OPERATOR'S MANUAL

Metrix Type Poker
Operator's Manual

FAIRPORT

CONSTRUCTION EQUIPMENT LTD

Blagden Street
Sheffield
S2 5QS
England
Tel: +44 (0) 114 276 7921
Fax: +44 (0) 114 272 0965
Email: sales@fairport.uk.com
Website: www.fairport.uk.com

Unit 32,
The Bell Centre,
Newton Road,
Manor Royal,
Crawley,
West Sussex,
RH10 9FZ
Tell +44 (0) 1293 534742
Fax +44 (0) 1293 529056

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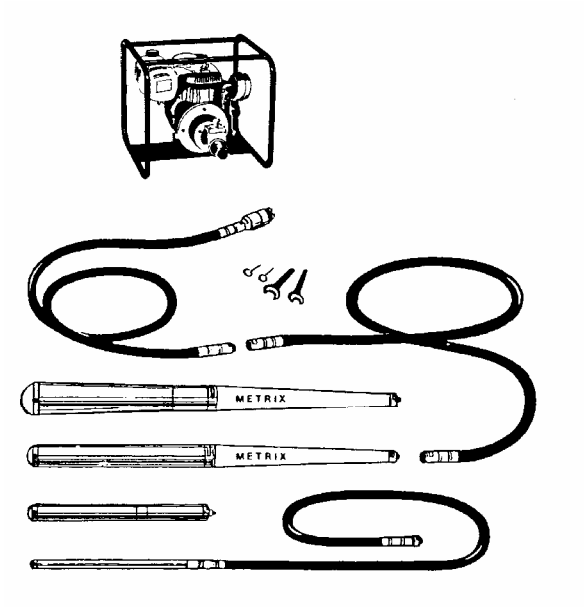
1. INTRODUCTION

The Metrix range of internal concrete vibrators (pokers) is petrol engine or electric motor powered and drive is transmitted to the vibrating head using a flexible shaft. The Metrix system has four main components:

a) A vibrating poker head
b) A flexible drive shaft
c) A quick action coupling
d) A drive unit.



Each of these components can be disconnected easily and quickly from its mating component on site either by hand, coupling/drive unit, or with spanners and tommy bars.

Four models of poker head are available, 281, 385, 501 and 651. The first two numbers of the model designation indicates the poker diameter in millimetres.

The flexible drive shafts are produced in standard lengths of 3 metres, 5 metres and 6 metres. The flexible shaft for the 281 poker is 28mm diameter and 32mm diameter for the larger pokers. The versatility of the Metrix system allows 32mm diameter flexible shafts to be connected together to increase overall lengths and also allows 32mm diameter flexible shafts to be connected to a 28mm diameter shaft. Special lengths can made up to suit individual requirements.

Couplings are available that will screw on to the Metrix flexible drive and plug in to alternative makes of drive unit. The alternatives that are available are shown on the parts list in this manual.

This manual is concerned with the safe use and routine maintenance of this equipment. It is recommended that poker heads-requiring repair be returned to one of the Fairport depots at either Sheffield or Crawley.

A service manual and special service tools are available from Fairport for customers wishing to carry out their own repairs. Instruction courses are available to customers' personnel at Sheffield – please contact the head office at Sheffield for further details.

2. TECHNICAL DATA

Drive Units, Square type - Petrol/Diesel

Engine Make/Type	Length mm	Width mm	Height mm	Weight kg	Net BHP @2800rpm	LwA dB (A)
Honda GX160						
W/o clutch	455	460	470	25	4.0	98
With clutch	465	460	470	27	4.0	98
Yanmar L40						
W/o clutch	460	460	470	41	3.4	96
With clutch	509	460	470	43	3.4	96
Petter AC1, rope start						
W/o clutch	635	416	530	70	5.2	102
With clutch	653	416	530	72	5.2	102

LwA levels based on engine manufacturers' data.

Drive Units - Electric

	EMD	ESD
Electrical data	0.75kw, 115/230v, 12.6/6.3A, 1ph	1.5kW,various voltages, see motor plate
Length:	365mm	360mm
Width:	245mm	360mm
Height:	315mm	350mm
Weight:	17kg	23kg
LWA:	less than 85dB(A)	less than 85dB(A)

Poker Sound Levels dB (A)	281	385	501	651
In concrete:				
Operator position LpA:	73.8	78.2	84.6	81.0
Power level LwA:	88.0	92.2	100.4	91.4
In air:				
Operator position LpA:	86.3	86.6	91.4	88.5
Power Level LwA:	96.4	99.0	105.6	102.1

Hand/arm vibration levels, m/sec2 maximum axis:

In concrete:	2.0	5.0	3.2	3.5
In air:	2.0	5.0	4.0	3.5

Sound levels tested according to ISO 5349
Vibration levels tested according to ISO 3746

3. SAFETY

Never run petrol or diesel engines in trenches or confined spaces.

Never attempt to carry out maintenance with engine or motor running.

Never top up fuel tank whilst engine is running; don't smoke; wipe up spilt fuel.

Dispose of fuel contaminated wipes safely.

Always turn off fuel after use.

Always isolate electric motors after use.

Always use residual current devices with electric motors.

Always wear suitable protective clothing, i.e. safety helmet, footwear, ear defenders and gloves.

Ensure guards are always fixed in position when engines/motors are running.

Always comply with site safety regulations.

Do not attempt to carry out repairs to electric drive units unless you are a competent electrician.

3.1 FLEXIBLE CASING - COSHH REGULATIONS

This data sheet provides the information required on Section 6 of the Health and Safety at Works Act 1974 as amended by Schedule 3 of the consumer Protection Act 1987.

3.1.1 Data Sheet On Flexible Casing

The Polymeric compounds used on hose may contain materials that can migrate to the surface from whence they could be transferred to the skin during handling. This may cause skin irritation to persons who frequently handle hose. Persons who have to handle the hose frequently are advised to follow good hygienic practices e.g. wear gloves whenever practicable, use barriers cream and wash hands after work before eating, drinking or smoking.

FIRE

With a few exceptions the polymeric materials used by Dunlop Hose Limited are not

easy to ignite in bulk. However when exposed to flame or to serious overheating they will decompose liberating noxious or toxic smoke or fumes. Fire precautions should recognise the hazards that may arise from indirect involvement in a fire as well as the inherent fire risk of the individual products.
Specialised advice on fire precautions is available from local Fire Authorities and from Health & Safety Executive.

STORAGE

Hose may deteriorate in appearance and physical properties during storage particularly if adverse storage conditions apply. BS3574 details the most suitable conditions for storage. In summary, hose should be stored in an unstressed darkened condition below 25° C and protected from moisture and air circulation. Exposure to atmosphere containing high concentration of ozone (eg. near discharge for electric motors) is to be particularly avoided. Hose should be stored away from direct heat and contact with strong oxidising agents should be avoided.

WASTE DISPOSAL

Hose should be disposed of by normal waste disposal procedures. Where incineration is used the incinerator must be specifically designed to give complete combustion of the gases and fumes produced.

3.2 PICTOGRAMS USED ON THIS EQUIPMENT

Wear Gloves

Wear ear protectors

Read the manual before using this equipment

4. COMMISSIONING AND OPERATING INSTRUCTIONS

The machine as delivered will generally be in two main assemblies:

a) The drive unit

b) The poker head complete with flexible shaft drive and coupling.

To assemble the flexible poker drive to the power unit, raise the latch knob on the coupling housing on the engine and insert the coupling attached to the end of the flexible drive. On releasing the knob the plunger should locate itself in the groove in the plug-in connector. When connecting to a petrol or diesel engine it may be necessary to rotate the engine crankshaft by means of the rope or handle starter at the same time applying pressure to the coupling in order to obtain engagement. Check the engagement by pulling on the coupling after releasing the latch knob. The coupling must never be inserted into or removed from the housing with the engine or electric motor running except in the case of engines fitted with centrifugal clutches, in which case the coupling may be inserted or removed with the engine ticking over.

If the vibrating head or the coupling is disconnected from the flexible shaft at any time, be sure to protect all exposed ends from possible damage or entry of foreign matter.

When transporting flexible poker shaft assemblies, it is essential that they be never coiled too tightly, likewise acute bends should be avoided when operating on site. The recommended method of storing these flexible shafts is on timber racks so that the shaft is kept straight and supported throughout its full length.

4.1 POKER DRIVE UNIT - PETROL OR DIESEL

Carefully read the engine manufacturer's instruction book before starting.

Check oil level.

Turn fuel tap on.

Put speed control lever to tick-over.

If engine is cold, close the choke (petrol engines only).

Turn engine switch to ON (1) position.

Pull the starter rope toggle lightly until resistance is felt, then pull briskly using quick short pull. Do not pull rope to its full extent or allow toggle to snap back against engine. Return it gently to avoid damage.

When engine is warm open choke.

Position engine speed control lever to give required engine speed (usually full speed, but see note below).

To stop engine, position the engine speed control to slow and turn the engine switch to off (0).

Turn the fuel valve to off.

NOTE: The governors of petrol and diesel engine drive units have been set at 2,750/2,850 rpm maximum. It is essential that the engine speed is not increased over 3,000 rpm as this will induce stress which may result in the failure of the poker head or flexible shaft and therefore invalidate any warranty. CHECK ENGINE SPEED.

4.2 POKER DRIVE UNIT - ELECTRIC

The electric motor supplied is a totally enclosed, fan-cooled type, operating at a continuous rated speed of 2,850 rpm. Check that the voltage, number of phases and frequency requirements of the motor being used are compatible with the supply.

When making electric connections, it is essential that the output shaft runs in an anti-clockwise direction when viewing the drive claw through the open end of the housing.

Always use a cable of sufficient cross section to avoid excessive voltage drop. This is the major cause of electrical problems and motor overloading with 110v supplies. If in doubt consult a qualified electrician.

4.3 STARTING THE VIBRATING POKER

With the coupling correctly inserted into the housing start the engine or switch on the electric motor. During cold weather it is advisable to run petrol or diesel engines for a few minutes before connecting the flexible drive unless the engines are fitted with a centrifugal clutch.

To start the poker head vibrating tap the nose cap on a hard surface. Avoid tapping the body of the poker head as this could cause damage as the housing is not manufactured from heat treated (hardened) steel.

4.4 USER HINTS AND INSTRUCTIONS

Use the largest poker that the job and reinforcement will allow.

Move the poker frequently. A little and often over an area is better than holding it in one place for a long time.

Make sure the whole area is covered.

Withdraw the poker slowly to ensure the hole is closed with adequately vibrated concrete.

When using a poker with timber formwork make sure the poker does not damage the formwork. Consider using a poker with a polyurethane nose cap – contact Fairport or your dealer.

When vibrating a layer of concrete, which has been poured onto a previously vibrated layer, ensure the poker penetrates the previous layer by about 100mm.

Do not try to vibrate concrete in layers greater than 300mm to 400mm.

Try to immerse the whole of the poker head in the concrete to provide some cooling.

Do not leave the poker running when it is not in concrete. This will prevent overheating of the bearings.

Avoid tight bends in the flexible drive shaft. Tight bends cause rapid wear of the flexible core.

Check on a regular basis (weekly) that all joints on the flexible drive are tight.

Do not allow the coupling end of the flexible drive to lay in wet conditions on the ground, as the entry of water to the bearings will cause rusting.

Do not stop the vibration whilst the poker is still in the concrete. It may prove difficult to remove and it will leave a void.

5. ROUTINE ATTENTION

5.1 CLEANING THE POKER VIBRATOR UNIT

Time on regular maintenance is well spent, as it prolongs the life of the machine between regular overhauls. Therefore, a few minutes each day removing excessive cement deposits from the poker head, flexible drive and power unit will ensure satisfactory operation.

5.2 POKER DRIVE UNIT

When using a petrol or diesel engine as the prime mover, it is essential that the oil level in the crankcase is checked daily and replenished if necessary with the correct grade.

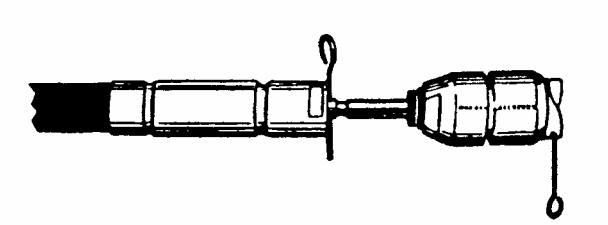
Cleanliness of both the lubricating oil and fuel cannot be over stressed. Therefore, use clean measures and containers and always observe recommended safety procedure.

5.3 FLEXIBLE POKER SHAFT

In order to minimise damage to the flexible shaft drive, avoid acute bends, especially where the flexible drive passes over the edge of trenches, shuttering etc.

5.4 REMOVING A PLUG-IN COUPLING

Fit a spanner to the flats on the end of the flexible drive and a spanner to the flats on the coupling body and unscrew the coupling from the flexible drive (left hand thread). Suitable spanners, part no. W81692, are available from Fairport Construction Equipment Ltd.

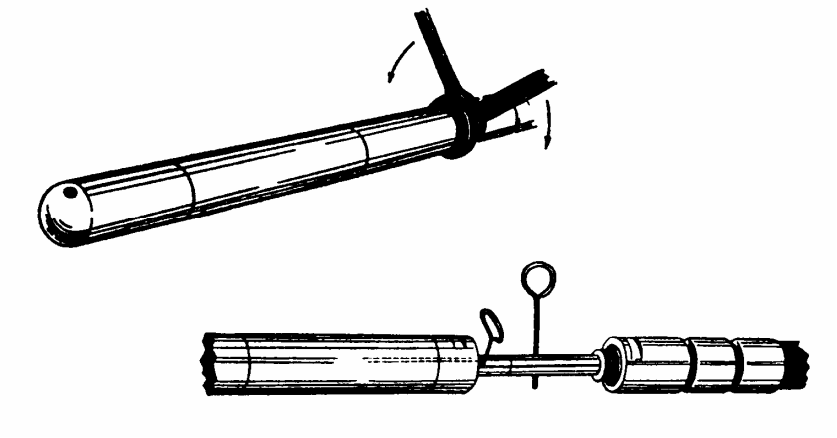


Pull the coupling away from the end of the flexible drive exposing the tommy bar hole in the connector on the end of the inner core. Place a tommy bar through this hole and also insert a tommy bar into the hole on the side of the drive claw of the coupling and unscrew (right hand thread) the coupling from the core. If the coupling is being replaced leave the tommy bar in the hole in the core connector. Replacement of the coupling is the reverse of this procedure. Suitable tommy bars, part no. W81691, are available from Fairport Construction Equipment Ltd.

Replacement is the reverse of the above procedure, but it is worth renewing the ‘O’ ring

5.5 REMOVING A POKER HEAD

Fit a spanner to the flats on the end of the flexible drive and a spanner to the flats on the poker head and unscrew the poker head from the flexible drive (left hand thread). Suitable spanners, part no. W81692, are available from Fairport Construction Equipment Ltd.



Pull the poker head away from the end of the flexible drive exposing the tommy bar hole in the connector on the end of the inner core. Place a tommy bar through this hole and also insert a tommy bar into the hole on the poker head drive connector. Unscrew the poker head connector from the core connector (right hand thread). If the poker head is being replaced leave the tommy bar in the hole in the core connector. Replacement of the poker head is the reverse of this procedure. Suitable tommy bars, part no. W81691, are available from Fairport Construction Equipment Ltd.

Replacement is the reverse of the above procedure, but it is worth renewing the 'O' ring

5.6 REMOVING AND REGREASING A FLEXIBLE SHAFT

The flexible drive shaft should be dismantled and re-charged with grease every 500 working hours. As it is extremely difficult to keep accurate records, it is suggested that the flexible shaft be overhauled at six monthly intervals. This will ensure trouble free operation.

Do not attempt to carry out the lubrication of the flexible shaft drive under site conditions; this should always be carried out in a maintenance workshop.

Remove the coupling and poker head as described above.

Remove and c0lean the flexible steel inner core and core connectors thoroughly with grease solvent.

Clean ends of outer casing with a cloth.

After thoroughly cleaning the complete flexible drive shaft, inspect the inner core for any excessive wear due to rubbing action between the core and outer casing spiral reinforcement; also for damaged and broken outer layer wires. If there is a permanent bend in the outer casing we advise fitting a replacement, as this is liable to cause damage to the inner core.

Regrease the first 12" - 18" (30 - 40cm) of the inner core with Castrol BM2 grease or equivalent moly-graphite grease. Insert the greased inner core into the casing ensuring it is the correct way round. Continue greasing the inner core and at the same time insert it into the casing. Continue until the whole length of inner core has been greased. Also grease thoroughly the sliding connector.

As the inner core is pushed through the outer casing, some of the grease will naturally adhere to the inner walls of the casing. To ensure adequate lubrication, it is advisable to draw out the core for approximately 6ft (2 metres) from the other end, regrease as the core is inserted back into the casing.

It is essential during the regreasing operation to keep dirt and grit away from the component parts.

When reassembling shaft, head and coupling always renew the ‘O’ rings.

6. WARRANTY CONDITIONS AND CLAIMS PROCEDURE

All products supplied by Fairport Construction Equipment Ltd (hereafter referred to as FCE) are warranted to be free of defects due to faulty materials or workmanship for a period of 12 months from the date of original despatch from FCE or as specified below:

Hydraulic hoses and hydraulic couplings – 3 months.
Hydraulic accumulators – 6 months.
Flexible drives – 6 months.
All spare parts used in repairs carried out by FCE or an authorised dealer or repairer – 3 months.

If the goods have been purchased through a stockist the above warranty periods also apply from receipt of the goods by the user of the equipment up to a total of a further 6 months from date of despatch from FCE whichever is earlier.

Filter elements, gauges and oils are specifically excluded from this warranty.

FCE shall at their option repair or replace during normal working hours goods accepted as faulty free of charge to the user.

For proprietary items such as engines, the original manufacturer’s warranty and conditions shall apply.

6.1 CONDITIONS

The goods shall be returned at the purchaser’s expense to FCE or to a destination FCE may reasonably direct. Carriage costs will be refunded if warranty is accepted.

Warranty claims will not be considered where there is evidence that failure has been caused by carelessness, improper use, negligence, inadequate servicing, incorrect engine speeds, fair wear and tear or non-compliance with instructions issued by the manufacturer.

To the extent permitted by law, the liability of FCE under this section is confined only to providing a remedy for defective goods and does not extend to any consequential loss, loss of profit, injury or damage suffered.

Warranty will not be accepted on dismantled goods unless dismantling was carried out with the written permission of FCE.

No claim shall be considered if other than genuine parts supplied by FCE have been used.

Products are only covered by this warranty in the country to where they were supplied by FCE.

Warranty on products applies only to the original user of the equipment.

This warranty shall not apply if the serial number or other identifying numbers or marks applied by FCE have been removed, defaced or are otherwise illegible.

6.2 CLAIMS PROCEDURE

Check that the goods are still under warranty before returning them to FCE (see above for warranty periods).

Return the goods to FCE with an order number for the work to proceed. If warranty is accepted no charge will be made. If warranty is not accepted a quotation will be given for the repair and the conditions under the section headed REPAIRS AND ESTIMATES will apply.

In the customer's interest, goods must be accompanied by documentation detailing the nature of the fault or its symptoms. Phrases such as 'Faulty' are unacceptable and will result in delays and possible charges to defray costs incurred in identifying the fault.

In the case of hydraulic breakers and power packs, both the breaker and the pack should be returned

7. REPAIRS AND ESTIMATES

When returning a machine, or an assembly for repair, always include an Advice Note quoting model and serial number of the machine.

An official order must also be forwarded to FCE giving detailed instructions. No repair work can be carried out unless covered by an official order.

An estimate will be submitted before proceeding with any repair. To partly cover the cost in dismantling, cleaning and inspection, a small charge will be made, this however will be waived upon receipt of your official instructions to proceed with the repair.

In the event of the estimate not being accepted, a further charge will be made to defray the rebuilding of the machine.

Estimates must be treated as approximate only as it may be found necessary to use additional parts on further examination.

8. PARTS LIST

This parts list is limited to giving part numbers for complete poker heads, flexible drives and their component parts and complete couplings. A separate manual is available from Fairport Construction Equipment Ltd giving full details on servicing and maintenance procedures on poker heads, couplings and flexible drives and includes full details on spare parts complete with parts diagrams.

Description	Part No.
281 poker head	W92106
385 poker head	W92013
501 poker head c/w sleeve	W92019
651 poker head c/w sleeve	W92031
3metre flexible drive for 281 poker	W92111
Outer case for above	W92110
Inner core for above	W92081
5metre flexible shaft for 281 poker	W92287
Outer case for above	W92288
Inner core for above	W92289
6 meter flexible drive for 281 poker	W92492
Outer case for above	W92515
Inner core complete	W92516
3meter flexible drive for 501, 385, 651 pokers	W92040
Outer case for above	W92041
Inner core for above	W92042
5metre flexible shaft for 501, 385. 651 pokers	W92287
Outer case for above	W92288
Inner flex for above	W92289
6 meter flexible drive for 501,385, 651 pokers	W92215
Outer case for above	W92515
Inner core for above	W92516
Couplings:	
Metrix	W92050
CEL	W92051
Winget	W92051
Dynapac	W92051
Wacker	W92051
Warsop	W92283
Fyne	W92054
CEL sq. drive	W92518
‘O’ ring for couplings and 385, 501 and 651 flexible shafts	W81107
‘O’ ring for 281 flexible shafts	W81100