

TA35/TA40

Operation - Safety - Maintenance

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WARNING

These vehicles are equipped with cylinders containing compressed nitrogen gas. Transportation of these vehicles by any method may require a special permit from the appropriate authority of the country involved. Consult your dealer for details.

All information, illustrations and specifications contained in this publication are based on the latest product information available at the time of publication. The right is reserved to make changes at any time without notice.

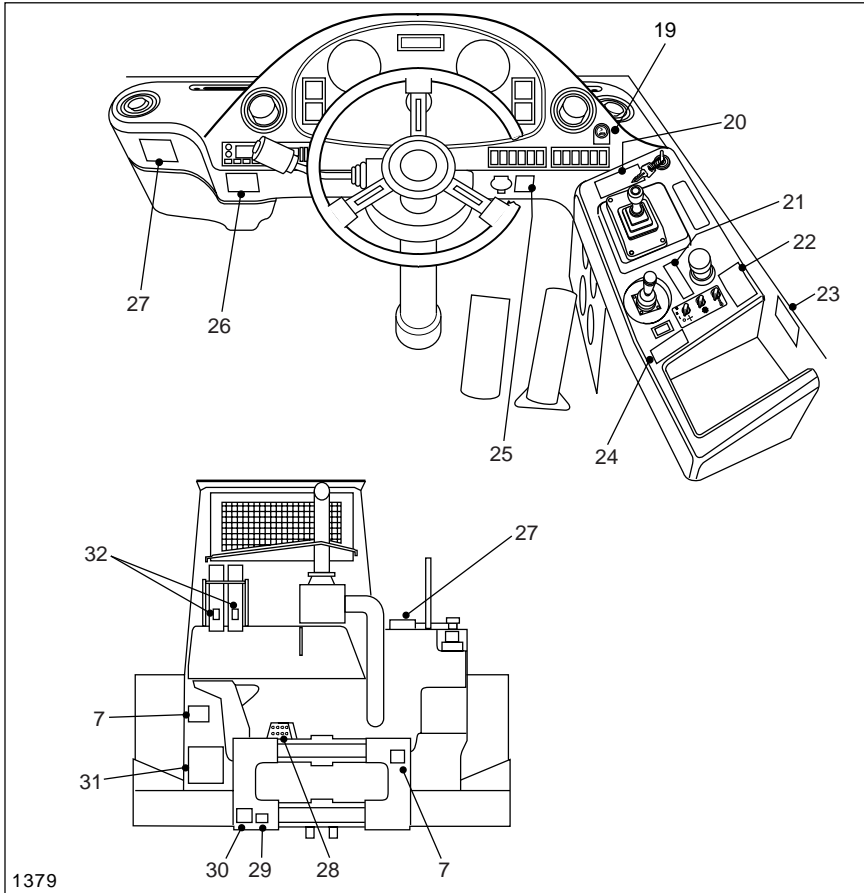
Continuing improvement and advancement of the design may cause changes to your vehicle which may not be included in this publication. Each publication is reviewed and revised, as required, to update and include these changes in later editions.

This Handbook contains lubrication and routine servicing instructions, most of which can be performed in the field. Service manuals containing repair/rebuild procedures can be obtained from your dealer.

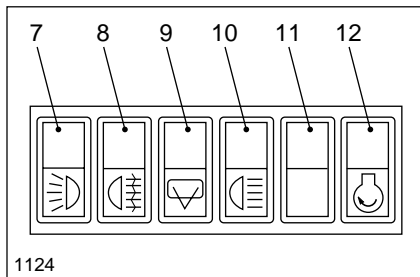
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- * Never check battery charge by placing metal objects across battery posts to avoid sparks at battery posts.
 - * Use jumper cables only as recommended. Improper use can result in battery explosion or unexpected vehicle motion.
 - * Never operate engine starter for more than 30 seconds and allow two minutes between cranking periods for cooling. An overheated starter could cause a fire.
 - * If electric coolant or lubricant heaters are used, be sure to follow heater manufacturer's recommendations for use to avoid electrical and/or fire hazards.

Mounting and Dismounting

- * Only use steps and hand holds provided to mount or dismount the vehicle. Do not grasp steering wheel.
- * Always face the access system and maintain at least three points of support to mount or dismount the vehicle.
- * Always use care when mounting the vehicle with oil covered, frosted, or iced fenders, decks, hand holds or steps.
- * Never mount or dismount a moving vehicle. Never jump off the vehicle.



- 19.** Cigar Lighter 24 V
- 20.** Transmission Shift Control
- 21.** Park/Emergency Brake Control
- 22.** Differential Lock Precautions
- 23.** Document Holder
- 24.** Hydraulic Control Lever
- 25.** Hand Lamp
- 26.** Back Alarm
- 27.** Pre-operating Instructions
- 28.** Hydraulic Oil Recommendations
- 29.** Remote Lube and Pressure Points
- 30.** CE Certification
- 31.** Machine Serial Plate
- 32.** Service Instruction Plate
- 33.** Accumulator Precautions



7. Sidelight and Headlight - Press bottom of switch to the first position to operate side, tail and panel lights. The lights in the other switches will illuminate. Press switch to the second position to operate the headlights. To switch lights off; press the top of the switch.

8. Rear Fog Lamp (Optional) - Pressing the bottom of the switch when the headlights are on will operate the high intensity rear fog lamp for use in conditions of poor visibility. To switch off; press top of switch.

9. Rear Screen Wiper and Washer Switch - Press bottom of switch to operate the rear screen wiper. Press switch again for wash. To switch off; press top of switch.

10. Rear Work Light (Optional) - Press bottom of switch to operate the work lights to illuminate the body. To switch off; press top of switch.

11. Position Unused.

12. Diagnostic Request/Stop Engine Override Switch - Operates as a diagnostic request switch when:

a - the engine is not running and ignition is 'On'.

b - the engine is idling and not in an engine protection condition.

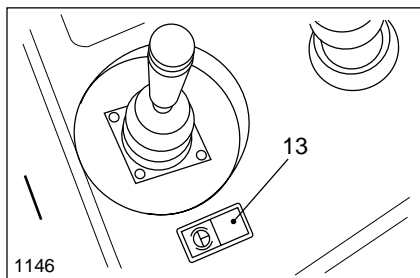
Pressing and releasing the switch will flash out the engine codes. Pressing the switch a second time will stop the engine codes flashing.

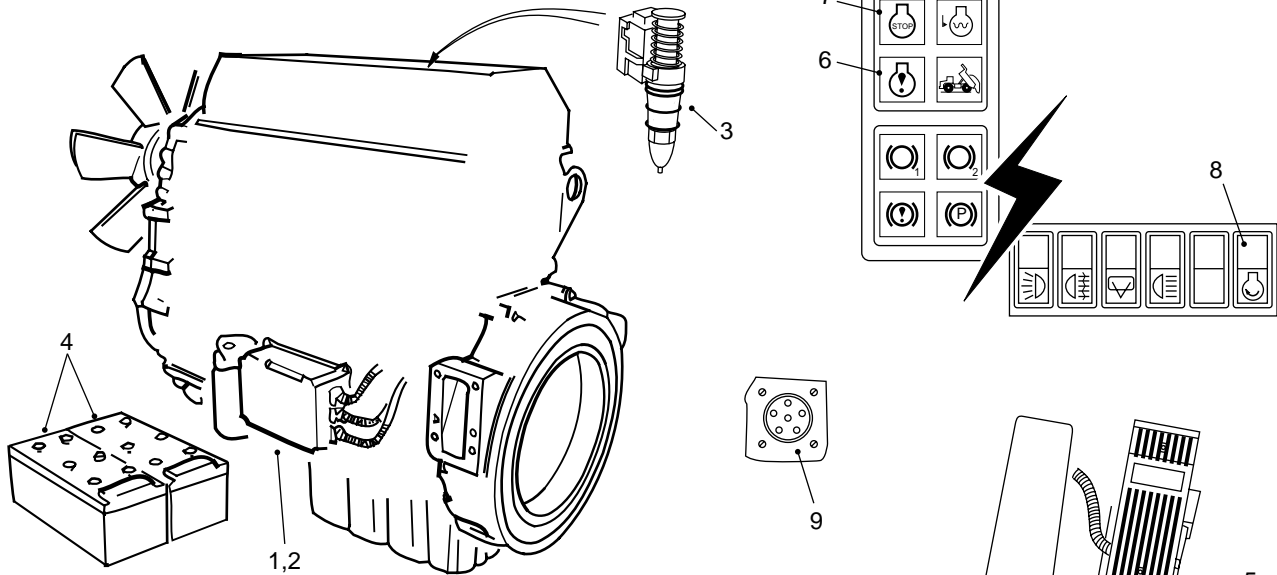
Note: Inactive codes are displayed on Check Engine Light and active codes are displayed on Stop Engine Light. Code 25 means no codes present.

Operates as a Stop Engine Override Switch when the engine is in a rampdown protection mode for any of the following:

- Low Coolant Level
- High Coolant Temperature
- Low Oil Pressure
- High Oil Temperature

13. Retarder Switch - Pressing the bottom of the switch will request and engage the transmission retarder, provided the transmission is in 'lockup'. To disengage retarder; press the top of the switch.





- 1 - Electronic Control Module (ECM)
- 2 - Programmable Read Only Memory (PROM)
- 3 - Electronic Unit Injectors (EUI)
- 4 - Batteries
- 5 - Electronic Foot Pedal

- 6 - Check Engine Light
- 7 - Stop Engine Light
- 8 - Diagnostic Request/Stop Engine Override Switch
- 9 - Diagnostic Test Point

DDEC IV DIAGNOSTIC CODES

DDEC Code # (Flashed)	PID	SID	FMI	DDEC Description
81	98	-	3	Oil level sensor input voltage high
81	101	-	3	Crankcase pressure sensor input voltage high
81	164	-	3	Injection control pressure circuit voltage high
81	173	-	3	Exhaust temperature sensor input voltage high
82	-	20	4	Timing actuator (dual fuel) input voltage low
82	98	-	4	Oil level sensor input voltage low
82	101	-	4	Crankcase pressure sensor input voltage low
82	164	-	4	Injection control pressure circuit voltage low
82	173	-	4	Exhaust temperature sensor input voltage low
83	98	-	0	Oil level high
83	101	-	0	Crankcase pressure high
83	173	-	0	Exhaust temperature high
83	173	-	4	Exhaust temperature sensor input voltage low
83	73	-	0	Pump pressure high
84	98	-	1	Oil level low
84	101	-	1	Crankcase pressure low
85	190	-	0	Engine overspeed
86	73	-	3	Pump pressure sensor input voltage high
86	108	-	3	Barometric pressure sensor input voltage high
87	73	-	4	Pump pressure sensor input voltage low
87	108	-	4	Barometric pressure sensor input voltage low
88	109	-	1	Coolant pressure low
88	20	-	1	High range coolant pressure low
89	95	-	0	Fuel restriction high
89	111	-	12	Maintenance alert coolant level fault

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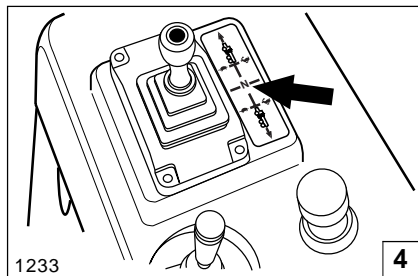
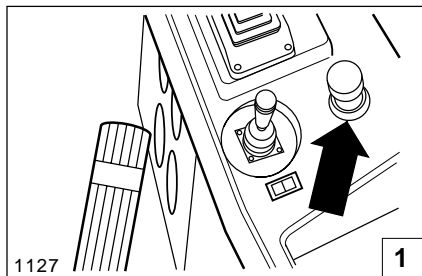
DESCRIPTION OF FAULT CODES ERGOCONTROL

Code	Operator Action	Mode	Meaning	Service Action
F 1 F 3 F 5 F 6	Stop	F1-F5: No operation	General fault	(F6) Start AEB, else replace TCU
Abbreviations:		TCU = Transmission Control Unit AEB = Self Calibration Clutches		

Operator Warning Codes

Code	Meaning	Action
W E	Will show when engine speed is above 2 500 rev/min.	Reduce engine speed, apply brakes / retarder
L R	Limp home in reverse	Shows as a consequence having a 'B' code. See above
L F	Limp home in forward	Shows as a consequence having a '7, 8 or B' code. See above
W S	Warning sump	High oil temperature in sump. Reduce engine power and speed
W R	Warning retarder temperature	Reduce vehicle speed, apply brakes
N N	Selector not in neutral position when switched on	Code clears by moving selector to neutral
E E	TCU heavily damaged or program faulty	No drive, system completely disabled

Note: Operator Warning Codes give pre-warning indication of a potential fault



Starting the Engine

Attention to the warning lights and instruments when starting the engine, and operating, will help the operator monitor the vehicle systems and components.

1. Make sure park-emergency brake control is in the 'PARK' position.

2. Turn master switch to 'ON' position.

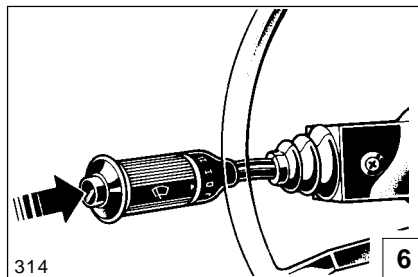
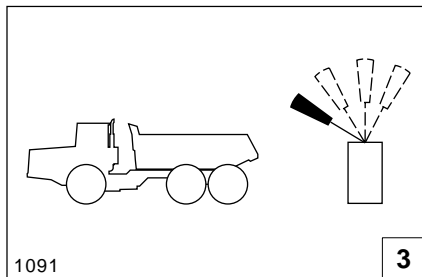
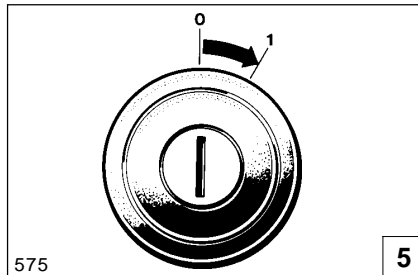
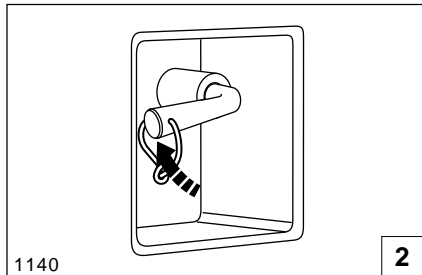
3. Make sure the body control lever is in the 'FLOAT' position.

4. Make sure the transmission gear shift control is in the 'NEUTRAL' position.

5. Insert switch key and turn clockwise to position '1' to switch on the ignition. Press warning light test switch to test operation of warning lights.

6. Press horn control to sound horn.

Note: Always sound horn before starting engine or operating any control.





5 - Working the Truck

Inspection

Perform all pre-starting and post-starting checks described in this Handbook. Pay particular attention to the function of all instruments and lights, and make any repairs necessary.

Note: Improper tyre inflation during over-the-road operation can cause rapid tyre deterioration by overheating. Tyre pressures increase with heat. Always check pressures while tyre is cold. Consult your tyre dealer for proper pressures and tyre speed limits for roading.

Check the inflation pressures of all tyres, while cold, with an accurate tyre pressure gauge. Inflate tyres if necessary, while cold, to the recommended pressure for 'ROADING'. Inspect all tyres thoroughly and carefully for stones or other debris embedded in the treads or carcasses. Inspect for cuts, bruises, burned beads abnormal wear and damaged wheels rims. Replace any damaged or excessively worn tyres.

Check all hoses, drain cocks, fuel level check cocks, and other potential sources of leaks. Make sure that all leaks are repaired and that all drain cocks are sufficiently tightened to avoid subsequent loosening. Make sure that all warning flags, oversize load signs etc. are in place and secure.

Clean all glass and adjust the seat for proper operation of all controls.

Check the lights, horn, windscreen wipers, heater, defroster, headlight dip control, and all controls for proper operation.

Make sure the truck body is empty, fully lowered and the body control lever is in the 'FLOAT' position. If spill guard extension is fitted, this should be removed and placed inside body.

Make sure the differential lock switch is in the 'OFF' position.

Shift transmission through all gears while slowly accelerating engine.

LUBRICATION AND SERVICE CHART

Interval Hours	Ref. Points	Identification	Service Instructions	No. of Points	Lubricant	Service Quantities
10	1	Engine	Check oil level. Add if low.	1	EO	As required
	2	Transmission	Check oil level. Add if low.	1	*	As required. See Note 3
	3	Hydraulic Tank	Check oil level. Add if low.	1	HO	As required
	4	Hydraulic Oil Filter Indicator	Check. Replace element if required.	1		
	6	Radiator Top Tank	Check coolant level. Add if low.	1		
	8	Fuel Tank	Check fuel level. Add if low.	1		As required
	-	Fuel Lines	Check for leaks.			
	-	Turbocharger	Check for leaks.			
	-	Hydraulic Systems	Check for proper operation.			
	9	Air Filter Restriction Gauge	Check. Replace element if required.	1		
	-	Air Cleaner Vacuator Valve	Check for proper operation.	1		
	-	Tyres	Check condition and pressure.	6		Refer to Page 3
-	Transmission Oil Gauge	Check temperature readings.				
28	Oscillation Bushes	Lube.	2	EP, NLGI	See Note 1	
-	General	Check for debris, leaks and damage.				
50	10	Steering Cylinder Pins	Lube.	4	EP, NLGI	See Note 1
	11	Body Cylinder Pins	Lube.	4	EP, NLGI	See Note 1
	12	Suspension Beam Bushings	Lube.	2	EP, NLGI	See Note 1
	13	Body Hinge Pins	Lube.	2	EP, NLGI	See Note 1
	14	Wheel Rim Nuts (GKN Axles)	Check torque.	138		540 Nm (400 lbf ft)
	14	Wheel Rim Nuts (ZF Axles)	Check torque.	138		730 Nm (540 lbf ft)
	15	Cab Ventilation Filter	Inspect and clean if required.			
	18	Drive Belts	Check tension. Adjust if required.			See Engine Manual
-	Battery Electrolyte	Check level. Add if low.	2		As Required.	
150	-	Engine Air Cleaner	Check. Clean inlet screen.	1		
250	1	Engine	Drain oil and refill.	1	EO	See Page 13
	17	Engine Oil Filters	Replace.	2	EO	See Page 13
	-	Transmission Breather	Clean if required.	1		
	19	Wheel Planetaries	Check oil level. Add if low.	6	EPL	As required
	20	Differentials	Check oil level. Add if low	3	EPL & LZ	As required
	21	Driveline Universal Joints	Lube.	10	*EP, NLGI	See Note 1
	22	Driveline Slip Joints	Lube.	5	*EP, NLGI	See Note 1
	23	Primary Fuel Filter	Replace.	1		

Recommended Lubricants notes

* Capacities given are approximate, work to dipstick, sight gauges or level plugs.

** Refer to the 'Recommended Lubricants Table' for the different applications. DO NOT use on the Articulation or Oscillation bearings.

Note 1 - Operation below the minimum temperatures listed for the oil used without proper preheat or warm-up results in greatly reduced transmission life. Proper warm-up requires 20 minutes minimum operation in neutral (with engine at part throttle) before operating the transmission in gear.

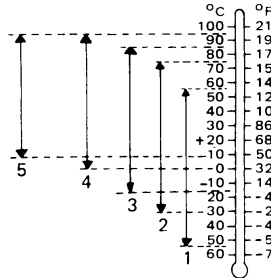
Note 2 - Hydraulic Transmission Oil meeting Specification EMS19058 is suitable for use in the hydraulic system.

Note 3 - Axles have limited slip differentials. If use of standard SAE 90 oil results in very loud noise and jerking of the wheels when driving slowly round sharp corners, an EP oil with limited slip additives should be used.

Note 4 - Automatic Transmission Fluids (ATF) may only be used when the ambient temperature is less than -10° C (14° F). Should the temperature increase, it is necessary to switch to engine oil.

LUBRICANT GRADE SELECTION GUIDE AT AMBIENT (START-UP) TEMPERATURE

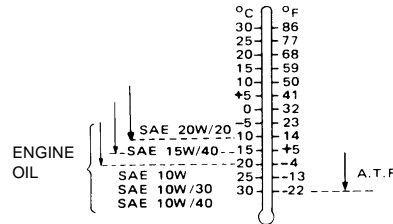
HYDRAULIC OIL



	SAE	API CODE	MIL-SPEC
1	-	-	MIL-H-5606A
2	DEXRON Auto Trans. Fluid		
3	10W	CC/CD	MIL-L-2104 B/C
4	20W/20	CC/CD	MIL-L-2104 B/C
5	30	CC/CD	MIL-L-2104 B/C

584

TRANSMISSION OIL



586

(See Note 4)

Note: Consult your lubricant supplier for correct viscosity of lubricant when ambient temperatures are consistently above or below those listed.

TECHNICAL DATA - TA40

ENGINE

Make/Model Detroit Diesel Series 60
Type Four cycle diesel, turbocharged with air-to-air
charge cooling, water-cooled. Electronic management.
Gross power to SAE J1995 298 kW (400 hp, 406 PS)
Net power at 2 100 rev/min 280 kW (375 hp, 380 PS)

Note: Gross power rated to SAE J1995 Jun 90. Engine
emission meets USA EPA/CARB MOH 40 CFR 89 and
proposed EU non-road mobile machinery directive.

Maximum Torque 1 966 Nm (1 450 lbf ft) at 1 200 rev/min
Number of cylinders/configuration 6 cylinder, in line
Bore and stroke 130 x 160 mm (5.12 x 6.30 in)
Total Displacement 12.7 litres (774 in³)
Injector 10 mm
Air cleaner Dry type, double element
Starting Electric
Maximum Speed (No load) 2 225 rev/min
Maximum Speed (Full load) 2 100 rev/min
Idle Speed 700 rev/min
Maximum Operating Slope 30° (57% Grade)

TRANSMISSION

Make/Model ZF 6WG 310 Automatic
with manual override. The transmission consists of a torque
converter close-coupled to a 6 speed gearbox with integral
output transfer gearing. Automatic shifting in gear ranges
3 to 6, with kickdown feature. Lockup in all forward gears. A
torque-proportioning output differential transmits drive
permanently to front and rear axles. This differential may be
locked by the driver for use in difficult traction conditions.
Integral hydraulic retarder.

Pressures:

Main 16 + 2 bar (232 + 30 lbf/in²)
Lockup (Wk) 14 + 1 bar (190 + 15 lbf/in²)
Converter 'IN' 7.6 bar (110 lbf/in²) at 2 300 rev/min
Converter 'OUT' 4.8 bar (70 lbf/in²) at 2 300 rev/min
Converter Relief Valve 8.5 bar (123 lbf/in²)
Retarder 6 bar (87 lbf/in²) Maximum

Temperatures:

Normal 80° - 110° C (176° - 230° F)
Maximum 120° C (248° F)

Stall Speed 1 835 ± 50 rev/min

Ratios:

Torque Converter 1.84:1
Transmission Refer to table below

Note: During reversing operations it is recommended to
reduce engine speed, use only 1st or 2nd gear and never
exceed 10 km/h (6.2 mile/h).

		Forward					
Gear		1	2	3	4	5	6
Ratio		6.30	3.99	2.63	1.73	1.10	0.72
Max. Speed		50km/h (31 mile/h)					
		Reverse					
Gear		1	2	3			
Ratio		6.30	2.63	1.73			
Max. Speed		20km/h (12.5 mile/h)					

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