SERVICE MANUAL

INTERNATIONAL

435
AND
445
PICKUP BALERS

SM - 52

INTERNATIONAL HARVESTER COMPANY
OF GREAT BRITAIN LIMITED

P O BOX 25 259 CITY ROAD LONDON EC1P 1AD

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GROUP INDEX

GENERAL 1
HITCH, PTO SHAFTS AND FLYWHEEL 2
GEARBOX 3
PACKER FINGERS AND CRANK 4
PLUNGER AND BALE CHAMBER 5
PICKUP, AUGER AND DRIVES 6
MAINFRAME. WHEELS AND SHEET METAL 7
TYING AND TWISTING MECHANISM 8
ADJUSTMENTS 9

The above tabs line up with the corresponding tabs in the manual

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GROUP 1

GENERAL

CONTENTS	Page Numbers
GENERAL	1
SERVICE TOOLS	1
SERVICE PARTS	1
SERIAL NUMBER	1
ADJUSTMENTS	1
ILLUSTRATION REFERENCES	1
INSPECTION AND REPAIR	1
LUBRICATION	2
METRICATION	2
BOLT IDENTIFICATION	3
TORQUE DATA	3
PRINCIPLES OF BALER OPERATION	4
SPECIFICATIONS	6

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GROUP 2

HITCH, PTO SHAFTS & FLYWHEEL

CONTENTS	REMOVAL	DISMANTLING	INSPECTION	ASSEMBLY	INSTALLLATION	ADJUSTMENTS
	Page Numbers					
JACK	1	2	-	2	3	-
HITCH	3	3	-	4	4	-
PTO SHAFTS	5	5	-	6	7	-
UNIVERSAL JOINTS	7	-	-	-	7	-
FLYWHEEL AND CLUTCH	8	9	9	10	10	10

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2. BOLT IDENTIFICATION CHART

IH TYPE	BSS	TENSILE STRENGTH T/in^2	MANUFACTURERS MARKINGS					
5	S	50 - 55	BEES 50 S 55	NEWALL HITENSILE "S"	SPNS	NEWTON S	SPARTS S	TWLS
	T	55 - 65	BEES 55 T 65	NEWALLOY T or NEWALL HITENSILE T	SPNT	NEWTON T	SPARTS T	TWLT
8	V	65 - 75	BEES 65 V 75	NEWALLOY "V"	SPNV	NEWTON V	SPARTS V	TWLV

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3. TORQUE DATA

Where no special torque figure is provided in SPECIFICATIONS, the following torque should be used on all nuts and bolts providing that the threads are lubricated with engine oil or chassis grease.

BOLT SIZE (in)	TYPE 5				TYPE 8			
	MIN.		MAX.		MIN.		MAX.	
	kgm	lbft	kgm	lbft	kgm	lbft	kgm	lbft
1/4	1.24	9	1.26	10	1.66	12	1.93	14
5/16	2.62	19	2.90	21	3.73	27	4.14	30
3/8	4.56	33	5.11	37	6.22	45	6.91	50
7/16	7.32	53	8.30	60	10.37	75	11.75	85
1/2	11.06	80	12.44	90	15.90	115	17.97	130
9/16	15.90	115	17.97	130	22.81	165	25.58	185
5/8	22.12	160	24.89	180	30.42	220	34.56	250
3/4	40.09	290	44.24	320	55.30	400	62.21	450
7/8	58.07	420	64.98	470	89.87	650	100.93	730
1	87.10	630	98.16	710	134.11	970	150.70	1090
1-1/8	117.52	850	131.34	950	190.79	1380	214.30	1550
1-1/4	165.91	1200	186.64	1350	268.21	1940	301.40	2180

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4d. INSTALLATION

1. PTO Rear Shaft

(a) Position the shaft (3-8) on the flywheel and secure with the bolts (2-8) torqued to 4.7 to 5.2kgm (34 to 38lbft).

(b) Slide the rear half guard (1-10) into position on the shaft then fully push in the bearing tags (2-9), ensuring the locking tabs (1-9) are behind the tags. Secure the outer shield with the screws (3-7).

(c) Install the front shaft, referring to sub-para.2.

2. PTO Front Shaft

(a) Locate the centre bearing shield on the shaft.

(b) Slide the front shaft onto the rear shaft ensuring that the setscrew holes are in the same plane. Align the setscrew holes, apply Loctite 241 to the threads then install the setscrew (5-10) and secure with the locknut (4-10).

(c) Lift the centre bearing into position, install the shield and secure with the bolts (1 & 2-7).

5. UNIVERSAL JOINTS

5a. REMOVAL

Experience has shown that, on a shaft with two universal joints, when one of the universal joints fails the other undergoes a strain and may fail within a short time. It is recommended that both universal joints be changed at the same time.

(a) Remove the four circlips from the universal joint.

(b) With the U.J. held over a vice use a dolly on one of the bearings

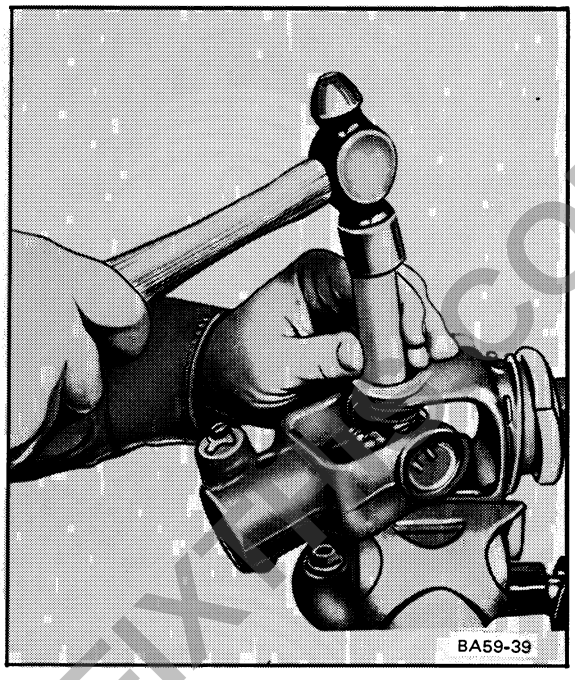


Figure 11

to drive the cross through the yoke, refer to Fig.11, until the opposite bearing projects about 7mm (1/4in). Grip this projecting bearing in a vice then gently tap the yoke away until the bearing is removed.

(c) Using the dolly against the exposed end of the cross knock the outer bearing through until it projects 7mm (1/4in). Grip the bearing in a vice and tap the yoke until the bearing is free.

(d) Lift the yoke from the cross.

(e) Remove the bearings from the other yoke in a similar manner.

5b. INSTALLATION

(a) Press one bearing cup (1-12) into one yoke until it is just entered.

(b) Install the cross (2-12) then using the dolly and vice, press in the bearing until just past the circlip groove. Install the circlip.

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1. DESCRIPTION

1a. HITCH

The hitch is of welded box construction with a plunger type latch which allows the hitch to be moved into either a transport or one of two working positions. The hitch strap or clevis may be fitted inside or outside the box type drawbar.

The hitch carries the PTO shaft centre bearing support. This support is adjustable in height to ensure that the two PTO shafts are aligned.

1b. JACK

The screw type jack supports the front of the baler and can be adjusted to line up the hitch with the tractor drawbar. When the baler is coupled to the tractor the jack is wound up as close to the hitch as possible.

1c. DRIVE SHAFTS

The power drive shaft consists of a two piece PTO shaft from the tractor to the baler flywheel. The front shaft is a short shaft with a universal joint at either end. The rear shaft has a universal joint at the rear end only.

1d. FLYWHEEL

The PTO shaft drives the clutch assembly which is bolted to the flywheel which in turn drives the transmission through a shear bolt. The flywheel contains three protective devices to protect the tractor and baler.

(a) The Friction Clutch

This is designed to slip if the baler becomes overloaded, limiting the torque in the drive shaft to 55,3kgm (400lbft).

(b) The Over-running Clutch

This allows the flywheel to continue rotating independently of the PTO shaft thus protecting the drive when the tractor is slowed down.

(c) The Shear Bolt

This flywheel bolt shears if the baler becomes overloaded thus allowing the PTO shaft and flywheel to continue rotating.

2. JACK

2a. REMOVAL

(a) Support the baler under the hitch then wind up the jack until clear of the ground.

(b) Drive out the roll pin (1-1), securing the handle to the jack screw, and lift the handle clear. Remove the cotter pin (2-1) and washers then push out the headed pin (3-1) to remove the jack channel (4-1). Remove the thrust washer (8-2) from under the jack screw pivot pin.

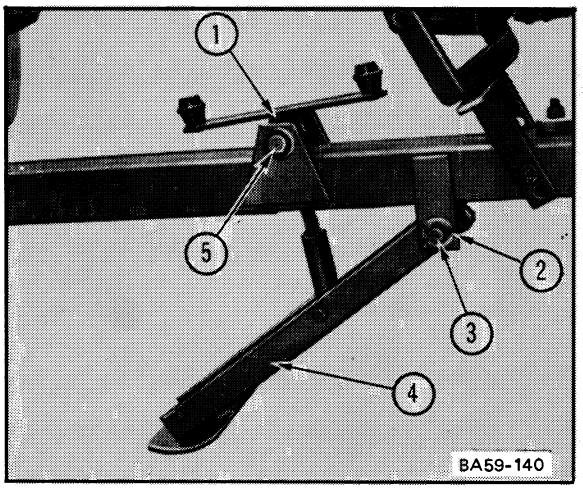


Figure 1

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(c) Remove the cotter pin and washers to remove the jack screw pivot pin (5-1) from the hitch.

2b. DISMANTLING

(a) Remove the bolts (4-2), spring washers and spacers (2-2) to remove the jack screw and pivot from the jack channel (1-2).

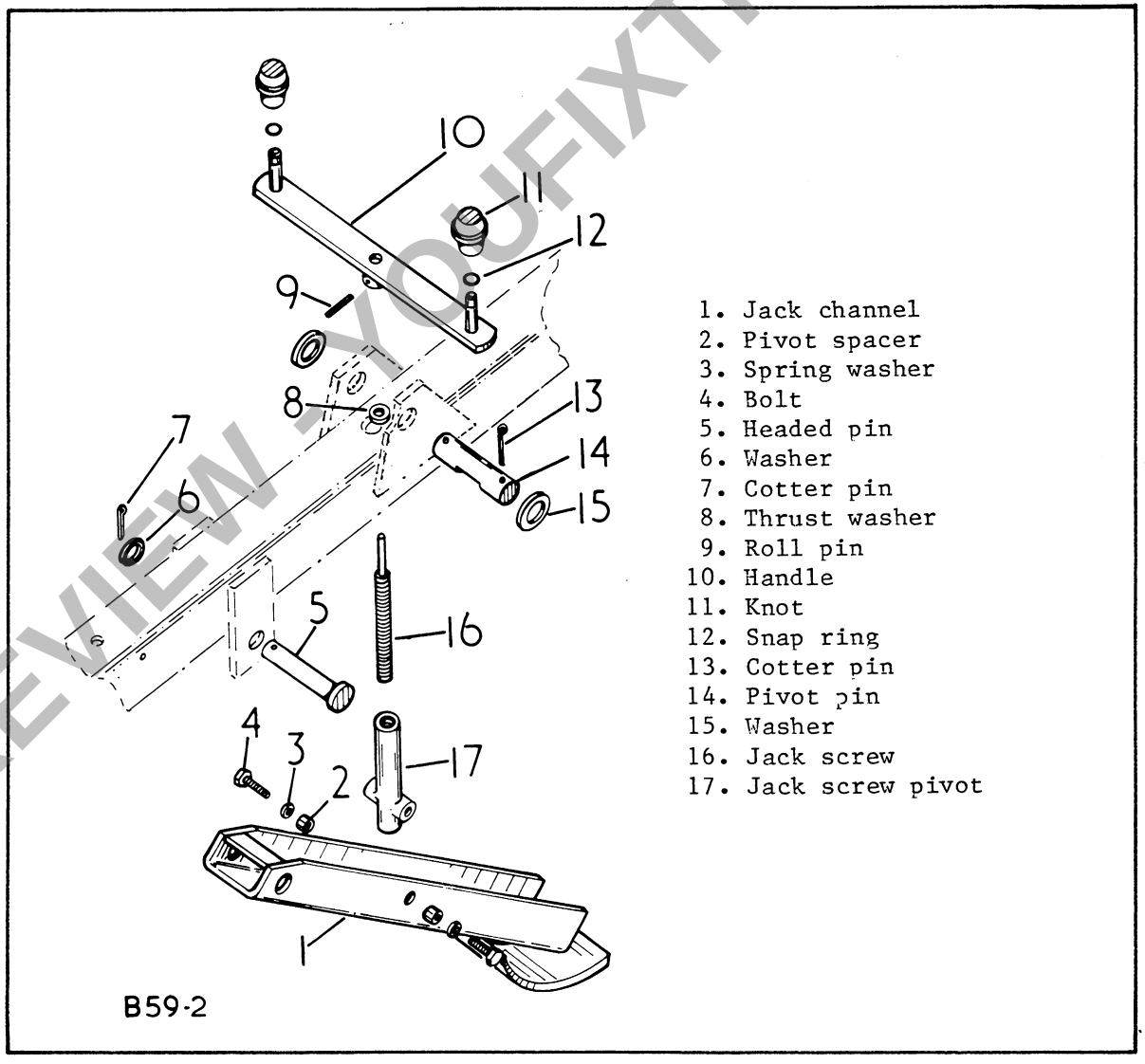
(b) The knobs (11-2) can be levered off the jack handle and the snap rings (12-2) removed from the grooves in the handle.

2c. ASSEMBLY

(a) Locate the snap rings (12-2) in the grooves of the jack handle then push the knobs (11-2) fully over the snap rings.

(b) Locate the jack screw pivot (17-2) in the channel (1-2) and secure it with the spacers (2-2), spring washers and bolts.

(c) Lubricate the thread of the jack screw (16-2) as detailed in the Operator's Manual and screw it into the jack pivot.



1. Jack channel
2. Pivot spacer
3. Spring washer
4. Bolt
5. Headed pin
6. Washer
7. Cotter pin
8. Thrust washer
9. Roll pin
10. Handle
11. Knot
12. Snap ring
13. Cotter pin
14. Pivot pin
15. Washer
16. Jack screw
17. Jack screw pivot

Figure 2

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(c) Remove the flywheel hub, if not previously removed, then remove the 'O' ring (8-14) and shims (6-14) from the pinion shaft (3-14).

(d) Press the pinion shaft from the pinion housing, the rear bearing cone (15-1) will remain on the shaft.

(e) Remove the oil seal and front bearing cone from the pinion housing.

(f) Press the bearing cups (14 & 17-1) from the pinion housing and the rear bearing cone (15-1) from the shaft.

(g) Remove the end cover from the bevel gear housing.

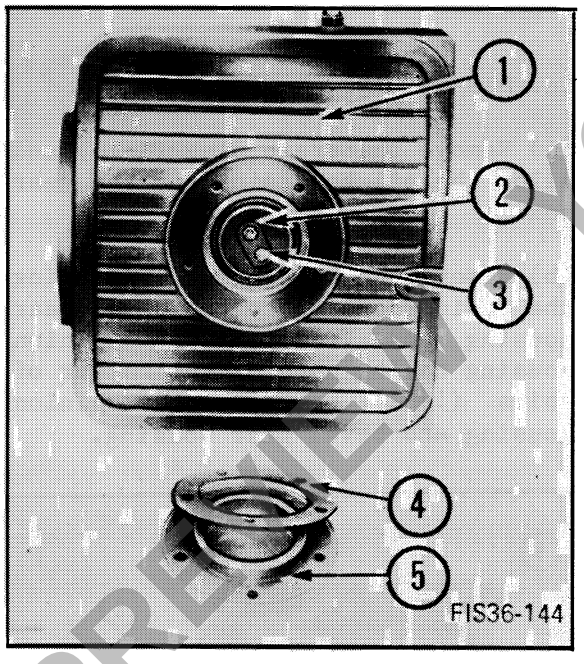


Figure 12

(h) Remove the left bearing retainer (5-12) from the bevel gear housing (1-12) noting the number of shims (4-12).

(i) Bend back the locktabs then remove the bolts (3-13) and bearing cone retainer (2-12).

(j) Press the crank from the bevel gear housing. The crankshaft can be removed by positioning a spacer under the left bearing retainer and using longer screws through the retainer to press out the crankshaft. Lift out of the bevel gear and hub (10-1).

(k) Remove the right bearing retainer (27-1) noting the number of shims then press the oil seal (26-1) from the retainer.

(l) Remove the bearing cups (8 & 29-1) from the gear case bores.

(m) Mark the bevel gear and hub then bend back the locktabs, remove the bolts (6-18) and lift the gear from the hub.

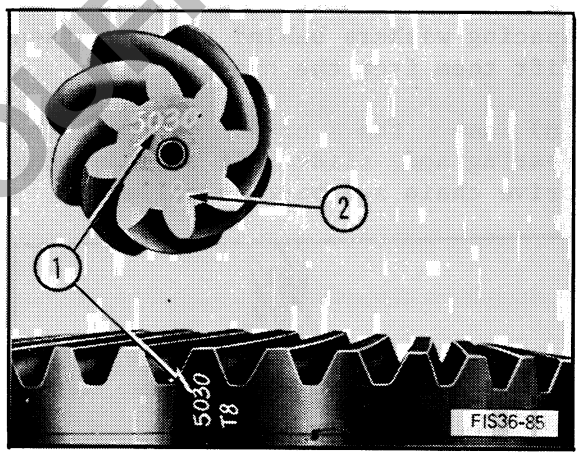


Figure 13

2d. INSPECTION

Check the bevel gear and pinion for damage. If either is damaged both must be changed. Sets have the same identification mark (1-13) on the gear and pinion.

2e. ADJUSTMENTS

1. Pinion Bearing Preload

(a) Press the rear bearing cone (2-14) onto the pinion shaft until seated against the shoulder.

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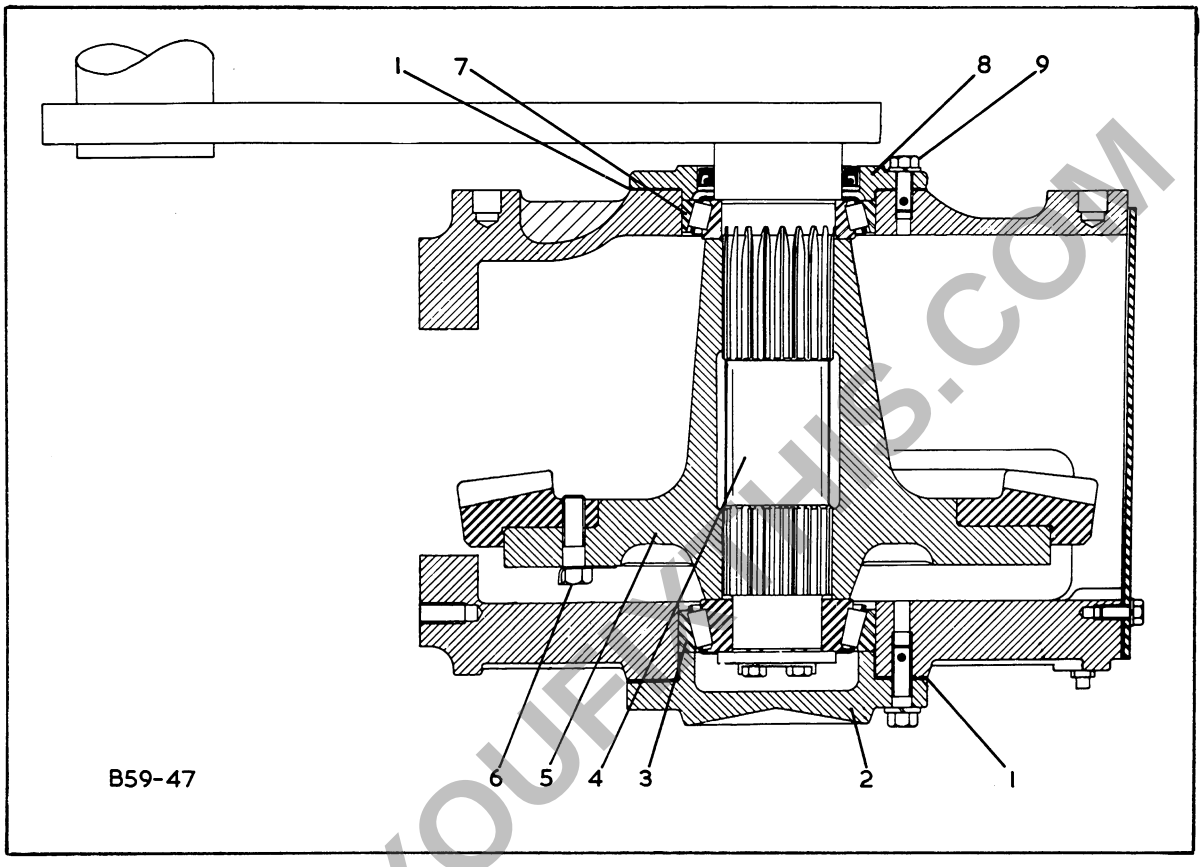


Figure 18

(d) Install the left side bearing cup and cone (3-18) and left bearing retainer with approximately 1.45mm (0.057in) shims and tighten the bolts.

(e) Lay the bevel gear housing on its left side on two wooden blocks. Install an arbor made from the splined shaft of an old crankshaft or install the crankshaft (4-18) through the bevel gear. Using a block of hard wood or copper/hide hammer against the inner arm of the crankshaft, drive the crankshaft into the bearings.

(f) Slacken the bolts on the left bearing retainer sufficient to release any preload on the bearings.

(g) With the arbor or crankshaft pointing upward, wrap a length of string around the exposed crankshaft journal where it enters the right bearing retainer. Using a spring balance measure the FREE ROLLING pull or torque required to keep the crankshaft rotating.

(h) Torque the left bearing retainer bolts to 8.2kgm (60lbft) and measure the pull or torque required to keep the crankshaft rotating.

(i) Add or remove shims under the left bearing retainer (2-18) until the pull required to keep the crankshaft rotating is 9 to 13kg (20 to 28lb) GREATER than the FREE ROLLING torque or pull measured in op. (g). This is equivalent to a torque at the bearings of 288 to 403gm (25 to 35lbin).

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knife, plunger thrust spacer, filler and shim, the twine guides, hay retainers and plunger stop.

4c. ASSEMBLY

(a) Install the twine guides, hay retainers and plunger stop.

(b) Install the hitch support plate.

(c) Install the hay knife then install the plunger thrust spacer and filler.

4d. INSTALLATION

(a) Position the bale chamber and connect the diagonal brace, twine chest support, feed opening sheet, cross conveyor support channel and bale chamber support.

(b) Tighten the outer nut on the bale chamber support until all play is taken up then tighten the inner nut.

(c) Install the feed opening top sheets and channels.

(d) Install the hitch, gear box, plunger, packer fingers and drive, breastplate, knotter or twister frame and needle mechanism referring to the relevent groups.

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