



# POWER JACKS

Manufacturers and European Distributors of **Duff-Norton®** Actuators

## OPERATING & MAINTENANCE INSTRUCTIONS WITH PARTS LIST

### **Duff-Norton® TRACK JACKS**



MODEL NUMBERS 117,117A

#### **IMPORTANT - CAUTION**

This manual contains important information for all the correct installation, operation and maintenance of the equipment described herein. All persons involved in such installation, operation and maintenance should be thoroughly familiar with the contents. To safeguard against the possibility of personal injury or property damage, follow the recommendations and instructions of this manual and keep it for further reference.

#### **WARNING**

The equipment shown in this manual is intended for industrial use only and should not be used to lift, support or otherwise transport people.

**PJ-TJMM-01**

## SECTION I

### INTRODUCTION

#### 1-1 General

This manual provides instructions for operating, inspection and maintenance for Duff-Norton track jacks, models 117 and 117A. To ensure the safe and long satisfactory use of the track jacks, the instructions should be closely followed. Safety precautions to protect against accidental injury or property damage should be observed at all times.

#### NOTE

Because of the trip lowering feature, track jacks are not recommended for general industrial use.

#### 1-2 Construction

The track jacks feature hardened steel wearing plates that eliminate housing wear. A sturdy spring assures positive pawl action and prevents accidental tripping of load.

Tripping is both quick and positive. The short pawl, being set to full length of socket lever, gives greater bearing surface, greater distribution of load, reduces wear and gives longer life. Close fulcrum and correct socket angle provide high mechanical efficiency.

#### 1-3 Technical Characteristics

The user should be aware of the capabilities of the track jack, especially its load capacity.

#### WARNING

Overloading can be hazardous to the jack, the operating personnel and the load in the event of jack failure. Refer to Table 1-1 for technical characteristics of jacks.

**TABLE 1-1. TECHNICAL CHARACTERISTICS**

JACK No	117A	117
Capacity, Tons	7.5 Tons	15 Tons head / 7.5 Tons Toe
Height, Inches	22	22
Raise, Inches	13	13
Base, Inches	6½ x 11	6½ x 11
Head, Inches	3 x 3	3 x 3
Ft. Lft. Ht., Inches	2	2
Weight, Pounds	46	66
Rack Size, Inches	1½ x 1½	1½ x 1½

## SECTION II

### INSPECTION, TESTING AND MAINTENANCE

#### 2-1 Inspection

The inspection classifications herein are recommended minimum requirements and should be augmented when experience from operating conditions indicate. Refer to Table 2-1 for minimum schedule inspection.

##### 2-1-1 Inspection Classification

The jack inspection classification consists of initial inspection prior to use and two general classifications designated as Frequent Inspection and Periodic Inspection based upon the intervals at which inspection should be performed.

The intervals in turn are dependent upon the nature of the critical components of the jack and degree of their exposure to wear, deterioration or malfunction.

##### 2-1-2 Initial Inspection

Any new or repaired jack should be carefully inspected prior to initial use. An inspection should be made by or under the direction of a person familiar with track jack operations and safety standards.

- (a) Visually check mechanism for correct assembly. Check for any loose or missing parts, such as bushing locks, spring or pins.
- (b) Operate the jack through one or more lifting and lowering cycles while observing lifting mechanism operation. During this check, it maybe necessary to apply a light load to the top to simulate a load.
- (c) Check for adequate lubrication of all interacting parts. (Refer to Section 3-2).

**2-1-3 Frequent Inspection**

Visual examination by the operator or other qualified designated personnel with records not required.

- (a) Normal service - one month
- (b) Severe service - before each use or daily, whichever is less frequent.

**CAUTION**

Any unsafe condition disclosed by the inspection should be corrected before operation of the jacks is resumed.

Repairs should be performed only by designated qualified personnel.

The following items should be visually inspected and observed during operation for any deficiencies which might appear between frequent inspections. The deficiencies listed should be carefully examined and determination made whether or not they constitute a hazard. If such a determination is made, the jack should be removed from service until the deficiency is corrected.

- (a) Check for improper engagement or extreme wear of pawls and rack.
- (b) Check for cracked or broken rack.
- (c) Inspect for cracked or damaged base, socket lever and top.
- (d) Visually check jack for correct assembly. Check for any loose, damaged or missing parts, such as bushing locks, spring, washers or pins.
- (e) Check for adequate lubrication. (Refer to Section 3-2).
- (f) Check for foreign substances which may damage or interfere with proper operation of the jack.

**TABLE 2-1 MINIMUM INSPECTION SCHEDULE**

Minimum Inspection Schedule	Normal Service		Severe Service	
	Visual Monthly*	Record Yearly**	Visual Before use***	Record Yearly
<b>Frequent Inspection</b>				
Improper pawl engagement	X		X	
Extreme pawl wear	X		X	
Cracked rack teeth	X		X	
Cracked or damaged base	X		X	
Improper functioning	X		X	
Cracked or damaged top	X		X	
Damaged or improperly assembled accessory equipment	X		X	
Other items as specified in manufacturer's instructions	X		X	
Rack wear or bending	X		X	
<b>Periodic Inspection</b>				
Same as Frequent Inspection		X		X
Disassemble and check for wear		X****		X

\* By operator or designated personnel without records

\*\* By appointed person making records of apparent external conditions to provide the basis for continuing evaluation

\*\*\* Or daily, whichever is longer

\*\*\*\* If external conditions indicate internal difficulty

**NOTE**

A jack that has been idle for one year or more should be inspected in accordance with Frequent Inspection.

**2-1-4 Periodic Inspection**

Visual inspections by designated qualified personnel, making records of apparent external conditions, provide the basis for a continuing evaluation.

- (a) Normal Service - one year
- (b) Severe service - before each use or daily, whichever is less frequent, unless external conditions indicate that disassembly should be done to permit detailed inspection.

Perform inspection in the same manner as Frequent Inspections, except that records should be kept. A dated and signed inspection record should be kept on all Periodic Inspections. Refer to Figure 2-1 for a typical "Inspector's Record".

It is recommended that the Periodic Inspection be performed by an authorized service center or appropriate trained authorized individuals.

During Periodic Inspection, if external appearance indicates possible internal difficulty, the jack should be disassembled for cleaning and examination for internal wear or damage.

Refer to Paragraph 2-3 entitled "Maintenance" for dis-assembly and assembly procedures. See Table 2-1 for Minimum Inspection Schedule.

**2-2 Load Test**

Any new, altered or repaired jack shall be tested for its ability to sustain its rated load prior to regular use. The jacks should be operated to 100 per cent of their capacity. Refer to Table 1-1 for applicable load capacity.

**2-3 Maintenance**

The maintenance of the jacks should include lubrication, cleaning and replacement of parts during disassembly and assembly.

**2-3-1 Lubrication**

The jack should be kept well-lubricated. Shell Alvania EP-1 grease, or equivalent, is satisfactory for all points requiring lubrication. A thin coat applied with hand or brush is sufficient for all moveable parts, except the bushings. The bushings should be filled with grease at the time of assembly and after every 50 cycles during operation. A hole in the bushing is provided for greasing purposes. Keep sides and front of the rack greased but do not grease the rack teeth.

**2-3-2 Cleaning**

Exposed teeth of the rack should be cleaned as necessary. If the jack has had severe exposure to mud, water, sand or cinders, disassemble and clean. Any acid-free cleaning solvent will be satisfactory. Soak the parts and agitate in the solvent to ensure cleaning. Stubborn deposits of dirt and grease can be removed from the housing by using a stiff bristled brush dipped in the solvent. The housing has several recesses which dirt can be trapped. Check these carefully. After drying, relubricate before assembling.

**Figure 2-1. Typical Inspector's Record**

Inspector's Report			
Item	Remarks (List deficiencies and recommended action)		
Inspector's Signature	Date Inspected	Approved by	Date

## CAUTION

Ensure that adequate ventilation is provided when using cleaning solution. Wear protective clothing and avoid prolonged contact with solvents.

### 2-3-3 Repair Parts

When repair parts are required, refer to applicable parts list.

### 2-3-4 Disassembly

The following paragraphs suggest the easiest method of disassembly and reassembly of the track jacks, with references made to the exploded view illustration for parts identification.

It is expected that whenever any part is removed from the jack that the part will be cleaned and inspected before reuse. Refer to paragraphs 2-3-2 and 2-3-1 for cleaning and inspection. Always give careful attention to lubrication of parts during reassembly.

#### 2-3-4-1 Disassembly Procedure

Disassemble the jack as follows while referencing parts list.

- (a) Remove pin (13) from top (4).
- (b) Remove top (4) from rack (3).
- (c) Disengage the two pawls (6&7) from rack (3), then remove rack from base (1) by grasping handle of base and lifting up to permit the rack to slip out the bottom of base. The wearing plate (14) is located in a recess near tip of base and should fall free when the rack is removed.
- (d) Remove spring (11) from base (1).
- (e) Press long pawl pins (10) from base (1) to free long pawl (7). Lift out long pawl from base.
- (f) Remove bushing lock (9) from each side of jack to free the two bushings (8). The end of the bushing lock on outside of jacks should have a 90 degree bent tab that must be straightened before the lock can be pried or tapped out from between the bushing and base (1). Remove locks from inside of base.

- (g) Remove the two bushings (8) to free socket lever (2) and short pawl (6) assembly. If bushing will not come free easily, lay jack on side and gently tap on inside edge of bushing to drive bushing out.
- (h) Lift socket lever (2) and short pawl (6) assembly until short pawl can be separated from socket lever and removed from base (1) through side window.
- (i) Remove socket lever (2) from base (1).

### 2-3-5 Assembly

#### 2-3-5-1 Assembly Procedure

Assemble the jack as follows while referencing parts list.

- (a) Insert socket lever (2) into base (1) through back opening.
- (b) Insert short pawl (6) through side window of base (1) and assemble into socket lever (2). The socket lever must be held up such that its ears are above the slots inside the base.
- (c) Lower the socket lever (2) and short pawl (6) assembly into proper position.
- (d) Press two bushings (8) into base (1) to hold socket lever (2).
- (e) Insert bushing locks (9) and bend outside tab 90 degrees against base (1).
- (f) Locate long pawl (7) in base (1) and secure pawl by pressing pins (10) into base. Place curved end of spring (11) around protrusion on long pawl.
- (g) Insert wearing plate (14) in recess near top of base (1). Pull pawls toward socket lever and slide base over rack (3).
- (h) Assemble spring (11) into base (1) by compressing coils of spring together, inserting into base with the connector up and allowing it to spring back over last lugs inside base.
- (i) Secure top (4) to rack (3) with pin (13).

## SECTION III

### OPERATION

#### 3-1 Operational Requirement

The operator should familiarize himself with the jack, its capabilities and its operation. To raise a load operate the lever up and down. The jacks will raise the load one notch for each lever downstroke. The rack cannot be ratcheted out of the base because it is designed to stop when raised to its top limit. To trip the jacks, raise the lever as high as it will go and disengage short pawl (6) by pulling on pawl knob as far as it will go in the direction of socket lever (2). Lower lever slightly to allow short pawl to become locked against long pawl (7), then release short pawl and continue to lower lever until long pawl is disengaged from rack which trips jack.

#### 3-2 Operating Procedures and Precautions

The following precautions and procedures should be followed in operation of the jack:

- (a) Visually inspect the jack before each shift or each use, whichever is less frequent.
- (b) Determine if the load is within the load rating of the jack.

- (c) Support the jacks firmly at the base in such a manner that it cannot shift under load.
- (d) Use shims or constraints to prevent slippage of base or load.
- (e) Use an operating lever of correct size and make sure operating lever is properly seated in its socket.
- (f) Do not straddle the operating lever.
- (g) Remove operating levers when not in use to avoid accidental dislocation of the jack and reduce the tripping hazard.
- (h) Take precaution to assure that all personnel are clear of the load before tripping.
- (i) Assure sufficient swing area for operating lever.
- (j) Avoid off-center loading of jacks.
- (k) Do not use and extruder.
- (l) Lubricate jack generously with Shell Alvania grease, or equal, frequently (every 50 cycles or less). Apply grease to bushing through holes at ends, to front and sides of rack when extended and to front of base around slot for rack toe.

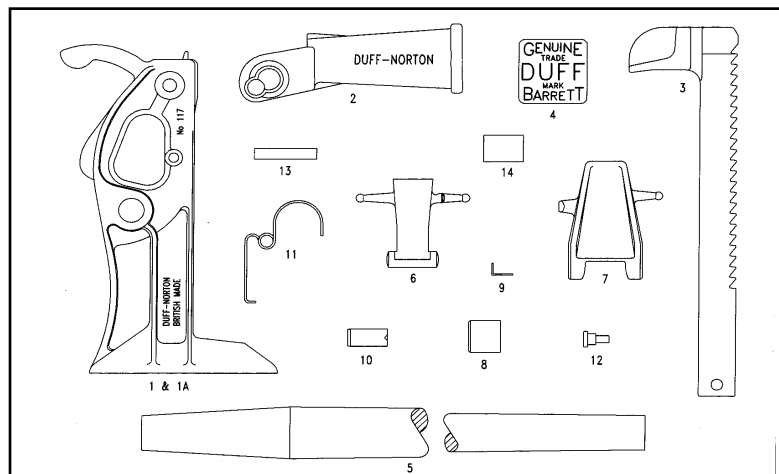


Illustration No	Description	Part No
1	Base 117	BX2881
1a	Base 117A	BX4453
2	Single Round Socket Lever	BX3715
3	Rack	BX2885
4	Top	BX2808
5	Operating Lever	BS6-39
6	Short Pawl	BX3702
7	Long Pawl	BX2883
8	Bushing	BX4139
9	Bushing Lock	BX2887
10	Pin for Long Pawl	BX2888
11	Spring	BX4394
12	Spring Pin	BX4452
13	Pin for Top	BS1-84
14	Wearing Plate	BX3294
	Set Screw	106FPS1602

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