جهان کمپرسور ۱۳۶۲

Welcome to Familiarization Program of Ashok Leyland Industrial Engines for G Drives

Program Content

- General Specifications
- Design Features
- Engine System
- Valve Setting
- Fuel Pump Removal & Fitment
- Maintenance Checks

Technology

- Inline Cylinders
- Water Cooled
- Four-Cycle
- Naturally Aspirated
- Direct Injection
- Metric Dimensions

Ratings

Engine Model	Engine Model	Engine Model	Electrical Output @ 1500 RPM	Typical Alternator output
ALGP WO 4 D	Genset*	Natural	24 kWe	30 kVA
AL GP 400	Genset*	Natural	50 kWe	62.5 kVA
ALGP 402	Genset @	Natural	50 kWe	62.5 kVA

*** Gensets Supplied by Super Nova**

@ Gensets Supplied by Jeevan Diesels

Ashok Leyland Engine Specifications
ALGP WO4D

AL - Ashok Leyland

GP - Genset Power

WO - Water Cooled Hinno Design

4 - Number of cylinders

D - Direct Injection

Aspiration - Natural

Bore x Stroke 104 x 118

Compression Ratio - 17.9 :1

Firing Order : 1 - 3 - 4 - 2

Ashok Leyland Engine Specifications
ALGP 400 / 401/402

AL - Ashok Leyland

GP - Gen set Power

400 - Cubic Inch Displacement

6 - Number of cylinders

Aspiration - Natural

Bore X Stroke - 107.18 X 120.65 MM

Compression Ratio - 16:1

Firing Order : 1 - 5 - 3 - 6 - 2 - 4

Design Features

Cylinder Block : The cylinder block has many innovative design features. High grade cast Iron with dry cylinders, and the crankcase is enclosed from below the oil sump.

Cylinder liners : Dry, pre finished, soft type made of cast iron.

Cylinder head : A single piece made of high grade cast iron , accommodating all cylinders, fitted with replaceable pre finished valve seats and valve guides.

Crankshaft : High tensile strength steel forging with induction hardened pins and journals for high fatigue resistance. Dynamically balanced in all planes.

Design Features

Vibration Damper - Mounted on on the front end of the crankshaft. Proper care is to be taken while handling the damper.

Alfin Pistons - Reentrant bowl type madeof special aluminum alloy with cast iron insert to form the first compression ring.

Main & Small End bearing shells - Thin walled , with aluminum and tin or lead bronze linings for sliding surfaces.

Camshaft - Made entirely of steel, mounted in the cylinder block in four replaceable bushings. Drive is supplied from the front end of engine through gear train.

Valve - Made of high grade alloy steel. - Chrome plated and Stellited.

Fuel System

Standard MICO high pressure fuel system is used on these engines.

For ALW04 D

Injection Pump - PES 4A 95D 320 RS 3545
Governor - RSV 300 …750 A1 C 1309 R
Nozzle - 9 430 034 290
Nozzle opening pressure bar **220 -228**

For ALGP 400 / 402

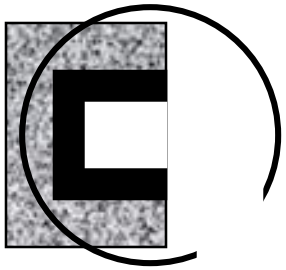
Injection Pump - PES 6A 90D 320 RS 3049
Governor - RSV 300 …750 A1 C 1309 R
Nozzle - 9 430 034 272
Nozzle opening pressure bar **230 - 238**

A specification sheet is available with us.

Design Features

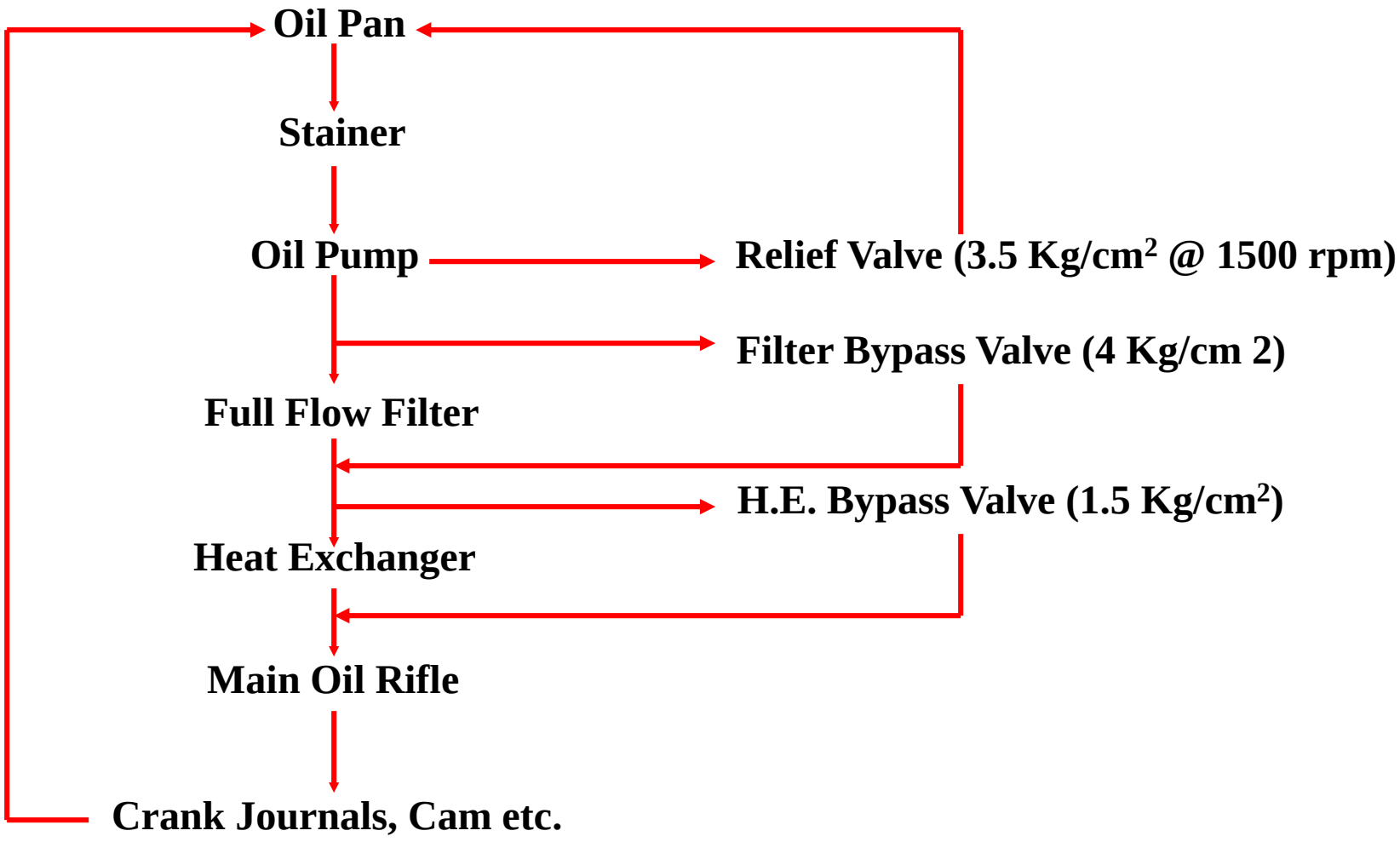
Valve Spring - Made of spring steel, unevenly pitched coil type springs. Double springs are use in 400 & 402/402 type of engines.

Piston & Piston Pin: Aluminum alloy, cam turned and barrel shaped to compensate for thermal expansion, 3 ring piston design, with full floating piston pin retained by snap rings.

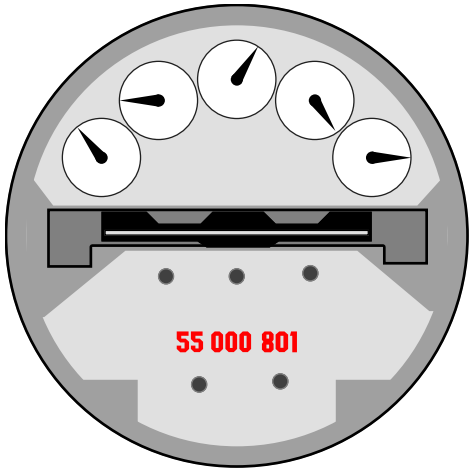


Now let us discuss System Design and Operation starting with Lubricating System

Lubricating System (oil flow)



Lubricating System



Minimum Engine Oil pressure @ 85 0 C

@ rated speed - 4.5 to 4.8 Kg/cm2

@ low idle - 1.2 /1.6 Kg/cm2

Oil Change Intervals

Oil change at 375 Hours or 6 months which ever is earlier

Recommended Oil is 15W40, CF4

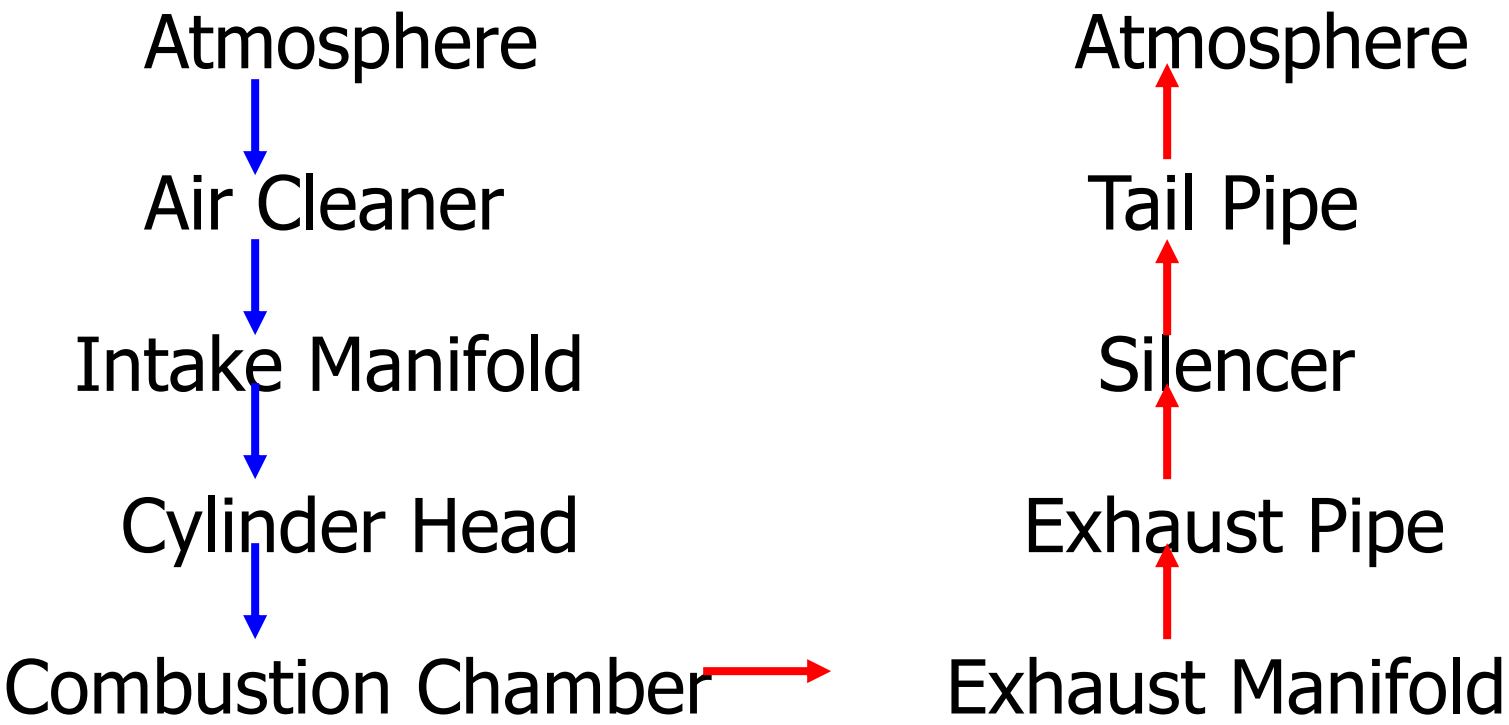
Cooling System

Capacity with radiator - 11 litres

(Water : Ethylene Glycol -- 50:50)

- Cooling system pressure - 0.5 bar (7 psi)
- Operating temperature - 75^0 C to 95^0 C

Air Intake and Exhaust System



Air System

An Oil bath type air cleaner is used for Naturally Aspirated engines with Oil pan capacity 0.600 to 0.650 litre

Dry type air cleaner is used for turbocharged & turbocharged / after cooled engines. For a dry type element, maximum allowable restriction is 25// of water column.

Exhaust System

Maximum exhaust back pressure is 2.0// of Hg.
Maximum exhaust gas temp range at full load is 407°C to 565°C
Minimum exhaust pipe size is 50 mm.

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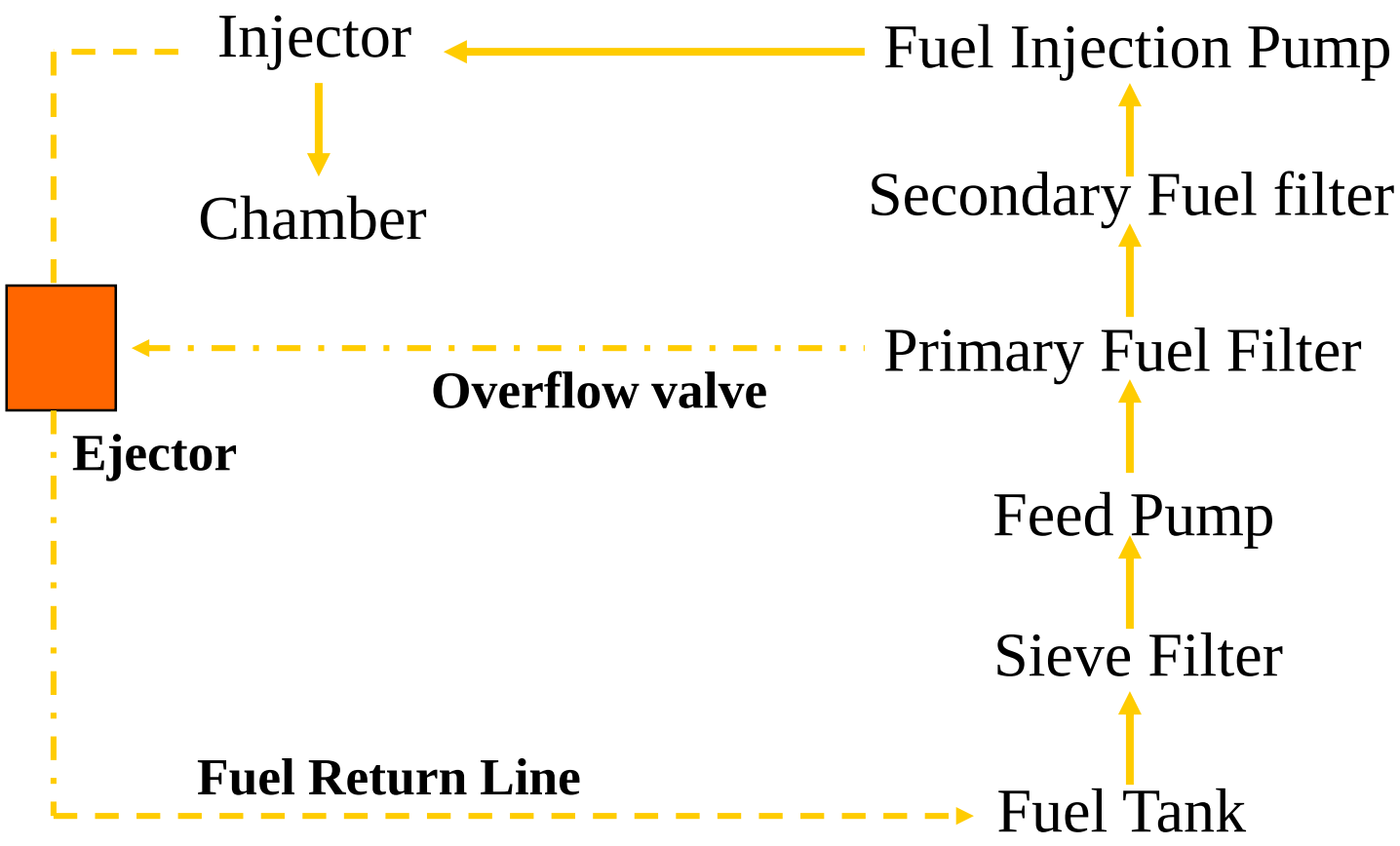
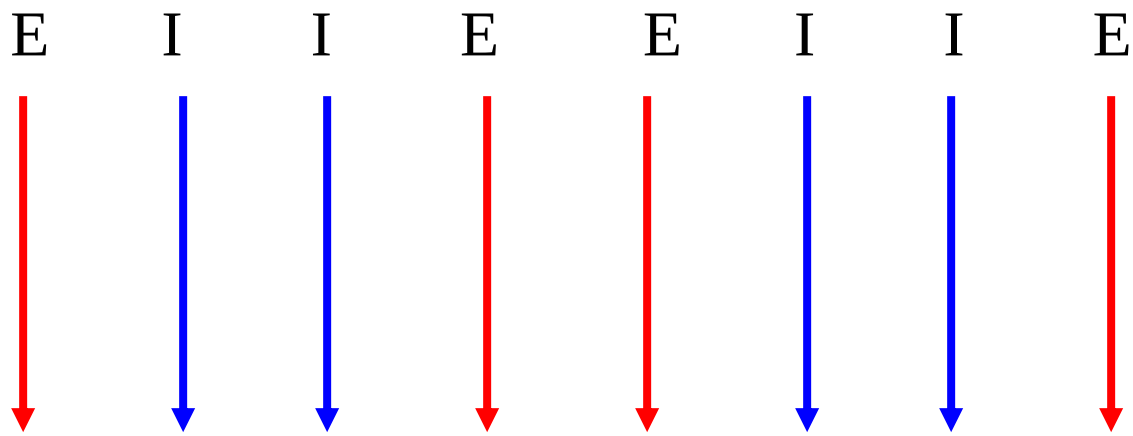
Fuel System (Fuel Flow)



Valve Setting

Valve setting procedure

1. Open inspection window on top of flywheel housing.
2. Rotate crankshaft in clockwise direction to align red-mark on flywheel with pointer (in inspection window)
3. This will bring either # 1 or # 4 piston in T D C of compression stroke
4. For Valve setting # 1 piston has to be in T D C of compression stroke. Confirm by checking that both pushrods of Cylinder No. 1 are free.
5. Adjust clearance of intake and exhaust valves serially for valve No.1,2,3,5 (viewed from engine front end)
6. Rotate Crankshaft 360^0 and set remaining valves



Exhaust & Intake valve location

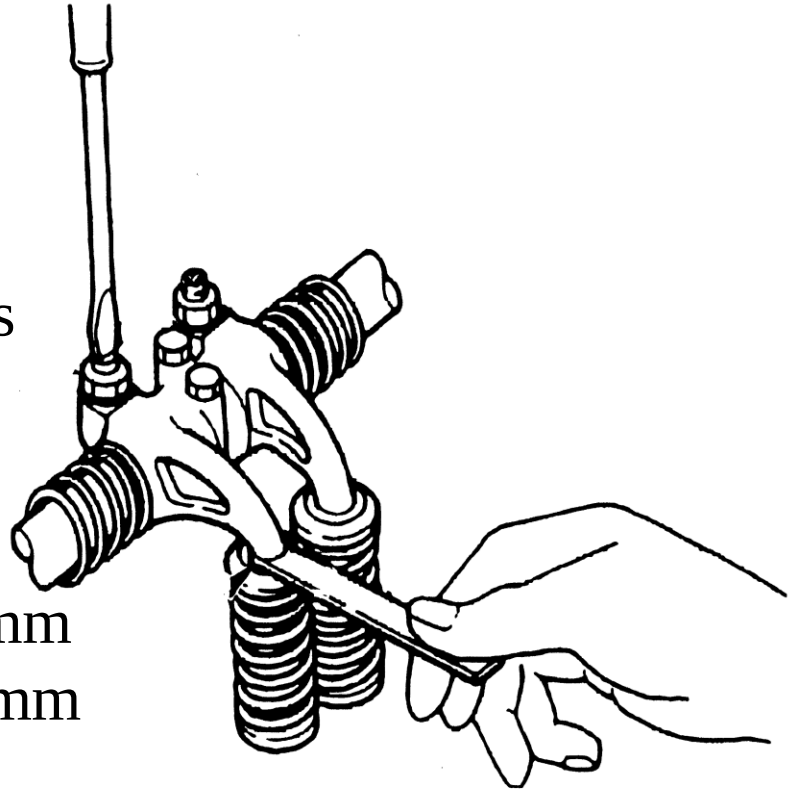
Rocker Lever Assembly Adjustment

Every 600 hrs check or 6 months

Cold setting (50^0 max cooling system temperature)

Tappet clearance Inlet 0.20 mm

Tappet clearance Exhaust 0.30 mm



Fuel Injection Pump -Removal & Fitment

Fuel Injection Pump - Removal

1. Remove all Fuel connections with Fuel Pump
2. Remove mounting capscrews on fuel pump mounting flange mounted on Cylinder Block

Fuel Injection Pump - Fitment

1. Rotate Crankshaft in clockwise direction and bring # 1 piston to 20^0 B T D C. (achieved by aligning yellow mark on flywheel with pointer in inspection window of flywheel housing)
2. Slide Fuel Pump in position ensuring that `notched gear teeth' on F I P Cam gear aligns with pointer (can be viewed by removing breather fitted on Cylinder Block.
3. Follow `spill cut adjustment procedure' for fine adjustment of Fuel Pump

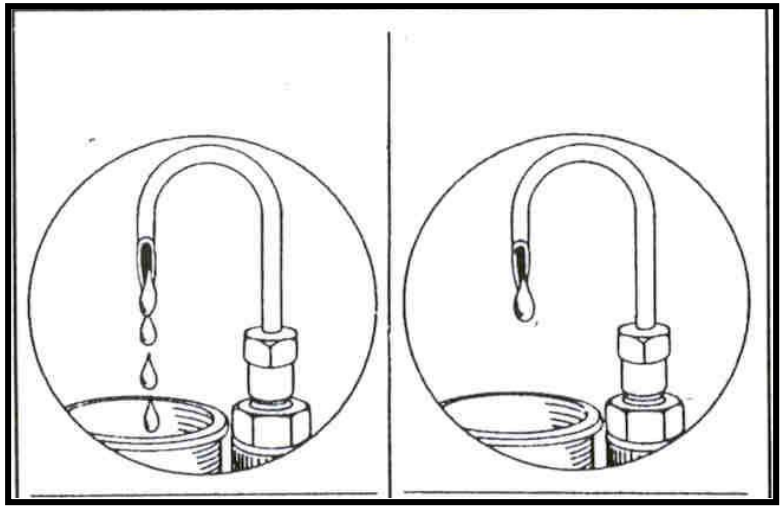
Fuel Injection Pump -Spill Cut Adjustment

Fuel Injection Pump - Spill cut adjustment

1. Remove from Fuel Pump High pressure fuel line, delivery valve holder, P E G, spring and delivery valve of # 1 Cylinder

Fuel Injection Pump -Spill Cut Adjustment

2. Connect `swan neck pipe' to # 1 delivery valve holder to measure fuel drop correctly.
3. Connect Diesel container to supply connection of Fuel Pump (container should be two feet above Fuel pump)
4. Loosen mounting bolts of Fuel Pump body to mounting flange



5. Swivel Fuel Pump body either away towards the engine to ensure one drop of fuel from Swain neck pipe in approximately 20 seconds
6. Tighten fuel pump body cap screw in above position
7. Remove swan neck pipe and diesel container. Connect all connections
8. Ensure proper fitment of delivery valve holder / P E G / spring and delivery valve
9. This completes the timing

Fuel System

- Priming fuel system by Fuel feed pump
- Maximum Suction lift - 1 meter
- Maximum fuel head 4 meters
- Maximum fuel inlet temperature 71^0 C

Scope of supply

Air Intake System

Air intake manifold

Oil bath / dry type air cleaner

Exhaust System

Industrial silencer

Stainless steel clamp

Coolant System

Engine water pump -centrifugal type

Aluminum Radiator - Tata Toyo make with Recovery Bottle

50:50 Ethylene Glycol - First fill along with engine.

Engine mounted radiator

Scope of supply

Lubricating System

Front sump oil pan

Engine mounted lub oil pump and cooler.

Lub oil filter - Replaceable paper Element

First fill along with engine

Fuel System

MICO pump, MICO injector

Fuel filter -Replaceable paper Element

Scope of supply

Starting System

12 V DC electric starter

12 V DC battery charging alternator

Scope of supply

Others

Rear engine support
Front engine support
Present Flywheel is suitable for
Double bearing alternator - with Holset coupling
For Single bearing alternator - with FLEX plate
Engine painted in Green Color (Onan Green).

Channel of Distribution & Aftermarket support

Distribution Channel
Through G - OEMs

Warranty
1 year or 3600 Hrs.

Engine Warranty and Aftermarket support
CDS&S Network

Parts Book
CIL Part book released
Part Nos. will include Telco’s and CIL add on part Nos.

Electrical System

- Electrical System - 12 Volts, - Ve earthing
- Battery - 12 Volts, 120 AH
- Alternator - 35 Amps
- Starter Motor - Flange Mounted

Thank You