

Section IV

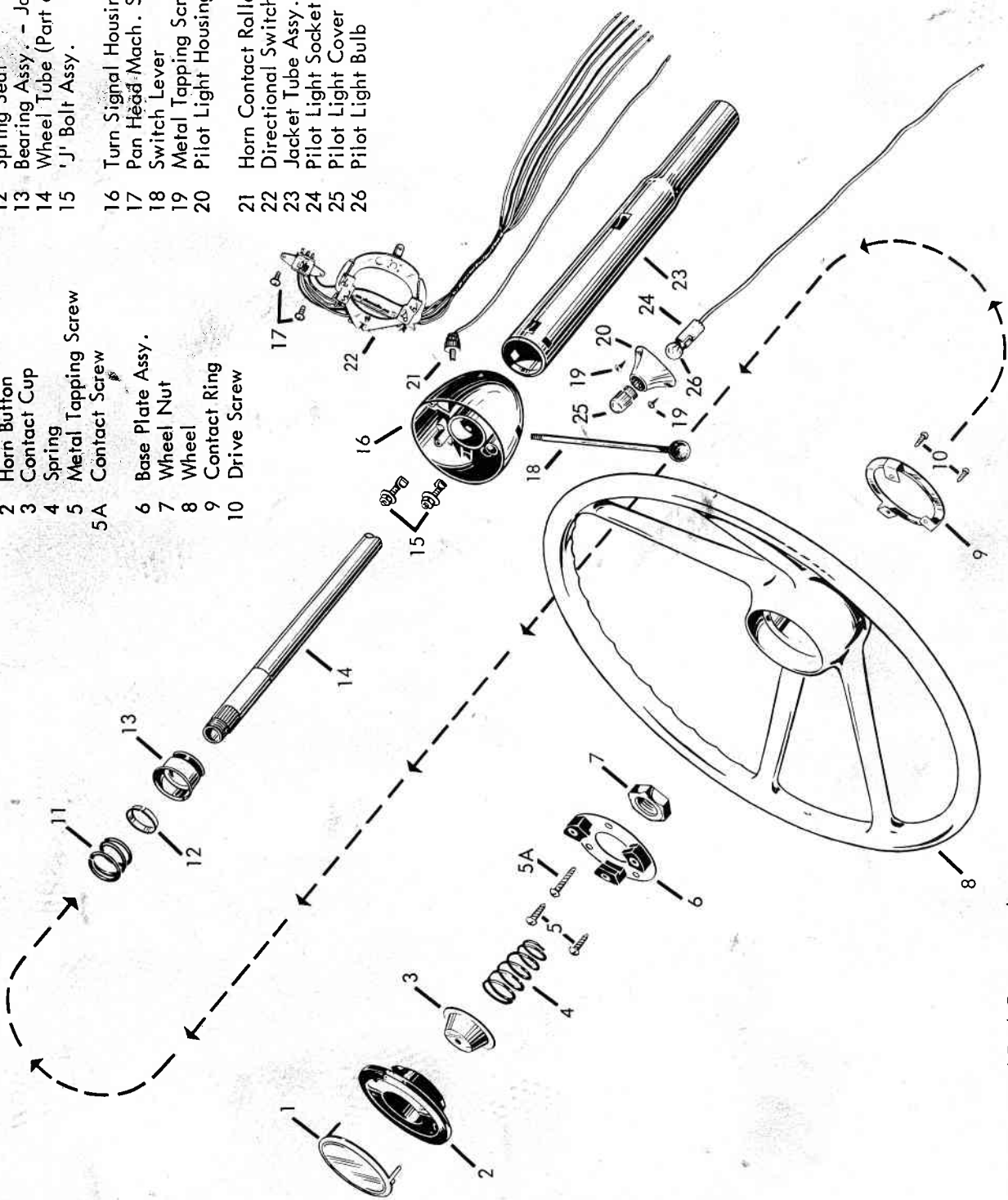
Steering

Ross steering is used exclusively on Blue Bird Chassis, including hydraulic power steering when your unit is so equipped.

Service bulletings, parts, lists, and engineering diagrams are included to aid you in servicing, maintaining, and ordering replacement parts.

ALWAYS GIVE PART NUMBER OF EACH PART AND COMPLETE DESCRIPTION AND MANUFACTURER WHEN ORDERING PARTS.

- | | |
|-----------------------|---------------------------------------|
| 1 Emblem Plate | 11 Spring |
| 2 Horn Button | 12 Spring Seat |
| 3 Contact Cup | 13 Bearing Assy. - Jacket Tube |
| 4 Spring | 14 Wheel Tube (Part of Steering Gear) |
| 5 Metal Tapping Screw | 15 'J' Bolt Assy. |
| 5A Contact Screw | 16 Turn Signal Housing |
| 6 Base Plate Assy. | 17 Pan Head Mach. Screws |
| 7 Wheel Nut | 18 Switch Lever |
| 8 Wheel | 19 Metal Tapping Screw |
| 9 Contact Ring | 20 Pilot Light Housing |
| 10 Drive Screw | 21 Horn Contact Roller Assy. |
| | 22 Directional Switch Assy. |
| | 23 Jacket Tube Assy. |
| | 24 Pilot Light Socket and Cable |
| | 25 Pilot Light Cover |
| | 26 Pilot Light Bulb |

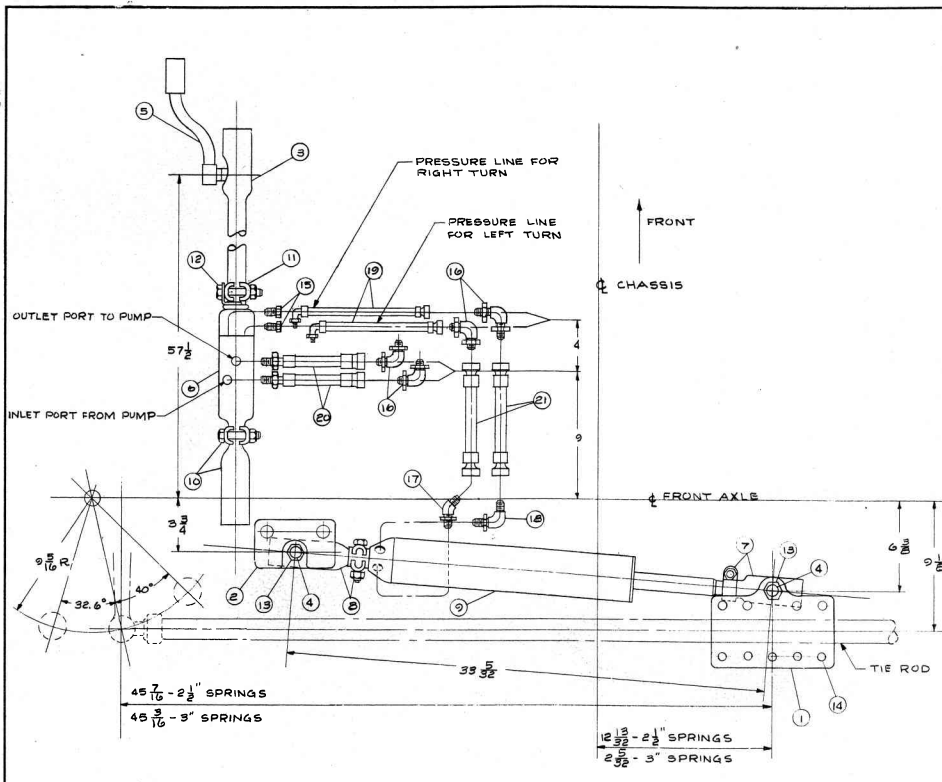


Ross Gear and Tool Company, Inc.
 Lafayette, Indiana
 Turn Signal and Column Assembly
 (For Integral Column)
 Col-12 Rev. 11-62

ROSS STEERING SECTION (Continued)

PART NO.	PART NAME	QTY.
033042	Shim .002	
033036	Shim .003	
033037	Shim .010	
456053-A63-3075	J. T. and turn signal assembly	1
456053-A21-3075	J. T. and turn signal housing assembly	1
456053	Turn signal housing	1
097503-A1-2925	J. T. assembly	1
097503-2925	J. T. 2 - 1/8 #18	1
454098	Wire trough	1
477180	Reinforcing ring	1
065987	Bearing assembly	1
021193	Clamp bolt	2
025082	Lock nut	2
G 106261	5/16 x 3/4 plain washer	2
480885	Directional signal switch assembly	1
G 274883	#10 - 16 x 5/16 pan head cr. rec. tapping screw	2
032308	Contact brush assembly	1
055025-1000	Protective tubing	1
452207	Lever	1
465575	Horn button unit	1
450145	Horn button assembly	1
450131	Horn button	1
450128	Horn button emblem	1
029059	Contact cup	1
401246	Horn button spring	1
454875 453081-A1 →	Base plate assembly	1
144677	Flat head slot tap screw	1
148595	#10 x 5/8 round slot head screw	2
145067	#6 x 3/8 driver screw	2
453087	Contact ring	1
Sheller #61-622	Steering wheel	1

Power Steering Assy., Valve to Cylinder, Ross



ITEM NO.	QUANTITY	NAME	VENDOR AND THEIR PART NUMBER	R.R. PART NO.	REMARKS
1	2	Tire Rod Ball Bracket	--	14049	
2	1	Stationary Ball Bracket	--	14109	Use with 2 1/2" Springs
2	1	Stationary Ball Bracket	--	14048	Use with 3" Springs
3	1	Drag Rod Assembly	Columbus Auto Parts Company	14058	1 1/2" Dia. Ball Socket
4	2	1 1/2" Ball Stud	Columbus Auto Parts Co. #8-4542		1 1/2" Dia Ball
5	1	Pittman Arm	Ross Gear & Tool Co. #43735-31		1 1/2" Dia. Ball, Ball in, 2 1/4" Offset in, 8 1/2" Arm
6	1	Valve Assembly	Ross Gear & Tool Co. #9200022		11 1/8" Long
7	1	Socket Assembly w/clamp	Ross Gear & Tool Co. #403573-A1-400		1 1/2" Dia Ball Socket, 7/8"-18 - Female Threads
8	1	Socket Assembly w/clamp	Ross Gear & Tool Co. #403573-A1-500		1 1/2" Dia Ball Socket, 7/8"-18 - Female Threads
9	1	Cylinder	Ross Gear & Tool Co. #C36518-1-1200		2 1/4 I.D. x 12" Stroke, 2 5/8" Max. O.D. - 9/16-18 Threads SAE Boss
10	1	Socket Assembly w/clamp	Ross Gear & Tool Co. #403576-A1-500		1 1/2" Dia Ball Socket, 1" - 16 Female Threads
11	1	Clamp Assembly	Ross Gear & Tool Co. #475-156-A1		1 1/4" Dia.
12	1	Piston Rod Lock	Ross Gear & Tool Co. #24-499030		
13	2	Regular Slotted Nut			3/4 - 16 NF Threads
14	9	Hex Head Cap Screws			1/2 - 20 NF Threads x 2" Long
15	2	Inverted Male Connector	Weatherhead #236x6		3/8 Male Pipe x 3/8 Tube
16	4	Bulkhead Union Elbow	Imperial Eastman #8558H-PS-06		3/8 Tube, SAE 37° J.I.C.
17	1	Straight Thread 45° Elbow	Weatherhead #5365x6		3/8 Tube x 9/16 - 18 Straight Threads
18	1	Straight Thread 90° Elbow	Weatherhead #5515x6		3/8 Tube x 9/16 - 18 Straight Threads
19	2	Hose Assembly	Imperial Eastman #D7-5A06-06NJ & 50458-18		D706 Hose 18" O.A. with 3/8 Tube (5/8 - 18) Short Bent Tube (90°) Inverted Flare Coupling and with 3/8 Tube (9/16 - 18) Female 37° J.I.C. Flare Swivel Coupling
20	2	Hose Assembly	Imperial Eastman #7-HADS-06NJ & 06AS-18		D706 Hose 18" O.A. with 3/8 Tube (9/16 - 18) Female 37° J.I.C. Flare Swivel Coupling and 3/8 Male Pipe Thread Coupling (Cut length - 15 25/64")
21	2	Hose Assembly	Imperial Eastman #7-HADS-06NJ & 06AJ-37		D706 Hose 37" O.A. with 3/8 Tube (9/16-18) Female 37° J.I.C. Flare Swivel Couplings - Both Ends (Cut length - 14 1/4")
22	9	Lock Washers			1/2" Dia. (Not Shown)
23	18	Regular Nut			1/2" - 20NF Threads, Double Nut Each Cap Screw (Not Shown)
24	6	Cotter Pin			1/8" Dia x 3" Long (Not Shown)
25	4	45° Lubrication Fitting			1/8" I.P.S. (Not Shown)
26	2	Hose Clamps	Automotive Rubber Products #1361		(Not Shown)
27	1	Hose Clamp Bracket		25116	(Not Shown)

NOTE: Rotate Tie Rod Bracket, Item 1 on Tie Rod So As To Insure Levelness of Cylinder Assembly

* Tie Rod Ball Bracket, Item No. 1, To Be Milled in Matched Sets to Insure Proper Fit of Ball Stud, Item 4

All Dimensions Shown with Chassis Steering in Forward Position

Ground Clearance is 9 2/32" Using 9.00x20 - 12 ply Tires

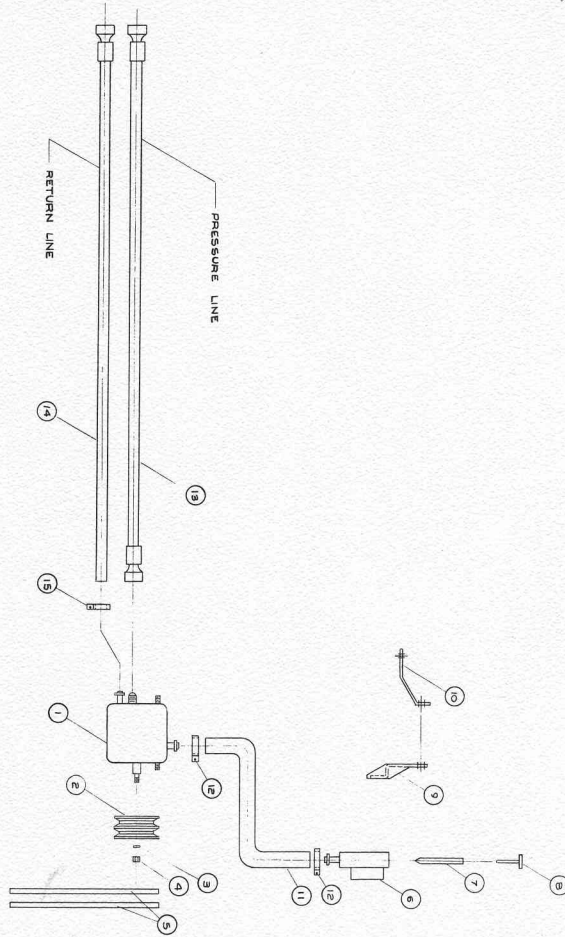
Set Turning Stop on Right Wheel so as to Insure Left Tire Clearing Valve and Drag Rod Assembly on Right Turn
Set Turning Stop on Left Wheel so as to Insure Tie Rod Clearing Cylinder Assembly on Left Turn

INACTIVE NO. 20307-A
 REPLACED BY NO. 2511-A

DATE	BY	REVISION
1/4/65	W. J. BIRD	1
1/4/65	W. J. BIRD	2
1/4/65	W. J. BIRD	3
1/4/65	W. J. BIRD	4
1/4/65	W. J. BIRD	5
1/4/65	W. J. BIRD	6
1/4/65	W. J. BIRD	7
1/4/65	W. J. BIRD	8
1/4/65	W. J. BIRD	9
1/4/65	W. J. BIRD	10
1/4/65	W. J. BIRD	11
1/4/65	W. J. BIRD	12
1/4/65	W. J. BIRD	13
1/4/65	W. J. BIRD	14
1/4/65	W. J. BIRD	15
1/4/65	W. J. BIRD	16
1/4/65	W. J. BIRD	17
1/4/65	W. J. BIRD	18
1/4/65	W. J. BIRD	19
1/4/65	W. J. BIRD	20
1/4/65	W. J. BIRD	21
1/4/65	W. J. BIRD	22
1/4/65	W. J. BIRD	23
1/4/65	W. J. BIRD	24
1/4/65	W. J. BIRD	25
1/4/65	W. J. BIRD	26
1/4/65	W. J. BIRD	27

Form #BBC-65-VI-6
January 4, 1965

Power Steering Assy., Pump to Valve, 348, 348A
409, 409A



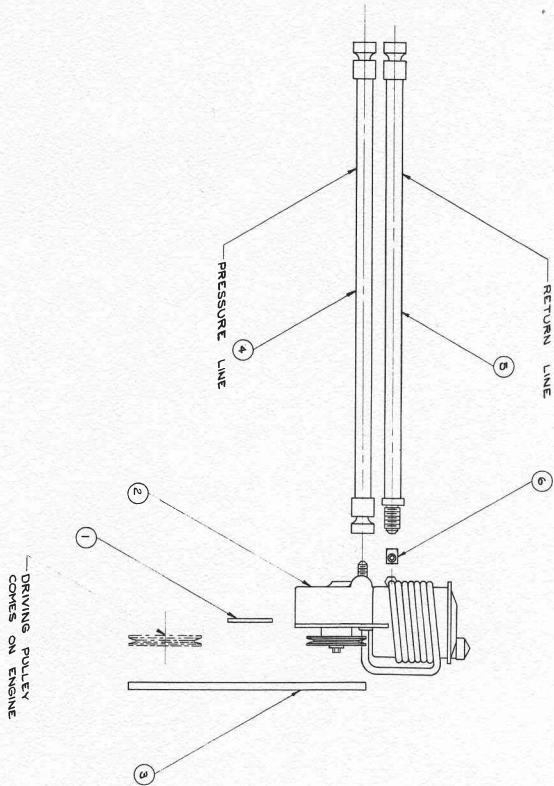
ITEM NO.	QTY	NAME	VENDOR & THEIR PART NUMBER	REMARKS
1	1	PUMP ASSEMBLY	CHEVROLET # 56 831E	
2	1	PULLEY, PUMP	CHEVROLET # 383469B	
3	1	LOCKWASHER, PUMP PULLEY	CHEVROLET # 103329	
4	1	NUT, PUMP PULLEY	CHEVROLET # 103028	
5	2	BELT ALTERNATOR & PUMP DRIVE GATES # 662475		MATCHED SET
6	1	RESERVOIR ASSEMBLY	CHEVROLET # 370B00	
7	1	SCREEN, RESERVOIR	CHEVROLET # 370B09	
8	1	CAP, RESERVOIR	CHEVROLET # 5687247	
9	1	BRACKET, FRONT PUMP	CHEVROLET # 3768285	
10	1	BRACKET, REAR PUMP	CHEVROLET # 3768469	
11	1	HOSE, PUMP TO RESERVOIR	CHEVROLET # 3781987	
12	2	HOSE CLAMP, PUMP TO RESERVOIR	BALKAMP 4 - 1208	26" LONG
13	1	HOSE ASSEMBLY, RETURN PRESSURE	IMPERIAL EASTMAN # E7-HA06-06-N17 DONS-582 CUT LENGTH-55 3/8"	E706 HOSE 58 1/2" O.A. WITH 3/8" (10) FEMALE 7/8" SAE FLARE SWIVEL COUPLING AND 3/8" TUBE (18) COUPLING
14	1	HOSE ASSEMBLY, RETURN	IMPERIAL EASTMAN # E7-HA06-06-N17-582 CUT LENGTH: 57 3/8"	E706 HOSE 58 1/2" O.A. WITH 3/8" TUBE (18) COUPLING AND 3/8" TUBE (18) COUPLING
15	1	CLAMP, RETURN HOSE		ONE END ONLY

INACTIVATES NOS. 25115-A
REPLACED BY NOS.

DATE: _____
 BY: _____
 APPROVED BY: _____
 BLUE BIRD BODY CO.
 FORT VALLEY, GEORGIA, U.S.A.
 POWER STEERING ASSY. PUMP TO VALVE
 348, 348A, 409, 409A
 10-13-65 P.B.F.
 25655-A

Form #BBC-65-VI-7
January 4, 1965

Power Steering Assy., pump to valve,
Ford 391, 391A



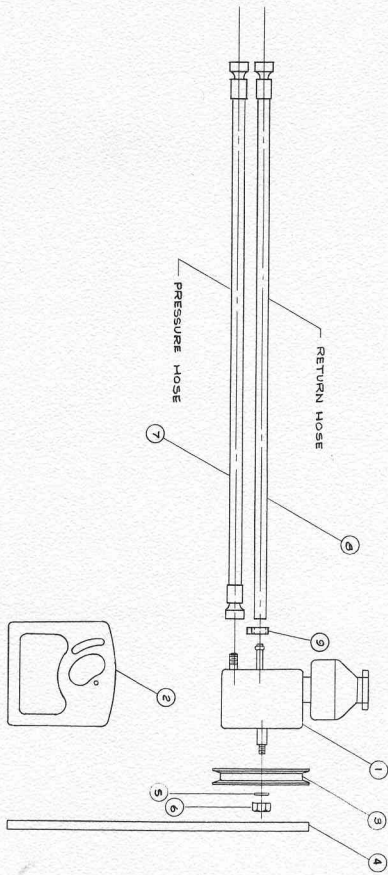
ITEM NO.	QTY.	NAME	VENDOR & THEIR PART NUMBER	REMARKS
1	1	MOUNTING BRACKET	FORD MOTOR CO # C4TE-3C511-A	
2	1	PUMP ASSEMBLY	FORD MOTOR CO # C4TK-3A691-A	
3	1	V-BELT	FORD MOTOR CO # C4TE-8660-U	
4	1	HOSE ASSEMBLY, PRESSURE	ANCHOR #6F-6FJ5-50458-530C	6F HOSE 53' O.A. WITH 3/8" TUBE (3/8"-18) BENT 3/8" TUBE (3/8"-18) INVERTED FLARE COUPLING AND 3/8" TUBE (1/2"-18) FEMALE 31° JIC FLARE SWIVEL COUPLING.
5	1	HOSE ASSEMBLY, RETURN	IMPERIAL EASTMAN # ET-HOSE-C6NU & C6WB-51/2" CUT LENGTH-48 3/4"	ET HOSE 53' O.A. WITH 3/8" MALE PIPE THREAD COUPLING AND 3/8" FEMALE 31° JIC FLARE SWIVEL COUPLING
6	1	FEMALE ELBOW	WEATHERHEAD # 50 X6	1/2" TUBE X 3/8" PIPE THREAD
2	2	CAPSCREW		3/8"-16 N.C. X 1 1/2" LONG
1	1	CAPSCREW		3/8"-16 N.C. X 6" LONG
1	1	FLAT WASHER		3/32" ID X 1 1/8" O.D.
3	3	LOCK WASHER		3/32" ID X 1 1/8" O.D.
3	3	RUBBER HOSE CLAMP	AUTOMOTIVE RUBBER PRODUCTS #1361	NOT SHOWN

INACTIVATES NOS. 25113-A
REPLACED BY NOS.

DATE	APPROVED	BY
BLUE BIRD BODY CO. MOBILE FORD VALVE DIVISION, BIRMINGHAM, ALA. U.S.A. POWER STEERING ASSY., BUREAU 46-21-2148 #10-DAB/LSM 27074-A		

Form #BBC-65-VI-8
January 4, 1965

Power Steering Assy., pump to valve, 401, 478



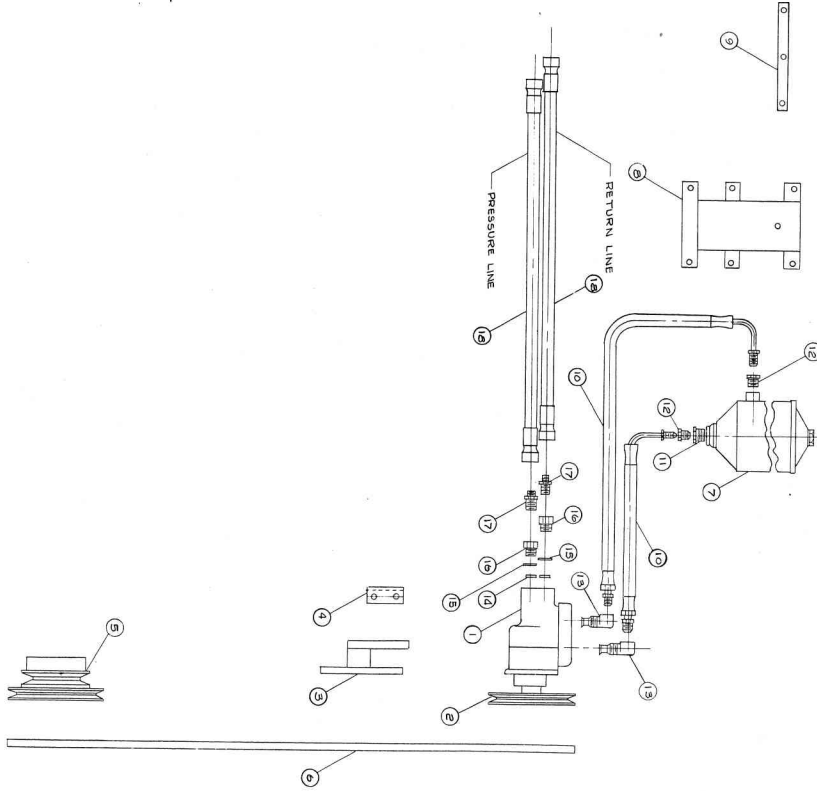
ITEM NO.	QTY	NAME	VENDOR & THEIR PART NO.	REMARKS
1	1	PUMP ASSEMBLY	GM.C. # 5066070	
2	1	BRACKET, PUMP	GM.C. # 2392912	
3	1	PULLEY, PUMP	GM.C. # 2393446	
4	1	BELT	GM.C. # 2392157	1/2" x 4 1/2" LONG
5	1	WASHER, PULLEY NUT	GM.C. # 1203966	
6	1	NUT, PULLEY SHAFT	GM.C. # 451071	
7	1	HOSE, ASSEMBLY, PRESSURE	IMPERIAL EASTMAN # 67-1A00-00N2 & 66MS-574 (Call # 4-598)	6706 HOSE 57 1/2" O.A. WITH 3/8" TUBE (1-10) FEMALE 45° 5/16" FLARE SWIVEL COUPLING AND 3/8" TUBE (1-10) FEMALE (1-10) FEMALE 37 3/16" FLARE SWIVEL COUPLING
8	1	HOSE, ASSEMBLY, RETURN	IMPERIAL EASTMAN # 67-1A00-00N1-578 (Call # 4-598)	6706 HOSE 57 1/2" O.A. WITH 3/8" TUBE (1-10) FEMALE 45° 5/16" FLARE SWIVEL COUPLING, ONE END ONLY
9	1	CLAMP, HOSE, RETURN	(NOT SHOWN)	3/8" x 1 1/2" - 16 N.C.
9	1	BOLT, BRACKET TO ENGINE	(NOT SHOWN)	3/8" x 1-1/2" N.C.
2	1	BOLT, PUMP TO BRACKET	(NOT SHOWN)	FOR 3/8" O.D. HOSE
3	1	CLAMP, HOSE	(NOT SHOWN)	FOR 3/8" BOLT
5	1	WASHER, LOCK	(NOT SHOWN)	FOR 3/8" BOLT
1	1	WASHER, FLAT	(NOT SHOWN)	FOR 3/8" BOLT

INACTIVATES NOS. 20 542
REPLACED BY NOS.

DATE	BY	REVISION
7/26/65	W.A.	1
1. 10786 For Reference Copying BLUE BIRD BODY CO. FORT VALLEY, GEORGIA, U. S. A. POWER STEERING ASSEMBLY PUMP TO VALVE 401, 478 BR CHASSIS 20 542 20 542 25114-A		

Form #BBC-65-VI-9
January 4, 1965

Power Steering Assy., pump to valve and Reservoir, Reo 331



ITEM NO.	QTY	NAME	VENDOR & THEIR PART NUMBER	REMARKS
1	1	PUMP ASSEMBLY	REO 1676-K1	VICKERS MODEL NO. V.T. 17-100-40-75-50-110
2	1	PUMP PULLEY	REO 2127-K1	
3	1	FRONT PUMP SUPPORT BRACKET	REO 2123-K1	
4	1	REAR PUMP SUPPORT BRACKET	REO 2124-K1	
5	1	PUMP & AIR COMPRESSOR DRIVE PULLEY	REO 2729-MS	
6	1	PUMP DRIVE BELT	REO 2119-K1	2 X 3/8" X 4 1/2" OUTSIDE LENGTH
7	1	RESERVOIR ASSEMBLY	REO 1522-K1	
8	1	RESERVOIR SUPPORT ASSY	REO 2137-K1	
9	1	RESERVOIR BRACE	REO 2141-K1	
10	2	HOSE ASSEMBLY	REO 1970-K1	ANCHOR COUPLING NUMBER AP-900-15
11	1	REDUCING BUSHING	REO 1440-S9	
12	2	MALE CONNECTOR	REO 181-H3	
13	2	90° STREET ELBOW	REO 1374-23	
14	2	Ø" RING	REO 1360-K1	
15	2	COPPER WASHER	REO 1463-D1	
16	2	MALE CONNECTOR	REO 1373-K1	
17	2	INVERTED MALE TO MALE HOSE ASSY, PRESSURE AND RETURN	WEATHERHEAD 5860 X 6 IMPERIAL EASTMAN # DT-FA00-DONT #08N17 (NOT SHOWN)	DTG HOSE - Ø 1/4" WITH 3/8" TUBE (Ø 1/8") FEMALE 37° JIC FLARE SWIVEL COUPLINGS ON BOTH ENDS FOR 3/8" O.D. HOSE
18	2	HOSE ASSEMBLY, PRESSURE AND RETURN		
19	2	HOSE CLAMP		

NOTE: WHEN 331 ENGINE IS ORDERED WITH POWER STEERING PUMP & RESERVOIR ASSEMBLY, ITEMS 1 THRU 16 COME ASSEMBLED TO ENGINE.

INACTIVATOR NO.	18226-A
REPLACED BY NO.	
DATE	
BY	
APPROVED	
BLUE BIRD BODY CO. POWER STEERING ASSY., PUMP & RESERVOIR VALVE & RESERVOIR ASSEMBLY, ITEMS 1 THRU 16 COME ASSEMBLED TO ENGINE.	
FORM NO. 5112-A	

SERVICE BULLETIN 770

Maintenance Procedure Standard V20 Valve

The valve is the control center of the Ross Hydrapower Linkage system. To enable the operator to achieve maximum results from his steering, the principal parts of the unit (valve body, sleeve, spool, reaction rings and glands) are machined to very close limits.

Because of their selective fit it is not practicable to service the valve body or spool separately. When either is required replace with a new valve unit. The remaining parts may be serviced separately.

As the unit floats in oil during operation there is very little wear on any of the moving parts.

ADJUSTMENTS

No adjustments are required. The centering springs are preloaded in the assembled unit and the preload cannot be changed by adjustment. Barring damage the valve is expected to last the life of the vehicle, except for "O" ring replacement.

SERVICING

Cleanliness through the entire servicing procedure cannot be overemphasized. Parts should be cleaned with a suitable solvent, washed and dried, and kept free from lint. Use extreme caution in the handling of all parts. The precision edges on these parts are vitally important to smooth operation.

When necessary to service, remove and discard all "O" ring seals, using new ones when reassembling. Lubricate all seals and "O" rings with SAE 10 oil before assembling.

DISASSEMBLING PROCEDURE

Remove Dust Seal (1).

Unlock end cover (2) and reducer-end cover (16) by straightening lock rings (3) which have been pressed into slots in end cover and reducer-end cover (2 and 16).

Unscrew end cover and reducer-end cover (use of strap wrench will prevent damage to exterior finish.

Remove lock rings (3) from each end of valve body assembly (11).

Remove "O" ring retainer (4) and "O" ring seal (5) from threaded end of spool.

To remove spool (10) (Note relation of threaded end of valve spool to parts in the valve body before removing spool so that upon reassembly the spool will not be reversed end-wise. This is important for reassembly.) thump threaded end of spool with the heel of the hand to push it from the valve body (11).

Glands (7), springs (8), and reaction rings (9) are removable from valve body and spool.

Remove "C" washer (15) from end of the spool and remaining "O" ring (4).

Remove "O" rings (6) from O.D. of glands (7).

Components of the relief valve unit should not require servicing except for possible replacement should leakage be evident. To disassemble remove plug assembly (14). Use care not to damage any surfaces or edges. Remove spring (13) and steel ball (12).

ASSEMBLY PROCEDURE

Assemble steel ball (12) into relief valve hole in valve body assembly (11), then slide in spring (13). Insert plug assembly (14) until flush with outside surface of valve body.

Holding spool (10) by threaded end slide on opposite end one reaction ring (8), spring (9).

Next assemble one "O" ring (6) on O.D. of gland (7). Slide this assembly over end of spool to which reaction ring and spring have been assembled.

Install small "O" ring seal (5) in short counterbore of gland (7). Next slide on "O" ring retainer (4).

Assemble "C" washer (15).

Insert spool assembly, as far as it will go, into proper end of valve body (11).

Then assemble lock ring (3) and screw on reducer-end cover until tight.

Next assemble, over threaded end of spool (10), reaction ring (9), spring (8). Assemble "O" ring (6) on O.D. of gland (7) and slide this assembly over threaded end of spool.

Install small "O" ring (5) in short counterbore of gland (7). Be careful not to damage seal as you slide it over the threaded end of spool.

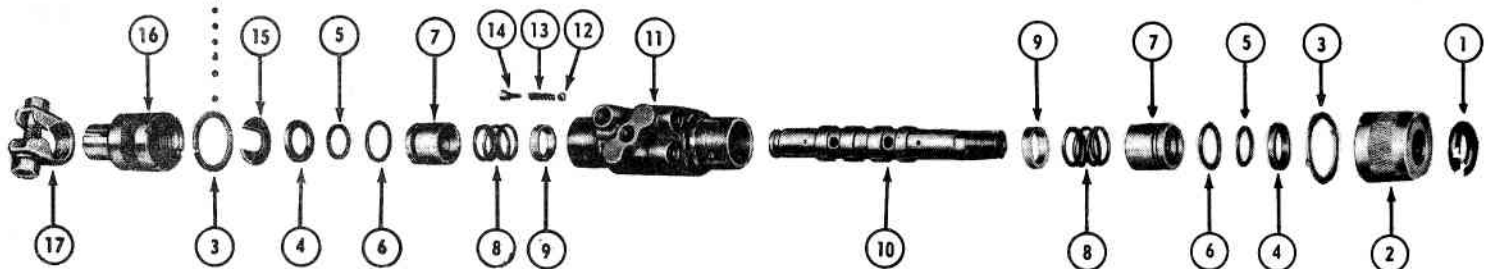
Now slide on "O" ring retainer (4).

Assemble lock ring (3) and screw on end cover (2) until tight.

Assembly is now complete. To Check, actuate spool (10) in both directions. Spool (10) should move a minimum of .060 in each direction, and, upon release, return to center.

If actuation is satisfactory stake lock rings (3) into notches in valve body (11).

..... NOTE: This Lock Ring (3), on this end, is now available with "Crimped Ear" to hold Relief Valve Plug (14) tight.



- | | | | |
|---------------------|-----------------|-----------------|------------------------|
| 1 Dust Seal | 5 "O" Ring Seal | 9 Reaction Ring | 13 Spring |
| 2 End Cover | 6 "O" Ring Seal | 10 Spool | 14 Plug Assembly |
| 3 Lock Ring | 7 Gland | 11 Valve Body | 15 "C" Washer |
| 4 "O" Ring Retainer | 8 Spring | 12 Steel Ball | 16 Reducer - End Cover |
| | | | 17 Clamp Assembly |

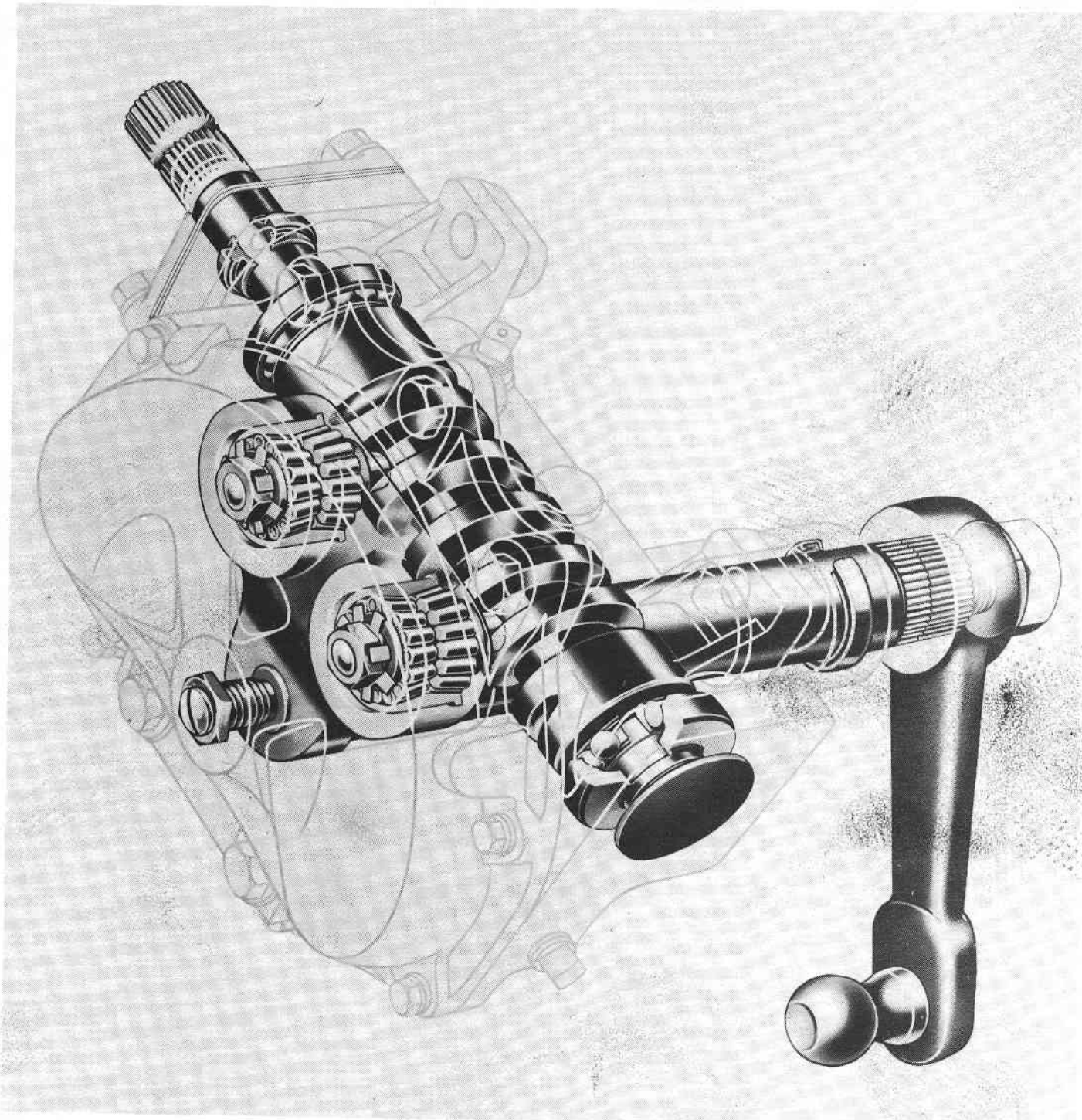
FRONT WHEEL ALIGNMENT

For maximum steering ease and minimum tire wear, the front wheels alignment must be within the following limits:

	<u>Caster</u>	<u>Camber</u>	<u>Toe-In</u>
Manual Steering	3° - 6°	1/2° - 1°	1/16"-1/8"
Hydraulic Power Steering	3° - 6°	1/2° - 1°	1/16"-1/8"
Air Power Steering	0° - 1°	1/2° - 1°	1/16"-1/8"

ROSS STEERING SECTION

PART NO.	PART NAME	QTY.
TE 702012-325	Housing	1
069011	Bushing	2
TE 703021-A1-4200	Cam and tube assembly	1
TE 703021	Cam	1
091120-3300	W. T. 1D	1
TE 704000-A1-625	Levershaft assembly	1
TE 704000-625	Levershaft	1
044960	Bearing assembly	2
025084	Nut	2
028015	Pronged washer	2
TE 705004	Side cover	1
T 266000-A1	Upper cover assembly	1
T 266000	Upper cover	1
G 181378	Hex head screw	1
G 103321	3/8 med. lock washer	1
G 120369	3/8 - 24 hex nut	1
477100	Spacer	1
436836-31	Pitman arm assembly	1
G 444583	3/8 sq. hd. pipe plug	2
G 444698	3/8 hex sacket pipe plug	1
032074	Oil seal	1
402246 2	2 1/8 dia. expansion plug	1
400020	Ball cup	2
400076-A1	Ball and retainer	2
400076	Retainer	1
400014	Ball - 3/8 dia.	10
025003	1 1/8 - 12 hex nut	1
G 120731	1 1/8 med. LW	1
021065	Adjusting screw	1
025031	Lock nut	11
032332	Sealing ring	1
020190	3/8 - 16 bolt and washer assembly	2
223818	5/8 - 18 x 3 3/4 hex head bolt	2
B.B. 27283	5/8 - 18 x 10 1/2 hex head cap screw	2
G 028336	41/64 x 1 1/8 plain washer	4
G 121358	5/8 - 18 hex nut	4
020188	3/8 - 16 x 1 1/8 bolt and washer assembly	4
401105	Spring	1
028104	Spring seat	1
TE 709001	Side cover gasket	1



Form #BBC-65-VI-2
January 4, 1965