OPERATORS MANUAL
AT-20
OM906LA / MD3060

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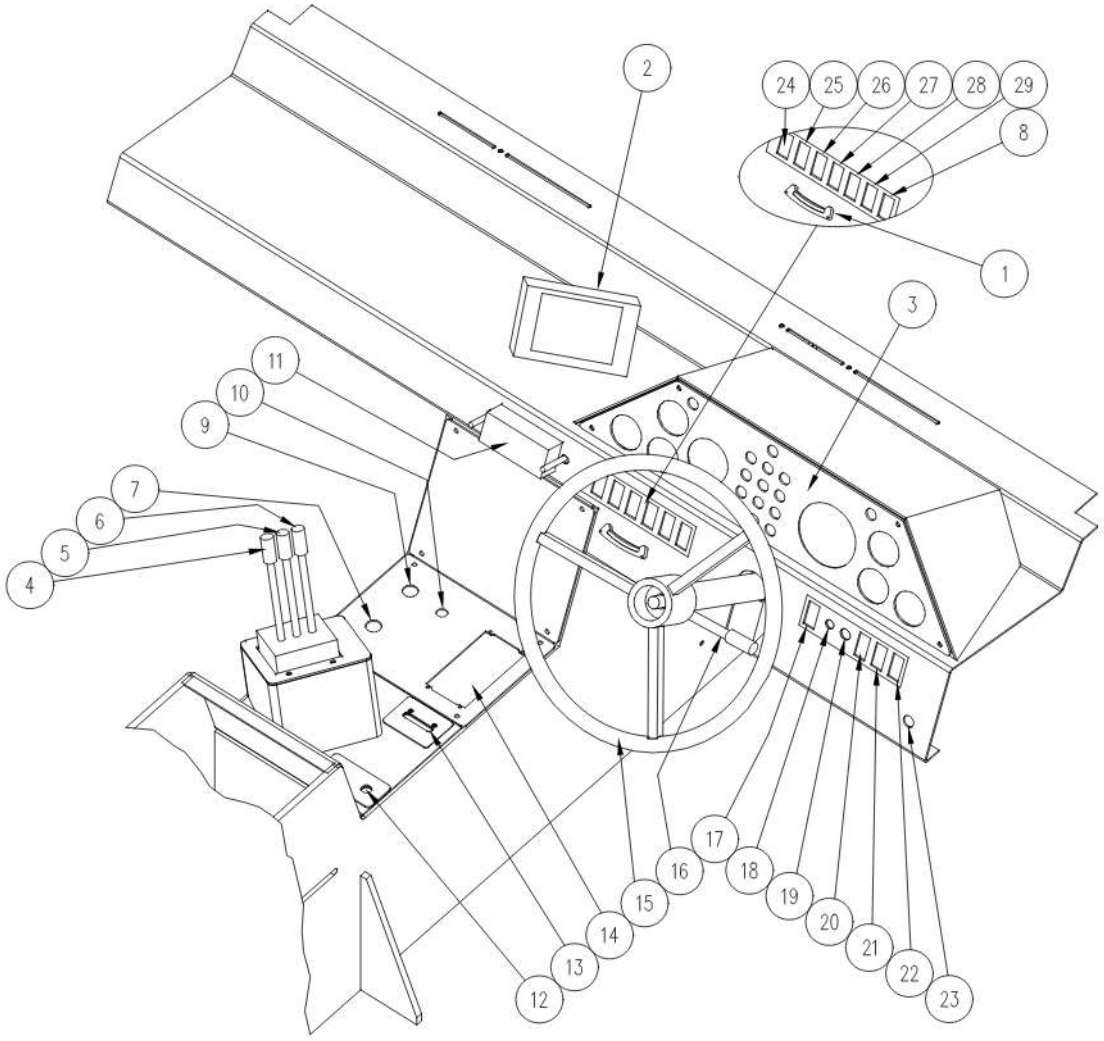
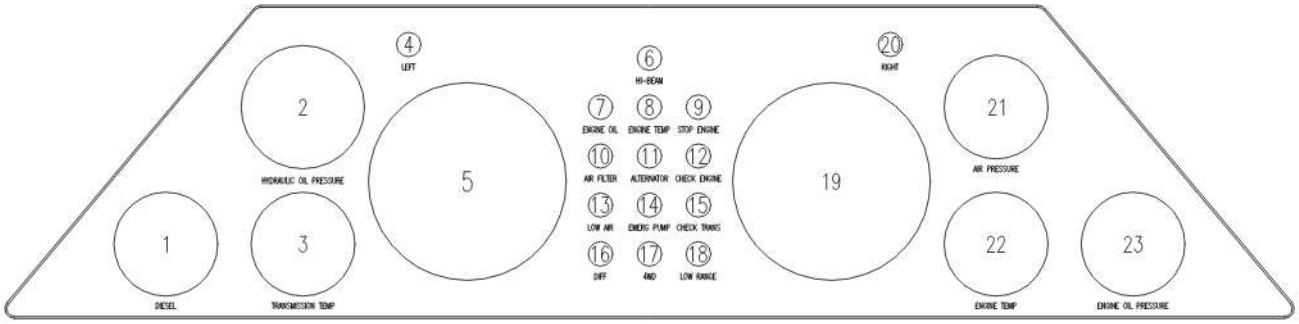


INSTRUMENT PANEL



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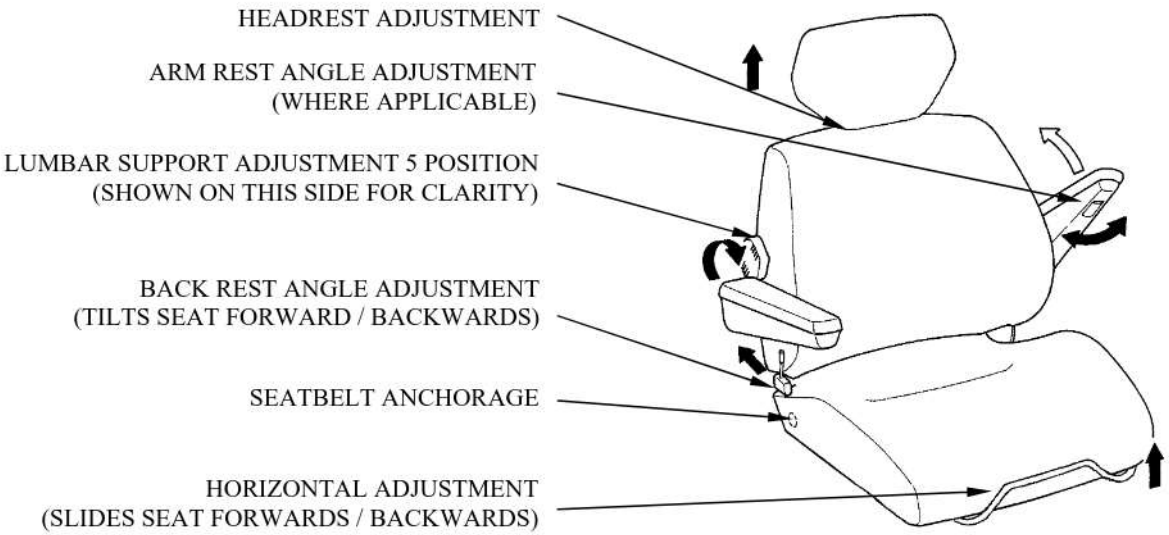
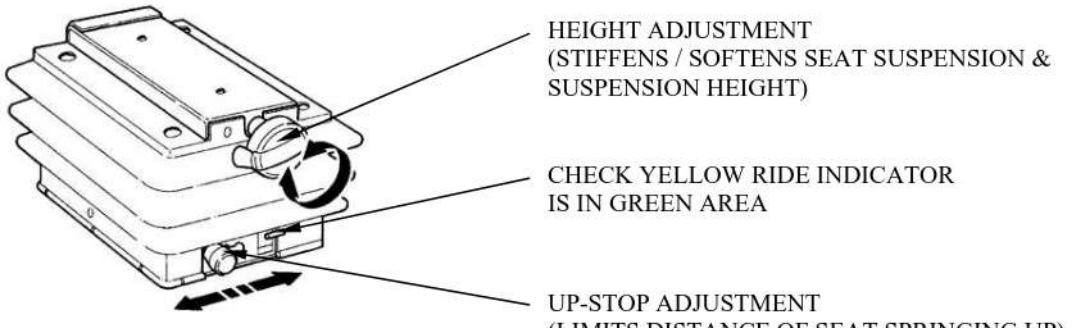
SEATING ADJUSTMENTS / CONTROLS

CAUTION:

- **SEATS ARE FOR ONE SEATED OCCUPANT.**
- **DO NOT ADJUST SEAT WHEN VEHICLE IS IN OPERATION.**
- **KEEP CLEAR OF MOVING PARTS.**
- **INSTALLATION AND MAINTENANCE SHOULD BE CARRIED OUT BY AUTHORISED AND COMPETENT PERSONNEL ONLY.**



VIEW OF DRIVER SIDE SEAT UPPER



SEAT SUSPENSION

SERVICE INTERVALS

100 HOUR	FIRST SERVICE
	(ENGINE REQUIRES HEAD / VALVE SETTING)
250 HOUR	INTERMEDIATE SERVICE
500 HOUR	INTERMEDIATE SERVICE
750 HOUR	INTERMEDIATE SERVICE
1000 HOUR	SECOND MAJOR SERVICE
	(ENGINE REQUIRES HEAD / VALVE SETTING)

END OF MACHINE WARRANTY PERIOD

250 HOUR SERVICE INTERVALS THEREAFTER

FAILURE TO RETURN COMPLETED SERVICE SHEETS (SUPPLIED) FOR ALL SERVICES, DURING THE WARRANTY PERIOD WILL VOID WARRANTY ON CERTAIN COMPONENTS.

CONTACT YOU LOCAL FRANNA DEALER FOR ALL PARTS AND SERVICE REQUIREMENTS.

RECOMMENDED LUBRICANTS

ENGINE	28L TECTION PLUS
TRANSMISSION	25L DEXTRON III
HYDRAULICS	HYSPIN AWS68
TRANSFER CASE	EPX 85W/140
DIFFERENTIAL	EPX 85W/140
RADIATOR	20L DISTILLED WATER 20L CORROSION INHIBITOR / ANTI-FREEZE
GREASE POINTS	SBX-2 GREASE
UNIVERSAL JOINTS	EPL-2 GREASE
FAN SUPPORT BEARING	EPL-2 GREASE

REGULAR MAINTENANCE

DAILY CHECKS

- ✓ **CHECK ENGINE OIL LEVEL (WITH ENGINE STOPPED AND MAINTAIN LEVEL AS NECESSARY)**
- ✓ **CHECK RADIATOR WATER LEVEL**
- ✓ **CHECK AIR CLEANER SERVICE INDICATOR & CLEAN ELEMENT (IF NECESSARY)**
- ✓ **CHECK ALLISON AUTOMATIC TRANSMISSION OIL LEVEL – SEE NEXT PAGE FOR DETAILED INSTRUCTIONS**
- ✓ **CHECK FUEL SYSTEM WATER TRAPS & DRAIN (IF NECESSARY)**
- ✓ **CHECK FOR OIL LEAKS**
- ✓ **CHECK FOR LOOSE BOLTS ETC.**
- ✓ **CHECK TYRE PRESSURES : REFER TO RATED CAPACITY MANUAL**
- ✓ **CHECK ALL HOOKS, PINS, & CLIPS**
- ✓ **CHECK FOR DAMAGE ON WINCH ROPE**
- ✓ **DRAIN MOISTURE FROM AIR TANKS**
- ✓ **RETIGHTEN ALL WHEEL NUTS – (REFER TO SPARE PARTS MANUAL FOR TORQUE SETTINGS)**
- ✓ **GREASE ARTICULATION JOINTS**
- ✓ **PERFORM EMERGENCY STEERING PUMP FUNCTION CHECK:**
  1. **PARK THE CRANE ON LEVEL GROUND**
  2. **START THE ENGINE, APPLY THE FOOT BRAKE AND RELEASE THE PARK BRAKE. THE EMERGENCY STEERING PUMP SHOULD NOT OPERATE**
  3. **WITH THE IGNITION KEY REMAINING ON, SHUT DOWN THE ENGINE USING THE ENGINE STOP SWITCH / CABLE STOP**
  4. **CHECK THE OPERATION OF THE EMERGENCY STEERING PUMP FOR FUNCTION AND WARNING INDICATION**
  5. **START THE ENGINE AGAIN**
  6. **THE EMERGENCY STEERING PUMP AND WARNING SHOULD CONTINUE TO OPERATE UNTIL THE PARK BRAKE IS APPLIED**

WEEKLY CHECKS

ALL DAILY CHECKS TO BE PERFORMED – PLUS:

- ✓ **CHECK STEERING PINS & NUTS & TIGHTEN (IF NECESSARY)**
- ✓ **CHECK HYDRAULIC OIL LEVEL WITH ALL RAMS FULLY RETRACTED**
- ✓ **CHECK BRAKE SLACK ADJUSTERS**
- ✓ **CHECK BATTERY WATER LEVELS & TERMINALS**
- ✓ **GREASE STEERING RAM PIVOTS**
- ✓ **GREASE DRIVE SHAFTS**
- ✓ **GREASE ALL BOOM WEAR PADS**

CHECKING ALLISON TRANSMISSION

ALL CHECKS MUST BE DONE ON A LEVEL SURFACE. ENSURE PARK BRAKE IS APPLIED AND TRANSMISSION IN NEUTRAL BEFORE LEAVING CABIN TO CHECK TRANSMISSION WITH ENGINE RUNNING.

1. **PRE-STARTUP: WITH ENGINE STOPPED, TRANSMISSION FLUID LEVEL MUST BE NEAR "HOT FULL" MARK ON DIPSTICK.**
2. **COLD CHECK: WITH ENGINE RUNNING AT IDLE (500-800RPM) FOR ABOUT ONE MINUTE, SHIFT IN NEUTRAL, TRANSMISSION FLUID LEVEL MUST BE WITHIN "COLD RUN" BAND ON DIPSTICK.**
3. **HOT CHECK: WITH TRANSMISSION TEMPERATURE BETWEEN 71°-93°C (160°-200°F), CHECK WITH ENGINE RUNNING AT IDLE (500-800RPM), SHIFT IN NEUTRAL. TRANSMISSION FLUID LEVEL MUST BE WITHIN "HOT RUN" BAND ON DIPSTICK.**
4. **CHECK USING SHIFT SELECTOR/DISPLAY: THE TRANSMISSION FLUID MUST BE BETWEEN 60°-104°C (140°-220°F) AND THE CRANE STATIONARY TO OBTAIN A READING VIA THE SHIFT SELECTOR. WITH ENGINE RUNNING AT IDLE (500-800RPM) AND SHIFT IN NEUTRAL, SIMULTANEOUSLY PRESS BOTH ↑(UP) AND ↓(DOWN) ARROW BUTTONS ON THE SHIFT SELECTOR. LOOK FOR THE FOLLOWING INDICATIONS ON THE SHIFT DISPLAY (ONE CHARACTER IS DISPLAYED AT A TIME):**

   "o","L" FOLLOWED BY "o","K": FLUID (OIL) LEVEL IS WITHIN CORRECT LEVEL ZONE.

   "o","L" FOLLOWED BY "L","o": FLUID (OIL) LEVEL LOW, FOLLOWED BY THE NUMBER OF QUARTS (LITRES) REQUIRED TO FILL THE TRANSMISSION.

   "o","L" FOLLOWED BY "H","I": FLUID (OIL) LEVEL HIGH, FOLLOWED BY THE NUMBER OF QUARTS (LITRES) THE TRANSMISSION IS OVERFILLED.

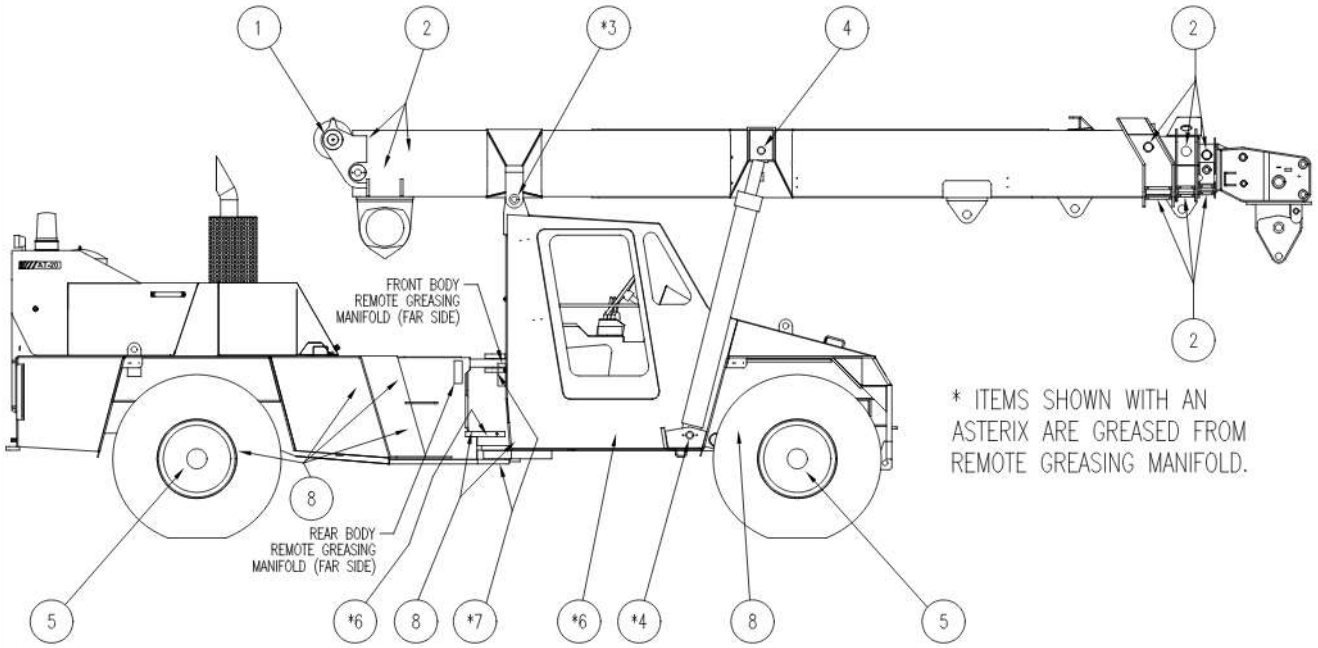
   "o","L" FOLLOWED BY "-","7","0" INDICATES THE FLUID TEMPERATURE IS TOO LOW TO OBTAIN A CORRECT READING. TO EXIT THE FLUID LEVEL DISPLAY MODE, PRESS ANY RANGE BUTTON ON THE SHIFT SELECTOR.

   REFER TO THE ALLISON TRANSMISSION OPERATOR'S MANUAL FOR FURTHER INFORMATION OR IF A DIFFERENT DISPLAY (FAULT CODE) APPEARS WHILE CHECKING FLUID LEVELS.

WEEKLY LUBRICATION POINTS

USE EPL-2 GREASE UNLESS OTHERWISE NOTED

1. DIVERTER SHEAVE
2. BOOM WEAR PADS
3. REAR JIB PIVOTS (SBX2)
4. LUFF CYLINDER PIVOTS (SBX2)
5. BRAKE ADJUSTMENTS AND SHAFTS
6. STEERING RAM PIVOTS (SBX2)
7. ARTICULATION PIVOTS (SBX2)
8. DRIVE SHAFTS UNIVERSAL JOINTS



ENGINE STARTING PROCEDURE

PERFORM ALL DAILY CHECKS PRIOR TO STARTING

1. **APPLY PARK BRAKE**
2. **CHECK GEAR LEVER/ SHIFT SELECTOR IS IN NEUTRAL POSITION**
3. **ACCELERATOR PEDAL IN IDLE POSITION (FOOT OFF THROTTLE)**
4. **TURN IGNITION KEY CLOCKWISE TO START ENGINE WHEN ENGINE FIRES RELEASE STARTER KEY (DO NOT OPERATE STARTER KEY FOR MORE THAN 20sec AT A TIME. WAIT AT LEAST 60sec BETWEEN ATTEMPTS).**
5. **CHECK ALL WARNING LIGHTS ARE OUT OIL PRESSURE & ALTERNATOR. IF WARNING LIGHTS ARE STILL ACTIVE AFTER 10sec IDLING – STOP THE ENGINE.**
6. **RUN ENGINE AT 1000 TO 1500 RPM TO BUILD UP MAXIMUM AIR PRESSURE.**

ENGINE STOPPING PROCEDURE

1. **APPLY PARK BRAKE**
2. **SELECT NEUTRAL ON TRANSMISSION CONTROL**
3. **BEFORE STOPPING THE ENGINE IDLE FOR 3 MINUTES WITHOUT LOAD. WHEN THE IGNITION KEY IS SWITCHED OFF, THE TURBO TIMER DEFAULTS AUTOMATICALLY TO A 3 MINUTES SHUTDOWN DELAY TO ALLOW COOLING DOWN OF THE ENGINE TURBO (THE OPERATOR CAN VARY THE TIME DELAY WITH F3 BUTTON (ON THE 3B6 DISPLAY) PRIOR TO TURNING OFF THE IGNITION KEY).**
4. **AT THE EXPIRATION OF THE TIME SET THE ENGINE WILL STOP AND ALL LIGHTS AND DISPLAY PANEL WILL SWITCH OFF.**
5. **IN AN EMERGENCY SITUATION THE ENGINE CAN BE SHUT DOWN WITH THE EMERGENCY ENGINE SHUTDOWN BUTTON.**
   NOTE: BEFORE SWITCHING ON AGAIN, IT IS ESSENTIAL TO WAIT SEVERAL SECONDS TO ALLOW THE SYSTEM TO RESET LIKE ANY OTHER COMPUTER.

STOP THE ENGINE IMMEDIATELY IF:

- **THE OIL PRESSURE DROPS BELOW ITS NORMAL LEVEL OR FLUCTUATES HEAVILY**
- **OUTPUT AND ENGINE SPEED DROP DESPITE ACCELERATOR PEDAL POSITION REMAINING UNCHANGED**
- **A LARGE AMOUNT OF SMOKE IS EMITTED FROM THE EXHAUST**
- **COOLANT OR OIL TEMPERATURES CLIMB ABOVE THEIR NORMAL LEVELS**
- **SUDDEN UNUSUAL NOISES ARE HEARD FROM THE ENGINE OR TURBOCHARGER**

ROAD TRAVEL

1. **REMOVE ALL HOOKS, RETRACT BOOM & FALL BLOCK FULLY & SET BOOM AT APPROX. 0°. *NOTE: IT IS NOT ADVISABLE TO TWO BLOCK ON 3 PARTS AS DAMAGE MAY BE CAUSED TO ROPE AND HEAD SHEAVES.***
2. **TRAVEL/CRANE MODE: THE TRAVEL/CRANE MODE SWITCH MUST BE SET TO THE "*TRAVEL*" POSITION FOR DRIVING ON PUBLIC ROADS OR AT HIGH SPEED. IN THIS MODE THE ENGINE AND TRANSMISSION RESPOND LIKE A TYPICAL HEAVY VEHICLE TO THROTTLE INPUTS. THE CRANE FUNCTIONS (WITH THE EXCEPTION OF TELE-IN AND WINCH-DOWN) WILL BE DISABLED. "*CRANE*" MODE CAN ONLY BE SELECTED WITH THE TRANSFER CASE IN LOW RANGE, AND SHOULD ONLY BE USED WHILE PERFORMING CRANE DUTIES. IF IT IS NECESSARY TO OPERATE THE CRANE FUNCTIONS WHILE NOT IN CRANE MODE (E.G. LOWER THE BOOM FOR CLEARANCE) PRESSING THE "LMI OVERRIDE" SWITCH WILL ALLOW MOMENTARY USE OF THE CONTROL LEVERS.**
3. **PUSH BOTH 4WD & HI/LOW BUTTONS IN TO DISENGAGE 4WD & ENGAGE HIGH RANGE.**
4. **PUSH HOLDING BRAKE VALVE LEVER TO THE CENTRE TO RELEASE BRAKE, THIS WILL ALSO DISENGAGE THE FRONT AXLE CROSS LOCK (IF ENGAGED).**
5. **PUSH MAXI HAND BRAKE BUTTON IN TO RELEASE.**
6. **PROCEED TO DRIVE AS A NORMAL HEAVY VEHICLE, WITH THE FOLLOWING EXTRA CAUTION: *THE CRANE'S BOOM EXTENDS SIGNIFICANTLY IN FRONT OF THE CRANE CABIN AND MAIN BODY. ALWAYS CHECK THE BOOM IS FULLY RETRACTED BEFORE DRIVING. EXERCISE EXTREME CAUTION AT INTERSECTIONS AND DRIVEWAYS THAT THE BOOM DOES NOT PROTRUDE INTO THE PATH OF OTHER TRAFFIC.***
7. **<u>DO NOT</u> OPERATE WITH FRONT AXLE CROSS LOCK OR 4WD ENGAGED ON HARD SURFACES.**

8. **DO NOT SHIFT FROM HI/LOW RANGE OR LOW/HI RANGE, UNLESS THE MACHINE IS STATIONARY & IN NEUTRAL.**
9. **DO NOT SHIFT FROM FORWARD TO REVERSE OR REVERSE TO FORWARD, UNLESS THE MACHINE IS STATIONARY.**
   IF YOU SHIFT FROM NEUTRAL TO DRIVE OR REVERSE WITH THE ACCELERATOR DEPRESSED, THE TRANSMISSION WILL ONLY ENGAGE IF THE PEDAL IS RELEASED IN THE NEXT THREE SECONDS, OTHERWISE IT WILL REMAIN IN NEUTRAL. AVOID SELECTING FORWARD OR REVERSE WITH THE ACCELERATOR DEPRESSED.
10. **4WD MAYBE SELECTED IN EITHER HI/LOW RANGE, BUT IT IS NOT ADVISABLE TO USE AT HIGH SPEEDS.**
11. **WHEN SELECTING HI / LOW RANGE CRANE MUST BE STATIONARY AND IN THE NEUTRAL POSITION IN MAIN GEARBOX. THIS WILL HELP PREVENT POSSIBLE DAMAGE TO GEARS.**
12. **FRONT AXLE DIFFERENTIAL CROSS LOCK WILL ONLY BE ENGAGED ONCE LOW RANGE IS ENGAGED AND WILL DISENGAGE IF HOLDING BRAKE IS APPLIED.**
13. **DIFFERENTIAL CROSS LOCK MUST NOT BE USED ON HARD SURFACE**
14. **IT IS ALLOWABLE TO USE BOTH 4WD AND DIFFERENTIAL CROSS LOCK IN CONJUNCTION IN RUGGED TERRAIN.**
15. **CRUISE CONTROL OPERATION: THE CRUISE CONTROL FUNCTION IS ENABLED VIA A ROCKER SWITCH TO THE LEFT OF THE STEERING WHEEL. ONCE IT IS ENABLED, PRESSING THE "DECEL/SET" SWITCH WILL INSTRUCT THE ENGINE/TRANSMISSION TO MAINTAIN THE PRESENT SPEED. USING THE BRAKES WILL CAUSE THE CRUISE CONTROL TO DROP OUT. PRESSING THE "ACCEL/RESUME" BUTTON WILL CAUSE THE VEHICLE TO RESUME THE PREVIOUS SET SPEED. THE SET SPEED CAN BE VARIED BY PRESSING THE "ACCEL/RESUME" OR "DECEL/SET" BUTTONS. THE SPEED WILL INCREASE OR DECREASE BY 2KM/H FOR EACH SECOND THE BUTTON IS PRESSED. THE CRUISE CONTROL FUNCTION WILL ONLY ACTIVATE ABOVE 48KM/H.**
16. **DANGER: LOOK OUT FOR OVERHEAD & POLE STAY WIRES.**

CRANE OPERATION

1. **THE TRANSFER CASE MUST BE IN LOW RANGE AND "CRANE" MODE SELECTED USING THE SWITCH TO THE RIGHT OF THE STEERING WHEEL. ALL CRANE FUNCTIONS WILL BECOME OPERATIONAL. THE ENGINE MANAGEMENT WILL BE SET TO "RPM GOVERNING" AND WILL MAINTAIN THE RPM SET BY THE ACCELERATOR PEDAL DESPITE FLUCTUATING LOAD (AS CAUSED BY OPERATING THE CRANE FUNCTIONS).**

2. **REFER TO THE LMI OPERATING MANUAL FOR DUTY SELECTION AND OTHER LMI FUNCTIONS.**

3. **THE CRANE IS FITTED WITH MOTION CUTS THAT RESTRICT THE MOVEMENT OF THE BOOM AND WINCH IF THE RATED LOAD IS EXCEEDED. TELE-IN AND WINCH-DOWN REMAIN ACTIVE, TO ALLOW THE LOAD TO BE MOVED TO A SAFER POSITION.**

4. **IF IT IS NECESSARY TO OPERATE THE CRANE FUNCTIONS WHILE NOT IN CRANE MODE (E.G. TO LOWER THE BOOM FOR CLEARANCE) OR TO OVERRIDE THE MOTION LIMITERS *FOR SAFETY REASONS*, PRESSING THE "LMI OVERRIDE" SWITCH WILL ALLOW MOMENTARY USE OF THE CONTROL LEVERS AT ANY TIME THE ENGINE IS RUNNING. THIS SHOULD ONLY BE USED WHEN NECESSARY AND WITH EXTREME CAUTION. CRANE DAMAGE OR TIPPING COULD OCCUR.**

5. **THE CRANE IS FITTED WITH A TWO SPEED WINCH AND WILL NORMALLY BE REEVED WITH A 4 PART FALL BLOCK. SELECTING "HIGH SPEED" ON THE WINCH INCREASES THE SPEED BUT DECREASES THE LIFTING CAPACITY IN A SIMILAR WAY TO REEVING FOR 2 PARTS. IT WILL AUTOMATICALLY SWITCH BACK TO LOW SPEED IF THE LIFTED LOAD EXCEEDS THE HIGH-SPEED CAPACITY. THE TWO-SPEED WINCH HAS ENOUGH ROPE TO REACH THE GROUND ON 4 PARTS EVEN WITH THE MANUAL SECTION EXTENDED. A 2&3 PART FALL BLOCK IS AVAILABLE AS AN OPTION TO FURTHER INCREASE THE FLEXIBILITY OF THE CRANE. <u>NOTE:</u> IT IS NOT ADVISABLE TO TWO BLOCK ON 4 PARTS AT BOOM ANGLES ABOVE 10° (OR AT ALL ON 3 PARTS) AS DAMAGE MAY BE CAUSED TO THE ROPE AND HEAD SHEAVES.**

6. **THE WINCH ROPE IS AUTOMATICALLY COMPENSATED FOR TELESCOPING OF THE POWERED BOOM SECTIONS. *NOTE: WINCH ROPE MUST BE RUN OFF AS MANUAL EXTENSION IS BEING EXTENDED. FAILURE TO DO SO WILL CAUSE TWO BLOCKING RESULTING IN POSSIBLE DAMAGE TO THE INTERNAL WORKINGS OF THE BOOM.***

7. **WHEN SLEWING CRANE IN THE STATIONARY POSITION, USE HOLDING BRAKE RATHER THAN FOOT BRAKE (ONLY AVAILABLE IN LOW RANGE). APPLYING THIS HOLDING BRAKE HOLDS THE**

RIGHT FRONT WHEEL ONLY ALLOWING THE OTHER WHEELS TO ROLL, ENABLING THE MACHINE TO SLEW FREELY. IT IS NOT POSSIBLE TO ENGAGE DIFFERENTIAL CROSS LOCK AND THE HOLDING BRAKE TOGETHER AS THE BRAKE SWITCH DISENGAGES THE DIFFERENTIAL CROSS LOCK.

8. **WHEN MOBILISING A LOAD LOW RANGE MUST BE ENGAGED TO GIVE BETTER CONTROL AT CREEP SPEED 0.4 m/s (1.44 km/hr).**

9. **WHEN CRANE FUNCTIONS (WINCHING, TELESCOPING & LUFFING) ARE BEING OPERATED, A MINIMUM ENGINE SPEED OF 1000RPM MUST BE USED. WHEN FEATHERING OF CRANE CONTROLS CAUSES THE PARTICULAR FUNCTION TO STALL, THE CONTROL LEVER TO THIS FUNCTION MUST BE RETURNED TO THE NEUTRAL POSITION WITHIN 20 SECONDS.**

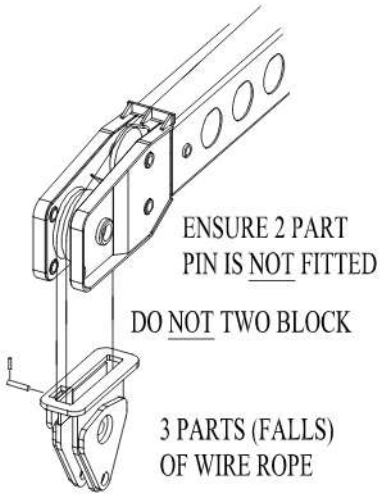
LIFTING – PRECAUTIONS TO PREVENT INJURY AND MACHINE DAMAGE

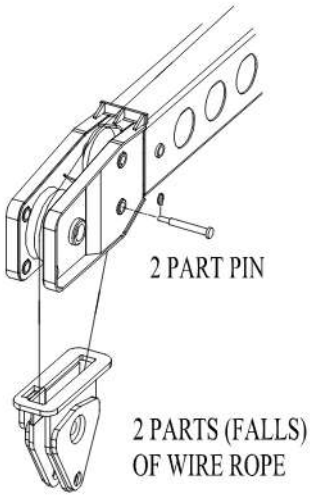
- **THE RATED CAPACITY MANUAL IS BASED ON FIRM LEVEL SURFACE (1% SLOPE (0.6 DEG) AS PER AS1418.5) WITH TYRES INFLATED TO CORRECT PRESSURES.**

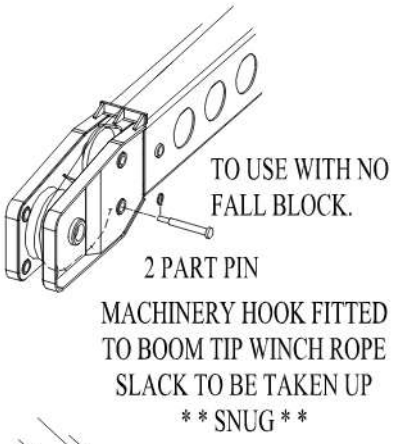
ANY DEVIATION FROM THIS STANDARD WILL DERATE THE CAPACITY ACCORDINGLY.

- **LIFT & CARRY – THE LOAD SHALL BE CARRIED WITH THE MINIMUM BOOM LENGTH & AS CLOSE TO THE GROUND AS POSSIBLE AT SPEEDS NOT IN EXCESS OF 0.4 m/sec (1.44 km/h).**
- **WHEN TRAVELLING WITH A LOAD ON THE HOOK, REMEMBER RADIUS INCREASES ON A DOWNGRADE AND DECREASES ON AN UPGRADE *USE CAUTION*.**
- **LOAD MOMENT INDICATOR AND MOTION LIMITER ONLY OPERATES IN LOW RANGE WITH "CRANE" MODE SELECTED.**
- **USE THE SIDE SLOPE INCLINOMETER AS A GUIDE ONLY, IT IS ONLY ACCURATE WHEN THE CRANE'S ARTICULATION IS STRAIGHT AHEAD WITH NO LOAD. ALL ARTICULATED CHASSIS CRANES WILL SHOW SOME DEGREE OF SIDE TILT, WHEN ARTICULATED WITH A LOAD – THIS SHOULD NOT BE CONFUSED WITH THE GROUND'S SIDE SLOPE.**
- ***ALWAYS* -BE SURE BEFORE LIFTING A LOAD.**
- ***LOOK DOWN* -BEWARE OF SOFT FOOTING.**
- ***LOOK EITHER SIDE* -CLEARANCE.**
- ***ALWAYS* -TAGLINE UNUSUAL LOADS.**
- ***ALWAYS* -ENSURE THAT ANY LIFTING DEVICES, SUCH AS SWIVEL HOOKS, SLINGS ETC ARE FREELY SUSPENDED AND DO NOT FOUL ON ANY PART OF THE LIFTING POINT OR BOOM THROUGH THE ENTIRE WORKING RANGE OF THE LIFTING CYCLE.**
- ***DO NOT* -SIDE LOAD BOOM.**
- ***DO NOT* -DRAG LOADS IN ANY DIRECTION WITH BOOM OR HOOKS.**
- ***DO NOT* -PASS LOADS OVER PEOPLE.**
- ***DO NOT* -PICK AND CARRY A LOAD IN HIGH RANGE.**
- ***DO NOT* -EXCEED THE RATED CAPACITY.**
- ***DO NOT* -TWO BLOCK HOOK WHILST LIFTING LOAD ON WINCH.**
- ***DO NOT* -OPERATE WINCH WHEN BOOM IS BELOW 0 DEGREES UNLESS RHINO HOOK / PINS ARE REMOVED.**
- ***DANGER* -LOOK OUT FOR OVERHEAD & POLE STAY WIRES.**

REEVING FALL BLOCK



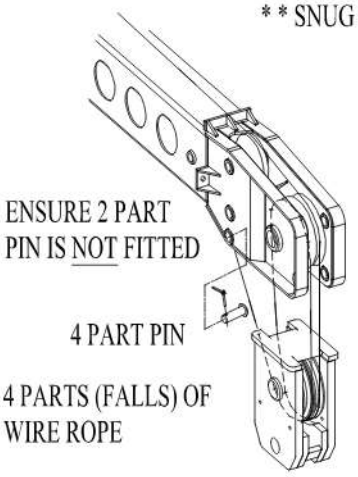




NOTE : AVOID DAMAGE TO THE ROPE AND SHEAVES

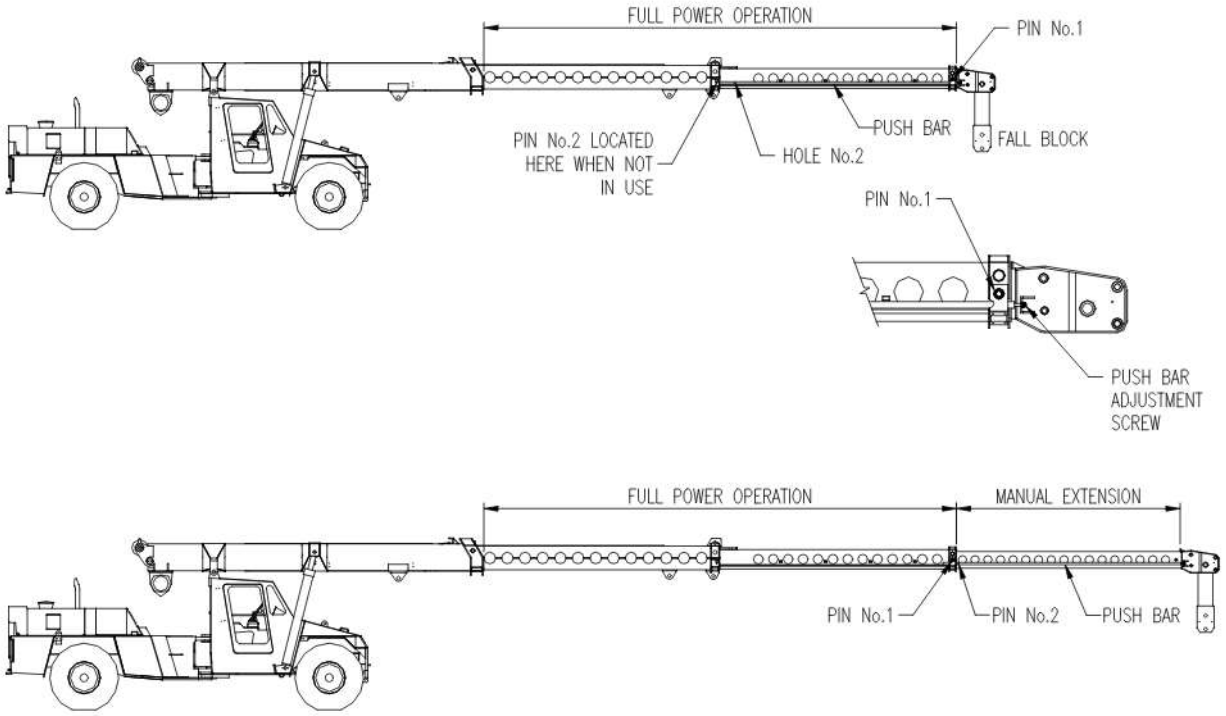
IT IS NOT ADVISABLE TO TWO BLOCK AT BOOM ANGLES ABOVE 10° WHEN THE FALL BLOCK IS REEVED ON 2 OR 4 PARTS, OR AT ANY ANGLE WHEN THE FALL BLOCK IS REEVED ON 3 PARTS

AVOID TWO BLOCKING WHILST SUSPENDING A LOAD EXCEPT WITH THE BOOM HORIZONTAL & REEVED ON 2 OR 4 PARTS



WITH ALL FOUR TYPES OF CONFIGURATION *NEVER* TELESCOPE BOOM, EITHER *IN* OR *OUT* WITHOUT THE FULL WEIGHT OF THE FALL BLOCK, OR THE WINCH ROPE TAKEN UP SNUG AS *DAMAGE TO WINCH ROPE WILL OCCUR.*

SETTING MANUAL EXTENSION



NOTE: **HOIST ROPE MUST BE RUN OFF, AS MANUAL EXTENSION IS BEING EXTENDED. FAILURE TO DO SO WILL CAUSE 2 BLOCKING - RESULTING IN POSSIBLE DAMAGE TO THE INTERNAL WORKINGS OF THE BOOM.**

EXTENDING THE MANUAL EXTENSION. PAY OUT THE WINCH ROPE SO THE FALL BLOCK IS 300 – 450mm BELOW THE HEAD OF THE BOOM. THE WINCH ROPE MUST BE LOWERED CONTINUALLY DURING THE SETTING OF THE MANUAL EXTENSION. FULLY EXTEND THE BOOM AND LUFF FULLY DOWN. REMOVE PIN (No. 1) FROM SIDE OF 2nd SECTION HEAD STIFFENER. REMOVE PIN (No. 2) FROM RETAINER ON FRONT OF 1st SECTION AND PLACE IN HOLE 2 (WHERE APPLICABLE) ON PUSH BAR. SLOWLY RETRACT BOOM FULLY, WHILE CONSTANTLY PAYING OUT WINCH ROPE. ONCE BOOM IS FULLY RETRACTED, PLACE PIN (No. 1) IN LOCKING HOLE ON SIDE OF 2nd. SECTION HEAD STIFFENER. EXTEND BOOM BY 30mm AND REMOVE PIN (No. 2). REPLACE IN PIN RETAINER ON 1st SECTION HEAD STIFFENER.

RETRACTING THE MANUAL EXTENSION. REMOVE PIN (No. 1) & WINCH UP SLOWLY, PULLING THE MANUAL HOME. REPLACE PIN (No. 1) TO LOCK MANUAL IN THE RETRACTED POSITION.

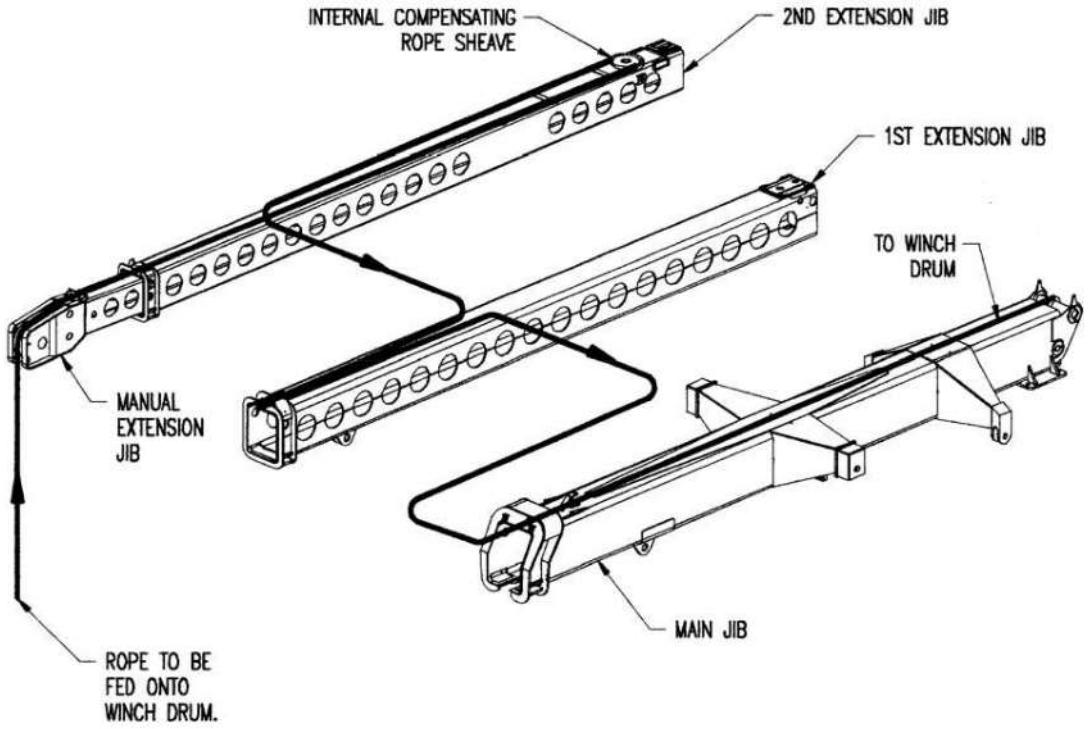
IT MAY BE NECESSARY DURING THE FIRST FEW MONTHS TO ADJUST THE ALIGNMENT OF HOLE (No. 2). THIS MAY BE DONE BY ADJUSTING THE NUTS ON THE FRONT END OF THE PUSH BAR, ALTERING Its LENGTH, THEREBY ALIGNING THE REQUIRED HOLES.

REPLACE WINCH ROPE

1. EXTEND MAIN BOOM FULLY
2. WINCH DOWN USING A SECOND PERSON TO PULL OFF THE WINCH ROPE.
3. WITH WINCH DRUM BARE, KNOCK OUT ROPE WEDGE AND PULL OFF REMAINING ROPE.
4. TO REFIT WINCH ROPE, FEED ROPE THROUGH GUIDES ON THE TOP OF THE MANUAL AND SECOND EXTENSION, THEN FEED THE ROPE INTO THE INTERNAL COMPENSATING SHEAVE ON THE RIGHT HAND SIDE (LOOKING TOWARDS THE CABIN). FEED ROPE AROUND THIS SHEAVE, USING THE SLOTS IN THE TOP OF THE 1ST EXTENSION TO GUIDE IT THROUGH.

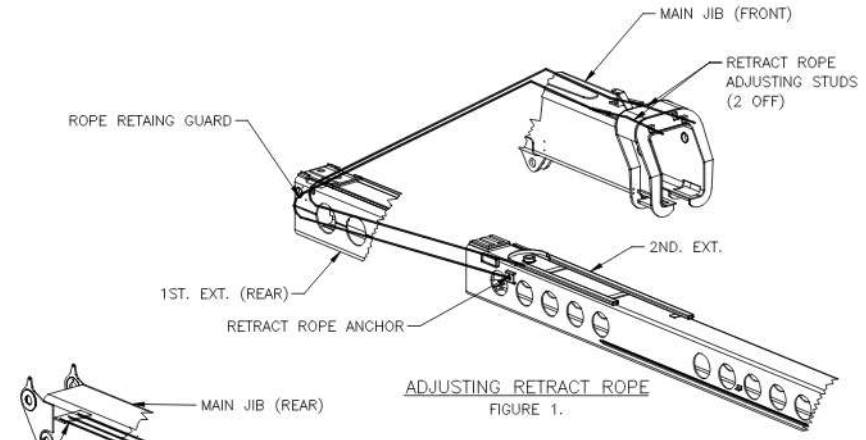
   <u>CAUTION:</u> TAKE CARE THE ROPE DOES NOT FALL DOWN THE SIDE OF THE BOOM SECTION.

   FEED THE ROPE AROUND THE EXTERNAL COMPENSATING SHEAVE, THROUGH THE MAIN JIB HEAD STIFFENER AND ALONG THE OUTSIDE OF BOOM BACK ONTO THE WINCH DRUM. REPLACE THE WEDGE AND WINCH ON THE ROPE, ENSURING SUFFICIENT TENSION IS USED SUCH THAT THE ROPE LAYS CORRECTLY.

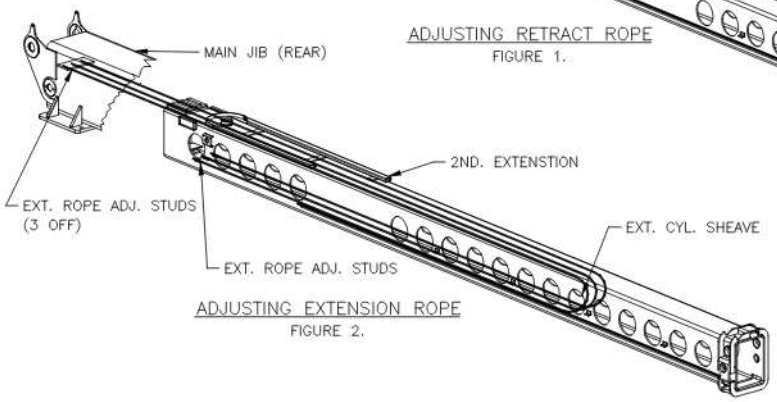


ADJUSTING RETRACT & EXTENSION ROPES

1. RUN WINCH ROPE DOWN APPROXIMATELY 600mm.
2. TIGHTEN RETRACT ROPE ADJUSTING STUD (2 OFF) ON FRONT OF MAIN JIB (FIGURE 1) UNTIL 2ND SECTION IS FULLY RETRACTED. CHECK IF BOTH ROPES ARE EQUALLY TENSIONED
3. WITH THE FALL BLOCK REEVED ON TWO PARTS AND THE ENGINE SET AT 1500 RPM - WINCH UP UNTIL THE WINCH MOTOR HYDRAULICALLY STALLS, CAUSING THE FALL BLOCK TO 'TWO BLOCK' ON THE HEAD OF THE MANUAL EXTENSION. THIS WILL INDUCE THE MAXIMUM TENSION IN THE RETRACT ROPES. THE 2ND EXTENSION SHOULD MOVE OUT - MEASURE THE GAP BETWEEN THE SECTION OF THE 1ST EXTENSION AND THE STIFFENING COLLAR OF THE 2ND EXTENSION. THIS SHOULD MEASURE 15 -18mm WHEN THE RETRACT ROPES ARE CORRECTLY TENSIONED. IF THE MEASURED GAP IS LESS, REPEAT STEPS 1 -3. ONLY LOOSEN RETRACT ROPES AT STEP 2. IF THE MEASURED GAP IS MORE, REPEAT STEPS 1-3 TIGHTENING RETRACT ROPES AT STEP 2.
4. TIGHTEN EXTENSION ROPE ADJUSTING STUDS (3 OFF) ON REAR OF MAIN JIB (FIGURE 2) UNTIL THE 2ND EXTENSION JUST STARTS TO MOVE OUT. CHECK IF ALL 3 ROPES ARE NOW EQUALLY TENSIONED.
5. THE MANUAL EXTENSION PUSH BAR MUST BE RESET AFTER ROPES ARE ADJUSTED. THIS IS DONE BY ADJUSTING NUTS ON THE FRONT END OF THE PUSH BAR, UNTIL THE PIN DROPS NEATLY INTO IT'S ALIGNING HOLE TO LOCK THE MANUAL OUT.



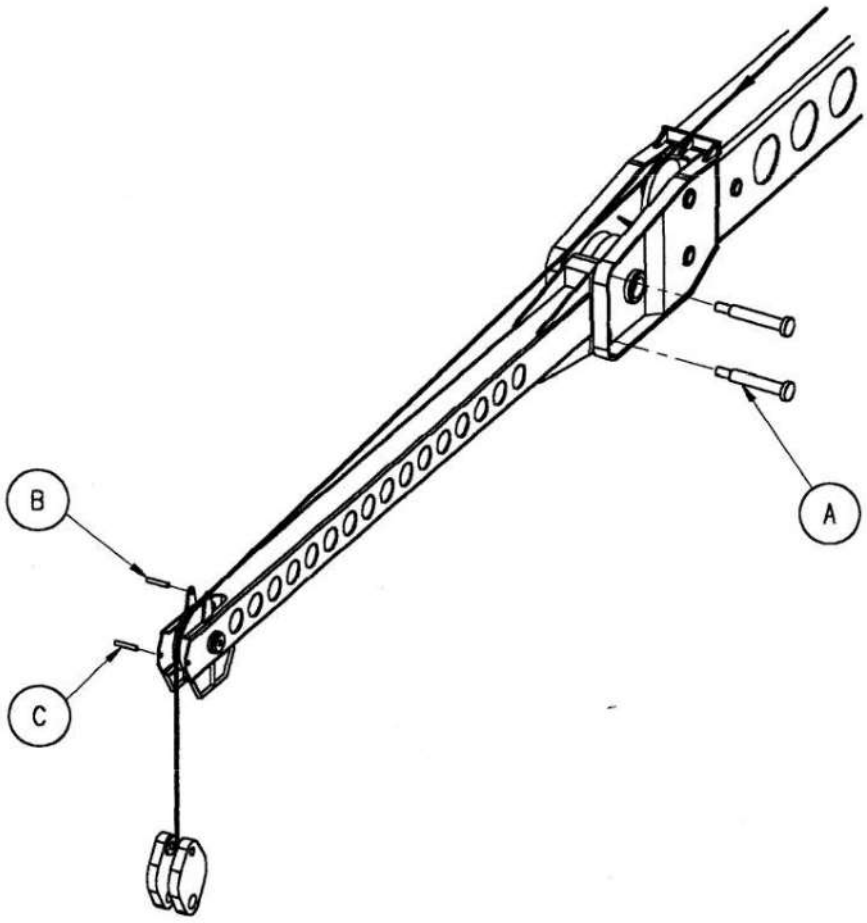
ADJUSTING RETRACT ROPE
FIGURE 1.



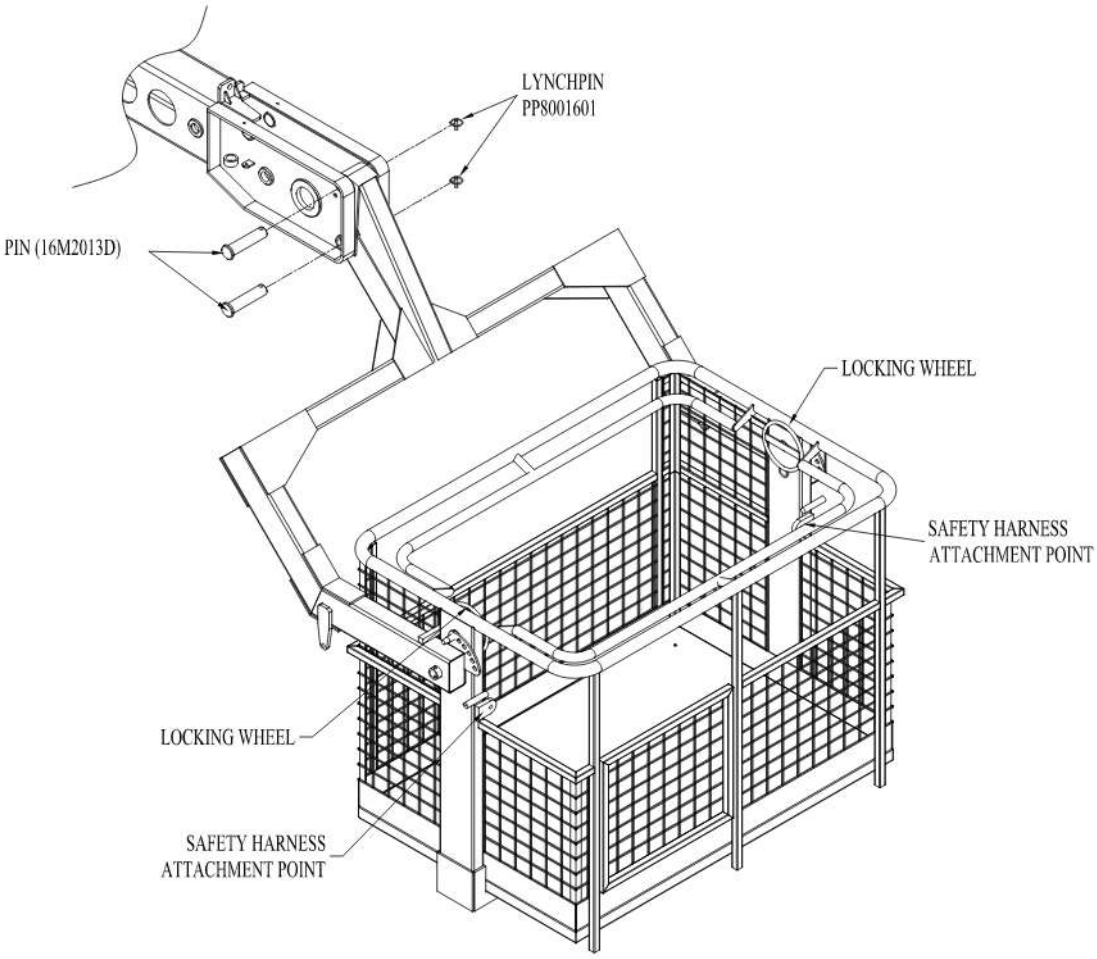
ADJUSTING EXTENSION ROPE
FIGURE 2.

FLY JIB INSTALLATION

1. REMOVE FALL BLOCK
2. REMOVE RHINO HOOK (IF FITTED)
3. FIT THE FLY JIB TO BOOM HEAD USING JIB PINS “A” AND FIT RETAINING NUTS
4. REMOVE PIN “B” & “C” AND RUN ROPE OVER THE SHEAVE. REPLACE PINS “B” & “C” AND FIT MINSUP RETAINING CLIPS
5. FIT SINGLE PART HOOK BLOCK TO END OF WINCH ROPE
6. LOAD MUST NOT EXCEED THE FLY JIB RATED CAPACITY CHART.



MAN BASKET OPERATION



INSTALLATION:

1. REMOVE THE FALL BLOCK AND REEVE FOR “NO FALL BLOCK”
2. ENSURE THE MANBASKET ARM IS LOCKED IN THE UPPERMOST POSITION.
3. POSITION THE CRANE SO THE MANBASKET IS JUST IN FRONT OF THE MANUAL EXTENSION HEAD WITH ABOUT 0.5 METRE OF THE BOOM EXTENDED.
4. LUFF DOWN, TELE OUT AND ARTICULATE TO ALIGN THE UPPER HOLE IN THE ARM WITH THE UPPER HOLE IN THE BOOM HEAD.
5. INSERT THE PIN IN THIS HOLE, RETAIN WITH LYNCH PIN.
6. LUFF UP SLOWLY, TO ALIGN THE LOWER HOLE OF THE ARM WITH THE HOLE IN THE MANUAL EXTENSION HEAD.
7. INSERT THE PIN IN THIS HOLE AND RETAIN WITH LYNCH PIN.

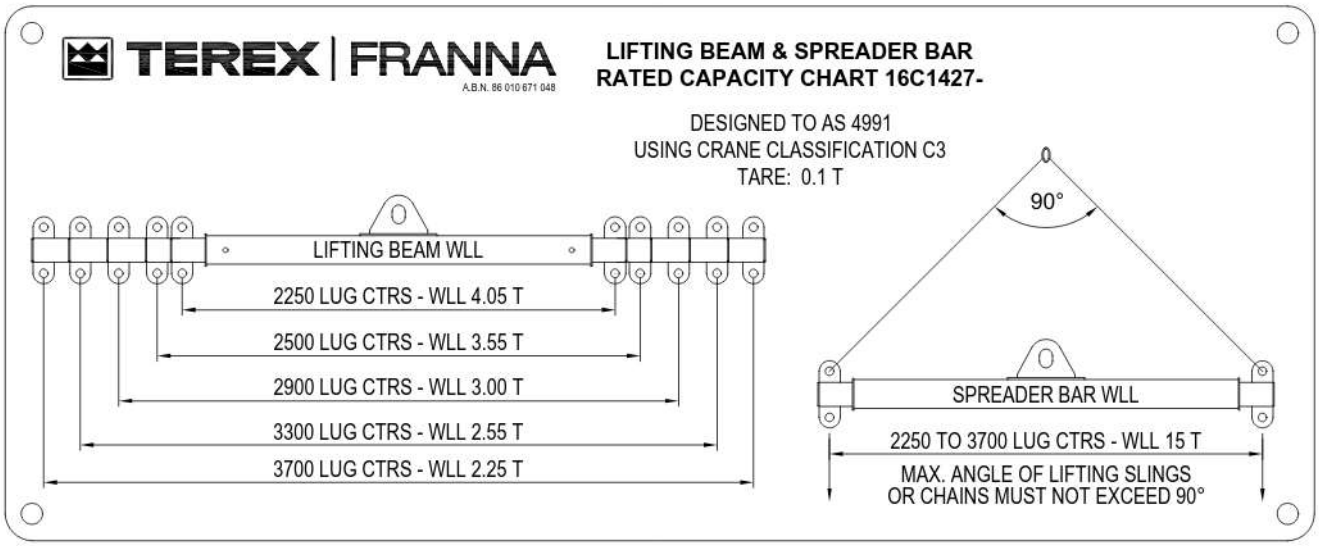
OPERATION:

(REFER TO AS 2550.1-1993 CLAUSE 7.16 FOR GENERAL OPERATIONAL GUIDELINES)

1. ENSURE THE MANBASKET IS PROPERLY MAINTAINED.
2. ENSURE THE INTENDED USAGE IS WITHIN THE RATED CAPACITY FOR THE BOOM LENGTH, ANGLE AND RADIUS TO BE USED - REFER TO THE CRANE AND MANBASKET'S RATED CAPACITY MANUAL.
3. ENSURE BOTH THE CRANE OPERATOR AND AT LEAST ONE OF THE MANBASKET OCCUPANTS IS COMPETENT WITH CRANE SIGNALS.
4. TO AVOID CONFUSION, NOMINATE ONE PERSON TO CARRY OUT CRANE SIGNALS.
5. ENSURE ALL OCCUPANTS ARE USING AN APPROVED AND PROPERLY MAINTAINED SAFETY HARNESS.
6. ENSURE THAT THE MANBASKET IS RESTING ON THE GROUND WITH THE LOCKING WHEELS FULLY TIGHTENED.
7. ENTER THE BASKET THROUGH THE SPRUNG CLOSED DOOR.
8. ATTACH THE SAFETY HARNESS TO THE ANCHOR POINTS.
9. ENSURE ANY EQUIPMENT IS POSITIONED CLOSE TO THE MANBASKET'S BALANCE POINT.
10. SIGNAL THE CRANE OPERATOR TO LUFF UP THE MANBASKET JUST OFF THE GROUND.
11. WITH OCCUPANTS POSITIONED SO AS TO ASSIST IN BALANCING THE MANBASKET, LOOSEN BOTH THE LOCKING WHEELS.
12. BECOME FAMILIAR WITH THE BALANCE CHARACTERISTICS OF THE MANBASKET, THEN SIGNAL THE CRANE OPERATOR TO POSITION THE MANBASKET AS REQUIRED.
13. ONCE IN POSITION FULLY TIGHTEN BOTH LOCKING WHEELS.
14. IT IS NOW SAFE TO MOVE FREELY ABOUT THE MANBASKET.
15. MINOR MANBASKET RE-POSITIONING CAN BE MADE WITHOUT LOOSENING THE LOCKING WHEELS.
16. UPON COMPLETION OF THE TASK, POSITION OCCUPANTS SO AS TO ASSIST IN BALANCING THE MANBASKET, AND LOOSEN BOTH THE LOCKING WHEELS.
17. ONCE AGAIN BECOME FAMILIAR TO THE BALANCE CHARACTERISTICS OF THE MANBASKET, THEN SIGNAL THE CRANE OPERATOR TO POSITION THE MANBASKET AS REQUIRED.
18. WITH THE MANBASKET JUST OFF THE GROUND TIGHTEN FULLY BOTH LOCKING WHEELS.
19. SIGNAL THE CRANE OPERATOR TO POSITION THE MANBASKET ON THE GROUND.
20. DISCONNECT YOUR SAFETY HARNESS AND DISEMBARK THROUGH THE SPRUNG CLOSED DOOR.

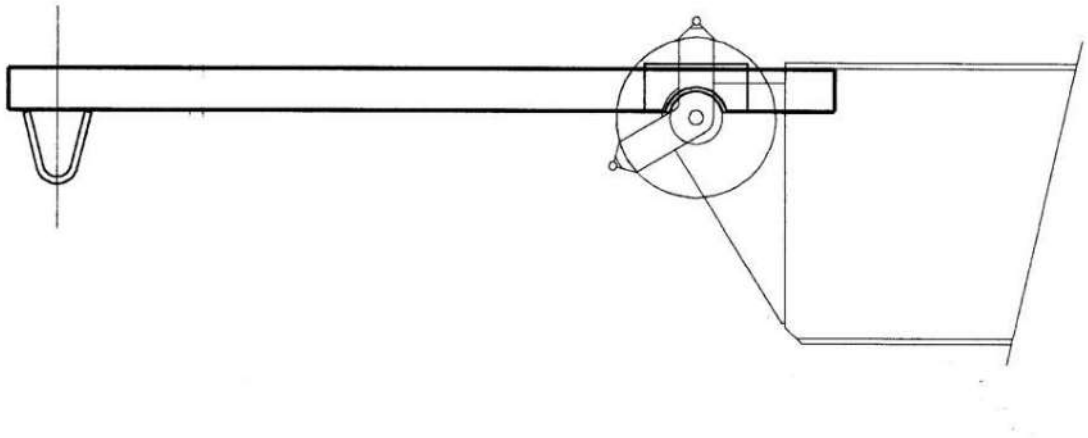
SPREADER BAR OPERATION

1. THE SPREADER BAR IS DESIGNED TO BE USED AS EITHER A SPREADER BAR OR LIFTING BEAM WITH ITS RATED CAPACITY BEING DIFFERENT FOR EACH CONFIGURATION, AS SHOWN ON ITS RATED CAPACITY CHART.
2. ALL PINS SHOULD BE CHECKED AND SECURED BEFORE EACH LIFT AND WITHOUT ANY LOAD APPLIED
3. LIFTING CHAINS BETWEEN THE LOAD AND THE SPREADER BAR SHOULD BE AS CLOSE AS POSSIBLE TO VERTICAL TO REDUCE HORIZONTAL LOAD INDUCED INTO THE SPREADER BAR.
4. INSPECT THE SPREADER BAR FOR DAMAGE PRIOR TO LIFTING AND DO NOT USE IF THERE IS DAMAGE TO ANY PART OF THE SPREADER BAR OR THE RATED CAPACITY IS NOT CLEARLY VISIBLE.
5. ALWAYS USE GENUINE SPARE PARTS TO ENSURE THE RATED CAPACITY OF THE SPREADER BAR.
6. ALL REPAIRS MUST BE PERFORMED AS PER TEREX LIFTING AUSTRALIA'S INSTRUCTIONS IN COMPLIANCE WITH AS4991
7. ALWAYS REFER TO ACTUAL RATED CAPACITY CHART FITTED TO SPREADER BAR BEFORE USE.



SPARE WHEEL REMOVAL

1. LOWER WINCH ROPE / FALL BLOCK BY 1m. THIS ENABLES THE WINCH ROPE DIVERTER SHEAVE TO BE MOVED TO ONE SIDE OF THE BOOM.
2. AFFIX LIFTING ARM INSIDE THE REAR OF THE MAIN BOOM AS SHOWN BELOW. THE HALF CIRCLE OF THE LIFTING ARM RESTS ON THE WINCH DIVERTER SHEAVE SHAFT.
3. SLEW CRANE TO THE LEFT AND ALIGN ARM WITH THE SPARE WHEEL.
4. WITH THE BOOM HORIZONTAL AFFIX SLING TO THE SPARE WHEEL.
5. LUFF DOWN TO RAISE THE ARM AND LIFT THE SPARE WHEEL.
6. SLEW FURTHER TO THE LEFT SO THE SPARE WHEEL CLEARS THE REAR BODY.
7. LUFF UP TO LOWER THE SPARE WHEEL TO THE GROUND.
8. INSTALLATION OF THE SPARE WHEEL IS THE REVERSE PROCEDURE.



AFTER CHANGING A WHEEL, TORQUE WHEEL NUTS TO 650 Nm (480 lb.ft.).
RE-TORQUE AFTER 120 km OF DRIVING

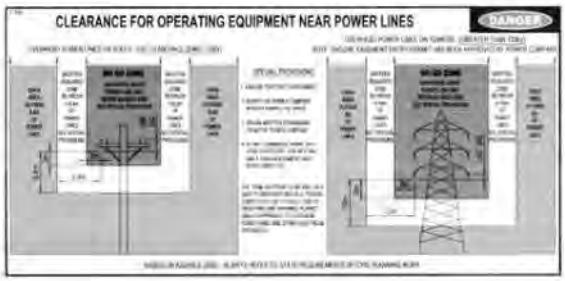
TEREX CRANES SAFETY PRECAUTIONS

- **THE FOLLOWING WARNING / CAUTION SIGNS SHOULD BE READ & UNDERSTOOD (APPLICABLE TO SPECIFIED CRANE MODELS)**
- **ALL SIGNS CAN BE PURCHASED THROUGH SPARE PARTS**

ALL FRANNA CRANE MODELS:
PART No.: PP0802500

PART No.: MP-1-346

PART No.: MP-1-434



PART No. MP-1-459

ALL N.S.W. REGISTERED CRANES:
PART No.: MP-1-342

ALL EURO. SPEC. CRANES:
PART No.: MP-2-161