SERVICE MANUAL

544D-10

9136-4003

April 30, 2007

Starting Serial No.
0355001 thru 0455362

CORPORATE OFFICE

JLG INDUSTRIES, INC.
1 JLG DRIVE
McConnellsburg, PA
17233-9533
USA
Telephone: (717) 485-5161
Fax: (717) 485-6417

GRADALL DIVISION

JLG INDUSTRIES, INC.
406 Mill Avenue S.W.
New Philadelphia, OH
44663
USA
Telephone: (330) 339-2211
Fax: (330) 339-8458

MidWestTech | Gradall 544D-10 Telehandler Service Manual | Publication 91364003 Order the manual at mid-west-tech.com >

TABLE OF CONTENTS

IMPORTANT SAFETY NOTICE	inside front cover
TABLE OF CONTENTS	
INTRODUCTION	
General	
Operator Qualifications	
Orientation	
Related Manuals & Decals	
Serial Number Location	
NOMENCLATURE	
SAFETY HIGHLIGHTS	1.0
DECALS	2.0
Decals Inside Cab	
Decals Outside Cab	
OPERATORS CAB	3.0
Cab	
Control & Instrument Identification	
CHECKS & SERVICES BEFORE STARTING ENGINE	4.0
WARM-UP & OPERATIONAL CHECKS	5.0
ENGINE OPERATION	6.0
Starting the Engine	
Cold-Weather Starting Aids	
Battery-Boosted Starting	
Normal Engine Operation	
Stopping the Engine	
John Deere Engine Shut-Down Protection Feature	
BRAKE SYSTEM	7.0
General	
Inching Travel	
Service Brakes	
Parking Brakes	
PARKING THE HANDLER	8.0
STEERING SYSTEM	9.0
DRIVE TRAIN	10.0
LEVELING THE HANDLER	11.0
OPERATING PROCEDURE & TECHNIQUES	12.0
Hydraulic Controls	
Rated Capacity Chart	
ATTACHMENTS	13.0
Approved Attachments	
Non-Approved Attachments	
Carriage/Fork Capacities	
Other Attachment Capacities	
Attachment Installation	
Attachment Operation	
OBTAINING HYDRAULIC OIL SAMPLE FOR ANALYSIS	14.0
LOADING & SECURING FOR TRANSPORT	15.0
MOVING HANDLER IN EMERGENCY	16.0
Moving Short Distances	
Moving Longer Distances	
To Activate Tow Bypass	
To Release Parking Brake	
To Restore Parking Brake	
MAINTENANCE SECTION	17.0
Nomenclature	
Lubrication and Maintenance	
Lubrication Chart	
Torque Chart	
Boom	
Stabilizer	
INSPECTION AND MAINTENANCE LOG	18.0
HAND SIGNALS	inside back cover

MidWestTech | Gradall 544D-10 Telehandler Service Manual | Publication 91364003 Order the manual at mid-west-tech.com >

MERITOR™

Table of Contents

Section 1: Introduction

Description 1
Identification

Section 2: Removal and Disassembly

Remove Axle 2
Disassemble Ball and Ramp Brake
Disassemble Trumpet Assembly 3
Disassemble Planetary System and Axle Shaft 4
Disassemble Hydraulic Apply Wet Disc Brake 5
Disassemble Three Function Wet Disc Brake
Disassemble Main Housing 7
Disassemble Differential Case 8
Disassemble Pinion Bearing Cage 10

Section 3: Prepare Parts for Assembly

Clean Ground and Polished Parts 13
Clean Parts With Rough Finish
Clean Axle Assemblies
Dry Cleaned Parts
Prevent Corrosion
Inspect Parts
Inspect Tapered Roller Bearings 14
Inspect Hypoid Pinion and Ring Gear Sets 15
Inspect Main Differential Assembly
Inspect Axle Shafts
Inspect Main Housing 16
Inspect Yoke
Inspect Planetary System Parts
Inspect Brakes
Repair or Replace Parts
Repair Welding
Liquid Adhesive 17
Disassemble Locked Sets
Cleaning
Reassembly
Application
Apply Silicone Gasket Material 18
Duo-Cone Oil Seal: Mount and Install

Section 4: Assembly and Installation

Assemble Differential Case 23
Check Rotating Resistance of Differential Gears (Not Limited Slip) 26
Assemble Drive Pinion and Bearing Cage 27
Adjust Pinion Bearing Preload (Without Press) 28
Adjust Thickness of Pinion Bearing Cage Shim Pack (Depth of Pinion) 29
Install Pinion Bearing Cage Assembly on Main Housing 31
Install Differential Housing Assembly into Main Housing (With Shims) 32
Install Differential Housing Assembly into Main Housing (With Adjusting Ring 2 Sides) 33
Assemble Axle Shaft 34
Assemble Trumpet Assembly 35

MidWestTech | Gradall 544D-10 Telehandler Service Manual | Publication 91364003 Order the manual at mid-west-tech.com >

Table of Contents

Assemble Hydraulic Apply Brake Housing Assembly 38
Hydraulic Apply Brake Housing Functional Test
Assemble Three Function Brake Housing Assembly 39
Assemble Ball and Ramp Brakes, Brake Discs, Reaction Plate and Pins 42
Assemble Three Function Brake, Brake Discs, Reaction Plate and Pins 43
Install Housing Assembly into Main Housing
Assemble Three Function Brake Release Bolts and Sleeves 44
Assemble Ball and Ramp Brake Cylinder Assembly and Install on Main Housing

Section 5: Adjustments

Check Ring Gear Runout Specification: 0.008 in. (0.20 mm) 47
Adjust Pinion and Ring Gear Backlash Specification: 0.005 in-0.015 in (0.13 mm-0.38 mm)
Teeth Contact Patterns 48
Verification Procedure
Correct Contact Patterns 49
Incorrect Contact Patterns
  High Contact Pattern
Deep Contact Pattern 50
Variations Along Length of Gear Teeth
Replace Lubricant 51

Section 6: Specifications

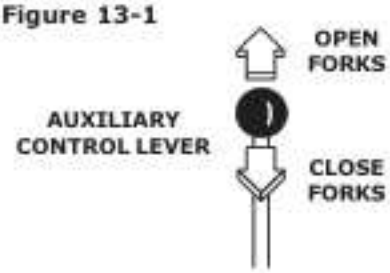
Oil Change Intervals and Specifications 52
Nut Lock Special Tool 53
Torque Charts
  PROA 352/382 54
  PRA 352 56
  PROA 352 G2H/G2M 58

MidWestTech | Gradall 544D-10 Telehandler Service Manual | Publication 91364003 Order the manual at mid-west-tech.com >

Fork Positioner

Capacity:
Maximum load capacity for fork positioner carriage is the same as standard carriage without fork positioner. **Refer to Attachment Capacity Chart.** Capacity varies with boom extension and elevation positions.

Controls:
Figure 13-1



The auxiliary control lever is used to adjust fork position. Pull lever back to close forks, push lever forward to open forks.

Installation Procedure:
1. Remove standard carriage/fork combination or other attachment from boom head. ***(See "Attachment Installation" Page 13.1)***

2. Install carriage/fork combination with positioner.

3. Connect auxiliary hydraulic hoses to positioner cylinders.

Operation:
- Always adjust fork position before engaging load. Moving forks after engaging load could cause load to fall from forks.

WARNING

PRECAUTIONS
- *Always adjust fork position before engaging load.*
- *As with all other attachments, handler must be level before handling a load more than four feet (1.2m) above ground level.* ***(See "Leveling The Handler," page 11.0)***

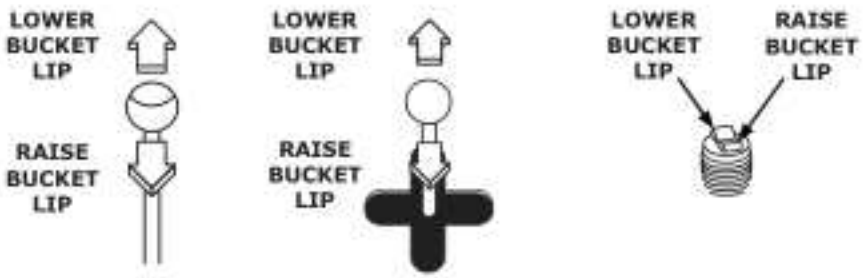
WARNING

Observe all precautions and load capacity limits (listed previously) when handling loads with carriage/ fork positioner.

Light Material Bucket

Capacity:
Maximum capacity of light material bucket is shown on the attachment serial number plate and may be used in areas where it does not exceed capacities shown on standard carriage/fork capacity chart. Capacity must be reduced for areas where maximum bucket capacity would exceed standard carriage/fork capacity chart.

Attachment Tilt Controls:
Figure 13-2



Because the carriage tilt cylinder is used to tilt the bucket, the carriage tilt lever is used to control the bucket. Pull lever back to raise bucket lip push lever forward to lower bucket lip.

Installation Procedure:
1. Remove carriage/fork combination or other attachment from boom head. ***(See Page 13.1)***

2. Install light material bucket on boom head.

3. Retract boom fully and tilt bucket up or down as required to position bottom of bucket parallel with ground.

WARNING

PRECAUTIONS
- *Handler must be level before handling a load more than four feet (1.2m) above ground level.* ***(See Page 11.0)***
- *Retract boom fully before loading bucket. Loading bucket with boom extended could damage structural members or extension chains/cables.*
- *Avoid shock loads; drive into stockpile smoothly to load bucket.*
- *Do not use bucket as a lever to pry heavy material. Excessive prying forces could damage the bucket.*
- *Do not use bucket for "back dragging." This could cause severe damage to Quick Switch fittings.*

WARNING

Observe all precautions and load capacity limits (listed previously) when handling loads with light material bucket.

MidWestTech | Gradall 544D-10 Telehandler Service Manual | Publication 91364003 Order the manual at mid-west-tech.com >

E.2 Axle problems and diagnosis

Problem	Cause	Action
Noise while driving	1. Excessive backlash between pinion and ring gear 2. Worn out pinion and gear ring 3. Worn out pinion bearings 4. Pinion beanings loosened 5. Excessive axial pinion backlash 6. Worn out differential bearings 7. Differential bearings loosened 8. Ring gear out of roundness 9. Low lubricant level 10. Poor or wrong lubricant 11. Bent halfshaft	1. Adjust 2. Replace 3. Replace 4. Adjust 5. Adjust 6. Replace 7. Adjust 8. Replace 9. Oil level 10. Replace 11. Replace
Noise while driving in neutral	1. Noise coming from axle are usually heard when vehicle moves in neutral gear but are not loud. 2. Incorrect backlash between pinion and ring (sound heard while decelerating disappears while increasing the speed) 3. Pinion or input flange worn out	1. Replace or adjust (see above) 2. Replace 3. Adjust
Intermittent noise	1. Ring gear damaged 2. Differential box bolts loosened	1. Replace bevel gear set 2. Tighten to torque
Constant noise	1. Ring gear teeth or pinion damaged 2. Worn out bearings 3.Pinion spline worn out 4. Bent halfshaft	1. Replace bevel gear set 2. Replace 3. Replace 4. Replace
Noise while seering	1. Worn out differential gears 2. Worn out differential box or spider 3. Differential thrust washers worn out 4. Half shaft spline worn out	1. Replace 2. Replace 3. Replace 4. Replace

MidWestTech | Gradall 544D-10 Telehandler Service Manual | Publication 91364003 Order the manual at mid-west-tech.com >

Cyclopac® Service Procedures

Proper air cleaner servicing results in maximum engine protection against the ravages of dust. Proper servicing can also save time and money by maximizing filter life and dust cleaning efficiency.

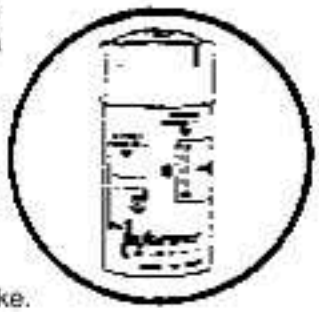
Two of the most common problems:

A) Over Servicing. New filter elements increase in dust cleaning efficiency as dust builds up on the media. Don't be fooled by filter appearance.... the filter should look dirty. By using proper filter measurement tools you will use the full life of the filter at maximum efficiency.

B) Improper Servicing. Your engine is vulnerable to abrasive dust contaminants during servicing. The most common cause of engine damage is careless servicing procedures. By following the steps shown, you can avoid unnecessary risk to the engine.

Measure Restriction

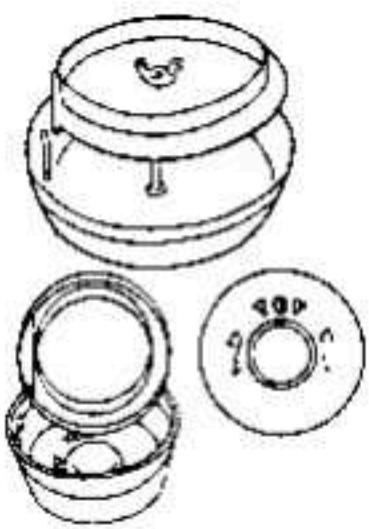
Measure the restriction of the air cleaner with a Donaldson restriction indicator, such as The Informer, a service gauge, or water manometer at the restriction tap provided in the air cleaner, the transfer pipe, or the blower intake.



One of two conditions will exist
(1) If the reading indicates the maximum restriction (per engine manufacturer's recommendations), change out the filter.
(2) If the reading shows below the maximum, the filter still has life left and should not be touched.

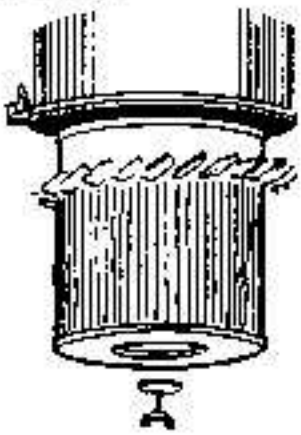
Empty the Dust Cup

Dust should not be allowed to build up closer than one inch from the baffle. On models equipped with a Donaldson Vacuator valve, dust cup service is cut to a minimum; all that is necessary is a quick check to see that the Vacuator valve is not inverted, damaged, or plugged.



Filter Servicing

When restriction indicates that filter servicing is required, loosen the wingnut and remove the primary filter. Before installing new filter, inspect the filter and gasket for shipping or storage damage. (See service tips on reverse side of this document.) Carefully install new element and wingnut.



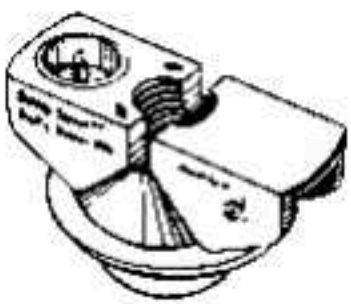
Always use authentic replacement Donaldson filters, which have been engineered to fit the air cleaner and engine intake system exactly.

Cover the Inlet

Don't leave the air inlet exposed! If the new filter won't be installed immediately, cover the opening to prevent stray contaminant from entering the induction system.

Safety Element Service

For Maximum engine protection and air cleaner service life, replace the safety filter **every third** primary filter change or cleaning, or as indicated by the Donaldson Safety Signal service indicator. Note that the safety element is not intended to be cleaned.



Reinstall the Dust Cup

Be sure the dust cup is sealed 360° around the air cleaner body. Reset the restriction indicator to green.

Check Connections

Ensure that all connections between the air cleaner and the engine are tight and leak-free.

Donaldson®

Order the manual at mid-west-tech.com >

KEY		
WIRE DESIGNATION	WIRE COLOR/STRIPE	WIRE GAGE
ACC-A	ORANGE/TAN	16
ACC-B	ORANGE/BLUE	16
ACC-C	ORANGE/RED	16
ALT BAT	RED/WHITE	6
ALT EXC-A	VIOLET/RED	16
ALT EXC-B	VIOLET/RED	16
AUXLT	BLACK	16
BAT	RED	8
BAT-HN	RED	16
CLT TMP	BLUE/VIOLET	16
FUL GAG	BLUE/BLACK	16
FWD	BROWN/WHITE	16
GND-1	BLACK	16
GND-2	BLACK	16
GND-3	BLACK	16
GND-4	BLACK	16
GND-5	BLACK	16
GND-6	BLACK	12
GND-7	BLACK	16
GND-8	BLACK	16
GND-10	BLACK	16
HN-AC	ORANGE/VIOLET	16
HORN	VIOLET/YELLOW	16
HR MTR	BLUE/RED	16
IGN-A	ORANGE/GRAY	16
IGN-B	ORANGE/LT GREEN	16
IGN-C	ORANGE/DK GREEN	16
N-START	BROWN/LT. GREEN	16
OIL GAG	BLUE/BROWN	16
PB LHT	BLACK	16
PRK BRK	VIOLET	16
PRK IGN	ORANGE/BLACK	16
PS IGN	ORANGE/YELLOW	16
REV	BROWN/YELLOW	16
REV-B	BLUE	16
SHT IGN	ORANGE/BROWN	16
SNSR	RED/BLACK	16
SPL ACC	ORANGE	16
SPL ACC2	ORANGE/VIOLET	16
STAB-PWR	ORANGE/LT GREEN	16
STAB-SW1	ORANGE/DK GREEN	16
STAB-SW2	VIOLET	16
START-A	VIOLET/BROWN	16
START-B	VIOLET/BROWN	16
START-C	VIOLET/BROWN	16
STRT SOL	RED/VIOLET	10
TRC LOK	BROWN/GRAY	16
4X4	BROWN	16
4X4 LHT	BLACK	16
4X4 PWR	BLACK	16

KEY		
WIRE DESIGNATION	WIRE COLOR/STRIPE	WIRE GAGE
002A	RED	12
002B	RED	12
012B	RED	16
012C	RED	18
012D	RED	16
020C	BLACK	18
020E	BLACK	18
020F	BLACK	18
022A	RED	12
022C	RED	16
050C	BLACK	18
050D	BLACK	12
050G	BLACK	16
050F	BLACK	12
428	GRAY	18
447	PURPLE	18
448	GRAY	18
461	BROWN	18
463	ORANGE	18
467	PURPLE	16
473	ORANGE	16
491	BROWN	16
493	ORANGE	16
904B	YELLOW	18
904C	YELLOW	18
904D	YELLOW	18
904E	YELLOW	18
905B	DR. GREEN	18
905C	DR. GREEN	18
905D	DR. GREEN	18
905E	DR. GREEN	18
911A	BROWN	16
911B	BROWN	16
911D	BROWN	16
911E	BROWN	16
914A	YELLOW	16
914B	YELLOW	16
914C	YELLOW	16
914D	YELLOW	16
914E	YELLOW	16
914F	YELLOW	16
915	DR. GREEN	16
918	GRAY	16
941	BROWN	16
947	PURPLE	16

ELECTRICAL SCHEMATIC

544D-10

9155-9012

Order the manual at mid-west-tech.com >