Husqvarna®

CRT 36-25
CRT 36-26A

Huskvarna, 2019-12-01

说明书，CN

尊敬的客户：

非常感谢您选择 Husqvarna 的优质产品！我们希望您真正喜欢上我们的产品。

请知悉，随附的说明书中包含有关 Wacker Neuson 的介绍。

Husqvarna Group 为此产品的质量作出担保。

如果您有任何疑问，请随时联系我们当地的销售或服务网点，或访问网站 www.husqvarnacp.com。

Husqvarna AB

SE-561 82 Huskvarna, Sweden

1142220-73

操作员手册

坐式抹平机

CRT36-25
CRT36-26A

类型	CRT36-25, CRT36-26A
文件	5200012432
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语言	ZH

前言

保存这些说明—本手册包含有关以下机器型号的重要指南。这些指南由 Wacker Neuson Production Americas LLC （威克诺森公司）明确发布，在安装、操作和维护机器时必须遵守。

机器	项目号	机器	项目号
CRT 36-26A	0620999	CRT 36-25	0620115
CRT 36-26A	0621000	CRT 36-25	0620295
CRT 36-26A	0621001	CRT 36-25	0620803
CRT 36-26A	0621002	CRT 36-25	0620804

机器文档

- 本手册以此处开始， Wacker Neuson Production Americas LLC （威克诺森公司）将简称为 Wacker Neuson （威克诺森）。
- 请始终将一份操作员手册与机器放在一起。
- 使用机器随附的独立零件手册以订购替换部件。
- 有关维护和维修机器的详细指引，请参考独立的维修手册。
- 若缺失任何这些文件，请联系威克诺森索取或登录 www.wackerneuson.com。
- 订购部件或索取服务信息时，请准备好提供机器型号、项目号、修订号和序列号。

对本手册所载信息的期望

- 本手册提供旨在确保安全操作和维护上述威克诺森机器的信息和程序。为您自身的安全着想并确保减少受伤的风险，请仔细阅读、理解和遵守本手册所述的所有指引。
- 威克诺森明确保留可在不作出通知的情况下进行技术改进的权利，以提升其机器的性能或安全标准。
- 本手册所载信息基于截至本手册出版时生产的机器。威克诺森保留在不作出通知的情况下对相关信息的任何部分进行更改的权利。
- 本手册中的图解、部件和程序均参照威克诺森的原厂安装组件。取决于特定地区的要求，您的机器可能会有所不同。

制造商认可

本手册提及*认可的*部件、附件和修改。以下定义适用：

- **认可的部件或附件**是指由威克诺森生产或提供的部件或附件。
- **认可的修改**是指由威克诺森授权服务中心根据威克诺森出版的书面指南执行的修改。
- **非认可部件、附件和修改**是指不符合认可标准的部件、附件和修改。

非认可部件、附件和修改会导致以下后果：

- 导致操作员和工作区的其他人员严重受伤
- 对机器造成永久性损坏，且不包括在保修范围内

若对认可或不认可的部件、附件或修改有疑问，请立即联系威克诺森经销商。

欧盟一致性声明

我们（Husqvarna AB, SE 561 82 Huskvarna, SWEDEN，电话 +46 36 146500）谨此声明，本产品：

描述	**混凝土磨光机，抹平机**
品牌	HUSQVARNA
类型/型号	CRT 36-26A
标识	序列号自 2019 年起

完全符合以下欧盟指令和法规的要求，我们对此负有唯一的责任：

指令/法规	**描述**
2006/42/EC	“关于机械”
2014/30/EU	“关于电磁兼容性”

并应用以下标准和/或技术参数；

EN 12649:2008+A1:2011

帕蒂勒市，2019 年 12 月 1 日

Martin Huber

Husqvarna AB，建筑事业部
混凝土表面和地面研发总监

技术文档负责人

1 安全信息

1.1 本手册中的警示文字

本手册含有危险、警告、小心、*注意*，及注释等信号文字，必须遵循该等文字的指示，以减少人员受伤、设备损坏或使用不当的可能性。

这是安全警告标志，用于提醒您对潜在人身危险的注意。

► 遵守该符号随附的所有安全信息。

危险

危险表示存在如下危险状况：若不避免该状况，将会导致死亡或重伤。

► 为避免这种危险造成的死亡或严重受伤，遵守此警示文字随附的所有安全信息。

警告

警告表示存在如下危险状况：若不避免该状况，可能会导致死亡或重伤。

► 为避免这种危险可能造成的死亡或严重受伤，遵守此警示文字随附的所有安全信息。

小心

小心表示存在如下危险状况：若不避免该状况，可能会导致轻微或中等伤害。

► 为避免这种危险可能造成的轻伤或中伤，遵守此警示文字随附的所有安全信息。

注意： 注意未与安全警告标志配合使用，它表示存在如下状况 : 若不避免该状况 , 将会导致财产损失。

注释： *注释包含程序的其它重要信息。*

1.2 机器描述和指定用途

本机器属于坐式混凝土磨光抹平机。威克诺森坐式抹平机具有一个框架，其上装有汽油或柴油发动机、燃料箱、水箱、两个由驱动轴连接的齿轮箱及配有控制杆和座位的操作员平台。每个齿轮箱均接有一套金属刀片。环状保护结构环绕着刀片。发动机将通过齿轮箱和离合器机构转动刀片。旋转的刀片在正在养护的混凝土表面作业，形成光滑的表面。坐在操作员平台上的操作员使用控制杆和节流踏板来控制机器的速度和方向。

本机器用于抹平和磨光养护中的混凝土。

本机器针对上述指定用途严格设计和制造。将机器用于任何其它用途可能会永久性损坏机器或严重伤害操作员或该区域的其他人员。使用不当造成的机器损坏不在保修范围内。

以下是使用不当的一些例子：

- 将机器用作梯子、支撑或工作表面
- 使用机器运载或运输人员或设备
- 使用机器磨光不合适的材料，如泥浆、密封层或环氧树脂表面。
- 超出厂方规格范围操作机器
- 以违反机器及操作员手册上载列的所有警告的方式操作机器

本机器依据最新的全球安全标准设计和制造。本机器经过仔细的工程设计以尽可能消除危险，并通过防护罩和标签提高操作员的安全性。但是，采取防护措施后仍可能存在某些风险。它们称为残余风险。在本机器上，这些风险包括：

- 暴露在发动机的高温、噪音、废气以及一氧化碳之下
- 养护中的混凝土产生的化学灼伤
- 暴露在因不当加油导致的火灾危险之下
- 因不当的提升操作导致的燃油、烟雾及燃油喷溅
- 不恰当的提升技巧造成的人身伤害
- 锋利或破损的刀片导致的割伤风险

为保护自己和其他人的安全，确保在操作机器前仔细阅读和明白本手册所载述的安全信息。

1.3 操作安全

若要安全操作机器，必须熟悉机器并接受适当培训。不当操作机器或由
未经培训的人员操作机器非常危险。阅读本手册所载的操作说明，熟悉
所有控件的位置以及如何正确使用控件。经验不足的操作员在获准操作机器前应接受熟悉机器的人员的指导。

操作员资格

只有经过培训的合资格人员才能启动、操作和关闭机器。他们也必须符合以下资格:

- 已接受有关如何正确使用机器的指导
- 熟悉各种必要的安全装备

机器不能由以下人员接触或操作：

- 儿童
- 受到酒精或毒品影响的人员

个人防护装备 **(PPE)**

操作本机器时，穿戴以下个人防护装备 (PPE)：

- 不会阻碍动作的紧身工作服
- 带有侧面防护的护目镜
- 听力保护装备
- 护趾工作鞋

1.3.1 不得将本机用于预期用途以外的应用。

1. 3. 2 不能让未经适当培训的人员操作本机。操作本机的人员必须了解潜在的风险和相关的危险。

1. 3. 3 不能在发动机运行时或关闭后即时接触发动机或消音器。这些区域具有高温，会导致灼伤。

1.3.4 不得使用未经批准的附件操作机器。切勿在缺失皮带护罩的情况下操作机器。外露的驱动皮带和皮带轮非常危险，会造成严重伤害。

1.3.5 绝对不能让机器在没人监管的情况下运行。

1. 3. 6 切勿在室内或密闭区域（如，深沟）内操作机器，除非已通过排气扇或排气管等装置提供足够的通风。发动机废气含有一氧化碳。这是无色无味的有毒气体。暴露在一氧化碳下会导致失去知觉，几分钟即可致命。

1.3.7 始终留意活动的零件，让双手、双脚和宽松的衣物远离机器的活动零件。

1.3.8 操作机器时始终穿上适合工地状况的防护服。

1.3.9 在尝试操作机器前，应阅读、理解并遵循操作员手册中载列的程序。

1.3.10 确保操作员在使用机器前熟悉相关安全预防措施和操作技巧。

1.3.11 不使用机器时，关闭发动机上的燃油阀。

1. 3. 12 不使用机器时，应正确存放。机器应存放在干净、干燥且儿童不能接触的位置。

1. 3. 13 操作机器时，始终确保所有安全装备和防护罩到位并处于良好的工作状态。

防尘措施

施工活动产生的粉尘可能会伤害矽肺或呼吸道。降低接触风险：

- 在通风良好的地方工作
- 使用粉尘控制系统

佩戴经认证的粉尘/颗粒呼吸器

1.4 操作员使用内燃机时的安全事项

警告

内燃机在操作和加油期间存在特殊危险。若不遵守警告和安全标准，可能会导致重伤或死亡。

► 请阅读及遵循发动机用户手册的警告指示和以下安全指南。

危险

发动机排出的废气含有一氧化碳，这是一种致命气体。暴露在一氧化碳下数分钟即可致命。

► 切勿在密闭空间 （如隧道）内操作机器，除非这些空间装有排气扇或排气管以确保适当的通风。

操作安全

运行发动机时：

- 确保排气管周围没有易燃材料。
- 启动发动机前检查燃料管和燃料箱有无泄漏和裂痕。若出现燃料泄漏或燃料管松脱，切勿运行机器。

运行发动机时：

- 操作机器时切勿吸烟。
- 不得在火花或明火附近运行发动机。
- 不得在发动机运行时或刚刚停止后立即触摸发动机或消音器。
- 不得在燃料盖松动或缺失时操作机器。
- 若发生燃料溢出或空气中弥漫燃油气味时，切勿起动发动机。启动前将机器从泄漏区域移开并擦干机器。

加油安全

为发动机加油时：

- 若有燃料溢出，立即清理干净。
- 在通风良好的区域加燃料。
- 加油后，牢固地盖上燃料箱盖。
- 不得吸烟。
- 不能对高温或正在运行的发动机加油。
- 不得在火花或明火附近为发动机加油。
- 使用适当的工具加油 （例如，加油管或漏斗）。
- 当机器放置在带塑料底板衬垫的卡车上时，不得对其加油。静电会点燃燃料或燃料蒸气。

1.5 维修安全

警告

维护不当的机器会造成安全隐患！为确保机器长期安全和正确运行，必须定期进行保养和不时进行维修。

维修培训

维修或维护机器前：

- 阅读和理解与机器一同交付的所有手册内载列的指南。
- 让自己熟悉所有控件和安全装备的位置和正确使用。
- 只有经过培训的人员才能对机器进行故障检修或维修。
- 必要时可联系威克诺森，获取额外的培训。

维修或维护本机器时：

- 不得让未经适当培训的人员对机器进行维修或维护。维修或维护机器的人员必须熟悉相关潜在风险和危险。

个人防护装备 (PPE)

维修或维护本机器时，穿戴以下个人防护装备 (PPE)：

- 不会阻碍动作的紧身工作服
- 带有侧面防护的护目镜
- 听力保护装备
- 护趾工作鞋

此外，在维修或维护机器前：

- 将长头发扎好。
- 脱下所有首饰 （包括戒指）。

1.5.1 不得在机器正在运行时尝试清洁或维修机器。旋转的部件会导致严重的人身伤害。

1.5.2 若汽油发动机的火花塞已拆除，切勿发动该溢油的发动机。汽缸内的燃油会从火花塞口喷出。

1.5.3 若汽油发动机溢油或闻到汽油气味，切勿进行火花测试。火星会点燃汽油蒸汽。

1.5.4 不得使用汽油或其它类型的燃料或易燃溶液清洁零件，尤其是在封闭的区域内。燃料和溶剂的蒸汽会导致爆炸。

1.5.5 始终在进行维护或维修前关闭发动机并拔出钥匙。

1.5.6 小心操作刀片。刀片的边缘可能会变得非常锋利，会导致严重割伤。

1.5.7 确保消音器周围的区域没有任何杂物（如树叶、纸、纸箱等）。高温的消音器会点燃这些杂物，导致火灾。

1.5.8 在机器需要替换零件时，仅使用威克诺森的替换零件或与原装零件的所有规格 （如实际尺寸、类型、强度和材料）相当的零件。

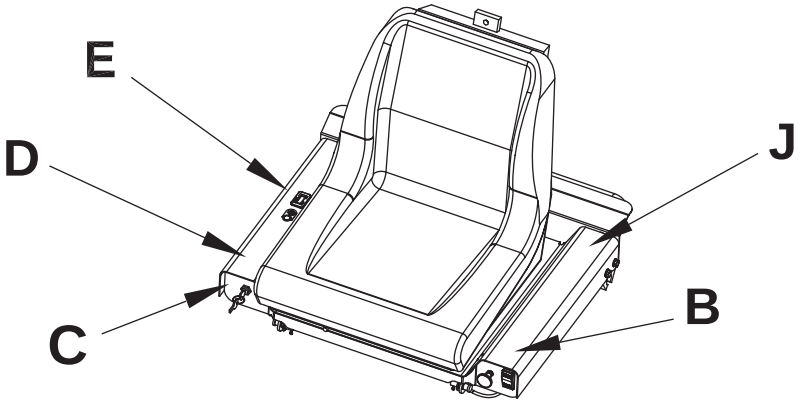
1.5.9 对于配备汽油发动机的机器，在维修前断开火花塞连接，以免意外启动。

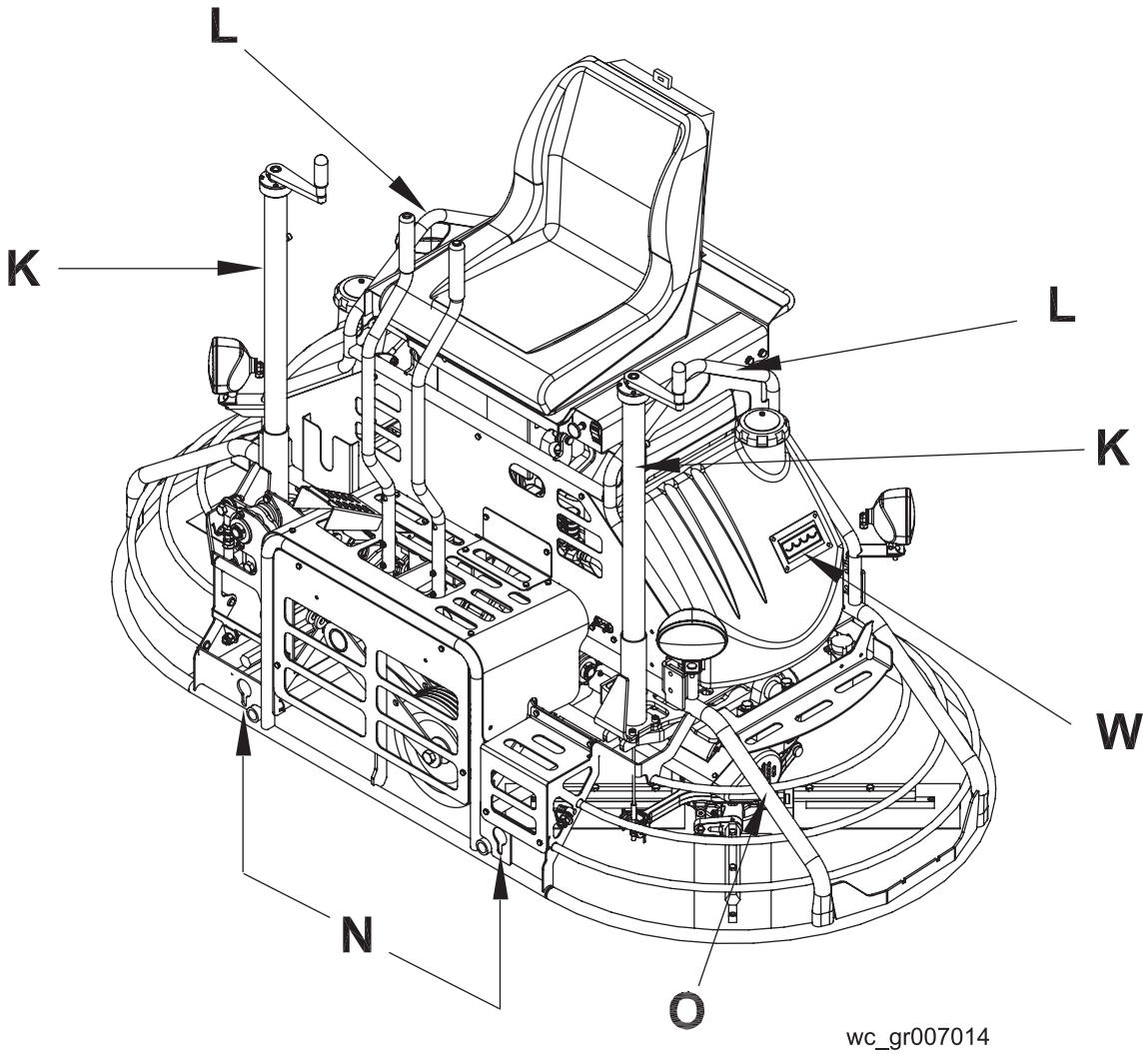
1.5.10 始终在调整或维护电气设备前在断开电池连接时关闭电源。

1.5.11 保持机器清洁和标签清晰可读。更换所有缺失或难以阅读的标签。标签可提供重要的操作指示和关于危险和危害的警告。

2 标签

2.1 标签位置





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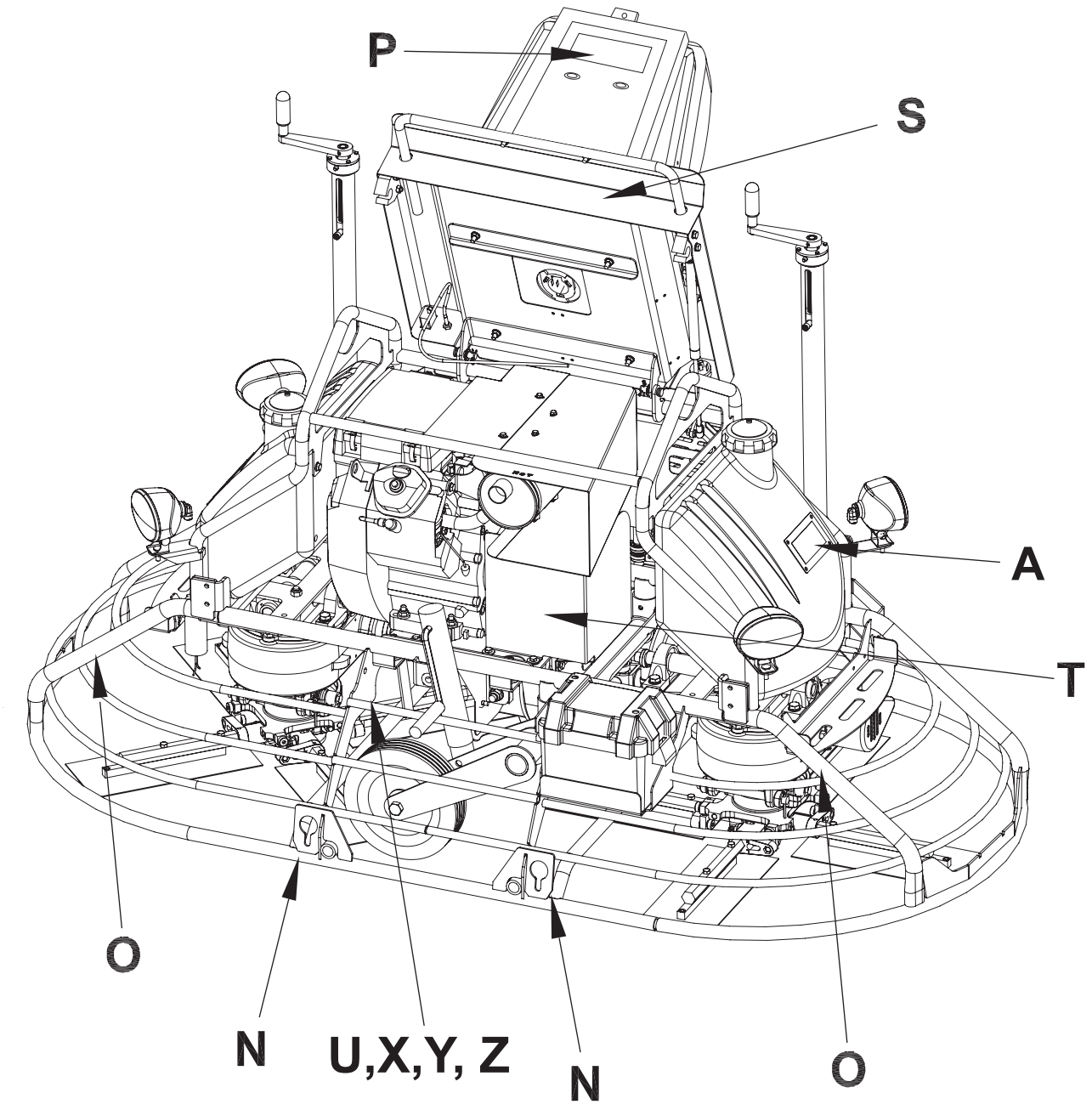

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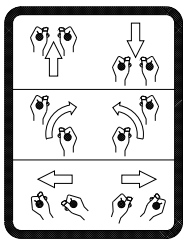
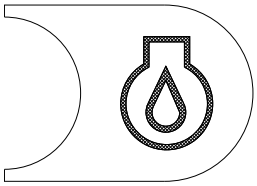
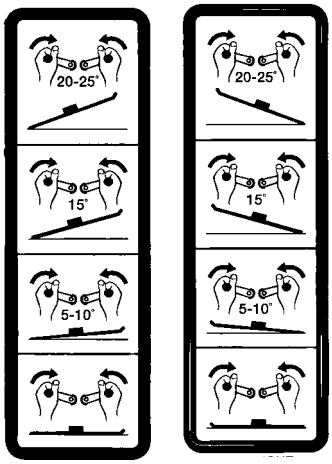
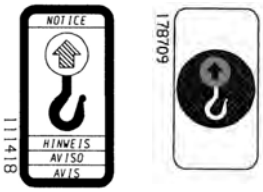
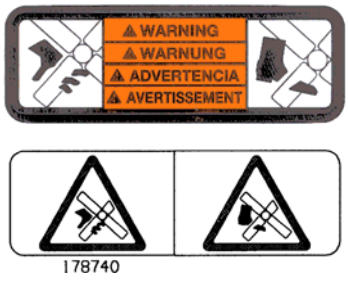
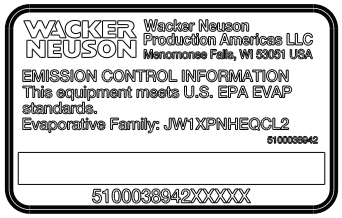
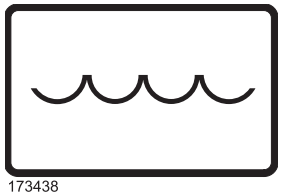
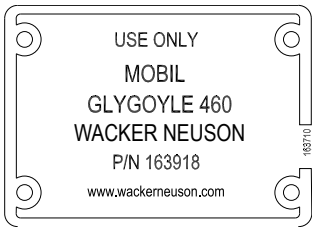
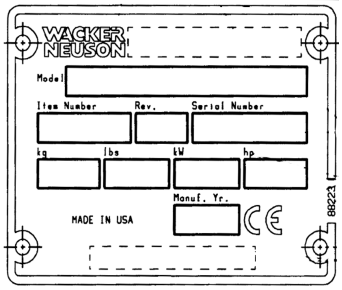
2.2 标签含义

A		危险！ 窒息危险。 ■ 发动机会排放一氧化碳。 ■ 切勿在室内或密闭区域运行机器，除非可通过排气扇或排气管提供充足的通风。 ■ 阅读操作员手册。 ■ 在机器附近不得存在火星、火焰或燃烧的物体。 ■ 加油前关闭发动机。
B		警告！ 为减少失聪和眼睛受伤的风险，操作机器时始终戴上听力保护装备和眼睛保护装备。
C		钥匙开关的位置： ■ ON （开） ■ OFF （关） ■ 发动机曲柄
D		转向控制杆： ■ 向前推两个控制杆以向前移动 ■ 向后拉两个控制杆以向后移动 ■ 向前推左控制杆同时向后拉右控制杆以顺时针旋转 ■ 向后拉左控制杆同时向前推右控制杆以逆时针旋转 ■ 向左移动两个控制杆以向左移动 ■ 向右移动两个控制杆以向右移动
E		检查发动机油位。

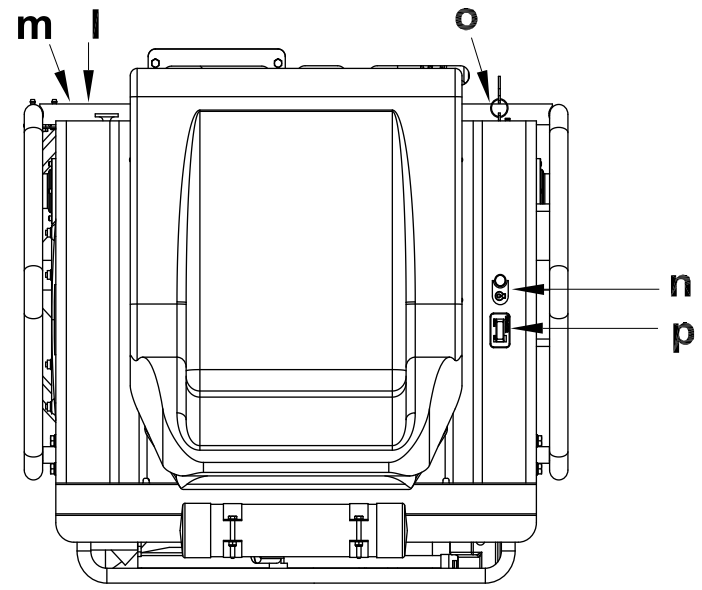
J		警告！ 操作本机器前，阅读和理解所提供的操作员手册。否则会增加您自己和其他人受伤的风险。
K		倾角调整： 若要增大倾角：顺时针旋转左倾角调整，逆时针旋转右倾角调整。 若要减小倾角：逆时针旋转左倾角调整，顺时针旋转右倾角调整
L		注意 提升点
N		系紧点
O		警告！ 割伤危险。让双手和双脚远离活动刀片。

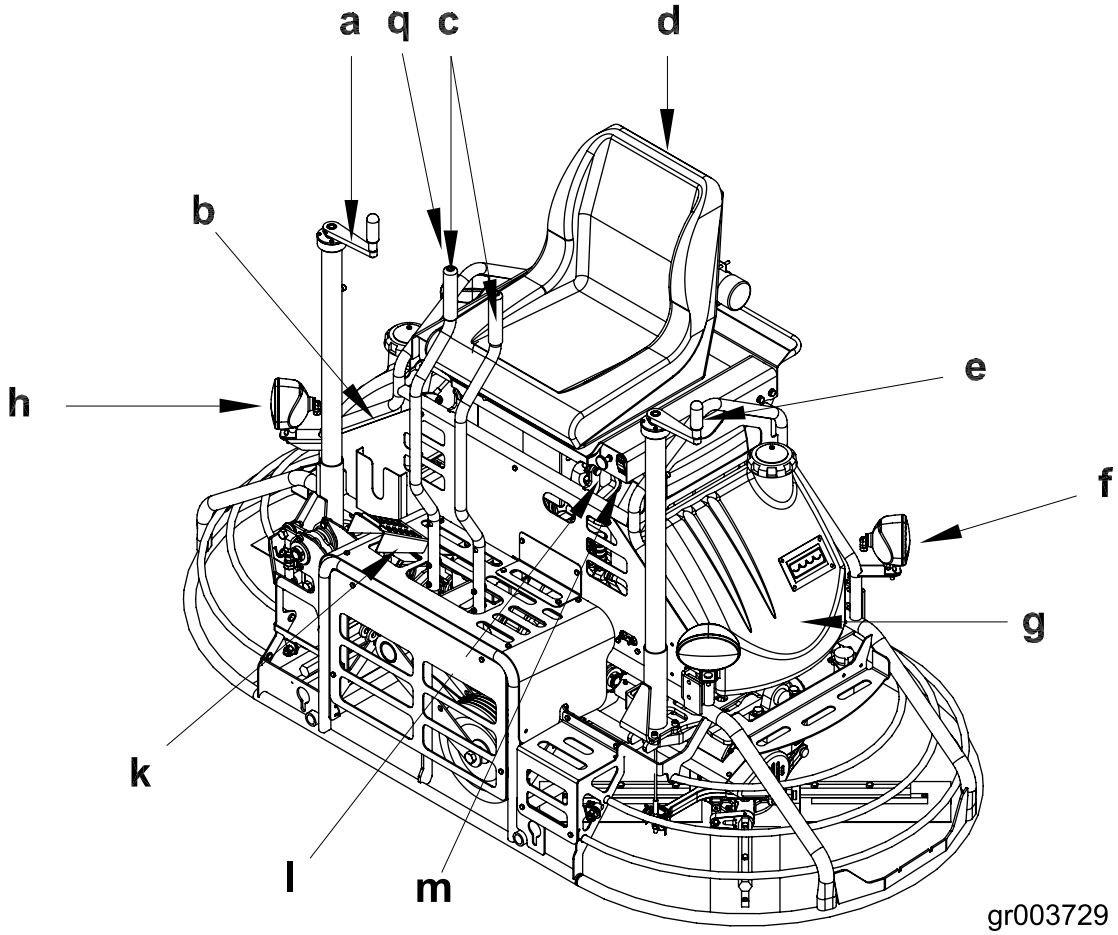
P		操作员手册必须保存在机器上。可通过本地威克诺森经销商索取替换操作员手册。
S		警告！ 表面高温！
T		警告！ 存在被缠住的危险。双手要远离旋转的皮带和滑轮。
U		排放控制信息 本设备符合美国环境保护局 (EPA) 燃油蒸汽控制系统 (EVAP) 标准。 蒸汽系列：JW1XPNHEQCL2
W		水箱注水。仅使用清水或水性阻燃剂。

--		警告！ 从抹平机上卸下抹平盘，然后再将机器吊起。抹平盘有可能会掉落，如果砸中某人会导致死亡或严重伤害。 （标签位于抹平盘的顶部。）
--		在齿轮箱中仅使用 Glygoyle 460 齿轮油。
--		ﾃｿｸ? 睢ｸｶｼｸｽﾓﾐﾁﾐﾊｾﾐﾍｺﾅ。「ﾏ?ｿｱ犲ﾅ。「ﾐﾞｶｩｺﾅｺﾍﾐ? ﾐｺﾅｵﾄﾃ愰ﾆ。」 ﾇ?ﾇﾂｼﾃ愰ﾆﾉﾏｵﾄﾐﾅﾏ「」ｬﾒﾔｱｸﾃ愰ﾆｶｪﾊｧｻ? ? ｵﾊｱｿﾉﾌ盪ｩﾏ犹ﾘﾐﾅﾏ「。」 ｵｱｶｩｹｺﾁ羹?ｻ? ? 。ｷ?ﾎ? ﾅﾏ「ﾊｱ」ｬｻ瞑ｪﾇ? 擎盪ｩﾉ睢ｸｵﾄﾐﾍｺﾅ。「ﾏ?ｿｱ犲ﾅ。「ﾐﾞｶｩｺﾅｺﾍﾐ? ﾐｺﾅ。」
--		本机受一或多个专利保护?
--		加拿大工业ICES-002合规标签：CAN ICES-2/NMB-2

3 操作

3.1 功能和控件





控件位置和功能：

编号	说明	编号	说明
a	右倾角调整	k	脚踏板 （节流控制）
b	燃料箱	l	发动机阻气门控件
c	控制臂	m	工作灯开关
d	配有 “操作员存在”开关的操作员座位	n	油压指示灯
e	左倾角调整	o	发动机钥匙开关
f	后工作灯 （每侧各一个）	p	计时表
g	水箱	q	喷水控件
h	工作灯 （每侧各一个）	—	—

坐式抹平机具有配备了一体化 “操作员存在”系统的座位，可与节流阀安装开关配合使用。此系统允许发动机在操作员不坐在座位上时仍可运行（怠速），前提是节流阀不减压。此系统符合所有安全要求，且无需用脚操作来 “切断开关”。

为了让新操作员熟悉坐式抹平机，应采取以下步骤：

3.1.1 让操作员坐在座位上，向其展示控制臂 **(c)** 的功能以及如何启动机器。

3.1.2 让操作员练习操纵抹平机。用少许水润湿的坚硬混凝土板是操作员练习使用该机器的理想场地。针对这一练习，将前缘的刀片向上提起约 ¼ 英寸的倾角。通过让机器在某一点盘旋来启动机器，然后练习直线驾驶机器以及 180° 旋转。在全转速时将达到**最佳控制**。

3.2 操作员的位置

操作员应负责安全和高效使用本机器。除非操作员始终保持在正确的工作位置，否则，将无法对机器实现完全控制。

操作本机器时，操作员必须：

- 坐在操作员座位上，面朝前方
- 双脚放在控制甲板上
- 双手握住控制杆

3.3 首次使用机器时的准备工作

3.3.1 确保所有松散的包装材料已从机器上移除。

3.3.2 检查机器及所有元件是否有损坏。如果有可见的损坏，请勿启动机器。即时联系威克诺森经销商寻求协助。

3.3.3 清点机器随附的所有项目，确保所有零散的元件和紧固件已齐全。

3.3.4 将未连接的部件连接好。

3.3.5 添加所需及适用的液体，包括燃料、发动机油以及电池酸液。

3.3.6 将机器运送到工作地点。

3.4 推荐的燃料

发动机需要使用常规无铅汽油。仅使用新鲜、干净的汽油。含有水或杂质的汽油会损坏燃料系统。完整的燃料规格，请查阅发动机用户手册。

使用含氧燃料

某些传统汽油混合酒精。这些汽油统称含氧燃料。如果您使用含氧燃料，请确保它是无铅汽油，且满足最低额定辛烷值要求。

使用含氧燃料前，确认燃油的成分。某些州 / 省要求在燃油泵上显示该信息。

以下为威克诺森认可的增氧剂百分比：

乙醇 —— （酒精）：容量的 10%。您可以使用乙醇含量最高占容量 10% 的汽油 （一般称为 E10）。不能使用乙醇含量超过 10% 的汽油（如 E15、 E20 或 E85），因为它会损坏发动机。

如果您注意到任何异常的运行迹象，尝试其他加油站或切换到其他品牌的汽油。

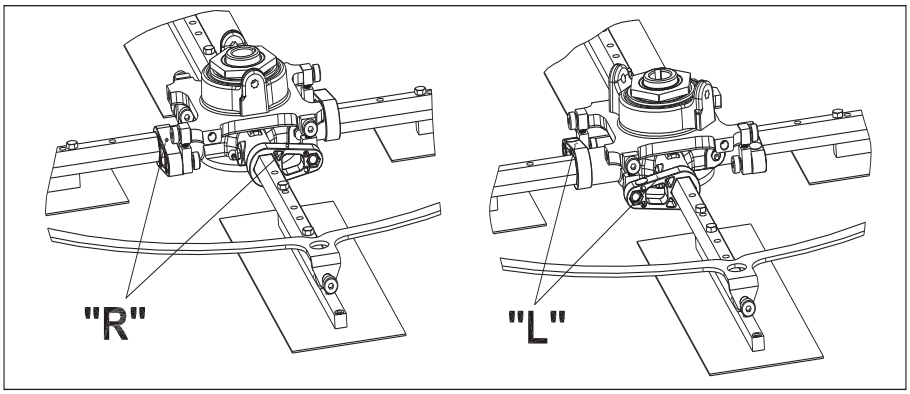
由于使用增氧剂百分比超过上述标准的含氧燃料导致的燃料系统损坏或性能问题不在保修范围内。

3.5 磨合期

3.5.1 为了磨合齿轮箱，在前 24 小时应以 50% 的全节流来运行发动机。这可防止过早磨损并延长齿轮寿命。

***注意*：**在磨合期间以全节流运行发动机可能会导致过早发生齿轮故障。

3.5.2 检查水平刀片倾角链节是否正确组装。坐在机器上时，倾角链节上部前方的右转子有 **“R”**标志，左转子有 **“L”**标志。



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3.6 启动前

启动抹平机前，请检查以下项目：

- 燃料液位
- 发动机的机油油位
- 空气滤清器的状况
- 抹平机臂和刀片的状况

每天润滑抹平机臂。

3.7 启动

在启动前，操作员必须了解所有控件的位置和功能。

3.7.1 踩下节流脚踏板，转动发动机钥匙开关 **(o)** 并保持，直到发动机启动。

注释：如果*发动机冰冷，则完全拔出阻气门控制旋钮。即使在启动温热的发动机时，也需要打开阻气门。*

***注意*：**启动发动机的时间超过 5 秒可能会导致起动器损坏。如果发动机无法启动，松开钥匙开关等候 10 秒，然后再运行起动器。

注释：*发动机有油量警示灯，如果油压过低则会通知操作员。如果发动机不启动，或在运行期间停止，请检查发动机油位。*

3.7.2 在操作抹平机之前，让发动机预热。

3.8 停止

若要使抹平机停止移动，将控制杆返回至空档位置，并松开节流脚踏板。

若要使发动机停止工作，将钥匙开关转到 “O”（关闭）。

3.9 操作

若要以满电量使用威克诺森坐式抹平机，则应向操作员的正前方驱动机器。这将能磨光尽可能宽的区域，同时还能让操作员对要抹平的混凝土板表面拥有绝佳的视野。机器到达混凝土板边缘时，进行 180° 旋转掉头，然后沿着直线方向，向混凝土板的另一端行使。

注释：*在磨合期间，以 50% 的全节流来运行发动机。请参阅“新机器”一节。*

***注意*：切勿**对控制杆施加过大压力。过大压力不能提高机器的反应时间，并且可能会损坏转向控件。

***注意*：**试图在混凝土养护阶段使用抹平机为时过早，可能会导致磨光不理想。仅应由经验丰富的磨光师操作抹平机。

3.10 转向

请参阅下述说明，以了解沿所需方向移动抹平机的所需手动操作。

1 - 向前

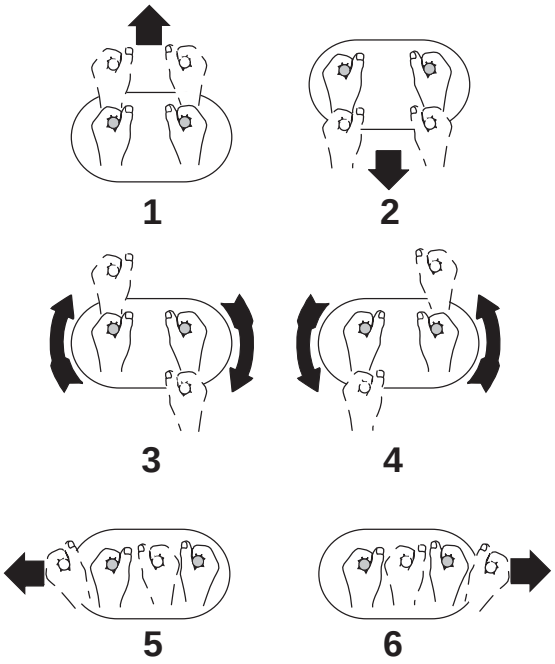
2 - 向后

3 - 顺时针旋转

4 - 逆时针旋转

5 - 左侧

6 - 右侧



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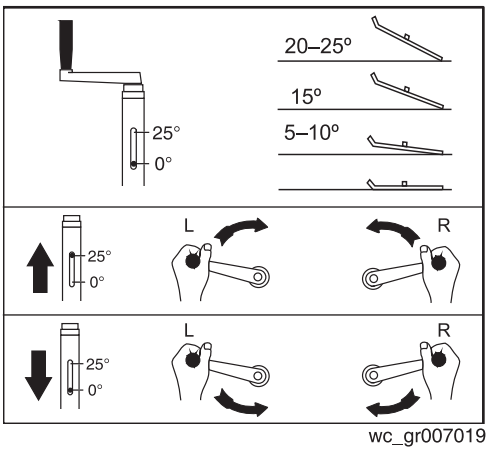
3.11 倾角调整

在更改或设置抹平机刀片倾角 （角度）时，降低发动机的速度，在机器左侧设置所需的倾角，然后调整右侧以使其与左侧相匹配。

若要增大倾角：顺时针旋转左倾角调整 **(L)**，逆时针旋转右倾角调整 **(R)**。

若要减小倾角：逆时针旋转左倾角调整 **(L)**，顺时针旋转右倾角调整 **(R)**。



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混凝土的工作状况	建议的工作倾角
1. 湿面工作阶段	平贴 （无倾角）
2. 湿润至塑性阶段	小倾角
3. 半硬工作阶段	增大倾角
4. 硬面磨光阶段 （抛光）	最大倾角

3.12 紧急关机程序

程序

若机器在工作时出现故障或意外，执行以下程序。

3.12.1 关闭发动机。

3.12.2 关闭燃料阀。

3.12.3 使用轮组将机器从工地移走。

3.12.4 清除刀片和机器上粘附的混凝土。

3.12.5 联系出租公司或机器拥有者以获取进一步指示。

4 保养

4.1 维护排放控制系统

排放控制装置和系统的正常维护、更换或维修可由任何维修机构或个人进行，但保修维修必须由威克诺森授权的经销商 / 服务中心执行。使用在性能和耐用性方面不如授权部件的维修部件会损害排放控制系统的效能，并可能影响保修申索的结果。

4.2 定期保养计划

下表列出了基本的机器维护。标有勾号的任务可由操作员执行。
标有方点的任务需要经过专门的培训和使用专门的设备执行。
关于发动机保养的信息，请参阅发动机操作员手册。

	每日	每 20 小时	每 50 小时	每 100 小时	每 200 小时	每 300 小时
润滑抹平机臂。	■					
检查燃料液位。	✓					
检查发动机油位。[1]	✓					
检查空气滤清器。需要时进行更换。	✓					
检查外部硬件。	✓					
压力冲洗所有表面直至去除所有混凝土。[2]	■					
检查齿轮箱的油位。		✓				
润滑齿轮箱、驱动系统和倾角支撑连接装置。		■				
润滑控制连杆。		■				
检查驱动皮带是否磨损。			✓			
更换发动机机油。[3]				■		
检查燃料过滤器。				✓		
清洁和检查火花塞。					■	
更换滤油器。					■	
更换火花塞。						■
更换燃油过滤器。						■
更换齿轮箱中的机油。						■

[1] 每天检查 2 次发动机机油 （每 4 小时）。
[2] 使用后立即进行压力冲洗。
[3] 在首次工作 20 小时后更换发动机机油。

4.3 抹平机齿轮箱

每工作 20 小时后检查齿轮箱的油位是否正确。每 300 小时更换一次齿轮箱机油。

油位检查方法：

每个 CRT 齿轮箱均配备 2 个加油塞。取下 1 个齿轮箱加油塞 **(b)**。如果油位低于加油塞小孔的螺纹，则通过此开口加入合成齿轮油。切勿加油过量。擦干齿轮箱和加油塞的螺纹，在加油塞的螺纹上使用乐泰 （Loctite）545 或同等级别的机油，更换加油塞，并以 16 – 20 牛顿米 （12 – 15 英尺磅）的扭矩拧紧。

***注意*：切勿**使用混合类型的齿轮油。**切勿**对齿轮箱加油过量。如果齿轮油为混合油或者齿轮箱加油过量，那么可能会损坏齿轮箱。有关机油的数量和类型，请参阅*技术参数*。

齿轮油换油方法：

4.3.1 每个齿轮箱下面放一个足够大的容器 （约 3.8 升 [1 加仑]）。

4.3.2 取下齿轮箱排油塞 **(c)** 让油排干。可能需要取下齿轮箱加油塞以促进排油。在大部分机油排出后，向上提起抹平机的背部，以便残余机油得以排出。

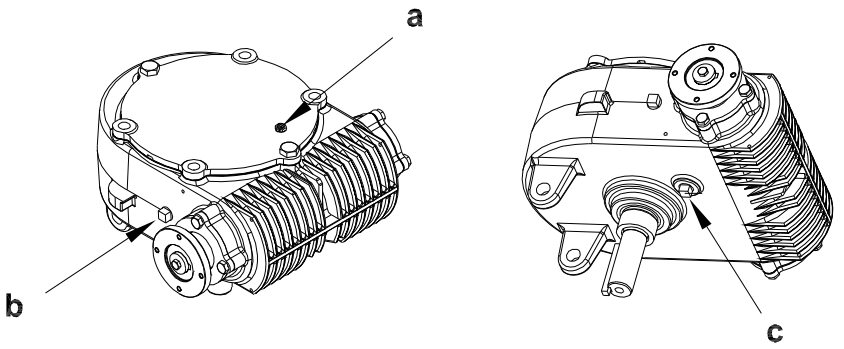
4.3.3 在排出所有机油后，擦干齿轮箱和排油塞的螺纹，在排油塞的螺纹上使用乐泰 （Loctite）545 或同等级别的机油，并更换齿轮箱排油塞。

注释：*根据环保法规处置使用过的齿轮油。*

4.3.4 按照上述指示，根据抹平机油位，通过加油塞向齿轮箱注入约 1.83 升（62 盎司）的合成齿轮油。

4.3.5 擦干齿轮箱和加油塞的螺纹，在加油塞的螺纹上使用 Loctite 545 或同等级别的机油，更换加油塞，并以 16 – 20 牛顿米（12 – 15 英尺磅）的扭矩拧紧所有塞子。

每个齿轮箱都有一个泄压阀 **(a)**，随着时间的推移，该阀可能会堵塞。需要时进行检查或更换。未能更换泄压阀可能会导致齿轮箱轴封泄漏机油。



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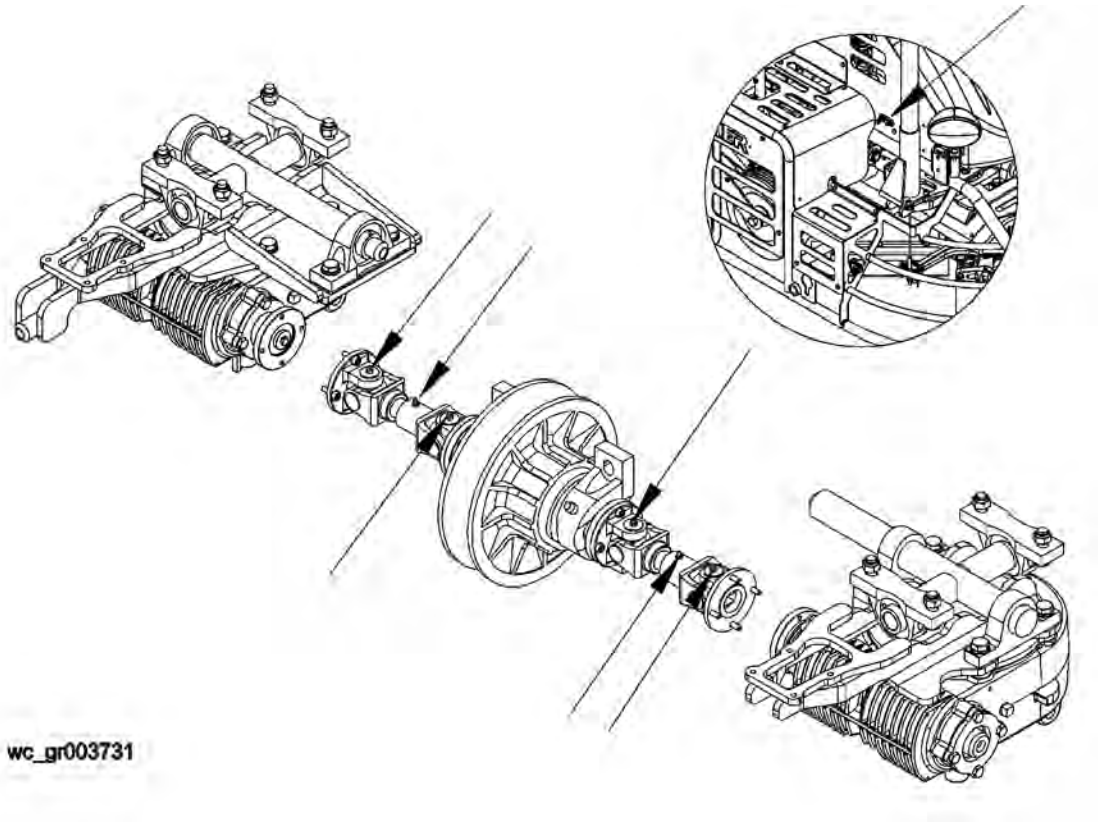
4.4 控制连杆润滑

驱动系统、齿轮箱和倾角支撑配有若干润滑连接装置。每周、或每 20 小时对这些连接装置进行一次润滑，以防止磨损。

使用通用润滑脂向每个连接装置注射 1 到 2 次。



4.5 控制臂调节 （向前或向后）

控制臂应均匀地排成一条直线。如果不能调节控制臂，可按照以下方式向前或向后重新调节：

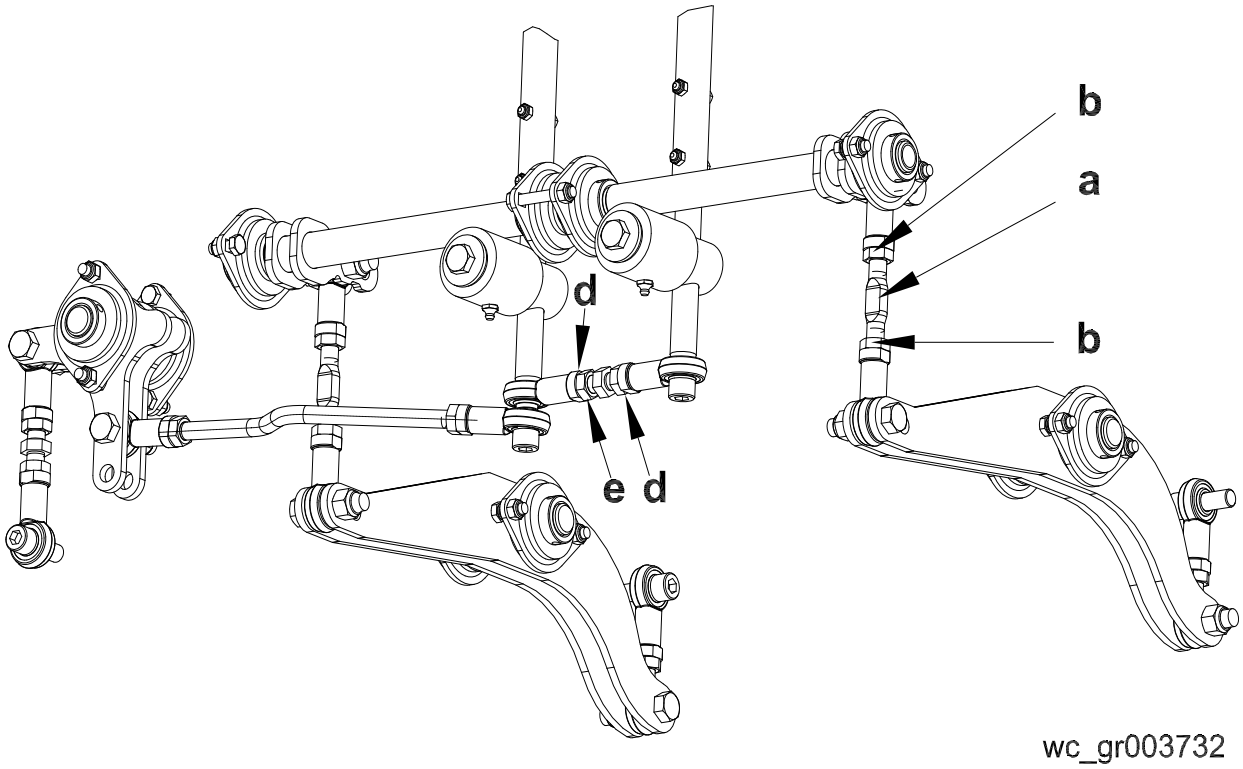
4.5.1 松开止动螺母 **(b)**。

4.5.2 按照以下方式转动垂直连杆 **(a)**：

- 拉长连杆以向前调节控制杆。在拉长连杆前请参见第 4.5 节。
- 缩短连杆以向后调节控制杆。

4.5.3 在将控制臂调节到所需位置后，拧紧止动螺母 **(b)**。

注释：控制臂的调节可作为转向辅助系统的一部分。更改控制臂的方向可能会影响转向效果。



4.6 右侧控制臂调节 （右或左）

应将控制臂设为完全垂直状态。如果要调节控制臂，可按照以下方式调节：

4.6.1 松开止动螺母 **(d)**。

4.6.2 降低水平连杆 **(e)** 以远离支架。

4.6.3 缩短连杆以向左移动控制臂。

4.6.4 拉长连杆以向右移动控制臂。

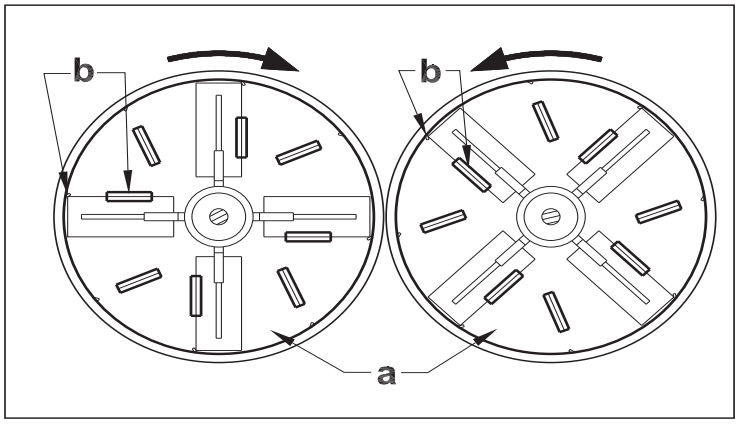
4.6.5 在将控制杆调节到所需位置后，重新装配螺母和螺栓 **(c)** 并拧紧止动螺母 **(d)**。

4.7 安装抹平盘

某些应用可能需要使用抹平盘。可提供可选的抹平盘 **(a)**，并仅能与非重叠配置下的机器配套使用。

安装抹平盘的方法：

从地面提起抹平机，在这之前，抹平机的**发动机关闭**，抹平盘与刀片相对。向右或向左转动抹平盘以形成夹角 **(b)**，如下图所示。请记住，逆时针转动右侧的抹平机刀片，顺时针转动左侧的抹平机刀片。



wc_gr000151

4.8 运输抹平机

警告

始终在移动或运输机器前关闭发动机并拔出钥匙。

吊升抹平机的方法：

将吊索或吊链连接到座位底座两侧的提升杆 **(a)**。

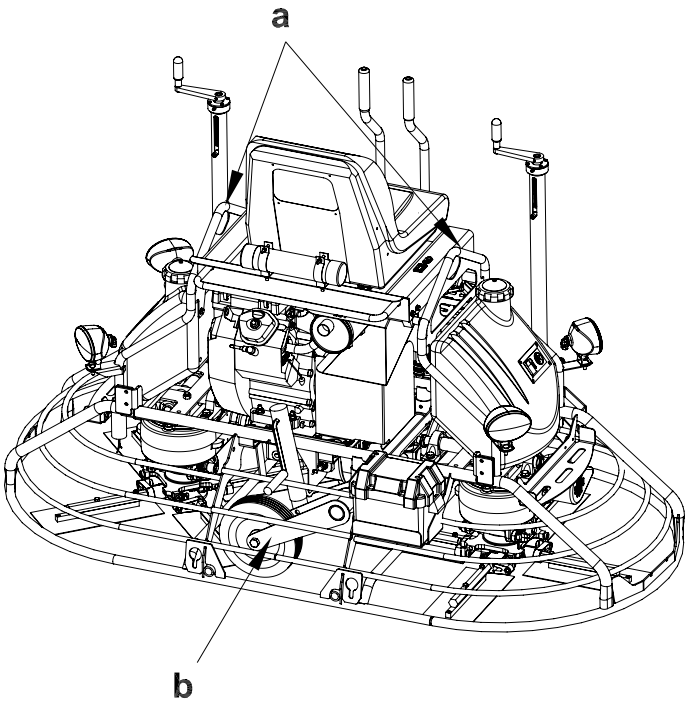
***注意*：**确保提升设备具有足够的承重能力，能够安全提升机器。请参阅*技术参数*一节。

警告

切勿通过环状保护结构或抹平机的任何部位而非提升装置来提升抹平机，因为该组件可能会损坏，导致机器掉落，可能会伤及旁人。

如果配备了可选的一体化轮组 (b)：

从机器的后部，使用千斤顶手柄将刀片升到离地面 76-102 毫米 （3-4 英寸）处。使用上框架推动机器。



wc_gr003733

4.9 驱动带

若要更换驱动皮带：

4.9.1 将抹平机放在平坦的水平表面，刀片倾角水平。

4.9.2 关闭发动机并断开电池连接。

4.9.3 卸下皮带护罩。

4.9.4 从每个轴承凸缘上卸下 2 个螺栓 **(a)**、垫圈 **(b)** 和螺母 **(c)**。

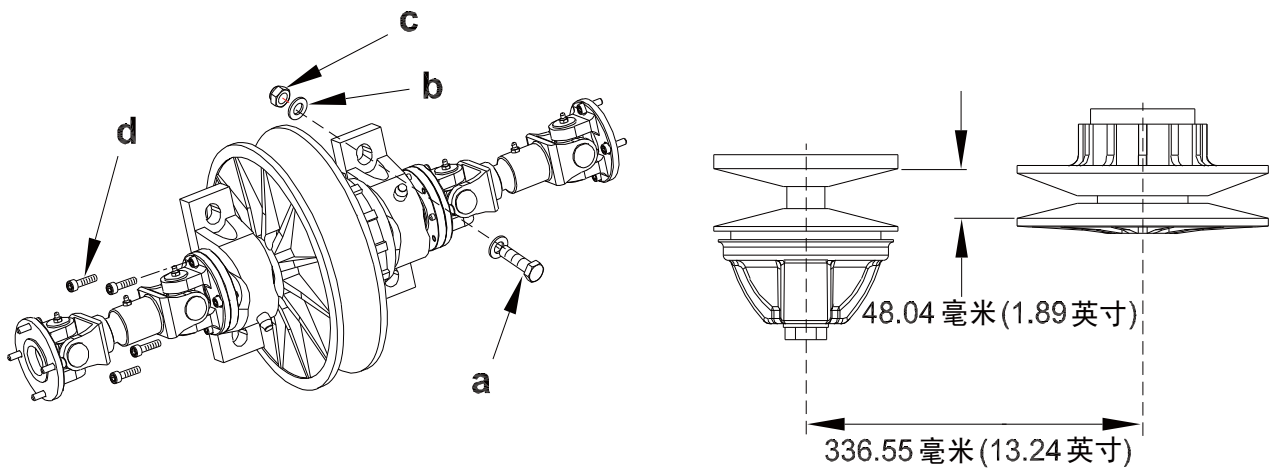
4.9.5 卸下将每个内部通用接头固定到轴配件的 4 个螺栓 **(d)**。从驱动轴两端卸下通用接头和垫片 （若包括）。

4.9.6 将驱动滑轮提升足够的高度，以便皮带穿过。

4.9.7 取下旧皮带并安装新皮带。

4.9.8 按相反的程序进行组装。使轴承和轴对齐，尽可能地处于同一直线。将滑轮偏置和中心距离调整到如下所示的值。

4.9.9 用 99±10 英尺磅的扭矩拧紧轴承螺栓 **(a)**。用 10±1 英尺磅的扭矩拧紧通用接头 **(d)**。



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4.10 电池跨接程序

也许需要不时地跨接电量不足的电池。如果需要跨接，建议使用以下程序以防止起动器损坏、电池损坏以及人身伤害。

危险

不正确地跨接电池可能会导致电池爆炸，从而导致严重的人身伤害或死亡。切勿在电池附近吸烟或出现点火源，不要跨接拒充电池。

警告

电弧可导致严重的人身伤害。切勿让电缆的正负极相接触。

4.10.1 断开发动机负载连接。

4.10.2 使用与发动机具有相同电压的电池 (12 伏特)。

4.10.3 将正极充电电缆（红色）的一端与充电电池的正极 (+) 端子相连接。将另一端与发动机电池的正极端子相连。

4.10.4 将负极充电电缆 （黑色）的一端与充电电池的负极 (-) 端子相连接。将负极电缆的另一端与发动机上的实心底盘接地相连。

注意: 以其他任何方式跨接都可能会导致电池或电气系统损坏。

4.10.5 踩下节流脚踏板，转动发动机钥匙开关并保持，直到发动机启动。

注意: 启动发动机的时间超过 5 秒可能会导致起动器损坏。如果发动机无法启动，松开钥匙开关等候 10 秒，然后再运行起动器。

注意: 在使用照明灯或高电流牵引配件时，让发动机怠速运行 20 分钟，以便使电池进入充电状态。

4.11 火花塞

必要时清洁或更换火花塞，以确保正常运行。请参阅发动机用户手册。

注释： *有关建议的火花塞类型和电极间距设置，请参阅 “技术参数”。*

警告

在运行过程中，消音器和发动机汽缸会变得非常热，在关闭发动机后一段时间内，仍将保持高温。取下火花塞前，先让发动机冷却。

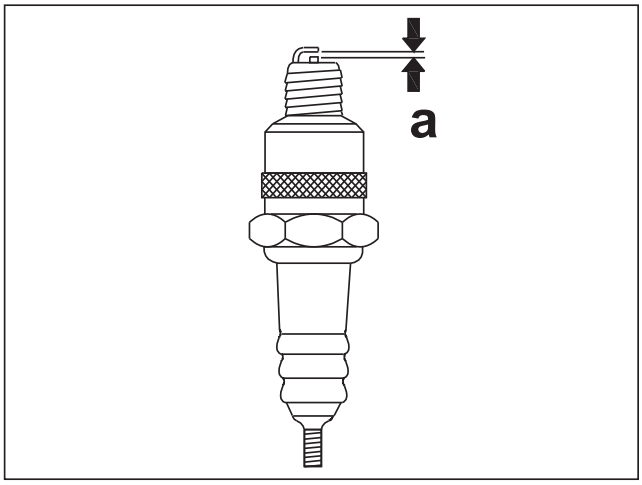
4.11.1 取下火花塞并进行检查。

4.11.2 若绝缘体破裂或有缺口，更换火花塞。使用钢丝刷清洁火花塞电极。

4.11.3 设置电极间距 **(a)**

4.11.4 牢固地拧紧火花塞。

注意： 松脱的火花塞可能带有高温，导致发动机损坏。



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4.12 空气滤清器

发动机配备双滤芯空气滤清器。定期维修空气滤清器，以防化油器故障。

***注意*: 切勿**在没有空气滤清器的情况下运行发动机。这会导致发动机严重损坏。

警告

切勿使用汽油或其他类型的低燃点溶剂清洁空气滤清器。这可能造成火灾或爆炸。

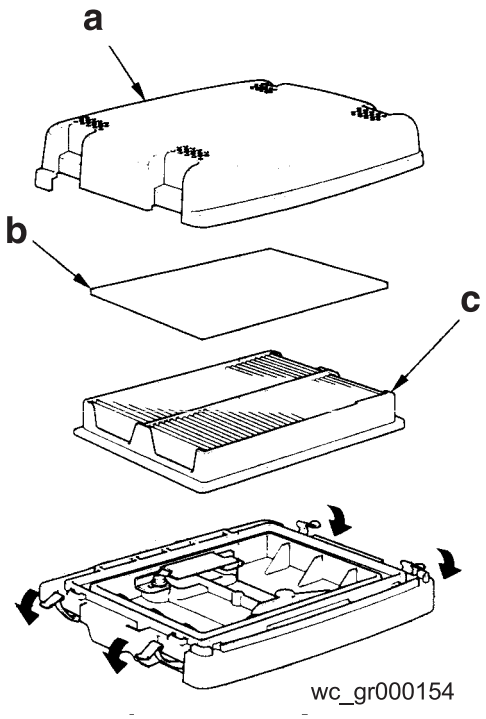
若要进行维护：

4.12.1 移开空气滤清器盖 **(a)**。取下两个滤芯（**b**、**c**），查看有无穿孔或破损。更换损坏的滤芯。

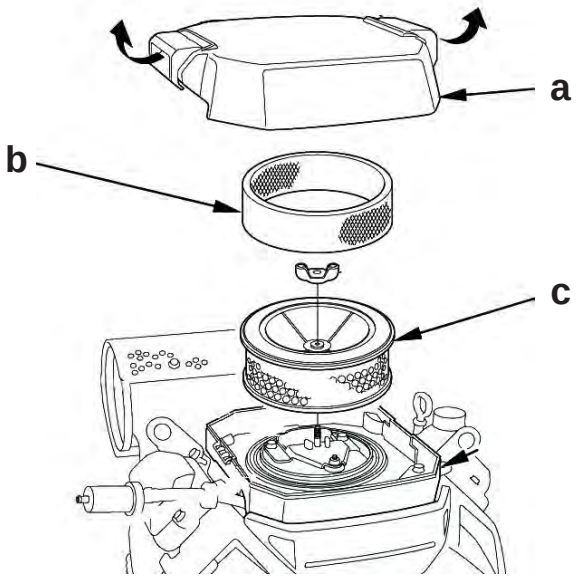
4.12.2 用温和溶剂和温水溶液清洗泡沫滤芯 **(b)**。用干净的水彻底冲洗。让滤芯完全变干。

切勿给泡沫滤芯上油。

4.12.3 轻拍纸滤芯 **(c)** 以清除尘埃。若纸滤芯严重受污，更换纸滤芯。



wc_gr000154



wc_gr008243

4.13 发动机机油和过滤器 （本田发动机）

当发动机还处于温暖状态时进行排油。

4.13.1 取下加油口盖 **(a)** 和排油塞 **(b)**，排干机油。

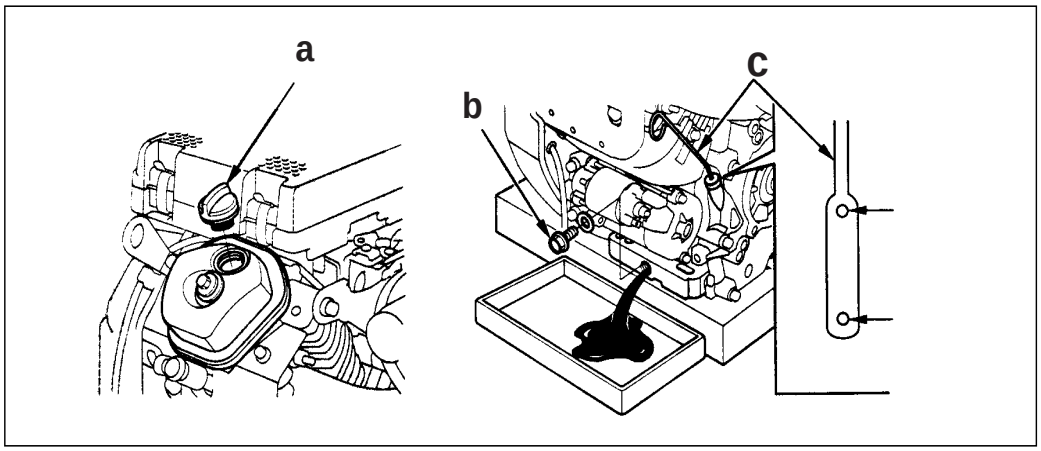
注释：*为保护环境，应在机器下方放置塑料膜和容器，以收集排出的任何液体。根据环保法规处置该液体。*

4.13.2 装上排油塞并拧紧。

4.13.3 将推荐的机油注入发动机曲轴箱，直至油位达到油标尺 **(c)** 的上限标记。

4.13.4 牢固地装上加油口盖和油标尺。

4.13.5 取下前基座板以接触滤油器。若要更换滤油器，在排干机油后取下已安装的滤油器。给更换的滤油器橡胶衬垫涂上一层干净的机油。上紧滤油器直至其接触到滤油器适配器，然后在转动 22.24 毫米 （7/8 英寸）。按上述指示重新加满机油。



wc_gr000155

警告

大部分用过的油都含有少量有害物质，若吸入、咽下或长时间接触皮肤，会导致癌症或其他健康问题。

- ▶ 采取措施避免吸入或咽下用过的发动机油。
- ▶ 若皮肤接触到发动机油，彻底清洗皮肤。

4.14 发动机机油和过滤器 （威克诺森发动机）

在发动机还是温暖的时候排出机油。排干机油的方法：

4.14.1 取下加油口盖 **(a)** 和排油盖 **(d)**。将机油排入适合的容器。

注释：*为保护环境，在机器底部放置塑料膜和容器以收集排出的液体。以恰当的方式处置排出的液体。*

4.14.2 重新插入排油盖并拧紧。

4.14.3 将推荐的机油注入发动机，直至油位达到油标尺 **(c)** 的上限标记。有关油量和机油类型，请参阅*技术参数*一节。

警告

灼伤危险。在排出高温机油时一定要倍加小心。高温的机油会导致烫伤！

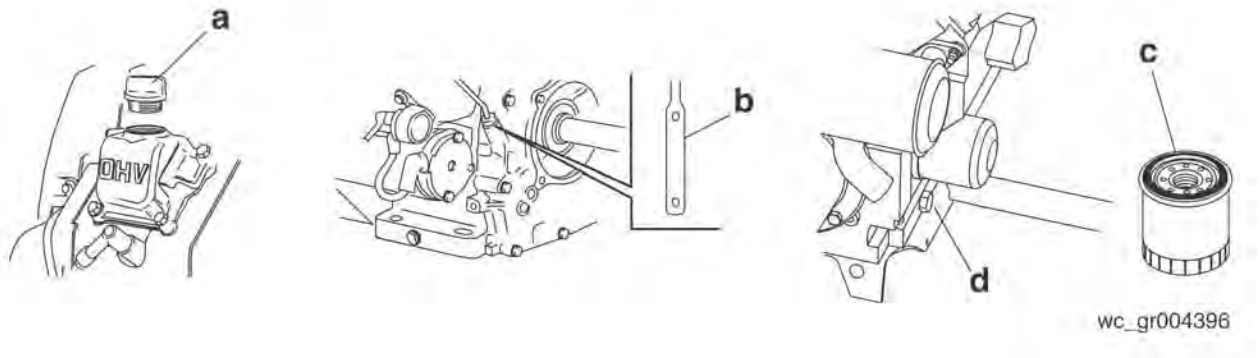
更换过滤器的方法：

4.14.4 排出发动机机油。取下使用过的过滤器。

4.14.5 在安装新过滤器前，使用新鲜、干净的发动机机油略微浸润过滤器衬垫 **(c)**。用手上紧过滤器直至其接触到衬垫，然后再拧紧 7/8 圈。

4.14.6 用推荐的机油灌注发动机。有关油量和机油类型，请参阅*技术参数*一节。

4.14.7 启动并运行发动机，检查是否漏油。关闭发动机。重新检查油位，如果需要可进行加油。请参阅发动机用户手册。



警告

大部分用过的油都含有少量有害物质，若吸入、咽下或长时间接触皮肤，会导致癌症或其他健康问题。

- ▶ 采取措施避免吸入或咽下用过的发动机油。
- ▶ 若皮肤接触到发动机油，彻底清洗皮肤。

4.15 存放机器

时间

若机器将要存放超过 30 天，则按照以下程序进行。

保养机器

准备长期存放机器的方法：

4.15.1 排空燃料箱和水箱。

4.15.2 更换发动机机油。

4.15.3 保养发动机 （请参见下文）。

4.15.4 清洁整台抹平机和发动机室。

4.15.5 清除发动机汽缸和风扇外壳的散热片上的灰尘。

4.15.6 将电池从机器中卸下并定期充电。

4.15.7 盖住整台机器并放置在干燥、受保护的区域。

保养发动机

- 如果您的机器配备柴油发动机，请查阅发动机用户手册以获取保养说明。
- 如果您的机器配备汽油发动机：

4.15.8 断开点火电线与火花塞的连接。取下火花塞。

4.15.9 通过火花塞开口向每个发动机汽缸注入约 30 毫升 （1 盎司）的 SAE 30W 机油。

4.15.10 重新装上火花塞，但是要断开点火电线以防止发动机启动。

4.15.11 启动发动机 1 或 2 秒，以分配发动机汽缸内的机油。

4.15.12 重新连接点火电线。

4.16 故障检修

问题	原因	解决方法
发动机不启动。	发动机问题。	请查阅发动机制造商维修手册。
机器失衡；剧烈颤动。	操作员转向过度。	每个齿轮箱的移动由 “挡块”控制，以便提供正确的控制臂移动与机器移动关系。控制臂任何方向上的过大压力不但不能提高反应时间，还可能会损坏转向控件，从而导致机器颤动。
	抹平机臂弯曲。	更换抹平机臂。
	抹平机刀片弯曲。	更换抹平机刀片。
	由于机器掉落造成的主轴弯曲。	更换主轴。
处理不当；控制杆移动范围过大。	由于缺乏润滑而导致的衬套磨损。	更换衬套，至少每 20 小时润滑一次。
	控制臂杆调整发生变化或控制臂弯曲。	重新设定控制臂杆。
	下部控制臂弯曲。这可能由机器掉落造成。	更换下部控制臂。使用机器上随附的提升支架和 / 或叉车槽提升机器。

问题	原因	解决方法
机器无法移动。	驱动皮带破损。	更换驱动皮带。
	刀片底部和混凝土表面之间存在真空。	改变刀片倾角来打破吸入口。
	主轴轴键变形。	更换损坏的轴键。
抹平机发出噪音。	抹平机刀片不对齐，在旋转时彼此触碰。	更换损坏的刀片。对齐刀片以便从上面观察时一套刀片呈 (+) 形，另一套则呈 (x) 形。
	键变形。	检查驱动系统的所有键。
	松动离合器。	拧紧离合器。

5 技术参数

5.1 发动机

发动机额定功率

净额定功率符合 SAE J1349 标准。实际功率输出可根据具体使用条件变化。

零件号		CRT 36-26A	CRT 36-25
发动机			
发动机制造商		本田	威克诺森
发动机型号		GX690	WM720
额定转速时的最大额定功率	千瓦 （马力）	16.6 (22.2) （3600 转 / 分钟时）	18.6 (25) （3600 转 / 分钟时）
排量	厘米 ^{3} (英寸 ^{3})	690 (42)	720 (44)
火花塞		NGK ZFR5F DENSO KJ16CR	NGK BPR4EY
电极间距	毫米 （英寸）	0.70 (0.028)	
发动机转速 - 运行	转 / 分钟	3850	
发动机转速 - 怠速	转 / 分钟	1400	
电池	伏 / 尺寸	12 / 340CCA	
燃料	类型	常规无铅汽油	
燃料箱容量	升 （加仑）	24.6 (6.5)	
燃料消耗量	升 （夸脱） / 小时	9 (9.5)	
运行时间	小时	3.3	
离合器	类型	变速	
发动机机油容量	升 （夸脱）	2 (2.1)	1.9 (1.8)
发动机润滑	机油等级	SAE 10W30 API CF-4、 CF、 SJ	

5.2 抹平机

零件号		CRT 36-26A	CRT 36-25
抹平机			
操作重量 **不带轮组** **带轮组**	公斤 （磅）	 373 (830) 392 (865)	 376 (835) 395 (870)
尺寸 （长 x 宽 x 高）	毫米 （英寸）	2042 x 1041 x 1372 (80 x 41 x 54)	
转子转速 （范围）	转 / 分钟	25–165	
刀片倾角 （范围）	度	0-25	
齿轮箱	类型	重载	
齿轮箱润滑	类型	Mobil Glygoyle 460 （美孚格高 460）	
	升 （盎司）	每个 1.83 (62)	
驱动轴	类型	花键通用接头	

操作		
抹平宽度 **带抹平盘** （非重叠） **不带抹平盘** （非重叠）	毫米 （英寸）	 1975 (78) 1905 (75)
抹平区域 **带抹平盘** （非重叠） **不带抹平盘** （非重叠）	米^2 （英尺^2）	 1.8 (19) 1.6 (18)

5.3 声音和振动规范

根据附录 1 （欧盟机械法规 2006/42/EC 指令）的要求，要求的声音规格为：

- 操作员位置的声压级 (L_{pA})：91.2 dB(A) (CRT 36-26A) 和 91.7 dB(A) (CRT 36-25)。
- 保证的声功率级 (L_{WA})：104.7 dB(A) (CRT 36-26A) 和 108.6 dB(A) (CRT 36-25)

这些声音值分别根据适用的标准在操作员的位置测定，声功率级 (L_{WA}) 为 ISO 3744，声压级 (L_{pA}) 为 ISO 11204 。

根据 ISO 5349-1 和 ISO 2631 测得的加权加速度有效值为：

- 对于全身：0.215 米/秒^2 (CRT 36-26A) 和 0.316 米/秒^2 (CRT 36-25)。
- 或手部/手臂：1.81 米/秒^2 (CRT 36-26A) 和 1.72 米/秒^2 (CRT 36-25)。

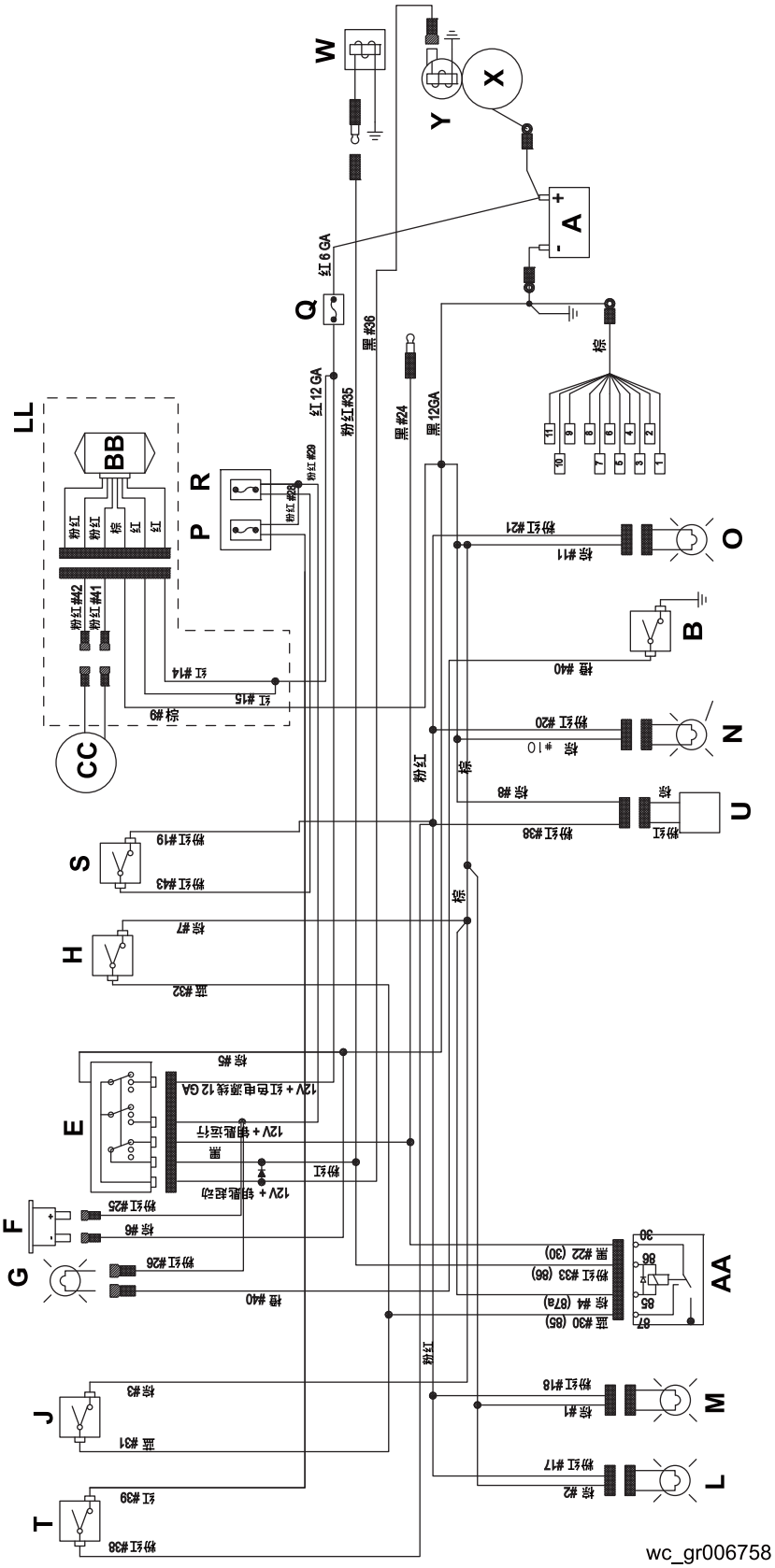
声音和振动规格是在设备以标称发动机转速在完全养护的湿润混凝土表面操作的条件下获得。

振动不确定度

手传振动根据 ISO 5349-1 测量。该测量带有 1.5 米/ 秒^2 的测量不确定度。

全身振动根据 ISO 2631-1 测量。该测量带有 0.3 米/秒^2 的测量不确定度。

6 原理图



6.1 原理图组件

编号	说明	编号	说明
A	电池	U	喷水泵电机
B	油压开关 （双路）	V	发动机连接器
C	燃料泵	W	燃料关闭螺线管
D	燃料泵继电器	X	起动器电机
E	钥匙开关	Y	发动机发动螺线管
F	计时表	Z	预热塞保险丝
G	油压指示灯	AA	继电器 - 安全系统
H	操作员存在开关（常开）	BB	稳压器
J	节流阀感应开关（常闭）	CC	交流发电机
K	无极继电器	DD	预热塞温度传感器
L	右前灯	EE	预热塞
M	右后灯	FF	键控电源保险丝
N	左后灯	GG	温度传感器
O	左前灯	HH	线圈 - 点火
P	保险丝 - 喷水系统	JJ	点火模块
Q	保险丝 - 主机	KK	发动机速度传感器
R	保险丝 - 照明电路	LL	外部稳压器 (仅限本田发动机)
S	照明开关	MM	预热塞继电器
T	喷水泵开关	—	—

Important: For spare parts information, please see your Wacker Neuson Dealer, or visit the Wacker Neuson website at http://www.wackerneuson.com/.

Wichtig! Informationen über Ersatzteile erhalten Sie von Ihrem Wacker Neuson Händler oder besuchen Sie die Wacker Neuson Website unter http://www.wackerneuson.com/.

Important : Pour des informations sur les pièces détachées, merci de consulter votre distributeur Wacker Neuson, ou de visiter le site Internet de Wacker Neuson sur http://www.wackerneuson.com/.

Importante : Para saber más sobre las piezas de repuesto, póngase en contacto con su distribuidor de Wacker Neuson o acceda al sitio web de Wacker Neuson en http://www.wackerneuson.com/.

Importante : Per informazioni sui pezzi di ricambio, contattare il rivenditore Wacker Neuson o visitare il sito di Wacker Neuson all'indirizzo www.wackerneuson.com.

Viktigt : För information om reservdelar, kontakta din Wacker Neuson-leverantör eller besök Wacker Neusons webbplats på http://www.wackerneuson.com/.

Tärkeää : Pyydä varaosatietoja Wacker Neusonin jälleenmyyjältä tai vieraile Wacker Neusonin web-sivustolla osoitteessa http://www.wackerneuson.com/

Viktig : For informasjon om reservedeler, vennligst kontakt din Wacker Neuson-forhandler, eller besøk Wacker Neusons nettside på http://www.wackerneuson.com/.

Vigtigt : Hvis du ønsker oplysninger om reservedele, bedes du kontakte din Wacker Neuson forhandler eller besøg Wacker Neuson websiden på http://www.wackerneuson.com/.

Belangrijk! Neem contact op met uw Wacker Neuson dealer of bezoek de website van Wacker Neuson op http://www.wackerneuson.com/ voor meer informatie over reserveonderdelen.

Importante : Para obter informações sobre as peças sobresselentes, consulte o seu fornecedor da Wacker Neuson ou aceda ao site Web da Wacker Neuson em http://www.wackerneuson.com

Ważne : W celu uzyskania informacji na temat części zamiennych skontaktuj się z przedstawicielem firmy Wacker Neuson lub skorzystaj z witryny internetowej http://wackerneuson.com/.

Důležité upozornění! Pro informace o náhradních dílech, prosím, kontaktujte svého Wacker Neuson dealera, nebo navštivte webové stránky http://www.wackerneuson.com/.

FONTOS: A pótalkatrészekre vonatkozó információkért kérjük, forduljon Wacker Neuson kereskedőjéhez vagy látogasson el a Wacker Neuson weboldalára a következő címen: http://www.wackerneuson.com/.

Важно! Для ознакомления с информацией о запасных частях, пожалуйста, обратитесь к местному торговому представителю компании Wacker Neuson или посетите веб-сайт http://www.wackerneuson.com/.

Σημαντικό : Για πληροφορίες σχετικά με τα ανταλλακτικά, μιλήστε με τον αντιπρόσωπό σας της Wacker Neuson, ή επισκεφθείτε τον ιστότοπο http://www.wackerneuson.com/.

Važno : Za rezervne dijelove obratite se svom Wacker Neuson prodavaču ili posjetite mrežne stranice tvrtke Wacker Neuson: http://www.wackerneuson.com/.

Önemli : Yedek parça bilgileri için Wacker Neuson Bayinize bakın veya Wacker Neuson web sitesini ziyaret edin. http://www.wackerneuson.com/

重要 交換部品の情報については、ワッカーノイソンディーラーにお問い合わせ頂くか、ワッカーノイソンウェブサイト http://www.wackerneuson.com/ をご覧ください。

重要 有关备件信息，请咨询您的威克诺森经销商或访问威克诺森网站：http://www.wackerneuson.com/。

Important : Pentru informaţii referitoare la piesele de schimb, vă rugăm să vă adresaţi distribuitorului Wacker Neuson sau să vizitaţi site-ul web Wacker Neuson la adresa http://www.wackerneuson.com/.

Важно : За информация относно резервни части, моля, обърнете се към местния дилър на Wacker Neuson или посетете уебсайта на Wacker Neuson на адрес http://www.wackerneuson.com/.

Wacker Neuson Produktion GmbH & Co. KG, Preußenstraße 41, D-80809 München,
Tel.: +49-(0)89-3 54 02-0 Fax: +49 - (0)89-3 54 02-390
Wacker Neuson Production Americas LLC, N92W15000 Anthony Ave., Menomonee Falls, WI. 53051
Tel.: (262) 255-0500 Fax: (262) 255-0550 Tel.: (800) 770-0957
Wacker Neuson Limited - Room 1701–03 & 1717–20, 17/F. Tower 1, Grand Century Place, 193 Prince Edward Road West, Mongkok, Kowloon, Hongkong. Tel: (852) 3605 5360, Fax: (852) 2758 0032

制造商

Wacker Neuson Production Americas LLC（威克诺森公）

N92W15000 Anthony Avenue

Menomonee Falls, WI 53051 U.S.A.

电话：(262) 255-0500 · 传真：(262) 255-0550 · 电话：(800) 770-0957 www.wackerneuson.com

原版说明

本操作员手册为原版说明。本操作员手册的原始语言为美式英语。

Operator's Manual

Ride-On Trowel

CRT36-25
CRT36-26A

5200001020	04	0616

5 2 0 0 0 0 1 0 2 0

Manufacturer

Wacker Neuson Production Americas LLC

N92W15000 Anthony Avenue

Menomonee Falls, WI 53051 U.S.A.

Tel: (262) 255-0500 · Fax: (262) 255-0550 · Tel: (800) 770-0957

www.wackerneuson.com

Original instructions

This Operator’s Manual presents the original instructions. The original language of this Operator’s Manual is American English.

Foreword

SAVE THESE INSTRUCTIONS—This manual contains important instructions for the machine models below. These instructions have been written expressly by Wacker Neuson Production Americas LLC and must be followed during installation, operation, and maintenance of the machines.

Machines covered by this manual

Machine	Item Number	Machine	Item Number
CRT 36-26A	0620999	CRT 36-25	0620115
CRT 36-26A	0621000	CRT 36-25	0620295
CRT 36-26A	0621001	CRT 36-25	0620803
CRT 36-26A	0621002	CRT 36-25	0620804

Machine documentation

- From this point forward in this documentation, Wacker Neuson Production Americas LLC will be referred to as Wacker Neuson.
- Keep a copy of the Operator's Manual with the machine at all times.
- Use the separate Parts Book supplied with the machine to order replacement parts.
- Refer to the separate Repair Manual for detailed instructions on servicing and repairing the machine.
- If you are missing any of these documents, please contact Wacker Neuson to order a replacement or visit www.wackerneuson.com.
- When ordering parts or requesting service information, be prepared to provide the machine model number, item number, revision number, and serial number.

Expectations for information in this manual

- This manual provides information and procedures to safely operate and maintain the above Wacker Neuson model(s). For your own safety and to reduce the risk of injury, carefully read, understand, and observe all instructions described in this manual.
- Wacker Neuson expressly reserves the right to make technical modifications, even without notice, which improve the performance or safety standards of its machines.
- The information contained in this manual is based on machines manufactured up until the time of publication. Wacker Neuson reserves the right to change any portion of this information without notice.

CALIFORNIA Proposition 65 Warning

Engine exhaust, some of its constituents, and certain vehicle components, contain or emit chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

Laws pertaining to spark arresters

NOTICE: State Health Safety Codes and Public Resources Codes specify that in certain locations spark arresters be used on internal combustion engines that use hydrocarbon fuels. A spark arrester is a device designed to prevent accidental discharge of sparks or flames from the engine exhaust. Spark arresters are qualified and rated by the United States Forest Service for this purpose. In order to comply with local laws regarding spark arresters, consult the engine distributor or the local Health and Safety Administrator.

Manufacturer's approval

This manual contains references to *approved* parts, attachments, and modifications. The following definitions apply:

- **Approved parts or attachments** are those either manufactured or provided by Wacker Neuson.
- **Approved modifications** are those performed by an authorized Wacker Neuson service center according to written instructions published by Wacker Neuson.
- **Unapproved parts, attachments, and modifications** are those that do not meet the approved criteria.

Unapproved parts, attachments, or modifications may have the following consequences:

- Serious injury hazards to the operator and persons in the work area
- Permanent damage to the machine which will not be covered under warranty

Contact your Wacker Neuson dealer immediately if you have questions about approved or unapproved parts, attachments, or modifications.

EC Declaration of Conformity

Manufacturer

Wacker Neuson Production Americas LLC, N92W15000 Anthony Avenue, Menomonee Falls, Wisconsin 53051 USA

Product

Product	CRT36-26A
Product category	Trowel
Product function	To smooth and finish semi-cured concrete
Item number	5000621001, 5000621002

Directives and Standards

We hereby declare that this product meets and complies with the relevant regulations and requirements of the following directives and standards:
2006/42/EC, 2014/30/EU, EN12649

Authorized Person for Technical Documents

Robert Raethsel, Wacker Neuson Produktion GmbH & Co. KG, Wackerstrasse 6, 85084 Reichertshofen, Germany

Menomonee Falls, WI, USA, 16.06.16

Keith Herr
Vice President and Managing Director
For Wacker Neuson

Jeff Volden
Director, Product Engineering
For Wacker Neuson

Scott Grahl
Manager, Product Engineering
For Wacker Neuson

Original Declaration of Conformity

1 Safety Information

1.1 Signal Words Used in this Manual

This manual contains DANGER, WARNING, CAUTION, *NOTICE,* and NOTE signal words which must be followed to reduce the possibility of personal injury, damage to the equipment, or improper service.

This is the safety alert symbol. It is used to alert you to potential personal hazards.
← Obey all safety messages that follow this symbol.

DANGER
DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.
← To avoid death or serious injury from this type of hazard, obey all safety messages that follow this signal word.

WARNING
WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.
← To avoid possible death or serious injury from this type of hazard, obey all safety messages that follow this signal word.

CAUTION
CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
← To avoid possible minor or moderate injury from this type of hazard, obey all safety messages that follow this signal word.

NOTICE: Used without the safety alert symbol, NOTICE indicates a situation which, if not avoided, could result in property damage.

Note: *A Note contains additional information important to a procedure.*

1.2 Machine Description and Intended Use

This machine is a ride-on concrete finishing trowel. The Wacker Neuson Ride-On Trowel consists of a frame onto which are mounted a gasoline or diesel engine, a fuel tank, a water tank, two gearboxes joined by a drive shaft, and an operator's platform with controls and a seat. A set of metal blades is connected to each gearbox. A ring guard surrounds the blades. The engine rotates the blades via the gearboxes and a clutch mechanism. The rotating blades ride on the surface of curing concrete, creating a smooth finish. The operator, who sits on the operator's platform, uses the controls and the throttle pedal to control speed and direction of the machine.

This machine is intended to be used for floating and burnishing curing concrete.

This machine has been designed and built strictly for the intended use described above. Using the machine for any other purpose could permanently damage the machine or seriously injure the operator or other persons in the area. Machine damage caused by misuse is not covered under warranty.

The following are some examples of misuse:

- Using the machine as a ladder, support, or work surface
- Using the machine to carry or transport passengers or equipment
- Using the machine to finish inappropriate materials such as slurries, sealers, or epoxy finishes
- Operating the machine outside of factory specifications
- Operating the machine in a manner inconsistent with all warnings found on the machine and in the Operator's Manual

---

This machine has been designed and built in accordance with the latest global safety standards. It has been carefully engineered to eliminate hazards as far as practicable and to increase operator safety through protective guards and labeling. However, some risks may remain even after protective measures have been taken. They are called residual risks. On this machine, they may include exposure to:

- Heat, noise, exhaust, and carbon monoxide from the engine
- Chemical burns from the curing concrete
- Fire hazards from improper refueling techniques
- Fuel and its fumes, fuel spillage from improper lifting technique
- Personal injury from improper lifting techniques
- Cutting hazards from sharp or worn blades

To protect yourself and others, make sure you thoroughly read and understand the safety information presented in this manual before operating the machine.

1.3 Operating Safety

WARNING
Familiarity and proper training are required for the safe operation of the machine. Machines operated improperly or by untrained personnel can be hazardous. Read the operating instructions contained in this manual and the engine manual, and familiarize yourself with the location and proper use of all controls. Inexperienced operators should receive instruction from someone familiar with the machine before being allowed to operate it

Operator qualifications

Only trained personnel are permitted to start, operate, and shut down the machine. They also must meet the following qualifications:

- have received instruction on how to properly use the machine
- are familiar with required safety devices

The machine must not be accessed or operated by:

- children
- people impaired by alcohol or drugs

Personal Protective Equipment (PPE)

Wear the following Personal Protective Equipment (PPE) while operating this machine:

- Close-fitting work clothes that do not hinder movement
- Safety glasses with side shields
- Hearing protection
- Safety-toed footwear
- Never operate this machine in applications for which it is not intended.
- Do not allow anyone to operate this equipment without proper training. People operating this equipment must be familiar with the risks and hazards associated with it.
- Do not touch the engine or muffler while the engine is on or immediately after it has been turned off. These areas get hot and may cause burns.
- Do not operate the machine with unapproved accessories or attachments.
- Do not operate the machine with the beltguard missing. Exposed drive belt and pulleys create potentially dangerous hazards that can cause serious injuries.
- Do not leave the machine running unattended.
- Do not run the machine indoors or in an enclosed area such as a deep trench unless adequate ventilation, through such items as exhaust fans or hoses, is provided. Engine exhaust contains carbon monoxide. This is a poison you cannot see or smell. Exposure to carbon monoxide can cause loss of consciousness and CAN KILL YOU IN MINUTES.
- ALWAYS remain aware of moving parts and keep hands, feet, and loose clothing away from the moving parts of the machine.
- Always wear protective clothing appropriate to the job site when operating the machine.
- Read, understand, and follow procedures in the Operator’s Manual before attempting to operate the machine.
- Be sure operator is familiar with proper safety precautions and operation techniques before using machine.

- Close fuel valve on engines equipped with one when machine is not being operated.
- Store the machine properly when it is not being used. The machine should be stored in a clean, dry location out of the reach of children.
- Always operate the machine with all safety devices and guards in place and in working order.

Dust precaution

Dust created by construction activities may cause silicosis or respiratory harm. To reduce the risk of exposure:

- Work in a well ventilated area
- Use a dust control system
- Wear an approved dust/particle respirator

1.4 Operator Safety while Using Internal Combustion Engines

WARNING

Internal combustion engines present special hazards during operation and fueling. Failure to follow the warnings and safety standards could result in severe injury or death.

▶ Read and follow the warning instructions in the engine owner's manual and the safety guidelines below.

DANGER

Exhaust gas from the engine contains carbon monoxide, a deadly poison. Exposure to carbon monoxide can kill you in minutes.

▶ NEVER operate the machine inside an enclosed area, such as a tunnel, unless adequate ventilation is provided through such items as exhaust fans or hoses.

Operating safety

When running the engine:

- Keep the area around exhaust pipe free of flammable materials.
- Check the fuel lines and the fuel tank for leaks and cracks before starting the engine. Do not run the machine if fuel leaks are present or the fuel lines are loose.

When running the engine:

- Do not smoke while operating the machine.
- Do not run the engine near sparks or open flames.
- Do not touch the engine or muffler while the engine is running or immediately after it has been turned off.
- Do not operate a machine when its fuel cap is loose or missing.
- Do not start the engine if fuel has spilled or a fuel odor is present. Move the machine away from the spill and wipe the machine dry before starting.

Refueling safety

When refueling the engine:

- Clean up any spilled fuel immediately.
- Refill the fuel tank in a well-ventilated area.
- Reinstall the fuel tank cap after refueling.

- Do not smoke.
- Do not refuel a hot or running engine.
- Do not refuel the engine near sparks or open flames.
- Use suitable tools for refueling (for example, a fuel hose or funnel).
- Do not refuel if the machine is positioned in a truck fitted with a plastic bed liner. Static electricity can ignite the fuel or fuel vapors.

1.5 Service Safety

WARNING

A poorly maintained machine can become a safety hazard! In order for the machine to operate safely and properly over a long period of time, periodic maintenance and occasional repairs are necessary.

Service training

Before servicing or maintaining the machine:

- Read and understand the instructions contained in all manuals delivered with the machine.
- Familiarize yourself with the location and proper use of all controls and safety devices.
- Only trained personnel shall troubleshoot or repair problems occurring with the machine.
- Contact Wacker Neuson for additional training if necessary.

When servicing or maintaining this machine:

- Do not allow improperly trained people to service or maintain the machine. Personnel servicing or maintaining the machine must be familiar with the associated potential risks and hazards.

Personal Protective Equipment (PPE)

Wear the following Personal Protective Equipment (PPE) while servicing or maintaining this machine:

- Close-fitting work clothes that do not hinder movement
- Safety glasses with side shields
- Hearing protection
- Safety-toed footwear

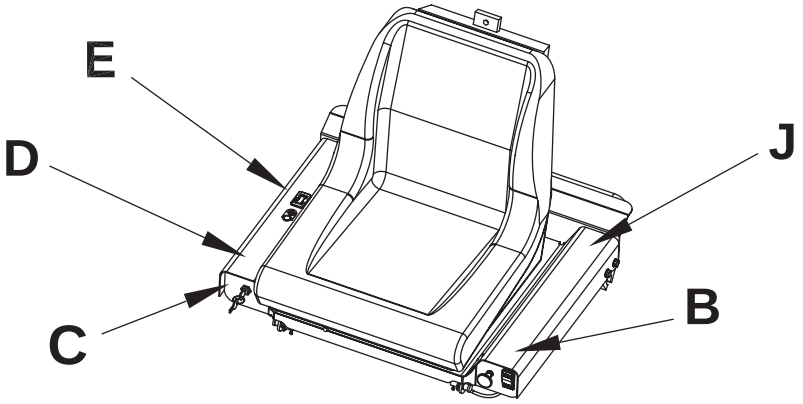
In addition, before servicing or maintaining the machine:

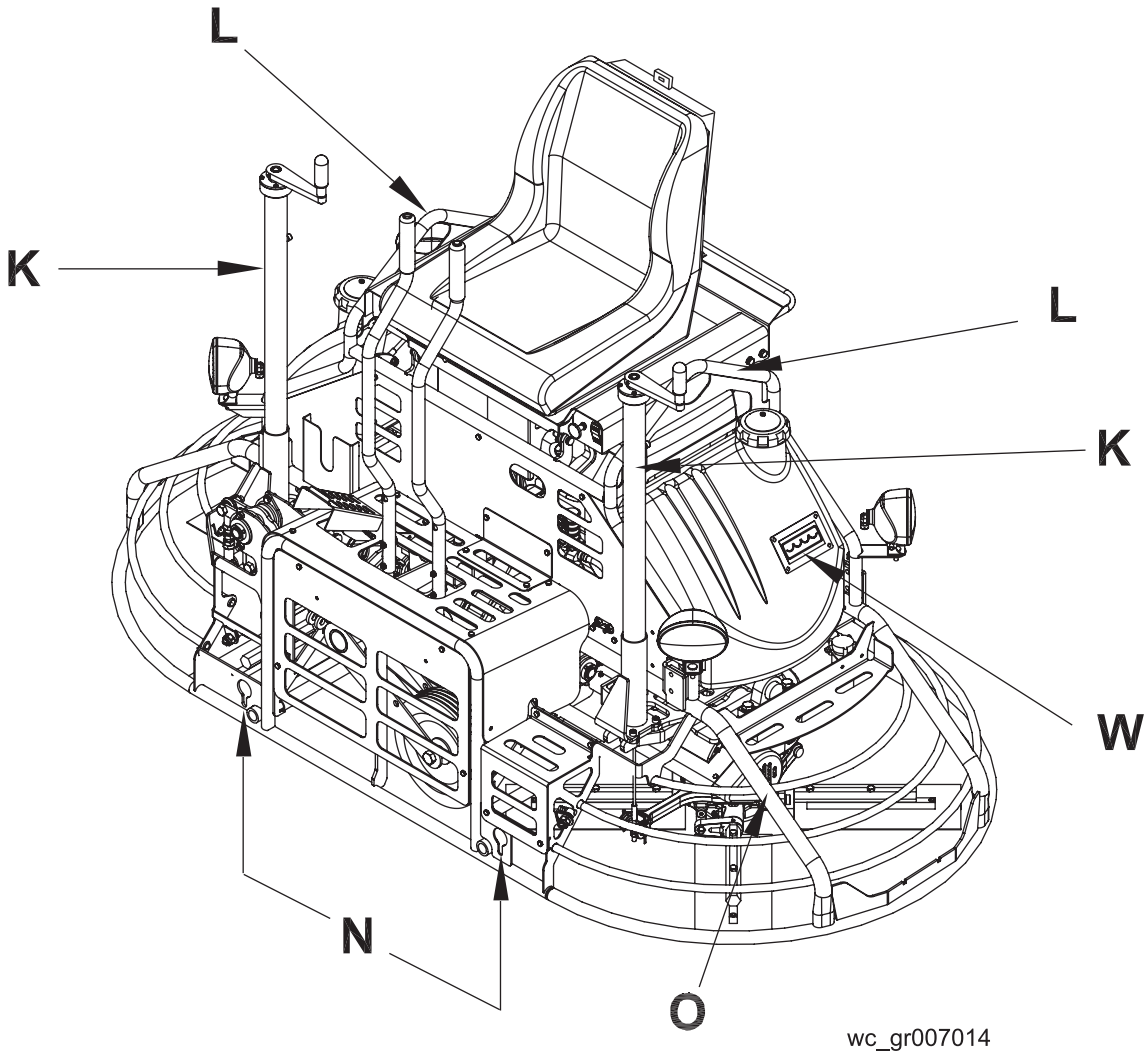
- Tie back long hair.
- Remove all jewelry (including rings).
- Do not attempt to clean or service the machine while it is running. Rotating parts can cause severe injury.
- Do not crank a flooded engine with the spark plug removed on gasoline-powered engines. Fuel trapped in the cylinder will squirt out the spark plug opening.
- Do not test for spark on gasoline-powered engines if the engine is flooded or the smell of gasoline is present. A stray spark could ignite the fumes.

- Do not use gasoline or other types of fuels or flammable solvents to clean parts, especially in enclosed areas. Fumes from fuels and solvents can become explosive.
- ALWAYS turn engine off and remove key from machine before performing maintenance or making repairs.
- Handle blades carefully. The blades can develop sharp edges which can cause serious cuts.
- Keep the area around the muffler free of debris such as leaves, paper, cartons, etc. A hot muffler could ignite the debris and start a fire.
- When replacement parts are required for this machine, use only Wacker Neuson replacement parts or those parts equivalent to the original in all types of specifications, such as physical dimensions, type, strength, and material.
- Disconnect the spark plug on machines equipped with gasoline engines, before servicing, to avoid accidental start-up.
- ALWAYS switch off the power supply at the battery disconnect before adjusting or maintaining the electrical equipment.
- Keep the machine clean and labels legible. Replace all missing and hard-to-read labels. Labels provide important operating instructions and warn of dangers and hazards.

2 Labels

2.1 Label Locations





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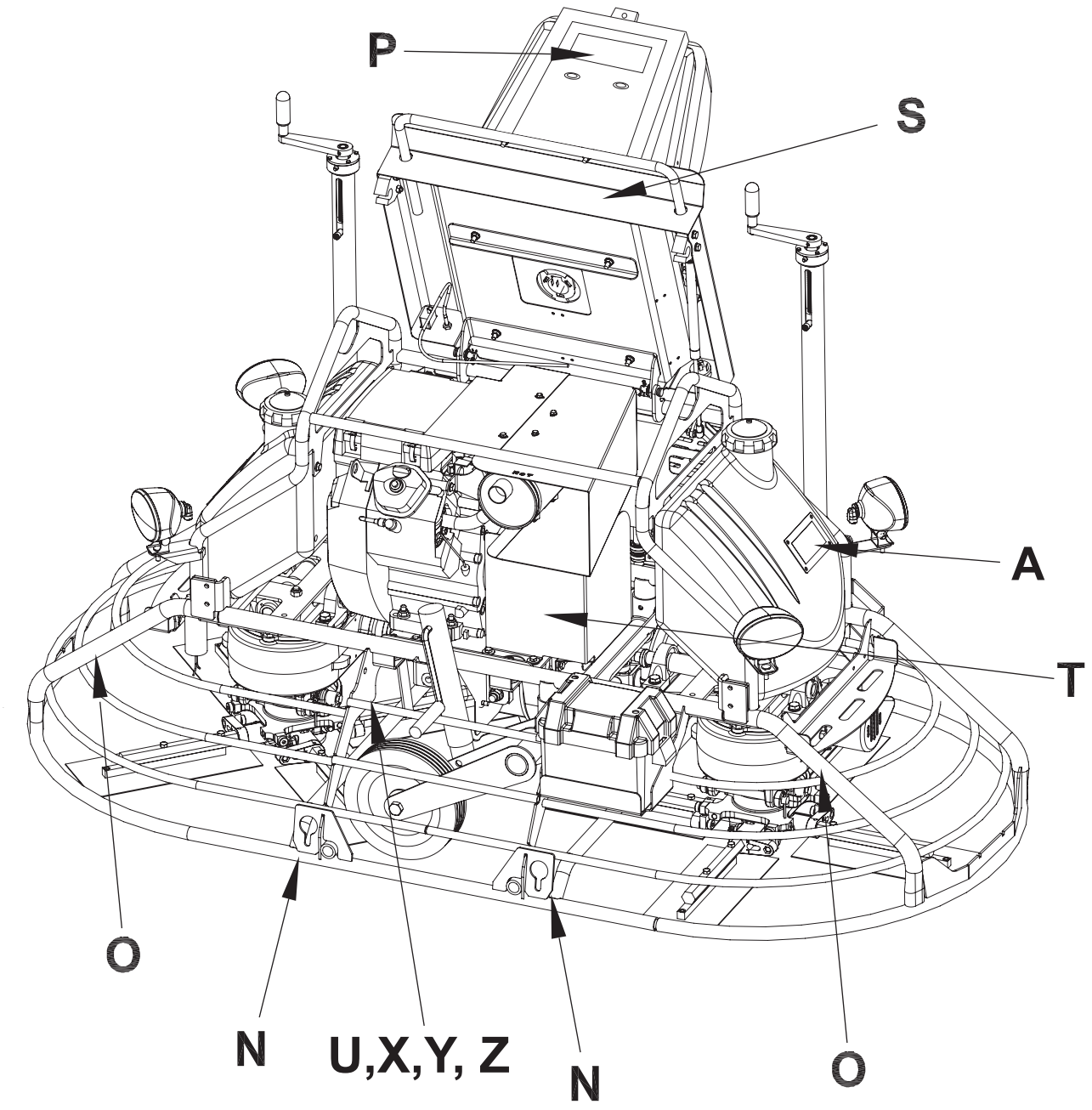
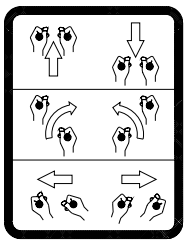
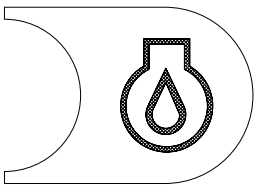
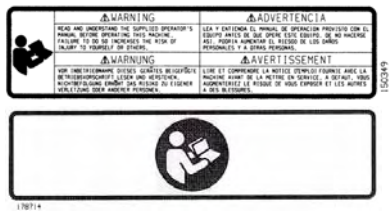
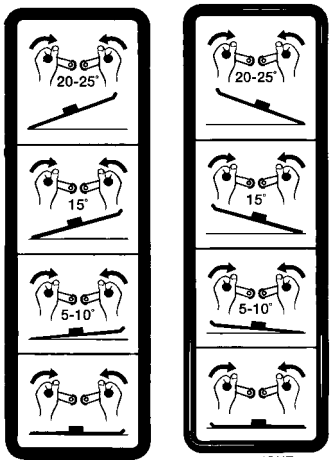
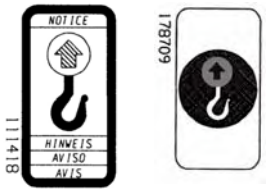
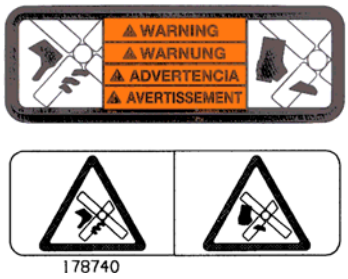
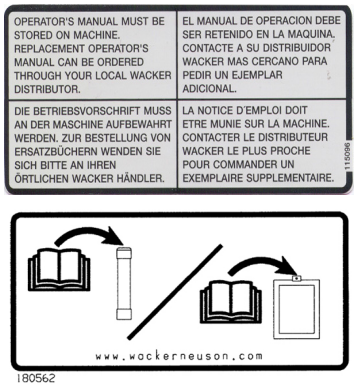
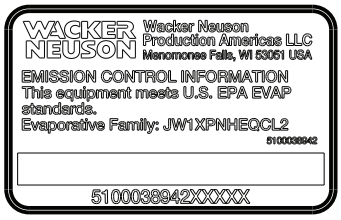
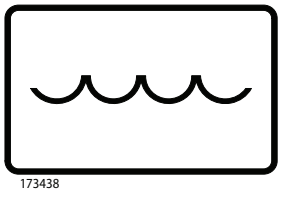


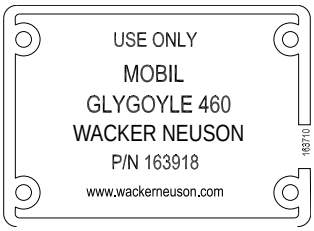
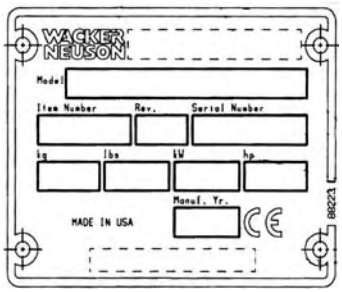
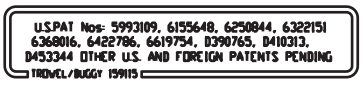
wc_gr007015

2.2 Label Meanings

A		DANGER! Asphyxiation hazard. ■ Engines emit carbon monoxide. ■ Do not run the machine indoors or in an enclosed area unless adequate ventilation, through such items as exhaust fans or hoses, is provided. ■ Read the Operator's Manual. ■ No sparks, flames, or burning objects near the machine. ■ Stop the engine before refueling.
B		WARNING! To reduce the risk of hearing loss and eye injury, always wear hearing protection and eye protection when operating this machine.
C		Positions of the key switch: ■ ON ■ OFF ■ Engine crank
D		Steering control: ■ Push both levers forward to move forward ■ Pull both levers backward to move rearward ■ Push the left lever forward and pull the right lever backward to rotate clockwise ■ Pull the left lever backward and push the right lever forward to rotate counterclockwise ■ Move both levers to the left to move left ■ Move both levers to the right to move right
E		Check engine oil level.

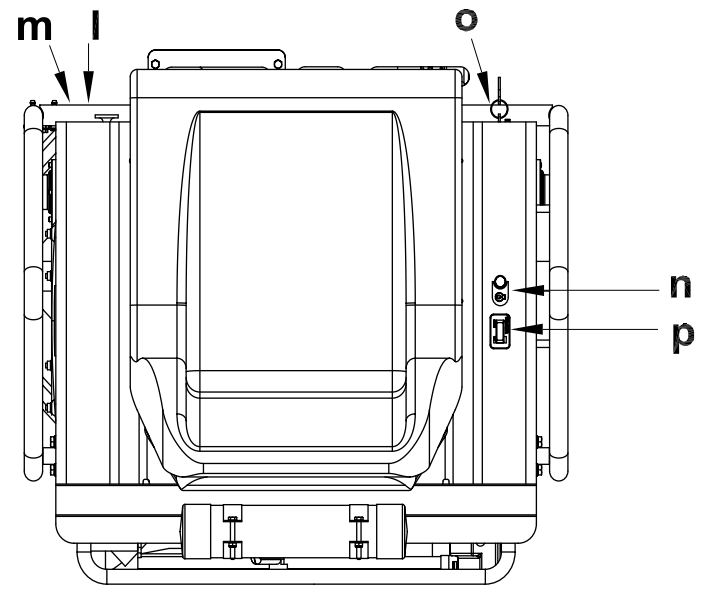
J		WARNING! Read and understand the supplied Operator's Manual before operating the machine. Failure to do so increases the risk of injury to yourself and others.
K		Pitch control: To increase pitch: Rotate the left pitch control clockwise, rotate the right pitch control counterclockwise. To decrease pitch: Rotate the left pitch control counterclockwise, rotate the right pitch control clockwise
L		NOTICE Lifting point.
N		Tie-down point.
O		WARNING! Cutting hazard. Keep hands and feet away from moving blade.

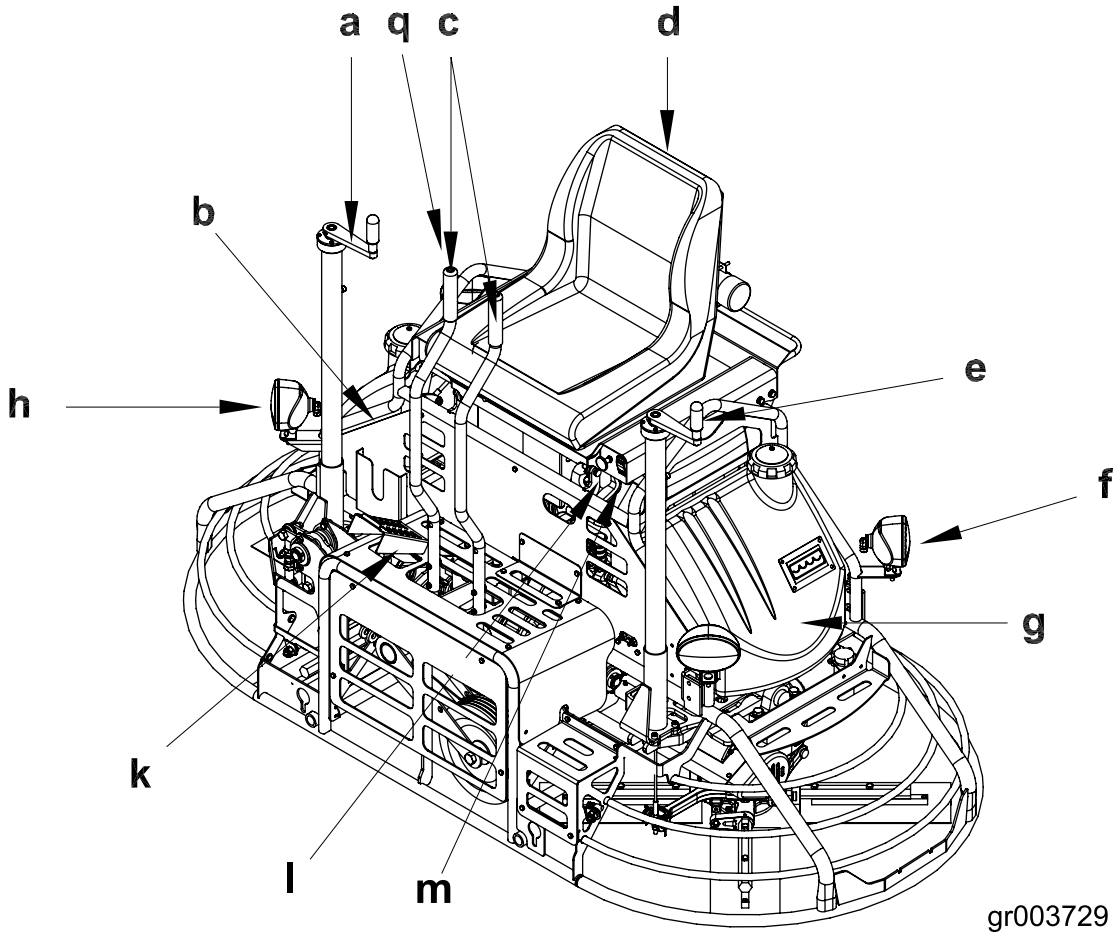
P		Operator's Manual must be stored on machine. Replacement Operator's Manual can be ordered through your local Wacker Neuson distributor.
S		WARNING Hot surface
T		WARNING! Entanglement hazard. Keep hands away from spinning belt and pulley.
U		Emission Control Information This equipment meets U.S. EPA EVAP standards. Evaporative Family: JW1XPNHEQCL2
W		Water tank fill. Use only clean water or water-based retardants.

--		WARNING! Remove pan from trowel before lifting machine overhead. Pans can fall and cause death or serious injury if a person is hit. (Label located on top side of float pan.)
--		Use **only** Glygoyle 460 gear oil in gearbox.
--		A nameplate listing the model number, item number, revision number, and serial number is attached to each unit. Please record the information found on this nameplate so it will be available should the nameplate become lost or damaged. When ordering parts or requesting service information, you will always be asked to specify the model number, item number, revision number, and serial number of the unit.
--		This machine may be covered by one or more patents.

3 Operation

3.1 Features and Controls





Control locations and functions:

Ref.	Description	Ref.	Description
a	Right pitch control	k	Foot pedal (throttle control)
b	Fuel tank	l	Engine choke control
c	Control arms	m	Work light switch
d	Operator's seat with "operator presence" switch	n	Oil pressure indicator light
e	Left pitch control	o	Engine keyswitch
f	Rear work light (one each side)	p	Hour meter
g	Water tank	q	Water spray control
h	Work light (one each side)	—	—

The Ride-On Trowel features a seat with an integrated "operator presence" system, which works in conjunction with a throttle mounted switch. This system allows the engine to remain running (idling) with no operator seated in the seat, as long as the throttle is not depressed. This system meets all safety requirements and eliminates the need for a foot-operated "kill switch".

To familiarize a new operator with the Ride-On Trowel the following steps should be taken:

3.1.1 With the operator in the seat, show him or her the functions of the control arms **(c)** and how to start the machine.

3.1.2 Have the operator practice steering the trowel. A hard concrete slab slightly wetted with water is an ideal place for an operator to practice with the machine. For this practice, pitch the blades up approximately ¼" on the leading edge. Start by making the machine hover in one spot, and then practice driving the machine in a straight line and making 180° turns. The **best control** is achieved at full rpm.

3.2 Position of the Operator

Safe and efficient use of this machine is the operator's responsibility. Full control of the machine is not possible unless the operator maintains the proper working position at all times.

While operating this machine the operator must:

- be seated in the operator's seat facing forward
- have both feet on the control deck
- have both hands on the controls

3.3 Preparing the Machine for First Use

Preparing for first use

To prepare your machine for first use:

3.3.1 Make sure all loose packaging materials have been removed from the machine.

3.3.2 Check the machine and its components for damage. If there is visible damage, do not operate the machine! Contact your Wacker Neuson dealer immediately for assistance.

3.3.3 Take inventory of all items included with the machine and verify that all loose components and fasteners are accounted for.

3.3.4 Attach component parts not already attached.

3.3.5 Add fluids as needed and applicable, including fuel, engine oil, and battery acid.

3.3.6 Move the machine to its operating location.

3.4 Recommended Fuel

The engine requires regular grade unleaded gasoline. Use only fresh, clean gasoline. Gasoline containing water or dirt will damage fuel system. Consult engine owner’s manual for complete fuel specifications.

Use of oxygenated fuels

Some conventional gasolines are blended with alcohol. These gasolines are collectively referred to as oxygenated fuels. If you use an oxygenated fuel, be sure it is unleaded and meets the minimum octane rating requirement.

Before using an oxygenated fuel, confirm the fuel's contents. Some states / Provinces require this information to be posted on the fuel pump.

The following are Wacker Neuson approved percentages of oxygenates:

ETHANOL - (ethyl or grain alcohol) 10% by volume. You may use gasoline containing up to 10% ethanol by volume (commonly referred to as E10). Gasoline containing more than 10% ethanol (such as E15, E20, or E85) may not be used because it could damage the engine.

If you notice any undesirable operating symptoms, try another service station, or switch to another brand of gasoline.

Fuel system damage or performance problems resulting from the use of an oxygenated fuel containing more than the percentages of oxygenates mentioned above are not covered under warranty.

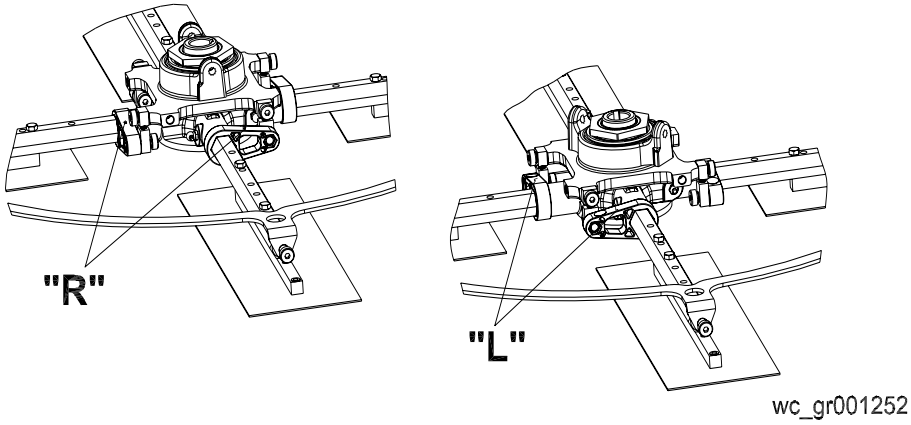
3.5 Break-in Period

See Graphic: wc_gr001252

3.5.1 To break in the gearboxes, run the engine at 50% of full throttle for the first 2–4 hours. This will prevent premature wear and extend gear life.

***NOTICE*:** Running the engine at full throttle during the break-in period could result in premature gear failure.

3.5.2 Verify that the horizontal blade pitch links are properly assembled. When seated on the machine, the right rotor should have an **"R"** designation located towards the upper portion of the pitch link and the left rotor should have an **"L"**.



3.6 Before Starting

Before starting the trowel, check the following:

- fuel level
- oil level in the engine
- condition of the air filter
- condition of trowel arms and blades

Grease the trowel arms daily.

3.7 Starting

Before starting the operator must know the location and function of all controls.

3.7.1 Push down on the throttle foot pedal, turn the engine keyswitch **(o),** and hold it until the engine starts.

Note: I*f the engine is cold, pull out the choke control knob fully. The choke may need to be opened even when starting a warm engine.*

NOTICE**:** Cranking the engine for more than 5 seconds can cause starter damage. If the engine fails to start, release the keyswitch and wait 10 seconds before operating the starter again.

Note: *The engine has an oil alert light to notify operator if the oil pressure is low. If engine will not start, or stops during operation, check engine oil level.*

3.7.2 Allow the engine to warm up before operating the trowel.

3.8 Stopping

To stop trowel movement, return control levers to their neutral position and release pressure on the throttle foot pedal.

To stop the engine, turn the keyswitch to “O” (off).

3.9 Operation

To utilize your Wacker Neuson Ride-On Trowel to its fullest capacity, the machine should be driven in the direction that the operator is facing. This will finish the widest possible area, while giving the operator an excellent view of the slab surface about to be troweled. When the machine reaches the end of the slab, make a 180° U-turn, and repeat the straight line of direction to the other end of the slab.

Note: *During the break-in period, run the engine at 50% of full throttle. Refer to Section New Machines.*

NOTICE**: DO NOT** use excessive pressure on the control levers. Excessive pressure does not increase the reaction time of the machine and can damage the steering controls.

NOTICE**:** Attempting to use the trowel too early in the curing stage of the concrete may result in an undesirable finish. Only experienced concrete finishers should operate the trowel.

3.10 Steering

See Graphic: wc_gr000146

Refer to the illustration for the necessary hand motions to move the trowel in the desired direction, described below.

1 - forward

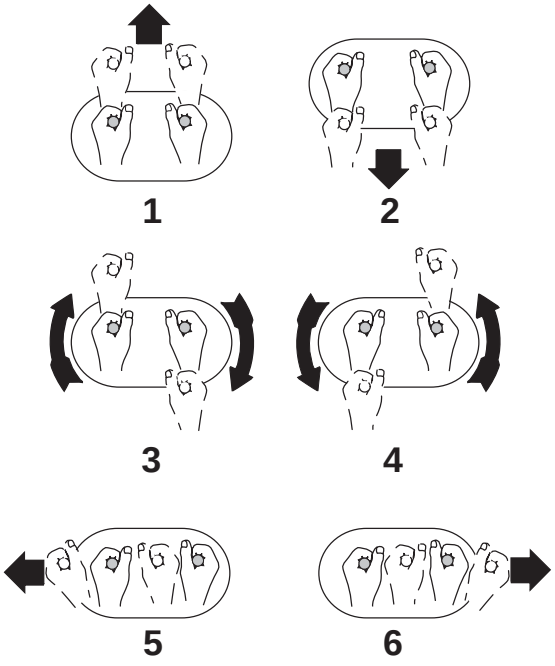
2 - reverse

3 - rotate clockwise

4 - rotate counter-clockwise

5 - left sideways

6 - right sideways



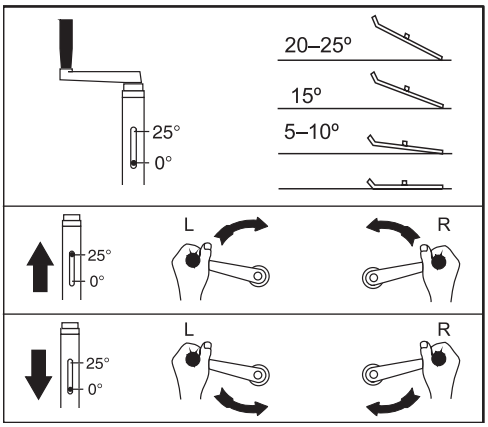
wc_gr000146

3.11 Pitch Adjustment

When changing or setting the pitch (angle) of the trowel blades, slow the machine, set the desired pitch on the left side of the machine, then adjust the right side to match.

To increase pitch: Rotate the left pitch control **(L)** clockwise, rotate the right pitch control **(R)** counterclockwise.

To decrease pitch: Rotate the left pitch control **(L)** counterclockwise, rotate the right pitch control **(R)** clockwise.



wc_gr007019

Working Conditions of Concrete	Suggested Working Pitch
1. Wet surface working stage	Flat (No Pitch)
2. Wet to plastic working stage	Slight Pitch
3. Semi-hard working stage	Additional Pitch
4. Hard finishing stage (burnishing)	Maximum Pitch

3.12 Emergency Shutdown Procedure

Procedure

If a breakdown or accident occurs while the machine is operating, follow the procedure below:

3.12.1 Stop the engine.

3.12.2 Close the fuel valve.

3.12.3 Remove the machine from the job site using the wheel kit.

3.12.4 Clean concrete from the blades and the machine.

3.12.5 Contact the rental yard or machine owner for further instructions.

4 Maintenance

4.1 Maintaining the Emission Control System

Normal maintenance, replacement or repair of emission control devices and systems may be performed by any repair establishment or individual; however, warranty repairs must be performed by a dealer/service center authorized by WACKER NEUSON. The use of service parts that are not equivalent in performance and durability to authorized parts may impair the effectiveness of the emission control system and may have a bearing on the outcome of a warranty claim.

4.2 Periodic Maintenance Schedule

The table below lists basic machine maintenance. Tasks designated with check marks may be performed by the operator. Tasks designated with square bullet points require special training and equipment.
Refer to the engine operator's manual for information on engine maintenance.

	Daily	Every 20 hrs.	Every 50 hrs.	Every 100 hrs.	Every 200 hrs.	Every 300 hrs.
Grease trowel arms.	■					
Check fuel level.	✓					
Check engine oil level.[1]	✓					
Inspect air filter. Replace as needed.	✓					
Check external hardware.	✓					
Pressure wash all surfaces until free of concrete.[2]	■					
Check oil level in gearboxes.		✓				
Grease gearbox, drive system and pitch posts fittings.		■				
Grease control linkage.		■				
Check drive belt for wear.			✓			
Change engine oil.[3]				■		
Check fuel filter.				✓		
Clean and check spark plug.					■	
Replace oil filter.					■	
Replace spark plug.						■
Replace fuel filter.						■
Replace oil in gearboxes.						■

[1] Check engine oil twice daily (every 4 hours).
[2] Pressure wash immediately after use.
[3] Change engine oil after first 20 hours of operation.

4.3 Trowel Gearboxes

Check the gearboxes for the correct oil level after every 20 hours of operation. Change the gearbox oil every 300 hours.

To check the oil level:

Each CRT gearbox is equipped with two oil fill plugs. Remove one gearbox oil fill plug **(b)**. If the level is below the threads of the oil fill plug hole, add synthetic gear oil through the opening. DO NOT overfill. Wipe the threads dry on both the gearbox and the oil fill plug, apply Loctite 545 or equivalent to the oil fill plug threads, replace the oil fill plug and torque to 16–20 Nm (12–15 ft.lbs.).

***NOTICE*: DO NOT** mix types of gear oil. **DO NOT** overfill the gearbox with oil. Damage to the gearbox may occur if oils are mixed, or if the gearbox is overfilled. See *Technical Data* for oil quantity and type.

To change gearbox oil:

4.3.1 Place a container of sufficient capacity (approximately 3.8 l [1 gallon]) under each gearbox.

4.3.2 Remove the gearbox oil drain plug **(c)** and allow the oil to drain out. It may be necessary to remove the gearbox oil fill plug(s) to facilitate draining. After most of the oil has drained out, tip the back of the trowel upwards to allow the remaining oil to drain out.

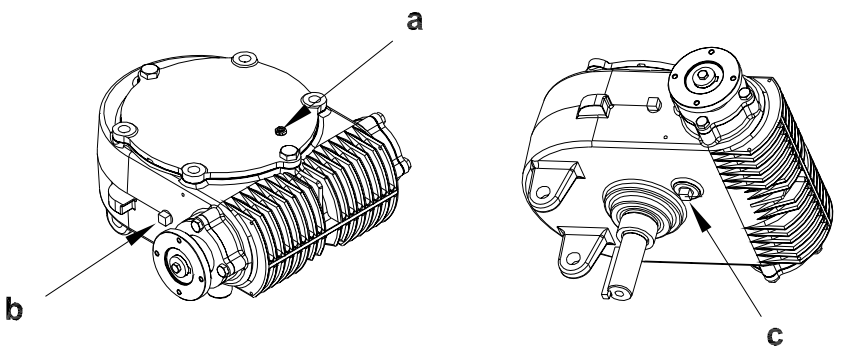
4.3.3 After all the oil has drained out, wipe the threads dry on both the gearbox and the oil drain plug, apply Loctite 545 or equivalent to the oil drain plug threads, and replace the gearbox oil drain plug.

Note: *Dispose of used gear oil in accordance with environmental protection legislation.*

4.3.4 With the trowel level, fill the gearbox with approximately 1.83 l (62 oz.) synthetic gear oil through the oil fill plug as described above.

4.3.5 Wipe the threads dry on both the gearbox and the oil fill plug, apply Loctite 545 or equivalent to the oil fill plug threads, replace the oil fill plug(s), and torque all plugs to 16-20 Nm (12–15 ft.lbs.).

Each gearbox has a pressure relief valve **(a)** which can become clogged over time. Check or replace as needed. Failure to replace the valve can result in oil leakage from the gearbox shaft seals.

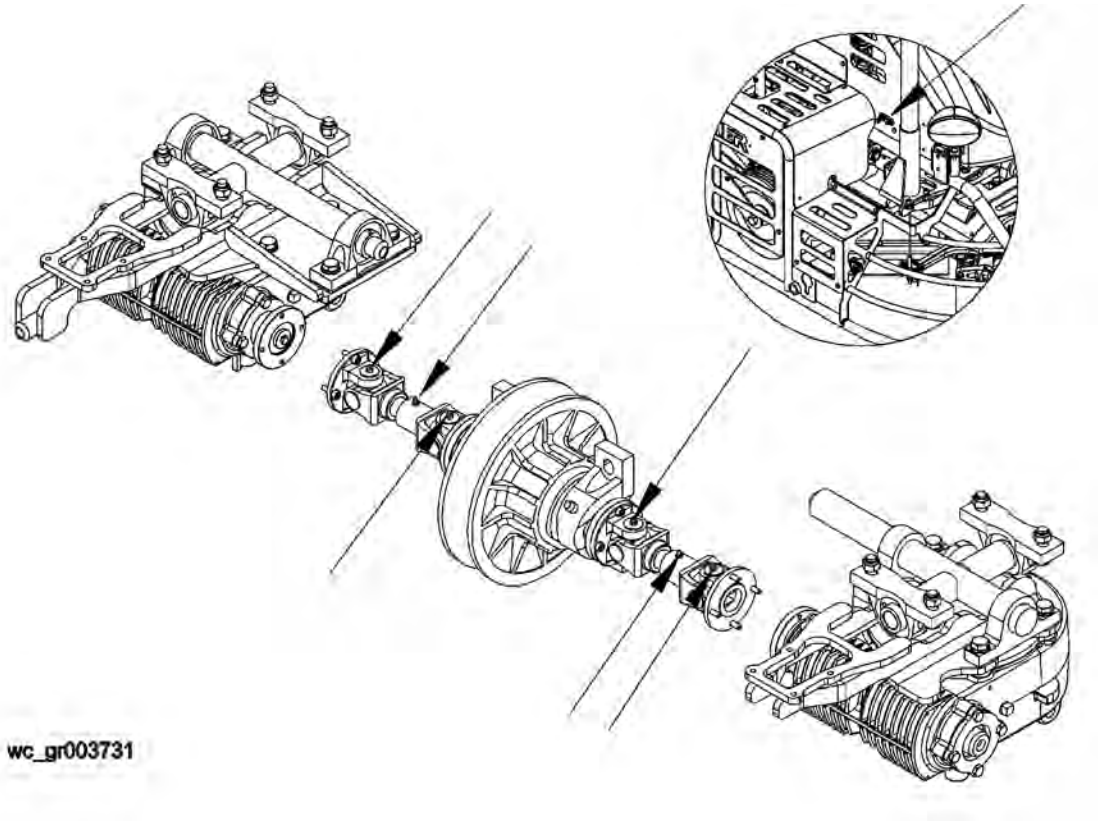


wc_gr003730

4.4 Control Linkage Lubrication

The drive system, gearbox and pitch posts are equipped with several grease fittings. Grease these fittings once a week, or every 20 hours, to prevent wear.

Use a general purpose grease and add one to two shots of grease at each fitting.



4.5 Control Arm Adjustment (Forward or Backward)

See Graphic: wc_gr003732

The control arms should line up evenly. If arms appear out of adjustment, they can be re-adjusted forward or backward as follows:

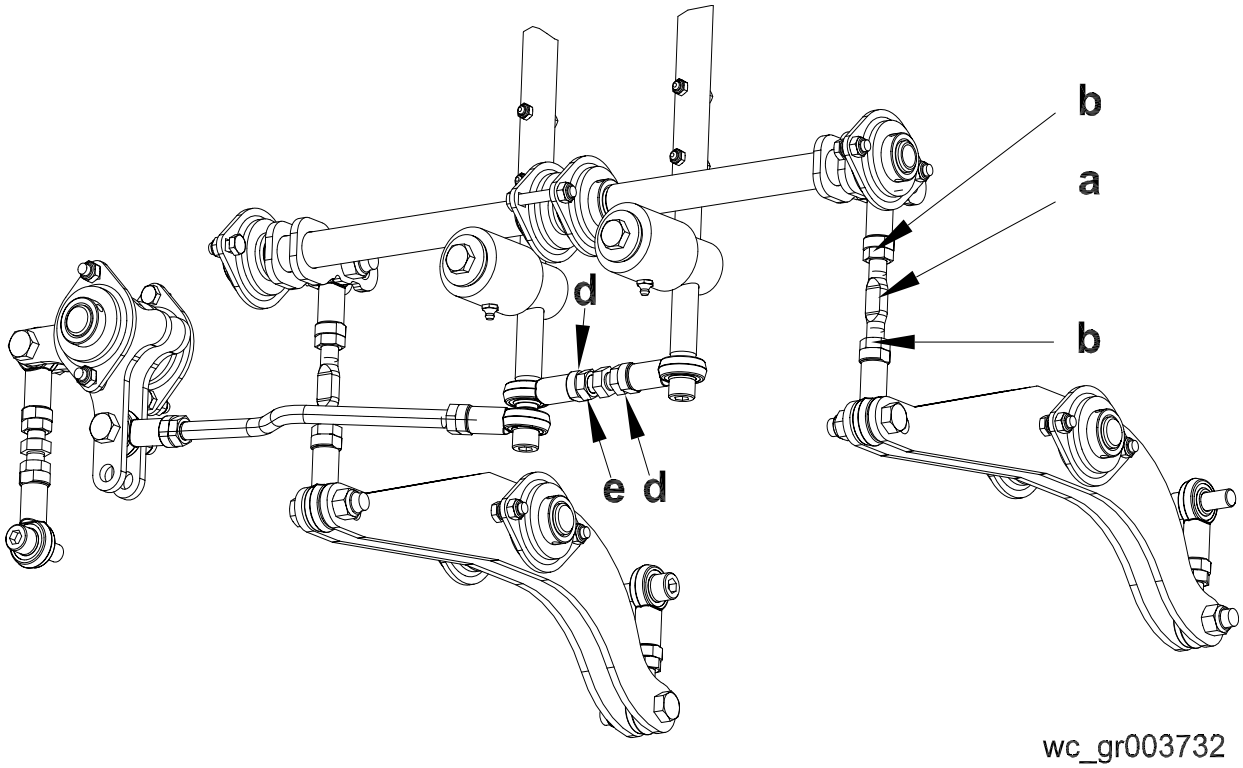
4.5.1 Loosen jam nuts **(b)**.

4.5.2 Turn the vertical linkage **(a)** as follows:

- Extend the linkage to adjust control levers forward. See section 4.5 before extending linkage.
- Shorten the linkage to adjust control levers backward.

4.5.3 After the arms have been adjusted to the desired position, tighten jam nuts **(b)**.

NOTICE: Control arms are adjusted as part of the steering assist system. Changing orientation of the control arms may affect steering effort.



wc_gr003732

4.6 Right-hand Control Arm Adjustment (Right or Left)

See Graphic: wc_gr003732

The arms should be set to be perfectly vertical. Should the arms come out of adjustment, adjust as follows:

4.6.1 Loosen the jam nuts **(d)**.

4.6.2 Drop the horizontal linkage **(e)** down to clear the bracket.

4.6.3 Shorten the linkage to move the control arms to the left.

4.6.4 Extend the linkage to move the control arms to the right.

4.6.5 After the control lever has been adjusted to the desired position, reassemble the nut and the bolt **(c)** and tighten the jam nuts **(d)**.

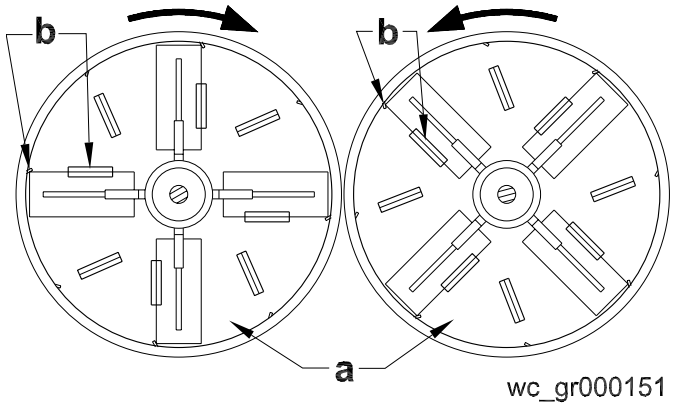
4.7 Mounting Float Pans

See Graphic: wc_gr000151

Certain applications may require the use of float pans. Optional float pans **(a)** are available, and are used with the machines in the non-overlapping configuration only.

To mount float pans:

Lift trowel off the ground **with the engine off** and position the pan against the blades. Turn pan either to the right or left to engage clip angles **(b)** as shown. Remember, the right-hand trowel blades turn counterclockwise; the left-hand blades turn clockwise.



wc_gr000151

4.8 Transporting Trowels

See Graphic: wc_gr003733

WARNING

ALWAYS turn the engine off and remove the key from the machine before moving or transporting machine.

To hoist the trowel:

Attach a sling or chains through the lifting bars **(a)** on each side of the seat pedestal.

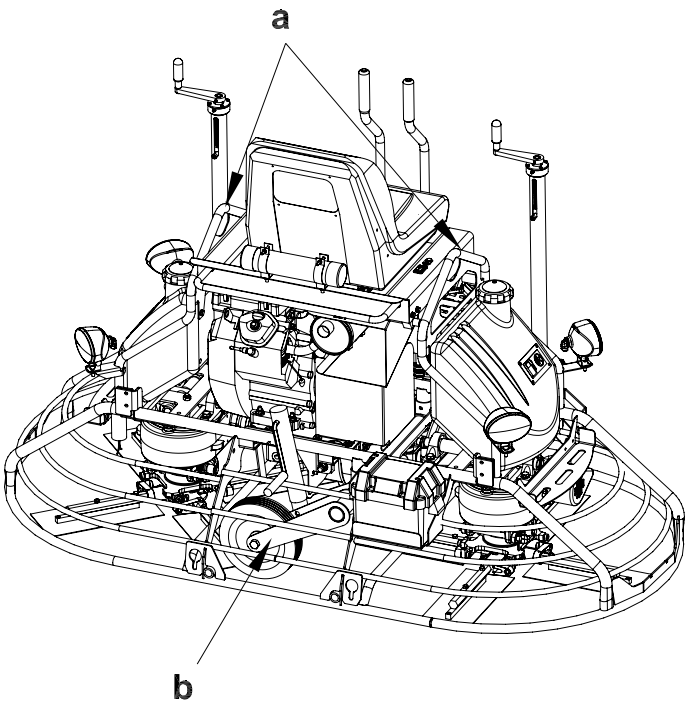
***NOTICE*:** Make sure the lifting device has enough weight-bearing capacity to lift machine safely. Refer to section *Technical Data.*

WARNING

DO NOT lift the trowel by the guard rings or any part of the trowel other than the lifting fixture, as the component may fail, causing the trowel to fall, possibly injuring bystanders.

If equipped with the optional integrated wheel kit (b):

From the rear of machine, use the jack handle to raise the blades off the ground 76-102 mm (3-4 in.). Push the machine using the upper frame.



wc_gr003733

4.9 Drive Belt

See Graphic: wc_gr003734

To replace the drive belt:

4.9.1 Place the trowel on a flat, level surface with the blades pitched flat.

4.9.2 Turn engine off and disconnect battery.

4.9.3 Remove the beltguard.

4.9.4 Remove 2 bolts **(a)**, washers **(b)** and nuts **(c)** from each bearing flange.

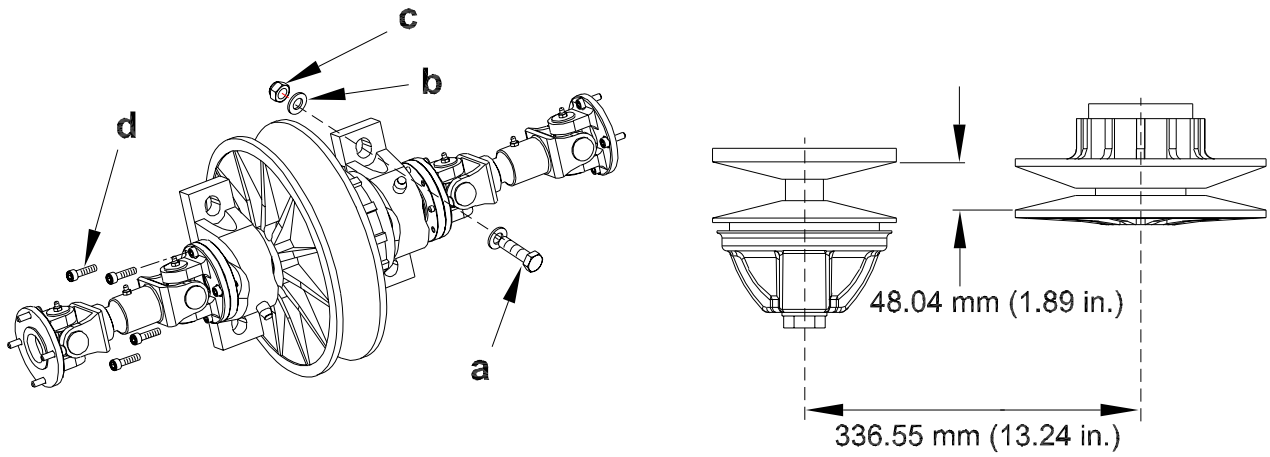
4.9.5 Remove the 4 bolts **(d)** holding each inside universal joint to the shaft fitting. Remove universal joints and shims (if included) from ends of drive shaft.

4.9.6 Lift the drive pulley up far enough to slide belt past.

4.9.7 Remove the old belt and install a new one.

4.9.8 Reverse the procedure for assembly. Align the bearings and shaft as straight as possible. Adjust pulley offset and center distance to values as shown.

4.9.9 Torque the bearing bolts **(a)** to 99±10 ft.lbs. Torque the universal joint bolts **(d)** to 10±1 ft.lbs.



wc_gr003734

4.10 Battery Jump Start Procedure

Occasionally, it may be necessary to jump start a weak battery. If jump starting is necessary, the following procedure is recommended to prevent starter damage, battery damage, and personal injuries.

DANGER

Jump starting a battery incorrectly can cause battery to explode, resulting in severe personal injury or death. Do not smoke or allow ignition sources near the battery, and do not jump start a frozen battery.

WARNING

Electrical arcing can cause severe personal injury. Do not allow positive and negative cable ends to touch.

4.10.1 Disconnect engine load.

4.10.2 Use a battery of the same voltage (12V) as is used with your engine.

4.10.3 Attach one end of the positive booster cable (red) to the positive (+) terminal of the booster battery. Attach the other end to the positive terminal of your engine battery.

4.10.4 Attach one end of the negative booster cable (black) to the negative (–) terminal of the booster battery. Attach other end of negative cable to a solid chassis ground on your engine.

***NOTICE*:** Jump starting in any other manner may result in damage to the battery or the electrical system.

4.10.5 Push down on the throttle foot pedal, turn the engine keyswitch and hold it until the engine starts.

***NOTICE*:** Cranking the engine for more than 5 seconds can cause starter damage. If the engine fails to start, release the keyswitch and wait 10 seconds before operating the starter again.

***NOTICE*:** When using lights or high amperage draw accessories, idle the engine for a period of 20 minutes to bring the battery to charge state.

4.11 Spark Plug

Clean or replace spark plug as needed to ensure proper operation. Refer to the engine Owner's Manual.

Note: *Refer to the Technical Data for the recommended spark plug type and the electrode gap setting*.

WARNING

The muffler and engine cylinder become very hot during operation and remain hot for a while after stopping the engine. Allow engine to cool before removing spark plug.

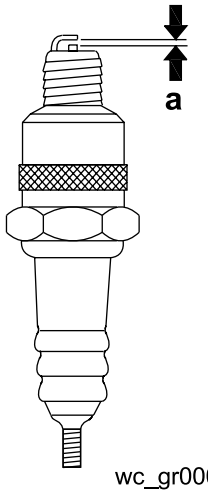
4.11.1 Remove spark plug and inspect it.

4.11.2 Replace plug if the insulator is cracked or chipped. Clean spark plug electrodes with a wire brush.

4.11.3 Set the electrode gap **(a)**

4.11.4 Tighten spark plug securely.

***NOTICE*:** A loose spark plug can become very hot and may cause engine damage.



wc_gr000028

4.12 Air Cleaner

See Graphic: wc_gr000154, wc_gr008243

The engine is equipped with a dual element air cleaner. Service air cleaner frequently to prevent carburetor malfunction.

***NOTICE*: NEVER** run engine without air cleaner. Severe engine damage will occur.

WARNING

NEVER use gasoline or other types of low flash point solvents for cleaning the air cleaner. A fire or explosion could result.

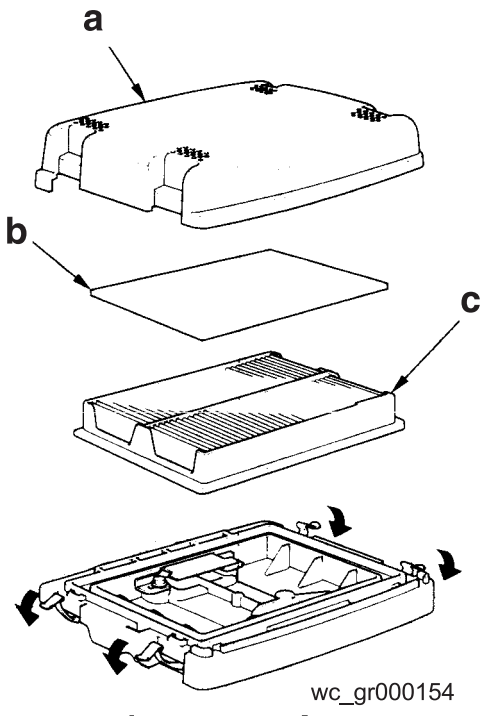
To service:

4.12.1 Remove air cleaner cover **(a)**. Remove both elements **(b, c)** and inspect them for holes or tears. Replace damaged elements.

4.12.2 Wash foam element **(b)** in solution of mild detergent and warm water. Rinse thoroughly in clean water. Allow element to dry thoroughly.

Do not put oil on the foam element.

4.12.3 Tap paper element **(c)** lightly to remove excess dirt. Replace paper element if it appears heavily soiled.



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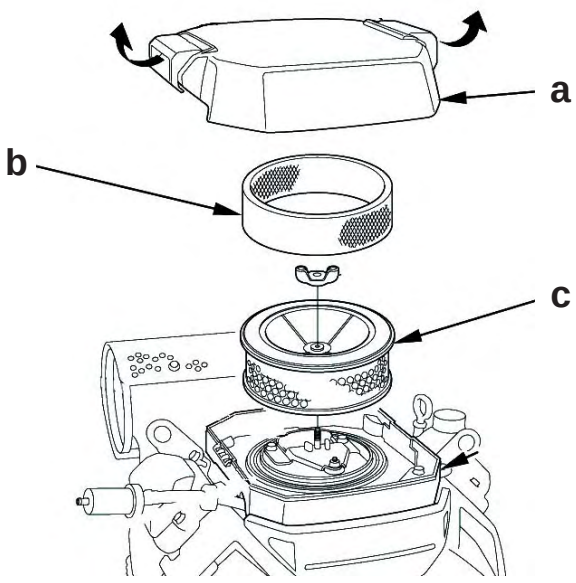

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4.13 Engine Oil and Filter (Honda engine)

Drain oil while engine is still warm.

4.13.1 Remove oil fill cap **(a)** and drain plug **(b)** to drain oil.

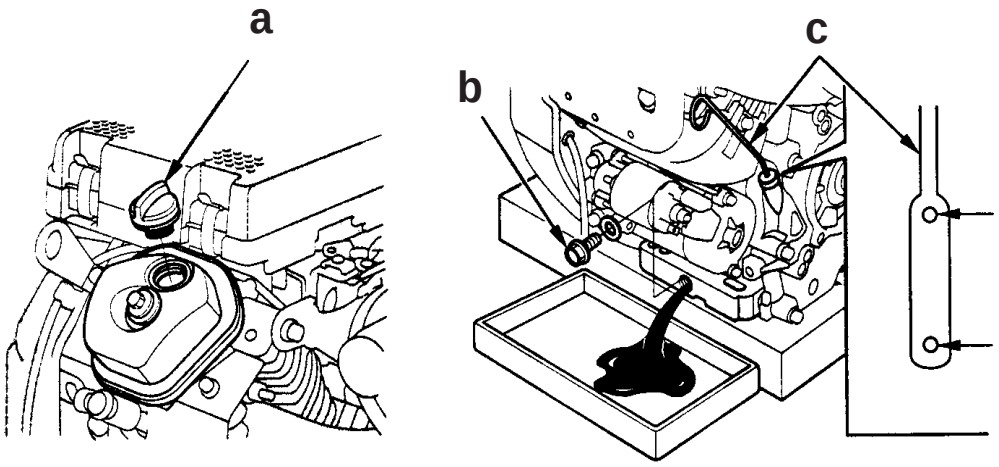
Note: *In the interests of environmental protection, place a plastic sheet and a container under the machine to collect any liquid which drains off. Dispose of this liquid in accordance with environmental protection legislation.*

4.13.2 Install drain plug and tighten.

4.13.3 Fill engine crankcase with recommended oil to the upper limit mark on the dipstick **(c)**.

4.13.4 Install oil fill cap and dipstick securely.

4.13.5 Remove front pedestal panel to access oil filter. To replace the oil filter, remove the installed oil filter after oil has been drained. Apply a thin coat of oil to the rubber gasket of the replacement oil filter. Screw the filter on until it just contacts the filter adapter, then turn it an additional 22.24 mm (7/8 in.) turn. Refill with oil as described above.



WARNING
Most used oil contains small amounts of materials that can cause cancer and other health problems if inhaled, ingested, or left in contact with skin for prolonged periods of time.
- ▶ Take steps to avoid inhaling or ingesting used engine oil.
- ▶ Wash skin thoroughly after exposure to used engine oil.

4.14 Engine Oil and Filter (Wacker Neuson engine)

Drain the oil while the engine is still warm. To drain oil:

4.14.1 Remove the filler cap **(a)** and drain cap **(d)**. Drain oil into a suitable container.

Note: *In the interests of environmental protection, place plastic sheeting and a container under the machine to collect the liquid which drains off. Dispose of this liquid properly.*

4.14.2 Re-insert the drain cap and tighten.

4.14.3 Fill the engine with the recommended oil to the upper limit mark on the dipstick **(b)**. See section *Technical Data* for the oil quantity and type.

WARNING

Burn hazard. Care must be taken when draining hot engine oil. Hot oil can burn!

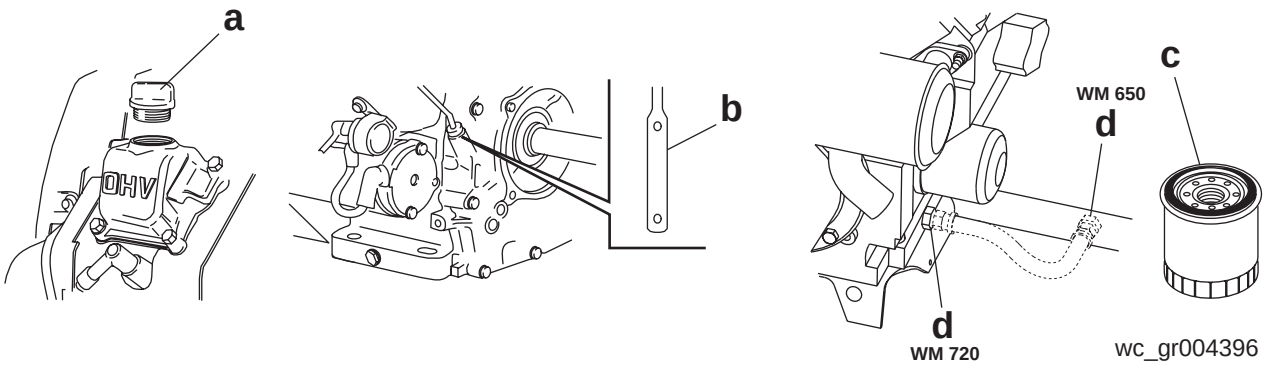
To change the filter:

4.14.4 Drain the engine oil. Remove used filter.

4.14.5 Before installing the new filter, lightly oil the filter gasket **(c)** with fresh, clean engine oil. Screw the filter on by hand until the gasket makes contact, then tighten an additional 7/8 turn.

4.14.6 Fill the engine with the recommended oil. See section *Technical Data* for oil quantity and type.

4.14.7 Start and run the engine to check for leaks. Stop the engine. Recheck the oil level and add oil if required. Refer to the engine owner's manual.



WARNING

Most used oil contains small amounts of materials that can cause cancer and other health problems if inhaled, ingested, or left in contact with skin for prolonged periods of time.

- Take steps to avoid inhaling or ingesting used engine oil.
- Wash skin thoroughly after exposure to used engine oil.

4.15 Storing the Machine

When

Follow the procedures below if the machine is to be stored for more than 30 days.

Maintaining the machine

To prepare the machine for long-term storage:

4.15.1 Drain the fuel tank and the water tank.

4.15.2 Change the engine oil.

4.15.3 Maintain the engine (see below).

4.15.4 Clean the entire trowel and engine compartment.

4.15.5 Remove dirt from the cooling fins on the engine cylinders and on the blower housing.

4.15.6 Remove the battery from the machine and charge it periodically.

4.15.7 Cover the entire machine and place it in a dry protected area.

Maintaining the engine

- If your machine has a diesel engine, consult your engine owner's manual for maintenance instructions.
- If your machine has a gasoline engine:

4.15.8 Disconnect the ignition wires from the spark plugs. Remove the spark plugs.

4.15.9 Pour approximately 30 ml (1 ounce) of SAE 30W oil into each engine cylinder through the spark plug opening.

4.15.10 Reinstall the spark plugs, but leave the ignition wires disconnected to prevent the engine from starting.

4.15.11 Crank the engine for one or two seconds to distribute the oil inside the engine cylinders.

4.15.12 Reconnect the ignition wires.

4.16 Troubleshooting

Problem	Reason	Remedy
Engine does not start.	Engine problem.	Consult engine manufacturer's service manual.
Machine out of balance; wobbling excessively.	Operator is over-steering.	The movement of each gearbox is controlled by "stops" to provide the correct relationship of the control arm movement to machine movement. Excessive pressure on control arms in any direction will not increase reaction time and can damage steering controls causing machine to wobble.
	Trowel arm(s) bent.	Replace trowel arm(s).
	Trowel blade(s) bent.	Replace trowel blade(s).
	Main shaft(s) bent due to machine being dropped.	Replace main shafts(s).
Poor handling; excessive range in control lever movement.	Worn bushings due to lack of lubrication.	Replace bushings and lubricate at least every 20 hours.
	Control arm lever adjustment has moved or control arm has been bent.	Reset control arm lever.
	Lower control arm(s) bent. This can be caused by dropping machine.	Replace lower control arm(s). Use lifting brackets and/or forklift pockets provided on machine for lifting.

Problem	Reason	Remedy
Machine does not move.	Drive belt broken.	Replace drive belt.
	Vacuum between bottom of blades and surface of concrete.	Change pitch on blades to break suction.
	Key sheared in the main shaft.	Replace damaged key.
Trowel noisy.	Trowel blades have become misaligned and are contacting each other during rotation.	Replace damaged blades. Align blades so that one set represents a (+) and the other an (x) when viewed from above.
	Sheared key.	Check all keys in drive system.
	Loose clutch.	Tighten clutch.

5 Technical Data

5.1 Engine

Engine Power Rating

Net power rating per SAE J1349. Actual power output may vary due to conditions of specific use.

Part No.		CRT 36-26A	CRT 36-25
Engine			
Engine make		Honda	Wacker Neuson
Engine model		GX690	WM720
Max. rated power @ rated speed	kW (Hp)	16.6 (22.2) @ 3600 rpm	18.6 (25) @ 3600 rpm
Displacement	cm^3 (in^3)	690 (42)	720 (44)
Spark plug		NGK ZFR5F DENSO KJ16CR	NGK BPR4EY
Electrode gap	mm (in.)	0.70 (0.028)	
Engine speed - operating	rpm	3850	
Engine speed - idle	rpm	1400	
Battery	V / size	12 / 340CCA	
Fuel	type	Regular unleaded gasoline	
Fuel tank capacity	l (gal.)	24.6 (6.5)	
Fuel consumption	l (qt.)/hr.	9 (9.5)	
Running time	hrs.	3.3	
Clutch	type	Variable speed	
Engine oil capacity	l (qt.)	2 (2.1)	1.9 (1.8)
Engine lubrication	oil grade	SAE 10W30 API CF-4, CF, SJ	

5.2 Trowel

Part No.		CRT 36-26A	CRT 36-25
Trowel			
Operating Weight **without wheel kit** **with wheel kit**	kg (lbs.)	 373 (830) 392 (865)	 376 (835) 395 (870)
Dimensions (L x W x H)	mm (in.)	2042 x 1041 x 1372 (80 x 41 x 54)	
Rotor Speed (range)	rpm	25–165	
Blade Pitch (range)	degrees	0-25	
Gearbox	type	heavy duty	
Gearbox Lubrication	type	Mobil Glygoyle 460	
	l (oz.)	1.83 (62) each	
Driveshaft	type	splined universal joint	

Operation		
Troweling Width **with pans** (non-overlapping) **without pans** (non-overlapping)	mm (in.)	 1975 (78) 1905 (75)
Troweling Area **with pans** (non-overlapping) **without pans** (non-overlapping)	m^2 (ft^2)	 1.8 (19) 1.6 (18)

5.3 Sound and Vibration Specifications

The required sound specifications, per Annex I, Directive 2006/42/EC of the EC-Machine Regulations, are:

- the sound pressure level at operator's location (L_{pA}): 91.2 dB(A) (CRT 36-26A), and 91.7 dB(A) (CRT 36-25).
- the guaranteed sound power level (L_{WA}): 104.7 dB(A) (CRT 36-26A) and 108.6 dB(A) (CRT 36-25)

These sound values were determined according to ISO 3744 for the sound power level (L_{WA}) and ISO 11204 for the sound pressure level (L_{pA}) at the operator's location.

The weighted effective acceleration value, determined according to ISO 5349-1and ISO 2631, is:

- for whole body: 0.215 m/s2 (CRT 36-26A) and 0.316 m/s2 (CRT 36-25).
- or hand/arm: 1.81 m/s2 (CRT 36-26A) and 1.72 m/s2 (CRT 36-25).

The sound and vibration specifications were obtained with the unit operating on fully cured, water wetted concrete at nominal engine speed.

Vibration Uncertainties

Hand-transmitted vibration was measured per ISO 5349-1. This measurement includes an uncertainty of 1.5 m/sec^2.

Whole body vibration was measured per ISO 2631-1. This measurement includes an uncertainty of 0.3 m/sec^2.

6 Emission Control Systems Information and Warranty

The Emission Control Warranty and associated information is valid only for the U.S.A., its territories, and Canada.

6.1 Emission Control System Background Information

Introduction

Wacker Neuson spark-ignited engines/equipment must conform with applicable Environmental Protection Agency (EPA) and the State of California emissions regulations. There are two types of emissions that fall under these regulations: 1) exhaust, and 2) evaporative. These regulations require that manufacturers warrant the emission control systems for defects in materials and workmanship.

Furthermore, EPA and California regulations require all manufacturers to furnish written instructions describing how to operate and maintain the engines/equipment including the emission control systems. This information is provided with all Wacker Neuson engines/equipment at the time of purchase.

Exhaust Emissions

The combustion process produces carbon monoxide, oxides of nitrogen, and hydrocarbons. Control of hydrocarbons and oxides of nitrogen is very important because, under certain conditions, they react to form photochemical smog when subjected to sunlight. Carbon monoxide does not react in the same way, but it is toxic.

Wacker Neuson utilizes lean carburetor settings and other systems to reduce the emissions of carbon monoxide, oxides of nitrogen, and hydrocarbons.

Evaporative Emissions

Evaporative emissions are fuel emissions and generally include emissions that result from permeation of fuel through the fuel-system materials or from ventilation of the fuel system.

Wacker Neuson utilizes low-permeation fuel lines and fuel tanks where applicable to reduce evaporative emissions.

Problems that may affect Emissions

If any of the following symptoms arise, have the engine/equipment inspected and repaired by a Wacker Neuson dealer/service center.

- Hard starting or stalling after starting
- Rough idling
- Misfiring or backfiring under load
- Afterburning (backfiring)
- Presence of black exhaust smoke during operation
- High fuel consumption

Tampering and Altering

Tampering with or altering the emission control system may increase emissions beyond the legal limit. If evidence of tampering is found, Wacker Neuson may deny a warranty claim. Among those acts that constitute tampering are:

- Removing or altering of any part of the air intake, fuel, or exhaust systems.
- Altering or defeating the speed-adjusting mechanism causing the engine to operate outside its design parameters.

6.2 Limited Defect Warranty for Exhaust Emission Control System

See the supplied engine owner’s manual for the applicable emission warranty statement.

6.3 Limited Defect Warranty for Wacker Neuson Evaporative Emission Control Systems

The Emission Control Warranty is valid only for the U.S.A., its territories, and Canada.

Wacker Neuson Sales Americas, LLC, N92 W15000 Anthony Avenue, Menomonee Falls, WI 53051, (hereinafter “Wacker Neuson”) warrants to the initial retail purchaser and each subsequent owner, that this engine/equipment, including all parts of its evaporative emission control system, have been designed, built, and equipped to conform at the time of initial sale to all applicable evaporative emission regulations of the U.S. Environmental Protection Agency (EPA), and that the engine/equipment is free of defects in materials and workmanship which would cause this engine/equipment to fail to conform to EPA regulations during its warranty period.

Wacker Neuson is also liable for damages to other engine/equipment components caused by a failure of any warranted parts during the warranty period.

Limited Defect Warranty Period for Wacker Neuson Evaporative Emission Control Systems

The warranty period for this engine/equipment begins on the date of sale to the initial purchaser and continues for a minimum of two (2) years. For the warranty terms for your specific engine/equipment, visit wackerneuson.com.

Any implied warranties are limited to the duration of this written warranty.

What is covered

Wacker Neuson recommends the use of genuine Wacker Neuson parts, or the equivalent, whenever maintenance is performed. The use of replacement parts not equivalent to the original parts may impair the effectiveness of the engine/equipment emission controls systems. If such a replacement part is used in the repair or maintenance of the engine/equipment, assure yourself that such part is warranted by its manufacturer to be equivalent to the parts offered by Wacker Neuson in performance and durability. Furthermore, if such a replacement part is used in the repair or maintenance of the engine/equipment, and an authorized Wacker Neuson dealer/service center determines it is defective or causes a failure of a warranted part, the claim for repair of the engine/equipment may be denied. If the part in question is not related to the reason the engine/equipment requires repair, the claim will not be denied.

For the components listed in the following table, an authorized Wacker Neuson dealer/service center will, at no cost to you, make the necessary diagnosis, repair, or replacement necessary to ensure that the engine/equipment complies with the applicable EPA regulations. All defective parts replaced under this warranty become property of Wacker Neuson.

System Covered	Components
Evaporative emissions	Fuel tank (if applicable)
	Fuel tank cap (if applicable)
	Fuel line (if applicable)
	Fuel line fittings (if applicable)
	Clamps (if applicable)
	Carbon canister (if applicable)
	Purge port connector (if applicable)
Miscellaneous parts associated with the evaporative emission control system	Clamps
	Gaskets
	Mounting brackets

What is not covered

- Failures other than those resulting from defects in material or workmanship.
- Any systems or parts which are affected or damaged by owner abuse, tampering, neglect, improper maintenance, misuse, improper fueling, improper storage, accident and/or collision; the incorporation of, or any use of, add-on or modified parts, or unsuitable attachments, or the alteration of any part.
- Replacement of expendable maintenance items made in connection with required maintenance services after the item's first scheduled replacement as listed in the maintenance section of the engine/equipment operator's manual, such as spark plugs and filters.
- Incidental or consequential damages such as loss of time or the use of the engine/equipment, or any commercial loss due to the failure of the engine/equipment.
- Diagnosis and inspection charges that do not result in warranty-eligible service being performed.
- Any non-authorized replacement part, or malfunction of authorized parts due to use of-non authorized parts.

Owner's Warranty Responsibility

The engine/equipment owner, is responsible for the performance of the required maintenance listed in the Wacker Neuson engine/equipment operator's manual. Wacker Neuson recommends that all receipts covering maintenance on the engine/equipment be retained, but Wacker Neuson cannot deny warranty coverage solely for the lack of receipts or for the failure to ensure the performance of all scheduled maintenance.

Normal maintenance, replacement, or repair of emission control devices and systems may be performed by any repair establishment or individual; however, warranty repairs must be performed by an authorized Wacker Neuson dealer/service center.

The engine/equipment must be presented to an authorized Wacker Neuson dealer/service center as soon as a problem exists. Contact Wacker Neuson Product

Support Department (1-800-770-0957) or visit wackerneuson.com to find a dealer/service center in your area, or to answer questions regarding warranty rights and responsibilities.

How to Make a Claim

In the event that any emission-related part is found to be defective during the warranty period, you shall notify Wacker Neuson Product Support Department (1-800-770-0957), and you will be advised of the appropriate dealer/service center where warranty repair can be performed. All repairs qualifying under this limited warranty must be performed by an authorized Wacker Neuson dealer/service center.

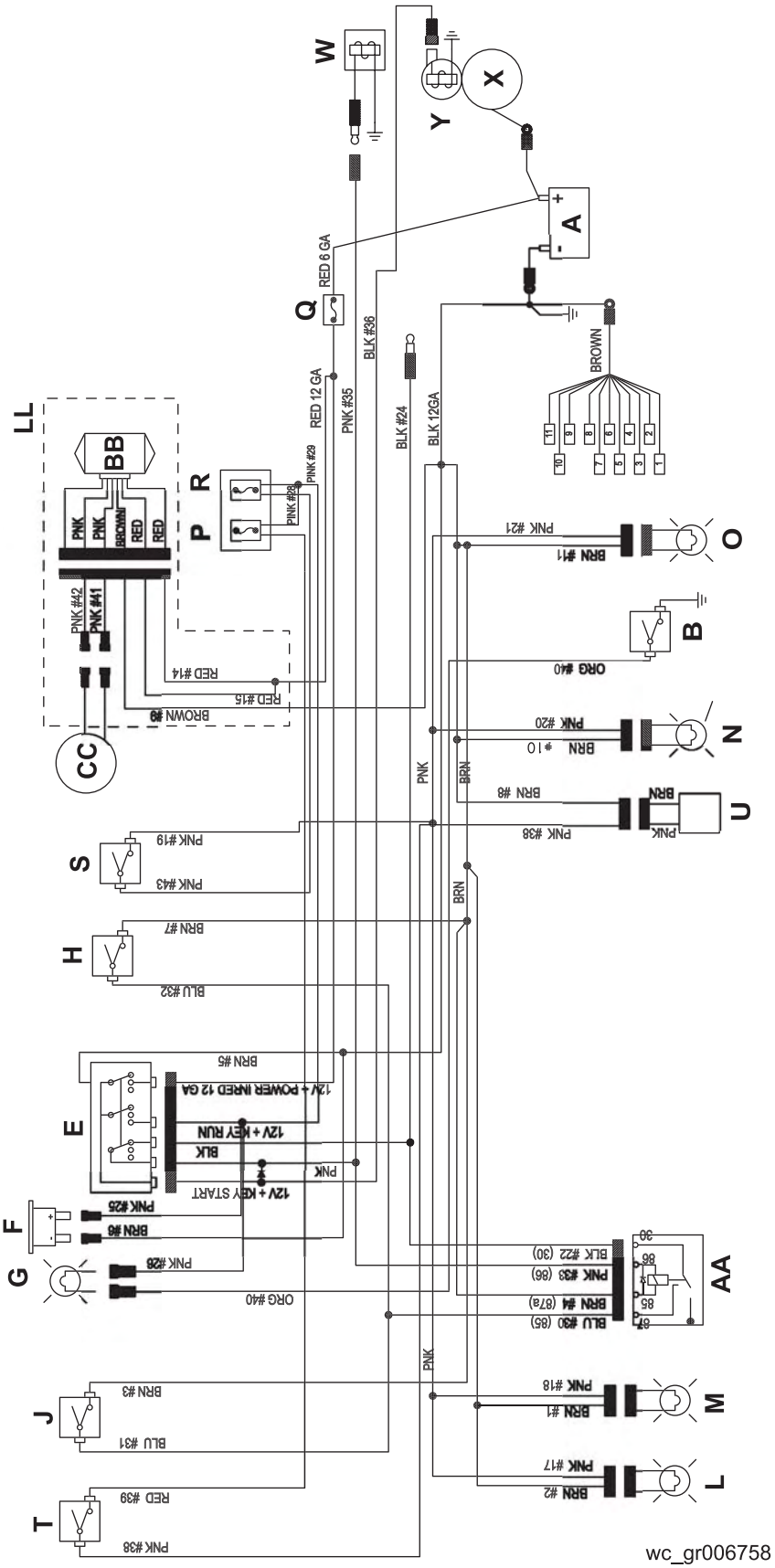
You must take your Wacker Neuson engine/equipment along with proof of original purchase date, at your expense, to the authorized Wacker Neuson dealer/service center during their normal business hours.

For owners located more than 100 miles from an authorized dealer/service center (excluding the states with high-altitude areas as identified in 40 CFR Part 1068, Appendix III), Wacker Neuson will pay for pre-approved shipping costs to and from an authorized Wacker Neuson dealer/service center.

Claims for repair or adjustment found to be caused solely by defects in material or workmanship will not be denied because the engine/equipment was not properly maintained and used.

The warranty repairs should be completed in a reasonable amount of time, not to exceed 30 days.

7 Schematic



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7.1 Schematic Components

Ref.	Description	Ref.	Description
A	Battery	U	Spray pump motor
B	Oil pressure switch (dual circuit)	V	Engine connector
C	Fuel pump	W	Fuel cut-off solenoid
D	Fuel pump relay	X	Starter motor
E	Key switch	Y	Engine crank solenoid
F	Hour meter	Z	Glow plug fuse
G	Oil pressure indicator light	AA	Relay—safety system
H	Operator presence switch (normally open)	BB	Voltage regulator
J	Throttle sense switch (normally closed)	CC	Alternator
K	Neutral relay	DD	Glow plug temperature sensors
L	Right front light	EE	Glow plugs
M	Right rear light	FF	Keyed power fuse
N	Left rear light	GG	Temperature sensor
O	Left front light	HH	Coils—ignition
P	Fuse—spray system	JJ	Ignition module
Q	Fuse—main	KK	Engine speed sensor
R	Fuse—light circuit	LL	External voltage regulator (Honda engines only)
S	Light switch	MM	Glow plug relay
T	Spray pump switch	—	—

CONCRETE
POWER TROWELS

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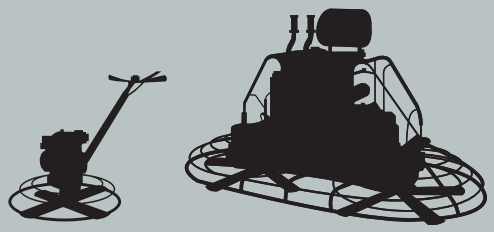
ASSOCIATION OF AEM EQUIPMENT MANUFACTURERS

SAFETY MANUAL

FOR OPERATING AND MAINTENANCE PERSONNEL



SAFETY ALERT SYMBOL

This Safety Alert Symbol means ATTENTION is required!

The Safety Alert Symbol identifies important safety messages on machines, safety signs, in manuals or elsewhere. When you see this symbol, be alert to the possibility of personal injury or death. Follow the instructions in the safety message.

Why is SAFETY important to YOU?

3 BIG REASONS

- **Accidents KILL or DISABLE**
- **Accidents COST**
- **Accidents CAN BE AVOIDED**

WORD OF EXPLANATION

The following is a partial list of reference material on safe operating practices:

U.S. Department of Labor publishes Safety and Health Regulations and Standards under the authority of the Occupational Safety and Health Act for the General Construction and Mining Industries. Its address is: U.S. Department of Labor, Washington, DC 20210 (www.OSHA.gov and www.MSHA.gov).

ANSI – American National Standards Institute, c/o The American Society of Mechanical Engineers, United Engineering Center, 345 East 47th Street, New York, NY 10017 (www.ANSI.org).

ISO – International Standards Organization, 1, rue de Varembe Case postale 56, CH-1211 Geneva 20, Switzerland (www.ISO.ch).

SAE – Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15096, publishes a list, “Operator Precautions” SAE J153 MAY 87 (www.SAE.org).

AEM – Association of Equipment Manufacturers, 111 East Wisconsin Avenue, Milwaukee, WI 53202 (www.AEM.org).

TABLE OF CONTENTS

FOREWORD

This safety manual is intended to point out some of the basic situations which may be encountered during the normal operation and maintenance of your walk-behind or ride-on concrete power trowel and to suggest possible ways of dealing with these conditions.

Additional precautions may be necessary, depending on application and attachments used and conditions at the work site or in the maintenance area.

The trowel manufacturer has no direct control over machine application, operation, inspection, lubrication, or maintenance. Therefore, it is your responsibility to use good safety practices in these areas.

Do not use the trowel for any purpose other than its intended purposes or applications.

The information provided in this manual supplements the specific information about your machine and its application that is contained in the manufacturer's manual(s).

Other information which may affect the safe operation of your machine may be displayed on safety signs, or in insurance requirements, employer's safety programs, safety codes, local, state/provincial, and federal laws, rules, and regulations.

If you do not understand any of this information, or if errors or contradictions seem to exist, consult with your supervisor before operating your trowel!

IMPORTANT: If you do not have the manufacturer's manual(s) for your particular machine, get a replacement manual from your employer, equipment dealer, or manufacturer of your machine. Keep this safety manual and the manufacturer's manual(s) accessible to the operator and maintenance personnel.

A WORD TO THE USER

Remember that **YOU** are the key to safety. Good safety practices not only protect you but also protect the people around you. It is your responsibility to study this manual and the manufacturer's manual(s) for your specific machine before operating your machine. Make them a working part of your safety program. Keep in mind that this safety manual is written for concrete power trowels only. Practice all other usual and customary safe working precautions, and above all –

REMEMBER – SAFETY IS UP TO YOU

YOU CAN PREVENT SERIOUS INJURY OR DEATH

FOLLOW A SAFETY PROGRAM

EQUIPMENT/CLOTHING

Consult your supervisor for specific instructions on a job, and the personal safety equipment required. For instance, you may need:

- Hard Hat
- Heavy Gloves
- Eye Protection
- Ear Protectors
- Safety Shoes
- Dust Mask or Respirator

Do not wear loose clothing or any accessory – flopping cuffs, dangling neckties and scarves, or jewelry – that can catch in moving parts.

DUST PRECAUTION

Some dust created by construction activities may cause silicosis or respiratory harm.

Your risk of exposure varies depending on how often you do this type of work. To reduce your risk, work in a well ventilated area, use a dust control system, and wear approved personal safety equipment such as a dust/particle respirator designed to filter out microscopic particles.

LEARN TO BE SAFE

- Read the operator's manual. If one has not been provided, get one and study it before operating the equipment.
- Learn the location and understand the functions of all controls before attempting to operate the equipment.
- Know the meaning of all identification symbols on the controls and gauges.
- Check to determine that the manufacturer's furnished safety warning labels are securely attached to the trowel and all warnings can clearly read. Replace labels and decals if they are missing or become worn or unreadable.
- Know the location and type of emergency shut-down control the trowel is equipped with.
- Never start or operate the trowel without protective guards and panels in place.
- Know the capabilities and limitations of the trowel.

SAFETY DEVICES

Know what safety devices your trowel is equipped with … and see that each item is securely in place and in operating condition.

For example:

- Emergency stop switch or other "Shut-Down" devices
- Guards, Shields & Panels
- Alarms or Warning Lamps
- Drain Covers, Plugs, and Caps
- Pressure Relief Devices
- Lights

PREPARE FOR SAFE OPERATION

PRE-OPERATIONAL CHECKS

Walk around the trowel. Carefully inspect for evidence of physical damage, such as cracks, bends, or deformation of plates and welds. Check for loose, broken or missing parts on the trowel, including brackets, vibration isolators, nuts and bolts. Hardware should be replaced with original equipment manufacturer's (OEM) parts, and should be properly tightened to the manufacturer's recommendations.

Remove all trash and debris from the trowel. Make sure oily rags, leaves, or other flammable material are removed and not stored on the trowel. Avoid potential fire hazards!

Clean all oil or grease from operator areas such as control handles, foot pedals, or platforms to prevent slipping.

Check for fuel, oil, and hydraulic fluid leaks. All leaks must be corrected before the trowel is operated.

Inspect all hydraulic hoses for cracks or signs of wear and replace if necessary. Secure all caps and filler plugs for all systems.

Always use a a flashlight or shielded trouble light when checking for leaks – never use an open flame. Never check for hydraulic leaks with your hand. Hydraulic systems are under high pressure and leaks in these systems can penetrate the skin which can result in serious injury or even death. Always use a piece of cardboard or wood when looking for hydraulic leaks.

Be sure the trowel is properly lubricated. See that the fuel, lubricating oil, coolant and hydraulic reservoirs are filled to the proper levels with the correct fluids according to the manufacturer's instructions and recommendations.

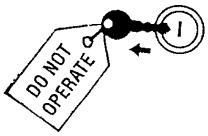
FIRE PREVENTION

Always stop the engine and allow it to cool before refueling.

Never refuel –

- When engine is running
- Near open flame or sparks
- While smoking
- In poorly ventilated areas

Never overfill fuel tanks or fluid reservoirs. In the event of a fuel spill, do not attempt to start the engine until the fuel residue has been completely wiped up, and the area surrounding the engine is dry. Replace fuel cap securely after refueling.



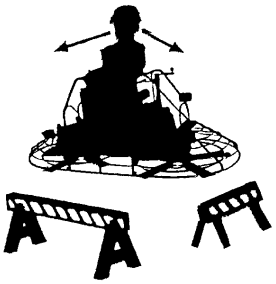
Inspect electrical wiring for damage or wear.

Batteries produce explosive gas. Keep open flame or sparks away.

In case of accident or fire, be ready to act quickly, yet calmly. Do not panic. Knowing ahead of time where to locate a first aid kit, fire extinguisher, or to get assistance will help should an emergency situation come up.

CHECK THE WORK AREA

Learn – beforehand – as much about your working area as possible.



Be observant of other workers, bystanders and other machinery in the area. Keep all unauthorized, untrained people and children out of the area while the trowel is in operation.

PREPARE FOR SAFE OPERATION

CHECK THE AREA

Thoroughly check the area for unusual or dangerous conditions, such as tools, or items that may damage the trowel or be propelled by the trowels rotating blades. Note where pipes and forms are located. Locate and mark protrusions (rebar, anchor bolts, floor drains, etc.) in the concrete.

GETTING ON AND OFF A RIDE-ON TROWEL

If operating a ride-on trowel, mount and dismount carefully. Use the steps and hand holds provided. Do not use control levers as hand holds and never use guard rings as steps. Watch for surfaces that may be slippery. Never jump off a ride-on trowel.

OPERATING ON AN ELEVATED DECK (MULTI-STORY OPERATION)

Consult local/state regulations before you operate equipment on an elevated deck. If operating on an elevated deck, ensure perimeter safety cabling of proper size and strength is in place. Do not operate the trowel close to the edge of the deck.

TRANSPORTING THE TROWEL

Never transport the trowel with float pans attached unless safety catches are used and are specifically cleared for such transport by the manufacturer. Under no circumstances hoist the trowel more than three feet off the ground with float pans attached. Always consult the manufacturer's operation manual for specific information on transporting the trowel.

START CORRECTLY – START SAFELY

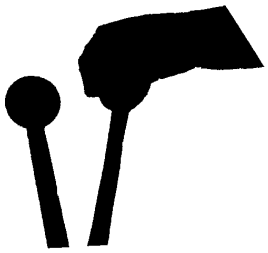
Before starting, check for proper functioning of all operation and shutdown controls. Check all controls to be sure they are in the correct startup position. Know the proper starting procedure for your trowel. Follow the manufacturer's operational instructions.

WALK-BEHIND TROWELS

- Ensure that the operator is familiar with the trowel and is trained on its operation.
- Ensure the operator is well rested, not fatigued, is alert, and not impaired in any way (medications, drugs, alcohol, etc.).
- Do not start or operate the trowel if the drive train will not disengage. Centrifugal force between the trowel and surface when starting can cause uncontrolled handle movement that can cause serious injury. The handle must not move while pulling the engine recoil starter.
- Visually check to be sure that the blades are free of obstructions and the area is clear for operation.
- For trowels that use this feature, ensure that the emergency stop switch is in the ON position.
- Move the throttle to the idle position.
- Switch the engine ON/OFF switch to the ON position.
- Never place your foot on the ring guard when starting the engine or severe injury can occur if your foot slips through the ring guard as the blades start to spin.
- While firmly holding the handle with one hand, start the engine following the guidelines in the engine manufacturer's instruction manual.
- Hold the handle bar firmly with both hands while the trowel is "throttled-up".
- If control of the trowel is lost, stay clear and do not attempt to regain control until the trowel has stopped moving. Depending on the engine speed, the trowel handle can swing around before it stops completely.
- You are ready to operate the trowel!

RIDE-ON TROWELS

- Ensure that the operator is familiar with the trowel and is trained on its operation.
- Ensure the operator is well rested and not fatigued, is alert, and not impaired in any way (medications, drugs, alcohol, etc.).
- Adjust the seating if necessary and get into a comfortable position where all controls are accessible.
- Visually check to be sure that the blades are free of obstructions and the area is clear for operation.
- Start the trowel following the instructions in the engine manufacturer's operation manual. For diesel powered trowels, follow the instructions for glow plug and cold start operation.
- Observe any gauges and warning lights to ensure they are functioning and their readings are within the manufacturer's normal operating range.
- Check operation of controls. Make certain they operate properly.
- You are ready to operate the trowel!



SAFE WORKING PROCEDURES

DANGER – CARBON MONOXIDE

Exhaust from the engine contains poisonous carbon monoxide gas that is not easily detected as it is colorless and odorless. Exposure to carbon monoxide can cause loss of consciousness and may lead to death! Do not operate your trowel indoors or in an enclosed area unless adequate ventilation is provided. Ensure that permissible carbon monoxide levels are monitored and not exceeded.

OTHER PRECAUTIONS

- Never leave the trowel unattended while it is running.
- Always keep clear of rotating or moving parts.
- Never use additional weights other than the weights recommended by the manufacturer. The use of unauthorized weights could lead to personal injury or damage to the trowel.
- Never fill the fuel tank while the engine is running. Turn the engine off and allow it to cool before refueling.
- The muffler, exhaust pipes and other engine parts will become hot during operation and will remain hot for a while after shutdown. Do not touch until allowed to sufficiently cool. Do not allow debris, rags, paper, or leaves to accumulate around these areas.

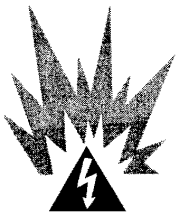
- Do not keep tools, buckets, loose materials on the trowel while it is running and never allow anyone other than the operator on or near the trowel while it is in operation.
- Do not use the trowel for any purpose other than its intended purposes or applications.

WORK SAFELY

ELECTRICAL EQUIPMENT

Some walk-behind trowels are powered by electric motors. Electric motors and components present special hazards during operation. Read the operator's manual.

- Never operate a trowel with a damaged or worn electrical cord. When using an extension cord, be sure to use one heavy enough to carry the current load. When trowel is used outdoors, use only extension cords that are marked for outdoor use.
- Use only appropriate extension cords that have grounding-type plugs and receptacles that accept the machine's plug.



- Keep all electrical cords away from rotating elements, heat, oil, and sharp edges to avoid damaging them.
- Avoid body contact with grounded surfaces such as pipes, metal railings, radiators and metal ductwork.
- Always check the power supply before running the trowel. Using the wrong voltage supply will damage the motor.
- Always make sure the motor switch is OFF or in the stop position before plugging the trowel into the power supply.
- Do not operate an electric powered trowel in the rain or snow. Keep the motor, switch, and electrical cords dry.
- Never operate the trowel in areas exposed to flammable or explosive liquids or gases. Sparks could ignite fumes.

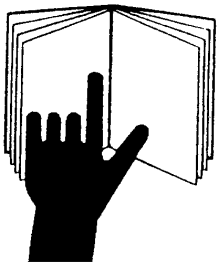
SHUT DOWN SAFELY

SHUT DOWN PROCEDURES

Never disable or disconnect the safety devices!

Always close fuel valves when the machine is not being used.

Refer to the manufacturer's manuals for specific shut down procedures.



LOAD AND UNLOAD SAFELY

PRECAUTIONS

- Power trowels are heavy and awkward to move around.
- Do not attempt to lift the ride-on trowel by the guard rings.
- Use proper heavy lifting procedures.
- Keep all non-essential personnel clear of the area.
- Never hoist the trowel over areas where people are standing or working.
- Remove tools and loose items before lifting.
- Make sure the crossbars on the safety catches are in good condition if so equipped.
- Always consult your operator's manual for the best and proper lifting, loading, and unloading methods.

WALK-BEHIND TROWELS

Some walk-behind trowels can be lifted or moved by two people utilizing lifting tubes or other special attachments. Generally however, they must be lifted using lifting bales (special lifting brackets), or other specific lifting points provided by the manufacturer, and cranes, hoists, or forklifts. Be certain any lifting devices used have adequate capacity.

RIDE-ON TROWELS

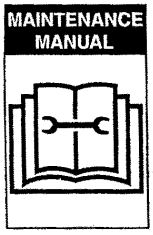
Ride-on trowels are very heavy. They require heavy-duty lifting devices such as cranes or heavy-duty hoists to lift them on and off the concrete slab.

Be certain any lifting devices used have adequate capacity. Some ride-on trowels are equipped with lifting bosses that are used with specialized apparatus to assist in moving the trowels around. Use extreme care when lifting or moving a ride-on trowel.

STORAGE

Always store equipment properly when it is not being used. Equipment should be stored in a clean, dry location out of reach of children.

SERVICE AND MAINTENANCE SAFETY



Poorly maintained equipment can become a safety hazard! In order for your trowel to operate safely and properly over a long period of time, periodic maintenance and occasional repairs are necessary.

Do not attempt to clean, service, or perform adjustments on the trowel while it is running.

GOOD HOUSEKEEPING

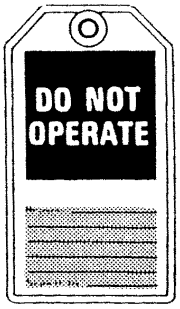
Keep area clean and dry if possible. Oily and wet surfaces are slippery; greasy rags are a fire hazard; wet spots are dangerous around electrical equipment.

GENERAL PROCEDURES

Do not perform any work on the trowel unless you are authorized to do so.

Standard maintenance procedures should always be observed. Read the manufacturer's manual or find assistance if you do not understand what you are doing.

Maintenance can be dangerous unless performed properly. Be certain that you have the necessary skill and information, correct tools and equipment to do the job correctly.



Attach a Do Not Operate tag or similar warning tag to the control panel (or handle on walk-behind trowels), and disconnect the battery (disconnect the spark plug wire on walk-behind trowels), before performing maintenance on the machine.

Disconnect the electric cord on electrical machines.

PERFORM MAINTENANCE SAFELY

FORM GOOD DRESS HABITS

Loose clothing and jewelry can catch in moving parts and cause serious injury.

Keep hands – and clothing – away from moving parts.

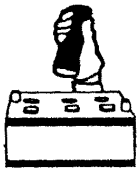
GUARDS AND SAFETY DEVICES

After performing maintenance make certain all guards and panels have been reinstalled and all safety devices are functional.

BATTERY MAINTENANCE

Always wear eye and face protection.

Batteries produce explosive gases. Keep open flame or sparks away. See the manufacturer's instructions when servicing the batteries, when using jumper cables, or when using a battery charger.



Use a flashlight to check battery electrolyte level. Always check with engine stopped.

Battery electrolyte is poisonous. It is strong enough to burn your skin, eat holes in clothing, and can cause blindness if splashed into eyes. Always wear eye and face protection.

Flush any contacted area with water immediately.

FIRE PREVENTION

Avoid fire hazards.

Always stop the engine and allow it to cool before you refuel the trowel. Do not refuel while smoking or near open flame or sparks. Never overfill fuel tanks or fluid reservoirs.

Remove all trash or debris. Make sure oily rags or other flammable materials are not stored on or in the trowel.

Check for fuel, oil, or hydraulic fluid leaks. Repair the leaks and clean the machine before you operate it.

Inspect electrical wiring or worn or frayed insulation. Install new wiring if wires are damaged.

Do not weld or flame cut on pipes, tubes, or tanks that contain flammable fluids or gases.

Ether and starting fluid is flammable. Do not smoke when using. Always follow the instructions on the can and in the manufacturer's manual for your trowel.

Always use a safe, nonflammable solvent when you clean parts. Do not use flammable fluids or fluids that give off harmful vapors.

Store all flammable fluids and materials away from your work area.

Whenever the sparkplug is removed, do not test for spark on gasoline powered engines if engine is flooded or the smell of gasoline is present. A stray spark could ignite fumes.

Know where fire extinguishers are kept – how they operate – and for what type of fire they are intended!

Check readiness of fire suppression systems and fire detectors (is so equipped).

PERFORM MAINTENANCE SAFELY

EXHAUST FUMES

Engine exhaust fumes can cause sickness or death. When performing maintenance, if it is necessary to run an engine in an enclosed area, remove the exhaust fumes from the area when an exhaust pipe extension. If you do not have an exhaust pipe extension, make sure you open the doors and get outside air into the area.

Ensure that permissible carbon monoxide levels are monitored and not exceeded.

FLUID SIPHONING

Never siphon gasoline or hydraulic fluid using a hose and suction by mouth. Ingestion of these fluids even in small amounts will require immediate medical attention and can cause death.

COOLING SYSTEM

Maintain the cooling system according to the manufacturer's instructions.

Hot coolant can spray out and you can be burned if you improperly maintain or service the cooling system.

Remove filler cap only when cool.

TROWEL BLADES AND PANS

- Do not attempt to clean, service or perform adjustments on the trowel while it is running.
- Do not remove while the trowel is hanging overhead. Always support the trowel securely on a flat, level surface before changing blades or pans.
- Always handle blades and pans carefully. Worn blades or pans may develop sharp edges that can cause serious cuts.
- Always replace worn or damaged parts with service parts designated by the manufacturer.
- Replace blades and pans as a complete set – even if only one blade or pan is showing wear or damage. They can wear differently depending on different jobs, and a difference in blade size will damage the finish of the slab surface.

HYDRAULIC SYSTEMS

Hydraulic fluid systems operate under high pressure. Even a small leak can have enough force to penetrate the eyes or skin. If injury occurs, seek immediate medical treatment by a physician familiar with injuries that are caused by hydraulic oil escaping under pressure.

Use a piece of wood or cardboard to find hydraulic oil leaks. Do not use your bare hands.

Wear safety glasses to prevent injuries to the eyes.

TEST YOUR KNOWLEDGE

Do you understand this AEM manual and items such as –

- Your safety program?
- Your trowel manufacturer's manual(s)?
- Proper clothing and personal safety equipment?
- Your trowel's controls, warning signs and devices, and safety equipment?
- Proper trowel lifting and moving procedures?
- How to inspect and start your trowel?
- How to check your trowel for proper operation?
- Proper working procedures?
- Proper shut down procedures?
- Your work area and any special hazards that may exist?
- Under what conditions you should not operate your trowel?

If you do not understand any of these items, consult with your supervisor before operating your trowel.

A FINAL WORD TO THE USER

Remember that **YOU** are the key to safety. Good safety practices not only protect you but protect the people around you.

You have read this safety manual and the manufacturer's manual(s) for your specific trowel. Make them a working part of your safety program. Keep in mind that this safety manual is written for only this type of machine.

Practice all other usual and customary safe working precautions, and above all –

REMEMBER – SAFETY IS UP TO YOU

YOU CAN PREVENT SERIOUS INJURY OR DEATH

This manual is another in a series on the safe operation of machinery published by AEM.
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Association of Equipment Manufacturers
Toll free 1-866-AEM-0442
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FORM PT-160

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Wacker Neuson Produktion GmbH & Co. KG, Preußenstraße 41, D-80809 München,
Tel.: +49-(0)89-3 54 02-0 Fax: +49 - (0)89-3 54 02-390
Wacker Neuson Production Americas LLC, N92W15000 Anthony Ave., Menomonee Falls, WI. 53051
Tel.: (262) 255-0500 Fax: (262) 255-0550 Tel.: (800) 770-0957
Wacker Neuson Limited - Room 1701–03 & 1717–20, 17/F. Tower 1, Grand Century Place, 193 Prince Edward Road West, Mongkok, Kowloon, Hongkong. Tel: (852) 3605 5360, Fax: (852) 2758 0032