

ANDHRA PRADESH STATE ROAD TRANSPORT CORPORATION

No.OP2/462(4)/2000-MED

**Office of the VC & MD,
MSRD:HYDERABAD-20.
Dated : 24.05.2000.**

CIRCULAR NO.17/2000-MED, Dated 24.05.2000

SUB: MAINTENANCE - Introduction of HINO 6E Engines with EURO-0 & 6E EURO-I standards punched chassis frame on Ashok Leyland Vehicles - Instructions issued - Regarding.

INTRODUCTION OF HINO 6E EURO-I AND HINO 6E EURO-0 ENGINES:

M/s Ashok Leyland have introduced HINO 6E Engines with EURO-0 and EURO-I norms on their chassis to meet the environmental emission standards. All future Chassis will be with HINO 6E EURO-I Engines only. Meanwhile we have received some Chassis fitted with HINO 6E EURO-0 and we will be receiving these Engines for some more months. The list of Vehicles sent to Depots upto 25.05.2000 with HINO 6E EURO-0 Engines and HINO 6E EURO-I Engines are enclosed for ready reference. The differences between HINO 6E EURO-0 Engine and HINO 6E EURO-I Engine are FIP, INJECTOR and Injector Pipes.

Some of the major and minor spares related to the above Engines are not interchangeable with the existing Hino 6D Engine and the spares are to be stocked for HINO 6E EURO-0 Engine and HINO 6E EURO-I Engines immediately.

There are some modifications in HINO 6E EURO-0 Engine and HINO 6E EURO-I Engine Vehicles in comparison with the existing HINO 6D Engine Vehicles. To create awareness among the Mechanical Supervisors and staff about the modifications introduced on Ashok Leyland Vehicles fitted with HINO 6E EURO-0 and HINO 6E EURO-I Engines and to maintain these Vehicles properly, the salient features of the Vehicles fitted with above Engines are furnished below.

IDENTIFICATION OF HINO 6E EURO-I ENGINE & HINO 6E EURO-0 Engines:

- 1) The Hino 6E EURO-0 and HINO 6E EURO-I Engines can be identified externally by observing the type of the FIP. The HINO 6E EURO-0 Engine is fitted with MICO FIP type 700 and HINO 6E EURO-I Engine has a ZEXEL FIP. To denote EURO-I Standard EI mark is punched below the Engine number on the cylinder block of HINO 6E EURO-I Engines.
- 2) The inlet manifold is different for HINO 6E EURO-0 ENGINE and HINO 6E EURO-I ENGINE and it is bigger in size as against the existing HINO 6D ENGINE and mounted with 5 studs.
- 3) Diameter of Damper pulley is also more in HINO 6E EURO-0 ENGINE and HINO 6E EURO-I ENGINE as against the HINO 6D ENGINE. The colour is green as compared to 6D Engine which is black.

I. ADVANTAGES OF 6E ENGINES:

**Improved fuel economy.
Reduced exhaust emission,**

II; ENGINE OIL:

API CF4 & MB 228.1 performance level with 15W/40 viscosity grade Engine oil is recommended for the Engines of HINO 6E EURO-I Engines as against the SAE-40 grade in the existing Engine. The following brands of different companies are recommended. For HINO 6E EURO-0 Engines the Engine oil of SAE-40 grade may be used.

| S.No. | MANUFACTURER | COMMERCIAL NAME | VISCOSITY GRADE |
|-------|--------------|-----------------|-----------------|
|-------|--------------|-----------------|-----------------|

| | | | |
|----|------------------------|--------------------|-------|
| 1. | GULF OIL INDIA LIMITED | GULF SUPER FLEET | 15W40 |
| 2. | INDIAN OIL CORPORATION | SERVO PREMIUM CF-4 | 15W40 |
| 3. | HPCL | MILCY POWER | 15W40 |
| 4. | BPCL | MAKCF4 | 15W40 |
| 5. | BHARAT SHELL | RIMULAX | 15W40 |
| 6. | ELF LUBRICANTS | ELF PERFORMANCE 3D | 15W40 |

The total capacity of Engine oil is 10.50 ltrs.

The drain period for Engine oil is 15,000 KMs which is same as that of existing Engine.

III. FIP ALONG WITH FEED PUMP:

ZEXEL type FIP is introduced on 6E EURO-I Engine as against 621/620 type FIP in the existing HINO 6D Engine. There is a difference in the FIP for HINO 6E EURO-0 Engine and HINO 6E EURO-I Engine and the part numbers of FIP are given below:

| | | |
|---------------------------|---|------------------------|
| FOR HINO 6E EURO-0 ENGINE | X | 7424800 (700 MICO FIP) |
| FOR HINO 6E EURO-I ENGINE | X | 7408000 (ZEXEL FIP) |

Due to the change in FIP the parts are not interchangeable with the existing Hino 6D Engine FIP. Further the parts for the above two FIP's i.e., HINO 6E EURO-0 & HINO 6E EURO-I are also not interchangeable.

For ZEXEL FIP which is assembled on 6E Euro-I Engine lift pump with MICO part No.9440610067 is fitted. The part Nos. of both outlet, inlet valves and coil springs are provided at ANNEXURE-I.

IV. INJECTORS:

There is a change in Injectors and injector pipes for HINO 6E EURO-0 Engine and HINO 6E EURO-I Engine to that of existing HINO 6D Engine. Further Injectors and Injector pipes of HINO 6E EURO-0 Engine and HINO 6E EURO-I Engine are also different and not interchangeable.

| SL NO. | DESCRIPTION OF ITEM | FOR 6E EURO-0 PART NUMBER | FOR 6E EURO-I PART NUMBER |
|--------|---------------------|---------------------------|---------------------------|
| 1. | SET OF INJECTOR | 5. INJ ECTOR | 7. INJ ECTOR |
| 2. | INJECTOR PIPE-I | PIPE-IV | PIPE-VI |
| 3. | INJECTOR PIPE-II | 6. INJ ECTOR | |
| 4. | INJECTOR PIPE-III | PIPE-V | |

X 7424900 B 7775502 B
7775503 B 7775504 B
7775505 B 7775506 B
7775507

X 7406300
B 8217201
B 8217202
B 8217203
B 8217204
B 8217205
B 8217206

The Injector opening pressure for both type of Injectors i.e., Injectors fitted on EURO-0 and EURO-I Engines is 220 kg/square cm.

V. INJECTION TIMING:

The injection timing is different for HINO 6E EURO-I i.e., $10.5 + 0.05$ deg and for HINO 6E EURO-0 Engine it is 18 deg as against 20 deg of Hino 6D Engine. Since there is a change in Injection timing the fly wheel is also different and not interchangeable.

VI. OIL COOLER ELEMENT:

Oil cooler element is different for HINO 6E EURO-0 and HINO 6E EURO-I Engines with four plates as against three plates element of existing HINO 6D ENGINE. The heat discipation is more due to increased area of oil cooler element and enhances cooling effect on Engine. The existing three plate cooler element is not interchangeable with HINO 6E ENGINE.

VII. FAN ASSEMBLY:

The fan assembly for HINO 6E EURO-0 Engine and HINO 6E EURO-I Engine is different to the existing fan assembly of HINO 6D ENGINE and is not interchangeable. The diameter of fan for HINO 6E EURO-I and HINO 6E EURO-O Engine is 450 MM as against 430 MM of HINO 6D Engine. The following are the parts for fan assembly of HINO 6E EURO-0 and HINO 6E EURO-I Engines.

| | |
|----------------------|-----------|
| SUB ASSEMBLY | B 7786601 |
| FAN SPACER | X1201702 |
| FAN MOUNTING BOLT | L1011008 |

2
1
6

VIII. FAN BELT:

The length of fan belt has increased for HINO 6E EURO-0 Engine and HINO 6E EURO-I Engine since there is a modification in the alternator bracket and the existing fan belt of HINO 6D Engine is not interchangeable for HINO 6E EURO-0 & HINO 6E EURO-I Engine. Due to the above change the following spares are required.

| | |
|--------------------|-----------|
| ALTERNATOR BRACKET | F 7103622 |
| LINK BOLT | F 3570911 |

The above modification was introduced earlier to the introduction of Hino 6E Engine along with the supplies of punched chassis frame by M/s Ashok Leyland irrespective of ENGINE i.e., HINO 6D, HINO 6E EURO-0 and HINO 6E EURO-I ENGINES.

B) INTRODUCTION OF PUNCHED CHASSIS FRAME ON ASHOK LEYLAND VEHICLES:

M/s Ashok Leyland Limited have introduced punched chassis frame on their Vehicles as a part of product development. In the above modification, the side members are pressed and holes punched as against rolling and hole drilling process. M/s Ashok Leyland have standardized the fitment of punched chassis frames on their Vehicles and supplied to APSRTC with effect from Dec '99 irrespective of type of Engine fitted and future delivery of chassis is only with punched chassis frames.

On the introduction of punched chassis frames on Ashok Leyland Vehicles, the following are the modifications.

FRONT CROSS MEMBER : Pressed front cross member with rivetted end gussets is provided, resulting in lowering Engine and Radiator, there by visibility for drivers has improved and the transmission noise has reduced comparatively.

CENTRE BEARING X MEMBER : Channel type cross member with modified Centre bearing mounting brackets are provided to suit the lowered Engine.

ENGINE MOUNTING BRACKETS : Altered to suit lowered Engine.

RADIATOR STAY ROD : Radiator stay rod is modified for easy maintenance.

EXHAUST PIPINGS : Altered to suit lowered Engine.

PROPELLER SHAFT ASSEMBLIES : Length of P.P. shafts is altered suitably to take care of improved drive angle.

CAB MOUNTING BRACKETS: Broader and wider mounting brackets with 4 bolts are provided as against small brackets with 2 bolts to ensure better support.

STEERING BOX MOUNTING: Out trigger cast iron brackets are introduced as against fabricated brackets. Single UJ steering column is introduced as against rigid column to minimise road shocks and to improve driving comfort.

AIR TANKS: Air tanks are relocated on RH side as against LH side of earlier drilled chassis frame Vehicles.

FUEL TANK: Fuel tank is shifted towards rear side in RH.

With the above information, the identification of punched chassis frames is very easy. The list of unique spares required for punched chassis frame Vehicles is enclosed at ANNEXURE-III for reference.

We have requested M/s Ashok Leyland Limited to organize training programmes for Mechanical Supervisors and staff at Depot level to cover all the Depots of Leyland area on the maintenance of HINO 6E EURO-0 and HINO 6E EURO-I Engine Vehicles with punched chassis frames along with bare chassis to give practical demonstration to update the knowledge on new introductions.

The consumable spares required for Hino 6E EURO-0 Engine and Hino 6E EURO-I Engine Vehicles with punched chassis frames are identified for stocking at Depots and Leyland warehouse separately to maintain these Vehicles effectively. The List of spares required for stocking at Depots is enclosed at ANNEXURE- I.

Dy.CMEs of Leyland area are advised to organize the training programmes for Supervisors and Staff and ensure to update their knowledge on the new product in respect of maintenance aspects.

The Controller of Stores of Leyland area are advised to arrange to procure the spares required as per the list enclosed and supply to Depots immediately. They are also advised to procure and ensure to supply Engine oil of recommended grade/brands as per the requirement to the Depots along with the spares mentioned above.

The COS's/WM's of Leyland area are advised to place indent on M/s Leyland, warehouse, whenever spares required other than Depot stock items. The list of items to be stocked in the warehouse of Ashok Leyland for HINO 6E EURO-0, HINO 6E EURO-I ENGINES with Punched chassis frame Vehicles is at ANNEXURE-II & III.

The Dy.CMEs of Leyland area are also advised to coordinate with the COS's of the concerned to ensure the stocking of spares at the Depots.

Further, the Dy.CMEs are advised to fix the limits for the spares required for HINO 6E EURO-0 Engine and HINO 6E EURO-I Engine Vehicles with punched chassis frames in the Limits Fixation Committee meeting after observing the consumption pattern for at least 3 months.

The WMs of Leyland Workshops are advised to co-ordinate with the COS of the concerned and ensure the stocking of spares required at the Workshops to carry out urgent repair works.

All Depot Managers and garage in charges of Leyland area re advised to note the above changes on the Leyland Vehicles fitted with HINO 6E EURO-0 Engine, HINO 6E EURO-I Engine with punched chassis frames compared to the existing HINO 6D Engine Vehicles with drilled hole chassis frames and educate the staff on these changes to maintain the Vehicles correctly.

The Depot managers are also advised to arrange to mark as "6E EURO-0" on Vehicles fitted with HINO EURO-0 Engine Vehicles and " 6E EURO-I " on Vehicles fitted with HINO 6E EURO-I Vehicles on the front portion near side with paint for easy identification of Vehicles during the course of maintenance at Depots.

**Sd/-
(P.ARJUNA)**

EXECUTIVE DIRECTOR(Engg)

// Attested by //

**Sd/-
(M.V.NAGAVENDER RAO)
Chief Mechanical Engineer (O)**

ANNEXURE-1**LIST OF PAST MOVING SPARES TO BE STOCKED AT DEPOTS FOR HINO
6E EURO - O ENGINE AND HINO 6E EURO-I ENGINE VEHICLES**

| SL NO. | DESCRIPTION REMARKS | PART NUMBER | QTY./ 10VEH. PER YEAR | |
|-----------------------------------|------------------------|-------------------------------|--------------------------|-------|
| FOR HINO 6E EURO-0 ENGINE: | | | | |
| 1. | INJECTOR PIPE - I | B 7775502 | ONE | ADHOC |
| 2. | INJECTOR PIPE - II | B 7775503 | ONE | ADHOC |
| 3. | INJECTOR PIPE - III | B 7775504 | ONE | ADHOC |
| 4. | INJECTOR PIPE - IV | B 7775505 | ONE | ADHOC |
| 5. | INJECTOR PIPE - V | B 7775506 | ONE | ADHOC |
| 6. | INJECTOR PIPE - VI | B 7775507 | ONE | ADHOC |
| 7. | FAN BELT (V-BELT) | F 0331250 | FOUR | ADHOC |
| FOR HINO 6E EURO-I ENGINE: | | | | |
| 1. | INJECTOR PIPE - I | B 8217201 | ONE | ADHOC |
| 2. | INJECTOR PIPE - II | B 8217202 | ONE | ADHOC |
| 3. | INJECTOR PIPE - III | B 8217203 | ONE | ADHOC |
| 4. | INJECTOR PIPE - IV | B 8217204 | ONE | ADHOC |
| 5. | INJECTOR PIPE - V | B 8217205 | ONE | ADHOC |
| 6. | INJECTOR PIPE - VI | B 8217206 | ONE | ADHOC |
| 7. | FAN BELT (V-BELT) | F 0331250 | FOUR | ADHOC |
| 8. | VALVE FOR LIFT PUMP | 9441610010 (MICO PART No.) | TWO | ADHOC |
| 9. | SPRING FOR LIFT PUMP | 9441610011 (MICO PART No.) | TWO | ADHOC |

NOTE: FAN BELT IS COMMON FOR 6E EURO-0, 6E EURO-I AND HINO 6D
ENGINES WITH PUNCHED CHASSIS)

ANNEXURE-II

**LIST OF SPARES TO BE STOCKED AT LEYLAND WARE HOUSE FOR
HINO 6E EURO-0 & 6EURO-I ENGINES**

| SL NO. | DESCRIPTION | PART NUMBER | ADHOC QTY. REQUIRED PER 10 VEH./YEAR |
|-----------|--|----------------|--|
| 1. | FIP FOR HINO 6E EURO-0 ENGINE | X 7424800 | E-2 Nos. |
| 2. | INJECTOR SET 6 NOS. FOR HINO 6E EURO-0 ENGINE | X 7424900 | E-2 Sets |
| 3. | FIP FOR HINO 6E EURO-I ENGINE | X 7404800 | E-2 Sets |
| 4. | INJECTOR SET 6 NOS. FOR HINO 6E EURO-I ENGINE | X 7406300 | E-2 Sets |
| 5. | SUB ASSEMBLY CYLINDER BLOCK | B 7774802 | E-4 Nos. |
| 6. | PISTON 6 NO.S | F 4233342 | E-2 Sets |
| 7. | ENGINE SET | P0931151 | E-2 Nos. |
| 8. | CRANK SHAFT | F 3349611 | E-1 No |
| 9. | INLET MANIFOLD | X1831142 | E-2 No. |
| 10. | INTAKE PIPE | X1904942 | E-2 Nos. |
| 11. | STUD AC MOUNTING | F3769215 | E-4 Nos. |
| 12. | TIMER COVER | F 1137522 | E-2 Nos. |
| 13. | STUD TIMER COVER | F 3769515 | E-4 Nos. |
| 14. | PLUG TIMER HOLE | F 3147315 | E-2 Nos. |
| 15. | FLANGE COUPLING | F 1437911 | E-2 Nos. |
| 16. | SUB ASSEMBLY OF PIPE OIL COM .TIMER | B 7007705 | E-2 Nos. |
| 17. | SUB ASSEMBLY FLY WHEEL (FOR 6E EURO-0) | B 7769601 | E-1 No. |
| 18. | SUB ASSEMBLY FLY WHEEL (FOR 6E EURO-I) | B 8217401 | E-1 No. |
| 19. | SUB ASSEMBLY OIL COOLER | B 7786301 | E-2 Nos. |
| 20. | OIL COOLER ELEMENT | F 7824800 | E-2 Nos. |
| 21. | SUB ASSEMBLY FAN | B 7786601 | E-4 Nos. |
| 22. | FAN MOUNTING BOLT | L1011008 | E-12 Nos. |
| 23. | SPACER | X1201702 | E-2 Nos. |
| 24. | BOLT SPACER MOUNTING | X3533211 | E-2 Nos. |
| 25. | SUB ASSEMBLY COMP. OUTLET PIPE | B 4348201 | E-2 Nos. |
| 26. | BANJO BOLT FOR COMP.LUBE PIPE | F 3575511 | E-6 Nos. |
| 27. | LINK BOLT | F3570911 | E-10 Nos. |
| 28. | V - BELT (FAN BELT) | F 0331250 | E-20 Nos. |
| 29. | ALTERNATOR BRACKET | F 7103622 | E-4 Nos. |
| 30. | DAMPER PULLY | X 3964300 | E-1 No. E- |
| 31. | FIP KIT(FOR 6E EURO-I ENGINE) | P0938651 | 2 Nos. E-2 |
| 32. | FIP KIT(FOR 6E EURO-0 ENGINE) | P0928651 | Nos. E-2 |
| 33. | FIP REAR SUPPORT | X0407910 | Nos. |

ANNEXURE-III

**LIST OF SPARES REQUIRED FOR PUNCHED CHASSIS FRAME VEHICLES
OTHER THAN ENGINE TO BE STOCKED AT WAREHOUSE, ASHOK LEYLAND**

| SL NO. | DESCRIPTION | PART NUMBER | ADHOC QTY. REQUIRED PER 10 VEH./YEAR |
|-------------------------------|-------------------------------|-------------|--------------------------------------|
| I. FRAME: | | | |
| 1. | FRAME ASSEMBLY | A 8107800 | E-1 |
| 2. | SIDE MEMBER RH | F 7599713 | E-1 |
| 3. | SIDE MEMBER LH | F 7599813 | E-1 |
| 4. | END GUSSET | F 4610810 | Not necessary |
| 5. | CENTRE BEARING X MEMBER | B 8105403 | E-2 |
| 6. | REAR FLITCH LH | F 7522614 | Not necessary |
| 7. | REAR FLITCH RH | F 7522714 | Not necessary |
| 8. | FRONT X MEMBER | B 1088504 | E-2 |
| 9. | ENGINE MOUNTING BRACKET RH | X 0415910 | E-2 |
| 10. | ENGINE MOUNTING BRACKET LH | X 0416010 | E-2 |
| 11. | ENGINE MOUNTING FLITCH RH | F 7522514 | E-2 |
| 12. | ENGINE MOUNTING FLITCH LH | F 7522814 | E-2 |
| 13. | RADIATOR MOUNTING BRACKET RH | F 8057010 | E-4 |
| 14. | RADIATOR MOUNTING BRACKET LH | F 8057110 | E-4 |
| 15. | GUSSET RH | F 8057910 | E-1 |
| 16. | GUSSET LH | F 8058010 | E-1 |
| 17. | BUSH | X 0503815 | E-6 |
| II. STEERING GEAR: | | | |
| 18. | STEERING BOX MOUNTING BRACKET | F 7114222 | E-1 |
| 19. | DROP ARM | F 3213311 | E-1 |
| 20. | CLAMP | F 0401310 | E-2 |
| 21. | SUB ASSEMBLY SUPPORT BRACKET | B 2229404 | E-1 |
| 22. | STEERING COLUMN BRACKET | B 2290208 | E-1 |
| | | 2 | |
| | | 2 | |
| | | 1 | |
| 23. | SUPPORT BRACKET | B 2217101 | E-1 |
| 24. | STEERING COLUMN | F 8051900 | E-1 |
| 26. | STEERING GEAR | B 2213306 | E-1 |
| III. OPERATING PEDALS: | | | |
| 27. | SUB ASSEMBLY OF PEDAL BRACKET | B 3627904 | E-2 |
| 28. | DISTANCE BUSH | F 1298115 | E-2 |
| 29. | CLUTCH LEVEL BRACKET | B 3627902 | E-2 |
| 30. | RELAY SHAFT | F 3366215 | E-2 |

IV. PROPELLER SHAFT:

| | | | |
|-----|--------------------------------|-----------------|----------|
| 31. | FRONT & MIDDLE PROPELLER SHAFT | F 8049000 | E-2 sets |
| 32. | REAR PROPELLER SHAFT | F 8048000 | E-2 |
| 33. | CENTRE BEARING BRACKET | FRONT F 8057210 | E-4 |
| 34. | CENTRE BEARING BRACKET | REAR F 8031610 | E-4 |

V. CAB MOUNTING:

| | | | |
|-----|---------------------------|----------------|-----|
| 35. | SUB ASSEMBLY CAB MOUNTING | RH B 0120407 | E-1 |
| 36. | SUB ASSEMBLY CAB MOUNTING | LH B 0120405 | E-1 |
| 37. | CAB MOUNTING BRACKET | REAR B 0120406 | E-1 |

VI. EXHAUST PIPING:

| | | | |
|-----|--------------|------------|-----|
| 38. | EXHAUST PIPE | B4503501 F | E-2 |
| 39. | TAIL PIPE | 1913710 | E-2 |

VII. RADIATOR MOUNTING:

| | | | |
|-----|---------------------------|--------------|-----|
| | | B 1101601 | E-4 |
| | | B 1101602 | E-4 |
| 40. | SUB ASSEMBLY STAY ROD | RH B 1101603 | E-4 |
| 41. | SUB ASSEMBLY STAY ROD | LH B 1101604 | F-4 |
| 42. | SUB ASSEMBLY STAY BRACKET | RH | |
| 43. | SUB ASSEMBLY STAY BRACKET | LH | |

VIII. CONTROL GEAR (FOR GB 13):

| | | | |
|-----|----------------------------|-----------|-----|
| 44. | CONTROL SHAFT | B 3701301 | E-2 |
| 45. | SUB ASSEMBLY CONTROL TUBE | B 3722701 | E-2 |
| 46. | SUB ASSEMBLY CONTROL SHAFT | B 3722702 | E-2 |

IX. AIR PIPING: (UNIQUE SPARES)

| | | | |
|-----|---|------------------------|------------|
| 47. | PIPE COMPRESSOR TO HOSE | B4308612 | F 2 |
| 48. | S/A PIPE UNION TO UNLOADER VALVE | B4308602 4308606 | E-2 E-2 |
| 49. | S/A OF PIPE UNION TO TEE1 | | E-2 |
| 50. | S/A OF PIPE TEE1 TO FRONT BRAKE ELOWB LH | B 4308607 | E-2 |
| 51. | S/A OF PIPE TEE 1 TO FRONT BRAKE ELBOW RH | B 4308608 | E-2 |
| 52. | S/A OF PIPE - UNION TO UNION | | |
| 53. | S/A OF PIPE - UNION TO UNION | B 4308612 | E-2 |
| 54. | S/A OF PIPE - UNION TO TEE2 | B 4308613 | E-2 |
| 55. | S/A PIPE UNION TO TEE3 | B 4308614 B 4308622 | E-2 E-2 |

X. FUEL PIPING: (UNIQUE SPARES)

| | | | |
|-----|---|--------------|----|
| 56. | BRACKET ON CLUTCH HOUSING | F7635214 E2 | |
| 57. | S/A OF SUPPLY PIPE ADAPTER TO FUEL PIPE | B4482604 | E2 |
| 58. | RETURN HOSE FUEL PUMP TO FUEL TANK | F 1937660 | E2 |
| 59. | RUBBER CROMETE FOR FUEL RETURN HOSE | F1133850 | |
| 60. | CLIP FOR SUPPLY PIPES | F0830110 E-4 | |
| 61. | CLIP FOR SUPPLY PIPE | F0830310 E-2 | |
| 62. | CLIP | F0831310 E-4 | |

| | | | |
|-----|---|-----------|-----|
| 63. | L - BRACKET | F 0466414 | E-2 |
| 64. | NYLON STRAP | F 0634600 | E-2 |
| 65. | S/A OF SUPPLY PIPE - FUEL TANK TO ADAPTER ON FRAME | B 4482601 | E-2 |
| 66. | S/A OF SUPPLY PIPE - ADAPTER TO UNION | B 4482602 | E-2 |
| 67. | S/A OF SUPPLY PIPE - UNION TO ADAPTER | B 4482603 | E-2 |

NOTE: PART NOS. OF THE OTHER SPARES REQUIRED IN THE SYSTEMS
OF AIR PIPING AND FUEL PIPING ARE NOT CHANGED.