Service Call:
Aerial Hydraulic Oil Specifications

Tools Required:
Correct Maintenance Manual for Unit

Model(s):
All past and current production Terex Aerials

Tech Tip Safety Rules

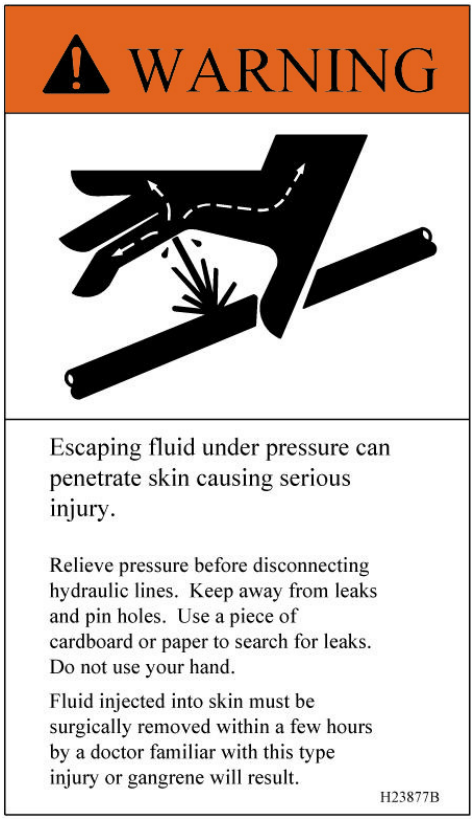
Danger

Failure to obey the instructions and safety rules in the appropriate Operator's Manual and Service Manual for your machine will result in death or serious injury. Many of the hazards identified in the operator's manual are also safety hazards when maintenance and repair procedures are performed.

Do Not Perform Maintenance Unless:

- You are trained and qualified to perform maintenance on this machine.
- You read, understand and obey:
  - manufacturer's instructions and safety rules
  - employer's safety rules and worksite regulations
  - applicable governmental regulations
- You have the appropriate tools, lifting equipment and a suitable workshop.

The information contained in this tech tip is a supplement to the service manual. Consult the appropriate service manual of your machine for safety rules and hazards.



Introduction:

HYDRAULIC OIL SPECIFICATIONS

HYDRAULIC SYSTEM

Your hydraulic system has been engineered to give many years of useful service. A few simple rules and maintenance procedures are necessary to insure efficient operation.

Hydraulic oil for your Aerial Device must meet the following requirements listed below.

1. A petroleum based oil (see list).
2. Anti-wear additives to ensure the long life of the hydraulic components.
3. Anti-foam additives to minimize air entrapment.
4. Good chemical stability at anticipated operating temperatures.
5. A flash point above anticipated operating temperatures.
6. Good demulsibility or water separation characteristics.
7. Dielectric strength.

Step 1

There are 3 possible ways to find and determine the proper hydraulic oil to use on an Aerial Device. They are outlined in steps 2, 3, and 4 below. In the examples below, the Terex Optima series will be used. Always use the unit specific maintenance manual for the unit being repaired.

Step 2

Look up correct hydraulic oil type in Quick Reference section at start of the unit specific maintenance manual.

Optima Aerial Unit Example:

OPTIMA TC/TCX/HR/HRX SERIES

QUICK REFERENCE
LUBRICANTS

Hydraulic system . . . . . ISO 15/MIL H 5606

In this case, two types of oil are listed: ISO 15 and MIL H 5606.

Step 3

Using the unit specific maintenance manual for the unit, go directly to the “Hydraulic Oil Specifications” section.

Here you will find detailed information on selecting the proper hydraulic oil for the unit, as well as information on hydraulic oil system maintenance.

Optima Aerial Unit Example:

A detailed description of the correct type of oil to use can be found under “Oil Type”, both by technical specification, and a few suppliers known to meet the specification.

OIL TYPE

Oil used in the hydraulic system performs the dual function of lubrication and transmission of power. Oil must be selected with care and with the assistance of a reputable supplier.

Terex South Dakota, Inc. does not guarantee the quality or characteristics of any hydraulic oil for usage. A reputable distributor or supplier should be consulted in any hydraulic oil application. Mixing different oils or additives must be done only by the supplier. Serious damage to a hydraulic system can result from mixing incompatible hydraulic oils or additives.

Contaminated fluid may cause damage to the pump and/or control valve. Before adding fluid to the system, be sure the fluid has been filtered through a 10-micron (absolute) or less filter.

The following chart is a list of suitable hydraulic oils with their respective properties. This information will be helpful in the selection of a hydraulic oil or an equivalent oil for a particular application.

AMBIENT TEMPERATURE RANGE	RECOMMENDED ISO VISCOSITY GRADE
-20° F To 100° F (-29° C To 38° C)	15

BRAND NAME	ISO GRADE	VISCOSITY				VISCO-SITY INDEX	POUR POINT		FLASH POINT	
		SUS		CST						
		100°F	210°F	40°C	100°C		°F	°C	°F	°C
EXXON UNIVIS J-13*	15	75.1	43.5	14.1	5.2	374	-75	-59	200	93
KENDALL GLACIAL	15	90	42	17	4.5	200	-50	-46	300	149
SHELL TELLUS T-23	23	110	43	22.5	5.1	167	-50	-46	320	160
MOBIL DTE 11 M	15	80	43	15	4.1	140	-40	-40	330	166
MOBIL AERO HFA *	15	79	45	14	5.6	199	-75	-59	200	93
American Synthol PGHD 15** Planet Green	15	77.4	38.6	15	3.8	151	-51	50	370	188

** BIODEGRADABLE HYDRAULIC OIL

* MEETS MIL-H-5606 SPECIFICATIONS

Hydraulic oil is flammable and will burn.

Step 4

In the kit-sheets (parts section of manual or using online access-See tech Tip #50) under Final Assembly section is “Oil, Hydraulic, ISO 15” as an example. To the left of the description is our part number 419419. This kit-sheet will list the oil specifications. It will also list oils by manufacturer that meet specification.

ISO 15 Oil Specification:

TEREX

OIL, HYDRAULIC- ISO 15

DATE: 11/09/2016	ECN#: 73776	419419 H

OIL HYDRAULIC - ISO 15 SPECIFICATIONS

1) ISO VG RATING - 15
2) MINIMUM FLASH POINT - 280* F
3) MINIMUM POUR POINT - -40* F
4) MINIMUM V.I - 140
5) TYPICAL VISCOSITY RATING @ 100* F - (70 - 90 SUS)
6) TYPICAL VISCOSITY RATING @ 210* F - (39 - 43 SUS)
7) TYPICAL VISCOSITY RATING @ 0* F - (600 - 1300 SUS)
8) MINIMUM DIELECTRIC STRENGTH - 25 KV
9) TYPICAL API, GRAVITY RATING - (26 - 31)
10) DOES NOT REQUIRE CHARACTERISTICS OR RATING O.C. MIL. SPEC. 5606A.

SUGGESTED SUPPLIERS

1) MOBIL DTE - 11M
2) EXXON UNIVIS N15
3) TEXACO RANDO HDZ - 15HVI
4) PENZOIL AWX ARTIC 15
5) TEXACO RANDO POLAR ICE
6) KENDALL GLACIAL BLUE
7) NORTHLAND TALAMAR EXTREME LTT
8) AMERICAN SYNTHOL INC AMERILUBE PGHD 15 XLT
9) PETRO-CANADA HYDREX MV ARCTIC

* SEE SEPARATE ASSEMBLY SHEET PAGE 1 OF 1 (NS) = NOT SHOWN

MIL-5606A Specification:

TEREX.		
OIL, HYDRAULIC - LOW TEMP		
DATE: 6/17/10	ECN# 55973	436396 D

OIL, HYDRAULIC - LOW TEMP SPECIFICATIONS

1) SIMILAR CHARACTERISTICS TO MIL. SPEC. 5606A
2) NOT REQUIRED TO MEET MIL. SPEC. 5606A.
3) MINIMUM FLASH POINT - 200° F
4) MINIMUM POUR POINT - -65° F OR LESS.
5) MINIMUM V.I. - 200.
6) TYPICAL VISCOSITY RATING @ 100° F - (70-90 SUS)
7) TYPICAL VISCOSITY RATING @ 210° F - (38-43 SUS)
8) MAXIMUM VISCOSITY RATING @ 0° F - (550 SUS)
9) TYPICAL API, GRAVITY RATING - (28-33)
10) MINIMUM DIELECTRIC STRENGTH - 25 KV

SUGGESTED SUPPLIERS

1) MOBIL AERO HFA(5606A RATED)
2) EXXON UNIVIS J-13(5606A RATED)
3) TEXACO AIRCRAFT HYD OIL #15(5606A RATED)
4) NORTHLAND GULFSTREAM AGHF
5) SHELL AERO SHELL #4(5606A RATED)
6) CHEVRON AVIATION HYD A(5606A RATED)
   - AVIATION HYD C(5606A RATED)
7) BENZOIL HVI15
8) BP ENERGOL - SHF-LT15
9) PETRO-CANADA HYDREX MV. ARCTIC

* SEE SEPARATE ASSEMBLY SHEET PAGE 1 OF 1 (NS)=NOT SHOWN

Special note regarding oil selection and low temperatures:

The pour point listed in a manufacturers specifications must be lower than the anticipated ambient temperature or the hydraulic system will need to be heated.

Symptoms of incorrect oil type

During cold weather:

1. Slow, sluggish, or loss of performance
2. Increased noise from pump
3. Inconsistent pressure adjustments

During hot weather:

1. Increase in oil leaks
2. Increased noise from pump
3. Increase in oil temperature
4. Slow, sluggish, or loss of performance

Consequences of incorrect oil type

During cold weather:

1. Cavitation of pump.
2. Decreased lifespan of pump.
3. Increased contamination passed through system components.

During hot weather:

1. Inadequate lubrication of pump.
2. Decreased lifespan of pump.
3. Increased contamination passed through system components.