WATERFORD III SES
PLANT LUBRICATION MANUAL

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SECTION I
GENERAL DESCRIPTION

The Waterford 3 SES Plant Lubrication Manual (PLM) is a plant manual controlled in accordance with UNT-04-007, Control of Plant Manuals. Maintenance of the PLM shall be the responsibility of the Maintenance Superintendent - Nuclear (MS-N) or his designee. Any changes to the PLM shall be brought to the attention of the MS-N or his designee for implementation.

The PLM (as part of the Plant Lubrication Program) is a functional manual designed to give the user pertinent information pertaining to: (1) Actual equipment/component lubrication and, (2) Lubricant sampling and analysis.

In conjunction with the Quadrex Maintenance Planning and Scheduling System (MPSS), MD-01-010, Plant Lubrication Program and various deparmental procedures, the PLM will insure that the overall Plant Lubrication program is effective in preventing equipment failure due to lubrication problems.

All lubricants listed in the PLM have been recommended for equipment use by the Mobil Oil Corporation and have been approved for use by the Plant Engineering Department. If a conflict should exist between a vendor recommendation and the PLM, the PLM shall govern, unless determined otherwise by the Department Head.

The following are to be used in conjunction with the PLM:

1. MD-01-010, Plant Lubrication Program
2. UNT-05-001, Hazardous Waste Management Control
3. MM-04-001, Lubrication Procedure
4. ME-04-701, Greasing Electrical Equipment
5. MD-01-004, PReventive Maintenance Scheduling

SECTION II
LUBRICATION RECORDS

Plant Equipment Lubrication and Lubricant Sampling at the Waterford III SES shall be governed by the applicable procedures listed in Section I and scheduled, performed and historical records kept utilizing the Quadrex MPS System. The instructions for utilizing the MPSS are contained in the MPSS Users manual.

SECTION III
ACRONYMS, ABBREVIATIONS, AND CODES

The various acronyms, abbreviations, and codes used in this manual are included on the Lubrication Data Sheets of this manual Section V. Therefore, they will be defined in this section by defining the column headings and listings of the Lubrication Data Sheets.

1.0 Definitions of column headings on Lubrication Data Sheets.

1.1 UNID (Unique Identification Number) - The number asigned to a specific system equipment assembly to differentiate it from another equipment assembly in the system.

1.2 COMPONENT NAME - System equipment assembly.

1.3 PARTS TO LUBRICATE - Subassembly located on the system equipment assembly.

1.4 LC (Lubricant Code) - The specific lubricant to be used. Listing under this heading are defined in TABLE III.1.

1.5 LUBRICANT - The specific lubricant to be used. Listings under this heading are defined in TABLE III.1.

1.6 FC (Frequency) - The frequency at which the lubrication activity is to be implemented and the type of lubrication activity to implemented. Listings under this heading are defined in TABLE III.4.

1.7 APL (Application Method) - Method by which the lubricant is to be applied to the equipment subassembly. Listings under this heading are defined in TABLE III.2.

1.8 INST (Lubrication Instructions) - Refers to sections of MM-4-001 Lubrication Procedure, for instructions necessary

to implement the lubrication activity. Listings under this heading are defined in TABLE III.6.

1.9 QUANT (Quantity) - The amount of lubricant to be used during the lubrication activity. Listings under this heading are defined in TABLE III.3.

1.10 DP (Department) - The department responsible for implementing the lubrication activity. Listings under this heading are defined TABLE III.5.

1.11 T (Tag Out Required) - Indicates whether the system equipment assembly must be shut down and tagged out in accordance with SAP-09, Tagging. The listing under this heading will be "Y" for yes and "N" for no.

1.12 R (Released) - Indicates equipment that has been turned over to LP&L.

1.13 SERVICE - Denoted by an "S" preceding the time interval. Service means to check the amount of lubricant and add as needed. Do not over lubricate. Check for noisy or hot operation as well as for lubricant leakage. Report any unusual or unsafe conditions.

1.14 CHANGE - Denoted by a "C" preceding the time interval. Change means to remove all of the old lubricant, clean the reservoir as required and refill with fresh lubricant. Follow the procedure outlined in MM-04-001. Report any unusual or unsafe conditions.

1.15 SAMPLE - Denote by an "X" preceding the time interval. The Chemistry and Environmental Department is responsible for lubrication sampling. Sampling will be performed in accordance with MM-04-001.

TABLE III.1-LUBRICANTS

LUBRICANT	ABBREVIATION	CODE
Mobil DTE 797	DTE 797	01
Mobil DTE Heavy Medium	DTE HVYMED	02
Mobil DTE Extra Heavy	DTE XHVY	03
Mobil DTE BB	DTE BB	04
Mobil DTE 26	DTE 26	05
Mobil Delvac 1230	DEL 1230	06
Mobil Delvac 1340	DEL 1340	07
Mobil Vacuoline 1405	VAC 1405	08
Mobil Cactra 2	VAC 2	10
Cincinnati	5STR40	11
Mobil 600W Cylinder Oil	600W	12
Mobil Arctic	ARCT 155	13
Mobil Mobil Gear 632	GR 632	14
Mobil SHC 824	SHC 824	15
Mobil SHC 626	SHC 626	16
		17
		18
		19
Mobil Mobil Grease 28	GRS 28	20
		21
Mobil Mobilux EP111	EP111	23
Mobil SHC 32	SHC 32	24
No Lubricant	None	99

TABLE III.2-APPLICATION METHODS

ACRONYM

APPLICATION METHOD	OR ABBREVIATION
Grease	GUN
Reservoir	RES
Screw Cup	SC
Ring Oiler	RO
Chain Oiler	CO
Brush	BR
Coat	CT
Constant Level Oiler	CLO
Hand Grease	HG
Hand Oil	HO
Forced Oil System	FOS

TABLE III.3-QUANTITIES

QUANTITY	ACRONYM OR ABBREVIATION
Pint	XPNT
Quart	XQRT
Gallon	XGAL
Barrel	XBAL
Full	Full

The "X" in the acronym specifies the total number of quantities (e.g., one pint would be written "1PNT").

TABLE III.4-FREQUENCY

FREQUENCY	ABBREVIATION
Shift	A

Daily	D
Weekly	W
Monthly	M
Quarterly	Q
Semi-Annually	S
Yearly	Y
Eighteen Months	E
Two Years	T
Four Years	F
Five Years	V
Ten Years	X
Hot Standby	H
Hot Shutdown	B
Cold Shutdown	C
Startup	U
Refueling	R
Other	Z

An "S" preceding the frequency abbreviation indicates inspection of oil reservoir levels and adding of oil as necessary. A "C" preceding the frequency abbreviation indicates removal and replacement of lubricant.

TABLE III.5-DEPARTMENTS

DEPARTMENT	ACRONYM OR ABBREVIATION
OPERATIONS	OP
MECHANICAL MAINTENANCE	MM
ELECTRICAL MAINTENANCE	ME

TABLE III.6-LUBRICATION INSTRUCTIONS

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SECTION IV
LUBRICATION DATA SHEETS

SECTION IV
LUBRICANT DATA SHEETS

TABLE IV,2 - Lubrication Oil Characteristics

OIL, MOBIL PRODUCTS ONLY	CHARACTERISTIC											
	API GRAVITY	SPECIFIC GRAVITY	POUR POINT °F	FLASH POINT	VISCOSITY SUS AT 100°F	VISCOSITY SUS AT 210°F	COLOR ASTM	VISCOSITY INDEX	ASTM GRADE	ISO GRADE	*SAE MOTORS	*SAE GEARS
DTE 26	31.0	0.877	0	400	335	52.7	3.5	95	315	68	20	85W
DTE 797	33.4	0.858	20	410	157.5	44	0.5	111	150	32	10W	75W
DTE Light	31.7	0.871	20	400	157.5	44	1.5	100	150	32		
DTE Medium	30.6	0.876	20	400	227	48.8	2.0	100	215	46		
DTE Heavy Medium	29.9	0.879	20	400	335	55	2.5	100	315	68		
DTE Heavy	29.2	0.882	20	400	425	60	2.5	100	465	—		
DTE Extra Heavy	28.0	0.887	25	410	750	70	6.5	98	700	150		
DTE BB	27.5	0.890	25	440	1105	84	7.5	98	1030	220	40	90
DTE AA	25.4	0.897	25	460	1615	115	8.0	96	—	320		
DTE HH	26.2	0.900	25	520	2337	150	8.0	95	—	460		
Delvac 1210	30.1	-	-20	390	783	46.5	7.0	100	—	—	10	
Delvac 1220	27.8	-	-10	415	323	55.0	7.5	95	—	—	20	
Delvac 1230	27.0	-	0	430	550	67.5	8.0	95	—	—	30	85W
Delvac 1240	26.9	-	10	440	750	77.5	8.0	95	—	—	40	
Delvac 1340	26.5	0.896	-5	445	809	78	8.0	96	—	—	40	90W
Vacuoline 1405	30.0	-	15	385	157	43.5	3.0	-	150	32		
Vacuoline 1409	26.0	-	20	390	335	52	3.0	-	315	68		
Vactra No. 1	30.0	0.876	20	315	157	45	7.0	102	150	32		
Vactra No. 2	30.0	0.876	20	330	335	55	7.0	101	315	68	20	85W
Vactra No. 3	29.0	0.881	20	350	495	63	7.0	95	465	100		
Vactra No. 4	26.5	0.895	20	350	1105	92	7.0	96	1000	220		
600w Cylinder Oil	25.5	-	40	540	2000	142	8+	99	2150	—		
Mobil Gear 630	26.5	0.896	0	420	1105	92.0	7.0	95	1000	220		
Mobil Gear 632	26.5	0.896	0	450	1620	115	7.5	95	1500	320		
Mobil Gear 634	25.5	0.901	20	450	2335	148	8.0	95	2150	460		
Mobil Arctic	23.0	-	-40	330	155	41.5	1.0	-	—	—		
Mobil SHC 824	38.0	0.835	-65	425	159	45	14.5	135	150	32	10W	75W
Mobil SHC 626	34.4	0.853	-65	450	315	61.3	11.0	135	315	68	30	85W

*These oils not intended for automotive use.

SECTION IV
LUBRICATION DATA

The characteristics of the applicable lubrication greases and oils are listed in TABLE IV.1 and TABLE IV.2 respectively.

TABLE IV.1 - Lubrication Grease Characteristics

GREASE	CHARACTERISTIC						
	NLGI GRADE	SOAP TYPE	PENETRATION AT 77°F WKED	COLOR ASTM	VISCOSITY SUS AT 100°F	SUS AT 210°F	DROP PT. ASTM °F
Mobil Mobil Grease	28	Non Soap	295	DK. Red	Synthetic	—	500
Mobilux EP1	1	Lithium Plus EP	310-340	Medium Brown	Hydrocarbon	75	340
Mobilux EP2	2	Lithium Plus EP	265-295	Brown	750	75	350
Mobilux EP111	1	Lithium Lead	-	Black	4600	200-225	350
SHC 32	2	Non Soap	295	Dk. Red	Synthetic	—	500

Mobil Product Information

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File 12:34

MOBIL VAPROTEC LIGHT

Mobil Vaprotec Light oil was developed to provide the hydraulic and lubricating oil requirements of many types of equipment during their test, run-in and normal operational use. It is particularly designed to provide a full range of rust protection in addition to good lubricating characteristics.

Product Description

Mobil Vaprotec Light is formulated from turbine quality and chemically stable base stocks. It contains an antioxidant, a defoamant and a three phase rust inhibitor package. A thin film rust inhibitor protects surfaces which have been coated with oil but have subsequently drained away. The liquid phase inhibitor protects surfaces which are submerged in the oil, while the vapor phase inhibitors protect surfaces which do not come into contact with the fluid oil, only its vapors. The vapor rust inhibitors are selectively chosen to provide high and low temperature protection at ambient to operational temperatures. The unusual blend of the vapor and liquid types has been accomplished to give protection in operational and stand-by service. In addition, Mobil Vaprotec Light oil has excellent demulsibility and lubrication characteristics.

Application

Mobil Vaprotec Light oil is recommended for use in all applications when a double inhibited, turbine quality circulation oil with additional rust protection is required. It has been approved by manufacturers of hydraulic pumps, gas turbines and steam turbines for use in their test stand run-in and check. The excellent rust inhibitor characteristics of the oil protect all surfaces during storage and shipment.

Typical Characteristics

Typical physical characteristics of Mobil Vaprotec Light are shown in the data table. The values shown are typical characteristics which may vary slightly.

Gravity, API	30.2
Pour Point, °F.	20
Flash Point, °F.	395
Viscosity	
SUS @ 100°F.	150-165
SUS @ 210°F.	43
Color, ASTM	1.5
Carbon Residue, %	0.1
Viscosity Index	98
Neutralization Number	0.2
Demulsibility (ASTM D-1401 @ 130°F., ml after 30 min.)	3
Rust Test ASTM D665	
Distilled Water	Pass
Synthetic Sea Water	Pass

Advantages

When used as recommended, Mobil Vaprotec Light provides the following advantages:

- Excellent thin film, vapor and liquid phase long term rust protection
- Superior oxidation stability
- Good demulsibility for rapid separation of water
- Wide range of application

Mobil Product Information

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OF MOBIL OIL CORPORATION

MOBIL VAPROTEC CONCENTRATE

(60032)

In 1974 we commercialized Mobil Vaprotec Light, a vapor space-inhibited, turbine-circulating oil which provides excellent corrosion protection to metal surfaces above fluid oil level through a controlled-volatility inhibitor system. Field experience with this product as a run-in oil prior to storage or shipment of equipment or for intermittently used machinery has been very good. More recently, there has been strong interest in providing these corrosion protection features for existing charges of circulating oil and for other products through the use of an additive concentrate, thus gaining this special corrosion protection without the need to change the oil fill. We have found that the additives in Vaprotec Light can be combined into a stable additive concentrate which can be easily made in blending plants using materials currently in the Mobil system.

The scope of our Vaprotec Concentrate development program was essentially limited to turbine-circulating oils where the VSI benefits are most likely needed.. However, it should also confer VSI properties to most other oils, including all internal combustion engine applications.

The addition of Vaprotec to concentrate oil provides the following benefits:

- Wide-temperature-range rust protection for steel surfaces in the vapor (air) spaces which do not come into contact with the oil.
- Thin oil film inhibition which protects metal surfaces where the oil has drained off leaving only a thin film. It also provides bulk oil rust inhibition for surfaces which are submerged in the oil.
- Good corrosion protection for nonferrous metals.
- Maintains good demulsibility equivalent to that of a normal turbine oil.

Vaprotec Concentrate should be particularly useful in upgrading oil for run-in and subsequent shipment/storage of new equipment, as well as standby and periodic operating service. Continuously operating systems at normal running temperatures will tend to deplete the VSI additives, but the protection can be maintained by addition of more additive as required.

Vaprotec Concentrate should be added as a 5% volume spike to oils below 140°F. Air agitation should be avoided because it will deplete the concentrate.

At this initial stage of commercialization, Vaprotec is established at Vernon and Cleveland. Performance data is very limited at this time. However, as experience is gathered, the field will be informed. TSL is presently working on data of this nature, including compatibility with other than turbine-type oils. Specific compatibility requests hould be checked out by TSL before firm recommendation is made.

TYPICAL CHARACTERISTICS

TEST	METHOD	
Gravity, °API	D-237	19.9
Color	Visual	Dark Brown
Pour Point, °F, Max	D-97	20
Flash Point, °F (PM)	D-93	145
Viscosity @ 100°F, SUS	D-445	400
@ 210°F, SUS	D-445	53.4
@ 40°C, cSt	D-445	78.8
@ 100°C cSt	D-445	8.07
TBN	D-664	54.6
Nitrogen, % wt.	M-993	1.16
Barium, % wt.	M-800	2.88
Government Emulsion @ 130°F 5% wt. in DTE Light minutes to 40/40/0, Max	D-1401	22

9-15-76

TYPICAL CHARACTERISTICS

Physical characteristics of the Mobilux EP greases are shown in the data sheet table. Values not shown as maximums or minimums are typical characteristics and may vary slightly.

APPLICATION

Mobilux EP greases are recommended for the lubrication of plain and rolling element bearings in normal through heavy-duty industrial applications. They are particularly recommended where loads are high or shock loads are present, or where severe vibration is a problem. They are also suitable for the lubrication of geared couplings. The softer grade may be considered for the lubrication of gear sets that do not have oil-tight cases.

Mobilux EP 0 and 1 greases have excellent handling and dispensing properties at low temperature. The lowest recommended ambient temperature for operating bearings lubricated with Mobilux EP 0 or 1 is about -20 °F (-29 °C); and for Mobilux EP 2, a stiffer grease, about -10 °F (-23 °C).

Three Mobilux EP greases are recommended for the lubrication of plain bearings. The highest operating temperature recommended for these greases is 250 °F (121 °C). For continuous service at temperatures above 200 °F, proper purging and relubrication frequencies are critical to maintenance of correct bearing protection.

The excellent water resistance, rust and corrosion protection afforded by the Mobilux EP greases makes them particularly applicable for equipment such as the wet ends of paper machines, steel mill hot strip rolling operations, underground mining equipment, tunneling projects and ore crushing plants where moisture or wet conditions are common. Their excellent dispensing characteristics will also be advantageous in many of these applications because of the exposed nature of the operations.

Mobilux EP greases are compatible with some other greases, particularly those made with lithium soap. However, the best procedure is not to mix greases of different soap types. When replacing another grease with a Mobilux EP grease, the previously used grease should be completely cleaned or flushed from the system.

In plants where human or animal foods are being processed, Mobilux EP greases, despite their unleaded extreme pressure formulation, are not recommended for applications where contamination of food could result. Mobilux EP greases have U.S. Department of Agriculture (USDA) Category 3B approval.

ADVANTAGES

When used as recommended, the Mobilux EP greases will provide the following outstanding benefits and advantages:

Superior lubrication under heavy or shock loading
Good load carrying ability
Longer service life in bearings at temperatures up to 250 °F
Good low temperature dispensing characteristics
Excellent resistance to water washing
Good rust protection and corrosion resistance
Extreme pressure protection with an unleaded formulation
Reduction of plant inventories through multipurpose capabilities

Mobilux® EP 0, 1, 2

Extreme Pressure Industrial Greases

Mobilux EP 0, 1, and 2 unleaded multiservice, extreme pressure greases are designed for normal through heavy-duty industrial applications. They are formulated to resist the effects of both the extreme heavy loads and shock loads to which plant equipment is commonly exposed. Heavy loads tend to squeeze lubricant from mating surfaces, and shock loads rupture the lubricant film, thus creating a condition of metal-to-metal contact and causing parts wear, shortening equipment life. Equipment experiencing these loading extremes may also be exposed to conditions where extremes of temperature, moisture, or water washing are present. Greases for these applications must provide good extreme pressure characteristics and cling strongly to resist the pressures and pounding to which they are exposed. They must also provide good protection against rust and corrosion, resist water washing and dispense and lubricate satisfactorily over a broad range of temperature. The Mobilux EP greases fulfill these requirements.

PRODUCT DESCRIPTION

The Mobilux EP greases are lithium 12 hydroxystearate soap based greases which contain an unleaded EP additive and oxidation, rust and corrosion inhibitors. They are smooth textured, brown colored greases in the NLGI No. 0, 1, or 2 consistency classification.

The use of lithium 12 hydroxystearate as the soap base for these greases ensures good resistance to softening under severe working, good water resistance and a consistency which will remain relatively constant over the recommended operating temperature range.

The extreme pressure characteristic of the Mobilux EP greases is supplied by an unleaded additive which provides them with exceptional wear protection, also improving their ecological acceptability. Other formulation improvements provide good water wash resistance, low temperature dispensing, and long service life in bearings operating at elevated temperatures.

The petroleum oil used in the greases meets the lubrication requirements of most heavy-duty industrial operations. It also provides low temperature pumpability and enhances the greases' high temperature oxidation resistance.

The Mobilux EP greases pass the ASTM Rust Test (D 1743) and are noncorrosive to steel and copper. The latter is of importance because of the use of bronze cages in many antifriction bearings. The greases show good resistance to bleeding and superior resistance to water washout. Their load carrying and antiwear characteristics are illustrated by their Timken OK load of 40 lbs., 18.2 kg.

Characteristic	Mobilux EP 0	Mobilux EP 1	Mobilux EP 2
NLGI No.	0	1	2
Structure	smooth	smooth	smooth
Soap Type	Unleaded Lithium 12 Hydroxystearate		
Color	brown	brown	brown
Penetration at 77 °F (25 °C)			
Unworked, min-max	350-390	305-345	260-300
Worked 60 strokes, min-max	355-395	310-340	265-295
Dropping Point, min. °F (C)	340 (171)	340 (171)	350 (177)
Mineral Oil %	92	89	87
Viscosity			
SUS at 100 °F	900	900	900
SUS at 210 °F	75	75	75
cSt at 40 °C	170	170	170
cSt at 100 °C	13.3	13.3	13.3
Timken OK Load, min. lb (kg)	40 (18)	40 (18)	40 (18)
Rust Test ASTM D 1743	Pass	Pass	Pass
Bomb Oxidation Stability # PSI Drop, max.	10	10	10

Mobilarma® 200 Series

Solvent-based Rust Preventives

PRODUCT DESCRIPTION

The Mobilarma 200 series is a group of four rust preventives: Mobilarma 244, 245, 246 and 247. Each is based on light-bodied solvents, a polar rust preventive and, with the exception of Mobilarma 244, all contain displacement additives and fingerprint suppressants.

Mobilarma 244 rust preventive is a light-bodied petroleum solvent containing a substantial amount of a polar-rust-preventive additive. Applied to dry surfaces, the solvent will evaporate, leaving a thin, transparent, greasy film. It strongly resists displacement from metal surfaces by water. The material is suitable for light and moderate service, for example, indoor and protected outdoor storage. It is best suited for application on plain, smooth surfaces that are accessible for easy cleaning, but can also be used on miscellaneous parts having holes, threads, crevices or pockets.

Mobilarma 244 can be applied at room temperature by any convenient means (brushing, rolling, dipping, spraying) and the film can be removed later, if desired, by dipping parts in kerosene or solvent. This light-bodied product gives excellent coverage, on the average, 1500 to 2000 square feet per gallon.

Mobilarma 245, a light-bodied blend of petroleum solvent and oil, contains a number of additives that impart a highly effective water displacing ability and a special ability to displace fingerprint moisture. This latter property suppresses fingerprint corrosion and etching.

In application by dipping, water drops harmlessly to the bottom of the bath. If spray, brush or roller application is used, the displaced water is forced to the outside of the film and drops off or evaporates. Evaporation of the petroleum solvent leaves a thin, transparent, oily rust-preventive film suitable for indoor storage for a period of three to six months. Average coverage is 1750 to 2500 square feet per gallon.

The characteristics of Mobilarma 245 make it especially suitable for the protection of finely finished parts between machining operations, including operations where water-soluble cutting or grinding fluids have been used. The product is also suitable for use just before the packaging of parts for storage or shipment. Still another use is to "dry" parts and protect them temporarily until a heavier-duty rust preventive can be applied. The product meets the AMS 3065C specification.

Generally, removal of the thin, practically invisible protective film left by Mobilarma 245 is unnecessary, but if desired, removal is easily accomplished by simply dipping parts in kerosene or a petroleum solvent.

Mobilarma 246 and **Mobilarma 247** rust preventives are blends of solvents, waxes and polar additives capable of providing water displacement and fingerprint neutralizing characteristics. Upon evaporation of the solvent, a soft, waxy protective film is left behind. The products have water displacement properties, are dark in color, very fluid and leave a non-drying film. Each is applied by dip, slush or spray and removed by dipping or rinsing in kerosene, petroleum solvent or caustic bath. Coverage by Mobilarma 246 averages 1200 to 1400 square feet per gallon, while Mobilarma 247 averages 1000 to 1200 square feet per gallon.

Mobilarma 247 is the heaviest duty of the Mobilarma 200 solvent-based rust-preventive series. It leaves a thicker non-drying film that provides a greater degree of rust protection for up to twelve months or longer in indoor storage. It is recommended for inter-operational purposes in machine shops and will also provide excellent protection of parts in protected outdoor storage (unheated sheds or under a tarpaulin).

TYPICAL CHARACTERISTICS

Typical physical characteristics of the Mobilarma 200 series are listed in the data sheet table.

Mobilarma® 200 Series

Characteristic	Mobilarma 244	Mobilarma 245	Mobilarma 246	Mobilarma 247
Gravity, API	41.0	37.1	39.0	33.0
Flash Point, °F	100	100	100	140
Viscosity				
SUS at 100°F	45	35	65	95
cSt at 40°C	5.5	2.6	10.5	17.5
Color, ASTM	3.0	Dk. Gr.	Red Br.	Red Br.
% nonvolatile	30	30	25	30
Water Displacement	No	Yes	Yes	Yes
Coverage, sq. ft./gal.	1500/2000	1750/2500	1200/1400	1000/2000
Protection (inside storage), months	6-12	3-6	12 +	12 +
Removal	Solvent, alkaline or emulsion	Solvent, alkaline or emulsion	Solvent or emulsion	Solvent or emulsion

Mobilarma® 500 Series

Lubricating Oils/Rust Preventives

The Mobilarma 500 Series products are high-grade hydraulic and/or lubricating oils containing rust-preventive additives. They have been designed as run-in oils to protect the working parts of enclosed assemblies such as engines, compressors, pumps, gear sets, hydraulic assemblies, machine tool spindles and air tools; the oils are applied in place of the lubrication oils normally used. Their viscosity, anti-wear, chemical stability and detergent properties also make them suitable as high-quality, short-term lubricants for many applications.

Mobilarma 500 products are not operating oils and are not recommended for long-term use. They are carefully blended compromises between effective rust preventives and lubricants. The characteristics which embue them with rust prevention properties reduce their long-term value as lubricating oils.

PRODUCT DESCRIPTION

The Mobilarma 500 Series consists of four lubricating oil/rust preventive blends. The base oils are high-quality lubricating oils of the type used in automotive engine crankcases and contain detergents and oxidation inhibitors. Four viscosity grades are available: Mobilarma 522, an SAE 10W oil; Mobilarma 523, a 10W oil; Mobilarma 524, an SAE 30 oil; and Mobilarma 525, an SAE 10W-20 oil.

The rust preventives in the Mobilarma formulations function by displacing water from metal surfaces by forming strong water resistant films on the surfaces and by absorbing water in the system into a water-in-oil emulsion. The Mobilarma 500 Series products provide as much as 30 to 40 times the protection against rust as high quality lubricating oils that have not been especially formulated to prevent rust.

TYPICAL CHARACTERISTICS

The typical physical characteristics of the Mobilarma 500 Series lubricating oils/rust preventives are shown in the data sheet table.

APPLICATIONS

In addition to rust prevention, the Mobilarma 500 Series products can also be used for run-in, calibration testing, wet-sump initial fill, and in the seasonal lay-up of machines.

In applying a Mobilarma 500 Series product for the protection of new machines during storage and shipment, considerable savings can often be made by using it for lubrication during run-in, adjustment, calibration, or testing, as well. This avoids the use of a separate run-in oil and the costs associated with its installation, draining, filtration, and storage. The Mobilarma product can usually be drained, filtered to remove chips and dirt, and re-used over and over again.

Machines and components for which Mobilarma 500

Characteristic	Mobilarma 522	Mobilarma 523	Mobilarma 524	Mobilarma 525
SAE Grade	10W	10W	30	10W-20
Gravity, API	30.2	28.8	28.5	27.8
Pour Point, °F	-10	-10	0	-35
Flash Point, °F	380	380	425	350
Viscosity				
SUS at 100 °F	150	210	460	330
SUS at 210 °F	43	49	61	57
cSt at 40 °C	29	41	88.7	64.5
cSt at 100 °C	—	—	10.4	9.2
Viscosity Index	95	95	95	128
Color, ASTM	5.0	6.0	6.0	3.0
Protection (Indoor Storage), Months	3-6	3-6	3-6	3-6
Removal	Dipping in solvent; drain machine			

Mobilarma® 500 Series

products are applicable for this type of service include: diesel and petroleum engines, air tools, compressors, large electric motors, enclosed gears, fuel injection systems, gear motors, hydraulic and mechanical presses, rubber and plastics machinery, torque converters, and variable speed drives.

Because Mobilarma 500 rust preventives combine the characteristics of high quality lubricating oils and rust preventives, their use simplifies the lubrication/rust prevention procedure. The usual procedure involves six steps (1) Install lubricating oil for run-in testing or adjusting; (2) Drain; (3) Circulate flushing oil to remove lubricant and to secure better surface wetting by rust preventive; (4) Drain; (5) Apply rust preventive; (6) Drain. With Mobilarma, the procedure is simple: (1) Install Mobilarma 500 product for run-in, testing adjustment, and rust prevention; (2) Drain.

To secure the most satisfactory results from the Mobilarma procedure, the application system must be well designed. It should have adequate reservoir capacity to provide for precipitation of wear debris as well as adequate filter capacity to remove particles suspended in the fluid. Since the procedure usually involves re-use of the fluid, good housekeeping practices must be followed. Precautions should be taken to keep out chips, dirt and other solids that can cause abrasion and scoring. A schedule of periodic testing is desirable to determine when a batch change is necessary.

Another use of the Mobilarma 500 products is in the seasonal lay-up of machines. The regular lubrication oil is replaced at some convenient time before an extended shutdown by the Mobilarma grade that is nearest to it in viscosity. Where the viscosities of the two products are about the same, the Mobilarma can be used in normal service for substantial periods both before and after lay-up. However, where the machine requires a lubricating oil that is substantially heavier in body than Mobilarma 524, the latter should be applied under no-load conditions just before lay-up. The excess fluid should be drained for re-use, and at the end of the lay-up period a charge of the regular lubricating oil should be installed before starting.

In addition to protecting internal surfaces against rusting when machine tools are shut down for periods of several months, certain external surfaces such as ways and slides require protection also. The Mobilarma 500 Series products are excellent for this purpose and may be applied by any convenient means such as brushing or spraying.

Mobilarma 522 or 524 can be used as the last crankcase fill before shutdown of internal combustion engines. Where lubricators are used, it can be substituted for the same operating period. Although these Mobilarma oils have a detergency level equal to MIL-L-2104A, they should be drained within 75 percent of the normal service period for the approved engine oil.

In most applications, the residual rust preventive film left by these products need not be flushed away or otherwise removed when the assembly is to be charged with lubricating oil and put into normal service. However, flushing with a charge of lubricating oil to remove the Mobilarma 500 Series product or its residual film before installation of the regular oil charge should be considered in the following situations: (1) in equipment where drainage is not good and a considerable amount of Mobilarma is trapped in the system; (2) in Freon compressors where contamination will increase the Freon cloud point of the new oil charge; and (3) in turbine and similar systems subject to water contamination, since the presence of rust preventive agents will reduce the water separating ability of the new oil charge.

As with all mineral oil products, good personal hygiene should be practiced. This includes laundering clothing wet with this product before reuse and washing skin contact areas with soap and warm water.

ADVANTAGES

The Mobilarma 500 Series rust preventives will provide the following advantages and benefits:

Highly effective rust and corrosion preventive
Effective anti-oxidation characteristics
Detergent engine oils to MIL-L-2104A performance level
Simplified lubrication/rust prevention procedure
High quality circulation oils

Mobilgear® 600 Series

Heavy Duty
Industrial Gear Lubricants

The Mobilgear series, a family of premium quality, unleaded, heavy duty industrial gear lubricants are intended for enclosed gear sets operating under most service conditions. Modern metallurgy and precision manufacturing techniques have permitted the design of gear units that will transmit more power for a given size unit. As a result, operating temperatures have increased and lubricant performance has become much more critical. Lubricants for these newer, more heavily loaded gear sets must provide increased protection against wear and gear tooth damage as well as reduce friction in order to minimize bulk oil temperature.

PRODUCT DESCRIPTION

The Mobilgear 600 series is formulated from high quality, high VI base oils selected for their oxidation stability and water separating characteristics. Additives are incorporated to provide extreme pressure and wear protection, rust and corrosion protection, increased oxidation stability, and resistance to foaming.

Antiwear provided by sulfur-phosphorus additives reduces frictional characteristics and helps to lower overall oil temperatures, especially in heavily loaded gear sets. Temperature reductions of as much as 35 degrees F can be obtained as compared to other types of lubricants. Copper and copper alloys are fully protected against corrosion while steel parts are protected against rust and corrosion. Foaming can be a problem in gear sets of small oil volume where oil "rest" time is short. These oils are fully protected against foaming in both low and high speed gear applications.

TYPICAL CHARACTERISTICS

Physical characteristics of the Mobilgear 600 series products are shown in the data sheet table. Those values not shown as maximums or minimums are typical characteristics which may vary slightly.

APPLICATION

Mobilgear 600 series lubricants are recommended for all types of enclosed gear drives. They are suitable for both circulation and splash lubrication systems. They are particularly recommended for gear sets operating under heavy or shock loads.

	MOBILGEAR						
Characteristics	626	627	629	630	632	634	636
Gravity, API	28.0	27.0	26.5	25.7	25.3	24.1	22.5
Pour Point, °F (°C) max.	-10 (-23)	-10 (-23)	-10 (-23)	0 (-17)	0 (-17)	20 (-6)	20 (-6)
Flash Point, °F (°C) min.	400 (204)	405 (207)	410 (210)	420 (216)	450 (232)	450 (232)	450 (232)
Viscosity							
SUS at 100 °F (37.8 °C)	315/355	495/550	710/790	1045/1165	1535/1705	2215/2460	3300/3670
SUS at 210 °F (98.9 °C)	54	64	70	92	115	148	180
cSt at 40 °C	61/68	95/105	135/150	198/220	288/320	414/460	612/680
cSt at 100 °C	8.3	11.0	12.5	18.0	23.1	30.4	37.2
Viscosity Index (V.I.)	95	95	95	95	95	95	85
Color ASTM	4.0	5.0	5.5	6.0	6.0	6.5	8.0
Channel Point, °F (°C)	-35 (-37)	-35 (-37)	-35 (-37)	-25 (-32)	-25 (-32)	-5 (-20)	-5 (-20)
Rust, ASTM D 665	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Timken OK Load, lb, ASTM D 2782 min.	60	60	60	60	60	70	70
*U.S. Steel Extra-Duty Gear Oil Requirement No.							
222	Pass	Pass	Pass	Pass	Pass	Pass	Pass
224	Pass	Pass	Pass	Pass	Pass	Pass	Pass
FZG Test — No. Stages Passed	13	13	13	13	13	13	13
**ISO/ASTM Viscosity Grade (VG) °C	68	100	150	220	320	460	680
AGMA Lubricant No.	2 EP	3 EP	4 EP	5 EP	6 EP	7 EP	8 EP

*Under Requirement 222, oxidation characteristics of lead gear oils are determined. Test is conducted for 312 hr at 203 °F. Requirement 224 is for unleaded gear oils and is conducted for 312 hr at 250 °F.

**ISO (Industrial Standards Organization) and ASTM (American Society for Testing Materials) have accepted the same range values.

Mobilgear® 600 Series

Heavy Duty Industrial Gear Lubricants

For industrial enclosed spur, helical, and bevel gear drives, lubricant viscosity selection is based on speed, load, operating temperature, and type of lubricant system. As a basic principle, the viscosity required increases as the speed decreases or as the maximum operating temperature increases. Splash lubrication also generally requires higher viscosity lubricants than similar units equipped with circulation systems. In the temperature range between 30°F (-1C) minimum ambient temperature and 230°F (110°C) maximum operating temperature, applications exist for all of the Mobilgear 600 series.

The Mobilgear 600 series also provides good lubrication for enclosed worm gear drives. Lubricant viscosity selection for drives of this type is based on speed and operating temperature. Performance in moderately severe applications is entirely satisfactory. However, in very severe applications, cylinder oils are still considered superior to any sulfur-phosphorus gear oil.

There are applications for the Mobilgear 600 series where their combination of excellent antiwear and friction reduction characteristics, good oxidation stability, water separating ability, and rust and corrosion protection will provide superior lubrication and long lubricant life, such as heavily loaded plain bearings operating at slow speeds.

HEALTH AND SAFETY

Based on available toxicology information, these products, when properly used and handled have little potential health effect. No special precautions are suggested beyond attention to good personal hygiene including avoiding prolonged, repeated skin contact. A detailed Material Safety Data Bulletin discussing these products is available upon request from your local Commercial office.

ADVANTAGES

Mobilgear 600 series provides the following outstanding advantages and benefits:

Superior load carrying capacity
Excellent lubricity to minimize friction and bulk oil temperature rise
Outstanding antiwear properties
Good oxidation stability
Rust and corrosion protection
Good demulsibility for rapid water separation
Improved gear set and system cleanliness

Mobilarma® 633

Asphaltic-based Rust Preventive

PRODUCT DESCRIPTION

Mobilarma 633 is a specially processed asphaltic material that is made fluid by the addition of a petroleum solvent. It is a medium-body, black liquid that can be applied at room temperature by any convenient method, such as brush, dip, or spray. It has a flash point of 100°F minimum. After application, the solvent evaporates and leaves a hard, strong, dry, acid-resistant film. The coating provides long term protection under severe conditions such as unprotected outdoor storage or in the presence of corrosive fumes. It provides complete indoor protection on an extended basis.

Mobilarma 633 is especially suitable for smooth, unpainted external surfaces. The treated parts will withstand considerable scuffing and moderately rough handling, but they should be protected against severe physical damage because the hard, dry film is not self-healing. The film is somewhat similar to paint and although semi-permanent, it can be removed even after prolonged aging by vigorous rubbing with solvent-soaked rags. Because of the difficulty of removal, Mobilarma 633 should not be applied to surfaces with crevices in cases where the rust preventive will be removed later.

APPLICATIONS

Typical applications for Mobilarma 633 are components that are destined for long term storage or extended delivery procedures, particularly those involving sea transport. It is also suitable for steelwork exposed to acid fumes, pithead gear, girders, conveyors, pitprops, and all other types of structural steelwork. Because of its excellent resistance to salt spray, Mobilarma 633 is also recommended for marine use, such as on ocean-going vessels, drilling rigs, conveyors and loading equipment.

Mobilarma 633 is economical to use. It has an average covering capacity of 100 square feet per pound and dries with a glossy finish within two or three hours after application. Once dry, it retains its elasticity and remains pliable so that no cracking or peeling, caused by contraction or expansion of the metal, occurs. Adequate preservation of the base metal is provided by the thin adhesive film. One coat is sufficient; however, care must be taken, particularly when application is by brush, to ensure that the coating is even and continuous. It must be spread out by the brush since tears may tend to drag the protective film away from the base metal.

It is normal for Mobilarma 633 to thicken after prolonged exposure to the atmosphere because of solvent evaporation. It can be rendered more fluid by thoroughly stirring into it a small volume of Sovasol® No. 5 petroleum distillate.

For best results, the surface should be wire brushed to remove all loose dirt and scale. The surface should be dry. If scale is difficult to remove, a preliminary coating of Mobilarma 633 will enable the scale to be chipped off easily before the final coat is applied.

TYPICAL CHARACTERISTICS

The typical physical characteristics of Mobilarma 633 are shown in the data sheet table.

Characteristics	Mobilarma 633
Gravity, API	24.9
Flash Point, °F	100
Viscosity, SSF at 77°F	135
Color	Black
Coverage, sq. ft./gal.	200/300
Protection (Inside Storage), months	24+
Removal	Vigorous rubbing with solvent-soaked cloths

ADVANTAGES

When used properly, Mobilarma 633 asphaltic-based rust preventive will provide the following advantages and benefits:

- Long term outdoor protection
- Resists water washing
- Resists corrosive fumes
- Dries to hard film very quickly
- Will not crack or peel

Mobilarma® 355

Petrolatum-based Rust Preventive

PRODUCT DESCRIPTION

Mobilarma 355 is a light-colored petrolatum-based material (an oily wax) which has been specially developed as a long term rust preventive for anti-friction bearings. Light amber in color, it has the consistency of a soft grease.

Mobilarma 355 can be applied by brushing or, when heated to 125°F (51.6°C), it can be applied by dipping or spraying. The transparent, greasy film that is formed provides good protection against rusting under a wide range of conditions including protected outdoor storage. Mobilarma 355 will provide inside storage protection for twelve months or more. It is suitable for use on high-surface-finish precision components and plain, smooth surfaces accessible for easy cleaning, and for miscellaneous parts having holes, threads, crevices or pockets.

The protective film provided by Mobilarma 355 will retain a considerable degree of its protective value under handling because it remains soft and is self-healing after rupture. Due to its low application temperature, no special hoods are needed during application of Mobilarma 355 petrolatum-based rust preventive.

Average coverage provided by Mobilarma 355 is 225 to 325 square feet per gallon. The film can be removed, if necessary, by moderate rubbing with solvent-soaked cloths or by immersion in a solvent for a short period of time.

TYPICAL CHARACTERISTICS

Typical characteristics of Mobilarma 355 are listed in the data sheet table.

Characteristic	Mobilarma 355
Gravity, API	31.2
Flash Point, °F	370
Viscosity	
SUS at 210°F	55
cSt at 100°C	8.3
Color, ASTM	3.5
Congealing point, °F	100
Coverage, sq. ft./gal.	225/325
Protection (Inside Storage), months	12+
Removal	Dipping in solvent; rubbing with solvent-soaked cloths

ADVANTAGES

When used properly, Mobilarma 355 petrolatum-based rust preventive will provide the following advantages and benefits:

- Remains soft and is self-healing after rupture
- Low application temperature; no special hoods needed

Mobil SHC® 824, 825

Gas Turbine Lubricants

Mobil SHC 824 and 825 gas turbine lubricants are based on Mobil's work in the field of synthesized hydrocarbons. Increasing numbers of gas turbines are being used in industrial and commercial service for such applications as standby power units and total energy systems. Standby units generally operate essentially unattended and start and pick up load automatically in the event of a power failure. In winter when power failures are more apt to occur, the turbine and lubricating system often will be cold at startup. During periods of operation, temperatures will usually reach normal operating levels, but when the emergency is over and the system shuts down, heat soakback from the turbine may cause overheating of portions of the oil that do not drain completely from bearings and housings. Under these conditions, conventional mineral oil based lubricants may not have adequate low temperature fluidity for rapid circulation at startup. In addition, thermal and oxidative degradation during the hot soak period after shutdown may result in deposits that interfere with lubrication and necessitate maintenance for system cleaning and oil changes. The excellent low temperature fluidity of Mobil SHC 824 and 825 gas turbine lubricants, combined with their superior high temperature oxidation stability, help to minimize these problems and provide improved reliability with reduced maintenance cost.

PRODUCT DESCRIPTION

Mobil SHC 824 and 825 gas turbine lubricants are 150 SUS at 100°F (ISO VG32) and 225 SUS at 100°F (ISO VG46) gas turbine lubricating oils manufactured from Mobil's synthesized hydrocarbon base oils and a combination of additives designed to provide superior rust protection and oxidation stability. The synthesized hydrocarbons used as the base oils are chemically similar to mineral oils, and are fully compatible with them, but provide several advantages compared to mineral oils as a base for gas turbine lubricants. The synthesized base oils have superior oxidation stability, high natural viscosity indexes, low pour points, and excellent low temperature fluidity. The measured low temperature viscosities are generally below those predicted by extrapolation on an ASTM Viscosity-Temperature Chart from values measured at 100°F and 210°F. Since the high VI and good low temperature fluidity are inherent characteristics of the fluids, these properties do not change in service as a result of mechanical shearing or repeated cycling from high to low temperatures. The synthesized hydrocarbon fluids also have good response to many types of additives so their good oxidation stability can be enhanced with selected inhibitors, and they are resistant to foaming and have good air release properties.

During the development of Mobil SHC 824 gas turbine lubricant, a number of tests that are used for the evaluation of the stability and antiwear properties of gas turbine lubricants were conducted. Significant results of some of these tests are included in Table 1. These tests were not conducted on Mobil SHC 825 gas turbine lubricant since the slight variation in the base oil blend required to make the higher viscosity product has no significant effect on the results.

Characteristic	Mobil SHC 824	Mobil SHC 825
API Gravity	38.0	38.0
Specific Gravity 60/60°F (15.6/15.6°C)	0.835	0.835
Flash Point, °F (°C) min.	425 (218)	425 (218)
Pour Point, °F (°C) max.	−65 (−54)	−65 (−54)
Viscosity		
cSt at 0°F (−18°C)	820	1,455
cSt at 40°C (104°F)	34	45
cSt at 100°C	6	8
SUS at 100°F	159	225
SUS at 210°F	45.9	52.5
Viscosity Index	135	148
ISO Viscosity Grade	32	46
Total Acid Number (TAN)	0.2	0.2
Color, ASTM	4.5	4.5
Rust Test, ASTM D 665		
Distilled and Synthetic Sea Water	Pass	Pass
Foaming Tendency, ASTM D 892		
Immediately After Blowing		
Sequence I, II, III	0	0

TABLE 1

Test	Mobil SHC 824
Oxidation and Corrosion Test	
72 h at 347 °F (175 °C), 5 l/h air	
Viscosity increase at 100 °F (38 °C), %	7.0
TAN increase	1.4
Visual Sludge	Light
Specimen Weight Losses, mg/cm²	
Silver	0.08
Copper	0.11
Steel	0
Magnesium	0.04
Oxidation and Corrosion Test	
72 h at 400 °F (204 °C)	
Viscosity increase at 100 °F (38 °C), %	10
TAN increase	4.2
Specimen Weight Losses, mg/cm²	
Aluminum	0.00
Silver	0.02
Copper	0.40
Steel	0.08
Magnesium	0.02
SOD Lead Corrosion	
1 h at 325 °F (163 °C), mg/in.²	+0.48
Ryder Gear Test Rating, average, lb/in.	2200
Panel Coker, 24 h at 550 °F (288 °C)	
15 s splash, 45 s soak, mg coke	38

TYPICAL CHARACTERISTICS

Physical characteristics of Mobil SHC 824 and 825 gas turbine lubricants are not shown in the data sheet table. Those values not shown as maximums or minimums are typical characteristics which may vary slightly.

APPLICATION

Mobil SHC 824 and 825 gas turbine lubricants are recommended for use as circulating oils for the lubrication of land based gas turbines. They are particularly applicable to the small units, under about 3000 hp, used as standby power units and in some types of total energy systems. They are not recommended for use in steam turbines.

Mobil SHC 824 gas turbine lubricant is approved by Solar, Division of Caterpillar Tractor and the Garret Corporation for use in their gas turbines. It also meets the requirements of the General Electric Model 7000 gas turbine. Mobil SHC 825 gas turbine lubricant is approved by Cooper Bessemer for use in their gas turbines. Both products are also suitable for use in gas turbines from other manufacturers where their viscosities comply with the manufacturer's requirements.

While Mobil SHC 824 and 825 gas turbine lubricants preferably should be installed as the initial fill in the types of units for which they are recommended, units in service with other lubricants can be converted to them quite readily. Prior to the installation of Mobil SHC 824 or 825 gas turbine lubricant, the system should be drained, flushed and cleaned according to the procedure recommended by the equipment manufacturer. During the initial stages of operation on the first fill of the Mobil SHC product, as with any new fill of turbine lubricant, the filters and screens should be checked regularly for evidence of deposit materials being flushed from the system.

HEALTH AND SAFETY

Based on available toxicology information, when properly used and handled these products have little potential health effect. No special precautions are suggested beyond attention to good personal hygiene including avoiding prolonged, repeated skin contact. A detailed Material Safety Data Bulletin discussing these products is available upon request from your local Commercial office.

ADVANTAGES

When used in land based gas turbines, Mobil SHC 824 and 825 lubricants will provide the following advantages and benefits:

Broader temperature range of application
Better resistance to heat soakback
Reduced deposit formation
Extended intervals between overhauls
Reliable flow and lubrication after cold starts

Mobil Product Data Sheet

Mobil Vacuoline® 1400

Vacuoline 1405 | 1409

Mobil Vacuoline Oil 1405 and 1409 are two high quality lubricants developed specifically to satisfy the requirements of machine tools which utilize one common oil for the hydraulic and way oil systems.

In the lubrication of machine tool table ways, chatter and stick-slip can occur when the force necessary to overcome starting friction is greater than the force necessary to overcome friction after motion of the table begins. Under these conditions, when the table begins to move it tends to jump forward and, then, stop until the feed mechanism catches up. When mechanical conditions are such to cause the occurrence of this type of stick-slip, it can, in many cases, be prevented by using a lubricant such as Mobil Vacuoline 1405 or 1409. These oils possess the necessary lubricity properties to eliminate chatter and stick-slip of table and slideways, and reduce the starting friction so that it is no greater than the moving friction. These oils are also extremely stable for service as a hydraulic media in systems where conditions are not severe. Thus, Mobil Vacuoline 1405 and 1409 oils provide an optimum balance between the different requirements of hydraulic oils and slideway lubricants.

Characteristic	[illegible]	Vacuoline 1409
Gravity API	30.0	28.0
Pour °F (C), Max.	15 (-9.4)	20 (-6.7)
Flash °F (C), Min.	385 (196.8)	390 (198.0)
Viscosity		
SUS at 100°F	153/160	315/335
SUS at 210°F	43.0	54.5
cSt at 40°C	28.8/32.0	61.2/68.0
cSt at 100°C	5.04	8.44
Color, ASTM, Max.	3.0	3.0
ISO Vis Grade	150	315
ISO VG	32	68

PRODUCT DESCRIPTION

Mobil Vacuoline 1405 and 1409 oils are formulated from high quality, chemically stable, solvent refined, high VI base stocks combined with carefully chosen additives that provide the specific properties required in a combination hydraulic/way lubricant. These oils, when used under light to moderate load conditions provide excellent performance characteristics including demulsibility, rust protection, resistance to deposit formulation, and equal protection of table and slideways.

Two viscosity grades are available to accurately meet the requirements of hydraulic pump and machine tool builders utilizing dual functional lubrication systems. Furthermore, they conform to ISO viscosity grades 32 and 68. Mobil Vacuoline 1405 and 1409 oils have excellent load carrying capability and lubricity to ensure smooth chatter-free movement of table and slideways, thus eliminating metal-to-metal contact and stick-slip of ways.

These oils possess excellent oxidation stability to resist formation of lacquer and deposits in the hydraulic system under normal operating conditions. They also have superior anti-corrosion properties which protect the slideways from rusting and staining.

TYPICAL CHARACTERISTICS

Physical characteristics of Mobil Vacuoline 1405 and 1409 are shown in the data sheet table. Those values which are not shown as maximums or minimums are typical characteristics which may vary slightly.

APPLICATION

Mobil Vacuoline 1405 and 1409 are premium quality products recommended for use primarily in new or existing machine tools which provide lubrication of the ways or slideways by bleeding oil from its hydraulic systems. Most machine tools being built in the United States today have individual lubricant reservoirs for the way and hydraulic oils. However, combination way and hydraulic systems are not uncommon and are most often utilized on machine grinder tools.

Some of the machine tool builders who incorporate combination way-hydraulic systems in the machine tools they build (normally grinder tools) are:

Mobil Vacuoline 1400

rown and Sharpe Mfg., Co.

:incinnati Milacron, Inc.

ellows Corp., Div. of Emhart Corp.

eald Machine, Div. of Cincinnati Milacron

/arner and Swasey — Grinding Div.

n addition to the above machine tool builders, ileason Works and Moore Special Tool Company nake special machine tools intended for specific pplications — which often times are designed to use ne combination way-hydraulic lubrication systems.

s is always the case, the preference of the individual nachine tool builder determines whether Mobil acuoline 1405 and 1409 should be used. Since vis- osity is the most important lubricant characteristic, vo viscosity grades are available to satisfy the total scosity requirements of any plant having these A ns.

Mobil's representative will be glad to assist in selecting the most suitable product grade, taking into consideration all of the various factors. In some instances, other types of industrial lubricants — of which Mobil has a complete line — may be indicated.

ADVANTAGES

Mobil Vacuoline oil 1405 and 1409 offer the following advantages and benefits:

- Eliminate chattering and stick-slip on table and slideways.
- Helps maintain precision and surface finish of work pieces.
- Insures excellent operating performance of hydraulics.
- Long lubricant life.
- Reduced wear rates on table and slideways.
- Simplifies lubrication.

Mobil Product Data Sheet

Mobil D.T.E.® 797 Oil

Mobil D.T.E. 797 Oil is a high quality, double inhibited oil designed for the particularly long life demanded of oils used in direct connected steam turbine lubricating systems. Water due to condensation or steam leakage can be a constant problem in steam turbine systems. New oils of high quality will generally emulsify readily from water, and provide good protection against rusting. However, the oil in the system is held at elevated temperatures in the presence of air which tends to promote oxidation, and as oxidation progresses, some of the oxidation products may act as emulsion and foam stabilizers. Emulsions and foams increase rusting tendencies, and finely divided rust particles tend to further stabilize emulsion and foam, and act as catalysts to promote further oil oxidation. The effects are cumulative, can progress rapidly to sludging and deposit formation, and finally interfere with proper oil circulation and bearing lubrication. In order to achieve long life in this service, therefore, oils must have the maximum stable resistance to oxidation combined with good rust prevention, foam resistance and water separating characteristics. Additionally, such oils must be noncorrosive to system metals, and possess anti-wear characteristics where boundary lubrication conditions exist.

PRODUCT DESCRIPTION

Mobil D.T.E. 797 Oil* is a premium turbine oil manufactured from thermally refined base oils combined with an optimum additive package which provides exceptional chemical stability, cleanliness, and antirust protection.

In formulating Mobil D.T.E. 797 Oil, a crude source having a high quality paraffinic composition, long-term availability and superior additive response was selected. Pilot plant operations were employed to determine optimum refining conditions to provide a base stock which, with the optimum additive package, would exhibit superior resistance to oxidation, emulsion formation, etc. To select the best additive package, approximately 200 combinations were evaluated including antioxidants (conventional as well as experimental binary and ternary systems) rust inhibitors, metal deactivators, demulsifiers, demulsifiers and defoamers. The finally selected combination of base stocks and additive package provides exceptional stability and cleanliness due to the inherent properties of the base oil and the effectiveness of a synergistic antioxidant and rust inhibitor system. Additionally Mobil D.T.E. 797 Oil shows good demulsibility, low foaming tendency, good storage stability and is not corrosive to nonferrous metals.

In conjunction with the development of the improved Mobil D.T.E. 797 Oil formulation, a survey of nine prominent competitive premium turbine oils was conducted.

This survey included widely accepted chemical, physical, and performance tests used to evaluate steam turbine oils. Most of the tests are ASTM approved methods; the remainder are tests used by major utilities or ones developed by Mobil's laboratories to pinpoint salient features of steam turbine oils. The consistently high level of performance provided in the variety of tests rates Mobil D.T.E. 797 Oil the best overall of the nine competitive oils tested. Some products performed well in specific tests and showed up poorly in others.

Extensive field testing has been carried out both as initial fill and makeup in steam and gas turbines using a previous Mobil D.T.E. 797 Oil with successful results obtained.

Perhaps the single most important requirement of a steam turbine oil is its resistance to oxidation. Petroleum products exhibit a general tendency to react with oxygen, especially under conditions of elevated temperatures and in the presence of active metals and water, to form polymeric materials and organic acids. These reaction products can deposit on metal surfaces and prevent proper lubrication by plugging oil lines and filters and by affecting the lubricating film. Obviously, this tendency toward oxidation must be minimized if a turbine oil is to provide long term satisfactory service. Steam turbine oils must be able to provide many years of satisfactory service in order to be considered high quality products.

One of the best known tests for evaluating the ability of a turbine oil to resist oxidation in long term service is the

Characteristics	
API Gravity	33.4
Specific Gravity	0.858
Flash Point, min. F (C)	410 (210)
Pour Point, max. F (C)	25 (−4)
Viscosity	
SUS @ 100F	159/166
SUS @ 210F	44.5
cSt @ 40C	28.8/32.0
cSt @ 100C	5.6
ISO Viscosity Grade	32
Viscosity Index, min.	115
Color ASTM, max.	0.05
Emulsion ASTM D 1401	
@ 130F (54C)	
ml @ 15 min.	0
Rust ASTM D 665	
(dist. & syn. sea water)	pass
TOST, hr to 2NN	6000/7000

*Not available in all areas.

...obil D.T.E. 797 Oil

...STM Turbine Oil Stability Test (TOST) (ASTM D 943). ...this test, a sample of the oil, containing copper and steel ...ecimens as catalysts, is held at 203 F (95C) while oxygen ...bubbled through the oil. The most significant observation ...the number of hours before the Neutralization Number ...otal Acid Number) reaches a value of 2.0, and the ...mount of sludge present after 2500 hours. Mobil D.T.E. ...97 Oil requires 6000-7000 hours to reach a Neutraliza...on Number of 2.0, and 2000-3000 hours for an increase ...0.20 NN. After 2500 hours, Mobil D.T.E. 797 Oil shows ...xceptional cleanliness with only 0.06% deposits. The ...sual builder specifications require 1000 hours to reach ...0, and no specification limit on deposits, therefore, Mobil ...T.E. 797 Oil far exceeds the minimum requirements of ...e turbine builders. Significantly also, Mobil D.T.E. 797 ...il permits no blackening of the copper specimen, and no ...sting of the steel specimen, indicating that it neither ...fects nor is affected by either of these metals, and that ...provides excellent corrosion protection, even after ex...nsive oxidation.

...ust protection in steam turbine oils is of considerable im...rtance since rusting can contribute to several problems. ...ust particles carried in the oil tend to stabilize emulsions ...d foam, and act as catalysts to promote oil oxidation. ...[illegible] same time, rust itself is damaging to metal surfaces, ...[illegible] particles can be abrasive when carried into bear...gs [illegible] ...y block clearances in hydraulic governor systems.

...obil D.T.E. 797 Oil permits excellent water separation as ...dicated by complete separation in 15 minutes in the ASTM ...mulsion Test (D 1401). This indicates that any water enter...g the oil will be separated in the purification system and ...t be carried through the lubrication system to promote ...sting. At the same time, it provides excellent rust ...otection for oil wetted metal surfaces as indicated by the ...t that it passes the ASTM Rust Test (D 665) with both ...stilled water and synthetic sea water.

...am resistance of turbine oils is normally determined by ...e ASTM Foam Test (D 892). In this test a sample of the ...l is blown with air for 5 minutes. The amount of foam ...rmed is measured immediately after blowing, and again ...er a 10 minute rest period. In this test, Mobil D.T.E. 797 ...l shows only 90 ml of foam immediately after blowing, ...d this foam collapses completely before the end of 10 ...nutes. These are considered to be very acceptable results.

...der starting and stopping conditions in turbines, oil films ...y be partially squeezed out of the bearings, resulting in ...undary lubrication. Under these conditions, the additives ...Mobil D.T.E. 797 Oil, by chemical action, form tenacious, wear resistant films on exposed metal surfaces, greatly decreasing the possibility of harmful wear.

TYPICAL CHARACTERISTICS

Typical characteristics of Mobil D.T.E. 797 Oil are shown in the data sheet table. Those values which are not shown as maximums or minimums are typical characteristics which may vary slightly.

APPLICATION

Mobil D.T.E. 797 Oil is recommended for use in the circulation systems of direct connected steam turbines, and in ring oiled bearings of both direct connected and geared turbines when the oil temperature does not exceed 140 F (60 C). In turbines where it is used as the bearing oil, it is also recommended for oil lubricated components of valve mechanisms.

Mobil D.T.E. 797 Oil meets the requirements of all major United States steam turbine builders' specifications and in most cases exceeds the performance tests stipulated.

Activated clay or fullers' earth type filters should not be used in purification systems handling Mobil D.T.E. 797 Oil. These filters may remove part of the additives incorporated in the oil.

Mobil D.T.E. 797 Oil may be used as makeup oil in systems presently using the previous formulation of this product. Since a major requirement for a new turbine oil formulation is compatibility with previous fillings, the new Mobil D.T.E. 797 Oil was tested with 15 samples of a previous filling in use since 1960. The comparisons were made using blends of 10%, 50% and 90% of new to used oils. In all cases, the addition of the new formulation showed improved performance of the blend over the used oil alone.

ADVANTAGES

Mobil D.T.E. 797 Oil will provide the following outstanding advantages and benefits:

- Outstanding oxidation stability
- Longer oil life under all service conditions
- Better protection from rusting
- Reduced varnish and sludge in turbine systems
- Better separation of water
- Greater resistance to foam and emulsions

Mobil Product Data Sheet

Mobil SHC 600 Series

Mobil® SHC 600 Series

High Temperature Gear and Bearing Lubricants

The Mobil SHC® 600 Series is a family of gear and bearing lubricants based on Mobil's synthesized hydrocarbon fluids that are designed for applications where service conditions are severe because of high operating and bulk oil temperatures. An increasing amount of industrial equipment, either as a result of high temperatures in the process involved or as a result of heavy loads, operates at temperatures that can cause rapid oxidation and deterioration of mineral oil based lubricants. These conditions may require frequent lubricant ...ges and system cleaning, and in extreme cases, there ... risk of damage to gears, bearings, and other machine ...ents. Lubricants formulated from synthetically derived base oils that are more resistant to thermal and oxidative degradation can offer advantages of extension of lubricant life, reduced risk of damage to machine elements, and reduction of maintenance schemes. The products in the Mobil SHC 600 Series, in addition to outstanding thermal and oxidation stability resulting from use of Mobil's synthesized hydrocarbons as base fluids, are formulated to have excellent gear load carrying ability. They have proved in extensive field evaluations that they can give sufficiently extended service life to provide overall economic benefits.

PRODUCT DESCRIPTION

Mobil SHC 624, 626, 629, 630 and 634 lubricants are formulated from synthesized hydrocarbon base fluids combined with additives to provide enhanced oxidation stability, corrosion protection, and gear load carrying ability. The synthesized hydrocarbon base fluids provide much better thermal and oxidation stability than do conventional mineral oils, and with viscosity indexes over 130 also provide higher viscosities at high temperatures than mineral oils of comparable viscosity grades. Since these high viscosity indexes are inherent properties of the synthesized hydrocarbon fluids, there is virtually no permanent loss of VI and viscosity as a result of mechanical shearing in service, even in heavily loaded gear applications.

Mobil SHC 629 lubricant has a similar base fluid and additive system to the rest of the series, but in addition contains a VI improver to provide very high viscosity at high temperatures.

The FZG (Forschungsstelle für Zahnräder und Getriebebau) Spur Gear Test is receiving increasing acceptance for the

Characteristic	Mobil SHC 624	Mobil SHC 626	Mobil SHC 629	Mobil SHC 630	Mobil SHC 634	Mobil SHC 639
Gravity, API	34.4	34.4	34.4	34.4	34.4	32.7
Specific Gravity, 60/60°F (15.6/15.6°C)	.853	.853	.853	.853	.853	.862
Pour Point, °F (°C), max	-65 (-54)	-65 (-54)	-65 (-54)	-60 (-46)	-40 (-40)	-40 (-40)
Flash Point, °F (°C), min	440 (227)	450 (232)	460 (238)	480 (238)	500 (260)	460 (252)
Viscosity						
cSt at 40°C	27.5/32.0	56/60.8	134/147	210/240	385/405	1056
SUS at 100°F	146/168	290/340	700/770	1100/1250	1950/2150	5000
SUS at 210°F	—	—	—	—	—	460/490
Viscosity Index	135	135	135	145	145	180
Color, ASTM	L 1.0	L 1.0	L 1.0	L 1.0	3.0	L 3.0
ISO Viscosity Grade	32	68	150	220	—	1000
Rust Test, ASTM D 665, distilled water	Pass	Pass	Pass	Pass	Pass	Pass
Copper Corrosion, ASTM D 130						
24 h at 212°F (100°C)	2A	2A	2A	2A	2A	2A

Mobil SHC 600 Series

valuation of the load carrying ability of lubricants for industrial gear sets. In this test, a pair of long addendum spur gears is immersed in a bath of the test lubricant brought to 90°C (194°F) prior to starting the test. Due to the long addenda of the teeth, the sliding speed at the tips of the teeth is high and closely approaches current commercial practice. Torsional loading is applied to the gears in a series of increasing stages, with a 15 min run at each load stage. Failure is reported if the wear in any load stage exceeds 10 mg weight loss of the gears. Mobil SHC 624, 626 and 629 lubricants pass the 11th load stage in this test. These results are at least equivalent to the best current commercial industrial gear lubricants, and considerably exceed the 9th stage minimum required to meet the American Gear Manufacturers Association (AGMA) extreme pressure gear lubricant specification. In the Four-Ball Wear Test run at 1800 rpm and 200°F (93°C) for 60 min with a 40 kg load, the Mobil SHC 600 lubricants give typical wear scar diameters of about 0.45 mm. This is about equivalent to what is expected for good extreme pressure lubricants run under the less severe normal conditions of 1200 rpm and 167°F (75°C) for 60 min with a 40 kg load.

The excellent high temperature stability of Mobil SHC 600 S[illegible] lubricants has been demonstrated in Mobil's T30 to[illegible]on test. In this test, a sample of oil is held at an elevated temperature and stirred with copper pellets in the presence of steel, bronze and air. At a test temperature of 300°F (149°C), Mobil SHC 624 lubricant increased in viscosity (measured at 210°F) by 7.3 percent after 28 days. By comparison, a high quality inhibited mineral oil showed viscosity increased in viscosity (measured at 210°F) by 21.0 percent under the same test conditions.

Mobil SHC 600 lubricants have been field tested in a wide variety of applications, primarily where high operating oil sump temperatures resulted in short life and considerable difficulty with deposits and lubricant thickening when mineral oil based lubricants were used. Test equipment included both open and enclosed gear sets, and circulating systems supplying various types of bearings. In these cases, the Mobil SHC 600 product showed an extension of lubricant life of from two to six times, with a considerable reduction in deposits and system cleaning at the time of lubricant changes. In most cases, the benefits obtained readily justified the additional initial cost of the Mobil SHC 600 lubricant.

TYPICAL CHARACTERISTICS

Physical and chemical characteristics of the Mobil SHC 600 Series lubricants are shown in the data sheet table. These values not shown as maximums or minimums are typical values which may vary slightly.

APPLICATION

Mobil SHC 624, 626, 627, 629 and 634 lubricants are recommended for use in industrial gears and bearings where operating oil sump temperatures are such that conventional lubricants give unsatisfactorily short life or result in high maintenance costs for system cleaning and lubricant changes. The products can be used for both open and enclosed gear sets and for heavily loaded plain or rolling element bearings, and are suitable for application by bath, splash, or circulation systems. Selection of the proper viscosity must be based on such factors as operating temperature, type of gears or bearings, speeds, loads, and method of application. Splash or bath systems generally require higher viscosity lubricants than similar units equipped with circulation systems. Mobil's representative can assist in the selection of the correct viscosity grade for any specific application.

Mobil SHC 629 lubricant is recommended specifically for low to moderate speed plain or rolling element bearings operating at high temperatures or under heavy loads. Typical applications include plastics calender and mixing roll bearings, as well as roll neck bearings in other industries where high roll temperatures result in high operating temperatures for the bearings.

The base fluids used in the Mobil SHC 600 Series lubricants are chemically similar to mineral oils so seals that are suitable for use with mineral oils are usually suitable for use with the Mobil SHC 600 Series lubricants, provided they are used within their prescribed temperature ranges. While no special precautions are required when changing a system that has been operating on a mineral oil base product to one of the Mobil SHC 600 Series lubricants, the maximum benefits from the use of the Mobil SHC 600 product will be obtained when it is installed in a clean system. However, care must be exercised in the selection of equipment coatings (using Mobil SHC 624-634). Contamination with relatively small amounts of oxidized mineral oil may result in undesirable degradation of the Mobil SHC 600 lubricant, so the system should be thoroughly cleaned and flushed wherever possible.

Since the base fluids used in the Mobil SHC 600 Series lubricants are closely related to conventional mineral oils in hydrocarbon structure, no special precautions are required when handling the Mobil SHC 600 products. As with mineral oils, good personal hygiene should be practiced. Clothing that has been splashed or soaked with a Mobil SHC 600 lubricant should be removed immediately and laundered before reuse. Skin that has come in contact with one of the products should be washed with soap and water. Spills should be wiped up promptly to prevent the possibility of slips and falls.

ADVANTAGES

When used in high temperature gear and bearing applications, the Mobil SHC 600 Series lubricants provide the following advantages and benefits:

Outstanding oxidation stability at elevated temperatures	
Excellent wear protection and load carrying ability	
Improved system cleanliness through reduction of deposits	
Extended lubricant life resulting in lower maintenance and lubrication costs	

Mobil Product Data Sheet

Mobil Vactra® Oil

Numbered Series

Mobil Vactra Oil, numbered series, is a group of oils specially formulated for the proper lubrication of machine tool ways and slides.

Machine tool components that slide on ways must move smoothly and uniformly if close tolerances and good finishes of the machined parts are to be produced. Sliding surfaces normally operate under conditions of boundary lubrication where surfaces are separated by extremely thin films of oil. If these thin films fail, interlocking and welding of minute high spots on the mating surfaces will occur. This can produce a momentary stoppage of travel, with rapid movement after adhesion is broken. The erratic or uniform movement that results is referred to as "stick-slip" or "table chatter", and it can result in poor finishes or inaccuracy of the part being machined.

The use of a way oil which is too heavy for its assigned task will also create problems. A heavier than needed way oil will produce a full fluid film on which the table will ride. This is an undesirable condition because it permits the table to float-up or rock on its ways which will cause inaccuracies in the machining process.

Proper way lubricants can prevent the stick-slip effects by providing superior boundary lubrication. Also, by maintaining an oil film during shut down periods, it resists the formation of rust or corrosion. At the same time, they must be available in a sufficient choice of grades to permit selection of the correct viscosity to maintain boundary lubrication for each combination of way loading, speed and operating temperature.

PRODUCT DESCRIPTION

Mobil Vactra Oil, numbered series, is formulated from high-quality base oils combined with additives that provide good extreme pressure characteristics, adhesiveness, foam resistance, rust protection, [illegible] wetting and superior lubricity.

Characteristic	Mobil Vactra Oil No. 1	[illegible] Oil No. 2	Mobil Vactra Oil No. 3	Mobil Vactra Oil No. 4
Gravity, API	30.0	30.0	29.0	28.5
Specific Gravity	0.878	0.878	0.881	0.886
Pour Point, max. F (C)	20 (-7)	20 (-7)	20 (-7)	20 (-7)
Flash Point, min. F (C)	315 (157)	340 (166)	350 (177)	350 (177)
Viscosity				
SUS at 100°F	150/165	315/355	470/520	1045/1165
SUS at 210°F	46.0	55.0	63.0	92.0
cSt at 40°C	28.8/32.0	61.2/68.0	90/100	198/220
cSt at 100°C	5.3	8.6	10.7	18.0
Color, ASTM	7.0	7.0	7.0	7.0
Friction Test ASTM D 2877	Excellent	Excellent	Excellent	Excellent
Rust Test ASTM D 665	Pass	Pass	Pass	Pass
ASLE & CINCO Corrosion and Heat Stability Test	Pass	Pass	Pass	Pass

Mobil Vactra® Oil

he E.P. additive and lubricity agents effectively iminate stick-slip and chatter by preventing the iterlocking and welding of asperities of mating way urfaces under thin film, boundary lubrication conditions. This reduces the break-away force requirement or table movement, allowing smooth, uniform motion ven at low table speeds.

his characteristic was proven in the Mobil sliding iction test machine and the Cincinnati Millicron ydrotel Test. Through both of these tests, the superior ability of the Vactra Oils to resist the effects of iction and provide maximum machining accuracy as demonstrated to a degree never previously obtained with any product.

he Mobil Vactra way oils also provide excellent rust rotection and the high level of oxidation stability rge circulating way systems require. These properties were evaluated in the ASTM D-665 Rust Test here the excellent results obtained demonstrated the r ts exceptional stability.

he M l Vactra Oils are very stable products with an dditive package designed to provide the necessary otection for way surfaces without affecting the products filterability. This is an important quality because ome conventional way oils employ additives to improve their load carrying and friction reduction levels hich repeatedly plug the applicator filters. The oil ow stoppage resulting from the plugged filters will ause increased stick-slip and way surface wear. In aluating the Mobil Vactra Oils by the Bijur Filter est, results showed they caused no variation in flow filter plugging during the entire test.

he metal wetting and adhesion agents enable the obil Vactra Oils, numbered series, to form uniform ms that resist squeezing from way surfaces while e machine is not in operation. By effectively preventing stick-slip, the wear of way surfaces is minimized and their service life is greatly lengthened.

obil Vactra Oil, numbered series, is available in ur grades chosen to meet the existing requirements way lubricants for the majority of machine tools.

PICAL CHARACTERISTICS

y l and chemical characteristics are shown in the table. Those values which are not indicated minimums or maximums are typical characteristics d may vary slightly.

APPLICATION

The Mobil Vactra Oils, numbered series, are recommended for the lubrication of machine tool slides and ways. They are suitable for use with all conventional way materials as well as with the non-metallic materials utilized in newer machine tool design. Their outstanding lubricity and antiweld additives makes them particularly suitable for application where extreme machining precision, slow work or tool feed rates, or heavily loaded way surfaces demand uniform motion.

Mobil Vactra Oil, numbered series, perform well in many headstocks and translating screws on machine tools operated at normal speeds.

Mobil Vactra Oil, numbered series, may be applied by hand oiler, force feed lubricator or in flood application by circulating system. In dual purpose hydraulic and way lubricant systems, Mobil Vactra Oil of the proper viscosity can be used where bulk oil temperatures do not exceed 125°F (52°C). In systems where the dual purpose oil lubricates gears and ways, these oils are suitable for the lubrication of spur, bevel and lightly loaded worm gears.

Mobil Vactra Oil No. 2 is generally recommended for ways on small to medium size machine tools of all kinds, and for flood application in large machines. Vactra Oil No. 4 is the normal recommendation on large machines where way pressures are high or extreme precision is required. Vactra Oil No. 1 is generally recommended for dual purpose hydraulic and way lubrication service. Dual purpose gear and way lubrication systems usually require Vactra Oil No. 3 or No. 4.

ADVANTAGES

Mobil Vactra Oil numbered series, offer the following benefits and advantages:

- Elimination of stick-slip and table chatter
- Permits the highest precision and finish possible with even the slowest table speeds
- Outstanding load carrying and antiwear performance
- Excellent rust and corrosion resistance
- Suitable for dual purpose applications
- Minimizes wear on all types of way material
- Excellent filterability and demulsibility
- Endorsed by hundreds of machine tool builders

Mobil Product Mobil D.T.E. 20 Series
Data Sheet

Mobil D.T.E.® 20 Series

Super Stabilized Antiwear Hydraulic Oils

The Mobil D.T.E. 20 series of high quality oils has been developed specifically to satisfy the requirements of hydraulic systems using the newer, high-pressure, high-output pumps. The large growth in hydraulic operation of systems on mobile equipment has resulted in the development of pumps that are smaller, yet deliver greater volumes of fluid at higher pressures than were thought practicable a few years ago. Since response time is improved when a smaller volume of fluid at higher pressure is used, high pressure pumps are also being increasingly applied in hydraulic systems of machine tools and other industrial applications. Pump vanes or pistons, control valves, and linear and rotary actuators of hydraulic systems all operate with boundary or mixed film lubrication so that wear protection must be provided by thin oil films. As pressures and operating speeds are increased, the loading on these thin films is increased, and the fluid must provide greatly enhanced antiwear or film strength characteristics to protect against excessive wear. At the same time, oxidation and foaming resistance, demulsibility, and rust and corrosion protection must be maintained at high levels to avoid other operating problems.

PRODUCT DESCRIPTION

The Mobil D.T.E. 20 series was developed in cooperation with pump and hydraulic system component manufacturers to provide the superior antiwear and film strength characteristics necessary for the new high pressure hydraulic pumps that are coming into wide use. They are formulated from high quality, chemically stable, high VI base stocks combined with additives chosen to provide the specific properties required in hydraulic fluids. Compared to the best automotive oils, they provide superior performance characteristics including demulsibility, rust prevention, and resistance to deposit formation, and equal antiwear protection. In addition, the viscosities are chosen to accurately meet the requirements of hydraulic pump builders and coincide with the new ISO viscosity grades. Furthermore, their functional characteristics permit a wide range of industrial applications other than in hydraulic systems.

In the development of the Mobil D.T.E. 20 [illegible] a super stabilized additive system was selected that prevents or neutralizes the formation of corrosive materials. This technology maintains the excellent antiwear properties of the previous formulation, while providing excellent multimetal compatibility. The new additive system also provides better thin oil film protection (TOFT) against rusting, superior oil cleanliness retention and improved compatibility with water.

Characteristics	Mobil D.T.E. 24	Mobil D.T.E. 25	[illegible]
Gravity, API	32	31.5	31
Specific Gravity	0.867	0.873	0.877
Pour Point, max. °F (°C)	0 (−18)	0 (−18)	0 (−18)
Flash Point, min. °F (°C)	395 (202)	395 (202)	400 (204)
Viscosity			
SUS at 100°F	150/165	215/240	315/355
SUS at 210°F	43.6	47	54.2
cSt at 40°C	28.8/32.0	41.4/46.0	61.2/68.0
cSt at 100°C	5.0	6.2	7.9
ISO Viscosity Grade	32	46	68
Viscosity Index	95	95	95
Rust, ASTM D 665, A & B	Pass	Pass	Pass
or, ASTM, Max.	3.0	3.0	3.5
Cincinnati Milacron, Inc. C M Co Heat Test 1 Week at 275 °F (135°C)	Pass	Pass	Pass

Mobil D.T.E. 20 Series

TYPICAL CHARACTERISTICS

Typical and chemical characteristics of the Mobil D.T.E. 20 oils are shown in the data sheet table. Those values which are not shown as maximums or minimums are typical characteristics which may vary slightly.

APPLICATION

Mobil D.T.E. series oils are recommended for hydraulic applications in industrial, marine and mobile service. These oils are Mobil's primary recommendation for all hydraulic applications including the newer, high-pressure systems in industrial service, especially when the equipment manufacturer specifies the use of antiwear type hydraulic fluids.

Since Mobil D.T.E. 20 series oils are the primary hydraulic recommendation at all times, application consists mainly of selecting the proper grade for the particular system. Selection of the correct viscosity is based on ambient and bulk fluid temperatures, as well as operating pressure and design characteristics of the pump and system. Mobil D.T.E. 24 is recommended frequently for small gear pumps, vane pumps and both radial and axial piston pumps. Mobil D.T.E. 25 is recommended as the oil meeting the viscosity requirements of vane pumps and gear pumps operating at high pressures or temperatures. It is also recommended for radial and axial piston pumps. Mobil D.T.E. 26 meets the viscosity requirements for many vane pumps and is an excellent product to normally plant inventory when a single oil is desired to replace one of 150 SUS (32 cSt) at 100°F (38°C) and another oil of 300 SUS (65 cSt) at 100°F (38°C).

Some hydraulic equipment manufacturers specify a preferred viscosity (at 100°F) for vane and axial piston pumps. Mobil D.T.E. 24 is recommended where a 150 second oil is specified; Mobil D.T.E. 25 for a 250 second oil and Mobil D.T.E. 26 for a 300 second oil. Other manufacturers base their recommendations on pump pressures. When this pressure is below 1000 psig (70 kg/cm²), Mobil D.T.E. 24 is recommended; below 1500 psig (105 kg/cm²), Mobil D.T.E. 25; and over 1500 psig (105 kg/cm²), Mobil D.T.E. 26.

Mobil D.T.E. 20 series oils are also recommended for many circulation, splash, bath and ring oiling systems supplying lubricant for the bearings and gears of industrial machinery. Their adaptability to these applications can greatly reduce inventory and lubrication costs where these oils are required for hydraulic use. They are not recommended for steam turbine or ammonia refrigeration compressor service. Where unusually high temperatures are not involved, Mobil D.T.E. 25 may be used as the lubricant in single-stage reciprocating compressors up to 80 psig (5.6 kg/cm²) or in two-stage reciprocating compressors up to 150 psig (10.5 kg/cm²) of the type normally used for producing "plant" air.

ADVANTAGES

Mobil D.T.E. 20 series oils offer the following advantages and benefits:

- Excellent keep-clean performance for systems critical to deposit build-up, especially for more sophisticated control mechanisms.
- Carefully controlled demulsibility which allows the oils to work well when contaminated with small amounts of water and separate readily from large amounts.
- Multimetal compatibility under wet and dry conditions important in newer pump designs using steel and copper alloys.
- Excellent protection against rust and gentle thin oil film inhibition to protect surfaces which are only momentarily wetted by oil.
- Superior protection against wear due to outstanding load carrying and antiwear properties as evaluated in pump tests and the FZG gear test.
- Worldwide availability.

Mobil Product Data Sheet

Mobil Delvac® 1200

Commercial Automotive Engine Oils

Mobil Delvac 1200, a recently improved series of premium quality oils, is designed for most severe commercial on-highway automotive service in either diesel or gasoline engines. These heavy-duty engine oils can thus be recommended for mixed fleet use.

Turbocharged engine designs which develop greater power per cubic inch of piston displacement (greater specific output) are now being used to meet the power needs of the heavier on-highway vehicles being used today. At the same time, traffic density in terminal areas has increased markedly so that these higher specific output engines may spend a great portion of their time idling, or pumping off loads at high engine speeds for prolonged periods, or in low temperature service. Delvac 1200 series oils have proven consistently in the most grueling on-highway type operation in the world's turbocharged diesel engines including those of Mack, Cummins, Caterpillar, and Detroit Diesel that they can maintain superior engine cleanliness and wear control. In many of these models, oil consumption has been cut back through improved piston ring designs thus taxing the diesel engine oil even further. Improved Delvac 1200 has demonstrated capability for quality retention under these conditions. This same characteristic lends itself to the use of this new series in fleets desiring to extend oil drains beyond the builder norms.

Economy diesel fuels with higher sulfur content have also come into wider use in some areas. These developments mean that oils for engines can be exposed to greater contamination during all services. Therefore, oils for the varied use of on-highway equipment must provide good control of high temperature deposits, sludge, rust, corrosion, and wear resulting from the use of these fuels.

PRODUCT DESCRIPTION

Mobil Delvac 1200 series oils are highly stable, high VI base oils incorporating an extremely effective balance of ashless dispersants and metallic detergents, and additives to provide oxidation, wear, corrosion, and rust inhibition. All grades contain defoamants to control foam and minimize the amount of entrained air.

These oils are designed with a balanced additive package to provide superior control of low temperature stud, deposits (for cleaner oil screens, rocker arms, and valve train assemblies) combined with resistance to high temperature varnish (that causes ring sticking and wear) and to valve and

Characteristics	Mobil Delvac 1210	Mobil Delvac 1230	[illegible]	Mobil Delvac 1340
SAE No.	10W	20W-20	30	40
Gravity	30.1	27.8	27.0	26.9
Specific Gravity	0.876	0.889	0.893	0.894
Pour Point, °F (°C)	-25 (-32)	-12 (-29)	-10 (-23)	+5 (-15)
Flash Point, °F (°C)	410 (210)	430 (221)	467 (239)	466 (241)
Viscosity				
CP at 0 °F (max.)	2400	3500	—	—
SUS at 100 °F	182	323	530	718
SUS at 210 °F	46	55	68	76
cSt at -18 °C	2050	6200	—	—
cSt at 40 °C	35.5	62.7	103	142
cSt at 100 °C	6.2	8.8	12.0	14.4
Viscosity Index (ASTM D 2270)	115	109	103	100
Color, ASTM	4.5	4.5	8.0	8.5
Sulfated Ash, % wt.	1.0	1.0	1.0	1.0
Total Base Number (Mobil Method 308)	8	8	8	8

[illegible]obil Delvac 1200

mbustion chamber deposits. The combination of engine cleanliness and antiwear characteristics provided by them [illegible]ll ensure long engine life with minimum wear under [illegible]vere operating conditions. In addition, they provide out-[illegible]nding protection against low temperature rust and corro-[illegible]n. The high level of reserve alkalinity provides protection [illegible]ainst the strong acids that are formed by severe oxidation [illegible]d/or the combustion of diesel fuels containing high sulfur. [illegible]ey also minimize the formation of damaging deposits in [illegible]soline engine positive crankcase ventilation (PCV) valves.

[illegible]bil Delvac 1200 oils are available in a full range of single [illegible]cosity grades from SAE 10W through SAE 40. This pro-[illegible]es the proper selection for any vehicle in any type of [illegible]vice, and under most climatic conditions.

[illegible]PICAL CHARACTERISTICS

[illegible]emical and physical characteristics of the Mobil Delvac [illegible]00 series are shown in the data sheet tables. They are [illegible]ical values which may vary slightly.

[illegible]PLICATION

[illegible] [illegible]lvac 1200 oils are recommended for use in comme-[illegible]rc[illegible] service in either gasoline or diesel engines, and [illegible]reis[illegible] are particularly applicable to mixed fleet opera-[illegible]ts. They will provide outstanding performance under [illegible]ditions of high speed, high load, high temperature opera-[illegible]n or low speed, low temperature operation encountered [illegible]ver-the-road, short haul, pickup and delivery, and stop-[illegible]-go types of service. They are Mobil's primary recom-[illegible]ndations in commercial service for gasoline engines in-[illegible]porating emission control systems.

[illegible] recent years, there has been a trend for some manu-[illegible]turers to issue quite detailed and binding specifications [illegible]ining the minimum quality of oils that are suitable for use [illegible] their engines. Some other manufacturers recommend oils [illegible]cording to widely recognized specifications issued by [illegible]ous public bodies.

[illegible] either case, the specifications are usually written in terms [illegible] minimum performance standards in certain industry ac-[illegible]ted engine tests such as the MS Sequence Tests or some [illegible] the single cylinder diesel engine tests. Typical of the [illegible]nufacturer prepared specifications are Ford Motor Com-[illegible]y's ESE M2C 101C for oils for passenger cars and trucks, [illegible] General Motors Corporation's GM 6041-M for oils for [illegible]senger cars and light trucks. For heavy duty commercial service, the most commonly used specifications issued by a public body are U.S. Military Specification MIL-L-46152 and MIL-L-2104C. Some of these specifications place greater emphasis on some performance areas than on others, but products meeting several of the most common ones will offer good performance over a wide range of service.

Mobil Delvac 1200 series meets or exceeds the performance requirements of on-highway equipment engine builders, the military, and the equivalent American Petroleum Institute (API) service classifications. These include U.S. Military Specifications MIL-L-46152 and MIL-L-2104C, Ford Motor Company ESE-M2C 144C, General Motors GM 6041-M, Detroit Diesel 7SE 270 (Rev. 1-75), Mack EO-J and API Service Classifications CC, CD, and SE. In meeting these API classifications, Delvac 1200 series also conform to the requirements of Cummins, Mack, Detroit Diesel, and Cater-pillar. The satisfactory performance of these oils in meeting these requirements has been confirmed in laboratory engine testing and extensive field controlled operation. Mobil Delvac 1210 and 1230 have been approved by Detroit Diesel Allison Division of General Motors Corporation as Type C-2/C-3 Fluids meeting their semiautomatic (power shift) transmission requirements, as well as all frictional characteristics for their automatic transmissions. These combined requirements (C-2 plus friction) have been defined as Type C-3 Fluids by Allison. For all off-highway operations where Caterpillar equipment predominates, however, the performance of Mobil Delvac 1300 series may be desired.

ADVANTAGES

Mobil Delvac 1200 oils will offer the following outstanding advantages and benefits:

- Permit one oil for all highway fleet engine applications.
- Meet current automotive engine oil specifications — both diesel and gasoline fueled.
- Provide superior control of high temperature varnish deposits and wear.
- Minimize low temperature sludge buildup.
- Offer outstanding protection against rust and corrosion.
- Single viscosities available for all service and most climatic conditions.
- Protection against effects of high sulfur diesel fuels.
- Reduce number of products required in mixed-fleet highway applications.

Mobil Product Data Sheet

Mobil Delvac® 1300 Commercial Automotive Engine Oils

Mobil Delvac 1300 series of single viscosity, super heavy duty oils was developed primarily for high output diesel engines, both naturally aspirated and supercharged types, operating under severe conditions, or having design characteristics or using fuel tending to produce excessive wear or deposits. This type of oil is being recommended with increasing frequency by many manufacturers where high sulfur fuel or other severe conditions are encountered. The higher specific outputs and higher speeds of many of the newer engines have resulted in increasing sensitivity to piston and ring groove deposits, which may be further aggravated by the use of poor quality fuels. Oils of an extremely high level of detergency can be helpful in controlling these deposits, provided their other characteristics are such that they provide a proper balance of all of the desirable features of good engine oils.

PRODUCT DESCRIPTION

Mobil Delvac 1300 series oils are formulated from selected base oils combined with additives that greatly reduce the amount of metallic (ash-forming) material that must be incorporated to provide especially effective control of piston deposits in severe diesel service.

Sulfur is considered to have an adverse effect on the general condition and wear life of many engines, and highly detergent oils have proven to be a practical and powerful means of overcoming or greatly retarding the potentially ill effects of high sulfur fuels. Conventional oils for this service use large amounts of metallic detergents which can effectively control piston deposits, but may contribute excessively to harmful deposits in the valve and combustion areas.

Mobil Delvac 1300 series oils contain a minimum additive package which provides the high detergent level desired but with much less of the metallic ingredient. In addition, this additive system provides improved dispersancy for more effective control of sludge and deposits in severe low temperature operation. Increased antiwear protection is also provided, and the oxidation stability of the oils is enhanced.

These high quality engine oils are approved against U.S. Military Specification MIL-L-2104C. They also meet the industry specifications of the Caterpillar Tractor Company as Superior Engine Lubricants (Series 3) as well as Mack's EO-H Diesel Quality and Ford's M2C101-B gasoline engine requirements. All oils of this series meet Caterpillar's Transmission Fluid Specification [illegible]-2. Mobil Delvac 1310 and 1330 have been approved by Detroit Diesel Allison Division of General Motors Corporation as Type C-3 Fluids meeting their semiautomatic (power shift) transmission requirements, and all frictional characteristics for their automatic transmissions.

Characteristics	Mobil Delvac 1310	Mobil Delvac 1320	Mobil Delvac 1330	Mobil [illegible]	Mobil Delvac 1350
SAE No.	10W, 20	20W, 20	30	40	50
Gravity, API	28.0	25.0	27.0	26.5	26.0
Specific Gravity	0.882	0.887	0.893	0.898	0.898
Pour Point, max. °F (°C)	-25 (-32)	-10 (-23)	0 (-18)	+5 (-21)	10 (-12)
Flash Point, min. °F (°C)	405 (207)	410 (210)	425 (218)	445 (229)	450 (238)
Viscosity					
SUS at 100 °F	371	349	585	839	1200
SUS at 210 °F	48	55	67	78	98
cSt at 40 °C	79	88	139	194	228
cSt at 100 °C	8.4	8.8	11.8	14.7	19.4
Viscosity Index, min.	110	101	98	95	97
Sulfated Ash, % wt.	1.4	1.4	1.4	1.4	1.4
Total Base Number (Mobil Method 308)	13	12	12	12	12
Color, ASTM	7	7.5	8	8	8

Mobil Delvac 1300

TYPICAL CHARACTERISTICS

Chemical and physical characteristics of the Mobil Delvac 1300 series oils are shown in the data sheet table. Those values not shown as maximum or minimum are typical characteristics which may vary slightly.

Extensive field service has shown that these oils will provide superior control of deposits in high output automotive diesels operating on fuels with medium to high sulfur content, while also maintaining excellent control of wear and minimizing the buildup of combustion chamber and valve-area deposits. In mixed fleet use they have also provided excellent control of low temperature deposits and sludge in gasoline engines.

APPLICATIONS

Mobil Delvac 1300 series oils are recommended for use in high output diesel engines in fleet and contractor service where fuel sulfur content or other severe service factors dictate that this type and quality of oil is desirable. These oils are also recommended for gasoline engines, especially those operating under severe service conditions in mixed fleet operations. They are approved for the [illegible]

U.S. Military Specification MIL-L-2104C

Caterpillar Tractor Company Superior Engine Lubricants (Series 3)

Mack EO-H Diesel Quality Requirements

Ford M2C101B Gasoline Engine Requirements

Caterpillar Transmission Fluids Specification TO-2

General Diesel Allison Division, General Motors Corporation as Type C-3 Fluids (Delvac 1310 and 1320).

While not primarily recommended for gasoline engine service, the superior control of high temperature deposits offered by Mobil Delvac 1300 series oils offers benefits under conditions of severe operation. The good low temperature dispersancy and antiwear characteristics of these oils also ensure that they will provide acceptable performance throughout the range of gasoline engine operating conditions. These oils will satisfy the quality requirements for car manufacturers' warranties. Therefore they are recommended for mixed fleet use especially where it is desirable to minimize ordering and handling.

Mobil Delvac 1300 series oils are not recommended for use in engines having silver bearings or subject to salt water contamination of the crankcase.

ADVANTAGES

Mobil Delvac 1300 series oils offer the following advantages and benefits:

Top protection against the effects of high-sulfur fuels
Good control of high temperature deposits
Long engine life and low maintenance costs
Greater freedom from ring sticking and ring and cylinder wear
Reduced engine deposits in valve and combustion areas
Improved valve life in critical applications
Better protection against wear in general
Good control of low temperature sludge and deposits

Mobil Product Data Sheet

Mobil D.T.E. Oil

Named Series Circulation Oils

Mobil D.T.E. Oil, Named series, is a family of high quality, double inhibited, circulation oils designed for use in a wide variety of industrial equipment that uses lubricating oil on a recirculating basis. The eight grades available permit the selection of the correct viscosity for ensuring temperatures ranging from 20 F to 250 F (−7 C to 121 C) in such applications as enclosed gear drives, hydraulic systems, and plain and antifriction bearings. These oils provide optimum lubrication for equipment ranging from high speed machine tool spindles to heavy paper mill dryer cans and plastic calender rolls, and the comparatively slow and bearing systems of marine steam turbines. While system capacities may vary from a few quarts to several hundred or thousand gallons, the recirculation of the lubricating oil is intended to extend the service life of the machine with relatively infrequent oil changes. Good circulation oils must therefore resist oxidation and thickening, prevent the formation of harmful deposits, resist foaming, protect metals from rust and corrosion, separate readily from water and provide good antiwear characteristics. High viscosity index is also desirable to maintain the correct viscosity over as wide a range of operating temperatures as possible.

Characteristic	Mobil D.T.E. Oil Light	Mobil D.T.E. Oil Medium	Mixed D.T.E. Oil Heavy Medium	Mobil D.T.E. Oil Heavy	Mobil D.T.E. Oil Extra Heavy	[illegible] Oil [illegible]	Mobil D.T.E. Oil AA	Mobil D.T.E. Oil HH
Gravity, API	33.7	32.8	28.9	29.2	28.0	27.5	28.2	28.7
Specific Gravity	0.857	0.858	0.879	0.882	0.887	0.890	0.887	0.900
Pour, °F (°C)	20 (−7)	20 (−7)	20 (−7)	20 (−7)	25 (−4)	25 (−4)	25 (−4)	25 (−4)
Flash, °F (°C)	370 (201)	400 (207)	400 (204)	410 (210)	420 (2213)	440 (227)	480 (2329)	520 (271)
Viscosity								
SUS at 100 °F	150/165	215/240	315/355	470/440	710/790	1045/1188	1530/1700	2215/2460
SUS at 210 °F	44	48	58	60	78	93	110	132
cSt at 40 °C	27.3/32.0	41.4/49.0	61.2/69.0	78.2/84.2	133/150	196/220	285/320	414/480
cSt at 100 °C	5.3	6.6	8.6	9.0	14.1	18.0	21.9	28.2
VI, min	100	100	100	100	95	95	95	95
ISO Viscosity Grade	32	46	68	64.2	150	220	320	460
Color, ASTM, max	1.5	2.0	2.5	2.5	6.5	7.5	8	8
Neutralization Number	0.20	0.20	0.20	0.20	0.60	0.60	0.60	0.60
Rust Test (A & B) (ASTM D665-IP135)	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Demulsibility (ASTM 1401) 3 ml mist at 130 °F (54 °C) ½ hr at 180 °F (82 °C) 1 hr	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass

PRODUCT DESCRIPTION

The Mobil D.T.E. Oil, Named series, is formulated from premium quality, chemically stable, high VI base stocks. The inherent stability of these base stocks is further enhanced by the addition of oxidation inhibitors which provide resistance to thermal degradation over long periods of time in the presence of entrained air and catalyzing metals. Additional benefits are gained from the use of defoamants to ensure that entrained air is released and metal deactivators to prevent corrosion and reduce the catalytic effect of system metals. To protect system metals from entrained, condensed moisture, all grades contain a rust inhibitor selected for its ability to maintain its effectiveness over long periods of time. In addition, these oil formulations exhibit good demulsibility, which permits water and other contaminants to readily separate from the oil in the system reservoir.

In many applications such as paper machine dryer roll bearings, the oil is continuously exposed to high temperatures. The high viscosity grades, Mobil D.T.E. Oil Extra Heavy through HH, are formulated expressly for this type of service. Therefore, in addition to the other desirable characteristics of the series, these grades contain a special compound designed to help prevent the formation of harmful sludge and varnish deposits during extended periods of high temperature operation.

'he most important characteristic of a circulation oil is its bility to resist oxidation and the formation of oxy-products uring extended service. One of the tests for evaluating his property is the ASTM Turbine Oil Stability Test (TOST) ASTM D943). In this test, a sample of the oil, containing opper and steel specimens as catalysts, is held at 203 F 95 C) while oxygen is bubbled through it. The significant bservation is the number of hours before the Neutralization umber (Total Acid Number) reaches a value of 2.0. Typically, Mobil D.T.E. Oil Light requires approximately 4000 ours to reach this value, compared to about 2-3,000 hours or many competitive oils of the same viscosity. Other grades f the series show excellent results in this test, although haracteristically, the number of hours will decrease with e higher viscosity grades.

YPICAL CHARACTERISTICS

hysical and chemical characteristics of the Mobil D.T.E. il, Named series are shown in the data sheet table. Those lues not shown as maximums or minimums are typical haracteristics which may vary slightly.

PP 'CATION

'his ous of oils is intended primarily for continuous recirculation where design factors and maintenance practices sure y leakage losses. They are fed under pressure or ravity- o all parts requiring lubrication and drain back to e system reservoir for reuse. Specialized uses of circulation oils include steam and hydraulic turbines and hydraulic ystems. Circulation oil applications also include ring-, ollar-, and chain-oiled bearings; splash oiling; and bath ystems.

'he field of use of the Mobil D.T.E. Oil, Named series, is road, therefore only a general guide to the applications can e furnished in this data sheet. Mobil D.T.E. Oil Heavy edium, Heavy, and Extra Heavy are recommended for arine steam turbines and their associated reduction gears, ccording to the viscosity specifications of the equipment uilder. For industrial enclosed spur or bevel gears, lubricant viscosity selection is based on speed, load, and operating temperatures, and applications exist for all grades from obil D.T.E. Oil Light through HH. Where simplification of ant lubrication programs is desired, the heavier grades ave also been satisfactory for light to moderately loaded onventional worm gears.

Systems designed to lubricate plain and antifriction bearings require that the oil selection be based on operating speed and temperature. Grade recommendations vary from Mobil D.T.E. Oil Light for lightly loaded bearings at speeds up to 3600 rpm and low ambient temperatures, to Mobil D.T.E. Oil HH for low speed, heavily loaded bearings at high operating temperatures. Similar recommendations apply to oil lubricated electric motors and gear motors.

Moderate pressure hydraulic systems and hydraulic control systems generally require oils of the viscosity of Mobil D.T.E. Oil Light through Heavy Medium. Some gear pumps require Mobil D.T.E. Oil Extra Heavy grade, and some installations require a product as heavy as Mobil D.T.E. Oil BB. Compressors and vacuum pumps in other than refrigeration service can generally be lubricated with Mobil D.T.E. Oil Light through Extra Heavy. Heavy Medium is used extensively in water cooled single and two stage compressors.

The heavier grades, Mobil D.T.E. Oil Extra Heavy through HH, are particularly suited for lubrication of the antifriction bearings of paper mill dryer rolls, plastic film calenders and paper corrugators, where their excellent resistance to the formation of harmful deposits produces outstanding benefits. An antiwear additive is included in these grades to provide additional protection in critically loaded areas; therefore, they find wide application as gear and bearing lubricants in coal pulverizers and a variety of other ore and rock crushing machinery.

ADVANTAGES

Mobil D.T.E. Oil, Named series, provides the following outstanding advantages and benefits:

- Superior oxidation stability
- High resistance to the formation of deposits and to viscosity increase
- Excellent long term protection against rust and corrosion
- Good demulsibility for rapid separation of water
- Good antiwear characteristics
- Longer intervals between oil changes and system cleanups
- Proven performance over years of service
- Extensive choice of viscosities

Mobil Product Data Sheet

Mobilgrease® 28

Mobilgrease 28 is a nonsoap, synthetic-hydrocarbon-fluid type grease formulated to lubricate bearings and other mechanisms operating at high speeds and extremes of low and high temperatures. Technological developments in industry are frequently slowed by the inability of existing lubricants to function satisfactorily at the temperatures, speeds or loads that are encountered in many special applications. Many of these problems became critical first in the aviation industry where weight and speed are major factors in design. Some years ago, performance demands of some components, such as aircraft wheel bearing assemblies, exceeded the capability of the existing specialty greases and a cooperative study between Mobil and the Military was undertaken to find an improved solution to the problem. As a result of this study, Mobilgrease 28, an oil fields product, was developed. In aircraft applications Mobilgrease 28 has been outstanding and its use in industrial applications offers a solution to many difficult grease lubrication problems where design or operating factors impose temperature, speed, or load conditions that exceed the performance capabilities of the best conventional greases.

PRODUCT DESCRIPTION

Mobilgrease 28 is a completely synthetic lubricant, manufactured from a synthetic hydrocarbon fluid and a nonsoap thickner. It has extreme pressure characteristics and excellent resistance to water washing, as well as being effective over an extremely wide range of operating temperatures. Mobilgrease 28 is dark red in color, has a smooth buttery structure and a consistency between an NLGI No. 1 and No. 2 grease.

The chemical similarity of the synthetic hydrocarbon fluid of Mobilgrease 28 to petroleum products obviates several problems that have been of concern with other synthetic greases. Seal materials that are satisfactory with petroleum products are also satisfactory with Mobilgrease 28. In addition, slight contamination of Mobilgrease 28 with a previously used petroleum product or petroleum type grease will not cause compatibility problems that could result in excessive softening or hardening.

Mobilgrease 28 meets the requirements of U.S. Military Specification MIL-G-81322 A Grease, General-Purpose, Aircraft. The specification describes a grease intended for use over the temperature range from —65 F (—54 C) to 350 F (177 C) for such applications as aircraft landing wheel assemblies, control systems and actuators, screwjacks, servo mechanisms, sealed-bearing motors, oscillating bearings and helicopter rotor bearings. The qualification requires that the grease perform satisfactorily for extended periods in high speed bearings operating at 350 F (177 C), offer low starting and running torque at —65 F (—54 C), and provide good extreme-pressure and friction-reducing characteristics. Mobilgrease 28 exceeds the requirements of the specification in all respects.

During the development of Mobilgrease 28, extensive laboratory and full scale tests were conducted. One of the most significant was in F 4 C Phantom Jet brake and wheel assemblies in simulated rejected takeoffs. During the test, brake disc stack temperatures exceeded 2000 F (1093 C), and bearing temperatures exceeded 580 F (304 C). In spite of these temperatures and the accompanying heavy loads, bearings lubricated with Mobilgrease 28 performed satisfactorily, and both the bearings and grease were judged capable of further service.

Other tests indicated that Mobilgrease 28 offers unique ability to prevent friction oxidation (so-called fretting) and lubricate antifriction bearings under conditions of high loads, speeds and temperatures. It has also shown superior ability to lubricate heavily loaded sliding mechanisms such as wing flap screwjacks.

In summary, Mobilgrease 28 offers outstanding performance over wide temperature ranges, with excellent retention and resistance to high temperature segregation. In addition, it resists water washing, provides superior load carrying ability, reduces frictional drag, and prevents excessive wear.

TYPICAL CHARACTERISTICS

Physical and chemical characteristics of Mobilgrease 28 are shown in the data sheet table. These values not shown as maximums or minimums are typical characteristics which may vary slightly. In addition, pertinent test properties are given to exhibit performance characteristics of the grease.

APPLICATION

Mobilgrease 28 is recommended for the lubrication of plain and antifriction bearings at low to high speeds, and splines, screws, worm gears, and other mechanisms where high friction reduction, low wear, and low lubricant friction losses are required. It provides minimum resistance to starting at extreme low temperatures (down to —65 F, —54 C) as well as low running torque.

Mobilgrease 28 is recommended for use in landing wheel assemblies, control systems and actuators, screwjacks, servo devices, sealed-bearing motors, oscillating bearings and helicopter rotor bearings on military and civil aircraft. It should be used wherever a grease meeting U.S. Military Specification MIL-G-81322 A is specified and may be used wherever MIL-G-7711A is specified. It can also be used where the older, superseded specifications MIL-G-81322

Mobilgrease 28

[illegible]aracteristics	Mobilgrease 28
[illegible]ickener Type	Nonsoap
[illegible]uid Type	Synthetic Hydrocarbon
[illegible]olor	Dark Red
[illegible]ructure	Smooth, Buttery
[illegible]netration at 77 F	
Worked 60 X	265-320
Worked 100,000 X (% Change)	10
[illegible]opping Point, F (C) (ASTM D566, IP132)	500+ (260+)
[illegible]st Test (ASTM D1743)	Pass
[illegible]ad Wear Index, ASTM D2596, kg	40
[illegible]rrosion to Copper	
at 210 F (99 C)	Negative
[illegible]ter Resistance (ASTM D1264)	
% Washout at 105 F (40 C)	5
[illegible] kg, 2 hr, 1200 rpm	
at 1[illegible] (75 C) Steel-On-Steel (AST[illegible] D2266) Scar diam., mm	0.60
[illegible]poration (ASTM D972)	
22 hrs at 350 F (177 C), % Loss	7
[illegible] Separation	
30 hrs at 350 F (177 C), %	3.9
[illegible] Temp. Torque (ASTM D1478)	
—65 F (—48 C) Starting/Running g-cm 2202/180	
[illegible]bber Swell, ASTM D471	
[illegible] Type Synthetic, 1 wk	3%

(WP), MIL-G-3545B, and MIL-G-25760A may be called for, and will provide superior performance in all respects to products qualified under these older specifications.

Mobilgrease 28 is recommended for industrial grease lubrication applications including sealed or repackable ball and roller bearings, wherever extreme temperature conditions, high speeds or water washing resistance are factors. Typical applications where it has offered advantages are conveyor bearings, small alternator bearings operating at temperatures near 350 F (177 C), high speed miniature ball bearings, and bearing situations where oscillatory motion, vibration and fretting create problems.

Mobilgrease 28 is capable of retaining its consistency under high temperature and shear conditions over extended periods of operation. Therefore, it opens opportunities for the design of high output equipment. Mobil's representative will be glad to assist in the exploration of new uses for this product.

ADVANTAGES

- Improved friction reduction
- Low wear rates
- Low lubricant drag
- Wide temperature range
- High thermal stability
- Compatibility with mineral oil base greases
- Extreme pressure characteristics
- High resistance to water washing

[illegible]obil Oil Corporation COMMERCIAL PROGRAMS AND [illegible] DEPARTMENT 150 EAST 42ND STREET, NEW YORK, NEW YORK 10017

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Mobil Product Data Sheet

Mobilux® EP 0, 1, 2

Mobilux® EP 0, 1, 2

Extreme Pressure Industrial Greases

Mobilux EP 0, 1, and 2 are unleaded multipurpose, extreme pressure greases designed for normal through heavy-duty industrial applications. They are formulated to resist the effects of both the extremely heavy loads and shock loads to which plant equipment is commonly exposed. Heavy loads tend to squeeze lubricant from mating surfaces, and shock loads rupture the lubricant film, thus creating a condition of metal-to-metal contact and causing parts wear, shortening equipment life. Equipment experiencing these loading extremes may also be exposed to conditions where extremes of temperature, moisture, or water washing are present. Greases for these applications must provide good extreme pressure characteristics and oiling serenity to resist the pressures and pounding to which they are exposed. They must also provide good protection against rust and corrosion, resist water washing and dispersive and lubricate satisfactorily over a broad range of temperature. The Mobilux EP greases fulfill these requirements.

PRODUCT DESCRIPTION

The Mobilux EP greases are lithium 12 hydroxystearate soap based greases which contain an unleaded EP additive and oxidation, rust and corrosion inhibitors. They are smooth textured, brown colored greases in the NLGI No. 0, 1, or 2 consistency classification.

The use of lithium 12 hydroxystearate as the soap base for these greases ensures good resistance to softening under severe working, good water resistance and a consistency which will remain relatively constant over the recommended operating temperature range.

The extreme pressure characteristic of the Mobilux EP greases is supplied by an unleaded additive which provides them with exceptional wear protection, also improving their ecological acceptability. Other formulation improvements provide good water wash resistance, low temperature dispensing, and long service life in bearings operating at elevated temperatures.

The petroleum oil used in the greases meets the lubrication requirements of most heavy-duty industrial operations. It also provides low temperature pumpability and enhances the greases' high temperature oxidation resistance.

The Mobilux EP greases pass the ASTM Rust Test (D 1743) and are noncorrosive to steel and copper. The latter is of importance because of the use of bronze cages in many anti-friction bearings. The greases show good resistance to bleeding and superior resistance to water washout. Their load carrying and antiwear characteristics are illustrated by their Timken OK load of 40 lbs., 18.2 Kg.

Characteristic	Mobilux EP 0	Mobilux EP 1	Mobilux EP 2
NLGI No.	0	1	2
Structure	smooth	smooth	smooth
Soap Type	Unleaded Lithium 12 Hydroxystearate		
Color	brown	brown	brown
Penetration at 77°F (25°C)			
Unworked, min-max	350-390	305-340	265-300
Worked 60 strokes, min-max	355-385	310-340	265-295
Dropping Point, min, °F (C)	340 (171)	340 (171)	350 (177)
Mineral Oil %	92	89	87
Viscosity			
SUS at 100°F	790	750	750
SUS at 210°F	75	75	75
cSt at 40°C	143	143	143
cSt at 100°C	13.8	13.8	13.8
Timken OK Load, min, lb (kg)	40 (18)	40 (18)	40 (18)
Rust Test ASTM D 1743	Pass	Pass	Pass
Bomb Oxidation Stability			
ASTM D942			
PSI Drop, max	10	10	10

Mobilux EP 0, 1, 2

TYPICAL CHARACTERISTICS

Physical and chemical characteristics of the Mobilux EP greases are shown in the data sheet table. Values not shown as maximums or minimums are typical characteristics and may vary slightly.

APPLICATION

Mobilux EP greases are recommended for the lubrication of plain and rolling element bearings in normal through heavy-duty industrial applications. They are particularly recommended where loads are high or shock loads are present, or where severe vibration is a problem. They are also suitable for the lubrication of geared couplings. The softer grade may be considered for the lubrication of gear sets that do not have oil-tight cases.

Mobilux EP 0 and 1 greases have excellent handling and dispensing properties at low temperatures. The lowest recommended ambient temperature for operating bearings lubricated with Mobilux EP 0 or 1 is about -20°F (-29°C); and for Mobilux EP 2, a stiffer grease, about -10°F (-23°C).

All three Mobilux EP greases are recommended for the lubrication of plain bearings. The highest operating temperature recommended for these greases is 250°F (121°C). For continuous service at temperatures above 200°F, proper purging and relubrication frequencies are critical to maintenance of correct bearing protection.

The excellent water resistance and rust and corrosion protection afforded by the Mobilux EP greases makes them particularly applicable for equipment such as the wet ends of paper machines, steel mill hot strip rolling operations, underground mining equipment, tunneling projects and ore crushing plants where moisture or wet conditions are common. Their excellent dispensing characteristics will also be advantageous in many of these applications because of the exposed nature of the operations.

Mobilux EP greases are compatible with some other greases, particularly those made with lithium soap. However, the best procedure is not to mix greases of different soap types. When replacing another grease with a Mobilux EP grease, the previously used grease should be completely cleaned or flushed from the system.

In plants where human or animal foods are being processed, Mobilux EP greases, despite their unleaded extreme pressure formulation, are not recommended for applications where contamination of food could result. Mobilux EP greases have U.S. Department of Agriculture (USDA) Category H2 approval.

ADVANTAGES

When used as recommended, the Mobilux EP greases will provide the following outstanding benefits and advantages:

- Superior lubrication under heavy or shock loading
- Good load carrying ability
- Longer service life in bearings at temperatures up to 250°F
- Good low temperature dispensing characteristics
- Excellent resistance to water washing
- Good rust protection and corrosion resistance
- Extreme pressure protection with an unleaded formulation
- Reduction of plant inventories through multipurpose capabilities

Mobil Cylinder Oils

600 W® Cylinder Oil
600 W Super Cylinder Oil
Extra Hecla® Super Cylinder Oil
Extra Hecla Super Cylinder Oil Mineral

Mobil Cylinder Oils are a family of premium quality, heavy bodied lubricants properly formulated and recommended for enclosed worm gearing, steam cylinder, bearing and coupling lubrication.

Industrial worm gearing utilizing a steel worm and bronze gear, is commonly used in many of today's industrial applications. Worm gear sets provide certain advantages which have long been recognized and ably demonstrated through proven performance. However, worm gearing lubrication differs significantly from the typical steel on steel gear applications and thus requires lubricants having special characteristics and qualities such as Mobil's Compounded Cylinder Oils.

The combination of high sliding velocity, prolonged tooth engagement and consequent heat generation coupled with ample availability of copper catalysts and oxygen can result in severely pro-oxidant service conditions. Tooth geometry and contact pressures are such that hydrodynamic films are not readily formed or maintained. Therefore, the primary requisites of a quality worm gear lubricant must be, (a) good oxidation stability and (b) effective surface protection for both steel and bronze gear elements under boundary lubrication conditions. Mobil's Compounded Cylinder Oils have long been recognized for their ability to satisfy these requirements.

Steam cylinder lubrication also requires oils possessing specific characteristics and qualities, but for different reasons than that of worm gear lubrication. In general, quality steam cylinder lubricants must be made from thermally stable base stocks scientifically selected and processed to enhance them with the characteristics required to make them suitable for adverse operating conditions which exist in steam cylinders. Extremely high operating temperature is a critical factor in lubricating steam cylinders which must be dealt with by using highly refined lubricants such as Mobil Cylinder Oils — products designed to combat and reduce buildup of harmful deposits.

PRODUCT DESCRIPTION

Mobil 600W Cylinder Oil is a heavy bodied lubricating oil, compounded to augment its film forming characteristics under normal to heavy load conditions. It is recommended for steam cylinders and splash lubrication of selected enclosed worm gear sets operating at moderate to high speeds and temperatures.

Mobil Super Cylinder Oils represent three unusually high quality, highly filtered steam cylinder oils possessing excellent lubricating properties and having effective resistance to thermal degradation. They are available in compounded and straight mineral grades.

The compounded grades available are Mobil 600W Super Cylinder Oil and Mobil Extra Hecla Super Cylinder Oil. These oils have the ability to resist the warming effect of moisture and are augmented by their ability to maintain adequate lubricating and sealing films in steam cylinders. The compounding also enhances their load carrying capabilities.

The straight mineral grade available is called Mobil Extra Hecla Super Cylinder Oil Mineral. It is particularly effective where efficient removal from moisture and condensate is essential.

TYPICAL CHARACTERISTICS

Physical characteristics of Mobil Cylinder Oils are shown in the data sheet table. Those values not shown as maximums or minimums are typical characteristics which may vary slightly.

	Gravity, API	Flash, °F (C)	Pour, °F (C)	Viscosity, SUS @ 100°F	SUS @ 210°F	cSt @ 40°C	cSt @ 100°C	Color, ASTM	VI	ASTM Visc. Grade	ISO VG
[illegible]	25.5	40 (4.44)	540 (281)	2000	142	375	29.0	Dk. Gr.	98	2150	
Mobil 600W Super Cylinder Oil	25.7	40 (4.44)	540 (282)	2500	155	486	31.7	Dk. Gr.	95		460
Extra Hecla Super Cylinder Oil	24.8	40 (4.44)	586 (296)	3850	196	680	40.7	Dk. Gr.	95		680
Mobil Extra Hecla Super Cylinder Oil Mineral	25.0	40 (4.44)	590 (310)	4600	230	830	47.3	Dk. Gr.	95	4660	

Mobil Cylinder Oils

PPLICATION

obil 600W Cylinder Oil is intended primarily for use in team lubricated enclosed worm gear sets operating at oderate to high speeds and temperatures. It is also recomended for lubricating steam cylinders, couplings, bearings, ıd break-in of compressor cylinders.

obil 600W Super Cylinder Oil and Mobil Extra Hecla uper Cylinder Oil are recommended for the same applicaons as Mobil 600W Cylinder Oil but because of their ıgher viscosity, have expanded application ranges in rms of high temperature and load condition.

obil Extra Hecla Super Cylinder Oil Mineral is primarily commended for use in steam cylinders operating at mperatures above 500°F. It is especially suitable for those rvices demanding a straight mineral oil, for example, here ready separation from condensate is necessary as in rtain steam process work.

Mobil's Commercial Representative will be glad to assist in selecting the most suitable product for your application, taking into consideration all the various factors. In some instances, other types of industrial lubricants — of which Mobil has a complete line — may be indicated.

ADVANTAGES

Mobil Cylinder Oils provide the following outstanding advantages:

- Good protection against rust and corrosion
- Preferential Wetting Ability (compounded grades)
- Good film strength
- High oxidation resistance
- Good demulsibility (mineral grade)
- Good foam resistance
- Excellent lubricity
- High chemical stability

Mobil Commercial Comments

FOR INTERNAL USE ONLY

ISSUED BY THE
COMMERCIAL MARKETING DEPARTMENT
OF MOBIL OIL CORPORATION

File 13-28

7/15/73

MOBILUX EP 111

What is it?

Mobilux EP 111 is an extreme pressure Lithium Lead Grease made with an extremely heavy oil and containing an oil soluble Moly additive package.

Why developed?

For the purpose of having a single grease capable of lubricating all grease lubricated couplings. An emphasis was placed on developing an extreme pressure grease to provide protection against wear in heavily loaded misaligned gear couplings and resisting centrifugal separation of oil from soap and additives at extremely high speeds. These are conditions commonly found in spindle and other type couplings in the Primary Metals Industry. Our Specialty House competition enjoys most of this high volume critical application requirement; therefore it was agreed our product must equal or outperform the best spindle coupling greases available today. This has been accomplished.

[illegible] GEAR TYPE SPINDLE COUPLING

Where are the "Benefit Areas?"

- Extend Coupling Life - less wear due to excellent EP qualities and heavy base oil viscosity.
- Reduce Lubricant Consumption - less leakage due to adhesive characteristics may allow extension of application and/or repack schedules.
- Reduce Labor Costs - extending application and/or repack schedules, fewer inspections and extended coupling life all tend to reduce associated labor costs.
- Reduce Scheduled & Unscheduled Downtime - this represents the biggest and the most important benefit in terms of labor dollars and production dollars. This benefit always exists when coupling life is extended.

These are the benefit areas to be explored. The lubricant plays its part but a poor maintenance or poorly run preventive maintenance system often will bury the performance qualities of your product.

Intended Application for Mobilux EP 111:

For all type grease lubricated couplings such as:

Gear
Grid or Spring
Slipper Joint
Spindle (Gear)
Chain

Operating at ambient temperatures up to 250°F.

May replace all commonly used Mobil coupling greases such as:

Sovarex L 0 & L 1
Mobilux EP 0 and EP 1
Mobilgrease 46 and 47
Mobiltemp 0, 1 and 78

This does not mean these greases are not good coupling lubricants but it does mean Mobilux EP 111 is our BEST coupling grease.

Mobil Product Information

ISSUED BY THE
COMMERCIAL MARKETING DEPARTMENT
OF MOBIL OIL CORPORATION

File 13:4C

Mobilux EP 111

Product Description

Mobilux EP 111 grease is designed for the lubrication of all types of grease lubricated couplings. It is an extreme pressure, unleaded, lithium 12 hydroxystearate, soap-base grease made with a very viscous oil and an extremely effective, heavy-duty additive package.

The extreme pressure properties combined with the heavy base oil provides excellent antiwear protection. This grease also provides outstanding resistance to centrifugal separation of the oil from the soap and additives at extremely high speeds.

In addition, Mobilux EP 111 grease has a NLGI No. 1 consistency classification and has good resistance to corrosion and rust.

Application

Mobilux EP 111 grease is Mobil Oil Corporation's primary recommendation for all types of grease lubricated couplings, particularly for heavily loaded misaligned gear couplings. It maintains its excellent performance characteristics with ambient temperatures up to 250 °F; however, it is not recommended for temperatures below 20 °F.

Mobilux EP 111 can also be used for the lubrication of slow moving open gears, plain bearings operating under heavy load, and slow speed conditions, as well as a chassis lubricant when high ambient temperatures are encountered.

Typical Characteristics

Physical characteristics of Mobilux EP 111 grease are shown in the data table. Those values not shown as maximum or minimum are typical characteristics which may vary slightly.

Advantages

When used as recommended, Mobilux EP 111 offers the following advantages and benefits:

Reduced wear.

Reduced downtime.

Lower maintenance costs.

Good high temperature stability.

Excellent resistance to oil separation.

Good resistance to corrosion and rust.

Characteristics	Method	Mobilux EP 111
Color	Visual	Dark Brown
Texture	Visual	Buttery with slight tack
Thickner Type	—	Lithium 12 Hydroxystearate
Cone Penetration @ 77°F Worked X 60	ASTM D-127	310/340
Mineral Oil Viscosity SUS @ 210°F	ASTM D-445/2161	200/225
Dropping Pt., °F, min.	D-2265	340
Roll Stability, % change, max.	—	5
Timken OK load, lbs., min.	ASTM D-2509	50
Four-Ball E.P. Test Weld load, kg. Load Wear Index	ASTM D-2596 *	 315 41
Four-Ball Wear Scar, mm	ASTM D-2266	0.43
Centrifugal Bleed, %, max.	TSL*	2
Bearing Corrosion, min.	ASTM D-1743	1.1
Bomb Oxidation, PSI drop, max. 100 hrs. @ 210°F	ASTM D-942	20

*Mobil Technical Services Laboratory

[redacted]

[illegible]	Test Method	Typical Properties
[illegible]lor	-	Black
[illegible]ructure	-	Smooth with graying
[illegible]ap Type	-	Lithium Lead
[illegible]GI Grade	-	No. 1
[illegible]ap Content, %	-	6 to 8
[illegible]opping Point, °F	ASTM D-2265	350
[illegible]ne Penetration @ 77°F	ASTM D-217	
Worked X 60		310 - 340
[illegible]neral Oil Viscosity	ASTM D-445/2161	
SUS @ 100°F		4600
SUS @ 210°F		200 - 225
[illegible] 4 OK Load, 800 RPM,	ASTM D-2509	
[illegible]s., Minimum		50
[illegible]ur Ball E.P. Test	ASTM D-2596	
Weld Load, Kg.		400
[illegible]ur Ball Wear Scar, mm.	ASTM D-2266	0.45
[illegible]rding Corrosion	ASTM D-1743	Pass
[illegible]ntrifugal Tests	Koppers	
Separation, %		
17300 g @ 75°F, Max.		Less than 2
5700 g @ 200°F, Max.		Less than 5

[illegible]bilux EP 111 contains Extreme Pressure Additives, oil soluble Moly, corrosion [illegible]hibitors and rust inhibitors. (An oil soluble Molybdenum additive is derived [illegible] reacting a Molybdenum compound with an organic compound. The resulting oil [illegible]luble Moly additive provides anti-wear properties equal to solid Moly plus [illegible]ates the possibility of the Moly being centrifugally separated.)

Alternate Applications For Mobilux EP 111:

Due to the unique properties of this product we feel there are several alternate uses for Mobilux EP 111. It is black, sticky, contains a soluble moly additive, has high EP values and contains a very heavy oil. What a beautiful list to choose from when you meet one of your customers that is a self made grease expert.

What can you add to this list of possible alternate uses:

Open Gears (Slow)
Plain Bearings (Bushings)
Chassis Grease (Summer)
5th Wheel

Limitations For Mobilux EP 111:

Do not recommend when ambient temperatures may exceed 250°F. We suggest Mobiltemp 78 for temperatures over 250°F.

Do not consider this product for rolling element bearings unless the operating conditions so dictate. (Very slow speed and heavily loaded - remember the base oil is 4000 + SUS @ 100°F.).

Low temperature pumpability may pose a problem due to the heavy base oil No laboratory test work has been done or is planned regarding this characteristic.

Mobil® SHC 824, 825

Gas Turbine Lubricants

Mobil SHC 824* and 825* gas turbine lubricants are based on Mobil's work in the field of synthesized hydrocarbons. Increasing numbers of gas turbines are being used in industrial and commercial service for such applications as standby power units and total energy systems. Standby units generally operate essentially unattended and start and pick up the load automatically in the event of a power failure. In winter when power failures are more apt to occur, the turbine and lubricating system often will be cold at startup. During periods of operation, temperatures will usually reach normal operating levels, but when the emergency is over and the system shuts down, heat soakback from the turbine may cause overheating of portions of the oil that do not drain completely from bearings and housings. Under these conditions, conventional mineral oil based lubricants may not have adequate low temperature fluidity for rapid circulation at startup. In addition, thermal and oxidative degradation during the hot soak period after shutdown may result in deposits that interfere with lubrication and necessitate maintenance for system cleaning and oil changes. The excellent low temperature fluidity of Mobil SHC 824 and 825 gas turbine lubricants, combined with their superior high temperature oxidation stability, help to minimize these problems and provide improved reliability with reduced maintenance cost.

*These products were marketed originally under their development designations RL 852A and RL 322B. Mobil and SHC are registered trademarks of Mobil Oil Corporation.

PRODUCT DESCRIPTION

Mobil SHC 824 and 825 gas turbine lubricants are nominal 150 SUS at 100°F (ISO VG32) and 225 SUS at 100°F (ISO VG46) gas turbine lubricating oils manufactured from Mobil's synthesized hydrocarbon base oils and a combination of additives designed to provide superior rust protection and oxidation stability. The synthesized hydrocarbons used as the base oils are chemically similar to mineral oils, and are fully compatible with them, but provide several advantages compared to mineral oils as a base for gas turbine lubricants. The synthesized base oils have superior oxidation stability, high natural viscosity indexes, low pour points, and excellent low temperature fluidity. The measured low temperature viscosities are generally below those predicted by extrapolation on an ASTM Viscosity-Temperature Chart from values measured at 100°F and 210°F. Since the high VI and good low temperature fluidity are inherent characteristics of the fluids, these properties do not change in service as a result of mechanical shearing or repeated cycling from high to low temperatures. The synthesized hydrocarbon fluids also have good response to many types of additives so their good oxidation stability can be enhanced with selected inhibitors, and they are resistant to foaming and have good air release properties.

Mobil SHC 824 and 825 gas turbine lubricants combine these properties to provide products that have the viscosity-temperature characteristics required for rapid circulation during startup at low ambient temperatures, adequate viscosity for proper lubrication at normal operating temperatures, and the stability to resist excessive degradation at the high temperatures that result from heat soakback after shutdown. They also provide the other desirable gas turbine lubricant features of good rust protection and resistance to foaming.

Characteristics	[illegible]	Mobil SHC 825
API Gravity	35.0	35.0
Specific Gravity 60/60°F (15.6/15.6°C)	0.835	0.835
Flash Point, °F (°C)	480 (249)	480 (249)
Fire Point, °F (°C)	520 (271)	520 (271)
Pour Point, °F (°C)	below −65 (−54)	below −65 (−54)
Viscosity		
cSt at −40°F (−40°C)	8820	15,867
cSt at −20°F (−29°C)	2450	4,270
cSt at 0°F (−18°C)	820	1,455
cSt at 100°F (38°C)	34.0	48.5
cSt at 210°F (99°C)	6.0	8.01
cSt at 40°C (104°F)	32.2	44.8
cSt at 50°C (122°F)	21.8	30.8
SUS at 100°F	159	225
SUS at 210°F	45.9	52.4
Viscosity Index	135	148
ISO Viscosity Grade	32	46
Total Acid Number (TAN)	0.2	0.2
Color, ASTM	L 4.5	L 4.5
Rust Test, ASTM D 665		
Distilled and Synthetic Sea Water	Pass	Pass
Foaming Tendency, ASTM D 892		
Immediately After Blowing		
Sequence I, II, III	0	0

Mobil SHC 824 825

uring the development of Mobil SHC 824 gas turbine lubricant, a number of tests that are used for the evaluation of the stability and antiwear properties of gas turbine lubricants were conducted. Significant results of some of these tests are included in Table 1. These tests were not conducted on Mobil SHC 825 gas turbine lubricant since the slight variation in the base oil blend required to make the higher viscosity of this product has no significant effect on the results of tests of this type.

ABLE 1

Test	Mobil SHC 824
Oxidation and Corrosion Test	
72 h at 347°F (175°C), 5 l/h air	
Viscosity Increase at 100°F (38°C), %	7.0
TAN Increase	1.4
Visual Sludge	Light
Specimen Weight Losses, mg/cm²	
Silver	0.08
Copper	0.11
Steel	0
Magnesium	0.04
Oxidation and Corrosion Test	
[illegible] 400°F (204°C)	
Viscosity Increase at 100°F (38°C), %	10
TAN Increase	4.2
Specimen Weight Losses, mg/cm²	
Aluminum	0.00
Silver	0.02
Copper	0.40
Steel	0.08
Magnesium	0.02
CD Lead Corrosion	
1 h at 325°F (163°C), mg/in.²	+0.48
Ryder Gear Test Rating, average, lb/in.	2200
Coker Cycles, 24 h at 550°F (288°C)	
15 s heated, 45 s cold, mg coke	28

obil SHC 824 gas turbine lubricant was evaluated in services by Solar, Division of International Harvester Company; Ford Motor Company; and Cooper Bessemer in the gas turbines they manufacture. As a result of this testing, Solar and Ford approved the product and endorse its use, but Cooper Bessemer expressed an interest in a slightly higher viscosity product. Mobil SHC 825 gas turbine lubricant was then formulated and made available to satisfy the Cooper Bessemer requirement.

TYPICAL CHARACTERISTICS

Physical and chemical characteristics of Mobil SHC 824 and 825 gas turbine lubricant are shown in the data sheet table. Those values not shown as maximums or minimums are typical characteristics which may vary slightly.

APPLICATION

Mobil SHC 824 and 825 gas turbine lubricants are recommended for use as circulating oils for the lubrication of land based gas turbines. They are particularly applicable to the small units, under about 3000 hp, used as standby power units and in some types of total energy systems. They are not recommended for use in steam turbines.

Mobil SHC 824 gas turbine lubricant is approved by Solar, Division of International Harvester Company; and by Ford Motor Company against their specification ESG-M2C125-A. Mobil SHC 825 gas turbine lubricant is approved by Cooper Bessemer for use in gas turbines of their manufacture. Both products are also suitable for use in gas turbines from other manufacturers where their viscosities comply with the manufacturer's requirements.

While Mobil SHC 824 and 825 gas turbine lubricants preferably should be installed as the initial fill in the types of units for which they are recommended, units in service with other lubricants can be converted to them quite readily. Prior to the installation of Mobil SHC 824 or 825 gas turbine lubricant, the system should be drained, flushed and cleaned according to the procedure recommended by the equipment manufacturer. During the initial stages of operation on the first fill of the Mobil SHC product, as with any new fill of turbine lubricant, the filters and screens should be checked regularly for evidence of deposit materials being flushed from the system.

No special precautions are required when handling Mobil SHC 824 or 825 gas turbine lubricants. As with conventional petroleum products, good personal hygiene should be practiced. Any spills should be mopped up completely to prevent falls, and clothing on which the products have been spilled should be removed immediately and laundered before reuse. Skin that has been exposed to the products should be washed with soap and warm water.

Mobil's representative can provide up-to-date information on approvals of Mobil SHC 824 and 825 gas turbine lubricants and more complete information on installation procedures and drain intervals.

ADVANTAGES

When used in land based gas turbines, Mobil SHC 824 and 825 lubricants will provide the following advantages and benefits:

Broader temperature range of application
Better resistance to heat soakback
Reduced deposit formation
Extended intervals between overhauls
Reliable flow and lubrication after cold starts

SECTION V
LUBE DATA SCHEDULE

LUBRICATION DATA SCHEDULE SORTED BY UNID NUMBER

UNID	COMPONENT NAME	PART TO LUBRICATE	LC	LUBRICANT	FC	APL	INST	QUANT	UP	ROUTE	T	R
ABC-MPMP-0002A	AUX BOILER FD PMP A	PUMP BEARINGS		SHC-626	CI	RES	086		MM		I	
		COUPLING		EP-111	CI	HG	087		MM		I	
		PUMP BEARINGS		SHC-626	SW	RES	081		OP	53-AXB	M	
		MOTOR BEARINGS		SHC-32	SY	GUN	082		ME		M	
ABC-MPMP-0002B	AUX BOILER FD PMP B	PUMP BEARINGS		SHC-626	CI	RES	086		MM		I	
		COUPLING		EP-111	CI	HG	087		MM		I	
		PUMP BEARINGS		SHC-626	SW	RES	081		OP	53-AXB	M	
		MOTOR BEARINGS		SHC-32	SY	GUN	082		ME		M	
ABF-MFAN-0005	AB FORCE DRAFT FAN	COUPLING		EP-111	SY	HG	087		MM		I	
		PILLOW BLOCK BEARINGS		SHC-32	SY	GUN	082		MM		M	
		MOTOR BEARINGS		SHC-32	SY	GUN	082		ME		M	
ABF-MPMP-0002A	AUX BOILER FD PMP A	PUMP BEARINGS		NONE	--	--			--		N	
		COUPLING		EP-111	CY	HG	087		MM		I	
		MOTOR BEARINGS		SHC-32	SY	GUN	082		ME		M	
ABF-MPMP-0002B	AUX BOILER FD PMP B	PUMP BEARINGS		NONE	--	--			--		N	
		COUPLING		EP-111	CY	HG	087		MM		I	
		MOTOR BEARINGS		SHC-32	SY	GUN	082		ME		M	
ACC-MFAN-0001A	WET COOL TWR FAN 1A	MOTOR BEARINGS		SH-32	SY	GUN	082		ME		I	
ACC-MFAN-0001B	WET COOL TWR FAN 1B	MOTOR BEARINGS		SHC-32	SY	GUN	082		ME		I	
ACC-MFAN-0002A	WET COOL TWR FAN 2A	MOTOR BEARINGS		SHC-32	SY	GUN	082		ME		I	
ACC-MFAN-0002B	WET COOL TWR FAN 2B	MOTOR BEARINGS		SHC-32	SY	GUN	082		ME		I	
ACC-MFAN-0003A	WET COOL TWR FAN 3A	MOTOR BEARINGS		SHC-32	SY	GUN	082		ME		I	
ACC-MFAN-0003B	WET COOL TWR FAN 3B	MOTOR BEARINGS		SHC-32	SY	GUN	082		ME		I	
ACC-MFAN-0004A	WET COOL TWR FAN 4A	MOTOR BEARINGS		SHC-32	SY	GUN	082		ME		I	
ACC-MFAN-0004B	WET COOL TWR FAN 4B	MOTOR BEARINGS		SHC-32	SY	GUN	082		ME		I	
ACC-MFAN-0005A	WET COOL TWR FAN 5A	MOTOR BEARINGS		SHC-32	SY	GUN	082		ME		I	
ACC-MFAN-0005B	WET COOL TWR FAN 5B	MOTOR BEARINGS		SHC-32	SY	GUN	082		ME		I	
ACC-MFAN-0006A	WET COOL TWR FAN 6A	MOTOR BEARINGS		SHC-32	SY	GUN	082		ME		I	
ACC-MFAN-0006B	WET COOL TWR FAN 6B	MOTOR BEARINGS		SHC-32	SY	GUN	082		ME		I	
ACC-MFAN-0007A	WET COOL TWR FAN 7A	MOTOR BEARINGS		SHC-32	SY	GUN	082		ME		I	
ACC-MFAN-0007B	WET COOL TWR FAN 7B	MOTOR BEARINGS		SHC-32	SY	GUN	082		ME		I	
ACC-MFAN-0008A	WET COOL TWR FAN 8A	MOTOR BEARINGS		SHC-32	SY	GUN	082		ME		I	
ACC-MFAN-0008B	WET COOL TWR FAN 8B	MOTOR BEARINGS		SHC-32	SY	GUN	082		ME		I	
ACC-MPMP-0001A	AUX CCW PUMP A	PUMP BEARING		SHC-626	CI	RES	086		MM		I	
		COUPLING		EP 111	CI	HG	087		MM		I	
		PUMP BEARING		SHC-626	SW	RES	081		OP	52-RAB	M	
		MOTOR BEARINGS (2)		SHC-626	SW	RES	081		OP	52-RAB	M	
		MOTOR BEARINGS (2)		SHC-626	CI	RES	086		MM		I	
ACC-MPMP-0001B	AUX CCW PUMP B	PUMP BEARING		SHC-626	CI	RES	086		MM		I	

UNID	COMPONENT NAME	PART TO LUBRICATE	LC	LUBRICANT	FC	APL	INST	QUANT	OP	ROUTE	T	R
		COUPLING		SHC-626	CY	HG	087		MM		I	
		PUMP BEARING		SHC-626	SW	RES	081		OP	52-RAB	M	
		MOTOR BEARINGS (2)		SCH-626	SW	RES	081		OP	52-RAB	M	
		MOTOR BEARINGS (2)		SHC-626	CY	RES	086		MM		Y	
ADM-MPMP-0001A	CHILL WTR ADMIN PMPA	MOTOR BEARINGS (2)		SHC-32	ST	GUN	082		ME		N	
ADM-MPMP-0001B	CHILL WTR ADMIN PMPB	MOTOR BEARINGS (2)		SHC-32	ST	GUN	082		ME		N	
AE -MPMP-0001A	AIR EVAC PUMP A	PUMP BEARINGS (2)		SHC-626	CY	RES	086		MM		I	
		COUPLING		EP 111	CY	HG	087		MM		I	
		GEAR DRIVE		SHC-630	CY	RES	086		MM		I	
		MOTOR BEARINGS (2)		SHC-626	CY	RES	081		MM		I	
		GEAR DRIVE		SHC-630	SW	RES	081		OP	51-T8	M	
		MOTOR BEARINGS (2)		SHC-626	SW	RES	081		OP	51-T8	M	
		PUMP BEARINGS (2)		SHC-626	SW	RES	081		OP	51-T8	M	
AE -MPMP-0001B	AIR EVAC PUMP B	COUPLING		EP 111	CY	HG	087		MM		I	
		GEAR DRIVE		SHC-630	CY	RES	086		MM		I	
		MOTOR BEARINGS (2)		SHC-626	CY	RES	086		MM		I	
		PUMP BEARINGS (2)		SHC-626	CY	RES	086		MM		I	
		GEAR DRIVE		SHC-630	SW	RES	081		OP	51-T8	M	
		MOTOR BEARINGS (2)		SHC-626	SW	RES	081		OP	51-T8	M	
		PUMP BEARINGS (2)		SHC-626	SW	RES	081		OP	51-T8	M	
AE -MPMP-0001C	AIR EVAC PUMP C	PUMP BEARINGS (2)		SHC-626	CY	RES	086		MM		I	
		COUPLING		EP 111	CY	HG	087		MM		I	
		GEAR DRIVE		SHC-630	CY	RES	086		MM		I	
		MOTOR BEARINGS (2)		SHC-626	CY	RES	086		MM		I	
		GEAR DRIVE		SHC-630	SW	RES	081		OP	51-T8	M	
		MOTOR BEARINGS (2)		SHC-626	SW	RES	081		OP	51-T8	M	
		PUMP BEARINGS (2)		SHC-626	SW	RES	081		OP	51-T8	M	
ANP-MFAN-0001A	ANP FAN A	FAN BEARINGS		SHC-32	ST	GUN	082		MM		N	
		MOTOR BEARING		SHC-32	ST	GUN	082		ME		N	
ANP-MFAN-0001B	ANP FAN B	FAN BEARINGS		SHC-32	ST	GUN	082		MM		N	
		MOTOR BEARING		SHC-32	ST	GUN	082		ME		N	
ARR-MFAN-0002A	ARR EXHAUST FAN A	BLOWER BEARINGS		SHC-32	ST	GUN	082		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
ARR-MFAN-0002B	ARR EXHAUST FAN B	BLOWER BEARINGS		SHC-32	ST	GUN	082		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
BAM-MPMP-0003A	BA MAKEUP PUMP A	COUPLING		EP 111	CY	HG	087		MM		I	
		PUMP BEARING		SHC-626	CY	RES	086		MM		I	
		PUMP BEARING		SHC-626	SW	RES	081		OP	52-RAB	M	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
BAM-MPMP-0003B	BA MAKEUP PUMP B	COUPLING		EP 111	CY	HG	087		MM		I	
		PUMP BEARING		SHC-626	CY	RES	086		MM		I	
		PUMP BEARING		SHC-626	SW	RES	081		OP	52-RAB	M	
		MOTOR BEARING		SHC-32	ST	GUN	082		ME		N	
BD -MPMP-0002A	BLOW DOWN PUMP A	COUPLING		EP 111	CY	HG	087		MM		I	
		PUMP BEARINGS (2)		SHC-626	CY	RES	086		MM		I	
		PUMP BEARINGS (2)		SHC-626	SW	RES	081		OP	52-RAB	M	
		MOTOR BEARINGS (2)		SHC-32	ST	GUN	082		ME		N	
BD -MPMP-0002B	BLOW DOWN PUMP B	PUMP BEARINGS (2)		SCH-626	CY	R&S	086		MM		Y	

LUBRICATION DATA SCHEDULE SORTED BY UNID NUMBER

UNID	COMPONENT NAME	PART TO LUBRICATE	LC	LUBRICANT	FC	APL	INST	QUANT	DP	ROUTE	I	R
		COUPLING		EP 111	CY	MG	087		MM		I	
		PUMP BEARINGS (2)		SCH-626	SW	RES	081		OP	52-RAB	N	
		MOTOR BEARINGS (2)		SHC-32	ST	GUN	082		ME		N	
BD -MPMP-0004A	FLASH TANK PUMP A	COUPLING		EP 111	CY	MG	087		MM		I	
		PUMP BEARING		SHC-626	SW	RES	081		OP	52-RAB	N	
		MOTOR BEARINGS (2)		SHC-32	ST	GUN	082		ME		N	
BD -MPMP-0004B	FLASH TANK PUMP B	COUPLING		EP 111	CY	MG	087		MM		I	
		PUMP BEARING		SHC-626	SW	RES	081		OP	52-RAB	N	
		MOTOR BEARINGS (2)		SHC-32	ST	GUN	082		ME		N	
BD -MPMP-0007	FILTER FLUSH TK PUMP	PUMP BEARING		SHC-626	SW	RES	081		OP	52-RAB	N	
		MOTOR BEARINGS (2)		SHC-32	ST	GUN	082		ME		N	
BD -MPMP-0009	REGEN WASTE TANK PMP	COUPLING		NONE	--	---			--		N	
		PUMP BEARING		SHC-626	SW	RES	081		OP	52-RAB	N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
BM -MPMP-0002A	REACTOR DRN TK PUMP	PUMP BEARINGS		SHC 626	CB	RES	086		MM		I	
		COUPLING		EP 111	CB	MG	087		MM		I	
		PUMP BEARING		SHC-626	SW	RES	081		OP	52-RAB	N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
BM -MPMP-0004A	FLASH TK PUMP A	COUPLING		EP-111	CY	MG	087		MM		I	
		MOTOR BEARINGS (2)		SHC-32	ST	GUN	082		ME		N	
BM -MPMP-0004B	FLASH TK PMP B	COUPLING		EP-111	CY	MG	087		MM		I	
		MOTOR BEARINGS (2)		SHC-32	ST	GUN	082		ME		N	
BM -MPMP-0006A	HOLDUP RECIRC PMP	COUPLING		EP 111	CB	MG	087		MM		I	
		PUMP BEARINGS		SHC-626	CB	RES	086		MM		I	
		PUMP BEARING		SHC-626	SW	RES	081		OP	52-RAB	N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
BM -MPMP-0006B	HOLDUP DRAIN PMP	COUPLING		EP 111	CB	MG	087		MM		I	
		PUMP BEARINGS		SHC-626	CB	RES	086		MM		I	
		PUMP BEARINGS		SHC-626	SW	RES	081		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
BM -MPMP-0006C	HOLDUP RECIRC DR PMP	COUPLINGS		EP 111	CB	MG	087		MM		I	
		PUMP BEARINGS		SHC-626	CB	RES	086		MM		I	
		PUMP BEARING		SHC-626	SW	RES	082		OP	52-RAB	N	
		MOTOR BEARINGS		SHC 32	ST	GUN	082		ME		N	
BM -MPMP-0012A	BA CONC A DIST PMP A	PUMP BEARINGS		SHC-626	SW	RES	081		OP	52-RAB	N	
		PUMP BEARINGS		SCH 626	CY	RES	086		MM		I	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
BM -MPMP-0012B	BA CONC B DIST PMP A	COUPLING		NONE	--	- -			--		N	
		PUMP BEARINGS		SCH 626	CY	RES	086		MM		I	
		PUMP BEARINGS		SHC-626	SW	RES	081		OP	52-RAB	N	
		MOTOR BEARINGS		SHC 32	ST	GUN	082		ME		N	
BM -MPMP-0013A	BA CONC A DIST PMP B	PUMP BEARINGS		SHC-626	SW	RES	081		OP	52-RAB	N	
BM -MPMP-0013B	BA CONC B DIST PMP B	PUMP BEARINGS		SHC-626	SW	RES	081		OP	52-RAB	N	
BM -MPMP-0015A	BA CONC A CONC PMP A	COUPLING		NONE	--	---					N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
BM -MPMP-0016A	BA CONC B CONC PMP A	COUPLING		NONE	--	- -			--		N	

UNID	COMPONENT NAME	PART TO LUBRICATE	LC	LUBRICANT	FC	APL	INST	QUANT	DP	ROUTE	T	R
		MOTOR BEARINGS		SHC 32	ST	GUN	082		ME		M	
BN -MPMP-0016B	BA CONC B CONC PMP B	COUPLING		(NONE)	--						N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		M	
BN -MPMP-0020A	BA CONDENSATE PUMP A	PUMP BEARINGS		SHC 626	CY	RES	086		MM		I	
		COUPLING		SP 111	CY	HG	087		MM		I	
		PUMP BEARING		SHC-626	SW	RES	081		OP	52-RAB	I	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		M	
BN -MPMP-0020B	BA CONDENSATE PUMP B	COUPLING		SP 111	CY	HG	087		MM		I	
		PUMP BEARING		SHC-626	SW	RES	081		OP	52-RAB	I	
		COUPLING		SP 111	CY	HG	087		MM		I	
		PUMP BEARINGS		SCH 626	CY	RES	086		MM		I	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		M	
BN -MPMP-0022	EQUIPMENT DRN TK PMP	COUPLING		SP 111	CY	HG	087		MM		I	
		PUMP BEARINGS		SHC 626	CY	RES	086		MM		I	
		PUMP BEARING		SHC-626	SW	RES	081		OP	52-RAB	I	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		M	
BO -MPMP-0001A	FLUSH PUMP A	COUPLING		NONE	--	- -			MM		N	
		PUMP BEARINGS (2)		SHC 32	SS	GUN	082		MM		M	
		MOTOR BEARINGS (2)		SHC-32	ST	GUN	082		ME		M	
BO -MPMP-0001B	FLUSH PUMP B	PUMP BEARINGS (2)		SHC 32	SS	GUN	082		MM		M	
		COUPLING		NONE	--	- -			MM		N	
		MOTOR BEARINGS (2)		SHC-32	ST	GUN	082		ME		M	
BO -MPMP-0002A	SVC PUMP A	COUPLING		NONE	--	- -			MM		N	
		PUMP BEARINGS (2)		SHC 32	SS	GUN	082		MM		M	
		MOTOR BEARINGS (2)		SHC-32	ST	GUN	082		ME		M	
BO -MPMP-0002B	SVC PUMP B	COUPLING		NONE	--	- -			MM		N	
		PUMP BEARINGS (2)		SHC 32	SS	GUN	082		MM		M	
		MOTOR BEARINGS (2)		SHC-32	ST	GUN	082		ME		M	
BO -MPMP-0004A	PRI WTR TR DRN PMP A	PUMP BEARING		SHC-626	CY	RES	086		MM		N	
		COUPLING		NONE	--	---			MM		N	
		PUMP BEARING		SHC-626	SW	RES	081		OP	53-WTB	N	
		MOTOR BEARING		SHC-32	ST	GUN	082		ME		M	
BO -MPMP-0004B	PRI WTR TR DRN PMP B	COUPLING		NONE	--	---			MM		N	
		PUMP BEARING		SHC-626	CY	RES	086		MM		N	
		PUMP BEARING		SHC-626	SW	RES	081		OP	53-WTB	N	
		MOTOR BEARING		SHC-32	ST	GUN	082		ME		M	
BO -MPMP-0006A	CHEMICAL ADD PUMP A	GEAR PUMP		600-M	CY	RES	086		MM		I	
		GEAR PUMP CAP		600-M	SW	RES	081		OP	53-WTB	I	
BO -MPMP-0006B	CHEMICAL ADD PUMP B	GEAR PUMP		600-M	CY	RES	086		MM		I	
		MOTOR BEARINGS		NONE	--	- -			MM		I	
		GEAR PUMP CAP		600-M	SW	RES	081		OP	53-WTB	M	
CAR-MFAN-0001A	SUPPLY FAN A	BLOWER BEARINGS		SHC-32	ST	GUN	082		MM		I	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		I	
CAR-MFAN-0001B	SUPPLY FAN B	BLOWER BEARINGS		SHC-32	ST	GUN	082		MM		I	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		I	
CAR-MFAN-0002A	EXHAUST FAN 2A	BLOWER BEARINGS		SHC-32	ST	GUN	082		MM		I	

UNID	COMPONENT NAME	PART TO LUBRICATE	LC	LUBRICANT	FC	APL	INST	QUANT	DP	ROUTE	T	R
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		I	
CAR-MFAN-0002B	EXHAUST FAN 2B	BLOWER BEARINGS		SHC-32	ST	GUN	082		MM		I	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		I	
CB -ODOR-0001	EQUIPMENT HATCH	PT L1 FIGURE LED 1		EP-111	SS	GUN	083		MM		N	
		PT L3 FIGURE LED 1		EP-111	SS	GUN	083		MM		N	
		PT L4 FIGURE LED 1		DTE-797	SS	HUN	085		MM		N	
CB -NOID-0000	ESCAPE AIR LOCK	PT L2 FIGURE LED 1		EP-111	SS	GUN	083		MM		N	
		PT L3 FIGURE LED 1		EP-111	SS	GUN	083		MM		N	
CB -NOID-0001	ESCAPE AIR LOCK	PT L3 FIGURE LED 1		EP-111	SS	GUN	083		MM		N	
CB -NOID-0002	ESCAPE AIR LOCK	PT L4 FIGURE LED 1		DTE-797	SS	HU	085		MM		N	
CB -NOID-0003	PERSONNEL AIR LOCK	PT 1 FIGURE LP8		EP-111	SS	GUN	083		MM		N	
CB -NOID-0004	PERSONNEL AIR LOCK	PT L2 FIGURE LF3 THRU LP8		EP-111	SS	GUN	083		MM		N	
CB -NOID-0005	PERSONNEL AIR LOCK	PT L3 FIGURE LF3 THRU LP8		EP-111	SS	GUN	083		MM		N	
CB -NOID-0006	PERSONNEL AIR LOCK	PT L4 FIGURE LF3 THRU LP8		DTE-797	SS	HU	085		MM		N	
CB -NOID-0007	ESCAPE AIR LOCK	PT L1 FIGURE LED 1		EP-111	SS	GUN	083		MM		N	
CC -MFAN-0001A	DRY TOWER FAN 1A	GEAR DRIVE		SHC-630	SW	RES	081		DP	53-ECT	N	
		GEAR DRIVE		SHC-630	CY	RES	086		MM		Y	
		MOTOR BEARINGS		SHC-32	ST						N	
CC -MFAN-0001B	DRY TOWER FAN 1B	GEAR DRIVE		SHC-630	SW	RES	081		DP	53-WCT	N	
		GEAR DRIVE		SHC-630	CY	RES	086		MM		Y	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
CC -MFAN-0002A	DRY TOWER FAN 2A	GEAR DRIVE		SHC-630	SW	RES	081		DP	53-ECT	N	
		GEAR DRIVE		SHC-630	CY	RES	086		MM		Y	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
CC -MFAN-0002B	DRY TOWER FAN 2B	GEAR DRIVE		SHC-630	SW	RES	081		DP	53-WCT	N	
		GEAR DRIVE		SHC-630	CY	RES	086		MM		Y	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
CC -MFAN-0003A	DRY TOWER FAN 3A	COUPLING		NONE	--	- -			MM		N	
		GEAR DRIVE		SHC-630	CY	RES	086		MM		Y	
		GEAR DRIVE		SHC-630	SW	RES	081		DP	53-ECT	N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
CC -MFAN-0003B	DRY TOWER FAN 3B	COUPLING		NONE	--	- -			MM		N	
		GEAR DRIVE		SHC-630	CY	RES	086		MM		Y	
		GEAR DRIVE		SHC-630	SW	RES	081		DP	53-WCT	N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
CC -MFAN-0004A	DRY TOWER FAN 4A	COUPLING		NONE	--	- -			MM		N	
		GEAR DRIVE		SHC-630	CY	RES	086		MM		Y	
		GEAR DRIVE		SHC-630	SW	RES	081		DP	53-ECT	N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
CC -MFAN-0004B	DRY TOWER FAN 4B	COUPLING		NONE	--	- -			MM		N	
		GEAR DRIVE		SHC-630	CY	RES	086		MM		Y	
		GEAR DRIVE		SHC-630	SW	RES	081		DP	53-WCT	N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	

UNID	COMPONENT NAME	PART TO LUBRICATE	LC	LUBRICANT	FC	APL	INST	QUANT	DP	ROUTE	T	R
CC -MFAN-0005A	DRY TOWER FAN 5A	COUPLING		NONE	--	- -			MM		M	
		GEAR DRIVE		SHC-630	CI	RES	086		MM		M	
		GEAR DRIVE		SHC-630	SW	RES	081		OP	53-ECT	M	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		M	
CC -MFAN-0005B	DRY TOWER FAN 5B	COUPLING		NONE	--	- -			MM		M	
		GEAR DRIVE		SHC-630	CI	RES	086		MM		M	
		GEAR DRIVE		SHC-630	SW	RES	081		OP	53-WCT	M	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		M	
CC -MFAN-0006A	DRY TOWER FAN 6A	COUPLING		NONE	--	---			MM		M	
		GEAR DRIVE		SHC-630	CI	RES	086		MM		M	
		GEAR DRIVE		SHC-630	SW	RES	081		OP	53-ECT	M	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		M	
CC -MFAN-0006B	DRY TOWER FAN 6B	GEAR DRIVE		SHC-630	CI	RES	086		MM		M	
		COUPLING		NONE	--	---			MM		M	
		GEAR DRIVE		SHC-630	SW	RES	081		OP	53-WCT	M	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		M	
CC -MFAN-0007A	DRY TOWER FAN 7A	COUPLING		NONE	--	- -			MM		M	
		GEAR DRIVE		SHC-630	CI	RES	086		MM		M	
		GEAR DRIVE		SHC-630	SW	RES	081		OP	53-ECT	M	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		M	
CC -MFAN-0007B	DRY TOWER FAN 7B	COUPLING		NONE	--	- -			MM		M	
		GEAR DRIVE		SHC-630	CI	RES	086		MM		M	
		GEAR DRIVE		SHC-630	SW	RES	081		OP	53-WCT	M	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		M	
CC -MFAN-0008A	DRY TOWER FAN 8A	COUPLING		NONE	--	- -			MM		M	
		GEAR DRIVE		SHC-630	CI	RES	086		MM		M	
		GEAR DRIVE		SHC-630	SW	RES	081		OP	53-ECT	M	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		M	
CC -MFAN-0008B	DRY TOWER FAN 8B	COUPLING		NONE	--	- -			MM		M	
		GEAR DRIVE		SHC-630	CI	RES	086		MM		M	
		GEAR DRIVE		SHC-630	SW	RES	081		OP	53-WCT	M	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		M	
CC -MFAN-0009A	DRY TOWER FAN 9A	COUPLING		NONE	--	- -			MM		M	
		GEAR DRIVE		SHC-630	CI	RES	086		MM		M	
		GEAR DRIVE		SHC-630	SW	RES	081		OP	53-ECT	M	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		M	
CC -MFAN-0009B	DRY TOWER FAN 9B	COUPLING		NONE	-	--			MM		M	
		GEAR DRIVE		SHC-630	CI	RES	086		MM		M	
		GEAR DRIVE		SHC-630	SW	RES	081		OP	53-WCT	M	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		M	
CC -MFAN-0010A	DRY TOWER FAN 10A	GEAR DRIVE		SHC-630	CI	RES	086		MM		M	
		COUPLING		NONE	--	---			MM		M	
		GEAR DRIVE		SHC-630	SW	RES	081		OP	53-ECT	M	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		M	
CC -MFAN-0010B	DRY TOWER FAN 10B	COUPLING		NONE	--	- -			MM		M	
		GEAR DRIVE		SHC-630	CI	RES	086		MM		M	
		GEAR DRIVE		SHC-630	SW	RES	081		OP	53-WCT	M	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		M	
CC -MFAN-0011A	DRY TOWER FAN 11A	COUPLING		NONE	--	- -			MM		M	

UNID	COMPONENT NAME	PART TO LUBRICATE	LC	LUBRICANT	FC	APL	INST	QUANT	DP	ROUTE	T	R
		GEAR DRIVE		SHC-630	CI	RES	086		MM		I	
		GEAR DRIVE		SHC-630	SW	RES	081		OP	53-ECT	N	
		MOTOR BEARINGS		SHC-32	SI	GUN	082		ME		N	
CC -MFAN-0011B	DRY TOWER FAN 11B	COUPLING		NONE	--	- -			MM		N	
		GEAR DRIVE		SHC-630	CI	RES	086		MM		I	
		GEAR DRIVE		SHC-630	SW	RES	081		OP	53-WCT	N	
		MOTOR BEARINGS		SHC-32	SI	GUN	082		ME		N	
CC -MFAN-0012A	DRY TOWER FAN 12A	COUPLING		NONE	--	- -			MM		N	
		GEAR DRIVE		SHC-630	CI	RES	086		MM		I	
		GEAR DRIVE		SHC-630	SW	RES	081		OP	53-ECT	N	
		MOTOR BEARINGS		SHC-32	SI	GUN	082		ME		N	
CC -MFAN-0012B	DRY TOWER FAN 12B	COUPLING		NONE	--	- -			MM		N	
		GEAR DRIVE		SHC-630	CI	RES	086		MM		I	
		GEAR DRIVE		SHC-630	SW	RES	081		OP	53-WCT	N	
		MOTOR BEARINGS		SHC-32	SI	GUN	082		ME		N	
CC -MFAN-0013A	DRY TOWER FAN 13A	COUPLING		NONE	--	- -			MM		N	
		GEAR DRIVE		SHC-630	CI	RES	086		MM		I	
		GEAR DRIVE		SHC-630	SW	RES	081		OP	53-ECT	N	
		MOTOR BEARINGS		SHC-32	SI	GUN	082		ME		N	
CC -MFAN-0013B	DRY TOWER FAN 13B	COUPLING		NONE	--	- -			MM		N	
		GEAR DRIVE		SHC-630	CI	RES	086		MM		I	
		GEAR DRIVE		SHC-630	SW	RES	081		OP	53-WCT	N	
		MOTOR BEARINGS		SHC-32	SI	GUN	082		ME		N	
CC -MFAN-0014A	DRY TOWER FAN 14A	COUPLING		NONE	--	- -			MM		N	
		GEAR DRIVE		SHC-630	CI	RES	086		MM		I	
		GEAR DRIVE		SHC-630	SW	RES	081		OP	53-ECT	N	
		MOTOR BEARINGS		SHC-32	SI	GUN	082		ME		N	
CC -MFAN-0014B	DRY TOWER FAN 14B	COUPLING		NONE	--	- -			MM		N	
		GEAR DRIVE		SHC-630	CI	RES	086		MM		I	
		GEAR DRIVE		SHC-630	SW	RES	081		OP	53-WCT	N	
		MOTOR BEARINGS		SHC-32	SI	GUN	082		ME		N	
CC -MFAN-0015A	DRY TOWER FAN 15A	COUPLING		NONE	--	---			MM		N	
		GEAR DRIVE		SHC-630	CI	RES	086		MM		I	
		GEAR DRIVE		SHC-630	SW	RES	081		OP	53-ECT	N	
		MOTOR BEARINGS		SHC-32	SI	GUN	082		ME		N	
CC -MFAN-0015B	DRY TOWER FAN 15B	COUPLING		NONE	--	- -			MM		N	
		GEAR DRIVE		SHC-630	CI	RES	086		MM		I	
		GEAR DRIVE		SHC-630	SW	RES	081		OP	53-WCT	N	
		MOTOR BEARINGS		SHC-32	SI	GUN	082		ME		N	
CC -MPMP-0002A	CCW PUMP A	COUPLING		EP 111	CI	HG	087		MM		I	
		PUMP BEARING		SHC-626	SD	RES	081		OP	52-RAB	N	
		MOTOR BEARINGS (2)		SHC-626	SD	RES	081		OP	52-RAB	N	
		PUMP AND MOTOR BEARINGS		SHC-626	CT	RES	081		MM		I	
CC -MPMP-0002AB	CCW PUMP AB	PUMP BEARING		SHC-626	SD	RES	081		OP	52-RAB	N	
		MOTOR BEARINGS (2)		SHC-626	SD	RES	081		OP	52-RAB	N	
		COUPLING		EP 111	CI	HG	087		MM		I	
		PUMP AND MOTOR BEARINGS		SHC-626	CT	RES	081		MM		I	
CC -MPMP-0002B	CCW PUMP B	COUPLING		EP 111	CI	HG	087		MM		I	
		PUMP BEARING		SHC-626	SD	RES	081		OP	52-RAB	N	

LUBRICATION DATA SCHEDULE SORTED BY UNID NUMBER

UNID	COMPONENT NAME	PART TO LUBRICATE	LC	LUBRICANT	FC	APL	INST	QUANT	DP	ROUTE	T	R
		MOTOR BEARINGS (2)		SHC-262	SD	RES	081		OP	52-RAB	N	
		PUMP AND MOTOR BEARINGS		SHC-626	CY	RES	081		MM		Y	
CCS-MBLW-0003A	CNTMT CLG FAN A	MOTOR BEARINGS		SHC-32	SV	GUN	082		ME		N	
CCS-MBLW-0003B	CNTMT CLG FAN B	MOTOR BEARINGS		SHC-32	SV	GUN	082		ME		N	
CCS-MBLW-0003C	CNTMT CLG FAN C	MOTOR BEARINGS		SHC-32	SV	GUN	082		ME		N	
CCS-MBLW-0003D	CNTMT CLG FAN D	MOTOR BEARINGS		SHC-32	SV	GUN	082		ME		N	
CD -MPMP-0002A	CONDENSATE PMP A	COUPLING		EP 1[illegible]	CI	HG	087		MM		I	
		MOTOR BEARINGS		SHC-626	CI	RES	086		MM		I	
		MOTOR BEARINGS (2)		SHC-626	SD	RES	081		OP	51-T8	N	
		MOTOR BRGS			XQ	SMP	089		MM		N	
CD -MPMP-0002B	CONDENSATE PMP B	MOTOR BEARINGS		SHC-626	CI	RES	086		MM		I	
		COUPLING		EP 1[illegible]	CI	HG	087		MM		I	
		MOTOR BEARINGS (2)		SHC-626	SD	RES	081		OP	51-T8	N	
		MOTOR BEARINGS		SHC-626	CI	RES	086		MM		I	
		MOTOR BRGS SAMPLE		SHC-626	XQ	SMP	089		CE		N	
CD -MPMP-0002C	CONDENSATE PMP C	COUPLING		EP 1[illegible]	CI	HG	087		MM		I	
		MOTOR BEARINGS		SHC-626	CI	RES	086		MM		I	
		MOTOR BEARINGS (2)		SHC-626	SD	RES	081		OP	51-T8	N	
		MOROT BRGS SAMPLE		SHC-626	XQ	SMP	089		CE		N	
CD -MPMP-0005	AUX BLR HDZN PUMP	GEAR PUMP CAP		600 W	SW	RES	081		OP	53-WT8	N	
CD -MPMP-0011	GS LEAKOFF TNK PUMP	PUMP BEARINGS		SHC-32	SS	GUN	082		MM		N	
		COUPLING		EP-111	SS	HG	087		MM		Y	
CDC-MFAN-0002A	CEDM CLG FAN A	FAN SHAFT BEARINGS (2)		SHC-32	SR	GUN	082		MM		N	
		COUPLING FALK TYPE (1)		EP 1[illegible]	SR	HG	087		MM		I	
		VARIABLE VANE OPERATING LVR 1		SHC 32	SR	GUN	082		MM		N	
		MOTOR BEARINGS (2)		SHC-32	SV	GUN	082		ME		N	
CDC-MFAN-0002B	CEDM CLG FAN B	COUPLING FALK TYPE (1)		EP 1[illegible]	SR	HG	087		MM		I	
		FAN SHAFT BEARINGS (2)		SHC 32	SR	GUN	082		MM		N	
		VARIABLE VANE OPERATING LVR 1		SHC 32	SR	GUN	082		MM		N	
		MOTOR BEARINGS (2)		SHC-32	SV	GUN	082		ME		N	
CDC-MFAN-0002C	CEDM CLG FAN C	FAN SHAFT BEARINGS (2)		SHC 32	SR	GUN	082		MM		N	
		VARIABLE VANE OPERATING LVR 1		SHC 32	SR	GUN	082		MM		N	
		COUPLING FALK TYPE (1)		EP 1[illegible]	SR	HG	087		MM		I	
		MOTOR BEARINGS (2)		SHC-32	SV	GUN	082		ME		N	
CDC-MFAN-0002D	CEDM CLG FAN D	FAN SHAFT BEARINGS (2)		SHC 32	SR	GUN	082		MM		N	
		VARIABLE VANE OPERATING LVR 1		SHC 32	SR	GUN	082		MM		N	
		COUPLING FALK TYPE (1)		EP 1[illegible]	SR	GUN	087		MM		I	
		MOTOR BEARINGS (2)		SHC-32	SV	GUN	082		ME		N	
CDC-MVAA-00101C	CEDM CLG DAMPER	ACTUATOR DAMPER		SHC-824	CS	RES	086		MM		I	
CDC-MVAA-00101D	CEDM CLG DAMPER	DAMPER LEVER		SHC-32	SV	GUN	082		MM		N	
CF -MPMP-0002A	COND HDZN FEED PMP A	PUMP BEARING		SHC-32	SS	GUN	082		MM		N	
		GEAR PUMP CAP		600 W	SW	RES	081		OP	53-WT8	N	
		MOTOR BEARINGS (2)		SHC-32	SV	GUN	082		ME		N	
CF -MPMP-0002B	COND HDZN FEED PMP B	PUMP BEARINGS		SHC-32	SS	GUN	082		MM		N	

UNID	COMPONENT NAME	PART TO LUBRICATE	LC	LUBRICANT	FC	APL	INST	QUANT	DP	ROUTE	T	R
		GEAR PUMP CAP		600 W	SW	RES	001		OP	53-WTB	N	
		MOTOR BEARINGS (2)		SHC-32	ST	GUN	002		ME		N	
CF -MPMP-0004A	AMMONIA PUMP A	COUPLING		NONE	--	- -			MN		N	
		PUMP HOUSING		SHC-630	GS	RES	006		MN		Y	
		MOTOR BEARINGS		SHC-32	ST	GUN	002		ME		N	
CF -MPMP-0004B	AMMONIA PUMP B	COUPLING		NONE	--	- -			MN		N	
		PUMP HOUSING		SHC-630	GS	RES	006		MN		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	002		ME		N	
CF -MPMP-0005	AUX BLR HDZN PUMP	MOTOR BEARINGS (2)		SHC-32	ST	GUN	002		ME		N	
CF -MPMP-0006	AUX BLR AMMONIA PUMP	COUPLING		NONE	--	- -			MN		N	
		PUMP BEARING HOUSING		SHC-630	GS	RES	006		MN		Y	
		MOTOR BEARINGS		SHC-32	ST	GUN	002		ME		N	
CF -MPMP-0008A	DW ACID TRANSF PMP A	COUPLING		EP-111	SS	HG	007		MN		Y	
		PUMP THRUST BEARING		SHC-32	SS	GUN	002		MN		Y	
		MOTOR BEARINGS (2)		SHC-32	ST	GUN	002		ME		N	
CF -MPMP-0008B	DW ACID TRANSF PMP B	PUMP THRUST BEARING		SHC-32	SS	GUN	002		MN		Y	
		COUPLING		EP-111	SS	HG	007		MN		Y	
		MOTOR BEARINGS (2)		SHC-32	ST	GUN	002		ME		N	
CF -MPMP-0010A	DW CAUSTIC TRNS PMPA	COUPLING		EP-111	SS	HG	007		MN		Y	
		PMP THRUST BRG		SHC-32	SS	GUN	002		MN		Y	
		MOTOR BEARINGS (2)		SHC-32	ST	GUN	002		ME		N	
CF -MPMP-0010B	DW CAUSTIC TRNS PMPB	PMP THRUST BRG		SHC-32	SS	GUN	002		MN		Y	
		COUPLING		EP-111	SS	HG	007		MN		Y	
		MOTOR BEARINGS		SHC-32	ST	GUN	002		ME		N	
CF -MPMP-0012A	BLDWN ACID TK PMP A	PMP BEARINGS		SHC-32	SS	GUN	002		MN		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	002		ME		N	
CF -MPMP-0012B	BLDWN ACID TK PMP B	PMP BEARINGS		SHC-32	SS	GUN	002		MN		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	002		ME		N	
CF -MPMP-0014A	SCBD CAUS XFER PMP A	PUMP BEARINGS		SHC-32	SS	GUN	002		MN		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	002		ME		N	
CF -MPMP-0014B	SCBD CAUS XFER PMP B	PUMP BEARINGS		SHC-32	SS	GUN	002		MN		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	002		ME		N	
CF -MPMP-0017	CONC CF PUMP	COUPLING		NONE	--	- -			--		N	
		MOTOR BEARINGS		NONE	--	---			--		N	
		PUMP BEARINGS		NONE		---			--		N	
CHW-MPMP-0002A	CHILL WTR PMP A	COUPLING		EP-111	SS	HG	007		MN		Y	
		PUMP BEARINGS (2)		SHC-32	SS	GUN	002		MN		Y	
		MOTOR BEARINGS (2)		SHC-32	ST	GUN	002		ME		N	
CHW-MPMP-0002AB	CHILL WTR PUMP AB	COUPLING		EP-111	SS	HG	007		MN		Y	
		PUMP BEARINGS(2)		SHC-32	SS	GUN	002		MN		Y	
		MOTOR BEARINGS		SHC-32	ST	GUN	002		ME		Y	
CHW-MPMP-0002B	CHILL WTR PMP B	COUPLING		EP-111	SS	HG	007		MN		Y	
		PUMP BEARINGS (2)		SHC-32	SS	GUN	002		MN		Y	
		MOTOR BEARINGS (2)		SHC-32	ST	GUN	002		ME		N	
CMU-MPMP-0002	COND TRANSFER PMP	COUPLING		EP-111	SS	HG	007		MN		Y	

UNID	COMPONENT NAME	PART TO LUBRICATE	LC	LUBRICANT	FC	APL	INST	QUANT	DP	ROUTE	I	R
		PMP BEARINGS		SHC-626	CI	RES	086		MM		I	
		PMP BEARINGS		SHC-626	SO	RES	086		OP	53-FPH	I	R
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		I	R
CMU-MPMP-0003A	COND STRG TANK PMP A	PMP BEARINGS		SHC-32	SS	GUN	082		MM		I	
		COUPLING		EP-1	SS	HG	087		MM		I	R
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		I	R
CMU-MPMP-0003B	COND STRG TANK PMP B	PMP BEARINGS		SHC-32	SS	GUN	082		MM		I	
		COUPLING		EP-1	SS	HG	087		MM		I	R
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		I	R
CMU-MPMP-0004A	CCW MAKEUP PMP A	COUPLING		EP-1	CI	HG	087		MM		I	
		PMP BRGS		SHC-32	SS	GUN	082		MM		I	R
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		I	R
CMU-MPMP-0004B	CCW MAKEUP PUMP B	COUPLING		EP-1	CI	HG	087		MM		I	
		PMP BRGS		SHC-32	SS	GUN	082		MM		I	R
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		I	R
CO -MCMP-0003	REFRIGERATION UNIT	COMPRESSOR BELT DRIVE		NONE	--	- -			MM		I	
		MOTOR BEARINGS		NONE	--	- -			MM		I	R
		COMPRESSOR CRANKCASE		ARCT 155	CS	RES	084		MM		I	
		COMPRESSOR CRANKCASE		ARCT 155	SM	RES	084		OP	53-CWB	I	
CRN-MCRN-0001	SERV BLDG CRANE	BRD MICRO RED COUPL		EP-1	CI	HG	087		MM		I	R
		BRD MICRO REDUCER		SHC-630	CI	RES	086		MM		I	R
		BRD MICRO REDUCER		SHC-630	SO	RES	086		MM		I	R
		BRD SPD REDUCER		SHC-630	CI	RES	086		MM		I	R
		BRD SPD REDUCER		SHC-630	SO	RES	086		MM		I	R
		HOIST MICRO REDUCER		SHC-630	CI	RES	086		MM		I	R
		HOIST MICRO REDUCER		SHC-630	SO	RES	086		MM		I	R
		HOIST SPD RED COUPL		EP-1	CI	HG	087		MM		I	R
		HOIST SPD REDUCER		SHC-630	CI	RES	086		MM		I	R
		DRG RED COUPL		EP-1	CI	HG	087		MM		I	R
		TROL SPD RED COUPL		EP-1	CI	HG	087		MM		I	R
		TROL SPD REDUCER		SHC-630	CI	RES	086		MM		I	R
		TROL SPD REDUCER		SHC-630	SO	RES	086		MM		I	R
		PARALLEL SHAFT RED		SHC-630	CI	RES	086		MM		I	R
		PARALLEL SHAFT RED		SHC-630	SS	RES	086		MM		I	R
		WIRE ROPE		SHC-630	SS	HO	085		MM		I	R
		HOIST SPD REDUCER		SHC-630	SO	RES	086		MM		I	R
		TROL DRY SHAFT COUPL		EP-1	CI	HG	087		MM		I	R
		TROL MICRO RED		SHC-630	CI	RES	086		MM		I	R
		TROL MICRO RED		SHC-630	SO	RES	086		MM		I	R
		BRD DRY SHAFT COUPL		EP-1	CI	HG	087		MM		I	R
		RT ANGLE SPEED RED		SCH-630	CI	RES	086		MM		I	R
		RT ANGLE SPEED RED		SHC-630	SS	RES	086		MM		I	R
		WHEEL BRGS		SHC	SS	GUN	082		MM		I	R
		MISC PILLOW BL BRNGS		SHC	SS	GUN	082		MM		I	R
		HOIST DRUM GEAR		SHC	SS	GUN	082		MM		I	R
		HOIST DRM FLG BRG (1)		SHC	SO	GUN	082		MM		I	R
		HOIST DRM BRGS (2)		SHC	SS	GUN	082		MM		I	R
		BRD DRY BLOCKS (6)		SHC	SS	GUN	082		MM		I	R
		BLOCK-HOOK (3)		SHC	SS	GUN	082		MM		I	R
CRN-MCRN-0002	INTK STRUCTURE CRANE	PARALLEL SHAFT RED		SHC-630	CI	RES	086		MM		I	R
		WHEEL BRGS		SHC	SS	GUN	082		MM		I	R
		MISC GREASE POINTS		SHC	SS	GUN	082		MM		I	
		COUPLING		EP-1	CI	HG	087		MM		I	R
		CABLE DRESSING		SHC-630	SS	BR	085		MM		I	R

UNID	COMPONENT NAME	PART TO LUBRICATE	LC	LUBRICANT	FC	APL	INST	QUANT	DP	ROUTE	T	R
		RT ANGLE SPEED RED				RES	086		MM		I	
		MISC PILLOW BLOCKS		SHC 32	88	GUN	081		MM		I	
		OPEN GEARS		EP 1	85	BR			MM		I	
		MOTOR BEARINGS		SHC-32	87	GUN	081		ME		I	
CRN-MCRN-0005	TUR BLD GANTRY CRANE	HOIST UNIT		SHC-630	88	RES	086		MM		I	
		COUPLING		EP 1	88	HG	087		MM		I	
		PILLOW BLOCK		SHC 32	88	GUN	082		MM		I	
		OPEN DRUM GEAR		EP 1	88	BR			MM		I	
		TROLLEY DRIVE GEAR CASE		SHC-630	88	RES	086		MM		I	
		BRIDGE DRIVE GEAR CASE		SHC-630	88	RES	086		MM		I	
		DRUM SHAFT BEARINGS		SHC 32	88	GUN	082		MM		I	
		SHEAVE MEST FITTINGS		SHC 32	88	GUN	082		MM		I	
		SHEAVE PINS		SHC 32	88	GUN	082		MM		I	
		HYDRAULIC BRIDGE BRAKE		SHC 32	88	GUN	082		MM		I	
		THRUST BEARINGS		SHC 32	88	GUN	082		MM		I	
		BRIDGE WHEEL BRGS		SHC 32	88	GUN	082		MM		I	
		TROLLEY WHEEL BEARINGS		SHC 32	88	GUN	082		MM		I	
		HOIST MOTOR BRAKE LINKAGE		SHC-150	88	GUN	082		MM		I	
		HOIST MOTOR BEARINGS		SHC 32	87	GUN	082		ME		I	
		BRIDGE MOTOR BEARINGS		SHC 32	87	GUN	082		ME		I	
		TROLLEY MOTOR BEARINGS		SHC 32	87	GUN	082		ME		I	
CRN-MCRN-0006	FUEL HDLG BRDG CRANE	MISC PIVOT POINTS		DEL 1340	87	HG			MM		I	
		TROLLEY GEARS		EP 1	88	GUN			MM		I	
		MISC GREASE FITTINGS		SCH 150	88	HG			MM		I	
		DRIVE GEAR CASES		SHC-630	88	GUN			MM		I	
		MOTORS WITH GREASE FITTINGS		SCH 150	88	HG			MM		I	
		WIRE ROPE		SHC-630	88	BR			MM		I	
		COUPLINGS		EP 111	88	HG			MM		I	
CRN-MCRN-0007	RCB POLAR CRANE	MISC PIVOT POINTS		DEL 1340	88	HG	087		MM		I	
		MISC GREASE FITTINGS		SHC 150	88	HG	087		MM		I	
		TROLLEY GEARS		EP 1	88	GUN	082		MM		I	
		GEAR CASES		SHC-630	88	GUN	082		MM		I	
		SHEAVE ASSEMBLY		SHC 32	88				MM		I	
		MOTOR BRGS.		NONE	88	HG	087		ME		I	
		WIRE ROPE		SHC-630	88				MM		I	
CS -MPMP-0001A	CNTMT SPRAY PUMP A	COUPLING		EP 111	CI	HG	087		MM		I	
		PUMP BEARING		SHC-626	CI	RES	086		MM		I	
		MOTOR BEARINGS		SHC-626	CI	RES	086		MM		I	
		PUMP BEARING		SHC-626	SW	RES	081		OP	52-RAB	I	
		MOTOR BEARINGS (2)		SHC 626	SW	RES	081		OP	52-RAB	I	
CS -MPMP-0001B	CNTMT SPRAY PUMP B	COUPLING		EP 111	CI	HG	087		MM		I	
		MOTOR BEARINGS		SHC-626	CI	RES	086		MM		I	
		PUMP BEARING		SHC-626	CI	RES	086		MM		I	
		PUMP BEARING		SHC-626	SW	RES	081		OP	52-RAB	I	
		MOTOR BEARINGS		SHC-626	SW	RES	081		OP	52-RAB	I	
CS -MPMP-0002A	CNTMNT SPR RSR PMP A	PUMP BEARINGS		SHC-32	85	GUN	082		MM		I	N
		COUPLING		NONE	--	--			MM		I	N
CS -MPMP-0002B	CNTMT SPR RSH PUMP B	PUMP BEARINGS		SHC-32	85	GUN	082		MM		I	N
		MOTOR BEARINGS		NONE	--	---			--		I	N
CVC-MPMP-0007A	CHARGING PUMP A	COUPLING		EP 111	CS	HG	087		MM		I	
		FAULK GEAR REDUCER		SHC-630	CS	RES	086		MM		I	
		GAULIN CHARGING PUMP		SHC-626	CS	RES	086		MM		I	
		GAULIN CHARGING PUMP		SHC-626	SD	RES	081		OP	52-RAB	I	

UNID	COMPONENT NAME	PART TO LUBRICATE	LC	LUBRICANT	FC	APL	INST	QUANT	DP	ROUTE	T	R
		FAULK GEAR REDUCER		SHC-630	SD	DIP	081		OP	52-RAB	M	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		M	
CVC-MPMP-0007AB	CHARGING PUMP A/B	FAULK GEAR REDUCER		SHC-630	CS	RES	086		MM		I	
		GAULIN CHARGING PUMP		SHC-626	SD	RES	081		OP	52-RAB	M	
		FAULK GEAR REDUCER		SHC-630	SD	DIP	081		OP	52-RAB	M	
CVC-MPMP-0007B	CHARGING PUMP B	FAULK GEAR REDUCER		SHC-630	CS	RES	086		MM		I	
		COUPLING		EP-111	CS	HG	087		MM		I	
		GAULIN CHANGING PUMP		SHC-626	CS	RES	086		MM		I	
		GAULIN CHARGING PUMP		SHC-626	SD	RES	081		OP	52-RAB	M	
		FAULK GEAR REDUCER		SHC-630	SD	DIP	081		OP	52-RAB	M	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		M	
CVC-MPMP-0010	CHEM ADDITION PUMP	COUPLING		NONE	--	---			--		N	
		PUMP BEARINGS		SHC 626	SW	DIP	081		OP	52-RAB	M	
CVC-MPMP-0012A	A SEAL LUBE TNK PMP	COUPLING		NONE	--	---			--		N	
CVC-MPMP-0012AB	AB SEAL LUBE TNK PMP	COUPLING		NONE	--	---			--		N	
CVC-MPMP-0012B	B SEAL LUBE TNK PMP	COUPLING		NONE	--	---			--		N	
CW -MPMP-0001A	CIRC WATER PUMP A	MOTOR BEARING		SHC-626	CI	RES	086		MM		I	
		PUMP BEARINGS		NONE	--	--			MM		I	
		COUPLING		EP-111	CI	HG	087		MM		I	
		MOTOR BEARING		SHC-626	CI	RES	086		MM		I	
		SAMPLE			RQ	SMP			CE		I	
		MOTOR BEARING (UPPER)		SHC-626	SW	RES	081		OP	53-INT	I	
		MOTOR BEARING (LOWER)		SHC-626	SW	RES	081		OP	53-INT	I	
CW -MPMP-0001B	CIRC WATER PUMP B	PUMP BEARINGS		NONE	--	--			MM		N	
		COUPLING		EP-111	CI	HG	087		MM		I	
		MOTOR BEARINGS		SHC-626	CI	RES	086		MM		I	
		PUMP BEARINGS		NONE	--	--			MM		N	
		SAMPLE			RQ	SMP			CE		I	
		MOTOR BEARING (UPPER)		SHC-626	SW	RES	081		OP	53-INT	I	
		MOTOR BEARING (LOWER)		SHC-626	SW	RES	081		OP	53-INT	I	
CW -MPMP-0001C	CIRC WATER PUMP C	PUMP BEARINGS		NONE	--	--			MM		N	
		COUPLING		EP-111	CI	HG	087		MM		I	
		MOTOR BEARINGS		SHC-626	CI	RES	086		MM		I	
		MOTOR BEARING (UPPER)		SHC-626	SW	RES	081		OP	53-INT	I	
		MOTOR BEARINGS		SHC-626	SW	RES	081		OP	53-INT	I	
		SAMPLE			RQ	SMP			CE		I	
		MOTOR BEARING (LOWER)		SHC-626	SW	RES	081		OP	53-INT	I	
CW -MPMP-0001D	CIRC WATER PUMP D	PUMP BEARINGS		NONE	--	--			MM		N	
		COUPLING		EP-111	CI	HG	087		MM		I	
		MOTOR BEARINGS		SHC-626	CI	RES	086		MM		I	
		PUMP BEARINGS		NONE	--	--			MM		N	
		SAMPLE			CI	SMP			CE		I	
		MOTOR BEARING (UPPER)		SHC-626	SW	RES	081		OP	53-INT	M	
		MOTOR BEARING (LOWER)		SHC-626	SW	RES	081		OP	53-INT	M	
CW -MPMP-0002	RIVER WTR SUPP PUMP	MOTOR BEARINGS		ARCT 155	CI	RES	086		MM		I	
		PUMP BEARINGS		NONE	--	--			MM		I	
		COUPLING		EP-111	CI	MG	087		MM		I	
		MOTOR BRGS (UPPER)		ARCT 155	SD	RES	081		OP	53-INT	M	
		MOTOR BEARINGS		ARCT 155	CI	RES	086		MM		I	
		SAMPLE			RQ	SMP			CE		I	

UNID	COMPONENT NAME	PART TO LUBRICATE	LC	LUBRICANT	FC	APL	INST	QUANT	DP	ROUTE	T	R
CW -MPMP-0003A	SUP CW TWR MU PMP A	MOTOR BEARINGS		SEALED	--	- -			MM		N	
		PUMP BEARINGS		SHC-32	SU	GUN	082		MM		N	
		COUPLING		EP-111	SU	HG	087		MM		Y	
CW -MPMP-0003B	SUP CW TWR MU PMP B	MOTOR BEARINGS		SEALED	--	- -			MM		N	
		PUMP BEARINGS		SHC-32	SU	GUN	082		MM		N	
		COUPLING		EP-111	SU	HG	087		MM		Y	
CW -MPMP-0004A	IN STRUC SUMP PUMP A											
CW -MPMP-0004B	IN STRUC SUMP B											
CW -MPMP-0005A	CW AIR EVAC PUMP A	COUPLING		NONE	--	- -			MM		N	
		PUMP BEARINGS		SHC 32	CI	HG	087		MM		N	
		MOTOR BEARINGS		SHC 32	ST	HG	087		ME		Y	
CW -MPMP-0005B	CW AIR EVAC PUMP B	PUMP BEARINGS		SHC-32	CI	HG	087		MM		N	
		COUPLING		NONE	--	- -			MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	087		ME		Y	
DGC-MDSL-0001A	EMER DIESEL GEN 3A	ENGINE OIL		DELVAC 1340	AR	RES	086		MM		Y	
		PORTEC SHCR GEN BRG		SHC-626	CI	RES	086		MM		N	
		PORTEC SHCR GEN BRG		SHC-626	SD	RES	081		DP	52-RAB	N	
		ENGINE OIL		DELVAC 1340	SD	RES	081		DP	52-RAB	N	
		ENGINE OIL SAMPLE			XD				CE		Y	
DGC-MDSL-0001B	EMER DIESEL GEN 3B	ENGINE OIL		DELVAC 1340	AR	RES	086		MM		Y	
		PORTEC SHCR GEN BRG		SHC-626	CI	RES	086		MM		N	
		PORTEC SHCR BRG		SHC-626	SD	RES	081		DP	52-RAB	N	
		ENGINE OIL		DELVAC 1340	SD	RES	081		DP	52-RAB	N	
		ENGINE OIL SAMPLE			XD				CE		Y	
DW -MBLW-0007	DW MIXED BED BLOWER	GEAR CASE		SHC-630	SW	RES	081		DP	53-WTB	N	
DW -MPMP-0003A	DEMIN DEGAS XFER PPA	PUMP BEARING		SHC-626	CI	RES	086		MM		N	
		PUMP BEARING		SHC-626	SW	RES	081		DP	53-WTB	N	
		MOTOR BEARING		SHC-32	ST	GUN	082		ME		N	
DW -MPMP-0003B	DEMIN DEGAS XFER PPB	PUMP BEARINGS		SHC-626	CI	RES	086		MM		N	
		PUMP BEARING		SHC-626	SW	RES	081		DP	53-WTB	N	
		MOTOR BEARING		SHC-32	ST	GUN	082		ME		N	
DW -MPMP-0006	DEMIN RECYCLE PUMP	PUMP BEARINGS		SHC-626	CI	RES	086		MM		N	
		PUMP BEARING		SHC-626	SW	RES	081		DP	53-WTB	N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
DW -MPMP-0010	BRINE PUMP	PUMP BEARING		SHC-626	CI	RES	086		MM		N	
		PUMP BEARING		SHC-626	SW	RES	081		DP	53-WTB	N	*
		MOTOR BEARING		SHC-32	ST	GUN	082		ME		N	
EFW-MPMP-0002A	EMER FEED PMP A	PUMP BEARINGS		DTE 797	CI	RES	086		MM		Y	
		COUPLING		EP 111	CI	HG	087		MM		Y	
		PUMP BEARINGS (2)		DTE-797	SW	RES	081		DP	52-RAB	N	
		MOTOR BEARINGS (2)		SHC-626	SW	RES	081		DP	52-RAB	N	
EFW-MPMP-0002AB	EMER FEED PMP AB	PUMP BEARINGS		SHC 824	SW	RES	981		DP	52-RAB	N	
		TURBINE BEARINGS		SHC 824	SW	RES	081		DP	52-RAB	N	
		PUMP AND TURBINE BEARINGS		SHC 824	CI	RES	081		MM		N	
EFW-MPMP-0002B	EMER FEED PMP B	COUPLING		EP 111	CI	HG	087		MM		Y	

UNID	COMPONENT NAME	PART TO LUBRICATE	LC	LUBRICANT	FC	APL	INST	QUANT	DP	ROUTE	T	R
		PUMP BEARINGS		DTE 797	CI	RES	086		MM		I	
		PUMP BEARINGS (2)		DTE-797	SM	RES	081		OP	52-RAB	M	
		MOTOR BEARINGS (2)		SHC-626	SW	RES	081		OP	52-RAB	M	
EGA-MCMP-0007A	EDG A COMP A	COMPRESSOR CRANKCASE		DELVAC 1340	CU	RES	086		MM		I	
		COMPRESSOR CRANKCASE		DELVAC 1340	SD	RES	081		OP	52-RAB	M	
EGA-MCMP-0007B	EDG B COMP A	COMPRESSOR CRANKCASE		DELVAC 1340	CU	RES	086		MM		I	
		COMPRESSOR CRANKCASE		DELVAC 1340	SD	RES	081		OP	52-RAB	I	
EGA-MCMP-0008A	EDG A COMP B	COMPRESSOR CRANKCASE		DELVAC 1340	CU	RES	086		MM		I	
		COMPRESSOR CRANKCASE		DELVAC 1340	SD	RES	081		OP	52-RAB	I	
EGA-MCMP-0008B	EDG B COMP B	COMPRESSOR CRANKCASE		DELVAC 1340	CU	RES	086		MM		I	
		COMPRESSOR CRANKCASE		DELVAC 1340	SD	RES	081		OP	52-RAB	I	
EGA-MTGR-0001A	EDG A TURN GEAR	GEAR BEARING		SHC-32	SS	GUN	082		MM		I	
		MOTOR CASE		SHC-626	SS	RES	086		MM		I	
		GEAR CASE		600W	SS	RES	081		MM		I	
EGA-MTGR-0001B	EDG B TURN GEAR	GEAR BEARING		SHC-32	SS	GUN	082		MM		I	
		GEAR CASE		600W	SS	RES	086		MM		I	
		MOTOR CASE		SHC-626	SS	RES	086		MM		I	
EGC-MPMP-0001A	EDG A JW CIRC PUMP	COUPLING		NONE	--	---			--		N	
		MOTOR BEARINGS		SEALED	--	--			--		N	
		PUMP BEARINGS		PRODUCT	--	- -					N	
EGC-MPMP-0001B	EDG B JW CIRC PUMP	MOTOR BEARINGS		SEALED	--	- -			--		N	
		PUMP BEARINGS		PRODUCT	--	--			--		N	
		COUPLING		NONE	--	- -			--		N	
EGF-MPMP-0004A	EDG A FO BOOST PUMP	MOTOR BEARINGS		SEALED	--	---			-		N	
		COUPLING		NONE	--	---			-		N	
		PUMP BEARINGS		PRODUCT							N	
EGF-MPMP-0004B	EDG B FO BOOST PUMP	MOTOR BEARING		SEALED	--	---			-		N	
		PUMP BEARINGS		PRODUCT	--	---			-		N	
		COUPLING		NONE	--	---			-		N	
EGL-MPMP-0002A	EDG A LO CIRC PUMP	PUMP BEARINGS		SEALED	--	---			--		N	
		MOTOR BEARINGS		SEALED	--	---			--		N	
EGL-MPMP-0002B	EDG B LO CIRC PUMP	PUMP BEARINGS		PRODUCT	--	---			-		N	
		COUPLING		NONE	--	---			-		N	
EGL-MPMP-0003A	EDG A STBY LO PUMP	MOTOR BEARINGS		SEALED	--	---			-		N	
		PUMP BEARINGS		PRODUCT	--	---			-		N	
		COUPLING		NONE	--	---			-		N	
EGL-MPMP-0003B	EDG B STBY LO PUMP	MOTOR BEARINGS		SEALED	--	---			-		N	
		PUMP BEARINGS		PRODUCT	--	---			-		N	
		COUPLING		NONE	--	---			--		N	
EH -MPMP-0002A	EH FLUID PMP A	PUMP BEARING		NONE								
		COUPLING		EP-II	CR	MG	087		MM		N	
		MOTOR BEARING		SHC-32	SY	GUN	082		ME		N	
EH -MPMP-0002B	EH FLUID PMP B	PUMP BEARING		NONE								
		COUPLING		EP-II	CR	MG	087		MM		N	
		MOTOR BEARING		SHC-32	SY	GUN	082		ME		N	

UNID	COMPONENT NAME	PART TO LUBRICATE	LC	LUBRICANT	FC	APL	INST	QUANT	DP	ROUTE	T	R
FHD-MPMP-0005A	HEATER DRAIN PMP A	MOTOR BEARING (TOP)		SHC-626	CT	RES	086		ME		T	
FHD-MPMP-0005B	HEATER DRAIN PMP B	MOTOR BEARING (TOP)		SHC-626	CT	RES	086		ME		T	
FHS-MELV-0001	NEW FUEL ELEVATOR	DRIVE REDUCER		SHC-630	SR	RES	086		MM		M	
		DRUM BEARING		SHC-32	SR	GUN	087		MM		M	
FHS-MFHM-0001	SP FUEL HNDLG MACH	BRIDGE DRIVE REDUCER		600W	SR	RES	086		MM		M	
		TROLLEY DRIVE REDUCER		600W	SR	RES	086		MM		M	
		HOIST DRIVE REDUCER		600W	SR	RES	086		MM		M	
		BRIDGE WHEEL BRGS		SHC-32	SR	GUN	087		MM		M	
		TROLLEY WHEEL BRGS		SHC-32	SR	GUN	087		MM		M	
		HOIST DRUM BRGS		SHC-32	SR	GUN	087		MM		M	
		BRIDGE & TROLLEY DRIVE		SHC-32	SR	GUN	087		MM		M	
FHS-MPMP-0001	DRY SIPPING VENT PMP	PUMP BEARINGS		SHC-32	SS	GUN	082		MM		M	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		M	
FHS-MWNC-0001	TRANSFER WINCH	WINCH GEAR MOTOR		SHC-630	SR	RES	086		MM		M	
		DRUM BEARINGS		SHC-32	SR	GUN	087		MM		M	
FP -MPMP-0002	MOTOR FIRE PUMP	PUMP BEARINGS		SHC-32	SS	GUN	082		MM		M	
		COUPLING		EP 111	SS	HG	087		MM		M	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		M	
FP -MPMP-0003	JOCKEY PUMP	PUMP BEARINGS		SHC-626	SS	GUN	081		MM		M	
		COUPLING		EP 111	SS	HG	087.4		MM		M	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		M	
FP -MPMP-0004A	DIES FIRE PMP A	ENGINE AIR FILTER		DEL-1340	CI	RES	086		MM		M	
		DIESEL CRANKCASE		DEL-1340	CI	RES	086		MM		M	
		ENGINE AIR FILTER		DEL-1340	SM	RES	081		MM		M	
		DIESEL CRANKCASE		DEL-1340	SW	RES	081		OP	53-FPH	M	
		ENG GENERATOR BRNGS		DEL-1340	ST	HO			ME		M	
FP -MPMP-0004B	DIES FIRE PMP B	ENGINE AIR FILTER		DEL-1340	CI	RES	086		MM		M	
		DIESEL CRANKCASE		DEL-1340	CI	RES	086		MM		M	
		COUPLING		EP 111	CI	HG	087		MM		M	
		POWER TAKE-OFF		SHC 32	SS	GUN	082		MM		M	
		PMP BRGS (2)		SHC 32	SS	GUN	082		MM		M	
		DIESEL CRANKCASE		DEL-1340	SW	RES	081		OP	53-FPH	M	
		ENG GENERATOR BRNGS		DEL-1340	ST	HO			ME		M	
FS -MPMP-0002A	FUEL POOL PMP A	COUPLING		EP 111	ST	HG	087		MM		M	
		PUMP BEARING		SHC 626	ST	RES	086		MM		M	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		M	
FS -MPMP-0002B	FUEL POOL PMP B	PUMP BEARING		SHC 626	ST	RES	086		MM		M	
		COUPLING		EP 111	ST	HG	087		MM		M	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		M	
FS -MPMP-0004	REFLG CANAL DRS PMP	COUPLING		EP 111	CT	HG	087		MM		M	
		PUMP BEARINGS		SHC 626	SW	RES	081		OP	53-FHB	M	
		PUMP BEARINGS		SHC 626	CT	RES	086		MM		M	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		M	
FS -MPMP-0006	FUEL POOL PURIF PMP	COUPLING		EP 111	CI	HG	087		MM		M	
		CRANK PUMP BEARING		SHC 626	CI	RES	086		MM		M	
		PUMP BEARING		SHC 626	SW	RES	081		OP	53-FHB	M	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		M	

UNID	COMPONENT NAME	PART TO LUBRICATE	LC	LUBRICANT	FC	APL	INST	QUANT	DP	ROUTE	T	R
FS -MPMP-0009	REFLG POOL PURIF PMP	PUMP BEARINGS		SHC 626	CE	RES	086		MM		I	
		COUPLING		EP-1	CE	MC	087		MM		I	
		PUMP BEARINGS		SHC 626	SW	RES	086		OP	52-RAB	I	R
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
FS -MPMP-0010	REFLG CAVITY DR PMP	PUMP BEARINGS		SHC-32	SS	GUN	082		MM		N	
		COUPLING		EP-1	SS	MC	087		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
FW -MPMP-0002A	SG FW PMP A	SPEED LINKAGE		SHC-32	SS	GUN	082		MM		N	
		COUPLING		EP-111	CH	MC	087		MM		N	
FW -MPMP-0002B	SG FW PUMP B	COUPLING		EP-111	CH	MC	087		MM		I	
		SPEED LINKAGE		SHC-32	SH	GUN	082		MM		I	
FW -MTRB-0001A	SG FW TURBINE A	TURBINE LUBE OIL RESERVOIR		DTE-797	SD	RES	081		OP	51-T8	N	
FW -MTRB-0001B	SG FW TURBINE B	TURBINE LUBE OIL RESERVOIR		DTE-797	SD	RES	081		OP	51-T8	N	
GEN-MFAN-0001A	ISO PHASE BUS FAN 1A	COUPLING		EP-111	SS	MC	087		MM		I	
		PILLOW BLOCK BEARINGS		SHC-32	SS	GUN	082		MM		I	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		I	
GEN-MFAN-0001B	ISO PHASE BUS FAN 1B	COUPLING		EP-111	SS	MC	087		MM		I	
		PILLOW BLOCK BEARINGS		SHC-32	SS	GUN	082		MM		I	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		I	
GWR-MCMP-0004A	WASTE GAS COMP A	COMPRESSOR BEARINGS		SHC-630	CI	RES	086		MM		I	
		COMPRESSOR BEARINGS (2)		SHC-630	SD	RES	081		OP	52-RAB	I	R
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
GWR-MCMP-0004B	WASTE GAS COMP B	COMPRESSOR BEARINGS		SHC-630	CI	RES	086		MM		I	
		COMPRESSOR BEARINGS (2)		SHC-630	SD	RES	081		OP	52-RAB	I	R
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVC-MAHU-0013A	EQUIP ROOM AHU 13A	BLOWER BEARINGS (2)		SHC-32	ST	GUN	082		MM		N	
		MOTOR BEARINGS (2)		SHC-32	SV	GUN	082		ME		N	
HVC-MAHU-0013B	EQUIP ROOM AHU 13B	BLOWER BEARINGS		SHC-32	ST	GUN	082		MM		N	
		MOTOR BEARINGS		SHC-32	SV	GUN	082		ME		N	
HVC-MFAN-0002A	HVC WORK SUPPLY AH12	MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVC-MFAN-0002B	HVC WORK SUPPLY AH12	MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVC-MFAN-0008	COMPUTER RM AH31 FAN	BLOWER BEARINGS		SHC-32	ST	GUN	082		MM		N	
HVC-MFAN-0010A	EMER FLTR UNIT A FAN	MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVC-MFAN-0010B	EMER FLTR UNIT B FAN	MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVC-MFAN-0011A	EXH FAN 11	BLOWER BEARINGS		SHC-32	ST	GUN	082		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVC-MFAN-0011B	EXH FAN 11B	BLOWER BEARINGS		SHC-32	ST	GUN	082		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVC-MFAN-0012	EXH FAN 12	MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVD-MFAN-0002A	DECON RM FAN SUPPLY	FAN BEARINGS (2)		SHC-32	ST	GUN	082		MM		N	

UNID	COMPONENT NAME	PART TO LUBRICATE	LC	LUBRICANT	FC	APL	INST	QUANT	DP	ROUTE	I	R
		MOTOR BEARINGS (2)		SHC-32	ST	GUN	082		ME		N	
HVD-MFAN-0002B	HOT MACH SHOP FAN	FAN BEARINGS (2)		SHC-32	ST	GUN	082		MM		N	
		MOTOR BEARINGS (2)		SHC-32	ST	GUN	082		ME		N	
HVD-MFAN-0005A	DECON RM FAN EXH	FAN BEARINGS		SHC-32	ST	GUN	082		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVD-MFAN-0005B	HOT MACH SHOP FAN EX	FAN BEARINGS		SHC-32	ST	GUN	082		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVF-MAHU-0001	HVF INTAKE AHU-14	BLOWER BEARINGS		SHC-32	ST	GUN	082		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVF-MFAN-0002	FHB INTAKE AHU FAN	FAN BEARINGS		SHC-32	ST	GUN	082		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVF-MFAN-0003A	HVF NORMAL EXH FAN A	FAN BEARINGS		SHC-32	ST	GUN	082		MM		N	
		COUPLING		EP-111	ST	HG	087		MM		Y	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVF-MFAN-0003B	HVF NORMAL EXH FAN B	FAN BEARINGS		SHC-32	ST	B C			MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVF-MFAN-0005A	HVF EMERG EXH FAN A	COUPLING		EP-111	ST	HG	087		MM		Y	
		FAN BEARINGS (2)		SHC-32	ST	GUN	082		MM		N	
		MOTOR BEARING (2)		SHC-32	ST	GUN	082		ME		N	
HVF-MFAN-0005B	HVF EMERG EXH FAN B	FAN BEARINGS (2)		SHC-32	ST	GUN	082		MM		N	
		MOTOR BEARINGS (2)		SHC-32	ST	GUN	082		ME		N	
		COUPLING		EP-111	ST	GUN	082		MM		N	
HVF-MFAN-0006A	EMERG H&V RM EX FANA	BLOWER BEARINGS		SHC-32	ST	GUN	082		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVF-MFAN-0006B	EMER H&V RM EX FAN B	BLOWER BEARINGS		SHC-32	ST	GUN	082		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVR-MAHU-0001	RAB SUPPLY AHU 1	MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVR-MAHU-0010	PERSONNEL HP SUP AHU	MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVR-MAHU-0013	PERSONNEL SUP AHU 13	MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVR-MAHU-0017	HVR EXHAUST AHU 17	MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVR-MAHU-0020A	RAB EXHAUST AHU 20A	MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVR-MAHU-0020B	RAB EXHAUST AHU 20B	MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVR-MAHU-0022A	H&V ROOM AHU 22A	MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVR-MAHU-0022B	H&V ROOM AHU 22B	MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVR-MAHU-0026A	CC WTR HX A AHU 26A	MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVR-MAHU-0026B	CC WTR HX A AHU 26B	MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVR-MAHU-0028A	CC WTR PMP A AHU 28A	MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVR-MAHU-0028B	CC WTR PMP A AHU 28B	MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	

UNID	COMPONENT NAME	PART TO LUBRICATE	LC	LUBRICANT	FC	APL	INST	QUANT	DP	ROUTE	T	R
HVR-MAHU-0030	CC WTR PUMP AHU 30	MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVR-MAHU-0032A	SDHX A AHU 32A	MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVR-MAHU-0032B	SDHX A AHU 32B	MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVR-MAHU-0034A	SFEGRD PUMP AHU 34A	MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVR-MAHU-0034B	SFEGRD PUMP AHU 34B	MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVR-MAHU-0036A	SFEGRD PUMP AHU 36A	MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVR-MAHU-0036B	SFEGRD PUMP AHU 36B	MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVR-MAHU-0040A	CHG PUMP A AHU 40A	MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVR-MAHU-0040B	CHG PUMP A AHU 40B	MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVR-MAHU-0042	CHG PMP AB AHU 42	MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVR-MAHU-0044A	BD FILTER A AHU 44A	MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVR-MAHU-0044B	BD FILTER B AHU 28	MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVR-MFAN-0002A	NORM VENT SUP FAN A	BLOWER BEARINGS MOTOR BEARINGS		SHC-32 SHC-32	ST ST	GUN GUN	082 082		MM ME		N N	
HVR-MFAN-0002B	NORM VENT SUP FAN B	BLOWER BEARINGS MOTOR BEARINGS		SHC-32 SHC-32	ST ST	GUN GUN	082 082		MM ME		N N	
HVR-MFAN-0009A	RAB NORM EX FAN 9A	BLOWER BEARINGS MOTOR BEARINGS		SHC-32 SHC-32	ST ST	GUN GUN	082 082		MM ME		N N	
HVR-MFAN-0009B	RAB NORM EX FAN 9B	BLOWER BEARINGS MOTOR BEARINGS		SHC-32 SHC-32	ST ST	GUN GUN	082 082		MM ME		N N	
HVR-MFAN-0011	HVR SUP FAN AHU 10	COUPLING BLOWER BEARINGS MOTOR BEARINGS		EP-111 SHC-32 SHC-32	ST ST ST	MG GUN GUN	087 082 082		MM MM ME		I N N	
HVR-MFAN-0014	HVR SUP FAN AHU 13	COUPLING BLOWER BEARINGS MOTOR BEARINGS		EP-111 SHC-32 SHC-32	ST ST ST	MG GUN GUN	087 082 082		MM MM ME		I N N	
HVR-MFAN-0018	HVR SUP FAN 18 AHU17	COUPLING BLOWER BEARINGS MOTOR BEARINGS		EP-111 SHC-32 SHC-32	ST ST ST	MG GUN GUN	087 082 082		MM MM ME		I N N	
HVR-MFAN-0019	RAB EXH FAN E47	MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVR-MFAN-0021A	RAB CVAS EXH FAN A	MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVR-MFAN-0021B	RAB CVAS EXH FAN B	MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVR-MFAN-0023A	H&V ROOM SUP FAN 23A	BLOWER BEARINGS MOTOR BEARINGS		SHC-32 SHC-32	ST ST	GUN GUN	082 082		MM ME		N N	
HVR-MFAN-0023B	H&V ROOM SUP FAN 23B	BLOWER BEARINGS MOTOR BEARINGS		SHC-32 SHC-32	ST ST	GUN GUN	082 082		MM ME		N N	
HVR-MFAN-0024A	HVAC EQUIP RM FAN24A	BLOWER BEARINGS (2)		SHC-32	ST	GUN	082		MM		N	

UNID	COMPONENT NAME	PART TO LUBRICATE	LC	LUBRICANT	FC	APL	INST	QUANT	DP	ROUTE	I	R
		MOTOR BEARINGS (2)		SHC-32	ST	GUN	082		ME		N	
HVR-MFAN-0024B	HVAC EQUIP RM FAN24B	BLOWER BEARINGS (2)		SHC-32	ST	GUN	082		MM		N	
		MOTOR BEARINGS (2)		SHC-32	ST	GUN	082		ME		N	
HVR-MFAN-0025A	EDG A FAN 25A	BLOWER BEARINGS		SHC-32	ST	GUN	082		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVR-MFAN-0025B	EDG B FAN 25B	BLOWER BEARINGS		SHC-32	ST	GUN	082		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVR-MFAN-0027A	CC WTR HX A FAN 27A	BLOWER BEARINGS		SHC-32	ST	GUN	082		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVR-MFAN-0027B	CC WTR HX B FAN 27B	BLOWER BEARINGS		SHC-32	ST	GUN	082		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVR-MFAN-0029A	CC WTR PMP A FAN 29A	MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
		BLOWER BEARINGS		SHC-32	ST	GUN	082		MM		N	
HVR-MFAN-0029B	CC WTR PMP B FAN 29B	BLOWER BEARINGS		SHC-32	ST	GUN	082		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVR-MFAN-0031	CC WTR PMP AB FAN 31	BLOWER BEARINGS		SHC-32	ST	GUN	082		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVR-MFAN-0033A	SD HX FAN 33A	BLOWER BEARINGS		SHC-32	ST	GUN	082		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVR-MFAN-0033B	SD HX FAN 33B	BLOWER BEARINGS		SHC-32	ST	GUN	082		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVR-MFAN-0035A	SFEGRD PMP A FAN 35A	BLOWER BEARINGS		SHC-32	ST	GUN	082		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVR-MFAN-0035AB	SFEGRD PMP FAN 35AB	BLOWER BEARINGS		SHC-32	ST	GUN	082		MM		N	
HVR-MFAN-0035B	SFEGRD PMP B FAN 35B	BLOWER BEARINGS		SHC-32	ST	GUN	082		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVR-MFAN-0037A	SFEGRD PMP A FAN 37A	BLOWER BEARINGS		SHC-32	ST	GUN	082		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVR-MFAN-0037B	SFEGRD PMP B FAN 37B	BLOWER BEARINGS		SHC-32	ST	GUN	082		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVR-MFAN-0043	CHG PMP AB FAN 43	BLOWER BEARINGS		SHC-32	ST	GUN	082		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVR-MFAN-0045A	BLOWDOWN FLT FAN 45A	BLOWER BEARINGS		SHC-32	ST	GUN	082		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVR-MFAN-0045B	BLOWDOWN FLT FAN 45B	BLOWER BEARINGS		SHC-32	ST	GUN	082		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVT-MAHU-0001A	SWHRG RM SUP AHU 1A	BLOWER BEARINGS		SHC-32	ST	GUN	082		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVT-MAHU-0001B	SWHGR RM SUP AHU 1B	BLOWER BEARINGS		SHC-32	ST	GUN	082		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
HVT-MFAN-0002A	SWHGR RM SUP FAN 2A	BLOWER BEARINGS		SHC-32	ST	GUN	082		MM		N	

UNID	COMPONENT NAME	PART TO LUBRICATE	LC	LUBRICANT	FC	APL	INST	QUANT	DP	ROUTE	I	S
		MOTOR BEARINGS		SHC-32	ST	GUN	092		ME		N	
HVT-MFAN-0002B	SWHGR RM SUP FAN 2B	BLOWER BEARINGS		SHC-32	ST	GUN	092		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	092		ME		N	
HVT-MFAN-0003	HVT AXIAL FAN 3	BLOWER BEARINGS		SHC-32	ST	GUN	092		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	092		ME		N	
HVT-MFAN-0004	TUB FL EXH FAN 4	BLOWER BEARINGS		SHC-32	ST	GUN	092		MM		N	
HVT-MFAN-0005A	TUB FL EXH FAN 5A	BLOWER BEARINGS		SHC-32	ST	GUN	092		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	092		ME		N	
HVT-MFAN-0005B	TUB FL EXH FAN 5B	BLOWER BEARINGS		SHC-32	ST	GUN	092		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	092		ME		N	
HVT-MFAN-0006	TUR FL EXH FAN 6	BLOWER BEARINGS		SHC-32	ST	GUN	092		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	092		ME		N	
HVT-MFAN-0007A	COND PMP A EXH FAN7A	BLOWER BEARINGS		SHC-32	ST	GUN	092		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	092		ME		N	
HVT-MFAN-0007B	COND PMP B EXH FAN7B	BLOWER BEARING		SHC-32	ST	GUN	092		MM		N	
		MOTOR BEARING		SHC-32	ST	GUN	092		ME		N	
HVT-MFAN-0007C	COND PMP C EXH FAN7C	BLOWER BEARING		SHC-32	ST	GUN	092		MM		N	
		MOTOR BEARING		SHC-32	ST	GUN	092		ME		N	
HVT-MFAN-0008A	COND PMP A EXH FAN8A	BLOWER BEARINGS		SHC-32	ST	GUN	092		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	092		ME		N	
HVT-MFAN-0008B	COND PMP B EXH FAN8B	BLOWER BEARINGS		SHC-32	ST	GUN	092		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	092		ME		N	
HVT-MFAN-0008C	COND PMP C EXH FAN8C	BLOWER BEARINGS		SHC-32	ST	GUN	092		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	092		ME		N	
HVT-MFAN-0009	HVT AXIAL FAN 56	BLOWER BEARINGS		SHC-32	ST	GUN	092		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	092		ME		N	
HVT-MFAN-0010	MEZZ EXHAUST FAN 10	BLOWER BEARINGS		SHC-32	ST	GUN	092		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	092		ME		N	
HVT-MFAN-0011	MEZZ EXHAUST FAN 11	BLOWER BEARINGS		SHC-32	ST	GUN	092		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	092		ME		N	
HVT-MFAN-0012	MEZZ EXHAUST FAN 12	BLOWER BEARINGS		SHC-32	ST	GUN	092		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	092		ME		N	
HVT-MFAN-0013	MEZZ EXHAUST FAN 13	BLOWER BEARINGS		SHC-32	ST	GUN	092		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	092		ME		N	
HVT-MFAN-0014	MEZZ EXHAUST FAN 14	BLOWER BEARINGS		SHC-32	ST	GUN	092		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	092		ME		N	
HVT-MFAN-0015	MEZZ EXHAUST FAN 15	BLOWER BEARINGS		SHC-32	ST	GUN	092		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	092		ME		N	
HVT-MFAN-0016	MEZZ EXHAUST FAN 16	BLOWER BEARINGS		SHC-32	ST	GUN	092		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	092		ME		N	
HVT-MFAN-0017	MEZZ EXHAUST FAN 17	BLOWER BEARINGS		SHC-32	ST	GUN	092		MM		N	

UNID	COMPONENT NAME	PART TO LUBRICATE	LC	LUBRICANT	FC	APL	INST	QUANT	OP	ROUTE	I	R
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
MPT-MFAN-0018	MEZZ SUPPLY FAN 18	BLOWER BEARINGS		SHC-32	ST	GUN	082		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
IA -MCMP-0002A	INST AIR COMPRESSORA	COUPLING		EP-111	ST	HG	087		MM		I	
		COMPRESSOR BEARINGS		SHC-32	ST	GUN	082		MM		I	
		MOTOR BEARINGS		SHC-626	CT	RES	086		MM		I	
		MOTOR BEARINGS		SHC-626	SD	RES	081		OP	51-TB	N	
IA -MCMP-0002B	INST AIR COMPRESSORB	COMPRESSOR BEARINGS		SHC-32	ST	GUN	082		MM		N	
		COUPLING		EP-111	ST	HG	087		MM		N	
		MOTOR BEARINGS		SHC-626	CT	RES	086		MM		I	
		MOTOR BEARINGS		SHC-626	SD	RES	081		OP	51-TB	N	
LOF-MFAN-0007A	VAPOR EXTRACTOR	MOTOR BEARINGS		NONE	--	- -			MM		N	
		FAN BEARINGS		SHC-32	ST	GUN	082		MM		N	
		COUPLING		NONE	--	--			MM		N	
LOF-MFAN-0007B	VAPOR EXTRACTOR	MOTOR BEARINGS		NONE	--	---			MM		N	
		FAN BEARINGS		SHC-32	ST	GUN	082		MM		N	
		COUPLING		NONE	--	- -			MM		N	
LOF-MPMP-0001A	FW PUMP A MOP 1A	COUPLING		NONE	--	- -			--		N	
		PUMP BEARINGS		NONE	--	- -			--		N	
		MOTOR BEARING		SHC-32	ST	GUN	082		ME		N	
LOF-MPMP-0001B	FW PUMP B MOP 1B	COUPLING		NONE	--	- -			--		N	
		PUMP BEARINGS		NONE	--	-					N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
LOF-MPMP-0002A	FW PUMP A MOP 2A	COUPLING		NONE	--	- -			--		N	
		PUMP BEARINGS		NONE	--	- -			--		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
LOF-MPMP-0002B	FW PUMP B MOP 2B	COUPLING		NONE	--	--			-		N	
		PUMP BEARINGS		NONE	--	- -			--		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
LOF-MPMP-0005A	FW PUMP A EOP 5A	COUPLING		NONE	--	- -			--		N	
		PUMP BEARINGS		NONE	--	--			-		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
LOF-MPMP-0005B	FW PUMP B EOP 5B	COUPLING		NONE	--	--			--		N	
		PUMP BEARINGS		NONE	--	- -			-		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
LOG-MFAN-0009A	VAPOR EXTRACTOR	BLOWER BEARINGS		SHC-32	ST	GUN	082		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
LOG-MFAN-0009B	VAPOR EXTRACTOR	BLOWER BEARINGS		SHC-32	ST	GUN	082		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
LOG-MPMP-0002	SEAL OIL BACKUP PUMP	COUPLING		EP-111	CT	HG	087		MM		I	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		I	
LOG-MPMP-0005A	logllllllAC BRG OIL	PMP BRG		SHC 32	SS	GUN	082		MM		N	
		COUPLING		NONE	--	--			MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
LOG-MPMP-0005B	DC EMERG OIL PMP	PMP BRGS		SHC 32	SS	GUN	082		MM		N	

LUBRICATION DATA SCHEDULE SORTED BY UNID NUMBER

UNID	COMPONENT NAME	PART TO LUBRICATE	LC	LUBRICANT	FC	APL	INST	QUANT	DP	ROUTE	I	R
		COUPLING		NONE	--	--			MM			N
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME			N
LOG-MPMP-0007	SRG LIFT OIL PMP	COUPLING		EP 111	CV	HG	087		MM			I
LOS-MPMP-0002	LOS FILTER PUMP	PUMP BEARINGS		NONE	--	--			MM			N
		COUPLING		EP-111	CV	HG	087		MM			N
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME			N
LOS-MPMP-0005	LOS TRANSFER PUMP	PUMP BEARINGS		NONE	--	---			--			N
		COUPLING		NONE	--	--			--			N
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME			N
LOS-MPMP-0009	FW PUMP LO XFER PUMP	PUMP BEARINGS		NONE								N
		COUPLING		NONE	--	--						N
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME			N
LWM-MPMP-0002A	WASTE PMP A	COUPLING		EP-111	CE	HG	087		MM			I
		PUMP BEARING		SHC-626	CE	RES	086		MM			I
		PUMP BEARING		SHC-626	SW	RES	081		OP	52-RAB		N
		MOTOR BEARING		SHC-32	ST	GUN	082		ME			N
LWM-MPMP-0002B	WASTE PMP B	COUPLING		EP-111	CE	HG	087		MM			I
		PUMP BEARING		SHC-626	CE	RES	086		MM			I
		PUMP BEARING		SHC-626	SW	RES	081		OP	52-RAB		N
		MOTOR BEARING		SHC-32	ST	GUN	082		ME			N
LWM-MPMP-0008A	WST CONC DIST PMP A	PUMP BEARINGS		SHC 626	SW	RES	081		OP	52-RAB		N
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME			N
LWM-MPMP-0008B	WST CONC DIST PMP B	PUMP BEARINGS		SHC 626	SW	RES	081		OP	52-RAB		N
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME			N
LWM-MPMP-0010A	WST CONC CONC PP A											
LWM-MPMP-0010B	WST CONC CONC PP B											
LWM-MPMP-0014A	WASTE COND TK PMP A	PUMP BEARINGS		SHC-626	CE	RES	086		MM			I
		COUPLING		EP-111	CE	HG	087		MM			I
		PUMP BEARINGS		SHC-626	SW	RES	081		OP	52-RAB		N
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME			N
LWM-MPMP-0014B	WASTE COND TK PMP B	COUPLING		EP-111	CE	HG	087		MM			I
		PUMP BEARINGS		SHC-626	CE	RES	086		MM			I
		PUMP BEARINGS		SHC-626	SW	RES	081		OP	52-RAB		N
		MOTOR BEARING		SHC-32	ST	GUN	082		ME			N
LWM-MPMP-0016A	LAUNDRY TNK PUMP A	COUPLING		EP-111	CE	HG	087		MM			I
		PUMP BEARINGS		SHC-626	CE	RES	086		MM			I
		PUMP BEARINGS		SHC-626	SW	RES	081		OP	52-RAB		N
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME			N
LWM-MPMP-0016B	LAUNDRY TNK PUMP B	COUPLING		EP-111	CE	HG	087		MM			N
		PUMP BEARINGS		SHC-626	CE	RES	086		MM			N
		PUMP BEARINGS		SHC-626	SW	RES	081		OP	52-RAB		N
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME			N
LWM-MPMP-0018	CHEM WASTE TANK PUMP	PUMP BEARINGS		SHC-626	SW	RES	081		OP	52-RAB		N
MT -ENT -0001A	WSGN-3 MAIN XFMR A	GAS-IN-OIL SAMPLE			IS	RES			ME			N
		OIL SAMPLE			IA	RES			ME			N

UNID	COMPONENT NAME	PART TO LUBRICATE	LC	LUBRICANT	FC	APL	INST	QUANT	DP	ROUTE	T	R
MT -ENT -0001B	WSGN-3 MAIN XFMR B	GAS-IN-OIL SAMPLE			XS	RLS			ME		N	
		OIL SAMPLE			XA	RLS			ME		N	
NG -MPMP-0003	LIQ NITROGEN PMP	PMP BRGS		NONE	--	--			--		N	
		BELT DRIVE		NONE	--	--			--		N	
		MOTOR BEARING		SHC-32	ST	GUN	082		ME		N	
PMU-MPMP-0002A	PRIMARY WATER PUMP A	COUPLING		NONE	--	--			--		N	
		PUMP BEARINGS		SHC-626	SD	RES	086		OP	53-FPH	Y	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
PMU-MPMP-0002B	PRIMARY WATER PUMP B	COUPLING		NONE	--	--			-		N	
		PUMP BEARINGS		SHC-626	SD	RES	086		OP	53-FPH	N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
PSL-MPMP-0014	PSL PMP FROM SD	COUPLING		EP-111	GT	HG	087		MM		I	
		PUMP BEARINGS		SHC-626	GT	RES	086		MM		I	
		MOTOR BEARINGS		SHC-32	ST	GUN	081		ME		I	
PW -MPMP-0001	SB WTR MTR RECIRC	PMP BEARING		DEL-1340	ST	HO	084		MM		N	
		MTR BEARING		DEL-1340	ST	HO	084		ME		N	
PW -MPMP-0003	RAB HOT WTR RECIRC	PMP BEARING		DEL-1340	ST	HO	084		MM		N	
		MTR BEARING		DEL-1340	ST	HO	084		ME		N	
RC -MPMP-0001A	RC PUMP 1A	UPPER BEARING		SHC-626	AR	RES	086		MM		I	
		LOWER BEARING		SHC-624	AR	RES	086		MM		I	
		OIL SYSTEM SAMPLE			XE				CE		I	
RC -MPMP-0001B	RC PUMP 1B	LOWER BEARING		SHC-624	AR	RES	086		MM		I	
		UPPER BEARING		SHC-626	AR	RES	086		MM		I	
		OIL SYSTEM SAMPLE			XE				CE		I	
RC -MPMP-0002A	RC PUMP 2A	LOWER BEARING		SHC-624	AR	RES	086		MM		I	
		UPPER BEARING		SHC-626	AR	RES	086		MM		I	
		OIL SYSTEM SAMPLE			XE				CE		I	
RC -MPMP-0002B	RC PUMP 2B	LOWER BEARING		SHC-624	AR	RES	086		MM		I	
		UPPER BEARING		SHC-626	AR	RES	086		MM		I	
		OIL SYSTEM SAMPLE			XE				CE		I	
RFR-MCMP-0001C	RFR CMP MC2	COMPRESSOR UNIT		SHC-626	GT	RES	086		MM		I	
		COMPRESSOR UNIT		SHC-626	SD	RES	081		OP	53-CWB	N	
RFR-MCMP-0001D	RFR CMP MC3	COMPRESSOR UNIT		SHC-626	GT	RES	086		MM		I	
		COMPRESSOR UNIT		SHC-626	SD	RES	081		OP	53-CWB	N	
RFR-MCMP-0002A	RFR CMP MC1 A	COMPRESSOR UNIT		SHC-626	GT	RES	086		MM		I	
		COMPRESSOR UNIT		SHC-626	SD	RES	081		OP	52-RAB	N	
RFR-MCMP-0002AB	RFR CMP MC1 AB	COMPRESSOR UNIT		SHC-626	SD	RES	081		OP	52-RAB	N	
RFR-MCMP-0002B	RFR CMP MC1 B	COMPRESSOR UNIT		SHC-626	GT	RES	086		MM		I	
		COMPRESSOR UNIT		SHC-626	SD	RES	081		OP	52-RAB	N	
SA -MCMP-0002A	STA AIR COMPRESSOR A	COUPLING		EP 111	ST	HG	087		MM		I	
		COMPRESSOR BEARINGS		SHC-32	ST	GUN	082		MM		I	
		MOTOR BEARINGS		SHC-626	GT	RES	086		MM		I	
		MOTOR BEARINGS		SHC-626	SD	RES	081		OP	51-TB	N	
SA -MCMP-0002B	STA AIR COMPRESSOR B	COUPLING		EP 111	ST	HG	087		MM		I	

UNID	COMPONENT NAME	PART TO LUBRICATE	LC	LUBRICANT	FC	APL	INST	QUANT	OP	ROUTE	T	R
		COMPRESSOR BEARINGS		SHC-32	SY	GUN	082		MM		M	
		MOTOR BEARINGS		SHC-626	CE	RES	086		MM		I	
		MOTOR BEARINGS		SHC-626	SD	RES	081		OP	51-T8	M	
SBV-MFAN-0002A	SBV EXH FAN A	BLOWER BEARINGS (2)		SHC-32	SY	GUN	082		MM		M	
		MOTOR BEARINGS (2)		SHC-32	SY	GUN	082		ME		M	
SBV-MFAN-0002B	SBV EXH FAN B	BLOWER BEARINGS (2)		SHC-32	SY	GUN	082		MM		M	
		MOTOR BEARINGS (2)		SHC-32	SY	GUN	082		ME		M	
SCC-MFAN-0001A	SUPP COOLING TWR #1	FAN SHAFT BEARINGS		SHC-32	SY	GUN	082		MM		I	
		MOTOR BEARINGS		SHC-32	SY	GUN	082		ME		I	
SCC-MFAN-0001B	SUPP COOLING TWR #2	FAN SHAFT BEARINGS		SHC-32	SY	GUN	082		MM		I	
		MOTOR BEARINGS		SHC-32	SY	GUN	082		ME		I	
SCC-MPMP-0001A	SCC PUMP A	COUPLING		EP-111	SS	HG	087		MM		I	
		PUMP BEARINGS		SHC-626	CS	RES	086		MM		I	
		PUMP BEARINGS		SHC-626	SD	RES	081		OP	53-CWB	M	
		MOTOR BEARINGS		SHC-32	SY	GUN	082		ME		I	
SCC-MPMP-0001B	SCC PUMP B	COUPLING		EP-111	SS	HG	087		MM		I	
		PUMP BEARINGS		SHC-626	CS	RES	086		MM		I	
		PUMP BEARINGS		SHC-626	SD	RES	081		OP	53-CWB	M	
		MOTOR BEARINGS		SHC-32	SY	GUN	082		ME		I	
SCC-MPMP-0001C	SCC PUMP C	PUMP BEARINGS		SHC-626	CS	RES	086		MM		I	
		COUPLING		EP-111	SS	HG	087		MM		I	
		PUMP BEARINGS		SHC-626	SD	RES	081		OP	53-CWB	M	
		MOTOR BEARINGS		SHC-32	SY	GUN	082		ME		I	
SCH-MPMP-0001A	SUPP CHILL WTR PMP A	COUPLING		EP-111	CI	HG	087		MM		I	
		PUMP BEARINGS		SHC-626	CE	RES	086		MM		I	
		PUMP BEARINGS		SHC-626	SD	RES	081		OP	53-CWB	M	
		MOTOR BEARINGS		SHC-32	SS	GUN	082		ME		I	
SCH-MPMP-0001B	SUPP CHILL WTR PMP B	COUPLING		EP-111	CI	HG	087		MM		I	
		PUMP BEARINGS		SHC-626	CE	RES	086		MM		I	
		PUMP BEARINGS		SHC-626	SD	RES	081		OP	53-CWB	M	
		MOTOR BEARINGS		SHC-32	SS	GUN	082		ME		I	
SCW-MPMP-0002A	SCW PUMP A	COUPLING		EP-111	CI	HG	087		MM		I	
		PUMP BEARINGS		DTE-797	SW	RES	084		OP	51-T8	M	
		PUMP BEARINGS		DTE 797	CE	RES	086		MM		I	
		MOTOR BEARINGS		SHC-32	SY	GUN	082		ME		M	
SCW-MPMP-0002B	SCW PUMP B	COUPLING		EP 111	CI	HG	087		MM		I	
		PUMP BEARINGS		DTE 797	SW	RES	084		OP	51-T8	M	
		PUMP BEARINGS		DTE 797	CE	RES	086		MM		I	
		MOTOR BEARINGS		SHC-32	SY	GUN	082		ME		M	
SI -MPMP-0001A	LPSI PMP A	UPPER MTR BEARINGS		SHC-626	CS	RES	086		MM		I	
		UPPER MTR BEARING		SHC-626	SW	RES	081		OP	52-RAB	M	
		LOWER MTR BEARINGS		SHC-32	SY	GUN	082		ME		M	
SI -MPMP-0001B	LPSI PMP B	UPPER MTR BEARINGS		SHC-626	CS	RES	086		MM		I	
		UPPER MTR BEARING		SHC-626	SW	RES	081		OP	52-RAB	M	
		LOWER MTR BEARINGS		SHC-32	SY	GUN	082		ME		M	
SI -MPMP-0002A	HPSI PMP A	MOTOR BEARINGS		SHC 626	CS	RES	086		MM		I	
		COUPLING		EP 111	CS	HG	087		MM		I	

UNID	COMPONENT NAME	PART TO LUBRICATE	LC	LUBRICANT	FC	APL	INST	QUANT	DP	ROUTE	T	R
		PUMP BEARINGS		SHC 824	CS	RES	086		MM		I	
		PUMP BEARINGS (2)		SHC-824	SW	RES	081		OP	52-RAB	N	
		MOTOR BEARINGS (2)		SHC-626	SW	RES	081		OP	52-RAB	N	
SI -MPMP-0002AB	HPSI PMP AB	PUMP BEARINGS (2)		SHC-824	SW	RES	081		OP	52-RAB	N	
		MOTOR BEARINGS (2)		SHC-626	SW	RES	081		OP	52-RAB	N	
		PUMP BEARINGS (2)		SHC-824	SW	RES	081		OP	52-RAB	N	
		MOTOR BEARINGS		SCH 626	CS	RES	086		MM		I	
		COUPLING		EP 111	CS	RES	086		MM		I	
		PUMP BEARINGS		SCH 824	CS	RES	086		MM		I	
SI -MPMP-0002B	HPSI PMP B	MOTOR BEARINGS		SHC 626	CS	RES	086		MM		I	
		COUPLING		EP 111	CS	HG	087		MM		I	
		PUMP BEARINGS		SHC-824	CS	RES	086		MM		I	
		PUMP BEARINGS (2)		SHC-824	SW	RES	081		OP	52-RAB	N	
		MOTOR BEARINGS (2)		SHC-626	SW	RES	081		OP	52-RAB	N	
		MOTOR BEARINGS		SHC 626	CS	RES	086		MM		I	
		PUMP BEARINGS		SCH 824	CS	RES	086		MM		I	
SO -MPMP-0002A	AIR SIDE SOP A	COUPLING		EP-111	SV	HG	087		MM		I	
		MOTOR BEARINGS		SHC-32	SI	CON	082		ME		N	
SO -MPMP-0002B	AIR SIDE SOP B	COUPLING		EP-111	SV	HG	087		MM		I	
		MOTOR BEARINGS		SHC-32	SI	CON	082		ME		N	
SO -MPMP-0006	HG SIDE SEAL OIL PMP	COUPLING		EP-111	SV	HG	087		MM		I	
		MOTOR BEARINGS		SHC-32	SI	CON	082		ME		N	
SP -MPMP-0002A	SUMP, CNTMT PMP A	MOTOR BEARINGS		SHC-32	SI	HG			ME		N	
		PUMP BEARINGS		NONE					MM		N	
		COUPLING		EP-111	SV	HG			MM		N	
SP -MPMP-0002B	SUMP, CNTMT PMP B	PUMP BEARINGS		NONE					MM		N	
		COUPLING		EP-111	SV	HG			MM		N	
		MOTOR BEARINGS		SHC-32	SI	HG			ME		N	
SP -MPMP-0006A	SUMP, BA CD TK PMP A	PUMP BEARINGS		NONE					MM		N	
		COUPLING		EP-111	SV	HG			MM		N	
		MOTOR BEARINGS		SHC-32	SI	HG			ME		N	
SP -MPMP-0006B	SUMP, BA CD TK PMP B	COUPLING		EP-111	SV	HG			MM		N	
		MOTOR BEARINGS		SHC-32	SI	HG			ME		N	
		PUMP BEARINGS		NONE	--	---			MM		N	
SP -MPMP-0008A	DRY TWR SMP 1 PMP A	MOTOR BEARINGS		SHC-32	SI	HG			ME		N	
		COUPLING		EP-111	SV				MM		N	
SP -MPMP-0008B	DRY TWR SMP 1 PMP B	MOTOR BEARINGS		SHC-32	SI	HG			ME		N	
		COUPLING		EP-111	SV				MM		N	
SP -MPMP-0010A	RAB FL SMP 3 PMP A	MOTOR BEARINGS		SHC-32	SI				ME		N	
		PUMP BEARINGS		NONE	--				MM		N	
		COUPLING		EP-111	SV				MM		N	
SP -MPMP-0010B	RAB FL SMP 3 PMP B	COUPLING		EP-111	SV				MM		N	
		MOTOR BEARINGS		SHC-32	SI				ME		N	
		PUMP BEARINGS		NONE	--				MM		N	
SP -MPMP-0012A	RAB FL SMP 10 PMP A	COUPLINGS		EP-111	SV				MM		N	
		MOTOR BEARINGS		SHC-32	SI				ME		N	
		PUMP BEARINGS		NONE	--				MM		N	

UNID	COMPONENT NAME	PART TO LUBRICATE	LC	LUBRICANT	FC	APL	INST	QUANT	DP	ROUTE	T	R
SP -MPMP-0012B	RAB FL SMP 1B PMP B	PUMP BEARINGS		NONE	--				MM		N	
		MOTOR BEARINGS		SHC-32	SY				ME		N	
SP -MPMP-0014A	DRY TWR SMP 2 PMP A	MOTOR BEARINGS		SHC-32	SY				ME		N	
SP -MPMP-0014B	DRY TWR SMP 2 PMP B	MOTOR BEARINGS		SHC-32	SY				ME		N	
SP -MPMP-0018A	SUMP, WST TK PMP A	MOTOR BEARINGS		SHC-32	SY				ME		N	
		PUMP BEARINGS		NONE	--				MM		N	
		COUPLING		EP-111	SY				MM		N	
SP -MPMP-0018B	SUMP, WST TK PMP B	COUPLING		EP-111	SY				MM		N	
		MOTOR BEARINGS		SHC-32	SY				ME		N	
		PUMP BEARINGS		NONE	--				MM		N	
SP -MPMP-0020A	SUMP, LNDRY TK PMP A	COUPLING		EP-111	SY				MM		N	
		MOTOR BEARINGS		SHC-32	SY				ME		N	
		PUMP BEARINGS		NONE	--				MM		N	
SP -MPMP-0020B	SUMP, LNDRY TK PMP B	COUPLING		EP-111	SY				MM		N	
		MOTOR BEARINGS		SHC-32	SY				ME		N	
		PUMP BEARINGS		NONE	--				MM		N	
SP -MPMP-0026A	SUMP, RX DR TK PMP A	COUPLING		EP-111	SY				MM		N	
		MOTOR BEARINGS		SHC-32	SY				ME		N	
		PUMP BEARINGS		NONE	--				MM		N	
SP -MPMP-0026B	SUMP, RX DR TK PMP B	COUPLING		EP-111	SY				MM		N	
		MOTOR BEARINGS		SHC-32	SY				ME		N	
		PUMP BEARINGS		NONE	--				MM		N	
SP -MPMP-0028A	SFGRD PMP B FL SMP A	MOTOR BEARINGS		SHC-32	SY				ME		N	
		PUMP BEARINGS		NONE	--				MM		N	
		COUPLING		EP-111	SY				MM		N	
SP -MPMP-0028B	SFGRD PMP B FL SMP B	MOTOR BEARINGS		SHC-32	SY				ME		N	
		PUMP BEARINGS		NONE	--				MM		N	
		COUPLING		EP-111	SY				MM		N	
SP -MPMP-0032A	DSL OIL SUMP PMP 1A											
SP -MPMP-0032B	DSL OIL SUMP PMP 1B											
SP -MPMP-0034A	OIL SUMP PUMP A	COUPLING		EP-111	SY				MM		N	
		MOTOR BEARINGS		SHC-32	SY				ME		N	
		PUMP BEARINGS		NONE	--				MM		N	
SP -MPMP-0034B	OIL SUMP PUMP B	COUPLING		EP-111					MM		N	
		MOTOR BEARINGS		SHC-32					ME		N	
		PUMP BEARINGS		NONE					MM		N	
SP -MPMP-0036A	DSL OIL SMP PMP 2A											
SP -MPMP-0036B	DSL OIL SMP PMP 2B											
SP -MPMP-0040A	SUMP EQ DR TK PMP A	COUPLING		EP-111	AR				MM		N	
		MOTOR BEARINGS		SHC-32	SY				ME		N	
		PUMP BEARINGS		NONE	--				MM		N	
SP -MPMP-0040B	SUMP, EQ DR TK PMP B	COUPLING		EP-111	AR				MM		N	

LUBRICATION DATA SCHEDULE SORTED BY UNID NUMBER

UNID	COMPONENT NAME	PART TO LUBRICATE	LC	LUBRICANT	FC	APL	INST	QUANT	DP	ROUTE	I	R
		MOTOR BEARINGS		SHC-32	ST				ME		N	
		PUMP BEARINGS		NONE	--						N	
SP -MPMP-0042A	YARD OIL SEP SP PMPA	PUMP BEARINGS		NONE								
		COUPLING		EP 111	CV	MG	087		MM		N	
		MOTOR BEARINGS		SHC-32	SV	GUN	082		ME		N	
SP -MPMP-0042B	YARD OIL SEP SP PMPB	COUPLING		EP 111	CV	MG	087		MM		N	
		MOTOR BEARINGS		SHC-32	SV	GUN	082		ME		N	
SP -MPMP-0044A	REG WASTE XFER PMP A	COUPLING		EP 111	CV	MG	087		MM		N	
		PMP BRGS		NONE	--	--			MM		N	
SP -MPMP-0044B	REG WASTE XFER PMP B	COUPLING		EP 111	CV	MG	087		MM		N	
		PMP BRGS		NONE	--	---			MM		N	
SP -MPMP-0048	SLUDGE PUMP	PUMP BEARINGS (SEALED)		NONE	--	---			MM		N	
		COUPLING		EP 111	CV	MG	087		MM		N	
SP -MPMP-0050A	AUX BLR BD SP PMP A	COUPLING		EP-111	CV	MG	087		MM		N	
		PUMP BEARINGS		NONE	--	- -			MM		N	
		MOTOR BEARINGS (2)		SHC-32	SV	GUN	082		ME		N	
		MOTOR BEARINGS (2)		SHC-32	SV	GUN	082		ME		N	
SP -MPMP-0050B	AUX BLR BD SP PMP B	COUPLING		EP-111	CV	MG	087		MM		N	
		PUMP BEARINGS		NONE	--	- -			MM		N	
SS -MDSG-0001	AUX DSL GEN SET	CRANKCASE		DEL-1310	CI	RES	086		MM		N	
		CRANKCASE		DEL-1310	SM	RES	081		MM	53-FPH	N	
		SHAFT BEARINGS		SHC-32	SV	GC	083		MM		N	
SSL-MPMP-0001A	SAMPLING PMP	GEAR BOX		GR-632	CS	RES	086		MM		N	
SSL-MPMP-0001B	SAMPLING PMP	GEAR BOX		GR-632	CS	RES	086		MM		N	
SSL-MPMP-0001C	SAMPLING PMP	GEAR BOX		GR-632	CS	RES	086		MM		N	
SSL-MPMP-0002A	SAMPLING PMP	GEAR BOX		GR-632	CS	RES	086		MM		N	
SSL-MPMP-0002B	SAMPLING PMP	GEAR BOX		GR-632	CS	RES	086		MM		N	
SSL-MPMP-0002C	SAMPLING PMP	GEAR BOX		GR-632	CS	RES	086		MM		N	
SSL-MPMP-0020	SAMPLE RECOVERY PMP	PMP BRGS		SHC-626	CS	RES	086		MM		N	
		COUPLING		EP 111	SS	MG	087		MM		N	
		BEARING HOUSING		SHC-626	CS	RES	086		MM		N	
		PUMP BEARING		SHC-626	SM	RES	081		OP	52-RAB	N	
		MOTOR BEARINGS		SHC-32	SV	GUN	082		ME		N	
ST -EMT -0001A	STATRUP XFMR A	GAS-IN-OIL SAMPLE			XS	RES			ME		N	
		OIL SAMPLE			XA	RES			ME		N	
ST -EMT -0001B	STARTUP XFMR B	GAS-IN-OIL SAMPLE			XS	RES			ME		N	
		OIL SAMPLE			XA	RES			ME		N	
SVS-MAHU-0001A	SVS SUPPLY AHU 1A	BLOWER BEARINGS		SHC-32	ST	GUN	082		MM		N	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		N	
SVS-MAHU-0001B	SVS SUPPLY AHU 1B	BLOWER BEARINGS		SHC-32	ST	GUN	082		MM		N	
		MOTOR BEARINGS		SHC-32	SV	GUN	082		ME		N	
SVS-MFAN-0002A	SUP FAN 2A IN AHU 1A	FAN BEARINGS		SHC-32	SS	GUN	082		MM		Y	

UNID	COMPONENT NAME	PART TO LUBRICATE	LC	LUBRICANT	FC	APL	INST	QUANT	DP	ROUTE	T	R
		MOTOR BEARINGS		SHC-32	55	GUN	082		ME		Y	
SYS-MFAN-0002B	SUP FAN 2B IN AHU 1B	FAN BEARINGS		SHC-32	55	GUN	082		MM		Y	
		MOTOR BEARINGS		SHC-32	55	GUN	082		ME		Y	
SYS-MFAN-0009A	RECIRC FAN 9A AHU 8A	FAN BEARINGS		SHC-32	55	GUN	082		MM		Y	
		MOTOR BEARINGS		SHC-32	55	GUN	082		ME		Y	
SYS-MFAN-0009B	RECIRC FAN 9B AHU 8B	FAN BEARINGS		SHC-32	55	GUN	082		MM		Y	
		MOTOR BEARINGS		SHC-32	55	GUN	082		ME		Y	
SYS-MFAN-0011A	COMM EQUIP RM EXH A	FAN BEARINGS		SHC-32	55	GUN	082		MM		Y	
		MOTOR BEARINGS		SHC-32	55	GUN	082		ME		Y	
SYS-MFAN-0011B	COMM EQUIP RM EXH B	FAN BEARINGS		SHC-32	55	GUN	082		MM		Y	
		MOTOR BEARINGS		SHC-32	55	GUN	082		ME		Y	
SYS-MFAN-0012A	BATT RM AB EXH FAN A	FAN BEARINGS		SHC-32	55	GUN	082		MM		Y	
		MOTOR BEARINGS		SHC-32	55	GUN	082		ME		Y	
SYS-MFAN-0012B	BATT RM AB EXH FAN B	FAN BEARINGS		SHC-32	55	GUN	082		MM		Y	
		MOTOR BEARINGS		SHC-32	55	GUN	082		ME		Y	
SYS-MFAN-0013A	BATT RM B EXH FAN A	FAN BEARINGS		SHC-32	55	GUN	082		MM		Y	
		MOTOR BEARINGS		SHC-32	55	GUN	082		ME		Y	
SYS-MFAN-0013B	BATT RM B EXH FAN B	FAN BEARINGS		SHC-32	55	GUN	082		MM		Y	
		MOTOR BEARINGS		SHC-32	55	GUN	082		ME		Y	
SYS-MFAN-0014A	BATT RM A EXH FAN A	FAN BEARINGS		SHC-32	55	GUN	082		MM		Y	
		MOTOR BEARINGS		SHC-32	55	GUN	082		ME		Y	
SYS-MFAN-0014B	BATT RM A EXH FAN B	FAN BEARINGS		SHC-32	55	GUN	082		MM		Y	
		MOTOR BEARINGS		SHC-32	55	GUN	082		ME		Y	
SYS-MFAN-0015A	BATT FAN RM EXH 15A	FAN BEARINGS		SHC-32	55	GUN	082		MM		Y	
		MOTOR BEARINGS		SHC-32	55	GUN	082		ME		Y	
SYS-MFAN-0015B	BATT FAN RM EXH 15B	FAN BEARINGS		SHC-32	55	GUN	082	4	MM		Y	
		MOTOR BEARINGS		SHC-32	55	GUN	082		ME		Y	
SYS-MFAN-0016	SWGR EQUIP RM EXH 16	FAN BEARINGS		SHC-32	55	GUN	082		MM		Y	
		MOTOR BEARINGS		SHC-32	55	GUN	082		ME		Y	
SYS-MFAN-0017	CABLE VLT EXH FAN 17	FAN BEARINGS		SHC-32	55	GUN	082		MM		Y	
		MOTOR BEARINGS		SHC-32	55	GUN	082		ME		Y	
SYS-MFAN-0018	STAIR EXH FAN 18	FAN BEARINGS		SHC-32	55	GUN	082		MM		Y	
		MOTOR BEARINGS		SHC-32	55	GUN	082		ME		Y	
SWR-MBLR-0008	CEM BILD AER BLOWER	GEAR END		DELVAC 1340	CI	REG	086		MM		Y	
		DRIVE END BEARINGS		EP-1	ST	GUN	082		MM		Y	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		Y	
SWR-MPMP-0002	CONC FEED PUMP	PUMP BEARINGS		EP-1	ST	GUN	082		MM		Y	
		MOTOR SLEEVE BEARING		DTE-797	55	HO	086		ME		Y	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		Y	
SWR-MPMP-0003	PROCESS MIXING PMP	PUMP BEARINGS		EP-1	ST	GUN	082		MM		Y	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		Y	
		MOTOR SLEEVE BEARINGS		DTE-797	55	HO	086		ME		Y	

UNID	COMPONENT NAME	PART TO LUBRICATE	LC	LUBRICANT	FC	APL	INST	QUANT	DP	ROUTE	T	R
		MOTOR BEARINGS		SHC-32	SS	GUN	002		ME		Y	
SVS-MFAN-0002B	SUP FAN 2B IN AHU 1B	FAN BEARINGS		SHC-32	SS	GUN	002		MM		Y	
		MOTOR BEARINGS		SHC-32	SS	GUN	002		ME		Y	
SVS-MFAN-0009A	RECIRC FAN 9A AHU 8A	FAN BEARINGS		SHC-32	SS	GUN	002		MM		Y	
		MOTOR BEARINGS		SHC-32	SS	GUN	002		ME		Y	
SVS-MFAN-0009B	RECIRC FAN 9B AHU 8B	FAN BEARINGS		SHC-32	SS	GUN	002		MM		Y	
		MOTOR BEARINGS		SHC-32	SS	GUN	002		ME		Y	
SVS-MFAN-0011A	COMM EQUIP RM EXH A	FAN BEARINGS		SHC-32	SS	GUN	002		MM		Y	
		MOTOR BEARINGS		SHC-32	SS	GUN	002		ME		Y	
SVS-MFAN-0011B	COMM EQUIP RM EXH B	FAN BEARINGS		SHC-32	SS	GUN	002		MM		Y	
		MOTOR BEARINGS		SHC-32	SS	GUN	002		ME		Y	
SVS-MFAN-0012A	BATT RM AB EXH FAN A	FAN BEARINGS		SHC-32	SS	GUN	002		MM		Y	
		MOTOR BEARINGS		SHC-32	SS	GUN	002		ME		Y	
SVS-MFAN-0012B	BATT RM AB EXH FAN B	FAN BEARINGS		SHC-32	SS	GUN	002		MM		Y	
		MOTOR BEARINGS		SHC-32	SS	GUN	002		ME		Y	
SVS-MFAN-0013A	BATT RM B EXH FAN A	FAN BEARINGS		SHC-32	SS	GUN	002		MM		Y	
		MOTOR BEARINGS		SHC-32	SS	GUN	002		ME		Y	
SVS-MFAN-0013B	BATT RM B EXH FAN B	FAN BEARINGS		SHC-32	SS	GUN	002		MM		Y	
		MOTOR BEARINGS		SHC-32	SS	GUN	002		ME		Y	
SVS-MFAN-0014A	BATT RM A EXH FAN A	FAN BEARINGS		SHC-32	SS	GUN	002		MM		Y	
		MOTOR BEARINGS		SHC-32	SS	GUN	002		ME		Y	
SVS-MFAN-0014B	BATT RM A EXH FAN B	FAN BEARINGS		SHC-32	SS	GUN	002		MM		Y	
		MOTOR BEARINGS		SHC-32	SS	GUN	002		ME		Y	
SVS-MFAN-0015A	BATT FAN RM EXH 15A	FAN BEARINGS		SHC-32	SS	GUN	002		MM		Y	
		MOTOR BEARINGS		SHC-32	SS	GUN	002		ME		Y	
SVS-MFAN-0015B	BATT FAN RM EXH 15B	FAN BEARINGS		SHC-32	SS	GUN	002		MM		Y	
		MOTOR BEARINGS		SHC-32	SS	GUN	002		ME		Y	
SVS-MFAN-0016	SWGR EQUIP RM EXH 16	FAN BEARINGS		SHC-32	SS	GUN	002		MM		Y	
		MOTOR BEARINGS		SHC-32	SS	GUN	002		ME		Y	
SVS-MFAN-0017	CABLE VLT EXH FAN 17	FAN BEARINGS		SHC-32	SS	GUN	002		MM		Y	
		MOTOR BEARINGS		SHC-32	SS	GUN	002		ME		Y	
SVS-MFAN-0018	STAIR EXH FAN 18	FAN BEARINGS		SHC-32	SS	GUN	002		MM		Y	
		MOTOR BEARINGS		SHC-32	SS	GUN	002		ME		Y	
SWR-MBLR-0008	CEM SILO AER BLOW	GEAR END		DELTAC 1340	CI	RLS	006		MM		Y	
		DRIVE END BEARINGS		EP-1	SI	GUN	002		MM		Y	
		MOTOR BEARINGS		SHC-32	SI	GUN	002		ME		Y	
SWR-MPMP-0002	CONC FEED PUMP	PUMP BEARINGS		EP-1	SI	GUN	002		MM		Y	
		MOTOR SLEEVE BEARING		DTE-797	SS	HO	006		ME		Y	
		MOTOR BEARINGS		SHC-32	SI	GUN	002		ME		Y	
SWR-MPMP-0003	PROCESS MIXING PMP	PUMP BEARINGS		EP-1	SI	GUN	002		MM		Y	
		MOTOR BEARINGS		SHC-32	SI	GUN	002		ME		Y	
		MOTOR SLEEVE BEARINGS		DTE-797	SS	HO	006		ME		Y	

UNID	COMPONENT NAME	PART TO LUBRICATE	LC	LUBRICANT	FC	APL	INST	QUANT	DP	ROUTE	I	R
SWM-MPMP-0005	PROCESS FEED PMP	PUMP BEARINGS		EP-1	SI	GUN	082		MM		I	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		I	
		MOTOR SLEEVE BEARINGS		DTE-797	SS	HD	086		ME		I	
SWM-MPMP-0012	SODIUM SILICATE PUMP	PUMP BEARINGS		EP-1	SI	GUN	082		MM		I	
		MOTOR SLEEVE BEARINGS		DTE-797	SS	HD	086		ME		I	
		MOTOR BEARINGS		SHC-32	ST	GUN	082		ME		I	
TC -MPMP-0002A	TURB CLG WTR PMP A	COUPLING		EP 111	CI	HG	087		MM		I	
		MOTOR BEARINGS (2)		SHC-626	CI	RES	086		MM		I	
		PUMP BEARINGS (2)		SHC-626	CI	RES	086		MM		I	
		PUMP BEARINGS (2)		SHC-626	SD	RES	081		OP	51-TB	N	
		MOTOR BEARINGS (2)		SHC-626	SD	RES	081		OP	51-TB	N	
TC -MPMP-0002B	TURB CLG WTR PMP B	MOTOR BEARINGS (2)		SHC-626	CI	RES	086		MM		I	
		PUMP BEARINGS (2)		SHC-626	CI	RES	086		MM		I	
		COUPLING		EP 111	CI	HG	087		MM		I	
		PUMP BEARINGS (2)		SHC-626	SD	RES	081		OP	51-TB	N	
		MOTOR BEARINGS (2)		SHC-626	SD	RES	081		OP	51-TB	N	
TSW-MPMP-0001A	SCREEN WASH PUMP A	PUMP BEARING		NONE	--	---			MM		N	
		COUPLING		NONE	--	---			MM		N	
		UPPER MOTOR BEARINGS		DEL 1340	CI	RES	086		MM		I	
		LOWER MOTOR BEARING		DTE 797	CI	RES	086		MM		I	
		LOWER MOTOR BEARINGS		DTE 797	SW	RES	081		OP	53-INT	N	
		UPPER MOTOR BEARING		DEL-1340	SW	RES	081		OP	53-INT	N	
TSW-MPMP-0001B	SCREEN WASH PUMP B	UPPER MOTOR BEARING		DEL-1340	CI	RES	086		MM		I	
		LOWER MOTOR BEARING		DTE-797	CI	RES	086		MM		I	
		PUMP BEARING		NONE	--	- -			MM		N	
		LOWER MOTOR BEARINGS		DTE-797	SW	RES	081		OP	53-INT	N	
		UPPER MOTOR BEARING		DEL-1340	SW	RES	081		OP	53-INT	N	
TSW-MPMP-0001C	SCREEN WASH PUMP C	COUPLING		NONE	--	---			MM		N	
		LOWER MOTOR BEARINGS		DTE-797	CI	RES	086		MM		I	
		UPPER MOTOR BEARINGS		DEL 1340	CI	RES	086		MM		I	
		PUMP BEARING		NONE	--	---			MM		N	
		LOWER MOTOR BEARINGS		DTE-797	SW	RES	081		OP	53-INT	N	
		UPPER MOTOR BEARINGS		DEL-1340	SW	RES	081		OP	53-INT	N	
TSW-MTWS-0002A	TRAVELING SCREEN A1	DRIVE CHAIN		SHC-626	SM	RES	086		MM		N	
		DRIVE SPROCKET BORE		SHC 32	SM	GUN	008		MM		N	
		HEADSHAFT BEARING		SHC-32	SM	GUN	082		MM		N	
		SCREEN CHAIN		EP 1	SI	GUN	084		MM		N	
		SHEAR FACES		SHC 32	SI	HG	087		MM		N	
		TAKE-UP SCREEN THRUST BEARING		SHC 32	SM	GUN	082		MM		N	
		GEAR REDUCER		DEL 1340	SI	RES	086		MM		N	
		COUPLING		NONE	--	- -			MM		N	
		MOTOR BEARINGS		SHC-32	SI	GUN	082		ME		N	
TSW-MTWS-0002B	TRAVELING SCREEN B1	HEADSHAFT BEARING		SHC-32	SM	GUN	082		MM		N	
		SCREEN CHAIN		EP-1	SI	GUN	084		MM		N	
		TAKE-UP SCREW THRUST BEARING		SHC-32	SM	GUN	082		MM		N	
		SHEAR FACES		SHC-32	SI	HG	087		MM		N	
		DRIVE CHAIN		SHC-626	SM	RES	086		MM		N	
		DRIVE SPROCKET BORE		SHC-32	SM	GUN	082		MM		N	
		GEAR REDUCER		DEL 1340	SI	RES	086		MM		N	
		COUPLING		NONE	--	- -			MM		N	
		MOTOR BEARINGS		SHC-32	SI	GUN	082		ME		N	
TSW-MTWS-0002C	TRAVELING SCREEN C1	SHEAR FACES		SHC-32	SI	HG	087		MM		N	

LUBRICATION DATA SCHEDULE SORTED BY UNID NUMBER

UNID	COMPONENT NAME	PART TO LUBRICATE	LC	LUBRICANT	FC	APL	INST	QUANT	DP	ROUTE	T	R
		TAKE-UP SCREW THRUST BEARING		SHC-32	SM	GUN	082		MM		S	
		COUPLING		NONE	--	--			MM			
		SCREEN CHAIN		EP-1	SY	GUN	084		MM		N	
		DRIVE CHAIN		SHC-626	SM	RES	086		MM		N	
		DRIVE SPROCKET BORE		SHC-32	SM	GUN	082		MM		N	
		GEAR REDUCER		DEL 1340	SY	RES	086		MM		N	
		HEADSHAFT BEARING		SHC-32	SM	GUN	082		MM		N	
		MOTOR BEARINGS		SHC-32	SY	GUN	082		ME		N	
TSW-MTWS-0002D	TRAVELING SCREEN D1	COUPLING		NONE	--	--			MM		N	
		DRIVE CHAIN		SHC-626	SM	RES	086		MM		N	
		DRIVE SPROCKET BORE		SHC-32	SM	GUN	082		MM		N	
		GEAR REDUCER		DEL 1340	SY	RES	086		MM		N	
		HEADSHAFT BEARING		SHC-32	SM	GUN	082		MM		N	
		TAKE-UP SCREW THRUST BEARING		SHC-32	SM	GUN	082		MM		N	
		WATER SCREEN CHAIN		EP 1	SY	GUN	084		MM		N	
		SHEAR FACES		SHC-32	SY	HG	087		MM		N	
		MOTOR BEARINGS		SHC-32	SY	GUN	082		ME		N	
TSW-MTWS-0003A	TRAVELING SCREEN A2	COUPLING		NONE	--	---			MM			
		HEADSHAFT BEARING		SHC-32	SM	GUN	082		MM		N	
		DRIVE SPROCKET BORE		SHC-32	SM	GUN	082		MM		N	
		SCREEN CHAIN		EP-1	SY	GUN	084		MM		N	
		TAKE UP SCREW THRUST BEARING		SHC-32	SM	GUN	082		MM		N	
		DRIVE CHAIN		SHC-626	SM	RES	086		MM		N	
		GEAR REDUCER		DEL 1340	SY	RES	086		MM		N	
		SHEAR FACES		SHC-32	SY	HG	087		MM		N	
		MOTOR BEARINGS		SHC-32	SY	GUN	082		ME		N	
TSW-MTWS-0003B	TRAVELING SCREEN B2	SCREEN CHAIN		EP 1	SY	GUN	084		MM		N	
		TAKE UP SCREW THRUST BEARING		SHC-32	SM	GUN	082		MM		N	
		DRIVE CHAIN		SHC-626	SM	RES	086		MM		N	
		GEAR REDUCER		DEL 1340	SY	RES	086		MM		N	
		SHEAR FACES		SHC-32	SY	HG	087		MM		N	
		COUPLING		NONE	--	- -			MM			
		HEADSHAFT BEARING		SHC-32	SM	GUN	082		MM		N	
		DRIVE SPROCKET BORE		SHC-32	SM	GUN	082		ME		N	
		MOTOR BEARINGS		SHC-32	SY	GUN	082		ME		N	
TSW-MTWS-0003C	TRAVELING SCREEN C2	COUPLING		NONE	--	- -			MM		N	
		DRIVE SPROCKET		SHC-32	SM	GUN	082		MM		N	
		HEADSHAFT BEARING		SHC-32	SM	GUN	082		MM		N	
		SCREEN CHAIN		EP 1	SY	GUN	084		MM		N	
		TAKE-UP SCREW THRUST BEARING		SHC-32	SM	GUN	082		MM		N	
		DRAIN CHAIN		SHC-626	SM	RES	086		MM		N	
		GEAR REDUCER		DEL 1340	SY	RES	086		MM		N	
		SHEAR FACES		SHC-32	SY	HG	087		MM		N	
		MOTOR BEARINGS		SHC-32	SY	GUN	082		ME		N	
TSW-MTWS-0003D	TRAVELING SCREEN D2	COUPLING		NONE	--	--			MM		N	
		HEADSHAFT BEARING		SHC-32	SM	GUN	082		MM		N	
		DRIVE SPROCKET BORE		SHC-32	SM	GUN	084		MM		N	
		SCREEN CHAIN		EP-1	SY	GUN	084		MM		N	
		TAKE-UP SCREEN THRUST BEARING		SHC-32	SM	GUN	082		MM		N	
		GEAR REDUCER		DEL 1340	SY	RES	086		MM		N	
		SHEAR FACES		SHC-32	SY	HG	087		MM		N	
		DRIVE CHAIN		SHC-626	SM	RES	086		MM		N	
		MOTOR BEARINGS		SHC-32	SY	GUN	082		ME		N	
TUR-MTRB-0001	HP TURBINE	TURBINE BEARINGS		DTE-797	AH	FOS	086		MM		I	
		TURBINE PEDESTAL		SHC-32	SS				MM		I	

UNID	COMPONENT NAME	PART TO LUBRICATE	LC	LUBRICANT	FC	APL	INST	QUANT	DP	ROUTE	T	R
TUR-MTR3-0002A	LP TURBINE A	TURBINE BEARINGS		DTE-797	AR	FOS	086		MM		I	
		TURBINE PEDESTAL (60)		SHC-32	SS				MM		I	
TUR-MTR8-0002B	LP TURBINE B	TURBINE BEARINGS		DTE-797	AR	FOS	086		MM		I	
		TURBINE PEDESTAL (60)		SHC-32	SS				MM		I	
TUR-MTR8-0002C	LP TURBINE C	TURBINE BEARINGS		DTE-797	AR	FOS	086		MM		I	
		TURBINE PEDESTAL (60)		SHC-32	SS				MM		I	
TW -MPMP-0002A	TW XFER PMP A	PMP BRGS		SHC-32	SU	GUN	082		MM		N	
		MOTOR BEARINGS (2)		SHC-32	ST	GUN	082		ME		N	
TW -MPMP-0002B	TW XFER PMP B	PMP BRGS		SHC-32	SU	GUN	082		MM		N	
		MOTOR BEARINGS (2)		SHC-32	ST	GUN	082		ME		N	
TW -MPMP-0003A	CW LUBE WATER PMP A	PUMP BEARINGS		SCH-32	SU	GUN	082		MM		N	
TW -MPMP-0003B	CW LUBE WATER PMP B	PUMP BEARINGS		SCH-32	SU	GUN	082		MM		N	
UAT-EMT -0001A	UNIT AUX XFMR A	GAS-IN-OIL SAMPLE			XS	RES			ME		N	
		OIL SAMPLE			XA	RES			ME		N	
UAT-EMT -0001B	UNIT AUX XFMR B	GAS-IN-OIL SAMPLE			XS	RES			ME		N	
		OIL SAMPLE			XA	RES			ME		N	
ZZZ-XXXX-0000	MILLING MACH (HOT)	TABLE SADDLES		VAC-2	S	RES	081		MM		N	
		FEED GEAR BOI CLUTCHES		VAC-1405	CT	RO	081		MM		N	
		FEED GEAR BOI CLUTCHES		VAC-1405	CT	RO	086		MM		N	
		CENTRAL OIL SISTEM		VAC-1405	CT	RES	086		MM		N	
		RAPID TRAVERSE GEARS		VAC-1405	CT	RES	086		MM		N	
		QUICK CHANGE GEARS		VAC-1405	CT	RES	086		MM		N	
		MISC OIL POINTS		VAC-2	SM	HO			MM		N	
		MISC OILED PIVOT POINTS		DEL-340	SM	HO			MM		N	
		FEED WORM/WORM WHEEL		VAC-2	CT	RES	086		MM		N	
		DRIVE GEARS/ELEV MECH		VAC-1405	CT	RES	086		MM		N	
		COLUMN SLEEVE/ELEV SCREW		VAC-2	CT	RES	086		MM		N	
		COMPRESSOR BEARING		DTE-797	SM	RES	086		MM		N	
		COMPRESSOR BEARING		DTE-797	SM	RES	086		MM		N	
		TOP FLOOR PULLEY BEARINGS		SHC-32	SU	GUN	082		MM		N	
		PULLEY BEARINGS		SHC-32	SU	GUN	082		MM		N	
		COMPRESSOR BEARING		DTE-797	CS	RES	086		MM		N	
		COMPRESSOR BEARING		DTE-797	CS	RES	086		MM		N	
		FAN BEARINGS (2)		SHC-32	ST	GUN	082		MM		N	
		FAN BEARINGS (2)		SHC-32	ST	GUN	082		MM		N	
		FAN BEARINGS (2)		SHC-32	ST	GUN	082		MM		N	
		HEADSTOCK FILTER		NONE	CS	FOS	086		MM		N	
		TRANSMISSION CASE		VAC-02	SM	RES	081		MM		N	
		SPEED & FEED MECHANISM		VAC-1405	CT	RES	086		MM		N	
		MISC GREASE POINTS		SHC-32	SU	GUN	082		MM		N	
		PMP		DTE-797	SS	RES	081		MM		N	
		HYDRAULIC SYSTEM		VAC-1405	SU	RES	081		MM		N	
		WIRE CABLE		SHC-630	SU	BR	082		MM		I	
		BOTTOM FLOOR PULLEY BRG		SHC-630	SU	GUN	082		MM		I	
		HYDRAULIC CLAMPS		VAC-1405	CT	RES	086		MM		N	
		TRANSMISSION CASE		VAC-2	CT	RES	086		MM		N	
		UPPER GUIDE FELT PAD		VAC-02	SM	HO			MM		N	
		AIR PUMP		VAC-1405	SM	HO			MM		N	
		MISC OIL POINTS		VAC-02	SM	HO			MM		N	
		TABLE OIL POINTS		VAC-02	SM	HO			MM		N	
		CROSS SLIDE		VAC-02	SM	HO			MM		N	

UNID	COMPONENT NAME	PART TO LUBRICATE	LC	LUBRICANT	FC	APL	INST	QUANT	DP	ROUTE	T	R
		END BRACKET		VAC 02	SM	HG			NN		N	
		PUMP BEARINGS		NONE	--	- -			NN		N	
		BLOWER BRGS		SHC-626	CE	RES	086		NN		Y	
		CARRIAGE BEARINGS		VAC 02	SM	HO			NN		N	
		TAILSTOCK LUBE POINTS		VAC-405	SM	HO			NN		N	
		OIL CILINDER		VAC-405	SM	CLO	081		NN		N	
		PUMP BEARINGS		OIL	SS	RES	086		NN		N	
		MAIN DRIVE MOTOR BEARING (2)		SHC-626	CE	RES	086		NN		Y	
		FAN BEARINGS (2)		SHC-722	ST	GUN	082		NN		N	
		FAN BEARINGS (2)		SHC-722	ST	GUN	082		NN		N	
		FAN BEARINGS (2)		SHC-722	ST	GUN	082		NN		N	
		FAN BEARINGS (2)		SHC-722	ST	GUN	082		NN		N	
		RAPID TRAVERSE GEARS		VAC-405	SM	RES	086		NN		N	
		TAILSTOCK WAYS		VAC 02	SM	RES	086		NN		N	
		FAN BEARINGS (2)		SHC-722	ST	GUN	082		NN		N	
		OIL SHAFT BEARINGS		OIL-140	SM	CLO	081		NN		N	
		FEED GEARS		VAC-405	SM	RES	086		NN		N	
		HEAD STOCK		VAC-405	SM	RES	086		NN		N	
		TAPER ATTACHMENTS		VAC 02	SM	HO			NN		N	
		MISC OILED PORTS		VAC 02	SM	HO			NN		N	
		QUADRANT/TOOL SLIDE		VAC 02	SM	HO			NN		N	
		TAIL STOCK		VAC 02	SM	HO			NN		N	
		SPEED SCREW/MOTOR SLIDE		VAC 02	SM	HO			NN		N	
		END TABLE TRAIN		VAC-405	SS	CLO	081		NN		N	
		DRIVING HAND WHEELS		VAC-405	SS	CLO	081		NN		N	
		ARBOR SUPPORT		VAC-405	SS	CLO	081		NN		N	
		CROSS TRAVERSE HANDLE		VAC-405	SS	CLO	081		NN		N	
		FRONTAL BOX		VAC-405	CE	RES	086		NN		N	
		FRONTAL BOX		VAC-405	SS	RES	086		NN		N	
		VERTICAL COLUMN GUIDEWAYS		VAC-405	SS	CLO	081		NN		N	
		CROSS SUPPORT		SHC-722	SS	GUN	082		NN		N	
		SPEED GEAR BOX		VAC-405	CE	FOS	086		NN		N	
		SPEED GEAR BOX		VAC-405	SS	FOS	086		NN		N	
		KNEE ELEVATING SCREW		VAC 02	SS	RES	086		NN		N	
		BEVEL DRIVE GEARS		VAC 02	CE	RES	086		NN		N	
		WORM GEAR		600	CE	RES	086		NN		Y	
		APRON & CARRIAGE		VAC 02	CE	RES	086		NN		N	
		FLYWHEEL BRGS (2)		SHC-722	SG	GUN	082		NN		N	
		COMPRESSOR BEARINGS		ARCT-155	CE	RES	086		NN		N	
		HEAD BRGS		SHC-722	SG	GUN	082		NN		N	
		TABLE GREASE POINTS		SHC-722	SM	GUN	082		NN		N	
		MISC GREASED PIVOT POINTS		SHC-722	SG	GUN	082		NN		N	
		TOP ADJUSTING SCREWS (2)		SHC-722	SG	GUN	082		NN		N	
		ADJUSTMENT NTR BRGS		SHC-722	SG	GUN	082		NN		N	
		GREASED SHAFT BRGS		SHC-722	SG	GUN	082		NN		N	
		MAIN DRIVE MTR BRGS		SHC-722	SG	GUN	082		NN		N	
		OPEN GEARS		SHC-722	SM	BR			NN		N	
		CROSSFEED SCREW BRGS		SHC-722	SG	GUN	082		NN		N	
		HEADSTOCK		VAC-405	SY	GUN	082		NN		N	
		LEAD SCREW SUPPORT BRGS		SHC-722	SG	GUN	082		NN		N	
		UPPER SAW PULLEY		SHC-722	SI	HG	087		NN		Y	
		OPEN GEARS		SHC-722	SG	BR			NN		N	
		BLOWER BEARINGS (2)		SHC-722	ST	GUN	082		NN		N	
		FAN BEARINGS (2)		SHC-722	ST	GUN	082		NN		N	
		FAN BEARINGS (2)		SHC-722	ST	GUN	082		NN		N	
		FAN BEARINGS (2)		SHC-722	ST	GUN	082		NN		N	
		FAN BEARINGS (2)		SHC-722	ST	GUN	082		NN		N	
		PUMP BEARINGS		SHC-626	CE	RES	086		NN		Y	
		PUMP BEARINGS		SHC-626	CE	RES	086		NN		Y	
		PUMP BEARINGS		SHC-626	CE	RES	086		NN		Y	

UNID	COMPONENT NAME	PART TO LUBRICATE	LC	LUBRICANT	FC	APL	INST	QUANT	DP	ROUTE	T	R
		HYDRAULIC SISTEM		DTE 797	CT	PES	086		MM			
		CENTRAL OIL SISTEMS		VAC 405	SM	RES	081		MM		I	
		APRON LUBE WAYS		VAC 02	SM	RES	081		MM		I	
		HEADSTOCK		VAC 405	SM	RES	081		MM		I	
		QUICK CHANGE GEARS		VAC 405	SM	RES	081		MM		I	
		COUPLING (2)		GP 1	AR	GUN	087		MM		I	
		PMP		DTE 797	CT	RES	086		MM		I	
		HEADSTUCK		VAC 405	CS	RES	086		MM		I	
		FEED GEARS		VAC 405	CS	RES	086		MM		I	
		HEAD FILTER		NONE	CT	FOS	088		MM		I	
		BUN GUIDES		SHC 2	SM	GUN	082		MM		I	
		HYDRAULIC SISTEM		VAC 405	SM	RES	081		MM		I	
		WORM GEAR HOUSING (2)		DEL 460	SM	RES	081		MM		I	
		CENTRAL OIL SISTEM		DEL 460	SM	RES	081		MM		I	
		FEED WORM/WORM WHEEL		VAC 02	SM	RES	081		MM		I	
		SPEED & FEED MECHANISM		VAC 405	SM	RES	081		MM		I	
		BEVEL DRIVE GEARS		VAC 02	SM	RES	081		MM		I	
		COLUMN SLEEVE/ELEV SCREW		VAC 02	SM	RES	081		MM		I	
		DRIVE GEARS/ELEV MECHANISM		VAC 405	SM	RES	081		MM		I	
		HYDRAULIC CLAMPS		VAC 405	SM	RES	081		MM		I	
		PUMP BEARINGS		DEL 460	CT	RES	086		MM		I	
		HYDRAULIC SISTEM		VAC 405	CT	RES	086		MM		I	

WATERFORD 3

DOCUMENT REVIEW CHECKLIST

MANUAL ☒ DRAWING ☐ OTHER ☐

Document Access Number 4500115C

Title Waterford 3 SES Plant Laboratory Manual

Vendor _____ Purchase Order No. _____

Revision Number _____ Date _____

Safety Related? Yes ☐ No ☐

Complete? (All pages and sections intact)

Yes ☐ No ☐ (Note discrepancies below)

Component Applicability

Mechanical N/A ☐ Yes ☒ No ☐ (Note discrepancies below)

Electrical N/A ☒ Yes ☐ No ☐ (Note discrepancies below)

I&C N/A ☒ Yes ☐ No ☐ (Note discrepancies below)

Discrepancies (Attach extra pages if necessary)

Mech. - Sections I thru V OK. Section VI data input continued.

Fill in Yes, No, or N/A

Manual Change Necessary Mechanical N/A Electrical No I&C _____

Change Implemented Mechanical / Electrical N/A I&C _____

Record of Change Logged Mechanical / Electrical N/A I&C _____

Reviewer: Mechanical RB Smith Jr Date 4/7/95

Electrical [signature] Date 4/8/95

I&C V. Williams Date 4/10/95

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WATERFORD 3

DOCUMENT REVIEW CHECKLIST

☑ MANUAL ◯ DRAWING ◯ OTHER___________

DOCUMENT ACCESS NUMBER 45700854

TITLE Agastat Timing Controls Buchanan Terminal Blocks

PURCHASE ORDER NO. ___________

VENDOR Agastat Buchanan

REVISION NONE

REVISION DATE N/A

DOCUMENT REVIEWED FOR COMPLETENESS (ALL PAGES, ALL SECTIONS INTACT) YES (YES/NO)

DOCUMENT REVIEWED FOR COMPONENT APPLICABILITY YES (YES/NO)

SAFETY RELATED NO (YES/NO)

DISCREPANCIES NOTED NONE

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