

**MARINE DIESEL SPECIALISTS, INC
SURVEY REPORT**

September 2, 2026

Arrow USA Yacht Management
1700 Las Olas Blvd. Suite 104
Ft. Lauderdale, FL 33301

M/Y “CUPCAKE” 2001 40 M (132’) WESTSHIP TRIDECK OFFICIAL # 70469

MAIN ENGINES: MTU 12V 396 TE94 – 2285 HP (1680 KW) at 2000 RPM

Port Engine Number: 558 3368 **Gearbox: ZF BW 465** S/N: 5970 1663 Hours: 6,159

Stbd. Engine Number: 558 3369 **Gearbox: ZF BW 465** S/N: 5970 1664 Hours: 6,158

DESCRIPTION

The MTU 12V396 TE94 is a four-stroke diesel engine with a 90-degree V, enclosed liquid cooling, twin sequential turbochargers, freshwater charge-air cooler, direct injection, wet type cylinder liners, piston cooling and electronic governor control. The cylinder block is cast iron, and the engine is equipped with individual cylinder heads consisting of two intake and two exhaust valves per cylinder. The cylinder bore diameter is 165 mm and the stroke is 185 mm with a displacement of 3.96 liters per cylinder. The engine is equipped with sequential turbochargers located at the end of the exhaust manifolds boosting into a charge-air cooler. The charge-air cooler serves to cool the intake air, making it denser and in conjunction with the exhaust gas driven turbochargers, allowing more fuel to be burned efficiently increasing engine horsepower. The engine is equipped with triple wall, liquid cooled exhaust manifolds and turbo exhaust covers. The engines are resiliently mounted. The engine monitoring systems are standard MTU electronic monitoring and alarm system with standard LOP control panels in the engine room with monitoring and alarms in the bridge. The throttle and clutch controls are electronic. Turbocharger switching is both electronically and pneumatically controlled.

MAIN ENGINE PERFORMANCE

A sea trial was not performed due to the customer’s request. Engines were run at the dock until they reached dockside temperatures to pull oil samples for testing.

The engine application group for this yacht is IDS which is applicable to fast passenger vessels, ferries, hydrofoils, catamarans, and Surface Effect Ships (SES).

234 SW 32nd Street, Fort Lauderdale, FL 33315
www.marinedieselspecialists.com

M/Y 'CUPCAKE'

COOLING SYSTEM

The engine cooling water temperatures were within normal parameters during dockside running. Cooling system components such as sea strainers, water pumps and the heat exchanger require periodic inspection and maintenance. This engine model is equipped with a titanium plate type heat exchanger located at the front of the engine. The heat exchanger plates should be removed and cleaned periodically and new inhibitor added to the cooling system every two years.

EXHAUST SYSTEM

The exhaust system is connected to the exhaust outlet of the turbocharger housing through a flexible compensator which is blanketed with soft fiberglass insulating material and connects to the ship's exhaust system and muffler. The exhaust is injected with seawater at the spray ring and is then diverted through the hull bottom in the engine room. Both port and starboard exhaust systems incorporate a bypass that exits the hull sides at the waterline. This is designed to reduce back pressure at slower speeds. The exhaust risers are supported by exhaust brackets attached to the overhead in the engine room. The overall condition of the exhaust system appears to be satisfactory, however, due to age the exhaust risers should be disassembled and tested.

GAUGES

The engine room is equipped with the MTU LOP panel with gauge and start / stop capabilities. The bridge is also equipped with MTU full monitoring system including gauges and MTU complete alarm system. All LOP's and alarms were functional during sea trials. Starboard LOP backlight does not function.

FUEL SYSTEM

Fuel is routed from the main tanks through a centrifuge and then to the day tank. The primary fuel filters consist of dual Separ model 2000/40 and they were inspected and appear to be in good condition. Separ WIF sensors are installed. Engine mounted filters are normal MTU type double canister with internal cartridge filter. The fuel system appears to be in good condition at this time. However, due to the Separ's having metal bowls we could not visually inspect the fuel.

STARTER / ALTERNATOR

The engines are equipped with the standard MTU supplied Bosch 24-volt starters and alternators. Both port and starboard starters are functioning properly at this time. The alternators charging voltage was 26.7-27 volts.

M/Y “CUPCAKE”

OIL SAMPLES

Oil samples were drawn from the main engines, marine gears and the generators. The samples were drawn after dockside running with no sea trial. The samples indicate all equipment is within normal wear limits with no external contamination present. Sample results are attached.

COMBUSTION AIR SUPPLY

Combustion air is supplied to the engines through MTU supplied nylon mesh type air filters that are connected to the air inlet of the turbocharger via hose. They are manufactured by MANN ☐o. This application utilizes engine room air supply. The filter elements are slightly dirty at this time. They can be removed and ultrasonically cleaned.

COUPLING

The coupling is manufactured by ☐eislinger, and it is a spring-loaded oil bathed type coupling. The coupling appears to be functioning in that there were no obvious problems, however, the coupling was not disassembled and inspected due to time constraints and major disassembly required for this procedure.

CHARGE AIR COOLER

The charge air coolers were visually inspected and appear to be in serviceable condition at this time. The charge air pressures and temperatures were within manufacturer's specifications during dockside runs. There were leaks noted at this time.

MOUNTS

The engines are resiliently mounted with front mounts located at the front of the engine and rear mounts connected to the transmissions. The mounts appear to be in fair condition. Movement could not be noted due to no maneuvering or sea trial. The mounts have surface rust and should be cleaned and painted as needed.

TURBOCHARGERS

The turbochargers were inspected for excessive axial and radial play in the turbine shaft, and they were all found to be normal and in good condition. There was no excessive carbon build up noted on the compressor wheels. Both port and starboard flap actuators are functioning properly at this time. There was no air leaks noted. Turbocharger speeds could not be recorded without load being applied from a sea trial.

M/Y 'CUPCAKE'

CONTROLS

The vessel is equipped with controls provided by Mathers Corp. The controls feature single levers for port and starboard. The controls also feature push button control for taking command, troll and synchronization. All functions and controls are working properly at this time except for starboard engine troll function. There are four control stations aboard the vessel, a main helm station along with port and starboard wing stations and a fly bridge station. The emergency control station is located in the engine room at the LOP's. All associated controls are functioning properly at this time. Starboard engine troll function is not working.

ELECTRONICS

Both port and starboard engines were supplied with the standard MTU-EES-UNI electronic control units (ECU). These units measure parameters and control the electronic governor on the engines. The engines are equipped with MTU monitoring systems. All of the associated engine electronics are functioning properly at this time.

PREHEATERS

Both port and starboard engines are equipped with coolant preheat assemblies provided by MTU. They are manufactured by Kim Hotstart Corp. model ES30602-000. They are designed to prevent cold start up along with prolonging engine life. The preheat assemblies are 240-volt AC. The port preheater is functioning properly at this time however the starboard preheater turns on but does not heat up.

MARINE GEARS Zetoradabri Friedrichsen (ZF) BW 465

The marine gears are manufactured in Germany with a gear reduction ratio of 2.529/1. They utilize light alloy cast housing and are hydraulically operated. The internal parts consist of an input shaft, output shaft, reversing shaft, related gearing and a forward and reverse clutch pack. The gearbox is a reduction and a reversing unit with replaceable clutch packs. The selector valve serves to direct oil flow to the clutch packs thereby providing forward, neutral or reverse depending upon direction of oil flow. The marine gears were visually inspected, and they appear to be in good condition at this time. Slipping, temperatures and shifting could not be noted without a sea trial. The marine gear is supplied with an oil cooler, which requires periodic inspection and maintenance. The marine gears are flanged onto the engines set up in a conventional configuration. Port gear has an oil leak and starboard gear oil pressure alarm was present.

M/Y "CUPCAKE"

DISCREPANCIES MAIN ENGINES

PORT

1. Charge air cooler seeping oil out of end plate gasket.
2. Random rocker box and valve cover o-rings seeping oil.
3. Random Exhaust manifold to head sealant is seeping.
4. Rust and corrosion on random surfaces. Clean and paint as needed.
5. Oil leak noted on back of gear by the PTO hydraulic pump. Clean and observe to determine location.
6. Oil prelube pumps did not work.
7. Alternator drive is seeping oil.
8. Gearbox high pressure oil lines need replacement.
9. Crankcase breather pipe is seeping oil from fitting on B bank by air inlet on turbo.
10. Risers should be tested due to age.
11. High exhaust temp alarm ET B Bank E214/0 was noted during sea trial at wide open throttle.
12. Oil leak at oil filters.
13. Oil leak on gear box banjo fitting above gear oil cooler.
14. Oil pump out hose is deteriorating.
15. Injection pump oil drain O-ring is seeping oil.
16. Engine mounts should be inspected and alignment checked.

STARBOARD

1. High gear oil pressure alarm was noted during sea trial.
2. Charge air cooler seeping oil out of end plate gasket.
3. Random Exhaust manifold to head sealant is seeping.
4. Random rocker box and valve cover o-rings seeping oil.
5. Troll valve does not work.
6. Rust and corrosion on random surfaces. Clean and paint as needed.
7. Oil prelube pumps did not work.
8. Emergency bilge pump is seeping oil from the seal.
9. B bank oil leak noted near flywheel housing and block. Clean and observe.
10. Alternator drive is seeping oil.
11. Gearbox high pressure oil lines need replacement.
12. LOP engine room panel backlight not working.
13. Risers should be tested due to age.
14. It was noted that at 1450 RPM the port engine was constantly emitting brown, black smoke overboard out the exhaust.
15. Coolant block heater inoperable.
16. Oil leak at oil filters.
17. Oil pump out hose is deteriorating.

M/Y “CUPCAKE”**DISCREPANCIES CONTINUED**

18. Oil leak noted on back of gear by the PTO hydraulic pump.
19. Engine mounts should be inspected and alignment checked.

GENERATORS: (2) NORTHERN LIGHTS 80 KW**PORT**

Model: 6068TE001
Serial #: TO6068T50001
Hours: 31,820
Coolant temp: 182 F
Oil press: 50 PSI
KW: 80
KVA: 80
Frequency: 60 Hz
RPM: 1800
Batt. V: 24
Voltage: 120/240
Amp: 277

STARBOARD

Model: 6068TE001
Serial #: TO6068T58002
Hours: 31,582
Coolant temp: 183 F
Oil press: 51 PSI
KW: 80
KVA: 80
Frequency: 60 Hz
RPM: 1800
Batt. V: 24
Voltage: 120/240
Amp: 277

Both generators were started and ran for 30 minutes under no load. There was no excessive smoke noted during operation. The generators feature dual Separ primary fuel filter assemblies. Model SWK2000/5 U. There was no water or algae present at this time.

Port and Starboard Generator Discrepancies

1. Starboard sea water pump has some rust / corrosion around water seal but not leaking at this time.
2. Starboard oil leak at front of pan. Clean and observe.
3. Port and starboard oil leak at oil pan pump out fittings.
4. Port and starboard hour meter on run panel is not secure or accurate.
5. Port volt gauge on run panel is broken inside.
6. Starboard oil pressure gauge on run panel inoperable.
7. Port oil PSI and coolant temp gauges are inoperable on the TecPower electrical panel.
8. Port and starboard oil pan gaskets are leaking oil.
9. Port and starboard hour meters are incorrect, not really sure of generator hours.
10. Port and starboard sound shield insulation is deteriorated

M/Y “CUPCAKE”**GENERAL COMMENTS**

The main engines and marine gears, along with generators, were found to be in serviceable condition at this time. An external visual inspection was performed with the outward appearance of the main engines and marine gears is satisfactory. The engines need servicing to remedy the discrepancies noted above. We could not test the generators under load.

NOTE:

The comments as stated in this report are based on engine inspections that were performed to the best of our ability and with as much attention to detail as possible. The results are believed to be an accurate evaluation as to the general condition of the engines at this time.

However, Marine Diesel Specialists, Inc. offers no warranty either express or implied on the engines of **M/Y “CUPCAKE”**. Survey results are intended to represent the physical condition of the vessel only on the day of the survey, based on the facts presented and discovered, in the opinion of the surveyor. This report will not specify or imply any type of warranty of the vessel or the vessel’s machinery.

This report is issued subject to the condition that it is understood and agreed that neither this office, nor any surveyor or employee thereof is under any circumstances whatsoever to be held responsible in any way for any error in judgment, default or negligence, nor for any inaccuracy, omission, misrepresentation or misstatement in this report, and that the use of this report shall be construed to be an acceptance of the foregoing conditions. This report is issued without prejudice to the rights of whom it may concern.

Thank you for the opportunity to be of service and if you have any questions, please call.

Sincerely,

Peter Angel
President

LLC.	Machine ID: CUP CAKE Machine Year : NA	Component ID: T06068T50001 Component Make: NORTHERN LIGHTS Component Model: 6068TE001 Component Year: NA Component Type : DIESEL ENGINE Component Location: PORT GENERATOR Sump Capacity: 16 Litres	 MOTORCHECK LAB 2000 N FLORIDA MANGO RD UNIT 104 WEST PALM BEACH FL 33409 561-684-7799
	Component Description:		

on Component	Hours on Oil	Oil Weight	Oil Brand	Oil Type	Oil Changed	Date Analyzed	User Sample ID
31820	100	15W40	UNKNOWN	UNKNOWN	No	9/4/2026	

ORMAL, SAMPLE APPEARS FREE OF EXTERNAL CONTAMINATION.

Metals(ppm)				Contaminant Metals (ppm)			Multi-Source Metals (ppm)					Additives (ppm)				
Copper	Lead	Tin	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Nickel	Manganese	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
>	6	>	X	9	12	>	X	15	X	X	X	X	X	X	X	X

	Physical Properties								
Glycol	Nitration	TBN	Oxidation	V40C	V100C	VIndex	V40C Limit	V100C Limit	Visc Mode
-	3.1	8.9	4.8	110	13.7	123	92 - 124	12.5 - 16.3	C

D = DETECTED

- = NOT DETECTED

X = NOT TESTED / NOT APPLICABLE

NA = NOT AVAILABLE

C = CALCULATED

M = MEASURED

LLC.	Machine ID: CUP CAKE Machine Year : NA	Component ID: T06068T58002 Component Make: NORTHERN LIGHTS Component Model: 6068TE001 Component Year: NA Component Type : DIESEL ENGINE	 MOTORCHECK LAB 2000 N FLORIDA MANGO RD UNIT 104 WEST PALM BEACH FL 33409 561-684-7799
	Component Description:	Component Location: STARBOARD GENERATOR Sump Capacity: 16 Litres	

on Component	Hours on Oil	Oil Weight	Oil Brand	Oil Type	Oil Changed	Date Analyzed	User Sample ID
31582	60	15W40	UNKNOWN	UNKNOWN	No	9/4/2026	

ORMAL, SAMPLE APPEARS FREE OF EXTERNAL CONTAMINATION, ANALYSIS INDICATES PROPER PERFORMANCE OF THE LUBRICANT AND UNIT.

Metals(ppm)				Contaminant Metals (ppm)			Multi-Source Metals (ppm)					Additives (ppm)				
Copper	Lead	Tin	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Nickel	Manganese	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
>2	>2	>2	X	6	4	>2	X	5	X	X	X	X	X	X	X	X

Physical Properties									
Glycol	Nitration	TBN	Oxidation	V40C	V100C	VIndex	V40C Limit	V100C Limit	Visc Mode
-	<2.0	10.2	4.3	109	14.4	134	92 - 124	12.5 - 16.3	C

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LLC.	Machine ID: CUP CAKE Machine Year : NA	Component ID: 5583 368 Component Make: MTU Component Model: 12V396TE Component Year: NA Component Type : DIESEL ENGINE Component Location: PORT MAIN Sump Capacity: 180 Litres	 MOTORCHECK LAB 2000 N FLORIDA MANGO RD UNIT 104 WEST PALM BEACH FL 33409 561-684-7799
	Component Description:		

on Component	Hours on Oil	Oil Weight	Oil Brand	Oil Type	Oil Changed	Date Analyzed	User Sample ID
6159	50	15W40	UNKNOWN	UNKNOWN	No	9/4/2026	

ORMAL. SAMPLE APPEARS FREE OF EXTERNAL CONTAMINATION.

Metals(ppm)				Contaminant Metals (ppm)			Multi-Source Metals (ppm)					Additives (ppm)				
Copper	Lead	Tin	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Nickel	Manganese	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
>2	>2	>2	X	5	4	>2	X	24	X	X	X	X	X	X	X	X

Physical Properties									
Glycol	Nitration	TBN	Oxidation	V40C	V100C	VIndex	V40C Limit	V100C Limit	Visc Mode
-	2.2	8.8	3.0	109	13.6	123	92 - 124	12.5 - 16.3	C

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NA = NOT AVAILABLE

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M = MEASURED

LLC.	Machine ID: CUP CAKE Machine Year : NA	Component ID: 5583369- Component Make: MTU Component Model: 12V396 TE94 Component Year: NA Component Type : DIESEL ENGINE Component Location: STARBOARD MAIN Sump Capacity: 180 Litres	 MOTORCHECK LAB 2000 N FLORIDA MANGO RD UNIT 104 WEST PALM BEACH FL 33409 561-684-7799
	Component Description:		

on Component	Hours on Oil	Oil Weight	Oil Brand	Oil Type	Oil Changed	Date Analyzed	User Sample ID
6158	50	15W40	UNKNOWN	UNKNOWN	No	9/4/2026	

ORMAL. SAMPLE APPEARS FREE OF EXTERNAL CONTAMINATION.

Metals(ppm)				Contaminant Metals (ppm)			Multi-Source Metals (ppm)					Additives (ppm)				
Copper	Lead	Tin	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Nickel	Manganese	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
4	>2	>2	X	5	5	>2	X	36	X	X	X	X	X	X	X	X

	Physical Properties								
Glycol	Nitration	TBN	Oxidation	V40C	V100C	VIndex	V40C Limit	V100C Limit	Visc Mode
-	2.7	8.5	2.7	109	13.5	122	92 - 124	12.5 - 16.3	C

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M = MEASURED

LLC.	Machine ID: CUP CAKE Machine Year : NA	Component ID: 597-01663 Component Make: ZF Component Model: BW465 Component Year: NA Component Type : GEARBOX Component Location: PORT Sump Capacity: 60 Litres	 MOTORCHECK LAB 2000 N FLORIDA MANGO RD UNIT 104 WEST PALM BEACH FL 33409 561-684-7799
	Component Description:		

on Component	Hours on Oil	Oil Weight	Oil Brand	Oil Type	Oil Changed	Date Analyzed	User Sample ID
6159	50	SAE 40	UNKNOWN	UNKNOWN	No	9/4/2026	

ORMAL, SAMPLE APPEARS FREE OF EXTERNAL CONTAMINATION. ANALYSIS INDICATES PROPER PERFORMANCE OF THE LUBRICANT AND UNIT.

Metals(ppm)				Contaminant Metals (ppm)			Multi-Source Metals (ppm)					Additives (ppm)				
Copper	Lead	Tin	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Nickel	Manganese	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
10	93	4	X	6	<2	27	X	12	X	X	X	X	X	X	X	X

Physical Properties									
Glycol	Nitration	TBN	Oxidation	V40C	V100C	VIndex	V40C Limit	V100C Limit	Visc Mode
X	X	X	<2.0	157	14.4	88	133 - 181	12.5 - 16.3	C

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M = MEASURED

LLC.	Machine ID: CUP CAKE Machine Year : NA	Component ID: 597-01664 Component Make: ZF Component Model: BW465 Component Year: NA Component Type : GEARBOX Component Location: STARBOARD Sump Capacity: 60 Litres	 MOTORCHECK LAB 2000 N FLORIDA MANGO RD UNIT 104 WEST PALM BEACH FL 33409 561-684-7799
	Component Description:		

on Component	Hours on Oil	Oil Weight	Oil Brand	Oil Type	Oil Changed	Date Analyzed	User Sample ID
658	50	SAE 40	UNKNOWN	UNKNOWN	No	9/4/2026	

ORMAL, SAMPLE APPEARS FREE OF EXTERNAL CONTAMINATION. ANALYSIS INDICATES PROPER PERFORMANCE OF THE LUBRICANT AND UNIT.

Metals(ppm)				Contaminant Metals (ppm)			Multi-Source Metals (ppm)					Additives (ppm)				
Copper	Lead	Tin	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Nickel	Manganese	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
21	89	>2	X	7	<2	26	X	4	X	X	X	X	X	X	X	X

Physical Properties									
Glycol	Nitration	TBN	Oxidation	V40C	V100C	VIndex	V40C Limit	V100C Limit	Visc Mode
X	X	X	<2.0	157	14.4	88	133 - 181	12.5 - 16.3	C

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M[✓]C[™] UNDERSTANDING YOUR REPORT

ENGINES

ALUMINUM:	PISTONS, BEARINGS, HOUSINGS, THRUST WASHERS, BUSHINGS
CHROMIUM:	COMPRESSION RINGS, LOW FRICTION BEARINGS, LINERS, CHROMATE COOLING SYSTEM
COPPER:	BEARINGS, BUSHINGS, THRUST WASHERS, OIL COOLER, CLUTCHES, AND AN OIL ADDITIVE IN SOME GASOLINE ENGINE OILS.
IRON:	CRANKSHAFT, CYLINDERS, PISTONS, LINERS, BEARINGS, VALVE TRAIN
LEAD:	BEARINGS, CONTAMINATION FROM LEADED GASOLINE
TIN:	PISTON SKIRTS, BEARINGS, AND BUSHINGS.
SILICON:	AIRBORN DIRT, SEAL MATERIAL, GASKETS, USED IN SOME OIL ADDITIVES, SPRAY LUBRICANTS, WHEN FOUND WITH POTASSIUM INDICATES GLYCOL ISSUE
POTASSIUM:	INDICATION OF GLYCOL OR SALTWATER INTRUSION, ADDITIVE IN SOME OILS
SODIUM:	FOUND IN SOME OIL ADDITIVES, GLYCOL, ENVIRONMENTAL CONTAMINANT OR SALT WATER
WATER:	MEASURED IN % VOLUME, CAN BE INDICATION OF CONDENSATION, COOLING SYSTEM LEAK, OR OUTSIDE CONTAMINATION
GLYCOL:	MEASURED IN % VOLUME, IN THE FORMULATION OF MOST COMMERCIAL COOLANTS
OXIDATION:	THIS IS THE RESULTS OF OXYGEN IN THE AIR REACTING WITH THE OIL AT ELEVATED TEMPERATURES. THIS IS A NORMAL PROCESS AS THE OIL AGES. IF AN ENGINE IS OPERATED CONTINUOUSLY AT A HIGH TEMPERATURE FOR EXTENDED PERIODS, OR IF DRAIN INTERVAL IS OVER EXTENDED, OIL CHANGE IS RECOMMENDED.
NITRATION:	FORMED DURING COMBUSTION PROCESS, LEADS TO ACCELERATED OIL DETERIORATION.
SOOT:	NORMAL COMBUSTION BY PRODUCT OF DIESEL FUEL AND APPEARS AS CONTAMINANT IN THE OIL CAUSING AN INCREASE IN VISCOSITY. INDICATE AN INPROPER AIR/FUEL RATIO, DEFECTIVE AIR INTAKE, FAULTY INJECTORS, OR BLOW-BY
VISCOSITY:	CALCULATED MEASUREMENT OF THE OIL'S ABILITY TO FLOW AND LUBRICATE, INDICATES IF OIL IS TOO THICK OR THIN
TBN:	MEASUREMENT OF OIL'S ALKALINE BASE RESERVE, ADDITIVE IN OIL CAPABLE OF NEUTRALIZING ACIDIC CONTAMINANTS, WHEN TBN IS BELOW 3, IT IS AN INDICATION THE OIL IS NO LONGER SERVICEABLE
FUEL DILUTION:	MEASURED IN % VOLUME, CAN INDICATE FAULTY COMBUSTION, RICH AIR/FUEL MIXTURE WHEN PRESENT BETWEEN 2%-5%. INJECTOR PROBLEM OR INTERNAL FUEL LINE LEAK IS TYPICALLY INDICATED WHEN FUEL IS DETECTED AT HIGH LEVELS

TRANSMISSIONS

TORQUE CONVERTER, THE CASE, THRUST WASHERS, HOUSINGS, GEAR AND VANE PUMPS
BALL AND ROLLER BEARINGS, ALLOY OF STEEL PARTS
CLUTCH PLATES, BRONZE BUSHINGS, OIL COOLER OXIDES, BRASS FITTINGS
GEARS, BEARINGS, SHAFTS, SOME CASES, CLUTCH PLATES
GEARS
SOME BEARING CAGES
AIRBORN DIRT, SEALERS, GASKETS, USED IN SOME OIL ADDITIVES, SPRAY LUBRICANTS, WHEN FOUND WITH POTASSIUM INDICATES GLYCOL ISSUE, SAND-CASTED PARTS
INDICATION OF GLYCOL OR SALTWATER INTRUSION, ADDITIVE IN SOME OILS
FOUND IN SOME OIL ADDITIVES, GLYCOL, ENVIRONMENTAL CONTAMINANT OR SALT WATER

ACCURACY OF RECOMMENDATIONS IS DEPENDENT ON THE REPRESENTATIVE OIL SAMPLES AND COMPLETELY CORRECT DATA ON BOTH UNIT AND OIL. THIS ANALYSIS IS INTENDED AS AN AID IN PREDICTING MECHANICAL WEAR. NO GUARANTEE, EXPRESS OR IMPLIED, IS MADE AGAINST FAILURE OF THIS COMPONENT, MOTOR CHECK(OIL LAB LLC.) LIABILITY IN ANY CASE IS LIMITED TO THE COST OF THE REPORTED ANALYSIS.