

**YAMAHA**

**SERVICE MANUAL**

**YM140(D)**

**YM147(D)**

**YM160(D)**

**YM167(D)**

---

# **YANMAR**

# **SERVICE MANUAL**

***DIESEL TRACTOR***

**MODEL**

**YM140(D)**

**YM147(D)**

**YM160(D)**

**YM167(D)**

# **YANMAR TRACTOR SERVICE MANUAL**

**YM140(D)**  
**YM147(D)**  
**YM160(D)**  
 MODEL **YM167(D)**

GENERAL	10
ENGINE REPAIR	20
FUEL AND AIR REPAIR	30
ELECTRICAL REPAIR	40
POWER TRAIN REPAIR	50
STEERING / BRAKE REPAIR	60
HYDRAULIC REPAIR	70
MISCELLANEOUS REPAIR	80
ENGINE OPERATION AND TESTS	220
FUEL / AIR OPERATION AND TESTS	230
ELECTRICAL OPERATION AND TESTS	240
POWER TRAIN OPERATION AND TESTS	250
STEERING / BRAKES OPERATION AND TESTS	260
HYDRAULIC OPERATION AND TESTS	270

---

# HOW TO USE THIS MANUAL

The chapters within this manual are divided into two groups; those indexed with cream colored dividers, chapters 10–80 and those indexed with blue dividers, chapters 220–270.

Each system within the tractor is discussed in both the cream colored chapters, dealing with specific mechanical repairs and the blue colored chapters, dealing with system operation.

The blue chapters are here employed on the premise that a general understanding of the system to be serviced can decrease the time required for diagnosis and repair.

Additionally, the blue chapters are provided as an aid to sales people, for whom a specific mechanical knowledge is not necessary, but for whom a theoretical understanding is a valuable sales tool.



**This symbol indicates an important safety message. Read it, it pertains to your safety.**



**This symbol indicates important instructions.**

“Right” and “left” in this manual are determined from the operator’s seat (eg. Clutch pedal is “left” of the operator’s seat, brake pedals are “right” of the operator’s seat).



**This tractor incorporates only metric (ISO) hardware. Use only metric parts as replacements.**

For your convenience, specifications are given in metric measurements followed by the corresponding U.S. measurement.

*All information, illustrations and specifications contained in this service manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.*



## SAFETY IN SERVICE

- 1) Refer to operation manual, pages 1–4, for tractor operation safety instructions.
- 2) Use dependable jacks of adequate capacity AND suitable stands (or wooden blocks) when removing wheels, or axles.
- 3) If it is necessary to work under raised equipment (i.e.: to perform adjustments, etc), insure that safety stands are used.
- 4) Wait for all moving parts to stop COMPLETELY before servicing.
- 5) Keep hands, feet and clothing safe distance away from belts, pulleys and other moving parts that may cause injury. Insure that all safety shields are installed.
- 6) Be extra careful when performing checks, inspections, adjustments or tests that require engine or hydraulic operation, or machine in motion. DO NOT make any check, adjustment, inspection or test under above conditions...UNLESS procedure *specifically* states so and THEN ONLY WITH STRICT ADHERENCE TO PROCEDURE AND SAFETY INSTRUCTIONS.
- 7) Before removing any hydraulic component, relieve hydraulic pressure within system, even if engine is not running.
- 8) Disconnect battery ground cable before servicing electrical system.
- 9) Safety shields are often removed for access to assemblies to be serviced. If removed, safety shields must be replaced after servicing. Replace any CAUTION, WARNING, or INSTRUCTION decal that is not readable, or missing. Refer to "Parts Catalog" for decal locations.



**CAUTION** : Personal injure may result if these safety instructions are not followed.

Carefully read the caution that follows this symbol. It pertains to your safety.

---

# GENERAL 10

- 00 SPECIFICATIONS AND  
SPECIAL TOOLS
- 05 DELIVERY SERVICE
- 10 PERIODIC SERVICE
- 15 FUEL AND LUBRICATION
- 20 SEPARATION

---

# CONTENTS

## GENERAL

ITEM	PAGE
<b>SPECIFICATIONS AND SPECIAL TOOLS</b>	
• GENERAL TRACTOR SPECIFICATIONS (YM140, YM147)	10-00-1
• GENERAL TRACTOR SPECIFICATIONS (YM160, YM167)	10-00-3
<b>DELIVERY SERVICE</b>	
• GENERAL INFORMATION	10-05-1
• BEFORE STARTING TRACTOR	10-05-2
• TEST OPERATIONS	10-05-17
• NEW TRACTOR STORAGE	10-05-23
• WARRANTY AND DELIVERY REPORT	10-05-25
• AFTER-SALE INSPECTION	10-05-26
<b>PERIODIC SERVICE</b>	
• INTRODUCTION	10-10-1
• PERIODIC SERVICE TIMETABLE	10-10-2
• DAILY CHECK LIST	10-10-6
• PERIODIC CHECK LIST	10-10-7
• PRELIMINARY ENGINE TESTING	10-10-10
• ENGINE TUNE-UP	10-10-10
• ELECTRICAL SYSTEM TUNE-UP	10-10-15
• GENERAL TUNE-UP	10-10-16
<b>FUEL AND LUBRICATION</b>	
• FUEL	10-15-1
• LUBRICANTS	10-15-2
• GENERAL INFORMATION	10-15-4
• ENGINE CRANKCASE	10-15-5
• TRANSMISSION AND HYDRAULIC SYSTEM	10-15-6
• FRONT WHEEL DRIVE (4WD)	10-15-8
• FRONT WHEEL BEARINGS (2WD)	10-15-8
• GREASING	10-15-9
<b>SEPARATION</b>	
• ENGINE AND CLUTCH HOUSING FROM CHASSIS	10-20-1
• TRANSMISSION AND REAR DIFFERENTIAL CASE FROM CHASSIS	10-20-6
• HYDRAULIC LIFT FROM TRANSMISSION CASE	10-20-11
• PANEL BOX FROM CHASSIS	10-20-13

# SPECIFICATIONS AND SPECIAL TOOLS

10-00-1

## GENERAL TRACTOR SPECIFICATIONS (YM140, YM147)

MODELS	YM140 · 140D	YM147 · YM147D
<b>DIMENSIONS</b>		
Overall Length		
with Three-point Hitch . . . . .	2476.5 mm (97.5 in.) . . . . .	2476.5 mm (97.5 in.)
without Three-point Hitch . . . . .	2159 mm (85.0 in.) . . . . .	2159 mm (85.0 in.)
Overall Width . . . . .	976 mm (38.4 in.) (YM140) . . . . .	976 mm (38.4 in.) (YM147)
	991 mm (39.0 in.) (YM140D)	991 mm (39.0 in.) (YM147D)
Overall Height		
to Steering Wheel . . . . .	1224 mm (48.2 in.) (YM140) . . . . .	1224 mm (48.2 in.) (YM147)
	1235 mm (48.6 in.) (YM140D) . . . . .	1235 mm (48.6 in.) (YM147D)
Wheel Base . . . . .	1350 mm (53.2 in.) . . . . .	1350 mm (53.2 in.)
Standard Tread		
Front . . . . .	810 mm (31.9 in.) (YM140) . . . . .	810 mm (31.9 in.) (YM147)
	820 mm (32.2 in.) (YM140D) . . . . .	820 mm (32.2 in.) (YM147D)
Rear . . . . .	750 mm (29.5 in.) . . . . .	750 mm (29.5 in.)
Turning Radius		
without Brake . . . . .	2300 mm (90.6 in.) . . . . .	2300 mm (90.6 in.)
with Brake . . . . .	2000 mm (78.7 in.) . . . . .	2000 mm (78.7 in.)
<b>GROUND CLEARANCE</b>		
	192 mm (7.6 in.) . . . . .	192 mm (7.6 in.)
	(at drawbar)	(at drawbar)
<b>SHIPPING WEIGHT</b>		
with Rear Tire 7 – 16 R1 . . . . .	497 kg (1096 lbs) (YM140) . . . . .	504 kg (1111 lbs) (YM147)
	540 kg (1190 lbs) (YM140D) . . . . .	546 kg (1204 lbs) (YM147D)
with Rear Tire 8 – 16 R1 . . . . .	510 kg (1124 lbs) (YM140) . . . . .	517 kg (1140 lbs) (YM147)
	557 kg (1272 lbs) (YM140D) . . . . .	563 kg (1241 lbs) (YM147D)
<b>ENGINE</b>		
Type . . . . .	2-cylinder, in-line diesel . . . . .	2-cylinder, in-line diesel
Model . . . . .	2T75UA . . . . .	2T75UA
Slow Idle Speed . . . . .	1000 – 1050 rpm . . . . .	1000 – 1050 rpm
Working Speed Range . . . . .	2100 – 2600 rpm . . . . .	2100 – 2600 rpm
Bore and Stroke . . . . .	75 x 72 mm (2.95 x 2.83 in.) . . . . .	75 x 72 mm (2.95 x 2.83 in.)
Displacement . . . . .	0.636 ℓ (38.81 cu. in.) . . . . .	0.636 ℓ (38.81 cu. in.)
Compression Ratio . . . . .	23 : 1 . . . . .	23 : 1
Valve Clearance		
Intake . . . . .	0.20 mm (0.008 in.) . . . . .	0.20 mm (0.008 in.)
Exhaust . . . . .	0.20 mm (0.008 in.) . . . . .	0.20 mm (0.008 in.)
Injection Timing . . . . .	BTDC 20° . . . . .	BTDC 20°
Lubrication System . . . . .	Force-feed, pressurized with . . . . .	Force-feed, pressurized with
	full-flow filter	full-flow filter
Max. Gross Horsepower . . . . .	14 HP (10.4 kW) at 2600 rpm . . . . .	14 HP (10.4 kW) at 2600 rpm
(Factory-observed)		
<b>FUEL SYSTEM</b>		
Type . . . . .	Swirl-precombustion chamber . . . . .	Swirl-precombustion chamber
Injection Pump Type . . . . .	Plunger/Bosch type . . . . .	Plunger/Bosch type
Air Cleaner . . . . .	Dry type . . . . .	Dry type

MODELS	YM140 · YM140D	YM147 · YM147D		
<b>COOLING SYSTEM</b>				
Type .....	Pressurized with centrifugal pump .....	Pressurized with centrifugal pump		
Temperature Control .....	Thermostat .....	Thermostat		
<b>CAPACITIES</b>				
Fuel Tank .....	15.8 ℓ (4.2 U.S. gallons) .....	15.8 ℓ (4.2 U.S. gallons)		
Cooling System .....	3.0 ℓ (0.8 U.S. gallons) .....	3.0 ℓ (0.8 U.S. gallons)		
(without Subtank)				
Crankcase (with Filter) .....	2.0 ℓ (2.1 U.S. quarts) .....	2.0 ℓ (2.1 U.S. quarts)		
Transmission Hydraulic System .....	9.0 ℓ (2.4 U.S. gallons) .....	9.0 ℓ (2.4 U.S. gallons)		
Front Drive Gear Case .....	2.1 ℓ (2.2 U.S. quarts) (YM140D) .....	2.1 ℓ (2.2 U.S. quarts) (YM147D)		
<b>TRANSMISSION</b>				
Type .....	Sliding gear and constantmesh .....	Power shift and Sliding gear		
	3 range shift gears,	3 range shift gears,		
	2-forward, 1-reverse speed gear	2-forward, 1-reverse speed gear		
Total Gears .....	6-forward, 3-reverse .....	6 forward, 3-reverse		
Clutch .....	Single-disk, dry .....	Single-disk, dry		
<b>POWER TAKE-OFF</b>				
Type .....	1-speed, transmission driven .....	1-speed, transmission driven		
	with overrunning clutch	with overrunning clutch		
Speed .....	540 rpm (2356 engine rpm) .....	540 rpm (2356 engine rpm)		
Size .....	35 mm (1-3/8 in.) .....	35 mm (1-3/8 in.)		
Clutch .....	Transmission clutch .....	Transmission clutch		
<b>HYDRAULIC SYSTEM</b>				
Type .....	Open center, constant flow .....	Open center, constant flow		
Max. Lift Capacity .....	400 kg (882 lbs) .....	400 kg (882 lbs)		
(@ 24 in. behind Points) .....	350 kg (772 lbs) .....	350 kg (772 lbs)		
Relief Pressure .....	120 kg/cm <sup>2</sup> (1706 psi.) .....	120 kg/cm <sup>2</sup> (1706 psi.)		
Pump .....	Gear pump, driven by engine .....	Gear pump, driven by engine		
Pump Rated Output .....	13 ℓ/min. (3.4 U.S. GPM) .....	13 ℓ/min. (3.4 U.S. GPM)		
<b>BRAKES</b>				
Type .....	Mechanical dry, internal .....	Mechanical dry, internal		
	expanding shoe	expanding shoe		
<b>ELECTRICAL SYSTEM</b>				
Type .....	Y100-S6 .....	Y100-S6		
Battery .....	One, 12-volt, 47 Ah .....	One, 12-volt, 47 Ah		
Alternator .....	12-volt, 15-amp .....	12-volt, 15-amp		
<b>TIRE</b>				
Tire	Front	AG (STD) .....	4.50 – 10 F2 (YM140) .....	4.50 – 10 F2 (YM147)
		(STD) .....	4.50 – 10 R1 (YM140D) .....	4.50 – 10 R1 (YM147D)
		(OPTIONAL) ...	5 – 12 R2 (YM140D) .....	5 – 12 R2 (YM147D)
		TURF .....	20.5 x 8.00 – 10 .....	20.5 x 8.00 – 10
	Rear	AG (STD) .....	7 – 16 R1 .....	7 – 16 R1
		(OPTIONAL) ..	8 – 16 R1 .....	8 – 16 R1
		TURF .....	29 x 12.00 – 10 .....	29 x 12.00 – 10

## GENERAL TRACTOR SPECIFICATIONS (YM160, YM167)

MODELS	YM160 · YM160D	YM167 · YM167D
<b>DIMENSIONS</b>		
Overall Length		
with Three-point Hitch	2476.5 mm (97.5 in.)	2476.5 mm (97.5 in.)
without Three-point Hitch	2184 mm (86.0 in.)	2184 mm (86.0 in.)
Overall Width	970 mm (38.2 in.) (YM160)	970 mm (38.2 in.) (YM167)
	998 mm (39.3 in.) (YM160D)	998 mm (39.3 in.) (YM167D)
Overall Height		
to Steering Wheel	1248 mm (49.1 in.) (YM160)	1248 mm (49.1 in.) (YM167)
	1256 mm (49.5 in.) (YM160D)	1256 mm (49.5 in.) (YM167D)
Wheel Base	1350 mm (53.2 in.)	1350 mm (53.2 in.)
Standard Tread		
Front	810 mm (31.9 in.) (YM160)	810 mm (31.9 in.) (YM167)
	820 mm (32.2 in.) (YM160D)	820 mm (32.2 in.) (YM167D)
Rear	750 mm (29.5 in.)	750 mm (29.5 in.)
Turning Radius		
without Brake	2300 mm (90.6 in.)	2300 mm (90.6 in.)
with Brake	2000 mm (78.7 in.)	2000 mm (78.7 in.)
<b>GROUND CLEARANCE</b>		
	220 mm ( 8.7 in.)	220 mm ( 8.7 in.)
	(at drawbar)	(at drawbar)
<b>SHIPPING WEIGHT</b>		
With Rear Tire 8 – 16R1	528 kg (1164 lbs) (YM160)	532 kg (1173 lbs) (YM167)
	572 kg (1261 lbs) (YM160D)	576 kg (1270 lbs) (YM167D)
<b>ENGINE</b>		
Type	2-cylinder, in-line diesel	2-cylinder, in-line diesel
Model	2T75HA	2T75HA
Slow Idle Speed	1000 – 1050 rpm	1000 – 1050 rpm
Working Speed Range	1800 – 2600 rpm	1800 – 2600 rpm
Bore and Stroke	75 x 85 mm (2.95 x 3.35 in.)	75 x 85 mm (2.95 x 3.35 in.)
Displacement	0.751 ℓ (45.8 cu. in.)	0.751 ℓ (45.8 cu. in.)
Compression Ratio	23 : 1	23 : 1
Valve Clearance		
Intake	0.20 mm (0.008 in.)	0.20 mm (0.008 in.)
Exhaust	0.20 mm (0.008 in.)	0.20 mm (0.008 in.)
Injection Timing	BTDC20°	BTDC20°
Lubrication System	Force-feed, pressurized with full-flow filter	Force-feed, pressurized with full-flow filter
Max. Gross Horsepower (Factory-observed)	16 HP (11.9 KW) at 2600 rpm	16 HP (11.9 KW) at 2600 rpm
<b>FUEL SYSTEM</b>		
Type	Swirl-precombustion chamber	Swirl-precombustion chamber
Injection Pump Type	Plunger/Bosch type	Plunger/Bosch type
Air Cleaner	Dry type	Dry type

MODELS	YM160 · YM160D	YM167 · YM167D		
<b>COOLING SYSTEM</b>				
Type .....	Pressurized with centrifugal pump .....	Pressurized with centrifugal pump		
Temperature Control .....	Thermostat .....	Thermostat		
<b>CAPACITIES</b>				
Fuel Tank .....	15.8 ℓ (4.2 U.S. gallons) .....	15.8 ℓ (4.2 U.S. gallons)		
Cooling System .....	3.0 ℓ (0.8 U.S. gallons) .....	3.0 ℓ (0.8 U.S. gallons)		
(without Subtank)				
Crankcase (with Filter) .....	2.0 ℓ (2.1 U.S. quarts) .....	2.0 ℓ (2.1 U.S. quarts)		
Transmission Hydraulic System .....	9.0 ℓ (2.4 U.S. gallons) .....	9.0 ℓ (2.4 U.S. gallons)		
Front Drive Gear Case .....	2.1 ℓ (2.2 U.S. quarts) (YM160D) .....	2.1 ℓ (2.2 U.S. quarts) (YM167D)		
<b>TRANSMISSION</b>				
Type .....	Sliding gear and constantmesh .....	Power shift and sliding gear		
	3 range shift gears,	3 range shift gears,		
	2-forward, 1-reverse speed gear	2-forward, 1-reverse speed gear		
Total Gears .....	6-forward, 3-reverse .....	6-forward, 3-reverse		
Clutch .....	Single-disk, dry .....	Single-disk, dry		
<b>POWER TAKE-OFF</b>				
Type .....	1-speed, transmission driven .....	1-speed, transmission driven		
	with overrunning clutch	with overrunning clutch		
Speed .....	540 rpm (2356 engine rpm) .....	540 rpm (2356 engine rpm)		
Size .....	35 mm (1-3/8 in.) .....	35 mm (1-3/8 in.)		
Clutch .....	Transmission clutch .....	Transmission clutch		
<b>HYDRAULIC SYSTEM</b>				
Type .....	Open center, constant flow .....	Open center, constant flow		
Max. Lift Capacity .....	400 kg (882 lbs) .....	400 kg (882 lbs)		
(@ 24 in. behind Points)				
	350 kg (772 lbs) .....	350 kg (772 lbs)		
Relief Pressure .....	120 kg/cm <sup>2</sup> (1706 psi.) .....	120 kg/cm <sup>2</sup> (1706 psi.)		
Pump .....	Gear pump, driven by engine .....	Gear pump, driven by engine		
Pump Rated Output .....	13 ℓ/min. (3.4 U.S. GPM) .....	13 ℓ/min. (3.4 U.S. GPM)		
<b>BRAKES</b>				
Type .....	Mechanical dry, internal .....	Mechanical dry, internal		
	expanding shoe	expanding shoe		
<b>ELECTRICAL SYSTEM</b>				
Type .....	DRN50Z .....	DRN50Z		
Battery .....	One, 12-volt, 60 Ah .....	One, 12-volt, 60 Ah		
Alternator .....	12-volt, 15 amp .....	12-volt, 15 amp		
<b>TIRE</b>				
Tire	Front	AG .....	4.50 – 10 F2 (YM160) .....	4.50 – 10 F2 (YM167)
			5 – 12 R1 (YM160D) .....	5 – 12 R1 (YM167D)
		TURF .....	20.5 x 8.00 – 10 .....	20.5 x 8.00 – 10
	Rear	AG .....	8 – 16 R1 .....	8 – 16 R1
		TURF .....	29 x 12.00 – 10 .....	29 x 12.00 – 10