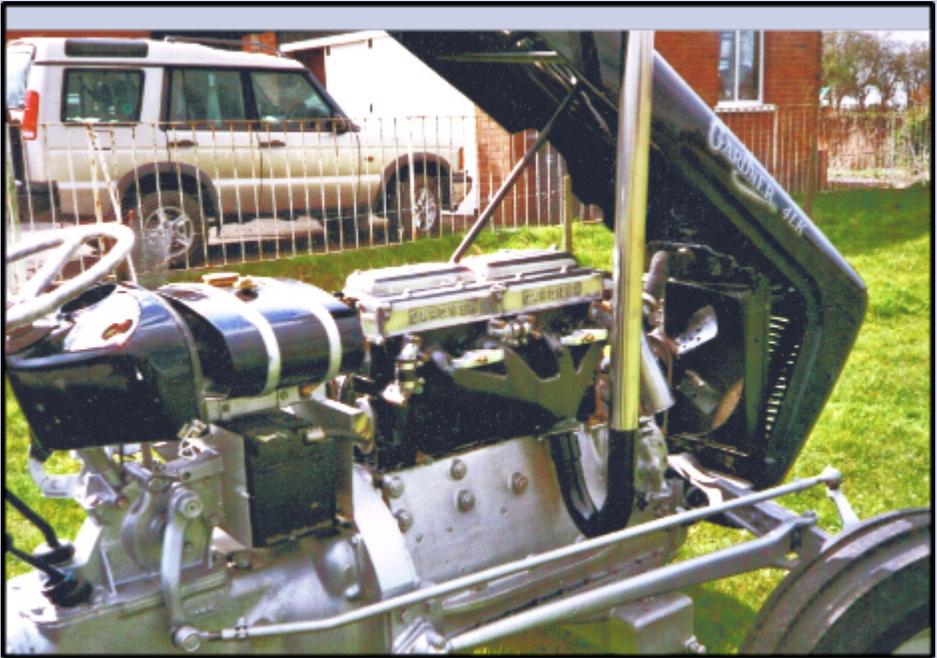


GARDNER

Engine Forum



Spring 2023

No. 43

www.gardnerengineforum.co.uk



*Engine
Forum*

Membership

Application

Title	Mr / Mrs / Miss / Dr / Other		
Forename(s)			
Surname			
Address			
		Post Code	
Telephone No	Ex-Directory	Yes/No	
Mobile Telephone Number			
Email Address *			
Engine Model			
Engine Serial No			
Engine Date			
Engine Application	Stationary	Road	Marine
Name of vehicle / vessel			
Any other information			
Signed		Dated	
Periodically we produce a membership list and circulate to members. The list comprises of the membership number, name and address only. To be included in the list and therefore receive a copy please indicate your preference.			
Yes please include me <input type="checkbox"/> No Thank You <input type="checkbox"/>			
* To keep the cost of running the forum as low as possible we use email communication for the notification of renewal and confirmation of membership where possible. If supplied the email address will not be passed on to any third party and will only be used for communicating matters relating the the Forum.			
Membership details are maintained on a computer database accessible to authorised committee members only.			
Membership fee £10.00 per annum (UK) renewable on the anniversary of joining.			
Payable by cheque, standing order mandate or electronic fund transfer.			
Cheque's to be made out to Gardner Engine Forum.			
For standing orders please complete the form below.download the compltte form from the website			
For electronic funds transfer please tick the box, <input type="checkbox"/> we will contact you with the banking details			
Send the completed form to			
Mrs J M Gray - Treasurer.Gardner Engine Forum 29 Verity Walk, Wordsley, Stourbridge, DY8 4XS			
Email:- gardnerengineforum@blueyonder.co.uk			

Gardner Engine Forum Philosophy

The aims of the Forum are to promote and foster interest in all Gardner engines”

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Advertising Rates:
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Cover Photo
By David Reed

4LK Tractor Conversion

Chairmans Notes

Welcome to your early Spring Newsletter, the main reason is to tell you more about the proposed rally in August, which I hope will be well attended. It is now coming up to five years since the last rally was held.

Further to the AGM, which I think was a great success, many thanks to the people who had the idea for the venue and who organised it. It was good to have a great turnout, AGM's are not everyone's cup of Darjeeling!

As you will note, we have a new committee member Mr. Neil Ecclestone, welcome aboard Neil. A big thank you to Pat and Simon Roberts for all your help over the years and have now retired from the committee.

I am often asked by Gardner enthusiasts who know of my experience of going around the different departments of the works, which one was the most important. After some thought I have often answered "the inspection department", as you will be well aware of the high standards of the engines, this in many ways was down to the high standards of inspection. I spent some time in the inspection department and got to know Mr. James Smith, "JY" to us all, he was chief inspector, finally ending up as production inspector in 1975. He joined LG&S in 1937, at the time the recession had not released it's grip on industry and jobs in engineering were hard to find. A native of Nant-y-mole, South Wales. He spent a year at Swansea University studying engineering, but job prospects were so bad he decided to take up the chance of a job offer before he finished his course. He started work on the shop floor working drop forge machines until 1943. As an engineer he was in a reserved occupation during the war and saw no actual service. JY was a charge hand foreman during the years when the factory turned out engines, tank parts and radar generator sets for the war effort.

In the 1950's he became chief of planning and rate fixing, His responsibilities including the positioning of plant and machinery and also the fixing of piece work rates. All of his 45 years at LG&S were spent in close contact with the shop floor and he prided himself with his special relationship with the workforce.

I kept in touch with JY after I had moved on from LG&S and remember after his retirement in 1982 he embarked on a light engineering course at Openshaw Technical College making grandfather clocks. Later in life I met up with one of his sons, Paul, who sadly is no longer with us. He was a member of the Forum and owned a very nice large Jaguar that was fitted with a 4LK. I was fortunate to have some trips in it.

Member Howard Evans has prepared a very good presentation on LG&S for the Institution of Engineering and Technology and it can be found on Youtube. At:-<https://youtu.be/lqCiXzODFI> or search "Gardner Diesel Engines Tue Oct 04 2022 - Howard Evans" I hope you have all managed to keep warm and look forward to seeing you in August

A warm welcome to new members, Philip Gameson, Andrew John Denman, Michael Buckley, William Pierce.

.John Naylor

2023 Rally

Following the disappointment of 2 failed attempts at organising a rally in 2022 and my request for help in finding a suitable site and making the arrangements for its use, Mike Hodgkinson and Val Lipworth suggested that the facilities at Alvecote Marina and the Samuel Barlow Pub would be suitable. Mike and Val contacted the owners who are happy for us to hold our event there free of charge as long as we frequent the pub. A site visit with Mike, Val, Judith and myself was arranged to see if there were likely to be any issues with getting all our normal exhibits in. There is more than ample space and hard standing on the car park and land adjacent to the moorings and the pub, road access is good being only a couple of miles off the M42 with no height or weight restrictions to contend with. So the decision was made to go ahead with finalising the arrangements to hold the event there. There were no restrictions imposed on this area last year so there should not be any issues with the water supply this time. At the moment we have been unable to arrange food for the Saturday night, the pub only does cobs (unless this changes before the rally), enquiries for Hog Roast has proved unsuitable, we are either too far away or the price per head was deemed too high, should we come up with something suitable before the rally date we will let entrants know. By the time this edition of the newsletter gets to the printers all the appropriate paperwork will have been sent off to Canal & River Trust. Traditionally the rally has been held in June with only the 150th Anniversary event being held in a different month, this time as the leg work has been done by Mike and Val it has been necessary to move the date to something that suits them. So it will happen on

Saturday 5th & Sunday 6th of August

We hope to see as many entrants as possible and hope that the change in date will suit some who have traditionally not been able to make the normal June date. As usual there will be a small poster and entry form with this newsletter, additional entry forms are available from the website.



Following my request for articles, Rob Wilcox was kind enough to put together his family's experience with Gardner powered vehicles down the years.

My company is

Massey Wilcox Transport Ltd of Chilcompton, Somerset.

My father Harry, and his business partner, Doug Massey started the company in 1954 with 2 worn out Bedfords from the BRS during de-nationalisation.

The value was of course in the A licences that came with the trucks and which allowed the partners to trade throughout the country.

The first new lorries to come along were Bedford A types, and D types and the big Bedford, the S type. Engines were either the 350 Leyland or Perkins P6 and the later R6.

The first involvement with a Gardner came in about 1960. Mercantile Credit rang father to ask if he would retrieve a 1950s ERF Chinese six rigid. The purchaser had defaulted and hid the ERF behind a hedge close to our depot in Gurney Slade. Father duly got the truck started and brought it home. He was impressed with the ERF and made an offer to buy it. It was fitted with a 5LW.

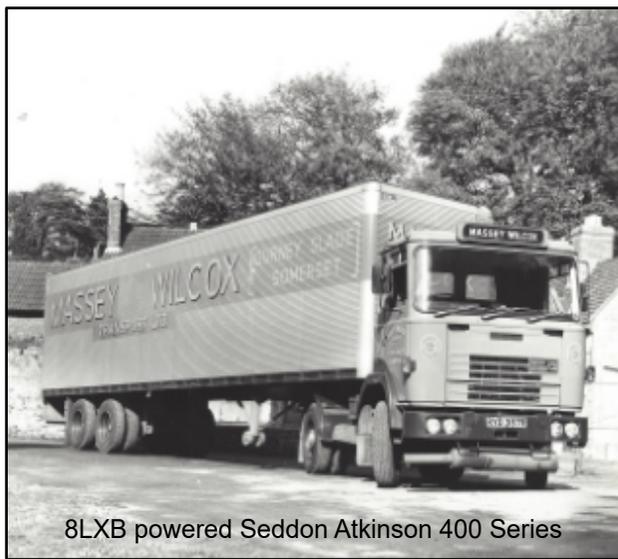
After that most new trucks purchased were Gardner powered. ERF 6 & 8 wheelers powered with 6LX, 4 wheelers with 5LW. We also had Atkinson and Seddon with 150s.

When the 6LXB was launched we bought Atkinson and GUY Big J. These vehicles came with big cyclonic air filters and father decided to clean one Big J filter with a paraffin sprayer, blowing the excess out with compressed air. Of course, when the vehicle was started the engine had an unlimited supply of fuel vapour and commenced to build revs far beyond the limit of 1800!!



Luckily, a quick-thinking driver leap in the cab and rammed it into top gear and stalled the engine!! Needless to say, future filter changes involved new elements! As I became involved in the business I was pushing father and Doug for more horse power. I think they would have stuck with 6 LXBs. So in 1974 and with the launch of the S/Atkinson 400 series we had our first 8LXB 240.

Not long after it took to the road it developed a problem with the cam shaft lobes coming loose and bending the push rods. This was fixed by the SA agent, Coventry & Jeffs of Whitehouse Street, Bristol and the truck went on to give 4 years service before being sold as it was only a day cab, and drivers were wanting



sleepers. Bought for £12,692.00 and sold after 4 years for £10,000.00. That is what owning a Gardner does for you!! I recall the driver ringing me when he had this vehicle from a service area on the M5 to say he had 9 reverse gears and 1 forward. I explained he must have momentarily stalled the engine and it started to run backwards. problem solved.

The newer S/Atkinsons were 8LXC at 265 BHP and were no problem to us.

With the advent of 38 tonnes and having a modern fleet of tandem axled trailers we opted to go for 3 axle tractors. The salesman who sold us the S/As had moved to Foden and talked us into having double drive tractors with 6LXDTs at 270 bhp. The gearbox was a 9 speed but followed by pre-production twin splitters. The vehicles were not good to be polite. The first one had its engine blow up at Preston on a Sunday afternoon. When I got there and looked underneath there was nothing to see but the crank shaft.

We left the tractor in a BP garage and Foden collected it and fitted a replacement engine, but uprated to 290 as was the other two that we owned. The damaged engine was re-built and bought by a local haulier, A H Gore of High Littleton, who fitted it in one of their ERFs.

The first Foden had a 9 speed Fuller and the other 2 had twin splits both of which had a habit of selecting 2 gears at the same time and completely jamming up. The other problem with them was they had a tendency to go straight on when trying to turn left or right because of the double drive and short wheelbase. The gear linkage was by cable and very stiff. With a Fuller speed of changing was key but the cable change slowed this up and changes were not always clean.

Still, we persevered and the next Foden had a 320 bhp 6LYT with a 9 speed and the final one was a tongue in cheek spec by the rep which had a 350 BHP 6 LYT, twin split, high roof cab, alloy wheels, torsion bar rear suspension, and pretty much every box ticked which could be ticked. To round it off he had it painted in our colours but metallic.

He brought it round and of course we ended up buying it. After only a short time the driver tipped it over in Scotland. It got repaired and re-joined the fleet.

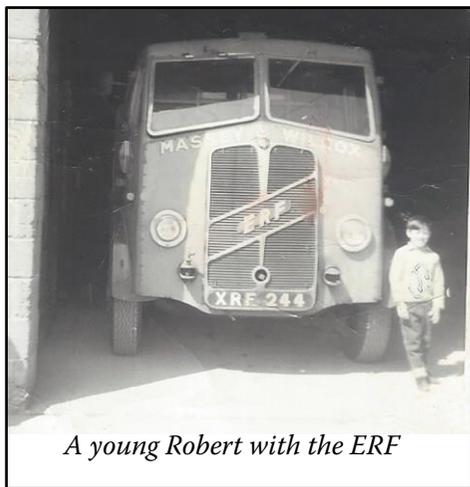
I am sorry to say that the Fodens were a disaster for us. Someone had to be ready every Sunday to take the call.

They were all sold after about 3 years and changed for Scania and our association with Foden and in particular Gardner came to a sad end.

But one tractor was going to have the last say. The 350 bhp version decided to flatten its cam followers just after selling it and it had to come back to our workshops for repair.

The 16 litre LYT could have been a wonderful engine but had been rushed into production and the result was as we experienced, and no doubt other operators had their tales to tell.

The strange thing is that most of the 5 we had, are still in existence. In-fact I passed the first one bought today pulling fair ground trailers. It is 38



A young Robert with the ERF

years old!!

But, I do have ONE Gardner left on the fleet. It's a 5LW fitted in a 1971 54G ERF. This vehicle was bought new in 1971, sold 1980 and bought back in 2018 for exactly the same sum of money as the original purchase price. I had the cab rebuilt and painted in period livery and it gets used for local shows and road runs.

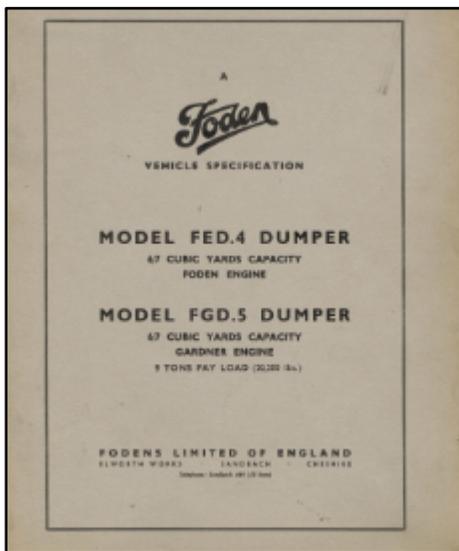
Foden are probably best known to most of us as manufacturers of road going commercial vehicles. Many of you will probably seen other models which had come from the works near Sandbatch, Foden built many special purpose vehicles, Aircraft refuelling tankers, Various military versions, Nuclear Warhead transporters, Log carriers, Lorry mounted cranes in conjunction with Smiths of Rodley who were also Gardner customers, and probably the hardest worked and abused, the Dump Truck.

The prototype purpose built Dump Truck was introduced in 1947 based on a pre war "S" type chassis with an unusual cab. The driver sat at the front of the vehicle facing the back, it was done this way so that the the driver could see where he was reversing up to, it was operated by Hughes Brothers of Buxton in a Peak District limestone quarry.

This lead to a completely new prototype design designated the DG5/12, four of these were built based on the DG6/12 truck chassis. The 5LW power plant was married up to a Foden gearbox which had 5 forward and 2 reverse gears including a super low gear in each direction.. These 4 dump trucks were put to work in the Cornelly limestone quarry in South Wales, after some teething troubles they were moving 4500 tons per week. When run on a three shift system this increased to 17,000 tons per week. Fodens monitored the vehicles closely to learn from any problems before introducing the next model. Over a 3 ½ year period they moved 2,460,000 tons of material.

The success of the trial led to the introduction in 1952 of the FGD6 (Foden-Gardner-Dumtruck-6 cylinder engine) coupled to a new gear train consisting of a 4 speed epi-cyclic gearbox and a further 3 speed range designated High, Direct and Low giving 12 speeds in total.

The FED.4 FGD.5 dump truck had a carrying capacity of 9 tons with a top speed of 37.6mph when fitted with the Gardner or 47 mph when fitted with Fodens own 4 cylinder two stroke engine, in its lowest gear a mere 1.8mph at 1700rpm in forward or 2.3 mph in reverse. Foden continued to offer Gardner engines either the LW or LX until 1967 when a new 40 ton model was introduced. It is probable that the Gardner LX was considered to be under powered to achieve suitable journey times. Although Gardner LX and later the LXB were still offered in road transport vehicles. An interesting video can be found on you tube. Search for:- Foden Dump Trucks at Work



<https://www.youtube.com/watch?v=ImZCVaPfgQgg&t=537s>

Whist reserching the dumptruck I found a book titled "Foden Special Vehicles" by Wobbe Reitsma to be an interesting read, it is available from Booklaw Publications.

CAB

Special half cab is provided as standard with accommodation for the driver only, and gives maximum visibility; also designed with all straight pillars, etc., for ease of maintenance.

The engine casing at the nearside is readily detachable, so making the engine readily accessible. As an alternative, the standard pattern framed full fronted cab can be provided to carry a passenger. Protection plates are mounted on to the massive front bumper to protect the front of the cab and headlamps. A strongly braced plate is also fitted to give the engine sump full protection. A combined radiator and fan heater with demister can be supplied as an extra.

TIPPING GEAR

A large capacity tipping pump is provided, being the same as used for the larger 6 wheel dumper, and this is capable of tipping the body in 12 seconds to an angle of 60°. The tipping cylinders are mounted in cradles carried on the outside of the frame and are exceptionally robust. Over tipping is made impossible by the special release cock which will automatically come into operation when maximum tip angle is reached.

STEERING GEAR

The steering gear incorporates the recirculatory ball principle on which all moving surfaces are in rolling contact, which gives exceptionally high steering efficiency. The effect is to reduce the effort necessary to manoeuvre the vehicle, light steering being maintained with the heaviest of loads.

REAR AXLES

Pressed high tensile steel casing with heavy duty overhead worm drive 8½ in. centres and 2½ in. diameter axle shafts, integral flange drive hub at the end, forged rear wheel hubs and large roller races carry the wheels. The rear springs are exceptionally heavy pattern capable of dealing with the most arduous conditions. Standard rear axle ratio is 6.25 to 1. Double reduction hubs can be fitted for exceptionally arduous conditions. These hubs halve the stresses throughout the transmission system. They can be quickly put out of action giving double the road speed for site to site journeys.

FRONT AXLES

Of stiffened I-section high tensile steel, conventional bed type, designed for very heavy duty with 2½ in. special axles and forged hubs. Heavy duty front springs are provided whilst axle stops prevent excessive movement on both axles.

CLUTCH

Large diameter single plate clutch, 15½ in. diameter, 270 sq. ins. friction area. Smooth engagement and light pedal pressure are a feature which enables the vehicle to take away with full load on the steepest of gradients without judder. The pressure plate is ducted by radially disposed slots giving air cooling to the plate and lining surfaces.

GEARBOX

Ground formed single helical teeth with dog couplings are used for all gears on the main gearbox and are carried on ball and roller bearings throughout. In conjunction with the epicyclic portion, the gearbox gives 8 forward speeds and 2 reverse and is capable of climbing any gradient providing wheel spin does not occur. The epicyclic gear change is pre-selected so that this change can be made simultaneously with one in the main gearbox enabling the driver to make full use of the 8 speeds.

TRANSMISSION

1,700 Series Hardy Spicer propeller shaft used throughout.

BRAKES

Foden two leading shoe design 16½ in. by 7 in. rear wheels, 16½ in. by 4½ in. front. The brakes are actuated by hydraulic servo of straightforward design requiring light pedal pressure for normal speeds. Their action is progressive and balanced which avoids load shedding.

HANDBRAKE

Transmission type fitted to rear axle casing. This is an important safety factor giving a handbrake which is independent of the main hydraulic system and is capable of holding the fully loaded vehicle on any gradient on which the wheels can grip.

WHEELS AND TYRES

Front 11-00 x 22 Tyres. Special reinforced disc. Rear 15-00 x 20 Trak-grip. Two-piece rims 10" x 20".

SPECIFICATION FOR 4 WHEEL 6/7 CUBIC YARD DUMPER (9 TONS PAYLOAD)

INTRODUCTION

This dump truck has been designed for heavy duty operation and in many ways is similar to the larger 6 wheel version which has been so successful over a number of years. It incorporates many of the same units as on the 6 wheeler such as axles, brakes, gearbox, clutch, steering gear, so that when replacements are required, servicing arrangements are much simplified; at the same time the design of all these units has been proved and thoroughly tested under the most arduous conditions over a number of years.

The standard body is made to carry a load of $7\frac{1}{2}$ cu. yds. capacity with an overall width of 7ft. 4 ins. and can be used on public highways.

Special bodies can be supplied to carry a load of $8\frac{1}{2}$ cu. yds. with an overall width of 8 ft. 5 ins. for off the road duty. These bodies are suitable for lighter but more bulky loads, the payload remaining at 9 tons.

In all, there are seventeen types of body available, each one designed to suit the many variations of use to which the dumper can be put.

As a result of much experience over years of building the heavy duty 6 wheeler dumper all the latest refinements are incorporated in this smaller version and a number of optional extras and variations are available upon request.

SPECIFICATION—FED.4 DUMPER

ENGINE

Foden FD.4, 2 stroke engine 4 cylinder.

This engine develops 84 b.h.p. at 2,000 r.p.m., has a fully balanced crankshaft, submerged lubricating pump, with pressure lubrication for all major operating surfaces.

The general construction of the engine is very robust. Crankcase and cylinder blocks are one piece casting. Wet liners are fitted, and all bearings are of large dimensions and give exceptionally long life. All units are designed for accessibility and are easy to service, and all auxiliaries are carried on the nearside of the engine which in conjunction with the half cab, which is fitted, makes servicing very accessible.

The engine and gearbox unit are mounted on large diameter rubber bushes, the 3-point suspension being utilised to minimise vibration and deflection. For cooling an extremely large block element water radiator is provided with easily detachable elements. The large fan, water pump and thermostat, control the engine water temperature in all conditions. An oil cooler is provided to maintain optimum lubricating oil temperature. Provision is made so that the grill, radiator, and front crossmember can speedily be removed to enable the engine and gearbox unit to be withdrawn through the front. Special care has been taken to provide for dusty conditions, two oil bath air filters of large capacity with pre-cleaners are fitted high up under the body canopy where they are fully protected against accidental damage and also where the air is cleanest.

GARDNER 5LW ENGINE

A 5 cylinder 94 b.h.p. Gardner engine can be fitted with an increase in weight of 3 cwt. and a road speed reduction of 18%. With this engine fitted the model will be known as FGD.5.

This engine is too well known to repeat its specification here. Full details can be had on request.

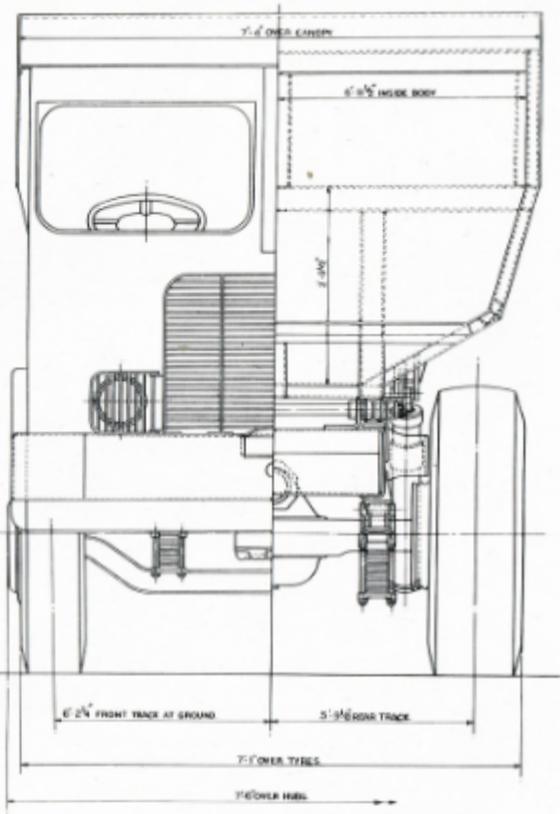
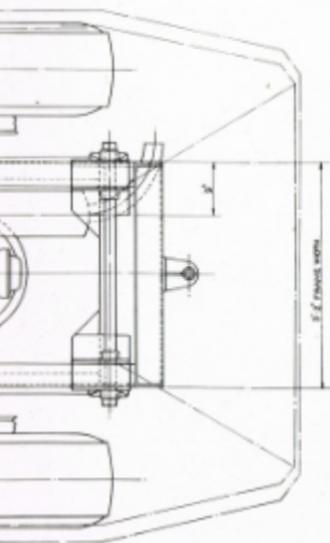
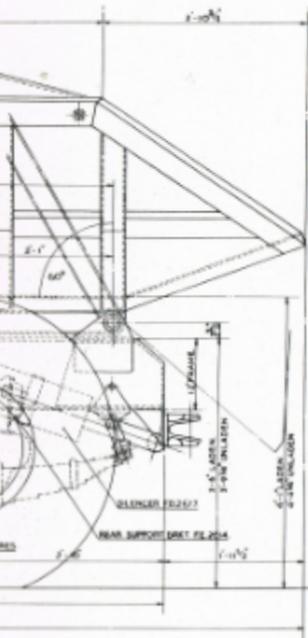
FRAME

$12" \times 4" \times \frac{3}{8}"$ channel section of high tensile steel, specially braced and reinforced for this class of duty.

BODY

The body has $\frac{3}{16}"$ thick steel floor and $\frac{3}{8}"$ thick side plates reinforced with channel steel sections welded throughout. An extension is provided on the forward end of the body to protect the cab and the engine. The body width is 7 ft. 4 ins. standard, but special types can be provided up to 8 ft. 5 ins. wide for off the road duty. Longer bodies can be provided to carry lighter materials and increased capacity. Special body floors of 3" section angle iron can be provided for loads such as granite. Some of the illustrations show this body in use.

The weight of the standard body is 1 ton 11 cwt.



**GEN. ARRGT. OF F.E.D. 4/4
WHEEL VEHICLE (DUMPER)**

F.E.A.3147



ELECTRICAL EQUIPMENT

The electrical equipment is 24 volt with automatic voltage control; two heavy duty 14 plate Exide batteries are fitted. The equipment also includes starter, dynamo, switchboard, control panel, master fuse, headlamps, side stop and tail lamps, rear reversing lamp. Speedometer fitted in the centre of the steering wheel (illuminated).

FUEL TANK

32 Gallon fuel tank is provided mounted on the nearside of the frame.

EQUIPMENT

Includes comprehensive tool kit with all special engine tools, hydraulic jack, grease gun, windscreen wiper, electric horn, speedometer.

A hydraulic operated Bulldozer Scraper can be fitted as an extra.

One Spare wheel fitted with 15-00x20 Tyre complete, supplied loose.

Unladen Weight including Body, Fuel, Oil and Water, (Foden engine)	7 tons 7 cwts.
Unladen Weight including Body, Fuel, Oil and Water, (Gardner engine)	7 tons 10 cwts.
Front Axle Weight (Foden engine)	3 tons 4 cwts.
" " " (Gardner engine)	3 tons 7 cwts.
Rear Axle Weight	4 tons 3 cwts.
Typical Gross Weight Laden	16 tons 3 cwts.
Turning Circle	46 feet

8 SPEED GEARBOX

TYRE SIZES, AXLE RATIOS AND ROAD SPEEDS (M.P.H. & K.P.H.)

TYRE SIZE			15-00x20			
AXLE RATIO			6.25 : 1			
ENGINE R.P.M.			1,700	2,000	1,700	2,000
Direct	Underdrive	Gearbox Ratio	Speed mph	Speed mph	Speed kph	Speed kph
4		1.00 : 1	39.6	47	64	75.6
3		1.69 : 1	23.6	27.8	38.0	44.4
2		3.03 : 1	13.2	15.4	21.2	24.8
	4	3.29 : 1	12.0	14.2	19.4	23.0
	3	5.56 : 1	7.0	8.4	11.4	13.6
1		6.18 : 1	6.4	7.6	10.4	12.2
	2	10.0 : 1	3.8	4.6	6.2	7.4
	1	20.8 : 1	1.8	2.3	3.1	3.5
Reverse Ratios						
Direct		5.41 : 1	7.3	8.8	11.9	14.4
	Underdrive	18.0 : 1	2.3	2.6	3.6	4.3

NOTE 1.—1,700 R.P.M. refers to vehicles fitted with Gardner engine; 2,000 R.P.M. for Foden engine.

NOTE 2.—For vehicles fitted with double reduction hubs, halve the speeds quoted above. When the hubs are turned over to direct drive the speeds above are as stated.

Annual General Meeting

A total of twenty two members attended the A.G.M held on Sunday October 23rd at The Wythall Transport Museum, typically after a long hot summer the weather conditions turned upside down and we had some heavy precipitation, this caused flooding issues for some making their journeys difficult. The first order of the day was refreshments in the onsite cafe followed by a conducted tour ably lead by museum volunteer Mark Millard who regaled us with some history and anecdote's about the various vehicles on display. As part of the tour we were guided around the workshops where there are a number of vehicles undergoing restoration. (Tours of the workshops can only be done as part of a guided tour.) After the tour it was time for lunch before heading onto the upper deck of a 6LX powered Daimler Fleetline for the formal part of the day.



Following the AGM we transferred to the 5LW powered Bristol L5G for a 30 minute step back in time ride through the local countryside.



Following the bus ride there was time left to further peruse the exhibits and partake in refreshments in the cafe. We all agreed an interesting day out.

GARDNER

SINGLE LEVER AND REMOTE CONTROL

for MARINE
ENGINES

FITTED WITH
2 U.C. or 3 U.C.
REVERSE GEARS



2287

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Telephone: 01-820-3315

Telephone: 041-221-0987

- Provides direct control from the bridge
- Simplifies manoeuvrability
- Reduces wear and tear of reverse gear



GARDNER

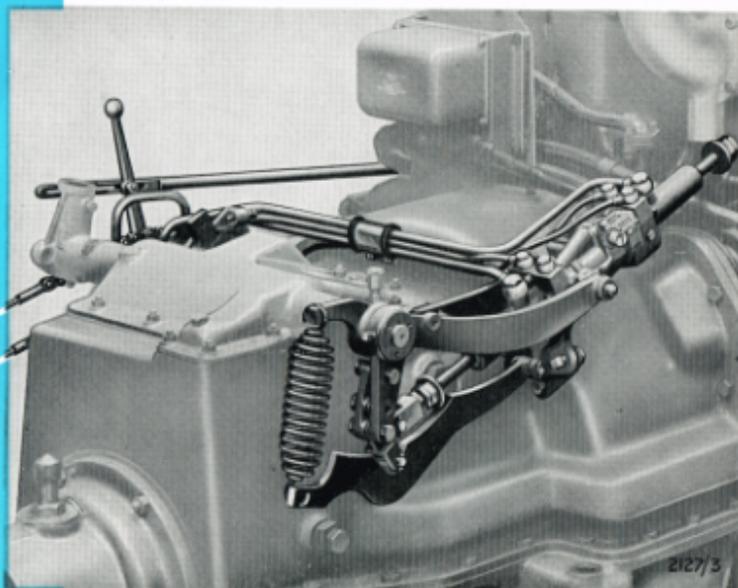
SINGLE LEVER CONTROL

INTRODUCTION

The Gardner Single Lever Control is a device which enables the operation of the reverse gear and change of engine revolutions to be controlled by one lever.

The design is such that the control system can be fitted to either No. 2 u.c. or No. 3 u.c. Gardner Unit Construction Reverse Gears.

Remote control can be effected either mechanically by means of the Gardner Wheelhouse Control Units which are available for both single and twin screw installations, or hydraulically through a Gardner Handwheel Hydraulic Pump Unit mounted in the wheelhouse. In the case of twin installations, two Gardner Handwheel Hydraulic Pump Units are used and may be mounted as desired.



DESCRIPTION

SINGLE LEVER CONTROL

The Single Lever Control arrangement comprises an engine driven hydraulic pump which delivers oil under pressure to the Reverse Gear Operating Cylinder via a control valve to which is attached the single operating lever.

The Single Lever is coupled to the engine speed control lever by two slotted link rods, so arranged that some lost motion is permitted during the initial fore and aft movement of the operating lever from the Neutral or mid-position.

A friction device ensures that the control valve and operating lever remain set at any desired position and Neutral location is positively identified by a "notching effect" felt through the operating lever.

Movement of the Control Lever approximately 11° forwards or backwards from the Neutral position puts the reverse gear in Ahead or Astern respectively. Further progressive movement of the lever in either direction serves to increase engine r.p.m. from idling to full speed. Similarly, due to the arrangement of the two links rod, when the operating lever is returned from the "Full Ahead" or "Full Astern" positions to Neutral, engine speed is reduced before the control valve operates the actuating cylinder and disengages the respective clutch.

Incorporated in the system is an isolating valve which when closed, permits independent control of engine speed—without gear engagement—for the purpose of winching, cargo pumping, etc. A manually operated or (when specified) electrically operated by-pass valve incorporated in the actuating cylinder also permits the Single Lever to be used as a speed control only, when set to the "manual" position. In this position it also enables the gear lever to be operated manually if required.

SINGLE LEVER REMOTE CONTROLS

The standard Remote Control System for operating the Single Lever consists of roller chains and stainless steel wire ropes running over pulleys. These connect the Gardner Wheelhouse Control Unit to a sprocket mounted on the reverse gear control valve spindle. Sufficient cable for a 28 ft. run and pulley assemblies to provide two changes in direction are supplied as standard equipment but alternative cable runs can be supplied to suit special requirements.

An alternative method of remote operation is by roller chains, chainwheels and a simple arrangement of rods and levers supplied by the customer. Both methods are suitable where 'the run' from wheelhouse to engine room is short and does not involve more than four changes in direction.

The Hydraulic Remote Control System is recommended where 'the run' from wheelhouse to engine room is long and/or complicated, or when Dual Station Control is to be installed.

With this system the Gardner Handwheel Hydraulic Pump Unit in the wheelhouse operates a slave unit mounted on the reverse gear; this in turn operates the reverse gear control valve. A by-pass valve fitted to the slave unit permits independent operation of the engine-room Single Lever Control when desired. Indicator lights mounted on a panel in the wheelhouse show the engagement of the Ahead, Neutral and Astern positions. They are illuminated by micro switches incorporated in the reverse gear selector mechanism. A master switch is provided on the indicator lights panel by means of which the lights and starter motor may be rendered inoperative. With this system hydraulic pipes sufficient for a 50 ft. 'run' will be supplied unless otherwise specified.

When Single Lever Control is required, it should be specified on the engine order and the following information should also be included:—

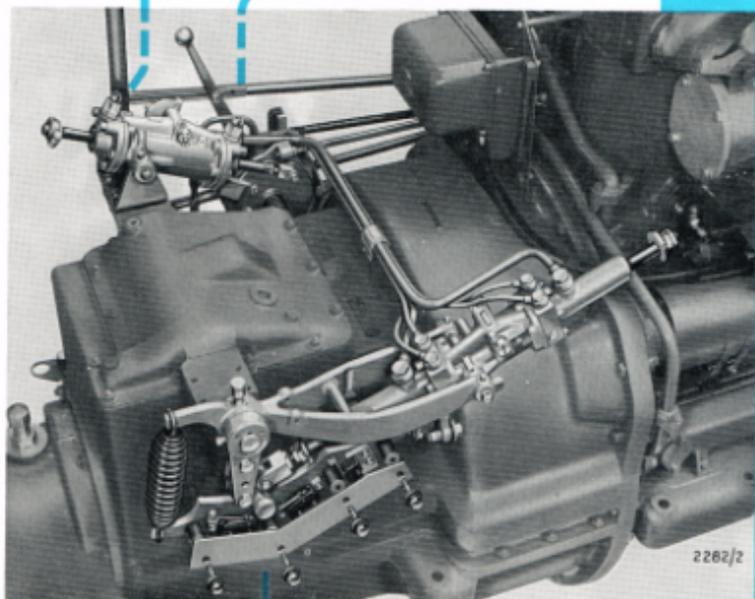
- (a) Is Dual Station Control to be installed, e.g. for operation from a flying bridge?
 - (b) If Dual Station Control is **not** required, what remote control system is to be installed between wheelhouse and engine room?
 - (c) What length of wire rope or pipe work will be required if standard lengths are inadequate?
 - (d) If wire rope is required and two pulley assemblies are insufficient, how many pulleys assemblies are required?
 - (e) Is/are Electrical Tachometers to be fitted to engine/s?
 - (f) Is/are Amal Fuel Lift Pump/s to be fitted to engine/s?
- } This information is only required for L3 and L3B Engines.

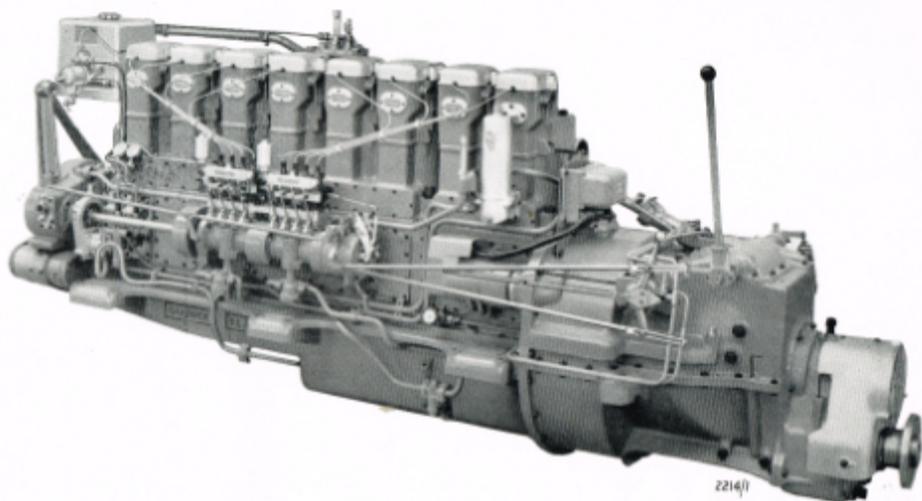
REMOTE OPERATION

The Gardner Wheelhouse Control Units can be supplied with one lever for single screw installation or two levers for twin screw sets. The Remote Control Lever serves as the counterpart of the Single Lever Control on the reverse gear and its function is similar in every respect that is to say, movement of the lever from STOP to SLOW AHEAD or SLOW ASTERN engages the ahead or astern clutch respectively and further progressive movement in either direction will increase the engine r.p.m. from idling to full speed with the drive engaged.

With the Hydraulic Remote Control System initial rotation of the handwheel, either clockwise or anti-clockwise, puts the reverse gear in Ahead or Astern and the appropriate indicator lamp lights up to indicate that the gear is engaged. Further rotation in either direction increases engine speed. Opposite rotation of the handwheel first reduces the engine speed and then puts the reverse gear in Neutral at which period the gear engagement indicator light is extinguished and the Neutral location indicator light is illuminated.

The clockwise and anti-clockwise rotation of the handwheel in relation to Ahead and Astern gear-selection can be reversed if desired, by merely reversing the pipe connections on the handwheel control unit.





8L3B MARINE ENGINE FITTED WITH SINGLE LEVER CONTROL

SPECIAL FEATURES

- 1** The system operates satisfactorily using the engine lubricating oil and therefore no special low viscosity hydraulic oil is required.
- 2** The design is such that engine speed is automatically reduced during the periods of clutch engagement and disengagement thus safeguarding the engine and gearbox against sudden excess loading.
- 3** The hydraulic power assisted operation of the reverse gear ensures smooth and effortless clutch engagement. As it is virtually impossible to slip the clutches with the Gardner Single Lever Control, clutch adjustment is required infrequently.
- 4** Provision is made to permit independent control of engine speed, without reverse gear operation, when desired.
- 5** All valve arrangements in the hydraulic system are of the sliding type. Spring loaded balls, or other types of valves liable to be rendered inoperative by particles of foreign matter, are not used.
- 6** The system, once installed, requires very little attention and no routine adjustments are necessary.
- 7** When the Hydraulic Remote Control System is installed, arrangement is made to ensure that the engine starter motor cannot be inadvertently operated while the reverse gear is engaged; a precaution which prevents the vessel from accidentally getting under way immediately the engine is started.



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ANSON ENGINE MUSEUM



For 2023 opening times check the website

The Museum holds many records of Gardner and other makes of engine and also offers a dating service. Go to <http://www.enginemuseum.org/news.html> to find the downloadable enquiry form

Special events occur throughout the year normally at Bank Holidays See the Museum Website www.enginemuseum.org for up to date information

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