UniCarriers Americas Corporation

SERVICE MANUAL

MODELS 2W5/2W6

WCX/WSX Series Walkie Counterbalance Stacker & Walkie Straddle Stacker
24V AC Powered Electric
3,000-4,000 lb. Capacities

SERVICE

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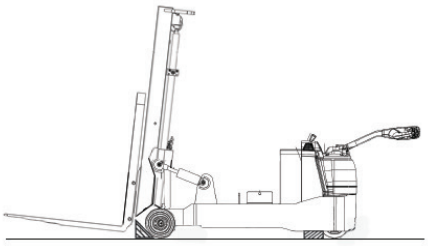
PUBLICATION NO.:
SM3UC-2W560

CAUTION

- **Always park the forklift on a flat, level and solid surface.**
- **Unload cargo from the forklift.**
- **Do not turn the ignition switch to “ON” or “OFF”, or operate control levers from any position while truck is being serviced.**
- **Disconnect the battery.**
- **Make sure the tiller handle is in the brake on position. Check the forklift and its surroundings for safety.**
- **Use hardwood blocks that do not slip easily and are strong enough to withstand the forklift weight. Do not use broken or cracked blocks or metal blocks that slip easily.**
- **Use wood blocks of the following size:**
  Width: 50 to 100 mm (1.97 to 3.94 in) larger than the longitudinal length of the frame.
  Length: 20 to 40 mm (0.79 to 1.57 in) larger than the width of the outside of base legs.
- **To prevent the forklift from inclining, do not place wood blocks of different heights under the right and left truck frame.**

Drive Tire

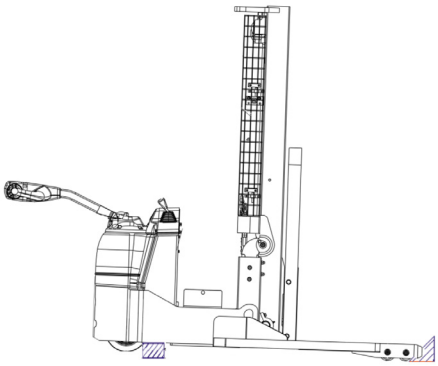


Changing the drive tire - 2W5

1. Place the forklift on a level and solid surface.
2. Turn the ignition switch to the “OFF” position.
3. Place chocks in front of load wheels to prevent movement of the forklift.
4. Loosen the wheel nuts one or two turns each by turning them counterclockwise.
5. Jack unit so wheel is off the ground and block frame.

WARNING

- **Do not operate the tiller handle. Doing so may cause the wood blocks on the ground to become unstable.**
- **Stop jacking up the forklift when the tire is slightly raised off the ground. Jacking up the forklift excessively high could cause it to roll over.**
- **Do not remove the wheel nuts until the drive tire is raised off the ground.**



Changing the drive tire - 2W6

6. Support the forklift by putting additional wood blocks under each side of the front-end of the frame as shown at left.
7. Remove the wheel nuts and replace the drive tire.

WARNING

- **Never get under the forklift while it is supported only by the wood blocks.**

8. Reinstall the wheel nuts and temporarily tighten them using the cross tighten method.

Maintenance & Service

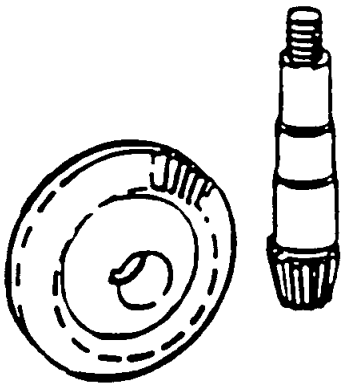
Spring Applied Brake Specifications

Item	Specification
Type Brake Disc	Electric release spring applied Floating, non-asbestos lined disc
Voltage Coil Resistor Maximum RPM's	24V 14.9 ohms, maximum 5,000
Air Gap in (mm) Motor Mounting Bolt Torque	Standard 0.012 (0.3), maximum 0.032 (0.8) 7.8 Nm (69 in/lb)

Tools Required:
Basic Hand Tools
Nonmagnetic Feeler Gauge in metric
Snap Ring Pliers
5mm Hex Socket or Wrench
Vacuum Cleaner
Personal Protection Equipment (i.e.; eye protection, dust protection)
V.O.M.

Gears, General Description

As described before, there are two sets of gears in the UCA transmission. The upper hi-speed reduction gears which determine the speed and power of a unit and the beveled gear set which transfers the speed and power to the output shaft. The only standard gear ratio is 14:1, these gear ratios are not matched sets.



NOTE:
New locknuts must be ordered whenever replacing either motor, or transmission reduction gear.

The beveled gear seat does not change from unit to unit and can only be purchased as a set (as shown at left).

NOTE:
As described later, these gears must be installed and adjusted to the proper backlash for quiet and efficient operation.

Planned Maintenance

The maintenance of this drive assembly is much like any other assembly of this type.

The following maintenance checks are required to be performed:

Steer Bearing
Lubricate the two (2) grease nipples on steer bearing every 30 days or 200 hours.

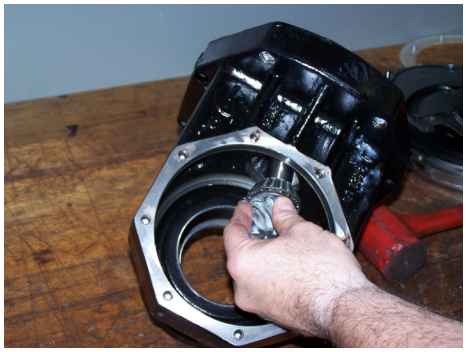
NOTE:
Use Chevron LC Grease EP for standard operation and use Mobil 28 (synthetic) for freezer operation.

Tools

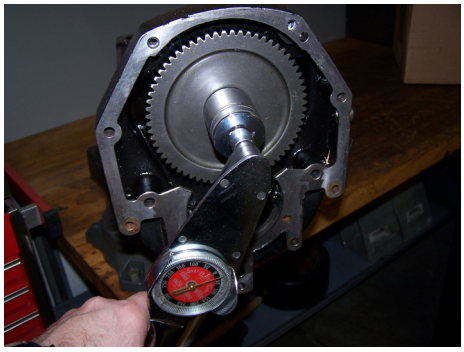
5mm Allen wrench	6mm Allen wrench
24mm Impact socket	30mm Impact socket
1/2 Inch Air impact	Pin punch
Brass drift	Hammer
Mallet/Dead blow hammer	Propane torch
Scraper	Press
250 ft/lb Torque wrench	Inch pound beam or Dial type torque wrench

Parts

O-Ring - motor	O-Ring - side cover
Lock nut pinion	Loctite/574 sealer
Loctite 603	Axle seal
Shim pinion shaft, if needed	Shim pinion position, if needed
Shim axle shaft, if needed	Shim ring gear position, if needed

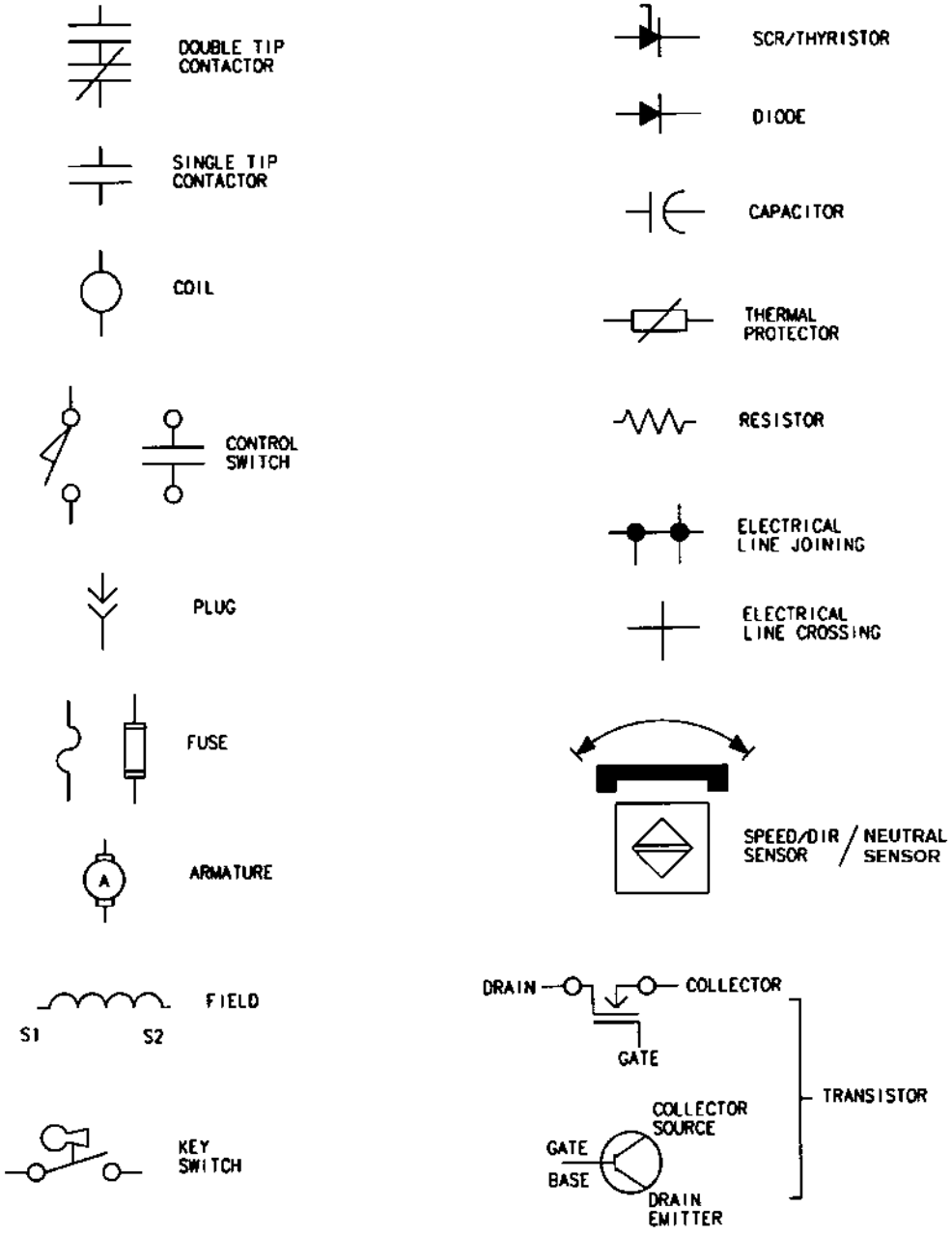


1. Clean up and inspect all parts. Clean up all sealing surfaces of sealant and internal/external threads of Loctite.
2. Do not install axle seal, loctite pinion nut, or ring gear bolt until all adjustments and checks have been made.
3. Pre lube axle and pinion bearings with a light oil. Install pinion shaft, shims/spacers and reduction gear. Install pinion nut and torque to 170 Nm (125 ft/lb). Rotate the pinion shaft, as the nut is to seat the bearings properly.



4. Check pinion bearing preload with a dial or beam type torque wrench. Rolling torque should be between 0.5 Nm (4.5 in/lb) and 0.8 Nm (7 in/lb).
5. Install inner axle bearing onto the axle shaft without the axle seal and install in transmission housing. Install spacer, shims and ring gear into the transmission and torque the ring gear retaining bolt to 300 mm (221 ft/lb). Rotate the ring gear as bolt is torqued to seat bearings properly.
6. Check axle bearing preload with a dial or beam type torque wrench using pinion shaft nut. Rolling torque should be between 1.2 Nm (10.6 in/lb) and 1.3 Nm (11.5 in/lb).

General Electrical Symbols



Meter Panel Explanation (Cont'd)

NOTE:
Contact your Local Authorized UCA Dealer for more information about how to set the Manual mode.

Factory defaults:
Traveling power level

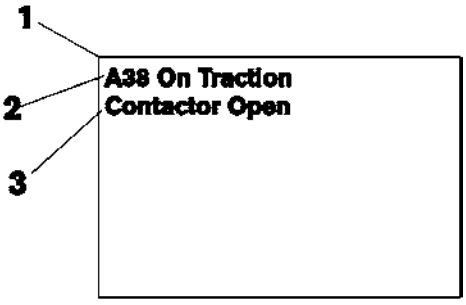
Mode E: Economy mode: For work requiring operation time to be saved or customers using the machine for a long time.

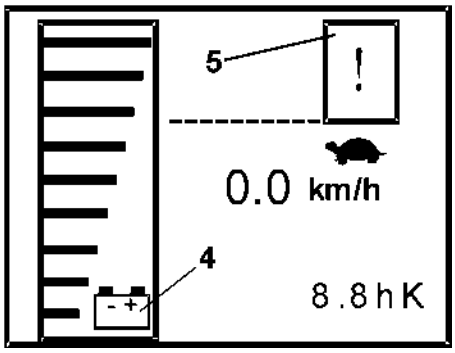
Mode M Manual: Use for custom speed setting

Mode H: High-power mode: For work or customers requiring higher traveling speed.

WARNING

- **After performance adjustment, operate the forklift slowly and carefully until you become accustomed to the new performance level. Be especially careful when the performance level has been increased. Higher performance levels can cause loads to shift, fall off or to be unstable during starts, which could result in serious injury or death.**





Malfunctions and Warning Indications

#1 LCD (Liquid Crystal Display)
#2 Error Code
#3 Malfunction Message
#4 Battery Warning Mark
#5 Exclamation Point

Battery Gate Sw. is the last screen. Press PB4 to exit/escape

Use PB1 or PB5 to select the Diagnose, Pump Screen

Press PB3 to enter/select Pump.

Motor Current is the first screen in Diagnose Pump. Use PB1 and PB5 to switch between screens. See the following Chart for a list of all the screens.

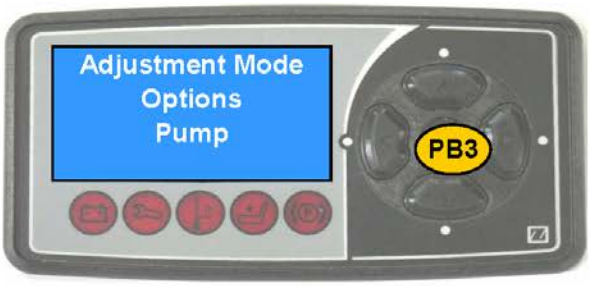
ECO ADJUSTMENT OPTIONS

Screen	Default Setting	Range		Description
Auto Power Off 15Min	15 Min.	0	60	Amount of time truck can sit idle before controller powers down (0 = OFF), requiring recycling of the ignition switch.

PB1 and PB5 can now be used to change the Auto Power Off value. Change the value to 10Min and press PB4 to exit/escape.

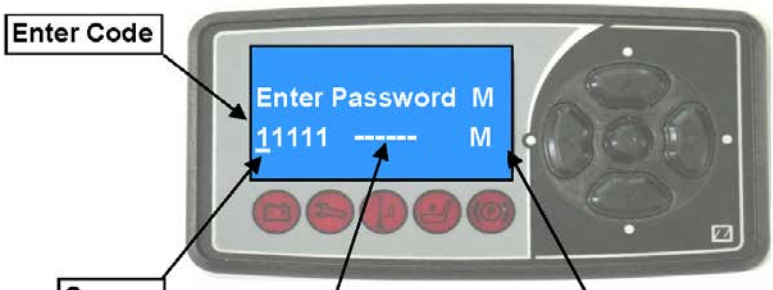
Press PB3 to exit and save the setting. Press PB4 to exit without saving the setting change.

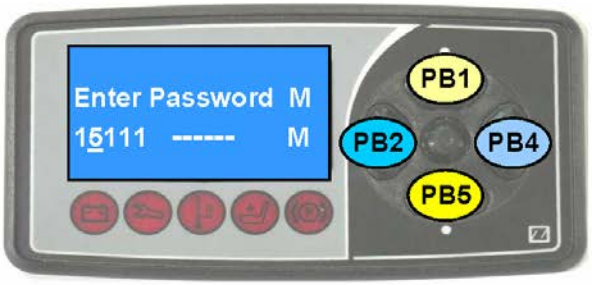
Auto Power Off is now set at 10Min. Press PB4 to exit/escape.



Use PB1 or PB5 to the selct Pump. Press PB3 to select/enter.

The cursor is now visible under the first character number 1. PB2 and PB4 will now move the cursor sideways across the screen. PB1 and PB5 will cange the values of the characters above the cursor.

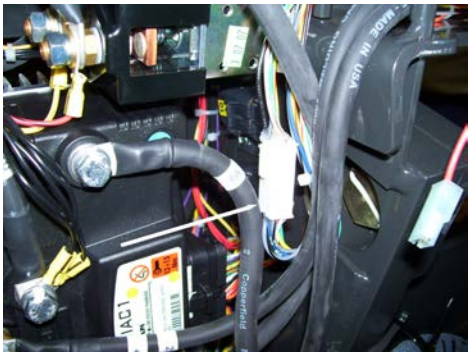




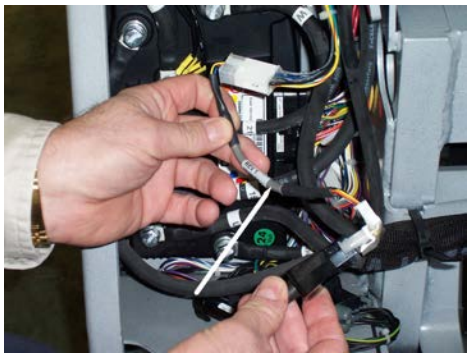
Use PB2 and PB4 to move the cursor to the next character.

Use PB1 or PB5 to change the 1 to a 5.

HANDSET CONNECTION



With ignition off, disconnect the J19 connector located to the right of the controller.

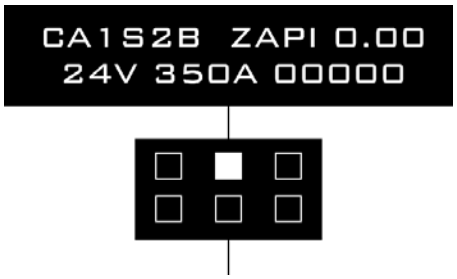


Connect the hand set adapter cable to the J19 plug.

Turn ignition on.

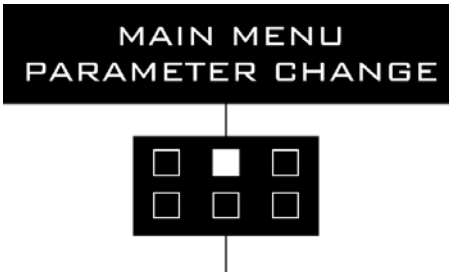
Main Menu “PARAMETER CHANGE” Functions List

To enter the MAIN MENU it is just necessary to push the ENTER button from the home display in the hand set.



Opening Zapi Menu

Press ENTER to go into the General Menu

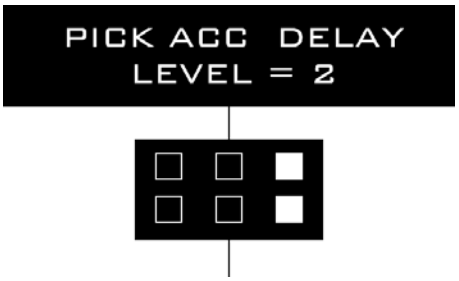


The Display will show: PARAMETER CHANGE

Press ENTER to go into the Parameter Change menu

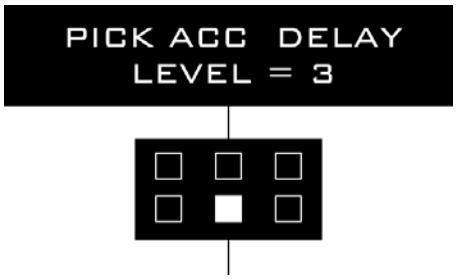
The Display will show the first parameter

Press either ROLL UP and ROLL DOWN to display the next parameter



The names of the Parameters appear on the Display

When the desired Parameter appears, it’s possible to change the Level by pressing either PARAMETER SET UP or PARAMETER SET DOWN buttons.



Then Display will show the new level

When you are satisfied with the result of the changes you have made, press OUT

Config Menu "ADJUSTMENTS" Functions List (Cont'd)

12. MAX EV1
- Factory Setting DO NOT ADJUST

13. LOWERING SPEED
- Factory Setting DO NOT ADJUST

14. EVP OPEN DELAY
- Factory Setting DO NOT ADJUST

15. EVP CLOSE DELAY
- Factory Setting DO NOT ADJUST

16. EV1 OPEN DELAY
- Factory Setting DO NOT ADJUST

17. EV1 CLOSE DELAY
- Factory Setting DO NOT ADJUST

Function Tester

1. MOTOR CURRENT
Amperes. Measurement of the DC current in the motor controlled by the slave of combiac 1.

2. MOTOR VOLTAGE
Volts. It is the voltage applied to the DC motor controlled by the slave of combiac 1, expressed in percentage of the nominal voltage.

3. HOURS METER
Pump hours.

4. LIFT RGT TILLER
On/Off: it indicates if the Right Hand LIFT switch (as viewed from ride-on position) of the handle is active.

5. LIFT LEFT TILLER
On/Off: it indicates if the Left Hand LIFT switch (as viewed from ride-on position) of the handle is active.

6. LOWER RGT - TILLER
On/Off: it indicates if the Right Hand LOWER switch (as viewed from ride-on position) of the handle is active.

7. LOWER LIFT - TILLER
On/Off: it indicates if the Left Hand LOWER switch (as viewed from ride-on position) of the handle is active.

8. HORN SW - TILLER
On/Off: it indicates if the HORN switch of the handle is active

9. SET POINT EVP
The parameter shows the setpoint of EVP valve.

2W5/2W6 MULTIPLEXER (PCB) BOARD MANUAL PROGRAM PROCEDURE

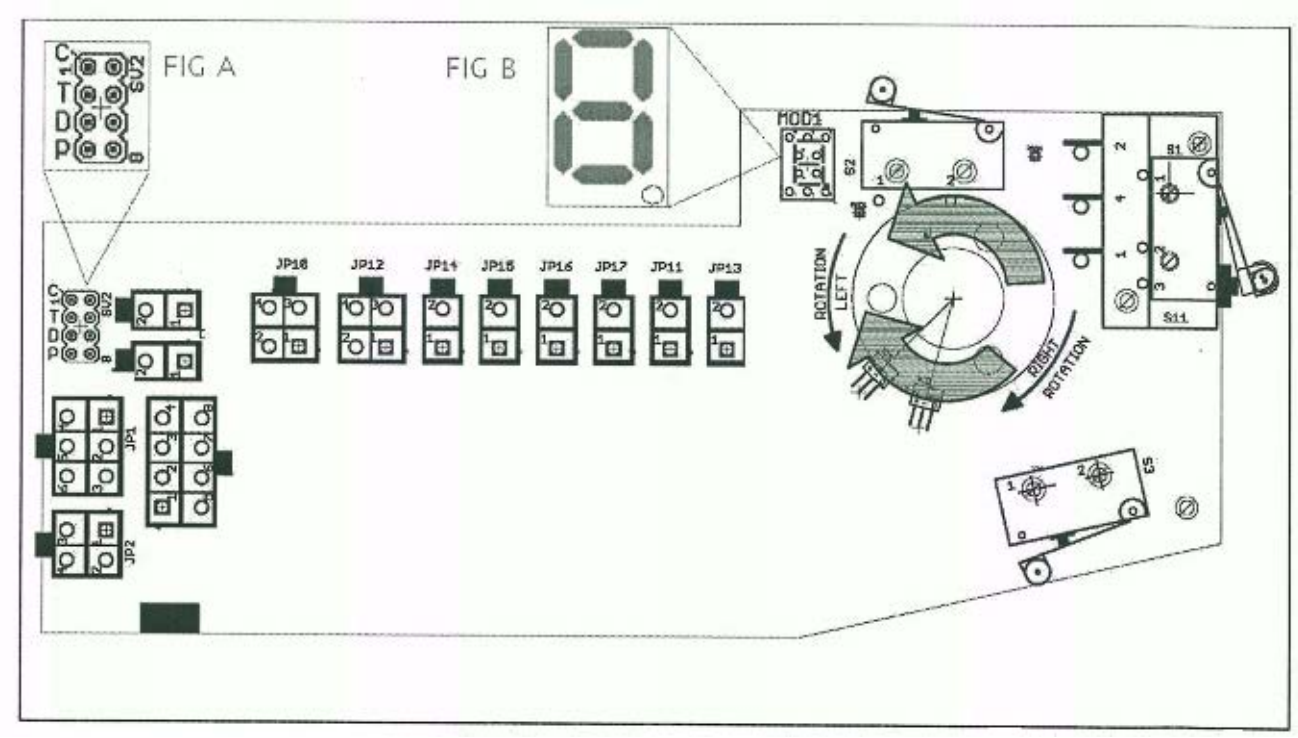
This procedure is required any time a new steer head assembly or Multiplexer (PCB) board is installed. This procedure should also be performed if the operation of the Forward or Reverse functions change in any way.

Disassembly and reassembly of the steer handle assembly must follow instruction per page ST-6.

Observe all warnings and procedures as outlined in service manual.

WARNING

- **As with any electric powered industrial truck, when carrying out testing, reprogramming, or diagnosis, always raise the drive tire off the floor to avoid any accidental movement.**



View and orientation for rotation left and rotation right, Connectors JP14 and JP15 must be connected.

Alarm Index (Cont'd)

SECONDARY/PUMP NODE 05 ALARMS OVERVIEW				SECONDARY WARNINGS OVERVIEW			
Alarm	**Number**	**Alarm**	**Page Number**	**Alarm**	**Number**	**Alarm**	**Page Number**
AL	08	WATCHDOG	ES-115*	AL	13	EEPROM KO	ES-120
AL	19	LOGIC FAILURE #1	ES-113	AL	52	PUMP I=0 EVER	ES-118
AL	28	PUMP VMN LOW	ES-112	AL	56	PUMP STBY I HIGH	ES-118
AL	29	PUMP VMN HIGH	ES-112	AL	64	PUMP MOTOR TEMPERATURE	ES-120*
AL	53	OUTPUT MISMATCH	ES-115*	AL	81	HW FAULT VALVE	ES-117*
AL	54	SAFETY FEED (TG)	ES-114*	AL	85	BATTERY GATE SWITCH OPTION	ES-118
AL	54	SAFETY FEED (EB)	ES-114*	AL	87	EEP WARNING	ES-119
AL	57	CAN INPUT MISMATCH	ES-114	AL	88	RAM WARNING	ES-119
AL	58	INPUT MISMATCH	ES-114	AL	90	INCORRECT START	ES-119
AL	59	WRONG SET POINT	ES-114	AL	91	CURRENT SENSOR LOW	ES-117
AL	67	WRONG ZERO	ES-113*	AL	92	EVP DRIVER KO	ES-118
AL	69	CAN BUS KO TILLER	ES-115	AL	94	WAITING FOR TRACTION	ES-118
AL	83	HW FAULT	ES-115	AL	95	VALVE CONT DRIVER	ES-117
AL	93	EVP DRIVER SHORTED	ES-112	AL	96	VALVE DRIVER SHORTED	ES-117
AL	97	ANALOG INPUT	ES-113	AL	98	VALVE COIL SHORTED	ES-117
AL	99	NO CAN MESSAGE #2	ES-115			LIFT + LOWER "SHOWS ON HAND SET ONLY"	ES-119

*Codes shared by both sides of the controller node 2 and node 5

Analysis and Troubleshooting of Master Warnings

1. HAND SET ONLY “PUMP WARNING”

Cause:
The slave has a warning.

Troubleshooting:
Connect to the slave with the handset and check the warning.

2. AL99 “SLIP PROFILE”

Cause:
There is an error on the choice of the parameters of the slip profile.

Troubleshooting:
Check in the hardware setting menu the value of those parameters.

3. AL79 “INCORRECT START”

Cause:
This is a warning for an incorrect starting sequence.

Troubleshooting:
The possible reasons for this alarm are (use the readings in the TESTER to facilitate the troubleshooting):
A. A travel demand active at ignition on
B. Brake (tiller) sensor is active at ignition on
Check the wirings. Check the microswitches. It could be also an error sequence made by the operator. A failure in the logic is possible too; so when all of the above conditions were checked and nothing was found, replace the controller.

4. AL62 “HIGH TEMPERATURE”

Cause:
This alarm occurs when the temperature of the base plate is higher than 85°C (185°F). Then the maximum current decreases proportionally with the temperature increases from 85°C (185°F) up to 105°(221°F). At 105° (221°F) the Current is limited to 0 Amps.

Troubleshooting:
Improve the air-cooling of the controller. If the alarm is signaled when the controller is cold, the possible reasons are a thermal sensor failure or a failure in the logic card. In this case, it is necessary to replace the controller.

5. AL66 + BLINKING RED LED “BATTERY LOW”

Cause:
It occurs when the battery charge is calculated as being less than or equal to 20% of the full charge and the BATTERY CHECK setting is other than 0 (refer to SET OPTION menu).

Analysis and Troubleshooting of Slave Warnings

1. AL91 “CURRENT SENSOR LOW”

Cause:
The pump chopper current sensor feedback is too low (below 0.5V).

Troubleshooting:
This type of fault is not related to external components; replace the controller.

2. AL81 “HW FAULT VALVE”

Cause:
The slave has detected that the master microcontroller is not able to stop hydraulic valves functions

Troubleshooting:
This fault is not related to external components, replace the controller.

3. AL98 “VALVE COIL SHORTED”

Cause:
This alarm occurs when there is a short circuit on an on/off valve coil.

Troubleshooting:
A. If the fault is present at start up, it is very likely that the hw over current protection circuit is damaged, it is necessary to replace the controller.
B. If the fault is present when the controller drives the outputs, the problem is located in the harness and or in the valve coils. Check for a short circuit of the negative coils’ connection to -BATT.

4. AL96 “VALVE DRIVER SHORTED”

Cause:
One or more on/off valve drivers are shorted.

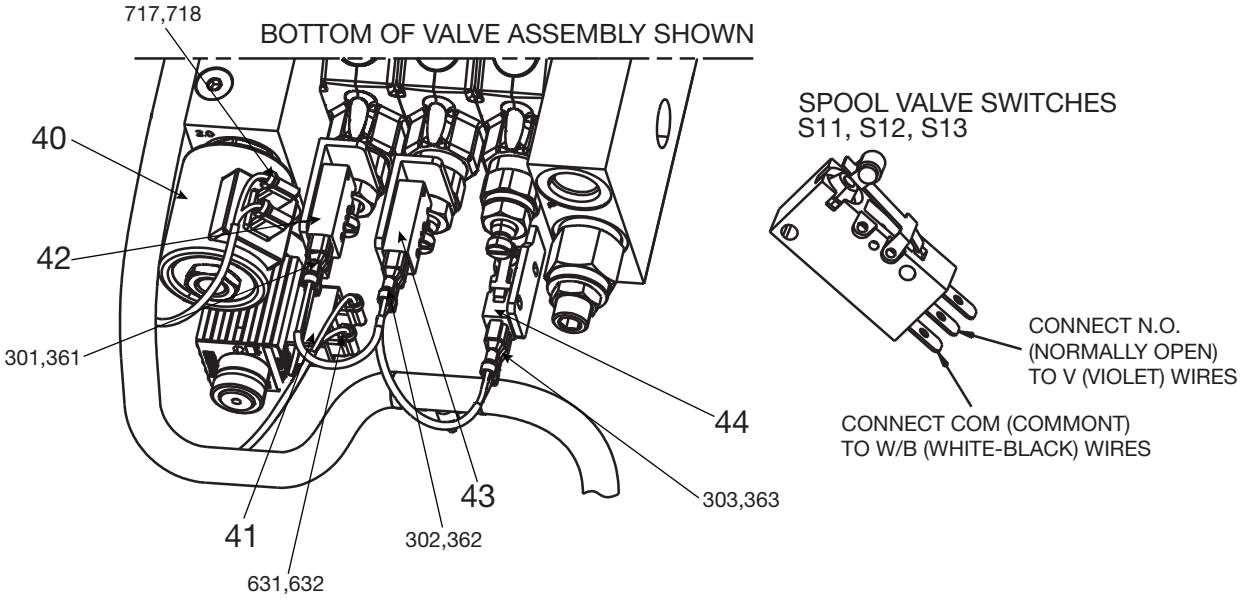
Troubleshooting:
Check if there is a short or a low impedance between the negative of one of those coils and -BATT. Otherwise the driver circuit is damaged and the controller must be replaced.

5. AL95 “VALVE CONT DRIVER”

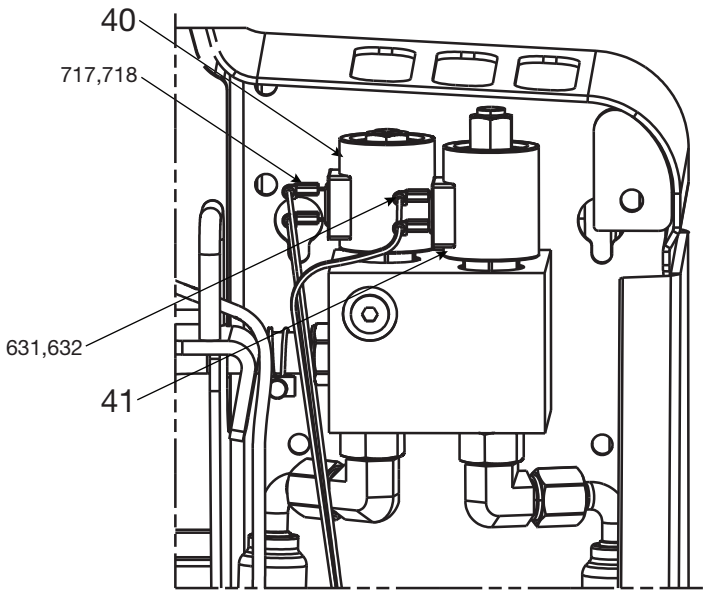
Cause:
One or more on/off valve drivers are not able to drive the load (cannot close).

Troubleshooting:
The device or its driving circuit is damaged. If device and circuit are okay replace the controller.

Standard - 2W5 / Optional - 2W6

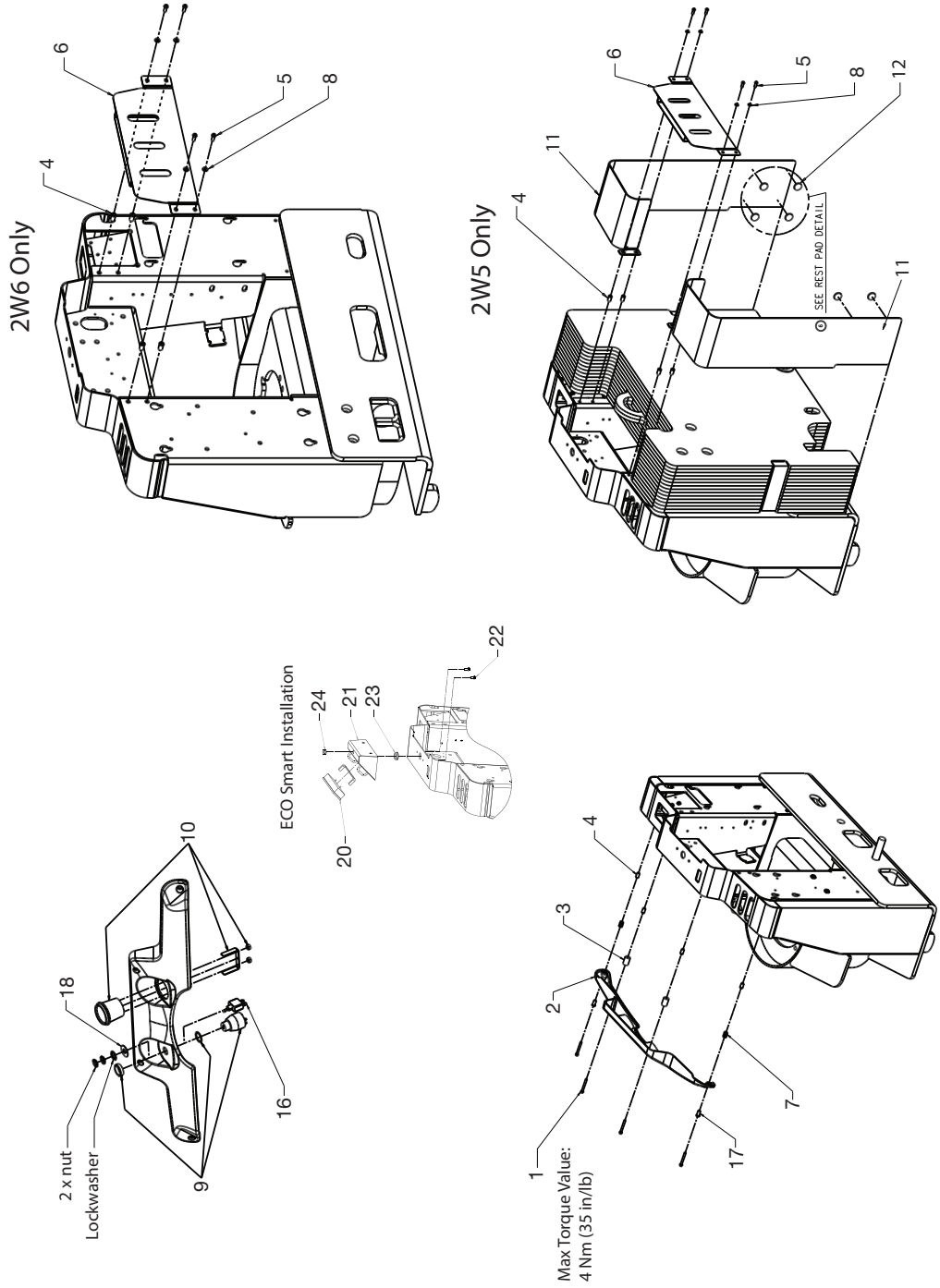


Standard - 2W6

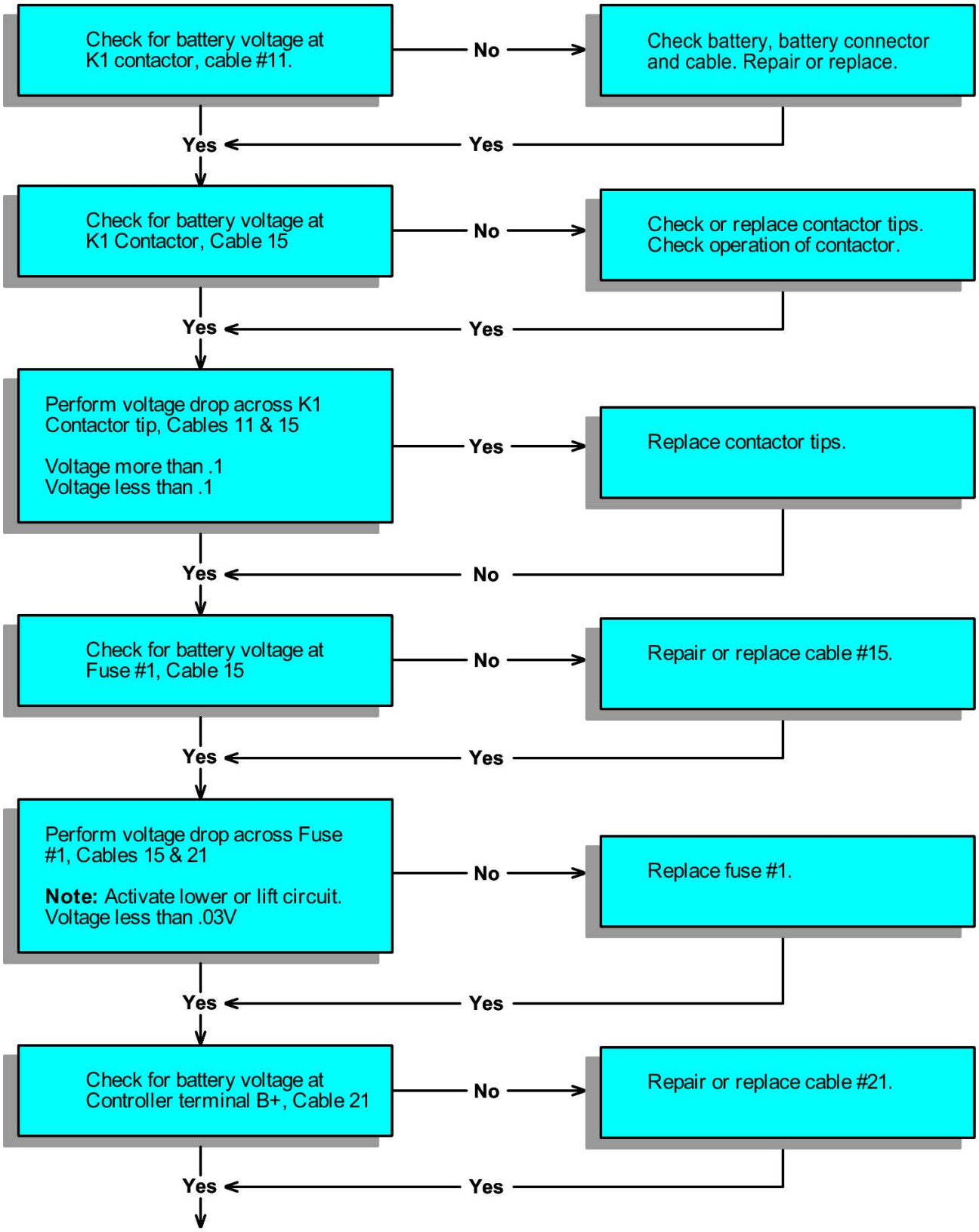


MDI, ECO-SMART DISPLAY AND IGNITION SWITCH

Item #	Description
1	Screw
2	Dashboard
3	Spacer - Dash Mounting
4	Rivnut
5	Screw
6	Pocket Assembly
7	Spring
8	Washer
9	Key Switch Assembly
10	AC MDI Meter Assembly
11	Hood
12	Foam Rest Pad
16	Toggle Switch Assembly
17	Flanged Dash Bushing
18	Toggle Switch Face Plate
20	ECO Smart Display
21	Meter Panel Weldment
22	Screw
23	Grommet
24	Grommet



Main Power Check - Positive Side



GENERAL INFORMATION

SECTION GI

CONTENTS

Always follow the warnings given in this Service Manual and any located on the truck to avoid accidents and/or injuries from occurring.

Warning Levels

Warning text is given in three levels and provides information on the risks, describes the consequences and instructs how to avoid accidents.

DANGER

- **Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.**

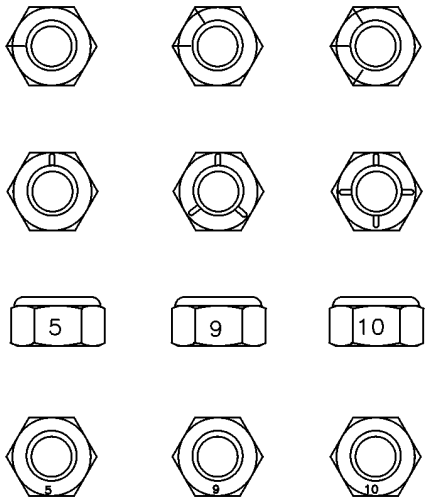
WARNING

- **Indicates a hazardous situation which, if not avoided, could result in death or serious injury.**

CAUTION

- **Indicates a hazardous situation which, if not avoided, may result in minor or moderate injury.**

SERVICE NOTE:
Marks the risk of a breakdown and/or material damage if the service procedure is not followed.



Introduction

Fasteners such as bolts, nuts, cap screws, and studs are made to specifications that best describe the mechanical strength and harness of that fastener. Any fastener used in a design application has been selected in accordance with its specifications. Parts used on these trucks come from many different sources and a few other countries. There are several standards used by these companies and the countries in which they are manufactured. Many of these fasteners are similar but cannot be used as a direct replacement.

Commonly threaded fasteners of each specification have identification marks for that specification. This specification is called “grade” for SAE standards and “property” for metric standards.

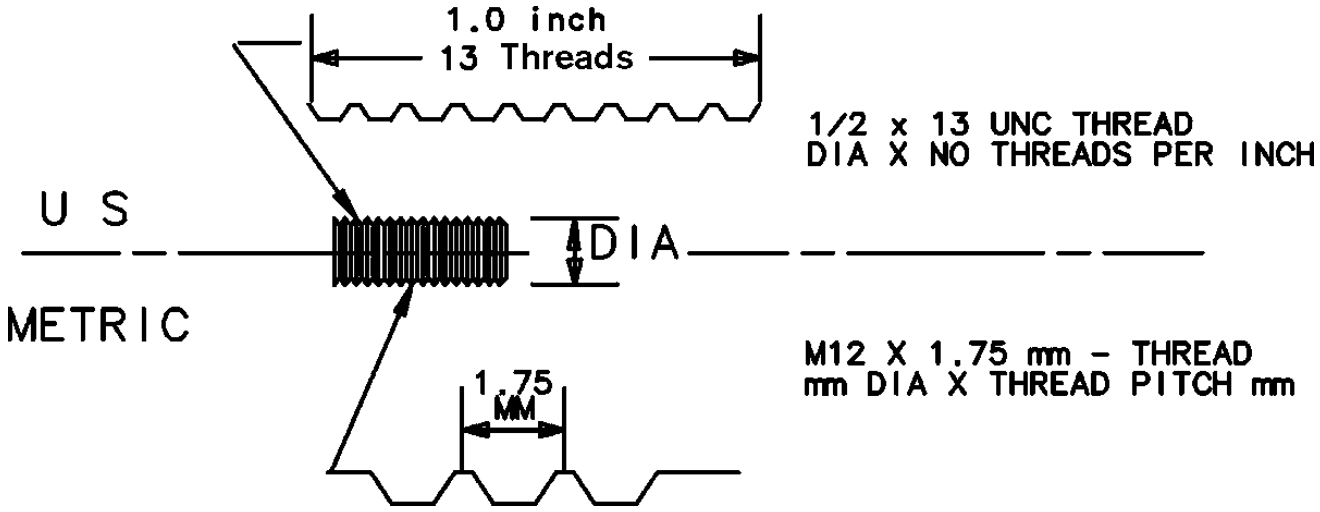
The metric system used is described as SI (International System of Units, also call SI in all languages). The SI system of measurement is described in ISO Standard 1000, 1973.

All service personnel must use replacement fasteners that have the same specifications.

This section will describe the identification of some of the more common fasteners found on our trucks.

Understanding Threads

As seen in the figure below, the thread design is specified by a series of numbers and letters for inch and metric fasteners. The diameter of the shank of the fastener is shown first in the series, e.g. M12=12mm, M20-20mm (1/2=1/2inch, 3/4=3/4inch).



General Specifications (Cont'd)

Micron Filter

Applied model		2W5 / 2W6 series
Filter type		Filter paper (cartridge) type
Filtration size	μm	20

Inspection and Adjustment

Hydraulic Oil Type and Capacity

Applied model		2W5 / 2W6 series
Hydraulic oil type	Standard	Daphne Fluid AW32 BH-U
	Freezer operation	Mobil DTE 13M
Oil capacity	ℓ (US gal, Imp gal)	13.0 (3.5, 2.9)

Oil Pump (Gear Pump)

Unit: mm (in)

Item	Pump type	Usable limit	Remarks
Gear shaft O.D.	Bucher 520-9	20.961 (0.8252)	Regular capacity

Tilt Cylinder (2W5 Only)

Unit: mm (in)

Item	Usable limit	Remarks
Clearance between cylinder head bushing and piston rod	0.2 (0.008)	-
Clearance between cylinder tube and piston	0.2 (0.008)	-

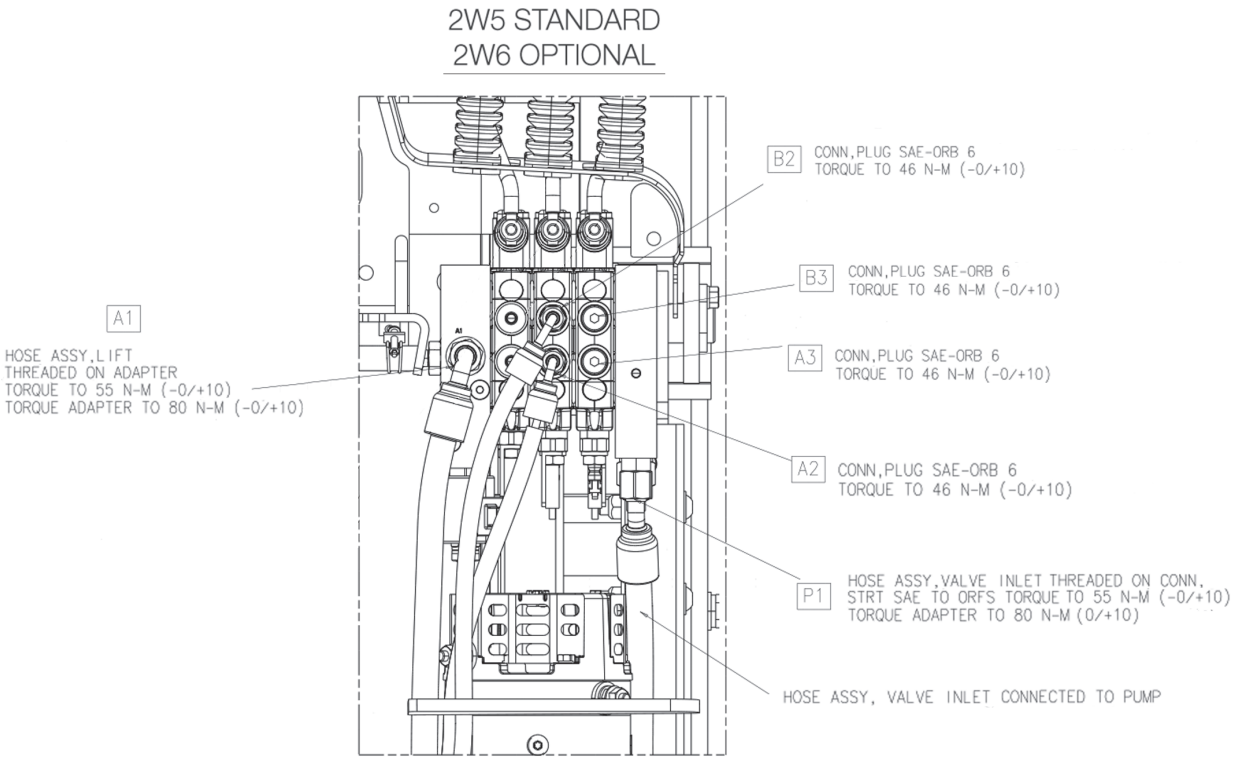
Lift Cylinder

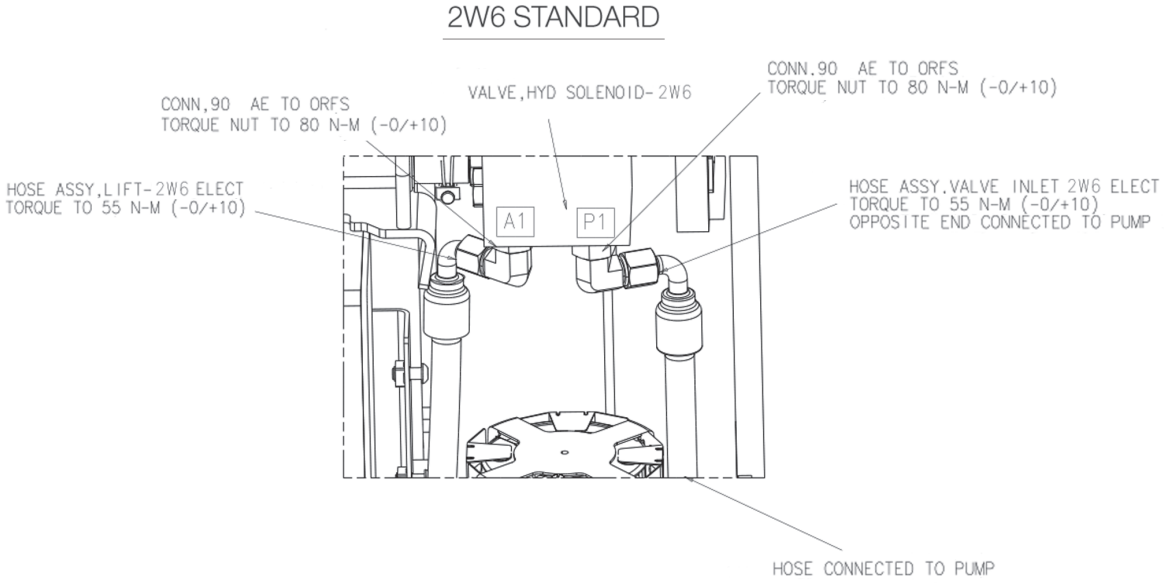
Unit: mm (in)

Item	Usable limit	Remarks
Clearance between cylinder head bushings and piston rod	0.2 (0.008)	-
Clearance between cylinder tube and piston ring	0.2 (0.008)	-

Disassembly and Assembly (Cont'd)

Combo Manual / Electric Valve Assembly





Test Procedures (Cont'd)

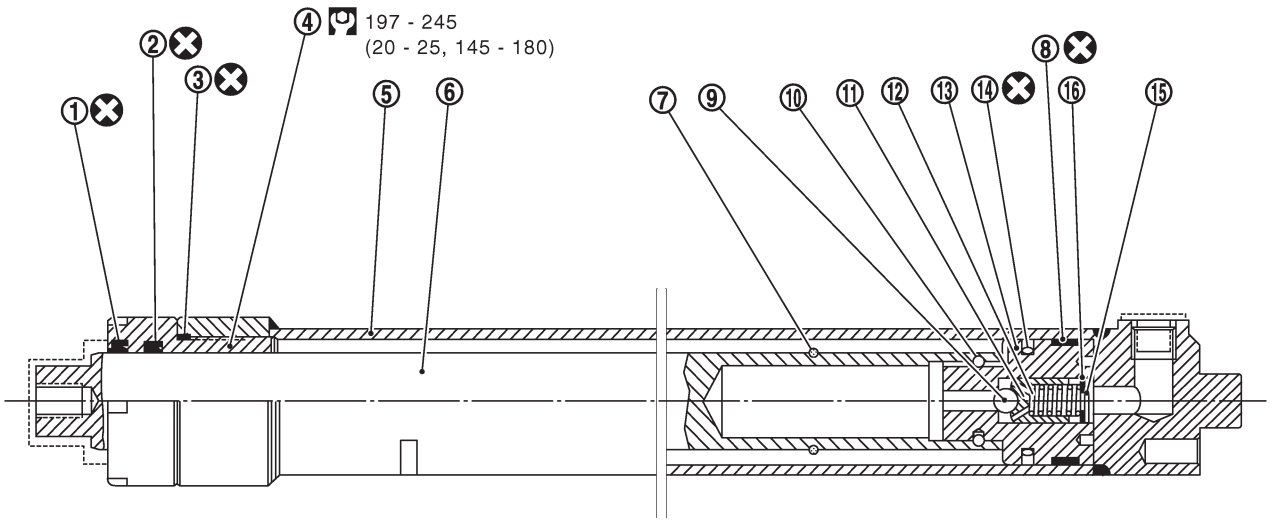
4. Perform pump delivery test.
   Measure fork lifting speed without load. If the speed is within standard value, pump delivery is correct.

Model	Mast	Lifting speed without load fpm (mm/s)	Lowering speed without load fpm (mm/s)
2W5	2W	50 (254)	50 (254)
2W5	3F	50 (254)	50 (254)
2W6	2W	50 (254)	50 (254)
2W6	3F	50 (254)	50 (254)

5. Move fork up and down with and without load, and check that it operates correctly.

Construction

2W Mast



⊗ : Always replace after every disassembly.

: N•m (kg-m, ft-lb)

① Dust seal
② U-ring
③ O-ring
④ Cylinder head
⑤ Cylinder tube assembly
⑥ Piston rod
⑦ Fixing ring
⑧ Wear ring
⑨ Ball
⑩ Pull-in wire
⑪ Check valve
⑫ Spring
⑬ Piston
⑭ Piston ring
⑮ Pull-in wire
⑯ Washer

Removal

CAUTION

- **Be sure to keep hands and feet out of danger.**

Preparation

1. Remove from mast carriage assembly with fork.
2. Jack up the front of vehicle to keep about 120 mm (4.72 in) of clearance from lower end of outer mast to floor (refer to GI section).
3. After setting mast vertical and lower full-free cylinder at the lower end, turn ignition OFF and disconnect the battery cable.

CAUTION

- **Be sure to lower full-free cylinder fully to discharge remaining pressure in pipes.**

Procedures

1. Disconnect the hydraulic piping from the full-free cylinder.

CAUTION

- **Oil tends to spill if hoses are disconnected, so be sure to block the end with stoppers.**

2. Lift up the full-free cylinder using a nylon sling or a lifting wire.
3. Remove the full-free cylinder mounting bolt. Lift up the full-free cylinder, and remove it.

Disassembly

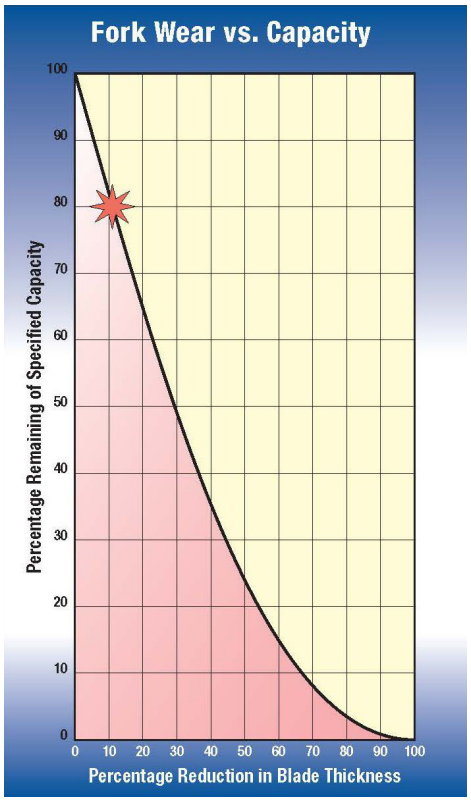
1. Loosen the cylinder head, and remove the cylinder head from the cylinder tube.
2. Disassemble the cylinder head.

- Push the wiper ring out by hitting with a screwdriver.

CAUTION

- **Replace a removed wiper ring with a new one. (Because the outer diameter of the removed wiper ring has been reduced, it cannot be reused.)**

- Remove the U-ring by prying with a screwdriver.



Fork Maintenance and Inspection

Fork Wear vs Capacity

- Forks for counterbalanced and straddle lift trucks are not just bent bars of steel. The manufacturing process is careful and precise with many checks and inspections critical to their safety. Some factors essential to fork manufacture include the steel, the bend thickness of the heel, the welding of the hooks that hold them on the carriage, and the heat treatment of the finished product.
- Finished forks are usually painted red, yellow or black when the truck is new. The paint is quickly scraped off once the truck is put into service. The top paint is abraded by the pallet or load and the bottom is worm mostly by contact with the floor.
- Lift truck operators are taught to keep their forks low and parallel with the travel surface when traveling empty and tilted back when carrying a load. But some operators go to extremes and travel with the heel of surface of the fork and reduces the capacity of the fork.
- Once in service, the bottom of forks may wear badly. This wear may not be noticed, but the consequences are. There are ANSI specifications for User Fork Wear Standards. They are part of the B56 standards by which lift trucks are manufactured and tested. Few operators or fleet managers know of the standards or understand that forks must be inspected.
- While the Industrial Truck Association (ITA) recommends that forks be withdrawn from service when fork blade thickness has been reduced by 10%, few users understand that a 10% reduction in blade thickness results in a capacity reduction of 20%. This means that the safety factor for a pair of forks has also been reduced by 20%.
- Measuring fork wear is not intuitive. You should make it a part of maintenance or inspection routines.

Adjustment

CAUTION

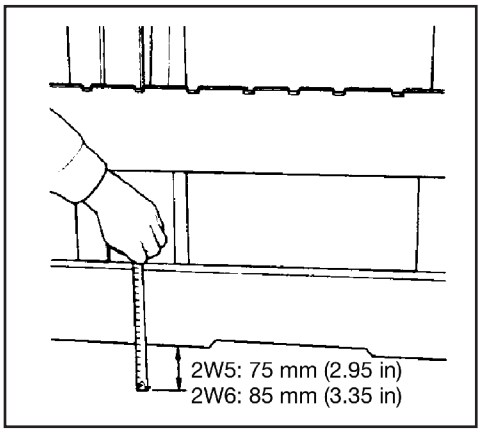
- **Before adjusting lift chain tension, park the vehicle on flat and solid ground.**
- **On pneumatic tire models, inflate the tires to the specified pressure.**
- **As for the 3F mast, adjust the mast chain and lift chain.**

1. Set the mast assembly in the vertical position and lower the carriage assembly all the way down.
2. Turning the adjustment nut in or out, adjust the carriage assembly until its lower end above the ground is within specifications.

   Standard clearance:

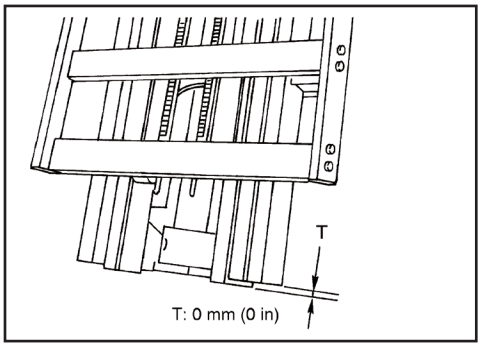
   2W5: 75 mm (2.95 in)

   2W6: 85 mm (3.35 in)



3. For the 3F mast, after the adjustment of the lift chain mentioned above, raise the carriage gradually to adjust the adjustment nut of the mast chain so that the difference between the inner mast lower end and the outer mast lower end conforms to the standard value.

   Standard: 0 mm (0 in)



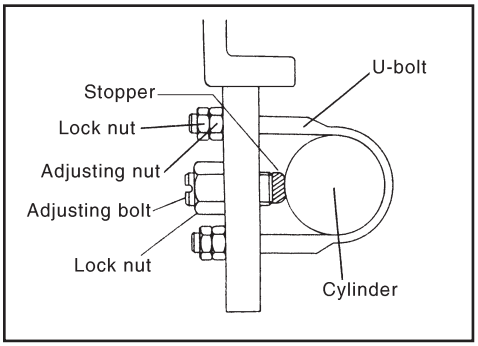
Removal (Cont'd)

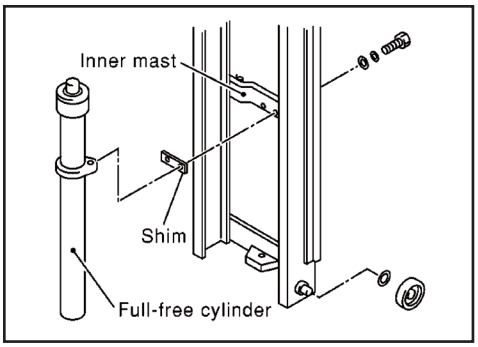
8. When the mast assembly and carriage assembly are removed as a unit, remove the carriage assembly from the mast assembly as follows:

- Attach a lifting wire or nylon sling to the carriage assembly and lift using a hoist.
- Disengage the lift chains at the lift joint link and adjustment bolt on the mast side, then place the disengaged lift chains on the carriage.
- Slide the carriage down and extract it from the lower side of the inner mast.

CAUTION

- **Do not allow the mast assembly to snag or catch the lift chain when removing the carriage assembly from the inner mast.**





Assembly (Cont'd)

8. Tighten the adjusting bolt, and check that the stopper contacts with the cylinder. Then, further tighten for 1/2 to 1 turn and tighten the lock nut.
   : 74 - 94 Nm (7.5 - 9.6 kg/m, 55 - 69 ft/lb)

- **When tightening the lock nut, make sure that the adjusting nut does not turn.**

9. Install the piping to the mast cylinder.

10. Install the chain wheel and mast chain (3F mast).

11. Install the full-free cylinder. At this time, perform the shim adjustment so that the inner mast and full-free cylinder become parallel (3F mast).
    Shim: 1.0 mm (0.039 in)
    : 128 - 156 Nm (13 - 16 kg/m, 94 - 115 ft/lb)

12. Install the piping of the head block (with the chain wheel) and full-free cylinder.
13. When the mast assembly is removed with the carriage mounted, adjust the lift roller of the carriage, lift the carriage assembly by a nylon sling or wire, then install to the inner mast. (As for the adjustment of the lift roller, refer to "CARRIAGE ASSEMBLY".)
14. Pass the lift chain in the chain wheel, connect the adjusting bolt to the chain joint linking section, and then install it to the full-free cylinder.

CAUTION

- **Replace the cotter pin with a new one.**

Periodic Maintenance and Lubrication Schedule

Before delivery of your new forklift, your dealer provides a pre-delivery inspection and adjustment service specified by the factory and designed to ensure satisfactory performance.

The following tables list the servicing required to keep your forklift operating in good mechanical condition. The forklift should be attended to as indicated, preferably by your Local Authorized Dealer.

WARNING

- **Do not inspect any part of the system while the battery is being charged.**
- **Before checking any part of the system, be sure to disconnect both connectors from the battery.**
- **When it is necessary to check with the battery connected, raise the drive wheels. Be extremely careful to prevent electric shocks.**

NOTE:

- Periodic maintenance should be performed after specified intervals have elapsed in months or hours, whichever comes first.
- Under dusty, dirty or heavy operation, more frequent maintenance is necessary. All items listed must be maintained in order to meet and keep control systems operating at design level. Failure to maintain the systems could compromise the warranty.
- The inspection/service intervals shown are based on the assumption that the vehicle is operated in a clean and dry environment for 200 hours or less in one month. When determining the inspection/service intervals, consider the actual working conditions of the vehicle

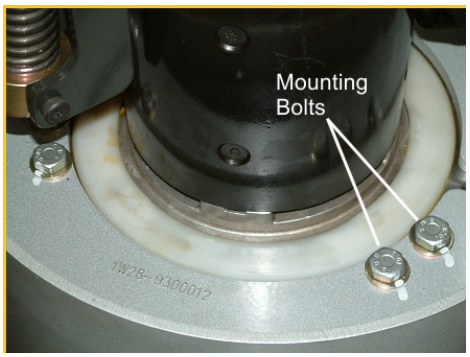
Transmission Gear Fluid

Every 30 days or 200 hours check oil level.

After the first 200 hours of operation, and then every 12 months or 2400 hours, drain and replace gear oil (use SAE 80/90) approximately 3.5 pints.

Drive Wheel Mount Nuts

After the first thirty days, or 200 hours, re-torque drive wheel nut to 100 ft/lb (135 Nm), then recheck torque and drive tire condition every 60 days or 400 hours going forward.



Mount Bolts

After the first two days, or 200 hours, check all mounting bolts to frame, should be 57 ft/lb (77 Nm).

Inspection of Fork

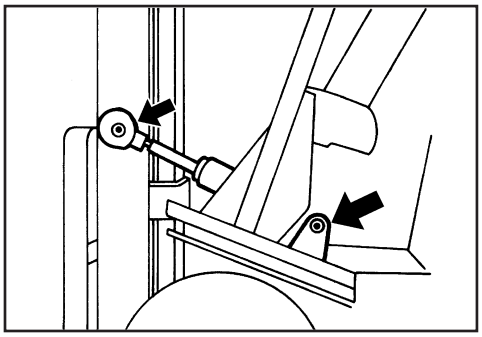
Fork Capacities per Pair

Full Tapered and Polished Forks, Reduce Capacity by 15%

Thickness and Width (inches)	Lbs. at 24" LC	Lbs. at 36" LC	Lbs. at 48" LC
1-1/2 x 2	2100		
2 x 2	3700	2750	
2 x 1-1/2	2900	1900	
1 x 4	1950		
1-1/4 x 4	3000	2000	1500
1-1/2 x 4	4100	2900	2100
1-3/4 x 4	5800	4000	2900
2 x 4	7000	5200	3900
1 x 5	2450		
1-1/2 x 5	5400	3800	2700
1-3/4 x 5	7100	5200	3700
2 x 5	9200	6500	4800
2-1/2 x 5	15000	10500	7600
1-3/4 x 5-1/2	7700	5750	
1 x 6	2900		
1-1/2 x 6	6500	4500	
1-3/4 x 6	8950	6000	
2 x 6	11000	8200	5500
2-1/4 x 6	17000	12100	8500
3 x 6	25000	18500	12500
1-1/2 x 7	7600	5000	3800
2 x 7	13500	9000	6400
2-1/2 x 7	21000	15000	10000
3 x 7	30000	21000	14500
1-1/2 x 8	8750	6000	4300
2 x 8	15500	10500	7500
2-1/2 x 8	24000	16000	11500
2-3/4 x 8	28000	20000	13500
3 x 8	33000	24000	16500
3-1/2 x 8	45000	32000	22500
1-1/2 x 10	10500	7500	5400
2 x 10	18500	13500	9500
2-1/2 x 10	28000	21000	14000
2 x 12	22000	16000	11000

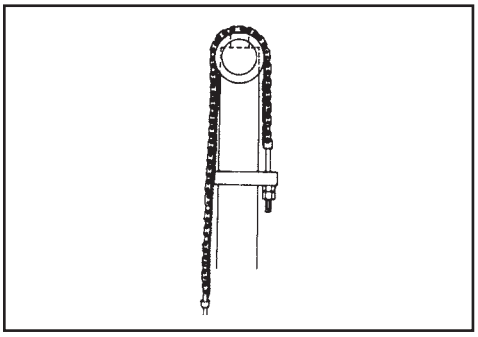
- All fork ratings shown are based on minimum safety factor of 3:1 with static load.
- Capacities shown are based on A.I.S.I. 4142 bar heat treated to industry accepted range.
- Capacities for fork sizes not shown are available from sales department.

Greasing Point



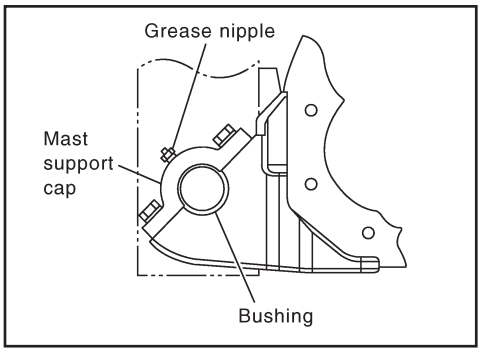
Tilt Cylinder Pivot Pin (2W5 Only)

- Supply grease to the grease nipple.



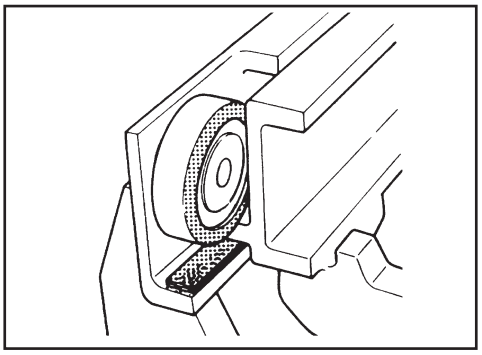
Lift Chain

- Apply specified oil to the entire surface of the chain.



Mast Support (2W5 Only)

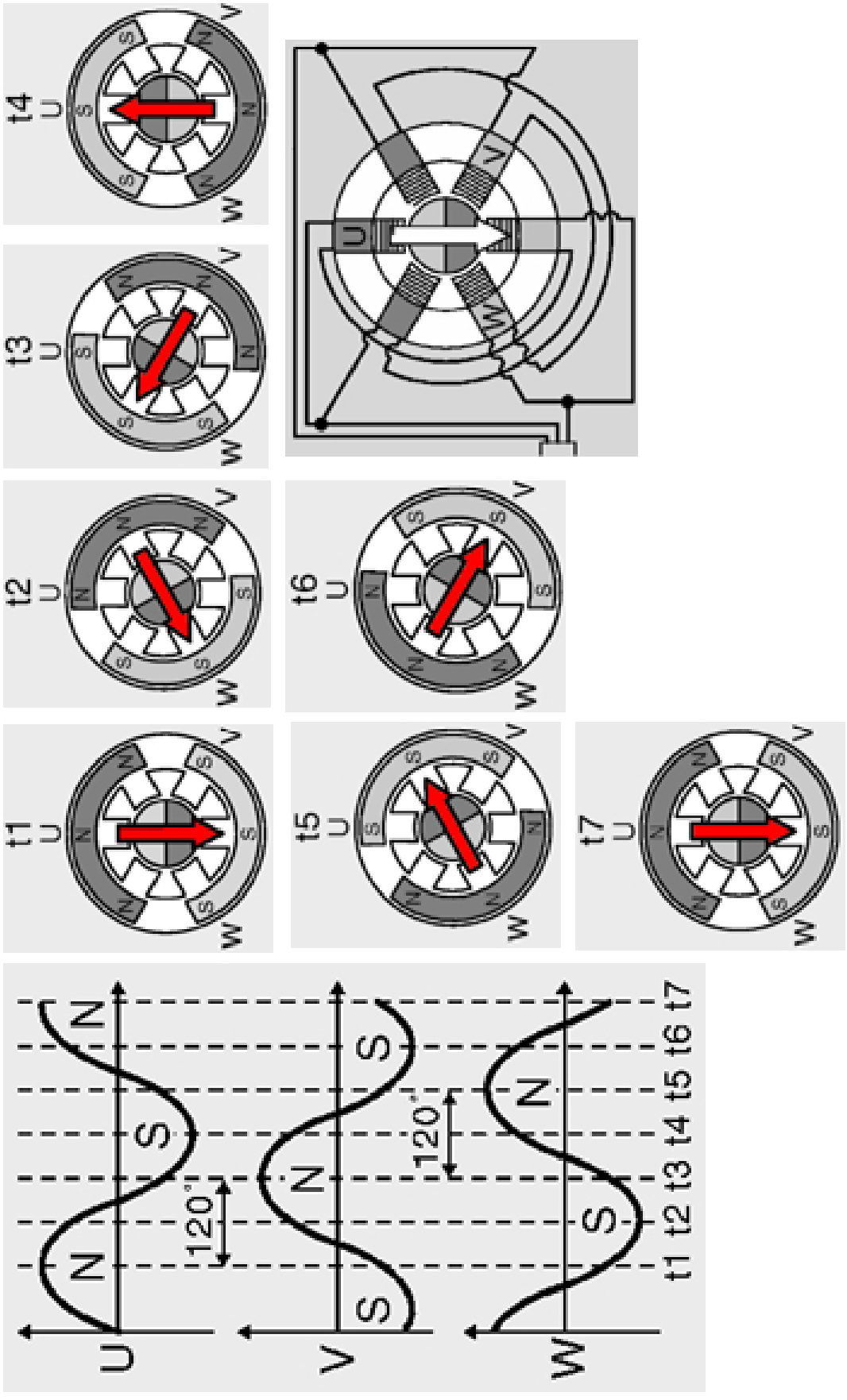
- Supply grease to the grease nipple.



Mast Roller and Mast Liner

- Apply grease to the roller sliding faces and mast liner.

Electromagnetic field rotation



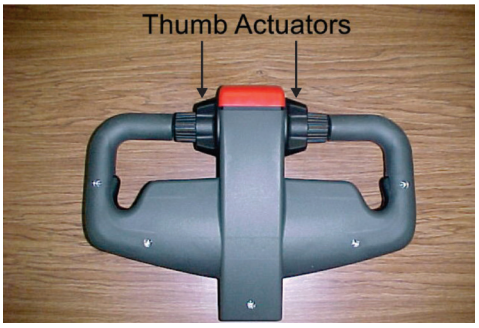
STEER ASSEMBLY

SECTION ST

CONTENTS

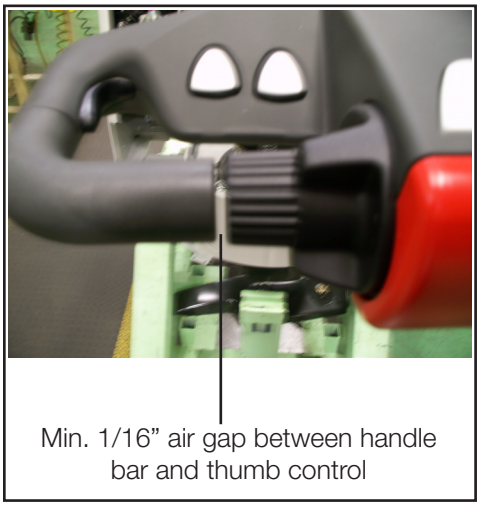
Figure 13.
Reinstall the top cover to the handles assembly and secure with Allen head screws removed in Step 1.
Torque screws to 31-35 in/lbs. And test throttle for proper operation while truck is set atop of the blocks.
Please refer to Power Head Cover Maintenance below for more details. This also includes the minimum air gap clearances between the side tracker lever and control head cover, thumb control lever and handle bar.

Please inspect the operation of the butterfly control knobs to confirm there is no binding or sticking.



Power Head Cover Maintenance

During the monthly planned maintenance service, as outlined in the MA section of this service manual, special attention should be made to the operating clearance of the accelerator thumb actuators.



The minimum air gap clearance between the thumb control and the steer head cover is 1/16” (1.6 mm). If the controls do not operate freely they should be repaired before the unit is allowed to return to operation.