

CHAPTER 29

HYDRAULICS

<i>Figure</i>	<i>Title</i>	<i>Page</i>
29-1	Forward Servos Installation	29.0
29-3	Aft Servo Installation	29.2
29-7	Hydraulic Reservoir Installation	29.6
29-11	Hydraulic Reservoir Installation	29.10
29-15	Forward Servo Hoses Installation	29.14
29-17	Hydraulic Pump Installation	29.16

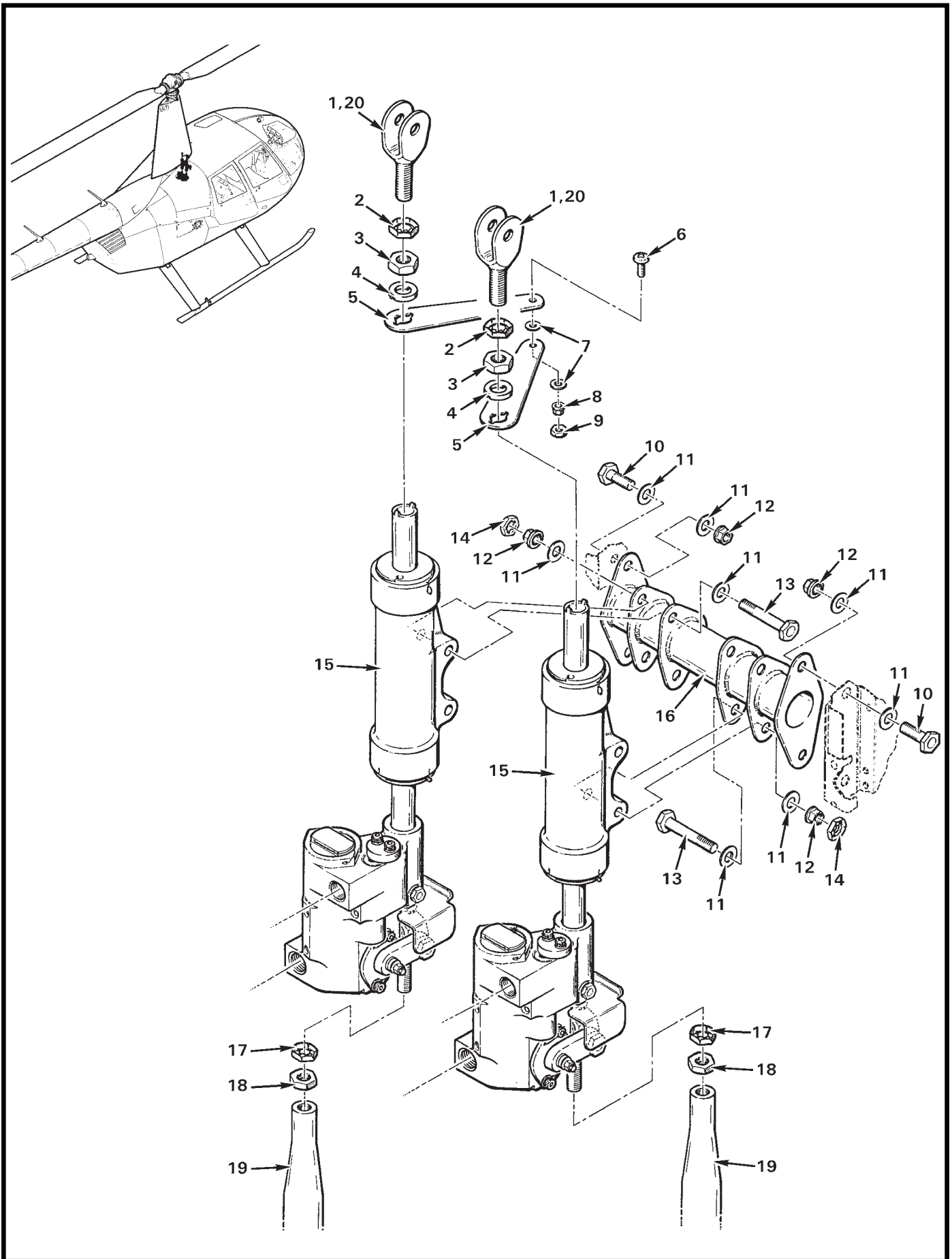


FIGURE AND INDEX NUMBER	PART NUMBER	DESCRIPTION	PARTS AVAIL	QTY PER ASSY
FORWARD SERVOS INSTALLATION				
29-1-1	D200-1	Clevis (install using item 20)	X	2
2	B330-19	Palnut	X	2
3	AN316-6R	Nut	X	2
4	D200-3	Washer	X	2
5	D200-2	Scissor	X	2
6	MS27039C0806	Screw	X	1
7	NAS1149FN832P	Washer	X	2
8	D210-08	Nut	X	1
9	B330-6	Palnut	X	1
10	NAS6604-2	Bolt	X	4
11	NAS1149F0432P	Washer	X	16
12	D210-4	Nut	X	8
13	NAS6604-16	Bolt	X	4
14	B330-13	Palnut	X	4
15	D212-1	Servo Assembly (forward; includes items 17 and 18)	X	2
	D212-1R	D212-1 Servo Assembly (overhaul exchange)	X	2
16	D201-5	Support (supersedes D201-1; must use D201-5 on R44 II)	X	1
17	B330-16	Palnut	X	2
18	AN316-5R	Nut	X	2
19	C121-28	Push-Pull Tube (Ref, see Figure 67-27; ship S/N 1001 and subsequent.)		
	C121-24	Push-Pull Tube (Ref, see Figure 67-31; ship S/N 1000 and prior.)		
20	B270-21	Protectant	X	A/R

NOTES

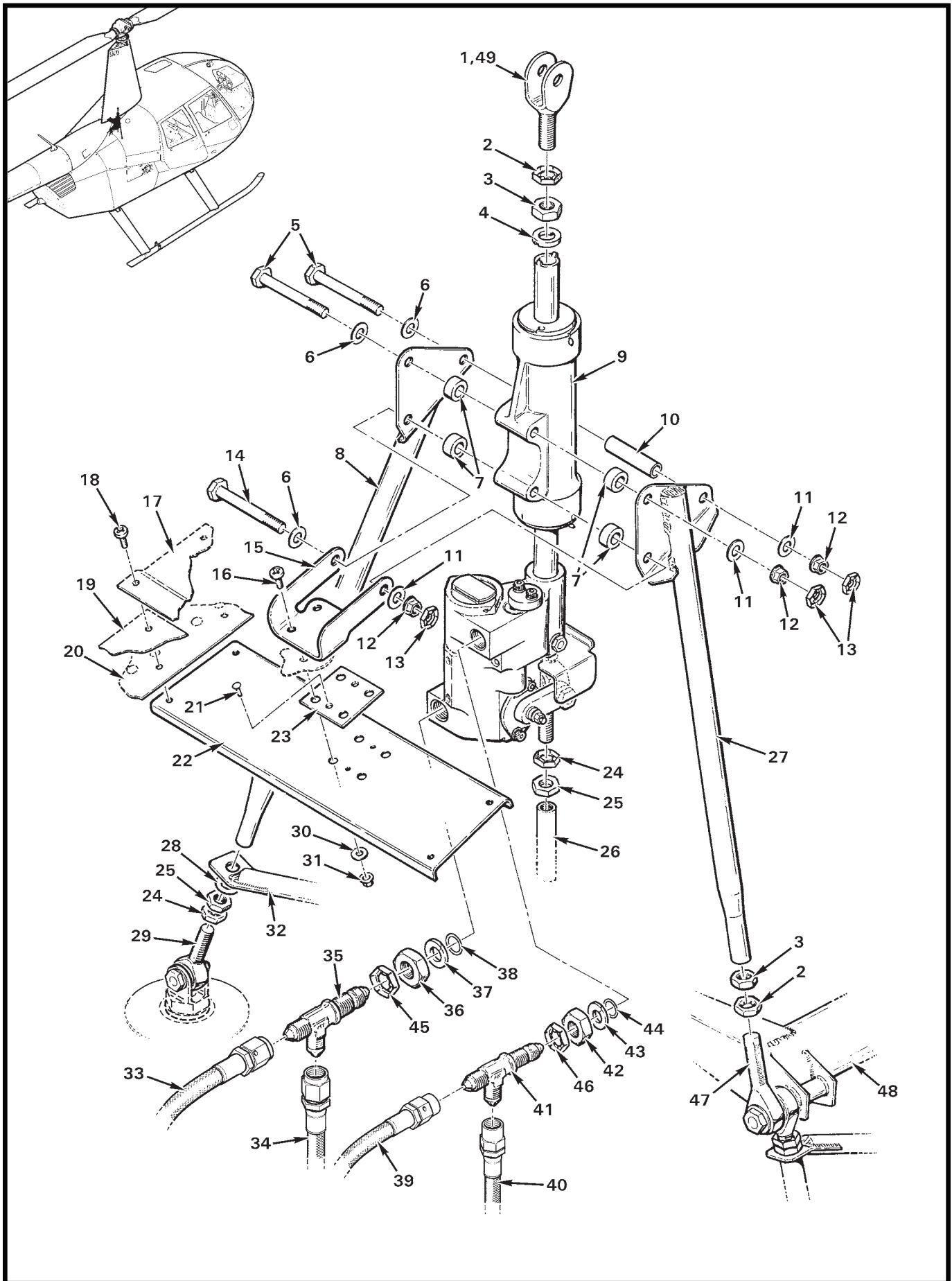


FIGURE AND INDEX NUMBER	PART NUMBER	DESCRIPTION	PARTS AVAIL	QTY PER ASSY
AFT SERVO INSTALLATION				
29-3-1	D200-1	Clevis	X	1
2	B330-19	Palnut	X	2
3	AN316-6R	Nut	X	2
4	D200-3	Washer	X	1
5	NAS6604-24	Bolt	X	2
6	NAS1149F0432P	Washer	X	3
7	C130-15	Spacer	X	4
8	D203-1	Support – LH	X	1
9	D212-1	Servo Assembly	X	1
	D212-1R	D212-1 Servo Assembly (overhaul exchange)	X	1
10	C130-14	Spacer	X	1
11	NAS1149F0463P	Washer	X	3
12	D210-4	Nut	X	3
13	B330-13	Palnut	X	3
14	NAS6604-25	Bolt	X	1
15	D202-4	Bracket Assembly	X	1
16	MS27039C0807	Screw (or MS27039C0808)	X	8
17	C347-6	Panel (Ref, see Figure 53-15)		
18	MS27039C0807	Screw	X	4
19	C706-1	Tailcone Fairing (Ref, see Figure 53-13)		
20	C028-1	Main Fuel Tank (Ref, see Figure 28-1)		
21	NAS1097AD3	Rivet	X	2
22	D202-1	Channel (see also Figure 53-15)	X	1
23	D202-3	Shim	X	A/R
24	B330-16	Palnut	X	2
25	AN316-5R	Nut	X	2
26	C343-8	Tube (Ref, see Figure 67-53)		
27	D204-8	Support – RH (Supersedes D204-1; must use D204-8 on R44 II.)	X	1
28	NAS1149F0532P	Washer	X	1
29	A101-4	Rod End (Ref)		
30	NAS1149FN832P	Washer	X	4

NOTES

Continues

FIGURE AND INDEX NUMBER	PART NUMBER	DESCRIPTION	PARTS AVAIL	QTY PER ASSY
AFT SERVO INSTALLATION (Cont'd)				
29-3-31	MS21042L08	Nut	X	4
32	D208-1	Weldment (Ref, see Figure 67-53)		
33	D205-16	Hose (90° elbow at reservoir end)	X	1
	D205-6*	Hose (straight both ends)	X	1
34	D205-7	Hose	X	1
35	AN804D4	Tee	X	1
36	D452-4	Nut	X	1
37	D454-4	Retainer (reusable, supersedes MS28773-04)	X	1
38	MS28778-4	Packing (o-ring)	X	1
39	D205-12	Hose (90° elbow at reservoir end)	X	1
	D205-2*	Hose (straight both ends)	X	1
40	D205-3	Hose	X	1
41	AN804D3	Tee	X	1
42	D452-3	Nut	X	1
43	D454-3	Retainer (reusable, supersedes MS28773-03)	X	1
44	MS28775-011	Packing (o-ring)	X	1
45	B330-21	Palnut	X	1
46	B330-19	Palnut	X	1
47	D173-1	Rod End (Ref)		
48	C339-10	Jackshaft Weldment (Ref, see Figure 67-53)		
49	B270-21	Protectant	X	A/R

NOTES * Installed on earlier R44s. See also Figure 29-7.

Intentionally Blank

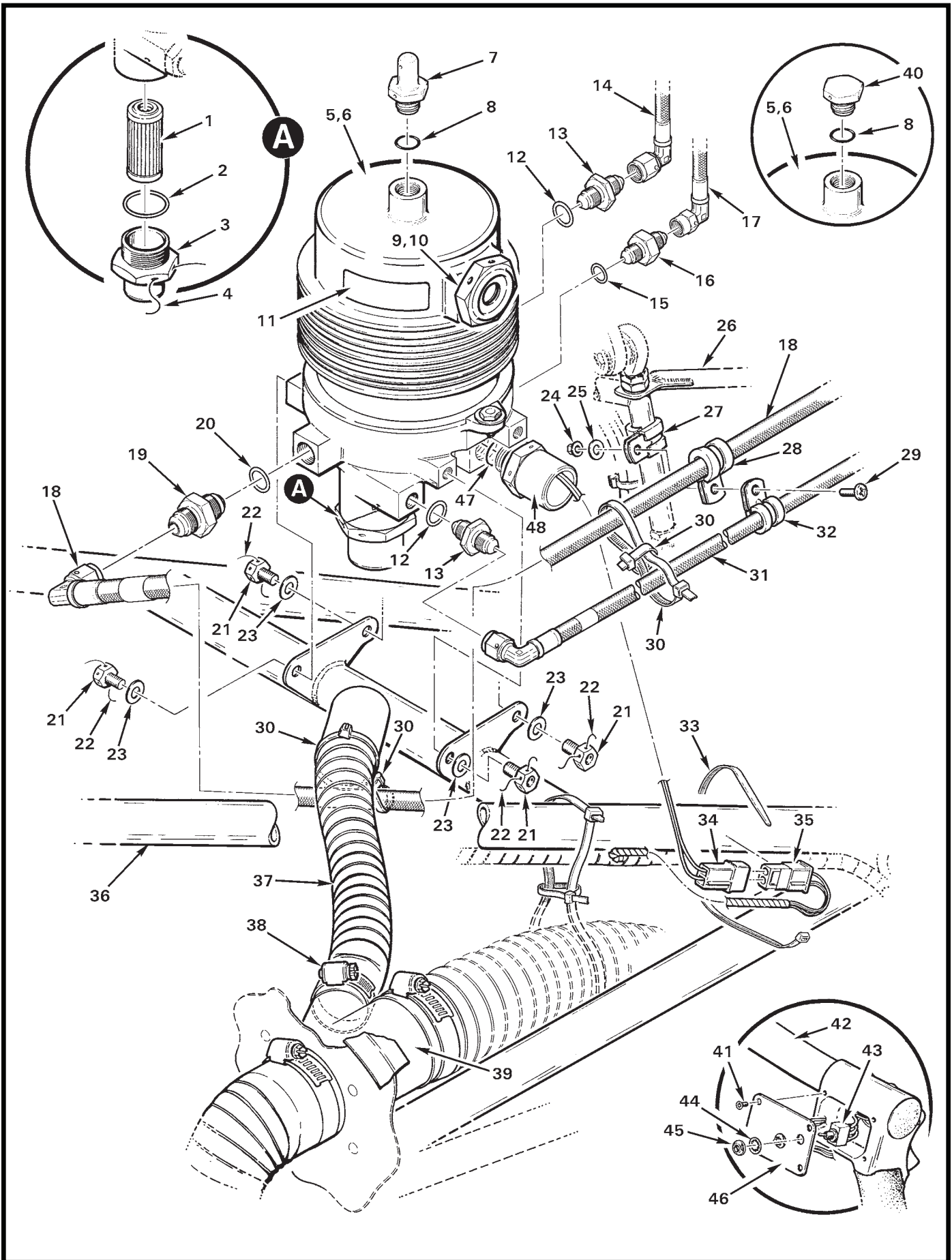


FIGURE AND INDEX NUMBER	PART NUMBER	DESCRIPTION	PARTS AVAIL	QTY PER ASSY
HYDRAULIC RESERVOIR INSTALLATION*				
29-7-1	AN6235-1A	Filter	X	1
2	MS28778-14	Packing (o-ring)	X	1
3	D516-1	Cap	X	1
4	MS20995C20	0.020 in. dia. Safety Wire (for earlier R44s)	X	A/R
5	D211-1	Reservoir Assembly (14-volt ships. Includes items 1 thru 4, 7 thru 11, 47, and 48.)	X	1
	D211-1R	D211-1 Reservoir Assembly (overhaul exchange)	X	1
	D211-2	Reservoir Assembly (28-volt ships. Includes items 1 thru 4, 7 thru 11, 47, and 48.)	X	1
	D211-2R	D211-2 Reservoir Assembly (overhaul exchange)	X	1
6	A257-15	Hydraulic Fluid (one-quart bottle)	X	A/R
7	D487-3	Filler - Vent Plug	X	1
8	MS28778-5	Packing (o-ring)	X	1
9	B563-3	Sight Gauge (supersedes S50P and B563-2)	X	1
10	MS28775-020	Packing (o-ring; not shown)	X	1
11	C654-37	Decal (hydraulic fluid fill instructions)	X	1
12	MS28778-4	Packing (o-ring)	X	2
13	AN815-4D	Union	X	2
14	D205-16	Hose	X	1
15	MS28775-011	Packing (o-ring)	X	1
16	AN815-3D	Union	X	1
17	D205-12	Hose	X	1
18	D205-15	Hose	X	1
19	AN815-6D	Union	X	1
20	MS28778-6	Packing (o-ring)	X	1
21	MS20074-04-03	Bolt	X	4
22	MS20995C32	0.032 in. dia. Safety Wire (for earlier R44s)	X	A/R
23	NAS1149F0432P	Washer	X	4
24	MS21042L08	Nut	X	1
25	NAS1149FN832P	Washer	X	1
26	C345-5	Weldment (Ref, see Figure 67-53)		
27	MS21919WDG8	Clamp	X	1

NOTES * Ship S/N 1001 and subsequent.

Continues

FIGURE AND INDEX NUMBER	PART NUMBER	DESCRIPTION	PARTS AVAIL	QTY PER ASSY
HYDRAULIC RESERVOIR INSTALLATION* (Cont'd)				
29-7-28	MS21919WDG7	Clamp	X	1
29	MS27039C0807	Screw	X	1
30	MS3367-5-9	Ty-Rap ([2] at each location as shown).	X	4
31	D205-11	Hose	X	1
32	MS21919WDG5	Clamp	X	1
33	MS3367-5-9	Ty-Rap (or MS3367-7-9; wires and hoses)	X	A/R
34	B263-12	Housing (14-volt ships)	X	1
	B263-14	Housing (28-volt ships)	X	1
	B263-1	Pin	X	2
35	B263-13	Housing (14-volt ships)	X	1
	B263-15	Housing (28-volt ships)	X	1
	B263-2	Socket	X	2
36	C020	Upper Frame Assembly (Ref)		
37	A785-28	Hose	X	1
38	B277-28	Clamp	X	1
39	C371	Tube Assembly (Ref)		
40	D487-1	Filler - Vent Plug (Ref, no longer available. Superseded by item 7.)		
41	MS24693-S2	Screw	X	1
42	C058	Cyclic Grip Assembly (Ref, see also Figure 97-15)		
43	B300-3	Switch Assembly - Hydraulic (Incl items 44 and 45)	X	1
44	B227-3	Lockwasher	X	1
45	B227-4	Dress Nut	X	1
46	C214	Plate (Ref, see Figure 67-11)		
47	A215-907	O-Ring	X	1
48	D507-1	Solenoid Assembly (14-volt; includes item 34 [B263-12 and -1])	X	1
	D507-2	Solenoid Assembly (28-volt; includes item 34 [B263-14 and -1]; not shown)	X	1

NOTES * Ship S/N 1001 and subsequent.

Intentionally Blank

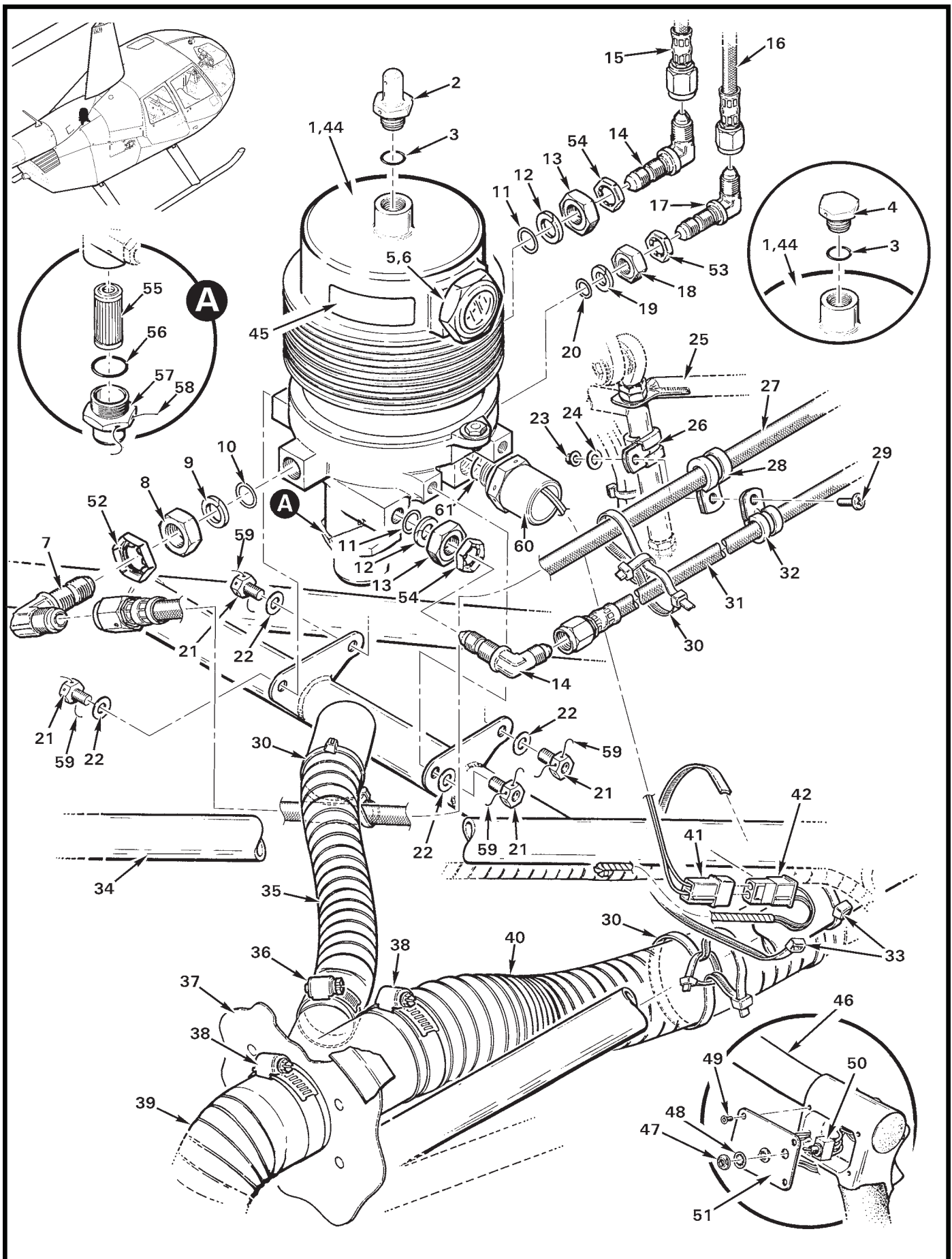


FIGURE AND INDEX NUMBER	PART NUMBER	DESCRIPTION	PARTS AVAIL	QTY PER ASSY
		HYDRAULIC RESERVOIR INSTALLATION*		
29-11-1	D211-1	Reservoir Assembly (14-volt ships. Includes items 2 thru 6, 55 thru 58, and 61.)	X	1
	D211-1R	D211-1 Reservoir Assembly (overhaul exchange)	X	1
	D211-2	Reservoir Assembly (28-volt ships. Includes items 2 thru 6, 55 thru 58, and 61.)	X	1
	D211-2R	D211-2 Reservoir Assembly (overhaul exchange)	X	1
2	D487-3	Filler - Vent Plug	X	1
3	MS28778-5	Packing (o-ring)	X	1
4	D487-1	Filler - Vent Plug (Ref, no longer available. Superseded by item 2.)		
5	B563-3	Sight Gauge (supersedes S50P and B563-2)	X	1
6	MS28775-020	Packing (o-ring; not shown)	X	1
7	AN833-6D	Elbow	X	1
8	D452-6	Nut	X	1
9	D454-6	Retainer (supersedes MS28773-06)	X	1
10	MS28778-6	Packing (o-ring)	X	1
11	MS28778-4	Packing (o-ring)	X	2
12	D454-4	Retainer (supersedes MS28773-04)	X	2
13	D452-4	Nut	X	2
14	AN833-4D	Elbow	X	1
15	D205-6	Hose	X	1
16	D205-2	Hose	X	1
17	AN833-3D	Elbow	X	2
18	D452-3	Nut	X	1
19	D454-3	Retainer (supersedes MS28773-03)	X	1
20	MS28775-011	Packing (o-ring; supersedes MS28778-3)	X	1
21	MS20074-04-03	Bolt	X	4
22	NAS1149F0432P	Washer	X	1
23	MS21042L08	Nut	X	1
24	NAS1149FN832P	Washer	X	1
25	D208-1	Weldment (Ref, see Figure 67-53)		
26	MS21919WDG8	Clamp	X	1

NOTES * Ship S/N 1000 and prior.

Continues

FIGURE AND INDEX NUMBER	PART NUMBER	DESCRIPTION	PARTS AVAIL	QTY PER ASSY
HYDRAULIC RESERVOIR INSTALLATION* (Cont'd)				
29-11-27	D205-15**	Hose (supersedes D205-5)	X	1
28	MS21919WDG7	Clamp	X	1
29	MS27039C0807	Screw	X	1
30	MS3367-5-9	Ty-Rap ([2] at each location as shown)	X	4
31	D205-1	Hose	X	1
32	MS21919WDG5	Clamp	X	1
33	MS3367-5-9	Ty-Rap (or MS3367-7-9; wires and hoses)	X	A/R
34	C020-1	Upper Frame Assembly (Ref)		
35	A785-28	Hose	X	1
36	B277-12	Clamp	X	1
37	C723-1	Bulkhead (Ref)		
38	B277-32	Clamp	X	3
39	A785-17	Hose (to scroll)	X	1
40	A785-6	Hose (to main rotor gearbox)	X	1
41	B263-12	Housing (14-volt ships)	X	1
	B263-1	Pin	X	2
	B263-14	Housing (28-volt ships)	X	1
	B263-1	Pin	X	2
42	B263-13	Housing (14-volt ships)	X	1
	B263-2	Socket	X	2
	B263-15	Housing (28-volt ships)	X	1
	B263-2	Socket	X	2
43	B161-2	Spirap	X	A/R
44	A257-15	Hydraulic Fluid (one-quart bottle)	X	A/R
45	C654-37	Decal (hydraulic fluid fill instructions)	X	1
46	C058-7	Cyclic Grip Assembly (Ref, see also Figure 97-15)		
47	B227-4	Dress Nut	X	1
48	B227-3	Lockwasher	X	1
49	MS24693-S2	Screw	X	1
50	B300-3	Switch Assembly - Hydraulic (Incl items 48 and 49)	X	1
51	C214	Plate (Ref, see Figure 67-11)		

NOTES * Ship S/N 1000 and prior.
 ** Order (1) AN815-6D union and (1) MS28778-6 packing with item 27 when replacing D205-5.

Continues

FIGURE AND INDEX NUMBER	PART NUMBER	DESCRIPTION	PARTS AVAIL	QTY PER ASSY
HYDRAULIC RESERVOIR INSTALLATION* (Cont'd)				
29-11-52	B330-25	Palnut	X	1
53	B330-19	Palnut	X	2
54	B330-21	Palnut	X	1
55	AN6235-1A	Filter	X	1
56	MS28778-14	Packing (o-ring)	X	1
57	D516-1	Cap	X	1
58	MS20995C20	0.020 in. dia. Safety Wire	X	A/R
59	MS20995C32	0.032 in. dia. Safety Wire	X	A/R
60	D507-1	Solenoid Assembly (14-volt ships)	X	1
	D507-2	Solenoid Assembly (28-volt ships)	X	1
61	A215-907	Packing (o-ring)	X	1

NOTES * Ship S/N 1000 and prior.

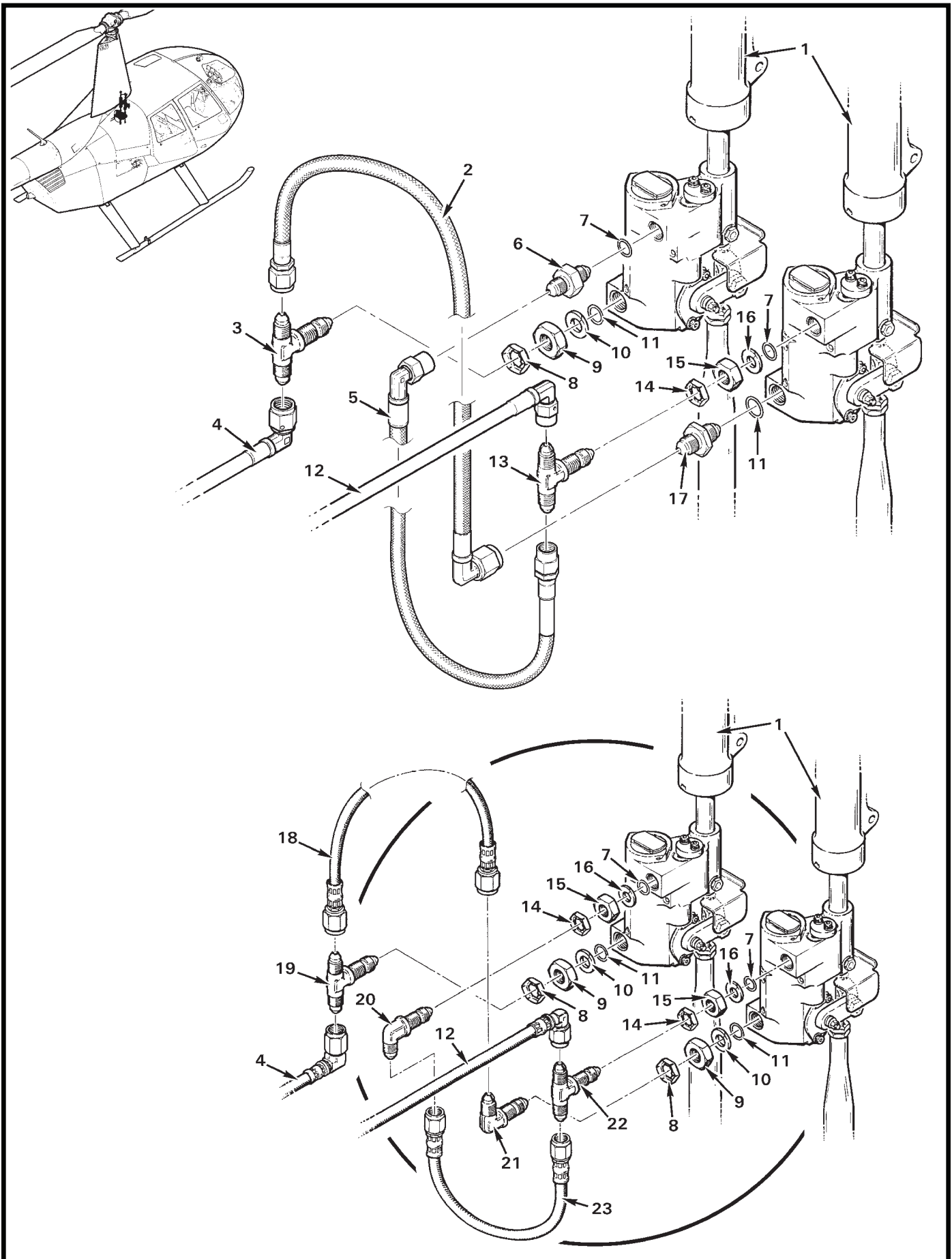


FIGURE AND INDEX NUMBER	PART NUMBER	DESCRIPTION	PARTS AVAIL	QTY PER ASSY
FORWARD SERVO HOSES INSTALLATION				
29-15-1	D212-1	Servo Assembly (Ref)		
2	D205-16	Hose	X	1
3	AN834D4	Tee	X	1
4	D205-7	Hose	X	1
5	D205-14	Hose	X	1
6	AN815-3D	Union	X	1
7	MS28775-011	Packing (o-ring)	X	2
8	B330-21	Palnut	X	1
9	D452-4	Nut	X	1
10	D454-4	Retainer (reusable, supersedes MS28773-04)	X	1
11	MS28778-4	Packing (o-ring)	X	2
12	D205-3	Hose	X	1
13	AN834D3	Tee	X	1
14	B330-19	Palnut	X	1
15	D452-3	Nut	X	1
16	D454-3	Retainer (reusable, supersedes MS28773-03)	X	1
17	AS5174D0404	Union	X	1
18	D205-6	Hose (No longer available. To replace, order items 2, 11, and 17.)	O	1
19	AN834D4	Tee	X	1
20	AN833-3D	Elbow	X	1
21	AN833-4D	Elbow	X	1
22	AN834D3	Tee	X	1
23	D205-4	Hose (No longer available. To replace, order items 5, 6, and 7.)	O	1

NOTES

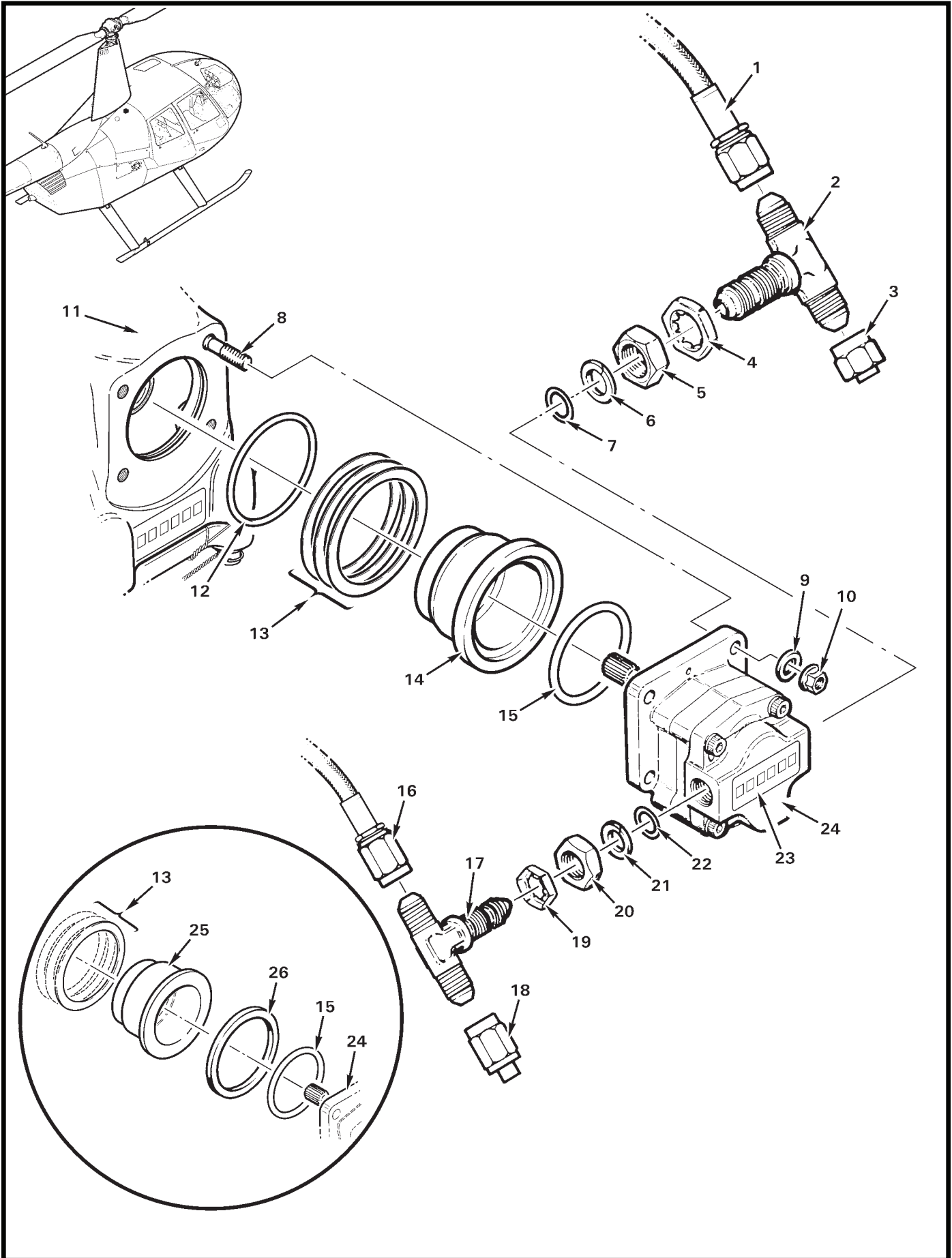


FIGURE AND INDEX NUMBER	PART NUMBER	DESCRIPTION	PARTS AVAIL	QTY PER ASSY
HYDRAULIC PUMP INSTALLATION				
29-17-1	D205-15	Hose (90° elbow at reservoir end)	X	1
	D205-5*	Hose (Straight both ends, no longer available. To replace, order D205-15 hose, [1] AN815-6D union, and item [1] 7.) . . .	X	1
2	AN834-6D	Tee	X	1
3	AN820-6	Cap	X	1
4	B330-25	Palnut	X	1
5	D452-6	Nut	X	1
6	D454-6	Retainer (reusable, supersedes MS28773-06)	X	1
7	MS28778-6	Packing (o-ring)	X	1
8	MS17300-056	Stud (Ref)		
9	A141-11	Washer	X	4
10	MS21042L4	Nut	X	4
11	C006	Main Rotor Gearbox Assembly with Hydraulic Pump (Ref, see Figure 63-1)		
12	C215-132	Packing (o-ring)	X	1
13	C117	Shims (Ref)		
14	C267-2	Cartridge (supersedes items 25 and 26)	O	1
15	C215-222	Packing (o-ring)	X	1
16	D205-11	Hose (90° elbow at reservoir end)	X	1
	D205-1*	Hose (straight both ends)	X	1
17	AN834D4	Tee	X	1
18	AN929-4	Cap	X	1
19	B330-21	Palnut	X	1
20	D452-4	Nut	X	1
21	D454-4	Retainer (reusable, supersedes MS28773-04)	X	1
22	MS28778-4	Packing (o-ring)	X	1
23	110-4	Telatemp (temperature recorder, 220° – 270°F)	X	1
24	D500-1	Pump Assembly	X	1
	D500-1R	D500-1 Pump Assembly (overhaul exchange)	X	1
25	C267-1	Cartridge (earlier R44s; Ref)	O	1
26	C256-1	Insulator (used only with item 25; earlier R44s)	X	1

NOTES * Installed on earlier R44s. See also Figure 29-11.

Intentionally Blank