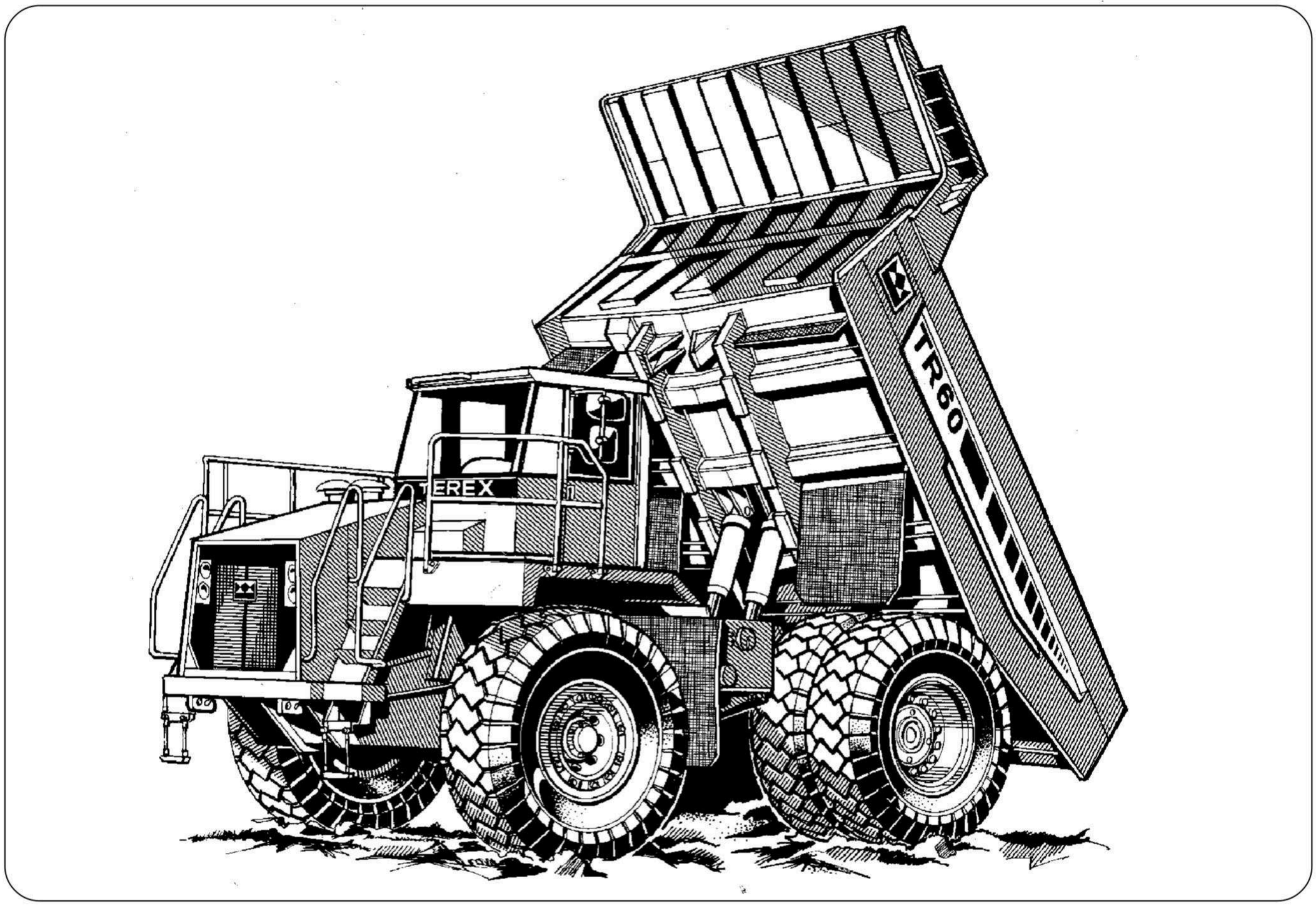
TEREX

TR60
Off-Highway Truck
Maintenance Manual



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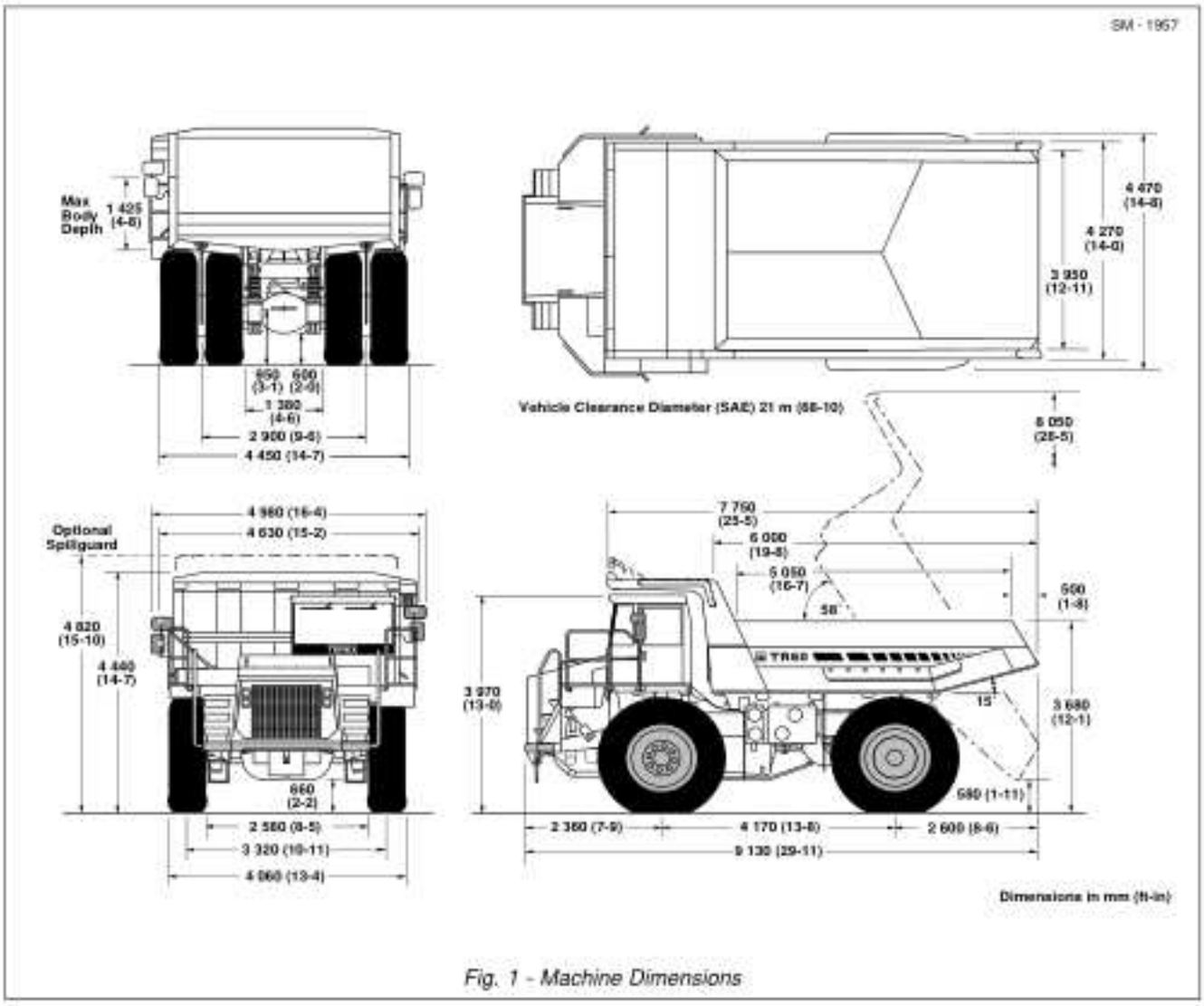


Fig. 1 - Machine Dimensions

ENGINE

Make/Model ..... Cummins QSK19-C650
Type ..... 4 Cycle, Turbocharged/Low Temperature Aftercooled. Electronic Management
Gross Power 1 500 through 2 100 rev/min ..... 485 kW (650 hp, 659 PS)
Net Power 1 500 through 2 100 rev/min ..... 462 kW (620 hp, 628 PS)

Note: Power ratings to SAE J1995 Jun 95. Engine emission meets USA EPA/CARB MOH 40 CFR 89 and EU NRMM (non-road mobile machinery directive).

Maximum Torque ..... 3 084 Nm (2 275 lbf ft) at 1 300 through 1 500 rev/min
Number of Cylinders/Configuration ..... 6, in line
Bore x Stroke ..... 159 x 159 mm (6.25 x 6.25 in)
Total Displacement ..... 18.9 litres (1 150 in³)
Starting ..... Electric
Maximum Speed, Full Load ..... 2 100 rev/min
Maximum Speed, No Load ..... 2 350 rev/min
Idle Speed ..... Self Adjusting
Safe Operating Angle ..... 30°/60% Grade

TRANSMISSION

Make/Model ..... Allison M6600AR automatic electronic control with soft shift feature. Remote mounted in the frame. Integral TC 682 torque converter and planetary gearing. Six speeds forward, two reverse. Automatic converter lockup action in all speed ranges. With body up, gear range is limited to 1st forward only. Downshift inhibitor. Intregal hydraulic retarder.

Speeds With 24.00 R 35 Tyres						
Forward						
Gear	1	2	3	4	5	6
Ratio	4.00	2.68	2.01	1.35	1.00	0.67
km/h	9.5	14.2	18.9	28.2	38.1	57.0
mile/h	5.9	8.8	11.8	17.5	23.7	35.5
Reverse						
Gear	1	2				
Ratio	5.12	3.46				
km/h	7.4	11.0				
mile/h	4.6	6.8				

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MECHANICAL TROUBLESHOOTING CHART		
CONDITION	REASON	REMEDY
C - Heavy metal debris found in oil	Transmission internal failure	Completely disassemble, clean and repair transmission. Replace filters and clean lines and oil cooler.
D - Coolant found in oil	Transmission oil cooler leaking	Completely disassemble and thoroughly clean transmission. Replace all friction faced clutch plates. Repair or replace oil cooler. Replace filters and clean external lines.
E - Transmission will not operate in any range regardless of selector position	Loss of electrical power	Refer to Electronic Troubleshooting
	Internal mechanical failure	Overhaul transmission
	Driveline failure	Check transmission input and output
	Low oil level	Restore proper oil level
	Low main pressure	Refer to condition 'V'
F - Transmission continues in the same forward gear regardless of selector position	Loss of electrical power	Refer to Electronic Troubleshooting
G - Shifting is erratic		Refer to Electronic Troubleshooting
H - Transmission operates only in first, neutral and reverse		Refer to Electronic Troubleshooting
I - Transmission shifts to neutral during reverse operation, but will operate normally in all other ranges		Refer to Electronic Troubleshooting
J - Vehicle operates in reverse and moves backwards in neutral when engine is accelerated, but stalls in all other gears when engine is accelerated - Electronic Troubleshooting OK	Reverse clutch has failed (won't release)	Overhaul transmission
K - Vehicle operates in first and second gears and moves forward in neutral when engine is accelerated, but stalls in all other gears when engine is accelerated - Electronic Troubleshooting OK	First and second gear clutch failed (won't release)	Overhaul transmission
L - Vehicle operates in third and fourth gears and moves forward in neutral when engine is accelerated, but stalls in all other gears when engine is accelerated - Electronic Troubleshooting OK	Third and fourth gear clutch failed (won't release)	Overhaul transmission

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2. Immediately after cleaning, dry all parts, except bearings, with compressed air, or lint-free cloth. Bearings are better left to air dry, then inspected and oiled thoroughly with gear lubricant for protection from corrosion.

3. With the parts cleaned, coat parts immediately with light oil to prevent corrosion. If parts are not to be assembled immediately, treat them with a good rust preventative and wrap them with treated paper or other suitable material designed to prevent corrosion.

4. Replace all gaskets, 'O' rings and seals with new parts.

5. Before installing the differential assembly to the banjo, clean the inside and outside of the banjo housing to remove any foreign material.

6. Oil seal (12) rides on a special sleeve (6), which is on yoke (5) to provide a smooth contact surface. If the sleeve is rough or worn, pull it from the yoke and install a new one. Heat the new sleeve to 177 - 205° C (350 - 400° F) in oil to expand it for installation. If oil heating equipment is not available, heat the bushing evenly to 205° C (400° F). This takes about 1 minute using a torch with a heating tip. Use a Tempilstik or other temperature gauge to make sure sleeve (6) is hot enough. Slide heated sleeve on the yoke and tap lightly with a hammer to seat it.

7. Examine bearing cap bushings (20) for wear or damage. Replace as necessary.

8. Inspect all gears, pinions and splines for cracked or broken teeth, excessive wear, and pitted or scored surfaces. Repair or replace as necessary.

Note: If either ring gear (29) or pinion gear (15) is defective, both gears must be replaced, because they are serviced only as a matched set. This set is identified by a serial number on the OD of ring gear (29) and outer face of pinion gear (15). It is also advisable to replace side gears (34) or spider pinion gears (36) in matched sets only, because a newer gear installed to operate in conjunction with an older, worn gear tends to carry an uneven portion of the load. This creates an excessive amount of stress on the new gear.

9. Check for pitted, scored or worn thrust surfaces of differential case halves, spider trunnions and thrust washers. It is also advisable to replace thrust washers in sets, as the use of a combination of old and new washers may cause premature failure.

10. Inspect carrier housing (19), ring gear (29), plain case (38) and retainer (9) for bore damage, cracks and wear. Replace as necessary.

11. Check the amount of run-out on the machined surfaces of retainer (9). The outer machined surface on the hub of the bearing cage must be concentric with the bearing cup bore within 0.05 mm (0.002 in) total indicator reading (T.I.R.).

12. The outer machined surface (OD) on retainer (9) must be concentric within 0.05 mm (0.002 in) T.I.R. with the surface into which oil seal (12) fits.

13. The threads and bores of bearing caps (22) and carrier housing (19) must be concentric within 0.127 mm (0.005 in) T.I.R. and must be square with the pinion bore within 0.08 mm (0.003 in) when checked at points 254 mm (10 in) from the centre line of the pinion bore.

Note: Bearing caps (22) and carrier housing (19) can only be replaced as an assembly.

14. The machined mating surfaces of plain case (38) and flanged case (28) must be square with the axis of the cases within 0.08 mm (0.003 in) T.I.R.. The mating diameters of the cases must also be concentric within 0.08 mm (0.003 in) T.I.R..

ASSEMBLY

Numbers in parentheses refer to Fig. 1.

> ⚠ **WARNING**
> **To prevent personal injury and property damage, be sure lifting equipment is properly secured and of adequate capacity to do the job safely.**

Pinion Cage Group

Note: During assembly and installation, make sure that mated, punch-marked or otherwise identified parts are returned to their original positions, if still serviceable.

1. Determine the required shim pack (18) thickness so as to give the proper gauging distance within 0.08 mm (0.003 in) etched on pinion gear (15) tail shaft (see Fig. 6) as follows:

Note: The OD of a bearing cup (17) can be ground to 162 - 161 mm (6.372 - 6.371 in) to provide a slip fit

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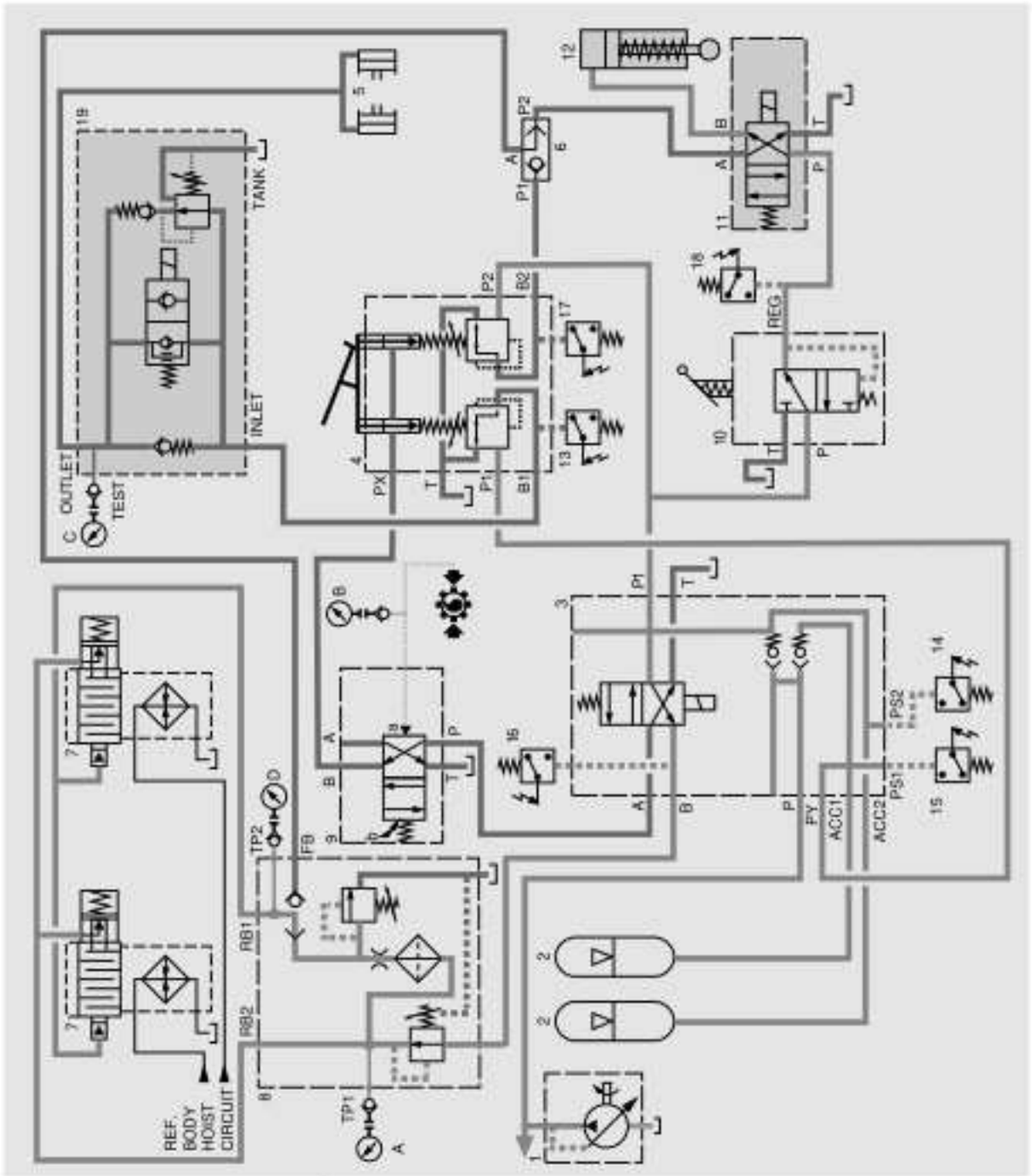


Fig. 7 - Braking System Schematic - Engine Running, Transmission Retarder Applied

COMPONENTS

1 - Steering Pump
2 - Accumulators
3 - Brake Manifold Valve
4 - Treadle Valve
5 - Front Brake Callipers
6 - Shuttle Valve
7 - Oil Cooled Disc Brakes
8 - Monoblock Brake Valve
9 - Directional Control Valve
10 - Retarder Control Valve
*11 - Directional Control Valve
*12 - Transmission Retarder Cylinder
13 - Stop Light Pressure Switch
14 - Rear Brake Accumulator Pressure Switch
15 - Front Brake Accumulator Pressure Switch
16 - Parking Brake Pressure Switch
17 - Lockup Drop Out Pressure Switch
18 - Retarder Light Pressure Switch
*19 - Pressure Reducing Valve

* - Optional Components

PRESSURE TEST POINTS

A - Park Brake Pressure
B - Transmission Pressure
C - Front Service Brake Pressure
D - Rear Service Brake Pressure, Residual Brake Pressure and Retarder Pressure.

COLOUR CODES

Red - Pressurized Oil
Blue - Exhaust or Return Oil
Green - Intake Oil
Orange - Pilot Pressure
Yellow - Static Oil

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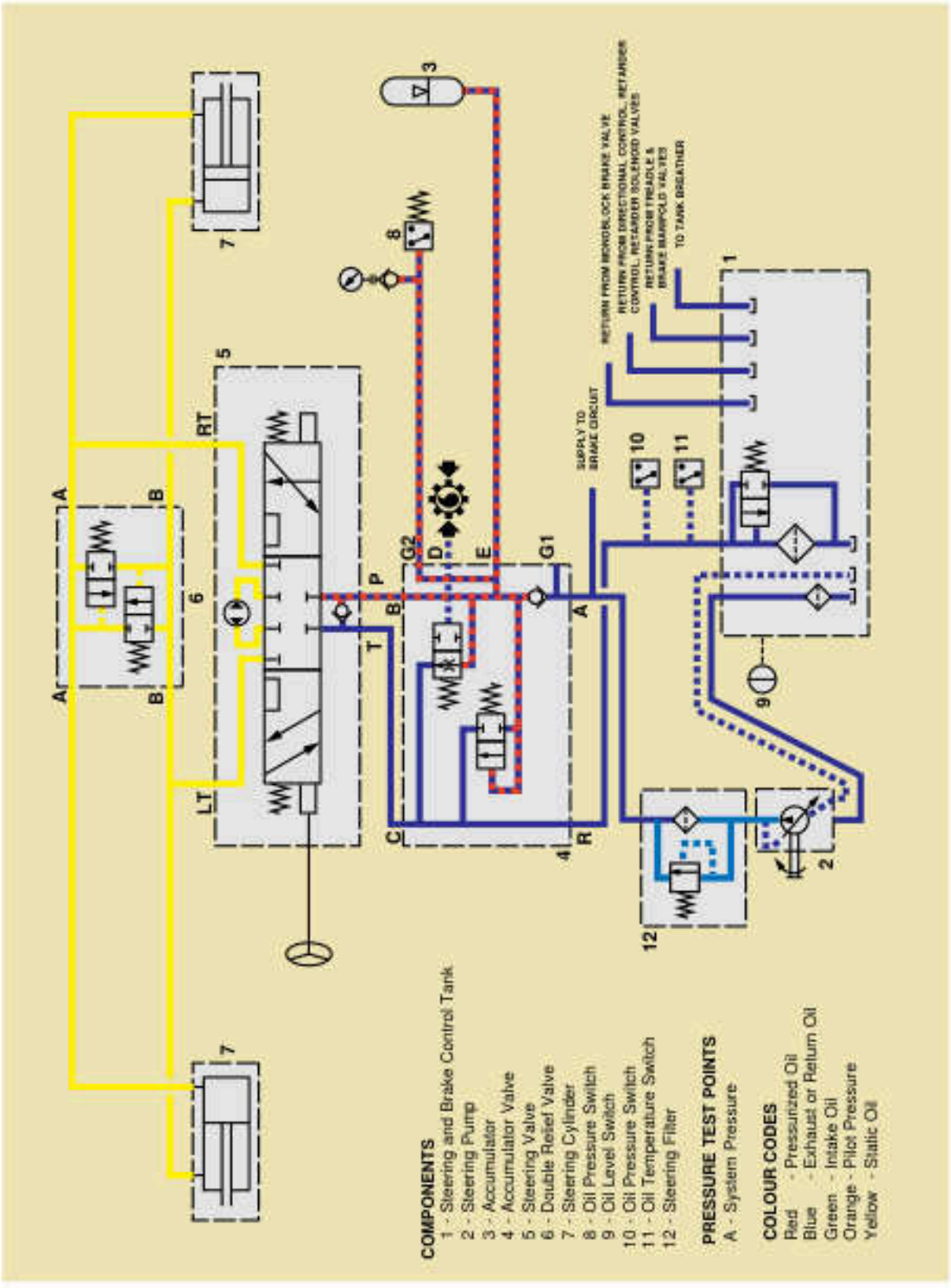


Fig. 2 - Steering System Schematic - Engine Shutdown

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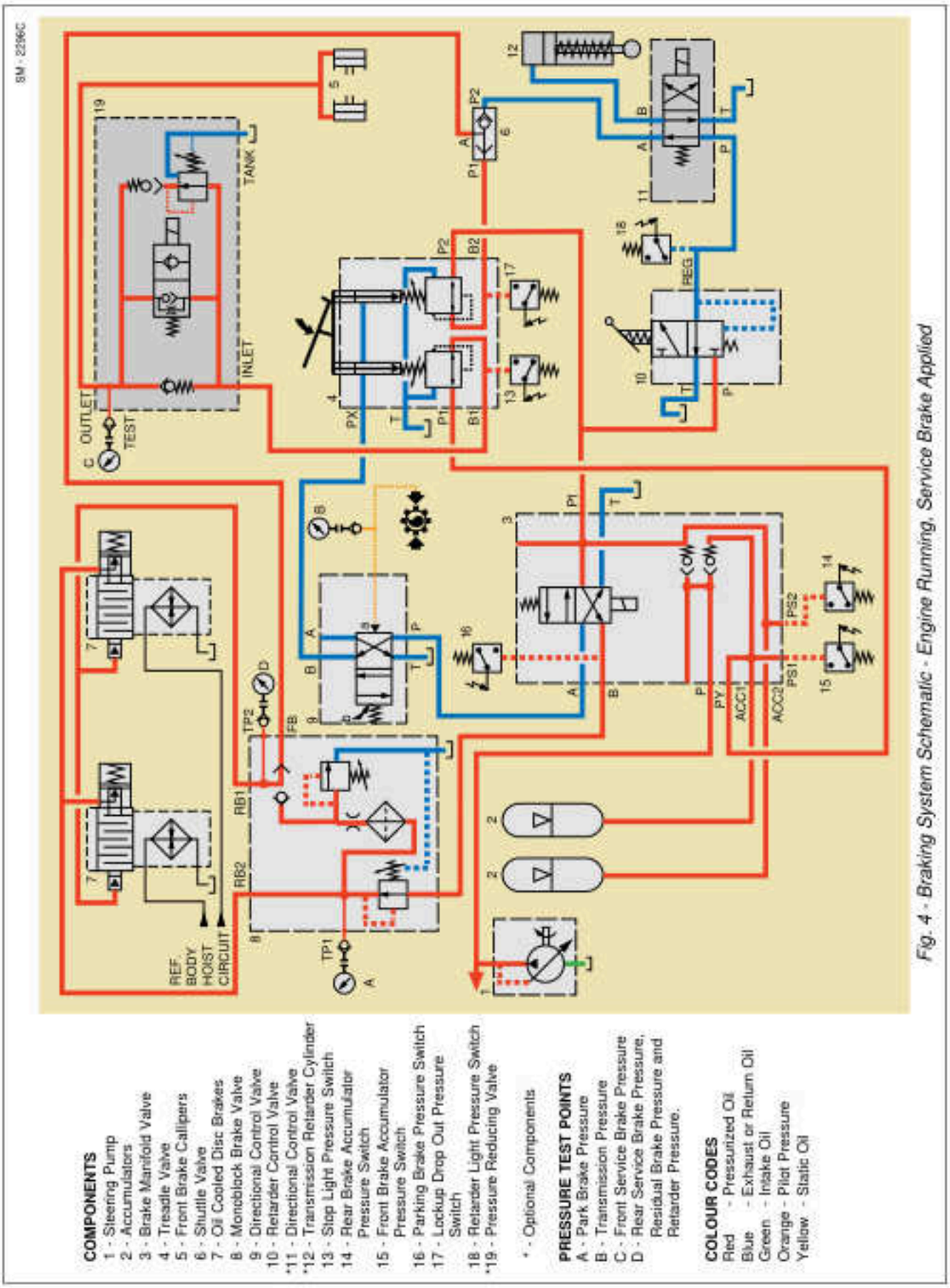


Fig. 4 - Braking System Schematic - Engine Running, Service Brake Applied

COMPONENTS

1 - Steering Pump
2 - Accumulators
3 - Brake Manifold Valve
4 - Treadle Valve
5 - Front Brake Calipers
6 - Shuttle Valve
7 - Oil Cooled Disc Brakes
8 - Monoblock Brake Valve
9 - Directional Control Valve
10 - Retarder Control Valve
*11 - Directional Control Valve
*12 - Transmission Retarder Cylinder
13 - Stop Light Pressure Switch
14 - Rear Brake Accumulator Pressure Switch
15 - Front Brake Accumulator Pressure Switch
16 - Parking Brake Pressure Switch
17 - Lockup Drop Out Pressure Switch
18 - Retarder Light Pressure Switch
*19 - Pressure Reducing Valve

* - Optional Components

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