National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594

June 26, 2023

COMPONENT EXAMINATION FACTAL REPORT

A. ACCIDENT INFORMATION

Place	:	Nuevo, CA
Date	:	March 24, 2023
Vehicle	:	Bell 407 / N14Z
NTSB No.	:	ANC23FA031
Investigator:		Mark Ward

B. COMPONENTS EXAMINED

Three flight control hydraulic servos were examined at the Woodward facility in Santa Clarita, California, on June 1, 2023. The servo numbers 1, 2, and 3, were arbitrarily assigned for the purpose of this report.

C. DETAILS OF THE EXAMINATION

1. Servo No. 1 (Figure 1)

Figure 1. Servo HN127453 installed on the test bench with fluid sample positioned next to the servo body.

The data tag was not present on the servo. The servo was identified by an engraved heat lot number on the servo body.

Heat Lot No.: HN127453

A visual examination of the servo was conducted. The piston rod was bent on the rod end side. Abrasions on the side of the gland retainer were observed. All safety lock wires were in place. The boot over the wire drive was pulled away from the main control valve (MCV) retainer lip. The torque stripe on the wire drive nut was undamaged. The supply and return ports were uncapped. There was free movement of the input lever when it was manipulated by hand. The tail stock spherical bearings were in place and free to rotate. The rod end bearing was free to rotate. The rod end was secured with a jam nut, a locking key, and safety wire. Witness and impact marks were observed on the underside of the housing.

Functional test:

The functional test was conducted according to the Woodward Assembly, Test, and Inspection Procedure for part number 41011400-103. The actuator was mounted into the test stand. It was then flushed with test stand hydraulic fluid and the fluid was collected. The fluid was red in color and no particulates were noted. Servo actuation was smooth and piston movement responded to input commands.

2. Servo No. 2 (Figure 2)

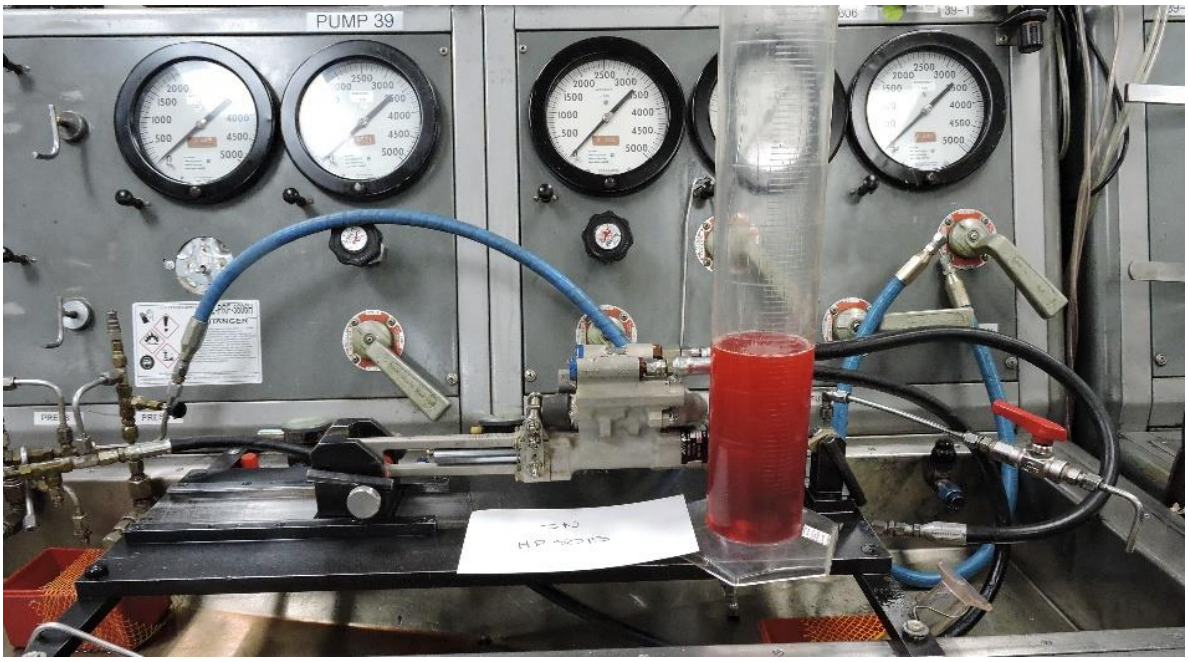

Figure 2. Servo HR5015 installed on the test bench with hydraulic fluid sample next to the servo body.

PN: 41011400-103
SN: HR5015
Assembly Date: 16-02-18

A visual examination of the servo was conducted. There were scuff marks on the tail stock and housing body. All safety lock wires were in place. The boot over the wire drive was pulled away from the MCV retainer lip. Undamaged torque stripe on the wire drive nut was observed. The supply and return ports were uncapped. There was free movement of the input lever when manipulated by hand. The tail stock spherical bearings were in place and free to rotate. The rod end bearing was free to rotate. The rod end was secured with a jam nut, a locking key, and safety wire.

Functional test:

The functional test was conducted according to the Woodward Assembly, Test, and Inspection Procedure for part number 41011400-103. The actuator was mounted into the test stand. It was then flushed with test stand hydraulic fluid and the fluid was collected. The fluid was red in color and no particulates were noted. Servo actuation was smooth and piston movement responded to input commands.

3. Servo No. 3 (Figure 3)

Figure 3. Servo HR5016 installed on the test bench with hydraulic fluid sample next to the servo body.

PN: 41011400-103
SN: HR5016
Assembly Date: 16-02-18

A visual examination of the servo was conducted. There were scuff marks on the tail stock and housing body. All safety lock wires were in place. The boot over the wire drive was pulled away from the MCV retainer lip. Undamaged torque stripe on the wire drive nut was observed. The supply and return ports were uncapped. There was free movement of the input lever when it was manipulated by hand. The tail stock spherical bearings were in place and free to rotate. The rod end bearing was free to rotate. The rod end was secured with a jam nut, a locking key, and safety wire.

Functional test:

The functional test was conducted according to the Woodward Assembly, Test, and Inspection Procedure for part number 41011400-103. The actuator was mounted into the test stand. It was then flushed with test stand hydraulic fluid and the fluid was collected. The fluid was red in color and no particulates were noted. Servo actuation was smooth and piston movement responded to input commands.

D. ATTACHMENTS

Attachment 1 - Acceptance Test Procedure (ATP) data sheets for each servo.

Submitted by:

Van S. McKenny IV
Aerospace Engineer (Helicopters)

WOODWARD
1000 E. Drake Rd 970-482-5411
Fort Collins, CO 80525
CAGE CODE 60029

ASSEMBLY, TEST, AND INSPECTION PROCEDURE

PRIMARY PART

AT&IP REV: J
DWG. REV: M

PART NUMBER: 41011400–103

DOCUMENT NUMBER: ATIP41011400-103

	UNIT SERIAL NUMBER	HN127453	
PARA	**REQUIREMENTS**	**STAMP**	**DATE**
30.7	**Cylinder Assembly and Installation**		
30.7.10	Torque four Screws (26) 45 to 55 in – lbs.		
30.7.11	Torque four Bolts (27) 45 to 55 in – lbs.		
30.8	**Lap Assembly**		
30.8.9	Bend minimum 2 Tabs of Tab Washer (48) over Nut (47). If possible, ALL Tabs should be bent flush against a flat surface. ▼		
	INSPECTION STAMP		
30.8.10	Torque three Screws (29) 12 to 15 in – lbs. ▼		
	2nd Technician STAMP		
30.8.11	Torque two Screws (32) 12 to 15 in – lbs.		
30.9	**Link and Rod End Assemblies**		
	Assemble per paragraphs 30.9.1 through 30.9.4. Bolts (7) shall rotate freely.		
30.10	**Weight**		
30.10.1	The Dry Weight shall not Exceed 5.70 lbs. (Add *.20 lbs.*) Actual _____		
40.0	**TEST PER 206-076-062 BHT SPEC**		
40.2	**Purge and Synchronization** .002 HRT 845		
40.2.6	Torque Slotted Locknut (92) 25 to 30 in – lbs. above running torque and bend two tabs of Tab Washer (31) over Locknut (92) and two tabs over Clevis (30). All Tabs shall be bent flush against a mating surface. ▼		JUN 01 2023
	INSPECTION STAMP		
40.3	**Manual Operation**		

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ASSEMBLY, TEST, AND INSPECTION PROCEDURE

PRIMARY PART

AT&IP REV: J
DWG. REV: M

PART NUMBER: 41011400–103

DOCUMENT NUMBER: ATIP41011400-103

UNIT SERIAL NUMBER			HN12753	
PARA	**REQUIREMENTS**		**STAMP**	**DATE**
40.3.2	Actuator moves at 26 lbs. maximum (Extend)	17 Lbs.	HRT 845	JUN 01 2023
40.3.3	Actuator moves at 26 lbs. maximum (Retract)	18 Lbs.		
40.4	**Proof Pressure Leakage Test**			
40.4.2	No evidence of external leakage or permanent damage.		N/A	
40.5	**Low Pressure Leakage**			
40.5.8	Torque two Screws (32) 12 to 15 in – lbs.		N/A	
40.5.9	Torque three Screws (29) 12 to 15 in – lbs.			
40.5.10	**Q.A. Inspection to verify Torque for Operation 40.5.8 and 40.5.9.**			
40.6	**Servovalve Check**			
40.6.4	Servo Stroke .009 to .011 inch (EXTEND)	0.010 Inches	HRT 845	JUN 01 2023
40.6.5	Bypass Stroke .011 to .019 inch (EXTEND)	0.012 Inches		
40.6.6	Servo Stroke .009 to .011 inch (RETRACT)	0.010 Inches		
	Bypass Stroke .011 to .019 inch (RETRACT)	0.012 Inches		
40.7	**Dynamic Leakage**			
40.7.1	Measured leakage at each Rod Seal shall not exceed one drop per 25 cycles and no leakage at any joint or boss during the last 100 cycles.		N/A	
40.8	**Input Force**			
40.8.2	Breakout force shall not Exceed 10 oz.			JUN 01 2023
	EXTEND	6 oz	HRT 845	
	RETRACT	14 oz		
40.9	**Override Force**			

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ASSEMBLY, TEST, AND INSPECTION PROCEDURE

PRIMARY PART

AT&IP REV: J
DWG. REV: M

PART NUMBER: 41011400–103

DOCUMENT NUMBER: ATIP41011400-103

UNIT SERIAL NUMBER			HN127453	
PARA	**REQUIREMENTS**		**STAMP**	**DATE**
40.9.2	Breakout Force (EXTEND): 15 to 30 lbs.	26 Lbs.	HRT 845	
	Force to Stops (EXTEND): 35 lbs. maximum	30 Lbs.		JUN 01 2023
40.9.3	Force to Close (EXTEND): 8 lbs. minimum	20 Lbs.		
40.9.4	Breakout Force (RETRACT): 15 to 30 lbs.	26 Lbs.		
	Force to Stops (RETRACT): 35 lbs. maximum	32 Lbs.		
	Force to Close (RETRACT): 8 lbs. minimum	22 Lbs.		
40.10	**Actuator Irreversibility**			
40.10.1	Shall not move with 50 lbs. force EXT to RET	✓	HRT 845	JUN 01 2023
40.10.2	Shall not move with 50 lbs. force. RET to EXT	✓		
40.11	**Check Valve Operation**			
40.11.1	Cracking Pressure: 2 to 5 psig	2.5 psig	HRT 845	JUN 01 2023
	Reseat within1 psig of Cracking Pressure	2.2 psig		
40.12	**Servovalve Leakage**			
40.12.2	Leakage shall not exceed 25 cc/min (NEUTRAL)	2 cc/min	HRT 845	JUN 01 2023
40.12.4	Leakage shall not exceed 25 cc/min (EXTEND)	5 cc/min		
40.12.5	Leakage shall not exceed 25 cc/min (RETRACT)	12 cc/min		
40.13	**Sequence Valve Operation**			
40.13.2	Actuator moves at 100 psig minimum	175 psig		JUN 01 2023
40.13.3	Actuator cycles at 275 psig	✓ Check	HRT 845	
40.13.4	Actuator stops at 65% minimum of cracking.	120 psig		

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ASSEMBLY, TEST, AND INSPECTION PROCEDURE

PRIMARY PART

AT&IP REV: J
DWG. REV: M

PART NUMBER: 41011400–103

DOCUMENT NUMBER: ATIP41011400-103

UNIT SERIAL NUMBER			1-IN127453	
PARA	**REQUIREMENTS**		**STAMP**	**DATE**
40.14	**Sequence Valve Leakage**		ret | Pres	JUN 01 2023
40.14.1	No Leakage at the RET port and no more than two drops at the PRESS port.		2 | 0	
40.15	**Differential Relief Valve Operation**		HRT 845	
40.15.2	Cracking shall occur between 825 to 895 psig.	840 psig		JUN 01 2023
40.15.3	Reseat within 130 psig of crack.	700 psig	HRT 845	
40.16	**Thermal Relief Valve Operation**			
40.16.1	Cracking between 125 to 200 psig	180 psig	HRT 845	JUN 01 2023
40.16.2	10 cc/min maximum leakage from Return	0 cc/min		
40.16.3	Actuator will not move between 100 to 105 psig	✓ Check		
40.17	**Velocity**			
40.17.5	Velocity shall be 3.22 in/sec to 5.36 in/sec.			
	EXTEND	_____ in/sec	N/A	
	RETRACT	_____ in/sec		
40.18	**Set Rod End**			
40.18.5	Torque Jam Nut (10) 200 to 250 in – lbs.		N/A	
40.19	**Install Protective Covers**			
40.19.1	Install Protective Plugs into PRESS and RETURN ports.			
40.19.2	Torque Bleeder Plug (69) 50 to 60 in – lbs.			

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ASSEMBLY, TEST, AND INSPECTION PROCEDURE

PRIMARY PART

AT&IP REV: J
DWG. REV: M

PART NUMBER: 41011400–103

DOCUMENT NUMBER: ATIP41011400-103

		UNIT SERIAL NUMBER	HR5015	
PARA	**REQUIREMENTS**		**STAMP**	**DATE**
30.7	**Cylinder Assembly and Installation**			
30.7.10	Torque four Screws (26) 45 to 55 in – lbs.			
30.7.11	Torque four Bolts (27) 45 to 55 in – lbs.			
30.8	**Lap Assembly**			
30.8.9	Bend minimum 2 Tabs of Tab Washer (48) over Nut (47). If possible, ALL Tabs should be bent flush against a flat surface. ▼			
	INSPECTION STAMP			
30.8.10	Torque three Screws (29) 12 to 15 in – lbs. ▼			
	2nd Technician STAMP			
30.8.11	Torque two Screws (32) 12 to 15 in – lbs.			
30.9	**Link and Rod End Assemblies**			
	Assemble per paragraphs 30.9.1 through 30.9.4. Bolts (7) shall rotate freely.			
30.10	**Weight**			
30.10.1	The Dry Weight shall not Exceed 5.70 lbs. (Add *.20 lbs.*)	Actual _____		
40.0	**TEST PER 206-076-062 BHT SPEC**			
40.2	**Purge and Synchronization**			
40.2.6	Torque Slotted Locknut (92) 25 to 30 in – lbs. above running torque and bend two tabs of Tab Washer (31) over Locknut (92) and two tabs over Clevis (30). All Tabs shall be bent flush against a mating surface. ▼		Hyd to mech. .001	HRT 845 JUN 01 2023
	INSPECTION STAMP			
40.3	**Manual Operation**			

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		UNIT SERIAL NUMBER	HR5015	
PARA	**REQUIREMENTS**		**STAMP**	**DATE**
40.3.2	Actuator moves at 26 lbs. maximum (Extend)	20 Lbs.	HRT 845	JUN 01 2023
40.3.3	Actuator moves at 26 lbs. maximum (Retract)	22 Lbs.		
40.4	**Proof Pressure Leakage Test**			
40.4.2	No evidence of external leakage or permanent damage.			
40.5	**Low Pressure Leakage**			
40.5.8	Torque two Screws (32) 12 to 15 in – lbs.			
40.5.9	Torque three Screws (29) 12 to 15 in – lbs.			
40.5.10	**Q.A. Inspection to verify Torque for Operation 40.5.8 and 40.5.9.**			
40.6	**Servovalve Check**		HRT 845	JUN 01 2023
40.6.4	Servo Stroke .009 to .011 inch (EXTEND)	_____ Inches	0.009	
40.6.5	Bypass Stroke .011 to .019 inch (EXTEND)	_____ Inches	0.013	
40.6.6	Servo Stroke .009 to .011 inch (RETRACT)	_____ Inches	0.010	
	Bypass Stroke .011 to .019 inch (RETRACT)	_____ Inches	0.012	
40.7	**Dynamic Leakage**			JUN 01 2023
40.7.1	Measured leakage at each Rod Seal shall not exceed one drop per 25 cycles and no leakage at any joint or boss during the last 100 cycles.		HRT 845	
40.8	**Input Force**			
40.8.2	Breakout force shall not Exceed 10 oz.		HRT 845	JUN 01 2023
	EXTEND	14 oz		
	RETRACT	6 oz		
40.9	**Override Force**			

Attachment 1

WOODWARD
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ASSEMBLY, TEST, AND INSPECTION PROCEDURE

PRIMARY PART

AT&IP REV: J
DWG. REV: M

PART NUMBER: 41011400–103

DOCUMENT NUMBER: ATIP41011400-103

		UNIT SERIAL NUMBER	HN50K	
PARA	**REQUIREMENTS**		**STAMP**	**DATE**
40.9.2	Breakout Force (EXTEND): 15 to 30 lbs.	22 Lbs.		
	Force to Stops (EXTEND): 35 lbs. maximum	26 Lbs.		
40.9.3	Force to Close (EXTEND): 8 lbs. minimum	14 Lbs.	HRT 845	JUN 01 2023
40.9.4	Breakout Force (RETRACT): 15 to 30 lbs.	22 Lbs.		
	Force to Stops (RETRACT): 35 lbs. maximum	26 Lbs.		
	Force to Close (RETRACT): 8 lbs. minimum	18 Lbs.		
40.10	**Actuator Irreversibility**			
40.10.1	Shall not move with 50 lbs. force EXT to RET	✓	HRT 845	JUN 01 2023
40.10.2	Shall not move with 50 lbs. force. RET to EXT	✓		
40.11	**Check Valve Operation**			
40.11.1	Cracking Pressure: 2 to 5 psig	2.5 psig	HRT 845	JUN 01 2023
	Reseat within1 psig of Cracking Pressure	2.0 psig		
40.12	**Servovalve Leakage**			
40.12.2	Leakage shall not exceed 25 cc/min (NEUTRAL)	3 cc/min		JUN 01 2023
40.12.4	Leakage shall not exceed 25 cc/min (EXTEND)	11 cc/min	HRT 845	
40.12.5	Leakage shall not exceed 25 cc/min (RETRACT)	5 cc/min		
40.13	**Sequence Valve Operation**			
40.13.2	Actuator moves at 100 psig minimum	180 psig		JUN 01 2023
40.13.3	Actuator cycles at 275 psig	Check	✓ HRT 845	
40.13.4	Actuator stops at 65% minimum of cracking.	165 psig		

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ASSEMBLY, TEST, AND INSPECTION PROCEDURE

PRIMARY PART

AT&IP REV: J
DWG. REV: M

PART NUMBER: 41011400–103

DOCUMENT NUMBER: ATIP41011400-103

UNIT SERIAL NUMBER			HL5015	
PARA	**REQUIREMENTS**		**STAMP**	**DATE**
40.14	**Sequence Valve Leakage**		HRT 845	JUN 01 2023
40.14.1	No Leakage at the RET port and no more than two drops at the PRESS port.		✓	
40.15	**Differential Relief Valve Operation**			
40.15.2	Cracking shall occur between 825 to 895 psig.	835 psig	HRT 845	JUN 01 2023
40.15.3	Reseat within 130 psig of crack.	780 psig		
40.16	**Thermal Relief Valve Operation**			
40.16.1	Cracking between 125 to 200 psig	190 psig		JUN 01 2023
40.16.2	10 cc/min maximum leakage from Return	0 cc/min	HRT 845	
40.16.3	Actuator will not move between 100 to 105 psig	✓ Check		
40.17	**Velocity**			
40.17.5	Velocity shall be 3.22 in/sec to 5.36 in/sec.			JUN 01 2023
	EXTEND	4.18 in/sec	HRT 845	
	RETRACT	4.2 in/sec		
40.18	**Set Rod End**			
40.18.5	Torque Jam Nut (10) 200 to 250 in – lbs.		N/A	
40.19	**Install Protective Covers**			
40.19.1	Install Protective Plugs into PRESS and RETURN ports.		N/A	
40.19.2	Torque Bleeder Plug (69) 50 to 60 in – lbs.			

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ASSEMBLY, TEST, AND INSPECTION PROCEDURE

PRIMARY PART

AT&IP REV: J
DWG. REV: M

PART NUMBER: 41011400–103

DOCUMENT NUMBER: ATIP41011400-103

	UNIT SERIAL NUMBER	HR5016	
PARA	REQUIREMENTS	STAMP	DATE
30.7	**Cylinder Assembly and Installation**		
30.7.10	Torque four Screws (26) 45 to 55 in – lbs.		
30.7.11	Torque four Bolts (27) 45 to 55 in – lbs.		
30.8	**Lap Assembly**		
30.8.9	Bend minimum 2 Tabs of Tab Washer (48) over Nut (47). If possible, ALL Tabs should be bent flush against a flat surface. ▼		
	INSPECTION STAMP		
30.8.10	Torque three Screws (29) 12 to 15 in – lbs. ▼		
	2nd Technician STAMP		
30.8.11	Torque two Screws (32) 12 to 15 in – lbs.		
30.9	**Link and Rod End Assemblies**		
	Assemble per paragraphs 30.9.1 through 30.9.4. Bolts (7) shall rotate freely.		
30.10	**Weight**		
30.10.1	The Dry Weight shall not Exceed 5.70 lbs. (Add *.20 lbs.*) Actual _____		
40.0	**TEST PER 206-076-062 BHT SPEC**		
40.2	**Purge and Synchronization** .001 HRT 845 JUN 01 2023		
40.2.6	Torque Slotted Locknut (92) 25 to 30 in – lbs. above running torque and bend two tabs of Tab Washer (31) over Locknut (92) and two tabs over Clevis (30). All Tabs shall be bent flush against a mating surface. ▼		
	INSPECTION STAMP		
40.3	**Manual Operation**		

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ASSEMBLY, TEST, AND INSPECTION PROCEDURE

PRIMARY PART

AT&IP REV: J
DWG. REV: M

PART NUMBER: 41011400–103

DOCUMENT NUMBER: ATIP41011400-103

		UNIT SERIAL NUMBER	HR5016	
PARA	REQUIREMENTS		STAMP	DATE
40.3.2	Actuator moves at 26 lbs. maximum (Extend)	22 Lbs.	HRT 845	JUN 01 2023
40.3.3	Actuator moves at 26 lbs. maximum (Retract)	21 Lbs.		
40.4	**Proof Pressure Leakage Test**			
40.4.2	No evidence of external leakage or permanent damage.		N/A	
40.5	**Low Pressure Leakage**			
40.5.8	Torque two Screws (32) 12 to 15 in – lbs.		N/A	
40.5.9	Torque three Screws (29) 12 to 15 in – lbs.			
40.5.10	**Q.A. Inspection to verify Torque for Operation 40.5.8 and 40.5.9.**			
40.6	**Servovalve Check**			
40.6.4	Servo Stroke .009 to .011 inch (EXTEND)	0.011 Inches		JUN 01 2023
40.6.5	Bypass Stroke .011 to .019 inch (EXTEND)	0.011 Inches	HRT 845	
40.6.6	Servo Stroke .009 to .011 inch (RETRACT)	0.010 Inches		
	Bypass Stroke .011 to .019 inch (RETRACT)	0.012 Inches		
40.7	**Dynamic Leakage**			
40.7.1	Measured leakage at each Rod Seal shall not exceed one drop per 25 cycles and no leakage at any joint or boss during the last 100 cycles.		✓ HRT 845	JUN 01 2023
40.8	**Input Force**			
40.8.2	Breakout force shall not Exceed 10 oz.			JUN 01 2023
	EXTEND	6 oz	HRT 845	
	RETRACT	7 oz		
40.9	**Override Force**			

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ASSEMBLY, TEST, AND INSPECTION PROCEDURE

PRIMARY PART

AT&IP REV: J
DWG. REV: M

PART NUMBER: 41011400–103

DOCUMENT NUMBER: ATIP41011400-103

UNIT SERIAL NUMBER: HR506

PARA	REQUIREMENTS		STAMP	DATE
40.9.2	Breakout Force (EXTEND): 15 to 30 lbs.	27 Lbs.		
	Force to Stops (EXTEND): 35 lbs. maximum	30 27 Lbs.		JUN 01 2023
40.9.3	Force to Close (EXTEND): 8 lbs. minimum	18 Lbs.	HRT 845	
40.9.4	Breakout Force (RETRACT): 15 to 30 lbs.	24 Lbs.		
	Force to Stops (RETRACT): 35 lbs. maximum	24 Lbs.		
	Force to Close (RETRACT): 8 lbs. minimum	18 Lbs.		
40.10	**Actuator Irreversibility**			
40.10.1	Shall not move with 50 lbs. force EXT to RET	✓	HRT 845	JUN 01 2023
40.10.2	Shall not move with 50 lbs. force. RET to EXT	✓		
40.11	**Check Valve Operation**			
40.11.1	Cracking Pressure: 2 to 5 psig	3.0 psig	HRT 845	JUN 01 2023
	Reseat within1 psig of Cracking Pressure	2.5 psig		
40.12	**Servovalve Leakage**			
40.12.2	Leakage shall not exceed 25 cc/min (NEUTRAL)	5 cc/min		JUN 01 2023
40.12.4	Leakage shall not exceed 25 cc/min (EXTEND)	7.5 cc/min	HRT 845	
40.12.5	Leakage shall not exceed 25 cc/min (RETRACT)	4 cc/min		
40.13	**Sequence Valve Operation**			JUN 01 2023
40.13.2	Actuator moves at 100 psig minimum	185 psig	HRT 845	
40.13.3	Actuator cycles at 275 psig	✓ Check		
40.13.4	Actuator stops at 65% minimum of cracking.	170 psig		

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		UNIT SERIAL NUMBER	HR5016	
PARA	**REQUIREMENTS**		**STAMP**	**DATE**
40.14	**Sequence Valve Leakage**			JUN 01 2023
40.14.1	No Leakage at the RET port and no more than two drops at the PRESS port.		12et/Ret 1 0 HRT 845	
40.15	**Differential Relief Valve Operation**			JUN 01 2023
40.15.2	Cracking shall occur between 825 to 895 psig.	850 psig	HRT 845	
40.15.3	Reseat within 130 psig of crack.	775 psig		
40.16	**Thermal Relief Valve Operation**			
40.16.1	Cracking between 125 to 200 psig	175 psig		JUN 01 2023
40.16.2	10 cc/min maximum leakage from Return	0 cc/min	HRT 845	
40.16.3	Actuator will not move between 100 to 105 psig	✓ Check		
40.17	**Velocity**			
40.17.5	Velocity shall be 3.22 in/sec to 5.36 in/sec.			
	EXTEND	4.14 in/sec	HRT 845	JUN 01 2023
	RETRACT	4.44 in/sec		
40.18	**Set Rod End**			
40.18.5	Torque Jam Nut (10) 200 to 250 in – lbs.		N/A	
40.19	**Install Protective Covers**			
40.19.1	Install Protective Plugs into PRESS and RETURN ports.		N/A	
40.19.2	Torque Bleeder Plug (69) 50 to 60 in – lbs.			

Attachment 1