

High-Frequency Banana Screen Assembly & Maintenance Manual

EA-HF Series — Models HF-1848, HF-2160, HF-2472 and HF-3072

Drawing No. EA-ENG-DRW-7834	Revision 2.4	Date 14 January 2026	Prepared By D. Waller — Head of Engineering	Checked By J. Patel — Senior Mechanical Engineer	Status ISSUED FOR USE
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1. EQUIPMENT OVERVIEW

The EA High-Frequency (HF) Banana Screen series is a multi-slope, high-frequency vibrating screen designed for fine wet screening, dewatering, and classification of mineral slurries. The curved (banana) deck profile creates a variable G-force along the screen length, improving stratification at the feed end and accelerating drainage at the discharge end. These units are used extensively in iron ore, gold, copper, and coal processing operations across Australia.

The HF series uses dual unbalanced vibrator motors (counter-rotating) to generate linear vibration at 1,500–1,800 RPM. Screening panels are EA polyurethane modular type (refer EA-ENG-DRW-4281 for panel specification) or rubber modular panels (EA-ENG-DRW-3301). Frame construction is fabricated from AS/NZS 3678-350 structural steel with full penetration welds and stress-relief heat treatment after fabrication.

& NOTE

IMPORTANT: The HF-1848 and HF-2160 models use 4-bolt motor mounting (M20 Grade 10.9). The HF-2472 and HF-3072 use 6-bolt mounting (M24 Grade 10.9). Do not interchange motor mounting hardware between model sizes — different dynamic load ratings apply.

2. MODEL SPECIFICATIONS

Parameter	HF-1848	HF-2160	HF-2472	HF-3072
Screen width (mm)	1,829 (6ft)	2,134 (7ft)	2,438 (8ft)	3,048 (10ft)
Screen length (mm)	4,877 (16ft)	6,096 (20ft)	7,315 (24ft)	7,315 (24ft)
Number of slopes	4	5	5	5
Slope angles (feed to discharge)	30° / 22° / 15° / 8°	35° / 25° / 18° / 12° / 6°	35° / 25° / 18° / 12° / 6°	35° / 25° / 18° / 12° / 6°
Vibration frequency (RPM)	1,500	1,500	1,800	1,800
Stroke amplitude (mm)	3.0–5.0	3.0–5.0	2.5–4.5	2.5–4.5
G-force (nominal)	4.5–7.5G	4.5–7.5G	5.0–8.0G	5.0–8.0G
Motor size (each, kW)	2 × 3.7	2 × 5.5	2 × 7.5	2 × 11.0
Total installed power (kW)	7.4	11.0	15.0	22.0
Operating weight (kg)	4,200	6,800	9,500	13,200
Max feed rate (t/h)	180	320	480	720
Panel size (standard)	305×305 PU	305×305 PU	305×305 PU	610×305 PU
Panel qty per deck	96	160	200	240
Bearing type (vibrator)	SKF 22320 EK	SKF 22322 EK	SKF 22326 EK	SKF 22330 EK

3. ASSEMBLY SEQUENCE

The following assembly sequence applies to new screen installation and major refurbishment requiring full deck strip. All steps must be completed in sequence. Do not advance to a subsequent step until the preceding step is completed and verified by the Lead Technician.

Stage 1: Frame Positioning & Levelling

- % Position screen frame on support structure per foundation drawing (EA-ENG-FDN-series, site-specific)
- % Level frame to within 2mm over full length and width using steel shim packs
- % Tighten hold-down bolts (M24 Grade 8.8) to 620 Nm (dry) — verify with calibrated torque wrench
- % Check diagonal measurements — maximum diagonal difference: 5mm
- % Weld shim packs in position after levelling is confirmed

Stage 2: Vibrator Motor Installation

- % Clean motor mounting pads with wire brush and solvent — remove all mill scale, paint, and contamination
- % Apply Molykote P-37 thread lubricant to all motor mounting bolt threads
- % Lower motor into position using correctly-rated lifting equipment — see motor nameplate for weight
- % HF-1848/2160: torque M20 bolts in cross pattern to 270 Nm (lubricated Grade 10.9)
- % HF-2472/3072: torque M24 bolts in cross pattern to 465 Nm (lubricated Grade 10.9)
- % Verify motor rotation direction per nameplate BEFORE first run (counter-rotation pair)
- % Rotation check: viewed from drive end — Motor A clockwise, Motor B anti-clockwise

Stage 3: Electrical Connection & Pre-Run Checks

- % Connect power supply per EA-ENG-ELEC-7834 wiring diagram — 415V 3-phase, star/delta start
- % Verify earthing continuity < 1 ohm (motor body to main earth)
- % Megger test: insulation resistance > 100 MΩ B S b D0
- % Confirm run capacitors installed (models with electronic variable speed — optional)
- % Jog motor A for 2 seconds, verify rotation. Jog motor B, verify counter-rotation

Stage 4: Screen Panel Installation

Install screen panels following the panel installation procedure EA-SOP-001 Section 7. Additional requirements specific to banana screens:

- % Start panel installation at discharge end (lowest slope, 6–8°) — work upward toward feed end
- % Critical: steeper slope sections (30–35°) require panels with anchor peg locking — confirm with order specification
- % Apply panel lubricant (water only on PU panels) to sub-deck cross members at each slope transition
- % Tension bolt torque for HF series: M16 × 135 Nm (lubricated) — check all bolts after first 2h of operation
- % Panel joint alignment at slope transitions: maximum 1mm step — use alignment bar tool EA-TOOL-023

Stage 5: First Start & Commissioning

- % Confirm all personnel clear — minimum 5m exclusion zone before start
- % Start at 50% speed (if VFD fitted) or direct-on-line for fixed speed units
- % Observe for: abnormal vibration, unusual noise, panel movement, loosening bolts — 5-minute check stop
- % Check motor current draw at nameplate speed — should be within ±10% of nameplate FLC
- % Allow to reach operating temperature (45°C motor surface) before taking amplitude reading
- % Verify stroke amplitude with a stroke meter at feed end, mid-deck, and discharge end
- % Target stroke at feed end: 4.5–5.0mm; discharge end: 3.0–3.5mm (feed end higher is correct)

4. PREVENTIVE MAINTENANCE SCHEDULE

The following maintenance schedule applies to all HF series screens operating in standard mining conditions ("d8 hours/day continuous, ambient >35°C). Duty operations (>16h/day or ambient >35°C) require intervals reduced by 40%. All maintenance must be performed with screen isolated and locked out per LOTO procedure.

Maintenance Task	HF-1848	HF-2160	HF-2472	HF-3072	Procedure Ref

Vibrator bearing grease (Mobilux EP2)

250h

250h

200h

200h

Motor bolt torque re-check

500h

500h

500h

500h

Panel inspection & replacement

250h

250h

200h

200h

Tension bolt re-torque (all panels)

500h

500h

400h

400h

Vibration amplitude check

250h

250h

200h

200h

Side plate wear liner check

1,000h

1,000h

750h

750h

Structural weld inspection (visual)

2,500h

2,500h

2,000h

2,000h

AS 3992

Structural weld inspection (NDT)

10,000h

10,000h

8,000h

8,000h

Bearing replacement — vibrator

8,000h

8,000h

6,000h

6,000h

Motor rewind / replace assessment

20,000h

20,000h

16,000h

16,000h

5. BEARING SPECIFICATION & LUBRICATION

5.1 Vibrator Bearing Specifications

The vibrator shaft bearings are the highest-stress components in the HF screen and the primary driver of unplanned downtime. Correct bearing selection, installation, and lubrication are critical to achieving target service life. Only bearings specified below or approved direct equivalents may be used:

Model	Bearing Designation	Bore (mm)	OD (mm)	Width (mm)	Dynamic Load (kN)	EA Part No.
HF-1848	SKF 22320 EK/C3	100	215	73	520	EA-BRG-22320
HF-2160	SKF 22322 EK/C3	110	240	80	665	EA-BRG-22322
HF-2472	SKF 22326 EK/C3	130	280	93	915	EA-BRG-22326
HF-3072	SKF 22330 EK/C3	150	320	108	1,120	EA-BRG-22330

5.2 Grease Specification

Approved greases for HF series vibrator bearings. Only the following greases are approved — do not mix grease types without purging the housing first. Mixing incompatible thickeners will cause premature bearing failure.

Grease	Grade	NLGI	Base Oil Viscosity	Temp Range	Application
Mobil Mobilux EP2	Primary approved	NLGI 2	110 cSt @ 40°C	-20°C to +120°C	Standard ambient conditions
Shell Alvania EP2	Approved alternative	NLGI 2	105 cSt @ 40°C	-20°C to +120°C	Standard ambient conditions
Kluber Staburags NBU8EP	High-temp approved	NLGI 2	170 cSt @ 40°C	-30°C to +140°C	Ambient > 35°C; no freezing
Molykote G-0052	NOT approved	—	—	—	Not compatible with bearings

Grease quantity per re-lubrication point: 15g (HF-1848/2160), 22g (HF-2472), 30g (HF-3072). Over-greasing is a primary cause of bearing overheating — do not exceed quantities. Use a calibrated grease gun with counter to ensure correct quantity.

6. FAULT DIAGNOSIS & CORRECTIVE ACTIONS

Symptom	Probable Cause	Investigation Steps	Corrective Action
Excessive vibration / shaking	Unbalanced counter-weights or broken eccentric weight bolts	Check both motors — verify eccentric weight bolts tight	Retorque or replace broken eccentric weights. Verify balance.
High motor temperature (>80°C)	Grease over-pack; wrong grease; overload	Check amperage draw; measure bearing temp; inspect grease type	Purge excess grease; verify correct grease; check feed rate vs. specification.
Abnormal bearing noise (rumble/squeal)	Bearing wear or contamination	Vibration analysis (EA-TOOL-039); check grease condition	Replace bearing if vibration signature shows wear. Do not reuse.
Screen blinding (panels clogging)	Wrong aperture size; feed moisture; G-force low	Check feed PSD vs. aperture size; check stroke amplitude	Review aperture selection; increase amplitude if within spec.
Low screening efficiency / poor cut	Insufficient G-force; worn panels; overloaded	Check stroke and frequency; inspect panel apertures for wear	Re-tune eccentric weight angle; replace worn panels; reduce feed rate.
Structural cracks — side plates	Fatigue from loose motor bolts or misalignment	Inspect all welds and mounting bolts	Stop immediately. Weld repair by certified welder to AS 3992. Engineering sign-off before restart.

7. SPARE PARTS — CRITICAL STOCK RECOMMENDATIONS

The following spare parts should be held on-site for screens in continuous production service. Lead times shown are ex-EA warehouse; emergency freight may reduce but is not guaranteed.

Part Description	EA Part No.	Qty (Min Stock)	Lead Time	Notes
Vibrator bearing (model-specific)	EA-BRG-22XXX	2 per screen	3–5 days	Match to model — do not substitute.

PU screen panels 305x305 PU-500

EA-PU-305-500

24 per screen

5–10 days

One full row minimum

PU screen panels 610x305 PU-500

EA-PU-610-500

12 per screen

5–10 days

HF-3072 only

Tension bolts M16x80 G10.9

EA-BOLT-M16-80

50 per screen

2 days

Replace at each panel change

Side tensioner bars (full set)

EA-TENS-HF-XXX

1 set per screen

7–14 days

Eccentric counter-weights (matched pair)

EA-ECW-HF-XXX

1 pair per screen

7–14 days

Must be replaced as matched pair

Motor seals (shaft seal kit)

EA-SEAL-HF-XXX

1 kit per motor

3–5 days

Replace at bearing change

Side plate wear liners (full set)

EA-LINER-HF-XXX

1 set per screen

14–21 days

PU, 20mm, full-width set

I9 NOTE

Emergency spare parts availability: EA maintains a critical parts pool at Dandenong South for contracted maintenance customers. Contact parts@elastomers.com.au or +61 3 9XXX XXXX (24/7 emergency line). Emergency freight available to all Australian mining sites — surcharge applies.

8. TORQUE REFERENCE — QUICK CARD

For field reference. All torque values are for lubricated fasteners (Molykote P-37 or equivalent) unless marked DRY. Always use a calibrated torque wrench — do not estimate.

Fastener / Location	Size	Grade	Torque (Lubricated)	Re-torque Interval
Motor mounting bolts — HF-1848/2160	M20	10.9	370 Nm	500h
Motor mounting bolts — HF-2472/3072	M24	10.9	465 Nm	500h
Hold-down / foundation bolts	M24	8.8	465 Nm (DRY: 620 Nm)	Annual
Screen panel tension bolts	M16	8.8	135 Nm	8h (first run), then 500h
Eccentric weight retaining bolts	M16	10.9	190 Nm	250h
Vibrator shaft lock nut	M90x2 (HF-1848/2160)	—	300 Nm (spanner)	At bearing change
Vibrator shaft lock nut	M110x2 (HF-2472/3072)	—	500 Nm (spanner)	At bearing change
Lifting lug bolts	M30	8.8	1,050 Nm (DRY)	Before each lift

!9 NOTE

All torque values must be re-verified after first 8 hours of operation on any screen that has had motor or panel work performed. Thermal cycling during first run will cause initial bolt relaxation — this is normal and does not indicate a fastener defect.

9. REVISION HISTORY

Rev	Date	Change Summary	Author
2.4	Jan 2026	Added HF-3072 model; updated bearing grease qty for HF-2472/3072; fault diagnosis table expanded	D. Waller
2.3	Aug 2025	Motor bolt torque correction for HF-2472/3072 (was 490 Nm, corrected to 465 Nm lubricated)	J. Patel
2.2	Mar 2025	Grease re-lubrication intervals reduced for HF-2472/3072 — field data from Fortescue site	D. Waller
2.1	Nov 2024	Banana screen slope angle data added; commissioning section expanded	J. Patel
2.0	Jun 2024	Full rewrite — new format, integrated HF-2472 model	D. Waller

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