

# **FIAT**

## **Trattori**

**55-66 LP    55-66 DT LP**  
**60-66 LP    60-66 DT LP**  
**70-66 LP    70-66 DT LP**

### **WORKSHOP MANUAL**

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**IDENTIFICATION DATA**

Marketing Code

- Two-wheel drive . . . . .
- Four-wheel drive . . . . .

Engineering Code:

- 12-speed, two-wheel drive . . . . .
- 12-speed, two-wheel drive with mechanical reverser . . . . .
- 20-speed, two-wheel drive . . . . .
- 12-speed, four-wheel drive . . . . .
- 12-speed, four-wheel drive with mechanical reverser . . . . .
- 20-speed, four-wheel drive . . . . .

Engine type (common to all versions) . . . . .

	<b>55-66 LP 55-66 DTLP</b>	<b>60-66 LP 60-66 DTLP</b>	<b>70-66 LP 70-66 DTLP</b>
	669.103.000	670.103.000	671.103.000
	669.103.000 var. 720.110	670.103.000 var. 720.110	671.103.000 var. 720.110
	669.103.000 var. 720.111	670.103.000 var. 720.111	671.103.000 var. 720.111
	669.115.000	670.115.000	671.115.000
	669.115.000 var. 720.110	670.115.000 var. 720.110	671.115.000 var. 720.110
	669.115.000 var. 720.111	670.115.000 var. 720.111	671.115.000 var. 720.111
	FIAT 8035.06.308 (C.A.V. pump) 8035.06.208 (BOSCH pump)	FIAT 8035.05.308 (C.A.V. pump) 8035.05.208 (BOSCH pump)	FIAT 8045.06.308 (C.A.V. pump) 8035.06.208 (BOSCH pump)
	kg      lb	kg      lb	kg      lb
	2200   4840	2200   4840	2400   4840
	2400   5280	2400   5280	2600   5720
	Refer to applicable data on pages 3 and 4, Sect. 00, for Mods. 55-66/60-66/70-66		

**WEIGHTS**

Operating weight (including lift, implement attachment, tow hook and ROPS)

- Two-wheel drive . . . . .
- Four-wheel drive . . . . .

**ENGINE**



**POWER TRAIN**

**Clutch** . . . . . see Mods. 55-66/60-66/70-66

**Transmission** . . . . . see Mods. 55-66/60-66/70-66  
and 80-66

**Central bevel gear** on differential

**Differential** of the two-pinion type, with pedal-controlled differential lock.

**Side final drives** of the epicyclic, three planetary gear design.

**BRAKES****Service**

Axle shaft-mounted, oil bath disc type.  
Mechanically controlled through two separate pedals  
(latchable for one foot operation).

**Parking/Emergency**

Acting on service brakes, mechanically operated by hand lever.

**STEERING**

Hydrostatic power steering with independent circuit.  
Permanent lubricated joint steering control linkage.

**FRONT AXLE**

(Mods. 55-66LP/60-66LP/70-66LP)

Center swing, telescoping, inverted-U beam axle.  
Sliding axle end track adjustments:  
Settings . . . . . 6

**LIVE FRONT AXLE**

(Mods. 55-66DTLP/60-66DTLP/70-66DTLP)

Full-floating, center-swing, articulations and unjointed drive shaft on tractor centerline.

Two-pinion and planetary epicyclic side final drive gears in wheel hubs.

Optional: NO-SPIN differential.

Track width adjustments by relative re-positioning of Disc/Rim/Hub:

Settings . . . . . 8

**REAR WHEELS**

Track width adjustments by relative re-positioning of Disc/Rim/Hub:

Settings . . . . . 7

**POWER-TAKE-OFF**

**Fully independent** . . . . . see Mods.  
55-66/60-66/70-66/80-66

**Ground Speed**

Drive shaft and rotation same as fully independent PTO.  
Shaft drive ratios (synchronized w/transmission):

— 540 RPM . . . . . 7.7 revs per wheel turn  
— 1000 RPM . . . . . 13.1 revs per wheel turn

**HYDRAULIC LIFT** . . . . . see Mods.  
55-66/60-66/70-66/80-66

**Remote Control Valves**

One or two valves may be used:

— Single- and double-acting, convertible.  
— Double-acting, float position.

**TOWING ATTACHMENTS**

Drilled cross member.  
Rear swinging drawbar.  
Rigid rear tow hook, height adjustable.

**BALLASTS****Front Axle**

Two or three, cast-iron, 45 kg (90 lb) plates for a total of 90 or 135 kg (198 or 297 lb).

**Rear Wheels**

Four cast-iron, 50 kg (110 lb) rings mounted on wheel discs for a total of 200 kg (440 lb).

**BODY**

One-piece, forward-tilting hood.

Conventional Operator's compartment.

Partly wrap-around, load-bearing fenders carrying the ROPS mounts.



Diesel fuel tank location: behind Operator's seat.  
Operator's seat: padded, with parallelogram plus hydraulic damper suspension; adjustable ride and position.

**ELECTRICAL SYSTEM**

Voltage . . . . . 12 V  
Alternator with integral electronic voltage regulator.  
Makes: LUCAS 18 ACR-14V-40A or MARELLI AA 108-14V-33A-1 or ISKRA AAG 110A-14V-33A.

Starter Motor Makes:

- Mods. 55-66 LP and 60-66 LP MARELLI . MT 71 AA  
BOSCH . . . JF 12 V  
LUCAS . . . 2M 113
- Mods. 70-66 LP MARELLI . MT 68 AB  
BOSCH . . . JF 12 V

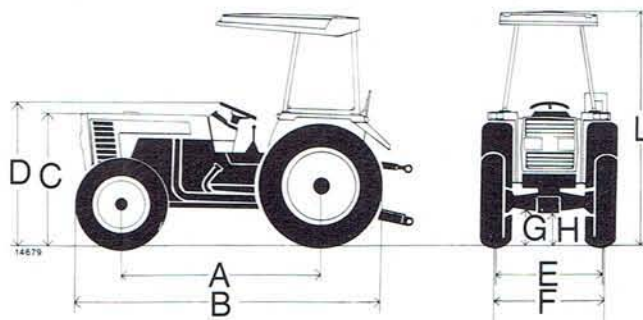
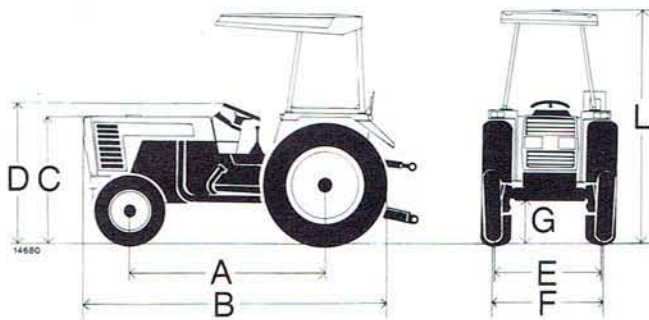
Battery located ahead of radiator, ratings: 88/92 Ah and 110/120 Ah (standard batteries) or 100 Ah or 132 Ah (sealed, maintenance free batteries).

**TIRE SIZES**

	55-66 LP	60-66 LP and 70-66 LP	55-66 DTLP	60-66 DTLP and 70-66 DTLP
Front	6.00-16 6.50-16	6.50-16	7.50-20 <sup>(1)</sup> 9.5/9-20 <sup>(2)</sup>	9.5/9-20 <sup>(1)</sup> 11.2/10-20 <sup>(2)</sup>
Rear	13.6/12-28 14.9/13-28	14.9/13-28 16.9/14-28	13.6/12-28 <sup>(1)</sup> 14.9/13-28 <sup>(2)</sup>	14.9/13-28 <sup>(1)</sup> 16.9/14-28 <sup>(2)</sup>

<sup>(1)</sup> <sup>(2)</sup> Tire matching references.

**MAIN DIMENSIONS**



**Standard tires (mm)**

Models	A mm	B mm	C mm	D mm	E mm	F mm	G mm	L mm
55-66 LP	2056	3065	1270	1426	1410 + 1910	1494 + 2005	460	2246
60-66 LP	2056	3090	1270	1426	1410 + 1910	1494 + 2005	460	2264
70-66 LP	2171	3205	1270	1426	1410 + 1910	1494 + 2005	460	2264

**Standard tires (mm)**

Models	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm	L mm
55-66 DTLP	1970	3067	1245	1381	1385 + 1820	1494 + 2005	362	300	2246
60-66 DTLP	1970	3108	1260	1394	1400 + 1805	1494 + 2005	334	314	2264
70-66 DTLP	2085	3223	1260	1394	1400 + 1805	1494 + 2005	334	314	2264

**Standard tires (inches)**

Models	A	B	C	D	E	F	G	L
55-66 LP	81	120.6	50	56.2	55.5 to 75.2	58.8 to 80	18	88.4
60-66 LP	81	121.6	50	56.2	55.5 to 75.2	58.8 to 80	18	89
70-66 LP	85	126.2	50	56.2	55.5 to 75.2	58.8 to 80	18	89

**Standard tires (inches)**

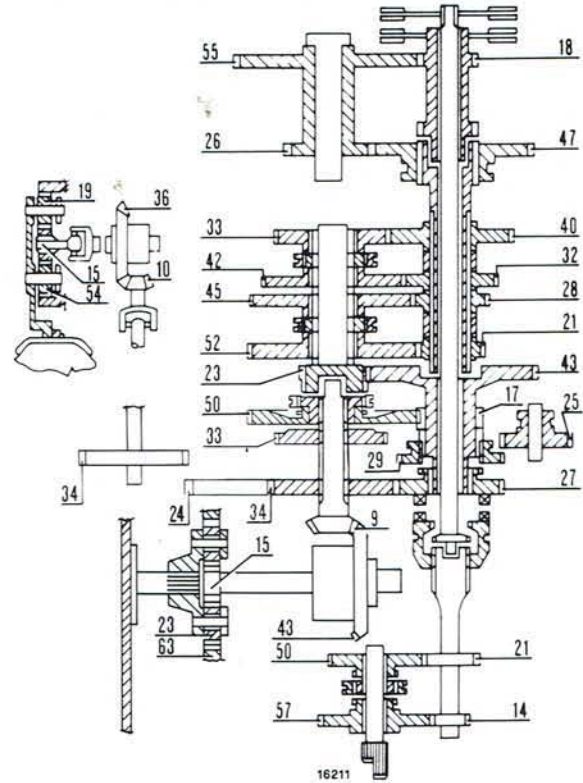
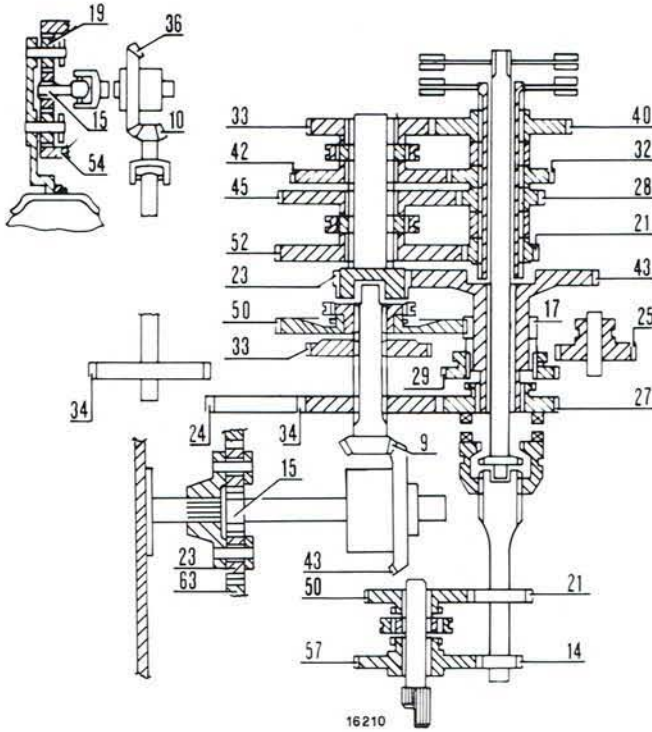
Models	A	B	C	D	E	F	G	H	L
55-66 DTLP	77	120.7	49	54.5	54.5 to 71.6	58.8 to 80	14.2	11.8	88.4
60-66 DTLP	77	122.4	49.6	54.9	55.1 to 71	58.8 to 80	13.1	12.4	89
70-66 DTLP	82	126.9	49.6	54.9	55.1 to 71	58.8 to 80	13.1	12.4	89



POWER TRAIN SCHEMATICS

Mods. 55-66LP/55-66DTLP/60-66LP/60-66DTLP  
70-66LP/70-66DTLP - 12-speed Versions

Mods. 55-66LP/55-66DTLP/60-66LP/60-66DTLP  
70-66LP/70-66DTLP - Splitter Versions



Travel speeds with engine at max power speed rating and rear tires as tabulated below.

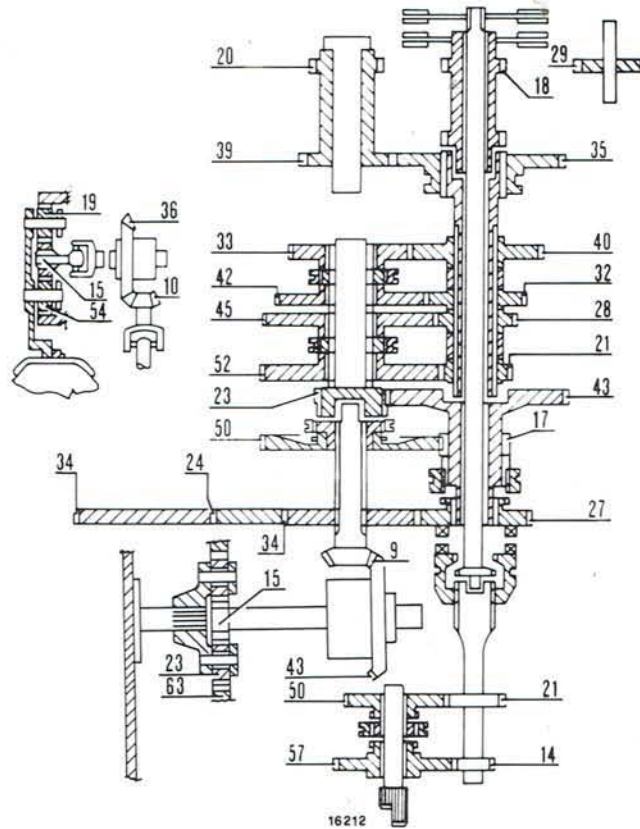
Marcia	55-66LP		55-66LP 60-66LP 70-66LP		60-66LP 70-66LP	
	13.6/12-28		14.9/13-28		16.9/24-28	
	kph	mph	kph	mph	kph	mph
1st Low	1.7	1	1.8	1.1	1.9	1.2
2nd »	2.6	1.6	2.7	1.7	2.9	1.8
3rd »	3.2	2	3.4	2.1	3.5	2.2
4th »	5.1	3	5.3	3.3	5.6	3.5
1st Normal	4.0	2.4	4.2	2.5	4.3	2.6
2nd »	6.2	3.8	6.4	3.9	6.7	4.0
3rd »	7.5	4.6	7.9	4.9	8.2	5.0
4th »	12.0	7.4	12.5	7.7	13.1	8.2
1st High	9.4	5.8	9.8	6.0	10.3	6.4
2nd »	14.5	9.0	15.1	9.4	15.8	9.8
3rd »	17.8	11	18.5	11.5	19.4	12
4th »	28.3	17	29.4	18.2	30.8	19
1st Reverse	4.4	2.7	4.6	2.8	4.8	2.9
2nd »	6.8	4.2	7.1	4.4	7.4	4.6
3rd »	8.4	5.2	8.7	5.4	9.1	5.6
4th »	13.3	8.2	13.8	8.5	14.5	9.0

Travel speeds, with engine at max power speed rating and rear tires as tabulated below.

Marcia	55-66LP				60-66LP, 70-66LP			
	13.6/12-38		14.9/13-28		14.9/13-28		16.9/14-28	
	kph	mph	kph	mph	kph	mph	kph	mph
1st Creeper low	0.3	0.18	0.3	0.18	0.3	0.18	0.3	0.18
2nd »	0.5	0.31	0.5	0.31	0.5	0.31	0.5	0.31
3rd »	0.6	0.37	0.6	0.37	0.6	0.37	0.6	0.37
4th »	0.9	0.56	0.9	0.56	1.0	0.62	1.0	0.62
1st Creeper Normal	0.7	0.43	0.7	0.43	0.7	0.43	0.8	0.50
2nd »	1.1	0.68	1.2	0.74	1.2	0.74	1.2	0.74
3rd »	1.4	0.87	1.4	0.87	1.4	0.87	1.5	0.93
4th »	2.2	1.36	2.3	1.43	2.3	1.43	2.4	1.50
1st Low	1.7	1.00	1.8	1.12	1.8	1.12	1.9	1.18
2nd »	2.6	1.61	2.7	1.67	2.7	1.67	2.9	1.80
3rd »	3.2	1.98	3.4	2.10	3.4	2.10	3.5	2.20
4th »	5.1	3.16	5.3	3.30	5.3	3.30	5.6	3.47
1st Normal	4.0	2.4	4.2	2.6	4.2	2.5	4.3	2.6
2nd »	6.2	3.8	6.4	3.9	6.4	3.9	6.7	4.0
3rd »	7.5	4.6	7.9	4.9	7.9	4.9	8.2	5.0
4th »	12.0	7.4	12.5	7.7	12.5	7.7	13.1	8.2
1st High	9.4	5.8	9.8	6.0	9.8	6.0	10.3	6.4
2nd »	14.5	9.0	15.1	9.4	15.1	9.4	15.8	9.8
3rd »	17.8	11.0	18.5	11.5	18.5	11.5	19.4	12.0
4th »	28.3	17.5	29.4	18.2	29.4	18.2	30.8	19.0
1st Low Reverse	0.8	0.49	0.8	0.49	0.8	0.49	0.9	0.56
2nd »	1.2	0.75	1.3	0.80	1.3	0.80	1.3	0.80
3rd »	1.5	0.93	1.6	0.99	1.6	0.99	1.6	0.99
4th »	2.4	1.48	2.5	1.55	2.5	1.55	2.6	1.61
1st High Reverse	4.4	2.73	4.6	2.85	4.6	2.85	4.8	2.97
2nd »	6.8	4.21	7.1	4.40	7.1	4.40	7.4	4.58
3rd »	8.4	5.20	8.7	5.40	8.7	5.40	9.1	5.64
4th »	13.3	8.2	13.8	8.5	13.8	8.5	14.5	9.0

**POWER TRAIN SCHEMATICS**

**Mods. 55-66LP/55-66DTLP/60-66LP/60-66DTLP/70-66LP/70-66DTLP - Mechanical reverser Versions**



Travel speeds with engine at max. power speed rating and tires as tabulated below						
Reverse	55-66LP		55-66LP 60-66LP 70-66LP		60-66LP 70-66LP	
	13.6/12-38		14.9/13-28		16.9/14-28	
	kph	mgh	kph	mgh	kph	mgh
1st Low	1.7	1	1.8	1.1	1.9	1.2
2nd »	2.6	1.6	2.8	1.74	2.9	1.8
3rd »	3.2	2	3.4	2.1	3.5	2.2
4th »	5.2	3.2	5.4	3.4	5.6	3.5
1st Normal	4.0	2.4	4.2	2.5	4.4	2.5
2nd »	6.2	3.8	6.4	3.9	6.7	4.0
3rd »	7.6	4.7	7.9	4.9	8.2	5.0
4th »	12.0	7.4	12.5	7.7	13.1	8.2
1st High	9.4	5.8	9.8	6.0	10.3	6.4
2nd »	14.5	9.0	15.1	9.4	15.9	9.8
3rd »	17.8	11	18.5	11.5	19.4	12
4th »	28.3	17	29.5	18.3	30.9	10.1

Travel speeds with engine at max. power speed rating and tires as tabulated below						
Forward	55-66LP		55-66LP 60-66LP 70-66LP		60-66LP 70-66LP	
	13.6/12-38		14.9/13-28		16.9/14-28	
	kph	mgh	kph	mgh	kph	mgh
1st Low	1.7	1	1.8	1.1	1.9	1.2
2nd »	2.6	1.6	2.7	1.67	2.9	1.8
3rd »	3.2	2	3.4	2.1	3.5	2.2
4th »	5.1	3.0	5.3	3.3	5.6	3.5
1st Normal	4.0	2.4	4.2	2.5	4.3	2.6
2nd »	6.2	3.8	6.4	3.9	6.7	4.0
3rd »	7.5	4.6	7.9	4.9	8.2	5.0
4th »	12.0	7.4	12.5	7.7	13.1	8.2
1st High	9.4	5.8	9.8	6.0	10.3	6.4
2nd »	14.5	9.0	15.1	9.4	15.8	9.8
3rd »	17.8	11	18.5	11.5	19.4	12
4th »	28.3	17	29.4	18.2	30.8	19

**FLUID CAPACITIES**

DESCRIPTION	CAPACITIES							INTERNATIONAL DESIGNATION
	RECOMMENDED FIAT PRODUCT	QUANTITY						
		55-66LP/60-66LP			70-66LP			
		dm <sup>3</sup> (litri)	Imp. Gals	kg	dm <sup>3</sup> (litri)	Imp. Gals	kg	
Engine sump and filters . . . . .	<b>Oliofiat AMBRA SUPER</b>	7.3	1 2/3	6.6	11.7	2 3/4	10.5	Diesel engine oil meeting MIL-L-2104D and API-CD Service specs
Sump only . . . . .		6.7	1 1/2	6	10.5	2 1/3	9.5	
Hydrostatic steering system . . . . .	<b>Oliofiat TUTELA MULTI F</b>		Imp. Pts			Imp. Pts		Transmission, drives, oil bath brakes and hydraulic lift oils-meeting Massey Ferguson MF 1135 and Ford M2 C 86 A specs.
Front axle		1.7	3	1.5	1.7	3	1.5	
— Axle housing . . . . .		4.3	9 1/2	3.9	4.3	9 1/2	3.9	
— Side final drives (each) . . . . .		1.1	2 1/5	1.0	1.1	2 1/5	1.0	
Rear drive housing (transmission, bevel gear and brakes) plus lift:			Imp. Gals			Imp. Gals		
— Two-wheel drive . . . . .		45	9 4/5	40.5	45	9 4/5	40.5	
— Four-wheel drive . . . . .	45.5	10	41	45.5	10	41		
Front wheel hubs . . . . .	<b>Grassofiat TUTELA G9</b>	—	—	—	—	—	—	Lithium-calcium base grease with NLGI No. 2 consistency
Grease fittings . . . . .		—	—	—	—	—	—	
Cooling system . . . . .	<b>FIAT Water and PARAFU 11</b>	10.5	2 1/3	—	13.5	3	—	
Fuel tank . . . . .	Decanted and filtered Diesel fuel	65	14 1/3	—	65	14 1/3	—	

**CLUTCH - LUK 11"/11"**

Type . . . . .	Twin, single plate, dry
Control: — Master (transmission) clutch . . . . . — PTO clutch . . . . .	Mechanical by pedal Manual, by lever
Release mechanism . . . . .	Single, dished spring
Plate facing material: — Master clutch . . . . . — PTO clutch . . . . .	Organic compound Organic compound
Driven plate thickness: — Master clutch . . . . . — PTO clutch . . . . .	8.9 to 9.5 mm (0.3504 to 0.3740 in) 8.3 to 8.9 mm (0.3268 to 0.3504 in)
Wear limiti . . . . .	See page 7, Sect. 201, for Mods. 466/566/666/766
Master (transmission) clutch control sleeve to seat clearance . . . . .	0.050 to 0.151 mm (0.0020 to 0.0059 in)
PTO clutch control sleeve to seat clearance . . . . .	0.060 to 0.180 mm (0.0024 to 0.0070 in)
Release lever alignment . . . . .	See pages 10 and 11, Sect. 201 for Mods. 466/566/666/766
Clutch linkage adjustment . . . . .	See pages 1 and 2, Sect. 201

**CLUTCH - VALEO 11"/11"**

Type . . . . .	Twin, single plate, dry
Control: — Master (transmission) clutch . . . . . — PTO clutch . . . . .	Mechanical, by pedal Manual, by lever
Release mechanism . . . . .	Single, dished spring
Plate facing material: — Master clutch . . . . . — PTO clutch . . . . .	Organic compound Organic compound
Driven plate thickness: — Master clutch . . . . . — PTO clutch . . . . .	9.4 to 10 mm (0.3700 to 0.3939 in) 8.5 to 8.9 mm (0.3346 to 0.3504 in)
Wear limiti . . . . .	See page 3, Sect. 201, for Mods. 55-66/60-66/70-66/80-66
Transmission clutch control sleeve to seat clearance . . . . .	0.05 to 0.151 mm (0.020 to 0.0059 in)
PTO clutch control sleeve to seat clearance . . . . .	0.060 to 0.180 mm (0.0024 to 0.0070 in)
Release lever alignment . . . . .	See pages 4 and 6, Sect. 201, for Mods. 55-66/60-66/70-66/80-66
Clutch linkage adjustment . . . . .	See pages 1 and 2, Sect. 201

# POWER TRAIN: Specifications and Data

## CLUTCH - O.M.G. 11"/11"

Type ..... Control: — Master clutch ..... — PTO clutch ..... — Release mechanism .....	Twin, single-plate, dry  Mechanical, by pedal Manual, by lever Single, dished spring
Plate facing material: — Master clutch ..... — PTO clutch ..... Plate thickness: — Master clutch ..... — PTO clutch ..... Wear limit .....	Organic compound Organic compound  8.8 to 9.4 mm (0.3464 to 0.3700 in) 8.7 to 9.0 mm (0.3425 to 0.3543 in)  See page 7, Sect. 201 for Mods. 466/566/666/766
Master (transmission) clutch control sleeve to seat clearance .....  PTO clutch control sleeve to seat clearance .....	0.050 to 0.151 mm (0.0020 to 0.0059 in)  0.060 to 0.180 mm (0.0024 to 0.0070 in)
Release lever alignment .....  Clutch linkage adjustment .....	See pages 10 and 11, Sect. 201 for Mods. 466/566/666/766  See pages 1 and 2, Sect. 201

## SIDE FINAL DRIVES

Type .....  Reduction ratio ..... Planet carrier adjustment shim thickness range .....	Epicyclic, 3-planet, straight spur gears  $15 \text{ to } (15 + 63) = 1 \text{ to } 5.2$  From 3.5 to 4.8 mm by 0.1 mm increments From 0.1378 to 0.1890 in by 0.0040 in increments
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## POWER TAKE OFF

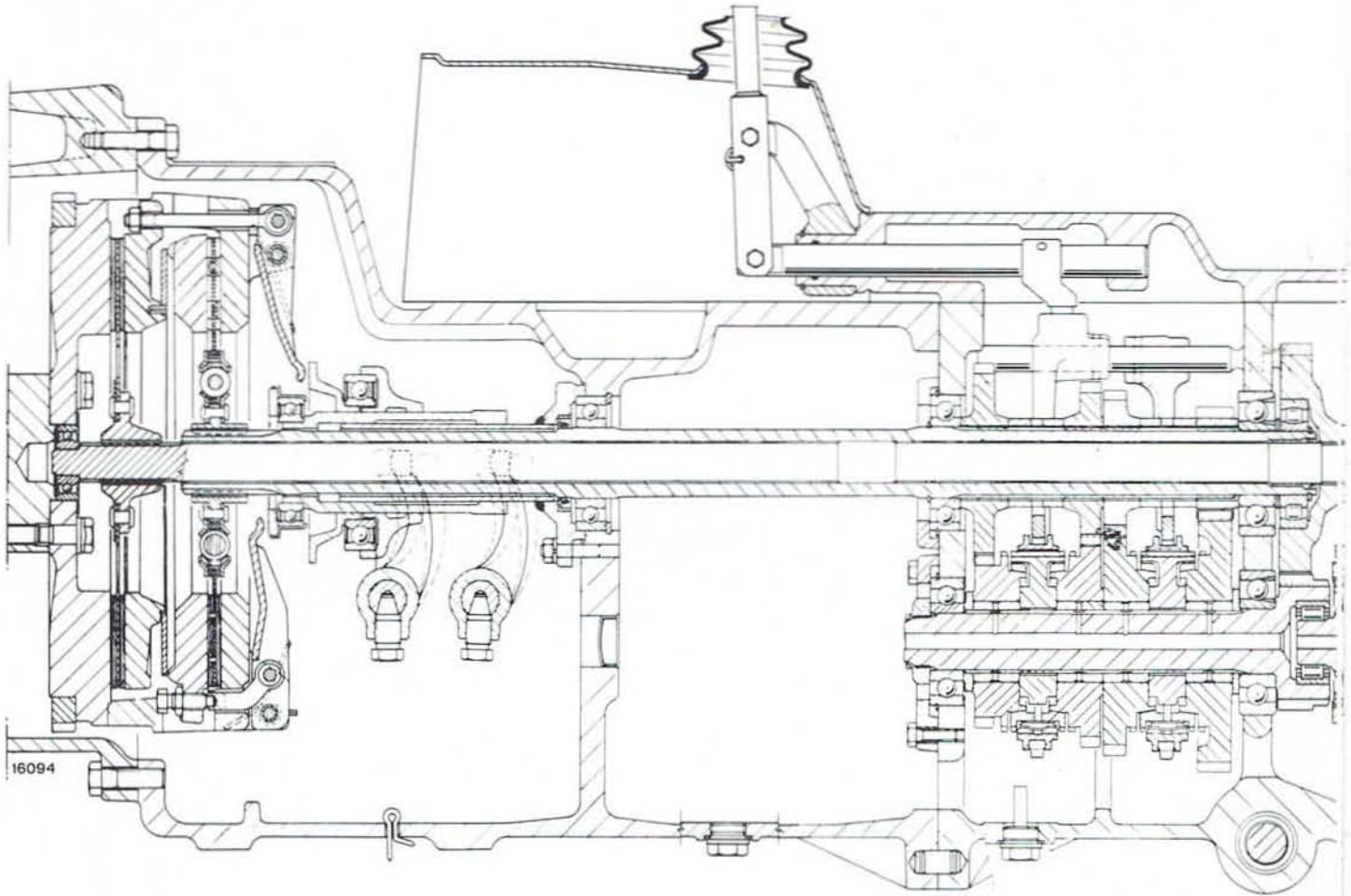
Data shown on page 3, Sect. 20, for Mods. 466/566/666/766 are applicable except

Ground speed PTO rotation: — At 540 Std. RPM ..... — At 100 Std. RPM .....	7.7 revs per wheel turn 13.1 revs per wheel turn
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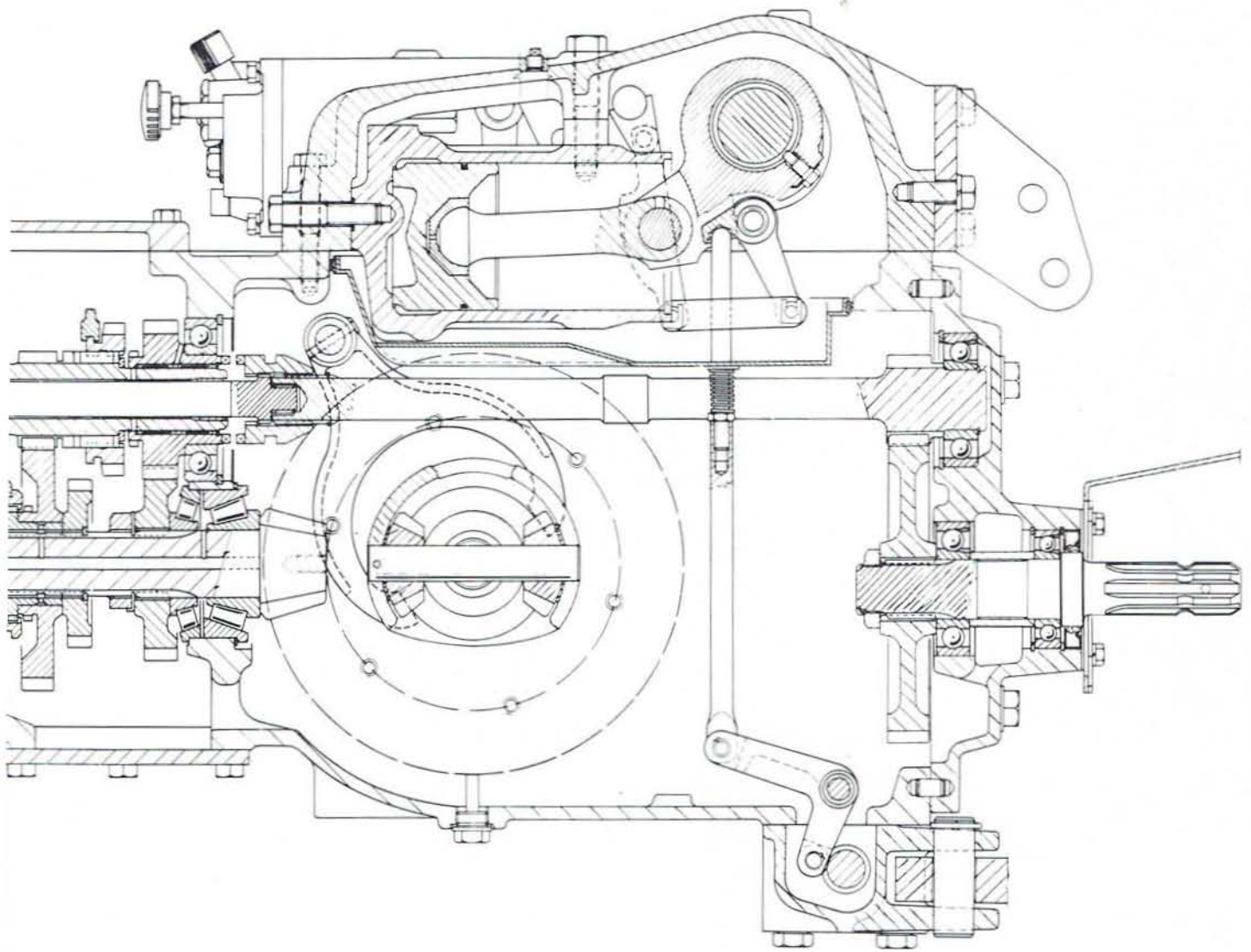
## TORQUE DATA

Data shown on pages 9 and 10, Sect. 20, for Mods. 466/566/666/766 are applicable except:

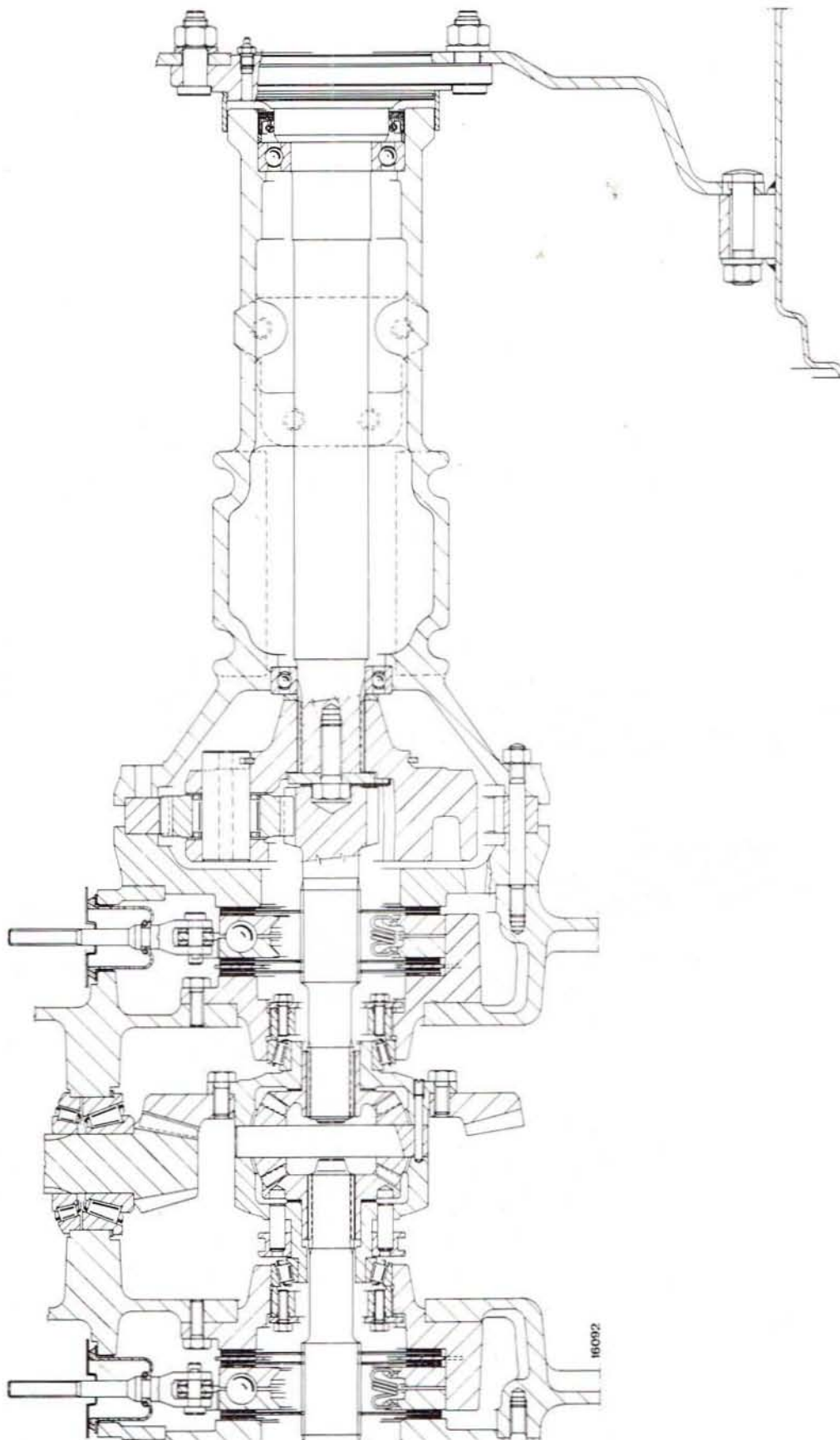
Item	Thread size	Torque		
		Nm	kgm	lb ft
<b>Side Final Drives - Sect. 206</b> Reduction housing stud nuts (C <sub>1</sub> , page 1) .....	M12x1.25	98	10	72
Driving wheel shaft lock screw (C <sub>2</sub> ) .....	M18x1.5	250	25.5	184



Power train longitudinal section

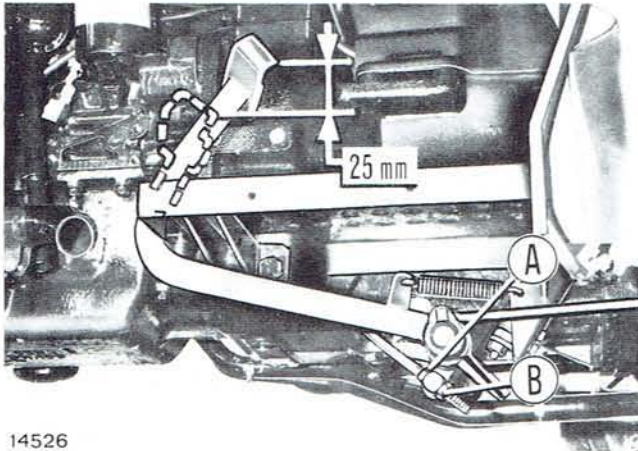


# POWER TRAIN: Specifications and Data



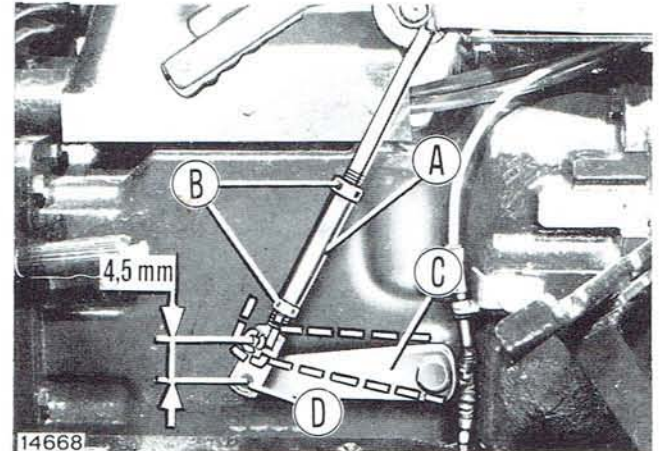
Power train cross section





**Master clutch pedal free travel adjustment.**

A. Nut - B. Nut.



**PTO clutch hand lever free travel adjustment.**

A. Sleeve - B. Jam nut - C. Outer relay lever - D. Pin.

**VALEO 11"/11" CLUTCH SERVICING**

Refer to the text and illustrations provided on pages 1 thru 6, Sect. 201, Mods. 55-66/60-66/70-66/80-66.

**LUK 11"/11" CLUTCH SERVICING**

Refer to the text and illustrations provided on pages 6 thru 9, Sect. 201, Mods. 466/566/666/766.

The LUK 11"/11" clutch longitudinal section is instead shown on page 5, Sect. 201, Mods. 55-66/60-66/70-66/80-66.

**O.M.G. 11"/11" CLUTCH SERVICING**

Refer to the text and illustrations on pages 6 thru 9, Sect. 201, Mods. 466, 566, 666, 766.

**MASTER CLUTCH CONTROL LINKAGE ADJUSTMENT**

Check that pedal free travel before releasing clutch is approximately 25 mm (1 in).

When this travel wears down to 15 mm (.60 in) re-adjust as follows:

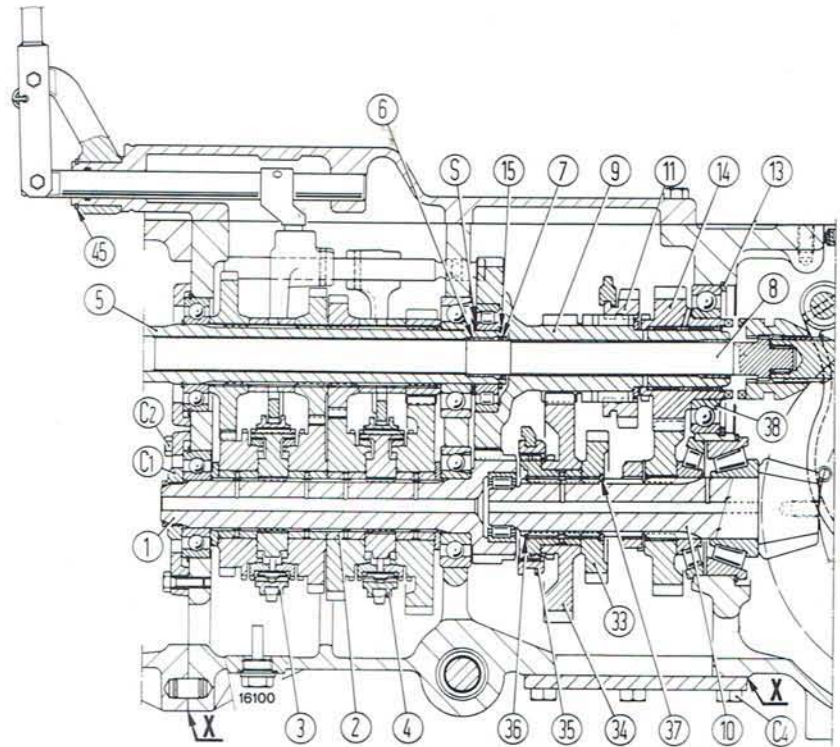
- Loosen nut (B) turn in nut (A) until the required pedal free travel of 25 mm (1 in) is restored.
- Re-lock jam nut (B).
- Check once more that pedal free travel is 25 mm as specified.

**PTO CLUTCH CONTROL ADJUSTMENT**

Set lever (C) to rest position (fully down) and check that free travel - in line with pin (D) - is approximately 4.5 mm (.18 in) before releasing the clutch.

When free travel is down to 2.5 mm (.10 in) re-adjust as follows:

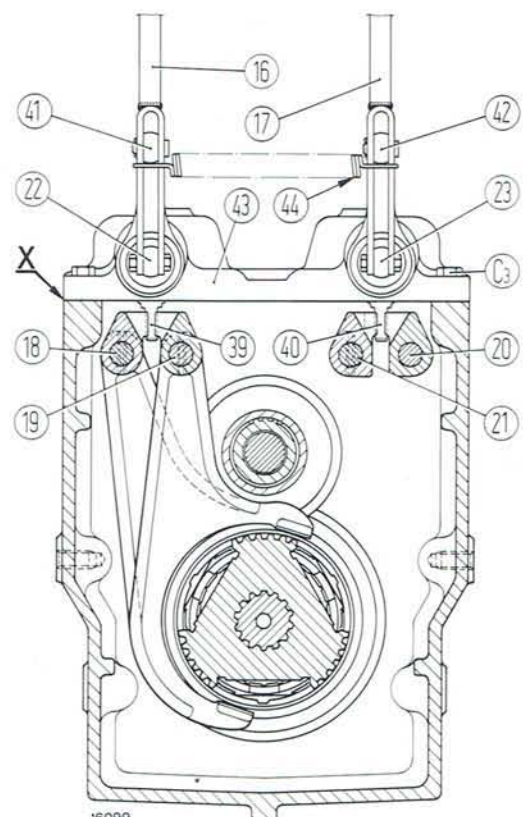
- Loosen jam nuts (B) and turn sleeve (A) clockwise about 3/4 turn (each turn causes pin D to shift 3 mm - .12 in).
- Re-lock jam nuts (B).
- Check once more that lever free travel is 4.5 mm as specified.



**Longitudinal and cross sections through transmission and splitter.**

C<sub>1</sub>. Driven gear drive shaft lock nut - C<sub>2</sub>. Bearing cover retaining screws - C<sub>3</sub>. Top cover retaining screws - C<sub>4</sub>. Bottom cover retaining screws - S. Drive shaft bearing shim - 1. Transmission driven shaft - 2. Transmission driven gear support bushings - 3. 3rd/4th sliding sleeve - 4. 1st/2nd sliding sleeve - 5. Transmission drive shaft - 6. PTO shaft support bush - 8. PTO shaft - 9. Direct drive and low range drive shaft - 10. Bevel drive pinion shaft - 11. Reverse and normal range sliding gear - 13. - 15. - 36. - 45. Retaining rings - 14. Normal range drive gear - 16. Transmission shift lever - 17. Splitter shift lever - 18. 1st/2nd speed striker rod - 19. 3rd/4th striker rod - 20. Low/High range striker rod - 21. Normal/Reverse range striker rod - 22. Transmission shift control horizontal relay bar - 23. Splitter shift control horizontal relay bar - 33. Reverse gear - 34. Low range driven gear - 35. Low range/direct drive sliding sleeve - 37. Rings - 38. Bearings - 39. Transmission shift plunger - 40. Splitter shift plunger - 41. Transmission shift lever fulcrum support - 42. Splitter shift lever fulcrum support - 43. Transmission housing cover - 44. Spring.

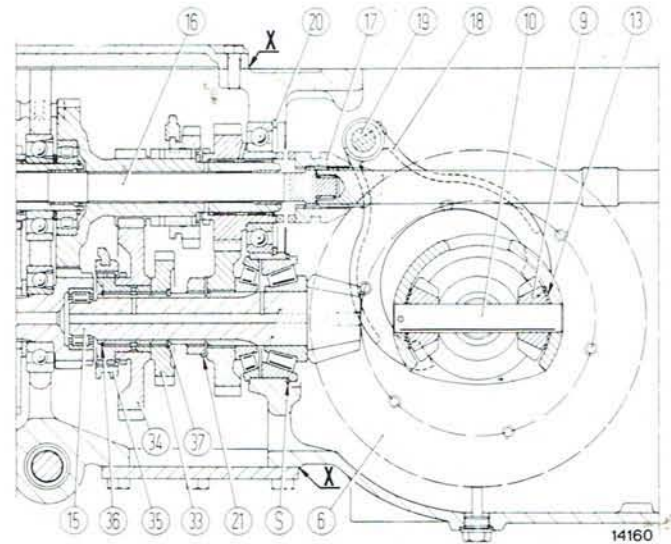
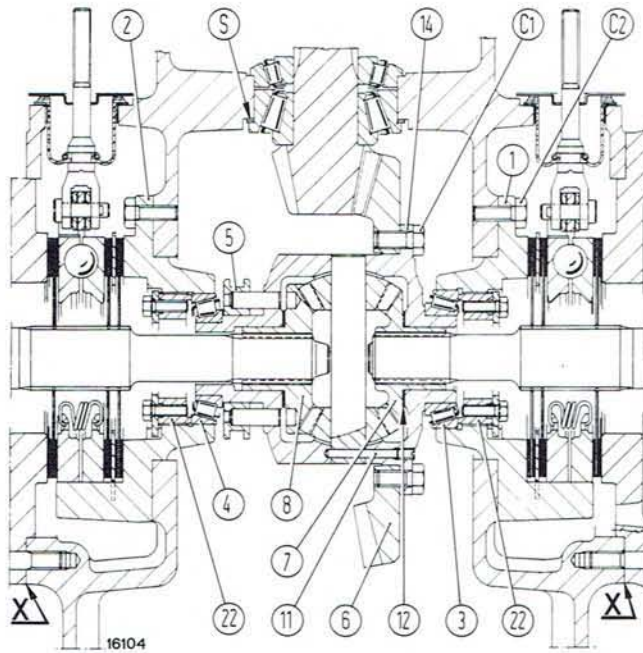
**NOTE** - Upon reassembly, apply jointing compound to mating surfaces **X** as instructed on page 6, Sect. A, for Mods. 466/566/666/766.



**TRANSMISSION REMOVAL-INSTALLATION**

Refer to the descriptions and illustrations shown on pages 1 thru 4, Sect. 202 for Mods. 55-66/60-66/70-66/80-66.

The Figures published on this page replace their counterparts given on page 1, Sect. 202, for Mods. 55-66/60-66/70-66/80-66



**Longitudinal and cross sections through bevel drive and differential.**

C<sub>1</sub>. Bevel ring gear retaining screws - C<sub>2</sub>. Differential support retaining screws - S. Bevel pinion positioning shims - 1 and 2. Differential supports - 3 and 4. Taper roller bearings - 5. Differential lock sleeve - 6. Bevel ring gear - 7 and 8. Side gears - 9. Differential pinion - 10. Journal - 11. Differential pinion journal retaining screw - 12 and 13. Shims - 14. Differential carrier - 15. Bevel pinion shaft - 16. P.T.O. shaft - 17. P.T.O. control sleeve - 18. Fork - 19. Differential lock shaft - 20. Retaining ring - 21. Lockwasher - 22. Differential bearing adjuster ring nut - 33. Reverse gear - 34. Creeper, driven gear - 35. Creeper and DD engagement sleeve - 36. Retaining ring - 37. Shims.

**Note** - On assembly, thoroughly clean and degrease mating surfaces **X** and apply one of the jointing compounds indicated on page 6, section A, for Mods. 466/566/666/766.

**BEVEL DRIVE - DIFFERENTIAL REMOVAL/  
INSTALLATION**

Proceed as follows:

**CAUTION**

Lift and handle all heavy parts using a suitable hoist. Ensure that units or parts are supported by suitable slings or hooks. Ensure that no one is in the vicinity of load to be lifted.

- Drain drive housing oil and fuel tank.
- Disconnect battery negative lead, power point wiring and lift lines.
- Remove ROPS frame, fenders and remote control valves, when fitted.
- Take down fuel tank.
- Remove Operator's seat, lift with control levers and transmission housing top cover with levers.
- Position a support stand under transmission housing, then remove wheels, side final drives, brake units, sensing bar support and PTO housing.

- Take off bearing supports and remove bevel drive/differential unit from top of rear drive housing.

Disassemble unit as follows:

- Remove screws (C<sub>1</sub>) and separate ring gear from differential carrier.
- Remove screw (11) and journal (10) retaining differential pinions and side gears.

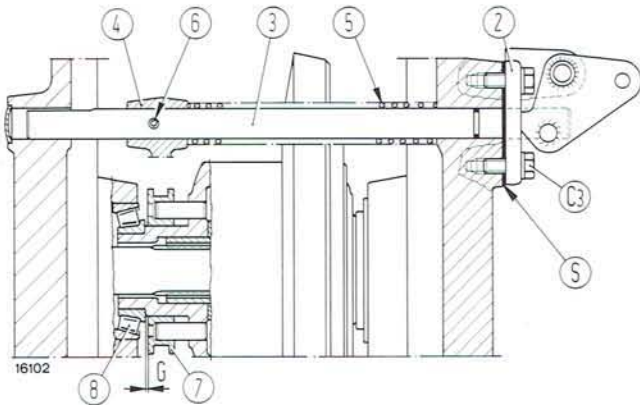
On reassembly, proceed as follows:

- Coat differential pinion washers with **Fiat TUTELA G9 grease**
- Turn in and tighten screws (C<sub>1</sub>) to the specified torque.
- Adjust taper roller bearings as instructed in applicable Sections.
- Adjust differential lock as instructed in applicable Section.

**CAUTION**

Handle all parts carefully. DO NOT put hand and fingers between parts. Wear safety equipment such as goggles, gloves and shoes.

# POWER TRAIN: Bevel Drive and Differential



### Installing and adjusting differential lock.

C<sub>3</sub>. Differential lock lever support screws - G = 2 mm (0.08 in). Clearance between sleeve (7) and bearing (8) - S. Sleeve positioning shims - 2. Lever support - 3. Fork shaft - 4. Fork - 5. Spring - 6. Roll pin - 7. Differential lock sleeve - 8. Differential bearing.

### BEVEL PINION SHAFT REMOVAL/INSTALLATION

Proceed as instructed on pages 1 and 2, Sect. 204, for Mods. 55-66/60-66/70-66/80-66.

### BEVEL DRIVE ADJUSTMENT

**Bevel pinion position adjustment and shim thickness measurement.**

**Bevel pinion shaft taper roller bearing adjustment.**

Proceed as instructed on pages 2, 3 and 4 Sect. 204, for Mods. 55-66/60-66/70-66/80-66.

### Differential bearing adjustment and bevel drive gear backlash check.

Refer to text and illustrations on pages 7 and 8, Sect. 204, for Mods. 466/566/666/766.

### DIFFERENTIAL PINION AND SIDE GEAR BACKLASH ADJUSTMENT

Refer to text and illustrations on pages 8 and 9, Sect. 204, for Mods. 466/566/666/766.

### DIFFERENTIAL LOCK INSTALLATION AND ADJUSTMENT

Assemble differential lock using tool **293452** to compress return spring (5) and to insert roll pin (6) which secures fork (4) in its seat on shaft.

Install bevel ring gear-differential unit on supports.

Using a feeler gauge, check that clearance (G) between sleeve (7) and R.H. differential bearing is 2 mm (0.08 in). Adjust clearance by changing shims (S) between support (2) and transmission housing.

**BRAKE UNIT REMOVAL  
AND INSTALLATION**

**CAUTION**

Lift and handle all heavy components using a suitable hoist. Ensure that units or parts are supported by suitable slings or hooks. Ensure that no one is in the vicinity of the load to be lifted.

Disassemble brake unit as follows:

- Drain transmission housing oil.
- Position a support stand under drive housing and remove ROPS, wheels, fenders and footboards.
- Unscrew retaining stud nuts (C<sub>1</sub>, page 1, Sect. 206) and remove splitter housing.
- Remove cotter pin and pin (2) securing brake pedal to link (1).
- Back off link (1) from spring side and remove complete brake unit.
- Check actuator (4) and brake discs (5) for wear. Replace discs when sintered material is almost worn out.

On brake unit installation, use driver **293847** as shown to position boot (11) correctly on brake link (1).

Before installing side final drive housing on rear drive housing, thoroughly clean and degrease mating surfaces and apply a 2 mm (0.08 in) bead of jointing compound as shown in Figure on page 2.

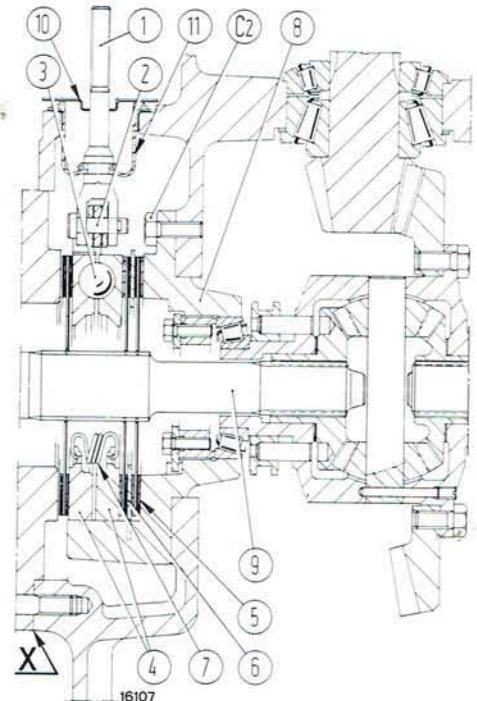
Jointing compound types are indicated on page 6, Section A, for Mods. 466/566/666/766.

**BRAKE PEDAL ADJUSTMENT**

Check that pedal free travel is the same for both pedals and does not exceed 80 mm (3.15 in).

To adjust, proceed as follows:

- Move brake hand lever down.
- Back off jam nuts (A, page 2) and turn sleeves (B) until free travel is 45 mm (1.77 in).



**Sections through brake unit.**

C<sub>2</sub>. Differential support screws - 1. Brake link - 2. Pin - 3. Ball - 4. Brake actuator - 5. Brake discs - 6. Back-up disc - 7. Actuator pull-off spring - 8. Differential support - 9. Axle shaft - 10. Boot cover plate - 11. Boot.

**NOTE** - On assembly, apply jointing compound to surface **X** as directed in notes and in diagram on page 2.

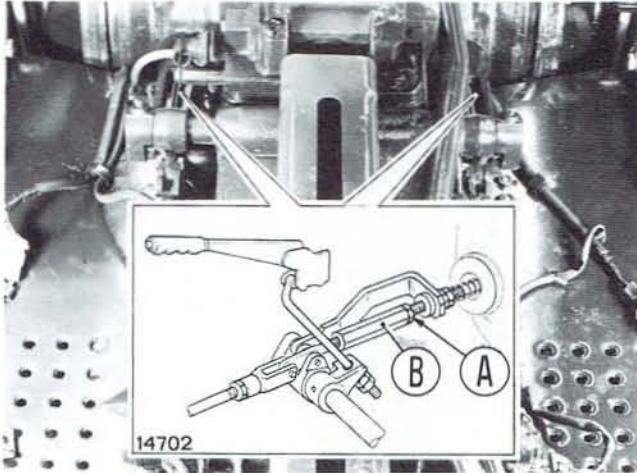
**Important** - New brake discs must be soaked for at least 2 hours or preferably for 5 to 6 hours, in TUTELA MULTI F oil before installation.

**PARKING BRAKE LEVER ADJUSTMENT**

After adjusting the pedal (service) brakes, check parking (hand) lever adjustment as follows:

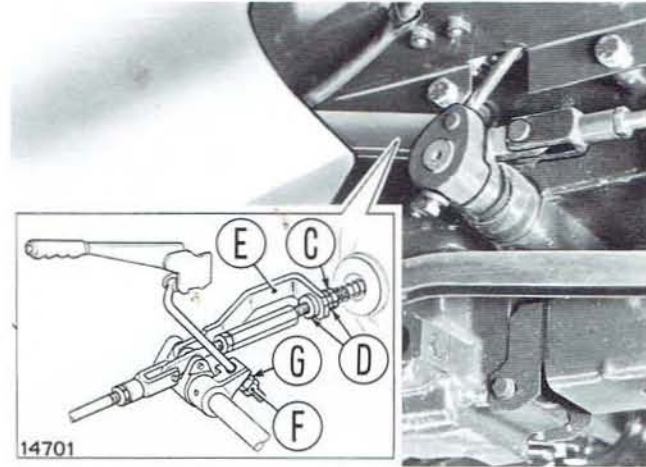
- Move lever to rest position.
- Back off jam nut (C, page 2).
- Turn sleeve (D) until it contacts bracket (E).
- Lock jam nut (C).
- Next, adjust hand lever travel.

# POWER TRAIN: Brakes



### Service brake pedal travel adjustment.

A. Jam nut - B. Adjuster sleeves.

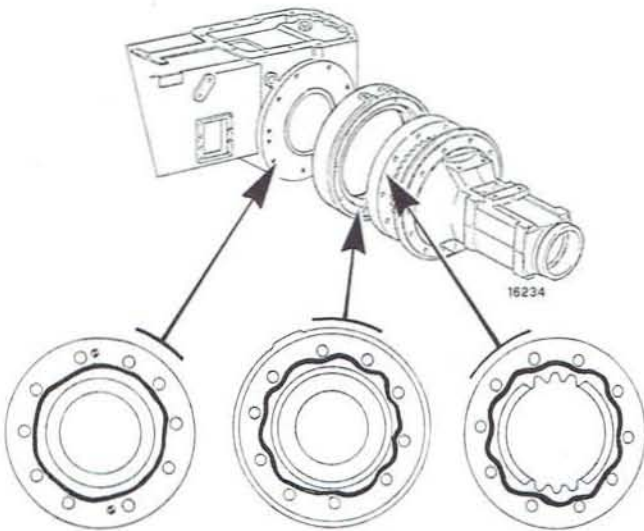


### Parking brake hand lever adjustment.

C. Jam nut - D. Adjuster sleeve - E. Reaction bracket - F. Jam nut - G. Nut.

by acting on RH link rod as follows:

- Release jam nut (F).
- Turn in or out, as required, nut (G) while checking at the same time that hand lever applies brake tight at 4th click on toothed sector.
- Re-lock jam nut (F).



### Jointing compound application scheme for installation of side final drive cases onto transmission housing.

For Types of jointing compound, refer to page 6, Sect. A, Mods. 466/566/666/766.

**REMOVAL**



**WARNING**

Raise and handle all components using a suitable hoist. Ensure that units or parts are supported by suitable slings or hooks. Ensure that no one is in the vicinity of the load to be lifted.

Remove final drives as follows:

- Drain oil from rear drive housing.
- Position a support stand under drive housing and take down the ROPS frame, wheels, fenders and footboards.
- Remove stud nuts (C<sub>1</sub>) and take down the final drive housing complete with bevel ring gear.

**DISASSEMBLY**

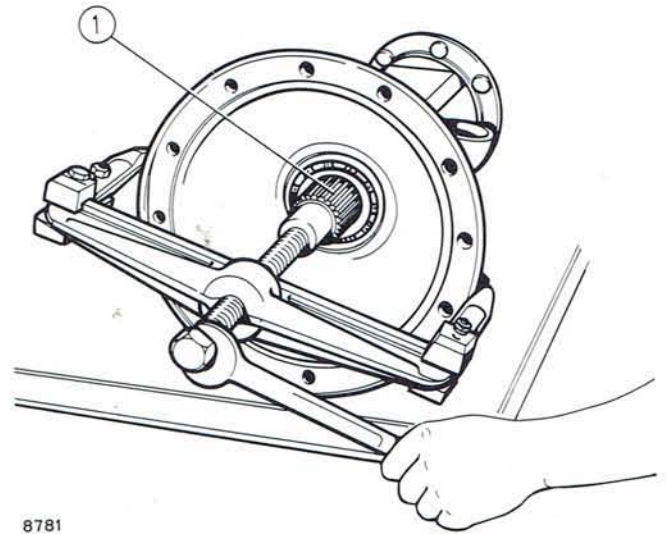


**WARNING**

Handle all parts with extreme care. Do not put hands and fingers between parts. Wear safety items such as goggles, gloves and shoes.

Proceed as follows:

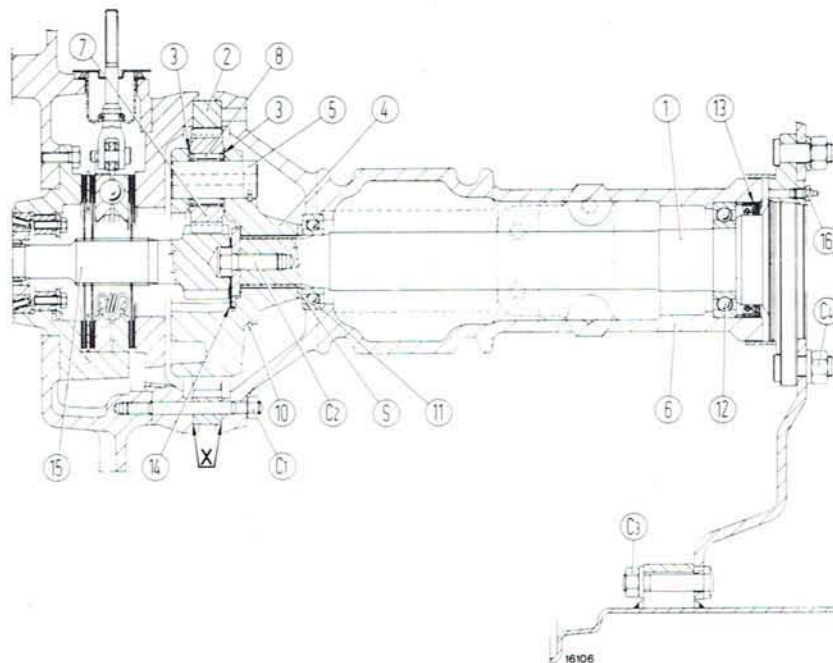
- Remove planet gear carrier (4) by first taking out lock washer (14) and screw (C<sub>2</sub>); pickup shim (S).



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**Removing wheel shaft using universal puller.  
1. Wheel shaft.**

- Using a universal puller, take out wheel drive shaft (1).
- Open retaining ring (10), take out planet gear journal (5) and planet gears (7); pickup needle roller bearings (8).

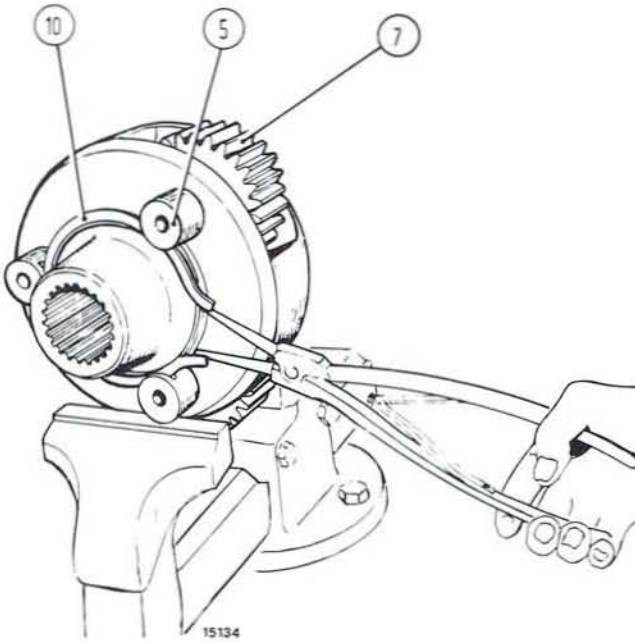


**RH final drive longitudinal section.**

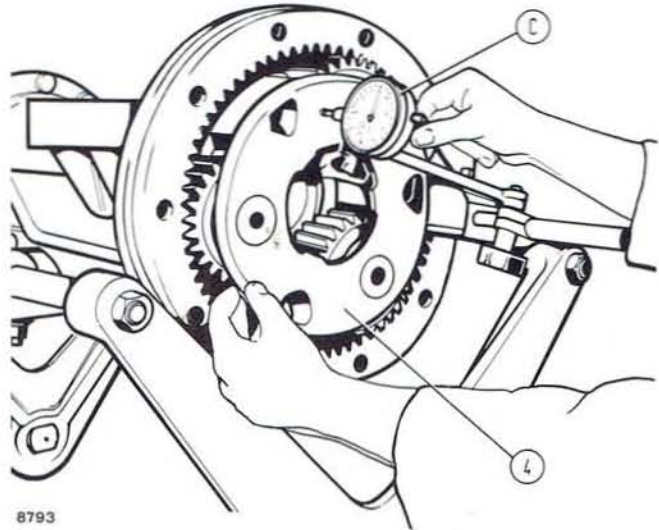
C<sub>1</sub>. Nuts, final drive housing studs - C<sub>2</sub>. Lock screw, wheel drive shaft - C<sub>3</sub>. Nut, sheet metal disc-to-driving wheel rim screw - C<sub>4</sub>. Screw, sheet metal disc to driving wheel hub - G. = 0.2 to 0.4 mm (0.0078 to 0.0157 in). Planet gear carrier end play - S. Shims, end play (G) adjustment - 1. Wheel drive shaft - 2. Ring gear - 3. Thrust washers - 4. Planet gear carrier, epicyclic final drives - 5. Planet gear journal - 6. Final drive housing - 7. Planet gear - 8. Needle roller bearing - 10. Retaining ring, planet gear journals - 11. and 12. Ball bearings - 13. Seal - 14. Lock washer, screw (C<sub>2</sub>) - 15. RH sun gear shaft - 16. Grease fitting.

**Note** - On assembly, apply jointing compound to surfaces X as instructed on page 6, Sect. A, for Mods. 466/566/666/766.

# POWER TRAIN: Brakes



**Removing (installing) planet gear journals.**  
5. Journals - 7. Planet gears - 10. Retaining ring.



**Checking planet carrier end play.**  
C. Dial gauge - 4. Planet carrier.

If necessary, replace seal (13) using a suitable driver to position the new seal at the correct depth.

### ASSEMBLY

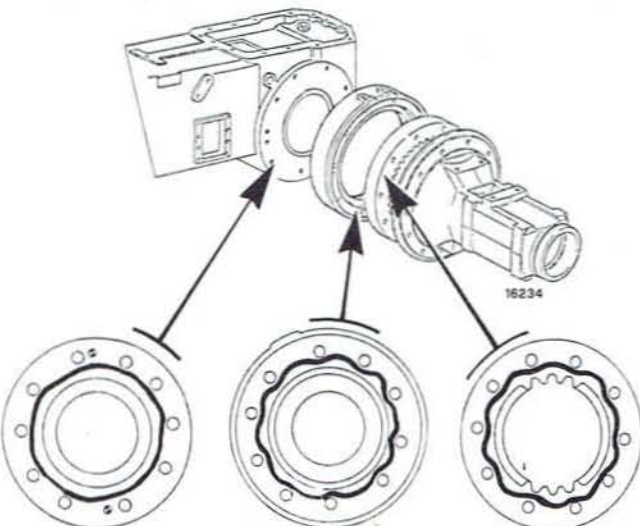
Place housing in upright position and assemble noting the following points:

- Following seal (13, page 1) assembly, insert wheel shaft and press on flange until shaft is flush with bearing (12).

- Position bearing (11) and install planet carrier (4) with shim (S).
- Tighten screw (C<sub>2</sub>, page 1) to the specified torque and check that carrier end play (G) is 0.2 to 0.4 mm (.007 to .015 in). To adjust, change shim (S).

**⚠ WARNING ⚠**

Use suitable tools to align holes. NEVER USE HANDS OR FINGERS.



**Applying jointing compound for final drive installation on drive housing.**

Jointing compound types are indicated on page 6, section A, for Mods. 466/566/666/766.

Before installing final drive housing rear drive housing, and cover on final drive housing, thoroughly clean and degrease mating surfaces and apply a 2 mm (0.08 in) bead of jointing compound as shown in Figure alongside.

Jointing compound types are indicated on page 6, section A, for Mods. 466/566/666/766.

Tighten screws (C<sub>1</sub>, page 1) to the specified torque and inject **fiat TUTELA G9 grease** through lubricator (16) until it issues from inner shield.

Turn hub to ensure that lubricant is evenly distributed.



**DEAD FRONT AXLE**

Type . . . . .	Inverted U, telescoping, centre pivoting
Track settings: six . . . . .	1410 - 1510 - 1610 - 1710 - 1810 1910 mm (55 <sup>1</sup> / <sub>2</sub> - 59 <sup>1</sup> / <sub>2</sub> - 63 <sup>1</sup> / <sub>2</sub> - 67 <sup>1</sup> / <sub>2</sub> - 71 <sup>1</sup> / <sub>2</sub> 75 <sup>1</sup> / <sub>2</sub> in)
Camber . . . . .	2°, equivalent to 15 mm (0.590 in) for 16 in rims, 18 mm (0.709 in) for 20 in rims at outermost edge of rim
Toe-in . . . . .	0 to 5 mm (0 to 0.197 in)

**Steering Knuckle Articulation** - See page 1, Sect. 30, Mods. 466/566/666/766.

**Axle Pivot** - See page 1, Sect. 30, Mods. 466/566/666/766.

**POWER STEERING**

Type . . . . .	Hydrostatic
Make . . . . .	DANFOSS
Hydraulic circuit . . . . .	Independent, separate pump
Oil reservoir . . . . .	Transparent plastic on R.H. side of engine
Oil filter . . . . .	In oil reservoir, gauze
<b>Hydraulic pump</b>	
Type . . . . .	Gear
Model . . . . .	C 25
Make . . . . .	FIAT
Drive . . . . .	From engine valve gear
Rotation (seen from drive side) . . . . .	Clockwise
Drive ratio . . . . .	0.931 to 1

**NOTE** - For operation and construction data regarding the **FIAT C 25** hydraulic pump, see pages 1 and 2, Sect. 30, Mods. 55-66/60-66/70-66/80-66.

**POWER STEERING**

Control Valve . . . . .	DANFOSS
Type . . . . .	with steering column operated rotary valve (permitting steering also in case of pump failure)
Outfit code: — DANFOSS (with valves in control valve) . . . . .	OSPC 100
Relief valve crack-off setting . . . . .	100 bar (102 kg/cm <sup>2</sup> , 1471.77 psi)
Power cylinder overload valve crack-off setting . . . . .	200 bar (204 kg/cm <sup>2</sup> , 2903.53 psi)
Power Cylinder:	
Type . . . . .	Double acting, located behind front axle
Make:	
— 55-66LP/60-66LP/70-66LP . . . . .	SIMA or WEBER or ERBER
— 55-66DTLP/60-66DTLP/70-66DTLP . . . . .	SIMA or WEBER or LAVERDA or GEA
Cylinder bore diameter:	
— 55-66LP/60-66LP/70-66LP . . . . .	48 mm (1.88 in)
— 55-66DTLP/60-66DTLP/70-66DTLP . . . . .	48 mm (1.88 in)
Piston rod diameter:	
— 55-66LP/60-66LP/70-66LP . . . . .	22 mm (.866 in)
— 55-66DTLP/60-66DTLP/70-66DTLP . . . . .	22 mm (.866 in)
Maximum piston stroke . . . . .	215 mm or 8.46 in (214 mm or 8.42 in SIMA)
— 55-66LP/60-66LP/70-66LP . . . . .	215 mm or 8.46 in (214 mm or 8.42 in SIMA)
— 55-66DTLP/60-66DTLP/70-66DTLP . . . . .	200 mm (7.87 in)

**LIVE FRONT AXLE**

Type . . . . .	Steering, full-floating, center pivoting
<b>Bevel Drive and Differential</b>	
Bevel drive ratio . . . . .	10/36 = 1 to 3.6
Bevel drive backlash . . . . .	0.15 to 0.20 mm (0.006 to 0.008 in)
Bevel pinion bearing shim thickness (S <sub>1</sub> , page 1, Sect. 402) . . . . .	2.50 - 2.55 - 2.60 - 2.65 - 2.70 - 2.75 2.80 - 2.85 - 2.90 - 2.95 - 3 - 3.05 3.10 - 3.15 - 3.20 - 3.25 - 3.30 - 3.35 3.40 - 3.45 - 3.50 - 3.55 - 3.60 - 3.65 3.70 mm (0.098 - .100 - .102 - .104 - .106 .108 - .110 - .112 - .114 - .116 - .118 .120 - .122 - .124 - .126 - .128 - .130 .132 - .134 - .136 - .138 - .140 - .142 .144 - .146 in)
Bevel pinion shim thickness (S <sub>2</sub> ) . . . . .	2.5 - 2.6 - 2.7 - 2.8 - 2.9 - 3.0 - 3.1 3.2 - 3.3 - 3.4 - 3.5 - 3.6 - 3.7 mm (0.098 - 0.102 - 0.106 - 0.110 - 0.114 0.118 - 0.122 - 0.126 - 0.130 - 0.134 0.138 - 0.142 - 0.146 in)
Differential pinion and side gear backlash . . . . .	0.15 mm (0.006 in)
Side gear thrust washer thickness (7, page 1, Sect. 402) . . . . .	1.470 to 1.530 mm (0.0579 to 0.0602 in)
Differential pinion thrust washer thickness (6) . . . . .	1.50 - 1.60 mm (0.0590 - 0.0630 in)
Differential pinion journal dia. . . . .	21.939 to 21.960 mm (0.864 to 0.865 in)
Differential pinion bore dia. . . . .	22.040 to 22.061 mm (0.868 to 0.869 in)
Side gear spigot diameter . . . . .	37.961 to 38.000 mm (1.494 to 1.496 in)
Side gear spigot bore diameter in differential case . . . . .	38.080 to 38.119 mm (1.499 to 1.501 in)
Side gear spigot clearance in differential case . . . . .	0.080 to 0.158 mm (0.003 to 0.005 in)
<b>Axle Shaft and Joints</b>	
Axle shaft journal diameter (5, page 1, Sect. 402) at bush (14) . . . . .	29.914 to 29.935 mm (1.178 to 1.179 in)
Axle bushing fitted I.D. (14) . . . . .	30.050 to 30.105 mm (1.183 to 1.185 in)
Axle shaft running clearance in bushing . . . . .	0.115 to 0.191 mm (0.004 to 0.007 in)
Bushing interference fit in housing . . . . .	0.064 to 0.129 mm (0.003 to 0.005 in)
Kingpin bearing shim thickness (S <sub>2</sub> , page 1) Sect. 402 . . . . .	0.10 0.15 - 0.20 - 0.25 - 0.30 mm (0.004-0.006-0.008-0.010-0.012 in)
<b>Epicyclic Final Drives</b>	
Reduction ratio . . . . .	15 to (15+54) = 1 to 4.6
Planet gear thrust washer thickness (18, page 1, Sect. 402) . . . . .	0.77 to 0.83 mm (0.030 to 0.033 in)

## LIVE FRONT AXLE

(continued)

<b>Centre Pivot</b> . . . . .	Refer to tabulation on page 2, Sect. 40, Mods. 466/566/666/766 which applies
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## AXLE DRIVE

Reduction ratio . . . . .	34/34 to 24/34
Relay lever pad width . . . . .	7.910 to 8.000 mm (0.3114 to 0.3149 in)
Pad seat width in driven gear . . . . .	8.280 to 8.370 mm (0.3260 to 0.3295 in)
Pad clearance in seat . . . . .	0.280 to 0.460 mm (0.0110 to 0.018 in)
Relay lever pivot diameter . . . . .	15.973 to 16.000 mm (0.6288 to 0.6299 in)
Pivot housing bore in casing . . . . .	16.016 to 16.059 mm (0.6305 to 0.6322 in)
Pivot clearance in housing . . . . .	0.016 to 0.086 mm (0.0006 to 0.0034 in)
Relay lever detent spring height	
— Free . . . . .	130 mm (5.118 in)
— Under 299 to 330 N (30.5 to 33.7 kg or 67 to 74 lb) . . . . .	142.5 mm (5.610 in)

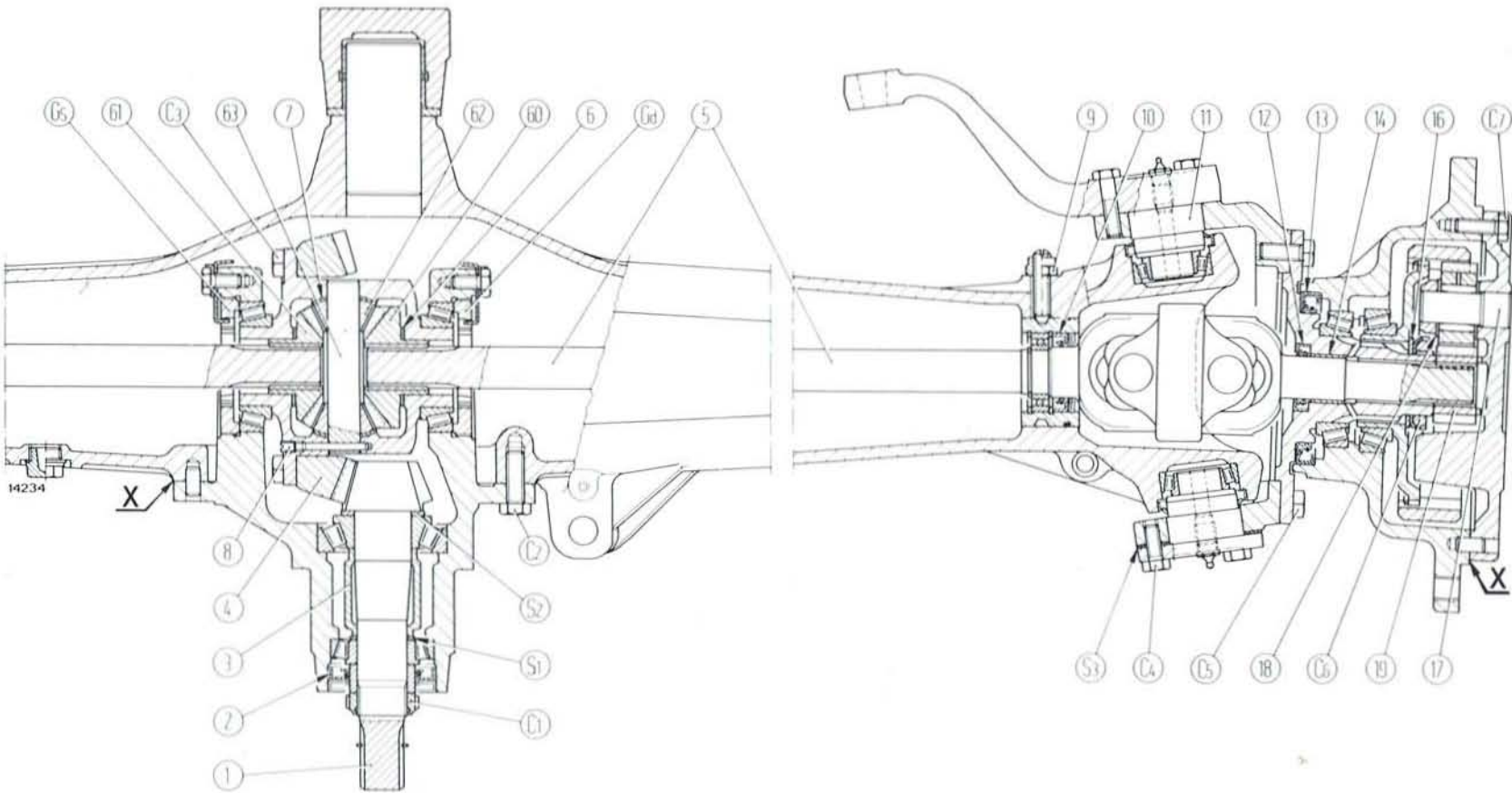
## DRIVE SHAFT

Refer to tabulation on page 2, Sect. 40, Mods. 466/566/666/766 which applies.

## TORQUE DATA

Refer to tabulation on page 3, Sect. 40, Mods. 466/566/666/766 except as indicated below.

Item	Thread size	Torque		
		Nm	kgm	lb ft
<b>Live Front Axle - Sect. 402</b>				
Bevel drive pinion lock ring nut (C <sub>1</sub> , page 1) . . . . .	M35x1.5	294	30	217
Wheel hub bearing lock ring nut (C <sub>6</sub> ) . . . . .	M45x1.5	118	12	86
Steering wheel disc to hub screw . . . . .	M16x1.5	255	26	188

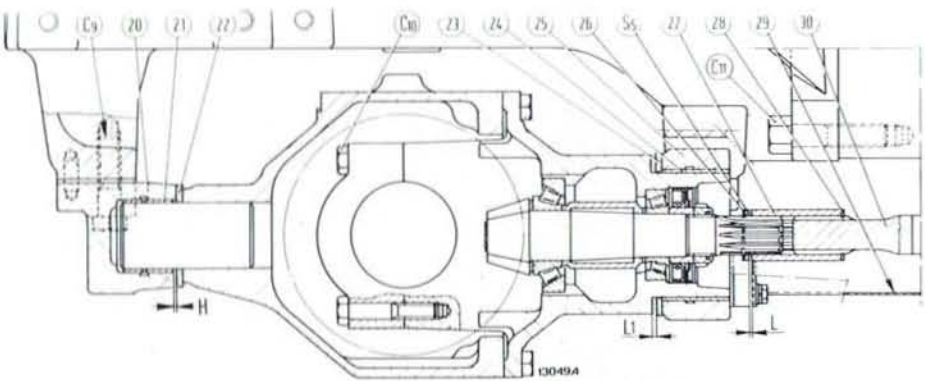


**Live front axle longitudinal section**

**Note** - On assembly, thoroughly clean and degrease mating surfaces **X** and apply one of jointing compounds listed on page 6, Sect. A, Mods. 466/566/666/766.

C<sub>1</sub>. Bevel pinion bearing lock ring - C<sub>2</sub>. Differential carrier screw - C<sub>3</sub>. Ring gear screw - C<sub>4</sub>. King pin bearing screw - C<sub>5</sub>. Steering knuckle screw - C<sub>6</sub>. Wheel hub bearing lock ring - C<sub>7</sub>. Final drive housing screw - Gd and Gs.

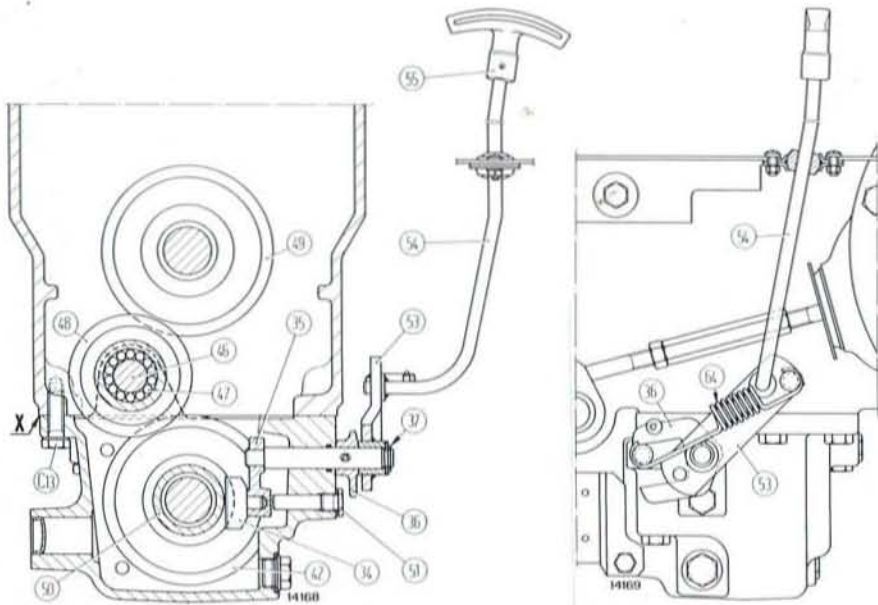
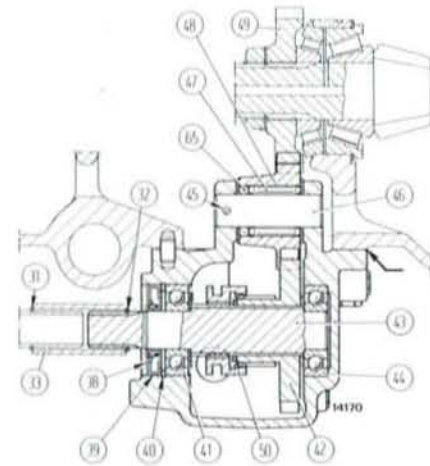
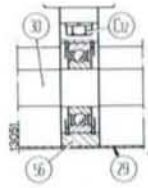
R.H. and L.H. differential bearing lock ring - S<sub>1</sub>. Bevel pinion bearing shim - S<sub>2</sub>. Bevel pinion position shim - S<sub>3</sub>. King pin bearing shims - 1. Bevel pinion - 2. Seal - 3. Bevel pinion bearing spacer - 4. Ring gear - 5. Axle shaft with universal joint - 6. Side gear washers - 7. Differential pinion washers - 8. Differential pinion journal screw - 9. Bearing carrier screw - 10. Seal - 11. King pin bearing - 12 and 13. Seals - 14. Axle shaft bushing - 16. Thrust washer - 17. Planet wheel journals - 18. Planet wheel shims - 19. Sun gear - 60 and 61. Side gears - 62. Differential pinion - 63. Differential pinion journal.



**Longitudinal section through axle pivot, axle drive and drive shaft.**

**Note** - On assembly, thoroughly clean and degrease mating surfaces **X** and apply one of jointing compounds listed on page 6, Sect. A, Mods. 466/566/666/766.

C<sub>9</sub>. Axle housing pivot front/rear support screws - C<sub>10</sub>. Differential bearing cap screw - C<sub>11</sub>. Front axle support-to-engine screws - C<sub>12</sub>. Drive shaft center bearing block screw - C<sub>13</sub>. Axle drive housing screws - H = 1 mm (0.04 in) Front bushing fitted stand-in - L = 1 to 1.5 mm (0.04 to 0.06 in) Sleeve end play. S<sub>5</sub>. Sleeve (27) positioning shim - 20. Axle front pivot support - 21. Front bushing - 22. Front thrust washer - 23. Rear thrust washer - 24. Rear bushing - 25. Axle rear pivot support - 26 and 28. Retaining rings - 27. Front splined sleeve - 29. Drive shaft guard - 30. Drive shaft - 31 and 32. Retaining rings - 33. Rear splined sleeve - 34. Shoe - 35. Inner relay lever - 36. FWD engagement fork - 37. Retaining ring - 38. Dust excluder - 39. Seal - 40. Retaining ring - 41. Ball bearing - 42. Driven gear - 43. Splined driven shaft - 44. Ball bearing - 45. Roll pin - 46. Intermediate shaft - 47. Needle roller bearing - 48. Intermediate gear - 49. Drive gear keyed on bevel pinion - 50. Axle engagement sleeve - 51. Plug - 53. Axle drive control lever - 54. Vertical link - 55. Hand lever - 56. Pillow block complete with ball bearing - 64. FWD IN/OUT lever detent spring - 65. Needle roller bearing spacer.



**LIFT**

Type . . . . .		Position, draft and mixed control
Control . . . . .		Two independent levers
Variospeed sensitivity adjustment . . . . .		Control valve-mounted, 4-position lever
LIFT-O-MATIC . . . . .		Link raising / lowering by fast-acting buttons without use of hand control levers
Response adjustment . . . . .		Knob on control valve
Single-acting cylinder:		
— Bore x stroke	{ Models 55-66LP and 60-66LP . . . . . Models 70-66LP . . . . .	100x128 mm (3.9x5.0 in) 110x128 mm (4.3x5.0 in)
— Displacement	{ Models 55-66LP and 60-66LP . . . . . Models 70-66LP . . . . .	1005 cm <sup>3</sup> (155.8 in <sup>3</sup> ) 1216 cm <sup>3</sup> (188.4 in <sup>3</sup> )
Relief valve crack-off setting . . . . .		186 to 191 bar (190 to 195 kg/cm <sup>2</sup> , 2.702 to 2.773 psi)
Safety valve crack-off setting . . . . .		210 to 215 bar (214 to 219 kg/cm <sup>2</sup> , 3.043 to 3.114 psi)
Design lift capacity	{ Models 55-66LP and 60-66LP . . . . . Model 70-66LP . . . . .	18944 N (1932 kg or 4250 lb) 22922 N (2337 kg or 5140 lb)
Lift piston dia.	{ Models 55-66LP and 60-66LP . . . . . Models 70-66LP . . . . .	99.980 to 100.000 mm (3.9362 to 3.937 in) 109.980 to 110.000 mm (4.3299 to 4.3307 in)
Lift cylinder bore dia	{ Models 55-66LP and 60-66LP . . . . . Models 70-66LP . . . . .	100.036 to 100.071 mm (3.9384 to 3.9398 in) 110.036 to 110.071 mm (4.3321 to 4.3335 in)
Piston working clearance in bore . . . . .		0.036 to 0.091 mm (0.0014 to 0.0036 in)

**Note** - For lift component design data refer to tabulations on pages 1 and 2, Sect. 50, covering Mods. 466/566/666/766 except as listed below:

Non-return (check) valve return spring:	
— Free length . . . . .	23.5 mm (0.925 in)
— Height under a load of 35.3 to 39.2 N (3.6 to 4 kg or 8 to 9 lb) . . . . .	18 mm (0.70 in)

# HYDRAULIC LIFT UNIT: Specifications and Data

## IMPLEMENT ATTACHMENT

Type . . . . .	3-point linkage
Category . . . . .	One and Two
Draft control . . . . .	Through lower links and sensing bar
Max. lift capacity, center of gravity 610 mm (24 in) from lower link bushings and starting with links horizontal (top link coupled to top hole): — Models 55-66LP and 60-66LP . . . . . — Models 70-66LP . . . . .	2275 daN (2320 kg or 5104 lb) 2746 daN (2800 kg or 6160 lb)
Max. lift capacity, starting with lower links horizontal (top link coupled to top hole): — Model 55-66LP: center of gravity 1050 mm or 41.3 in from lower link swivel bushings: . . . . . — Model 60-66LP: center of gravity 1090 mm or 42.9 in from lower link swivel bushings: . . . . . — Model 70-66LP: center of gravity 1170 mm or 46.1 in from lower link swivel bushings: . . . . .	1892 daN (1930 kg or 4296 lb) 1863 daN (1900 kg or 4180 lb) 2177 daN (2220 kg or 48884 lb)
Max. lower link end travel: — Lifting rods out and coupled to front mounting holes: . . . . . — Lifting rods out and coupled to rear mounting holes: . . . . .	abt. 770 m (30.3 in) abt. 660 mm (26 in)

## REMOTE CONTROL VALVE

Refer to the data in tabulation on pages 4 and 5, Sect. 50, Mods. 466/566/666/766 which apply.



## REMOVAL



Lift and handle all heavy components using a suitable hoist. Ensure that units or parts are supported by suitable slings or hooks. Ensure that no one is in the vicinity of the lifted load.

Proceed as follows:

- Disconnect the battery negative cable.
- Drain the fuel tank.
- Take off fuel tank rear guards, disconnect the fuel level indicator wiring and tank fuel outlet lines.
- Take down the fuel tank after having backed out its screws from mounting brackets.
- Disconnect lift arms from implement carrier.
- Disconnect the remote control valve coupling support plate and the top link support from lift body.
- Disconnect the remote control valve oil lines and associated mounting bracket.
- Disconnect the position/draft control linkage rods and the LIFT-O-MATIC flexible control.
- Backoff the screws securing lift unit to rear drive housing and, using hoist and sling, take down the lift unit being careful to avoid interference of draft control rod with lift lever linkages.

## DISASSEMBLY



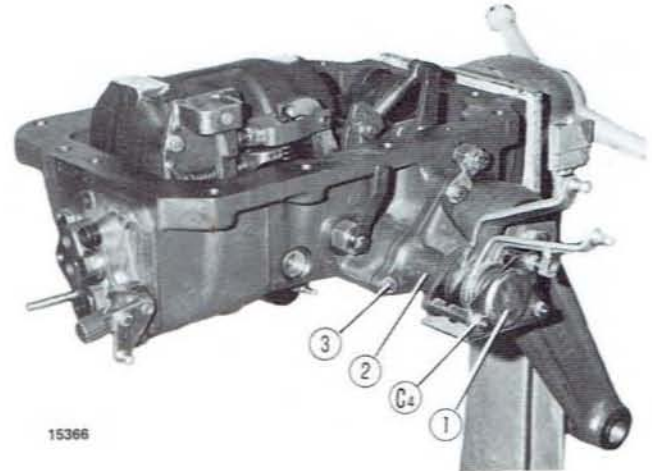
Handle all components with care. Do not put hands and fingers between parts. Wear safety goggles, gloves and shoes.

Secure lift on service stand and proceed with the disassembly minding the following:

**Note** - To install the lift on revolving stand make a plate with holes and dimensions as shown in the Figure on page 3, Sect. 501 Mods. 466/566/666/766.

Method used for plate mounting on stand will depend on stand configuration.

- Remove control valve assy after taking out its mounting screws.
- Remove lift control outer levers and relevant clutch plates after taking off nuts (C-) springs and bracket (1).



### Removing lift control outer levers.

C-. Spring bracket stud nuts - 1. Spring bracket - 2. Spacer - 3. Spacer screws.

- Remove screws (3) and spacer (2).
- Take off lifting arms and thrust washers.
- Remove the three screws securing cylinder (1) to lift housing and the two control valve lever support screws (3). Take off cylinder together with piston.
- Blow in compressed air through oil delivery port to eject the piston.
- Remove inner arm screws, insert protector **293384** over RH seal and remove cross shaft by tapping right end of shaft.
- Take inner levers out of lift body.
- Tractors not equipped with remote control valve: remove relief valve from lift body.

Disassemble control valve as described on page 5, Sect. 501, Mods. 466/566/666/766.

## INSPECTIONS - ASSEMBLY

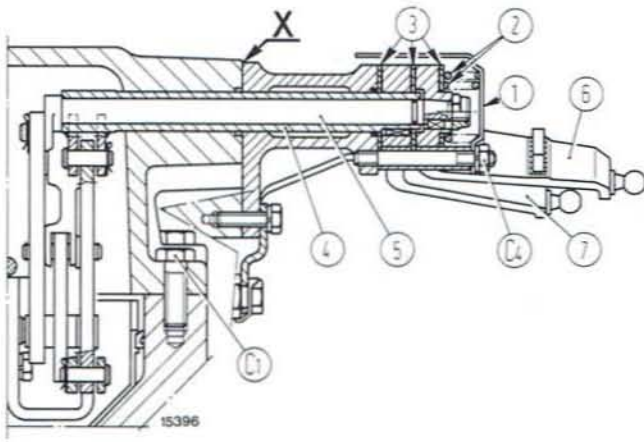
Refer to the text and illustrations provided on pages 5, 6 and 7, Sect. 501, for Mods. 466/566/666/766.

**Note** - The illustration on page 2 showing the section through lift levers and controls substitutes the corresponding figure on page 6, Sect. 501, Mods. 466/566/666/766.

## LIFT ADJUSTMENT

The following adjustments refer to a lift without hydraulic control valve and placed on work bench or secured to a rotary stand through a suitable bracket.

# HYDRAULIC LIFT UNIT: Lift



### Section through lift levers and controls.

C<sub>1</sub>. Lift screw - C<sub>4</sub>. Spring bracket stud nuts - 1. Spring bracket - 2. Springs - 3. Clutch plates - 4. Position lever pin - 5. Draft lever inner shaft - 6. Position outer lever - 7. Draft outer lever.

Adjust in the order given.

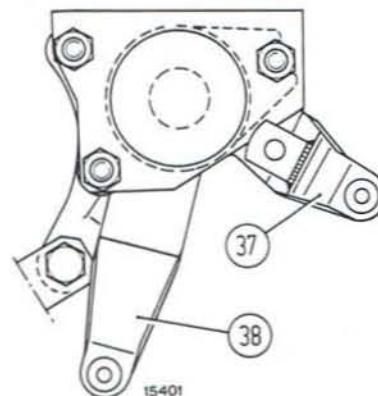
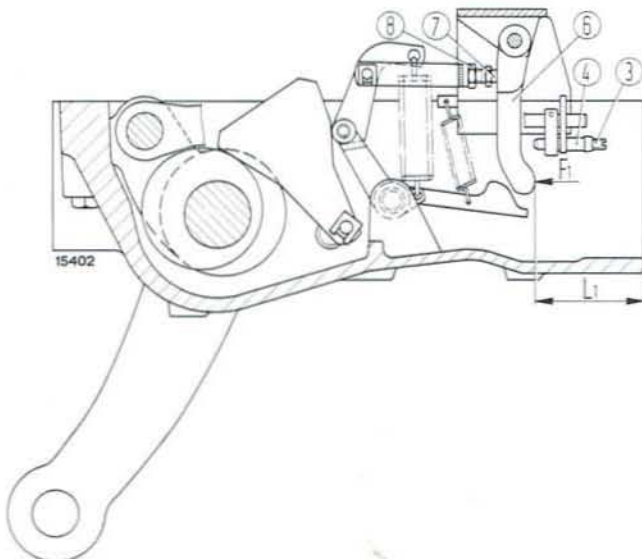
With lift installed on tractor, only arm upward travel adjustment is possible.

Unless otherwise indicated, LIFT-O-MATIC must be deactivated, i.e. external control lever must be locked in upright position.

### 1. Position control adjustment

Proceed as follows:

- Move position control lever (37), fully forward to contact spring bracket spacer and draft control lever (38) fully back against spacer.



### Adjusting position control.

$F_1$ . = 4 to 4.5 daN (kg) or 9 to 10 lb. Force applied by tool **293846** on lever (6) -  $L_1$ . Distance between lever end (6) and lift body front end - 3. Limit travel adjusting screw - 4. Locknut - 6. Control valve lever - 7. Link cap - 8. Locknut - 37. Outer position control lever - 38. Outer draft control lever.

- Rotate cross shaft to bring inner arm in contact with lift body.

- Using wrench **293870** (C, page 9) slacken locknut (4) and travel adjusting screw (3) until screw no longer touches lever (6).

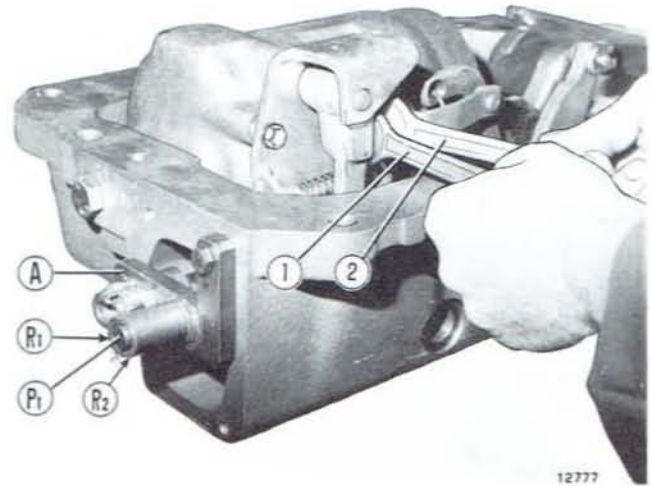
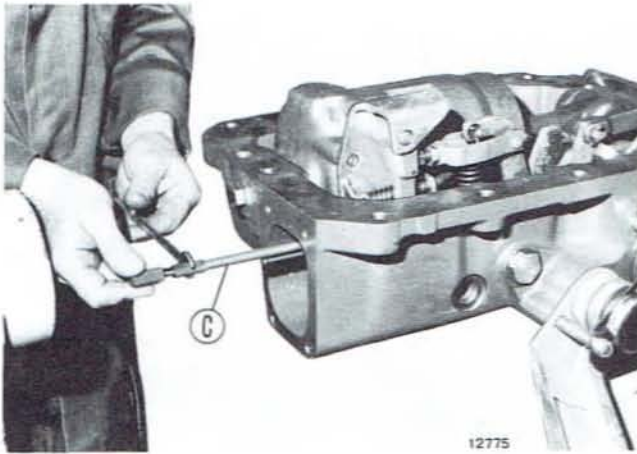
- Install tool **293846** (A, page 3) on lift body.

- Using wrenches (1 and 2), back off locknut (8) and tighten or slacken adjustable link rod (7) so that plunger (P<sub>1</sub>) is aligned with outer register (R<sub>1</sub>) of tool (A) as shown.

**Note** - This condition corresponds to a gap ( $L_1$ ) of 82 to 82.1 mm (3.22 to 3.23 in) between lever end (6) and lift body front face measured applying a force ( $F_1$ ) of 4 to 4.5 daN (kg) or 9 to 10 lb to lever end.

- Tighten locknut (8).

- Move position control lever (37) fully back on quadrant to contact spacers, rotate cross shaft to bring piston fully forward and check that plunger (P<sub>1</sub>) of tool **293846** (D, page 3) is retracted by 1.3 to 1.7 mm (0.0512 to 0.0670 in) with respect to register (R<sub>2</sub>) of same tool.



**Adjusting position control.**

A. Tool **293846** - C. Wrench **293870** - P<sub>1</sub>. Moving plunger - R<sub>1</sub>. Outer register - R<sub>2</sub>. Inner register - 1 and 2. Wrenches.

**Note** - This condition corresponds to a gap (L<sub>1</sub>, page 2) between lever end (6) and lift body front end of 86.3 to 86.7 mm or 3.39 to 3.41 in when measured applying a force (F<sub>1</sub>) of 4 to 4.5 daN (kg) or 9 to 10 lb on lever end.

**Note** - If early model tool **293845** is available, it may be changed into late model **293845/1** by modifying spindle (S) as shown in Fig. on page 1, Sect. 501, Mods. 55-66, 60-66, 70-66.

**2. Maximum lift arm travel adjustment on bench**

Proceed as follows:

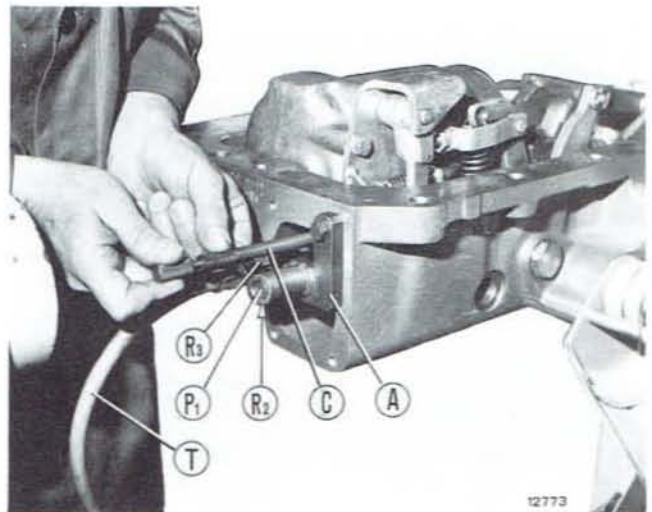
- With tool **293846** (A) installed on lift body, position draft control lever (38, page 2) fully back on quadrant to contact spacer and position control lever (37) fully forward against spacer.
- Rotate cross shaft to bring inner arm into contact with lift body.
- Hook up connection (R<sub>3</sub>) on tool (A) to a compressed air source (T) and introduce air to cylinder so that piston moves, through full lift stroke. Maintain air pressure to keep piston in this position.
- Using wrench **293870** (C), tighten screw (3, page 2) until end of plunger (P<sub>1</sub>), is recessed from inner register (R<sub>2</sub>) of tool (A) or by 1.3 to 1.7 mm (0.051 to 0.067 in).

**Note** - This condition corresponds to a gap (L<sub>1</sub>, page 2) of 86.3 to 86.7 mm (3.39 to 3.41 in) between lever end (6) and lift body front end.

- Tighten locknut (4).

Proceed as follows:

- Remove end of draft control rod (19, page 4 ) and install on spindle (S) of tool **293845/1** securing through lock nut (25).
- Place tool **293845/1** (B) together with spindle (S) and end of draft control rod (19) on a surface plate and measure gap (L<sub>6</sub>) between top of spindle and support face of depth gauge (M).



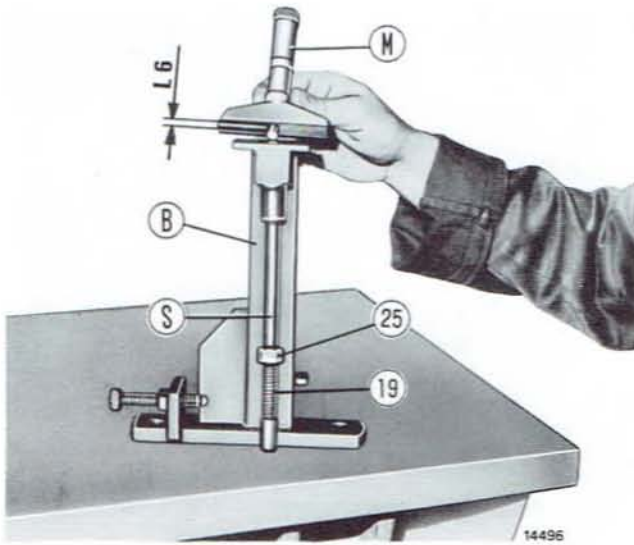
**Adjusting maximum lift arm travel on bench.**

A. Tool **293846** - C. Wrench **293870** - P<sub>1</sub>. Plunger - R<sub>2</sub>. Inner register face - R<sub>3</sub>. Compressed air connection - T. Compressed air line.

**3. Draft control adjustment**

**Important** - Draft control must be adjusted using tool **293846** along with **293845/1**.

# HYDRAULIC LIFT UNIT: Lift



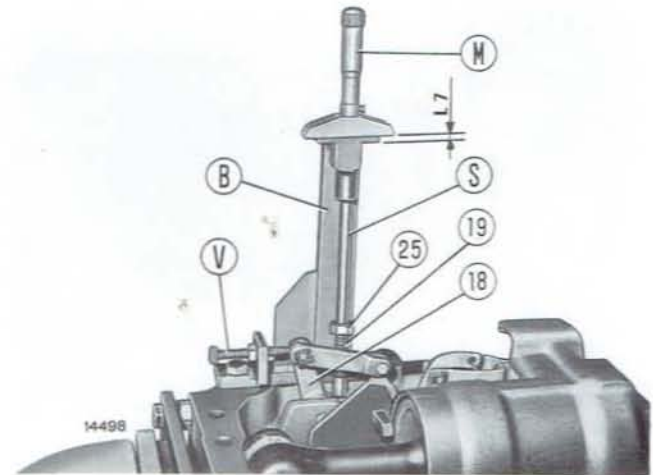
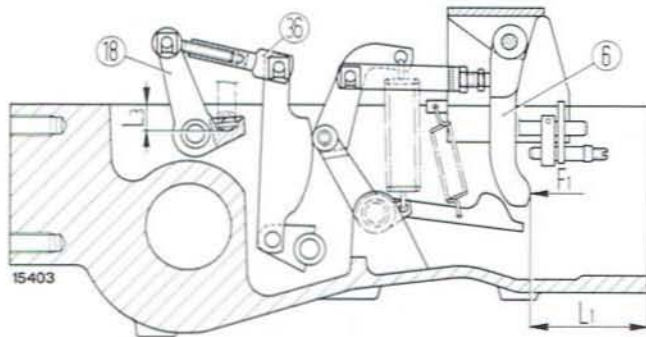
### Zeroing tool 293845/1 (B) for draft control adjustment.

L<sub>6</sub>. Gap between top of spindle (S) and depth gauge support face - M. Depth gauge - S. Spindle - 19. Draft control rod - 25. Lock nut.

(Turn in item (10) on spindle (S) so that the face of the latter is located a few mm lower than gauge support face on tool).

Next proceed as follows:

- With tool **293846** (A, page 3) installed on lift body and disconnected from compressed air supply, move

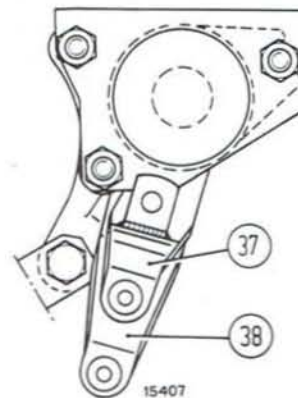


### Adjusting draft control.

B. Tool **293845/1** - L<sub>7</sub>. Gap between top of spindle and depth gauge support face - M. Depth gauge - S. Spindle - V. Screw - 18. Draft control inner lever - 19. Draft control rod - 25. Lock nut.

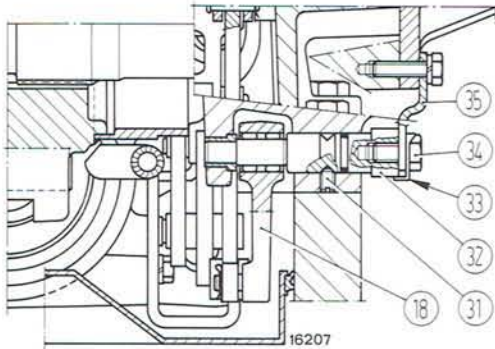
position control lever (37) and draft control lever (38) fully back to contact spacer.

- Locate cam pin (32, page 5) securing draft control inner lever in horizontal position with cam facing lift rear end.
- Install tool **293845/1** (B), on lift body and secure to two housing holes as shown in figure above. Turn knurled screw (V) to move draft control inner lever (18) until end of plunger (P<sub>1</sub>, page 3) is exactly aligned to outer register (R<sub>2</sub>) on tool **293846** (A).



### Adjusting draft control.

F<sub>1</sub> = 4 to 4.5 da N (kg) or 9 to 10 lb. Force applied to lever (6) by tool **293846** - L<sub>1</sub> = 81.9 to 82.1 mm (3.22 to 3.23 in). Distance between end of lever (6) and lift body front face - L<sub>3</sub> = 23.9 to 24.1 mm (0.940 to 0.948 in) Distance between lift housing mating face on transmission housing and rod contact face on lever (18) - 6. Control valve actuating lever - 18. Draft control inner lever - 37. Position control outer lever - 38. Draft control outer lever.



**Section through draft control inner lever linkage.**

31. Threaded dowel - 32. Lever cam - 33. Lock washer - 34. Screw - 35. Bracket.

- Rotate cam (32) slightly to retract end of plunger of tool **293846** as far back as possible.
- Turn screw (V, page 4) again to move lever (18) until end of plunger is aligned with inner register (R<sub>2</sub>, page 3) of tool **293846**.
- Rotate cam (32) as necessary to align end of plunger with outer register (R<sub>1</sub>, page 3).

Then proceed as follows:

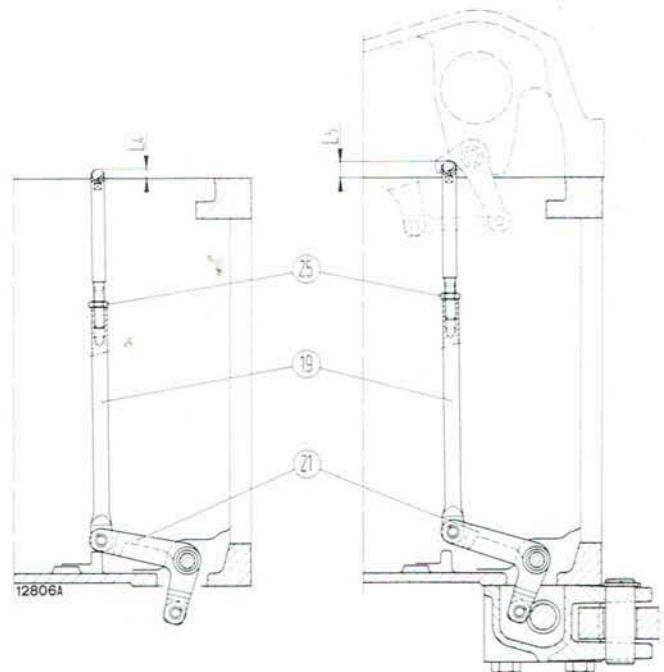
- Insert spindle of tool **293845/1** (B, page 4) in seat of draft control inner lever (18).
- With end of plunger in line with outer register (R<sub>1</sub>, page 3) move link (36, page 4) and measure distance (L<sub>7</sub>) with depth gauge (M, page 4) between top of spindle and depth gauge support face on tool **293845/1**.
- Dimension (L<sub>7</sub>, page 4) will be given by:

$$L_7 = L_6 + L_3$$

where:

**L<sub>6</sub>** = dimension measured with tool **293845/1** on surface plate.

**L<sub>3</sub> = 23.9 to 24.1 mm (0.940 to 0.948 in)** Distance between lift housing mating face on rear drive housing and rod contact face on lever (18).



**Installation of lift on tractor.**

L<sub>4</sub>. Rod (19) top end stand out relative to drive housing (sensing bar removed) - L<sub>5</sub>. Rod (19) end stand out relative to drive housing (sensing bar installed) - 19. Draft control rod - 21. Draft control link lever - 25. Jam nut.

**Note** - Check that with plunger (P<sub>1</sub>, page 3), aligned with outer register (R<sub>1</sub>) of tool **293846** (A), dimension (L<sub>7</sub>, page 4) is as follows:

$$L_7 = L_6 + L_3$$

where:

**L<sub>6</sub>** = dimension measured with tool **293845/1** on surface plate.

**L<sub>3</sub> = 23.9 to 24.1 mm (0.940 to 0.948 in)** Distance between lift housing mating face on rear drive housing and rod contact face on lever (18). To adjust, turn cam (32) and knurled screw (V, page 4) or tool **293845/1**.

- Install threaded dowel (31) and tighten screw (34) without folding down lockwasher tab. (33).

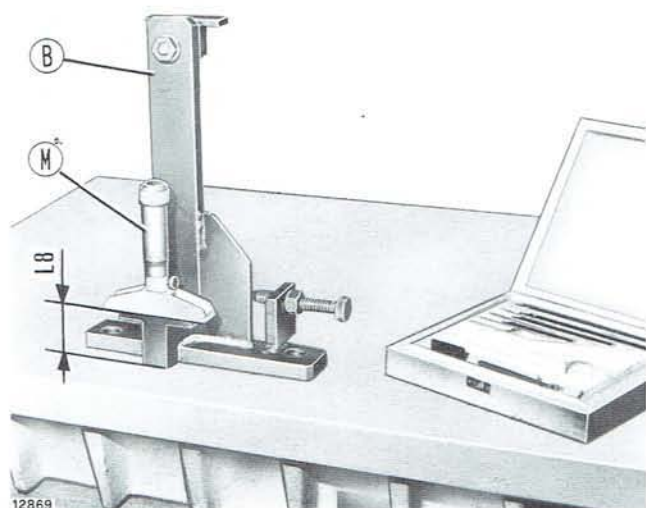
- Disassemble tools **293846** and **293845/1** and install hydraulic control valve on lift body.

Install lift on tractor as described below:

**Note** - This condition corresponds to a gap (L<sub>1</sub>, page 4) of 81.9 to 82.1 mm (3.224 to 3.232 in) between lever end (6) and lift body front face measured applying a force (F<sub>1</sub>) of 4 to 4.5 da N or 9 to 10 lb to lever end.

**Warning** - First place tool **293845/1** (B) on a surface plate and, using a depth gauge (M) measure distance (L<sub>8</sub>) between tool base and depth gauge support face on tool. Stamp measured dimension (L<sub>8</sub>) on tool.

# HYDRAULIC LIFT UNIT: Lift



### Zeroing tool 293845/1 (B) for draft control adjustment.

$L_8$ . Dimension between tool base on surface plate and depth gauge support face (to be stamped on tool) - M. Depth gauge.

- Install draft sensing unit complete with relay lever (21, page 5) and draft control rod (19) but without sensing bar on rear drive housing.
- Rest relay lever (21) against sensing bar housing, install tool **293845/1** (B), securing it to two housing holes in such a way that draft control rod (19) fits perfectly into hole on tool as shown.
- Using depth gauge (M) measure distance ( $L_9$ ) between top of rod (19) and depth gauge support face on tool.

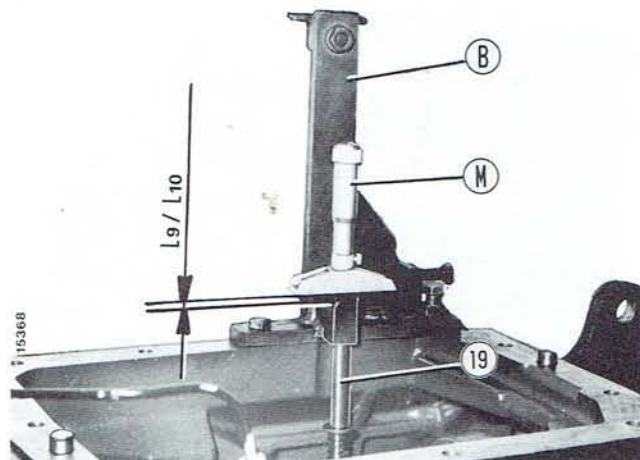
**Note** - Stand-out ( $L_4$ , page 5) of top rod end (19) from drive housing (with sensing bar removed) will be given by:

$$L_4 = L_8 - L_9$$

where:

$L_8$  and  $L_9$  = Dimensions measured with tool **293845/1** on surface plate ( $L_8$ ) or on drive housing ( $L_9$ ).

- Install sensing bar and measure new distance ( $L_{10}$ ) between top of rod (19) and depth gauge support face on tool.



### Adjusting draft control.

B. Tool **293845/1** -  $L_9$ . Distance between top of rod (19) and depth gauge support face on tool (with sensing bar removed) -  $L_{10}$ . Distance between top of rod (19) and depth gauge support face on tool (with sensing bar installed) - M. Depth gauge - 19. Draft control rod.

**Note** - Stand-out ( $L_5$ , page 5) of rod end (19) from drive housing (with sensing bar installed) will be given by:

$$L_5 = L_8 - L_{10}$$

where:

$L_8$  and  $L_{10}$  = Dimensions measured with tool **293845/1** on surface plate ( $L_8$ ) or on drive housing ( $L_{10}$ ).

- Check that dimension ( $L_5$ ) exceeds dimension ( $L_4$ ) by at least 5 mm (0.20 in).
- Slacken locknut (25, page 5) and adjust draft control rod length so that stand-out ( $L_5$ ) is 18.3 to 18.5 mm or 0.720 to 0.728 in.
- Stand-out ( $L_5$ ) may be determined using tool **293845/1** as follows:

$$L_{11} = L_8 - L_5$$

where:

$L_5$  = 18.3 to 18.5 mm (0.720 to 0.728 in). Stand-out of rod end from drive housing.

$L_8$  = Dimension measured with tool **293845/1** on surface plate.

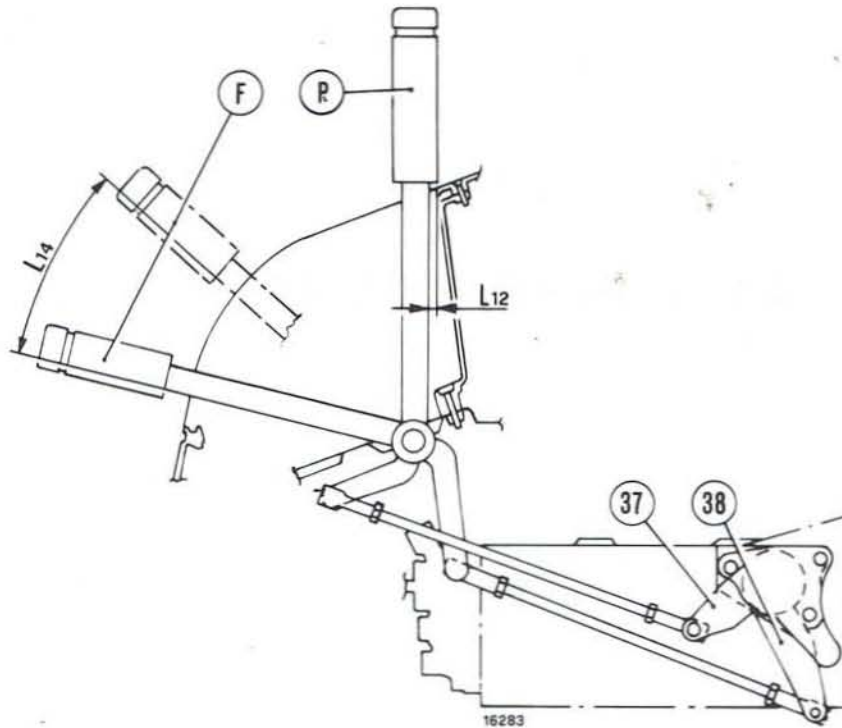
$L_{11}$  = Dimension measured with depth gauge on tool **293845/1**.

- Tighten lock nut (25, page 5) and install lift on tractor.

## 4. Position control link adjustment

Proceed as follows:

- Move position control lever (P) upright on quadrant and check that distance ( $L_{12}$ ) between lever and beginning of slot is 11 mm or 43 in.



**Adjusting position (P) and draft (F) control levers.**

F. Draft control lever -  $L_{12} = 11 \text{ mm}$  or  $.43 \text{ in.}$  distance between position control lever (P) and beginning of slot -  $L_{14} = 185 \text{ to } 195 \text{ mm}$  or  $7.28 \text{ to } 7.67 \text{ in.}$  Distance between beginning of slot and front edge of lever (F) - P. Position control lever - 37. Outer position control lever on lift - 38. Outer draft control lever on lift.

- Move outer lever (37) fully forward against spacer, connect link (adjusting length if necessary) and check that distance ( $L_{12}$ ) is 11 mm or .43 in.
- Secure link through jam nuts.
- If not, adjust lever cam (32, page 5) until distance ( $L_{14}$ ) is as specified.
- Secure cam (32) in position through dowel (31) and lock washer (33).

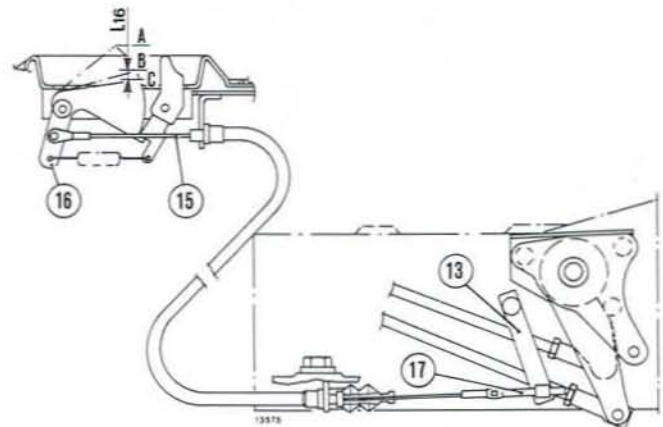
**5. Draft control link adjustment**

Test conditions:

- No additional weight on lower links.
- Engine mid acceleration.

Proceed as follows:

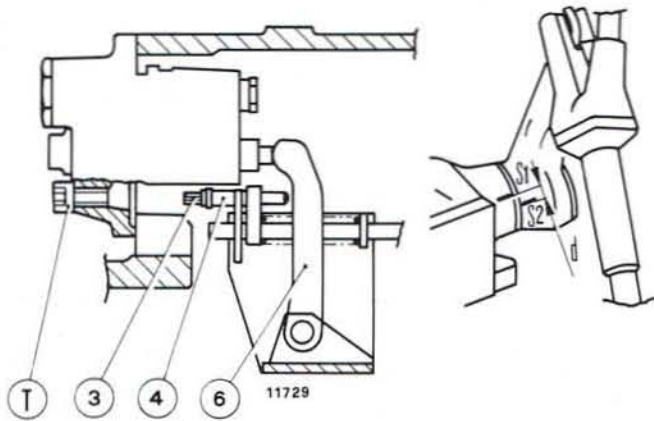
- Move lever (P) fully forward on quadrant (complete lowering).
- Move outer lever (38) fully back against spacer, and lever (F) forward on quadrant. Connect draft control link to levers (38) and (F). To adjust, alter length of link.
- Move draft control lever (F) to a distance  $L_{14} = 185 \text{ to } 195 \text{ mm}$  or  $7.28 \text{ to } 7.67 \text{ in}$  along quadrant. With lever (F) in this position, check that arms begin to raise.



**Adjusting Lift-O-Matic.**

A = Rest position of pushbutton (16) - B = Pushbutton position at start of control valve exhaust - C = Pushbutton latch position -  $L_{16} = 9 \text{ to } 12 \text{ mm}$  or  $0.35 \text{ to } 0.47 \text{ in.}$  Distance between pushbutton positions B and C - 13. Outer lever - 15. Cable - 16. Pushbutton - 17. Threaded end.

# HYDRAULIC LIFT UNIT: Lift



### Adjusting maximum lift arm travel.

$d = 2$  to  $3$  mm ( $0.08$  to  $0.12$  in). Distance between reference marks  $S_1$  and  $S_2 - S_1$ . Reference mark on lift body -  $S_2$ . Reference mark on lift arm -  $T$ . Plug - 3. Travel adjusting screw - 4. Adjusting screw jam nut - 6. Control valve actuating lever.

### 6. Lift-O-Matic adjustment.

**Note** - Release lever (13, page 7) to reactivate Lift-O-Matic.

Proceed as follows:

- With engine off, move draft and position control levers (F and P) fully forward on quadrant.
- Connect cable (15) and pushbutton (16) to outer lever (13) and secure pushbutton assy to mud-guard.
- Start engine and accelerate to mid position.
- Adjust cable (15) through end (17) so that when pushbutton (16) is actuated, lift arms start to lower when pushbutton is still short of its full stroke by a distance  $L_{16}$  of  $9$  to  $12$  mm or  $0.35$  to  $0.47$  in as measured at end of pushbutton (see Figure on page 7).

- Secure end (17) to outer lever (13) through associated clip.

### 7. Maximum lift arm travel adjustment with lift installed on tractor

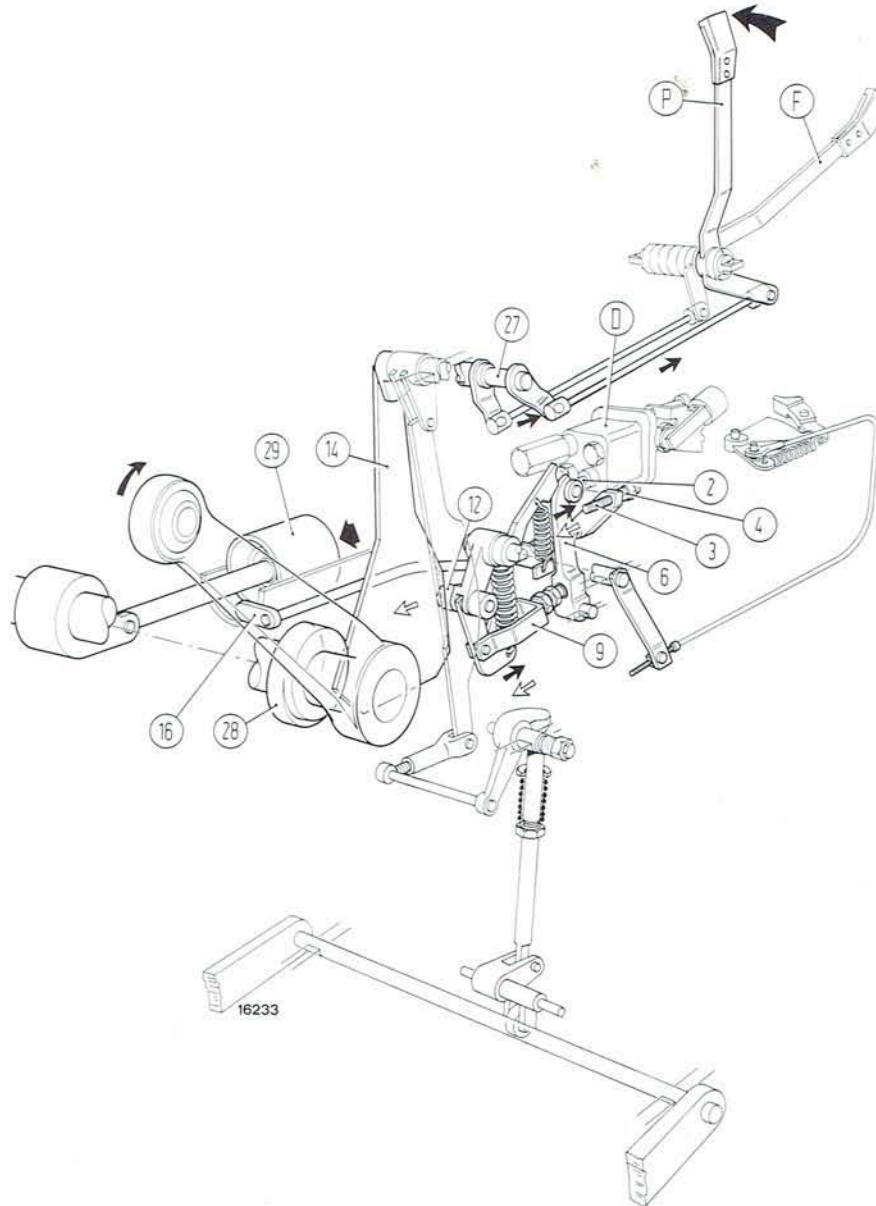
Test conditions:

- Apply  $50$  kg ( $100$  lb) to lower link swivel bushings.
- Bring oil temperature to  $50-60^\circ\text{C}$  ( $112$  to  $140^\circ\text{F}$ ).

Proceed as follows:

- Shut off engine, wait 5 minutes to allow oil in lift body to drain into rear drive housing, remove plug (T) and insert wrench **293870** in plug hole.
- Start engine and run at  $1200$  to  $1500$  rpm.
- Raise links by applying the Lift-O-Matic.
- Using wrench **293870** slacken jam nut (4) and back off limit travel adjusting screw (3) until relief valve cracks off.
- Apply two corresponding reference marks on lift body ( $S_1$ ) and on one lift arm ( $S_2$ ).
- Using wrench **293870**, tighten adjusting screw (3) until distance (d) between the two reference marks is  $2$  to  $3$  mm ( $0.08$  to  $0.12$  in).
- Tighten jam nut (4).
- Shut off engine, wait for approximately five minutes, remove wrench **293870** and reinstall plug (T).
- Operate lift through a few strokes to check that adjustment is correct.





**CONTROL VALVE LINKAGE OPERATION SCHEMATICS**

Refer to the text and illustrations provided on page 16, Sect. 501, for Mods. 466/566/666/766.

The only substantial differences in Mods. **55-66LP/60-66LP/70-66LP** control linkages with respect to the counterpart schematics for Mods. 466/566/666/766 are that the position/draft control levers (P) and (F) are connected to the linkage by adjustable rods and that the LIFT-

O-MATIC device is present.

The above schematic illustrating the implement lift stage during position control operation shows the different connection of control levers (P) and (F). The new schematics for implement lifting under draft control conditions and increased tractive effort are not given here as they are practically identical with those shown on page 16, Sect. 501, Mods. 466/566/666/766, the only differences being the connection of control levers (P) and (F) and the inclusion of the LIFT-O-MATIC.

**FUSES**

Six 8 Amp and two 16 Amp fuses, housed in box.

Fuses	PROTECTED CIRCUITS	Amp
1	Engine stopping solenoid	8
2	Turn signal and stop lights (tractor and trailer) with indicators, water temperature gauge, fuel gauge, air cleaner restriction indicator, battery charge indicator, low engine oil pressure indicator, parking brake indicator and sending unit.	8
3	Front R.H. parking light, rear L.H. parking light, license plate light, trailer L.H. parking light, parking light indicator.	8
4	Front L.H. parking light, rear R.H. parking light, trailer R.H. parking light, work light, instrument panel light.	8
5	Low beams.	8
6	High beams and indicator.	8
7	Hazard warning indicator and flasher, power point.	16
8	Thermostarter.	16



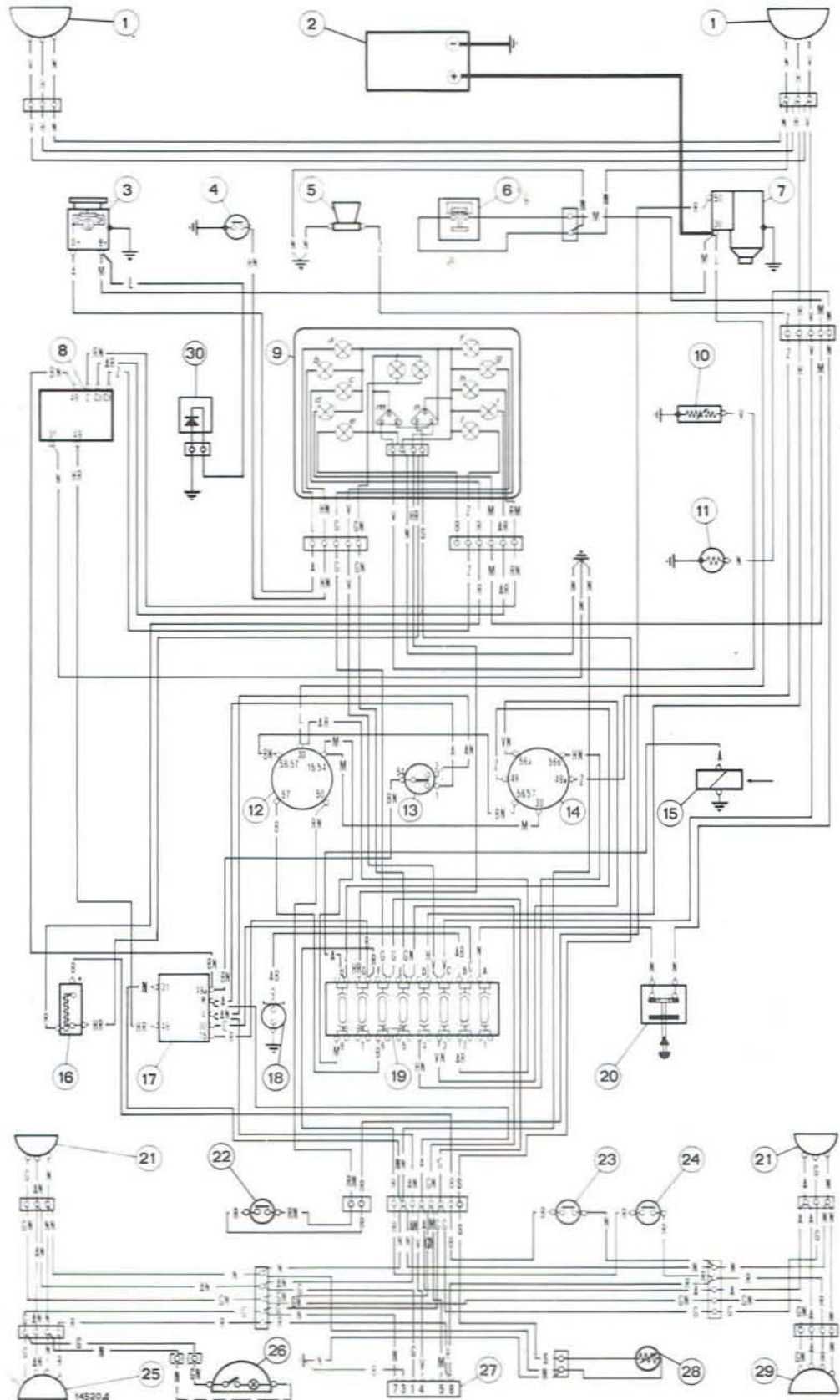
**Control Board.**

A. Fuse box - B. Starter switch - C. Lighting switch/Horn button - D. Lower point (unipolar) - E. Turn signal light switch - F. Hazard warning lights button switch and indicator - G. Thermostarter button switch.

# ELECTRICAL SYSTEM: Wiring Diagram

## WIRING DIAGRAM TRACTOR

1. Headlamps, asymmetric high/low beams
2. Battery.
3. Alternator.
4. Low engine oil pressure sending unit.
5. Horn.
6. Dry air cleaner restriction sending unit (optional).
7. Starter.
8. Hazard warning and turn signal electronic flasher.
9. Multi-function instrument cluster:
  - a. Battery charge indicator (red).
  - b. Low engine oil pressure indicator (red).
  - c. Dry air cleaner restriction indicator (red, optional).
  - d. Parking brake indicator (red).
  - e. Spare.
  - f. Parking lights indicator (green).
  - g. High beam indicator (blue).
  - h. Tractor turn signal indicator (green).
  - i. 1st trailer turn signal indicator (green).
  - l. 2nd trailer turn signal indicator (green).
  - m. Water temperature gauge.
  - n. Fuel gauge.
10. Water temperature gauge sending unit.
11. Thermostarter (optional).
12. Starter switch.
13. Turn signal switch.
14. Lighting switch and horn button.
15. Engine stopping solenoid.
16. Parking brake indicator flasher.
17. Hazard warning switch with indicator.
18. Single-conductor power point.
19. Fuse box.
20. Thermostarter control button (optional).
21. Front parking and turn signal lights.
22. Starter inhibitor switch.
23. Parking brake indicator sending unit.
24. Stop light switch.
25. Rear LH parking, turn signal, stop and license plate lights.
26. Seven conductor power point.
27. Work light and switch.
28. Fuel gauge sending unit.
29. Rear RH parking, turn signal and stop lights.
30. Overvoltage circuit breaker.



### CABLE COLOUR CODE

- |                |           |
|----------------|-----------|
| A = Light blue | M = Brown |
| B = White      | N = Black |
| C = Orange     | R = Red   |
| G = Yellow     | S = Pink  |
| H = Grey       | V = Green |
| L = Dark blue  | Z = Mauve |