



Manual: CSP-FF-1, Rotorcraft Flight Manual
Model: 530F-Plus (369FF) Helicopter
Reissue #1: 14 August 1998
Revision 9: 30 September 2010

FILING INSTRUCTIONS:

NOTE: Ensure that Revision 8 to Reissue #1 of CSP-FF-1 has been inserted into your manual before posting Revision 9.

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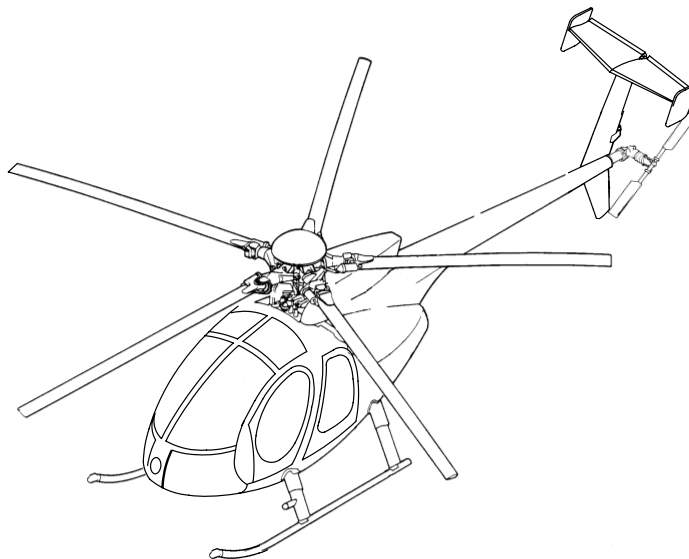


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MD 530F PLUS®

**FAA APPROVED
ROTORCRAFT
FLIGHT MANUAL**



Type Certificate No. H3WE

Approved By

Donald Armstrong

Manager, Flight Test Branch, ANM-160L
Federal Aviation Administration
Los Angeles Aircraft Certification Office
Transport Airplane Directorate

Original Approval Date: 25 October 1985

Reissue #1: 14 August 1998

THE FAA APPROVED ROTORCRAFT FLIGHT MANUAL CONSISTS OF THE FOLLOWING SECTIONS.

SECTION II -	LIMITATIONS
SECTION III -	EMERGENCY PROCEDURES
SECTION IV -	NORMAL PROCEDURES
SECTION V -	PERFORMANCE DATA
SECTION IX	OPTIONAL EQUIPMENT

THE HELICOPTER MUST BE OPERATED IN COMPLIANCE WITH THE OPERATING LIMITATIONS AS SET FORTH IN SECTION II OF THIS MANUAL AND ANY ADDITIONAL LIMITATIONS FROM SECTION IX AS A RESULT OF AN INSTALLED OPTIONAL EQUIPMENT ITEM.

SECTIONS III, IV, AND V CONTAIN RECOMMENDED PROCEDURES AND DATA AND ARE FAA APPROVED.

THE "AIRWORTHINESS LIMITATIONS" LISTED IN SECTION 04-00-00 OF CSP-HMI-2 SHALL BE COMPLIED WITH.


THIS MANUAL MUST BE KEPT IN THE HELICOPTER AT ALL TIMES.

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LOG OF REVISIONS BY DATE

FAA / NON–FAA REVISIONS

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Revision 9	30 September 2010



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SUMMARY OF REVISIONS TO THE ROTORCRAFT FLIGHT MANUAL

NOTE: Revisions are listed below by number with appropriate remarks.
Section II pages marked [C]* indicate FAA approved color pages.
Black-and-white reproductions of color pages are not considered to be “FAA Approved”.

REVISION NUMBER	REMARKS
Revision 9	<p><u>Section VII:</u> Table 7-1. Updated select engine oil and one-way lock material and manufacturer information.</p> <p><u>Section IX:</u> Paragraph 9-5. Revised preflight check and added rigging illustration to Figure 9-3.</p> <p>Changed page numbering format that now includes blank pages having the following text.</p> <p style="text-align: center;">“This page intentionally left blank!”</p>

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Table 1-7. Standard Atmosphere Table

Standard Sea Level Conditions:

Temperature: 59°F (15°C)

Pressure: 29.921 in. Hg (1013.25 mbar)

Density: 0.0023769 slugs/ft³ (1.225 kg/m³)

ALTITUDE (feet)	DENSITY RATIO σ	$\frac{1}{\sqrt{\sigma}}$	TEMPERATURE		PRESSURE (mbar)	PRESSURE (in. Hg)	PRESSURE RATIO
			(°C)	(°F)			
0	1.0000	1.000	15.00	59.000	1013.25	29.921	1.0000
1000	0.9711	1.0148	13.019	55.434	997.18	28.856	0.9644
2000	0.9428	1.0299	11.038	51.868	942.14	27.821	0.9298
3000	0.9151	1.0454	9.056	48.302	908.14	26.817	0.8962
4000	0.8881	1.0611	7.076	44.735	875.12	25.842	0.8637
5000	0.8617	1.0773	5.094	41.196	843.08	24.896	0.8320
6000	0.8359	1.0938	3.113	37.603	811.99	23.978	0.8014
7000	0.8106	1.1107	1.132	34.037	781.86	23.088	0.7716
8000	0.7860	1.1279	-0.850	30.471	752.63	22.225	0.7428
9000	0.7620	1.1456	-2.831	26.905	724.29	21.388	0.7148
10000	0.7385	1.1637	-4.812	23.338	696.82	20.577	0.6877
11000	0.7155	1.1822	-6.793	19.772	670.21	19.791	0.6614
12000	0.6932	1.2011	-8.774	16.206	644.40	19.029	0.6360
13000	0.6713	1.2205	-10.756	12.640	619.44	18.292	0.6113
14000	0.6500	1.2403	-12.737	9.074	595.23	17.577	0.5875
15000	0.6292	1.2606	-14.718	5.508	571.83	16.886	0.5643
16000	0.6090	1.2815	-16.669	1.941	549.14	16.216	0.5420
17000	0.5892	1.3028	-18.680	-1.625	527.23	15.569	0.5203
18000	0.5669	1.3246	-20.662	-5.191	505.99	14.942	0.4994
19000	0.5511	1.3470	-22.643	-8.757	485.48	14.336	0.4791
20000	0.5328	1.3700	-24.624	-12.323	465.63	13.750	0.4595
21000	0.5150	1.3935	-26.605	-15.899	446.47	13.184	0.4406
22000	0.4976	1.4176	-28.587	-19.456	427.91	12.636	0.4223
23000	0.4806	1.4424	-30.568	-23.002	409.99	12.107	0.4046
24000	0.4642	1.4678	-32.549	-26.588	392.72	11.597	0.3874
25000	0.4481	1.4938	-34.530	-30.154	375.99	11.103	0.3711

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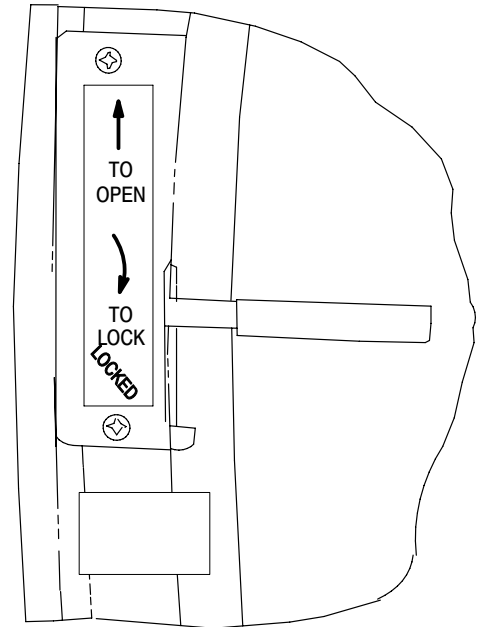
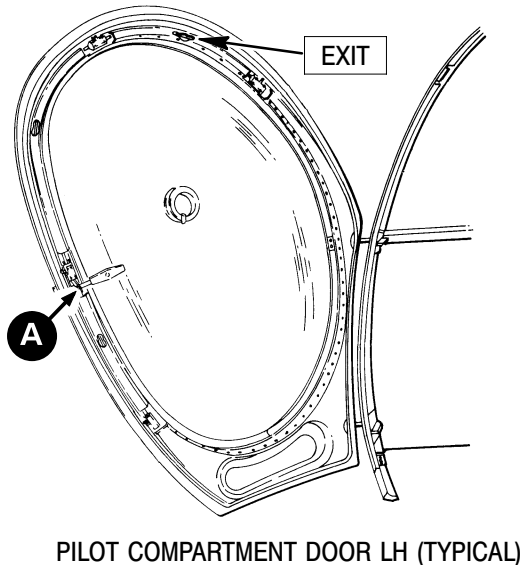
3-16. EMERGENCY EGRESS

Pilot compartment doors:

Pilot doors function as primary and emergency exits.

Cabin doors:

Passenger doors function as primary and emergency exits.



A PILOT/PASSENGER COMPARTMENT DOOR EXIT

F03-012

Figure 3-2. Emergency Exits

3-17. EMERGENCY EQUIPMENT

First Aid Kit:

The first aid kit is located on the right side forward edge of the pilot's seat structure.

The kit is a commercial type containing the items necessary to render limited emergency first aid.

Fire Extinguisher:

The fire extinguisher is located on the pilot side forward door frame.

Refer to the "FIRE" paragraph in this section for recommended use of fire extinguisher.

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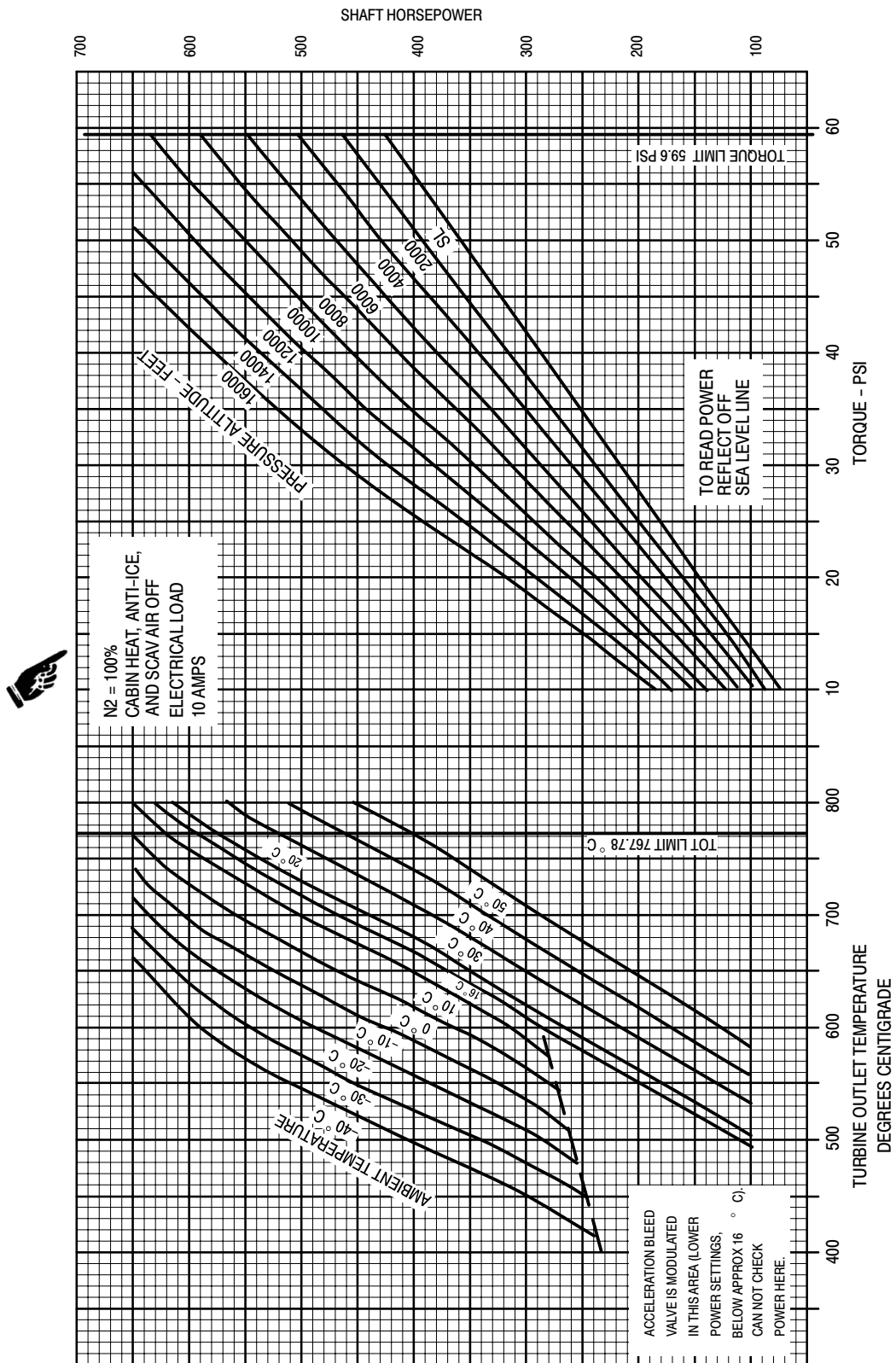
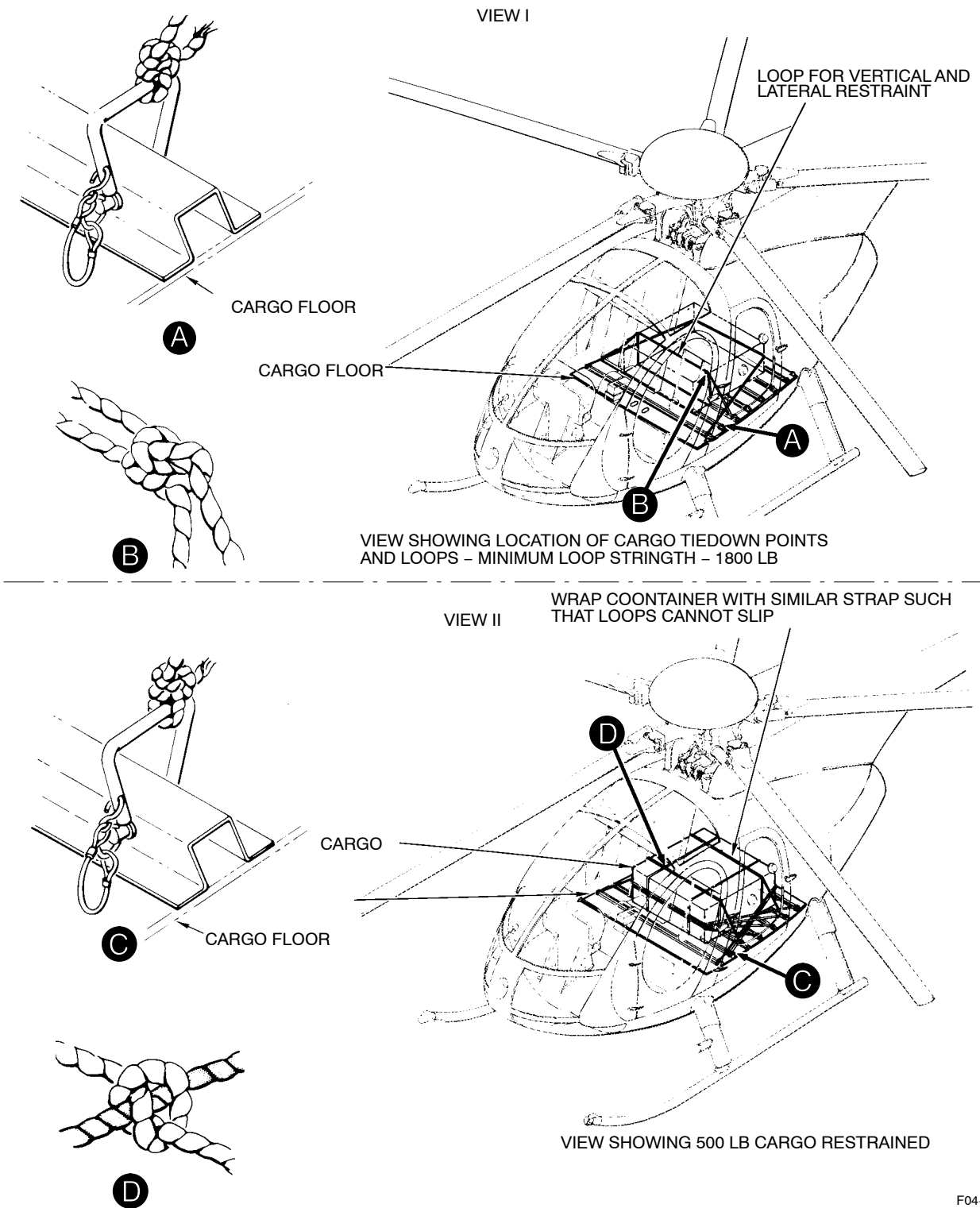


Figure 5-17. Engine Power Check Chart, Rolls-Royce 250-C30 Engine, Particle Separator Inlet with Mist Eliminator

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Figure 6-10. Cargo Restraint

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7-7. SERVICING – GENERAL

Servicing helicopter includes replenishment of fuel, changing or replenishment of oil and other such maintenance functions.

Fuels, oils, other servicing materials and capacities are listed in Table 7-1.

NOTE: Check the appropriate RollsRoyce Operation and Maintenance Manual for complete listing of approved lubricants.

Locations of servicing points are shown in Figure 7-4.

Table 7-1. Servicing Materials (Operating Supplies)

1. Tail Rotor Transmission - Capacity 0.5 US Pt (0.23 Liter) Use the materials listed under Item 4.		
2. Main Transmission (369D25100) - Capacity: 12.0 US Pt (5.67 liters) Use the materials listed under Item 4 or Mobil SHC 626.		
3. Main Transmission (369F5100) - Capacity: 14.0 US Pt (6.62 liters). Use Mobil SHC 626 only.		
4. Engine - Capacity: 3.0 US Qt. (2.84 liters)		
Ambient Temperature	Oil Type	
0°C (32°F) and above	MIL-PRF-23699C or subsequent preferred	
0°C (32°F) to -40°C (-40°F)	MIL-PRF-23699C or subsequent preferred or MIL-PRF-7808G or subsequent	
-40°C (-40°F) and below	MIL-PRF-7808G or subsequent only	
Specification	Material	Manufacturer
<u>MIL-PRF-7808</u> (see Footnote 2 and 3)	American PQ Lubricant 6899	American Oil and Supply Co. 238 Wilson Ave. Newark, NJ 07105
	BP Turbo Oil 2389 Exxon Turbo Oil 2389	Air BP Lubricants Maple Plaza II - 1N 6 Campus Drive Parsippany, NJ 07054
	Brayco 880	As above
	Mobil Avrex S Turbo 256	Mobil Oil Corporation 3225 Gallows Road Fairfax, VA 22037
	Mobil RM-201A	As above
	Mobil RM-184A	As above
	Stauffer Jet 1	Stauffer Chemical Co. 380 Madison Ave. New York, NY 10017

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Specification	Material	Manufacturer
<u>MIL-PRF-23699 STD</u>		
	AeroShell/Royco Turbine Oil 500	Anderol Inc. River Road, P.O. Box 518 East Hanover, NJ 07936
	American PQ Lubricant 6700	American Oil and Supply Co. 238 Wilson Ave. Newark, NJ 07105
	BP Turbo Oil 2380 Exxon Turbo Oil 2380	Air BP Lubricants Maple Plaza II - 1N 6 Campus Drive Parsippany, NJ 07054
	Caltex RPM Jet Engine Oil 5	Caltex Petroleum Corp. 380 Madison Avenue New York, NY 10017
	Castrol Aero Jet 5 Castrol 5050	Specialty Products Division 1000 West 31 st Street Downers Grove, IL 60515
	Chevron Jet Engine Oil 5	Chevron International Oil Co. 555 Market Street San Francisco, CA 94105
	Hatcol 3211	Hatcol Corporation King George Post Road Fords, New Jersey 08863
	Mobil Jet Oil II Stauffer Jet II	ExxonMobil Lubricants Stauffer Chemical Co. 380 Madison Ave. New York, NY 10017
	Turbonycoil 600 (TN 600)	NYCO S.A. 66, Champs-Elysees-51 Rue De Ponthieu F-75008 Paris, France
<u>MIL-PRF-23699 HTS</u>		
	Aeroshell/Royco Turbine Oil 560	Anderol Inc. River Road, P.O. Box 518 East Hanover, NJ 07936
	BPTO 2197	Air BP Lubricants Maple Plaza II - 1N 6 Campus Drive Parsippany, NJ 07054
	Mobil Jet 254 or 291	ExxonMobil Lubricants

<u>SAE AS5780 SPC</u>		
	BP Turbo Oil 2380	Air BP Lubricants Maple Plaza II - 1N 6 Campus Drive Parsippany, NJ 07054
	MJO II	ExxonMobil Swedesboro, NJ
<u>SAE AS5780 HPC</u>		
	BPTO 2197	Air BP Lubricants
	MJO 254	ExxonMobil Swedesboro, NJ
<p>5. Fuel Cells - Standard Nonself-sealing, Capacity: 64.0 US Gal (242 liters), 416 pounds Optional Self-sealing, Capacity: 62.0 US Gal (234 liters), 402 pounds. Refer to Rolls-Royce 250 Series Operations Manual for complete fuel specifications.</p>		
MIL-DTL-5624 JP-4	MIL-DTL-5624 JP-5	ASTM D 1655 Jet A
ASTM D 1655 Jet A-1 Peoples Republic of China RP-3.	ASTM D 1655 Jet B ASTM D 6615 Jet B	JP-1 conforming to ASTM D 1655, Jet A or Jet A-1
Arctic Diesel Fuel DF-A (W-F-800B) conforming to ASTM D 1655, Jet A or Jet A-1	Diesel No. 1 conforming to ASTM D 1655, Jet A or Jet A-1	MIL-DTL-83133, grade JP-8
<p>CAUTION: At 4.4°C (40°F) and below, fuel must contain anti icing additive that meets MIL-I-27686 requirements. For blending information and authorized fuels, refer to the appropriate Rolls-Royce Operation and Maintenance Manual.</p>		
<p>6. Overrunning Clutch (369A5350) - Capacity: 1.64 US Oz (45cc) Use the materials listed under item 4 but not Mobil SHC 626.</p>		
<p>7. Overrunning Clutch (369F5450) - Capacity: 3.64 US Oz. Use Mobil SHC 626 only.</p>		
<p>8. One-Way Lock - Capacity: 0.67 US Oz (20cc)</p>		
<u>MIL-PRF-5606</u>		
	Brayco Micronic 756 and 756PH	Specialty Products Division 1001 West 31st Street Downers Grove Illinois 60515
	Aero Shell Fluid 41	Shell Oil Co.
	Royco 756	Anderol Inc
	Mobil Aero HF	ExxonMobil Lubricants
One-Way Lock Continued		
	Invarol FJ 13	ESSO Saf 2, rue des Martinets 92569 Rueil-Malmaison Cedex, France

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<u>MIL-PRF-6083</u>		
	Brayco Micronic 783	Castrol Industrial North America Inc.
	Royco 783	Anderol Inc.
	Hydraunycoil FH-6	NYCO, S.A.
9. Battery (NiCad) - Capacity: As required		
<u>MS36300</u>	Distilled Water	Any acceptable source
Footnotes:		
(1) Oils approved for use in main transmission and tail rotor transmission are synthetic lubrication oils that have a certified Ryder Gear Value in excess of 2500 pounds per inch.		
(2) Not a preferred lubricant for transmissions. Use MIL-PRF-7808 lubricating oil in transmission only when other oils are not available.		
(3) For Model 250 Series engine oil change requirements and restrictions on mixing of oils, refer to the RollsRoyce Operation and Maintenance Manual. DO NOT use Mobil SHC 626 oil in 250 Series engines.		
WARNING: Only discretionary mixing of oils within an oil series is permitted without a time penalty. Use of mixed oils from different series in an engine is limited to five hours total running time during one overhaul period. Adequate maintenance records must be maintained to ensure that the five hour limit is not exceeded. Failure to comply with oil mixing restrictions can result in engine failure.		

Procedures:

- Ensure engine anti-ice, cabin heat, and scav air (if installed) are off prior to engine wash or rinse.
- Water injection will be started three seconds prior to starter engagement.
- Motor the engine with the twistgrip in CUTOFF.
- Release starter switch as necessary to maintain between 5% and 10% N_1 speed during the wash/rinse.
- Water injection will continue during coast down until N_1 stops.
- Allow engine to drain.
- Within 15 minutes of the water rinse, operate the engine at idle for five minutes and actuate anti-ice, cabin heat, and scav-air (if installed) systems for one minute to purge and evaporate all residual water .

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SECTION VIII

ADDITIONAL OPERATIONS AND PERFORMANCE DATA

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SECTION IX

OPTIONAL EQUIPMENT

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PART IV NORMAL PROCEDURES

Normal Operation:

Preflight

Place battery switch in BAT position and check that HOOK circuit breaker is in.

Push cargo load ring into hook throat. Cargo hook keeper should permit easy entrance into throat. Leave ring in hook for remainder of operational checks (Ref. Figure 9-3).

Pull aft and downward on load ring; hook must remain in locked position.

Operational Checks

Check electrical and emergency operation of cargo hook release (Ref. Figure 9-2).

Check operation of external release knob (located on left side of cargo hook body).

Hook should return to the closed position after above checks.

Move pilot's cyclic to all extreme positions. Cargo hook must remain locked and external release knob must not rotate.

With load ring in cargo hook, swing hook to the limits of travel in all directions. Hook must remain in the closed position.

Inflight

Check cargo HOOK circuit breaker IN.



Use care to avoid passing load attaching cables over landing gear skid tube when attaching load to hook with helicopter on the ground.

Apply collective smoothly when lifting cargo.

Activate cargo release switch on cyclic stick to release cargo.

NOTE: Use caution as size and shape of load, and load attaching cable size and length may affect flight characteristics. Satisfactory flight characteristics have been demonstrated with a compact 2000 pound load suspended on a 3/8-inch cable 5 feet long.

Optional Equipment
Cargo Hook Kit

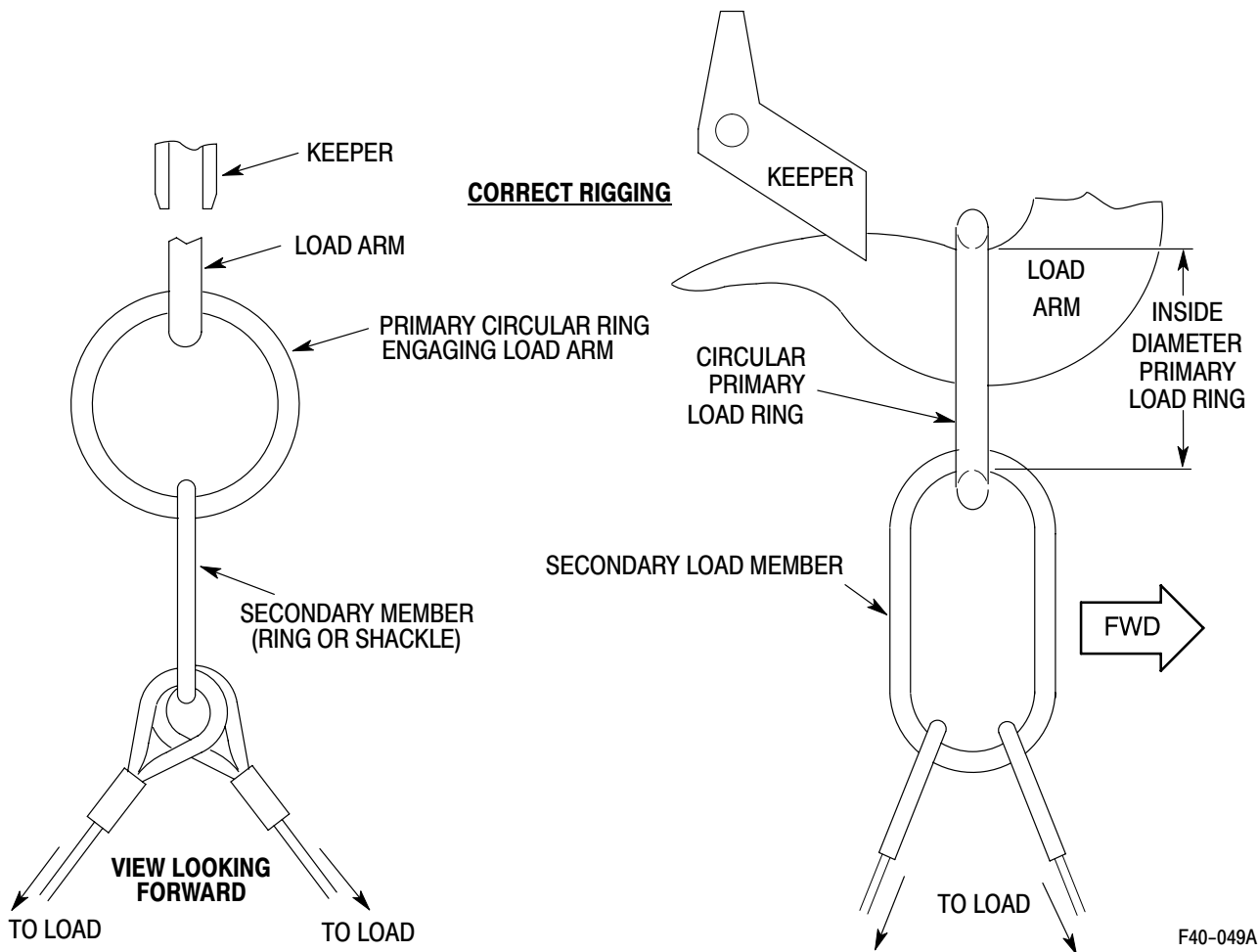
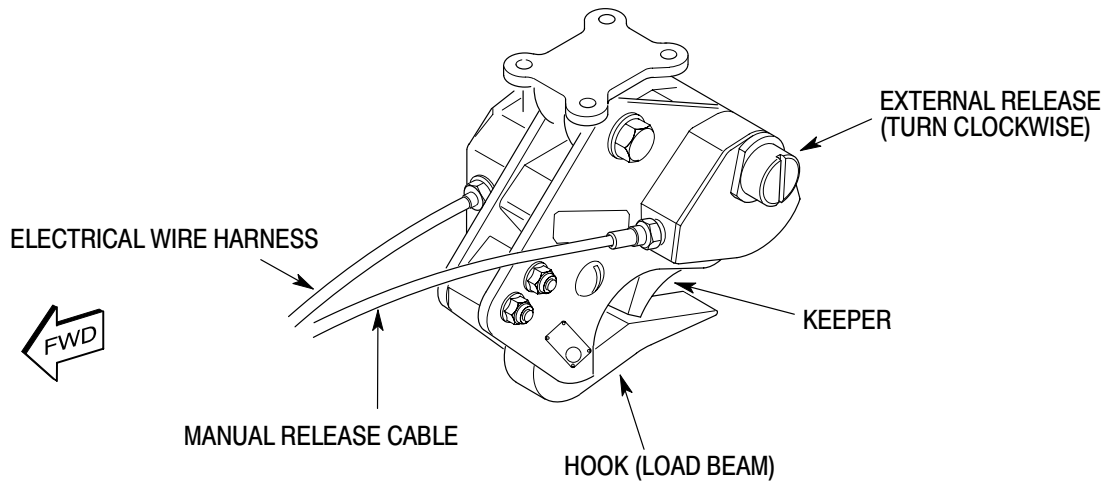
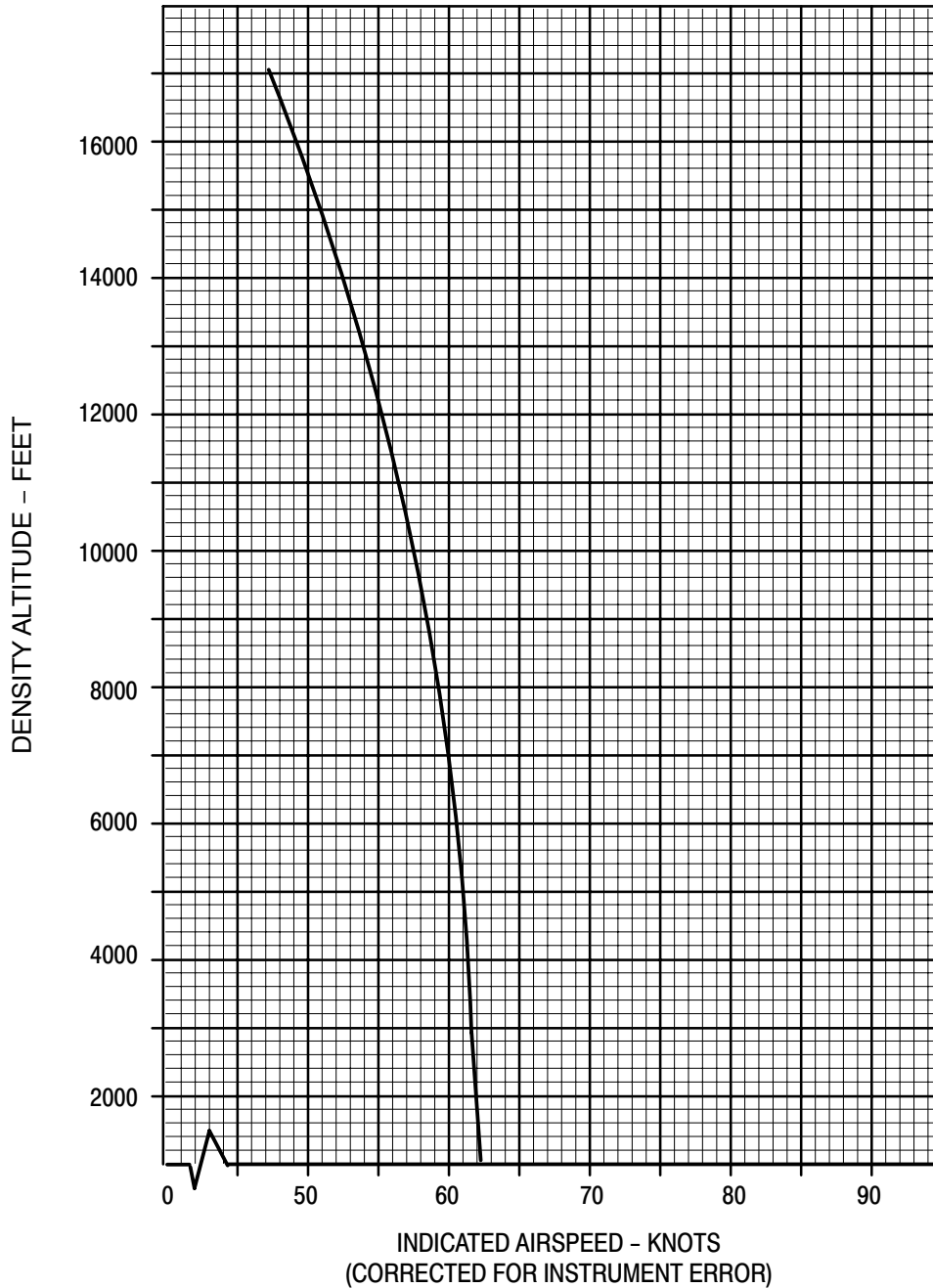


Figure 9-3. Cargo Hook

PART V PERFORMANCE DATA

Refer to Section V for IGE hover performance or Section VIII for OGE hover performance to assist in planning operations with the cargo hook.

Figure 9-4 provides speed for best rate of climb when there is an external load of 2.0 ft² of drag area applied to the cargo hook.



F40-038

Figure 9-4. Speed for Best Rate of Climb

PART VI WEIGHT AND BALANCE DATA

The following table of Cargo Hook Loading Data should be used by the operator to assist in evaluating the helicopter center of gravity for various hook load weights.

Cargo Hook Loading Data:

Cargo Longitudinal CG = 99.3	
Cargo Weight (lb)	Moment/100 (in.-lb)
100	99
200	199
300	298
400	397
500	497
600	596
700	695
800	794
900	894
1000	993
1100	1092
1200	1191
1300	1291
1400	1390
1500	1490
1600	1589
1700	1688
1800	1787
1900	1887
2000	1986