Eagle Tugs

Parts and Service Manual



Vehicle Types: USATS

Engine Type: Yanmar Diesel 4TNV98 Tier II and Tier III Engine Models

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Table of Contents

INTRODUCTION 3

Purpose & Use of This Manual 3
Technical assistance 3
Ordering Spare/Service Parts 3
Contact Information 3

WARRANTY & SAFETY 7

Important safety notice 7
Warranty information 9
Vehicle ID Information 10
Warranty Registration 11
Yanmar Engine Warranty Information 11
Service Bulletin esb-02-08 Fuel requirements 12

SERVICE PARTS ILLUSTRATIONS & DETAIL 13

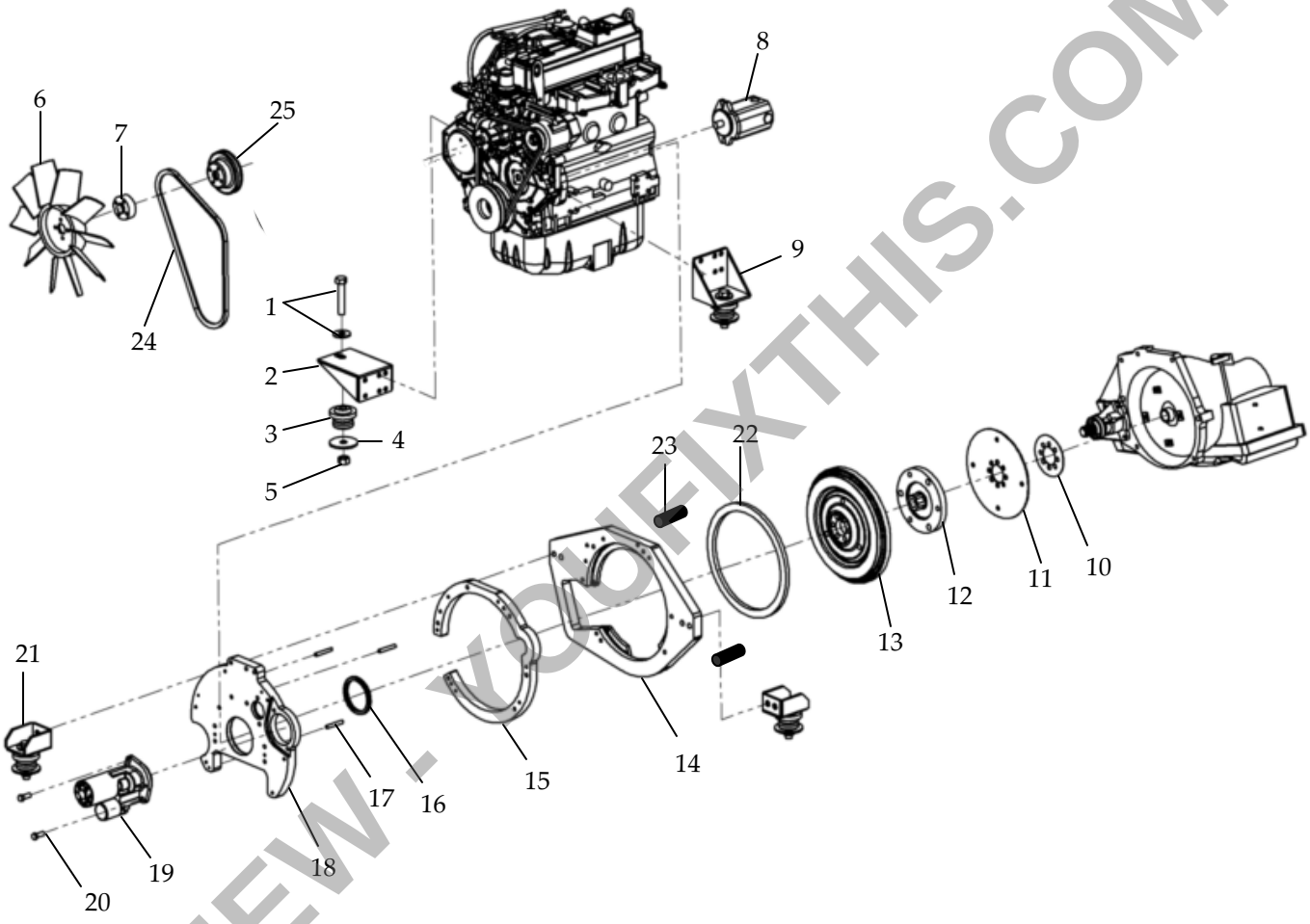
Identification Key 13
Power Train 14
Engine Dress & Torque Chart Yanmar Diesel 14
Fan Bracket Spacer Information 16
Alternator Assembly 17
Head Cover Assembly 20
Cylinder Block Assembly Tier II 20
Cylinder Block Assembly Tier III 24
Crankshaft & Piston Assembly Tier II 26
Crankshaft & Piston Assembly Tier III 28
Camshaft & Driving Gear Assembly Tier II 30
Camshaft & Driving Gear Assembly Tier III 32
Governor Assembly Tier III only 34
Oil Pan Assembly 35
Engine Oil Lube System 36
Engine Gear Housing Assembly 38
Engine Gaskets Tier II 40
Engine Gaskets Tier III 42
Cooling System 44
Engine Cooling System 44
Cooling System Radiator Assembly Manufactured Before Feb 1, 2012 46
Cooling System Radiator Assembly Manufactured After Feb 1, 2012 48
Driveline 50
Drive Shaft Assembly-Front 50
Drive Shaft Assembly-Rear 51
Transmission 52
Transaxle Mounting & Misc. Parts 52
Transaxle Case Extension & Retainer 54
Axles 56
Axle Assembly—Front Drive (AWD) 56
Axle Assembly—Rear 57

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Power train

ENGINE DRESS



Note: Torque values shown in this manual are for clean, non-lubricated fasteners unless otherwise specified.

CAUTION: The tightening torque in the above Standard Torque Chart should be applied only to the bolts with a "7" head. (JIS strength classification 71).

*Apply 60% torque to bolts that are not listed.

STANDARD TORQUE CHART							
Thread Size x Pitch mm		M6 x 1.0	M8 x 1.25	M10 x 1.5	M12 x 1.75	M14 x 1.5	M16 x 1.5
Tightening Torque	in-lb	87-105					
	ft-lb		17-21	32-40	58-72	94-108	160-174
	N-m	9.8-11.8	22.6-28.4	45-54.8	78.5-98.10	127.2-146.8	216.2-235.8
	kgf/m	1.1	2.03-2.09	4.5-5.5	8.0-10.0	12.5-15.5	21-25

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POWER TRAIN

ENGINE DRESS

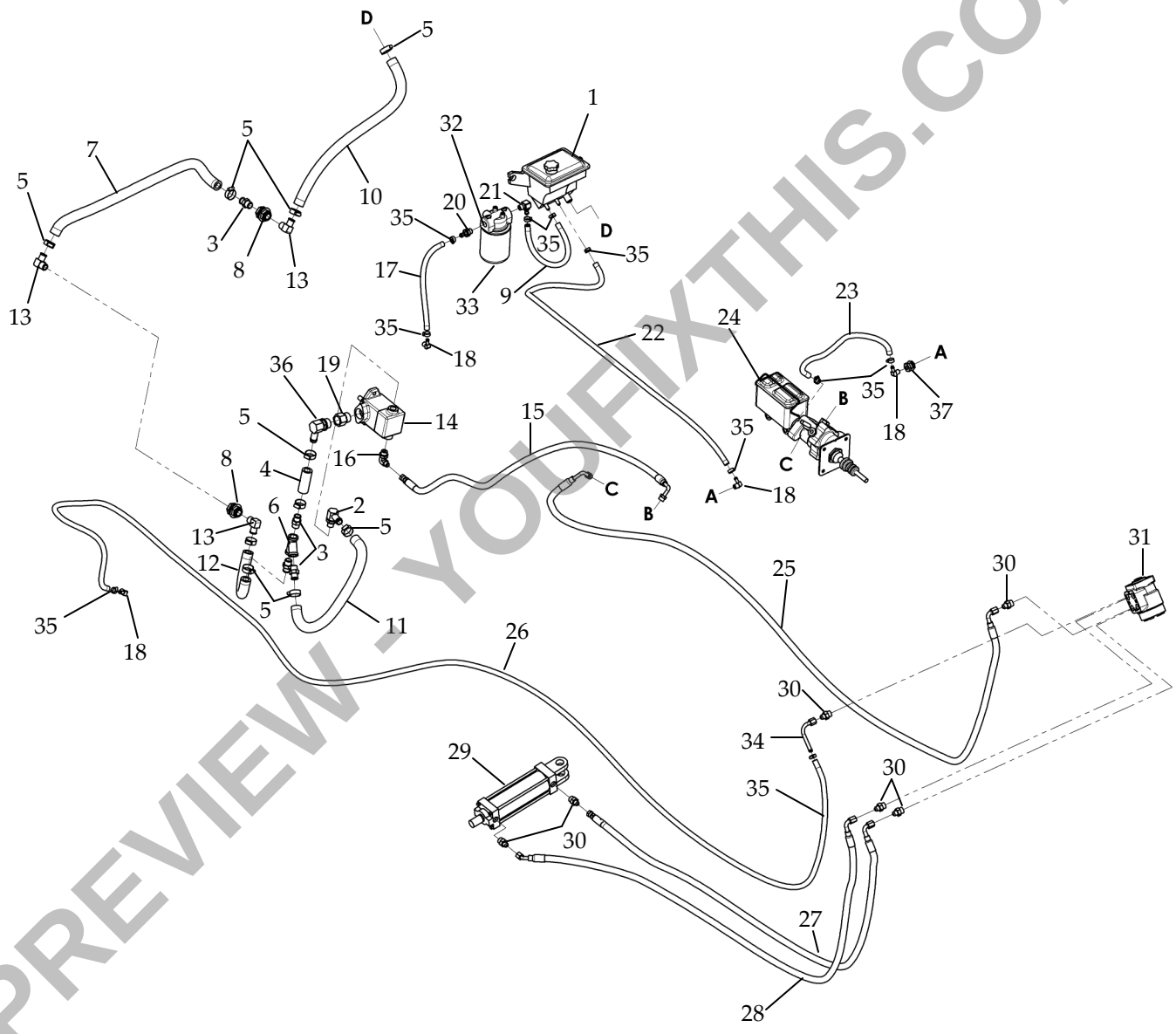
Item	Part Number	Qty	Description
1	NPN	4	3/4-16.5 BOLT & 3/4" FLAT WASHER
2	B-TT5D-00008-1	1	ENGINE MOUNT
3	A-TT5D-00013-1	4	ISOLATOR
4	A-TT5D-00010	4	LORD WASHER
5	NPN	4	3/4" LOCK NUT
6	5136603081	1	FAN
7	A-SATS-00360	1	FAN SPACER
8	V10F1T3T11C3F20L	1	METARIS PUMP
9	B-TT5D-00006-1	1	FRONT ENGINE MOUNT
10	TM27C00305-ID	1	FLEX PLATE WASHER
11	B-TT10TD-00016-ID	1	FLEX PLATE
12	B-TT5D-00017-4TNV	1	FLEX PLATE ADAPTER
13	129953-21570	1	FLYWHEEL WITH RING GEAR
14	B-TT10TD-00001-4TNV	1	TRANS PLATE
15	B-TT10TD-00002	1	TRANS PLATE SPACER
16	129900-01780	1	OIL SEAL
17	41HN28	3	ADJ PLATE DOWEL PINS 3/8 X 2.5
18	TMD27B00521-4TNV	1	ENGINE PLATE
19	129940-77010	1	STARTER
20	26116-120302	2	BOLT, M12 X 30 PLATED
21	B-TT5D-00009	2	ENGINE MOUNT TRANS PLATE
22	129900-21600	1	RING GEAR
23	5240849	2	TRANSMISSION DOWEL PIN
24	9440	1	REMOTE FAN BELT TIER II ENGINE MODELS/ TIER III WITH HI OUT PUT ALTERNATOR
24	A-TT8-00359	1	REMOTE FAN BELT TIER III ENGINE MODEL
25	129900-42450	1	PULLEY
26	A-USAT5-50-16-1	1	BOTTOM SHROUD (NOT SHOWN)
27	A-USAT5-50-15-1	1	UPPER SHROUD (NOT SHOWN)

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HYDRAULIC ASSIST

HYDRAULIC ASSIST SYSTEM WITH METARIS PUMP

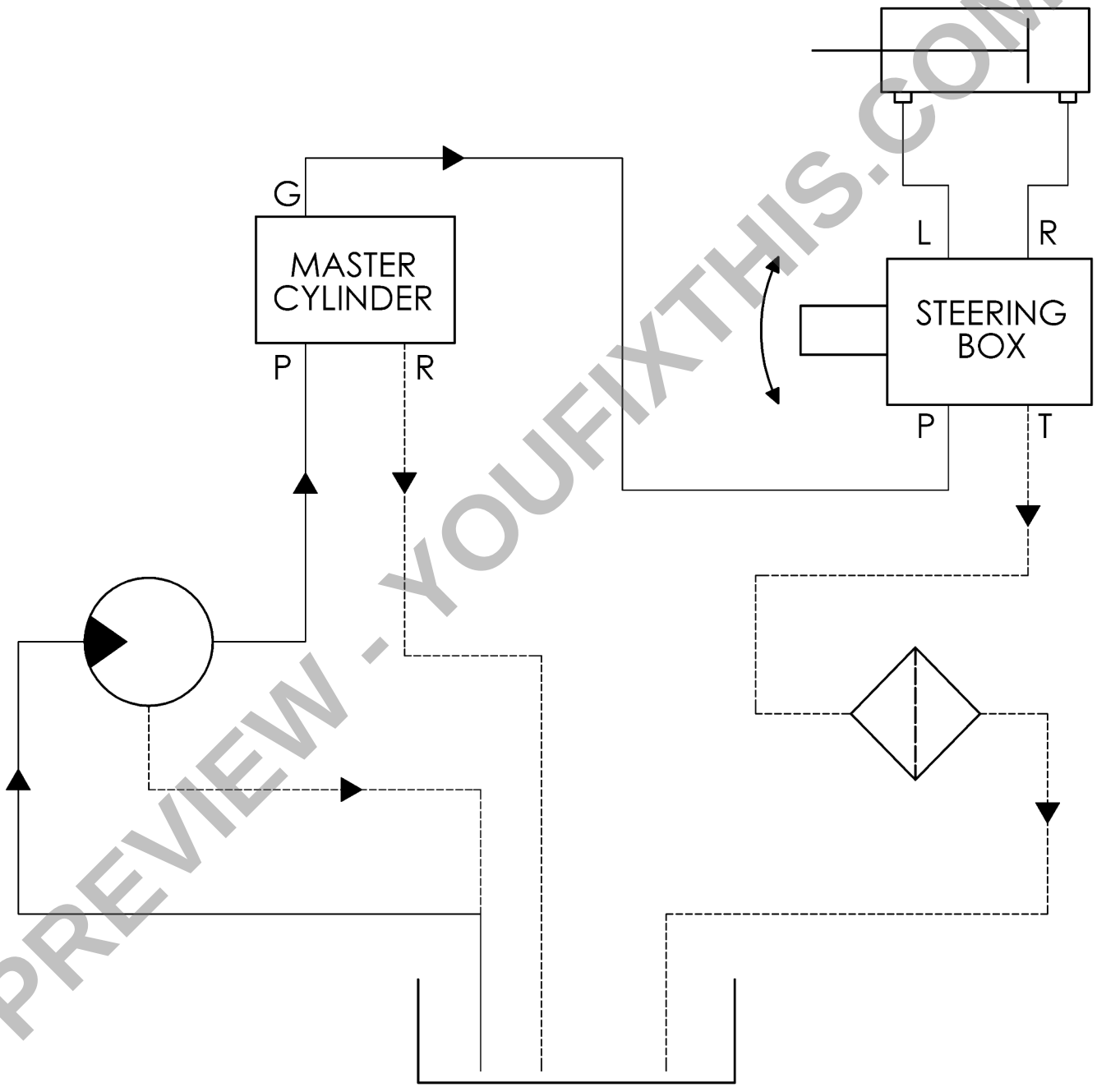


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HYDRAULIC ASSIST

HYDRAULIC ASSIST SYSTEM SCHEMATIC

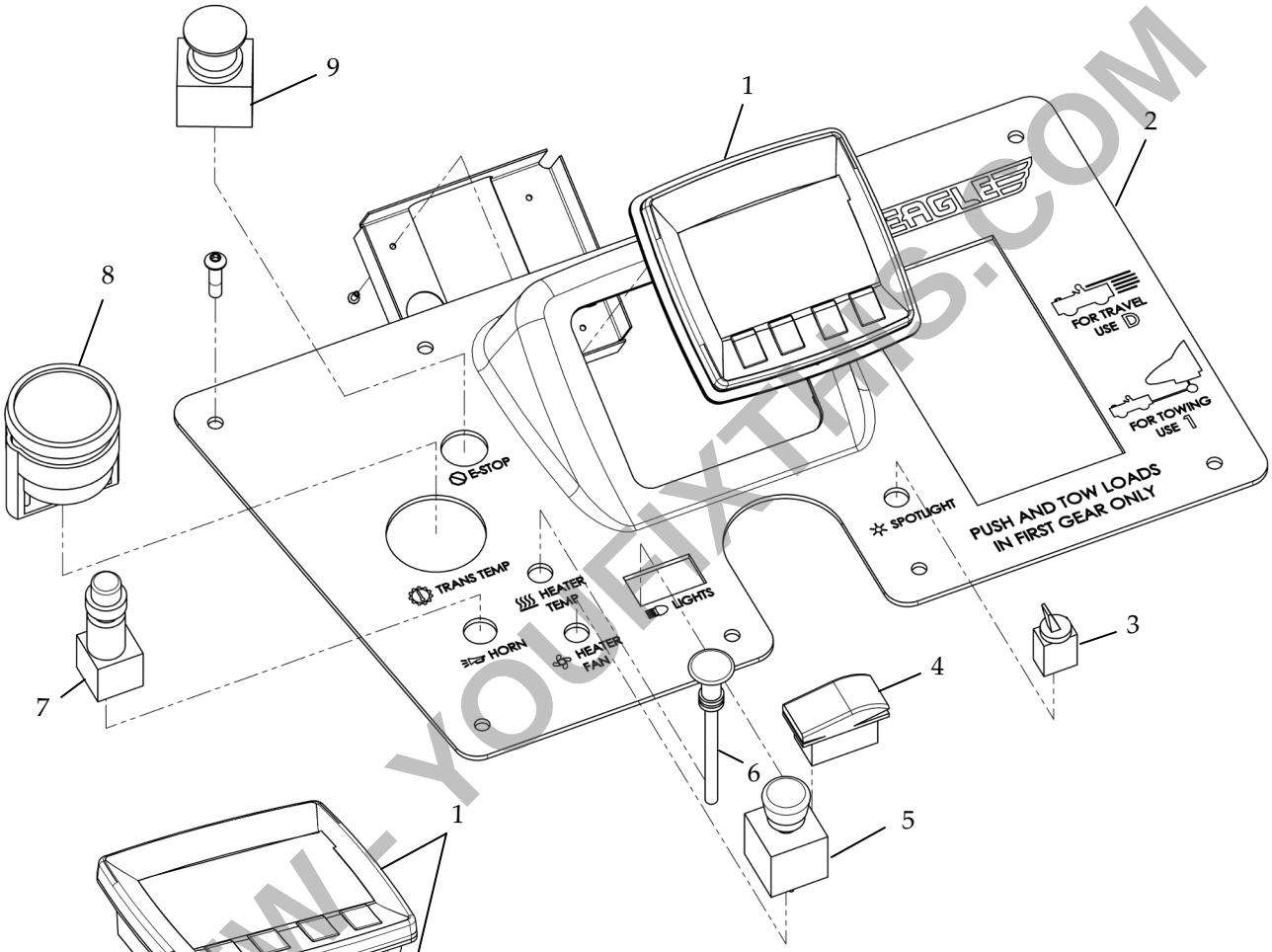


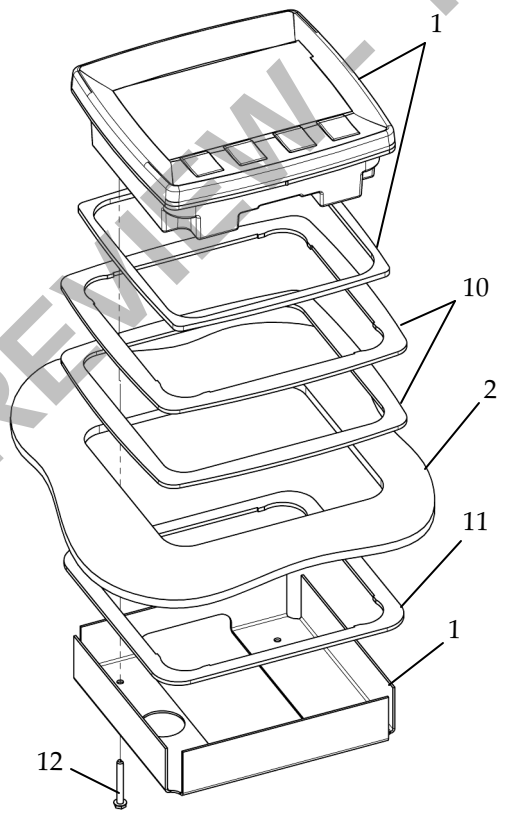
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Operator Compartment

INSTRUMENT PANEL WITH SAUER DISPLAY





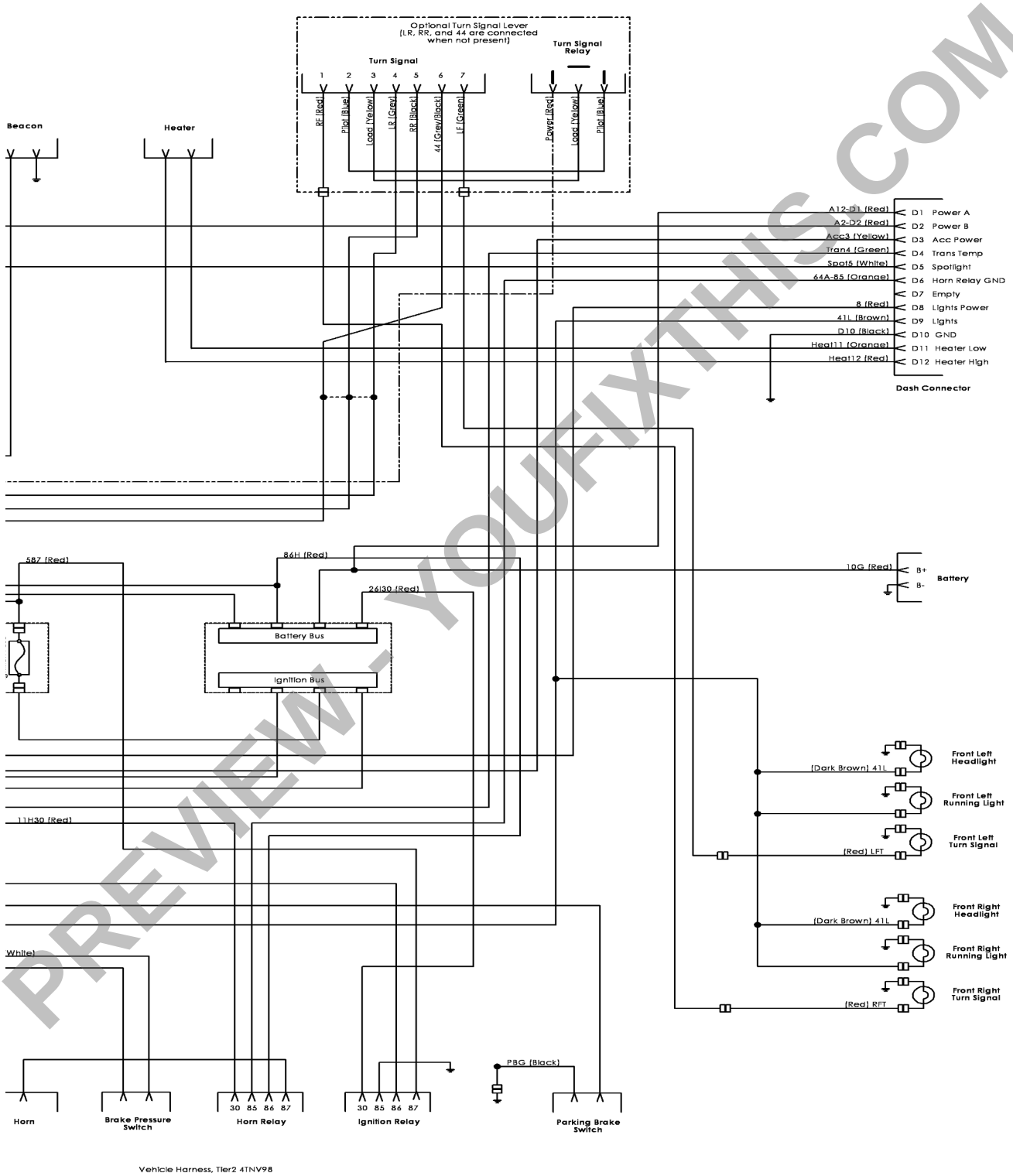
NOTE: FOR TIER III AND FOR TIER II UNITS MANUFACTURED BEFORE FEB 1, 2012

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ELECTRICAL SCHEMATICS

VEHICLE WIRING HARNESS — YANMAR TIER II DIESEL



Vehicle Harness, Tier2 4TNV98

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MAINTENANCE

PREVENTATIVE MAINTENANCE SCHEDULE

	Description of Check/Service	Operational Hours								
System	**X**-Check * Requires Service **Contact your local Yanmar distributor or dealer	Daily	50	250	500	750	1000	1250	1500	2000
Engine Oil	Engine Oil and filter ***first 50 and every 250 hours thereafter**	X	*	*	*	*	*	*	*	*
Transmission	Transmission Fluid	X								*
Steering	Power Steering Fluid	X								
	Steering Linkage				X		X		X	X
Cooling System	Coolant Level Check **X** Flush *	X					*			*
	Check & Clean Radiator Fins***every 50 hours**		*							
	Coolant Hoses		X	X	X	X	X	X	X	*
	Belts		X	X	X	X	X	X	X	X
Fuel System	Fuel System Leak Check		X	X	X	X	X	X	X	X
	Fuel Filter ***every 500 hours**				*		*		*	*
	Drain Water/Fuel Seperator ***every 50 hours**	X	*							
	Clean Water/Fuel Filter ***every 250 hours**			*	*	*	*	*	*	*
	Lubricity Filter ***every 250 hours**			*	*	*	*	*	*	*
Air Cleaner	Air Cleaner Element ***every 500 hours**				*		*		*	*
Engine Compartment	Engine Rubber Mounts		X	X	X	X	X	X	X	X
	Lap Intake/Exhaust Valve Seats						**			
	Adjust Intake/Exhaust Valve Clearance						**			
	Check & Adjust Governor Lever & Engine Speed Control ***every 250 hours**	X		X	X	X	X	X	X	X
	Inspect Crankcase Breather System Valve Cleaning								**	
	Inspect,Clean &Check Injection Nozzles								**	
Electrical	Electrical Wires and Connections		X	X	X	X	X	X	X	X
	Battery Cables	X								
Throttle	Throttle Controls		X	X	X	X	X	X	X	X
Brake System	Brake Fluid	X								
	Brake Pads (Front)				X		X		X	X
	Drum Brake Lining (Rear)				X		X		X	X
	Brake Lines and Hoses				X		X		X	X

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Maintenance

FRONT AXLE MAINTENANCE

Dana 44 Front Axle Disassembly Procedure

Please refer to the steps below for proper adjustment procedure.

Note: Please refer to the attached picture of the Dana 44 axle for number reference.

Disassembly Procedure:

Step 1: Lift the tug so that both of the front tires are off the ground and make sure the unit is secured properly.

Step 2: Remove both front wheels.

Step 3: Remove both front calipers leaving the brake hose intact.

Step 4: Remove both of the hub center caps.

Step 5: Use lock ring pliers to remove both lock rings on the left and right side of the tug. (#62)

Step 6: Remove the Gear (#69), spindle (#70) and spring retainer (#71) on both sides.

Step 7: Use socket #OTC 7157 to remove the locking nut. (#59)

Step 8: Remove the locking ring. (#58)

Step 9: Remove the spindle nut.

Step 10: Slide the rotor & hub assembly off the spindle leaving the bearings inside the hub.

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USATS Diesel Specifications

SPECIFICATIONS & CAPACITIES

MODEL #	YANMAR 4TNV98
DESCRIPTION:	Vertical In-line diesel, 3.3 Liter, four cylinder, direct injection engine

# OF CYLINDERS	4 IN-LINE
BORE & STROKE INCHES (mm)	3.858 X 4.331 in (98 X 112 mm)
DISPLACEMENT, CUBIC INCHES (L)	202, 502 cu in (3.319L)
COMPRESSION RATIO	171 (2.8)
FUEL	No 2 DIESEL
ALTERNATOR	55, 80 OR 105 AMP, NEG GROUND
ENGINE WEIGHT FULLY DRESSED LB (KG) (PROX)	557 (253)

ENGINE CRANKCASE CAPACITIES

ENGINE	U.S. QUARTS	IMPERIAL QUARTS	LITRES
3.3 L (DIESEL***	11.1	9.24	10.5
**10W30(5W20 ARCTIC)			
***15W40CD IN CONTINENTAL U.S.			

FUEL TANK REFILL CAPACITIES

U.S. GALLONS	IMPERIAL GALLONS	LITERS
24.0	19.98	90.8

USA -SAE (SOCIETY OF AUTOMOTIVE ENGINEERS) NO. 2-D, NO. 1-D, ASTM.D975-94

JAPAN– JIS K2204 GRADE NO 2

EUROPEAN UINION– EN590:96

INTERNATIONAL ISO 8217 DMX

UNITED KINGDOM– BS 2869-AL OR A2

KOREA– KSM-2610

CHINA– GB252

*Please refer to Yanmar Engine Instruction Manual for further information

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MAINTENANCE

RECOMMENDED TORQUE SPECIFICATIONS FOR DANA 44 AXLE (FRONT)

POSITION	THREAD	WRENCH TORQUE (LBS.-FT)
Drive Pinion Nut	3/4 - 16	175-225
Differential Bearing Cup Cap Screws	1/2 - 13	70-90
Ring Gear Cap Screws	3/8 - 24	45-65
Cover Screws	5/16 - 18	28-33 (Note A)
Axle Shaft Bearing & Brake Retainer Nuts	3/8 - 24	40-50
Spindle Mounting Nuts	3/8 - 24	40
Spindle Mounting Nuts	7/16 - 20	50-60
Tie Rod Stud Nut	1/2 - 20	35 Min (Note B)
Tie Rod Stud Nut	9/16 - 18	35 Min (Note B)
Tie Rod Clamp Nuts	3/8 - 24	15-25
Tie Rod Clamp Nuts	7/16 - 20	25-40
Steering Arm Nuts	9/16 / 18	80-100
Steering Bolt Stop Screw & Jam Nut	3/8 - 24	10-20

RECOMMENDED TORQUE SPECIFICATIONS FOR DANA 60 AXLE (REAR)

POSITION	THREAD	WRENCH TORQUE (LBS.-FT)
Drive Pinion Nut	7/8 - 14	240-300
Differential Bearing Cup Cap Screws	1/2 - 13	70-90
Ring Gear Cap Screws	1/2 - 20	100-120
Ring Gear Cap Screws	1/2 - 20	120-14 (Note A)
Cover Screws	3/8 - 16	30-40
Brake Retainer Nuts	7/16 - 20	64-70
Axle Shaft Flange Nuts	7/16 - 20	64-70
Upper Kingpin	1 1/8 - 12	500-600
Kingpin Cap Cap Screws	1/2 - 20	70-90
Spindle Mounting Nuts	1/2 - 20	60-80
Tie Rod Stud Nut	5/8 - 18	70 Min (Note B)
Tie Rod Clamp Nuts	1/2 - 20	35-45
Steering Arm Nuts	1/2 - 20	70-90
Steering Bolt Stop Screw & Jam Nut	1/2 - 20	10-20

A.For Grade 9 fastener with locking serrations on underside of cap screw head or nut.

B.If cotter pin cannot be installed after minimum torque is attained, the nut must be advanced until cotter pin can be installed.

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