

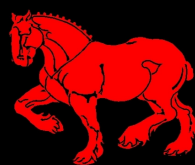
ACETARC

ENGINEERING



ACETARC FOUNDRY LADLES

General design specification



Acetarc foundry ladles are available as two standard design options:

Westminster medium duty foundry ladle

For non-ferrous foundries and for intermittent use in ferrous foundries.

Workhorse Heavy-duty foundry ladle

For continuous use in all types of foundries and with all types of molten metal.

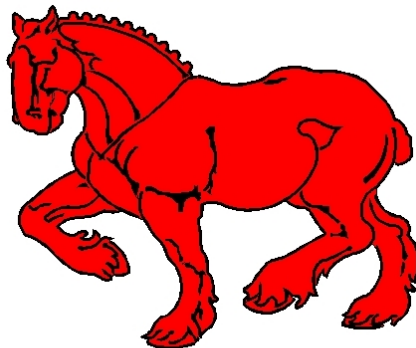
Acetarc Engineering Co. Ltd.

Established in 1967, Acetarc Engineering is an ISO 9001 registered company, specialising in the design and manufacture of foundry ladles and associated molten metal pouring & handling equipment.

All our equipment, including the ladle gearboxes, are of our own design & manufacture.

Our foundry ladles are based on long proven designs and are in use in foundries around the world.

Our symbol is the **WORKHORSE**; *solid, reliable and enduring.*



ACETARC

The following explains in detail the main design points for both the Westminster medium duty and the Workhorse heavy-duty ladles.

Westminster medium duty Foundry Ladle

For ladles with a working capacity up to 4500Kg molten cast iron (9900lbs).



The Westminster ladle is intended for continuous use in non-ferrous foundries and for intermittent use in ferrous foundries.

It is not recommended for use in foundries where the molten metal is at elevated temperatures.

The Westminster design is normally offered for:

- lip-pour casting/transfer ladles.
- Teapot spout & Extended spout ladles
- Small capacity treatment ladles (For infrequent use)
- Drum and "U" shaped ladles.



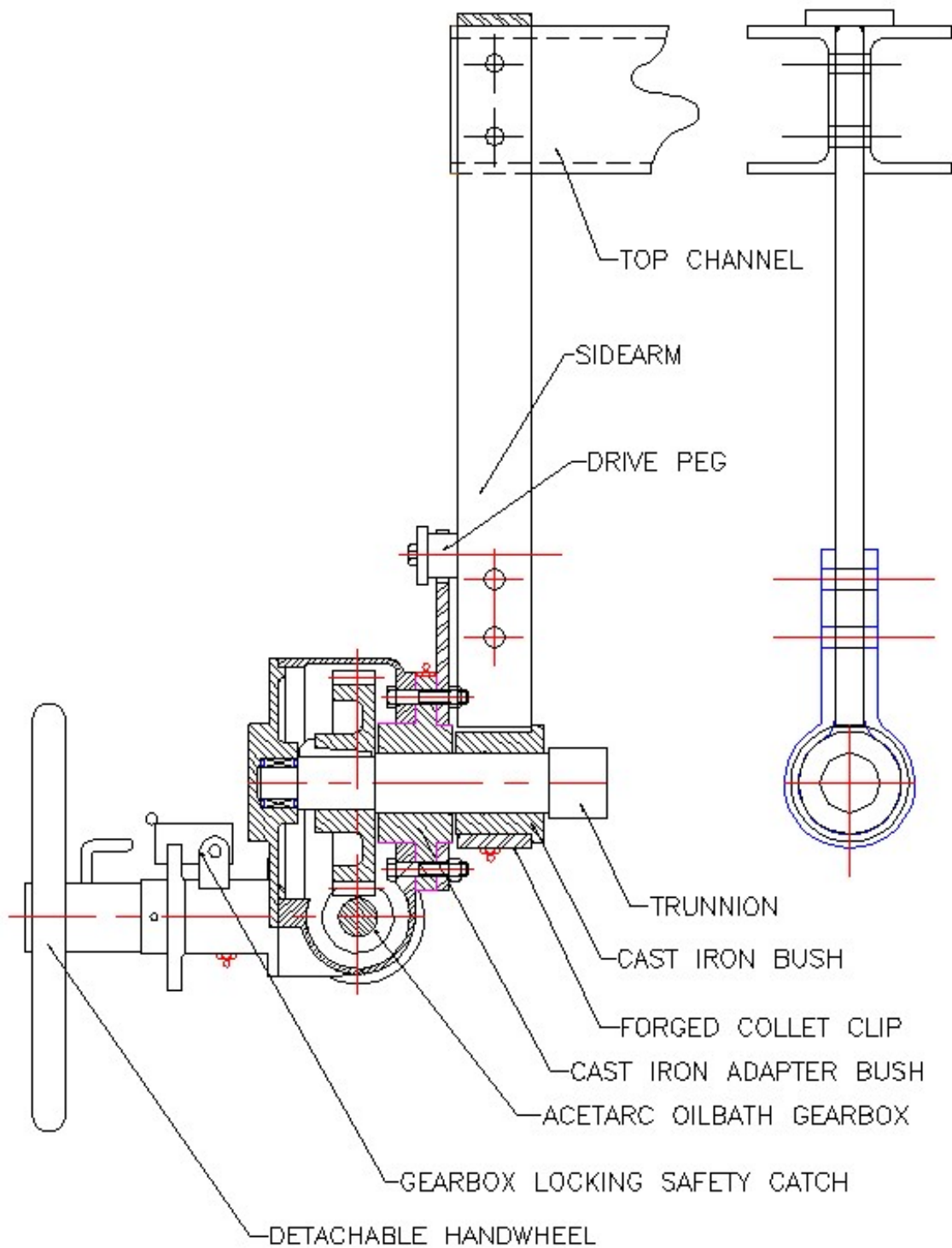
Acetarc Westminster medium duty ladles (lip-pour with Vee bail and a light duty loose tun-dish type) with a Acetarc Workhorse ladle in the background

The Westminster ladle is often supplied with a shell sized to take a pre-formed Insural liner or a crucible.

Acetarc Westminster ladles include the following as standard.

- The ladle shell is fabricated from steel plate with the body rolled to form a cone. The cone increases the rigidity and strength of the shell whilst the taper greatly aids the removal of the refractory lining.
- The base plate is made from the same thickness of plate as the ladle shell.

- To increase the rigidity and strength of the ladle shell a centre stiffening band is fitted. All stiffening bands are continuously welded to the ladle shell.
- The ladle shell is sized to accommodate the required working capacity when fitted with an appropriate refractory lining without compromising the freeboard of the ladle.
- The Westminster ladle is fitted with welded-on trunnions as standard. These are fitted to the ladle shell using a special jig to ensure that the trunnions are correctly aligned.
- The trunnions rotate in cast iron bushes. The cast iron bushes are fitted with lubrication points and are replaceable.
- The load on the lifting hook is taken by feet on the bottom of the hook and not by the locating bolts.
- The Westminster can be offered with various types of cover.
- The Acetarc Westminster ladle can be supplied with a Vee bail as an alternative to standard lifting bail arrangement. (Usually referred to as a Somerset Ladle)
- The Westminster is fitted with the same range of manually operated Oil-bath gearboxes as are fitted to the Workhorse heavy-duty ladle design.
- A safety locking bar is fitted to the gearbox side arm, with a matching locating slot on the ladle shell. This secures the ladle shell to the sidearm whilst the ladle is being transported, with the shell in the vertical position.
- A secondary locking assembly is fitted to the gearbox. This is intended to be used to lock the gearbox when the ladle is being moved with the shell in the partly rotated position.
- The ladle shell is drilled with Ø5 vent holes on a random pattern to allow moisture to escape during the drying of the refractory lining. (Not applicable to ladles that are intended to be fitted with an Insural liner).



Westminster Medium Duty Ladle side arm assembly

Workhorse Heavy-duty Foundry Ladle

For ladles with a working capacity from 450Kg (990lbs) up to 75,000Kg (165,000lbs) capacity molten cast iron.



The Workhorse ladle is intended for continuous use in all types of foundries and with all types of molten metal.

It forms the basis for:

- Casting & transfer ladles
- Treatment ladles (for the in ladle production of ductile iron).
- Bottom pouring Ladles
- Ladles fitted with motor drive for powered rotation
- Special ladles for non-standard applications



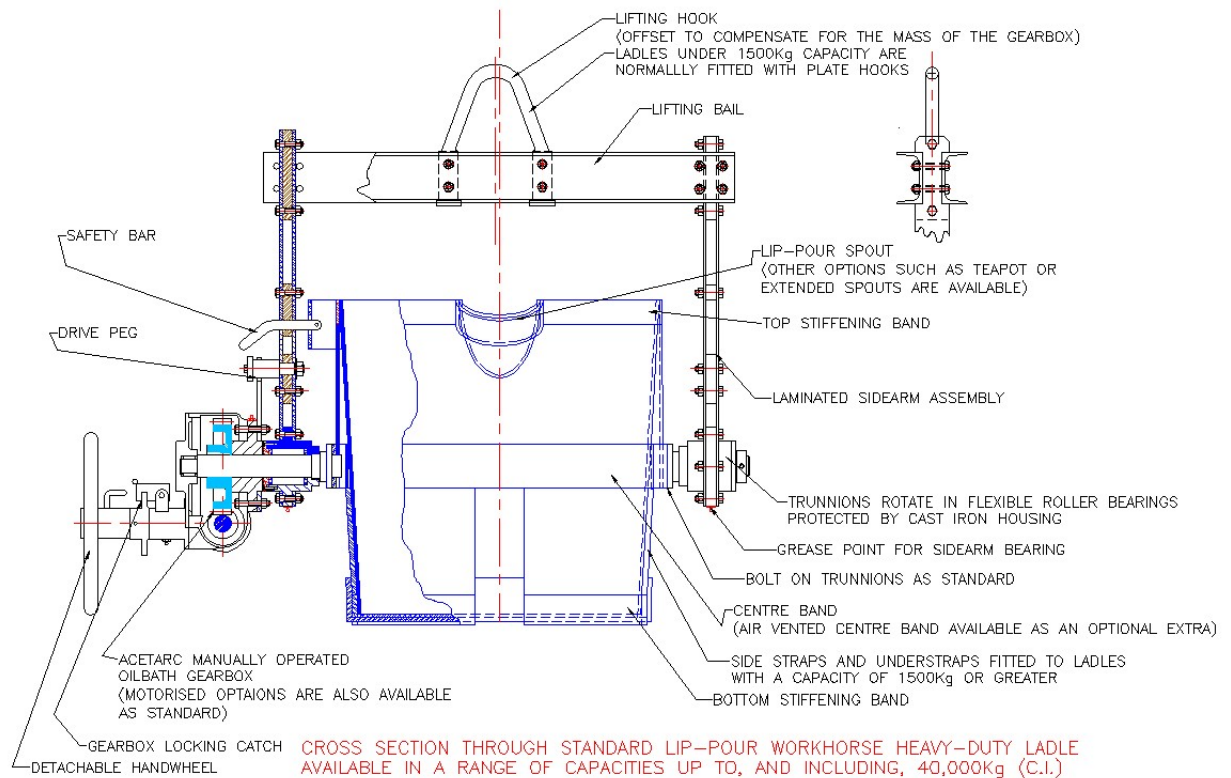
Acetarc Workhorse ladles include the following as standard.

- The ladle shell is fabricated from steel plate with the body rolled to form a cone. The cone increases the rigidity and strength of the shell whilst the taper greatly aids the removal of the refractory lining.
- The base plate is made from the same thickness of plate as the ladle shell.
- The ladle lifting bail will be fitted with a heat shield. Splash guards will be fitted over the trunnions.
- To increase the rigidity and strength of the ladle shell, top centre and bottom stiffening bands are fitted. Understraps are also fitted (See drawing for details) All stiffening bands are continuously welded to the ladle shell.
- If required, the top stiffening ring on the ladle can be changed to a flat ring but this must be specified at the time of ordering.



- The Workhorse ladle is fitted with bolt-on trunnions as standard. The bolt-on trunnion design has several advantages over welded trunnions often used on other ladles.
 1. It reduces heat transference from the ladle shell to the sidearms and gearbox, thereby reducing the likelihood of parts becoming tight due to thermal expansion.
 2. If a trunnion gets damaged or worn, it then becomes a relatively easy task to replace the bolt-on trunnion by the foundry's own maintenance team.

3. It also allows the foundry maintenance team to remove the sidearm and lifting bail assembly's without having to dismantle the gearbox. This can be a particularly useful feature when it comes to having the ladle fitted with a refractory lining.
- The trunnion mounting assembly is reinforced with a folded steel section that links the centreband to the top band. Following assembly, the trunnion pads are machined and bored to ensure that the pads, and therefore the trunnions, are accurately aligned.
- There is a large diameter spigot at the rear of the bolt-on trunnion that actually carried the load thereby removing the shear off the fixing bolts. The bolt-on trunnion is then bolted to the machined pad using grade 8.8 HT screws.
- Ladles that are to be used with elevated temperature molten metal for long periods can be offered with air-vented centre bands to further reduce the heat transference from the ladle body to the gearbox and sidearm assemblies.
- The sidearm assembly is a laminated construction with two sidearm flats set apart by packer blocks and the sidearm bearing housing. The laminated construction provides a strong and rigid assembly whilst minimising weight.
- The sidearm bearing housing forms an overlapping protective enclosure for the flexible roller bearings that the trunnions rotate in. The housing is fitted with grease points for general maintenance lubrication.
- The flexible roller bearing is a specially designed bearing that gives superior performance when compared to the bushes often used on other ladles. It is less affected by high temperatures and less prone to metal pick up.
- The top of the sidearm assembly is machined to provide an accurate locating point for the lifting bail top channels.
- The design of the ladle ensures that for added safety no shear load is taken simply on bolts.
- With regard to manually operated ladles a safety locking bar is fitted to the gearbox side arm, with a matching locating slot on the ladle shell. This secures the ladle shell to the sidearm whilst the ladle is being transported, with the shell in the vertical position. (This locking bar is not fitted as standard to ladles that have motor gear rotation unless specifically requested for by the customer in writing).
- A secondary locking assembly is fitted to the gearbox. This is intended to be used to lock the gearbox when the ladle is being moved with the shell in the partly rotated position. (Not fitted to motor gear ladles)
- The ladle shell is drilled with Ø5 vent holes on a random pattern to allow moisture to escape during the drying of the refractory lining.



The Acetarc Oil-Bath gearbox.

All ladles offered are each fitted with an appropriately sized manually operated Acetarc oil-bath gearbox.

The Acetarc gearbox is of our own design and manufacture. It is specifically intended for use with foundry ladles and to operate in the foundry environment, having been fitted to Acetarc foundry ladles since we commenced manufacturing foundry ladles.

The Acetarc gearbox is a simple unit that can withstand much abuse with the need for only the most basic maintenance. All maintenance tasks can be carried out by a foundry's own maintenance department using standard and readily available tools, which the maintenance department should already have.

The Acetarc gearbox can be considered as self-locking in normal operation and will not back drive. The gearbox is a long proven design using worm & wheel gearing for controlled rotation of the ladle. The gearbox will hold the ladle at any degree of rotation regardless of the amount of metal in the ladle.

The primary worm & wheel gear uses straight cut teeth that are tolerant of misalignment.

A secondary pinion & bevel gear provided the input to the gearbox, with the pinion shaft forming the handwheel input shaft.

All moving parts are supported by bearings and have grease points. Primary lubrication of the worm & wheel gear is via the oil-bath

It should be noted that the Acetarc gearbox is not mounted onto the ladle in the same way as some other foundry ladles gearbox designs often are.

Most other manufacturers' designs require the gearbox to be mounted directly onto the ladle sidearm whilst the main drive gear is obviously mounted onto the trunnion shaft of the gearbox.

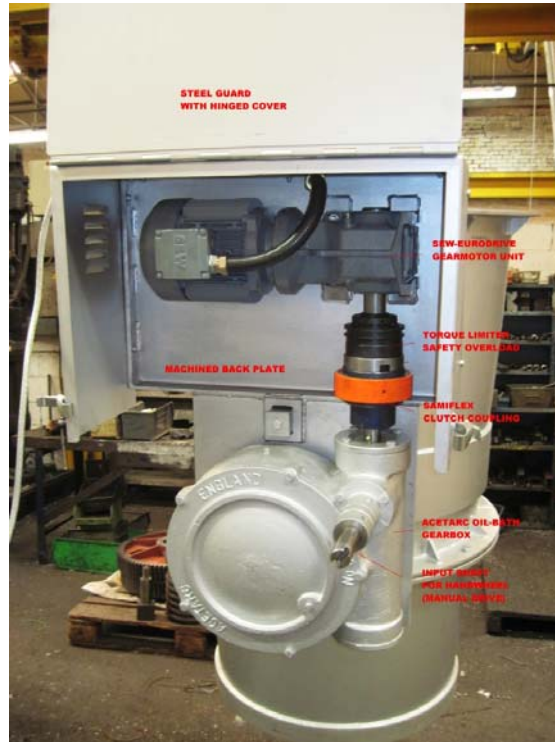
However, the Acetarc gearbox is mounted independently of the sidearm and drives via a slotted drive plate attached to the gearbox and a drive peg attached to the ladle sidearm. The Acetarc gearbox is shaft mounted and supported on the drive trunnion via the large cast iron adaptor boss.

Therefore if during a period of time the foundry ladle sidearms, ladle trunnions or lifting bail suffers damage and become bent, if the gearbox is attached to the ladle sidearm then it will move out of mesh with the drive wheel that is attached to the ladle trunnion. This will result in tight gears, increased wear rate and the ladle becoming much harder to manually rotate.

The Acetarc gearbox, not being directly bolted to the ladle sidearm, will not be affected by this and the gear centres will remain constant to each other.

Motorised Gear Assembly

The Acetarc Workhorse ladle can be offered with a motorised gearbox assembly as a standard option. (Either electric or pneumatic motor). Please see the Motorised ladle data sheet for further details.



The motor drive can be quickly converted to manual operation should the need arise.



4 tonne capacity (C.I.) Workhorse transfer ladle with electric motor drive and radio remote control (Ford Foundry UK)



5 tonne capacity (steel) Workhorse ladle with teapot spout, motor drive and radio remote control (Caterpillar Mexico)

Spare Parts

Acetarc foundry ladles are designed to give many years of trouble free service and are manufactured using a range of standard components that are kept ex-stock by Acetarc.

Therefore when spare parts are eventually required they can be supplied from our stores on demand so that foundry down time is minimised.

Materials & Construction

All steel used in the construction of the ladle is sourced from reputable UK steel stockists and is certified.

All steel used is metric sized. Where dimensions are given in inches these are equivalents only.

The steel grade is BS EN 1025 S275

The trunnions, including back plates are also manufactured using BS EN 1025 S275 steel.

All casting used in the construction of the ladle are sourced from UK foundries that are long established suppliers to Acetarc Engineering.

Cast iron for non-load bearing/ or low stressed items is to BS 1452 1990 grade 200

The worm wheel fitted to No. 3 and above gearboxes is grade BS EN 2789-1995 420/12 ductile iron.

The worm wheel fitted to No. 1 & No. 2 a gearboxes is grade BS EN 1561-1997 EN-GJL-200 grey iron.

All welds are continuous, using the MIG (metal inert gas) process and are to the procedures as laid out in BS4870 & BS EN 288-3 and using welders coded to BS EN 287-1.

All bolts used in the construction of the ladle are B.S. 4190 grade 8.8 HT

All keys comply with British standard metric specification BS4235.



General Notes

All equipment offered is new and covered by our standard 12 months warranty.

Ladles of capacities up to 14.9 tonnes are tested to 50% overload on the calculated gross weight and then a certificate is issued.

Ladles of capacities above 15 tonnes are tested to 25% overload on the calculated gross weight and then a certificate is issued.

Acetarc ladles are designed and manufactured to either comply with or exceed British and European standards BS EN 1247;2004+A1:2010.

Equipment is CE certified and is supplied with a letter of conformity where applicable.

Ladles are supplied with an operator's manual in English. Other languages can be offered but may incur translation charges.

All ladles are manufactured to order. We can therefore incorporate any specific details that you require and will be happy to quote accordingly.

The rated capacity for each ladle is based on the data given in the quotation. If the ladles are to be used for metals with different densities or different lining allowances than that stated in the quotation then Acetarc should be informed so that we can make any necessary adjustments to the shell dimensions so that the required working capacity is maintained.

The supply and fitting of all ladle linings and any other refractory materials is excluded from the scope of our supply and is the responsibility of the client.

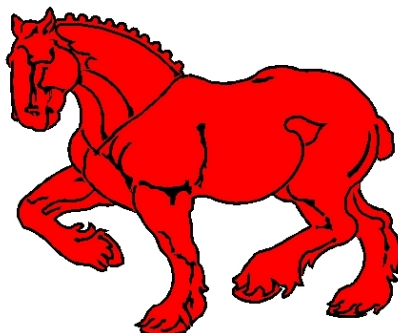
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