VIBROMAX

# SINGLE DRUM ROLLER

***SERVICE MANUAL SM85005***

March 2003

## Models 405, 605, 606




MidWestTech | JCB Vibromax 405, 605, 606 Single Drum Roller Service Manual | Publicati... Order the manual at mid-west-tech.com >

table of contents

# SECTION ONE


**GENERAL INFORMATION ..... 1 - 1**

MACHINE DESCRIPTION ..... 1 - 3
SERIAL NUMBERS ..... 1 - 5
IDENTIFYING MACHINE COMPONENTS ..... 1 - 6
FLUID SPECIFICATIONS - 405 ..... 1 - 8
FLUID SPECIFICATIONS - 605 ..... 1 - 9
MACHINE SPECIFICATIONS ..... 1 - 10
Model 405 ..... 1 - 11
Model 605 ..... 1 - 13
Model 606 ..... 1 - 15
STANDARD TORQUE DATA ..... 1 - 16
DIESEL FUEL SPECIFICATION ..... 1 - 18
ENGINE OIL SPECIFICATION ..... 1 - 19
SAFETY, GENERAL ..... 1 - 20
SPARK ARRESTER ..... 1 - 20
SAFETY, PERSONAL ..... 1 - 21
SAFETY, MACHINE OPERATION ..... 1 - 22
SAFETY, MAINTENANCE ..... 1 - 25
SAFETY, DECALS ..... 1 - 26


# SECTION TWO


**ENGINE ..... 2 - 1**

ENGINE DATA ..... 2 - 2
CUMMINS ENGINE WARRANTY ..... 2 - 3
ENGINE REMOVAL ..... 2 - 4


# SECTION THREE


**ELECTRICAL ..... 3 - 1**

GENERAL INFORMATION ..... 3 - 2
FUSE LOCATION ..... 3 - 3
RELAY LOCATION ..... 3 - 3
INSTRUMENT PANEL ..... 3 - 4
UNDERSTANDING ELECTRICAL SCHEMATICS ..... 3 - 7
UNDERSTANDING RELAYS ..... 3 - 9
VIBROMAX RELAYS ..... 3 - 11
STARTER/CHARGING CIRCUIT ..... 3 - 13




MidWestTech | JCB Vibromax 405, 605, 606 Single Drum Roller Service Manual | Publicati... Order the manual at mid-west-tech.com >

## table of contents


UNDERSTANDING BATTERIES ..... 3 - 13
BATTERY DIAGNOSTICS ..... 3 - 14
UNDERSTANDING ALTERNATORS ..... 3 - 15
CHARGING SYSTEM DIAGNOSTICS ..... 3 - 16
VOLTAGE CHECKS AT ALTERNATOR ..... 3 - 17
SYSTEM LEAKAGE ..... 3 - 17
CIRCUIT WIRING TEST ..... 3 - 17
MEASURING ALTERNATOR OUTPUT ..... 3 - 18
UNDERSTANDING STARTERS ..... 3 - 18
STARTER SOLENOID ..... 3 - 19
STARTER SYSTEM DIAGNOSTICS ..... 3 - 19
SOLENOID CIRCUIT TEST ..... 3 - 19
STARTER CIRCUIT WIRING TEST ..... 3 - 20
STARTER MOTOR TEST ..... 3 - 21
INSTRUMENTATION PANEL ..... 3 - 23
EMERGENCY STOP SWITCH/ BRAKE SWITCH ..... 3 - 25
HIGH SPEED CIRCUIT ..... 3 - 27
VIBRATION CIRCUIT ..... 3 - 29
LIGHTING CIRCUIT ..... 3 - 31
WORK LIGHTS, ACCESSORY PLUG, HEATER AND WIPERS ..... 3 - 33
CAB WIRING ..... 3 - 42
WIRE HARNESS 7241/80315 (0) ..... 3 - 43
WIRE CHART 7241/80315 (0) ..... 3 - 48
405 REAR HARNESS 7210/80510 ..... 3 - 52
WIRE CHART 7210/80510 ..... 3 - 53
605 REAR HARNESS 7221/80510 ..... 3 - 56
WIRE CHART 7221/80510 ..... 3 - 57


# SECTION FOUR


**HYDRAULIC ..... 4 - 1**

405 HYD. COOLER LINES ..... 4 - 2
605 HYD. COOLER LINES ..... 4 - 4
405 HYD. DRAIN LINES ..... 4 - 6
605 HYD. DRAIN LINES ..... 4 - 8
405 HYD. CHARGE SYSTEM ..... 4 - 10
605 HYD. CHARGE SYSTEM ..... 4 - 12
405 HYD. TEST STATION ..... 4 - 14
605 HYD. TEST STATION ..... 4 - 15
HYDRAULIC TEST FITTINGS ..... 4 - 17
405 PROPULSION SYSTEM ..... 4 - 18
605 PROPULSION SYSTEM ..... 4 - 20




MidWestTech | JCB Vibromax 405, 605, 606 Single Drum Roller Service Manual | Publicati... Order the manual at mid-west-tech.com >

## table of contents


PROPULSION SCHEMATIC ..... 4 - 22
PROPULSION SYSTEM DIAGNOSTICS ..... 4 - 24
INTERNAL LEAKAGE ..... 4 - 24
405 VIBRATION SYSTEM ..... 4 - 26
605 VIBRATION SYSTEM ..... 4 - 28
VIBRATION FREQUENCY ..... 4 - 32
VIBRATION AMPLITUDE ..... 4 - 34
VIBRATORY SYSTEM DIAGNOSTICS ..... 4 - 35
405 STEERING SYSTEM ..... 4 - 36
605 STEERING SYSTEM ..... 4 - 38
STEERING SYSTEM SCHEMATIC ..... 4 - 40
405 PARKING BRAKE SYSTEM ..... 4 - 41
605 PARKING BRAKE SYSTEM ..... 4 - 43
PARKING BRAKE SCHEMATIC ..... 4 - 45
TOWING YOUR MACHINE ..... 4 - 46
TOWING PROCEDURE ..... 4 - 47
405 DIFFERENTIAL LOCK SYSTEM ..... 4 - 48
605 DIFFERENTIAL LOCK SYSTEM ..... 4 - 50
DIFFERENTIAL LOCK SCHEMATIC ..... 4 - 52
405 HYDRAULIC COMPONENTS ..... 4 - 53
405 HYDRAULIC SCHEMATIC ..... 4 - 54
605 HYDRAULIC COMPONENTS ..... 4 - 55
605 HYDRAULIC SCHEMATIC ..... 4 - 56


# SECTION FIVE


**POWER TRAIN ..... 5 - 1**

GENERAL INFORMATION ..... 5 - 2
OPERATION ..... 5 - 3
405 SPETH AXLE ..... 5 - 4
405 DIFFERENTIAL GEARS ..... 5 - 5
405 INTERMEDIATE GEARS ..... 5 - 5
405 AXLE PLANETARY ..... 5 - 6
605 SPETH AXLE ..... 5 - 7
605/606 AXLE REPAIRS ..... 5 - 7
REAR AXLE REMOVAL ..... 5 - 8
REAR AXLE INSTALLATION ..... 5 - 9
AXLE TUBE DISASSEMBLY ..... 5 - 10
PLANETARY & TUBE DISSASSEMBLY ..... 5 - 12
PLANETARY & TUBE ASSEMBLY ..... 5 - 14
605 INTERMEDIATE GEARS ..... 5 - 16
INTERMEDIATE GEAR DISASSEMBLY ..... 5 - 18




MidWestTech | JCB Vibromax 405, 605, 606 Single Drum Roller Service Manual | Publicati... Order the manual at mid-west-tech.com >

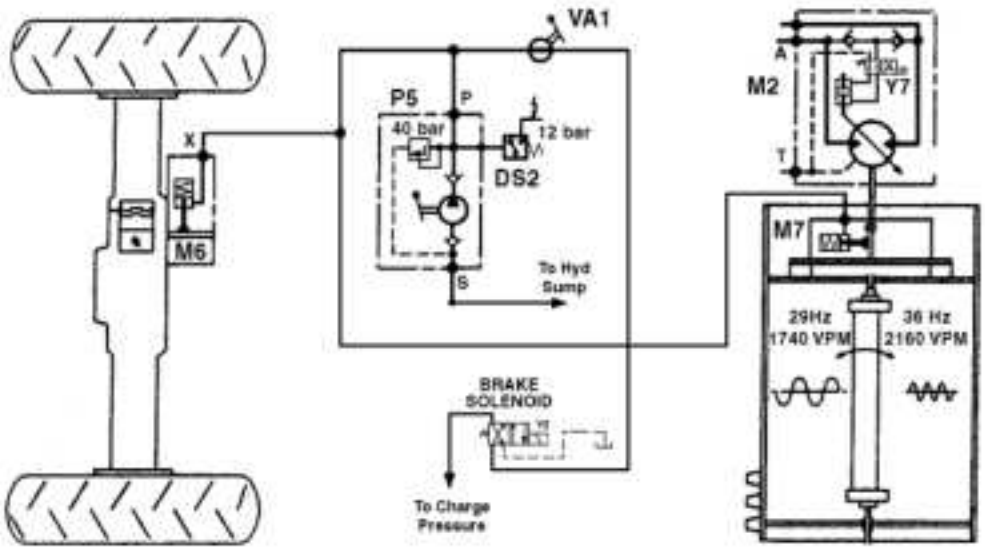
## FLUID SPECIFICATIONS - 405

| MACHINE PART | CAPACITY USA (metric) | SPECIFICATIONS |
|---|---|---|
| Fuel tank | 47.5 gal (180 ltr) | see diesel fuel |
| Engine crankcase | 11.5 qts(10.9 ltr) | engine oil<br>API classification API-CD MIL-L-2104C<br>multigrade engine oil (see oil chart)<br>single grade engine oil (see oil chart) |
| Hydraulic system<br><br>Reservoir only | 15.9 gal (60 ltr)<br><br>11.8 gal (45 ltr) | cold weather HLP 46 DIN 51524/2<br>hot weather HLP 68 DIN 51524/2<br>Mobil DTE 25,26<br>Shell Tellus OL 46,68<br>Amoco Rykon HD 46,68<br>Texaco Rando HD 46,68 |
| Vibration system | 2.6 qts. (2.5 ltr) | CLP DIN 51517/3<br>Mobil Gear 629<br>Shell Omala 150<br>Texaco Meropa 150 |
| Battery | as required | Distilled water |
| Grease | as required | KP3K DIN 51502<br>Mobil Oil - Mobilux 3<br>Shell Oil - Alvania 3<br>Texaco Oil - Starplex 3 |
| Engine coolant | 14.8 qts (14 ltr) | 50% ethylene glycol and 50% water |
| Tire ballast | none | |
| Intermediate gear and Axle gear and Planetary gear | 5.5 qts (5.25 ltr) | SAE 90 API GL-5 gear lubricant |
| Drum gearbox | 1.4 qts (1.3 l) | CLP 220 LS 2 DIN 51517/3<br>Mobilgear 630<br>Mobilgear SHC 220<br>Texaco Syngear 220 |



MidWestTech | JCB Vibromax 405, 605, 606 Single Drum Roller Service Manual | Publicati... Order the manual at mid-west-tech.com >

## PARKING BRAKE SCHEMATIC




A spring applied, hydraulically released, multi-disc brake is built into the drum drive motor gearbox. The rear axle has a multi-disc brake at the input shaft of the intermediate gear box. Pilot pressure is used to release the brake. Without pilot pressure, the spring keeps the brake applied.

The brakes are controlled by a push button on the dash or by the emergency stop button on the direction console. When the brake switch on the dash is depressed, hydraulic pressure is removed from the brake circuit and the brakes become applied through spring force. The brake switch also activates the differential lock solenoid for improved brake holding and removes electrical power to a pump control valve which puts the pump into neutral stroke. When the emergency stop switch is activated, the brake solenoid is de-energized removing hydraulic pressure allowing the springs to apply the brakes, the vibration circuit is turned off, the two speed motor is placed in low range, the differential lock is applied and the drive system stops with the pump stroked to neutral.

The pressure used to release the brakes is tapped off the charge system. Maximum brake release pressure should be 25 bar (355 psi).

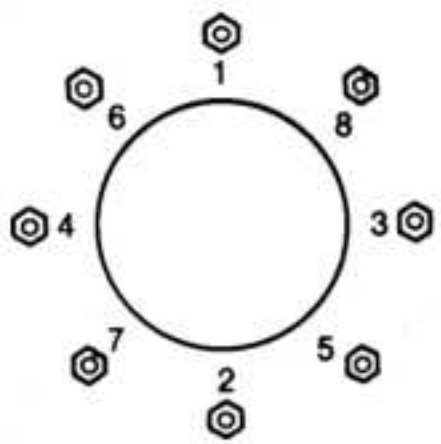
The pump control valve VW2 solenoid Y8 controls the pump by looping the two servo cylinder ports on the propulsion pump when the brake valve solenoid is de-energized. With the ports looped the pressure is equal on both side of the servo cylinder allowing spring pressure to stroke the pump to neutral. This feature is present in both the 405 and 605/606.



MidWestTech | JCB Vibromax 405, 605, 606 Single Drum Roller Service Manual | Publicati... Order the manual at mid-west-tech.com >

## REAR AXLE INSTALLATION

1. Position the axle under the machine frame rails. Install and tighten the axle bolts to 273 ft. lbs. (370 Nm.).
2. Install both wheels with snug wheel lug nuts.
3. Remove the jack support stands from under the machine and allow the machine to sit on the ground.
4. Tighten and torque the wheel nuts to 288 ft. lbs. (390 Nm.).
   **NOTE: Re-tighten the wheel nuts every 8 hours until nut torque stabilizes.**




5. Reconnect the hydraulic lines to the axle drive motor. Use tie straps to group the hoses.
   **NOTE: Be sure to fill the hydraulic motor case with oil!**
6. Reconnect the electrical plug on the two speed valve.
7. Reconnect the hydraulic line to the axle brake.
8. Refill the hydraulic reservoir with the proper amount of filtered hydraulic fluid.
9. Fill the planetary drives with SAE 90 API GL-5 oil until it flows from the filler plug hole in the planetary drive hub. Be certain that the fill plug in the hub is located at the top of rotation during filling.
10. Fill the differential and intermediate gearbox through the fill plug on the differential housing. Fill with SAE 90 API GL-5 oil until it flows from the plug hole in the differential housing.



MidWestTech | JCB Vibromax 405, 605, 606 Single Drum Roller Service Manual | Publicati... Order the manual at mid-west-tech.com >