BACKHOE LOADER WORKSHOP MANUAL

6111283M2 - English - January 2008

820
860/880 SX & ELITE
970/980 ELITE
TX760B
TX860B
TX970B
TX980B

TEREX®

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SECTION

GENERAL INFORMATION

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Service Techniques

General

The words 'front', 'rear', 'right-hand' and 'left-hand' used in this manual refer to the different parts of the machine as viewed from the Operator's seat, when facing the steering wheel.

Clean the exterior of all components before starting any type of repair. Dirt and abrasive dust can reduce the efficient working life of a component and lead to costly replacement.

Time spent on the preparation and cleanliness of working surfaces will pay dividends in making the job easier and safer and will result in overhauled components being more reliable and efficient in operation.

Use cleaning fluids which are known to be safe. Certain types of fluid can cause damage to O-rings and cause skin irritation. Solvents should be checked that they are suitable for the cleaning of components and also there is no risk to the personal safety of the user.

When replacing component parts, use the correct tool for the job.

Cleaning

⚠ **Caution:**

- **Care should be exercised to avoid skin rashes, fire hazards, and inhalation of vapours when using solvent type cleaners.**

Clean all parts thoroughly using solvent type cleaning fluid. It is recommended that parts be immersed in cleaning fluid and agitated until all old lubricant and foreign material is dissolved and the parts are thoroughly cleaned.

Bearings

Remove bearings from cleaning fluid and strike flat against a block of wood to dislodge solidified particles of lubricant. Immerse again in cleaning fluid to flush out particles. Repeat above operation until bearings are thoroughly clean. Dry bearings using moisture-free compressed air. Be careful to direct air stream across bearing to avoid spinning. **Do not spin bearings when drying** . Bearings may be rotated slowly by hand to facilitate the drying process.

Housings

⚠ **Caution:**

- **Care should be exercised to avoid inhalation of vapours and skin rashes when using alkali cleaners.**

Thoroughly clean interior and exterior of housings, bearing caps, etc. Cast parts may be cleaned in hot solution tanks with mild alkali solutions, provided these parts do not have ground or polished surfaces.

Parts should remain in the solution long enough to be thoroughly cleaned and heated. This will aid the evaporation of the cleaning solution and rinse water.

Parts cleaned in solution tanks must be thoroughly rinsed with clean water to remove all traces of alkali. Cast parts may also be cleaned with a steam cleaner. All parts cleaned must be thoroughly dried immediately by using moisture-free compressed air or soft lint—free absorbent wiping rags, free of abrasive materials such as metal filings, contaminated oil or lapping compound.

Inspection

The importance of careful and thorough inspection of all parts cannot be overstressed. Replacement of all parts showing indication of wear or stress will eliminate costly and avoidable failures at a later date.

Bearings

Carefully inspect all rollers, cages and cups for wear, chipping, or nicks to determine fitness of bearings for further use. **Do not replace a bearing cone or cup individually** without replacing the mating cup or cone at the same time. After inspection, lubricate the bearings with suitable clean oil and wrap in clean lint—free cloth or paper to protect them until installed.

Oil Seals, Gaskets, Etc.

Replace O-rings, seals or gaskets whenever they are disturbed. Never mix new and old seals or O-rings, regardless of condition. Always lubricate new seals and O-rings with suitable clean oil before installation.

Replacement of spring-load oil seals, O-rings, metal sealing rings, gaskets and snap rings is more economical when the unit is disassembled than premature overhaul to replace these parts at a future time.

Further loss of lubricant through a worn oil seal may result in failure of other more expensive parts of the assembly. Sealing members should be handled carefully, particularly when being installed. Cutting, scratching or curling under the lips of seals seriously reduces their efficiency.

When assembling new metal type sealing rings, these should be lubricated with a light grease to stabilise rings in their grooves for ease of assembly of mating members.

Gears and Shafts

Examine teeth on all gears carefully for wear, pitting, chipping, nicks, cracks or scores. If gear teeth show spots where case hardening is worn through or cracked, replaced with new gear. Small nicks may be removed with a suitable hone. Inspect shafts and quills to make certain they are not sprung, bent or spline-twisted, and that shafts are not bent.

Housings, Covers, Etc.

Inspect housings, covers and bearing cups to ensure that they are thoroughly clean and that mating surfaces, bearing bores, etc. are free from nicks or burrs. Check all parts carefully for evidence of cracks or conditions that would cause subsequent oil leaks or failures.

Hoses and Tubes

Always replace hoses and tubes if the cone end or the end connections on the hose are damaged.

When installing a new hose, loosely connect each end and make sure the hose takes up the designed position before tightening the connection. Clamps should be tightened sufficiently to hold the hose without crushing and to prevent chafing.

After hose replacement to a moving component, check the hose does not foul by moving the component through the complete range of travel.

Make sure any hose which has been installed is not kinked or twisted.

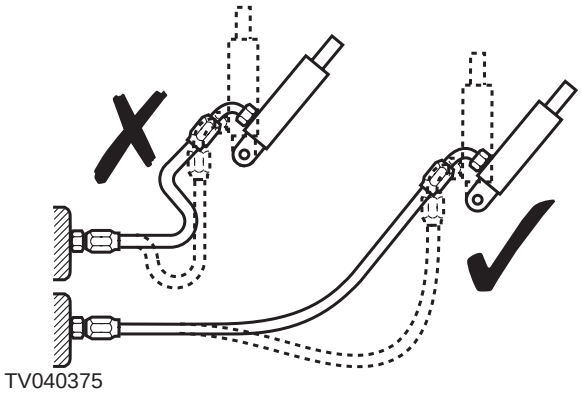
Hose connections which are damaged, dented, crushed or leaking, restrict oil flow and the productivity of the component being served. Connectors which show signs of movement from the original swagged position have failed and will ultimately separate completely.

A hose with a chafed outer cover will allow water to enter. Concealed corrosion of the wire reinforcement will subsequently occur along the hose length with resultant hose failure.

Ballooning of the hose indicates an internal leakage due to structural failure. This condition rapidly deteriorates and total hose failure will soon occur.

Kinked, crushed, stretched or deformed hoses generally suffer internal structural damage which can result in oil restriction, a reduction in the speed of operation and ultimately hose failure.

Free moving, unsupported hoses must never be allowed to touch each other or related working surfaces. This causes chafing which reduces hose life.



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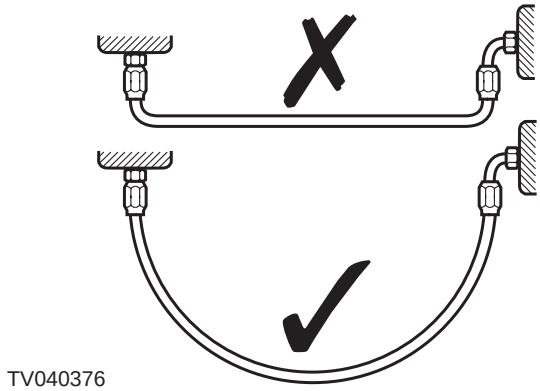

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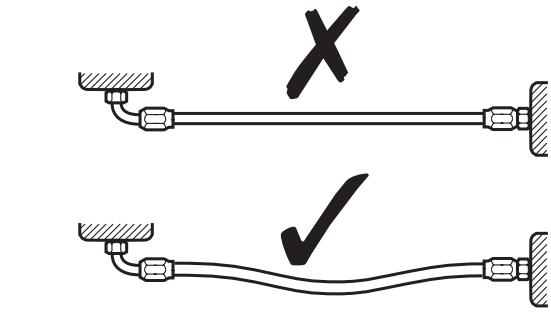

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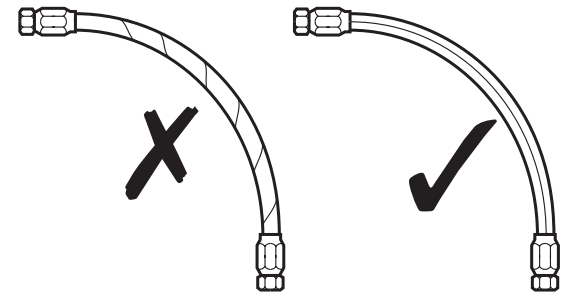
Installing Flexible Hoses



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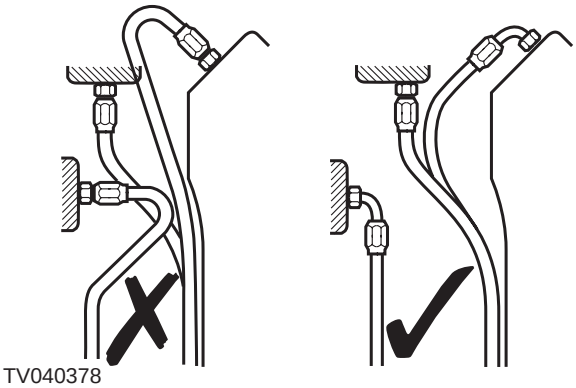

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VIN Definition

Item	Digit	Description/Values	Example
Manufacturer ID	S	Registered with BSI	S
	M		M
	F		F
Product Variants	X	**H** =Terex/TCE, **G** =Fermec	H
Transmission	X	**4** =4 Speed Synchro Shuttle, **3** =3 Speed Syncro Shuttle, **6** =4 Speed Power Shift, **5** =3 Speed Power Shift	5
Drive	X	**4** =4WD, **2** =2WD	4
Digging Length	X	**S** =4.5 Std, **T** =4.5 Ext, **L** =4.9 Std, **E** =4.9 Ext, **N** =None	T
Operator Compartment	X	**C** =Cab, **R** =ROPS	C
Loader Element Function	X	**0** =Mechanical, **N** =None	0
Production Year	X	BSA U175 Model Year, **1** =2001, **2** =2002, **3** =2003, **4** =2004 etc..	4
Chassis Type	X	See Table 1 Below	C
Engine Type	X	**F** =68.5 kW, **G** =74.5kW	G
Digging Element Function	X	**M** =Mechanical, **N** =None	M
Serial Number	X	Machine Serial Number	3, 6, 5, 7

Table 1 — Chassis Type

Digit	Type
A	2WS/Base/Sideshift (820)
B	2WS/Base/Centre Mount (820)
C	2WS/Main/Side Shift (860)
D	2WS/Main/Centre Mount (860)
E	4WS/Side Shift (970)
F	4WS/Centre Mount (970)

For additional information, refer to the Operator's Manual.

Fluids and Lubricants

Specifications

System	Temperatures		Viscosity	Specifications	Capacities (Litres)	Notes
	From	To				
Engine Turbocharged – 1100 Series 820/860/970	-40°C	+40°C	0W – 40	EMA DHD-1 or CH-4 API CH-4 ACEA E3 or E5	7.3	If sulphur content in fuel is above 0.2% of mass (2000ppm), change oil and filter every 250 hours)
	-30°C	+40°C	5W – 40			
	-10°C	+50°C	15W – 40			
Transmission Synchro Shuttle 820/860	ALL		10W	ATF	22 (Total System)	Check oil level with engine running at idle. Clean suction strainer at oil change
Transmission Powershift 860/970	ALL		10W	ATF	23 (Total System)	Check oil level with engine running at idle: Approved oils: ATF Elfmatic G3 Esso D (21611)
Front Axle 820/860	ALL		80W – 90	API GL5 MIL-L-2105D	6.5 + 1 + 1	As Alternative: Agip Rotra Multi THT Esso Torque Fluid 62 Mobil Fluid 422 or 424
Front Axle 970	ALL		80W – 90	API GL5 MIL-L-2105D	7.5 + 1 + 1	As Alternative: Agip Rotra Multi THT Esso Torque Fluid 62 Mobil Fluid 422 or 424
Rear Axle 820/860	ALL		80W	API GL4 M1135	14.5 + 1.5 + 1.5	Approved oils: Agip Rotra Multi THT Esso Torque Fluid 62 Mobil Fluid 422 or 424
Rear Axle 970	ALL		80W	API GL4 M1135	14.5 + 1.5 + 1.5	Approved oils: Agip Rotra Multi THT Esso Torque Fluid 62 Mobil Fluid 422 or 424
Hydraulics	Up to +30°C		ISO VG 46	DIN 51524	143 (Total System)	Tank Capacity = 85 Litre
	Up to +50°C		ISO VG 68			
Greasing – General	ALL		EP-NLGI	Grade 2		EP-Lithium based
Greasing - Backhoe swing	ALL		EP–NLGI	Grade 2		EP-Lithium based with Molybdenum disulphide (MoS2)

Greasing - Propeller Shafts	ALL	EP–NLGI	Grade 2		EP-Lithium based with Molybdenum disulphide (MoS2)
Greasing - Dive Shafts U.J					
Greasing - Axle(s) King Pins					
Coolant	Up to -33°C		BS 6580-1992 ASTM D3306	16 (Total System)	Antifreeze=33%
	Up to -50°C				Antifreeze=50%
Fuel	ALL			130	Cetane: Minimum 45 Sulphar content: Maximum 0.2% (of mass)
Air Conditioning			CFC 134 A	1200 gr (Initial Charge)	Recharge=900 – 1000gr

Service Schedule

System	Service Schedule (Hours)					
	10	50	250	500	1000	Yearly
Engine Turbocharged – 1100 Series 820/860/970	C			R		
Filter 2654403				R		
Transmission Synchro Shuttle 820/860		C			R	
Filter 6190810M1				R		
Transmission Powershift 860/970		C			R	
Filter 6193480M91					R	
Front Axle 820/860			C		R	
Front Axle 970			C		R	
Rear Axle 820/860			C		R	
Rear Axle 970			C		R	
Hydraulics		C			R	
Filter 3515328 M92					R	
Greasing – General	G					
Greasing - Backhoe swing	G					
Greasing - Propeller Shafts		G				
Greasing - Dive Shafts U.J			G			
Greasing - Axle(s) King Pins	G					
Coolant	C					C
Fuel					D (Tank)	
Filter 26560201				R		
Air Conditioning						C
C=Check, D=Drain, G=Grease, R=Replace						
NOTE: Synchro Shuttle Transmission oil level is checked with the engine running at idle and hot oil. **NOTE:** Distance from the flat on top of dipstick to the 'H' and 'L' marks 929mm respectively. Total length 952mm.						

Sealing and Locking Fluids

Type	Description
Loctite 242	Medium strength thread lock
Loctite 243	Medium strength oil tolerant sealant
Loctite 270	Maximum strength stud lock
Loctite 496	Instant Adhesive
Loctite 510	High temperature flange sealant
Loctite 542	Fine thread sealant
Loctite 638	Maximum strength retaining compound
Loctite 648	High strength/rapid cure retaining compound

General Specifications

Engine

Engine	Low Power (820)	High Power (860 – 970)
Make	Perkins	
Model	1104C–44T	
Bore and Stroke	105x127mm	
Capacity	4400 cc	
Compression Ratio	16.5:1	
Firing Order	1 3 4 2	
Type	2164/2200	2166/2200
Build List (With Air Con)	RG38043	RG38044
Build List (Without Air Con)	RG38100	RG38099
Power @ 2200rpm	68.5kW (92 HP)	74.5kW (100 HP)
Torque @ 1400rpm	395Nm	415Nm
Turbocharger	Garrett GT 25, with wastegate	
Perkins P/N	2674A226	
Wastegate beginning to operate pressure	1.0 +/- 0.05bar	
Injection Pump	Delphi	
Model	DP210	
Type	1398/2644H013	1405/2644H023
Setting Code	XR/2/2350	DT/2/2350
Perkins Type	9320A212G	9320A342G
Perkins P/N	2644H002	2644H003
Injection Advance	0.5° BTDC	
Timing	Pin Timed 0° ATDC	
Speed at which cut off starts under full load	2200 +/- 25rpm	
Maximum No Load Speed	2350 +/- 25rpm	
Idle Speed	700 – 1200rpm	

Injectors	Delphi
Type	LJBX6921101
Perkins P/N (Nozzle)	2645K611
Opening Pressure	290 +/- 8bar
Colour Code	Yellow
Fuel Feed Pump Pressure	0.1 – 0.7bar
Valve Lash (Cold) – Inlet	0.20mm
Valve Lash (Cold) – Exhaust	0.45mm
Valve Arrangement	IE IE IE IE
Cold Start System	Glow Plugs (4)
Make	Beru
Perkins P/N	2666A016
Initial Current	30A Immediately Reduced to 21A
After 8 sec	14A
After 20 sec	10A
After 60 sec	9A
Cold Start Sensor	Normally Open
Perkins P/N	2848A127
Closes at	50 +/- 3°C
Re–opens at	40 +/- 3°C
Radiator Cap Pressure	110kPa
Thermostat	Wax Element By-pass Blanking
Perkins P/N	2485C041P
Nominal Temperature Stamped on Thermostat	82°C
Start to Open Temperature	79 – 84°C
Fully Open Temperature	93°C
Minimum Valve Lift Fully Open	10mm
Lubrication	Rotor Pump
Minimum Oil Pressure at Max rpm	3.0bar

Transmission

Transmission	Synchro Shuttle	Power Shift
Make	Turner	Dana
Model	COM-T4-2032	121-4FT 16000-22
Fermec P/N	6108873M91	6108875M91
Torque Converter Stall Ratio	3.01:1	2.60:1
Pump Pressure	18.0bar	20.5 – 23.5bar
Clutch Pressure	16bar	20.5 – 23.0bar
Torque Converter Working Pressure	–	4.9 – 5.0bar
Torque Converter Safety Valve Pressure	6.5 – 7.5bar	9.0bar
Solenoid Pressure	–	9.5bar
860 Transmission Control Unit	–	4503428
970 Transmission Control Unit	–	4503427
Lubrication Pressure	1.5 – 3.0bar	0.4 – 0.5bar

Brakes

Brakes	Oil Immersed Disk Type in the Rear Axle
Booster	Transmission Pressure Activated
Boost ratio	2.60:1
Master Cylinders Diameter	31.75mm (1 1/4”)
Master cylinder seals	Specific for Mineral Oil
Brake Disks	
Friction Discs (820–860)	2 Each Side
Friction Disks (970)	3 Each Side
Brake Piston Seals	Specific for Mineral Oil