

**TE-24**



**INTERNATIONAL<sup>®</sup>**

**PARTS CATALOG**

**CABLE AND HYDRAULIC  
BULLDOZERS**

**AND**

**BULLGRADERS**

**For use with**

**TD-15 (151 SERIES) CRAWLER TRACTORS**

**INTERNATIONAL HARVESTER COMPANY**  
180 North Michigan Avenue  
Chicago 1, Illinois, U.S.A.

# The Importance of ADEQUATE PARTS and SERVICE

The wise purchaser of a new machine gives consideration to the following factors:

1. *Original quality*
2. *Availability of service parts*
3. *Availability of adequate service facilities*

In many cases the machine becomes the only means of performing certain tasks that must be done in a limited period of time. Wear and even breakage of parts are to be expected due to operating conditions. However, the user can still be assured of getting his work done on time if service parts and adequate service facilities are available.

Foresighted International Harvester dealers make every effort to provide good service and maintain a completely adequate stock of service parts.

When in need of parts, always give the International Construction Equipment distributor or dealer your Bullgrader or Bulldozer serial numbers. We suggest that you write these serial numbers in the spaces provided below, for ready reference when parts are required.

Bullgrader Serial No. \_\_\_\_\_  
(Stamped on name plate located on top right-hand corner in back of blade)

Bulldozer Serial No. \_\_\_\_\_  
(Stamped on name plate located on top right-hand corner in back of blade)

## INSTRUCTIONS FOR ORDERING PARTS

- (a) All parts orders should be sent to the control district office or parts depot when so instructed. Give complete address, state the county and railroad station (when shipping point is different than post office), also whether shipment is to go by parcel post, express, truck, or freight.
- (b) When ordering parts, give the IH part number, including suffix or prefix letters. To facilitate identification of these parts, "Serial Numbers" assigned to machines, if any, should be furnished.
- (c) Parts should be ordered on the standard parts order blank. The parts should be arranged in sequence by part numbers to facilitate service on orders at the control district office or parts depot.
- (d) Claims for shortage or error in the handling of an order for parts must be made upon receipt of goods.

*It is the policy of International Harvester Company to improve its products whenever it is possible and practical to do so.*

*We reserve the right to make changes or add improvements in the design or construction of parts at any time without incurring the obligation to install such changes on products previously delivered.*

## INTRODUCTION

This catalog contains a complete list of parts for the following Bullgraders and Bulldozers:

### CABLE OPERATED

Model 15D-1	Bulldozer
Model 15D-3	Bulldozer
Model 15G-1	Bullgrader
Model 15G-3	Bullgrader

### HYDRAULIC OPERATED

Model 15D-2	Bulldozer
Model 15G-2	Bullgrader

### HYDRAULIC CONTROL UNIT (For use with Hydraulic Bullgraders and Hydraulic Bulldozers)

Model 1540	Hydraulic Control Unit
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(Refer to paragraph 8 for key to model numbers and letters.)

Following is a brief summary of the system used in compiling this catalog. It is to your advantage to carefully study this summary.

This catalog is designed into a new double-column page format, and is divided into four separate sections --- Introductory pages, Indexes to Units; Illustrations and Parts Lists, and Numerical Index.

(1) INDEXES. Two types of indexes are employed herein. The Index to Units for a specific classification will list alphabetically all of the units comprising the classification and will direct the user of the catalog to the page where the illustration and parts list may be found. A Numerical Index at the back of the catalog contains a listing of part numbers (excluding standard fasteners) with the page number showing where each part is listed and described.

NOTE - It is important that you refer frequently to the Index to Units. Failure to do so will result in not being able to locate the proper unit.

(2) ILLUSTRATIONS. The method of illustrating parts in this catalog is known as the "Exploded View" method. The individual parts in each illustration are shown in their normal relationship to one another. Reference numbers only are shown in each illustration. These numbers correspond with numbers in the reference number column in the accompanying list of parts preceding or following the illustration. Unnumbered parts are the same as corresponding parts with reference numbers shown elsewhere in the illustration.

CAUTION: Reference numbers should not be used when ordering parts. Always use IH part numbers or description when ordering.

(3) METHOD OF LISTING. The parts list of each classification is divided into units. Parts are listed in order according to reference number shown in the illustration, followed by a full description based upon the "noun first" method --- i. e., the noun name of the part is listed first then the modifying descriptive information which serves to specifically identify the item. For example: BLADE w/EDGE and BITS. Parts not shown in illustrations appear at end of list in alphabetical sequence by noun name. Parts listed will work on all units covered in this catalog unless a serial number or other qualifying designation is given for purpose of identification.

Throughout this catalog the term "Front" indicates the radiator end and "Rear" indicates the drawbar end of the unit. Whenever the terms "Right" or "Left" are used it should be understood to mean from a rear position looking toward the radiator end.

In the new double-column catalog format the single "No. Req'd." column is eliminated and the quantity used of each item is shown in parenthesis (4) following the description of the item. Where no quantity is indicated it should be understood to mean that only (1) is required.

## INTRODUCTION - Continued

The number required information is shown in parenthesis (2 for Unit A, 3 for Unit B) following the description of the item. When a unit letter (Unit A) is shown without a quantity it should be understood to mean only one (1) is required per unit. Letters of these units correspond with those shown at the beginning of the individual parts list or at the beginning of a group comprising several minor parts lists.

Manufacturers part numbers are listed in brackets following the description of the part.

(4) **ASSEMBLIES AND ATTACHMENTS.** Where ever possible the component parts of assemblies or attachments are shown in the "exploded views" by the use of boxes, brackets or arrows. Component parts of assemblies or attachments are listed by one of the following methods.

(a) The listings are fully covered by descriptions for simple assemblies and attachments.

(b) When four or more parts are contained in the assemblies or attachments the listing of components immediately follows the description with the wording "(Composed of-)".

(c) Assemblies or attachments consisting of many parts shows the assembly or attachment number at the beginning of the unit list, followed by the listing of the components.

Exceptions to the above methods are explained by footnotes in the text.

Individual parts of an assembly which are not available for service are marked with a symbol §. In some instances, such parts are listed with a notation giving the information which is to be used for ordering.

(5) **PART NUMBERS.** The policy governing part numbers is outlined in the pamphlet "What is a Parts Number?" which has been distributed throughout the company operations.

(6) **MISCELLANEOUS PARTS.** In a great many instances, parts which appear in an "Exploded View" --- such as standard bolts, screws, nuts, etc. --- are not identified by a reference number. These parts are known as **COMMON HARDWARE** items and appear in abbreviated nomenclature and are shown indented under the major items with which they are used. They should be ordered as listed, since they are not component parts of the pieces they attach. Hardware parts identified with part numbers have been designed for a specific usage. Standard hardware parts should not be substituted for them.

**WARNING:** Attaching parts especially made for their location should never be substituted with regular standard parts.

The following rules are established to govern the listing of attaching parts:

The part number for Common Hardware items is eliminated. However, Design Hardware items will continue to be listed by part number and description.

All Carriage, Machine and Plow BOLTS; NUTS, and Cap, Machine and Set SCREWS will be considered furnished with National Coarse Thread unless otherwise specified. The number of threads per inch will be eliminated.

All **NUTS** will be considered "hex." unless otherwise specified.

All **WASHERS** will be considered "Plain" unless otherwise specified. The "ID", "OD" and "No." identity will be eliminated. The inside dimension will be listed first, followed by the outside diameter and the thickness.

All **LOCK WASHERS** will be considered "Medium" type unless specified as "Light" or "Heavy".

All **COTTER PINS** will be considered "Extended-Prong" type unless otherwise specified.

All **GROOV PINS** will be considered "Standard-Groove" unless otherwise specified.

All **COMMON RIVETS** will be considered "Annealed" unless otherwise specified.

INTRODUCTION - Continued

All COUNTERSUNK-HEAD TUBULAR RIVETS will be considered "Copper-Plated Steel" unless otherwise specified.

All OVAL-HEAD TUBULAR RIVETS will be considered "Brass".

Standard bolts used in International Harvester Products are manufactured under standards known as Unified National Coarse Thread (U. N. C.) and Unified National Fine Thread (U. N. F.) with the number of threads per inch for various diameters as shown below:

Diameter of Bolt	No. of Threads per inch (U. N. C.)	No. of Threads per inch (U. N. F.)
1/4"	20	28
5/16"	18	24
3/8"	16	24
7/16"	14	20
1/2"	13	20
9/16"	12	18
5/8"	11	18
3/4"	10	16
7/8"	9	14
1"	8	14
1-1/8"	7	12
1-1/4"	7	12
1-3/8"	6	12
1-1/2"	6	12

(7) ABBREVIATIONS. The abbreviations used in this catalog are explained in the list of abbreviations on page 4.

(8) SERIAL NUMBERS and LETTERS. Bulldozer and Bullgrader Serial Numbers start with 4001. These are stamped on the name plate on the back of the blade at the top of the right hand corner. Following are the prefixes and letters, which precede the serial numbers, for these units.

Model		Prefix Letters
15D-1	Bulldozer	TD-151 D1
15D-2	Bulldozer	TD-151 D2
15D-3	Bulldozer	TD-151 D3
15G-1	Bullgrader	TD-151 G1
15G-2	Bullgrader	TD-151 G2
15G-3	Bullgrader	TD-151 G3

NUMBER CODE

- 1 - Using front mounted cable control unit. (cable operated)
- 2 - Hydraulic operated.
- 3 - Using rear mounted cable control unit. (cable operated)

LETTER CODE

- G - Bullgrader
- D - Bulldozer

## LIST OF ABBREVIATIONS

A period after the abbreviation is used only when the abbreviation form spells a common English word.

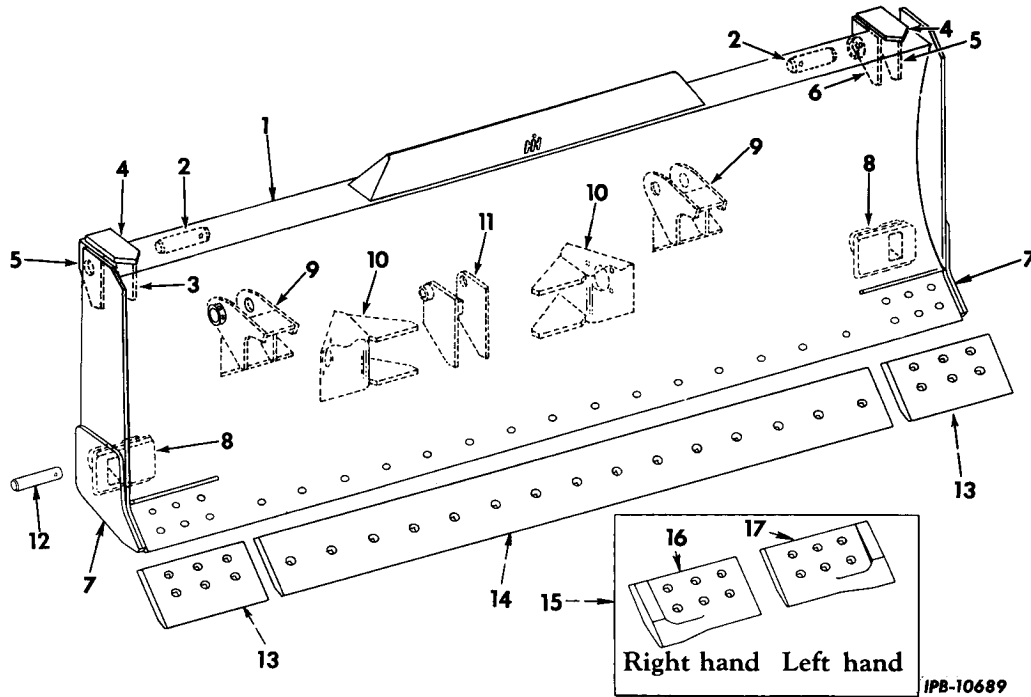
al	aluminum	in.	inch or inches
aly-stl	alloy steel	lb	pound, pounds
amp	ampere, amperes	lentil-hd	lentil head
anl	annealed	LH	left hand
approx	approximately	lkg	locking
assy	assembly	mach	machine
att	attachment	MI	malleable iron
bd-hd	binding head	NC	National Coarse Thread
b-hd	button head	NF	National Fine Thread
brs	brass	ni	nickel
brz	bronze	ni-pltd-stl	nickel plated steel
cd-pltd	cadmium plated	No.	number
cd-pltd-stl	cadmium plated steel	NPT	National pipe thread
cr-pltd	chromium plated	OC	outside circumference
cr-pltd-stl	chromium plated steel	OD	outside diameter
CI	cast iron	ov-hd	oval head
csk	countersunk	oz	ounce
csk-hd	countersunk head	parkerized-stl	parkerized steel
cl-rec-hd	clutch recess head	pkg	package
cone-pt	cone point	pltd	plated
contd	continued	pt	point
cop	copper	PTO	power take-off
cop-pltd	copper plated	rd-end	round end
c-pin	cotter pin	rd-hd	round head
crs	corrosion-resistant-steel (stainless)	rd-pt	round point
cr-rec-hd	cross recess head	reg	regular
cre	corrosion resisting	RH	right hand
crg	carriage	RPM	revolutions per minute
cup-pt	cup point	SAE	Society of Automotive Engineers
cyl	cylinder, cylinders	sf	semi-finished
dia	diameter	slt-hd	slotted head
dld	drilled	slt-bd-hd	slotted binding head
dld-f/c-pin	drilled for cotter pin	slt-fil-hd	slotted fillister head
dld-f/lkg-wire	drilled for locking wire	slt-f-hd	slotted flat head
dog-pt	dog point	slt-hex-hd	slotted hexagon head
f/	for	slt-pan-hd	slotted pan head
fil-hd	fillister head	slt-rd-hd	slotted round head
fin-nk	fin neck	sq	square
f-csk-hd	flat countersunk head	sq-hd	square head
f-fil-hd	flat fillister head	sq-nk	square neck
f-hd	flat head	std	standard
f-pt	flat-point	std-hd	standard head
flex	flexible	stl	steel
ft	foot (or feet)	T	teeth
ga	gauge	thd	thread
hd	head	unfin	unfinished
hdls	headless	wagon-box-hd	wagon box head
hex.	hexagon	w/	with
hex-hd	hexagonal-head	w/brz	with bronze
hex-soc-hd	hexagon socket head	w/hex.	with hexagon
hp	horsepower	w/o	without
hv	heavy	zn	zinc
ID	inside diameter	zn-ct	zinc coated
		zn-pltd	zinc plated

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(hydraulic).....	18	bullgrader.....	7
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**CABLE AND HYDRAULIC  
BULLGRADERS AND BULLDOZERS**

**BULLDOZER BLADE**



IPB-10689

REF. NO.	I. H. PART NUMBER	DESCRIPTION
1	320 789 R91	BLADE w/EDGE and BITS, ASSEMBLY (Composed of - 2 BITS 298 852 R1 1 BLADE 320 790 R91 15 BOLT 296 845 R1 6 BOLT 296 845 R1 6 BOLT 320 876 R1 1 EDGE 320 843 R1)
1	320 790 R91	BLADE ASSEMBLY, less EDGE and BITS (Composed of - 2 BRACKET 320 798 R91 2 BRACKET 320 828 R91 1 BRACKET 320 834 R11 1 LUG 315 089 R91 1 LUG 315 090 R91 2 LUG 315 091 R1 2 PLATE 315 111 R1 2 SOCKET 320 832 R1 2 REINFORCEMENT 315 092 R1 )
2	315 506 R1	PIN, upper strut front (2) 1/2 x 3-3/4" hex-hd cap SCREW (2) 1/2" stover lock NUT (2)
3	315 090 R91	LUG, upper strut RH
4	315 092 R1	PLATE, upper strut lug reinforcement (2)
5	315 091 R91	LUG, upper strut (2)
6	315 089 R91	LUG, upper strut LH
7	315 111 R1	PLATE, wear (2)
8	320 798 R91	BRACKET, push arm (2)
9	320 828 R91	BRACKET, hydraulic (2)

**CABLE AND HYDRAULIC  
BULLGRADERS AND BULLDOZERS**

**BULLDOZER BLADE - CONTINUED**

REF. NO.	I. H. PART NUMBER	DESCRIPTION
10	320 832 R1	SOCKET, diagonal strut (2)
11	320 834 R11	BRACKET, cable lift
12	309 789 R1	PIN, pusharm bracket 1/2 x 2-3/4" hex-hd cap SCREW (2) 1/2" stover lock NUT (2)
13	298 852 R1 296 845 R1 320 876 R1	BIT, end (not heavy) (2) BOLT, 3/4 x 2-1/2" plow (No. 3 hd) (6) BOLT, 3/4 x 5" plow (6) 3/4" NUT (12) 3/4" lock WASHER (12)
14	320 843 R1 296 845 R1	EDGE, cutting BOLT, 3/4 x 2-1/2" plow (No. 3 hd) (15) 3/4" NUT (15) 3/4" lock WASHER (15)
15	296 229 R91	ATTACHMENT, end bit (cast steel) (See NOTES 1 and 3) (Consists of BIT, 290 493 R3 and BIT, 290 494 R3)
16	290 493 R3 296 845 R1 296 849 R1	BIT, LH end (heavy duty) BOLT, 3/4 x 2-1/2" plow (No. 3 hd) (3) BOLT, 3/4 x 3-1/2" plow (No. 3 hd) (3) 3/4" NUT (6) 3/4" lock WASHER (6)
17	290 494 R3 296 845 R1 296 849 R1	BIT, RH end (heavy duty) BOLT, 3/4 x 2-1/2" plow (No. 3 hd) (3) BOLT, 3/4 x 3-1/2" plow (No. 3 hd) (3) 3/4" NUT (6) 3/4" lock WASHER (6)

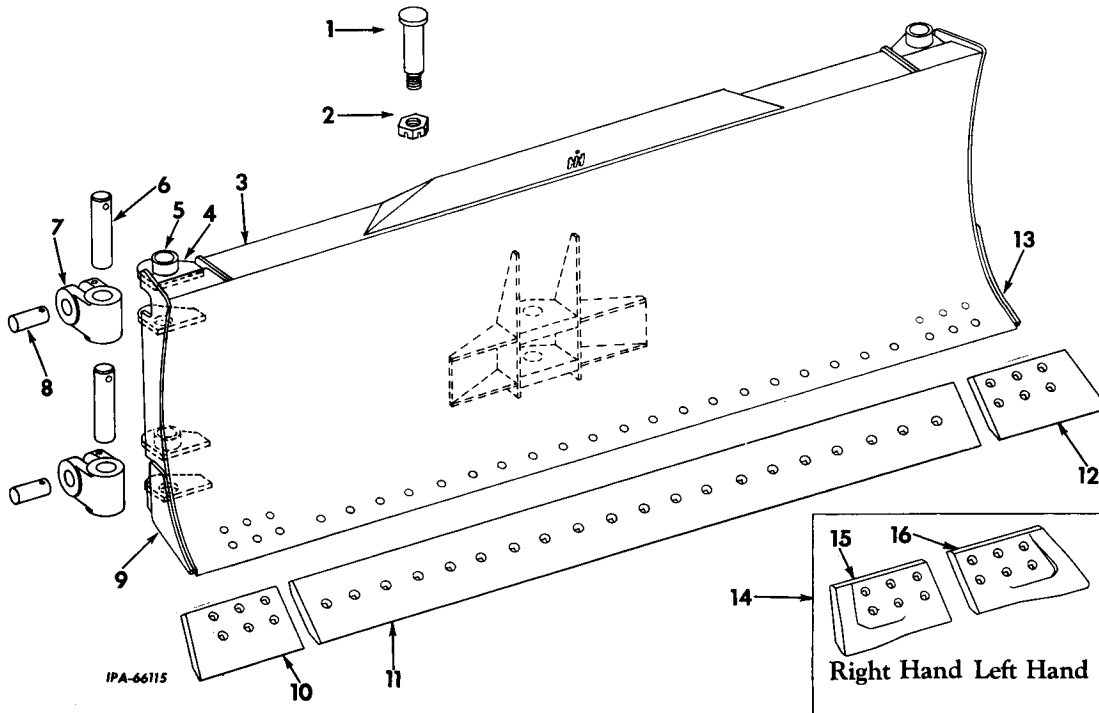
NOTE 1 - Factory Application - Order on  
Machine Order Form.  
NOTE 3 - Field Application - Order through  
Regular Service Parts Channels.





# CABLE AND HYDRAULIC BULLGRADERS AND BULLDOZERS

**BULLGRADER BLADE**  
(Cable and Hydraulic)



# CABLE AND HYDRAULIC BULLGRADERS AND BULLDOZERS

**BULLGRADER BLADE**  
(Cable and Hydraulic) - Continued

REF. NO.	I. H. PART NUMBER	DESCRIPTION
1	319 451 R1	PIN, crosshead clevis
2	286 473 R1 13 222 R1	NUT, 1-3/4" crosshead clevis pin PIN, 3/8 x 3-3/4" cotter
3	320 744 R91	BLADE w/EDGE and BITS ASSEMBLY (Composed of - 1 BIT 298 850 R1 1 BIT 298 851 R1 1 BLADE 320 743 R91 26 BOLT 296 845 R1 6 BOLT 296 849 R1 1 EDGE 315 023 R1 )
3	320 743 R91	BLADE ASSEMBLY, less EDGE and BITS (Composed of - 8 LUG 320 758 R1 1 PLATE 320 756 R1 1 PLATE 320 757 R1 4 TUBE 289 822 R1 )
4	320 758 R1	LUG, strut swivel (8)
5	289 822 R1	TUBE, strut lug (4)
6	319 453 R1	PIN, strut swivel (4) 1/2 x 3" hex-hd cap SCREW (4) 1/2" stover lock NUT (4)
7	319 452 R1	CLEVIS, strut swivel (4)
8	319 454 R1	PIN, strut clevis (4) 7/16" stover lock NUT (4) 7/16" x 4-1/4" hex-hd cap SCREW (4)
9	320 757 R1	PLATE, wear RH

REF. NO.	I. H. PART NUMBER	DESCRIPTION
10	298 851 R1 296 845 R1 296 849 R1	BIT, RH end (not heavy duty) BOLT, 3/4 x 2-1/2" plow (No. 3 hd) (3) BOLT, 3/4 x 3-1/2" plow (No. 3 hd) (3) 3/4" NUT (6) 3/4" lock WASHER (6)
11	315 023 R1 296 845 R1	EDGE, cutting BOLT, 3/4 x 2-1/2" plow (No. 3 hd) (20) 3/4" NUT (20) 3/4" lock WASHER (20)
12	298 850 R1 296 845 R1 296 849 R1	BIT, LH end (not heavy duty) BOLT, 3/4 x 2-1/2" plow (No. 3 hd) (3) BOLT, 3/4 x 3-1/2" plow (No. 3 hd) (3) 3/4" NUT (6) 3/4" lock WASHER (6)
13	320 756 R1	PLATE, wear LH
14	296 230 R91	ATTACHMENT, end bits (cast stl) (consists of Ref. Nos. 15 and 16) (See NOTES 1 and 3)
15	290 469 R3 296 845 R1 296 849 R1	BIT, RH end (heavy duty) BOLT, 3/4 x 2-1/2" plow (No. 3 hd) (3) BOLT, 3/4 x 3-1/2" plow (No. 3 hd) (3) 3/4" NUT (6) 3/4" lock WASHER (6)
16	290 468 R3 296 845 R1 296 849 R1	BIT, LH end (heavy duty) BOLT, 3/4 x 2-1/2" plow (No. 3 hd) (3) BOLT, 3/4 x 3-1/2" plow (No. 3 hd) (3) 3/4" NUT (6) 3/4" lock WASHER (6)

NOTE 1 - Factory Application - Order on Machine Order Form.  
NOTE 3 - Field Application - Order through Regular Service Parts Channels.



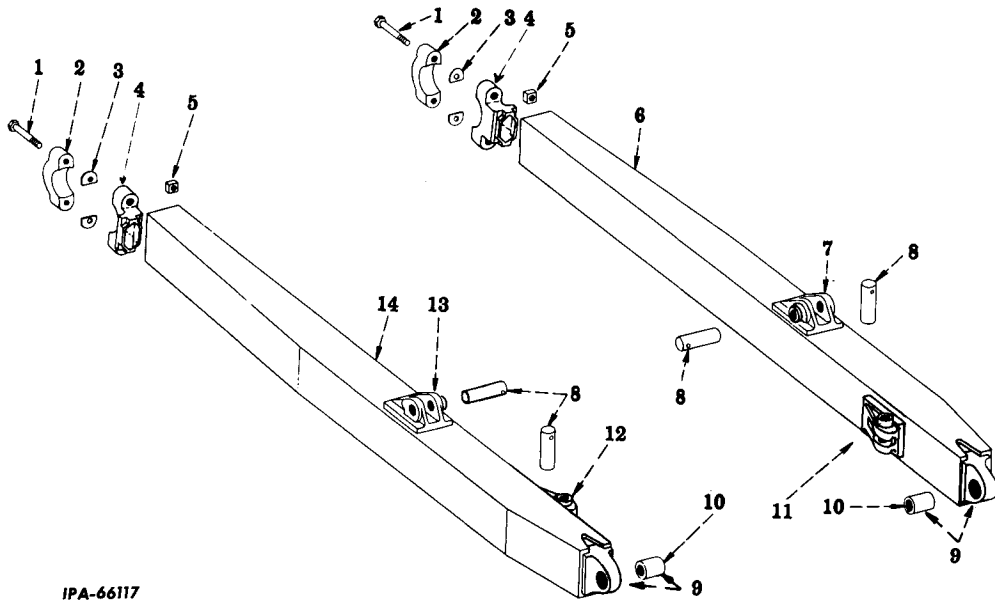
# CABLE AND HYDRAULIC BULLGRADERS AND BULLDOZERS

## BULLDOZER PUSH ARMS



# CABLE AND HYDRAULIC BULLGRADERS AND BULLDOZERS

## BULLDOZER PUSH ARMS - CONTINUED



IPA-66117

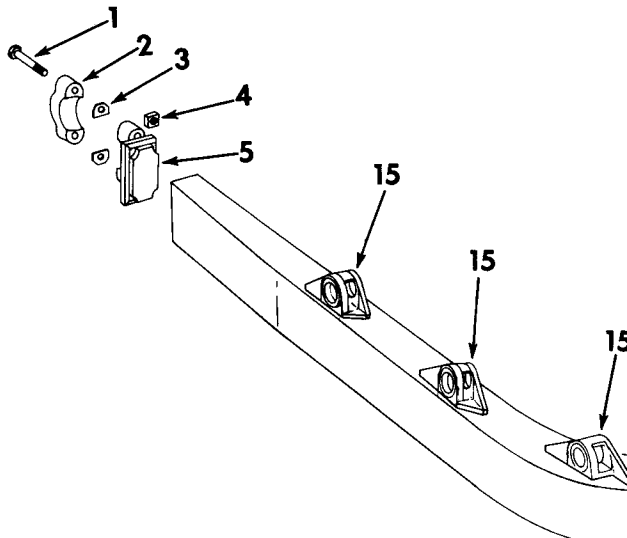
REF. NO.	I. H. PART NUMBER	DESCRIPTION
1	18 307 R1	SCREW 1 x 6" hex-hd cap (4)
2	290 255 R1	CAP, trunnion bearing (2)
3	290 257 R1	SHIM, trunnion bearing cap (16)
4	293 046 R1	BEARING, trunnion (2)
5	290 256 R1	NUT, trunnion bearing cap (4)
6	320 844 R91	ARM ASSEMBLY, LH push (Composed of - 1 ARM 320 846 R91 1 CAP 290 255 R1 2 NUT 290 256 R1 2 SCREW 18 307 R1 8 SHIM 290 257 R1 )
6	320 846 R91	ARM w/PIVOT, 320 875 R11, BRACKET, 315 355 R91, BRACKET, 315 356 R91 and BEARING, 293 046 R1, LH push
7	315 355 R91	BRACKET, strut
8	315 103 R1	PIN, strut bracket (4) 1/2" stover lock NUT (4) 1/2 x 3-3/4" hex-hd cap SCREW (4)

REF. NO.	I. H. PART NUMBER	DESCRIPTION
9	320 875 R11	PIVOT w/BUSHING, 290 267 R2 push arm (2)
10	290 267 R2	BUSHING, push arm pivot (2)
11	315 356 R91	BRACKET, strut
12	315 355 R91	BRACKET, strut
13	315 356 R91	BRACKET, strut
14	320 845 R91	ARM ASSEMBLY, RH push (Composed of - 1 ARM 320 847 R91 1 CAP 290 255 R1 2 NUT 290 256 R1 2 SCREW 18 307 R1 8 SHIM 290 257 R1 )
14	320 847 R91	ARM w/PIVOT, 320 875 R11, BRACKET, 315 356 R91, BRACKET, 315 355 R91 and BEARING, 293 046 R1, RH push
	295 748 R91	NOZZLE, track roller grease (flexible) (for lubricating track rollers located behind trunnions)



# CABLE AND HYDRAULIC BULLGRADERS AND BULLDOZERS

**BULLGRADER "C" FRAME**  
(Cable and Hydraulic)



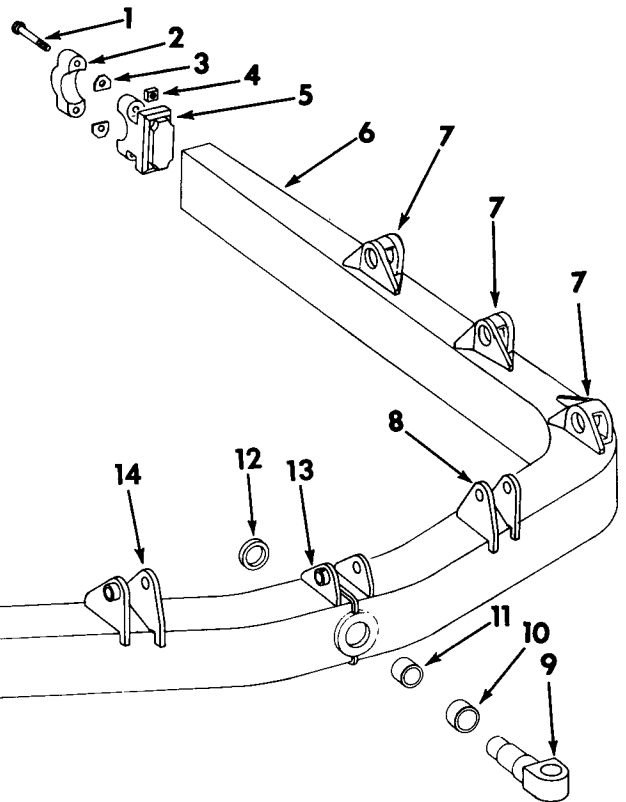
IPA-60976

REF. NO.	I. H. PART NUMBER	DESCRIPTION
1	18 307 R1	SCREW, 1 x 6" hex-hd cap (4)
2	290 255 R1	CAP, trunnion bearing (2)
3	290 257 R1	SHIM, trunnion bearing cap (16)
4	290 256 R1	NUT, trunnion bearing cap (4)
5	290 270 R2	BEARING, trunnion (2)
6	320 766 R91	"C" FRAME ASSEMBLY w/CAPS (Composed of -
	2	CAP 290 255 R1
	1	FRAME 320 767 R91
	4	NUT 290 256 R1
	4	SCREW 18 307 R1
	16	SHIM 290 257 R1 )



# CABLE AND HYDRAULIC BULLGRADERS AND BULLDOZERS

**BULLGRADER "C" FRAME**  
(Cable and Hydraulic) - Continued

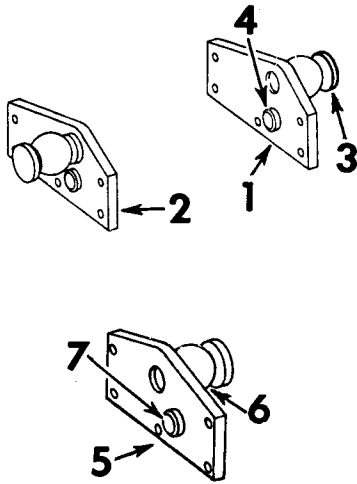


REF. NO.	I. H. PART NUMBER	DESCRIPTION
6	320 767 R91	"C" FRAME ASSEMBLY less CAPS (Composed of -
	2	BEARING 290 270 R2
	3	BRACKET 293 998 R1
	3	BRACKET 293 999 R1
	1	BRACKET 320 768 R91
	1	BRACKET 320 769 R91
	2	BRACKET 315 435 R1
	1	BUSHING 319 470 R1
	1	BUSHING 319 471 R1
	1	PIN 320 774 R1
	1	RING 319 469 R1 )
7	293 998 R1	BRACKET, LH strut (3)
8	320 768 R91	BRACKET, LH hydraulic
9	320 774 R1	PIN, swivel
10	319 470 R1	BUSHING, crosshead swivel pin (large)
11	319 471 R1	BUSHING, crosshead swivel pin (small)
12	319 469 R1	RING, retainer
13	315 435 R1	BRACKET, cable lift (2)
14	320 769 R1	BRACKET, RH hydraulic
15	293 999 R1	BRACKET, RH strut (3)



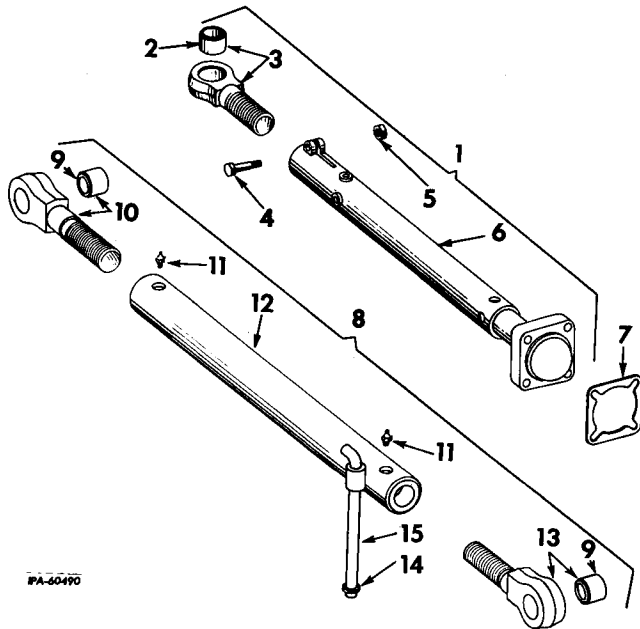
# CABLE AND HYDRAULIC BULLGRADERS AND BULLDOZERS

## TRUNNIONS (Cable and Hydraulic)



IPA-60883

## BULLDOZER STRUTS (Cable and Hydraulic)



PA-60490



# CABLE AND HYDRAULIC BULLGRADERS AND BULLDOZERS

## TRUNNIONS (Cable and Hydraulic - Continued)

REF. NO.	I. H. PART NUMBER	DESCRIPTION
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### MODEL 15G-2, 15G-3, 15D-1, 15D-2 and 15D-3 CABLE and HYDRAULIC

1	320 786 R91	TRUNNION, 294 552 R1 w/PILOT, 294 555 R1, LH 7/8 x 3" hex-hd cap SCREW (6)
2	320 787 R91	TRUNNION, 294 552 R1 w/PILOT, 294 555 R1, RH 7/8 x 3" hex-hd cap SCREW (6)
3	294 552 R1	TRUNNION (2)
4	294 555 R1	PILOT, trunnion (2)

### MODEL 15G-1 CABLE ONLY

5	320 733 R91	TRUNNION, 294 552 R1 w/PILOT, 294 555 R1 (2) 7/8 x 3" hex-hd cap SCREW (10)
6	294 552 R1	TRUNNION (2)
7	294 555 R1	PILOT, trunnion (2)

## BULLDOZER STRUTS (Cable and Hydraulic) - Continued

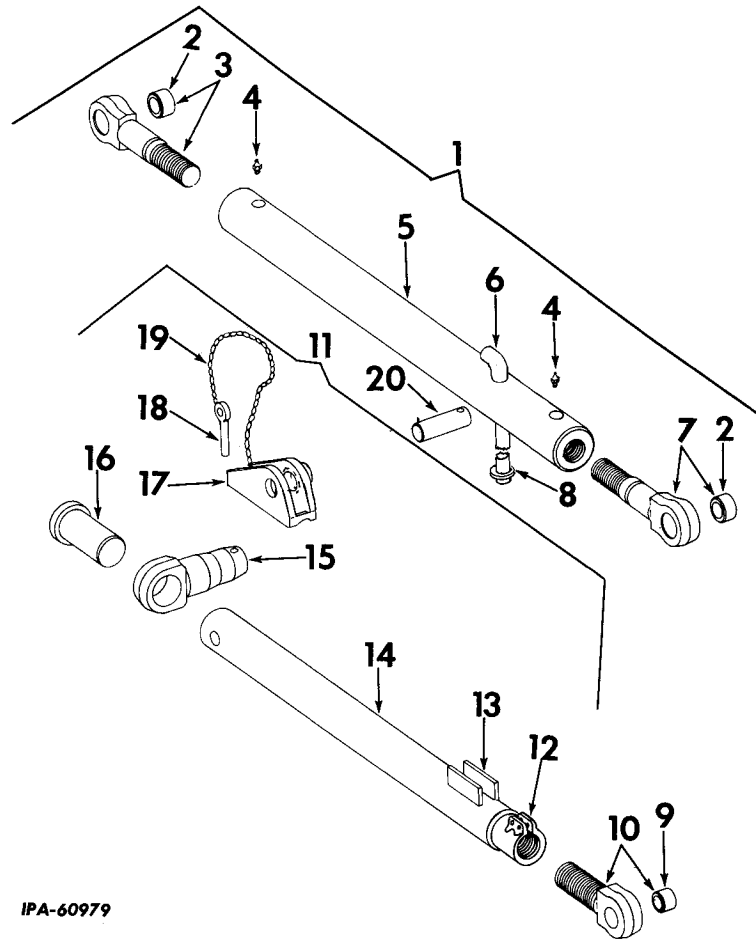
REF. NO.	I. H. PART NUMBER	DESCRIPTION
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1	320 878 R91	STRUT, 320 877 R11 w/EYEBOLT, 293 001 R11, diagonal (2) 3/4 x 2-1/2" hex-hd cap SCREW (8)
2	290 290 R2	BUSHING, diagonal strut eyebolt (2)
3	293 001 R11	EYEBOLT w/BUSHING, 290 290 R2, diagonal strut (2)
4		SCREW, 5/8 x 3" hex-hd cap (used with diagonal strut) (2)
5		NUT, 5/8" (used with diagonal strut) (2)
6	320 877 R11	STRUT, diagonal (2)
7	320 764 R1	SHIM, strut socket (8)
8	315 175 R91	STRUT ASSEMBLY, upper (2)
9	290 290 R2	BUSHING, upper strut eyebolt (4)
10	309 907 R11	EYEBOLT w/BUSHING, 290 290 R2, upper strut rear (2)
11	109 461	FITTING, 1/8" lubrication (Lincoln 5000) (optional with 138 322 H) (4)
11	138 322 H	FITTING, 1/8" lubrication (Alemite 1610B) (optional with 109 461) (4)
12	315 176 R11	STRUT w/PIN, 315 177 R1 and TUBE, 315 179 R1, upper (2)
13	315 180 R11	EYEBOLT w/BUSHING, 290 290 R2, upper strut front (2)
14	315 179 R1	TUBE, upper strut locking pin (2)
15	315 177 R1	PIN, upper strut locking (2)



# CABLE AND HYDRAULIC BULLGRADERS AND BULLDOZERS

**BULLGRADER STRUTS**  
(Cable and Hydraulic)



IPA-60979



# CABLE AND HYDRAULIC BULLGRADERS AND BULLDOZERS

**BULLGRADER STRUTS**  
(Cable and Hydraulic) - Continued

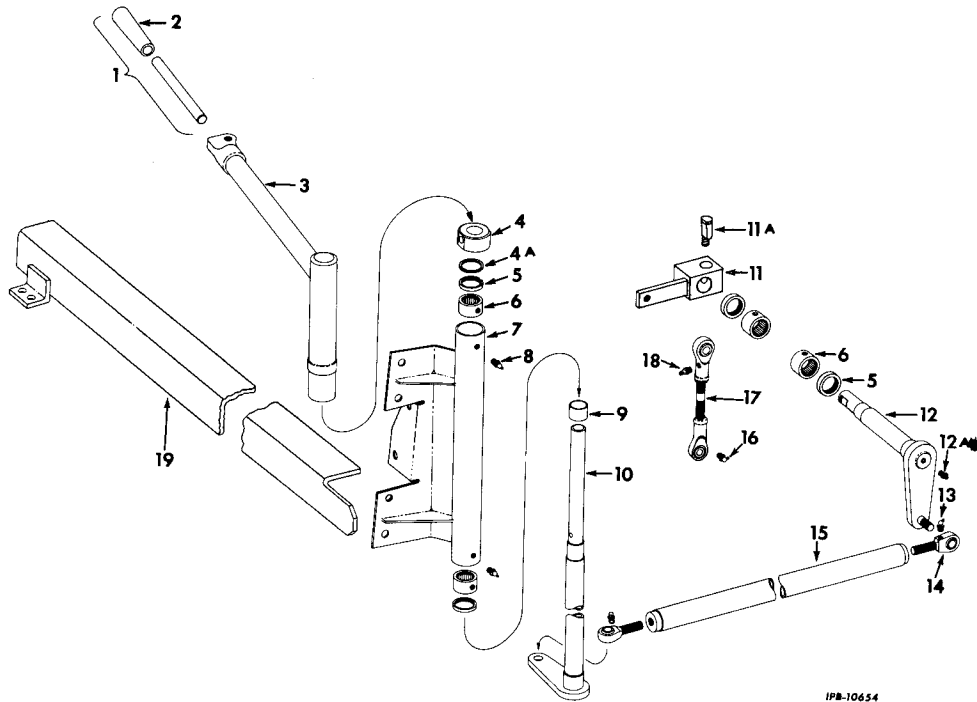
REF. NO.	I.H. PART NUMBER	DESCRIPTION
1	320 779 R91	STRUT ASSEMBLY, upper (2)
2	290 290 R2	BUSHING, strut eyebolt (4)
3	309 907 R11	EYEBOLT w/BUSHING, 290 290 R2, upper strut, rear (2)
4	109 461	FITTING, 1/8" lubrication (Lincoln 5000) (optional with 138 322 H) (4)
4	138 322 H	FITTING, 1/8" lubrication (Alemite 1610B) (optional with 109 461) (4)
5	315 182 R11	STRUT, less eyebolt w/BODY, 315 182 R1, PIN, 315 183 R1 and TUBE, 315 179 R1 ASSEMBLY, upper (2)
5	315 182 R1	BODY, upper strut (2)
6	315 183 R1	PIN, strut locking (2)
7	315 180 R11	EYEBOLT w/BUSHING, 290 290 R2, upper strut, front (2)
8	315 179 R1	TUBE, strut locking pin (2)
9	290 290 R2	BUSHING, strut eyebolt (2)

REF. NO.	I.H. PART NUMBER	DESCRIPTION
10	293 001 R11	EYEBOLT w/BUSHING, 290 290 R2, lower strut (2) 5/8" NUT (4) 5/8" x 2-1/4" hex-hd cap SCREW (4)
11	315 475 R91	STRUT ASSEMBLY, lower LH
11	315 476 R91	STRUT ASSEMBLY, lower RH
12	290 283 R2	NUT, lower strut (2)
13	315 189 R1	BAR, pin lock (4)
14	290 532 R2	BODY, lower strut (2)
15	290 284 R1	TRUNNION (2)
16	290 285 R1	PIN, trunnion swivel (2)
17	215 445 R91	BRACKET, lower strut LH
17	315 446 R91	BRACKET, lower strut RH
18	19 643 R1	PIN, trunnion (2)
19	290 287 R2	CHAIN, trunnion pin (2)
20	315 103 R1	PIN, upper strut rear (2) 1/2" stover lock NUT (2) 1/2" x 3-3/4" hex-hd cap SCREW (2)



# CABLE AND HYDRAULIC BULLGRADERS AND BULLDOZERS

## CONTROLS (Cable)



IPB-10654

REF. NO.	I. H. PART NUMBER	DESCRIPTION
1	293 808 R91 41 597 DA	GRIP, 41 597 DA, hand control adjustable GRIP, hand
3	284 033 R91	HANDLE, control 1/2 x 1-1/4" hex-hd cap SCREW 1/2 x 1-1/2" hex-hd cap SCREW (2) 1/2" lock WASHER (3)
4	284 032 R1	COLLAR, rear control shaft 5/16" NUT 5/16 x 2-1/2" hex-hd cap SCREW 5/16" lock WASHER
4A	615 227 R1	WASHER, 1-3/4 x 11/32 x 11 ga flat
5	287 058 R91	OIL SEAL, front and rear control shaft (4)
6	298 175 R91	BEARING, needle (4)
7	284 026 R91	BRACKET w/two BEARING, 298 175 R91 and two OIL SEAL, 287 058 R91, rear control shaft 3/8" NUT (6) 3/8 x 3/4" hex-hd cap SCREW (5) 3/8 x 7/8" hex-hd cap SCREW 3/8" lock WASHER (6)
8	110 146 R91	FITTING, control shaft housing link lubrication (Alemite 1792B) (optional with 102 467 H) (2)
8	102 467 H	FITTING, control shaft housing lubrication (Lincoln 5042) (optional with 110 146 R91) (2)
9	284 030 R1	RACE, inner
10	284 029 R21	SHAFT w/RACE, 284 030 R1, rear control
11	309 865 R91	LEVER, front control inner
11A	295 535 R1	BOLT, control lever locking 5/16" stover lock NUT
12	309 864 R11	SHAFT, front control



# CABLE AND HYDRAULIC BULLGRADERS AND BULLDOZERS

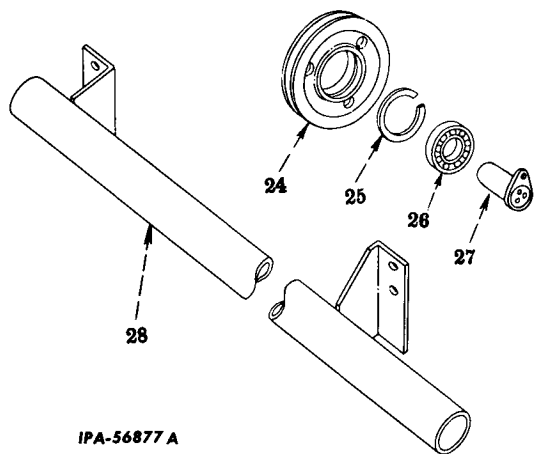
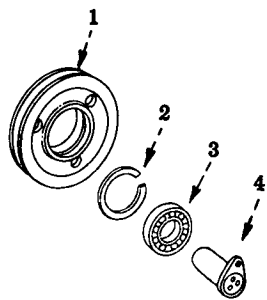
## CONTROLS (Cable) - Continued

REF. NO.	I. H. PART NUMBER	DESCRIPTION
12A	109 461	FITTING, front control shaft lubrication (Lincoln 5000) (optional with 138 322 H)
12A	138 322 H	FITTING, front control shaft lubrication (Alemite 1610 BL) (optional with 109 461)
13	16 964 R91	FITTING, end bearing lubrication (Lincoln 5410) (optional with 274 510) (2)
13	274 510	FITTING, end bearing lubrication (Alemite 1911 B) (optional with 16 964 R91) (2)
14	283 442 R91 287 072 R1	BEARING, end (2) NUT, 1/2NF (2)
15	299 587 R91	ROD, 299 588 R11 side reach w/two BEARING, 283 442 R91 and two NUT 1/2NF NUT 1/2NF sltd NUT 3/32 x 1-1/2" cotter PIN 1/2NF x 1-3/4" hex-hd cap SCREW
15	299 588 R11	ROD, side reach
16	274 510	FITTING, control link lubrication (Alemite 1911B) (optional with 16 964 R91)
16	16 964 R91	FITTING, control link lubrication (Lincoln 5410) (optional with 274 510)
17	295 541 R91	LINK, control 1/2" NUT 1/2NF NUT 1/2NF x 1-1/2" hex-hd cap SCREW 1/2 x 2" hex-hd cap SCREW
18	110 146 R91	FITTING, control link lubrication (Alemite 1792B) (optional with 102 467 H)
18	102 467 H	FITTING, control link lubrication (Lincoln 5042) (optional with 110 146 R91)
19	299 589 R11 287 074 R1	GUARD, reach rod NUT (2) 1/2 x 1-1/2" hex-hd cap SCREW (2) 1/2" lock WASHER (2)



# CABLE AND HYDRAULIC BULLGRADERS AND BULLDOZERS

## SHEAVE BLOCKS AND SHEAVES (Cable Only)

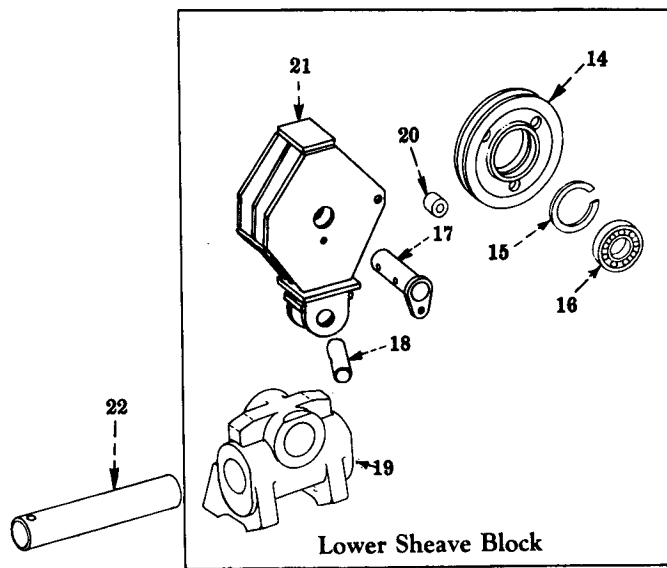
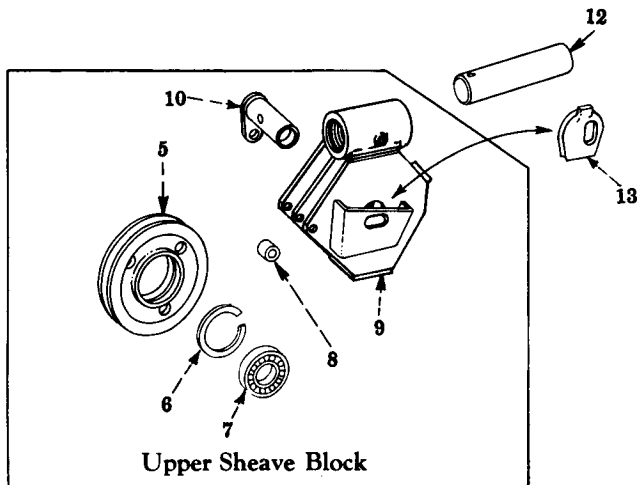


IPA-56877 A



# CABLE AND HYDRAULIC BULLGRADERS AND BULLDOZERS

## SHEAVE BLOCKS AND SHEAVES (Cable Only) - Continued



REF. NO.	I.H. PART NUMBER	DESCRIPTION
(X)		KEY TO UNITS -
	A	SHEAVE BLOCKS AND SHEAVES (Used with 15D-1 and 15G-1) (front cable control unit)
	B	SHEAVE BLOCKS AND SHEAVES (Used with 15D-3 and 15G-3) (rear cable control unit)
(X)		Letters of these units correspond with those shown following the description of the parts in the list below and identifies the unit for which the part is used. Items without letters after the description indicates the part is used for all units.
1	294 611 R1	SHEAVE, corner
1	294 611 R1	SHEAVE, side (Unit B)
2	290 358 R1	RING, corner sheave bearing retainer
2	290 358 R1	RING, side sheave bearing retainer (Unit B)

REF. NO.	I.H. PART NUMBER	DESCRIPTION
3	ST 596	BEARING, corner sheave (2)
3	ST 596	BEARING, side sheave (2 for Unit B)
4	289 273 R11	SHAFT, corner sheave
4	289 273 R11	SHAFT, side sheave (Unit B) 5/8 x 1" hex-hd cap SCREW
5	294 611 R1	SHEAVE, upper sheave block (2)
6	290 358 R1	RING, sheave block bearing retainer (2)
7	ST 596	BEARING, upper sheave block sheave (4)
8	294 610 R1	SPACER, upper sheave block cheek plate (2) 1/2" NUT 1/2 x 5" hex-hd cap SCREW
9	309 886 R91	BLOCK, upper sheave
10	309 884 R11	SHAFT, upper sheave block sheave 5/8 x 7/8" hex-hd cap SCREW



# CABLE AND HYDRAULIC BULLGRADERS AND BULLDOZERS

## SHEAVE BLOCKS AND SHEAVES (Cable Only) - Continued

REF. NO.	I. H. PART NUMBER	DESCRIPTION
12	315 514 R1	SHAFT, upper sheave block mounting 1/2" stover lock NUT 1/2 x 3-3/4" hex-hd cap SCREW
13	309 888 R1	LOCK, cable
14	294 611 R1	SHEAVE, lower sheave block (2)
15	290 358 R1	RING, sheave bearing retainer (2)
16	ST 596	BEARING, lower sheave block sheave (4)
17	309 884 R11	SHAFT, lower sheave block sheave 5/8 x 1-1/8" hex-hd cap SCREW
18	309 883 R1	SHAFT, lower sheave block universal
19	320 896 R1	UNIVERSAL, lower sheave block
20	294 610 R1	SPACER, lower sheave block cheek plate (2) 1/2" NUT 1/2 x 5" hex-hd cap SCREW
21	309 876 R91	BLOCK, lower sheave
22	315 504 R1	SHAFT, lower sheave block mounting 1/2" stover lock NUT 1/2 x 3-1/4" hex-hd cap SCREW
24	294 611 R1	SHEAVE, cable control unit adapter (Unit B)
25	290 358 R1	RING, sheave bearing retainer (Unit B)
26	ST 596	BEARING, cable control unit adapter sheave (2 for Unit B)
27	289 273 R11	SHAFT, cable control unit adapter sheave (Unit B) 5/18 x 1" hex-hd cap SCREW
28	299 591 R11	TUBE, cable guide (used to guide cable from radiator guard to rear mounted cable control unit) (Unit B) 7/16" NUT (4) 7/16 x 1-1/2" hex-hd cap SCREW (2) 7/16 x 2" hex-hd cap SCREW (2) 7/16" external tooth lock WASHER (4)
109 461		FITTING, 1/8" lubrication (Lincoln 5000) (optional with 138 322 H) (used with universal)
138 322 H		FITTING, 1/8" lubrication (Alemite 1610BL) (optional with 109 461) (used with universal)
109 461		FITTING, 1/8" lubrication (Lincoln 5000) (optional with 138 322 H) (used with sheave shafts) (6)
138 322 H		FITTING, 1/8" lubrication (Alemite 1610BL) (optional with 109 461) (used with sheave shafts) (6)
109 461		FITTING, 1/8" lubrication (Lincoln 5000) (optional with 138 322 H) (used with sheave shafts) (2 for Unit B)
138 322 H		FITTING, 1/8" lubrication (Alemite 1610BL) (optional with 109 461) (used with sheave shafts) (2 for Unit B)
109 461		FITTING, 1/8" lubrication (Lincoln 5000) (optional with 138 322 H) (used with mounting shaft)
138 322 H		FITTING, 1/8" lubrication (Alemite 1610BL) (optional with 109 461) (used with mounting shaft)
		ROPE, 1/2" x 50' steel (Unit A)
		ROPE, 1/2" x 70' steel (Unit B)



# MEMORANDA

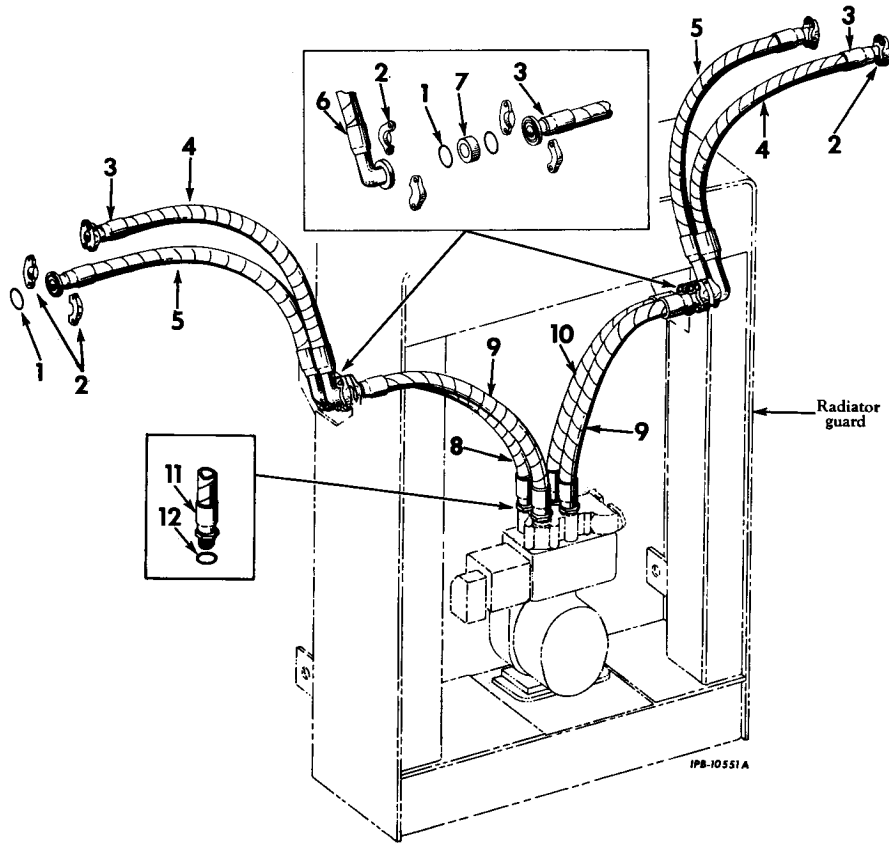


# CABLE AND HYDRAULIC BULLGRADERS AND BULLDOZERS

HYDRAULIC HOSES  
(Hydraulic Only)

# CABLE AND HYDRAULIC BULLGRADERS AND BULLDOZERS

HYDRAULIC HOSES  
(Hydraulic Only - Continued)



REF. NO.	I. H. PART NUMBER	DESCRIPTION
1	283 189 R1	"O" RING, pump to bulkhead hose and bulkhead to cylinder hose (1-5/16 x 1-9/16 x 1/8") (12)
2	295 698 R1	CLAMP-HALF, hose (split flange) (24) 3/8" NUT (16) 3/8 x 1-1/4" hex-hd cap SCREW (16) 3/8 x 2-1/2" hex-hd cap SCREW (16) 3/8" lock WASHER (32)
3	310 920 R91	FITTING, 1" ID split flange straight hose (8)
4	313 086 R91	HOSE w/FITTING, 310 920 R91 and FITTING, 313 096 R91, bulkhead to cylinder upper (43-1/2" long) (15G-2)
4		HOSE (less FITTINGS) bulkhead to cylinder upper (1" ID x 38-3/4" long) (order Aeroquip 1509-16) (15G-2) (2)
4	321 365 R91	HOSE w/FITTING, 310 920 R91 and FITTING, 313 096 R91, bulkhead to cylinder upper (41-1/2" long) (15D-2) (2)
4		HOSE (less FITTING) bulkhead to cylinder upper (1" ID x 36-1/2" long) (order Aeroquip 1509-16) (15D-2) (2)
5	313 087 R91	HOSE w/FITTING, 310 920 R91 and FITTING, 313 096 R91, bulkhead to cylinder lower (38" long) (15G-2) (2)
5		HOSE (less FITTINGS) bulkhead to cylinder lower (1" ID x 33" long) (order Aeroquip 1509-16) (15G-2) (2)

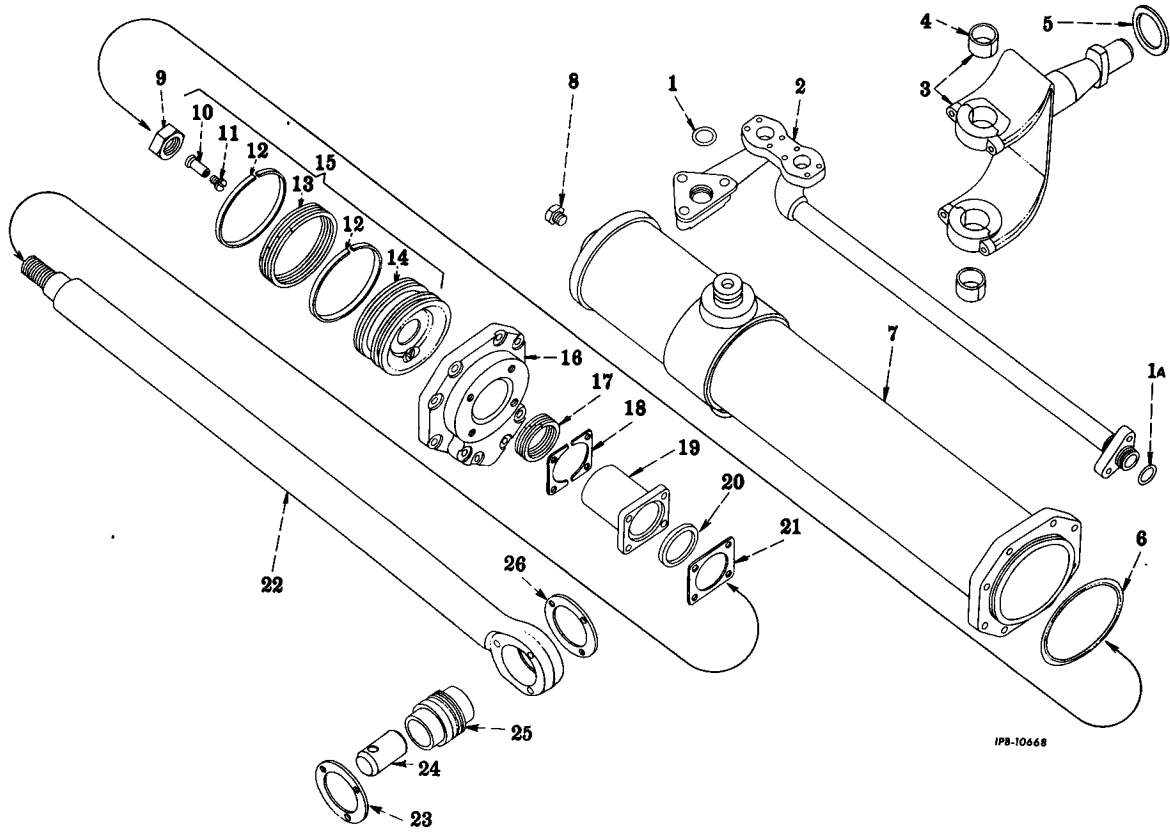
REF. NO.	I. H. PART NUMBER	DESCRIPTION
5	321 366 R91	HOSE w/FITTING, 310 920 R91 and FITTING, 313 096 R91 bulkhead to cylinder lower (36" long) (15D-2) (2)
5		HOSE (less FITTING) bulkhead to cylinder lower (1" ID x 31" long) (order Aeroquip 1509-16) (15D-2) (2)
6	313 096 R91	FITTING, 1" ID split flange 90° hose (4)
7	311 265 R1	TUBE, "O" ring seat (4)
8	310 917 R91	HOSE w/FITTING, 310 920 R91 and FITTING, 310 921 R91, pump to bulkhead lower RH (20-1/8" long)
8		HOSE (less FITTINGS) pump to bulkhead lower RH (1" ID x 16-1/8" long) (order Aeroquip 1509-16)
9	313 085 R91	HOSE w/FITTING, 310 920 R91 and FITTING, 310 921 R91, pump to bulkhead (23-1/2" long) (2)
9		HOSE (less FITTINGS) pump to bulkhead (1" ID x 19-1/2" long) (order Aeroquip 1509-16) (2)
10	313 084 R91	HOSE w/FITTING, 310 920 R91 and FITTING, 310 921 R91, pump to bulkhead lower LH (21" long)
10		HOSE (less FITTINGS) pump to bulkhead lower LH (1" ID x 17" long) (order Aeroquip 1509-16)
11	310 921 R91	FITTING, 1" ID straight thread boss hose (4)
12	296 247 R1	"O" RING, valve manifold (1.171 x 1.403 x .116) (4)

**CABLE AND HYDRAULIC  
BULLGRADERS AND BULLDOZERS**

HYDRAULIC CYLINDERS

**CABLE AND HYDRAULIC  
BULLGRADERS AND BULLDOZERS**

HYDRAULIC CYLINDERS - CONTINUED



IPB-10668

REF. NO.	I. H. PART NUMBER	DESCRIPTION
1	321 245 R1	"O" RING, manifold (1-5/16 x 1-9/16 x 1/8") (2)
1A	321 244 R1	"O" RING, manifold end (1-1/8 x 1-3/8 x 1/8") (2)
2	295 907 R91	MANIFOLD, LH hydraulic cylinder 3/8 x 3-1/4" hex-hd cap SCREW (2) 1/2 x 3" hex-hd cap SCREW (3) 3/8" lock WASHER (2)
2	295 908 R91	MANIFOLD, RH hydraulic cylinder 3/8 x 3-1/4" hex-hd cap SCREW (2) 1/2 x 3" hex-hd cap SCREW (3) 3/8" lock WASHER (2)
3	294 682 R12	YOKE and CAP ASSEMBLY, hoist cylinder (2) (Composed of - 2 BUSHING 294 684 R1 § 2 CAP 2 PIN 19 407 R1 § 1 YOKE 5/8 x 2" hex-hd cap SCREW (8) 5/8" external-tooth lock WASHER (8)
4	294 684 R1	BUSHING, hoist yoke and cap (4)
5	294 685 R1	WASHER, hoist yoke thrust (2)
6	313 938 R1	"O" RING, cylinder cap (5 x 5-1/4 x 1/8") (2)
7	295 893 R92	HOUSING, hydraulic cylinder (2)

REF. NO.	I. H. PART NUMBER	DESCRIPTION
8	444 824	PLUG, 3/8" hex-hd drain (4)
9	18 489 R1	NUT, stop (2)
10		STEM, relief valve (order 295 960 R91)
11		END, relief valve (order 295 590 R91)
12	295 903 R1	RING, piston rod wear (4)
13	295 904 R92	PACKING, piston (2)
14		PISTON, hydraulic (order 295 902 R13)
15	295 902 R13	PISTON ASSEMBLY, hydraulic (2) (Composed of - § 2 END 1 PACKING 295 904 R92 § 1 PISTON 2 RING 295 903 R1 § 2 STEM )
16	294 905 R1	CAP, hydraulic cylinder (2) 7/16 x 2-1/4" hex-hd cap SCREW (12) 7/16 x 3-1/4" hex-hd cap SCREW (4) 7/16" lock WASHER (12)
17	294 512 R92	PACKING, piston rod (2)
18	294 515 R1	SHIM, packing gland (X)
19	294 514 R2	GLAND, hydraulic cylinder packing (2)
20	294 513 R91	SEAL, hydraulic cylinder dust (2)

# CABLE AND HYDRAULIC BULLGRADERS AND BULLDOZERS

# MEMORANDA

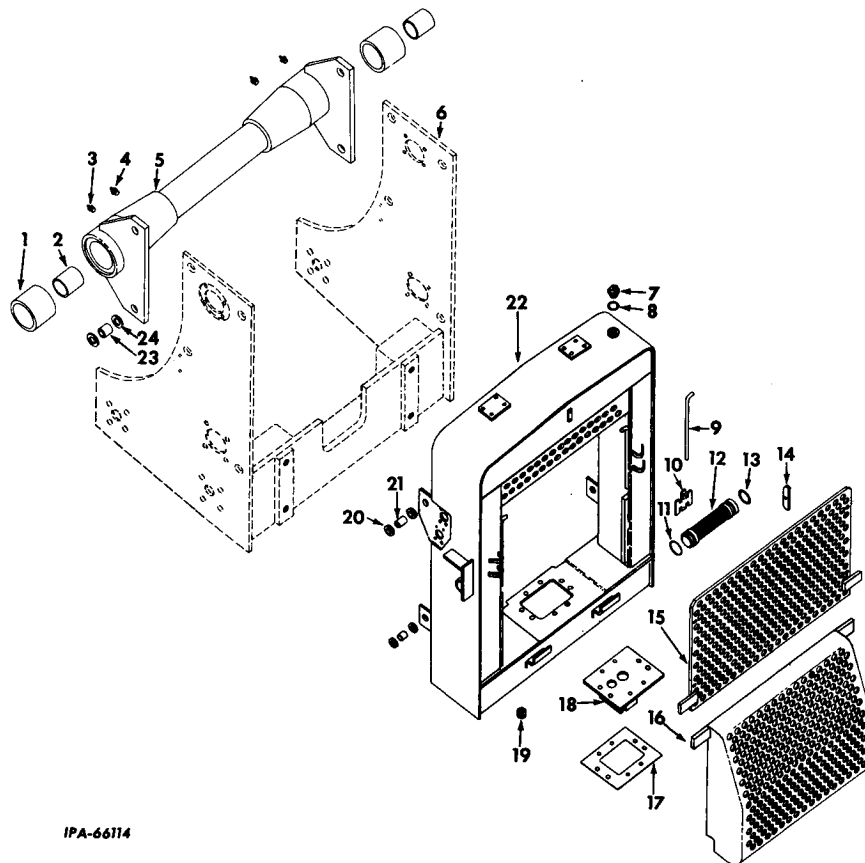
## HYDRAULIC CYLINDERS - CONTINUED

REF. NO.	I. H. PART NUMBER	DESCRIPTION
21	294 516 R1	PLATE, dust seal retainer (2) 1/2 x 1-3/8" hex-hd cap SCREW (8) 1/2" lock WASHER (8)
22	320 784 R11	ROD ASSEMBLY, piston (2) (Composed of - 1 BEARING 321 246 R91 1 FITTING 138 322 H 1 PLATE 320 741 R1 1 PLATE 320 742 R1 § 1 ROD )
23	320 741 R1	PLATE, outer locking (2)
24	320 788 R1	PIN, hydraulic cylinder (2) 3/8" stover lock NUT (2) 3/8" x 2-3/4" hex-hd cap SCREW (2)
25	321 246 R91	BEARING, piston rod (optional with 321 247 R91) (2)
25	321 247 R91	BEARING, piston rod (optional with 321 246 R91) (2)
26	320 742 R1	PLATE, inner locking 1/2 x 2-1/2" hex-hd cap SCREW (6)
320 782 R91	CYLINDER ASSEMBLY, LH hydraulic (Composed of - 1 CAP 295 905 R1 2 FITTING 138 322 H 1 GLAND 294 514 R2 1 HOUSING 295 893 R92 1 MANIFOLD 295 907 R91 1 NUT 18 489 R1 1 "O" RING 313 938 R1 1 "O" RING 321 244 R1 1 "O" RING 321 245 R1 1 PACKING 294 512 R92 1 PISTON 295 902 R13 1 PLATE 294 516 R1 2 PLUG 444 824 1 ROD 320 784 R11 1 SEAL 294 513 R91 X SHIM 294 515 R1 )	
320 783 R91	CYLINDER ASSEMBLY, RH hydraulic (Composed of - 1 CAP 295 905 R1 2 FITTING 138 322 H 1 GLAND 294 514 R2 1 HOUSING 295 893 R92 1 MANIFOLD 295 908 R91 1 NUT 18 489 R1 1 "O" RING 313 938 R1 1 "O" RING 321 244 R1 1 "O" RING 321 245 R1 1 PACKING 294 512 R92 1 PISTON 295 902 R13 1 PLATE 294 516 R1 2 PLUG 444 824 1 ROD 320 784 R11 1 SEAL 294 513 R91 X SHIM 294 515 R1 )	
132 322 H	FITTING, 1/8" lubrication (Alemite 1610 B) (optional with 109 461) (6)	
109 461	FITTING, 1/8" lubrication (Lincoln 5000) (optional with 138 322 H) (6)	
19 407 R1	PIN, bushing retainer (4)	
296 590 R91	VALVE w/END and STEM, relief (4)	

§ - Not Furnished Separately.  
X - As Required

**CABLE AND HYDRAULIC  
BULLGRADERS AND BULLDOZERS**

**RADIATOR GUARD**  
(Hydraulic Only) (For use with Model 15G-2 and 15D-2)



IPA-66114

**CABLE AND HYDRAULIC  
BULLGRADERS AND BULLDOZERS**

**RADIATOR GUARD - CONTINUED**  
(Hydraulic Only) (For use with Model 15G-2 and 15D-2)

REF. NO.	I. H. PART NUMBER	DESCRIPTION
322 109 R91		ATTACHMENT, radiator guard (for Model 15G-2 Bullgrader and 15D-2 Bulldozer) (See NOTES 1 and 3) (Consists of the following parts) NOTE 1 - Factory Application - Order on Machine Order Form. NOTE 3 - Field Application - Order through Regular Service Parts Channels.
1	289 254 R1	BUSHING, outer hoist cylinder yoke (2)
2	289 253 R1	BUSHING, inner hoist cylinder yoke (2)
3	109 461	FITTING, 1/8" lubrication (Lincoln 5000) (optional with 138 322 H) (for hoist cylinder yoke outer bushing) (2)
3	138 322 H	FITTING, 1/8" lubrication (Alemite 1610 BL) (optional with 109 461) (hoist cylinder yoke outer bushing) (2)
4	109 461	FITTING, 1/8" lubrication (Lincoln 5000) (optional with 138 322 H) (for hoist cylinder yoke inner bushing) (2)
4	138 322 H	FITTING, 1/8" lubrication (Alemite 1610 BL) (optional with 109 461) (for hoist cylinder yoke inner bushing) (2)

REF. NO.	I. H. PART NUMBER	DESCRIPTION
5	304 359 R91	TUBE w/two BUSHING, 289 253 R1 and two BUSHING, 289 254 R1 cylinder support cross 3/4" jam NUT (4) 3/4 x 2-1/2" hex-hd cap SCREW (4)
6	322 055 R91	FRAME, mounting (†)
7	294 118 R2	PLUG, oil filler
8	253 172 R1	RING, oil filler plug sealing
9	299 842 R1	PIN, door hinge (2)
10	311 263 R1	EMBLEM, "IH" No. 4 x 1/4" drive SCREW (2)
11	301 913 R1	RING, suction filter seal (small) (2-7/16 x 2-5/8 x 3/32")
12	310 897 R91	STRAINER, oil
13	352 313 R1	RING, hydraulic pump filter sealing (2-3/8 x 2-3/4 x 3/16")
14	284 179 R1	PLATE, strainer retainer (2) 3/8 x 5/8" hex-hd cap SCREW (2) 3/8" lock WASHER (2)
		(†) - Furnished with TD-15 (151 Series) Tractor. Not Furnished as Part of Attachment.

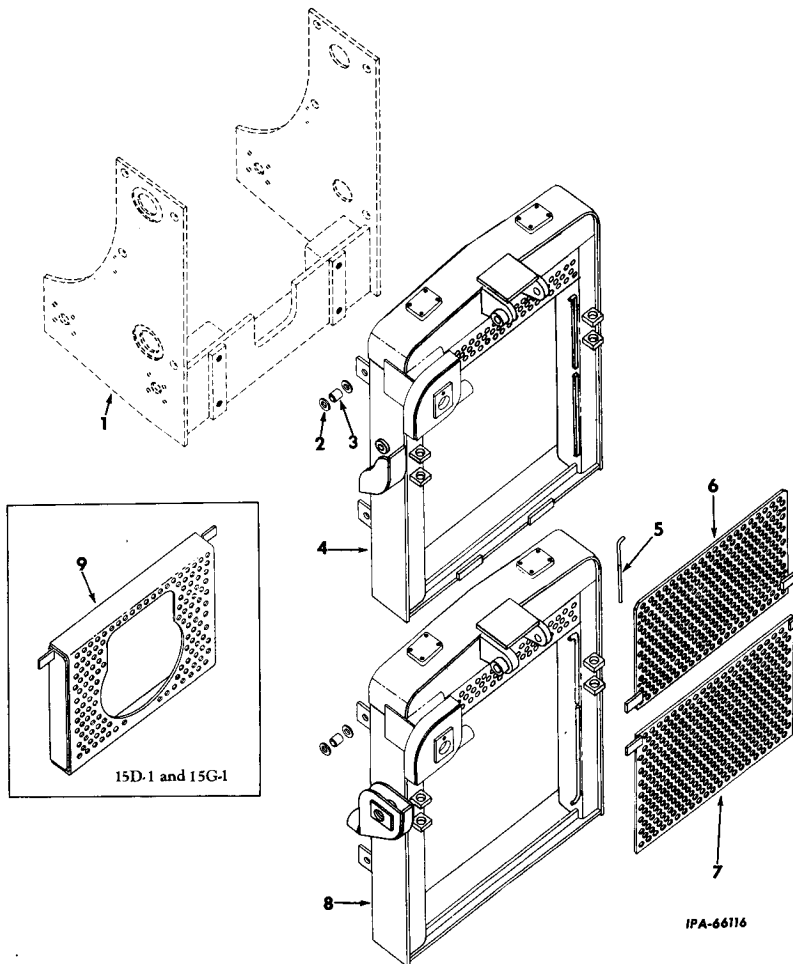


# CABLE AND HYDRAULIC BULLGRADERS AND BULLDOZERS

**RADIATOR GUARD - CONTINUED**  
(Hydraulic Only) (For use with Model 15G-2 and 15D-2)

REF. NO.	I. H. PART NUMBER	DESCRIPTION
15	307 680 R21	DOOR, radiator guard upper
16	322 183 R11	DOOR, radiator guard lower
17	309 304 R1	GASKET, pump adapter
18	309 303 R91 313 222 R1	ADAPTER, hydraulic pump BOLT, adapter mounting (4)
19	280 668 R91	PLUG, magnetic drain
20	303 667 R1	RETAINER, radiator guard mounting dowel (8)
21	303 669 R1	DOWEL, radiator guard mounting (4)
21	305 266 R1	DOWEL, radiator guard mounting (.062" oversize) (X)

**RADIATOR GUARD**  
(Cable Only) (For use with Model 15G-1, 15D-1, 15G-3 and 15D-3)



# CABLE AND HYDRAULIC BULLGRADERS AND BULLDOZERS

**RADIATOR GUARD - CONTINUED**  
(Hydraulic Only) (For use with Model 15G-2 and 15D-2)

REF. NO.	I. H. PART NUMBER	DESCRIPTION
22	322 093 R91	GUARD w/PLUG, 294 118 R2, PLUG, 260 668 R91 and RING, 253 172 R1, radiator 3/4" jam NUT (4) 3/4 x 2-1/2" hex-hd cap SCREW (4)
23	303 669 R1	DOWEL, cross tube mounting (4)
23	305 266 R1	DOWEL, cross tube mounting (.062" oversize) (X)
24	303 667 R1	RETAINER, cross tube mounting dowel (8)
	517 843 R1	PIN, Q. A. cotter (2)
		X - As Required

**RADIATOR GUARD - CONTINUED**  
(Cable Only) (For use with Models 15G-1, 15D-1, 15G-3 and 15D-3)



# CABLE AND HYDRAULIC BULLGRADERS AND BULLDOZERS

**RADIATOR GUARD - CONTINUED**  
(Cable only) (For use with Models 15G-1, 15D-1, 15G-3 and 15D-3)

REF. NO.	I.H. PART NUMBER	DESCRIPTION
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(X) - KEY TO UNITS -

- A - 322 107 R91 ATTACHMENT, radiator guard (for model 15G-1 Bullgrader or 15D-1 Bulldozer equipped with front mounted cable control unit) (See NOTES 1 and 3)
- B - 322 108 R91 ATTACHMENT, radiator guard (for model 15G-3 Bullgrader or 15D-3 Bulldozer equipped with rear mounted cable control Unit) (See NOTES 1 and 3)

(X) - Letters of these units correspond with those shown following the description of the parts in the list below and identifies the unit for which the part is used. Items without letters after the description indicates the part is used for all units.

- 1 322 055 R91 FRAME, radiator mounting (‡)
- 2 303 667 R1 RETAINER, radiator guard mounting dowel (8)
- 3 303 669 R1 DOWEL, radiator guard mounting (4)
- 3 305 266 R1 DOWEL, radiator guard mounting (.062" oversize) (X)
- 4 322 086 R91 GUARD, radiator (Unit A)  
3/4" NUT (4)  
3/4 x 2-1/2" hex-hd cap SCREW (4)
- 5 299 842 R1 PIN, latch (2)
- 517 843 R1 PIN, Q.A. cotter (2)
- 6 307 680 R21 DOOR, radiator guard upper
- 7 307 679 R21 DOOR, radiator guard lower (Unit B)
- 8 322 088 R91 GUARD, radiator (Unit B)  
3/4" NUT (4)  
3/4 x 2-1/2" hex-hd cap SCREW (4)
- 9 307 681 R21 DOOR, radiator guard lower (Unit A)

NOTE 1 - Factory Application - Order on Machine Order Form.  
 NOTE 3 - Field Application - Order through Regular Service Parts Channels.  
 (‡) - Furnished with TD-15-151 Series Tractor. Not Furnished as Part of Attachment.  
 X - As Required.

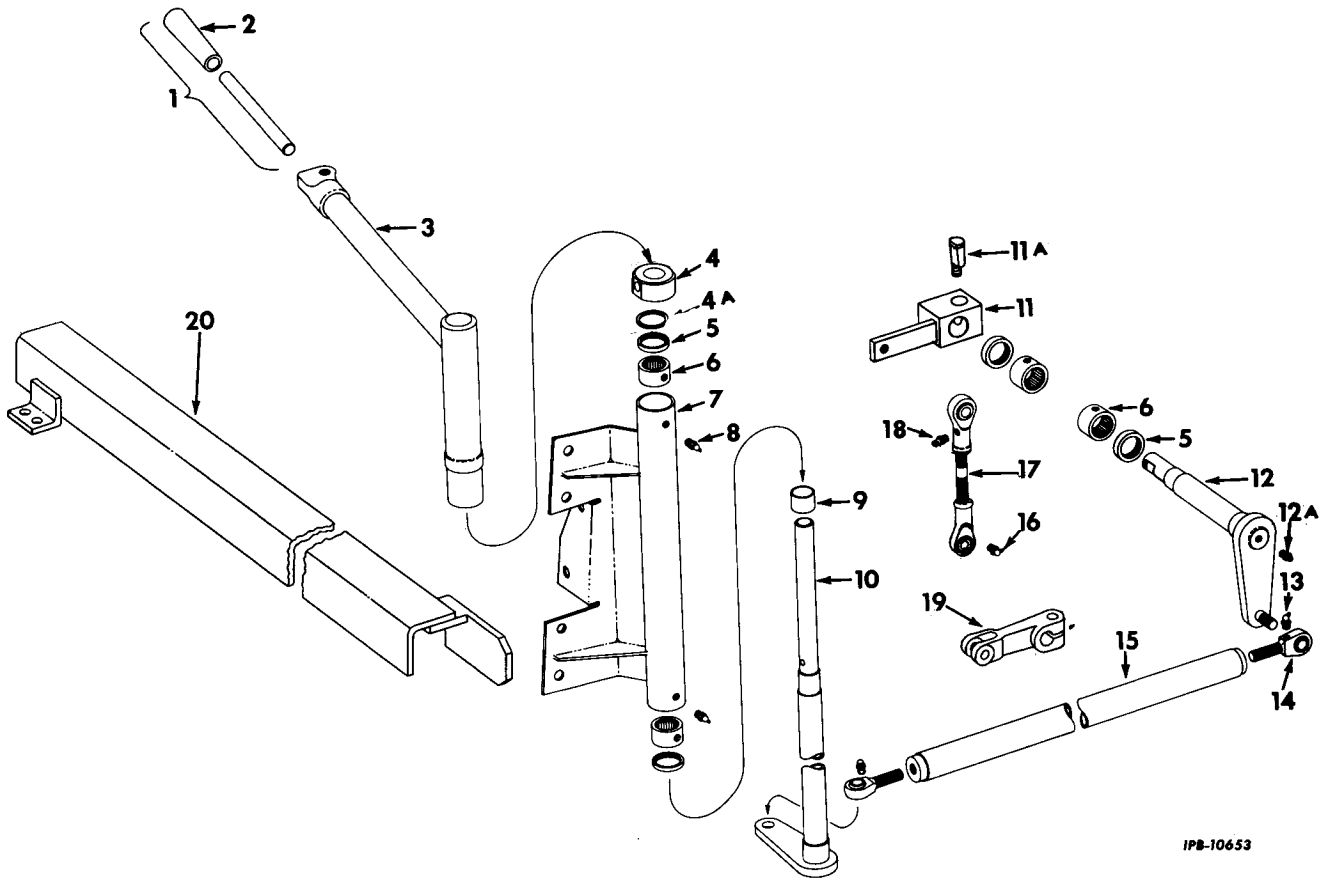


# MEMORANDA



-21-  
MODEL 1540  
HYDRAULIC CONTROL UNIT

CONTROLS  
(Hydraulic Only)



IPB-10653

REF. NO.	I.H. PART NUMBER	DESCRIPTION
1	293 808 R91	GRIP, 41 597 DA, hand control adjustable
2	41 597 DA	GRIP, hand
3	284 033 R91	HANDLE, control 1/2 x 1-1/2" hex-hd cap SCREW (2) 1/2 x 1-1/4" hex-hd cap SCREW 1/2" lock WASHER (3)
4	284 032 R1	COLLAR, rear control shaft 5/16" NUT 5/16 x 2-1/2" hex-hd cap SCREW 5/16" lock WASHER
4A	615 227 R1	WASHER, 1-3/4 x 11/32 x 11 ga flat
5	287 058 R91	OIL SEAL, front and rear control shaft (4)
6	298 175 R91	BEARING, needle (4)
7	284 026 R91	BRACKET w/two BEARING, 298 175 R91 and two OIL SEAL, 287 058 R91, rear control shaft 3/8" NUT (6) 3/8 x 3/4" hex-hd cap SCREW (5) 3/8 x 7/8" hex-hd cap SCREW 3/8" lock WASHER (6)

PRINTED IN UNITED STATES OF AMERICA



-21-  
MODEL 1540  
HYDRAULIC CONTROL UNIT

CONTROLS - CONTINUED  
(Hydraulic Only)

REF. NO.	I.H. PART NUMBER	DESCRIPTION
8	110 146 R91	FITTING, control shaft housing link lubrication (Alemite 1792 B) (optional with 102 467 H) (2)
8	102 467 H	FITTING, control shaft housing lubrication (Lincoln 5042) (optional with 110 146 R91) (2)
9	284 030 R1	RACE, inner
10	284 029 R11	SHAFT w/RACE, 284 030 R1, rear control
11	309 859 R91	LEVER, front control inner
11A	295 535 R1	BOLT, control lever locking 5/16" stover lock NUT
12	309 864 R11	SHAFT, front control
12A	109 461	FITTING, front control shaft lubrication (Lincoln 5000) (optional with 138 322 H)
12A	138 322 H	FITTING, front control shaft lubrication (Alemite 1610 BL) (optional with 109 461)
13	16 964 R91	FITTING, end bearing lubrication (Lincoln 5410) (optional with 274 510) (2)
13	274 510	FITTING, end bearing lubrication (Alemite 1911 B) (optional with 16 964 R91) (2)

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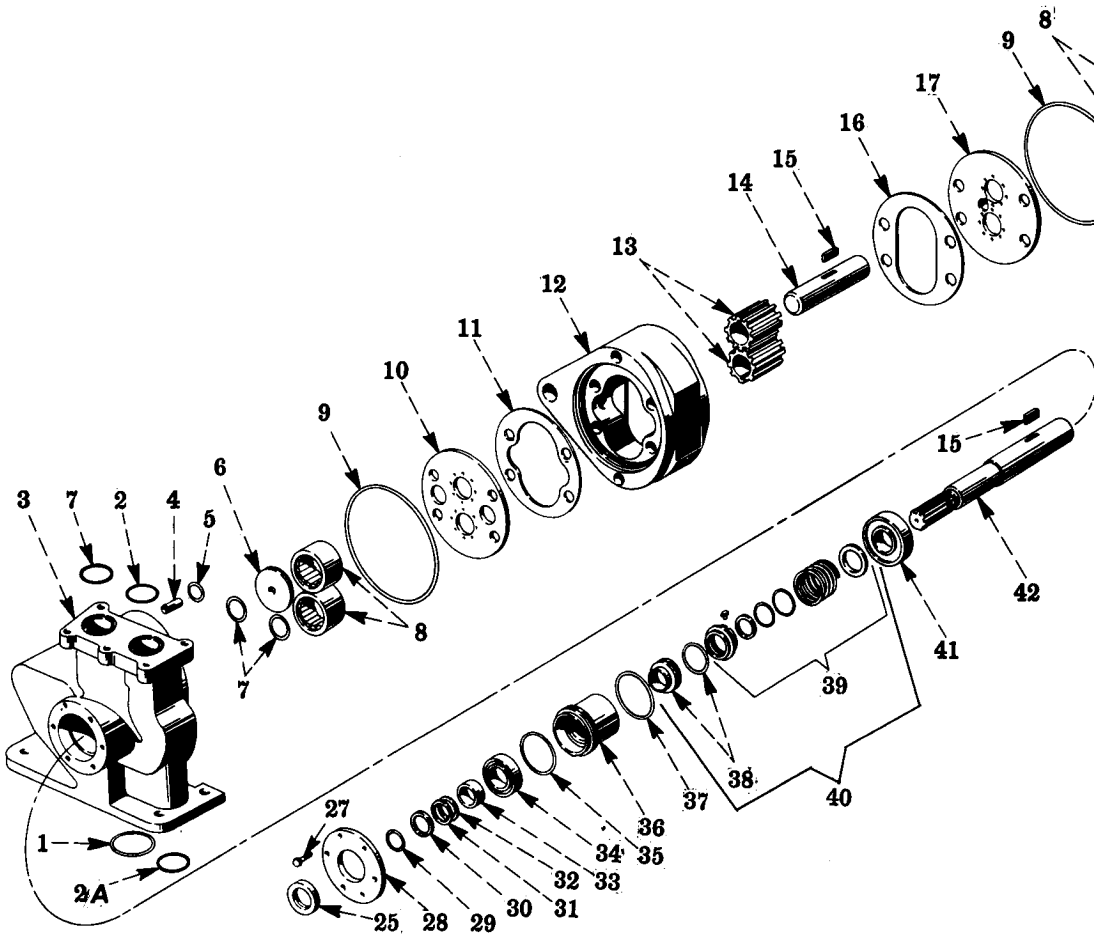


# MODEL 1540 HYDRAULIC CONTROL UNIT

## CONTROLS - CONTINUED (Hydraulic Only)

REF. NO.	I. H. PART NUMBER	DESCRIPTION
14	283 442 R91 287 072 R1	BEARING, end (2) NUT, 1/2NF (2)
15	299 587 R91	ROD, 299 588 R11 side reach w/two BEARING, 283 442 R91 and two NUT, 287 172 R1 1/2NF NUT 1/2NF sltd NUT 3/32 x 1-1/2" cotter PIN 1/2NF x 1-3/4" hex-hd cap SCREW
15	299 588 R11	ROD, side reach
16	274 510	FITTING, control link lubrication (Alemite 1911 B) (optional with 16 964 R91)
16	16 964 R91	FITTING, control link lubrication (Lincoln 5410) (optional with 274 510)

## PUMP (Hydreco) (Hydraulic Only)



# MODEL 1540 HYDRAULIC CONTROL UNIT

## CONTROLS - CONTINUED (Hydraulic Only)

REF. NO.	I. H. PART NUMBER	DESCRIPTION
17	295 541 R91	LINK, control (for use with Radiator Guards 1/2NF NUT (2) 1/2NF x 1-1/2" hex-hd cap SCREW (2)
18	110 146 R91	FITTING, control link lubrication (Alemite 1792 B) (optional with 102 467 H)
18	102 467 H	FITTING, control link lubrication (Lincoln 5042) (optional with 110 146 R91)
19	295 543 R1	LEVER, valve control 3/8 x 1-7/8" hex-hd cap SCREW NUT, 3/8" lock
20	299 590 R11 287 074 R1	GUARD, reach rod NUT (2) 1/2 x 1-1/2" hex-hd cap SCREW (2) 1/2" lock WASHER (2)

## PUMP - CONTINUED (Hydreco) (Hydraulic Only)

IPA-42637 B



**MODEL 1540  
HYDRAULIC CONTROL UNIT**

**PUMP - CONTINUED**  
(Hydreco) (Hydraulic Only)

REF. NO.	I.H. PART NUMBER	DESCRIPTION
	319 825 R91	PUMP ASSEMBLY, hydraulic (3025J18B2) (will work for 295 623 R92) (consists of the following parts)
1	254 091 R1	"O" RING, low pressure inlet to pump (4-3/4 x 3 x 1/8") (A395X47)
2	259 099 R1	"O" RING, valve to low pressure inlet (2-1/8 x 2-3/8 x 1/8") (A395X37)
2A	259 099 R1	"O" RING, low pressure outlet to tank (2-1/8 x 2-3/8 x 1/8") (A395X37)
3	321 083 R1	ADAPTER (2X30X30)
4	295 755 R1	PIN, dowel (A793X1) (2)
5	293 739 R91	"O" RING (1-3/8 x 1-5/8 x 1/8") (optional with 164 513 R1) (A395X25)
5	164 513 R91	"O" RING (1-3/8 x 1-5/8 x 1/8") (optional with 293 739 R91) (A395X25)
6	295 754 R1	WASHER, thrust (834X3) (3)
7	255 088 R1	"O" RING, high pressure inlet to valve (1-7/8 x 2-1/8 x 1/8") (A395X33)
7	255 088 R1	"O" RING, adapter end (1-7/8 x 2-1/8 x 1/8") (A395X33) (2)
8	307 910 R91	BEARING, roller (A340X30) (4)
9	259 190 R1	"O" RING, pump housing (7 x 7-1/4 x 1/8") (optional with 310 932 R1) (A791X107) (2)
9	310 932 R1	"O" RING, pump housing (7 x 7-1/4 x 1/8") (optional with 259 190 R1) (A791X107) (2)
10	295 766 R1	PLATE, wear (12X30X17)
11	295 771 R1	GASKET (.002" thick) (712X158) (X)
12	311 080 R1 294 773 R1	HOUSING, pump (1X3025X20) PLUG, hex-soc-hd pipe (A300X4)
13	321 082 R1	GEAR (6X3025X2) (2)
14	321 081 R1	SHAFT, driven (5X3025X3)
15	307 963 R1	KEY (A262X6) (2)
16	295 769 R1	GASKET (.002" thick) (712X159) (X)
17	295 765 R1	PLATE, wear (12X30X6)
18	252 482 R1	"O" RING, pump cover (1-1/2 x 1-3/4 x 1/8") (A395X27) (2)
19		SCREW, 3/8NF x 1-3/4 hex-soc-hd cap (A133X8) (2)
20	309 023 R2	COVER, pump (3X30X27)
21		SCREW, 7/8NF x 4-1/2" hex-hd cap (4)
25	307 964 R91	OIL SEAL (A907X1)
27	305 173 R1	SCREW, 3/8NF x 1" hex-dld-hd cap (A485X3) (6)
28	321 085 R1	PLATE, seal retainer (521X49)
29	308 667 R1	"O" RING, drive shaft spacer (1 x 1-1/4 x 1/8") (A928X19)
30	295 760 R1	RING, snap (812X129)
31	295 763 R1	SHIM (A774X1) (X)
32	295 764 R1	SHIM (A774X5) (X)

**MODEL 1540  
HYDRAULIC CONTROL UNIT**

**PUMP - CONTINUED**  
(Hydreco) (Hydraulic Only)

REF. NO.	I.H. PART NUMBER	DESCRIPTION
33	321 090 R1	SPACER (830X344)
34	ST 205 A	BEARING, drive shaft (A330X7)
35	321 087 R1	"O" RING (A987X2)
36	321 089 R1	RETAINER, seal (758X9)
37	259 252 R1	"O" RING (3 x 3-1/4 x 1/8") seal retainer (A395X51)
38		SEAT, seal (order 307 912 R91)
39		SEAL (order 307 912 R91)
40	307 912 R91	PACKAGE, field service (consists of KEY, 297 344 R1 "O" RING, 293 739 R1 and RING, 297 608 R1)
41	295 799 R91	BEARING, drive shaft (A754X2)
42	321 086 R1	SHAFT, drive (4X3025X31)
	297 344 R1	KEY, seal seat (827X80)
	293 739 R1	"O" RING (1-1/2 x 1-1/4 x 1/8")
	297 608 R1	RING, seal (A471X13)
	321 084 R91	SHAFT ASSEMBLY, drive (9X30X7) (Composed of -
		1 BEARING ST 205 A
		1 BEARING 295 799 R91
		1 "O" RING 308 667 R1
		1 "O" RING 259 252 R1
		1 PACKAGE 307 912 R91
		1 RETAINER 321 089 R1
		1 RING 295 760 R1
		1 SHAFT 321 086 R1
		X SHIM 295 763 R1
		X SHIM 295 764 R1
		1 SPACER 321 090 R1 )

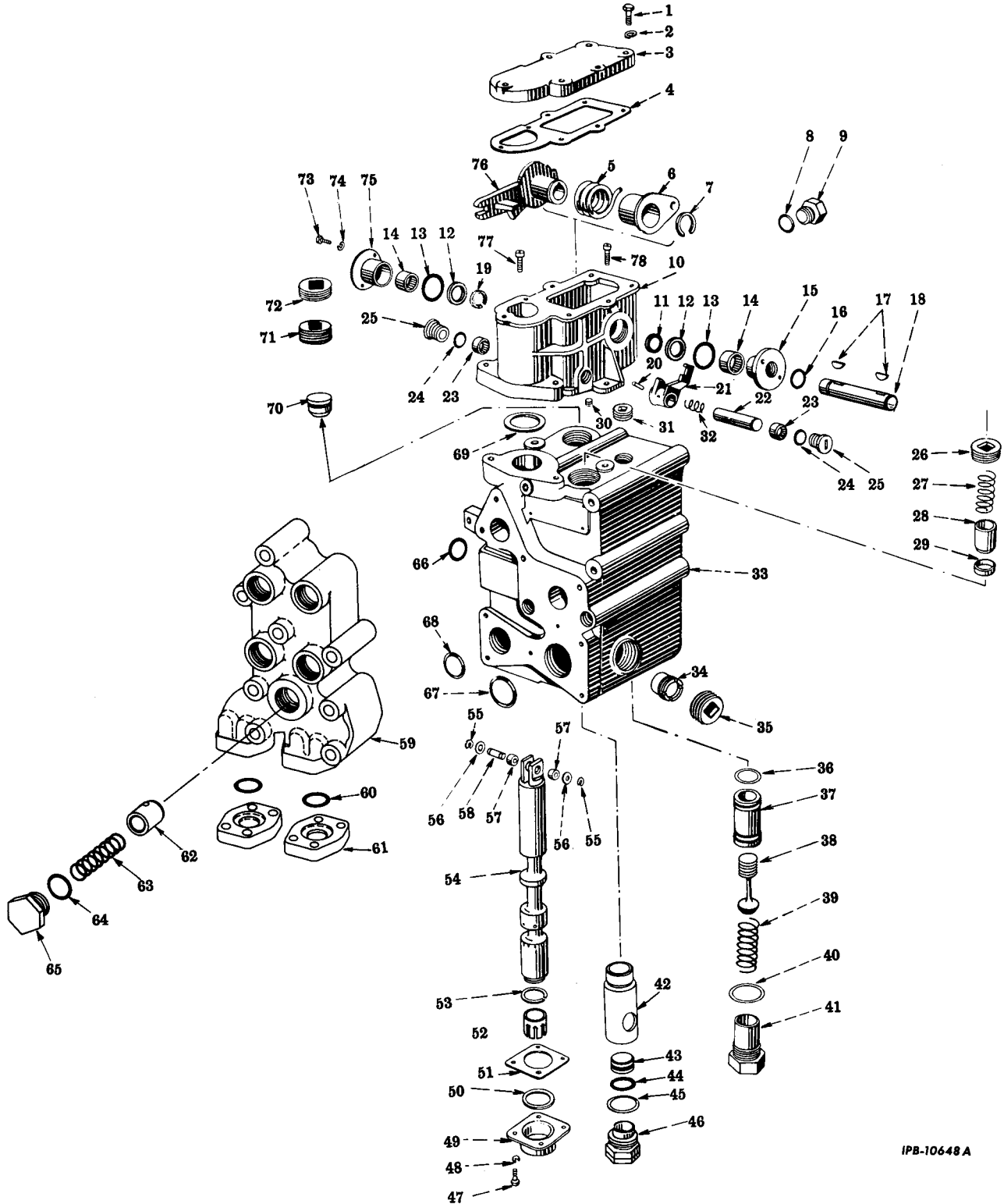
X - As Required.

# MODEL 1540 HYDRAULIC CONTROL UNIT

HYDRAULIC VALVE  
(Hydreco) (Hydraulic Only)

# MODEL 1540 HYDRAULIC CONTROL UNIT

HYDRAULIC VALVE - CONTINUED  
(Hydreco) (Hydraulic Only)



IPB-10648 A



# MODEL 1540 HYDRAULIC CONTROL UNIT

HYDRAULIC VALVE - CONTINUED  
(Hydreco) (Hydraulic Only)

REF. NO.	I.H. PART NUMBER	DESCRIPTION
	319 828 R91	VALVE ASSEMBLY, hydraulic (VZ26X12) (Consists of the following parts)
1		SCREW, 5/16 x 1-1/2" hex-hd cap (A102X6) (7)
2		WASHER, 5/16" lock (A252X8) (7)
3	295 777 R1	COVER, housing (763X5)
4	295 778 R1	GASKET (712X154)
5	296 947 R3	SPRING, cam plate torsion (A806X8)
6	296 946 R91	PLATE, spring (811X18)
7	300 025 R1	RING, snap (A611X35) (2)
8	356 005 R1	"O" RING, cover cap (1-1/8 x 1-3/8 x 1/8")
9	293 668 R1	CAP, cover (514X353)
10	295 776 R1	HOUSING, plunger lever (762X5)
11	293 673 R1	WASHER (A822X11) (X)
12	293 672 R1	WASHER (A408X35) (2)
13	293 739 R1	"O" RING, bearing retainer (1-3/8 x 1-5/8 x 1/8") (optional with 164 513 R1) (A395X25) (2)
13	164 513 R1	"O" RING, bearing retainer (1-3/8 x 1-5/8 x 1/8") (optional with 293 739 R1) (A395X25) (2)
14	551 139 R91	BEARING, control shaft (A340X25) (2)
15	293 674 R1	RETAINER, bearing (816X5)
16	253 070 R1	"O" RING, bearing retainer (7-1/8 x 1-1/8 x 1/8") (A394X17)
17	114 813	KEY, Woodruff No. 10 (A258X12) (2)
18	321 102 R1	SHAFT, control (M7X45)
19	979 848 R1	RING, snap (A611X23) (2)
20	17 175 R1	ROLL, pin (A770X9)
21	295 780 R1	CAM and LATCH (M6X78)
22	295 782 R1	SHAFT, latch
23	293 698 R91	BEARING, cam latch (A340X24) (2)
24	352 221 R1	"O" RING, latch shaft (9/16 x 3/4 x 3/32") (2)
25	293 681 R1	CAP (514X354) (2)
26	310 991 R1	PLUG, pipe (A639X7)
27	295 797 R1	SPRING (A501X146)
28	295 789 R1	VALVE, check (415X56)
29	295 788 R1	SEAT, check valve
30	294 286 R1	PLUG, pipe
31	444 703	PLUG, pipe (2)
32	295 783 R2	SPRING (A806X5)
33		Not Furnished Separately (order 319 828 R91)
34	321 092 R1	CAP (514X631)
35	293 696 R1	PLUG, pipe (A300X8)
36	252 482 R1	"O" RING (1-1/2 x 1-3/4 x 1/8")
37	295 787 R1	SEAT, relief valve (414X78)
38	293 650 R1	PLUNGER, relief valve (415X49)
39	295 325 R1	SPRING (A501X295)
40	290 987 R1	"O" RING (1-3/4 x 2 x 1/8") (optional with 310 939 R1) (A395X31)
40	310 939 R1	"O" RING (1-3/4 x 2 x 1/8") (optional with 390 987 R1) (A395X31)
41	296 925 R1	CAP (514X457)
42	321 098 R1	SLEEVE (830X405)
43	321 094 R1	PLUG (560X94)
44	356 005 R1	"O" RING (1-1/8 x 1-3/8 x 1/8") (optional with 151 244 R1)
44	151 244 R1	"O" RING (1-1/8 x 1-3/8 x 1/8") (optional with 356 005 R1)
45	290 987 R1	"O" RING (1-3/4 x 2 x 1/8") (optional with 310 939 R1)
45	310 939 R1	"O" RING (1-3/4 x 2 x 1/8") (optional with 290 987 R1)
46	321 093 R1	CAP (514X632)



# MODEL 1540 HYDRAULIC CONTROL UNIT

HYDRAULIC VALVE - CONTINUED  
(Hydreco) (Hydraulic Only)

REF. NO.	I.H. PART NUMBER	DESCRIPTION
47		SCREW, 3/8 x 5/8" hex-hd cap (4)
48		WASHER, 3/8" lock (4)
49	295 792 R1	COVER, plunger (M10X18)
50	321 095 R1	SPACER (560X95)
51	295 791 R1	GASKET (712X155)
52	321 097 R1	SLEEVE (830X404)
53	321 100 R1	RING, detent (A890X17)
54	321 099 R1	PLUNGER, operating (.010") (512X353)
55	271 110 R1	RING, plunger eye shaft snap (A611X12) (2)
56		WASHER, 17/32 x 1-1/16" (253X11) (2)
57	293 698 R91	BEARING, plunger eye shaft (2)
58	293 661 R1	SHAFT, plunger eye (M7X37)
59	321 077 R1	MANIFOLD (M15X46) 1/2 x 3-1/2" hex-hd cap SCREW (7) 1/2 x 4" hex-hd cap SCREW
60	252 482 R1	"O" RING (1-1/2 x 1-3/4 x 1/8") (2)
61	309 069 R1	COVER (M17X24) (2) 7/16 x 1-1/2" hex-hd cap SCREW (8) 7/16" lock WASHER (8)
62	321 078 R1	PLUNGER, check (513X55)
63	321 079 R1	SPRING (A501X413)
64	252 483 R1	"O" RING (1-1/4 x 1-1/2 x 1/8") (optional with 310 928 R1)
64	310 928 R1	"O" RING (1-1/4 x 1-1/2 x 1/8") (optional with 252 483 R1)
65	309 068 R1	CAP (514X278)
66	252 482 R1	"O" RING (1-1/2 x 1-3/4 x 1/8") (2)
67	290 028 R1	"O" RING (2 x 2-1/4 x 1/8")
68	290 987 R1	"O" RING (1-3/4 x 2 x 1/8") (optional with 310 939 R1)
68	310 939 R1	"O" RING (1-3/4 x 2 x 1/8") (optional with 290 987 R1)
69	254 091 R1	"O" RING (2-3/4 x 3 x 1/8") (optional with 310 929 R1)
69	310 929 R1	"O" RING (2-3/4 x 3 x 1/8") (optional with 254 091 R1)
70	321 096 R1	PLUG, pipe (560X104)
71	293 695 R1	PLUG, pipe
72	293 696 R1	PLUG, pipe
73		SCREW, 1/4 x 3/4" hex-hd cap (A101X4) (4)
74		WASHER, 1/4" lock (A252X7) (4)
75	293 675 R1	RETAINER, bearing (816X6)
76	311 130 R1	PLATE, cam
77		SCREW, 3/8 x 1" hex-soc cap (2)
78		SCREW, 3/8 x 1-1/2" hex-soc cap (2)
	110 146 R91	FITTING, 1/4" lubrication (Alemite 1792 B) (optional with 102 467 H)
	102 467 H	FITTING, 1/4" lubrication (Lincoln 5042) (optional with 110 146 R91)
	295 794 R1	SCREW, 1/2 x 7-1/2" hex-soc cap (3)
	295 795 R1	SCREW, 1/2 x 7-3/4" hex-soc cap (2)
	293 652 R1	WASHER (used in CAP, 296 925 R1) (A408X33) (6 maximum) (X)
	319 718 R91	UNIT ASSEMBLY, pump and valve (PV6X12) (Composed of -
	1	CAP 309 068 R1
	1	COVER 309 069 R1
	1	MANIFOLD 321 077 R1
	1	"O" RING 252 483 R1
	4	"O" RING 252 482 R1
	1	"O" RING 290 987 R1
	1	"O" RING 290 028 R1
	1	PLUNGER 321 078 R1
	1	PUMP 319 825 R91
	1	SPRING 321 079 R1
	1	VALVE 319 828 R91 )
	309 162 R1	3/4 x 2" hex-hd cap SCREW (4)

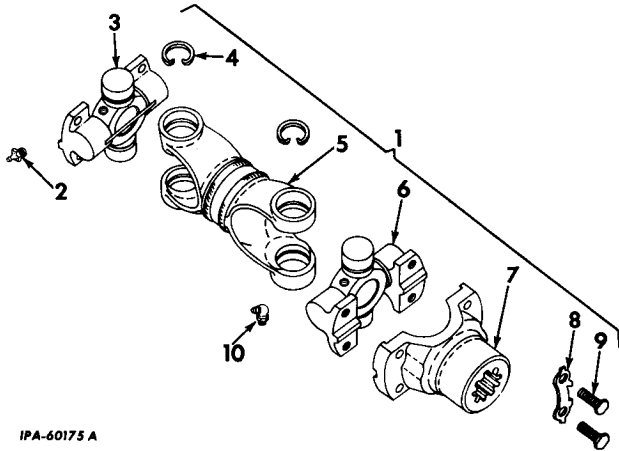
X - As Required.

# MODEL 1540 HYDRAULIC CONTROL UNIT



# MEMORANDA

## POWER TAKE-OFF SHAFT (Mechanics)



IPA-60175 A

REF. NO.	I. H. PART NUMBER	DESCRIPTION
1	317 615 R91	SHAFT w/"U" JOINT ASSEMBLY, power take-off (2A-15561-1) (Consists of the following parts) 3/8 x 1-3/4" hex-hd cap SCREW (4) 3/8" lock WASHER (4)
2	110 146 R91	FITTING, lubrication (Alemite 1792 B) (optional with 102 467 H)
2	102 467 H	FITTING, lubrication (Lincoln 5042) (optional with 110 146 R91)
3	317 721 R91	SPIDER w/BEARINGS (114-5131-A)
4	97 710 H	RING, snap (5785-J) (4)
5	317 718 R91	TUBE (42-15568-2)
6	317 722 R91	SPIDER w/BEARINGS (114-5132-A)
7	317 723 R1	YOKE, fitting (16782-J)
8	37 337 H	PLATE, lock (3550-J) (2)
9	37 479 HA	BOLT, 3/8NF x 27/32" (3544-J) (4)
10	274 508	FITTING, lubrication (Alemite 1637 B) (optional with 117 175)
10	117 175	FITTING, lubrication (Lincoln 5210) (optional with 274 508)
	305 109 R91	RETAINER and SEAL (12408-J) (8)
	37 335 H	SHIELD, dust (542-J) (8)



NUMERICAL INDEX



NUMERICAL INDEX

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		287 074 R1	12	295 541 R91	22	307 679 R21	20
		287 074 R1	22	295 543 R1	22	307 680 R21	19
41 597 DA	12	289 253 R1	18	295 698 R1	15	307 680 R21	20
41 597 DA	21	289 254 R1	18	295 748 R91	8	307 681 R21	20
		289 273 R11	13	295 754 R1	23	307 910 R91	23
		289 273 R11	14	295 755 R1	23	307 912 R91	23
<b>H</b>		289 822 R1	7	295 760 R1	23	307 963 R1	23
		290 028 R1	25	295 763 R1	23	307 964 R91	23
		290 255 R1	8	295 764 R1	23	308 667 R1	23
37 335 H	26	290 255 R1	9	295 765 R1	23	309 023 R2	23
37 337 H	26	290 256 R1	8	295 766 R1	23	309 068 R1	25
37 479 HA	26	290 256 R1	9	295 769 R1	23	309 069 R1	25
97 710 H	26	290 257 R1	8	295 771 R1	23	309 162 R1	25
102 467 H	12	290 257 R1	9	295 776 R1	25	309 303 R91	19
102 467 H	21	290 267 R2	8	295 777 R1	25	309 304 R1	19
102 467 H	22	290 270 R2	9	295 778 R1	25	309 789 R1	6
102 467 H	25	290 283 R2	11	295 780 R1	25	309 859 R91	21
102 467 H	26	290 284 R1	11	295 782 R1	25	309 864 R11	12
138 322 H	10	290 285 R1	11	295 783 R2	25	309 864 R11	21
138 322 H	11	290 287 R2	11	295 787 R1	25	309 865 R91	12
138 322 H	12	290 290 R2	10	295 788 R1	25	309 876 R91	14
138 322 H	14	290 290 R2	11	295 789 R1	25	309 883 R1	14
138 322 H	17	290 358 R1	13	295 791 R1	25	309 884 R11	13
138 322 H	18	290 358 R1	14	295 792 R1	25	309 884 R11	14
138 322 H	21	290 468 R3	7	295 794 R1	25	309 886 R91	13
		290 469 R3	7	295 795 R1	25	309 888 R1	14
		290 493 R3	6	295 797 R1	25	309 907 R11	10
		290 494 R3	6	295 799 R91	23	309 907 R11	11
<b>R</b>		290 532 R2	11	295 893 R92	16	310 897 R91	18
		290 987 R1	25	295 902 R13	16	310 917 R91	15
16 964 R91	12	293 001 R11	10	295 903 R1	16	310 920 R91	15
16 964 R91	21	293 001 R11	11	295 904 R92	16	310 921 R91	15
16 964 R91	22	293 046 R1	8	295 907 R91	16	310 928 R1	25
110 146 R91	12	293 650 R1	25	295 908 R91	16	310 929 R1	25
110 146 R91	21	293 652 R1	25	296 229 R91	6	310 932 R1	23
110 146 R91	22	293 661 R1	25	296 230 R91	7	310 939 R1	25
110 146 R91	25	293 668 R1	25	296 247 R1	15	310 991 R1	25
110 146 R91	26	293 672 R1	25	296 590 R91	17	311 080 R1	23
151 244 R1	25	293 673 R1	25	296 610 R1	13	311 130 R1	25
164 513 R1	25	293 674 R1	25	296 845 R1	6	311 263 R1	18
164 513 R91	23	293 675 R1	25	296 845 R1	7	311 265 R1	15
252 482 R1	23	293 681 R1	25	296 849 R1	6	313 084 R91	15
252 482 R1	25	293 695 R1	25	296 849 R1	7	313 085 R91	15
252 483 R1	25	293 696 R1	25	296 925 R1	25	313 086 R91	15
253 070 R1	25	293 698 R91	25	296 946 R91	25	313 087 R91	15
253 172 R1	18	293 739 R1	23	296 947 R3	25	313 096 R91	15
254 091 R1	23	293 739 R1	25	297 344 R1	23	313 222 R1	19
254 091 R1	25	293 739 R91	23	297 608 R1	23	313 938 R1	16
255 088 R1	23	293 808 R91	12	298 175 R91	12	315 023 R1	7
259 099 R1	23	293 808 R91	21	298 175 R91	21	315 089 R91	6
259 190 R1	23	293 998 R1	9	298 850 R1	7	315 090 R91	6
259 252 R1	23	293 999 R1	9	298 851 R1	7	315 091 R91	6
271 110 R1	25	294 118 R2	18	298 852 R1	6	315 092 R1	6
280 668 R91	19	294 286 R1	25	299 587 R91	12	315 103 R1	8
283 189 R1	15	294 512 R92	16	299 587 R91	22	315 103 R1	11
283 442 R91	12	294 513 R91	16	299 588 R11	12	315 111 R1	6
283 442 R91	22	294 514 R2	16	299 588 R11	22	315 175 R91	10
284 026 R91	12	294 515 R1	16	299 589 R11	12	315 176 R11	10
284 026 R91	21	294 516 R1	17	299 590 R11	22	315 177 R1	10
284 029 R11	21	294 552 R1	10	299 591 R11	14	315 179 R1	10
284 029 R21	12	294 555 R1	10	299 842 R1	18	315 179 R1	11
284 030 R1	12	294 610 R1	14	299 842 R1	20	315 180 R11	10
284 030 R1	21	294 611 R1	13	300 025 R1	25	315 180 R11	11
284 032 R1	12	294 611 R1	14	301 913 R1	18	315 182 R1	11
284 032 R1	21	294 682 R12	16	303 667 R1	19	315 182 R11	11
284 033 R91	12	294 684 R1	16	303 667 R1	20	315 183 R1	11
284 033 R91	21	294 685 R1	16	303 669 R1	19	315 189 R1	11
284 179 R1	18	294 773 R1	23	303 669 R1	20	315 355 R91	8
286 473 R1	7	294 905 R1	16	304 359 R91	18	315 356 R91	8
287 058 R91	12	295 325 R1	25	305 109 R91	26	315 435 R1	9

