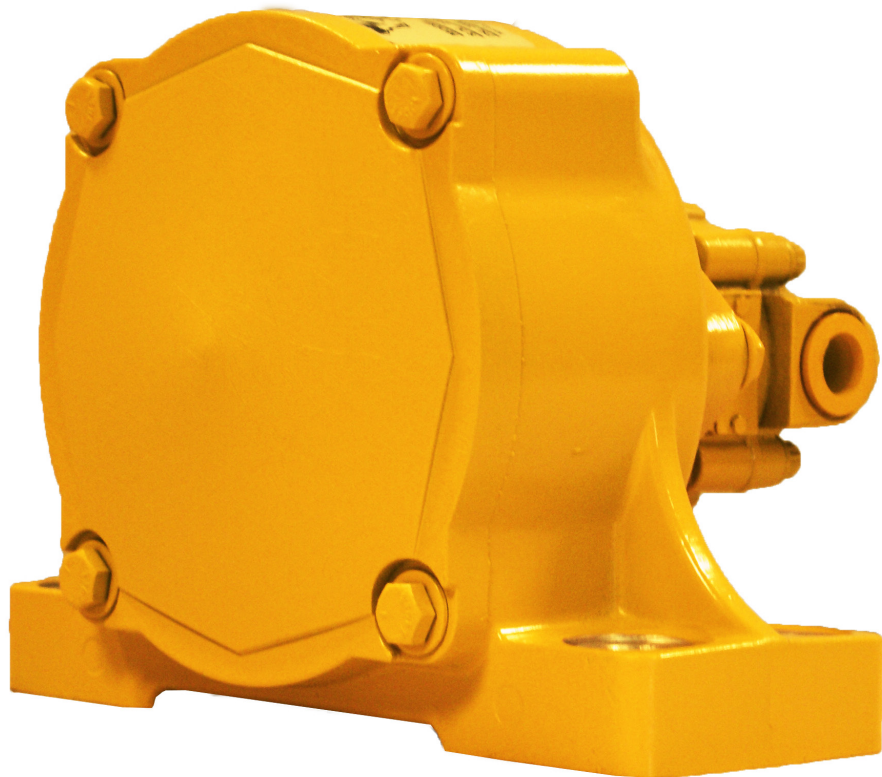


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Cougar®
THD Vibrators

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Operator's Manual
M4020

Important

MARTIN ENGINEERING HEREBY DISCLAIMS ANY LIABILITY FOR: DAMAGE DUE TO CONTAMINATION OF THE MATERIAL; USER'S FAILURE TO INSPECT, MAINTAIN AND TAKE REASONABLE CARE OF THE EQUIPMENT; INJURIES OR DAMAGE RESULTING FROM USE OR APPLICATION OF THIS PRODUCT CONTRARY TO INSTRUCTIONS AND SPECIFICATIONS CONTAINED HEREIN. MARTIN ENGINEERING'S LIABILITY SHALL BE LIMITED TO REPAIR OR REPLACEMENT OF EQUIPMENT SHOWN TO BE DEFECTIVE.

Observe all safety rules given herein along with owner and Government standards and regulations. Know and understand lockout/tagout procedures as defined by American National Standards Institute (ANSI) z244.1-1982, *American National Standard for Personnel Protection - Lockout/Tagout of Energy Sources - Minimum Safety Requirements* and Occupational Safety and Health Administration (OSHA) Federal Register, Part IV, 29 CFR Part 1910, *Control of Hazardous Energy Source (Lockout/Tagout); Final Rule*.

The following symbols may be used in this manual:



Danger: Immediate hazards that will result in severe personal injury or death.



Warning: Hazards or unsafe practices that could result in personal injury.



Caution: Hazards or unsafe practices that could result in product or property damages.



Important: Instructions that must be followed to ensure proper installation/operation of equipment.



Note: General statements to assist the reader.

Table of Contents

Section	Page
List of Figures	ii
List of Tables	ii
Introduction	1
General	1
References	1
Safety	1
Unit weights	1
Before Installing Vibrator	2
Installing Vibrator	3
Mounting vibrator onto structure	3
After Installing Vibrator	6
Troubleshooting	8
Monthly Maintenance	8
Part Numbers	9
Appendix. Cougar® THD Vibrators technical data	A-1

List of Figures

Figure	Title	Page
1	Locating Vibrator on Hoppers	3
2	Locating Vibrator on Truck Bed.....	3
3	Skip Weld	4
4	Cougar [®] THD Vibrator.....	10

List of Tables

Table	Title	Page
I	Shipping Weights of Cougar [®] THD Vibrators	1
II	Bolt Sizes and Torque.....	5
III	Cougar [®] THD Vibrator Part Numbers	11

Introduction

General

Cougar® THD Vibrators are equipped with motor-driven rotary eccentric weights that can be powered by a hydraulic or pneumatic motor, and deliver rotary vibration through a complete range of frequencies. The motor is attached to the separate head or case assembly containing the eccentric weights, bearings, and shaft. The motor shaft is inserted in the eccentric shaft and locked into place, which causes the eccentric weights to rotate with the motor shaft.

References

The following documents are referenced in this manual:

- *The National Electrical Code (NEC)*. National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy MA 02269-9101.
- American National Standards Institute (ANSI) z244.1-1982, *American National Standard for Personnel Protection - Lockout/Tagout of Energy Sources - Minimum Safety Requirements*, American National Standards Institute, Inc., 1430 Broadway, New York, NY 10018.
- Federal Register, Volume 54, Number 169, Part IV, 29 CFR Part 1910, *Control of Hazardous Energy Source (Lockout/Tagout); Final Rule*, Department of Labor, Occupational Safety Health Administration (OSHA), 32nd Floor, Room 3244, 230 South Dearborn Street, Chicago, IL 60604.

Safety

All safety rules in the above documents and all owner/employer safety rules must be strictly followed when working with this unit.

Unit weights

Table I. Shipping Weights of Cougar® THD Vibrators

Model No.	Weight lb (kg)
THD-1600	44 (20)
THD-2500	44 (20)

Before Installing Vibrator

IMPORTANT

The delivery service is responsible for damage occurring in transit. Martin Engineering CANNOT enter claims for damages. Contact your transportation agent for more information.

1. Inspect shipping container for damage. Report damage to delivery service immediately and fill out delivery service's claim form. Keep any damaged goods subject to examination.
2. Remove vibrator from shipping container.
3. If anything is missing or damaged, contact Martin Engineering or a representative.

⚠ WARNING

If equipment will be installed in an enclosed area, gas level or dust content must be tested before using a cutting torch or welding. Using a cutting torch or welding in an area with gas or dust may cause an explosion.

4. If using a cutting torch or welding, test atmosphere for gas level or dust content.
5. Make sure mounting surface is strong and flat, within 1/16 in. (2 mm) across vibrator feet. (This will prevent internal stress to vibrator casting when tightening mount bolts.)
6. Make sure mounting surface and vibrator are clean and free of debris.

IMPORTANT

Read entire section before beginning work. This manual provides instructions for installation onto steel bins and hoppers only. For other installations, call Martin Engineering or a representative.

CAUTION

If installation instructions are not followed, structure and vibrator can be damaged. Abusing or handling vibrator carelessly will accelerate wear and shorten bearing life.

Mounting vibrator onto structure

1. See Figure 1. Locate vibrator in lower 1/4 to 1/3 of structure slope length. If second vibrator is required, mount 180° from first vibrator and halfway up slope.

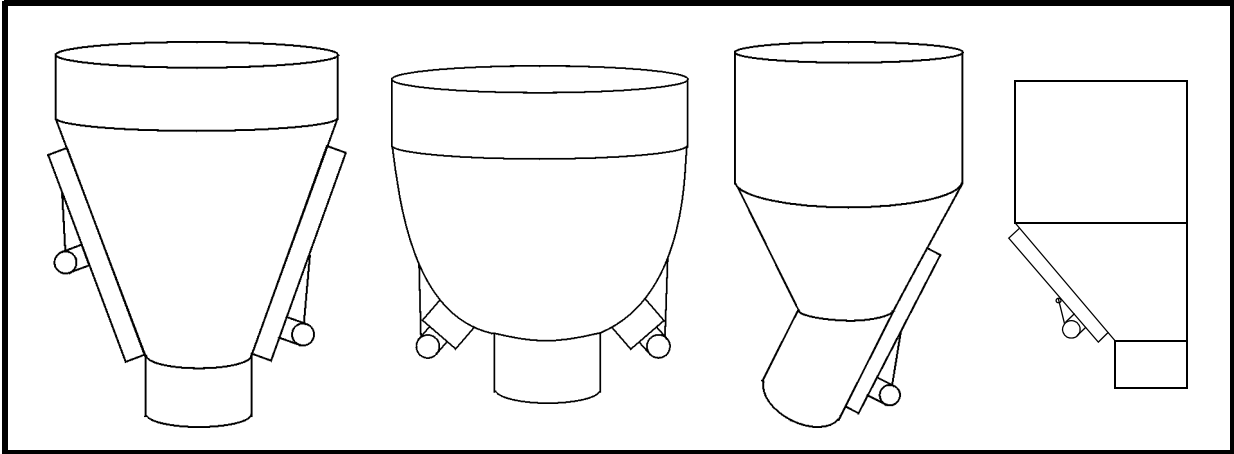


Figure 1. Locating Vibrator on Hoppers

2. For trucks, mount vibrator in center of front 1/3 of truck bed on 6 by 4-in. (152 by 102-mm) channel, or on rigid member of truck bed (see Figure 2). If two vibrators are required, mount 1/4 of width from each side in front 1/3 of truck bed.

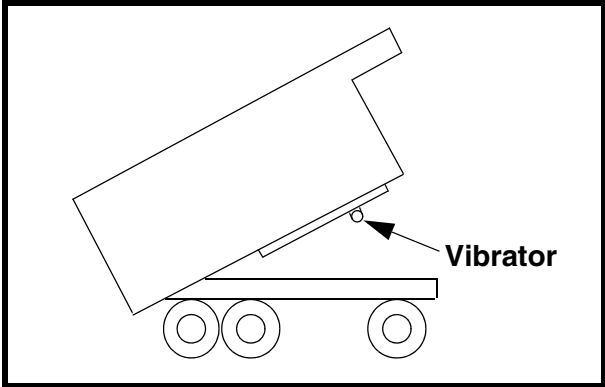


Figure 2. Locating Vibrator on Truck Bed

IMPORTANT

The object of rotary vibration on bins, hoppers, and chutes is to transmit vibration through the wall into the product contained inside. If structure is not made rigid, vibrator may draw high amperage or move material less efficiently.

3. If using reinforcing beam to strengthen hopper wall, do the following:
 - a. Locate reinforcing beam so vibrator can be positioned as shown in Figure 1 or 2.
 - b. Extend beam at least 3/4 the length of the sloped wall. Cut off end(s) of beam if necessary to fit on structure.
 - c. See Figure 3. Skip weld channel or beam onto hopper wall: Weld 3 in. (76 mm), then skip 2 in. (51 mm). Do not weld last 1 in. (25 mm) or either end of beam or any corner.

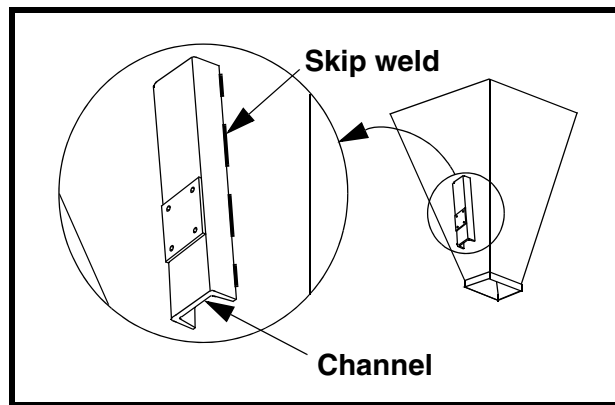


Figure 3. Skip Weld

4. If using customer-supplied mounting plate to mount vibrator onto structure, do the following:
 - a. Make sure plate is at least size of vibrator base.
 - b. Locate plate so that vibrator can be positioned as shown in Figure 1 or 2.
 - c. Weld mounting plate onto structure.

CAUTION

Never weld structure with vibrator mounted and wired. Welding may cause damage to motor components and bearings.

Use only new bolts, lock nuts, and compression washers to install vibrator. Old fasteners can break and cause damage to vibrator or structure.

Do not use split lock washers to install vibrator onto mount. Damage to vibrator could result.

5. Before installing vibrator onto mount, apply thread sealing compound to all bolts.

6. Install vibrator onto mounting plate with new Grade 5 lock nuts, compression washers, and bolts. See Table II for specific size and torque requirements. Use nuts and compression washers same size as bolts.
7. After vibrator has operated for 10 to 20 minutes, check bolt torque. Tighten if necessary.

Table II. Bolt Sizes and Torque

Bolt size	Bolt torque	
	ft-lb	kgm
1/2-in. - 13 NC	78 ft-lb	11
9/16-in. - 12 NC	114 ft-lb	16
5/8-in. - 11 NC	154 ft-lb	21
3/4-in. -10 NC	257 ft-lb	36
7/8-in. - 9 NC	382 ft-lb	53
1-in. - 8 NC	587 ft-lb	81

⚠ WARNING

If vibrator is mounted more than 6 in. (152 mm) above ground, install cable securing vibrator to structure. Without cable, vibrator could fall and cause injury.

8. Secure vibrator to structure by installing Martin® BBAC Cable Kit, P/N 32271, or equivalent, as follows:
 - a. Weld D-ring onto structure wall above vibrator.
 - b. Loop 1/4-in. (6 mm) wire cable around vibrator motor body and D-ring on structure wall.
 - c. Take up slack so cable is taut.
 - d. Apply thread sealing compound to nuts on cable clamps. Install four cable clamps (two on each) to secure cable to vibrator handle and D-ring. Torque cable clamps to 15-30 ft-lbs (2-4 kgm).
 - e. Trim loose ends of cable wire.

After Installing Vibrator

▲ WARNING

Hydraulic oil under pressure can penetrate skin and result in injection poisoning. Special medical treatment is required for fluid injection injuries. If oil penetrates skin, see a doctor trained in fluid injection medicine immediately.

NOTE

Make sure hydraulic system has a filtration system, and that oil is industrial petroleum-based oil, SAE 10 to 30, with wear, oxidation, and foaming inhibitors, and a viscosity of 200 SSU.

1. Make sure hydraulic hoses are secured to hydraulic pump.
2. Apply plastic sealing compound to all fittings.

▲ CAUTION

Avoid dropping disconnected hydraulic pump hoses where dirt or material can get in fittings.

Do not overtighten hydraulic hose fittings. If original position of fittings must be changed, end plate assembly, case, and motor assembly drive plate must be clamped together as a unit to prevent misalignment of plates. Misalignment of plates will cause motor damage. Contact Martin Engineering for further instructions.

Make sure inlet hose fitting is on inlet motor fitting, and outlet hose fitting is on outlet motor fitting. Motor seal failure will result if fittings are incorrectly installed.

Make sure inlet hose is same size as inlet motor fitting, and outlet hose is one size larger than outlet motor fitting and larger than inlet hose.

3. Place hydraulic hose fittings on back of vibrator motor. Place inlet hose fitting on inlet vibrator motor fitting, and outlet hose fitting on outlet vibrator motor fitting. Tighten fittings.

IMPORTANT

Do not place flow-control valve on return line from motor. Return line must be free of restrictions or vibrator will not run correctly and motor seal may be damaged.

4. To control vibrator speed, place a flow-control valve on pressure side of motor.
5. Make sure hydraulic oil temperature does not exceed 150°F (65°C). (If oil temperature is above 150°F [65°C], a larger reservoir or heat exchanger on hydraulic pump may be required to allow better cooling. Consult Martin Engineering for instructions.)
6. Start vibrator and operate using specifications in Appendix Table A-I as a guide.

⚠ CAUTION

Do not let inlet pressure exceed 2000 psi (137 bar). Seals will fail above 2000 psi (137 bar).

Remove pressure gauge after use. If pressure gauge is left on unit, gauge will be damaged.

- 7. Use a pressure gauge to check both inlet and outlet pressure at vibrator. If inlet pressure exceeds 2000 psi (137 bar) or outlet pressure exceeds 30 psi (2 bar), check for restrictive fittings or increase hose size. If fittings are not restricted, remove pressure gauge.

Troubleshooting

Symptom	Corrective action
Gallons-per-minute flow to vibrator is less than required (see Table A-I).	Outlet hose is too small. Make sure outlet hose is one size larger than outlet motor fitting.

Monthly Maintenance

WARNING

Hydraulic oil under pressure can penetrate skin and result in injection poisoning. Special medical treatment is required for fluid injection injuries. If oil penetrates skin, see a doctor trained in fluid injection medicine immediately.

1. Use cardboard to inspect hoses and fittings for leaks.
2. Inspect oil. If dark or thick, replace.

CAUTION

Do not overtighten hydraulic hose fittings. Damage to fittings and motor will result.

3. Make sure all fasteners are tight.
4. Inspect structure for cracks or fatigue. If found, repair before operating vibrator again.

Part Numbers

This section provides part numbers for Cougar® THD Vibrators and related equipment. Please reference part numbers when ordering parts.

Assembly Part Numbers

NOMENCLATURE

THD-XX XX YW XX

Vibrator Force Output ————┐
 Vibrator Mounting Pattern ———┐
 Mount Plate —————┘

VIBRATOR FORCE OUTPUT
25: 2500 lbs
16: 1600 lbs

VIBRATOR MOUNTING PATTERN
4M: Qty 4, 5/8 Bolts, 2.00" x 8.00" Rectangular Pattern
2V: Qty 2, 3/4 Bolts, 8.50" Between Center, In-Line Pattern

MOUNT PLATE
MO: Without Mount Plate
MS: Steel Mount Plate
MA: Aluminum Mount Plate

Mount Plates

	Vibrator Mounting Pattern	
	4M	2V
Steel Mount Plate	220526	220558
Aluminum Mount Plate	220582	220558-A

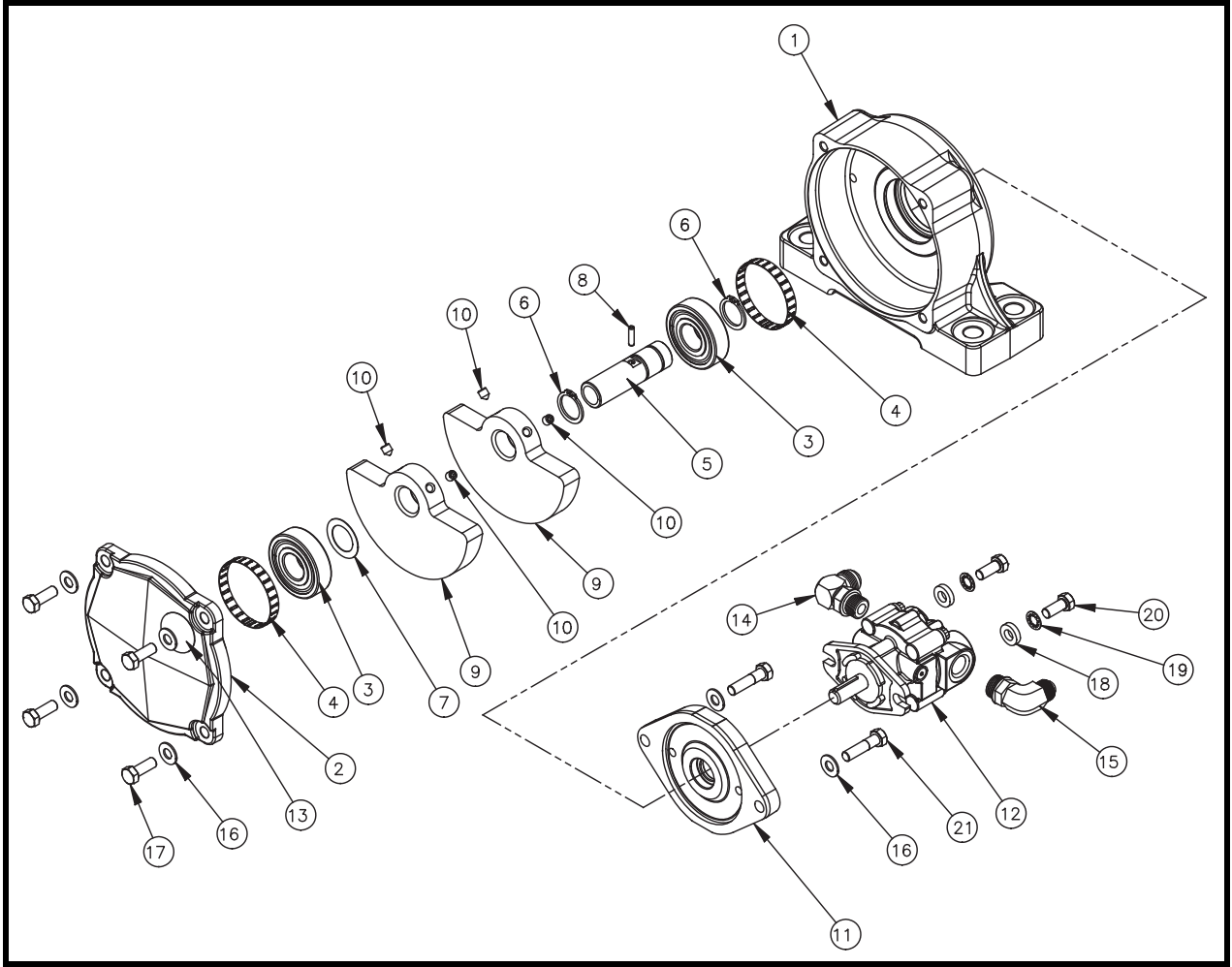


Figure 4. Cougar[®] THD Vibrator

Item	Description	Part Number	Qty
1	Housing Machined	Table III	1
2	End Bell Vibrator	120171	1
3	Bearing Ball 6305 2Z C3	CG-100104	2
4	Tolerance Ring O.D. 62.0 MM x 10 MM Wide 301 SS	140001	2
5	Shaft	155039	1
6	Retaining Ring Ext Heavy Duty 1.00 Dia. Shaft	530313	2
7	Spacer Bearing	CG-100285	1
8	Pin Slotted Spring 3/16 x 3/4 Plain	532406	1
9	Weight Eccentric	170711	2
10	Screw SHSS 5/16-18 x 3/8 CP	519898	4
11	Adapter Plate	120507	1
12	Hydraulic Motor	792010	1
13	Label	CG-100328-1	1
14	Fitting Elbow 3/4-16 to 7/8-14 37 Deg Flare	793002	1
15	Fitting 90 Degree Restricted Elbow	793011	1
16	Washer Compression 3/8 ZP	CG-517696	6
17	Screw HHC 3/8-16 x 1 GR5 ZP	500080	4
18	Washer Spacer .787 O.D. x .373 I.D. x .188	796951	2
19	Washer Lock Int Tooth 3/8 ZP	796902	2
20	Screw HHC 3/8-16 x 7/8 GR5 ZP	500079	2
21	Screw HHC 3/8-16 x 1-1/2 GR5 ZP	CG-500084	2

Figure 4. Cougar® THD Vibrator

Table III. Cougar® THD Vibrator Part Numbers

Assembly P/N	P/N Item 1
THD-16-2V-YW-MO THD-25-2V-YW-MO	110493
THD-16-4M-YW-MO THD-25-4M-YW-MO	110280

Appendix

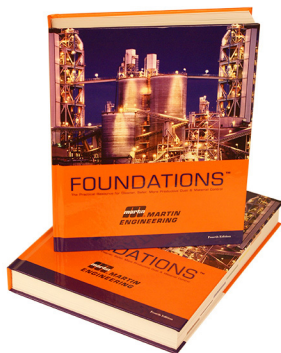
Cougar[®] THD Vibrator Technical Data

Table A-I. Cougar[®] THD Vibrator Specifications

Model	rpm	gpm (L/s)	Force lb (kg)
THD-1600	500	0.472 (0.0298)	22 (10)
	1000	0.944 (0.0596)	89 (40)
	1500	1.416 (0.0893)	200 (91)
	2000	1.887 (0.1190)	355 (161)
	2500	2.359 (0.1488)	555 (252)
	3000	2.831 (0.1786)	799 (362)
	3500	3.303 (0.2083)	1087 (493)
	4000	3.775 (0.2381)	1420 (644)
THD-2500	500	0.472 (0.0298)	43 (20)
	1000	0.944 (0.0596)	172 (78)
	1500	1.416 (0.0893)	387 (176)
	2000	1.887 (0.1190)	687 (312)
	2500	2.359 (0.1488)	1074 (487)
	3000	2.831 (0.1786)	1547 (702)
	3500	3.303 (0.2083)	2105 (955)
	4000	3.775 (0.2381)	2750 (1247)

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