie down	8
25.	NUT, lock; 1-8	16
26.	WASHER, hi-star; 1"	16

Figure C—1. Crane Installation



3—3. HYDRAULIC INSTALLATION

To install the hydraulic hoses, fittings, etc.:

1. Plumb the suction line filter as shown in Figure C-2.
2. Install the 1-1/4" suction hose between the suction-line filter and the pump inlet. Tighten the hose clamps.
3. Install the pressure hose between the valve bank and the pump outlet.
4. Fill the hydraulic oil reservoir to the "FULL" mark.

5. Open the gate valve at the suction filter.

CAUTION

Failure to open the gate valve will result in a dry running pump which may damage the pump.

6. Open the return gate valve.
7. Start the vehicle engine and engage the PTO. Allow the system to run for about 5 minutes and then check the vacuum gauge on the suction-line filter (it should read 8" or less of mercury). If the vacuum reading is too high, check to make certain that the gate valve is open. If the gate valve is open, check for a collapsed or restricted suction line.

Item No.	Description	Qty
1.	PTO	Ref.
2.	PUMP	Ref.
3.	HOSE; 1/2" ID x 72" lg.	1
4.	ELBOW, 90°; 7/8-14 str. thd. (m) x 3/4-16 JIC(m)	1
5.	ADAPTER; 1-5/8" str. thd. (f) x 1-1/4" npt(f)	1
6.	NIPPLE, barbed, 90°; 1-1/4"	2
7.	CLAMP, hose; 1-1/4"	4
8.	HOSE; 1-1/4" ID x 48" lg.	1
9.	NIPPLE, barbed; 1-1/4"	2
10.	FILTER, suction	1
11.	NIPPLE; 1-1/4" close	1
12.	GAUGE, vacuum	1
13.	VALVE, gate; 1-1/4"	1
14.	BRACKET, oil filter	1
15.	SCREW; 1/2-13 x 1-1/4" hex hd.	4
16.	WASHER, lock; 1/2"	4
17.	SCREW; 5/16-18 x 1" hex hd.	2
18.	WASHER, lock; 5/16"	2
19.	ELBOW, special, pressure gauge	1

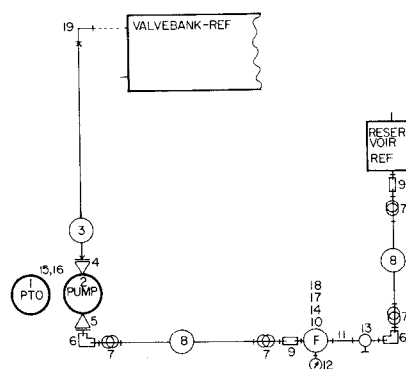


Figure C—2. Hydraulic Installation



Section 4. PARTS LIST

4—1. GENERAL

This section contains the exploded parts drawings with the accompanying parts list for the assemblies used on this crane. These drawings are intended to be used in conjunction with the instructions found in the REPAIR section in Volume 1. For optional equipment such as winches and remote controls, refer to the appropriate service manual.

WARNING

Do not attempt to repair any component without reading the information contained in the REPAIR section in Volume 1. Pay particular attention to the WARNING's, CAUTION's and NOTE's contained in that section. Failure to comply with these instructions may result in damage to the equipment, an injury or even death.

4—2. CRANE IDENTIFICATION

Every crane has an identification placard (Figure D-1) attached to the mast. When ordering parts, communicating warranty information or referring to the unit in correspondence, always include the assigned serial and model numbers. All inquiries should be addressed to Iowa Mold Tooling Company, Inc.; 500 Highway 18 West; Garner, Iowa 50438, telephone: (515) 923-3711 or TWX 910-523-6930. In Canada: Red Top Equipment, Ltd.; Orillia, Ontario; telephone: (705) 325-7458.

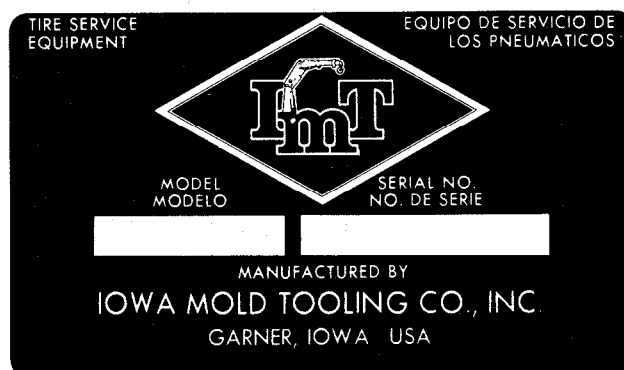


Figure D-1. Serial Number Placard

4—3. CYLINDER IDENTIFICATION

The crane has a cylinder identification placard (Figure D-2) attached to the mast. To ensure proper replacement parts are received, it is necessary to specify a complete number/letter sequence for any part request. Part numbers may be cross checked by comparing the stamped identification of the cylinder case (Figure D-3) against the information stamped on the placard. You must use the part number stamped on the cylinder case when ordering parts.

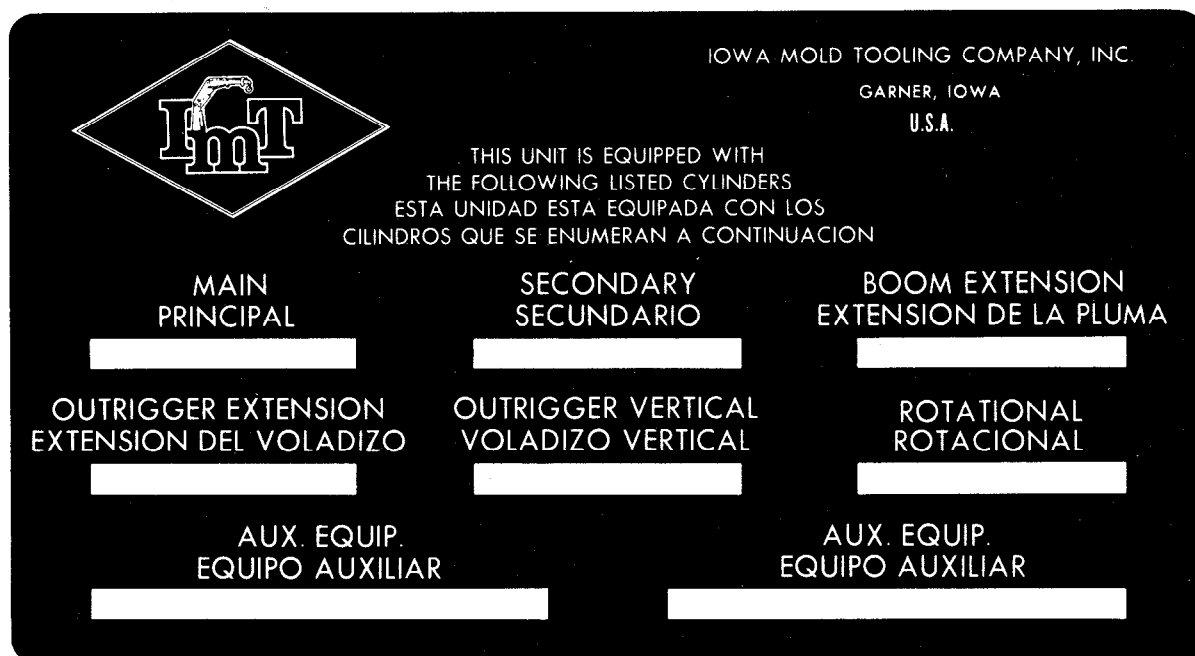


Figure D-2. Cylinder Identification Placard

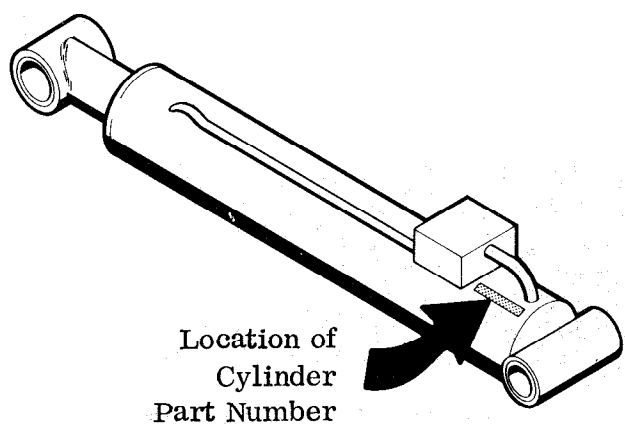


Figure D-3. Cylinder Part Number Location

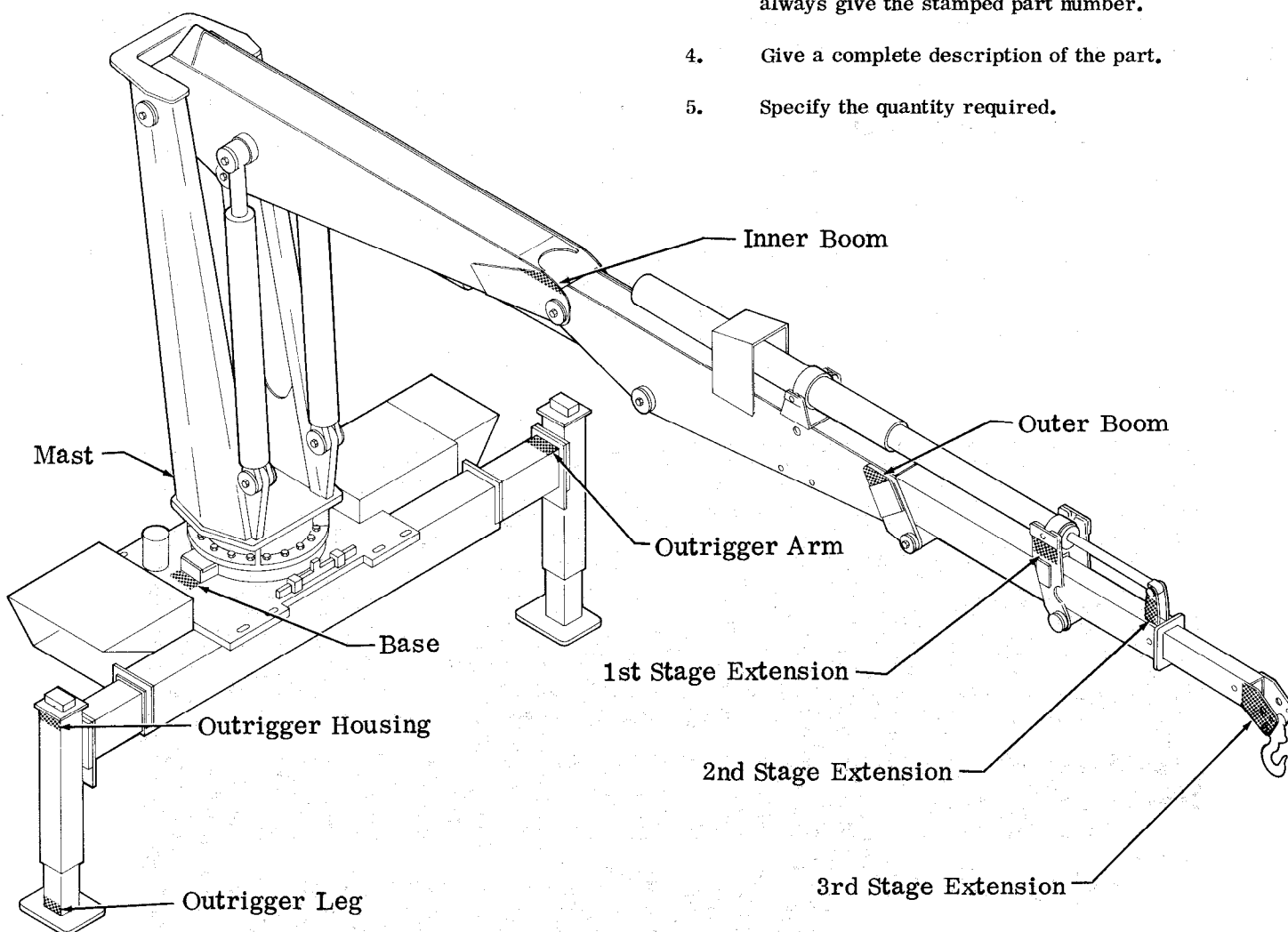


Figure D—4. Weldment Part Number Locations

4—4. WELDMENT IDENTIFICATION

Each of the major weldments - base, mast, inner boom, outer boom, extension boom and outrigger weldments - bear a stamped part number. Any time a major weldment is replaced, you must specify the complete part number as stamped on the weldment. The locations of the part numbers are shown in Figure D-4.

4—5. ORDERING REPAIR PARTS

When ordering replacement parts:

1. Give the model number of the unit.
2. Give the serial number of the unit.
3. Specify the complete part number. When ordering cylinder parts or one of the main weldments, always give the stamped part number.
4. Give a complete description of the part.
5. Specify the quantity required.

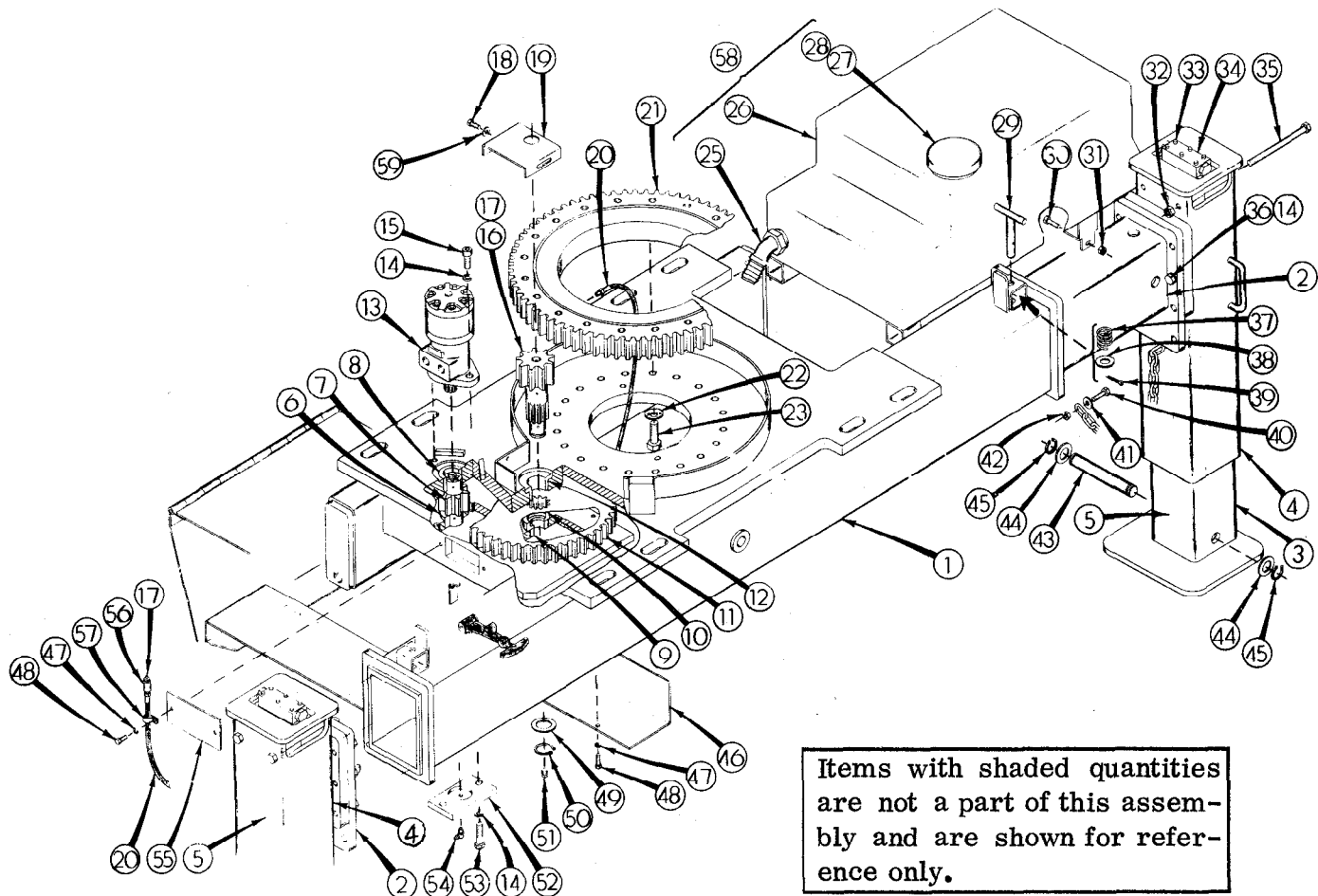


Figure 1-1. Base with Manual Pull-Out Outriggers (Part Number 41702847)

Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty
1.	52701061	BASE	1	31.	72062109	NUT, lock; 5/16-18	4
2.	52701065	ARM, outrigger	2	32.	72062080	NUT, lock; 1/2-13	4
3.	52701140	LEG, outrigger	2	33.	72060708	SCREW; 1/4-20 x 1-1/4" shcs	12
4.	52702642	SLEEVE, outrigger	2	34.	73054004	VALVE, locking holding	2
5.	3B084710	CYLINDER, outrigger	2	35.	72060104	SCREW; 1/2-13 x 6-1/2" hex hd.	4
6.	60020116	BUSHING, lower drive gear	1	36.	72060094	SCREW; 1/2-13 x 1-3/4" hex hd.	12
7.	71056011	GEAR, drive	1	37.	60010351	SPRING	2
8.	60020115	BUSHING, upper drive gear	1	38.	72063007	WASHER, wrt.; 5/8"	2
9.	60020154	BUSHING, lower pinion gear	1	39.	72066185	PIN, cotter; 5/32" x 1" lg.	2
10.	60104694	SPACER, pinion gear	1	40.	72060048	SCREW; 3/8-16 x 1-1/2 hex hd.	2
11.	71056012	GEAR, intermediate	1	41.	72063003	WASHER, wrt.; 3/8"	2
12.	60020114	BUSHING, upper pinion gear	1	42.	72062103	NUT, lock; 3/8-16	2
13.	73051228	MOTOR, hydraulic	1	43.	60102522	PIN, cylinder to leg	2
14.	72063053	LOCK WASHER; 1/2"	16	44.	72063034	BUSHING, machy.; 1" x 10 ga.	4
15.	72060794	SCREW; 1/2-13 x 1-1/4" shcs	2	45.	72066125	RING, retaining	4
16.	71056010	GEAR, pinion	1	46.	60102769	GUARD, gear	1
17.	72053508	ZERK; 1/8" npt	2	47.	72063049	WASHER, lock; 1/4"	4
18.	72060833	SCREW; 5/16-18 x 3/4" self-tap	2	48.	72060002	SCREW; 1/4-20 x 3/4" hex hd.	4
19.	60010235	COVER, pinion gear	1	49.	72063035	BUSHING, machy.; 1-1/4" x 10 ga.	1
20.	73731172	EXTENSION, grease	1	50.	72066084	RING, retaining	1
21.	71056001	GEAR-BEARING, turntable	1	51.	72053240	PLUG, pipe; 1/8" npt	1
22.	72066427	WASHER, spring; 5/8"	20	52.	60010844	PLATE, grease, drive gear	1
23.	72060151	SCREW; 5/8-11 x 2" hex hd. gr. 8	20	53.	72060092	SCREW; 1/2-13 x 1-1/4" hex hd.	2
25.	72531196	NIPPLE, barbed, 45°; 1-1/4"	1	54.	72053561	ZERK; 90°; 1/8" npt	1
26.	52702307	RESERVOIR	1	55.	60102767	PLATE, inspection	1
27.	73141276	SCREEN, fill	1	56.	72053301	COUPLING, pipe; 1/8" npt	1
28.	73014671	CAP, fill	1	57.	72066535	CLAMP; 3/8"	1
29.	52070138	PIN, lock	2	58.	51702823	RESERVOIR	1
30.	72060023	SCREW; 5/16-18 x 3/4" hex hd.	4	59.	72063002	WASHER, wrt.; 5/16"	2

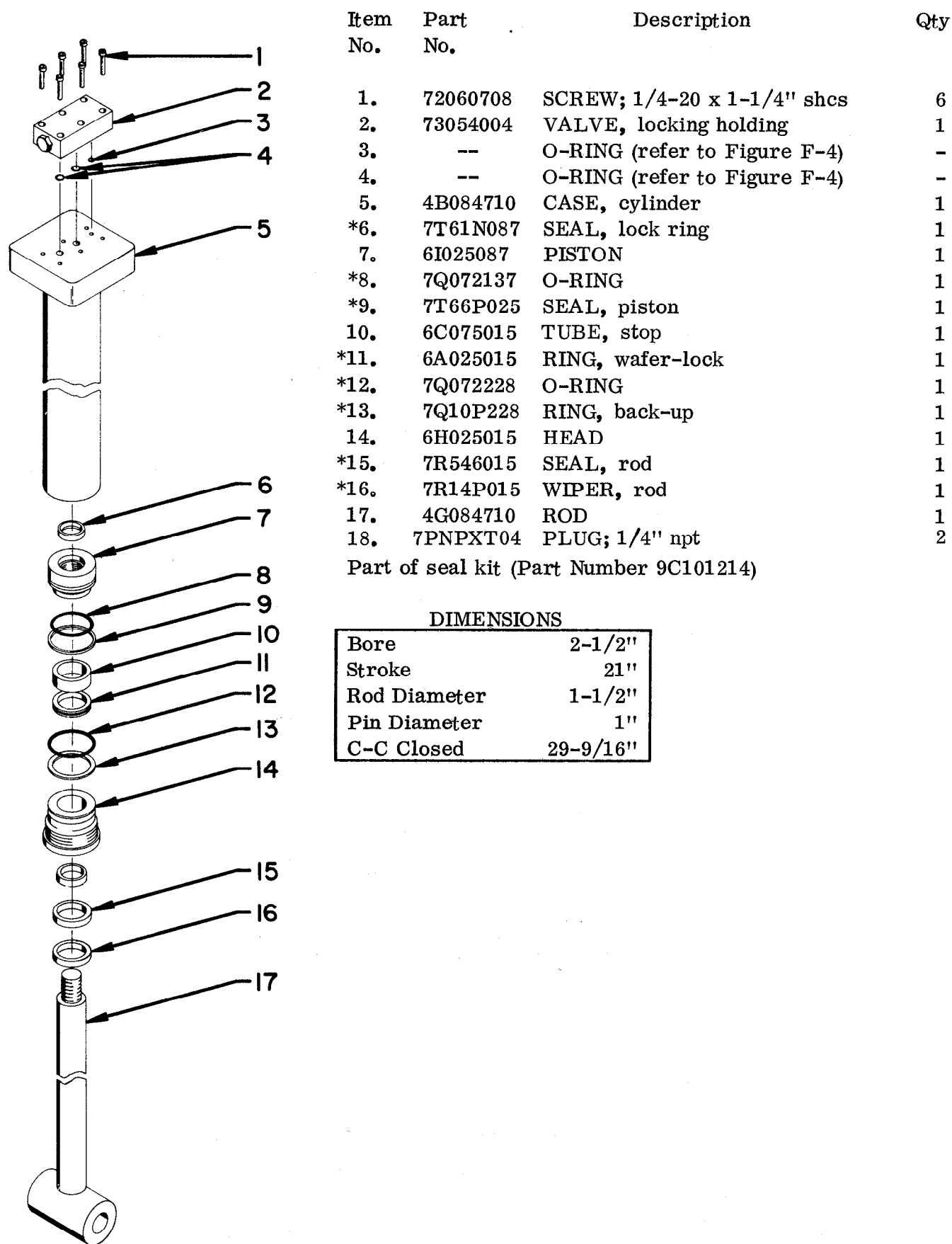


Figure 1-2. Outrigger Cylinder (Part Number 3B084710)

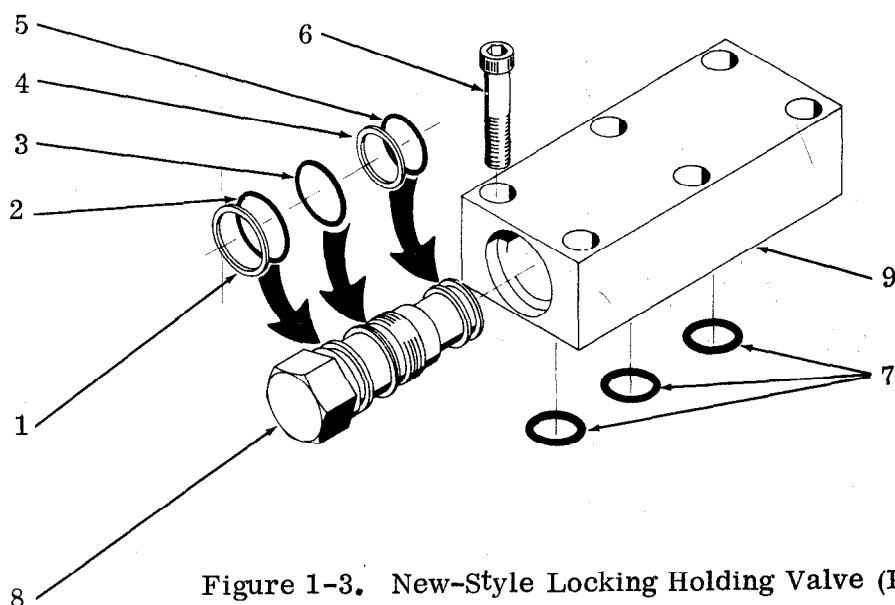
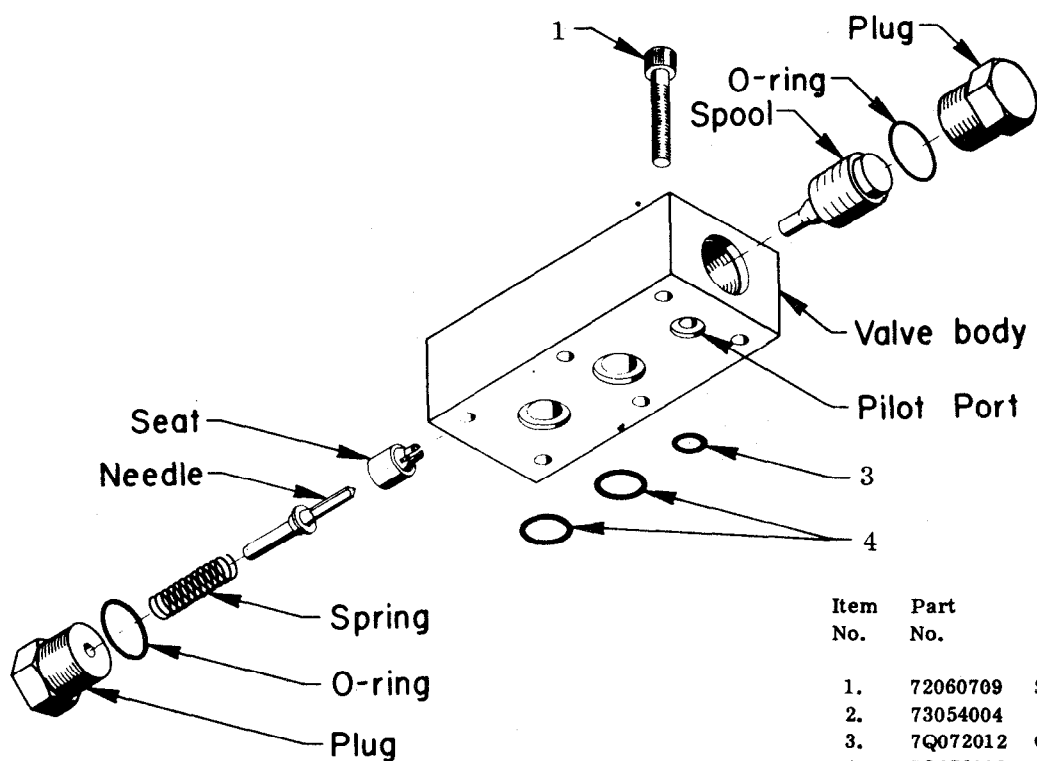


Figure 1-3. New-Style Locking Holding Valve (Part Number 73054004)

Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty
1.	7Q10P018	RING, back-up	1	9.	--	BLOCK (order item 10)	1
2.	7Q072018	O-RING	1	10.	73054004	VALVE, complete	1
3.	7Q072017	O-RING	1				
4.	7Q10P015	RING, back-up	1				
5.	7Q072015	O-RING	1				
6.	72060708	SCREW; 1/4-20 x 1-1/4" shcs	6				
7.	9C111411	KIT, o-ring*	1				
8.	--	VALVE (order item 10)	1				

*Includes 3 - 7Q072111 (large) and 3 - 7Q072014 (small)



Item No.	Part No.	Description	Qty
1.	72060709	SCREW, soc. hd.; 1/4-20 x 1-1/4"	6
2.	73054004	VALVE, safety locking	1
3.	7Q072012	O-RING; small	1
4.	7Q072113	O-RING; large	2

Figure 1-4. Old-Style Locking Holding Valve (Part Number 73054004)

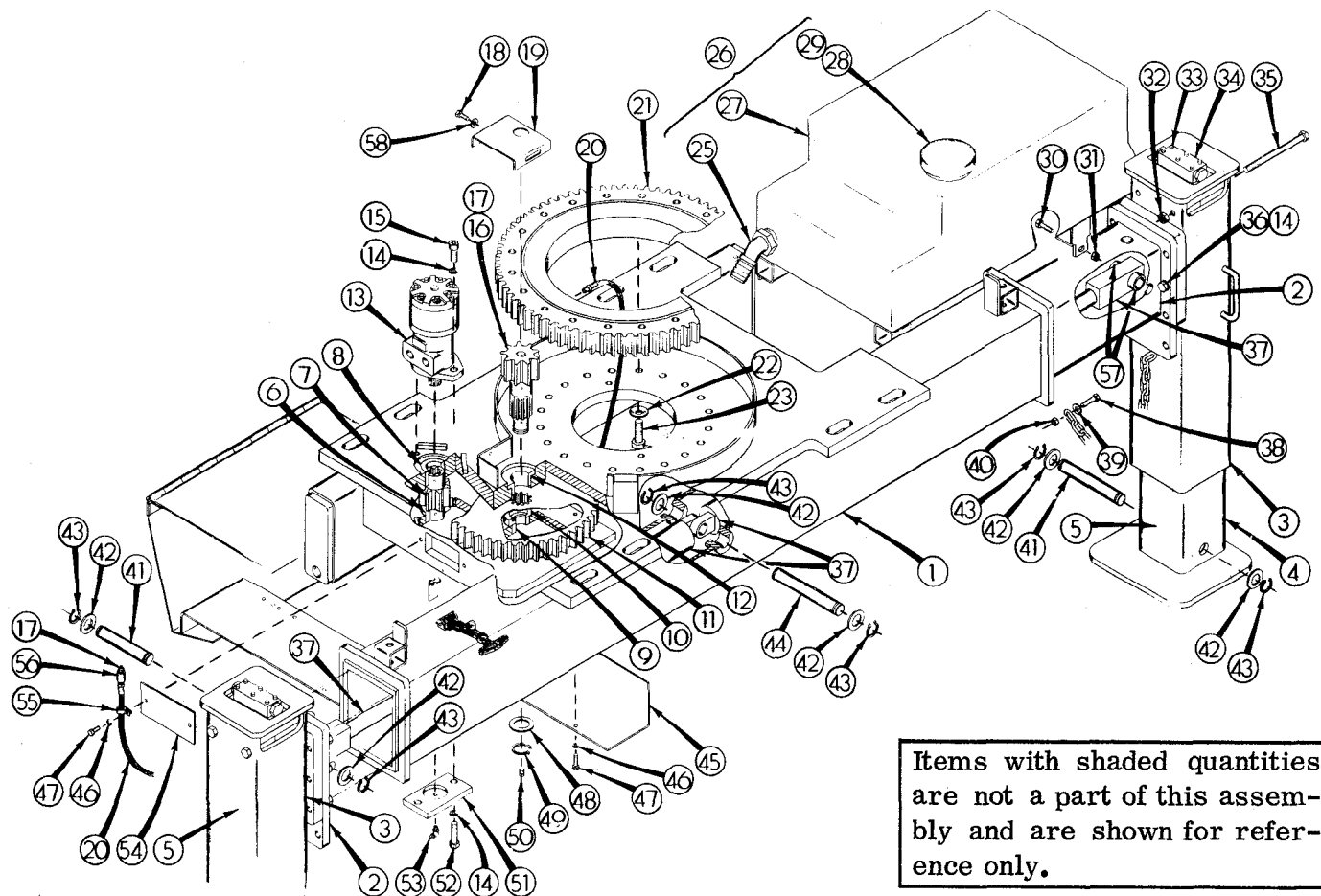


Figure 1-5. Base with Power-Out Outriggers (Part Number 41702848)

Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty
1.	52701061	BASE	1	30.	72060025	SCREW; 5/16-18 x 1" hex hd.	4
2.	52701065	ARM, outrigger	2	31.	72062109	NUT, lock; 5/16-18	4
3.	52702642	SLEEVE, outrigger	2	32.	72062080	NUT, lock; 1/2-13	4
4.	52701140	LEG, outrigger	2	33.	72060708	SCREW; 1/4-20 x 1-1/4" shcs	12
5.	3B084710	CYLINDER, power-down outrigger	2	34.	73054004	VALVE, safety locking	2
6.	60020116	BUSHING, lower drive gear	1	35.	72060104	SCREW; 1/2-13 x 6-1/2" hex hd.	4
7.	71056011	GEAR, drive	1	36.	72060094	SCREW; 1/2-13 x 1-3/4" hex hd.	12
8.	60020115	BUSHING, upper drive gear	1	37.	3B210520	CYLINDER, power-out outrigger	2
9.	60020154	BUSHING, lower pinion gear	1	38.	72060048	SCREW; 3/8-16 x 1-1/2" hex hd.	2
10.	60104694	SPACER, pinion gear	1	39.	72063003	WASHER, wrt.; 3/8"	2
11.	71056012	GEAR, intermediate	1	40.	72062103	NUT, lock; 3/8-16	2
12.	60020114	BUSHING, upper pinion	1	41.	60102522	PIN, power-down cylinder to sleeve	4
13.	73051228	MOTOR, hydraulic	1	42.	72063034	BUSHING, machy.; 1" x 10 ga.	10
14.	72063053	WASHER, lock; 1/2"	16	43.	72066125	RING, retaining	10
15.	72060794	SCREW; 1/2-13 x 1-1/4" shcs	2	44.	60103202	PIN, power-out cylinder to base	1
16.	71056010	GEAR, pinion	1	45.	60102769	GUARD, gear	1
17.	72053508	ZERK; 1/8" npt	2	46.	72063049	WASHER, lock; 1/4"	4
18.	72060833	SCREW; 5/16-18 x 3/4" self-tap	2	47.	72060002	SCREW; 1/4-20 x 3/4" hex hd.	4
19.	60010235	COVER, pinion	1	48.	72063035	BUSHING; 1-1/4" x 10 ga.	1
20.	73731172	EXTENSION, grease	1	49.	72066084	RING, retaining	1
21.	71056001	GEAR-BEARING, turntable	1	50.	72053244	PLUG, pipe; 1/8" npt	1
22.	72063119	WASHER, spring; 5/8"	20	51.	60010844	PLATE, grease, drive gear	1
23.	72060151	SCREW; 5/8-11 x 2" hex hd. gr. 8	20	52.	72060092	SCREW; 1/2-13 x 1-1/4" hex hd.	2
25.	72531196	NIPPLE, barbed, 90°; 1-1/4"	1	53.	72053561	ZERK, 90°; 1/8" npt	1
26.	51702823	RESERVOIR	1	54.	60102767	PLATE, inspection	1
27.	52702307	RESERVOIR	1	55.	72066535	CLAMP; 3/8"	1
28.	73141276	SCREEN, fill	1	56.	72053301	COUPLING, pipe; 1/8" npt	1
29.	73014671	CAP, fill	1	57.	60101908	SPACER, power-out cylinder to arm	4
				58.	72063002	WASHER, wrt.; 5/16"	2

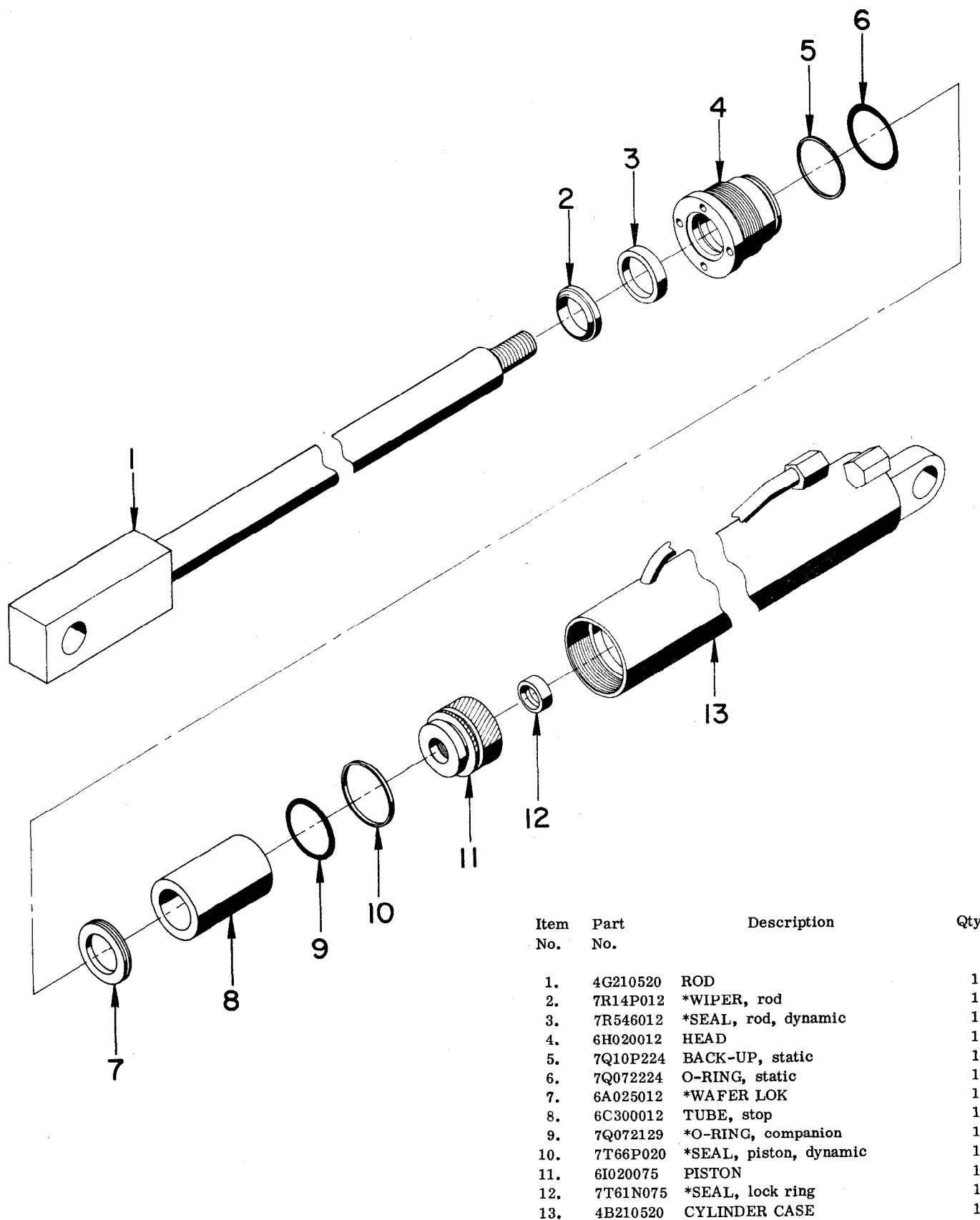


Figure 1-6. Power-Out Outrigger Cylinder (Part Number 3B210520)

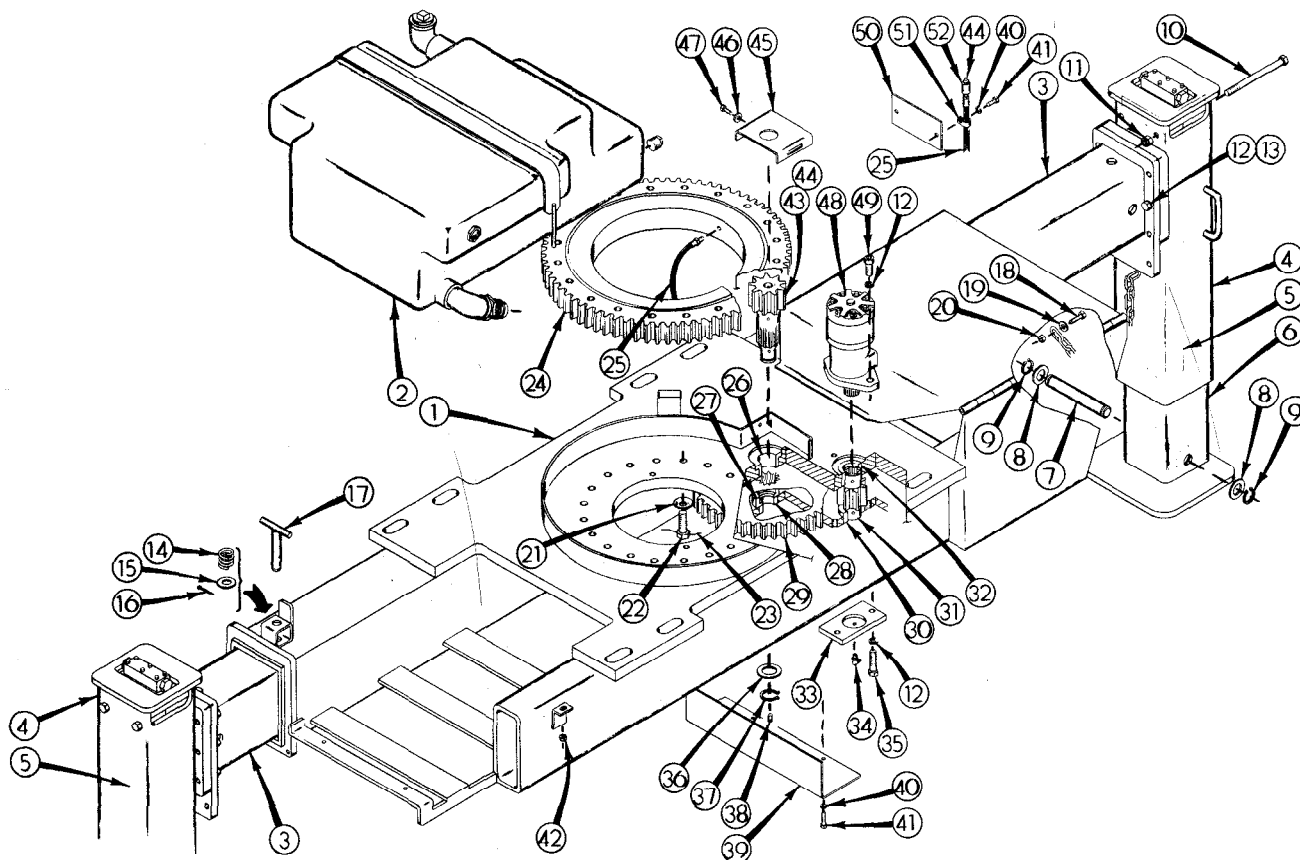


Figure 1-7. Base with Manual Pull-Out Outrigger and Plastic Reservoir

Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty
1.	--	BASE	1	27.	60104694	SPACER, pinion	1
2.	--	RESERVOIR, plastic	1	28.	60020154	BUSHING, lower pinion gear	1
3.	52701065	ARM	2	29.	71056012	GEAR, intermediate	1
4.	52701140	LEG, weldment	2	30.	60020116	BUSHING, lower drive gear	1
5.	3B084710	CYLINDER, outrigger	2	31.	71056011	GEAR, drive	1
6.	52702642	SLEEVE	2	32.	60020115	BUSHING, upper drive gear	1
7.	60102522	PIN, cylinder to sleeve	2	33.	60010844	PLATE, grease, drive gear	1
8.	72063034	BUSHING, machy.; 1" x 10 ga.	4	34.	72053561	ZERK, 90°; 1/8" npt	1
9.	72066125	RING, retaining	4	35.	72060092	SCREW; 1/2-13 x 1-1/4" hex hd.	2
10.	72060104	SCREW; 1/2-13 x 6-1/2"	4	36.	72063035	BUSHING, machy.; 1-1/4" x 10 ga.	1
11.	72062080	NUT, lock; 1/2-13	4	37.	72066084	RING, retaining	1
12.	72063053	WASHER, lock; 1/2"	16	38.	72053244	PLUG, pipe; 1/8" npt	1
13.	72060094	SCREW; 1/2-13 x 1" hex hd.	12	39.	60102769	GUARD, gear	1
14.	60010351	SPRING	2	40.	72063049	WASHER, lock; 1/4"	4
15.	72063007	WASHER, wrt.; 5/8"	2	41.	72060002	SCREW; 1/4-20 x 3/4" hex hd.	4
16.	72066185	PIN, cotter; 5/32" x 1"	2	42.	72062109	NUT, lock; 5/16"	2
17.	52070138	PIN, lock	2	43.	71056010	PINION	1
18.	72060048	SCREW; 3/8-16 x 1-1/2"	2	44.	62053508	ZERK; 1/8" npt	2
19.	72063003	WASHER, wrt.; 3/8"	2	45.	60010235	COVER, pinion	1
20.	72062103	NUT, lock; 3/8-16	2	46.	72063002	WASHER, wrt.; 5/16"	2
21.	72063119	WASHER, hardened; 5/8"	20	47.	72060833	SCREW; 5/16-18 self-tap	2
22.	72060151	SCREW; 5/8-11 x 2" gr. 8	20	48.	73051228	MOTOR, hydraulic	1
23.	--	NOT USED	-	49.	72060794	SCREW; 1/2-13 x 1-1/4" shcs	2
24.	71056001	BEARING, turntable	1	50.	60102767	PLATE, inspection	1
25.	73731172	EXTENSION, grease; 31-1/4"	1	51.	72066335	CLAMP; 3/8"	1
26.	60020114	BUSHING, upper pinion	1	52.	72053301	COUPLING; 1/8" npt	1

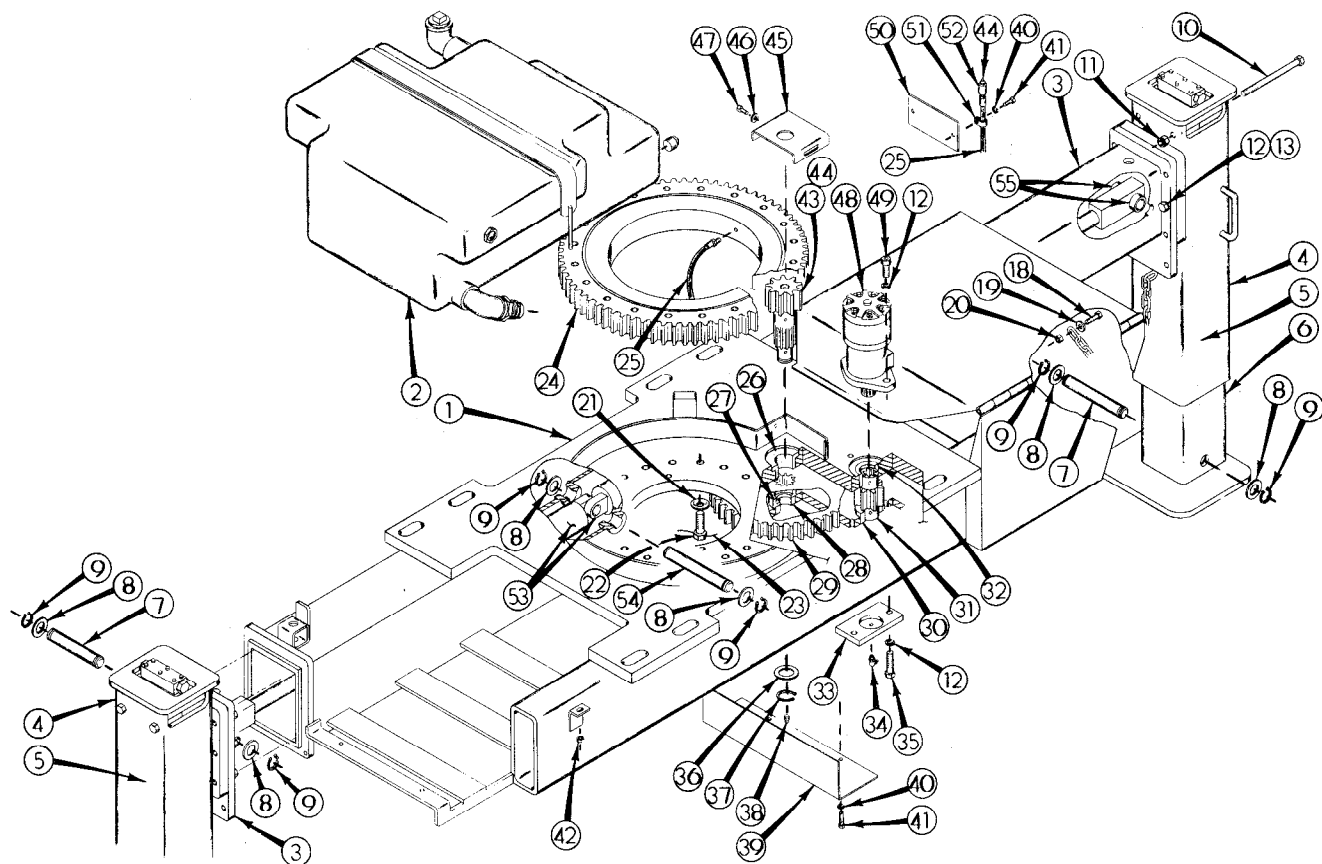


Figure 1-8. Base with Power-Out Outrigger and Plastic Reservoir

Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty
1.	--	BASE	1	31.	71056011	GEAR, drive	1
2.	--	RESERVOIR	1	32.	60020115	BUSHING, upper drive gear	1
3.	52701065	ARM	2	33.	60010844	PLATE, drive gear grease	1
4.	52701140	LEG	2	34.	72053561	ZERK, 90°; 1/8" npt	1
5.	3B084710	CYLINDER, power-down	2	35.	72060092	SCREW; 1/2-13 x 1-1/4" hex hd.	2
6.	52702642	SLEEVE	2	36.	72063035	BUSHING, machy.; 1-1/4" x 10 ga.	1
7.	60102522	PIN, cylinder to sleeve/arm	4	37.	72066084	RING, retaining	1
8.	72063034	BUSHING, machy.; 1" x 10 ga.	10	38.	72053244	PLUG; 1/8" npt	1
9.	72066125	RING, retaining	10	39.	60102769	GUARD, gear	1
10.	72060104	SCREW; 1/2-13 x 6-1/2" hex hd.	4	40.	72063049	WASHER, lock; 1/4"	4
11.	72062080	NUT, lock; 1/2-13	4	41.	72060002	SCREW; 1/4-20 x 3/4" hex hd.	4
12.	72063053	WASHER, lock; 1/2"	16	42.	72062109	NUT, lock; 5/16-18	2
13.	72060094	SCREW; 1/2-13 x 1-3/4" hex hd.	12	43.	71056010	GEAR, pinion	1
18.	72060048	SCREW; 3/8-16 x 1-1/2" hex hd.	2	44.	72053508	ZERK; 1/8" npt	1
19.	72063003	WASHER, wrt.; 3/8"	2	45.	60010235	COVER, pinion gear	1
20.	72062103	NUT, lock; 3/8-16	2	46.	72063002	WASHER, wrt.; 5/16"	2
21.	72063119	WASHER, hardened; 5/8"	20	47.	72060833	SCREW, self-tap; 5/16-18 x 3/4"	2
22.	72060151	SCREW; 5/8-11 x 2" grade 8	20	48.	73051228	MOTOR	1
24.	71056001	GEAR-BEARING, turntable	1	49.	72060794	SCREW; 1/2-13 x 1-1/4" shcs	2
25.	73731172	EXTENSION, grease; 31-1/4" lg.	1	50.	60102767	PLATE, inspection	1
26.	60010114	BUSHING, upper pinion	1	51.	72066535	CLAMP; 3/8"	1
27.	60104694	SPACER, pinion gear	1	52.	72053301	COUPLING, pipe; 1/8" npt	1
28.	60020154	BUSHING, lower pinion	1	53.	3B210520	CYLINDER, power-out	2
29.	71056012	GEAR, intermediate	1	54.	60103202	PIN, power-out cylinder to base	1
30.	60020116	BUSHING, lower drive gear	1	55.	60101908	SPACER, power-out cyl. to arm	4

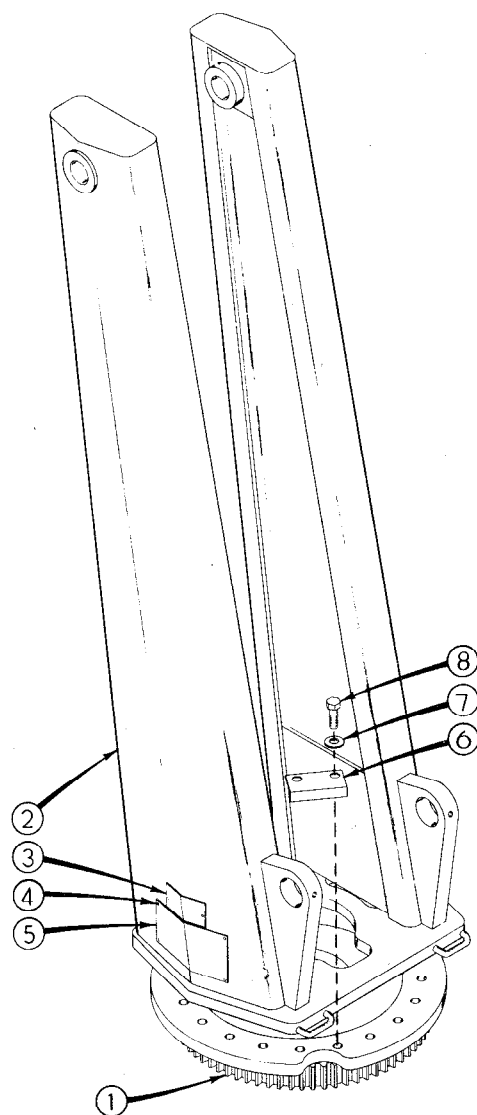


Figure 2-1. Mast (Part Number 41701028)

Item No.	Part No.	Description	Qty
1.	71056001	GEAR-BEARING, turntable	1
2.	52701033	MAST	1
3.	71029115	PLACARD, serial number	1
4.	72066340	RIVET, pop; 1/8"	6
5.	71029106	PLACARD, cylinder ID	1
6.	60104539	COVER, pinion gear	1
7.	72063119	WASHER; 5/8"	20
8.	72060151	SCREW; 5/8-11 x 2" hex hd. gr. 8	20

Items with shaded quantities are not a part of this assembly and are shown for reference only.

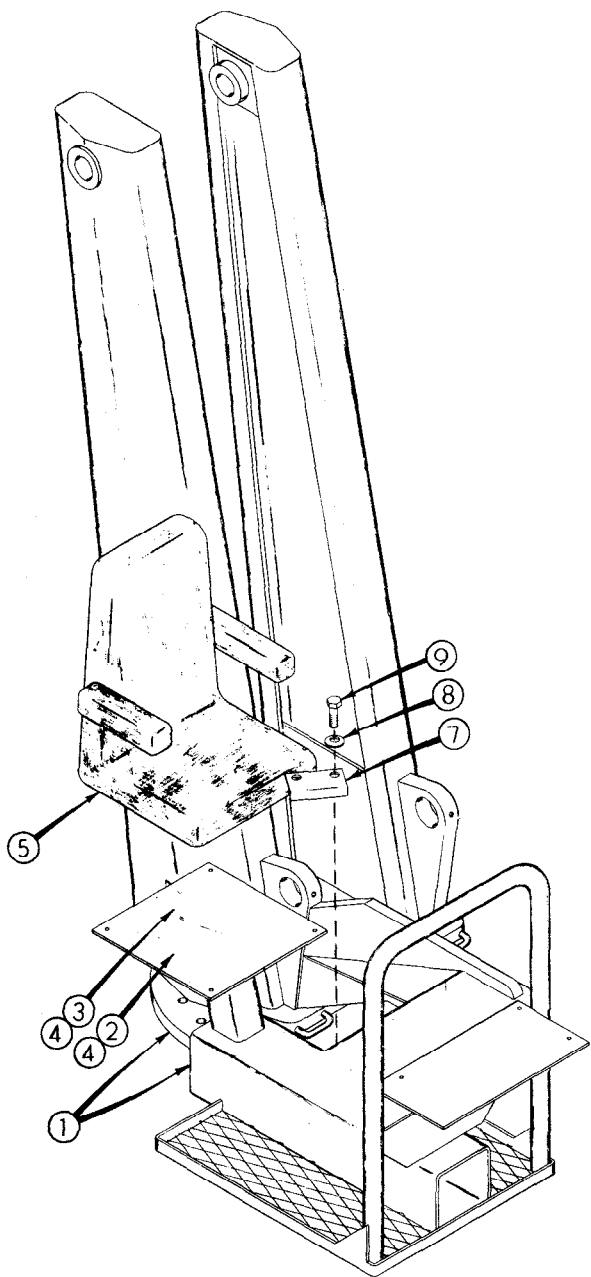


Figure 2-2. Mast with Lower Chair (Part Number 41702571)

Item No.	Part No.	Description	Qty
1.	52702577	MAST	1
2.	71029106	PLACARD, cylinder ID	1
3.	71029115	PLACARD, serial number	1
4.	72066340	RIVET, pop; 1/8"	6
5.	70073143	CHAIR w/mounting hardware	1
7.	60104539	COVER, pinion	1
8.	72063119	WASHER, spring; 5/8"	20
9.	72060151	SCREW; 5/8-11 x 2" hex hd. gr. 8	20

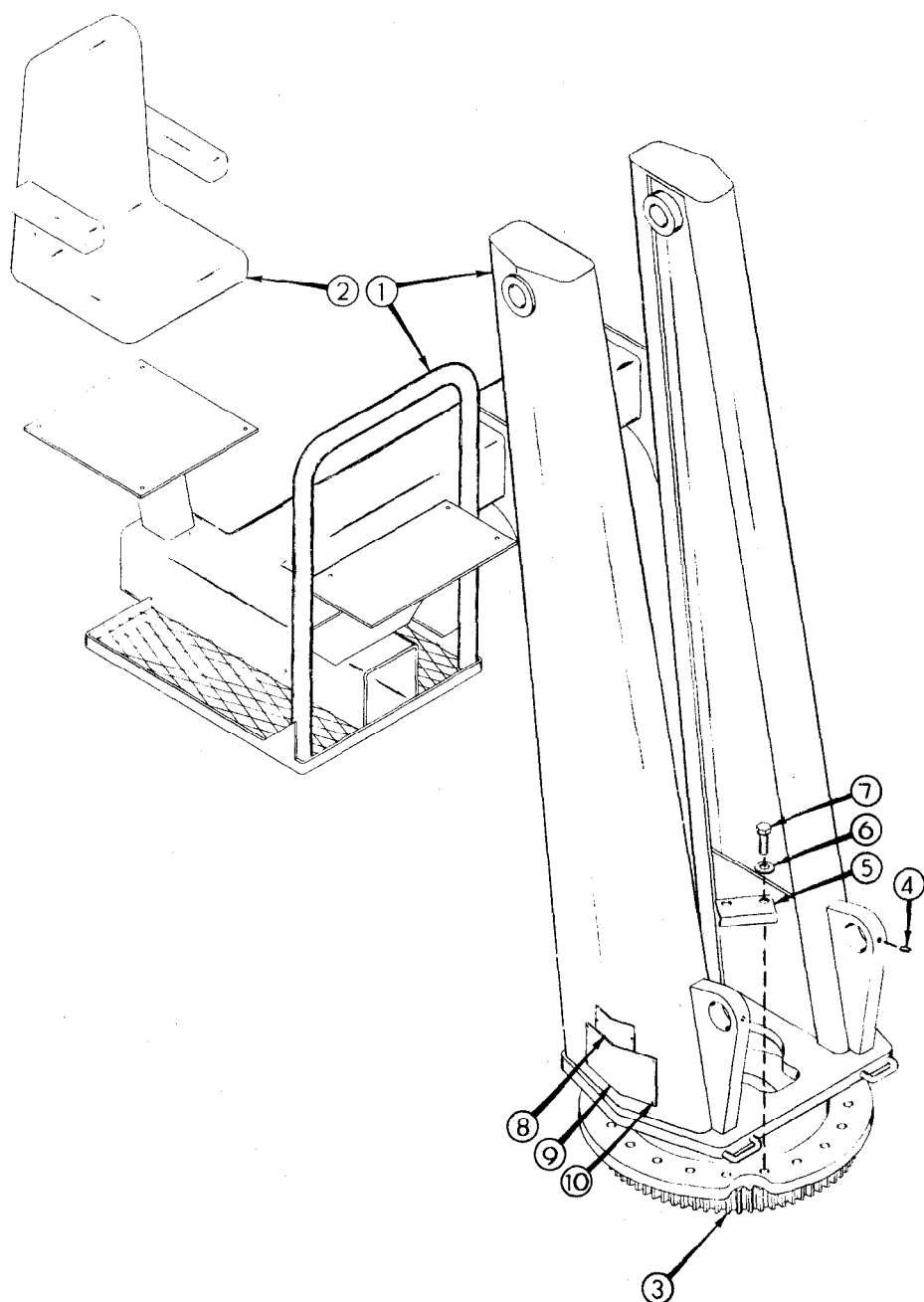


Figure 2-3. Mast with Upper Chair (Part Number 41702036)

Items with shaded quantities are not a part of this assembly and are shown for reference only.

Item No.	Part No.	Description	Qty
1.	52702033	MAST w/platform	1
2.	70073143	CHAIR w/mounting hardware	1
3.	71056001	GEAR-BEARING, turntable	1
5.	60104539	COVER, pinion gear	1
6.	72063119	WASHER, spring; 5/8"	20
7.	72060151	SCREW; 5/8-11 x 2" hex hd. gr. 8	20
8.	71029115	PLACARD, serial number	1
9.	71029106	PLACARD, cylinder ID	1
10.	72066340	RIVET, pop; 1/8"	6

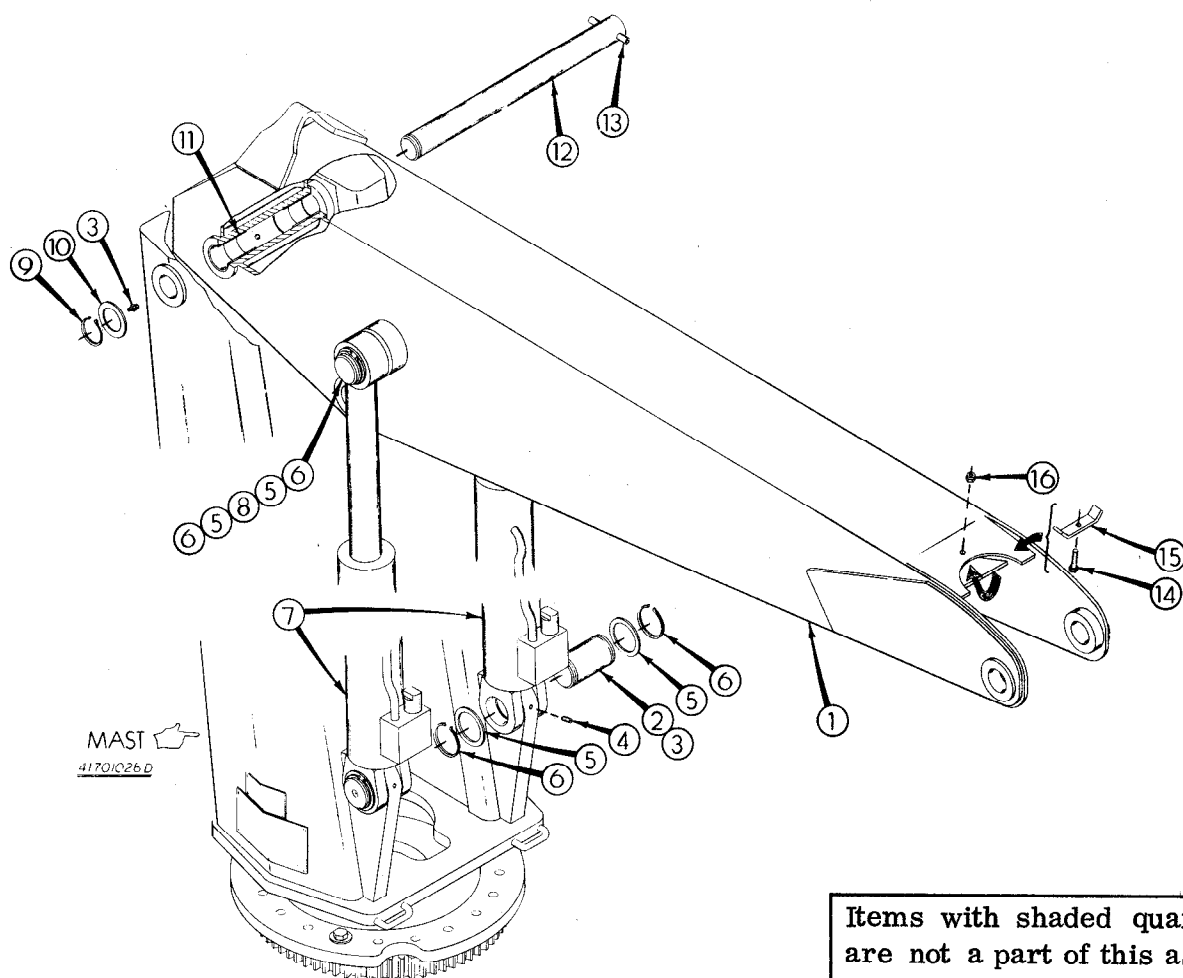


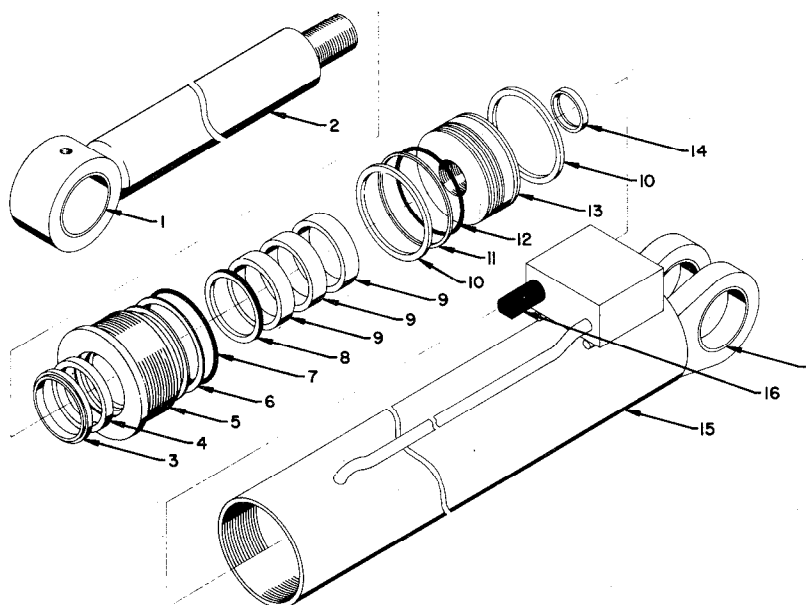
Figure 3-1. Main Boom (Part Number 41701029)

Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty
1.	52701069	BOOM	1	9.	72066136	RING, retaining	1
2.	60102275	PIN, cylinder/mast	2	10.	72063039	BUSHING, machy.; 2" x 10 ga.	1
3.	72053508	ZERK; 1/8" npt	3	11.	7BF81520	BUSHING, main boom	1
4.	72060858	SCREW, set; 3/8-16 x 3/4"	2	12.	60102276	PIN, main/mast	1
5.	72063040	BUSHING, machy.; 2-1/2" x 10 ga.	6	13.	72661163	PIN, groove; 1/2" x 4"	1
6.	72066103	RING, retaining	6	14.	72060048	SCREW; 3/8-16 x 1-1/2" hex hd.	1
7.	3B309522	CYLINDER, main	2	15.	60010118	CLAMP, hose	1
8.	60102320	PIN, cylinder/boom	1	16.	72062103	NUT, lock; 3/8-16	1



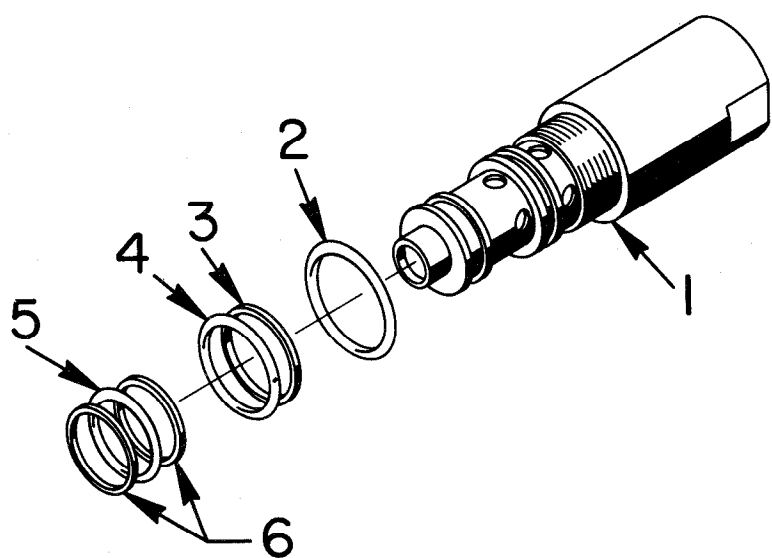
DIMENSIONS

Bore	4"
Stroke	32"
Rod Diameter	2-1/2"
Pin Diameter	2-1/2"
C-C Closed	45-7/8"



Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty
1.	7BF81025	BUSHING	4	10.	7T65I040	*RING, piston	2
2.	4G309520	ROD	1	11.	7T66P040	*SEAL, piston	1
3.	7R14P025	*WIPER, rod	1	12.	7Q072153	*O-RING	1
4.	7R546025	*SEAL, rod	1	13.	6I040143	PISTON	1
5.	6H040025	HEAD	1	14.	7T61N143	*SEAL, lock ring	1
6.	7Q10P342	*RING, back-up	1	15.	4B309520	CASE, cylinder	1
7.	7Q072342	*O-RING	1	16.	73054242	VALVE, counter balance	1
8.	6A025025	*RING, wafer lock	1				
9.	6C075025	TUBE, stop	3			*Part of seal kit (Part Number 9C162023)	

Figure 3-2. Main Cylinder (Part Number 3B309522)



Item No.	Part No.	Description	Qty
1.	--	BODY, valve (not a replacement part)	1
2.	7Q072215	O-RING	1
3.	7Q10P021	RING, back-up	1
4.	7Q072021	O-RING	1
5.	7Q072020	O-RING	1
6.	7Q10P020	RING, back-up	2

Figure 3-3. Counter Balance Holding Valve (Part Number 73054242)

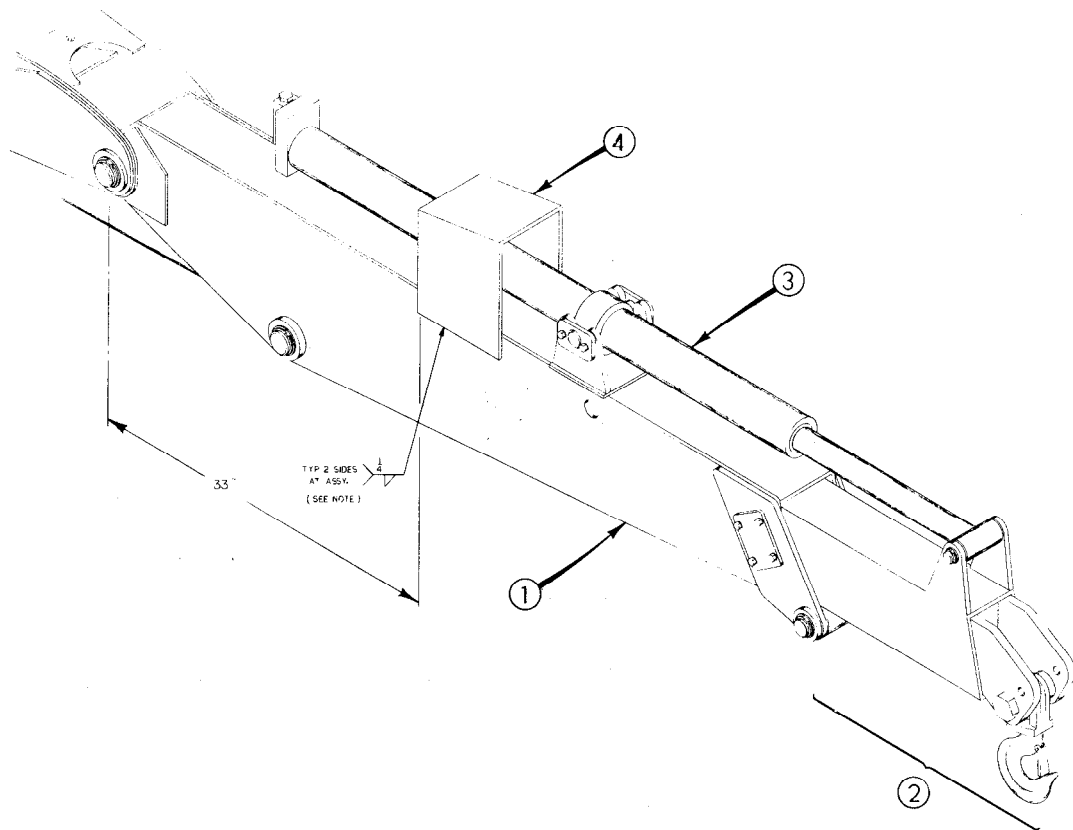


Figure 4-1. Secondary and Extension Boom - 1-Stage Hydraulic Extension
(Part Number 41701763)

Item No.	Part No.	Description	Qty
1.	41701776	BOOM, secondary	1
2.	41701197	BOOM, extension	1
3.	3B048610	CYLINDER, extension	1
4.	52701216	GUARD, cylinder	1

Items with shaded quantities are not a part of this assembly and are shown for reference only.

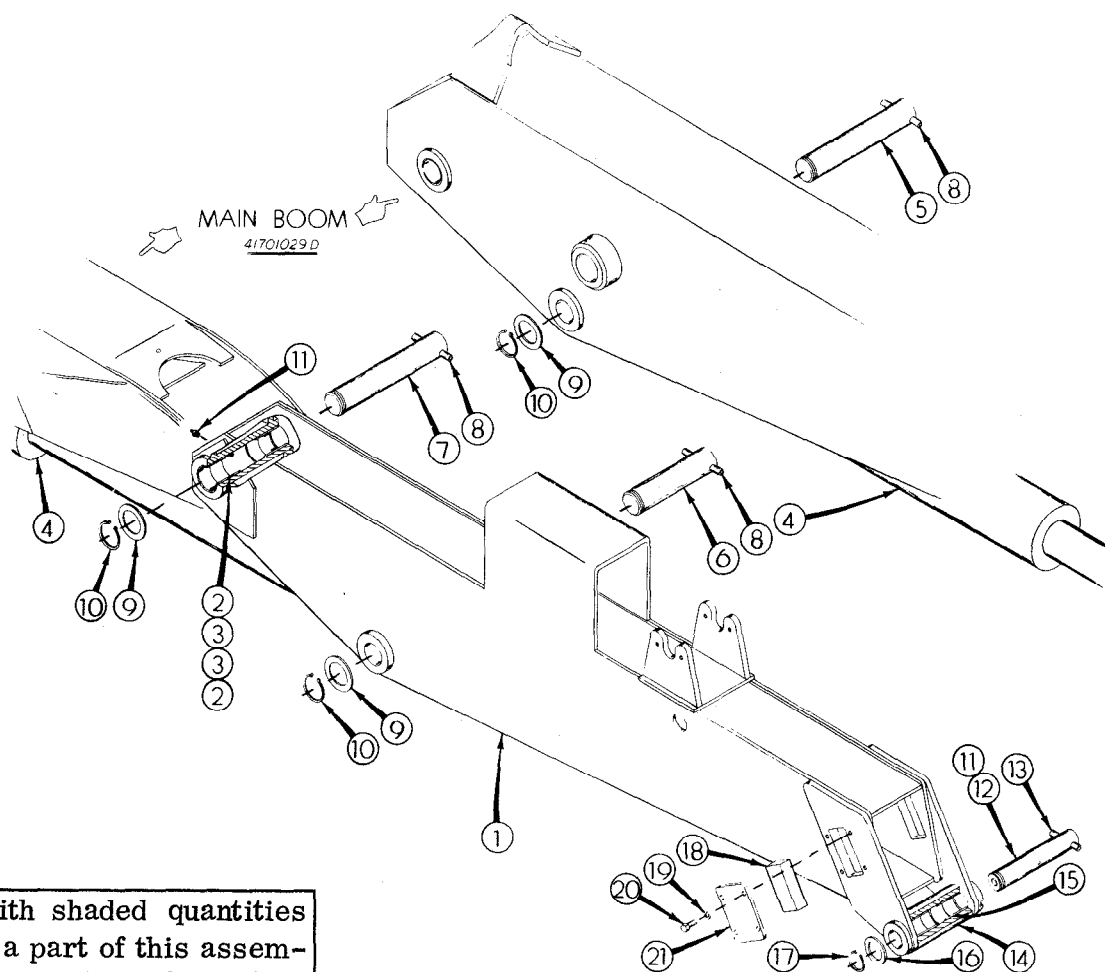


Figure 4-2. Secondary Boom (Part Number 41701776)

Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty
1.	52701777	BOOM, secondary	1	12.	60102647	PIN, roller	1
2.	7BF82020	BUSHING	2	13.	72661159	PIN, groove; 1/2" x 3"	1
3.	7BF81520	BUSHING	2	14.	60102322	ROLLER	1
4.	3C310512	CYLINDER, secondary	1	15.	7BF81215	BUSHING, roller	1
5.	60102319	PIN, secondary cylinder to main	1	16.	72063037	BUSHING, machy.; 1-1/2" x 10 ga.	1
6.	60102324	PIN, secondary cylinder to secondary	1	17.	72066132	RING, retaining	1
7.	60102321	PIN, main boom/secondary boom	1	18.	60030006	PAD, rub	2
8.	72661163	PIN, groove; 1/2" x 4"	3	19.	72063051	WASHER, lock; 3/8"	8
9.	72063039	BUSHING, machy.; 2" x 10 ga.	3	20.	72060044	SCREW; 3/8-16 x 3/4" hex hd.	8
10.	72066136	RING, retaining	3	21.	60102654	PLATE, retainer	2
11.	72053508	ZERK; 1/8" npt	2				

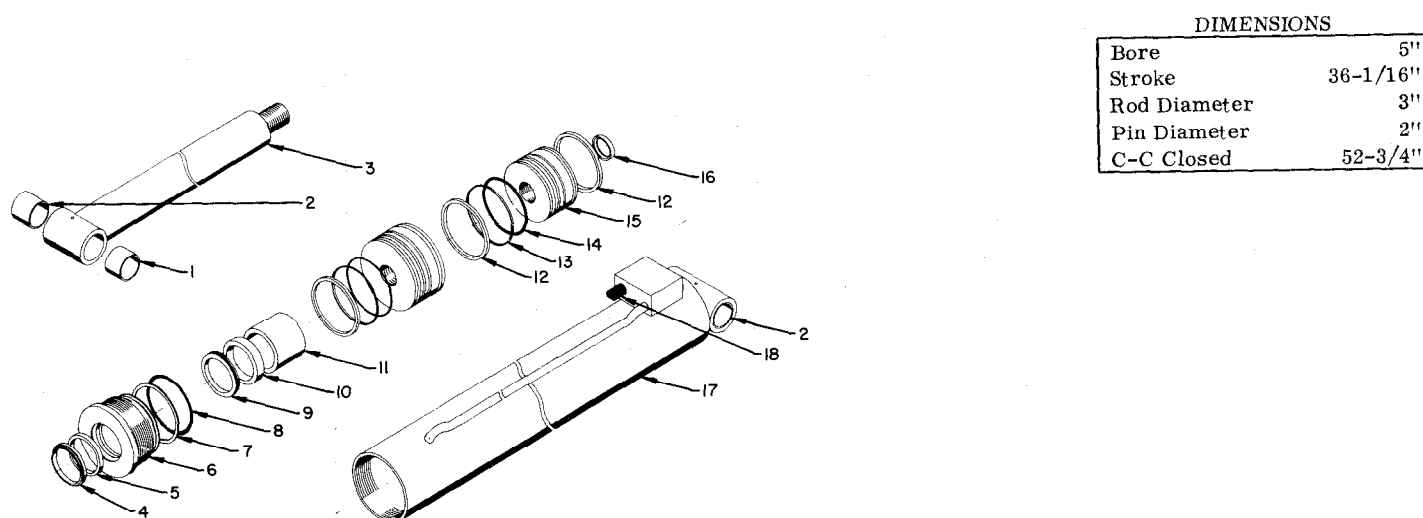
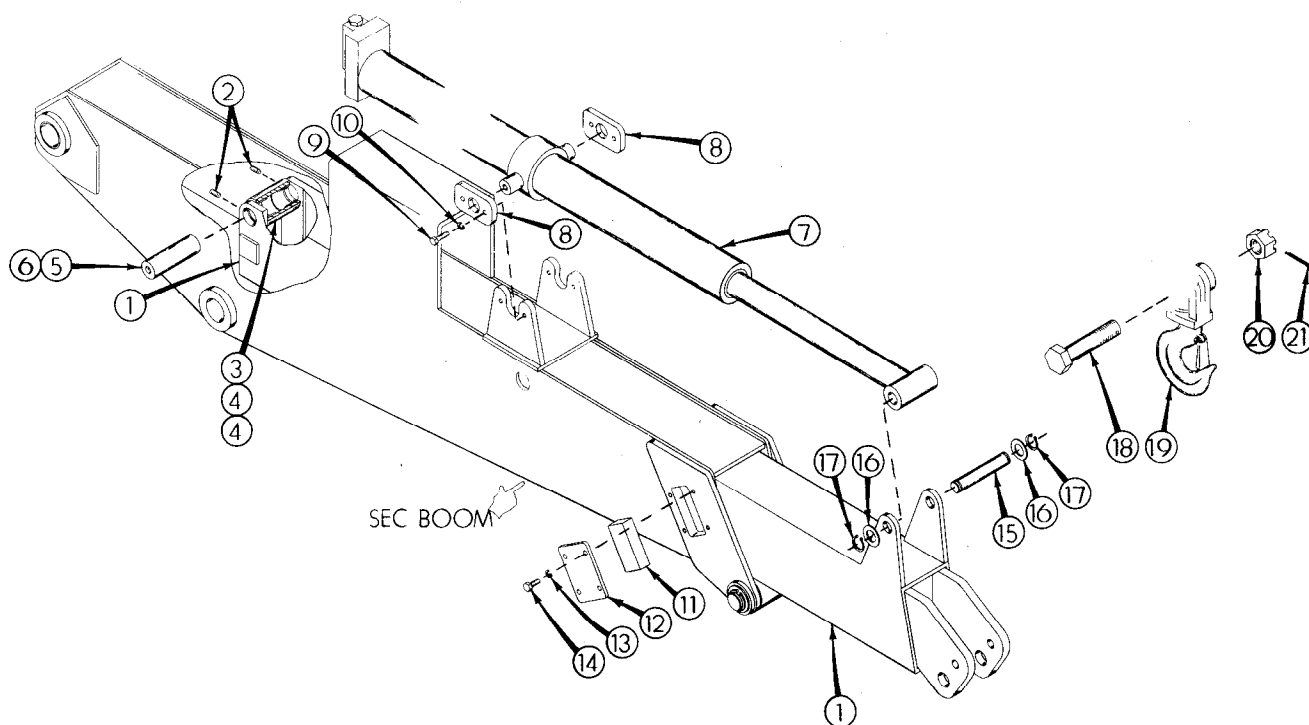


Figure 4-3. Secondary Cylinder (Part Number 3C310512)

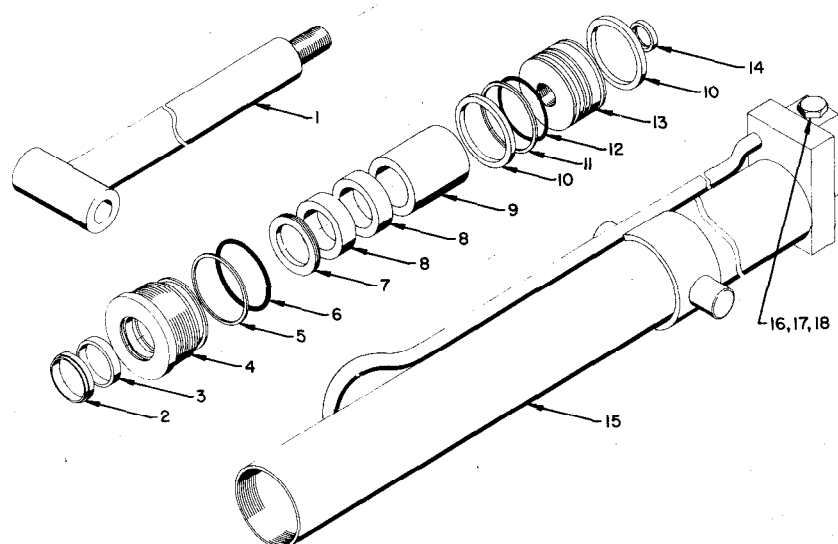
Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty
1.	7BF81520	BUSHING	1	11.	6C300030	TUBE, stop	1
2.	7BF82020	BUSHING	3	12.	7T651050	*RING, piston	2
3.	4G310510	ROD	1	13.	7T66P050	*SEAL, piston	1
4.	7R14P030	*WIPER, rod	1	14.	7Q072157	*O-RING	1
5.	7R546030	*SEAL, rod	1	15.	6I050181	PISTON	1
6.	6H050030	HEAD	1	16.	7T61N181	*SEAL, lock ring	1
7.	7Q10P350	*RING, back-up	1	17.	4C310510	CASE, cylinder	1
8.	7Q072350	*O-RING	1	18.	73054242	VALVE, counter balance	1
9.	6A025030	*RING, wafer lock	1	19.	7PNPXT02	PLUG, pipe; 1/8" npt	3
10.	6C075030	TUBE, stop	1	*Part of seal kit (Part Number 9C202429)			



Items with shaded quantities are not a part of this assembly and are shown for reference only.

Figure 4-4. Extension Boom - 1-Stage Hydraulic (Part Number 41701196)

Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty
1.	52701197	BOOM, extension	1	12.	60102654	PLATE, retainer	2
2.	72060858	SCREW, set; 3/8-16 x 3/4"	2	13.	72063051	WASHER, lock; 3/8"	2
3.	60102297	ROLLER	1	14.	72060044	SCREW; 3/8-16 x 3/4" hex hd.	2
4.	7BF81015	BUSHING	2	15.	60101906	PIN, extension cylinder	1
5.	60010004	PIN, roller	1	16.	72063034	BUSHING, machy.; 1" x 10 ga.	2
6.	72053508	ZERK; 1/8" npt	1	17.	72066125	RING, retaining	2
7.	3B048610	CYLINDER, extension	1	18.	60105601	BOLT, hook	1
8.	60102341	PLATE, lock	2	19.	52701716	HOOK	1
9.	72060026	SCREW; 5/16-18 x 1-1/4" hex hd.	4	20.	72062082	NUT, castled; 1-1/4 - 7	1
10.	72063050	WASHER, lock; 5/16"	4	21.	72066197	PIN, cotter; 3/16" x 2-1/2"	1
11.	60030006	PAD, rub	2				

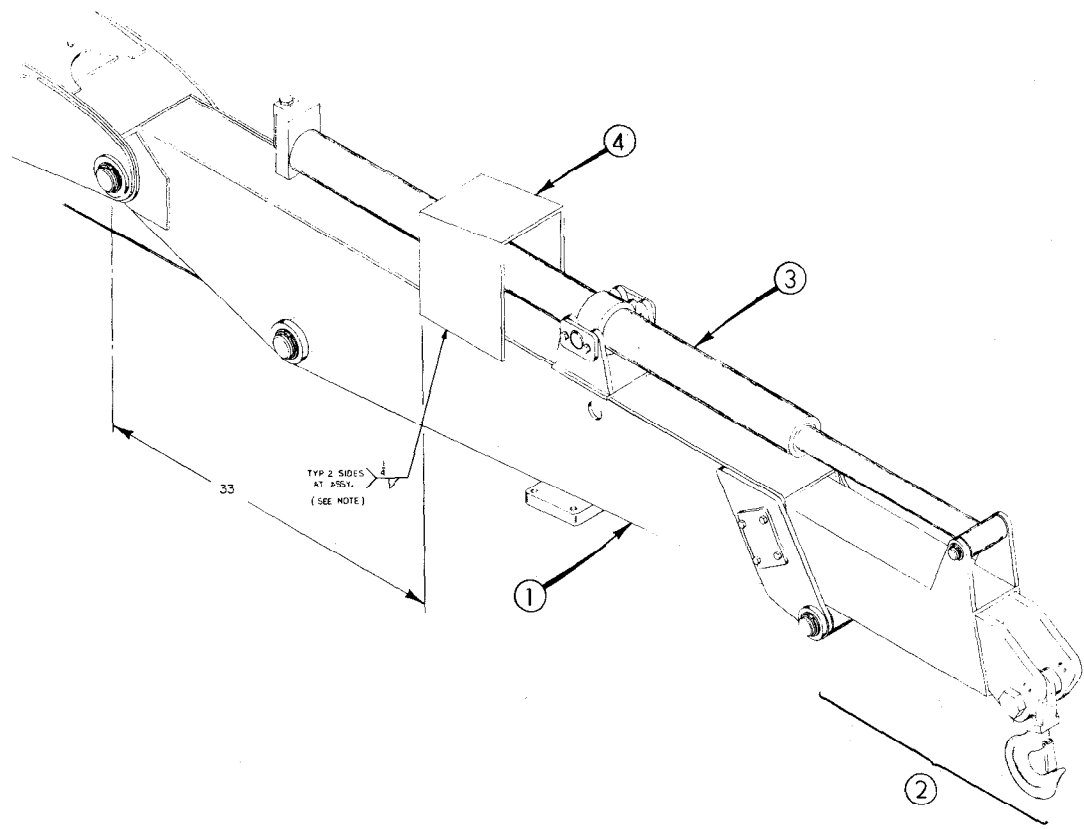


DIMENSIONS

Bore	3"
Stroke	45"
Rod Diameter	2"
Pin Diameter	1"
C-C Closed	25-1/16"

Figure 4-5. Extension Cylinder (Part Number 3B048610)

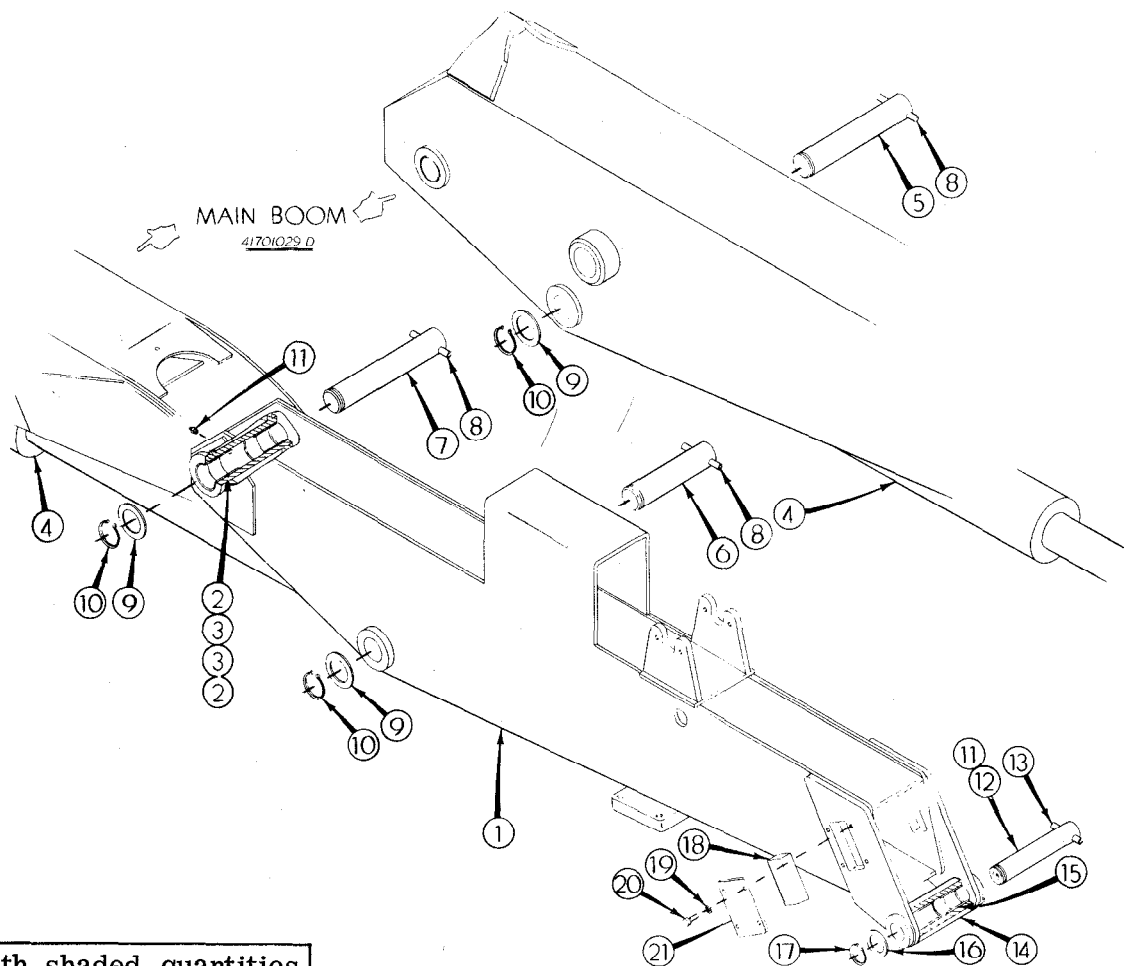
Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty
1.	4G048610	ROD	1	11.	7T66P030	*SEAL, piston	1
2.	7R14P020	*WIPER, rod	1	12.	7Q072145	*O-RING	1
3.	7R546020	*SEAL, rod	1	13.	6I030106	PISTON	1
4.	6H030020	HEAD	1	14.	7T61N106	*SEAL, lock ring	1
5.	7Q10P334	*RING, back-up	1	15.	4B048610	CASE, cylinder	1
6.	7Q072334	*O-RING	1	16.	73054004	VALVE, safety locking	1
7.	6A025020	*RING, wafer lock	1	17.	72060708	SCREW; 1/4-20 x 1-1/4" shcs	6
8.	6C075020	TUBE, stop	2	18.	9C111411	KIT, o-ring	1
9.	6C300020	TUBE, stop	1				
10.	7T65I030	*RING, piston	2			*Part of seal kit (Part Number 9C121617)	



Items with shaded quantities are not a part of this assembly and are shown for reference only.

Figure 4-6. Secondary and Extension Boom - 1-Stage Hydraulic Extension with Winch (Part Number 41702815)

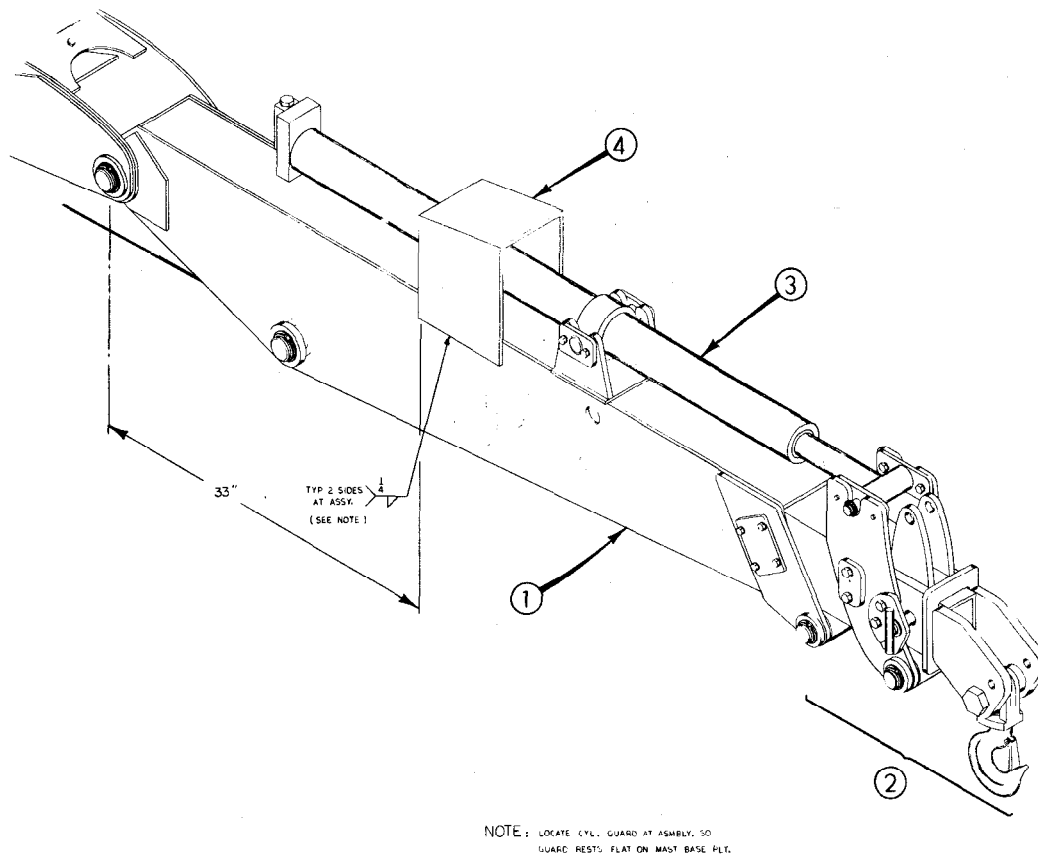
Item No.	Part No.	Description	Qty
1.	41702819	BOOM, secondary	1
2.	41701196	BOOM, extension	1
3.	3B048610	CYLINDER, extension	
4.	52701216	GUARD, cylinder	1



Items with shaded quantities are not a part of this assembly and are shown for reference only.

Figure 4-7. Secondary Boom with Winch (Part Number 41702819)

Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty
1.	52702949	BOOM, secondary	1	12.	60102647	PIN, roller	1
2.	7BF82020	BUSHING	2	13.	72661159	PIN, groove; 1/2" x 3"	1
3.	7BF81520	BUSHING	2	14.	60102322	ROLLER	1
4.	3C310512	CYLINDER, secondary	1	15.	7BF81215	BUSHING, roller	4
5.	60102319	PIN	1	16.	72063037	BUSHING, machy.; 1-1/2" x 10 ga.	1
6.	60102324	PIN	1	17.	72066132	RING, retaining	1
7.	60102321	PIN	1	18.	60030006	PAD, rub	2
8.	72661163	PIN, groove; 1/2" x 4"	3	19.	72063051	WASHER, lock; 3/8"	8
9.	72063039	BUSHING, machy.; 2" x 10 ga.	3	20.	72060044	SCREW; 3/8-16 x 3/4" hex hd.	8
10.	72066136	RING, retaining	3	21.	60102654	PLATE, retainer	2
11.	72053508	ZERK; 1/8" npt	2				



Items with shaded quantities are not a part of this assembly and are shown for reference only.

Figure 4-8. Secondary and Extension Boom - 1-Stage Hydraulic, 2-Stage Manual Extension (Part Number 41701765)

Item No.	Part No.	Description	Qty
1.	41701776	BOOM, secondary	1
2.	41701204	BOOM, extension	1
3.	3B048610	CYLINDER, extension	1
4.	52701216	GUARD, cylinder	1

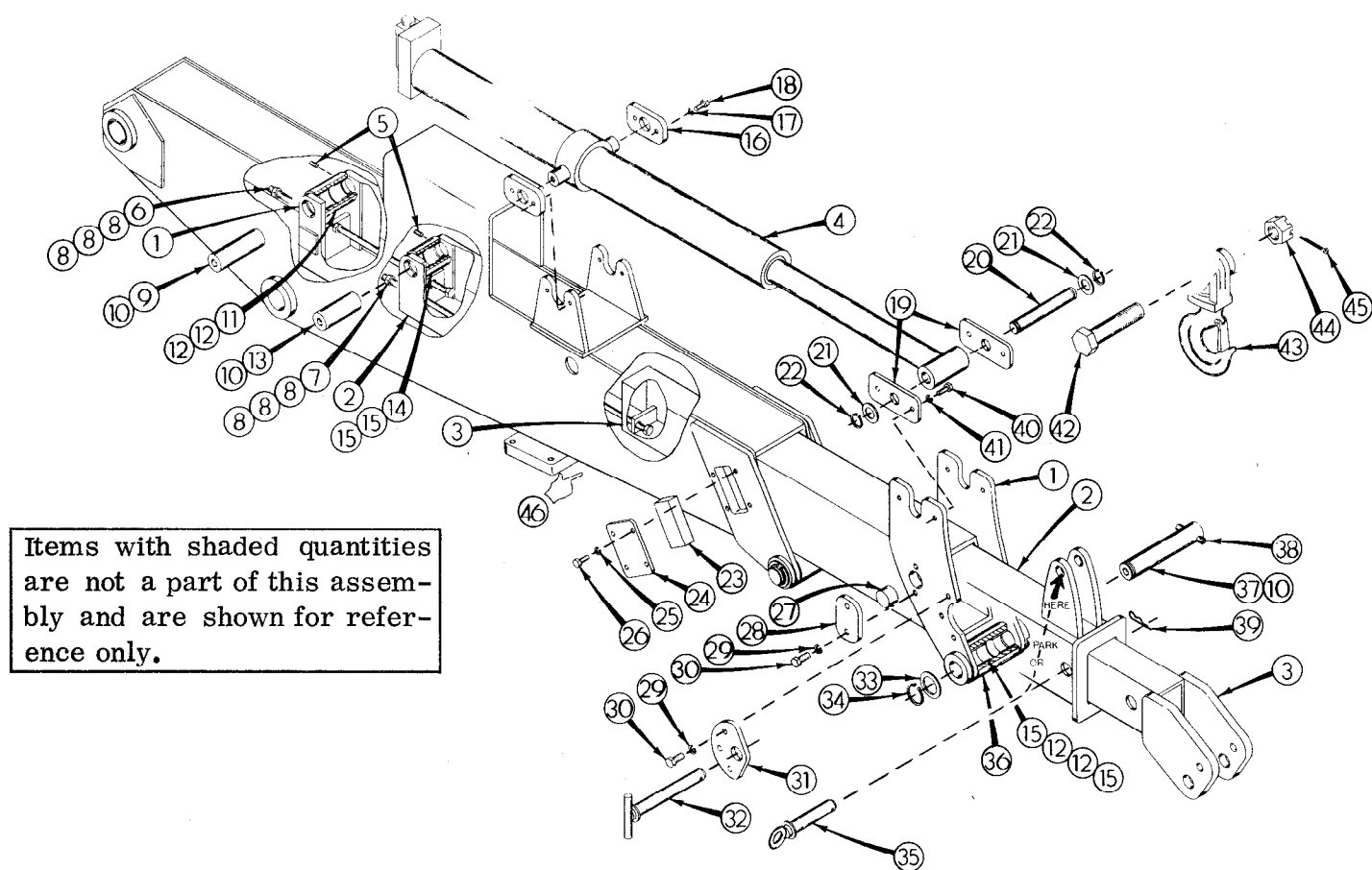


Figure 4-9. Extension Boom - 1-Stage Hydraulic, 2-Stage Manual
(Part Number 41701204)

Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty
1.	52701054	BOOM, 1st stage extension	1	24.	60102654	PLATE, retainer	2
2.	52701053	BOOM, 2nd stage extension	1	25.	72063051	WASHER, lock; 3/8"	2
3.	52701052	STINGER	1	26.	72060044	SCREW; 3/8-16 x 3/4" hex hd.	2
4.	3B048610	CYLINDER, extension	1	27.	60030007	PAD, rub	2
5.	72060858	SCREW, set; 3/8-16 x 3/4"	4	28.	60102649	PLATE, lock	2
6.	60102656	ROD, stop; 57-1/4" lg.	1	29.	72063053	WASHER, lock; 1/2"	10
7.	60102655	ROD, stop; 52-1/4" lg.	1	30.	72060091	SCREW; 1/2-13 x 1" hex hd.	10
8.	72062004	NUT, hex; 1/2-13	6	31.	60102669	PLATE	2
9.	60010004	PIN	1	32.	52702579	PIN	1
10.	72053508	ZERK; 1/8" npt	3	33.	72063037	BUSHING, machy.; 1-1/2" x 10 ga.	1
11.	60102297	ROLLER	1	34.	72066132	RING, retaining	1
12.	7BF81015	BUSHING	4	35.	52701059	PIN	1
13.	60102282	PIN	1	36.	60102294	ROLLER, support	1
14.	60102286	ROLLER	1	37.	60102329	PIN	1
15.	7BF81215	BUSHING	4	38.	72661157	PIN, groove; 1/2" x 2-1/2"	1
16.	60102341	PLATE, lock	2	39.	72066145	HAIRPIN; 3/16"	2
17.	72063050	WASHER, lock; 5/16"	4	40.	72060046	SCREW; 3/8-16 x 1" hex hd.	4
18.	72050026	SCREW; 5/16-18 x 1-1/4" hex hd.	4	41.	72063051	WASHER, lock; 3/8"	4
19.	60103436	PLATE, lock	2	42.	60105601	BOLT, hook	1
20.	60101874	PIN	1	43.	52701716	HOOK	1
21.	72063034	BUSHING, machy.; 1" x 10 ga.	2	44.	72062082	NUT, castled; 1-1/4 - 7	1
22.	72066125	RING, retaining	2	45.	72066197	PIN, cotter; 3/16" x 2-1/2"	1
23.	60030006	PAD, rub	2	46.	41702819	BOOM, secondary	Ref.

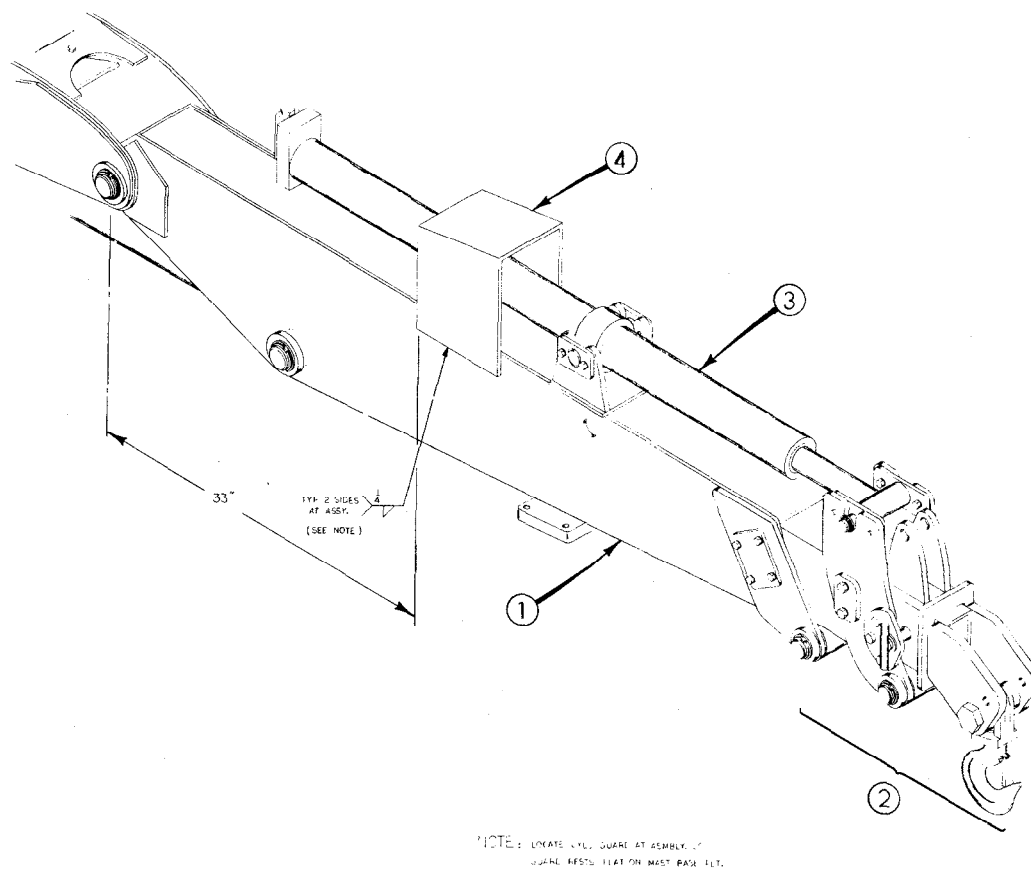


Figure 4-10. Secondary and Extension Boom - 1-Stage Hydraulic, 2-Stage Manual Extension with Winch (Part Number 41702817)

Item No.	Part No.	Description	Qty
1.	41702819	BOOM, secondary	1
2.	41701204	BOOM, extension	1
3.	3B048610	CYLINDER, extension	1
4.	52701216	GUARD, cylinder	1

Items with shaded quantities are not a part of this assembly and are shown for reference only.

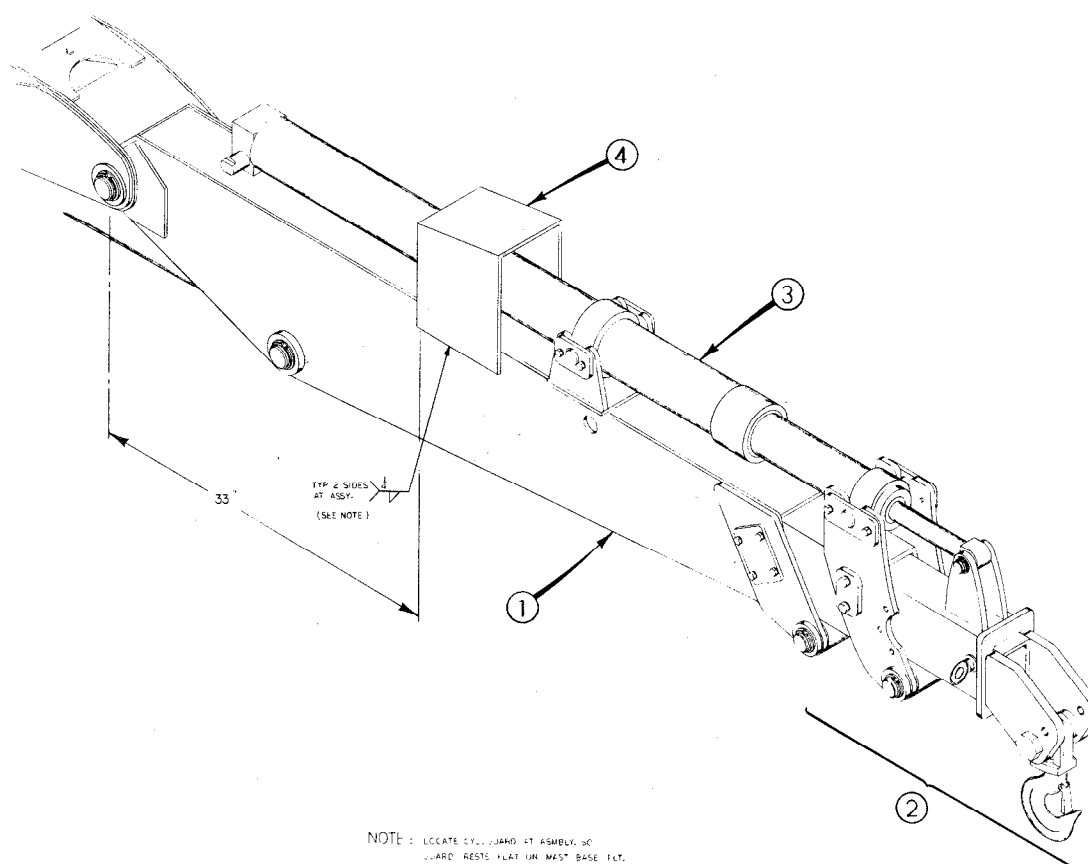


Figure 4-11. Secondary and Extension Boom - 2-Stage Hydraulic, 1-Stage Manual Extension (Part Number 41701764)

Item No.	Part No.	Description	Qty
1.	41701030	BOOM, secondary	1
2.	41701031	BOOM, extension	1
3.	3K171514	CYLINDER, extension	1
4.	52701216	GUARD, cylinder	1

Items with shaded quantities are not a part of this assembly and are shown for reference only.

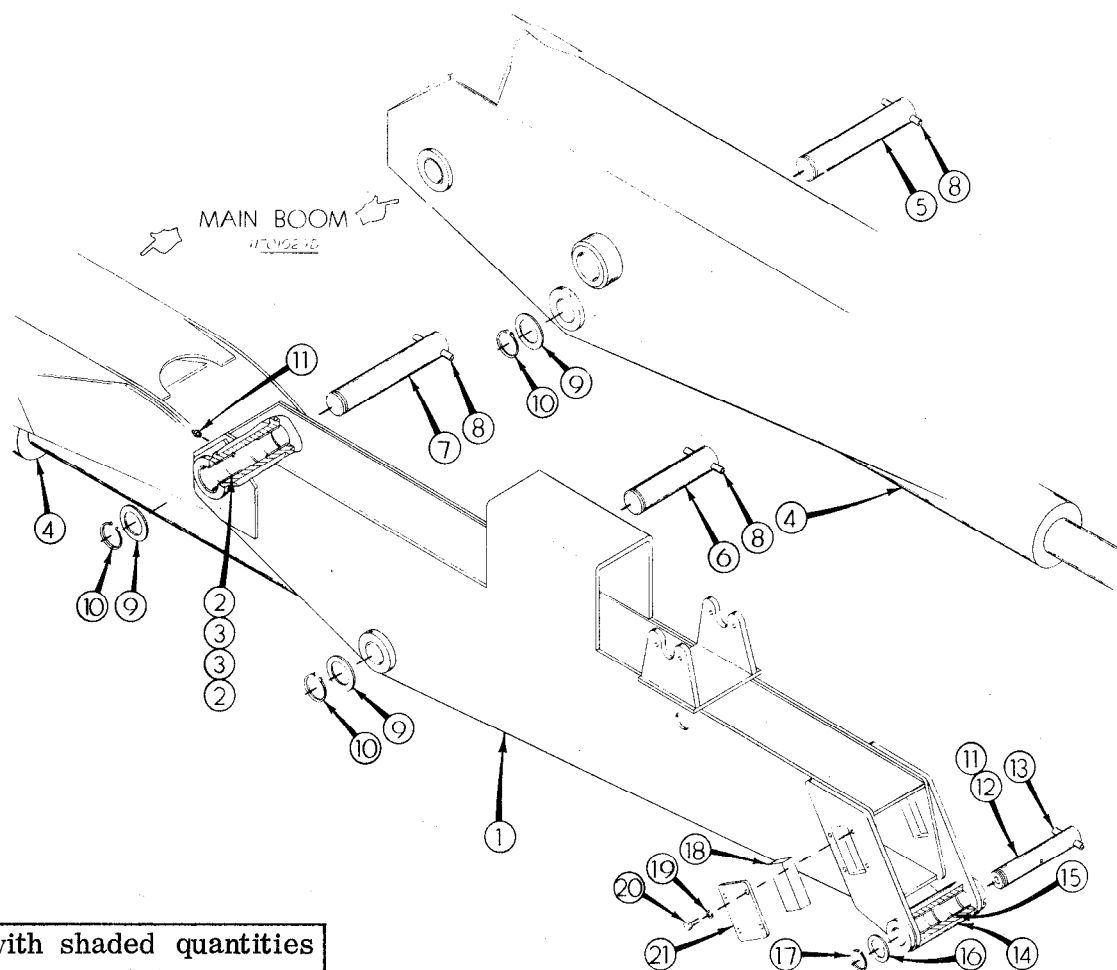
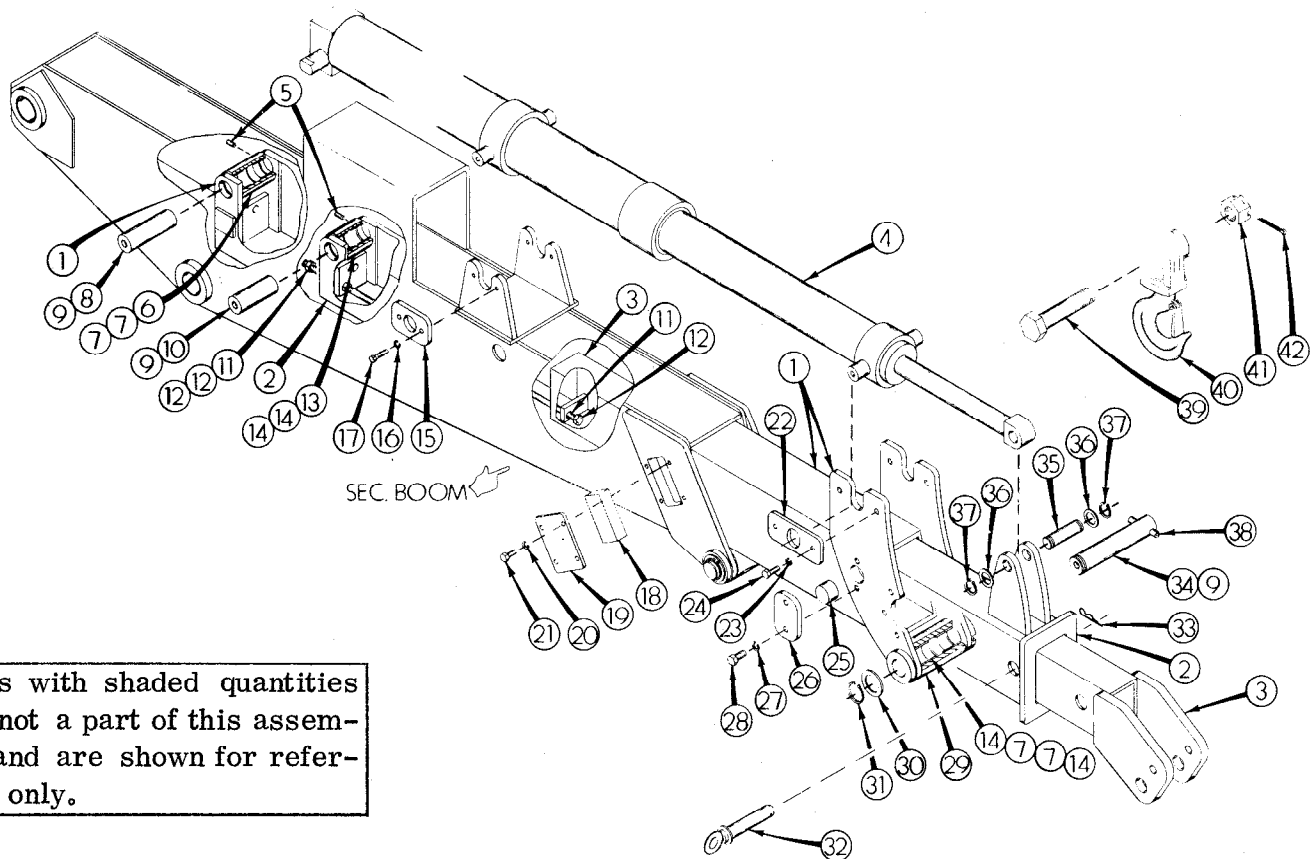


Figure 4-12. Secondary Boom (Part Number 41701030)

Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty
1.	52701067	BOOM, secondary	1	12.	60102647	PIN, roller	1
2.	7BF82020	BUSHING	2	13.	72661159	PIN, groove; 1/2" x 3"	1
3.	7BF81520	BUSHING	2	14.	60102322	ROLLER	1
4.	3C310512	CYLINDER, secondary	1	15.	7BF81215	BUSHING	4
5.	60102319	PIN	1	16.	72063037	BUSHING, machy.; 1-1/2" x 10 ga.	1
6.	60102324	PIN	1	17.	72066132	RING, retaining	1
7.	60102321	PIN	1	18.	60030006	PAD, rub	2
8.	72661163	PIN, groove; 1/2" x 4"	3	19.	72063051	WASHER, lock; 3/8"	8
9.	72063039	BUSHING, machy.; 2" x 10 ga.	3	20.	72060044	SCREW; 3/8-16 x 3/4" hex hd.	8
10.	72066136	RING, retaining	3	21.	60102654	PLATE, retainer	2
11.	72053508	ZERK; 1/8" npt	2				



Items with shaded quantities are not a part of this assembly and are shown for reference only.

Figure 4-13. Extension Boom - 2-Stage Hydraulic, 1-Stage Manual
(Part Number 41701031)

Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty
1.	52701054	BOOM, 1st stage extension	1	22.	60102278	PLATE, lock	2
2.	52701053	BOOM, 2nd stage extension	1	23.	72063051	WASHER, lock; 3/8"	4
3.	52701052	STINGER	1	24.	72060046	SCREW; 3/8-16 x 1" hex hd.	4
4.	3K171514	CYLINDER, extension	1	25.	60030007	PAD, rub	2
5.	72060858	SCREW, set; 3/8-16 x 3/4"	4	26.	60102649	PLATE, lock	2
6.	60102297	ROLLER, 1st stage extension	1	27.	72063053	WASHER, lock; 1/2"	4
7.	7BF81015	BUSHING, roller	4	28.	72060091	SCREW; 1/2-13 x 1" hex hd.	4
8.	60010004	PIN	1	29.	60102294	ROLLER, support	1
9.	72053508	ZERK; 1/8" npt	3	30.	72063037	BUSHING, machy.; 1-1/2" x 10 ga.	1
10.	60102282	PIN, roller	1	31.	72066132	RING, retaining	1
11.	60102280	ROD, stop; 54" lg.	1	32.	52701059	PIN	1
12.	72062004	NUT, hex; 1/2-13	3	33.	72066145	HAIRPIN; 3/16"	1
13.	60102286	ROLLER, 2nd stage extension	1	34.	60102329	PIN, support roller	1
14.	7BF81215	BUSHING, roller	4	35.	60102281	PIN	1
15.	60102341	PLATE, lock	2	36.	72063034	BUSHING, machy.; 1" x 10 ga.	2
16.	72063050	WASHER, lock; 5/16"	4	37.	72066125	RING, retaining	2
17.	72060026	SCREW; 5/16-18 x 1-1/4" hex hd.	4	38.	72661157	PIN, groove; 1/2" x 2-1/2"	1
18.	60030006	PAD, rub	2	39.	60105601	BOLT, hook	1
19.	60102654	PLATE, retainer	2	40.	52701716	HOOK	1
20.	72063051	WASHER, lock; 3/8"	8	41.	72062082	NUT, castled; 1-1/4 - 7	1
21.	72060044	SCREW; 3/8-16 x 3/4" hex hd.	8	42.	72066197	PIN, cotter; 3/16" x 2-1/2"	1

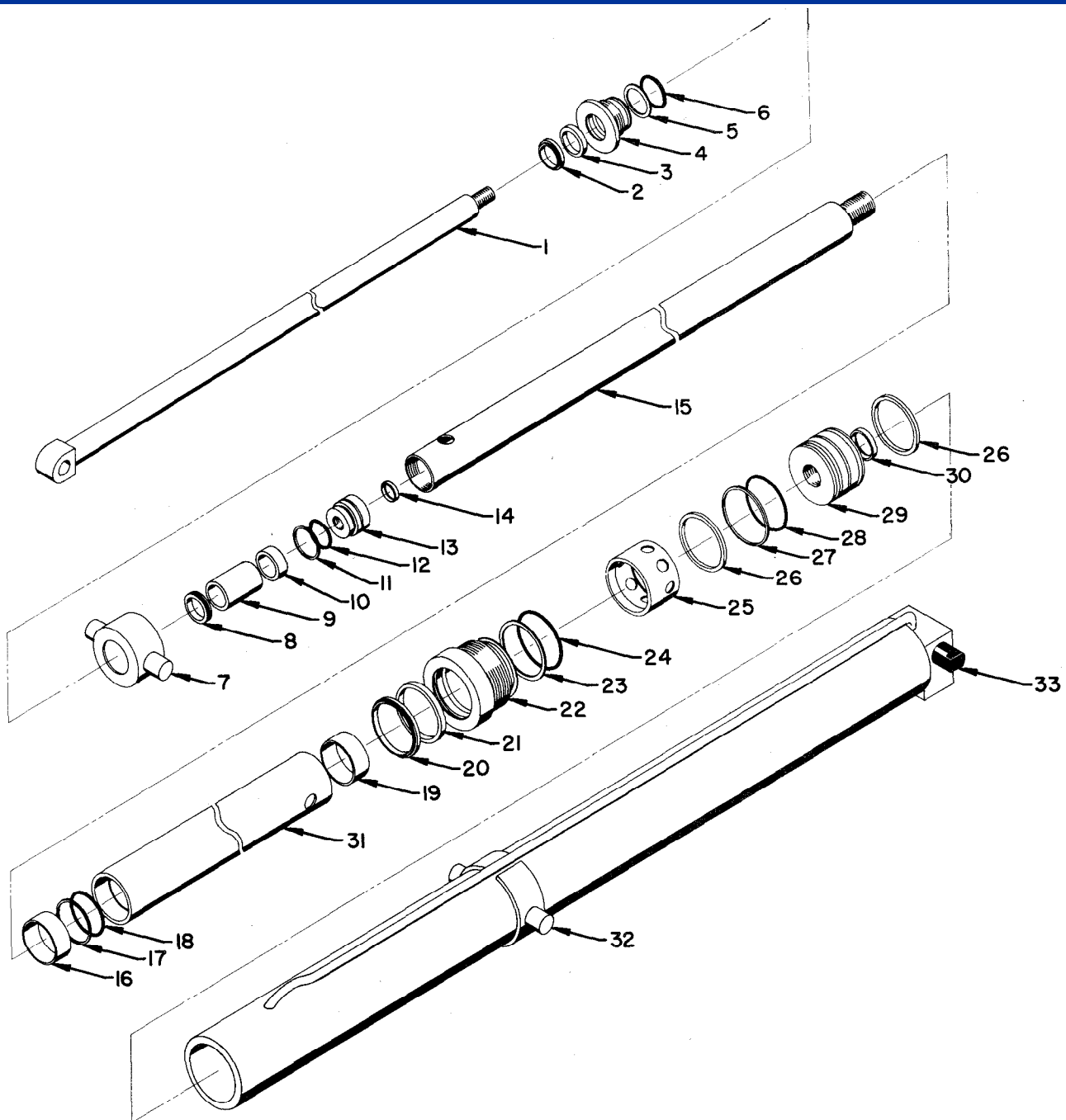


Figure 4-14. Telescoping Extension Cylinder (Part Number 3K171514)

Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty
1.	4G171513	ROD	1	19.	6M271510	RING, adapter	1
2.	7R14P015	*WIPER, rod	1	20.	7R14P035	*WIPER, rod	1
3.	7R546015	*SEAL, rod	1	21.	7R546035	*SEAL, rod	1
4.	6H271511	HEAD	1	22.	6H171513	HEAD	1
5.	7Q10P228	*RING, back-up	1	23.	7Q10P342	*RING, back-up	1
6.	7Q072228	*O-RING	1	24.	7Q072342	*O-RING	1
7.	4J171513	RING, case mounting	1	25.	6C271510	TUBE, stop	1
8.	6A025015	*RING, wafer lock	1	26.	7T65I040	*RING, piston	2
9.	6C300015	TUBE, stop	1	27.	7T66P040	*SEAL, piston	1
10.	6C075015	TUBE, stop	1	28.	7Q072153	*O-RING	1
11.	7T66P025	*SEAL, piston	1	29.	6I040143	PISTON	1
12.	7Q072137	*O-RING	1	30.	7T61N143	*SEAL, lock ring	1
13.	6I025087	PISTON	1	31.	6J271510	SLEEVE	1
14.	7T61N087	*SEAL, lock ring	1	32.	4K171513	CASE, cylinder	1
15.	4H271510	ROD	1	33.	73054242	VALVE, counter balance holding	2
16.	6M271510	RING, adapter	1	34.	7PNPXT02	PLUG, pipe; 1/8" npt	4
17.	7Q10P233	*RING, back-up	1				
18.	7Q092233	*O-RING, static	1				

*Part of seal kit (Part Number 9X171513)

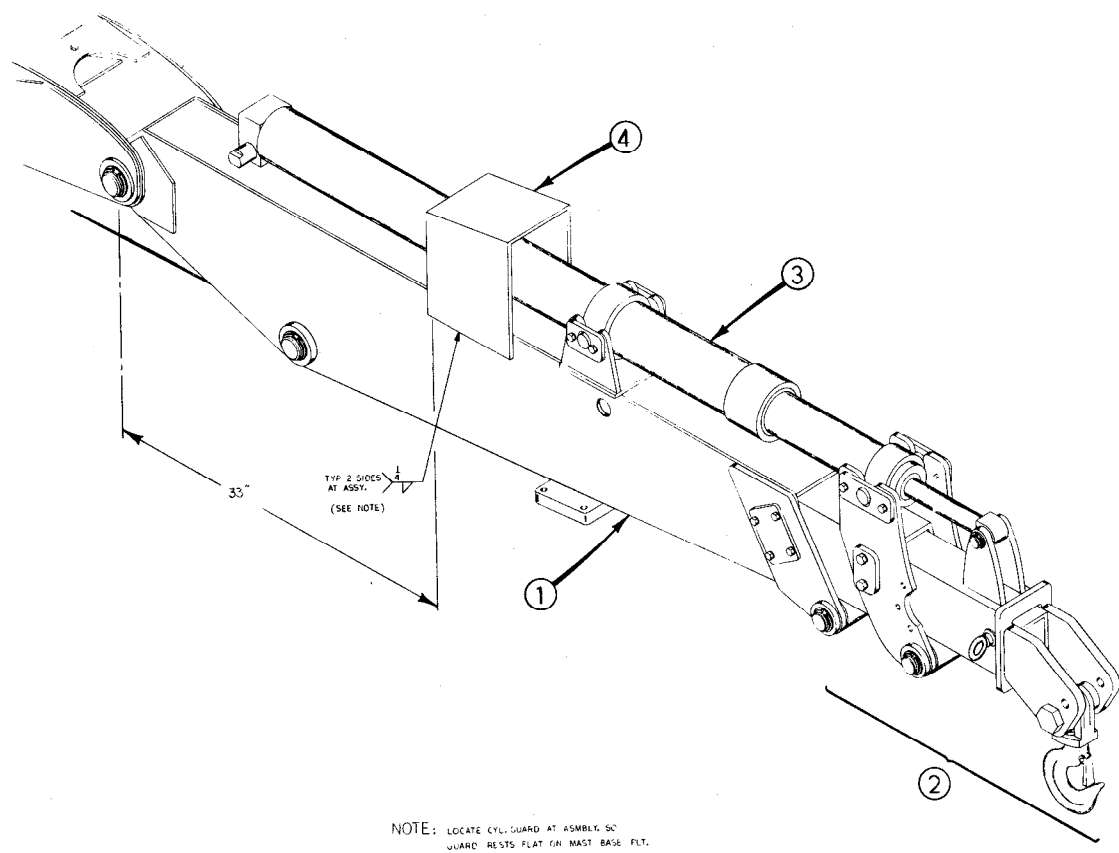
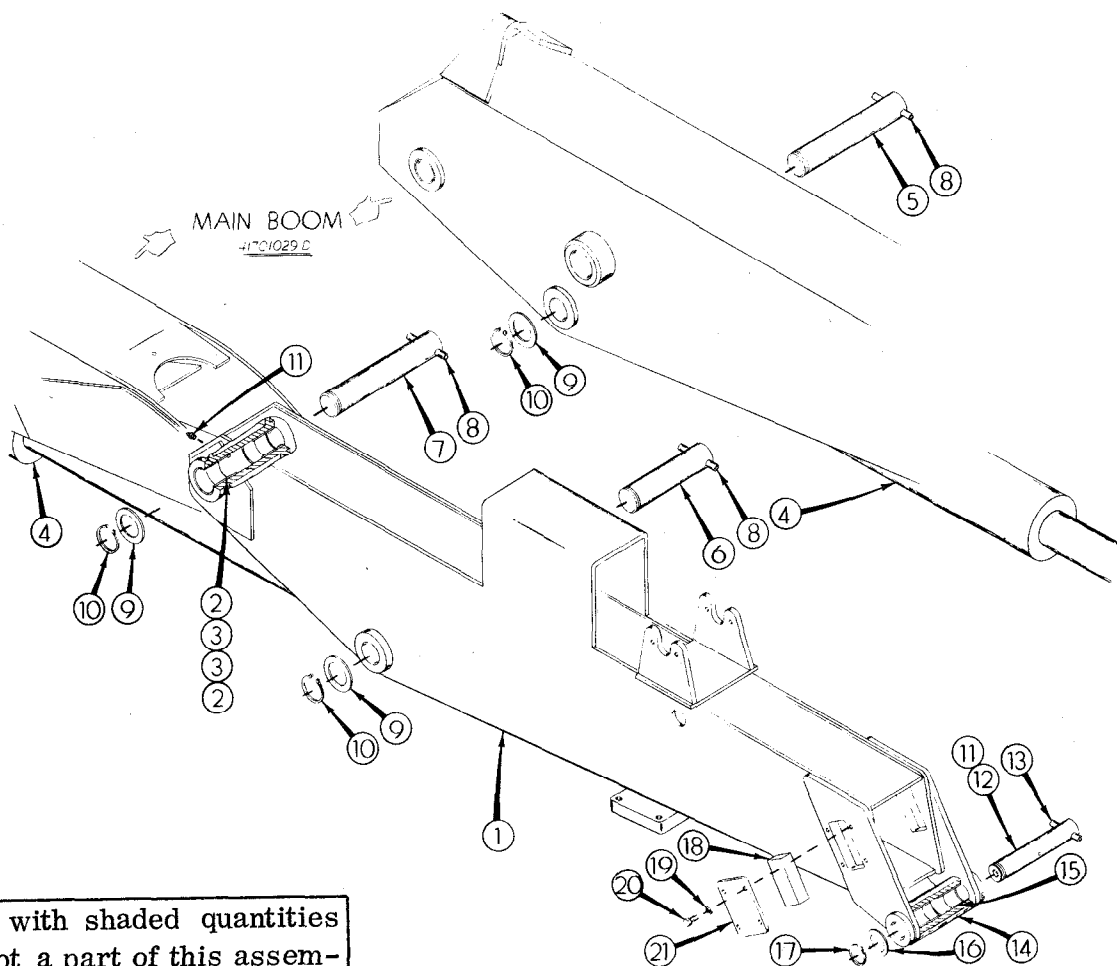


Figure 4-15. Secondary and Extension Boom - 2-Stage Hydraulic, 1-Stage Manual Extension with Winch (Part Number 41702816)

Item No.	Part No.	Description	Qty
1.	41702821	BOOM, secondary	1
2.	41701031	BOOM, extension	1
3.	3K171514	CYLINDER, telescopic	1
4.	52701216	GUARD, cylinder	1



Items with shaded quantities are not a part of this assembly and are shown for reference only.

Figure 4-16. Secondary Boom with Winch (Part Number 41702821)

Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty
1.	52702822	BOOM, secondary	1	12.	60102647	PIN, roller	1
2.	7BF82020	BUSHING, secondary boom	2	13.	72661159	PIN, groove; 1/2" x 3"	1
3.	7BF81520	BUSHING	2	14.	60102322	ROLLER	1
4.	3C310512	CYLINDER, secondary	1	15.	7BF81215	BUSHING	4
5.	60102319	PIN	1	16.	72063037	BUSHING, machy.; 1-1/2" x 10 ga.	1
6.	60102324	PIN	1	17.	72066132	RING, retaining	1
7.	60102321	PIN	1	18.	60030006	PAD, rub	2
8.	72661163	PIN, groove; 1/2" x 4"	3	19.	72063051	WASHER, lock; 3/8"	8
9.	72063039	BUSHING, machy.; 2" x 10 ga.	3	20.	72060044	SCREW; 3/8-16 x 3/4" hex hd.	8
10.	72066136	RING, retaining	3	21.	60102654	PLATE, retainer	2
11.	72053508	ZERK; 1/8" npt	2				

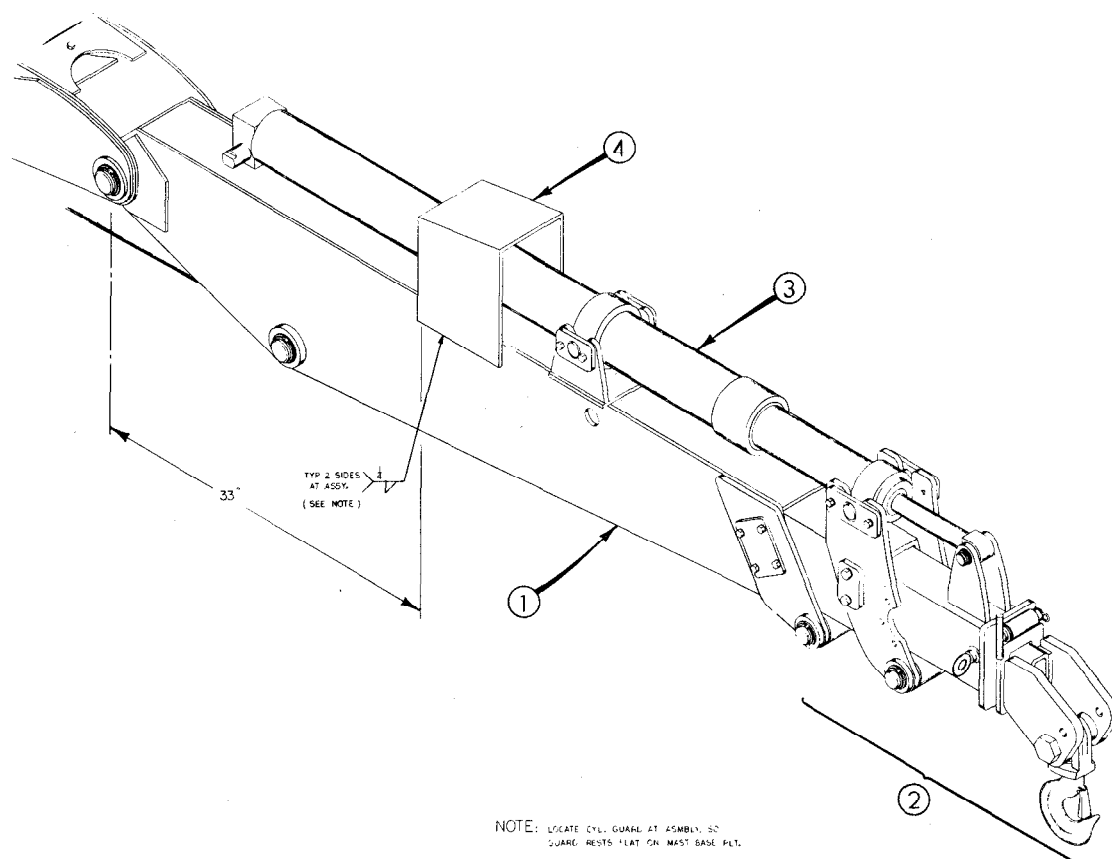


Figure 4-17. Secondary and Extension Boom - 2-Stage Hydraulic, 2-Stage Manual Extension (Part Number 41702258)

Item No.	Part No.	Description	Qty
1.	41701030	BOOM, secondary	1
2.	41701381	BOOM, extension	1
3.	3K171514	CYLINDER, extension	1
4.	52701216	GUARD, cylinder	1

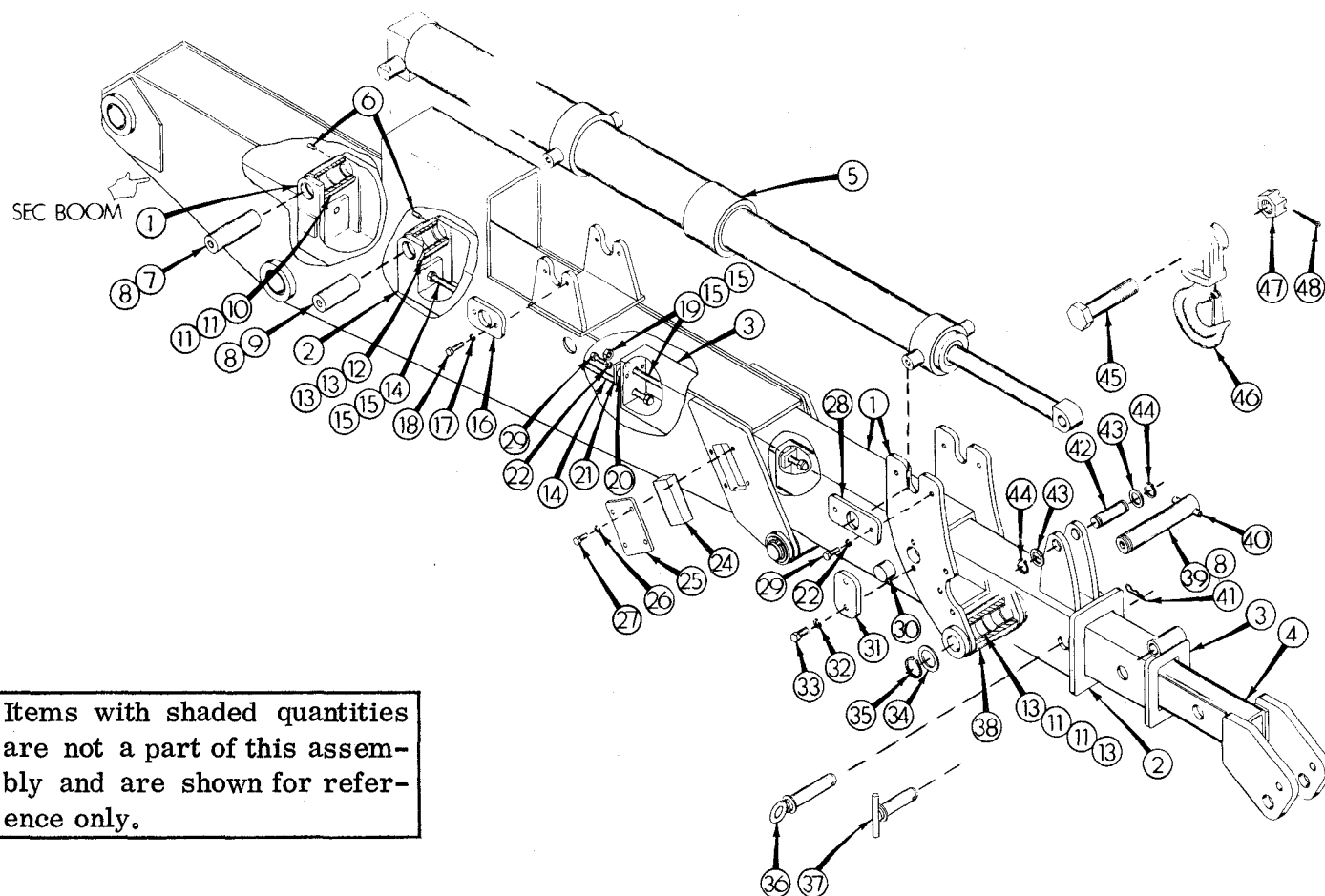
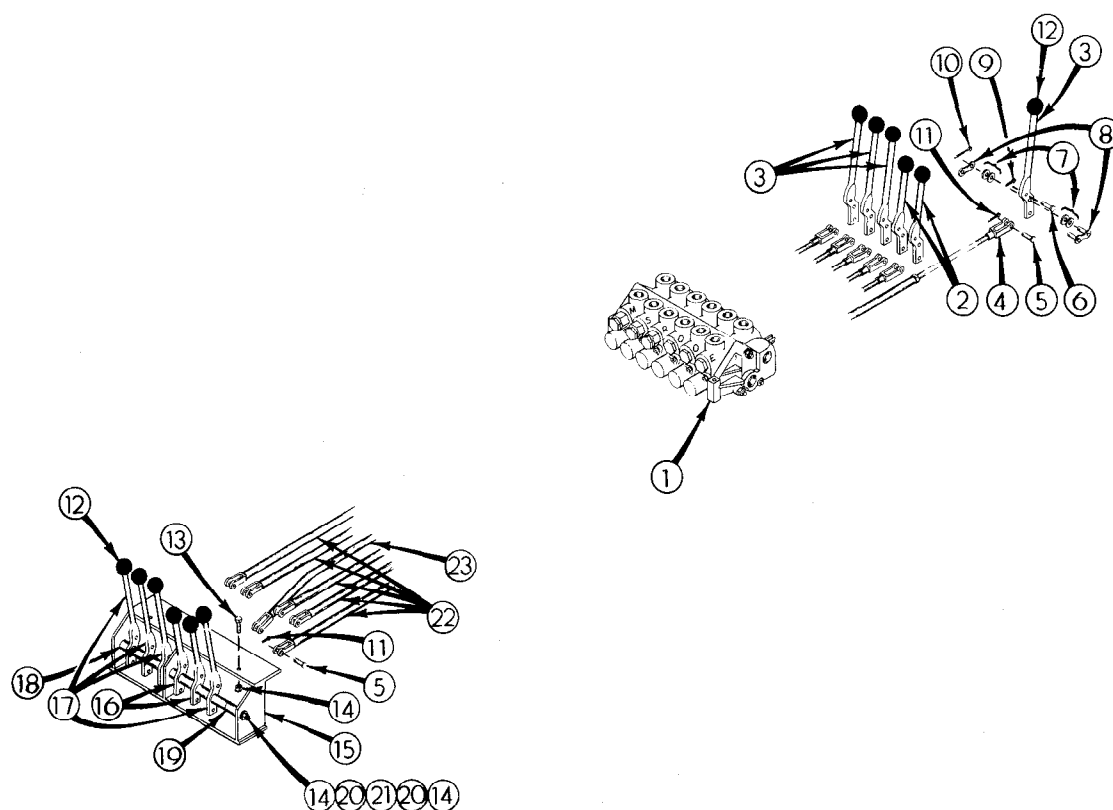


Figure 4-18. Extension Boom - 2 Stage Hydraulic, 2 Stage Manual
(Part Number 41701381)

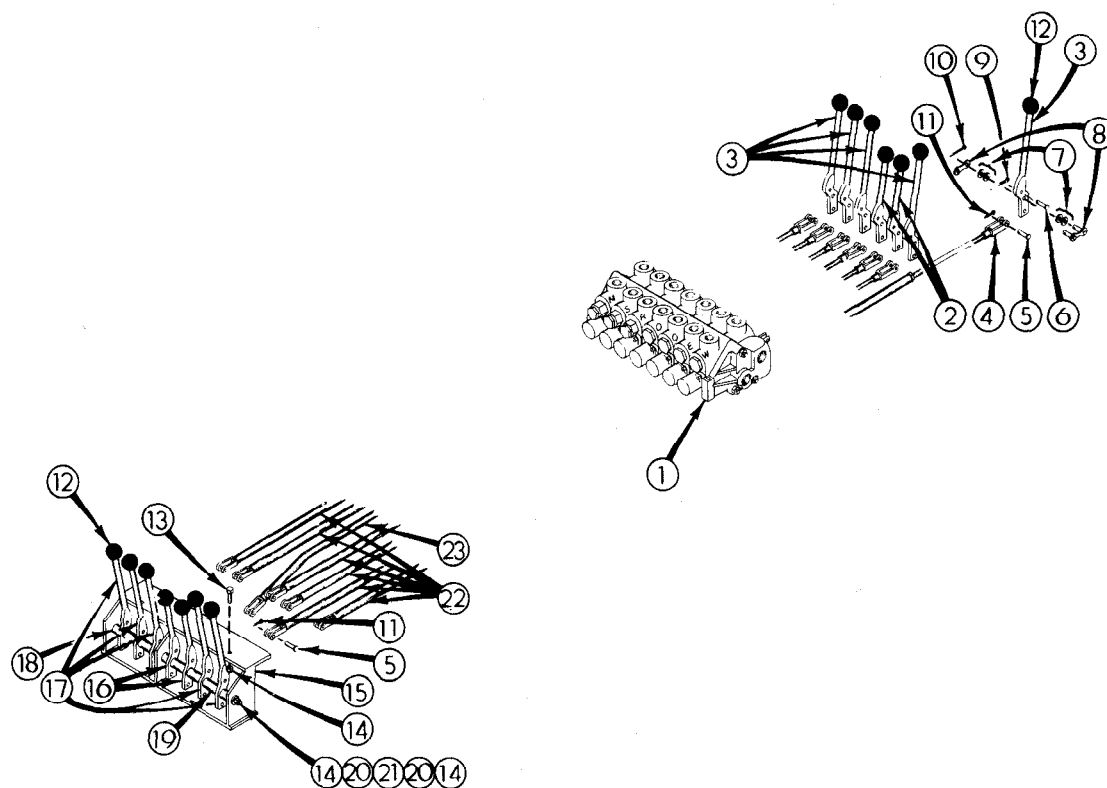
Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty
1.	52701054	BOOM, 1st stage extension	1	25.	60102654	PLATE, retainer	2
2.	52701384	BOOM, 2nd stage extension	1	26.	72063051	WASHER, lock; 3/8"	6
3.	52701383	BOOM, 3rd stage extension	1	27.	72060044	SCREW; 3/8-16 x 3/4" hex hd.	4
4.	52701382	STINGER	1	28.	60102278	PLATE, lock	2
5.	3K171514	CYLINDER, extension	1	29.	72060046	SCREW; 3/8-16 x 1" hex hd.	6
6.	72060858	SCREW, set; 3/8-16 x 3/4"	4	30.	60030007	PAD, rub	2
7.	60010004	PIN	1	31.	60102649	PLATE, lock	2
8.	72053508	ZERK; 1/8" npt	3	32.	72063053	WASHER, lock; 1/2"	4
9.	60102282	PIN	1	33.	72060091	SCREW; 1/2-13 x 1" hex hd.	4
10.	60102297	ROLLER	1	34.	72063037	BUSHING, machy.; 1-1/2" x 10 ga.	1
11.	7BF81015	BUSHING	4	35.	72066132	RING, retaining	1
12.	60102286	ROLLER	1	36.	52701059	PIN	1
13.	7BF81215	BUSHING	4	37.	52701396	PIN	1
14.	52701394	ROD, stop; 50-1/4" lg.	1	38.	60102294	SUPPORT, roller	1
15.	72062004	NUT, hex; 1/2-13	4	39.	60102329	PIN	1
16.	60102341	PLATE, lock	2	40.	72661157	PIN, groove; 1/2" x 2-1/2"	1
17.	72063050	WASHER, lock; 5/16"	4	41.	72066145	HAIRPIN; 3/16"	2
18.	72060026	SCREW; 5/16-18 x 1-1/4" hex hd.	4	42.	60102281	PIN	1
19.	52701393	ROD, stop; 56" lg.	1	43.	72063034	BUSHING, machy.; 1" x 10 ga.	2
20.	60010264	SPACER	2	44.	72066125	RING, retaining	2
21.	60103075	PLATE	1	45.	60105601	BOLT, hook	1
22.	72063051	WASHER, lock; 3/8"	6	46.	52701716	HOOK	1
23.	--	NOT USED	-	47.	72062082	NUT, castled; 1-1/4 - 7	1
24.	60030006	PAD, rub	2	48.	72066197	PIN, cotter; 3/16" x 2-1/2"	1



Items with shaded quantities are not a part of this assembly and are shown for reference only.

Figure 5-1. 6-Function Control Kit (Part Number 90702850)

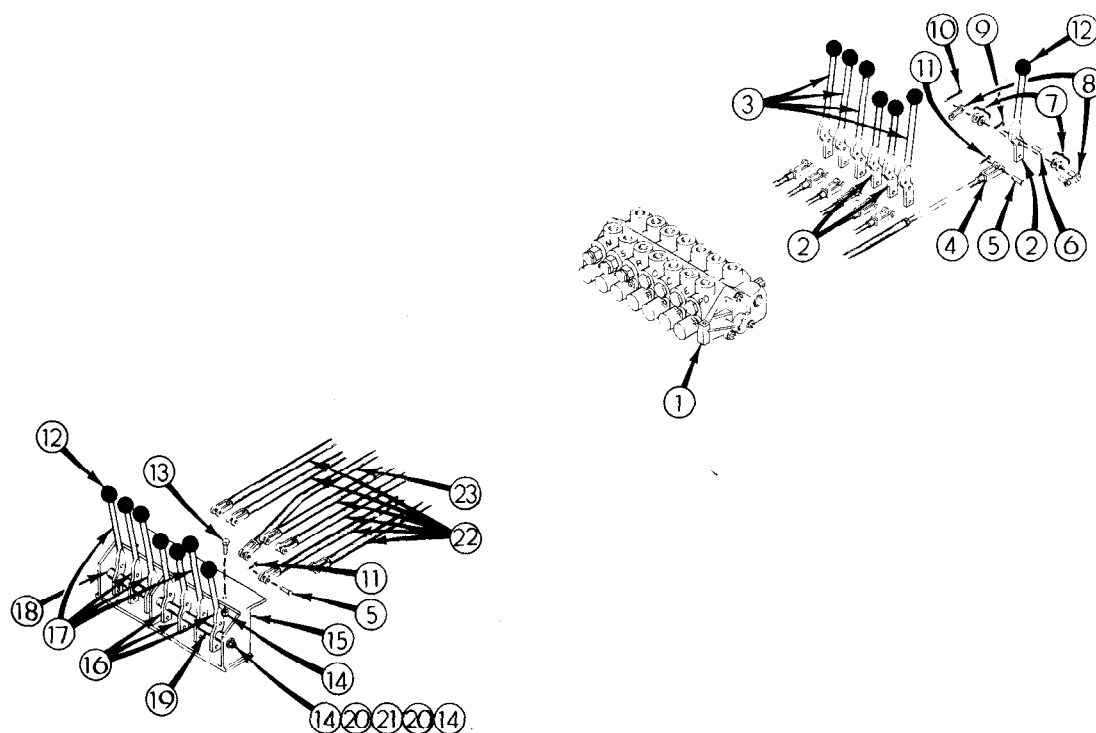
Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty
1.	51702920	VALVE, control; 6-spool	1	13.	72060025	SCREW; 5/16-18 x 1" hex hd.	2
2.	70141983	LEVER, valve control; short	2	14.	72062109	NUT, lock; 5/16-18	4
3.	70141982	LEVER, valve control; long	4	15.	52702715	DUMMY VALVE BANK	1
4.	52702018	LINK, male control	6	16.	70141985	LEVER, dummy control; short	2
5.	72066338	PIN, clevis	12	17.	70141984	LEVER, dummy control; long	4
6.	72066337	PIN, valve/lever	6	18.	60030045	SPACER, short	3
7.	72063001	WASHER, wrt.; 1/4"	24	19.	60030046	SPACER; long	6
8.	71058003	LINK, connecting	6	20.	72063002	WASHER, wrt.; 5/16"	2
9.	72066336	PIN, cotter	6	21.	60105501	ROD	1
10.	72066335	PIN, cotter	6	22.	52702016	LINK, female control	5
11.	72066168	PIN, cotter	12	23.	52702017	LINK, bent female control	1
12.	71039096	KNOB, lever	12				



Items with shaded quantities are not a part of this assembly and are shown for reference only.

Figure 5-2. 7-Function Control Kit with Winch (Part Number 90702827)

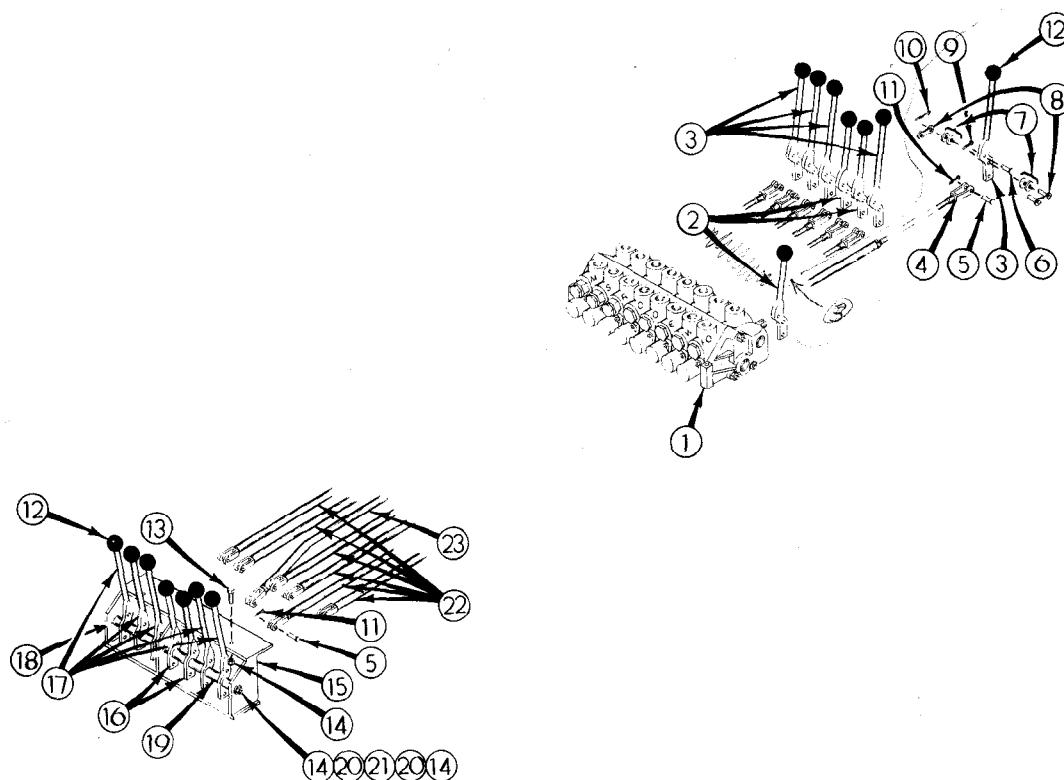
Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty
1.	51702925	VALVE, control; 7-spool	1	13.	72060025	SCREW; 5/16-18 x 1" hex hd.	2
2.	70141983	LEVER, valve control; short	2	14.	72062109	NUT, lock; 5/16-18	4
3.	70141982	LEVER, valve control; long	5	15.	52702715	DUMMY VALVE BANK	1
4.	52702018	LINK, male control	7	16.	70141985	LEVER, dummy control; short	2
5.	72066338	PIN, clevis	14	17.	70141984	LEVER, dummy control; long	5
6.	72066337	PIN, valve/lever	7	18.	60030045	SPACER, short	5
7.	72063001	WASHER, wrt.; 1/4"	28	19.	60030046	SPACER, long	5
8.	71058003	LINK, connecting	7	20.	72063002	WASHER, wrt.; 5/16"	2
9.	72066336	PIN, cotter	7	21.	60105501	ROD	1
10.	72066335	PIN, cotter	7	22.	52702016	LINK, female control	6
11.	72066168	PIN, cotter	14	23.	52702017	LINK, female control, bent	1
12.	71039096	KNOB, lever	14				



Items with shaded quantities are not a part of this assembly and are shown for reference only.

Figure 5-3. 7-Function Control Kit with Power-Out Outriggers (Part Number 90702828)

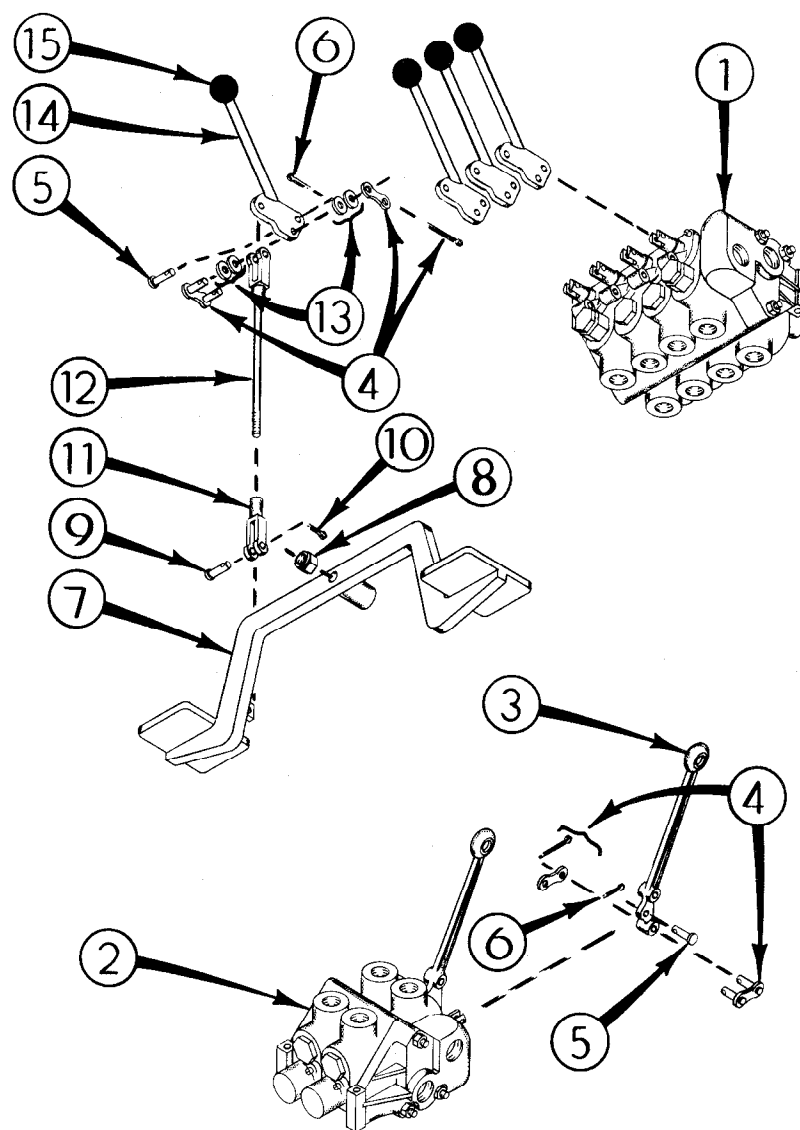
Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty
1.	51702925	VALVE, control; 7-spool	1	13.	72060025	SCREW; 5/16-18 x 1" hex hd.	2
2.	70141983	LEVER, valve control; short	3	14.	72062109	NUT, lock; 5/16-18	4
3.	70141982	LEVER, valve control; long	4	15.	52702715	DUMMY VALVE BANK	1
4.	52702018	LINK, male control	7	16.	70141985	LEVER, dummy control; short	3
5.	72066338	PIN, clevis	14	17.	70141984	LEVER, dummy control; long	4
6.	72066337	PIN, valve/lever	7	18.	60030045	SPACER, short	5
7.	72063001	WASHER, wrt.; 1/4"	28	19.	60030046	SPACER, long	5
8.	71058003	LINK, connecting	7	20.	72063002	WASHER, wrt.; 5/16"	2
9.	72066336	PIN, cotter	7	21.	60105501	ROD	1
10.	72066335	PIN, cotter	1	22.	52702016	LINK, female control	6
11.	72066168	PIN, cotter	14	23.	52702017	LINK, female control, bent	1
12.	71039096	KNOB, lever	14				



Items with shaded quantities are not a part of this assembly and are shown for reference only.

Figure 5-4. 8-Function Control Kit with Winch and Power-Out Outriggers
(Part Number 90702829)

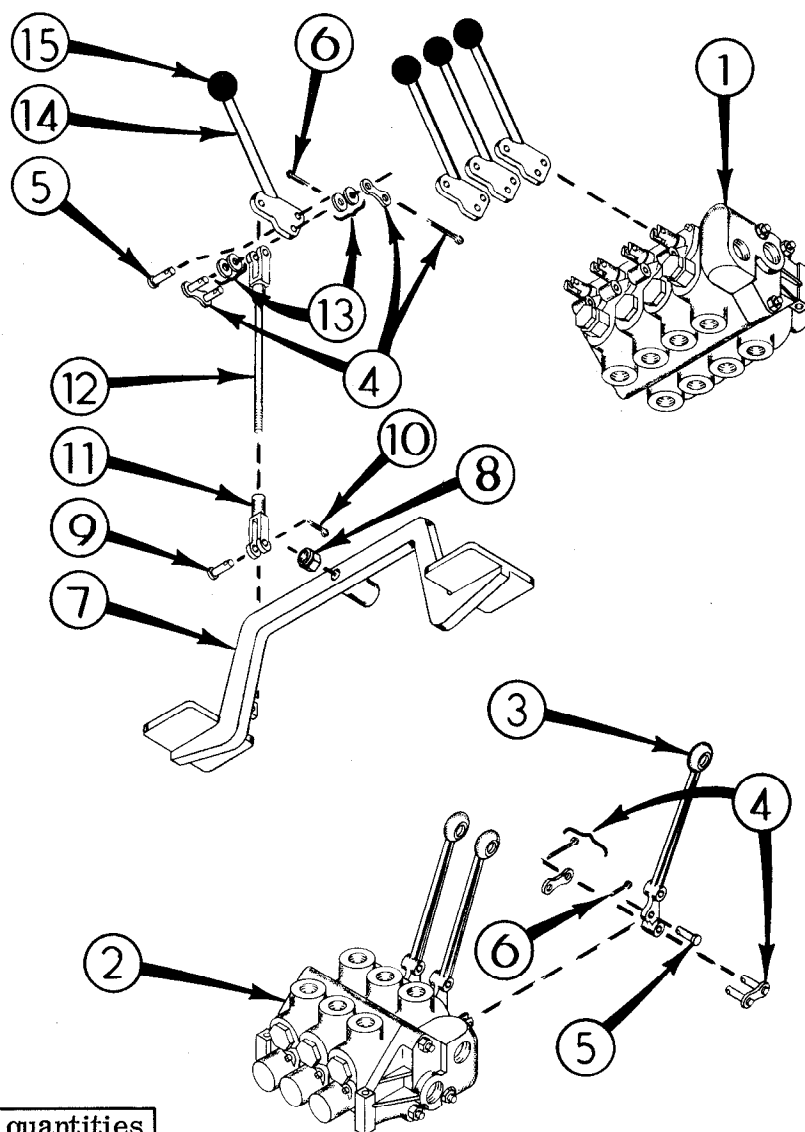
Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty
1.	51702928	VALVE BANK; 8-spool	1	13.	72060025	SCREW; 5/16-18 x 1" hex hd.	2
2.	70141983	LEVER, control valve; short	2 3	14.	72062109	NUT, lock; 5/16-18	4
3.	70141982	LEVER, control valve; long	6 5	15.	52702717	DUMMY VALVE BANK	1
4.	52702018	LINK, male control	3 7	16.	70141985	LEVER, dummy control; short	2
5.	72066338	PIN, clevis	16 14	17.	70141984	LEVER, dummy control; long	6 5
6.	72066337	PIN, valve/lever	8	18.	60030045	SPACER, short	4 5
7.	72063001	WASHER, wrt.; 1/4"	32	19.	60030046	SPACER, long	6 5
8.	71058003	LINK, connecting	8	20.	72063002	WASHER, wrt.; 5/16"	2
9.	72066336	PIN, cotter	8	21.	60105503	ROD	1
10.	72066335	PIN, cotter	16 14	22.	52702016	LINK, female control	7 6
11.	72066168	PIN, cotter	16 14	23.	52702017	LINK, female control, bent	1
12.	71039096	KNOB	16 15				



Items with shaded quantities are not a part of this assembly and are shown for reference only.

Figure 5-5. 6-Function Chair-Mount Control Kit (Part Number 90702834)

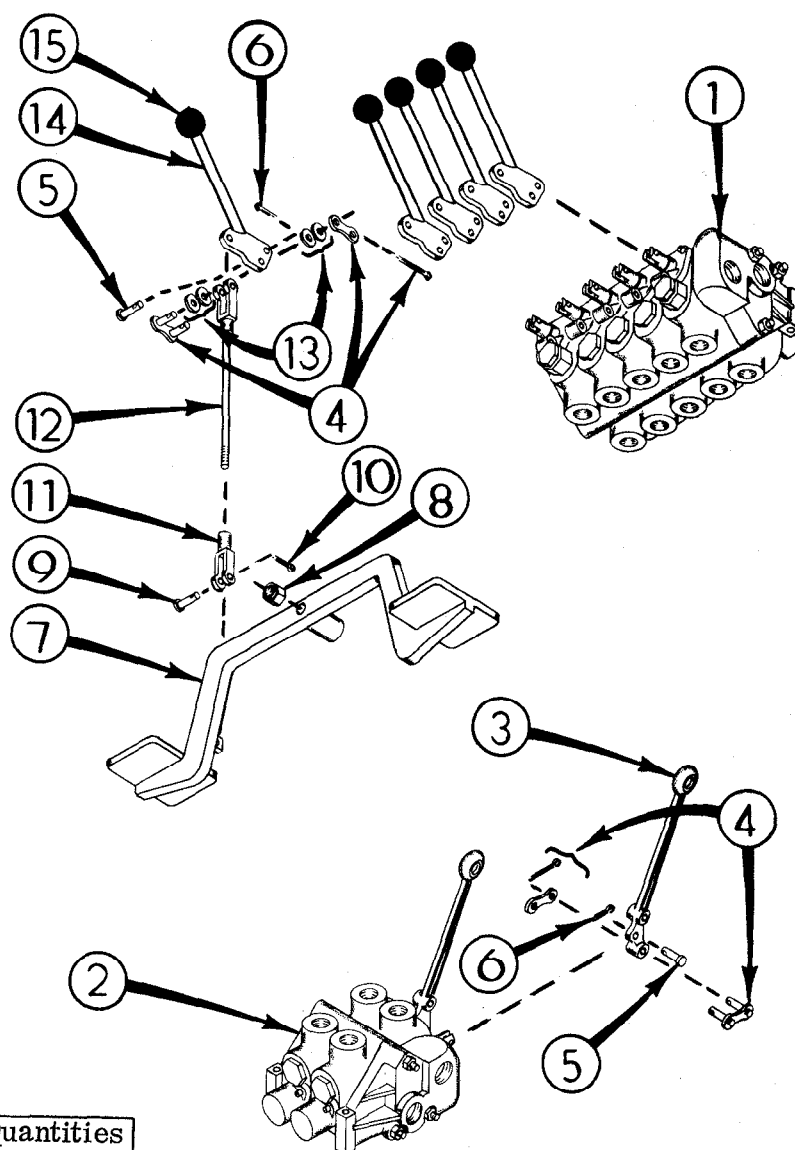
Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty
1.	51703414	VALVE BANK; 4-spool		9.	72066338	PIN, clevis	2
2.	51702933	VALVE BANK; 2-spool		10.	72066168	PIN, cotter	2
3.	73014848	LEVER, valve	2	11.	71058002	CLEVIS	2
4.	71058003	LINK, connecting	6	12.	60102876	LINK	1
5.	72066337	PIN	6	13.	72063001	WASHER, wrt.; 1/4"	16
6.	72066336	PIN, cotter	6	14.	52701560	LEVER, valve	4
7.	52701270	PEDAL, foot, ROTATION	1	15.	71039096	KNOB	4
8.	72062107	NUT, lock; 1/2-13	1				



Items with shaded quantities are not a part of this assembly and are shown for reference only.

Figure 5-6. 7-Function Chair-Mount Control Kit with Power-Out Outriggers
(Part Number 90702835)

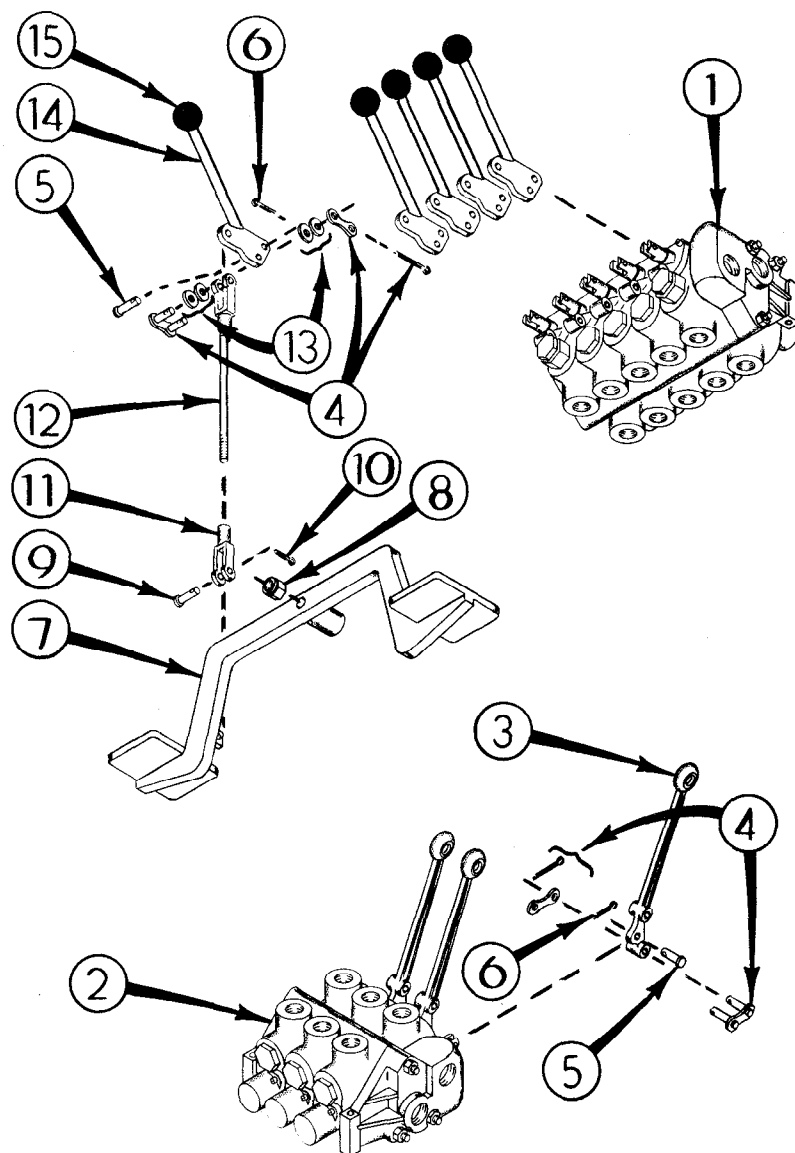
Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty
1.	51703414	VALVE BANK; 4-spool	1	9.	72066338	PIN, clevis	2
2.	51702934	VALVE BANK; 3-spool	1	10.	72066168	PIN, cotter	2
3.	73014848	LEVER, valve	3	11.	71058002	CLEVIS	2
4.	71058003	LINK, connecting	7	12.	60102876	LINK	1
5.	72066337	PIN	7	13.	72063001	WASHER, wrt. ; 1/4"	16
6.	72066336	PIN, cotter	7	14.	52701560	LEVER, valve	4
7.	52701270	PEDAL, foot, ROTATION	1	15.	71039096	KNOB	4
8.	72062107	NUT, lock; 1/2-13	1				



Items with shaded quantities are not a part of this assembly and are shown for reference only.

Figure 5-7. 7-Function Chair-Mount Control Kit with Winch (Part Number 90702836)

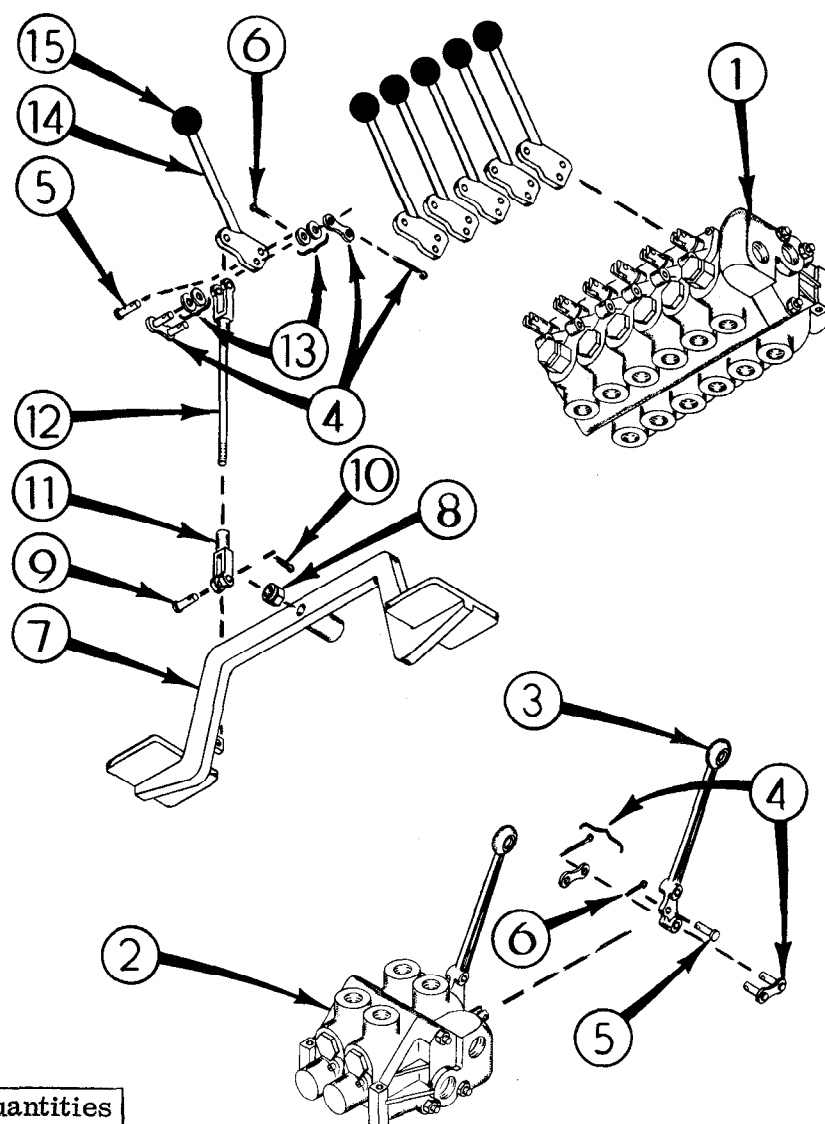
Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty
1.	51703415	VALVE BANK; 5-spool	1	9.	72066338	PIN, clevis	2
2.	51702933	VALVE BANK; 2-spool	1	10.	72066168	PIN, cotter	2
3.	73014848	LEVER, valve	2	11.	71058002	CLEVIS	2
4.	71058003	LINK, connecting	7	12.	60102876	LINK	1
5.	72066337	PIN	7	13.	72063001	WASHER, wrt.; 1/4"	20
6.	72066336	PIN, cotter	7	14.	52701560	LEVER, valve	5
7.	52701270	PEDAL, foot, ROTATION	1	15.	71039096	KNOB	5
8.	72062107	NUT, lock; 1/2-13	1				



Items with shaded quantities are not a part of this assembly and are shown for reference only.

Figure 5-8. 8-Function Chair-Mount Control Kit with Power-Out Outriggers and Winch (Part Number 90702837)

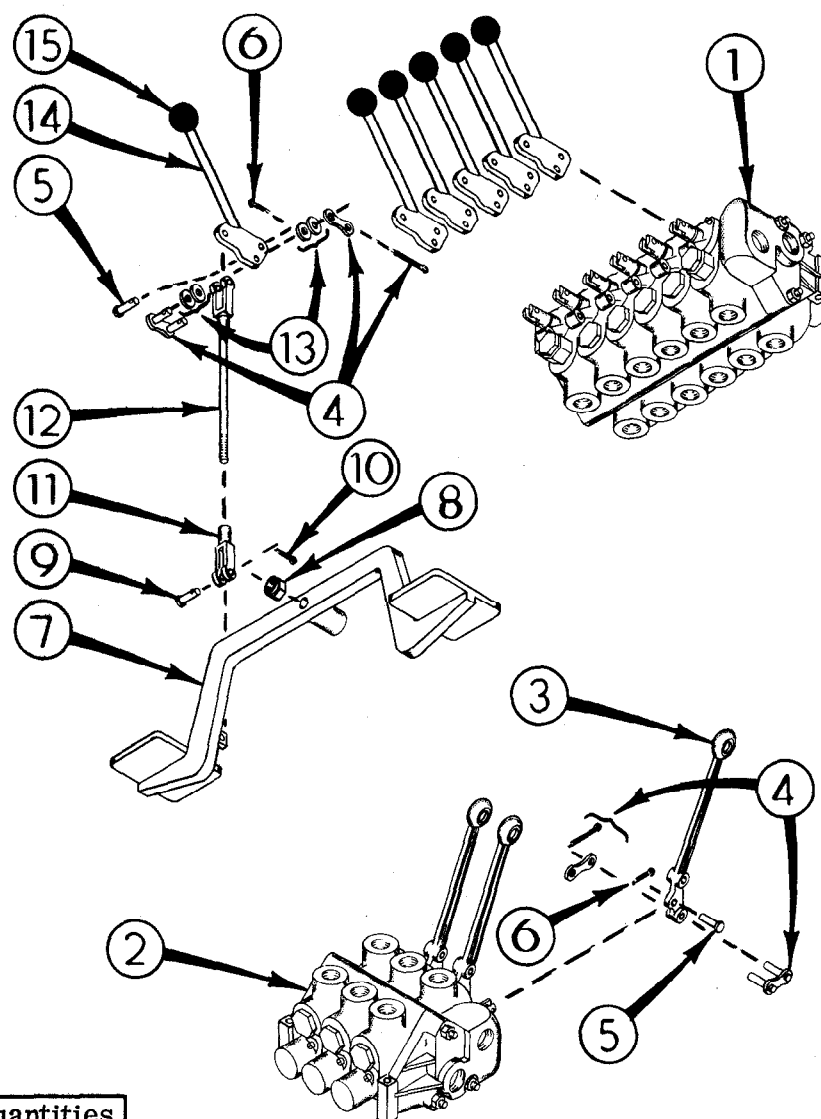
Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty
1.	51703415	VALVE BANK; 5-spool	1	9.	72066338	PIN, clevis	2
2.	51702934	VALVE BANK; 3-spool	1	10.	72066168	PIN, cotter	2
3.	73014848	LEVER, valve	3	11.	71058002	CLEVIS	2
4.	71058003	LINK, connecting	8	12.	60102876	LINK	1
5.	72066337	PIN	8	13.	72063001	WASHER, wrt.; 1/4"	20
6.	72066336	PIN, cotter	8	14.	52701560	LEVER, valve	5
7.	52701270	PEDAL, foot, ROTATION	1	15.	71039096	KNOB	5
8.	72062107	NUT, lock; 1/2-13	1				



Items with shaded quantities are not a part of this assembly and are shown for reference only.

Figure 5-9. 8-Function Chair-Mount Control Kit with Boom-Tip Service
(Part Number 90702838)

Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty
1.	51703146	VALVE BANK; 6-spool	1	9.	72066338	PIN, clevis	2
2.	51702933	VALVE BANK; 2-spool	1	10.	72066168	PIN, cotter	2
3.	73014848	LEVER, valve	2	11.	71058002	CLEVIS	2
4.	71058003	LINK, connecting	8	12.	60102876	LINK	1
5.	72066337	PIN	8	13.	72063001	WASHER, wrt.; 1/4"	24
6.	72066336	PIN, cotter	8	14.	52701560	LEVER, valve	6
7.	52701270	PEDAL, foot, ROTATION	1	15.	71039096	KNOB	6
8.	72062107	NUT, lock; 1/2-13	1				



Items with shaded quantities are not a part of this assembly and are shown for reference only.

Figure 5-10. 9-Function Chair-Mount Control Kit with Boom-Tip Service and Power-Out Outriggers (Part Number 90702839)

Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty
1.	51703416	VALVE BANK; 6-spool	1	9.	72066338	PIN, clevis	2
2.	51702934	VALVE BANK; 3-spool	1	10.	72066168	PIN, cotter	2
3.	73014848	LEVER, valve	3	11.	71058002	CLEVIS	2
4.	71058003	LINK, connecting	9	12.	60102876	LINK	1
5.	72066337	PIN	9	13.	72063001	WASHER, wrt.; 1/4"	24
6.	72066336	PIN, cotter	9	14.	52701560	LEVER, valve	6
7.	52701270	PEDAL, foot, ROTATION	1	15.	71039096	KNOB	6
8.	72062107	NUT, lock; 1/2-13	1				

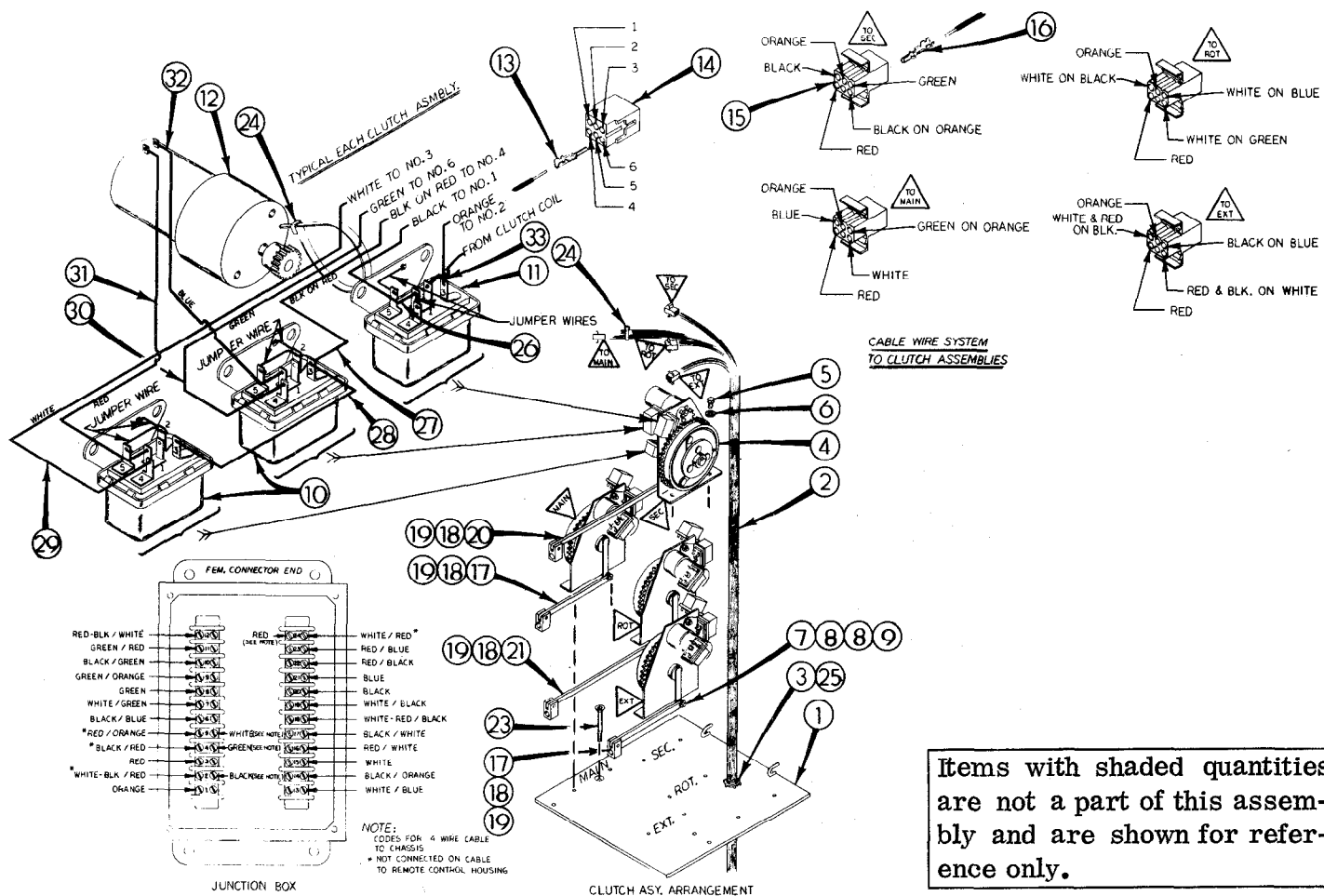


Figure 6-1. Standard Remote Control - Sheet 1 of 2 (Part Number 90703240)

Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty
1.	52703257	PLATE, base	1	18.	60104900	ADAPTER	4
2.	51703242	CABLE	1	19.	72066691	PIN, spring; 3/16" x 3/4"	4
3.	77044199	RELIEF, strain; 3/4"	4	20.	60105668	ARM, linkage, bent; 15-1/4"	1
4.	51703245	CLUTCH/MOTOR/RELAY	4	21.	60105665	ARM, linkage; 12-5/8"	1
5.	72060021	SCREW; 5/16-18 x 1/2" lg.	8	22.	--	NOT USED	-
6.	72063002	WASHER, wrt.; 5/16"	8	23.	72601136	SCREW; 5/16-18 x 3" slotted	1
7.	72601119	BOLT, shoulder; 1/4" x 3/8"	4	24.	70034060	TIE, plastic	1
8.	72063001	WASHER, wrt.; 1/4"	8	25.	77044202	NUT, conduit lock; 3/4"	1
9.	72062106	NUT, lock; #10-24	4	26.	60045012	WIRE, 18 ga. black; 7"	1
10.	77041193	RELAY, 6-pole; 12 VDC	4	27.	60045014	WIRE, 18 ga. black/red; 7"	1
11.	77041087	RELAY, 5-pole; 12 VDC	4	28.	60045013	WIRE, 18 ga. black/red; 3"	1
12.	77043019	MOTOR; 12 VDC	4	29.	60045003	WIRE, 18 ga. white; 9-1/2"	1
13.	77044195	PIN, male terminal	20	30.	60045011	WIRE, 18 ga. green; 7"	1
14.	77044193	CONNECTOR, female; 6-pin	4	31.	60045002	WIRE, 18 ga. red; 9-1/2"	1
15.	77044192	CONNECTOR, male; 6-pin	4	32.	60045015	WIRE, 18 ga. blue; 7"	1
16.	77044194	PIN, female terminal	20	33.	60045018	WIRE, 18 ga. orange; 7"	1
17.	60105667	ARM, linkage; 8-1/8"	2		60045008	WIRE, jumper; 4-1/2" (total)	1

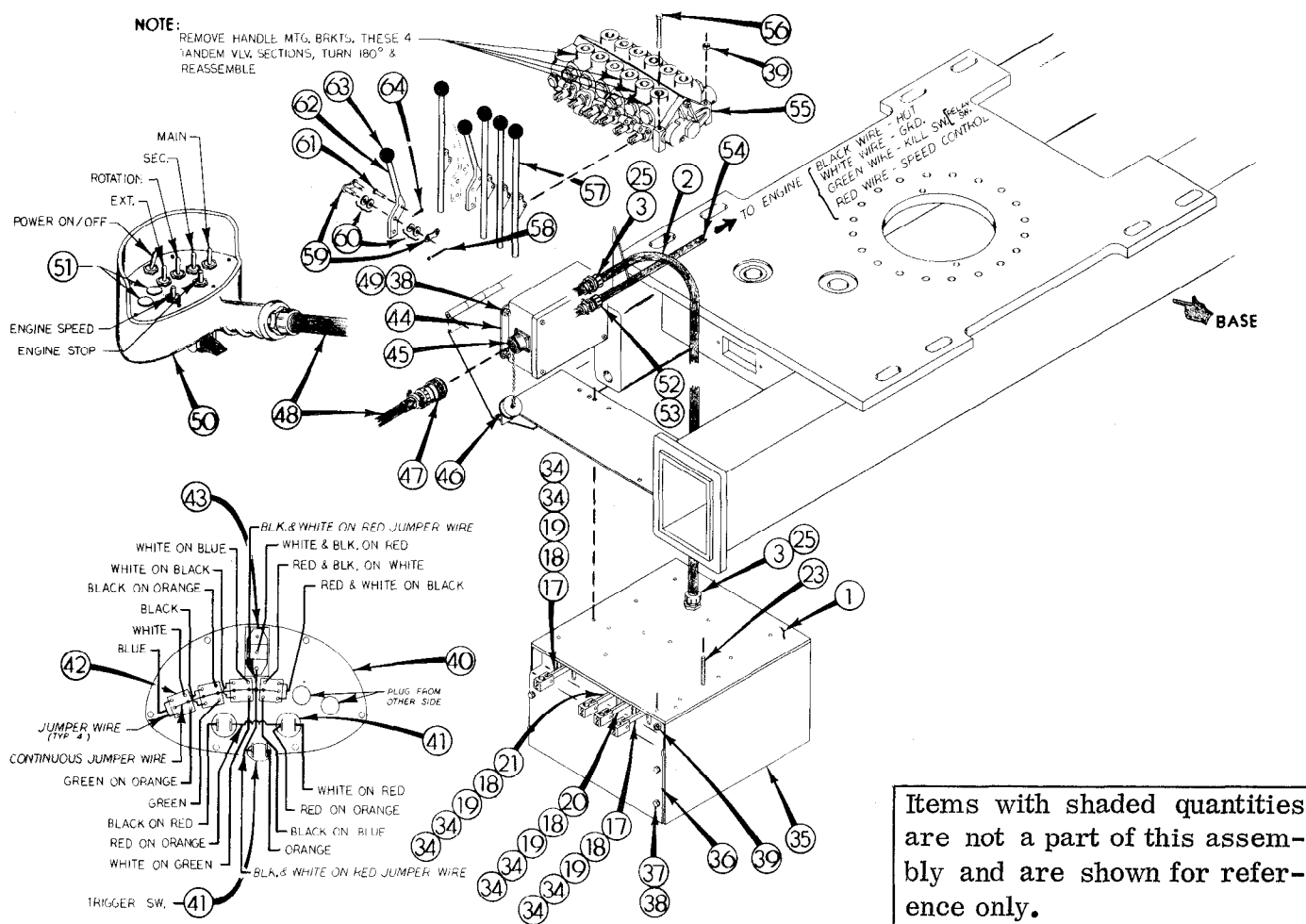


Figure 6-2. Standard Remote Control - Sheet 2 of 2 (Part Number 90703240)

Item	Part	Description	Qty	Item	Part	Description	Qty
1.	52703257	PLATE, base	1	45.	77044151	SHELL, female connector	1
2.	51703242	CABLE	1	46.	77044148	COVER, dust, female connector	1
3.	77044199	RELIEF, strain; 3/4"	1	47.	77044146	SHELL, male connector	1
17.	60105667	ARM, linkage; 8-1/8"	2	48.	60045006	CABLE; 35'	1
18.	60104900	ADAPTER, lever	4	49.	72062104	NUT, lock; 1/4-20	4
19.	72066691	PIN, spring; 3/16" x 3/4"	4	50.	51703244	HANDLE, remote control	1
20.	60105668	ARM, linkage; 15-1/4"	1	51.	72661125	BUTTON, snap	2
21.	60105665	ARM, linkage; 12-5/8"	1	52.	77044018	RELIEF, strain; 1/2"	1
22.	--	NOT USED	-	53.	77044201	NUT, conduit lock; 1/2"	1
23.	72601136	SCREW; 5/16-18 x 3" slotted	1	54.	60045019	CABLE; 4-wire	1
25.	77044202	NUT, conduit lock; 3/4"	1	55.	51702920	VALVE BANK; 6-spool	2
34.	72060556	SCREW, set; 1/4-20 x 1/4"	8	56.	72060033	SCREW; 5/16-18 x 3" hex hd.	2
35.	52702902	HOUSING, remote control	1	57.	52702901	LEVER, valve	4
36.	60105566	COVER, housing	1	58.	72066335	PIN, cotter	6
37.	72063049	WASHER, lock; 1/4"	4	59.	71058003	LINK, connecting	6
38.	72060000	SCREW; 1/4-20 x 1/2" hex hd.	8	60.	72063001	WASHER, wrt.; 1/4"	24
39.	72062109	NUT, lock; 5/16-18	2	61.	72066337	PIN	6
40.	60025146	PLATE, cover	1	62.	70141983	LEVER, outrigger	2
41.	77041023	SWITCH, push button	2	63.	71039096	KNOB	6
42.	77041169	SWITCH, toggle	4	64.	72066336	PIN, cotter	6
43.	77041004	SWITCH, toggle, POWER on/off	1				
44.	51703233	BOX, junction	1				

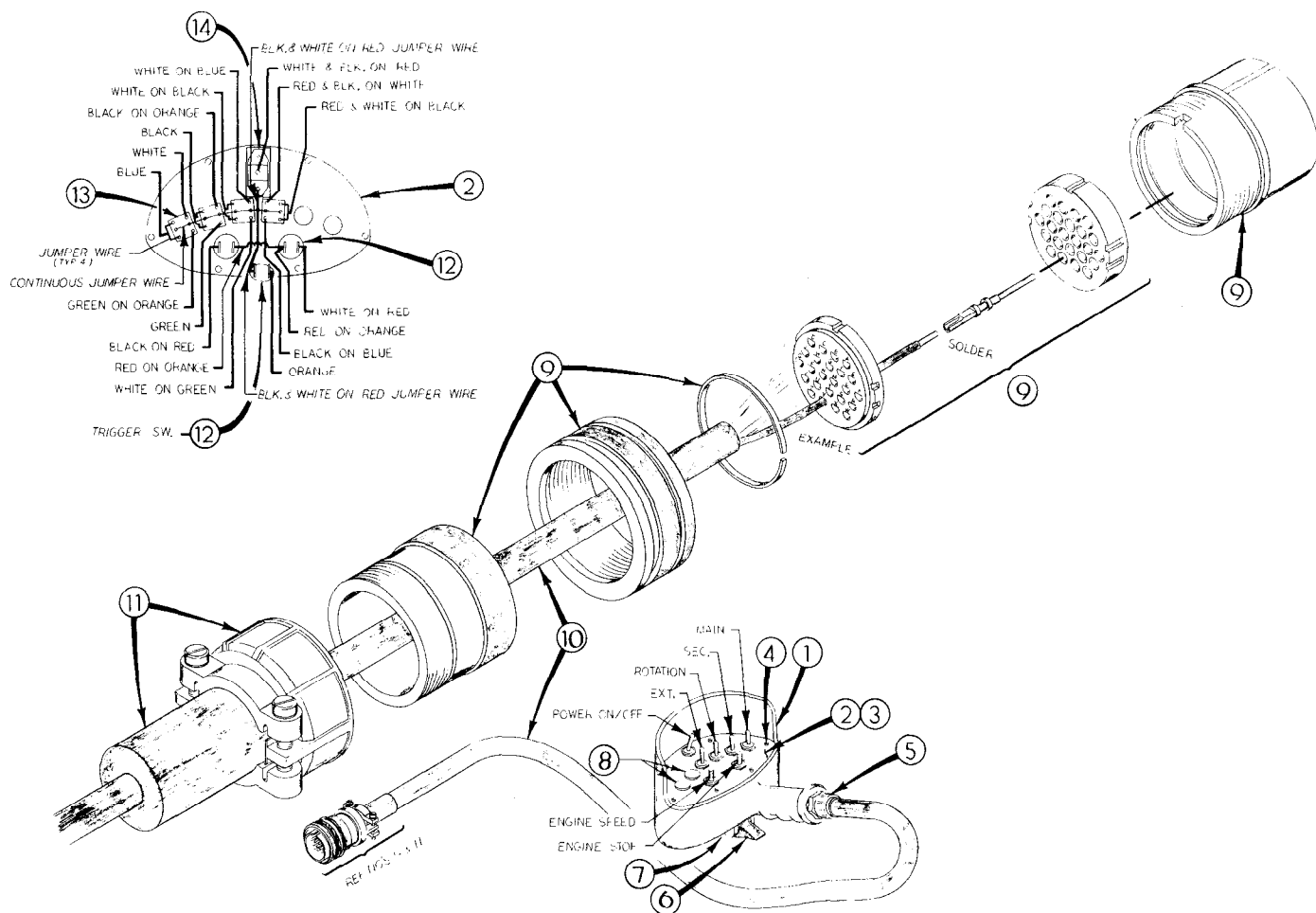
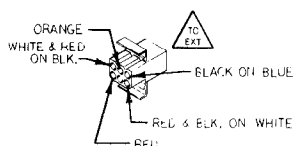
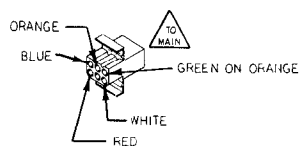
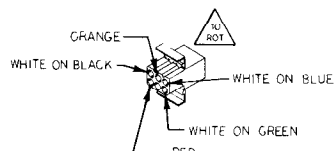
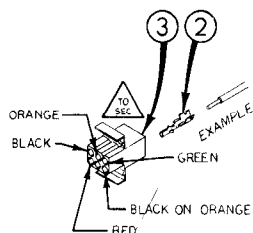
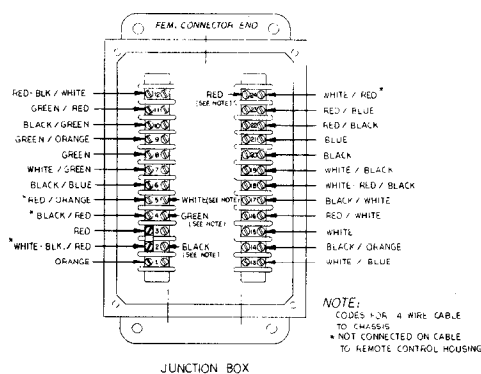


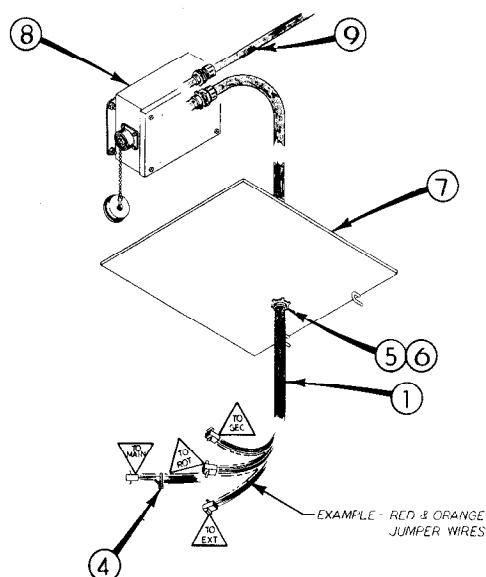
Figure 6-3. Standard Remote Control Handle (Part Number 51703244)

Item No.	Part No.	Description	Qty
1.	60025137	HANDLE	1
2.	60025146	PLATE, cover	1
3.	70391592	PLACARD, control	1
4.	72061003	SCREW; #6 x 1/2" self-tapping	6
5.	77044199	RELIEF, strain; 3/4"	1
6.	70034261	TRIGGER	1
7.	72066696	PIN, spring; 3/16" x 1-1/8"	1
8.	72661125	BUTTON, snap	2
9.	77044146	CONNECTOR, male; 24-pin	1
10.	60045006	CABLE, 18-24; 35'	1
11.	77044147	CLAMP, cable	1
12.	77041023	SWITCH, push button	3
13.	77041169	SWITCH, toggle	4
14.	77041004	SWITCH, toggle, POWER on/off	1
15.	60045020	WIRE, jumper; 7" (total)	1

PIN ASSIGNMENT COLOR CODES	
PIN	COLOR CODE
A	white & red on black
B	white & black on red
C	black on blue
D	red & black on white
E	white on black
F	white on red
G	white on green
H	white on blue
J	black
K	red
L	green
M	black on orange
N	blue
P	orange
Q	green on orange
R	red on white
S	black on green
T	black on red
U	red on black
V	white
W	red on blue
X	red on orange
Y	green on red
Z	black on white



CABLE WITH SYSTEM
TO CLUTCH ASSEMBLIES



Items with shaded quantities are not a part of this assembly and are shown for reference only.

Figure 6-4. Standard Remote Control Cable (Part Number 51703242)

Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty
1.	60045009	CABLE, 18-24; 50"	1	7.	52703257	PLATE, base	1
2.	77044194	PIN, female terminal	20	8.	51703233	BOX, junction	1
3.	77044192	CONNECTOR, male	4	9.	60045019	CABLE, 4-wire	1
4.	70034060	TIE, plastic	8	10.	77040051	TERMINAL, crimp on (not shown)	24
5.	77044199	RELIEF, strain; 3/4"	1	11.	60045016	WIRE, orange jumper; 36" (total)	1
6.	77044202	NUT, conduit lock; 3/4"	1	12.	60045017	WIRE, red jumper; 36" (total)	1

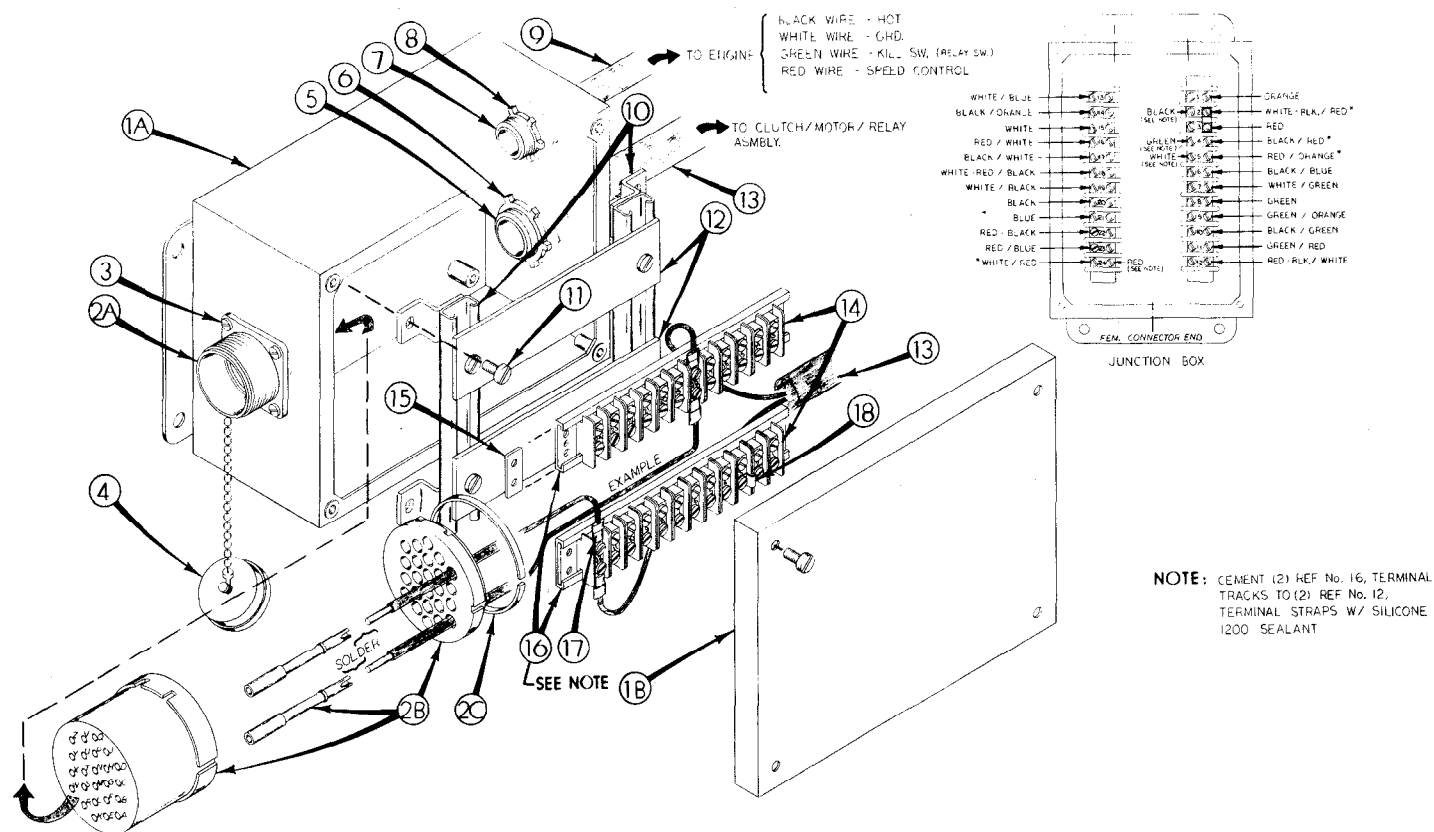


Figure 6-5. Remote Control Junction Box (Part Number 51703233)

Item No.	Part No.	Description	Qty
1.	77041194	BOX, junction	1
2.	77044151	CONNECTOR, female; 24-pin	1
3.	72061003	SCREW; #6 x 1/2" self-tap	4
4.	77044148	COVER, dust, female connector	1
5.	77044199	RELIEF, strain; 3/4"	1
6.	77044202	NUT, conduit lock; 3/4"	1
7.	77044018	RELIEF, strain; 1/2"	1
8.	77044201	NUT, conduit lock; 1/2"	1
9.	60045019	CABLE, 16/4; 25'	1
10.	77041195	BRACKET, mounting	1
11.	72060607	SCREW; #10-32 x 7/16" pan hd.	4
12.	77041196	STRAP, terminal	2
13.	--	CABLE	1
14.	60045044	STRIP, terminal	2
15.	77044111	RETAINER, terminal	4
16.	60044185	TRACK, terminal	2
17.	77040051	TERMINAL, clamp on	27
18.	77040130	JUMPER, terminal	1
19.	70034060	TIE, plastic (not shown)	3

Plug Pin	Term. No.	Description	Part No.
A	18	WIRE, white & red/black	60045021
B	2	WIRE, white & black/red	60045022
C	6	WIRE, black/blue	60045023
D	12	WIRE, red & black/white	60045024
E	19	WIRE, white/black	60045025
F	24	WIRE, white/red	60045026
G	7	WIRE, white/green	60045027
H	13	WIRE, white/blue	60045028
J	20	WIRE, black	60045029
K	--	WIRE, red (not used)	60045030
L	8	WIRE, green	60045031
M	14	WIRE, black/orange	60045032
N	21	WIRE, blue	60045033
P	1	WIRE, orange	60045034
Q	9	WIRE, green/orange	60045035
R	16	WIRE, red/white	60045036
S	10	WIRE, black/green	60045037
T	4	WIRE, black/red	60045014
U	22	WIRE, red/black	60045038
V	15	WIRE, white	60045039
W	23	WIRE, red/blue	60045040
X	5	WIRE, red/orange	60045041
Y	11	WIRE, green/red	60045042
Z	17	WIRE, black/white	60045043

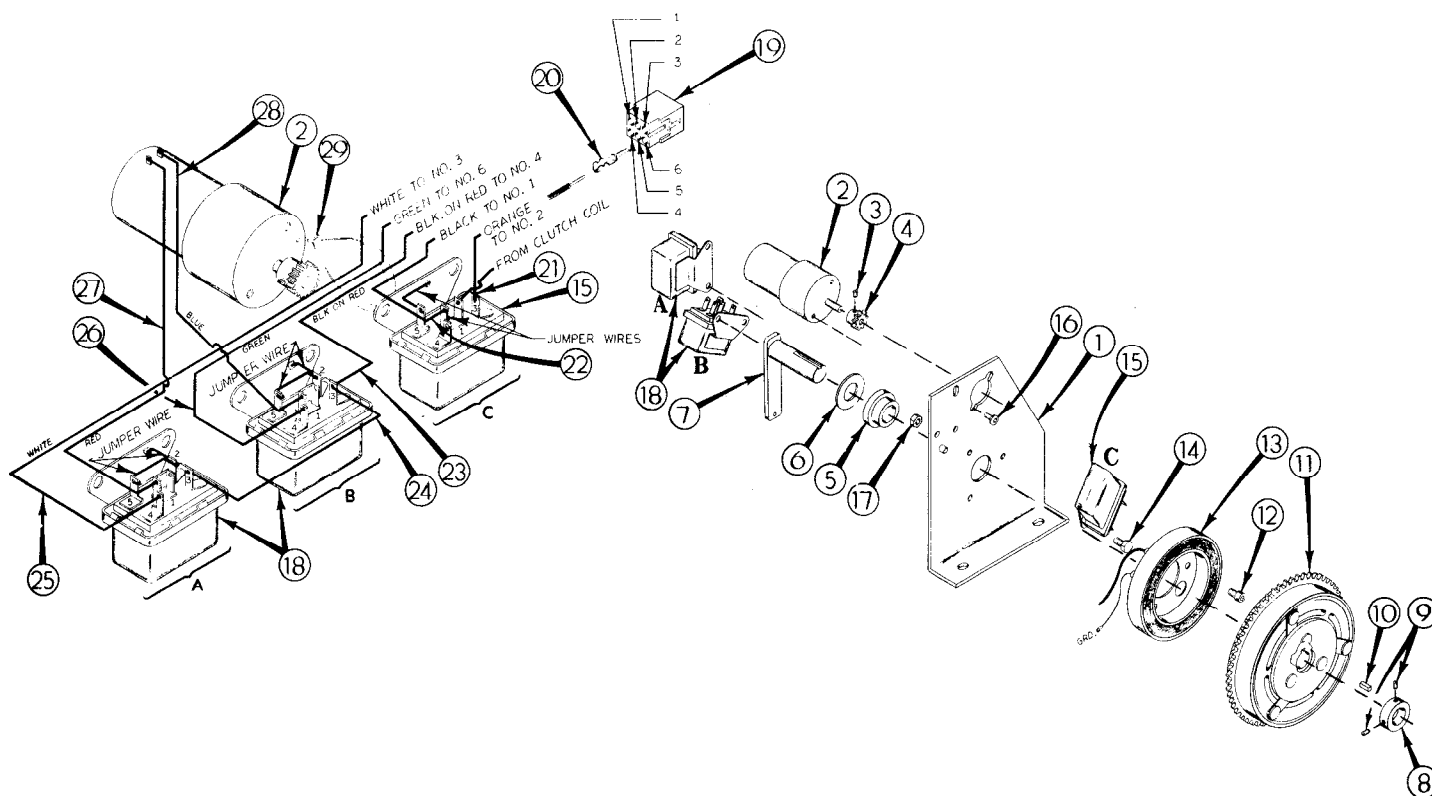


Figure 6-6. Clutch/Motor/Relay (Part Number 51703245)

Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty
1.	60105670	BRACKET, mounting	1	16.	72601030	SCREW; #10-32 x 3/8" soc. hd.	2
2.	77043019	MOTOR; 12 VDC	1	17.	72062104	NUT, lock; 1/4-20	4
3.	72060543	SCREW, set; #10-32	1	18.	77041193	RELAY, 6-pole; 12 VDC	2
4.	70056243	GEAR, drive	1	19.	77044193	CONNECTOR, female; 6-pin	1
5.	60020142	BUSHING	1	20.	77044195	PIN, male terminal	5
6.	72063028	BUSHING, machy.; 3/4" x 14 ga.	1	21.	60045018	WIRE, 18 ga. orange; 7"	1
7.	52702736	ARM, clutch	1	22.	60045012	WIRE, 18 ga. black; 7"	1
8.	60105142	COLLAR, set; 3/4"	1	23.	60045014	WIRE, 18 ga. black/red; 7"	1
9.	72060556	SCREW, set; 1/4-20 x 1/4"	2	24.	60045013	WIRE, 18 ga. black/red; 3"	1
10.	60105841	KEY	1	25.	60045003	WIRE, 18 ga. white; 9-1/2"	1
11.	51703327	CLUTCH	1	26.	60045011	WIRE, 18 ga. green; 7"	1
12.	72060702	SCREW; 1/4-20 x 3/8" shcs	3	27.	60045002	WIRE, 18 ga. red; 9-1/2"	1
13.	70056263	COIL	1	28.	60045015	WIRE, 18 ga. blue; 7"	1
14.	72060000	SCREW; 1/4-20 x 1/2" hex hd.	4	29.	70034060	TIE, plastic	1
15.	77041087	RELAY, 5-pole; 12 VDC	1	30.	60045008	WIRE, jumper; 4-1/2" (total)	1

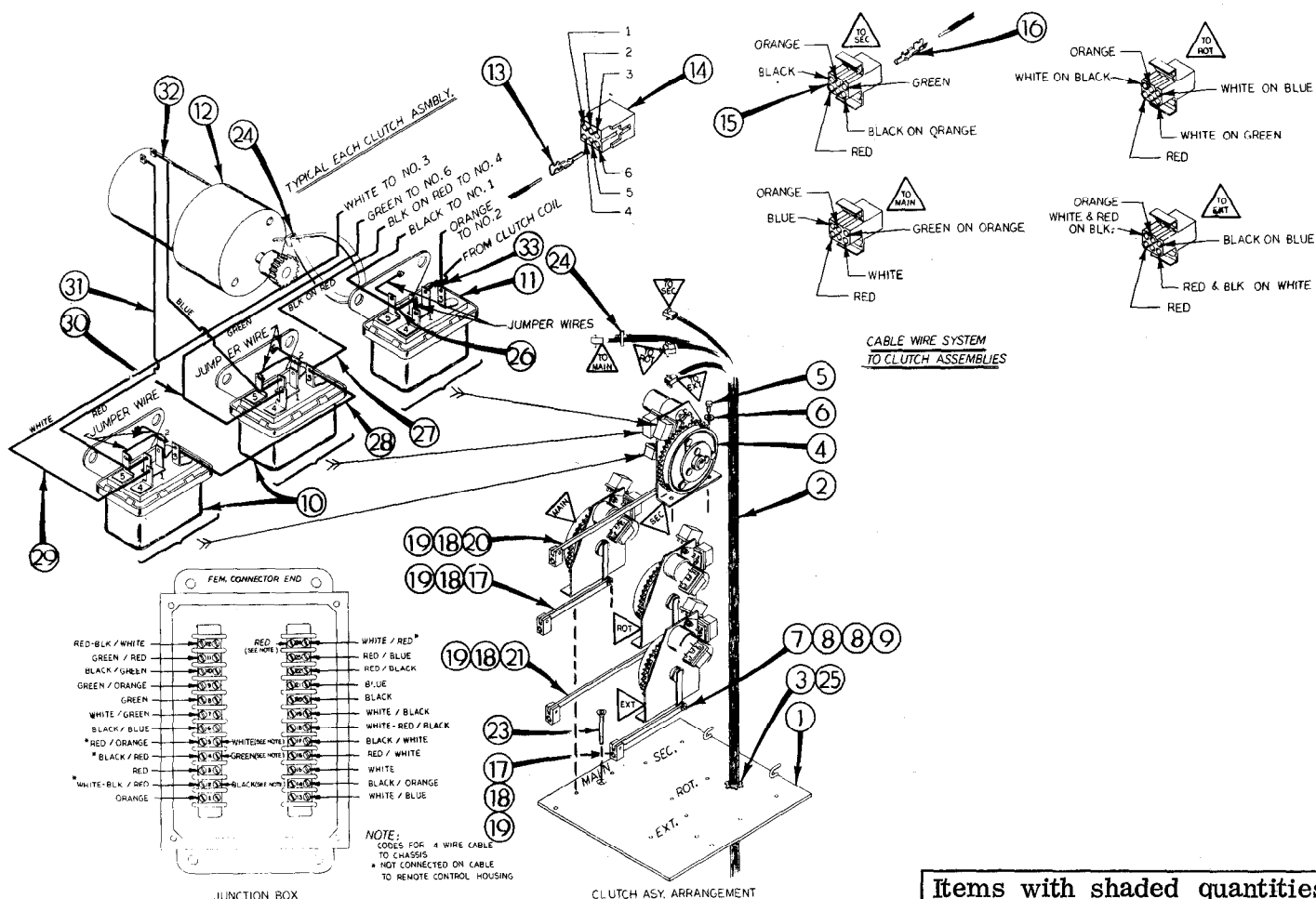


Figure 6-7. Remote Control with Power-Out Outriggers - Sheet 1 of 2
(Part Number 90703246)

Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty
1.	52703257	PLATE, base	1	18.	60104900	ADAPTER, lever	4
2.	51703242	CABLE	1	19.	72066691	PIN, spring; 3/16" x 3/4"	4
3.	77044199	RELIEF, strain; 3/4"	1	20.	60105668	ARM, linkage, bent; 15-1/4"	1
4.	51703245	CLUTCH/MOTOR/RELAY	4	21.	60105665	ARM, linkage; 12-5/8"	1
5.	72060021	SCREW; 5/16-18 x 1/2" hex hd.	8	22.	--	NOT USED	-
6.	72063002	WASHER, wrt.; 5/16"	8	23.	72601136	SCREW; 5/16-18 x 3" flat slotted hd.	1
7.	72601119	BOLT, shoulder; 1/4" x 3/8"	4	24.	70034060	TIE, plastic	11
8.	72063001	WASHER, wrt.; 1/4"	8	25.	77044202	NUT, conduit lock; 3/4"	1
9.	72062106	NUT, lock; #10-24	4	26.	60045012	WIRE, 18 ga. black; 7"	4
10.	77041193	RELAY, 6-pole; 12 VDC	4	27.	60045014	WIRE, 18 ga. black/red; 7"	4
11.	77041087	RELAY, 5-pole; 12 VDC	4	28.	60045013	WIRE, 18 ga. black/red; 3"	4
12.	77043019	MOTOR; 12 VDC	4	29.	60045003	WIRE, 18 ga. white; 9-1/2"	4
13.	77044195	PIN, male terminal	20	30.	60045011	WIRE, 18 ga. green; 7"	4
14.	77044193	CONNECTOR, female; 6-pin	4	31.	60045002	WIRE, 18 ga. red; 9-1/2"	4
15.	77044192	CONNECTOR, male; 6-pin	4	32.	60045015	WIRE, 18 ga. blue; 7"	4
16.	77044194	PIN, female terminal	20	33.	60045018	WIRE, 18 ga. orange; 7"	4
17.	60105667	ARM, linkage; 8-1/8"	2		60045008	WIRE, 18 ga. jumper; 4-1/2" (total)	4

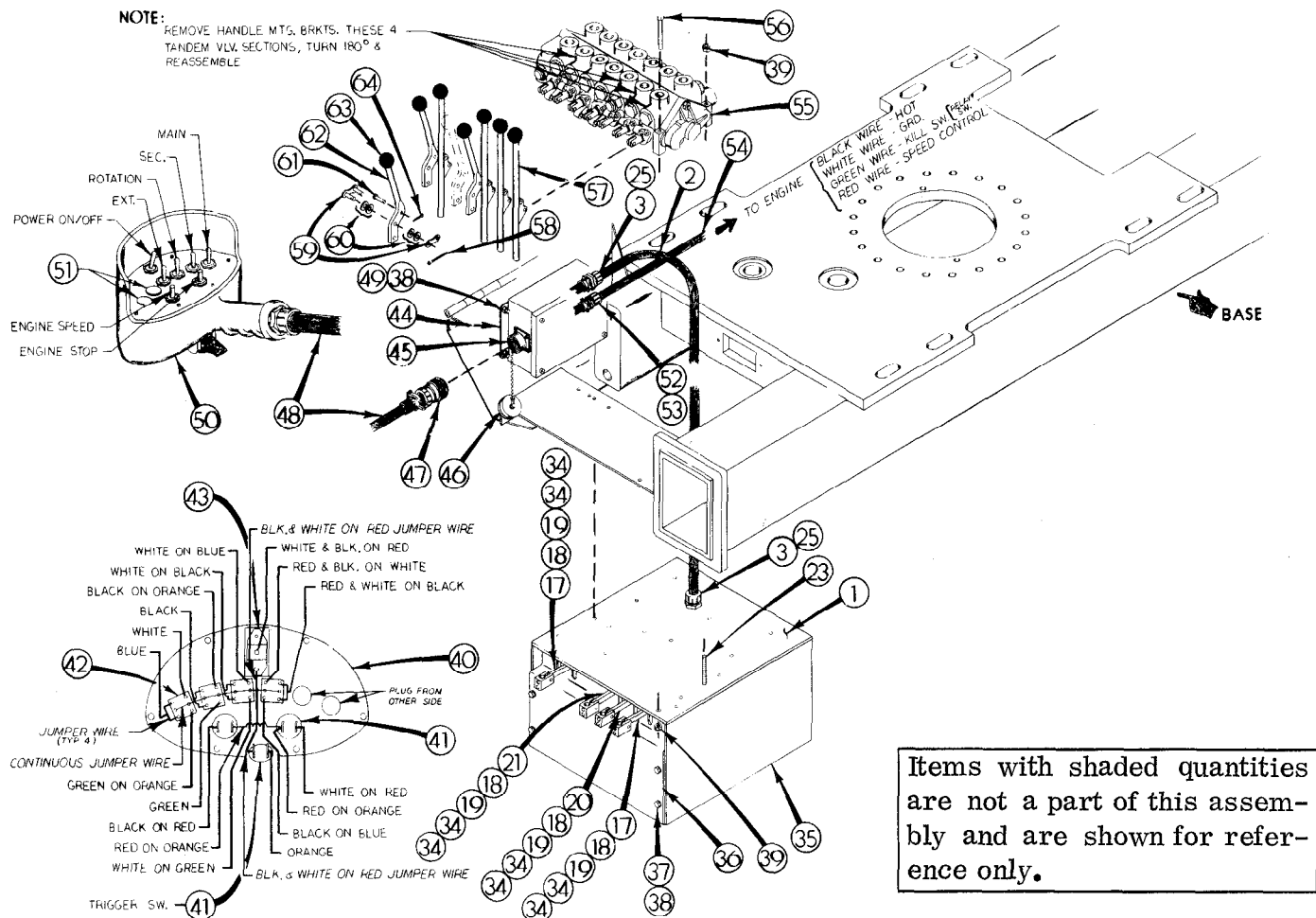


Figure 6-8. Remote Control with Power-Out Outriggers - Sheet 2 of 2
(Part Number 90703246)

Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty
1.	52703257	PLATE, base	1	45.	77044151	SHELL, female connector	1
2.	51703242	CABLE	1	46.	77044148	COVER, dust, female connector	1
3.	77044199	RELIEF, strain; 3/4"	3	47.	77044146	SHELL, male plug	1
17.	60105667	ARM, linkage; 8-1/8"	2	48.	60045006	CABLE; 35'	1
18.	60104900	ADAPTER, lever	4	49.	72062104	NUT, lock; 1/4-20	4
19.	72066691	PIN, spring; 3/16" x 3/4"	4	50.	51703244	HANDLE, remote control	1
20.	60105668	ARM, linkage; 15-1/4"	1	51.	72661125	BUTTON, snap	2
21.	60105665	ARM, linkage; 12-5/8"	1	52.	77044018	RELIEF, strain; 1/2"	1
23.	72601136	SCREW; 5/16-18 x 3" flat slotted hd.	1	53.	77044201	NUT, conduit lock; 1/2"	1
25.	77044202	NUT, conduit lock; 3/4"	2	54.	60045019	CABLE, 4-wire	1
34.	72060556	SCREW, set; 1/4-20 x 1/4"	8	55.	51702925	VALVE BANK; 7-spool	1
35.	52702902	HOUSING, remote control	1	56.	72060033	SCREW; 5/16-18 x 3" hex hd.	2
36.	60105566	COVER, housing	1	57.	52702901	LEVER, valve	4
37.	72063049	WASHER, lock; 1/4"	4	58.	72066335	PIN, cotter	7
38.	72060000	SCREW; 1/4-20 x 1/2" hex hd.	8	59.	71058003	LINK, connecting	7
39.	72062109	NUT, lock; 5/16-18	3	60.	72063001	WASHER, wrt.; 1/4"	28
40.	60025146	PLATE, cover	1	61.	72066337	PIN	7
41.	77041023	SWITCH, push-button	3	62.	70141983	LEVER, outrigger	3
42.	77041169	SWITCH, toggle	4	63.	71039096	KNOB, lever	7
43.	77041004	SWITCH, toggle; POWER on/off	1	64.	72066336	PIN, cotter	7
44.	51703233	BOX, junction	1				

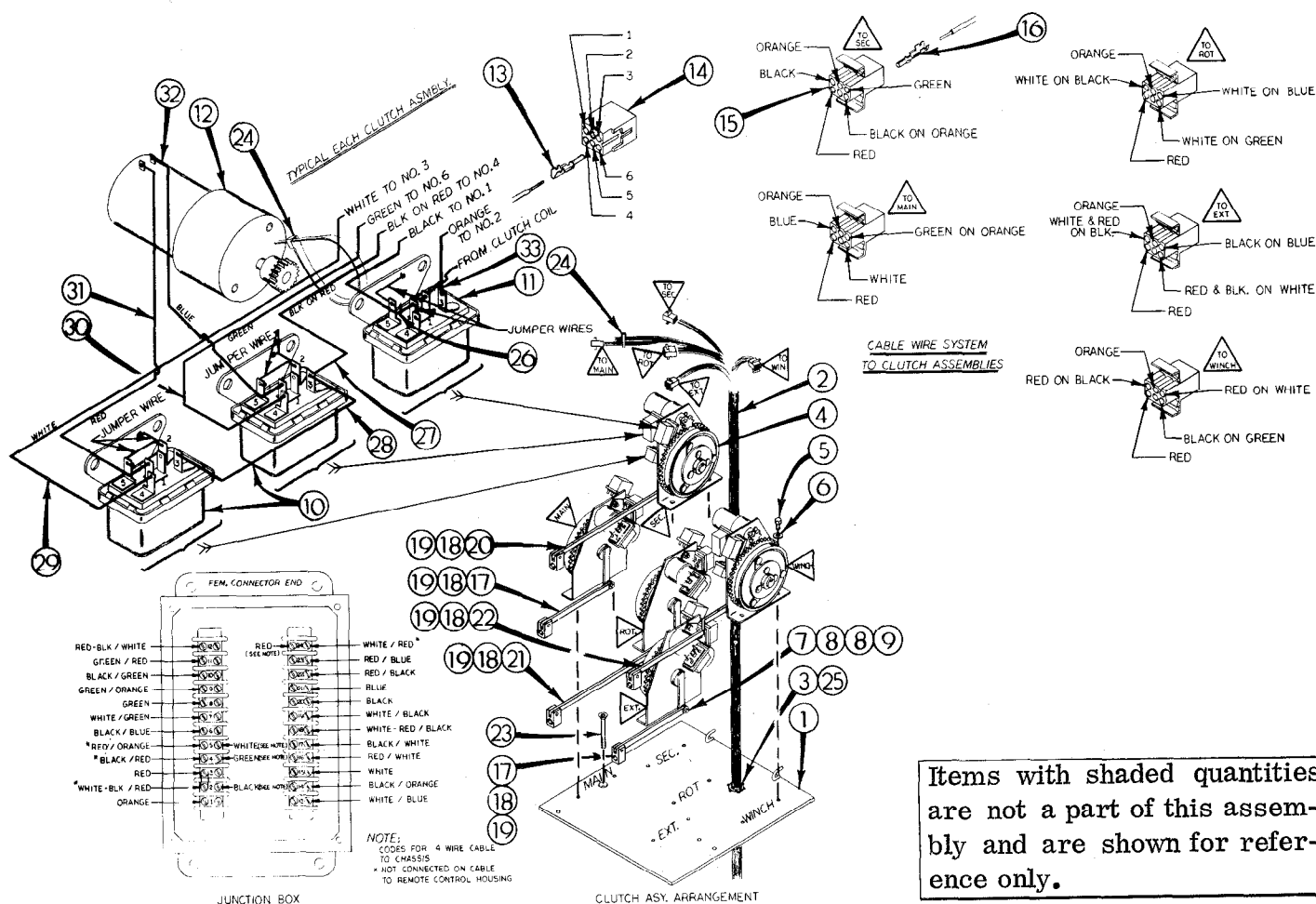


Figure 6-9. Remote Control with Winch - Sheet 1 of 2 (Part Number 90703241)

Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty
1.	52703257	PLATE, base	1	18.	60104900	ADAPTER, lever	5
2.	51703243	CABLE	1	19.	72066691	PIN, spring; 3/16" x 3/4"	5
3.	77044199	RELIEF, strain; 3/4"	1	20.	60105668	ARM, linkage, bent; 15-1/4"	1
4.	51703245	CLUTCH/MOTOR/RELAY	5	21.	60105665	ARM, linkage; 12-5/8"	1
5.	72060021	SCREW; 5/16-18 x 1/2"	10	22.	60105666	ARM, linkage, bent; 14-1/8"	1
6.	72063002	WASHER, wrt.; 5/16"	10	23.	72601136	SCREW; 5/16-18 x 3" flat slotted hd.	1
7.	72601119	BOLT, shoulder; 1/4" x 3/8"	5	24.	70034060	TIE, plastic	1
8.	72063001	WASHER, wrt.; 1/4"	38	25.	77044202	NUT, conduit lock; 3/4"	1
9.	72062106	NUT, lock; #10-24	5	26.	60045012	WIRE, 18 ga. black; 7"	5
10.	77041193	RELAY, 6-pole; 12 VDC	10	27.	60045014	WIRE, 18 ga. black/red; 7"	5
11.	77041087	RELAY, 5-pole; 12 VDC	5	28.	60045013	WIRE, 18 ga. black/red; 3"	5
12.	77043019	MOTOR; 12 VDC	5	29.	60045003	WIRE, 18 ga. white; 9-1/2"	5
13.	77044195	PIN, male terminal	25	30.	60045011	WIRE, 18 ga. green; 7"	5
14.	77044193	CONNECTOR, female; 6-pin	5	31.	60045002	WIRE, 18 ga. red; 9-1/2"	5
15.	77044192	CONNECTOR, male; 6-pin	5	32.	60045015	WIRE, 18 ga. blue; 7"	5
16.	77044194	PIN, female terminal	25	33.	60045018	WIRE, 18 ga. orange; 7"	5
17.	60105667	ARM, linkage; 8-1/8"	2		60045008	WIRE, jumper; 4-1/2" (total)	5

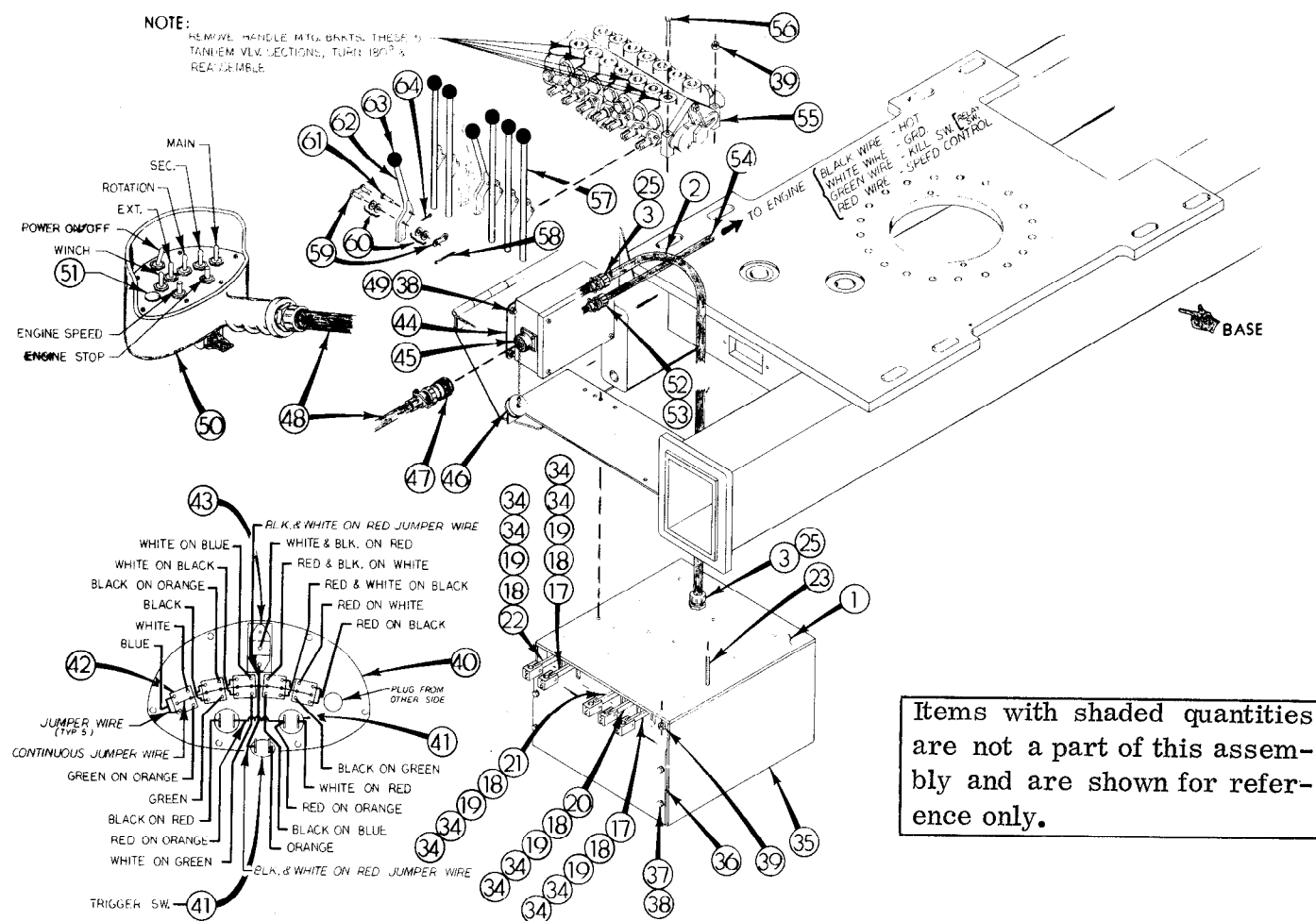


Figure 6-10. Remote Control with Winch - Sheet 2 of 2 (Part Number 90703241)

Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty
1.	52703257	PLATE, base	1	44.	51703233	BOX, junction	1
2.	51703243	CABLE	1	45.	77044151	SHELL, female connector	1
3.	77044199	RELIEF, strain; 3/4"	3	46.	77044148	COVER, dust, female connector	1
17.	60105667	ARM, linkage; 8-1/8"	2	47.	77044146	SHELL, male connector	1
18.	60104900	ADAPTER, lever	5	48.	60045006	CABLE; 35'	1
19.	72066691	PIN, spring; 3/16" x 3/4"	5	49.	72062104	NUT, lock; 1/4-20	4
20.	60105668	ARM, linkage; 15-1/4"	1	50.	51703249	HANDLE, remote control	1
21.	60105665	ARM, linkage; 12-5/8"	1	51.	72661125	BUTTON, snap	1
22.	60105666	ARM, linkage; 14-1/8"	1	52.	77044018	RELIEF, strain; 1/2"	1
23.	72601136	SCREW; 5/16-18 x 3" flat slotted hd.	1	53.	77044201	NUT, conduit lock; 1/2"	1
25.	77044202	NUT, conduit lock; 3/4"	2	54.	60045019	CABLE; 4-wire	1
34.	72060556	SCREW, set; 1/4-20 x 1/4"	10	55.	51702925	VALVE BANK; 7-spool	1
35.	52702902	HOUSING, remote control	1	56.	72060033	SCREW; 5/16-18 x 3" hex hd.	2
36.	60105566	COVER, housing	1	57.	52702901	LEVER, valve	5
37.	72063049	WASHER, lock; 1/4"	4	58.	72066335	PIN, cotter	7
38.	72060000	SCREW; 1/4-20 x 1/2" hex hd.	8	59.	72058003	LINK, connecting	7
39.	72062109	NUT, lock; 5/16-18	3	60.	72063001	WASHER, wrt.; 1/4"	38
40.	60025146	PLATE, cover	1	61.	72066337	PIN	7
41.	77041023	SWITCH, push-button	3	62.	70141983	LEVER, outrigger valve	2
42.	77041006	SWITCH, toggle	5	63.	71039096	KNOB	7
43.	77041004	SWITCH, toggle, POWER on/off	1	64.	72066336	PIN, cotter	7

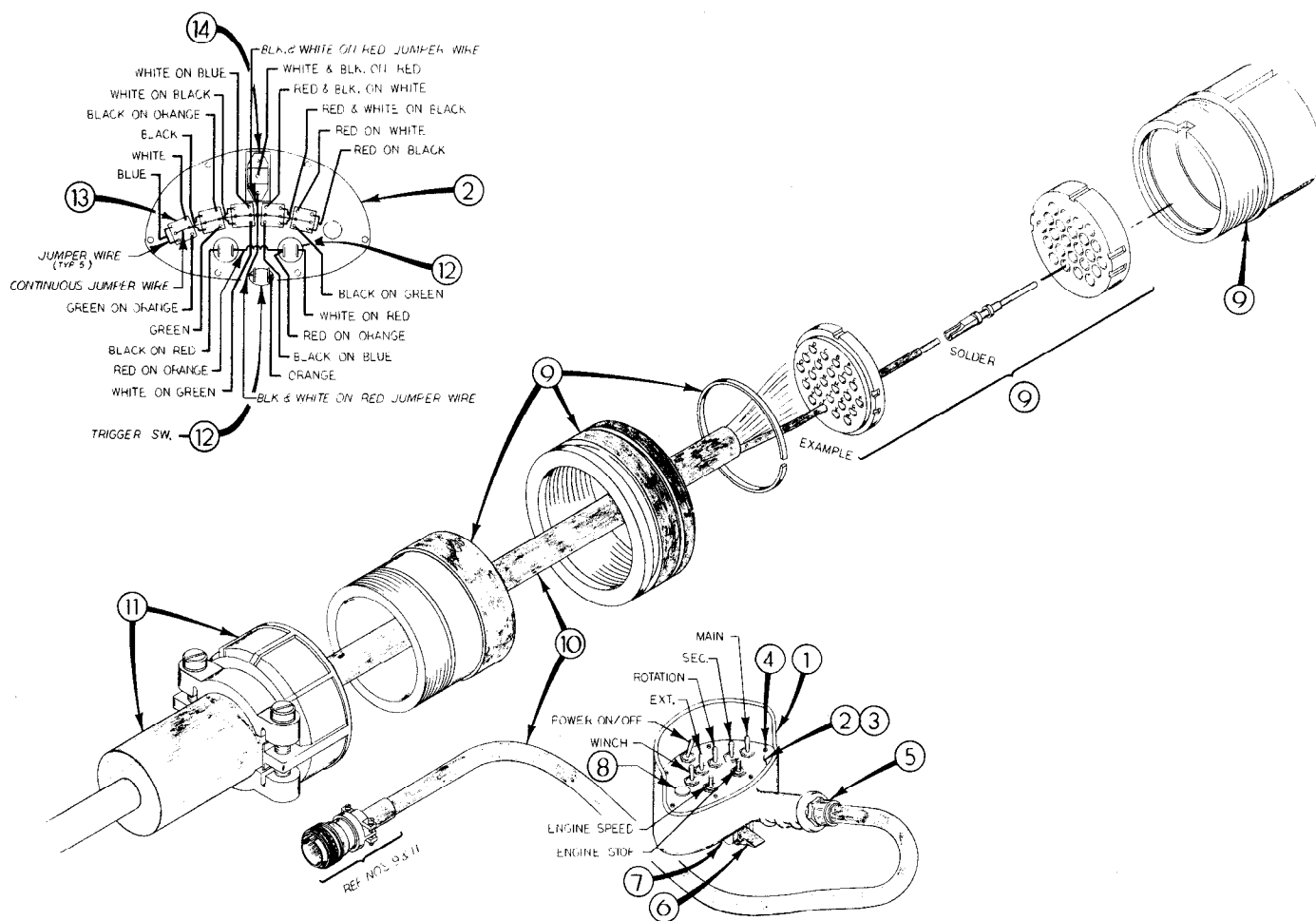


Figure 6-11. Remote Control Handle with Winch (Part Number 51703249)

Item No.	Part No.	Description	Qty
1.	60025137	HANDLE	1
2.	60025146	PLATE, cover	1
3.	70391592	PLACARD, control	1
4.	72061003	SCREW; #6 x 1/2" self-tapping	6
5.	77044199	RELIEF, strain; 3/4"	1
6.	70034261	TRIGGER	1
7.	72066696	PIN, spring; 3/16" x 1-1/8"	1
8.	72661125	BUTTON, snap	1
9.	77044146	CONNECTOR, male; 24-pin	1
10.	60045006	CABLE, 18-24; 35'	1
11.	77044147	CLAMP, cable	1
12.	77041023	SWITCH, push-button	3
13.	77041169	SWITCH, toggle	5
14.	77041004	SWITCH, toggle, POWER on/off	1
15.	60045020	WIRE, solid jumper; 7" (total)	1

PIN ASSIGNMENT COLOR CODES	
PIN	COLOR CODE
A	white & red on black
B	white & black on red
C	black on blue
D	red & black on white
E	white on black
F	white on red
G	white on green
H	White on blue
J	black
K	red
L	green
M	black on orange
N	blue
P	orange
Q	green on orange
R	red on white
S	black on green
T	black on red
U	red on black
V	white
W	red on blue
X	red on orange
Y	green on red
Z	black on white

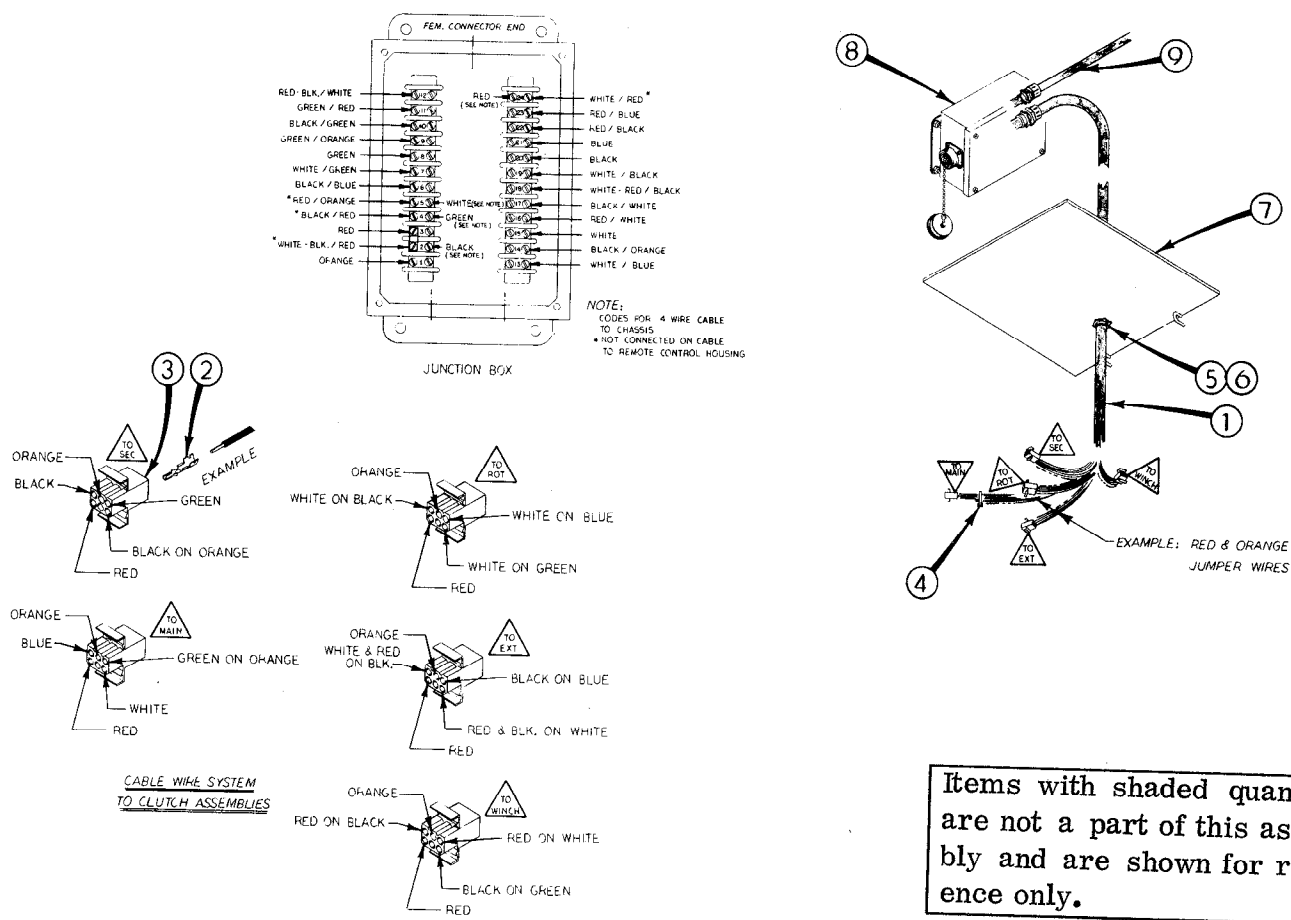


Figure 6-12. Remote Control Cable with Winch (Part Number 51703243)

Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty
1.	60045009	CABLE, 18-24; 50" lg.	1	7.	52703257	PLATE, base	1
2.	77044194	PIN, female terminal	25	8.	51703233	BOX, junction	1
3.	77044192	CONNECTOR, male; 6-pin	5	9.	60045019	CABLE, 4-wire	1
4.	70034060	TIE, plastic	9	10.	77040051	TERMINAL, crimp on (not shown)	24
5.	77044199	RELIEF, strain; 3/4"	1	11.	60045016	WIRE, orange jumper; 36" (total)	1
6.	77044202	NUT, conduit lock; 3/4"	1	12.	60045017	WIRE, red jumper; 36" (total)	1

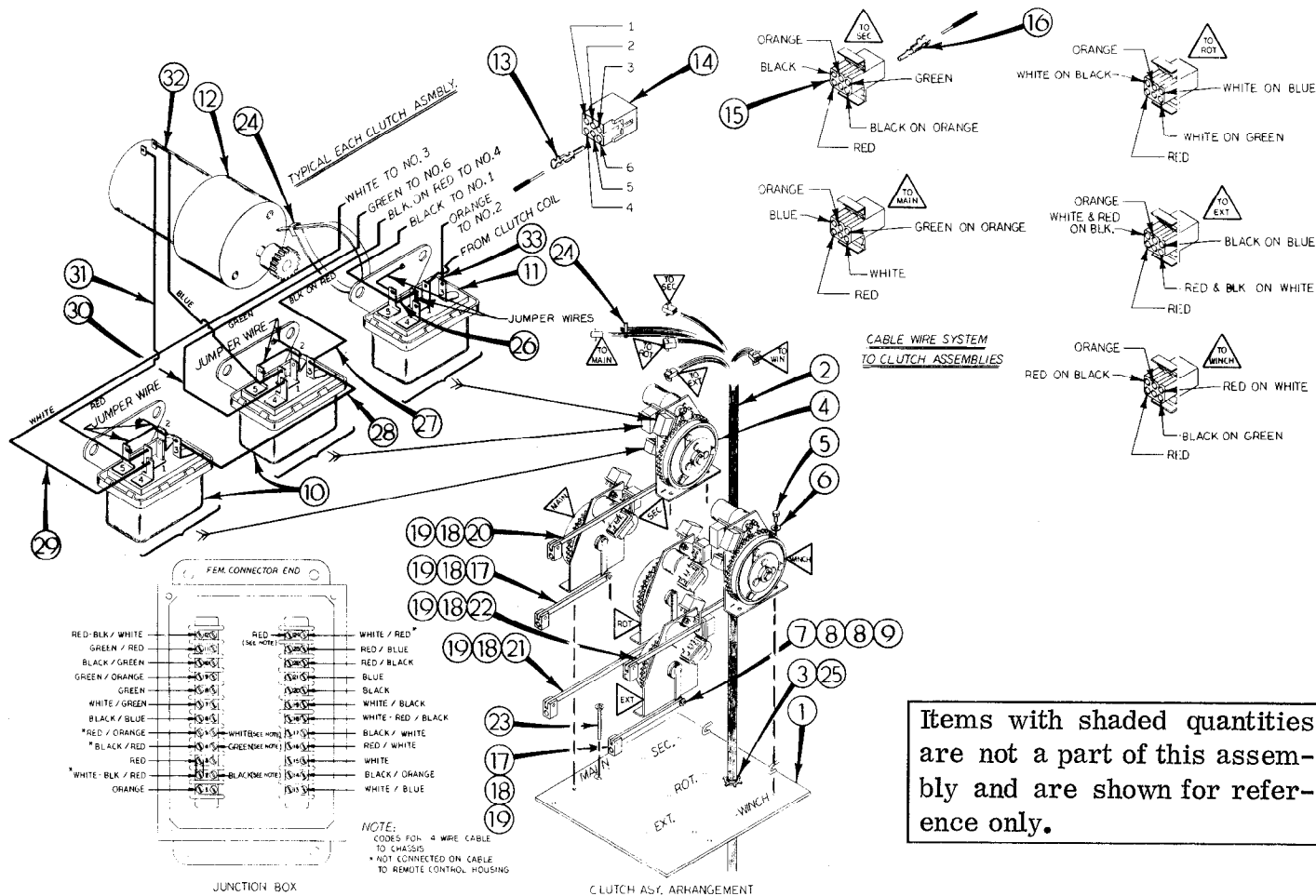


Figure 6-13. Remote Control with Power-Out Outriggers and Winch - Sheet 1 of 2
(Part Number 90703247)

Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty
1.	52703257	PLATE, base	1	18.	60104900	ADAPTER	5
2.	51703243	CABLE	1	19.	72066691	PIN, spring; 3/16" x 3/4"	5
3.	77044199	RELIEF, strain; 3/4"	1	20.	60105668	ARM, linkage; 15-1/4"	1
4.	51703245	CLUTCH/MOTOR/RELAY	5	21.	60105665	ARM, linkage; 12-5/8"	1
5.	72060021	SCREW; 5/16-18 x 1/2" hex hd.	10	22.	60105666	ARM, linkage; 14-1/8"	1
6.	72063002	WASHER, wrt.; 5/16"	10	23.	72601136	SCREW; 5/16-18 x 3" flat slotted hd.	1
7.	72601119	BOLT, shoulder; 1/4" x 3/8"	5	24.	70034060	TIE, plastic	1
8.	72063001	WASHER, wrt.; 1/4"	42	25.	77044202	NUT, conduit lock; 3/4"	1
9.	72062106	NUT, lock; #10-24	5	26.	60045012	WIRE, 18 ga. black; 7"	5
10.	77041193	RELAY, 6-pole; 12 VDC	10	27.	60045014	WIRE, 18 ga. black/red; 7"	5
11.	77041087	RELAY, 5-pole; 12 VDC	5	28.	60045013	WIRE, 18 ga. black/red; 3"	5
12.	77043019	MOTOR; 12 VDC	1	29.	60045003	WIRE, 18 ga. white; 9-1/2"	5
13.	77044195	PIN, male terminal	25	30.	60045011	WIRE, 18 ga. green; 7"	5
14.	77044193	CONNECTOR, female; 6-pin	5	31.	60045002	WIRE, 18 ga. red; 9-1/2"	5
15.	77044192	CONNECTOR, male; 6-pin	5	32.	60045015	WIRE, 18 ga. blue; 7"	5
16.	77044194	PIN, female terminal	25	33.	60045018	WIRE, 18 ga. orange; 7"	5
17.	60105667	ARM, linkage; 8-1/8"	2	34.	60045008	WIRE, jumper; 4-1/2" (total)	5

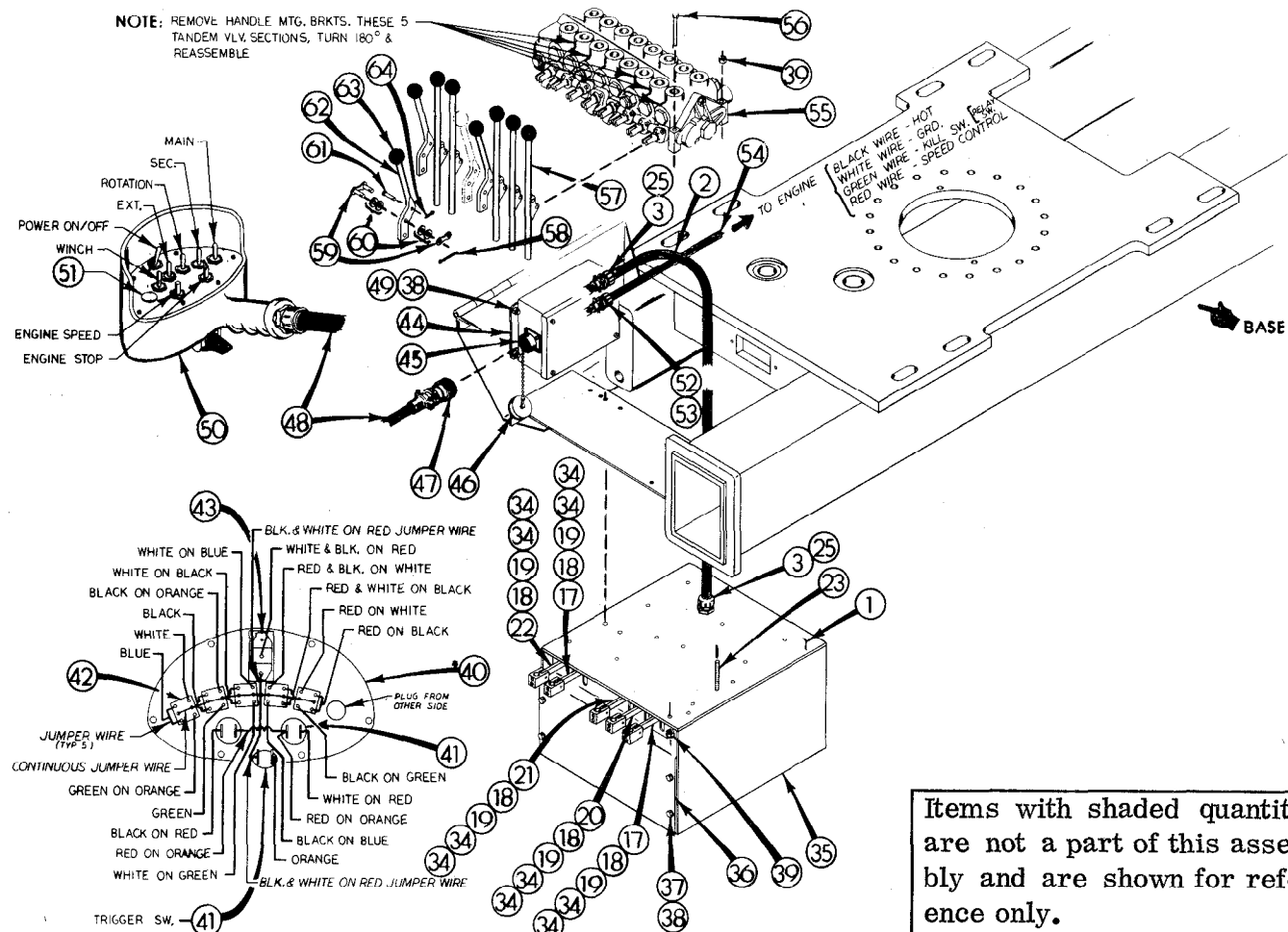


Figure 6-14. Remote Control with Power-Out Outriggers and Winch - Sheet 2 of 2
(Part Number 90703247)

Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty.
1.	52703257	PLATE, base	1	44.	51703233	BOX, junction	1
2.	51703243	CABLE	1	45.	77044151	SHELL, female connector	1
3.	77044199	RELIEF, strain	2	46.	77044148	COVER, dust, female connector	1
17.	60105667	ARM, linkage; 8-1/8"	2	47.	77044146	SHELL, male connector	1
18.	60104900	ADAPTER, lever	5	48.	60045006	CABLE; 35'	1
19.	72066691	PIN, spring; 3/16" x 3/4"	5	49.	72062104	NUT, lock; 1/4-20	4
20.	60105668	ARM, linkage; 15-1/4"	1	50.	51703249	HANDLE, remote control	1
21.	60105665	ARM, linkage; 12-5/8"	1	51.	72661125	BUTTON, snap	1
22.	60105666	ARM, linkage; 14-1/8"	1	52.	77044018	RELIEF, strain; 1/2"	1
23.	72601136	SCREW; 5/16-18 x 3" flat slotted hd.	1	53.	77044201	NUT, conduit lock	1
25.	77044202	NUT, conduit lock; 3/4"	2	54.	60045019	CABLE, 4-wire	1
34.	72060556	SCREW, set; 1/4-20 x 1/4"	10	55.	51702928	VALVE BANK; 8-spool	1
35.	52702902	HOUSING, remote control	1	56.	72060033	SCREW; 5/16-18 x 3" hex hd.	2
36.	60105566	COVER, housing	1	57.	52702901	LEVER, valve	5
37.	72063049	WASHER, lock; 1/4"	4	58.	72066335	PIN, cotter	2
38.	72060000	SCREW; 1/4-20 x 1/2"	8	59.	72058003	LINK, connecting	8
39.	72062109	NUT, lock; 5/16-18	3	60.	72063001	WASHER, wrt.; 1/4"	42
40.	60025146	PLATE, cover	1	61.	72066337	PIN	8
41.	77041023	SWITCH, push-button	3	62.	70141983	LEVER, outrigger	3
42.	77041006	SWITCH, toggle	5	63.	71039096	KNOB	8
43.	77041004	SWITCH, toggle, POWER on/off	1	64.	72066336	PIN, cotter	8

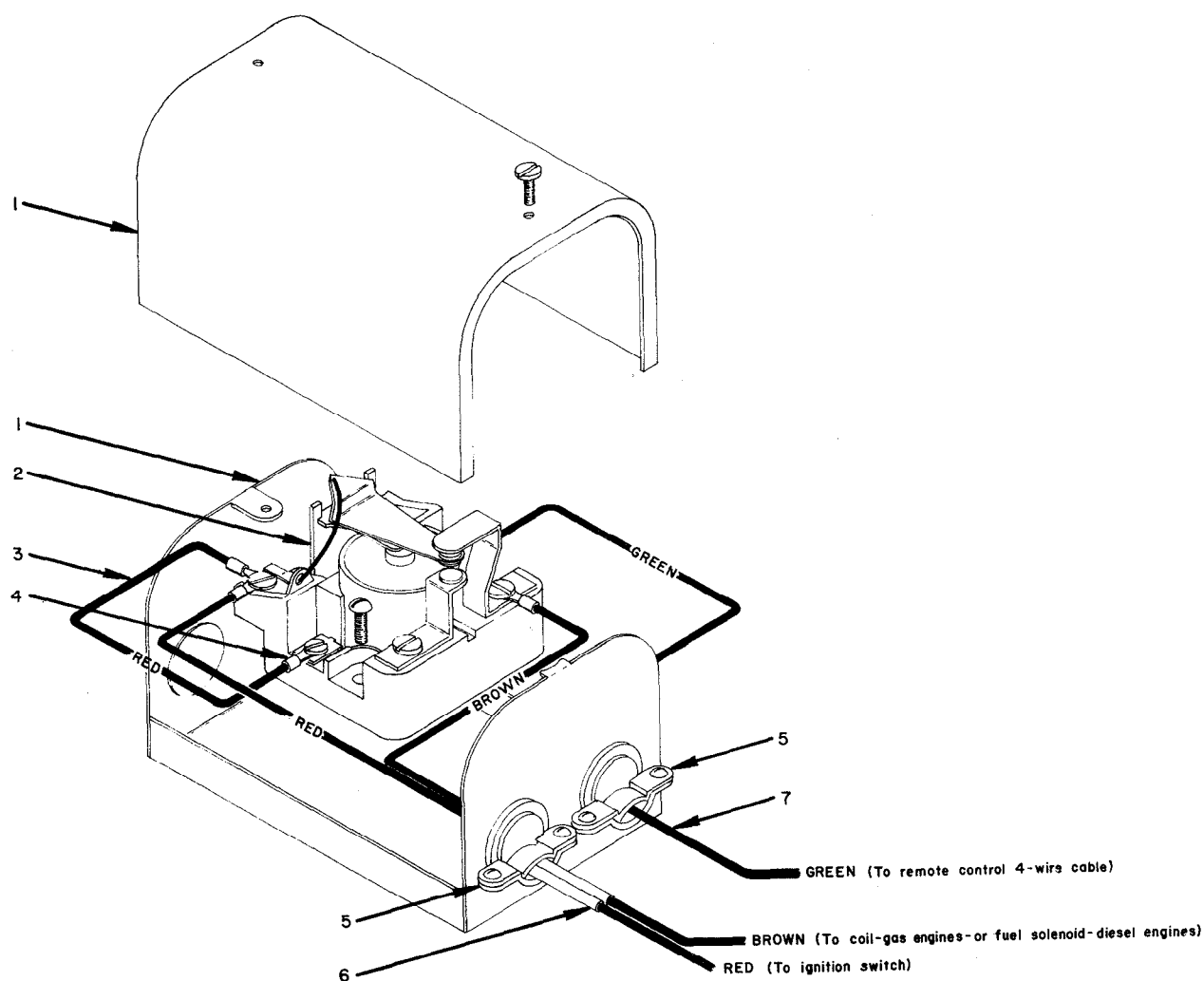


Figure 6-15. Emergency Stop Kit (Part Number 51703437)

Item No.	Part No.	Description	Qty
1.	77044112	HOUSING, relay	1
2.	77041063	RELAY	1
3.	60045063	WIRE, red, 14 ga. x 6"	1
4.	77040051	TERMINAL, eye	5
5.	77044099	CLAMP, conduit	2
6.	60045061	CABLE, 2-wire; 14 ga. x 48"	1
7.	60045062	WIRE, green; 14 ga. x 48"	1
8.	77040048	SPLICE, butt (not shown)	3